ASTI

Miniature circuit breakers 14

Residual current circuit breakers 35

Residual current circuit breakers with integral overcurrent protection 46

Technical data 58

Miniature circuit breakers and residual current devices



ETI Power needs control

MCBs - Miniature circuit breakers ETIMAT

Advantages of miniature circuit breakers ETIMAT 6

→ Sealing possibility



→ "ON/OFF" mark on the switch button



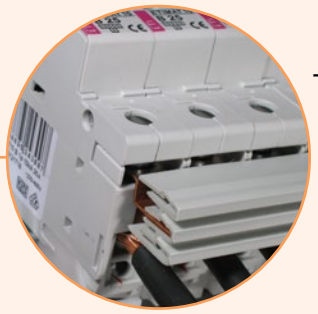


→ Option of mounting auxiliary devices (auxiliary switch, shunt trip)



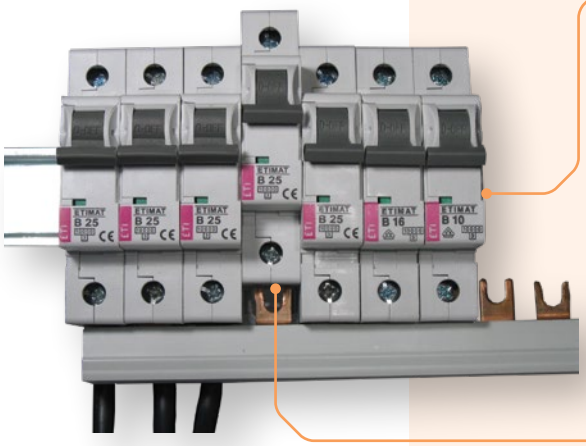


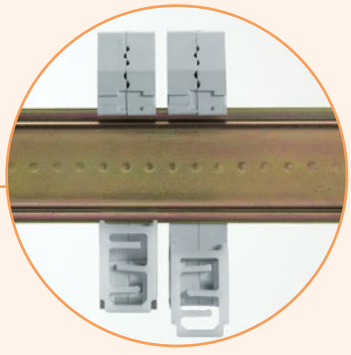
→ Better protection of terminals against touching the parts under voltage



→ Double connection possibility

→ Every product is marked with EAN Code





→ New method of mounting on the DIN rail and simple replacement

Miniature circuit breaker ETIMAT 6

Rated short-circuit capacity	Rated current	Tripping characteristic
6 kA	**0,5 - 63 A**	**B, C, D**

1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
0,5	230/400	/	002141501	002161501	115	12/108
1	230/400	002111509	002141504	002161504	115	12/108
1,6	230/400	/	002141507	002161507	115	12/108
2	230/400	002111510	002141508	002161508	115	12/108
3	230/400	/	002141509	/	115	12/108
4	230/400	002111511	002141510	002161510	115	12/108
6	230/400	002111512	002141512	002161512	112	12/108
10	230/400	002111514	002141514	002161514	112	12/108
13	230/400	002111515	002141515	002161515	112	12/108
16	230/400	002111516	002141516	002161516	112	12/108
20	230/400	002111517	002141517	002161517	112	12/108
25	230/400	002111518	002141518	002161518	112	12/108
32	230/400	002111519	002141519	002161519	112	12/108
40	230/400	002111520	002141520	002161520	112	12/108
50	230/400	002111521	002141521	002161521	123	12/108
63	230/400	002111522	002141522	002161522	123	12/108



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
0,5	230	/	002142501	002162501	232	6/54
1	230	002112509	002142504	002162504	232	6/54
1,6	230	/	002142507	002162507	232	6/54
2	230	002112510	002142508	002162508	232	6/54
3	230	/	002142509	/	232	6/54
4	230	002112511	002142510	002162510	232	6/54
6	230	002112512	002142512	002162512	227	6/54
10	230	002112514	002142514	002162514	227	6/54
13	230	002112515	002142515	002162515	227	6/54
16	230	002112516	002142516	002162516	227	6/54
20	230	002112517	002142517	002162517	227	6/54
25	230	002112518	002142518	002162518	227	6/54
32	230	002112519	002142519	002162519	227	6/54
40	230	002112520	002142520	002162520	227	6/54
50	230	002112521	002142521	002162521	245	6/54
63	230	002112522	002142522	002162522	245	6/54



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
0,5	400	/	002143501	002163501	232	6/54
1	400	002113509	002143504	002163504	232	6/54
1,6	400	/	002143507	002163507	232	6/54
2	400	002113510	002143508	002163508	232	6/54
3	400	/	002143509	/	232	6/54
4	400	002113511	002143510	002163510	232	6/54
6	400	002113512	002143512	002163512	227	6/54
10	400	002113514	002143514	002163514	227	6/54
13	400	002113515	002143515	002163515	227	6/54
16	400	002113516	002143516	002163516	227	6/54
20	400	002113517	002143517	002163517	227	6/54
25	400	002113518	002143518	002163518	227	6/54
32	400	002113519	002143519	002163519	227	6/54
40	400	002113520	002143520	002163520	227	6/54
50	400	002113521	002143521	002163521	245	6/54
63	400	002113522	002143522	002163522	245	6/54



Technical data on page 58



3-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
0,5	400	/	002145501	002164501	354	4/36
1	400	002115509	002145504	002164504	354	4/36
1,6	400	/	002145507	002164507	354	4/36
2	400	002115510	002145508	002164508	354	4/36
3	400	/	002145509	/	354	4/36
4	400	002115511	002145510	002164510	354	4/36
6	400	002115512	002145512	002164512	345	4/36
10	400	002115514	002145514	002164514	345	4/36
13	400	002115515	002145515	002164515	345	4/36
16	400	002115516	002145516	002164516	345	4/36
20	400	002115517	002145517	002164517	345	4/36
25	400	002115518	002145518	002164518	345	4/36
32	400	002115519	002145519	002164519	345	4/36
40	400	002115520	002145520	002164520	345	4/36
50	400	002115521	002145521	002164521	372	4/36
63	400	002115522	002145522	002164522	372	4/36



3-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
0,5	400	/	002146501	002165501	469	3/27
1	400	002116509	002146504	002165504	469	3/27
1,6	400	/	002146507	002165507	469	3/27
2	400	002116510	002146508	002165508	469	3/27
3	400	/	002146509	/	469	3/27
4	400	002116511	002146510	002165510	469	3/27
6	400	002116512	002146512	002165512	459	3/27
10	400	002116514	002146514	002165514	459	3/27
13	400	002116515	002146515	002165515	459	3/27
16	400	002116516	002146516	002165516	459	3/27
20	400	002116517	002146517	002165517	459	3/27
25	400	002116518	002146518	002165518	459	3/27
32	400	002116519	002146519	002165519	459	3/27
40	400	002116520	002146520	002165520	459	3/27
50	400	002116521	002146521	002165521	493	3/27
63	400	002116522	002146522	002165522	493	3/27

The circuit breakers type ETIMAT 6 / 3-pole + N are suitable for use as 4-pole circuit breakers

Miniature circuit breaker ETIMAT 1N

Rated short-circuit capacity	Rated current	Tripping characteristic
6 kA	**6 - 32 A**	**B, C**

ETIMAT 1N

I_n [A]	Code No. B	Code No. C	Packaging [pcs]
6	002191101	002191121	12/108
10	002191102	002191122	12/108
13	002191103	002191123	12/108
16	002191104	002191124	12/108
20	002191105	002191125	12/108
25	002191106	002191126	12/108
32	002191107	002191127	12/108

Description
Miniature circuit breaker ETIMAT 1N is a device with protected line pole and switched neutral pole.

Advantages:

- 1-pole+N in single housing
- Sealing possibility
- Indication of contacts' state
- New method of mounting on the DIN rail and simple replacement



Accessories for ETIMAT 6

PS ETIMAT is an auxiliary switch used for remote signalling of the MCB to which it is fixed. PS ETIMAT may also be fixed later of the state. Clamps are safe to touch. External dimensions comply with MCB, built-in width is 0,5 module (9 mm). During fitting, the MCB must be switched off.



Auxiliary switch PS ETIMAT

Code No.	Type	contacts	Weight [g]	Packaging [pcs]
002159031	PS ETIMAT 10 - MD	NO + NC	35	1/12
002159032	PS ETIMAT 10 - M	1 x NC	30	1/12
002159033	PS ETIMAT 10 - D	1 x NO	30	1/12

DA ETIMAT shunt trip release is fixed to the right side of the miniature circuit breaker ETIMAT for remote release of the MCB. Dimensions correspond to those of MCB ETIMAT.



Shunt trip release DA ETIMAT

	Code No.	Weight [g]	Packaging [pcs]
DA ETIMAT 10 230 V AC/DC	002159301	110	1/54
DA ETIMAT 10 48 V AC/DC	002159311	110	1/54
DA ETIMAT 10 24V AC/DC	002159312	110	1/54

Sealing piece ETIMAT

Code No.	Weight [g]	Packaging [pcs]
002159041	2	12



Marking cover ETIMAT

Code No.	Packaging [pcs]
002159051	12

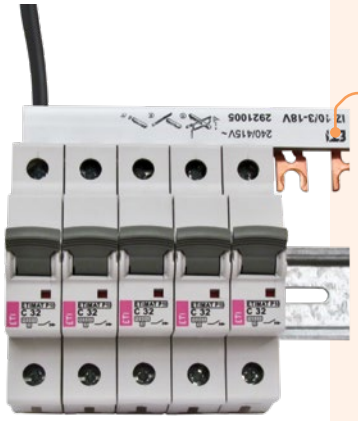


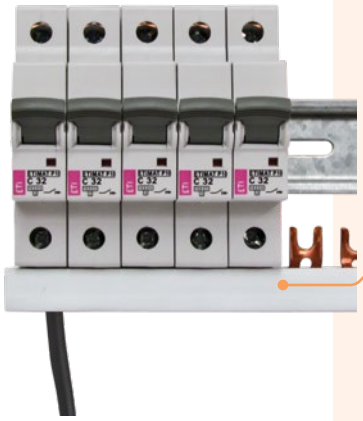
High breaking capacity MCB ETIMAT P10

→ New method of mounting on the DIN rail and simple replacement

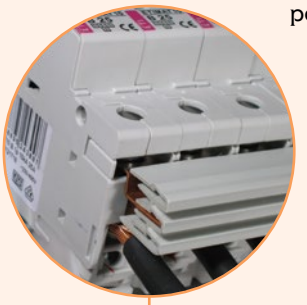


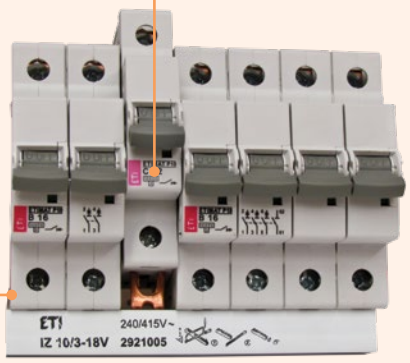
→ Supply possibility:
- top
- bottom



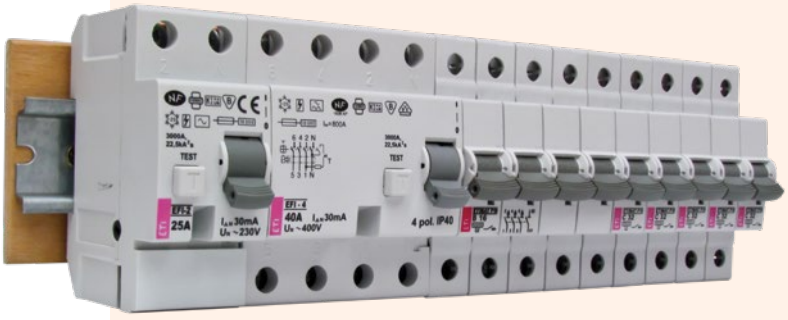


→ Double connection possibility





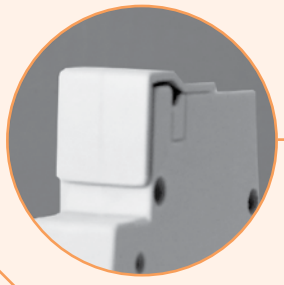
→ Every product is marked with EAN Code



→ Totally renewed, these products replace the ETIMAT 11 series and perfectly integrate with the ASTI product range, starting with identical profile which lends to a coordinated and streamlined look to the installation.

Other features

→ Terminal cover



→ "ON/OFF" mark on the switch button

→ Sealing possibility in ON and OFF position





→ Indication of contacts' state

→ Locking device





→ Better protection of terminals against touching the parts under voltage

Miniature circuit breaker ETIMAT P10

Rated short-circuit capacity	Rated current	Tripping characteristic
10 kA	**0,5 - 63 A**	**B, C, D, K, Z**



1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	230/400	/	270501104	270502105	270503106	270504107	124	12/60
1	230/400	270100101	270101102	270102103	270103104	270104105	124	12/60
2	230/400	270200104	270201105	270202106	270203107	270204108	124	12/60
3	230/400	270300107	270301108	270302109	270303100	270304101	124	12/60
4	230/400	270400100	270401101	270402102	270403103	270404104	124	12/60
6	230/400	270600106	270601107	270602108	270603109	270604100	124	12/60
10	230/400	271000109	271001100	271002101	271003102	271004103	121	12/60
13	230/400	271300108	271301109	271302100	271303101	271304102	121	12/60
16	230/400	271600107	271601108	271602109	271603100	271604101	121	12/60
20	230/400	272000100	272001101	272002102	272003103	272004104	121	12/60
25	230/400	272500105	272501106	272502107	272503108	272504109	121	12/60
32	230/400	273200107	273201108	273202109	273203100	273204101	121	12/60
40	230/400	274000102	274001103	/	/	/	130	12/60
50	230/400	275000103	275001104	/	/	/	130	12/60
63	230/400	276300103	276301104	/	/	/	130	12/60



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	230	/	270511101	270512102	270513103	270514104	249	6/30
1	230	270110108	270111109	270112100	270113101	270114102	249	6/30
2	230	270210101	270211102	270212103	270213104	270214105	249	6/30
3	230	270310104	270311105	270312106	270313107	270314108	249	6/30
4	230	270410107	270411108	270412109	270413100	270414101	249	6/30
6	230	270610103	270611104	270612105	270613106	270614107	249	6/30
10	230	271010106	271011107	271012108	271013109	271014100	245	6/30
13	230	271310105	271311106	271312107	271313108	271314109	245	6/30
16	230	271610104	271611105	271612106	271613107	271614108	245	6/30
20	230	272010107	272011108	272012109	272013100	272014101	245	6/30
25	230	272510102	272511103	272512104	272513105	272514106	245	6/30
32	230	273210104	273211105	273212106	273213107	273214108	245	6/30
40	230	274010109	274011100	/	/	/	261	6/30
50	230	275010100	275011101	/	/	/	261	6/30
63	230	276310100	276311101	/	/	/	261	6/30



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	400	/	270521108	270522109	270523100	270524101	249	6/30
1	400	270120105	270121106	270122107	270123108	270124109	249	6/30
2	400	270220108	270221109	270222100	270223101	270224102	249	6/30
3	400	270320101	270321102	270322103	270323104	270324105	249	6/30
4	400	270420104	270421105	270422106	270423107	270424108	249	6/30
6	400	270620100	270621101	270622102	270623103	270624104	249	6/30
10	400	271020103	271021104	271022105	271023106	271024107	245	6/30
13	400	271320102	271321103	271322104	271323105	271324106	245	6/30
16	400	271620101	271621102	271622103	271623104	271624105	245	6/30
20	400	272020104	272021105	272022106	272023107	272024108	245	6/30
25	400	272520109	272521100	272522101	272523102	272524103	245	6/30
32	400	273220101	273221102	273222103	273223104	273214108	245	6/30
40	400	274020106	274021107	/	/	/	261	6/30
50	400	275020107	275021108	/	/	/	261	6/30
63	400	276320107	276321108	/	/	/	261	6/30

Miniature circuit breakers

3-pole

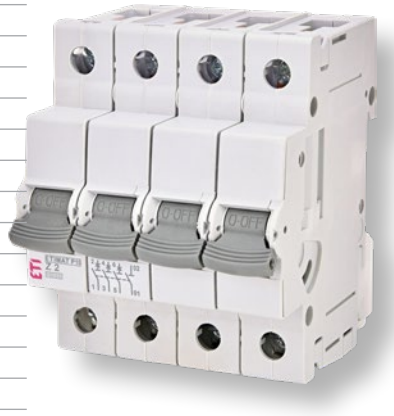
I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	400	/	270531105	270532106	270533107	270534108	377	4/20
1	400	270130102	270131103	270132104	270133105	270134106	377	4/20
2	400	270230105	270231106	270232107	270233108	270234109	377	4/20
3	400	270330108	270331109	270332100	270333101	270334102	377	4/20
4	400	270430101	270431102	270432103	270433104	270434105	377	4/20
6	400	270630107	270631108	270632109	270633100	270634101	377	4/20
10	400	271030100	271031101	271032102	271033103	271034104	367	4/20
13	400	271330109	271331100	271332101	271333102	271334103	367	4/20
16	400	271630108	271631109	271632100	271633101	271634102	367	4/20
20	400	272030101	272031102	272032103	272033104	272034105	367	4/20
25	400	272530106	272531107	272532108	272533109	272534100	367	4/20
32	400	273230108	273231109	273232100	273233101	273234102	367	4/20
40	400	274030103	274031104	/	/	/	393	4/20
50	400	275030104	275031105	/	/	/	393	4/20
63	400	276330104	276331105	/	/	/	393	4/20



The circuit breakers type ETIMAT P10 / 3-pole + N are suitable for use as 4-pole circuit breakers

3-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	400	/	270541102	270542103	270543104	270544105	500	3/15
1	400	270140109	270141100	270142101	270143102	270144103	500	3/15
2	400	270240102	270241103	270242104	270243105	270244106	500	3/15
3	400	270340105	270341106	270342107	270343108	270344109	500	3/15
4	400	270440108	270441109	270442100	270443101	270444102	500	3/15
6	400	270640104	270641105	270642106	270643107	270644108	500	3/15
10	400	271040107	271041108	271042109	271043100	271044101	488	3/15
13	400	271340106	271341107	271342108	271343109	271344100	488	3/15
16	400	271640105	271641106	271642107	271643108	271644109	488	3/15
20	400	272040108	272041109	272042100	272043101	272044102	488	3/15
25	400	272540103	272541104	272542105	272543106	272544107	488	3/15
32	400	273240105	273241106	273242107	273243108	273244109	488	3/15
40	400	274040100	274041101	/	/	/	524	3/15
50	400	275040101	275041102	/	/	/	524	3/15
63	400	276340101	276341102	/	/	/	524	3/15



Miniature circuit breaker ETIMAT P10-QC (Quick Connect)

Rated short-circuit capacity **10 kA**

Rated current **0,5 - 20 A**

Tripping characteristic **B, C, D, K**

1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Weight [g]	Packaging [pcs]
0,5	230/400	/	290501108	290502109	290503100	124	12/60
1	230/400	/	290101106	290102107	290103108	124	12/60
2	230/400	/	290201109	290202100	290203101	124	12/60
4	230/400	/	290401105	290402106	290403107	124	12/60
6	230/400	290600100	290601101	290602102	290603103	124	12/60
10	230/400	291000103	291001104	291002105	291003106	121	12/60
13	230/400	291300102	291301103	291302104	291303105	121	12/60
16	230/400	291600101	291601102	291602103	291603104	121	12/60
20	230/400	292000104	292001105	292002106	292003107	121	12/60



Technical data on page 63, 68



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Weight [g]	Packaging [pcs]
0,5	230	/	290511105	290512106	290513107	249	6/30
1	230	/	290111103	290112104	290113105	249	6/30
2	230	/	290211106	290212107	290213108	249	6/30
4	230	/	290411102	290412103	290413104	249	6/30
6	230	290610107	290611108	290612109	290613100	249	6/30
10	230	291010100	291011101	291012102	291013103	245	6/30
13	230	291310109	291311100	291312101	291313102	245	6/30
16	230	291610108	291611109	291612100	291613101	245	6/30
20	230	292010101	292011102	292012103	292013104	245	6/30

2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Weight [g]	Packaging [pcs]
0,5	400	/	290521102	290522103	290523104	249	6/30
1	400	/	290121100	290122101	290123102	249	6/30
2	400	/	290221103	290222104	290223105	249	6/30
4	400	/	290421109	290422100	290423101	249	6/30
6	400	290620104	290621105	290622106	290623107	249	6/30
10	400	291020107	291021108	291022109	291023100	245	6/30
13	400	291320106	291321107	291322108	291323109	245	6/30
16	400	291620105	291621106	291622107	291623108	245	6/30
20	400	292020108	292021109	292022100	292023101	245	6/30



3-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Weight [g]	Packaging [pcs]
0,5	400	/	290531109	290532100	290533101	377	4/20
1	400	/	290131107	290132108	290133109	377	4/20
2	400	/	290231100	290232101	290233102	377	4/20
4	400	/	290431106	290432107	290433108	377	4/20
6	400	290630101	290631102	290632103	290633104	377	4/20
10	400	291030104	291031105	291032106	291033107	367	4/20
13	400	291330103	291331104	291332105	291333106	367	4/20
16	400	291630102	291631103	291632104	291633105	367	4/20
20	400	292030105	292031106	292032107	292033108	367	4/20



3-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Weight [g]	Packaging [pcs]
0,5	400	/	290541106	290542107	290543108	500	3/15
1	400	/	290141104	290142105	290143106	500	3/15
2	400	/	290241107	290242108	290243109	500	3/15
4	400	/	290441103	290442104	290443105	500	3/15
6	400	290640108	290641109	290642100	290643101	500	3/15
10	400	291040101	291041102	291042103	291043104	488	3/15
13	400	291340100	291341101	291342102	291343103	488	3/15
16	400	291640109	291641100	291642101	291643102	488	3/15
20	400	292040102	292041103	292042104	292043105	488	3/15

Miniature circuit breaker ETIMAT P10-DC

Rated short-circuit capacity	Rated current	Tripping characteristic
10 kA	**0,5 - 63 A**	**B, C, K, Z**

Application: Miniature circuit breakers ETIMAT DC are used for protection of conductors in direct current electric circuits. 1-pole circuit breakers are used for voltages up to 220 V d.c., while 2-pole circuit breakers with poles connected in a series are used for higher voltages (up to 440 V d.c.). When connecting the MCB ETIMAT DC , attention must be paid to polarity as connected in a wrong way the MCB can be destroyed. Note that two 1-pole MCBs cannot be used instead of one 2-pole MCB.

1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	220	/	260501107	260503109	260504100	124	12/60
1	220	/	260101105	260103107	260104108	124	12/60
2	220	260200107	260201108	260203100	260204101	124	12/60
3	220	260300100	260301101	260303103	260304104	124	12/60
4	220	260400103	260401104	260403106	260404107	124	12/60
6	220	260600109	260601100	260603102	260604103	124	12/60
10	220	261000102	261001103	261003105	261004106	121	12/60
13	220	261300101	261301102	261303104	261304105	121	12/60
16	220	261600100	261601101	261603103	261604104	121	12/60
20	220	262000103	262001104	262003106	262004107	121	12/60
25	220	262500108	262501109	262503101	262504102	121	12/60
32	220	263200100	263201101	263203103	263204104	121	12/60
40	220	264000105	264001106	/	/	130	12/60
50	220	265000106	265001107	/	/	130	12/60
63	220	266300106	266301107	/	/	130	12/60



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. K	Code No. Z	Weight [g]	Packaging [pcs]
0,5	440	/	260521101	260523103	260524104	249	6/30
1	440	/	260121109	260123101	260124102	249	6/30
2	440	260220101	260221102	260223104	260224105	249	6/30
3	440	260320104	260321105	260323107	260324108	249	6/30
4	440	260420107	260421108	260423100	260424101	249	6/30
6	440	260620103	260621104	260623106	260624107	249	6/30
10	440	261020106	261021107	261023109	261024100	245	6/30
13	440	261320105	261321106	261323108	261324109	245	6/30
16	440	261620104	261621105	261623107	261624108	245	6/30
20	440	262020107	262021108	262023100	262024101	245	6/30
25	440	262520102	262521103	262523105	262524106	245	6/30
32	440	263220104	263221105	263223107	263224108	245	6/30
40	440	264020109	264021100	/	/	261	6/30
50	440	265020100	265021101	/	/	261	6/30
63	440	266320100	266321101	/	/	261	6/30



Accessories for ETIMAT P10 and ETIMAT P10-DC

Locking device

Code No.	Weight [g]	Packaging [pcs]
761900104	3	1/1



Shunt trip release DA ETIMAT P10

Type	Code No.	Weight [g]	Packaging [pcs]
DA ETIMAT P10 12-60V AC/DC	770620105	110	1/54
DA ETIMAT P10 110-250V AC/DC	772520104	110	1/54

Technical data on page 69

NEW GENERATION!

MCBs - Miniature circuit breakers ETIMAT P

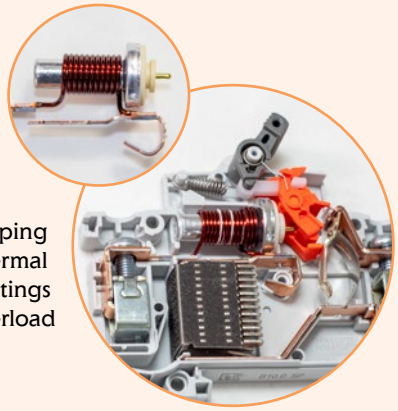
Advantages of miniature circuit breakers ETIMAT P



TESTED AND PROVEN QUALITY OF EACH MCB PRODUCED
EXACT TRACEABILITY AND HIGHEST QUALITY CONTROL

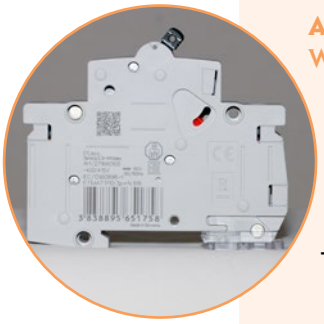
→ Fully automated assembly line with 17 different tests and measurements during asssembly process to ensure best functionality of each finished product

→ All important components are marked with a DMC code, containing individual test results and thus ensuring exact traceability and highest quality control of every MCB



UNIQUE TECHNOLOGY FOR
PRECISE OVERLOAD TRIPPING
THROUGH THE ENTIRE LIFE CYCLE

While other MCBs on the market are adjusted to the desired tripping characteristic afterwards, ETIMAT P uses a new integrated thermal release, preventing both manual tampering of overload settings and material deterioration, ensuring a precise and reliable overload tripping through the entire life cycle of the MCB.

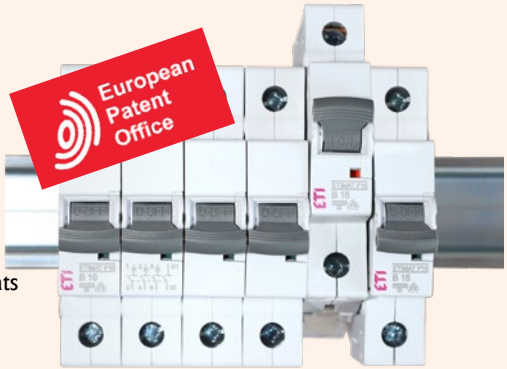


ALL REQUIRED DATA READILY AVAILABLE
WITH A SINGLE QR CODE SCAN

→ Every product has a QR code with a link to the product webpage with all relevant information, instruction manuals and other technical materials.

→ All important technical data is printed on the front and side of the MCB

→ Every product is marked with EAN code



SUPERIOR TECHNICAL FEATURES

→ reduced power dissipation
→ high electrical endurance: 20.000 operation cycles
→ operation in DC circuits with voltage up to 60V DC/pole
→ construction solutions protected by two European patents



SPECIAL VERSIONS
TOGGLE POSITION INDICATES TRIPPING
LESS ROOM FOR USER ERROR

→ Reset version:
In case of overcurrent , the button moves to the “trip” (middle) position. In case of manual turn off, the button moves to the “off” (lowest) position (only ETIMAT P10).

WIDE RANGE OF AUXILIARY DEVICES AND ACCESSORIES AND EASE OF INSTALLATION

→ possibility of mounting up to 3 auxiliary / signal switches

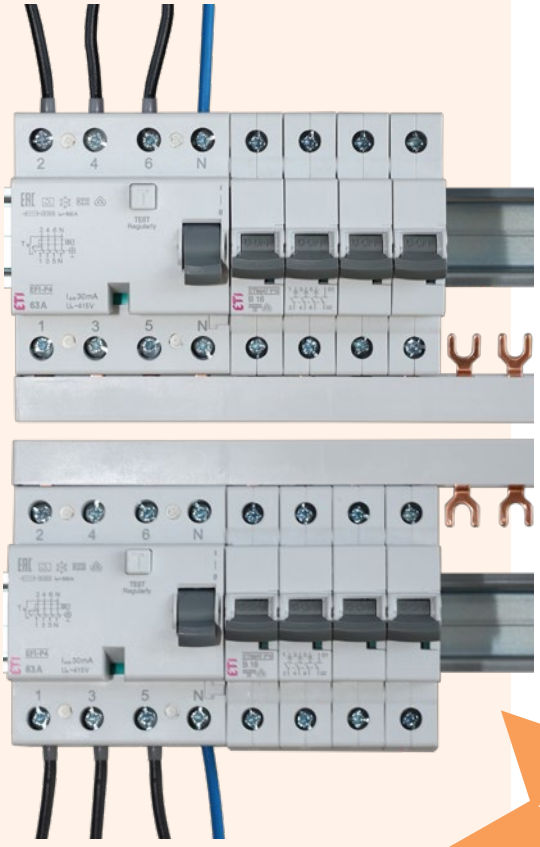




→ Terminal cover



→ Locking device





→ Double connection possibility - all MCBs can be simultaneously connected to busbar and conductor, both from above and below

→ supply possibility from top or bottom

→ possibility to connect wires to terminals up to 25 mm²

→ same profile as our other modular devices resulting in a coordinated and streamlined look to the installation

AVAILABLE IN 2023

ATTENTION TO DETAILS

→ Trip-free mechanism ensures that MCB trips even if the toggle is held in ON position

→ Separate indication of contacts' real state (independent of the toggle position) ensures additional user safety

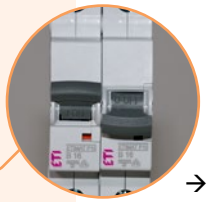
→ green flag: contacts open, red flag: contacts closed

→ Better protection of terminals against touching the parts under voltage



→ Sturdy pins on 4-module devices



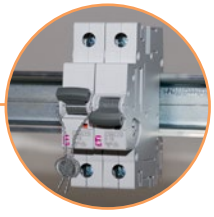


→ "ON/OFF" mark on the switch button

→ Possibility of sealing in "ON" or "OFF" position

→ Space for labeling









→ NO WOBBLE™ technology new snapping unit enables easy, firm and secure DIN-rail mounting and replacement

Miniature circuit breaker ETIMAT P6

2023

Rated short-circuit capacity	Rated current	Tripping characteristic
6 kA	**0,5 - 63 A**	**B, C, D**



1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Packaging [pcs]
0,5	240/415	-	001900021	001900041	12/108
1	240/415	001900002	001900022	001900042	12/108
1,6	240/415	001900003	001900023	001900043	12/108
2	240/415	001900004	001900024	001900044	12/108
3	240/415	001900005	001900025	001900045	12/108
4	240/415	001900006	001900026	001900046	12/108
6	240/415	001900007	001900027	001900047	12/108
10	240/415	001900008	001900028	001900048	12/108
13	240/415	001900009	001900029	001900049	12/108
16	240/415	001900010	001900030	001900050	12/108
20	240/415	001900011	001900031	001900051	12/108
25	240/415	001900012	001900032	001900052	12/108
32	240/415	001900013	001900033	001900053	12/108
40	240/415	001900014	001900034	001900054	12/108
50	240/415	001900015	001900035	001900055	12/108
63	240/415	001900016	001900036	-	12/108



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Packaging [pcs]
0,5	240	-	001900121	001900141	6/54
1	240	001900102	001900122	001900142	6/54
1,6	240	001900103	001900123	001900143	6/54
2	240	001900104	001900124	001900144	6/54
3	240	001900105	001900125	001900145	6/54
4	240	001900106	001900126	001900146	6/54
6	240	001900107	001900127	001900147	6/54
10	240	001900108	001900128	001900148	6/54
13	240	001900109	001900129	001900149	6/54
16	240	001900110	001900130	001900150	6/54
20	240	001900111	001900131	001900151	6/54
25	240	001900112	001900132	001900152	6/54
32	240	001900113	001900133	001900153	6/54
40	240	001900114	001900134	001900154	6/54
50	240	001900115	001900135	001900155	6/54
63	240	001900116	001900136	-	6/54



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Packaging [pcs]
0,5	415	-	001900221	001900241	6/54
1	415	001900202	001900222	001900242	6/54
1,6	415	001900203	001900223	001900243	6/54
2	415	001900204	001900224	001900244	6/54
3	415	001900205	001900225	001900245	6/54
4	415	001900206	001900226	001900246	6/54
6	415	001900207	001900227	001900247	6/54
10	415	001900208	001900228	001900248	6/54
13	415	001900209	001900229	001900249	6/54
16	415	001900210	001900230	001900250	6/54
20	415	001900211	001900231	001900251	6/54
25	415	001900212	001900232	001900252	6/54
32	415	001900213	001900233	001900253	6/54
40	415	001900214	001900234	001900254	6/54
50	415	001900215	001900235	001900255	6/54
63	415	001900216	001900236	-	6/54

3-pole					
I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Packaging [pcs]
0,5	415	-	001900321	001900341	4/36
1	415	001900302	001900322	001900342	4/36
1,6	415	001900303	001900323	001900343	4/36
2	415	001900304	001900324	001900344	4/36
3	415	001900305	001900325	001900345	4/36
4	415	001900306	001900326	001900346	4/36
6	415	001900307	001900327	001900347	4/36
10	415	001900308	001900328	001900348	4/36
13	415	001900309	001900329	001900349	4/36
16	415	001900310	001900330	001900350	4/36
20	415	001900311	001900331	001900351	4/36
25	415	001900312	001900332	001900352	4/36
32	415	001900313	001900333	001900353	4/36
40	415	001900314	001900334	001900354	4/36
50	415	001900315	001900335	001900355	4/36
63	415	001900316	001900336	-	4/36



3-pole + N					
I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Packaging [pcs]
0,5	415	-	001900421	001900441	3/27
1	415	001900402	001900422	001900442	3/27
1,6	415	001900403	001900423	001900443	3/27
2	415	001900404	001900424	001900444	3/27
3	415	001900405	001900425	001900445	3/27
4	415	001900406	001900426	001900446	3/27
6	415	001900407	001900427	001900447	3/27
10	415	001900408	001900428	001900448	3/27
13	415	001900409	001900429	001900449	3/27
16	415	001900410	001900430	001900450	3/27
20	415	001900411	001900431	001900451	3/27
25	415	001900412	001900432	001900452	3/27
32	415	001900413	001900433	001900453	3/27
40	415	001900414	001900434	001900454	3/27
50	415	001900415	001900435	001900455	3/27
63	415	001900416	001900436	-	3/27



Circuit breakers type ETIMAT P6 / 3-pole + N are suitable for use as 4-pole circuit breakers

Technical data on page 71

Miniature circuit breaker ETIMAT P10 - NEW GENERATION

2023

Rated short-circuit capacity **10 kA**

Rated current **0,5 - 63 A**

Tripping characteristic **B, C, D, K, Z**



1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Packaging [pcs]
0,5	240/415	-	001901021	001901041	001901061	001901081	12/108
1	240/415	001901002	001901022	001901042	001901062	001901082	12/108
1,6	240/415	001901003	001901023	001901043	001901063	001901083	12/108
2	240/415	001901004	001901024	001901044	001901064	001901084	12/108
3	240/415	001901005	001901025	001901045	001901065	001901085	12/108
4	240/415	001901006	001901026	001901046	001901066	001901086	12/108
6	240/415	001901007	001901027	001901047	001901067	001901087	12/108
10	240/415	001901008	001901028	001901048	001901068	001901088	12/108
13	240/415	001901009	001901029	001901049	001901069	001901089	12/108
16	240/415	001901010	001901030	001901050	001901070	001901090	12/108
20	240/415	001901011	001901031	001901051	001901071	001901091	12/108
25	240/415	001901012	001901032	001901052	001901072	001901092	12/108
32	240/415	001901013	001901033	001901053	001901073	001901093	12/108
40	240/415	001901014	001901034	001901054	-	-	12/108
50	240/415	001901015	001901035	001901055	-	-	12/108
63	240/415	001901016	001901036	-	-	-	12/108



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Packaging [pcs]
0,5	240	-	001901121	001901141	001901161	001901181	6/54
1	240	001901102	001901122	001901142	001901162	001901182	6/54
1,6	240	001901103	001901123	001901143	001901163	001901183	6/54
2	240	001901104	001901124	001901144	001901164	001901184	6/54
3	240	001901105	001901125	001901145	001901165	001901185	6/54
4	240	001901106	001901126	001901146	001901166	001901186	6/54
6	240	001901107	001901127	001901147	001901167	001901187	6/54
10	240	001901108	001901128	001901148	001901168	001901188	6/54
13	240	001901109	001901129	001901149	001901169	001901189	6/54
16	240	001901110	001901130	001901150	001901170	001901190	6/54
20	240	001901111	001901131	001901151	001901171	001901191	6/54
25	240	001901112	001901132	001901152	001901172	001901192	6/54
32	240	001901113	001901133	001901153	001901173	001901193	6/54
40	240	001901114	001901134	001901154	-	-	6/54
50	240	001901115	001901135	001901155	-	-	6/54
63	240	001901116	001901136	-	-	-	6/54



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Packaging [pcs]
0,5	415	-	001901221	001901241	001901261	001901281	6/54
1	415	001901202	001901222	001901242	001901262	001901282	6/54
1,6	415	001901203	001901223	001901243	001901263	001901283	6/54
2	415	001901204	001901224	001901244	001901264	001901284	6/54
3	415	001901205	001901225	001901245	001901265	001901285	6/54
4	415	001901206	001901226	001901246	001901266	001901286	6/54
6	415	001901207	001901227	001901247	001901267	001901287	6/54
10	415	001901208	001901228	001901248	001901268	001901288	6/54
13	415	001901209	001901229	001901249	001901269	001901289	6/54
16	415	001901210	001901230	001901250	001901270	001901290	6/54
20	415	001901211	001901231	001901251	001901271	001901291	6/54
25	415	001901212	001901232	001901252	001901272	001901292	6/54
32	415	001901213	001901233	001901253	001901273	001901293	6/54
40	415	001901214	001901234	001901254	-	-	6/54
50	415	001901215	001901235	001901255	-	-	6/54
63	415	001901216	001901236	-	-	-	6/54

3-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Packaging [pcs]
0,5	415	-	001901321	001901341	001901361	001901381	4/36
1	415	001901302	001901322	001901342	001901362	001901382	4/36
1,6	415	001901303	001901323	001901343	001901363	001901383	4/36
2	415	001901304	001901324	001901344	001901364	001901384	4/36
3	415	001901305	001901325	001901345	001901365	001901385	4/36
4	415	001901306	001901326	001901346	001901366	001901386	4/36
6	415	001901307	001901327	001901347	001901367	001901387	4/36
10	415	001901308	001901328	001901348	001901368	001901388	4/36
13	415	001901309	001901329	001901349	001901369	001901389	4/36
16	415	001901310	001901330	001901350	001901370	001901390	4/36
20	415	001901311	001901331	001901351	001901371	001901391	4/36
25	415	001901312	001901332	001901352	001901372	001901392	4/36
32	415	001901313	001901333	001901353	001901373	001901393	4/36
40	415	001901314	001901334	001901354	-	-	4/36
50	415	001901315	001901335	001901355	-	-	4/36
63	415	001901316	001901336	-	-	-	4/36



3-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. D	Code No. K	Code No. Z	Packaging [pcs]
0,5	415	-	001901421	001901441	001901461	001901481	3/27
1	415	001901402	001901422	001901442	001901462	001901482	3/27
1,6	415	001901403	001901423	001901443	001901463	001901483	3/27
2	415	001901404	001901424	001901444	001901464	001901484	3/27
3	415	001901405	001901425	001901445	001901465	001901485	3/27
4	415	001901406	001901426	001901446	001901466	001901486	3/27
6	415	001901407	001901427	001901447	001901467	001901487	3/27
10	415	001901408	001901428	001901448	001901468	001901488	3/27
13	415	001901409	001901429	001901449	001901469	001901489	3/27
16	415	001901410	001901430	001901450	001901470	001901490	3/27
20	415	001901411	001901431	001901451	001901471	001901491	3/27
25	415	001901412	001901432	001901452	001901472	001901492	3/27
32	415	001901413	001901433	001901453	001901473	001901493	3/27
40	415	001901414	001901434	001901454	-	-	3/27
50	415	001901415	001901435	001901455	-	-	3/27
63	415	001901416	001901436	-	-	-	3/27



Circuit breakers type ETIMAT P10 / 3-pole + N are suitable for use as 4-pole circuit breakers

Technical data on page 79

Miniature circuit breaker ETIMAT P10 Reset

2023

Rated short-circuit capacity	Rated current	Tripping characteristic
10 kA	**0,5 - 63 A**	**B, C**



1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Packaging [pcs]
0,5	240/415	-	001902021	12/108
1	240/415	001902002	001902022	12/108
1,6	240/415	001902003	001902023	12/108
2	240/415	001902004	001902024	12/108
3	240/415	001902005	001902025	12/108
4	240/415	001902006	001902026	12/108
6	240/415	001902007	001902027	12/108
10	240/415	001902008	001902028	12/108
13	240/415	001902009	001902029	12/108
16	240/415	001902010	001902030	12/108
20	240/415	001902011	001902031	12/108
25	240/415	001902012	001902032	12/108
32	240/415	001902013	001902033	12/108
40	240/415	001902014	001902034	12/108
50	240/415	001902015	001902035	12/108
63	240/415	001902016	001902036	12/108



1-pole + N

I_n [A]	U_n [V]	Code No. B	Code No. C	Packaging [pcs]
0,5	240	-	001902121	6/54
1	240	001902102	001902122	6/54
1,6	240	001902103	001902123	6/54
2	240	001902104	001902124	6/54
3	240	001902105	001902125	6/54
4	240	001902106	001902126	6/54
6	240	001902107	001902127	6/54
10	240	001902108	001902128	6/54
13	240	001902109	001902129	6/54
16	240	001902110	001902130	6/54
20	240	001902111	001902131	6/54
25	240	001902112	001902132	6/54
32	240	001902113	001902133	6/54
40	240	001902114	001902134	6/54
50	240	001902115	001902135	6/54
63	240	001902116	001902136	6/54

2-pole				
I_n [A]	U_n [V]	Code No. B	Code No. C	Packaging [pcs]
0,5	415	-	001902221	6/54
1	415	001902202	001902222	6/54
1,6	415	001902203	001902223	6/54
2	415	001902204	001902224	6/54
3	415	001902205	001902225	6/54
4	415	001902206	001902226	6/54
6	415	001902207	001902227	6/54
10	415	001902208	001902228	6/54
13	415	001902209	001902229	6/54
16	415	001902210	001902230	6/54
20	415	001902211	001902231	6/54
25	415	001902212	001902232	6/54
32	415	001902213	001902233	6/54
40	415	001902214	001902234	6/54
50	415	001902215	001902235	6/54
63	415	001902216	001902236	6/54



3-pole				
I_n [A]	U_n [V]	Code No. B	Code No. C	Packaging [pcs]
0,5	415	-	001902321	4/36
1	415	001902302	001902322	4/36
1,6	415	001902303	001902323	4/36
2	415	001902304	001902324	4/36
3	415	001902305	001902325	4/36
4	415	001902306	001902326	4/36
6	415	001902307	001902327	4/36
10	415	001902308	001902328	4/36
13	415	001902309	001902329	4/36
16	415	001902310	001902330	4/36
20	415	001902311	001902331	4/36
25	415	001902312	001902332	4/36
32	415	001902313	001902333	4/36
40	415	001902314	001902334	4/36
50	415	001902315	001902335	4/36
63	415	001902316	001902336	4/36



Circuit breakers type ETIMAT P10 / 3-pole + N are suitable for use as 4-pole circuit breakers

3-pole + N				
I_n [A]	U_n [V]	Code No. B	Code No. C	Packaging [pcs]
0,5	415	-	001902421	3/27
1	415	001902402	001902422	3/27
1,6	415	001902403	001902423	3/27
2	415	001902404	001902424	3/27
3	415	001902405	001902425	3/27
4	415	001902406	001902426	3/27
6	415	001902407	001902427	3/27
10	415	001902408	001902428	3/27
13	415	001902409	001902429	3/27
16	415	001902410	001902430	3/27
20	415	001902411	001902431	3/27
25	415	001902412	001902432	3/27
32	415	001902413	001902433	3/27
40	415	001902414	001902434	3/27
50	415	001902415	001902435	3/27
63	415	001902416	001902436	3/27



Technical data on page 79

Miniature circuit breaker ETIMAT P10-DC - NEW GENERATION

2023

Rated short-circuit capacity	Rated current	Tripping characteristic
10 kA	**0,5 - 63 A**	**B, C, K, Z**

Application: Miniature circuit breakers ETIMAT DC are used for protection of conductors in direct current electric circuits. 1-pole circuit breakers are used for voltages up to 220 V d.c., while 2-pole circuit breakers with poles connected in a series are used for higher voltages (up to 440 V d.c.). When connecting the MCB ETIMAT DC , attention must be paid to polarity as connected in a wrong way the MCB can be destroyed. Note that two 1-pole MCBs cannot be used instead of one 2-pole MCB.



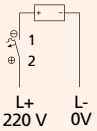
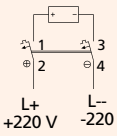
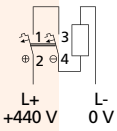
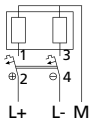
1-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. K	Code No. Z	Packaging [pcs]
0,5	220	-	001903021	001903061	001903081	12/108
1	220	001903002	001903022	001903062	001903082	12/108
1,6	220	001903003	001903023	001903063	001903083	12/108
2	220	001903004	001903024	001903064	001903084	12/108
3	220	001903005	001903025	001903065	001903085	12/108
4	220	001903006	001903026	001903066	001903086	12/108
6	220	001903007	001903027	001903067	001903087	12/108
10	220	001903008	001903028	001903068	001903088	12/108
13	220	001903009	001903029	001903069	001903089	12/108
16	220	001903010	001903030	001903070	001903090	12/108
20	220	001903011	001903031	001903071	001903091	12/108
25	220	001903012	001903032	001903072	001903092	12/108
32	220	001903013	001903033	001903073	001903093	12/108
40	220	001903014	001903034	-	-	12/108
50	220	001903015	001903035	-	-	12/108
63	220	001903016	001903036	-	-	12/108



2-pole

I_n [A]	U_n [V]	Code No. B	Code No. C	Code No. K	Code No. Z	Packaging [pcs]
0,5	440	-	001903221	001903261	001903281	6/54
1	440	001903202	001903222	001903262	001903282	6/54
1,6	440	001903203	001903223	001903263	001903283	6/54
2	440	001903204	001903224	001903264	001903284	6/54
3	440	001903205	001903225	001903265	001903285	6/54
4	440	001903206	001903226	001903266	001903286	6/54
6	440	001903207	001903227	001903267	001903287	6/54
10	440	001903208	001903228	001903268	001903288	6/54
13	440	001903209	001903229	001903269	001903289	6/54
16	440	001903210	001903230	001903270	001903290	6/54
20	440	001903211	001903231	001903271	001903291	6/54
25	440	001903212	001903232	001903272	001903292	6/54
32	440	001903213	001903233	001903273	001903293	6/54
40	440	001903214	001903234	-	-	6/54
50	440	001903215	001903235	-	-	6/54
63	440	001903216	001903236	-	-	6/54

Connecting diagrams in direct current electric circuits				
Rated voltage of circuit breaker	220 V ⎓	220/440 V ⎓	220/440 V ⎓	220/440 V ⎓
Voltage between conductors - max.	220 V ⎓	440 V ⎓	440 V ⎓	440 V ⎓
Voltage between conductor and earth - max.	220 V ⎓	220 V ⎓	440 V ⎓	220 V ⎓
Circuit breaker	1-pole	2-pole	2-pole	2-pole
Connecting diagram				

Accessories for ETIMAT P6, ETIMAT P10 and ETIMAT P10-DC



ETIMAT terminal cover		
Code No.	Weight [g]	Packaging [pcs]
002159011	2	12

Locking device		
Code No.	Weight [g]	Packaging [pcs]
001908401	3	1/1

PS/SS ETIMAT P6/P10 is an auxiliary / signal switch used for remote signalling of the MCB to which it is fixed on the left side.
PS/SS ETIMAT P6/P10 may also be fixed later of the state. Clamps are safe to touch. External dimensions comply with MCB, built-in width is 0,5 module (9 mm). During fitting, the MCB must be switched off. If you use only one PS/SS, connection springs are already included with a product.
Up to three PS/SS can be fitted to ETIMAT P6/P10, with special connection springs. If you use only one PS/SS, connection springs are already included.



Auxiliary / signal switch PS/SS ETIMAT P6/P10				
Type	Code No.	contacts	Weight [g]	Packaging [pcs]
PS/SS ETIMAT P6/P10	001908421	1xNC, 1xNC/NO	53	1/12

Connection spring for 2xPS/SS			
Type	Code No.	Weight [g]	Packaging [pcs]
ETIMAT P10 2xPS/SS	027324022	3,7	10

Connection spring for 3xPS/SS			
Type	Code No.	Weight [g]	Packaging [pcs]
ETIMAT P10 3xPS/SS	027324023	4,5	10

DA ETIMAT P6/P10 shunt trip release is fixed to the right side of the miniature circuit breaker ETIMAT P6/P10 for remote release of the MCB. Dimensions correspond to those of MCB ETIMAT P6/P10.



Shunt trip release DA ETIMAT P6/P10			
Type	Code No.	Weight [g]	Packaging [pcs]
DA ETIMAT P6/P10 12-60V AC/DC	001908411	110	1/54
DA ETIMAT P6/P10 110-250V AC/DC	001908412	110	1/54
DA ETIMAT P10/R 12-60V AC/DC	001908413	110	1/54
DA ETIMAT P10/R 110-250V AC/DC	001908414	110	1/54

Miniature circuit breaker ETIMAT10 80 -125A

Rated short-circuit capacity	Rated current	Tripping characteristics
15, 20 kA	**80 - 125 A**	**B, C, D**









1-pole

I_n [A]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
80	002121731	002131731	002151731	231	2/72
100	002121732	002131732	002151732	231	2/72
125	002121733	002131733		231	2/72

2-pole

I_n [A]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
80	002123731	002133731	002153731	466	1/36
100	002123732	002133732	002153732	466	1/36
125	002123733	002133733		466	1/36

3-pole

I_n [A]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
80	002125731	002135731	002155731	696	1/18
100	002125732	002135732	002155732	696	1/18
125	002125733	002135733		696	1/18

3-pole + N

I_n [A]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
80	002126731	002136731	002156731	860	1/14
100	002126732	002136732	002156732	860	1/14
125	002126733	002136733		860	1/14

4-pole

I_n [A]	Code No. B	Code No. C	Code No. D	Weight [g]	Packaging [pcs]
80	002127731	002137731	-	930	1/14
100	002127732	002137732	-	930	1/14
125	002127733	002137733	-	930	1/14

Accessories for ETIMAT10 80 - 125A



Shunt trip release DA ETIMAT 80/125

Type	Code No.	Weight [g]	Packaging [pcs]
DA ETIMAT 80/125 12-60V AC/DC	002159320	173	1/54
DA ETIMAT 80/125 110-415V	002159321	173	1/54

Auxiliary switch PSM 80/125

Code No.	Weight [g]	Packaging [pcs]
002159121	62	1/12

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RCCBs - Residual current circuit breakers EFI

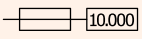
Residual current circuit breakers can be used in TN-S, TN-CS, TT and IT network systems, or with other words, in all systems where neutral and protective conductors are separated. Residual current circuit breakers EFI are used for protection against indirect contact (fault protection) and direct contact (additional protection) of parts under voltage. In the case of protection against indirect contact (fault protection) you can use residual current protective devices with a rated residual current of $I_{\Delta n} \leq 300mA$. Residual current protective devices with a rated residual current of $I_{\Delta n} \leq 30mA$ fulfil the conditions for protection against direct contact (additional protection). For protection against fire, according to DIN VDE 0100-482 and IEC 60364-4-482, all cables and conductors in TN and TT systems must be protected by means of residual current protective devices with rated residual current of $I_{\Delta n} \leq 300mA$. In applications where resistive faults can cause a fire (radiant ceiling heating with panel heating elements), the rated residual current must be $I_{\Delta n} = 30mA$.

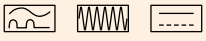
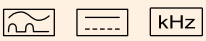
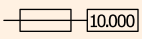
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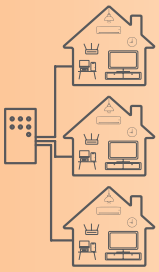
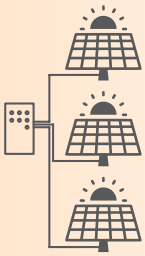
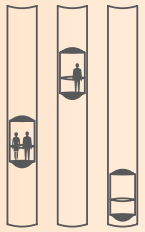
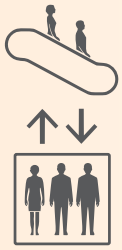
- AC Type: they are sensitive to alternating (sinusoidal) AC residual currents.
- A Type: they are sensitive to alternating (sinusoidal) AC residual currents and pulsating DC residual currents.
- B Type: they are sensitive to alternating (sinusoidal) AC residual currents, pulsating DC residual currents and smooth DC residual currents. Tripping values are defined up to 1kHz.
- B+ Type: they are sensitive to alternating (sinusoidal) AC residual currents, pulsating DC residual currents and smooth DC residual currents. Tripping values are defined up to 20kHz and they are below 420mA.

Classification regarding break time

- Instantaneous: max. break time 40ms (Inst.)
- G/KV-Short time delay: time delayed min. 10ms and max. 40ms (G/KV)
- S-Selective: time delayed min. 40ms and max. 150ms (S)

EFI 2 (2M)		Type AC	Type A		
		Inst.	Inst.	G/KV	S
	For alternating residual current	✓	✓	✓	✓
	For alternating and pulsating direct residual current		✓	✓	✓
	Short-circuit capacity with back-up fuse	✓	✓	✓	✓
	Lower temperature limit of application -25°C	✓	✓	✓	✓
	VDE 0664, part 1 (up to 80 A)		✓		✓
	Short time delayed (10 - 40 ms)			✓	
	Selective (time delayed 40 -150 ms)				✓

EFI 4 (4M)		Type AC	Type A			Type B			Type B+		
		Inst.	Inst.	G/KV	S	Inst.	G/KV	S	Inst.	G/KV	S
	For alternating residual current	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	For alternating and pulsating direct residual current		✓	✓	✓	✓	✓	✓	✓	✓	✓
	For alternating, pulsating direct and smooth DC residual current (up to 1kHz)					✓	✓	✓	✓	✓	✓
	For alternating, pulsating direct and smooth DC residual current (up to 20kHz)								✓	✓	✓
	Short-circuit capacity with back-up fuse	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Lower temperature limit of application -25°C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	VDE 0664, part 1 (up to 80 A)		✓		✓	✓		✓	✓		✓
	Short time delayed (10 - 40 ms)			✓			✓			✓	
	Selective (time delayed 40 -150 ms)				✓			✓			✓

Simple household installations without electronic components	Household installations with electronic components (LCD TV, computers, printers, wash machines, …)	Surge current proof 3kA (8/20µs). High immunity against unwanted tripping. For S: ensuring selectivity in case of serially connected RCD's	Installations where 3f frequency converters and speed regulated machines are used (elevators, cranes). PV systems on a.c. side, Charging stations for electric vehicles, UPS, computer data centres, X-ray devices	Surge current proof 3kA (8/20µs) High immunity against unwanted tripping. For S: ensuring selectivity in case of serially connected RCD's	Requirement for increased fire protection according to VDE 0664-400
				 	  

AC type - Instantaneous
2p / 4p
I_n = 25, 32, 40, 63, 80, 100 A
$I_{\Delta n}$ = 30, 100, 300, 500 mA

A type - Instantaneous
2p / 4p
I_n = 25, 40, 63, 80, 100 A
$I_{\Delta n}$ = 30, 100, 300, 500 mA

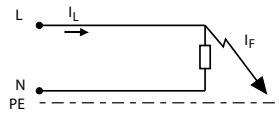
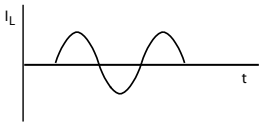
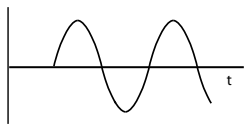
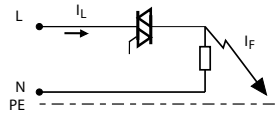
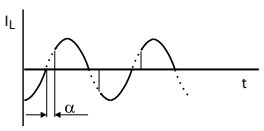
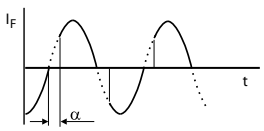
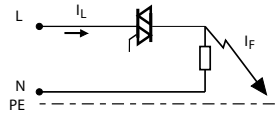
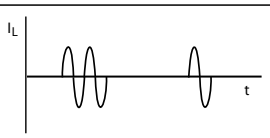
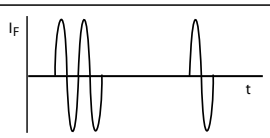
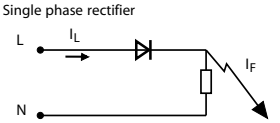
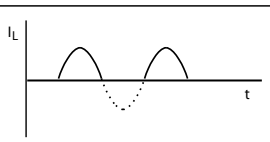
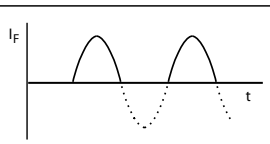
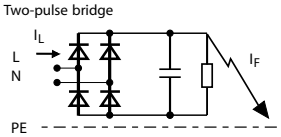
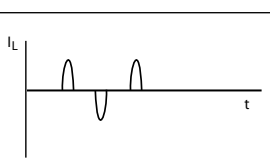
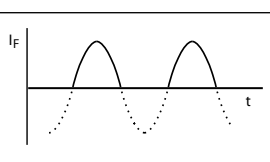
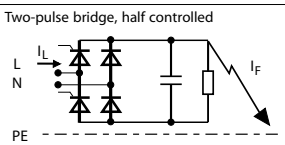
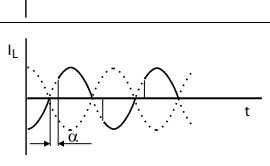
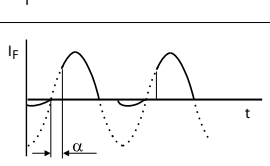
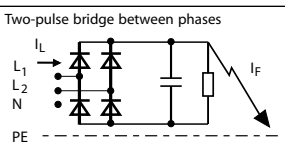
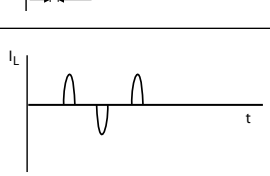
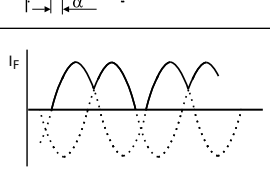
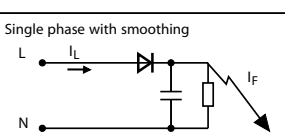
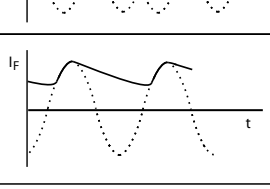
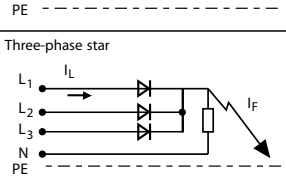
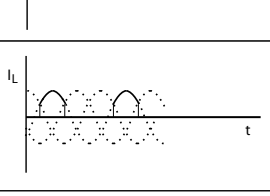
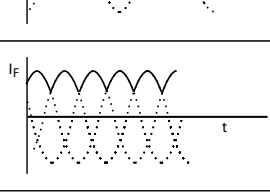
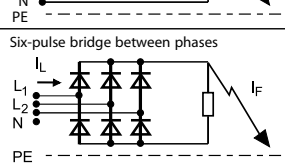
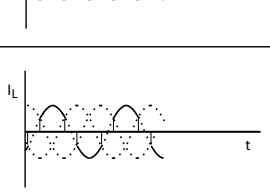
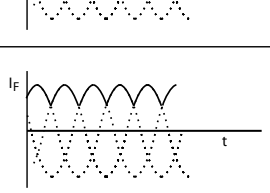
A type - **G/KV** (short-time delay: time delayed min. 10ms and max. 40ms) &
S (selective: time delayed min. 40ms and max. 150ms)
2p / 4p
I_n = 25, 40, 63, 80, 100 A
$I_{\Delta n}$ = 100, 300 mA

B type – Instantaneous (Tripping values are defined up to 1kHz)
4p
I_n = 25, 40, 63 A
$I_{\Delta n}$ = 30, 100, 300 mA

B type - **G/KV** (short-time delay: time delayed min. 10ms and max. 40ms) &
S (selective: time delayed min. 40ms and max. 150ms)
4p
I_n = 25, 40, 63A
$I_{\Delta n}$ = 100, 300 mA

B+ type – Instantaneous (Tripping values are defined up to 20kHz and they are below 420mA) according to VDE 0664-400
4p
I_n = 25, 40, 63 A
$I_{\Delta n}$ = 30, 100, 300 mA

Use of AC, A, and B type of RCCB's in case of different fault conditions

	Connection	Normal mains current	Fault earth current	AC	A	B, B+
1	Single phase 			✓	✓	✓
2	Phase control 			✓	✓	✓
3	Burst control 			✓	✓	✓
4	Single phase rectifier 				✓	✓
5	Two-pulse bridge 				✓	✓
6	Two-pulse bridge, half controlled 				✓	✓
7	Two-pulse bridge between phases 				✓	✓
8	Single phase with smoothing 					✓
9	Three-phase star 					✓
10	Six-pulse bridge between phases 					✓

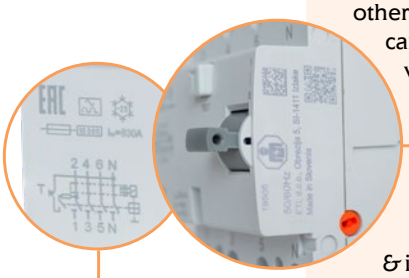
Features of residual current circuit breakers EFI-P

→ Individual test measurements and other production data for each device can be read from the QR code, as well as instruction manuals and other technical materials

→ Power dissipation per pole reduced by up to 45%

→ High mechanical endurance: > 10.000 cycles

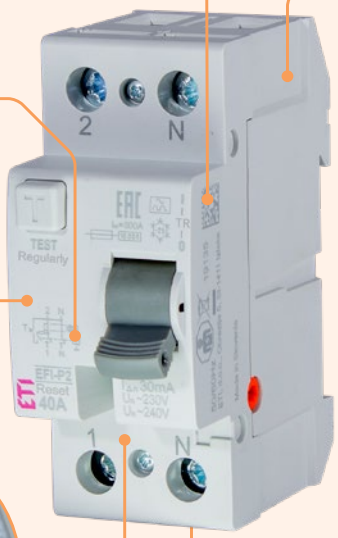
→ High electrical endurance: > 4.000 cycles



→ All necessary technical & installation information can be found on the front and side of the device

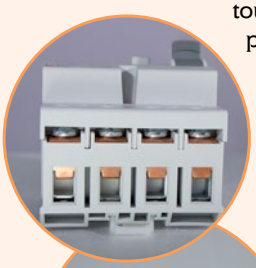


→ Basic installation requirements are engraved into housing



→ All important components are marked with a QR code, containing individual test results and thus ensuring exact traceability and highest quality control

→ Better protection of terminals against touching the parts under voltage





→ Patented two-step mechanism for max reliability of operation



→ The terminals accept not only wires but also time saving busbars

→ RCCBs can be supplied with single phase and three phase busbars

→ Supply is possible both from top and bottom terminals

→ Dimensionally the same as old EFI, making replacement effortless

→ Special versions available:
- RCCB for use in 110, 125 &127 V systems
- RCCB with neutral pole on the left side

→ Fully automated assembly line, enabling more intermediate measurements during asssembly process to ensure best functionality of final product



→ Due to dimensional and construction similarity, all EFI accessories can also be used with EFI-P



→ Improved housing attachment with sealed screws





→ Data matrix code



→ Test button enables user to check residual functionality

→ Rated conditional short-circuit current: 10 kA



→ Real contact position indication for easier identification, whether RCCB is in ON or OFF position

→ Reset version: in case of differential current, the button moves to the “trip” (middle) position. In case of manual turn off, the button moves to the “off” (lowest) position.



→ Clearly marked terminals to ensure appropriate connection

A and AC type residual current circuit breaker EFI-P2(R) & EFI-2

Rated residual current	Rated current	Type
0,03 - 0,5 A	**16 - 100 A**	**A, AC**



16 - 80 A



100 A

EFI-P2 Instantaneous, EFI-P2R Instantaneous

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A				Type AC	Weight [g]	Packaging [pcs]
				Reset**	127V***	NL****			
16	0,03	2	002061110	002061460	002061350	002061410	002061210	175	1/54
25	0,03	2	002061111	002061461	002061351	002061411	002061211	175	1/54
40	0,03	2	002061112	002061462	002061352	002061412	002061212	175	1/54
63	0,03	2	002061113	002061463	002061353	002061413	002061213	190	1/54
80	0,03	2	002061114	002061464	002061354	002061414	002061214	190	1/54
100	0,03	2	002062530*	-	-	-	002062531*	244	1/54
16	0,1	2	002061120	002061470	002061360	002061420	002061220	175	1/54
25	0,1	2	002061121	002061471	002061361	002061421	002061221	175	1/54
40	0,1	2	002061122	002061472	002061362	002061422	002061222	175	1/54
63	0,1	2	002061123	002061473	002061363	002061423	002061223	190	1/54
80	0,1	2	002061124	002061474	002061364	002061424	002061224	190	1/54
100	0,1	2	002062532*	-	-	-	002062533*	230	1/54
16	0,3	2	002061130	002061480	002061370	002061430	002061230	175	1/54
25	0,3	2	002061131	002061481	002061371	002061431	002061231	175	1/54
40	0,3	2	002061132	002061482	002061372	002061432	002061232	175	1/54
63	0,3	2	002061133	002061483	002061373	002061433	002061233	190	1/54
80	0,3	2	002061134	002061484	002061374	002061434	002061234	190	1/54
100	0,3	2	002062534*	-	-	-	002062535*	230	1/54
16	0,5	2	002061140	002061490	-	-	002061240	175	1/54
25	0,5	2	002061141	002061491	-	-	002061241	175	1/54
40	0,5	2	002061142	002061492	-	-	002061242	175	1/54
63	0,5	2	002061143	002061493	-	-	002061243	190	1/54
80	0,5	2	002061144	002061494	-	-	002061244	190	1/54

* Old version (EFI-2)

** Reset version: in case of differential current, the button moves to the "trip" (middle) position. In case of manual turn off, the button moves to the "off" (lowest) position.

*** For use in in lower than standard system voltage (for instance 110V, 125V or 127V) system

**** Version with N-pole on the left side



G/KV



S

EFI-2 Short time delay & Selective

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A		Weight [g]	Packaging [pcs]
			G/KV-Short time delay	S-Selective		
25	0,03	2	002062727	-	197	1/54
40	0,03	2	002062728	-	197	1/54
63	0,03	2	002062729	-	206	1/54
25	0,1	2	002063727	002063732	193	1/54
40	0,1	2	002063728	002063733	193	1/54
63	0,1	2	002063729	002063734	196	1/54
100	0,1	2	-	002062501	230	1/54
25	0,3	2	-	002064732	198	1/54
40	0,3	2	-	002064733	198	1/54
63	0,3	2	-	002064734	204	1/54
100	0,3	2	-	002062502	230	1/54

A and AC type residual current circuit breaker EFI-P4(R) & EFI-4

Rated residual current	Rated current	Type
0,03 - 0,5 A	**16 - 100 A**	**A, AC**

EFI-P4 Instantaneous, EFI-P4R Instantaneous

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A				Type AC	Weight [g]	Packaging [pcs]
				Reset**	127V***	NL****			
16	0,03	4	002061510	002061860	002061750	002061810	002061610	300	1/27
25	0,03	4	002061511	002061861	002061751	002061811	002061611	300	1/27
40	0,03	4	002061512	002061862	002061752	002061812	002061612	300	1/27
63	0,03	4	002061513	002061863	002061753	002061813	002061613	330	1/27
80	0,03	4	002062545*	-	-	-	002062145*	380	1/27
100	0,03	4	002062150*	-	-	-	002062151*	244	1/54
16	0,1	4	002061520	002061870	002061760	002061820	002061620	300	1/27
25	0,1	4	002061521	002061871	002061761	002061821	002061621	300	1/27
40	0,1	4	002061522	002061872	002061762	002061822	002061622	300	1/27
63	0,1	4	002061523	002061873	002061763	002061823	002061623	330	1/27
80	0,1	4	002063545*	-	-	-	002063145*	380	1/27
100	0,1	4	002062152*	-	-	-	002062153*	230	1/54
16	0,3	4	002061530	002061880	002061770	002061830	002061630	300	1/27
25	0,3	4	002061531	002061881	002061771	002061831	002061631	300	1/27
40	0,3	4	002061532	002061882	002061772	002061832	002061632	300	1/27
63	0,3	4	002061533	002061883	002061773	002061833	002061633	330	1/27
80	0,3	4	002064545*	-	-	-	002064145*	380	1/27
100	0,3	4	002062154*	-	-	-	002062155*	230	1/54
16	0,5	4	002061540	002061890	-	-	002061640	300	1/27
25	0,5	4	002061541	002061891	-	-	002061641	300	1/27
40	0,5	4	002061542	002061892	-	-	002061642	300	1/27
63	0,5	4	002061543	002061893	-	-	002061643	330	1/27
80	0,5	4	002065545*	-	-	-	002065145*	380	1/27

* Old version (EFI-4)

** Reset version: in case of differential current, the button moves to the "trip" (middle) position. In case of manual turn off, the button moves to the "off" (lowest) position.

*** For use in in lower than standard system voltage (for instance 110V, 125V or 127V) system

**** Version with N-pole on the left side



16 - 63 A



100 A

EFI-4 Short time delay & Selective

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A		Weight [g]	Packaging [pcs]
			G/KV-Short time delay	S-Selective		
25	0,03	4	002062747	-	328	1/27
40	0,03	4	002062748	-	328	1/27
63	0,03	4	002062749	-	350	1/27
25	0,1	4	002063747	002063752	320	1/27
40	0,1	4	002063748	002063753	320	1/27
63	0,1	4	002063749	002063754	338	1/27
100	0,1	4	-	002062503	407	1/27
25	0,3	4	002064747	002064752	320	1/27
40	0,3	4	002064748	002064753	320	1/27
63	0,3	4	002064749	002064754	338	1/27
100	0,3	4	-	002062504	372	1/27



G/KV



S

Features and advantages of UNIVERSAL CURRENT SENSITIVE RCCBs B type and B+ type

APPLICATION
- Fault protection (protection against indirect contact of live parts)
- Additional protection (protection in case of direct contact of live parts, IΔn≤30mA)
- Fire Protection (for locations exposed to fire hazard)

Residual current sensitivity – UNIVERSAL

AC pure sinus residual current, 50/60Hz
A sinus and pulsating direct current, 50/60Hz
B AC + A + smooth direct current + high frequency (1kHz)
B+ AC + A + smooth direct current + high frequency (20kHz)

Basic types

according to rated values:

4p B In = 25A, 40A, 63A, IΔn=30mA, 100mA, 300mA
4p B+ In = 25A, 40A, 63A, IΔn=30mA, 100mA, 300mA

according to breaking times:

4p B, B+ instantaneous, short time delayed (G/KV), selective (S)

according to the number of poles:

4p, 2p

Standards

IEC/EN 61008-1	basic standard for RCCB's AC and A type
IEC/EN 62423	additional requirements for type B
VDE 0664-400 B+	VDE standard for B+ requirements (20kHz)

Mode of operation

Pure a.c. and pulsating d.c. type residual current sensitivity, A voltage independent

Smooth d.c. current sensitivity:	B, B+ voltage dependent
Minimum operating voltage:	50V

Typical applications

Which are vulnerable to smooth d.c. residual currents:
- Frequency converters,
- Photovoltaic systems, a.c side,
- Charging stations for electric vehicles,
- Variable speed machine tools,
- UPS, computer data centres
- Elevator controls,
- Cranes of all kinds
- Electronic equipment on construction sites,
- Test set-ups in laboratories,
- Installation in general where we can expect d.c. smooth direct residual currents, etc.

B type residual current circuit breaker EFI-4 B Instantaneous

Rated residual current	Rated current	Type
0,03 - 0,3 A	**25 - 63 A**	**B (Instantaneous)**

EFI-4 B Instantaneous

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Code No	Weight [g]	Packaging [pcs]
25	0,03	4	002062642	335	1/27
40	0,03	4	002062643	335	1/27
63	0,03	4	002062644	340	1/27
25	0,1	4	002063642	335	1/27
40	0,1	4	002063643	335	1/27
63	0,1	4	002063644	340	1/27
25	0,3	4	002064642	335	1/27
40	0,3	4	002064643	335	1/27
63	0,3	4	002064644	340	1/27



B+ type residual current circuit breaker EFI-4 B+ Instantaneous

Rated residual current	Rated current	Type
0,03 - 0,3 A	**25 - 63 A**	**B+ (Instantaneous)**

EFI-4 B+ Instantaneous

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Code No	Weight [g]	Packaging [pcs]
25	0,03	4	002062647	335	1/27
40	0,03	4	002062648	335	1/27
63	0,03	4	002062649	340	1/27
25	0,1	4	002063647	335	1/27
40	0,1	4	002063648	335	1/27
63	0,1	4	002063649	340	1/27
25	0,3	4	002064647	335	1/27
40	0,3	4	002064648	335	1/27
63	0,3	4	002064649	340	1/27



B type residual current circuit breaker EFI-4 B G/KV-Short time delay

Rated residual current	Rated current	Type
0,03 - 0,3 A	**25 - 63 A**	**B (G/KV-Short time delay)**

EFI-4 B G/KV-Short time delay

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Code No	Weight [g]	Packaging [pcs]
25	0,03	4	002062652	340	1/27
40	0,03	4	002062653	340	1/27
63	0,03	4	002062654	345	1/27
25	0,1	4	002063652	340	1/27
40	0,1	4	002063653	340	1/27
63	0,1	4	002063654	345	1/27
25	0,3	4	002064652	340	1/27
40	0,3	4	002064653	340	1/27
63	0,3	4	002064654	345	1/27



Technical data on page 101

B type residual current circuit breaker EFI-4 B S-Selective

Rated residual current	Rated current	Type
0,1 - 0,3 A	**25 - 63 A**	**B (S-Selective)**



EFI-4 B S-Selective					
I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Code No	Weight [g]	Packaging [pcs]
25	0,1	4	002063662	340	1/27
40	0,1	4	002063663	340	1/27
63	0,1	4	002063664	345	1/27
25	0,3	4	002064662	335	1/27
40	0,3	4	002064663	335	1/27
63	0,3	4	002064664	340	1/27

Accessories for residual current circuit breakers EFI (16 - 80 A)

The PS EFI is fixed to EFI series switches. The width of the device is 9 mm, other dimensions are in compliance with EFI switches. The auxiliary switch PS EFI is used for the remote signalling of the state of contact's condition (closed/open) of EFI switches. During fitting, the EFI must be switched off. PS EFI and DA EFI can not be mounted both together, because both can only be mounted on the right side of EFI.



Auxiliary Switch PS EFI				
Type	Contact	Code No.	Weight [g]	Packaging [pcs]
PS EFI - MD	b-contact/a-contact	002069001	50	1/12
PS EFI - 2M	2 x b-contact	002069002	50	1/12
PS EFI - 2D	2 x a-contact	002069003	50	1/12

a - contact = make contact (NO)
b - contact = break contact (NC)



Sealing piece EFI-2		
Code No.	Weight [g]	Packaging [pcs]
002069011	2	2



Sealing piece EFI-4		
Code No.	Weight [g]	Packaging [pcs]
002069012	3	2



Shunt trip release DA EFI			
Type	Code No.	Weight [g]	Packaging [pcs]
DA EFI	002069004	45	1/12

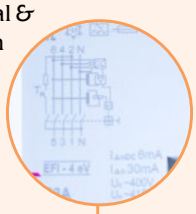
Technical data on page 101, 105

NEW EFI eV

Features and advantages of Residual Current Circuit Breakers for Protection of EV Charging Stations EFI eV

→ Meets requirements from standard IEC 60364-7-722 --> Low-Voltage electrical Installations - Requirements for special installations or locations - Supplies for electric vehicles

→ All necessary technical & installation information can be found on the front and side of the device



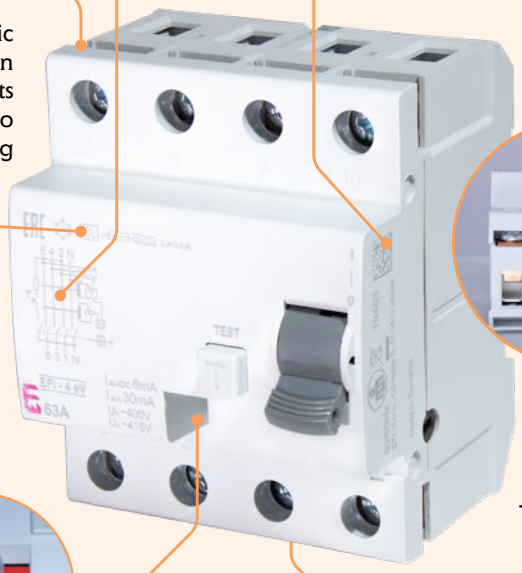
→ Individual test measurements and other production data for each device can be read from the QR code, as well as instruction manuals and other technical materials



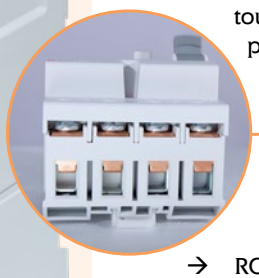
→ detects smooth DC residual currents above 6 mA



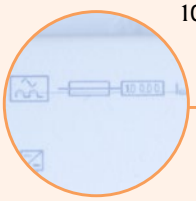
→ Basic installation requirements are engraved into housing



→ Better protection of terminals against touching the parts under voltage



→ Rated conditional short-circuit current: 10 kA



→ RCCBs can be supplied with single phase and three phase busbars

→ Supply is possible both from top and bottom terminals

→ Clearly marked terminals to ensure appropriate connection



→ Real contact position indication for easier identification, whether RCCB is in ON or OFF position

Residual Current Circuit Breakers for Protection of EV Charging Stations EFI eV

Rated residual current	Rated current	Type
0,03 A	**25 - 63 A**	**A**

EFI eV

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A	Weight [g]	Packaging [pcs]
25	0,03	4	002062632	328	1/27
40	0,03	4	002062633	328	1/27
63	0,03	4	002062634	328	1/27

Technical data on page 104

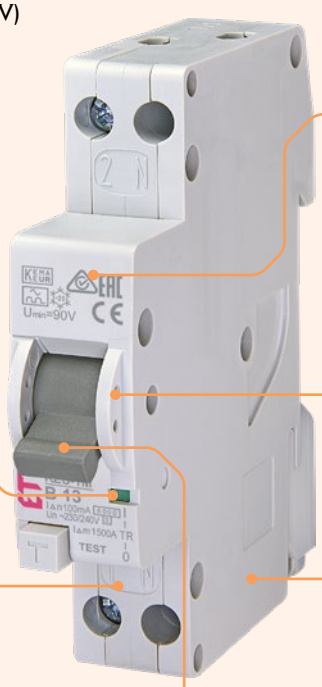
RCBOs - Residual current circuit breakers with integral overcurrent protection KZS

Advantages of residual current circuit breakers with integral overcurrent protection KZS - 1M

→ Combining the features of miniature circuit breaker and a residual current circuit breaker, functionally dependent on line voltage (minimum supply voltage 90V)

→ Version with operating temperature down to -350 C also available





→ Real contact position indication for easier identification, whether RCBO is in ON or OFF position



→ Added protection against any pulsating DC component that can be generated from electrical appliances



→ Energy limiting class 3: highest energy limiting performance for optimal protection of cable insulation and maximally reducing risk of fire and other damage

→ Sealing possibility

→ 1-module housing (18 mm), with switched neutral line



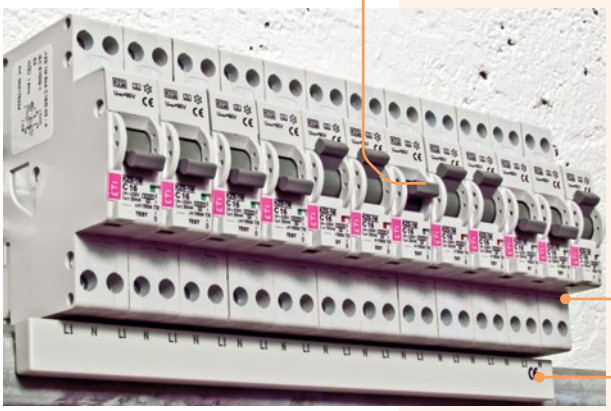


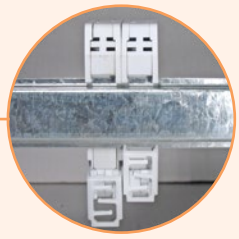


→ All necessary technical and installation information can be found on the front and side of the device

→ Clearly marked terminals to ensure appropriate connection

→ In case of overcurrent or differential current, the button moves to the “trip” (middle) position. In case of manual turn off, the button moves to the “off” (lowest) position.





→ The terminals accept not only wires but also time saving busbars

→ Advanced method of mounting enables an easy removal of single RCBO without disconnecting other units from the busbar

Residual current circuit breaker with integral overcurrent protection KZS -1M

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
6 kA	**6 -25 A**	**B, C**	**0,01 - 0,03 - 0,1 A**

**Recommended for use in installations with high level of additional protection required (bathrooms, hospitals, kindergartens etc).
Used for fault and additional protection.**

KZS - 1M (Supply from the bottom)

I_n [A]	$I_{\Delta n}$ [A]	Type A		Type AC		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C	Code No. B	Code No. C		
6	0,01	002175411	002175421	002175611	002175621	115	12/72
10	0,01	002175412	002175422	002175612	002175622		
13	0,01	002175413	002175423	002175613	002175623		
16	0,01	002175414	002175424	002175614	002175624		
20	0,01	002175415	002175425	002175615	002175625		
25	0,01	002175416	002175426	002175616	002175626		
6	0,03	002175201	002175221	-	-	115	12/72
10	0,03	002175202	002175222	-	-		
13	0,03	002175203	002175223	-	-		
16	0,03	002175204	002175224	-	-		
20	0,03	002175205	002175225	-	-		
25	0,03	002175206	002175226	-	-		
6	0,1	002175431	002175441	002175631	002175681	115	12/72
10	0,1	002175432	002175442	002175632	002175682		
13	0,1	002175433	002175443	002175633	002175683		
16	0,1	002175434	002175444	002175634	002175684		
20	0,1	002175435	002175445	002175635	002175685		
25	0,1	002175436	002175446	002175636	002175686		



KZS - 1M LT (Supply from the bottom)

I_n [A]	$I_{\Delta n}$ [A]	Type A		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C		
6	0,03	002175291	002175301	115	12/72
10	0,03	002175292	002175302	115	12/72
13	0,03	002175293	002175303	115	12/72
16	0,03	002175294	002175304	115	12/72
20	0,03	002175295	002175305	115	12/72
25	0,03	002175296	002175306	115	12/72

LT- suitable for temperatures down to -35°C

Description - KZS -1M is a residual current circuit breaker with integral over-current protection, functionally dependent on line voltage.



KZS - 1M SUP (Supply from the top)

I_n [A]	$I_{\Delta n}$ [A]	Type A		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C		
6	0,01	002175811	002175851	115	12/72
10	0,01	002175812	002175852		
13	0,01	002175813	002175853		
16	0,01	002175814	002175854		
20	0,01	002175815	002175855		
25	0,01	002175816	002175856		
6	0,03	002175701	002175721	115	12/72
10	0,03	002175702	002175722		
13	0,03	002175703	002175723		
16	0,03	002175704	002175724		
20	0,03	002175705	002175725		
25	0,03	002175706	002175726		
6	0,1	002175831	002175871	115	12/72
10	0,1	002175832	002175872		
13	0,1	002175833	002175873		
16	0,1	002175834	002175874		
20	0,1	002175835	002175875		
25	0,1	002175836	002175876		



Description:
KZS -1M DN is a residual current circuit breaker with integral overcurrent protection and added overvoltage protection according to EN 50550.
The device is functionally dependent on line voltage and operates at voltages above 90V.
KZS 1M-DN also has a sealing possibility.



KZS - 1M DN

I_n [A]	$I_{\Delta n}$ [A]	Type A		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C		
6	0,03	002175141	002175151	115	12/72
10	0,03	002175142	002175152	115	12/72
13	0,03	002175143	002175153	115	12/72
16	0,03	002175144	002175154	115	12/72
20	0,03	002175145	002175155	115	12/72
25	0,03	002175146	002175156	115	12/72

Description:
KZS -1M FN is a residual current circuit breaker with integral overcurrent protection, functionally dependent on line voltage.
It comes in a single pole version that switches the phase pole while the neutral pole stays fixed.
KZS 1M-FN is dependent on voltage and operates at voltages above 85V.
KZS 1M-FN also has a sealing possibility.



KZS - 1M FN $I_{\Delta n}$ = 30 mA

I_n [A]	$I_{\Delta n}$ [A]	Type A		Type AC		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C	Code No. B	Code No. C		
6	230	002175581	002175591	002175501	002175521	168	1/42
10	230	002175582	002175592	002175502	002175522	168	1/42
13	230	002175583	002175593	002175503	002175523	168	1/42
16	230	002175584	002175594	002175504	002175524	168	1/42
20	230	002175585	002175595	002175505	002175525	170	1/42
25	230	002175586	002175596	002175506	002175526	170	1/42
32	230	002175587	002175597	002175507	002175527	180	1/42
40	230	002175588	002175598	002175508	002175528	205	1/42
45	230	002175589	002175599	002175509	002175529	205	1/42

KZS - 1M FN $I_{\Delta n}$ = 100 mA

I_n [A]	$I_{\Delta n}$ [A]	Type A		Type AC		Weight [g]	Packaging [pcs]
		Code No. B	Code No. C	Code No. B	Code No. C		
6	230	002175781	002175791	002175511	002175531	168	1/42
10	230	002175782	002175792	002175512	002175532	168	1/42
13	230	002175783	002175793	002175513	002175533	168	1/42
16	230	002175784	002175794	002175514	002175534	168	1/42
20	230	002175785	002175795	002175515	002175535	170	1/42
25	230	002175786	002175796	002175516	002175536	170	1/42
32	230	002175787	002175797	002175517	002175537	180	1/42
40	230	002175788	002175798	002175518	002175538	205	1/42
45	230	002175789	002175799	002175519	002175539	205	1/42

Residual current circuit breaker with integral overcurrent protection KZS-2M

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 40 A**	**B, C**	**0,01 - 0,5 A**

Description: KZS (KZS-2M, KZS-4M) is a residual current circuit breaker combining the features of a miniature circuit breaker and a residual current circuit breaker and is functionally independent on line voltage. Used primarily in circuits with an increased requirements regarding touch voltage such as circuits of portable appliances, in kindergartens, schools, hospitals etc.

KZS-2M $I_{\Delta n}$ = 10 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002173211	002173231	225	1/54
10	002173212	002173232	225	1/54
13	002173213	002173233	225	1/54
16	002173214	002173234	225	1/54
20	002173215	002173235	225	1/54
25	002173216	002173236	225	1/54
32	002173217	002173237	225	1/54
40	002173218	002173238	225	1/54

KZS-2M $I_{\Delta n}$ = 30 mA

I_n	Type A		Type AC		Weight	Packaging
[A]	Code No. B	Code No. C	Code No. B	Code No. C	[g]	[pcs]
6	002173201	002173221	002173101	002173121	225	1/54
10	002173202	002173222	002173102	002173122	225	1/54
13	002173203	002173223	002173103	002173123	225	1/54
16	002173204	002173224	002173104	002173124	225	1/54
20	002173205	002173225	002173105	002173125	225	1/54
25	002173206	002173226	002173106	002173126	225	1/54
32	002173207	002173227	002173107	002173127	225	1/54
40	002173208	002173228	002173108	002173128	225	1/54



KZS-2M $I_{\Delta n}$ = 100 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002173701	002173721	225	1/54
10	002173702	002173722	225	1/54
13	002173703	002173723	225	1/54
16	002173704	002173724	225	1/54
20	002173705	002173725	225	1/54
25	002173706	002173726	225	1/54
32	002173707	002173727	225	1/54
40	002173708	002173728	225	1/54

KZS-2M $I_{\Delta n}$ = 300 mA

I_n	Type A		Type AC		Weight	Packaging
[A]	Code No. B	Code No. C	Code No. B	Code No. C	[g]	[pcs]
6	002173401	002173421	002173301	002173321	225	1/54
10	002173402	002173422	002173302	002173322	225	1/54
13	002173403	002173423	002173303	002173323	225	1/54
16	002173404	002173424	002173304	002173324	225	1/54
20	002173405	002173425	002173305	002173325	225	1/54
25	002173406	002173426	002173306	002173326	225	1/54
32	002173407	002173427	002173307	002173327	225	1/54
40	002173408	002173428	002173308	002173328	225	1/54

KZS-2M $I_{\Delta n}$ = 500 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002173901	002173921	225	1/54
10	002173902	002173922	225	1/54
13	002173903	002173923	225	1/54
16	002173904	002173924	225	1/54
20	002173905	002173925	225	1/54
25	002173906	002173926	225	1/54
32	002173907	002173927	225	1/54
40	002173908	002173928	225	1/54



KZS-2M Special types $I_{\Delta n}$ = 30 mA

I_n	Type A, G/KV		Type A, 120 V		Weight	Packaging
[A]	Code No. B	Code No. C	Code No. B	Code No. C	[g]	[pcs]
6	002174101	002174121	002173351	002173391	225	1/54
10	002174102	002174122	002173352	002173392	225	1/54
13	002174103	002174123	002173353	002173393	225	1/54
16	002174104	002174124	002173354	002173394	225	1/54
20	002174105	002174125	002173355	002173395	225	1/54
25	002174106	002174126	002173356	002173396	225	1/54
32	002174107	002174127	002173357	002173397	225	1/54
40	002174108	002174128	002173358	002173398	225	1/54

Residual current circuit breaker with integral overcurrent protection KZS-2M 2p

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 25 A**	**B, C**	**0,03 A**

KZS-2M 2p $I_{\Delta n}$ = 30 mA

I_n [A]	Type A Code No. B	Type A Code No. C	Weight [g]	Packaging [pcs]
6	002172501	002172521	210	1/54
10	002172502	002172522	210	1/54
13	002172503	002172523	210	1/54
15	002172504	002172524	210	1/54
16	002172505	002172525	210	1/54
20	002172506	002172526	210	1/54
25	002172507	002172527	210	1/54

KZS-2M 2p $I_{\Delta n}$ = 100 mA

I_n [A]	Type A Code No. B	Type A Code No. C	Weight [g]	Packaging [pcs]
6	002172471	002172481	210	1/54
10	002172472	002172482	210	1/54
13	002172473	002172483	210	1/54
15	002172474	002172484	210	1/54
16	002172475	002172485	210	1/54
20	002172476	002172486	210	1/54
25	002172477	002172487	210	1/54



Residual current circuit breaker with integral overcurrent protection with LED status signalisation KZS 2M2p EDI

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 25 A**	**B, C**	**0,03 A**

KZS-2M 2p EDI $I_{\Delta n}$ = 30 mA

I_n [A]	Type A Code No. B	Type A Code No. C	Weight [g]	Packaging [pcs]
6	002172401	002172411	205	1/54
10	002172402	002172412	205	1/54
13	002172403	002172413	205	1/54
15	002172404	002172414	205	1/54
16	002172406	002172416	205	1/54
20	002172407	002172417	205	1/54
25	002172408	002172418	205	1/54



Technical data on page 108, 109

Residual current circuit breaker with integral overcurrent protection KZS-4M 3p

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 32 A**	**B, C**	**0,03 A - 0,5 A**



KZS-4M 3p $I_{\Delta n}$ = 30 mA

I_n	Type A		Type AC		Weight	Packaging
[A]	Code No. B	Code No. C	Code No. B	Code No. C	[g]	[pcs]
6	002174701	002174721	002174801	002174821	482	1/27
10	002174702	002174722	002174802	002174822	482	1/27
13	002174703	002174723	002174803	002174823	482	1/27
16	002174704	002174724	002174804	002174824	482	1/27
20	002174705	002174725	002174805	002174825	482	1/27
25	002174706	002174726	002174806	002174826	482	1/27
32	002174707	002174727	002174807	002174827	482	1/27

KZS-4M 3p $I_{\Delta n}$ = 100 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002173001	002173021	482	1/27
10	002173002	002173022	482	1/27
13	002173003	002173023	482	1/27
16	002173004	002173024	482	1/27
20	002173005	002173025	482	1/27
25	002173006	002173026	482	1/27
32	002173007	002173027	482	1/27

KZS-4M 3p $I_{\Delta n}$ = 300 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174201	002174221	482	1/27
10	002174202	002174222	482	1/27
13	002174203	002174223	482	1/27
16	002174204	002174224	482	1/27
20	002174205	002174225	482	1/27
25	002174206	002174226	482	1/27
32	002174207	002174227	482	1/27

KZS-4M 3p $I_{\Delta n}$ = 500 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174301	002174321	482	1/27
10	002174302	002174322	482	1/27
13	002174303	002174323	482	1/27
16	002174304	002174324	482	1/27
20	002174305	002174325	482	1/27
25	002174306	002174326	482	1/27
32	002174307	002174327	482	1/27

Technical data on page 110

Residual current circuit breaker with integral overcurrent protection KZS-4M 3p+N

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
6 kA	**6 - 32 A**	**B, C**	**0,03 A - 0,5 A**

KZS-4M 3p+N $I_{\Delta n}$ = 30 mA

I_n	Type A		Type AC		Weight	Packaging
[A]	Code No. B	Code No. C	Code No. B	Code No. C	[g]	[pcs]
6	002174901	002174921	002174001	002174021	515	1/27
10	002174902	002174922	002174002	002174022	515	1/27
13	002174903	002174923	002174003	002174023	515	1/27
16	002174904	002174924	002174004	002174024	515	1/27
20	002174905	002174925	002174005	002174025	515	1/27
25	002174906	002174926	002174006	002174026	515	1/27
32	002174907	002174927	002174007	002174027	515	1/27

KZS-4M 3p+N $I_{\Delta n}$ = 100 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174401	002174421	515	1/27
10	002174402	002174422	515	1/27
13	002174403	002174423	515	1/27
16	002174404	002174424	515	1/27
20	002174405	002174425	515	1/27
25	002174406	002174426	515	1/27
32	002174407	002174427	515	1/27

KZS-4M 3p+N $I_{\Delta n}$ = 300 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174501	002174521	515	1/27
10	002174502	002174522	515	1/27
13	002174503	002174523	515	1/27
16	002174504	002174524	515	1/27
20	002174505	002174525	515	1/27
25	002174506	002174526	515	1/27
32	002174507	002174527	515	1/27

KZS-4M 3p+N $I_{\Delta n}$ = 500 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174601	002174621	515	1/27
10	002174602	002174622	515	1/27
13	002174603	002174623	515	1/27
16	002174604	002174624	515	1/27
20	002174605	002174625	515	1/27
25	002174606	002174626	515	1/27
32	002174607	002174627	515	1/27

KZS-4M 3p+N 120V $I_{\Delta n}$ = 30 mA

I_n	Type A		Weight	Packaging
[A]	Code No. B	Code No. C	[g]	[pcs]
6	002174451	002174491	515	1/27
10	002174452	002174492	515	1/27
13	002174453	002174493	515	1/27
16	002174454	002174494	515	1/27
20	002174455	002174495	515	1/27
25	002174456	002174496	515	1/27
32	002174457	002174497	515	1/27



Technical data on page 111

Accessories for KZS



PS KZS-2M/4M is an auxiliary switch used for remote signalling of the RCBO to which it is fixed on the right side. PS KZS-2M/4M may also be fixed later of the state. Clamps are safe to touch. External dimensions comply with RCBO, built-in width is 0,5 module (9 mm). During fitting, the RCBO must be switched off.
The auxiliary switch can be used in combination with RCBOs manufactured after 1. 10. 2018. The production date is visible on the bottom of the product or above the test button. The number must be greater than 18401.

Auxiliary switch PS KZS-2M/4M

Type	Code No.	contacts	Weight [g]	Packaging [pcs]
PS KZS-2M/4M	002159500	1xNC, 1xNC/NO	53	1/12

Residual current circuit breaker with integral overcurrent protection KZS-4M 2p B

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 40 A**	**B, C**	**0,03 A - 0,3 A**

KZS-4M 2p B $I_{\Delta n}$ = 30 mA

I_n [A]	Code No. B	Code No. C	Weight [g]	Packaging [pcs]
6	002174511	002174531	369	1/27
10	002174512	002174532	369	1/27
13	002174513	002174533	369	1/27
16	002174514	002174534	369	1/27
20	002174515	002174535	369	1/27
25	002174516	002174536	369	1/27
32	002174517	002174537	369	1/27
40	002174518	002174538	390	1/27



KZS-4M 2p B $I_{\Delta n}$ = 100 mA

I_n [A]	Code No. B	Code No. C	Weight [g]	Packaging [pcs]
6	002174611	002174631	369	1/27
10	002174612	002174632	369	1/27
13	002174613	002174633	369	1/27
16	002174614	002174634	369	1/27
20	002174615	002174635	369	1/27
25	002174616	002174636	369	1/27
32	002174617	002174637	369	1/27
40	002174618	002174638	390	1/27

KZS-4M 2p B $I_{\Delta n}$ = 300 mA

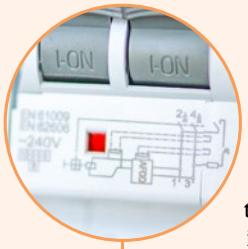
I_n [A]	Code No. B	Code No. C	Weight [g]	Packaging [pcs]
6	002174811	002174831	369	1/27
10	002174812	002174832	369	1/27
13	002174813	002174833	369	1/27
16	002174814	002174834	369	1/27
20	002174815	002174835	369	1/27
25	002174816	002174836	369	1/27
32	002174817	002174837	369	1/27
40	002174818	002174838	390	1/27

NEW Series of AFDD

Features and advantages of Arc Fault Detection Devices AFDD

→ Complete protection: MCB, RCCB and AFDD in one device

→ Supply is possible both from top and bottom terminals



→ All necessary technical & installation information can be found on the front of the device



→ Test button enables user to check residual functionality

→ LED indication of various types of fault (see table)



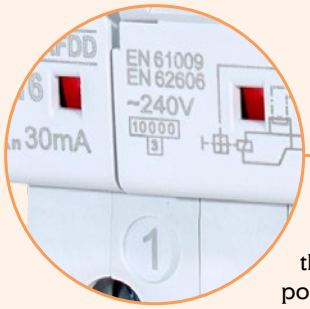
→ Rated short circuit capacity: 10 kA



→ Overcurrent and short circuit protection of both poles

→ Better protection of terminals against touching the parts under voltage





→ Real contact position indication for easier identification, whether the device is in ON or OFF position

→ Clearly marked terminals to ensure appropriate connection

→ High mechanical endurance: 20.000 cycles

→ High electrical endurance: 10.000 cycles

Arc Fault Detection Device AFDD

Rated short-circuit capacity	Rated current	Tripping characteristic	Rated residual current
10 kA	**6 - 32 A**	**B, C**	**0,03 A**



AFDD

I_n [A]	$I_{\Delta n}$ [A]	Number of poles	Type A Code No. B	Type A Code No. C	Weight [g]	Packaging [pcs]
6	0,03	2	002173811	002173871	377	1/33
10	0,03	2	002173812	002173872	377	1/33
13	0,03	2	002173813	002173873	377	1/33
15	0,03	2	002173819	002173879	377	1/33
16	0,03	2	002173814	002173874	377	1/33
20	0,03	2	002173815	002173875	377	1/33
25	0,03	2	002173816	002173876	377	1/33
32	0,03	2	002173817	002173877	377	1/33

Condition	LED Flashing sequence repeats every 1,5 sec for next 25 sec after powering up	After 25 sec
Series Arc Fault	● ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ...	● ● ● ● ● ● ...
Parallel Arc Fault	● ○ ○ ○ ● ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ...	● ● ● ● ● ● ...
Over Voltage Fault	● ○ ○ ○ ● ○ ○ ○ ● ○ ○ ○ ○ ○ ○ ○ ...	● ● ● ● ● ● ...
Self-Test Fault	● ○ ● ○ ● ○ ● ○ ● ○ ● ○ ● ○ ● ○ ...	● ● ● ● ● ● ...
No Fault	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ...	● ● ● ● ● ● ...

Residual current circuit breaker with integral overcurrent protection DIFO

DIFO module is add-on element which contains residual current protection. It could be assembled with miniature circuit breaker ETIMAT 6 or ETIMAT 10 and together it is residual current operated circuit breaker with integrated overcurrent protection (RCBO).

Add-on block for residual current protection DIFO2

DIFO2					
Type	rated current [A]	Code No. Type A	Code No. Type AC	Weight [g]	Packaging [pcs]
DIFO2 30 mA	6 – 32	002058001	002058006	165	1/16
	40 – 50	002058201	002058206	165	1/16
DIFO2 100 mA	6 – 32	002058002	002058007	165	1/16
	40 – 50	002058202	002058207	165	1/16
DIFO2 300 mA	6 – 32	002058003	002058008	165	1/16
	40 – 50	002058203	002058208	165	1/16



DIFO2 can be assembled with standard 2p and 1p+N miniature circuit breaker ETIMAT 6 and ETIMAT 10. Width of product: 2 modules.

Add-on block for residual current protection DIFO4

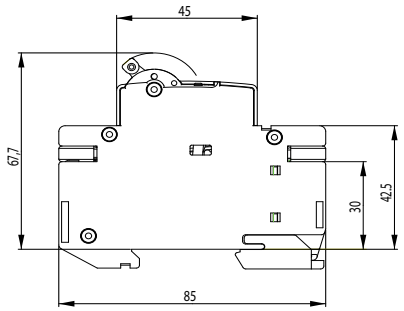
DIFO4					
Type	rated current [A]	Code No. Type A	Code No. Type AC	Weight [g]	Packaging [pcs]
DIFO4 30 mA	6 – 32	002058021	002058026	230	1/14
	40 – 50	002058221	002058226	230	1/14
DIFO4 100 mA	6 – 32	002058022	002058027	230	1/14
	40 – 50	002058222	002058227	230	1/14
DIFO4 300 mA	6 – 32	002058023	002058028	230	1/14
	40 – 50	002058223	002058228	230	1/14



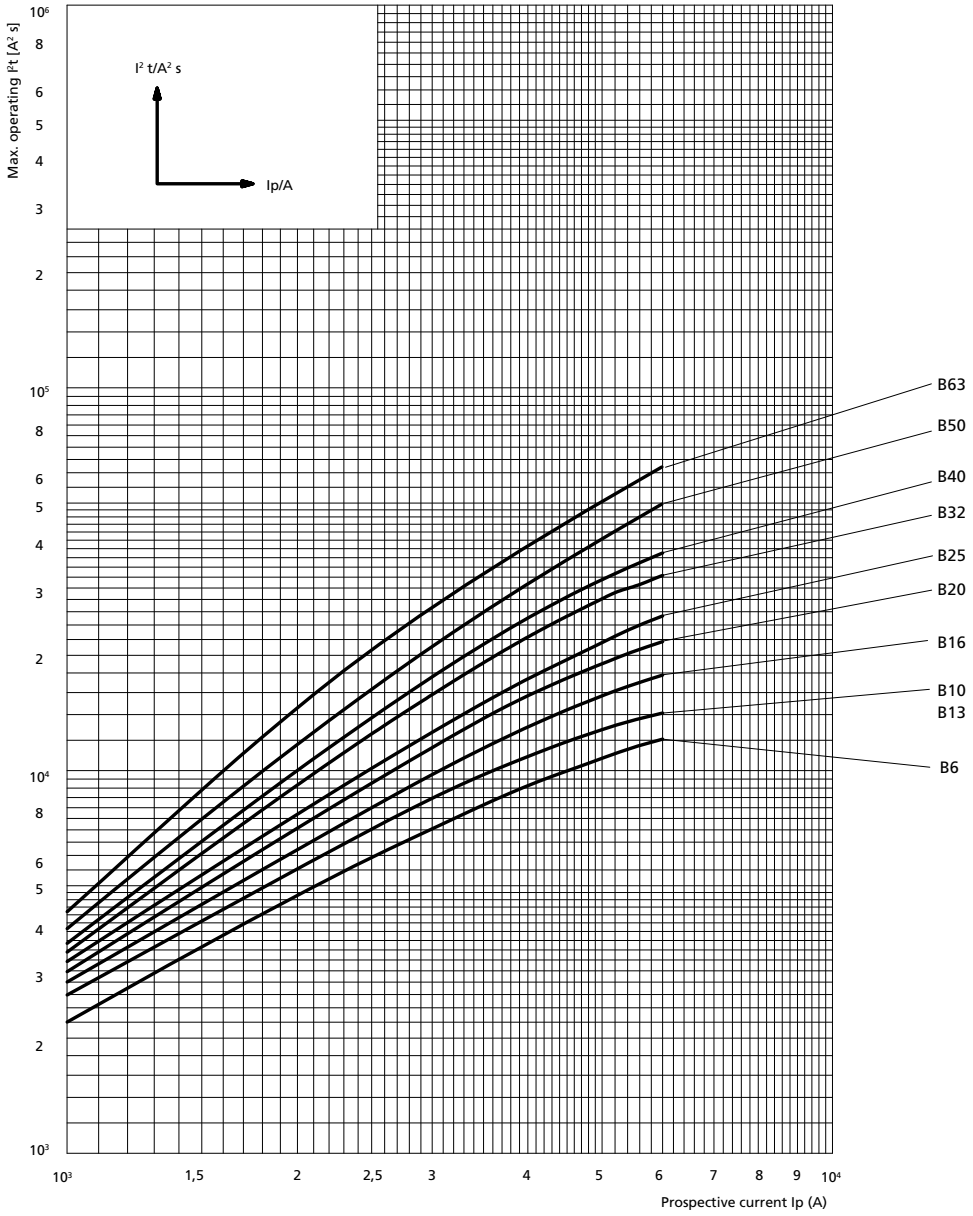
DIFO4 can be assembled with standard 4p or 3p+N miniature circuit breakers ETIMAT 6 and ETIMAT 10. Width of product: 3,5 modules.

Technical data on page 116

Miniature circuit breaker ETIMAT 6

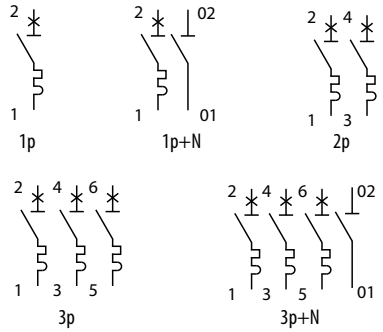


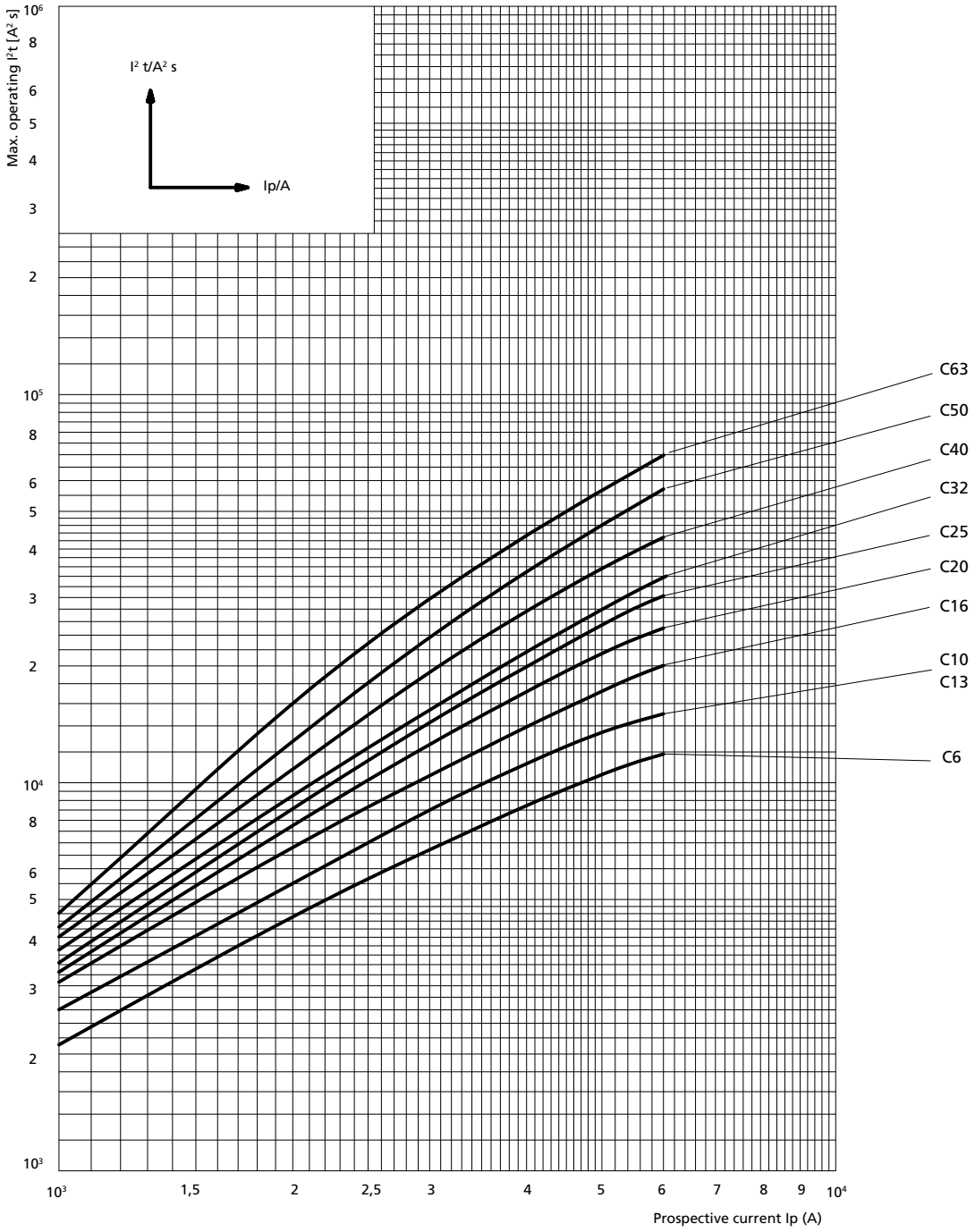
Technical data	
Rated voltage	230/400 V AC, max. 60 V DC / pole
Rated current	B:1-63A, C:0.5-63A, D:0.5-63A
Rated frequency	50/60 Hz
Rated short-circuit capacity	6 kA
Back-up fuse	100A gG
Energy limiting class	3; B, C
Tripping characteristic	B, C, D
Terminals	1 – 25 mm^2, max. 3 Nm
Terminal screw	M5 (Pozidrive PZ2)
Build-in width	18 mm/pol
Mounting on the rail	EN 60715 (EN 50022)
Busbar Thickness	0,8-2mm
Mounting position	any
Sealing possibility	ON / OFF
Electrical endurance (ops)	8.000
Mechanical endurance (ops)	20.000
Overvoltage category	III
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standards	IEC 60898, EN 60898, IEC 60947-2



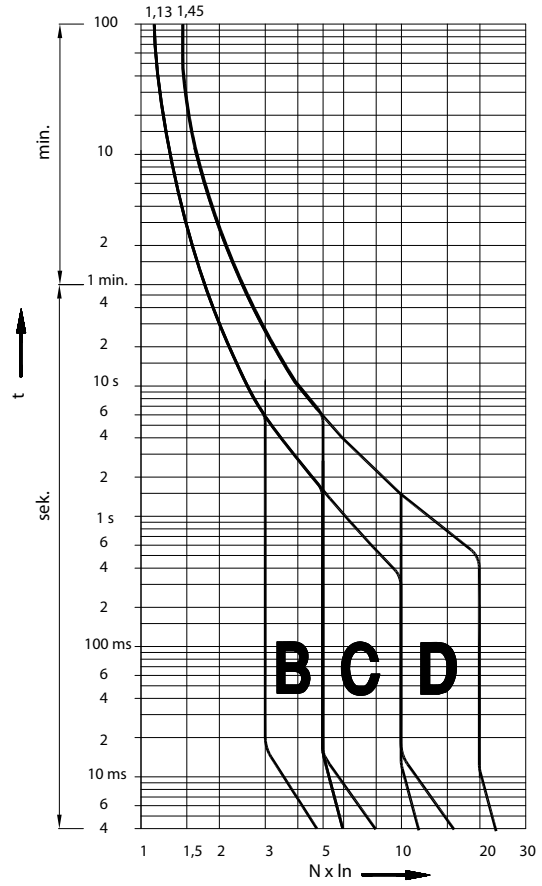
Tripping characteristics

Characteristic	Test current	Tripping time	Result
B, C, D	1,13 I_n	t ≥ 3600 s	No tripping
B, C, D	1,45 I_n	t < 3600 s	Tripping
B, C, D	2,55 I_n	1s < t < 60 s	Tripping
B	3,00 I_n	t ≤ 0,1 s	No tripping
C	5,00 I_n	t ≤ 0,1 s	No tripping
D	10,00 I_n	t ≤ 0,1 s	No tripping
B	5,00 I_n	t < 0,1 s	Tripping
C	10,00 I_n	t < 0,1 s	Tripping
D	20,00 I_n	t < 0,1 s	Tripping





I/t characteristic at 50 and 60Hz



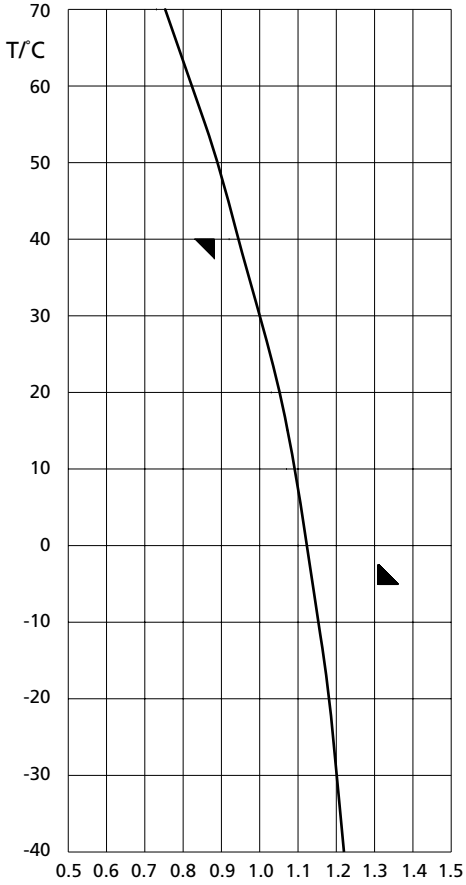
Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

Effect of the ambient temperature on the tripping characteristic



I_n [A]	Ambient temperature T/°C											
	-40	-30	-20	-10	0	10	20	30	40	50	60	70
0,5	0,61	0,6	0,59	0,57	0,56	0,54	0,52	0,5	0,47	0,44	0,41	0,38
1	1,22	1,2	1,18	1,15	1,12	1,09	1,05	1	0,94	0,88	0,82	0,75
1,6	1,95	1,92	1,89	1,84	1,79	1,74	1,68	1,6	1,51	1,42	1,32	1,2
2	2,44	2,4	2,36	2,30	2,24	2,18	2,1	2	1,88	1,77	1,65	1,5
4	4,88	4,8	4,72	4,61	4,49	4,36	4,20	4	3,77	3,55	3,29	3
6	7,32	7,2	7,09	6,91	6,73	6,54	6,31	6	5,66	5,33	4,94	4,5
10	12,2	12	11,8	11,5	11,2	10,9	10,5	10	9,44	8,89	8,23	7,5
13	15,9	15,6	15,4	14,9	14,5	14,1	13,6	13	12,2	11,5	10,7	9,75
16	19,5	19,2	18,9	18,4	17,9	17,4	16,8	16	15,1	14,2	13,2	12
20	24,4	24	23,6	23	22,4	21,8	21	20	18,8	17,7	16,5	15
25	30,5	30	29,5	28,8	28	27,2	26,3	25	23,6	22,2	20,6	18,8
32	39	38,4	37,8	36,9	35,9	34,9	33,6	32	30,2	28,4	26,3	24
40	48,8	48	47,8	46,1	44,9	43,6	42	40	37,7	35,5	32,9	30
50	61	60	59,1	57,6	56,1	54,5	52,6	50	47,2	44,4	41,2	37,5
63	76,9	75,6	74,4	72,6	70,7	68,7	66,2	63	59,4	56	51,9	47,3

Correction factor is valid for current with times over 30 s
I(x°C) - test current at x ambient temperature
I(30°C) - test current at 30°C ambient temperature

$$k = \frac{I(x°C)}{I(30°C)}$$

Technical data

Resistance and power loss

characteristic	I_n [A]	R/pole [mΩ]	P/pole [w]
C, D	0,5	4500	1,12
	1	1800	1,80
	1,6	450	1,15
	2	280	1,08
	4	110	1,70
B, C, D	6	29	1,08
	10	13	1,30
	13	11,6	2,00
	16	9,0	2,30
	20	5,3	2,00
	25	4,1	2,50
	32	2,6	2,70
	40	1,96	3,20
	50	1,5	4,00
	63	1,15	4,80

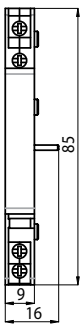
Selectivity

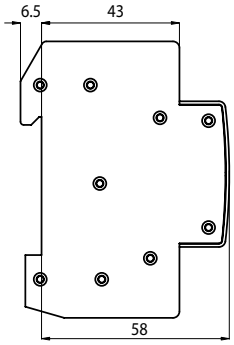
ETIMAT	gG NV										
	20	25	32	35	40	50	63	80	100	125	160
B 6	0,5	0,78	1,2	1,4	1,7	2,4	4,6	6,0	6,0	6,0	6,0
B 10/13	0,45	0,65	1,1	1,3	1,6	2,2	4,0	6,0	6,0	6,0	6,0
B 16		0,55	1,0	1,2	1,5	2,0	3,6	5,5	6,0	6,0	6,0
B 20			0,85	1,2	1,5	1,8	3,1	4,6	6,0	6,0	6,0
B 25				1,1	1,4	1,7	2,9	4,0	6,0	6,0	6,0
B 32					1,3	1,6	2,5	3,4	5,5	6,0	6,0
B 40						1,5	2,2	3,1	4,9	6,0	6,0
B 50							2,1	2,9	4,0	6,0	6,0
B 63								2,5	3,3	5,1	6,0

ETIMAT	gG NV										
	20	25	32	35	40	50	63	80	100	125	160
C,D 6	0,52	0,82	1,3	1,5	2,0	2,7	5,1	6,0	6,0	6,0	6,0
C,D 10/13	0,47	0,70	1,1	1,4	1,8	2,3	4,0	6,0	6,0	6,0	6,0
C,D 16		0,61	0,92	1,2	1,5	1,9	3,2	5,0	6,0	6,0	6,0
C,D 20			0,90	1,1	1,4	1,7	2,9	4,2	6,0	6,0	6,0
C,D 25				1,0	1,3	1,6	2,7	3,9	6,0	6,0	6,0
C,D 32					1,2	1,5	2,3	3,4	5,2	6,0	6,0
C,D 40						1,4	2,1	3,0	4,6	6,0	6,0
C,D 50							2,0	2,7	3,8	6,0	6,0
C,D 63								2,3	3,2	5,5	6,0

Auxiliary switch PS ETIMAT

Technical data	
Rated current	6A (230 V AC), 1A (110 V DC), 0,5A (220V DC)
Terminal	1-4mm², max 0,5Nm
Terminal screw	M3 (PH1)
Contact	1 xb-contact (NC)
	1 xa-contact (NO)
Conditional short-circuit current	1 kA with fuse-link 20 A
Mounting position	any
Standard	EN-62019

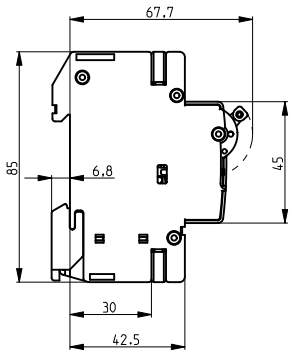




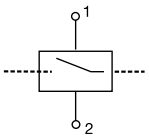
PS ETIMAT is an auxiliary switch only for ETIMAT 6.

Shunt trip release DA ETIMAT





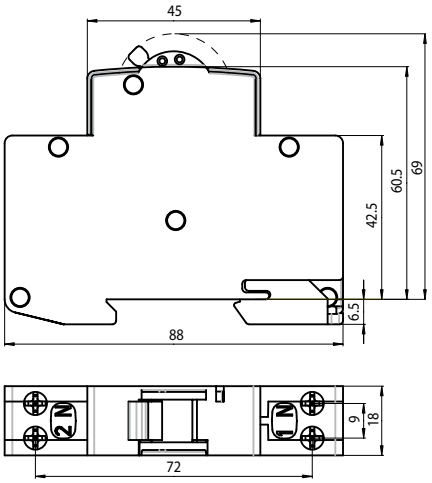
Technical data	
Nominal voltage	24V AC/DC, 48V AC/DC, 230V AC/DC
Rated frequency	50/60Hz
Max. inrush current	3,6 A
Terminals	1-25mm², max 3Nm
Terminal Screw	M5 (Pozidrive PZ2)
Build-in width	18mm
Mounting position	any
Mounting on the rail	EN 60715 (EN 50022)

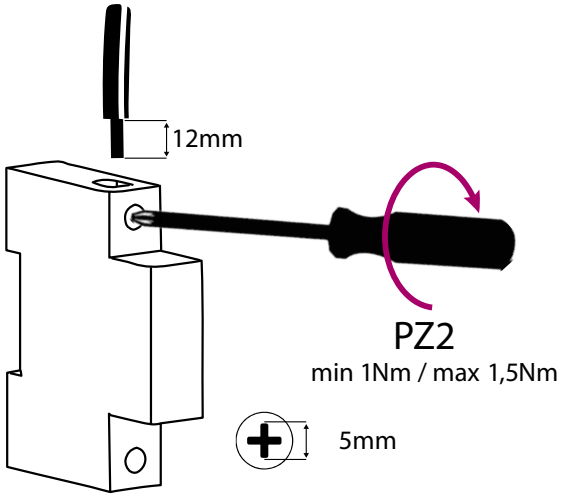


DA ETIMAT is a shunt trip release only for ETIMAT 6.

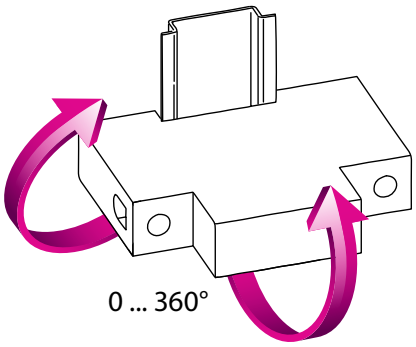
Miniature circuit breaker ETIMAT 1N

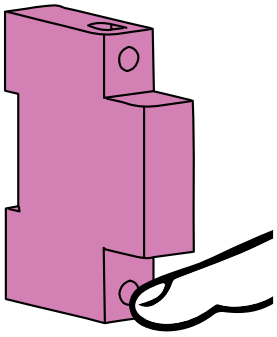
Technical data	
Rated voltage U_n	230 V AC
Rated current I_n	6-32 A
Min. operating voltage	12V AC/DC
Max operating voltage	240V AC
Rated frequency f_n	50/60Hz
Rated short-circuit capacity	6.000 A
Back-up fuse	100 A gG
Tripping characteristics	B, C
Overvoltage category	III
Energy limiting class	3
Terminals	1-10mm², max. 1,5Nm
Terminal screw	M4 (Pozidrive PZ2)
Ambient temperature	-40°C ... +70°C
Storage temperature	-60°C ... +70°C
Build-in width	18mm
Mounting position	any
Supply possibility	top or bottom
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standard	IEC 60898, EN 60898



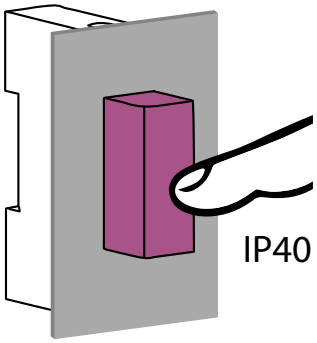


Any mounting position



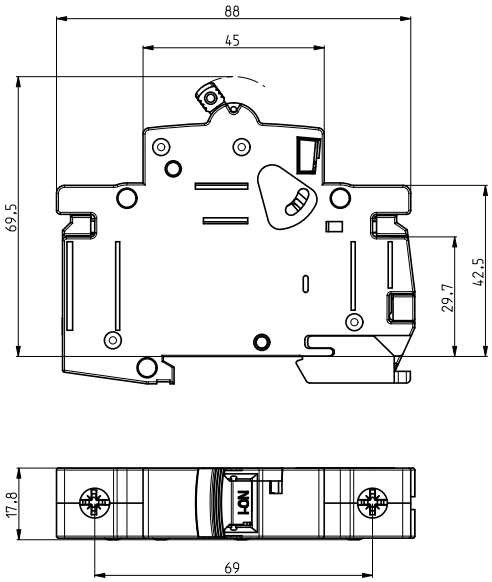


IP20

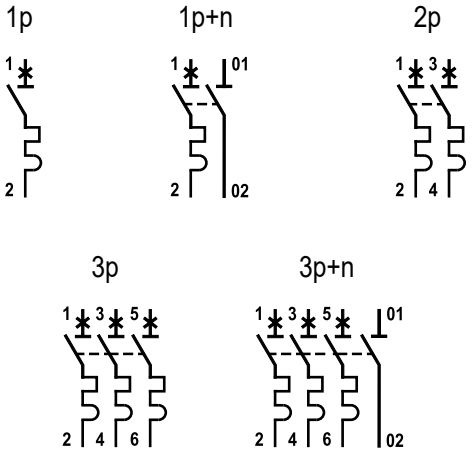


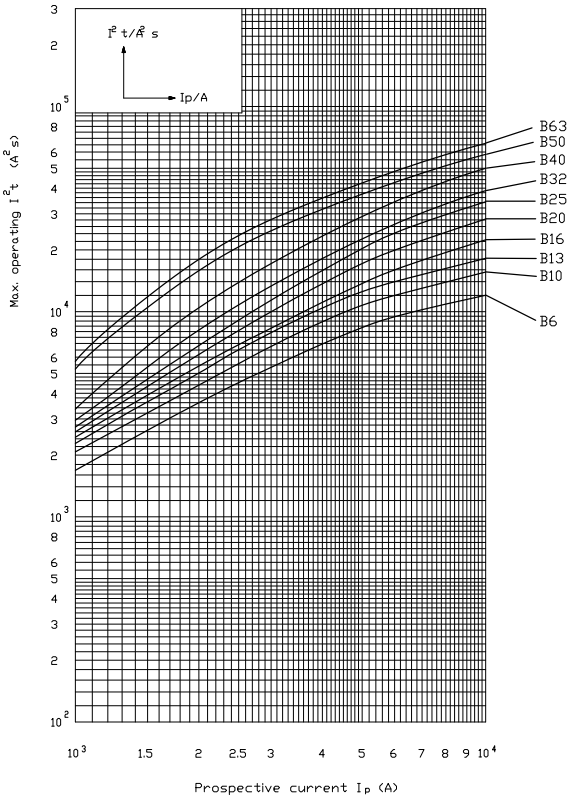
Miniature circuit breaker ETIMAT P10

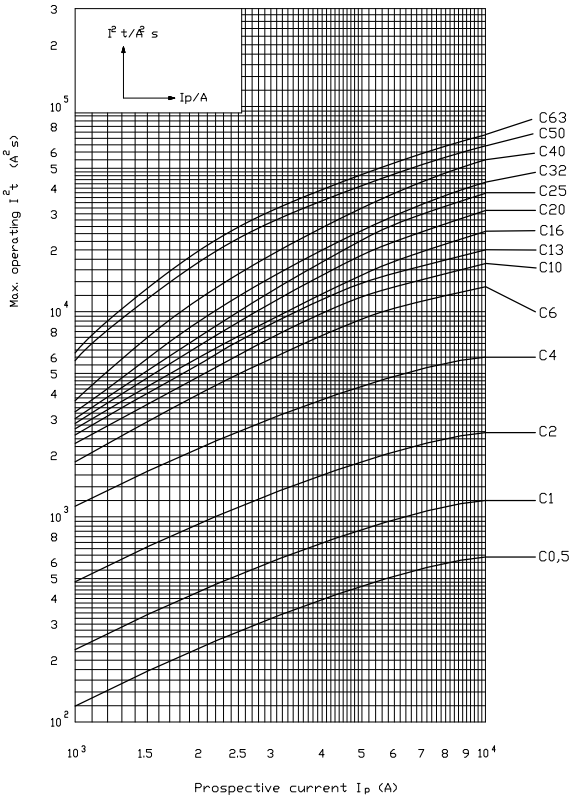
Technical data	
Rated voltage	230/400 V AC; max. 60 V DC / pole
Rated current	B:1-63A, C:0.5-63A, D:0.5-32A, K, Z:0.5-32A
Rated frequency	50/60Hz
Shock resistance	30g.min. 2 shocks, t = 13ms
Rated short-circuit capacity	10 kA
Energy limiting class	3; B,C
Tripping characteristic	B, C, D, K, Z
Back-up fuse	100A gG
Index of protection	IP 20 (IP 40)
Terminals	1-25mm², max. 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Mechanical endurance	20000 op.c.
Electrical endurance	20000 op.c. (In≤32A), 10000 op.c. (I_n>32A)
Ambient temperature	max. -25°C ... +55°C
Storage temperature	max. -40°C ... +70°C
Supply possibility	top or bottom
Build-in width	18 mm/pol
Insulating class	B
Overvoltage category	III
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Locking device	✓
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standards	EN 60898, IEC 60898, IEC 60947-2

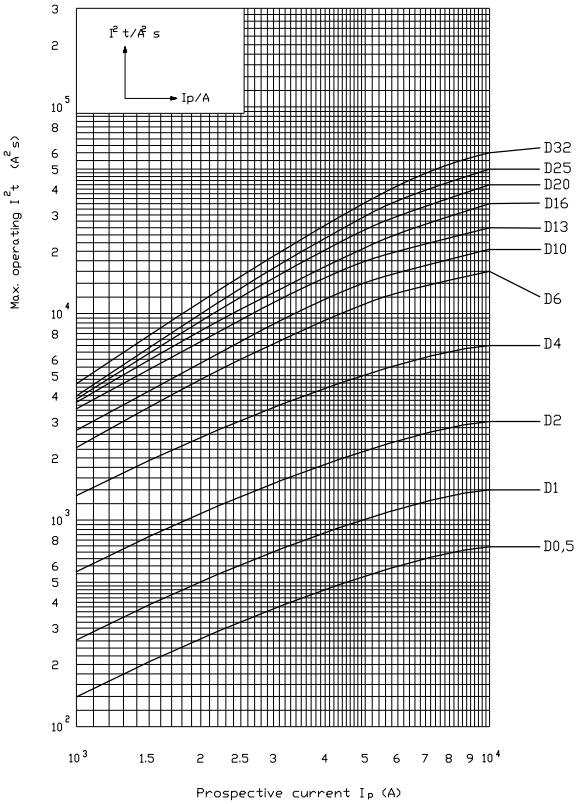


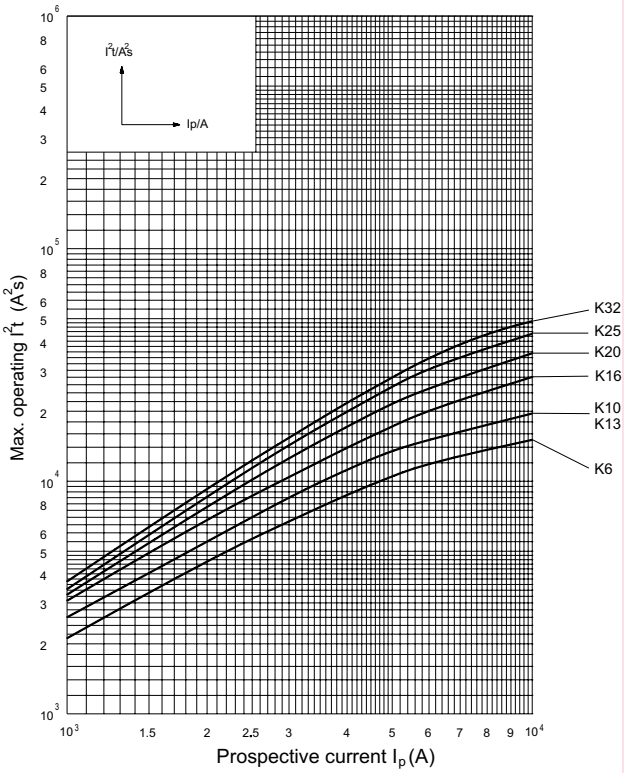
Tripping characteristics			
Characteristic	Test current	Tripping time	Result
B, C, D	1,13 I_n	t ≥ 3600 s	No tripping
B, C, D	1,45 I_n	t < 3600 s	Tripping
B, C, D	2,55 I_n	1s < t < 60 s	Tripping
B	3,00 I_n	t ≤ 0,1 s	No tripping
C	5,00 I_n	t ≤ 0,1 s	No tripping
D	10,00 I_n	t ≤ 0,1 s	No tripping
B	5,00 I_n	t < 0,1 s	Tripping
C	10,00 I_n	t < 0,1 s	Tripping
D	20,00 I_n	t < 0,1 s	Tripping
K	1,05 I_n	t > 7200 s	No Tripping
K	1,20 I_n	t < 7200 s	Tripping
K	8,00 I_n	t ≤ 0,2 s	No Tripping
K	12,00 I_n	t < 0,2 s	Tripping
Z	2,00 I_n	t ≤ 0,2s	No Tripping
Z	3,00 I_n	t < 0,2s	Tripping

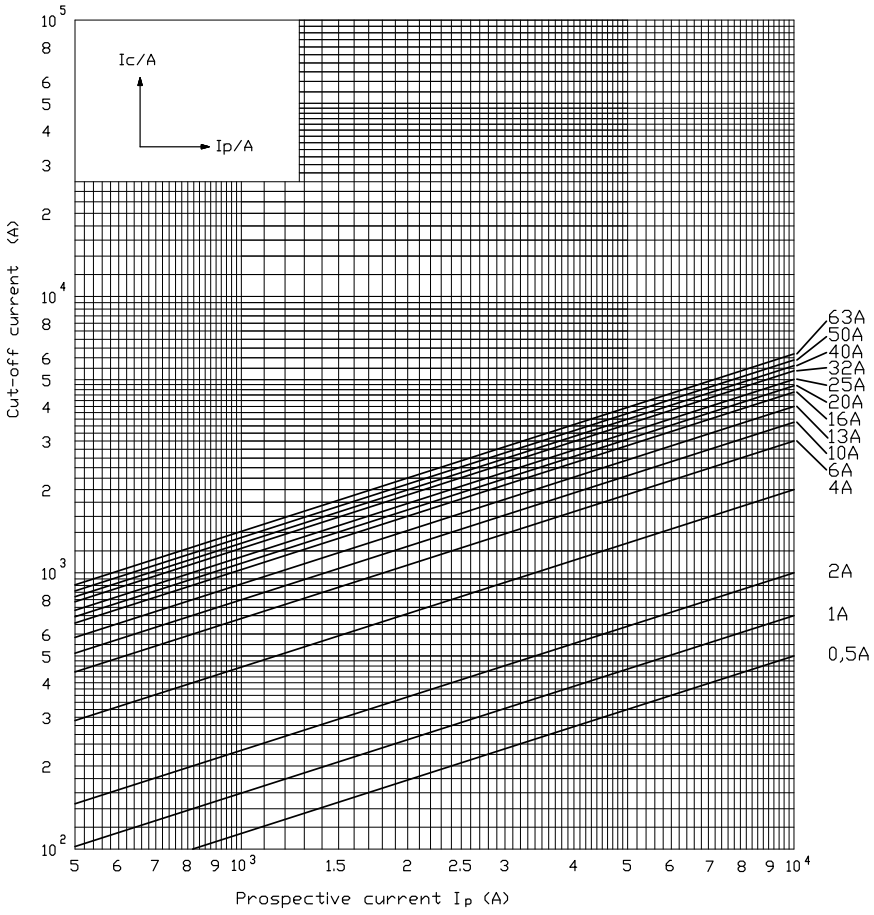



I² t/A² s
Ip/A
Max. operating I²t (A²s)
B63
B50
B40
B32
B25
B20
B16
B13
B10
B6
Prospective current Ip (A)

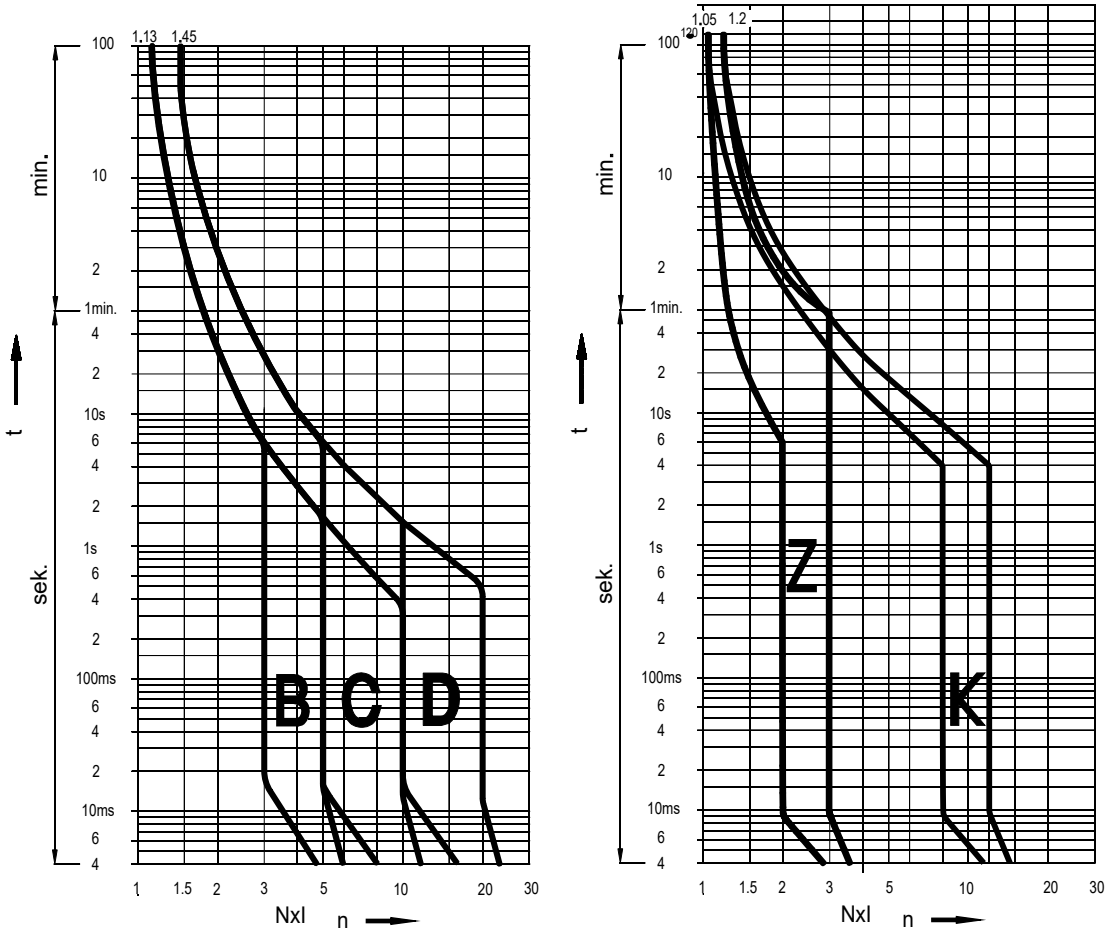

I² t/A² s
Ip/A
Max. operating I²t (A²s)
C63
C50
C40
C32
C25
C20
C16
C13
C10
C6
C4
C2
C1
C0,5
Prospective current Ip (A)


I² t/A² s
Ip/A
Max. operating I²t (A²s)
D32
D25
D20
D16
D13
D10
D6
D4
D2
D1
D0,5
Prospective current Ip (A)

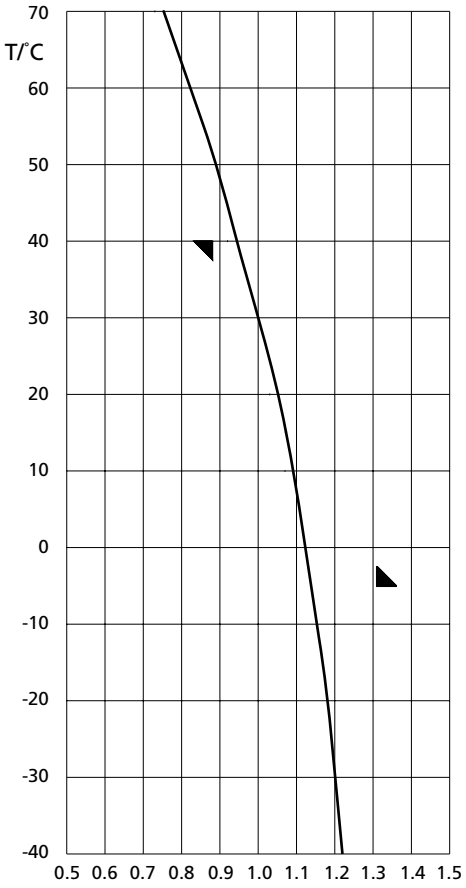

I²t/A²s
Ip/A
Max. operating I²t (A²s)
K32
K25
K20
K16
K10
K13
K6
Prospective current Ip (A)



I/t characteristic at 50 and 60Hz



Effect of the ambient temperature on the tripping characteristic



Correction factor is valid for current with times over 30 s
I(x°C) - test current at x ambient temperature
I(30°C) - test current at 30°C ambient temperature

$$k = \frac{I(x°C)}{I(30°C)}$$

I_n [A]	Ambient temperature T/°C											
	-40	-30	-20	-10	0	10	20	30	40	50	60	70
0,5	0,61	0,6	0,59	0,57	0,56	0,54	0,52	0,5	0,47	0,44	0,41	0,38
1	1,22	1,2	1,18	1,15	1,12	1,09	1,05	1	0,94	0,88	0,82	0,75
1,6	1,95	1,92	1,89	1,84	1,79	1,74	1,68	1,6	1,51	1,42	1,32	1,2
2	2,44	2,4	2,36	2,30	2,24	2,18	2,1	2	1,88	1,77	1,65	1,5
4	4,88	4,8	4,72	4,61	4,49	4,36	4,20	4	3,77	3,55	3,29	3
6	7,32	7,2	7,09	6,91	6,73	6,54	6,31	6	5,66	5,33	4,94	4,5
10	12,2	12	11,8	11,5	11,2	10,9	10,5	10	9,44	8,89	8,23	7,5
13	15,9	15,6	15,4	14,9	14,5	14,1	13,6	13	12,2	11,5	10,7	9,75
16	19,5	19,2	18,9	18,4	17,9	17,4	16,8	16	15,1	14,2	13,2	12
20	24,4	24	23,6	23	22,4	21,8	21	20	18,8	17,7	16,5	15
25	30,5	30	29,5	28,8	28	27,2	26,3	25	23,6	22,2	20,6	18,8
32	39	38,4	37,8	36,9	35,9	34,9	33,6	32	30,2	28,4	26,3	24
40	48,8	48	47,8	46,1	44,9	43,6	42	40	37,7	35,5	32,9	30
50	61	60	59,1	57,6	56,1	54,5	52,6	50	47,2	44,4	41,2	37,5
63	76,9	75,6	74,4	72,6	70,7	68,7	66,2	63	59,4	56	51,9	47,3

Conductor cross-section	Number of single conductors, rigid, single-wire CU conductor				
[mm²]	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section	Number of single conductors, flexible Cu conductors without cable ferrule					
[mm²]	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

Resistance and power loss

characteristic	I_n [A]	R/pole [mΩ]	P/pole [w]
C, D, K, Z	0,5	5700	1,43
	1	1540	1,54
	2	365	1,46
	4	104	1,66
B, C, D, K, Z	6	47	1,68
	10	21	2,1
	13	13,1	2,21
	16	9,7	2,48
	20	6,8	2,70
	25	5,0	3,13
	32	3,1	3,2
B, C	40	2,4	3,80
	50	1,7	4,25
	63	1,23	4,90

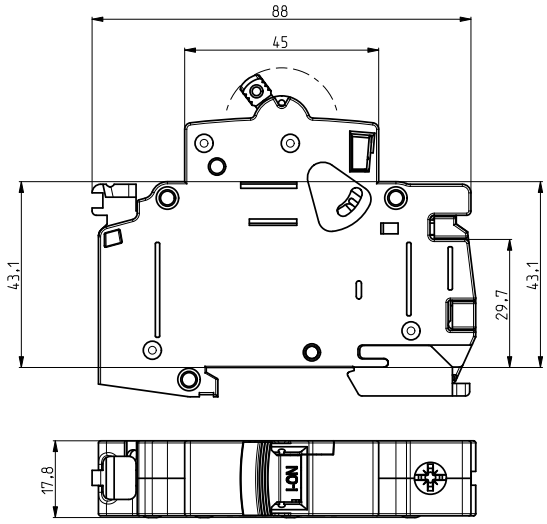
Selectivity

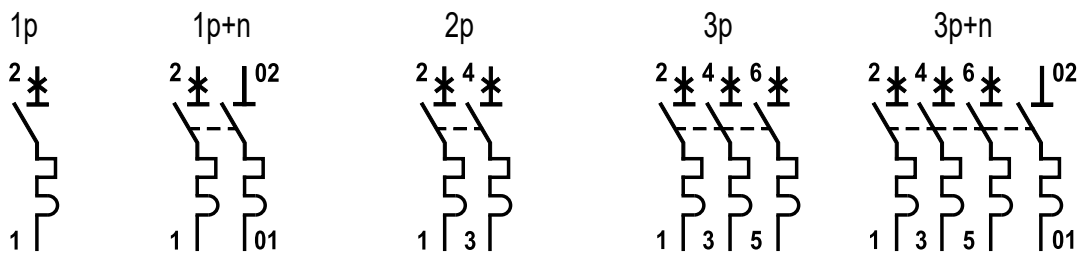
type	gG NV [kA]										
	20	25	32	35	40	50	63	80	100	125	160
B 6	0,5	0,78	1,2	1,4	1,7	2,4	4,6	7,0	10	10	10
B 10/13	0,45	0,65	1,1	1,3	1,6	2,2	4,0	6,5	10	10	10
B 16		0,55	1,0	1,2	1,5	2,0	3,6	5,5	9,5	10	10
B 20			0,85	1,2	1,5	1,8	3,1	4,6	9,0	10	10
B 25				1,1	1,4	1,7	2,9	4,0	8,0	10	10
B 32					1,3	1,6	2,5	3,4	5,5	9,0	10
B 40						1,5	2,2	3,1	4,9	8,0	10
B 50							2,1	2,9	4,0	6,2	10
B 63								2,5	3,3	5,1	8,0

type	gG NV [kA]										
	20	25	32	35	40	50	63	80	100	125	160
C,D,K,Z 6	0,52	0,82	1,3	1,5	2,0	2,7	5,1	9,0	10	10	10
C,D,K,Z 10/13	0,47	0,70	1,1	1,4	1,8	2,3	4,0	7,0	10	10	10
C,D,K,Z 16		0,61	0,92	1,2	1,5	1,9	3,2	5,0	9,0	10	10
C,D,K,Z 20			0,90	1,1	1,4	1,7	2,9	4,2	8,0	10	10
C,D,K,Z 25				1,0	1,3	1,6	2,7	3,9	6,0	10	10
C,D,K,Z 32					1,2	1,5	2,3	3,4	5,2	9,0	10
C 40						1,4	2,1	3,0	4,6	8,0	10
C 50							2,0	2,7	3,8	7,0	10
C 63								2,3	3,2	5,5	9,0

Miniature circuit breaker ETIMAT P10 QC (screwless terminal)

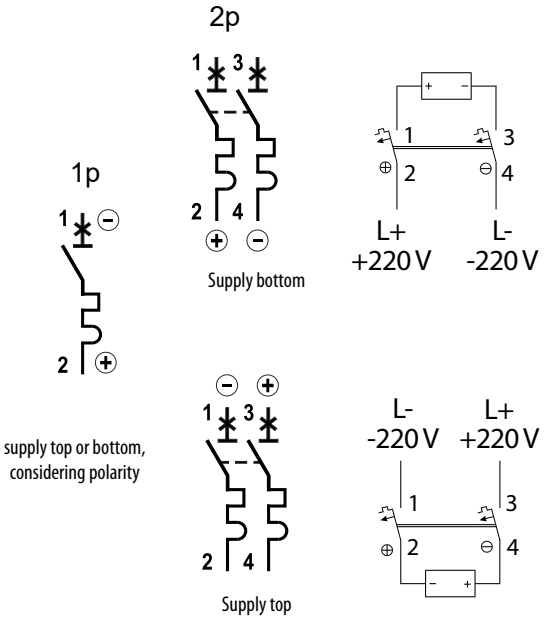
Technical data	
Rated voltage	230/400 V AC; max. 60 V DC / pole
Rated current	B:6-20A, C:0.5-20A, D:0.5-20A, K:0.5-20A
Rated frequency	50/60Hz
Shock resistance	30g.min. 2 shocks, t = 13ms
Rated short-circuit capacity	10 kA
Energy limiting class	3; B,C
Tripping characteristic	B, C, D, K
Back-up fuse	100A gG
Index of protection	IP 20 (IP 40)
Terminals	1-4mm^2
Mechanical endurance	20000 op.c.
Electrical endurance	20000 op.c.
Ambient temperature	max. -25°C to +55°C
Storage temperature	max. -40°C to +70°C
Build-in width	18 mm/pol
Insulating class	B
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Locking device	✓
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standards	EN 60898, IEC 60898, EN 60947-2

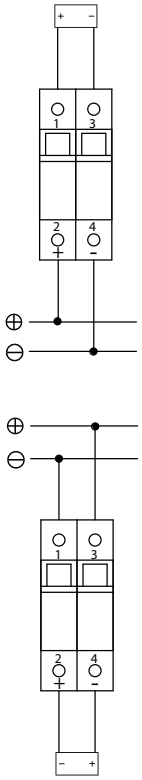


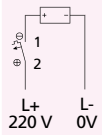
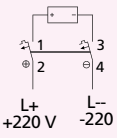
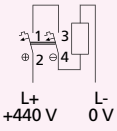
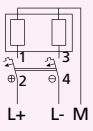


Miniature circuit breaker ETIMAT P10 DC

Technical data	
Rated voltage - for 1-pole U_n	220 V DC
- for 2-pole U_n	220 V /440 V DC
Rated time constant L/R	4 ms
Rated current I_n	0,5-32A (K & Z), 0,5-63A (C), 2-63A (B)
Rated short-circuit capacity	10 kA
Tripping characteristic	B, C, K, Z
Energy limiting class	3
Insulating class	B
Back-up fuse	100 A gG
Terminals	1-25mm^2, max. 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Mounting position	any
Resistance to vibrations (IEC 60068-2-7)	5g (10,60 & 500Hz)
Standards	IEC 60898, EN 60898, DIN VDE 0641





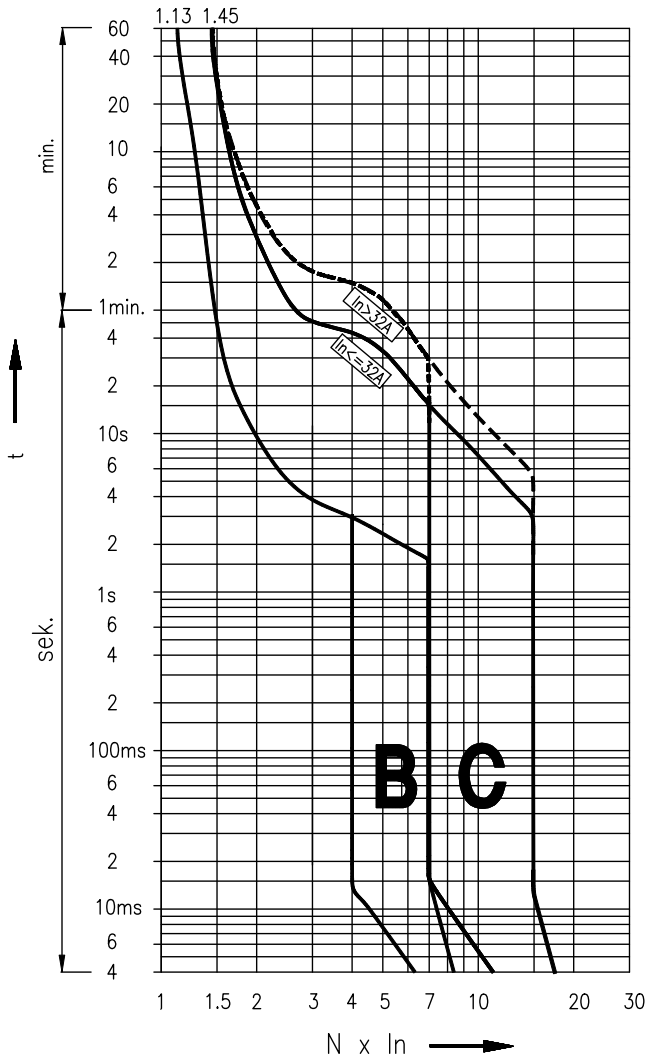
Connecting diagrams in direct current electric circuits				
Rated voltage of circuit breaker	220 V ⎓	220/440 V ⎓	220/440 V ⎓	220/440 V ⎓
Voltage between conductors - max.	220 V ⎓	440 V ⎓	440 V ⎓	440 V ⎓
Voltage between conductor and earth - max.	220 V ⎓	220 V ⎓	440 V ⎓	220 V ⎓
Circuit breaker	1-pole	2-pole	2-pole	2-pole
Connecting diagram	 L+ 220 V L- 0V	 L+ +220 V L-- -220	 L+ +440 V L- 0 V	 L+ L- M

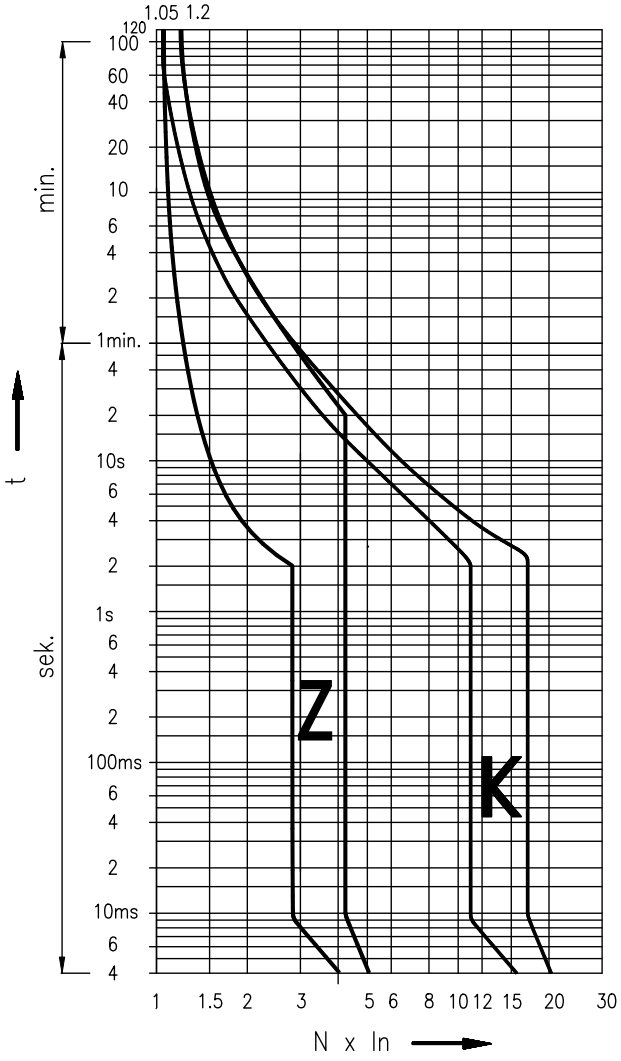
Conductor cross-section [mm^2]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm^2]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

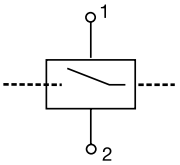
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed





Shunt trip release DA ETIMAT P10

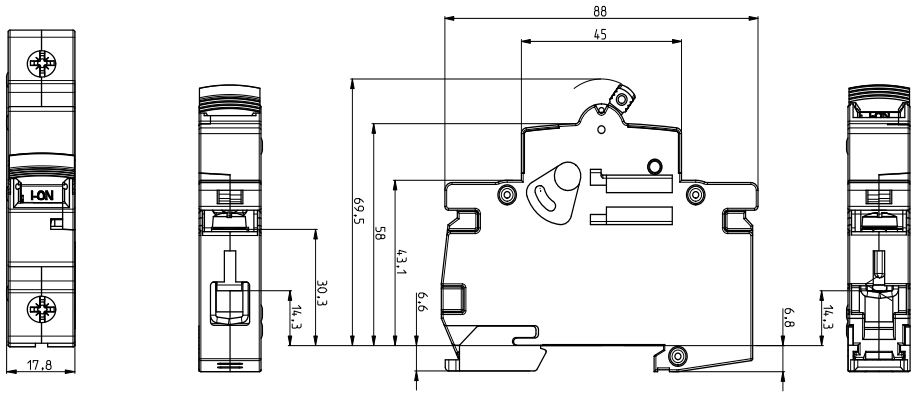
Technical data	
Rated voltage	12-60V AC/DC, 110-250V AC/DC
Rated frequency	50/60Hz, DC
Max inrush current	3A
Index of protection	IP 20 (IP 40)
Terminals	1-25mm^2, max. 2,5Nm
Ambient temperature	M5 (Pozidrive PZ2)
Terminal screw	max. 35°C
Storage temperature	max. -40°C ... +70°C
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Locking device	✓

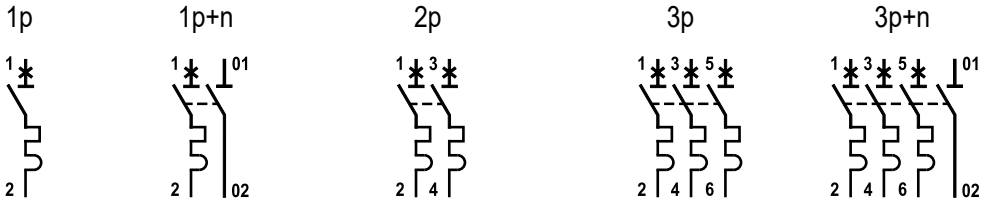


Note: Same dimensions as ETIMAT P10

Miniature circuit breaker ETIMAT P6

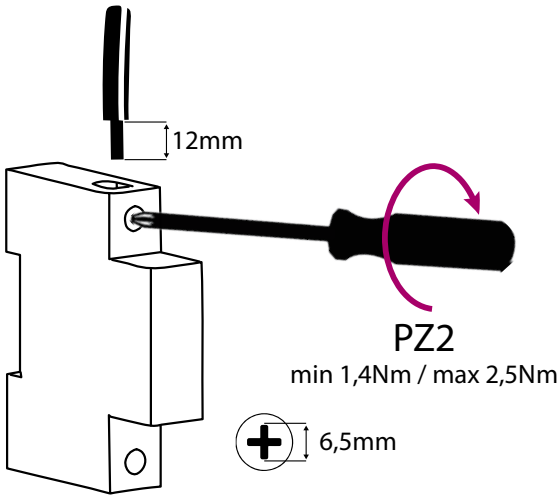
Technical data	
Rated voltage	240/415V AC; max 60V DC/pol
Min. operating voltage	12V AC/DC
Max operating voltage	250/440V AC
Rated current	0,5-63A
Rated frequency	50/60Hz
Rated insulation voltage	500V
Rated impulse withstand voltage	6kV (acc. to 60947-2)
Shock resistance	30g, min 2 shocks, t=13ms
Rated short-circuit capacity	6 kA
Energy limiting class	3; B,C
Tripping characteristic	B, C, D
Back-up fuse	100A gG
Index of protection	IP 20 (IP 40)
Terminals	1-25mm^2, min 1,4Nm / max 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Mechanical endurance	20.000 op. cycles
Electrical endurance	20.000 op. cycles
Ambient temperature	max -40°C ... +70°C
Storage temperature	max -60°C ... +70°C
Supply possibility	top or bottom
Build-in width	18mm/pol
Insulating class	B
Overvoltage category	III
Pollution degree	2
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Contact position indicator	✓
Locking device	✓
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standards	IEC/EN 60898-1, IEC 60947-2



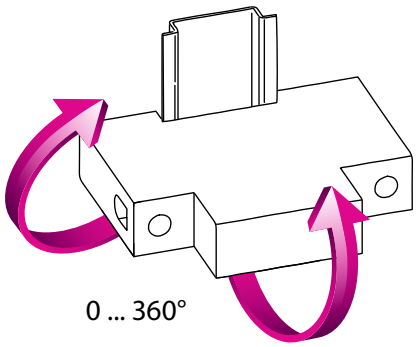


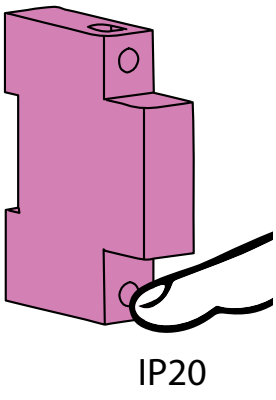
Tripping characteristics

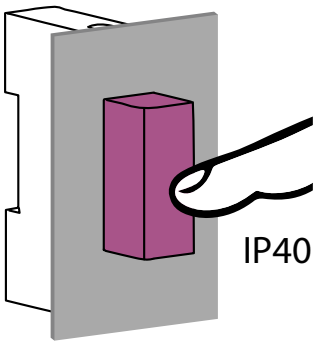
Characteristic	Test current	Tripping time	Result
B, C, D	1,13 I_n	t ≥ 3600 s	No tripping
B, C, D	1,45 I_n	t < 3600 s	Tripping
B, C, D	2,55 I_n	1s < t < 60 s	Tripping
B	3,00 I_n	t ≤ 0,1 s	No tripping
C	5,00 I_n	t ≤ 0,1 s	No tripping
D	10,00 I_n	t ≤ 0,1 s	No tripping
B	5,00 I_n	t < 0,1 s	Tripping
C	10,00 I_n	t < 0,1 s	Tripping
D	20,00 I_n	t < 0,1 s	Tripping

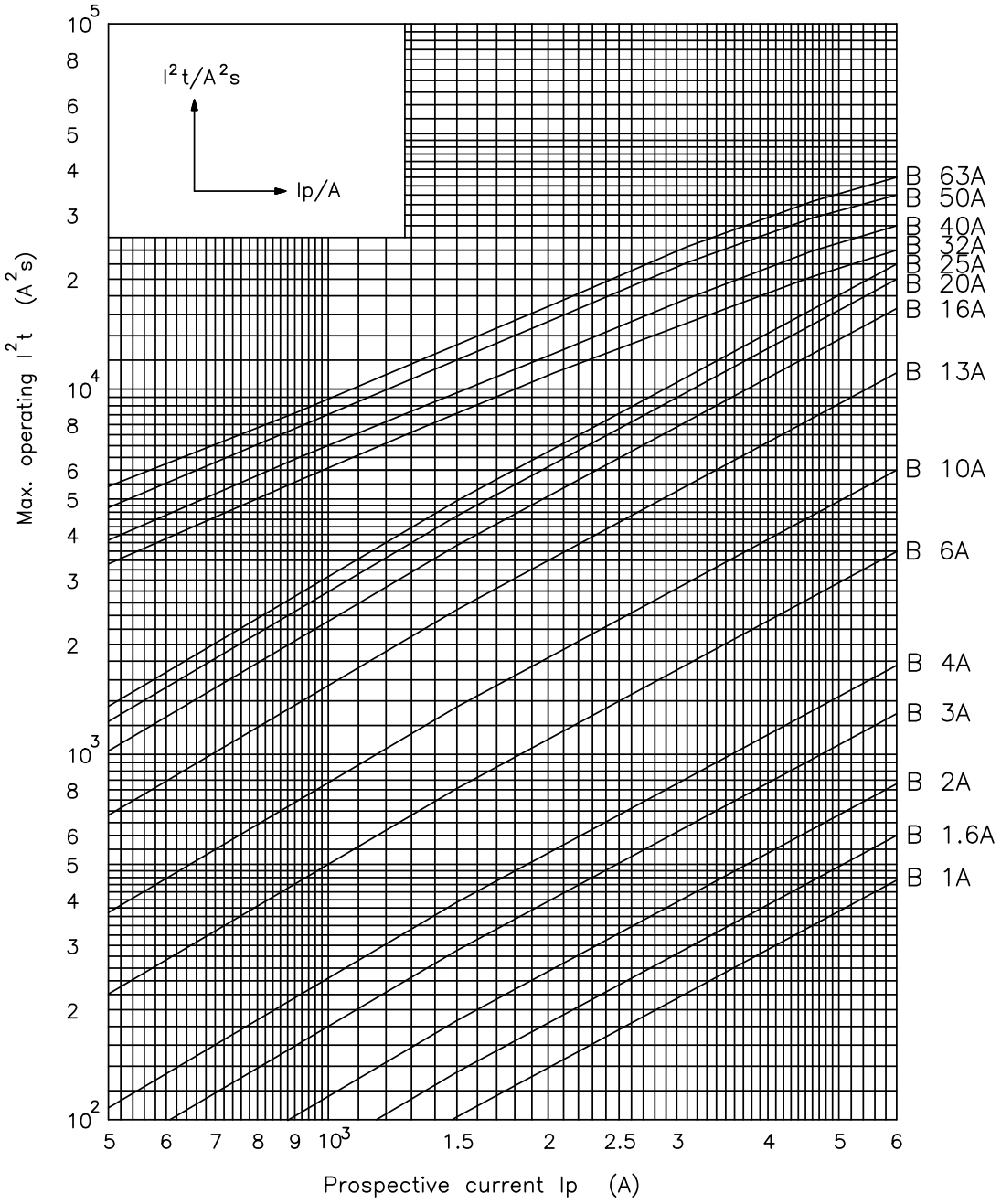


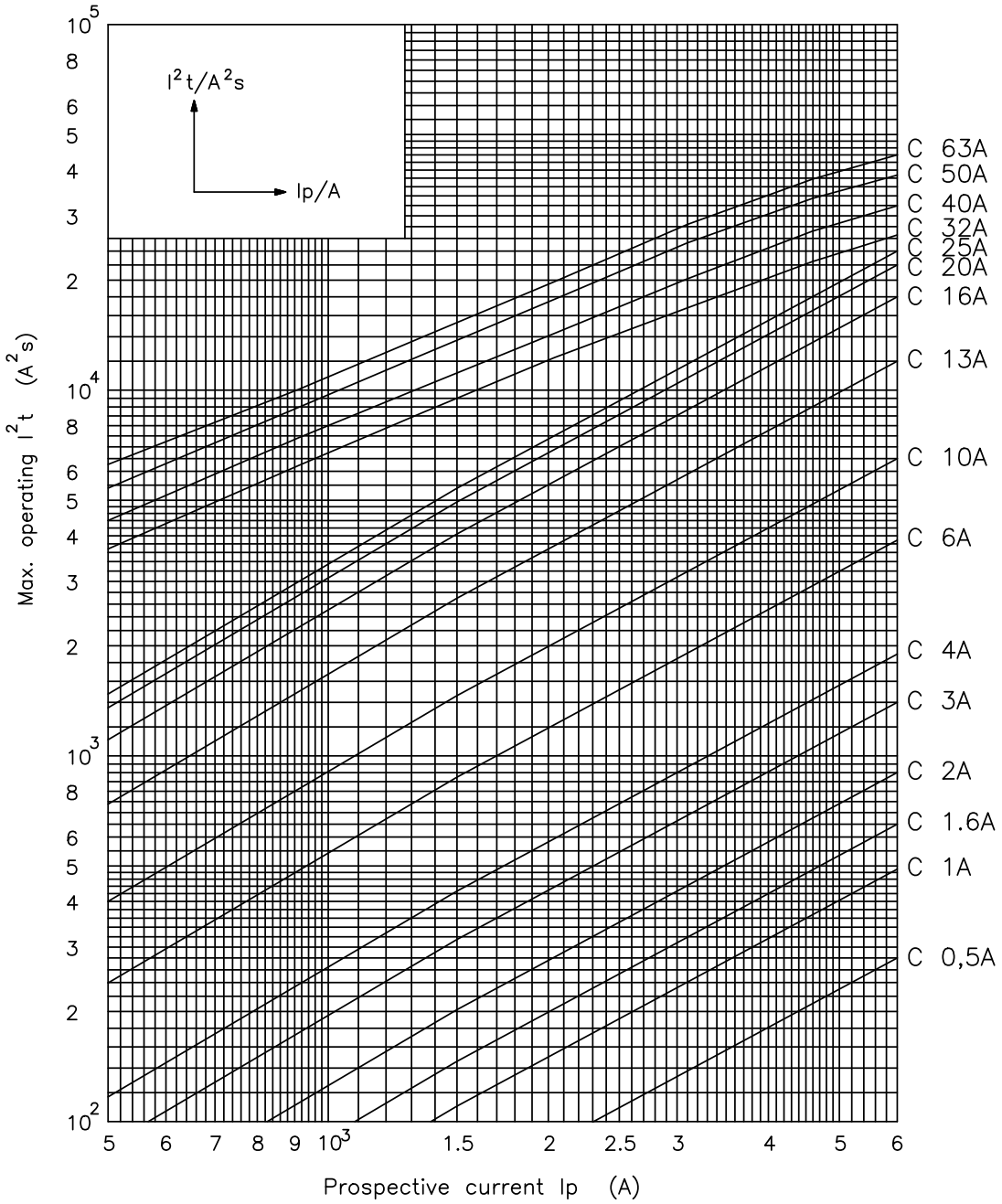
Any mounting position

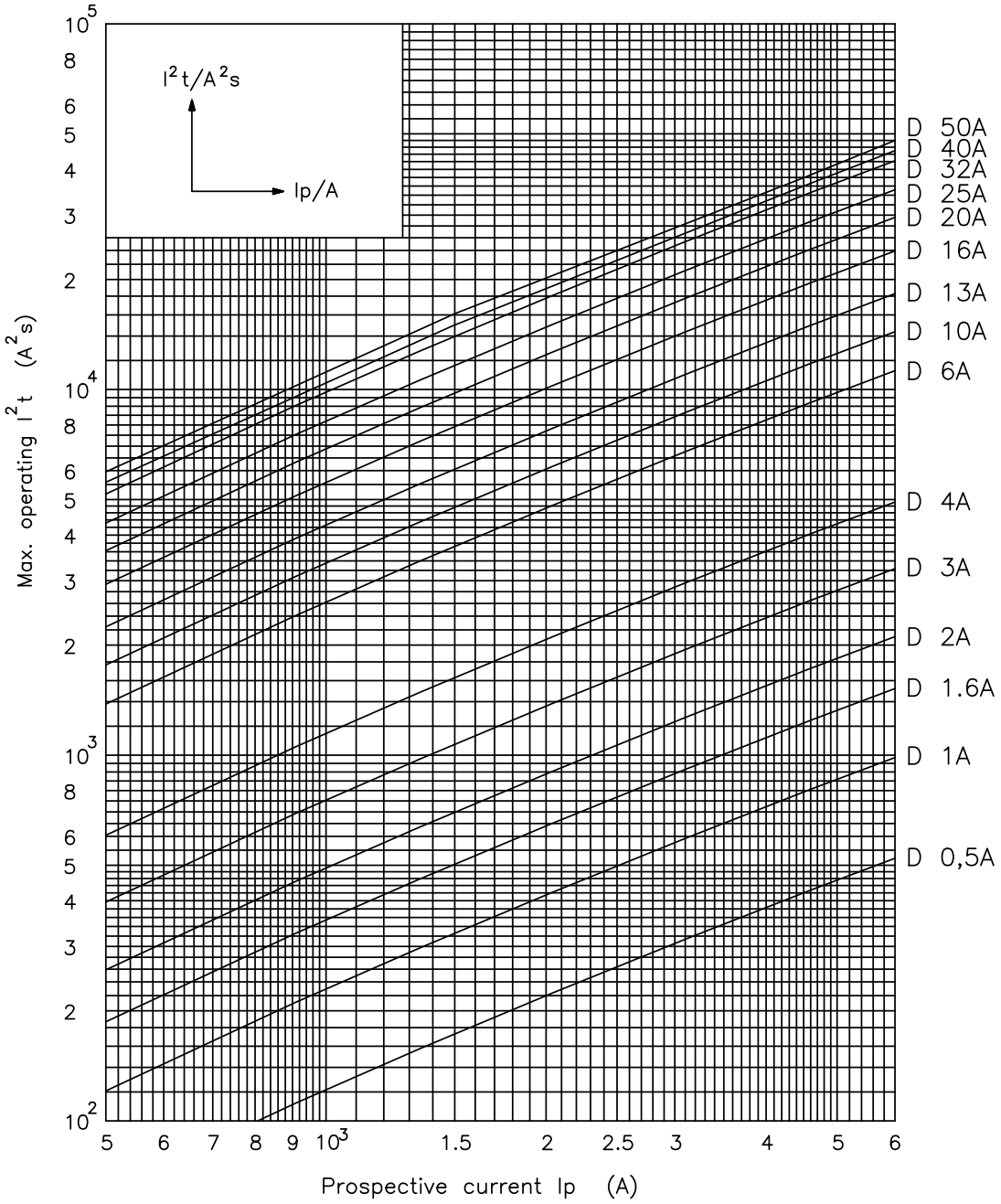


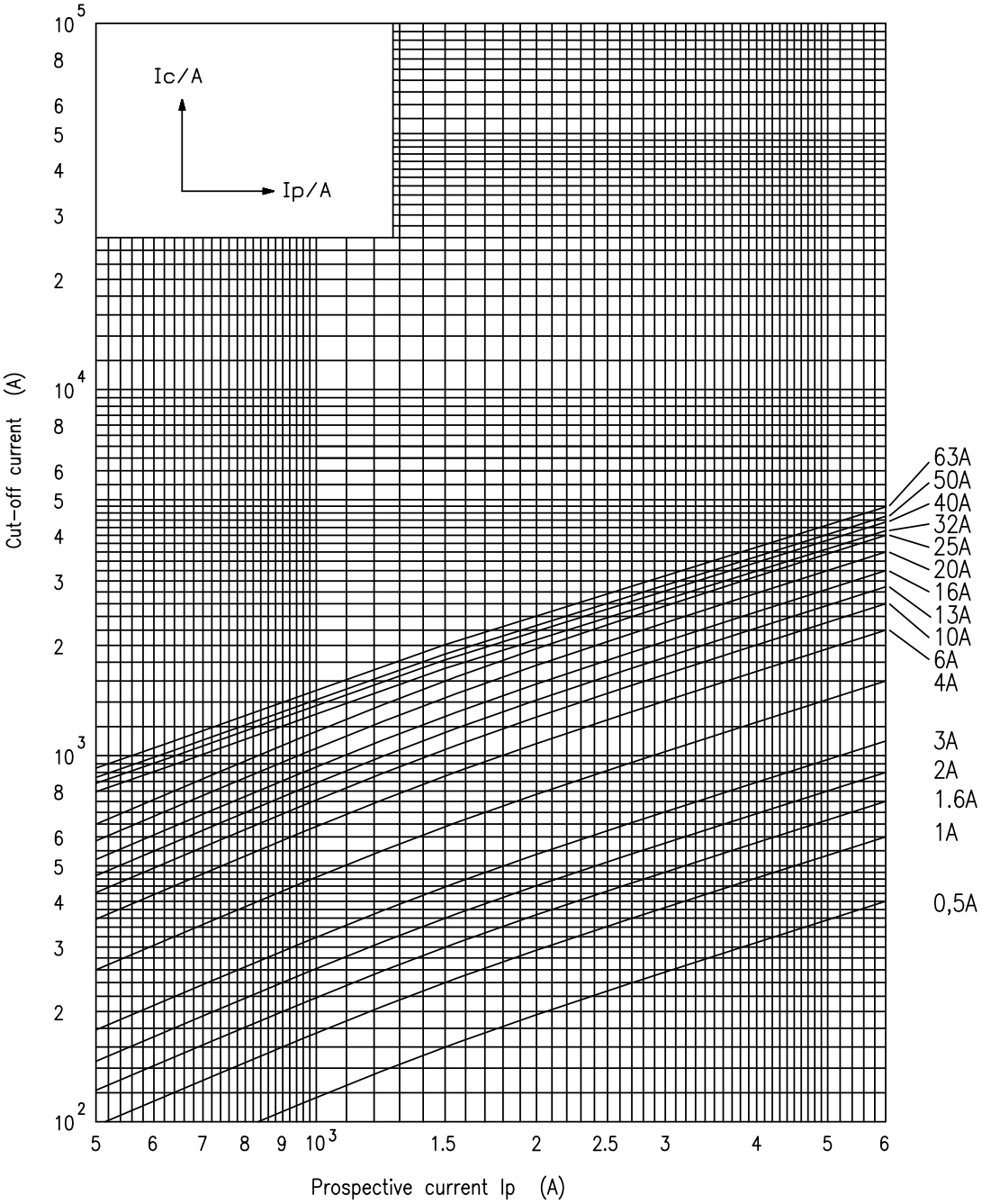




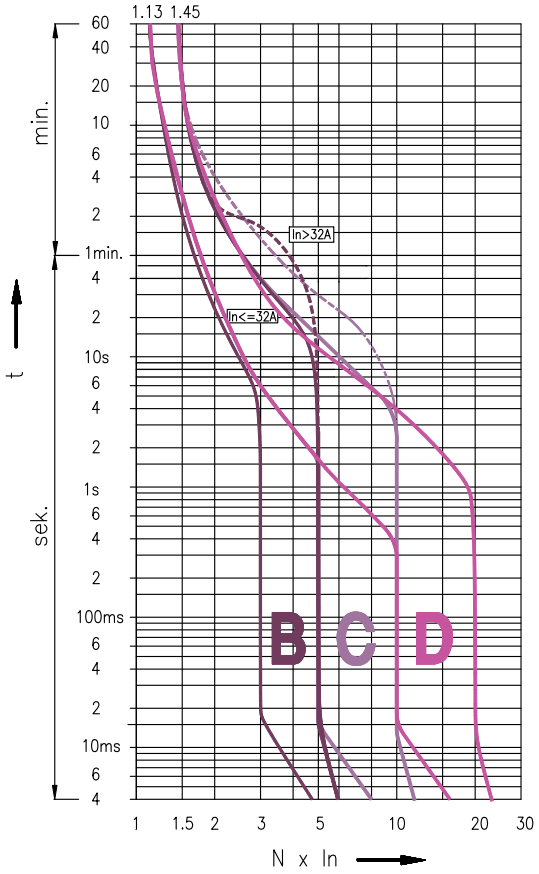

I^2t/A^2s
Ip/A
Max. operating I^2t (A^2s)
10^5
8
6
5
4
3
2
10^4
8
6
5
4
3
2
10^3
8
6
5
4
3
2
10^2
5 6 7 8 9 10^3 1.5 2 2.5 3 4 5 6
Prospective current Ip (A)
B 63A
B 50A
B 40A
B 32A
B 25A
B 20A
B 16A
B 13A
B 10A
B 6A
B 4A
B 3A
B 2A
B 1.6A
B 1A


I^2t/A^2s
Ip/A
C 63A
C 50A
C 40A
C 32A
C 25A
C 20A
C 16A
C 13A
C 10A
C 6A
C 4A
C 3A
C 2A
C 1.6A
C 1A
C 0,5A
Max. operating I^2t (A^2s)
Prospective current Ip (A)


I^2t/A^2s
Ip/A
Max. operating I^2t (A^2s)
10^5
8
6
5
4
3
2
10^4
8
6
5
4
3
2
10^3
8
6
5
4
3
2
10^2
5 6 7 8 9 10^3 1.5 2 2.5 3 4 5 6
Prospective current Ip (A)
D 50A
D 40A
D 32A
D 25A
D 20A
D 16A
D 13A
D 10A
D 6A
D 4A
D 3A
D 2A
D 1.6A
D 1A
D 0,5A


Ic/A
Ip/A
Cut-off current (A)
Prospective current Ip (A)
63A
50A
40A
32A
25A
20A
16A
13A
10A
6A
4A
3A
2A
1.6A
1A
0,5A

I/t characteristic at 50 and 60Hz



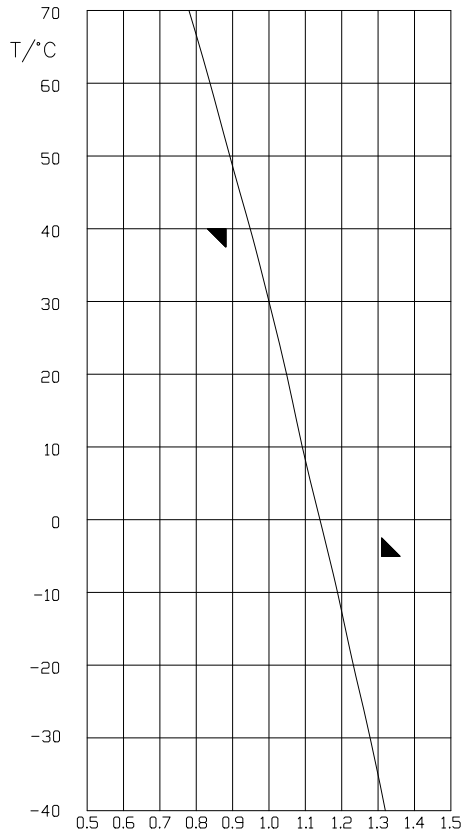
Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

Effect of the ambient temperature on the tripping characteristic



In (A)	Ambient temperature T/°C											
	−40	−30	−20	−10	0	10	20	30	40	50	60	70
0,5	0,66	0,64	0,62	0,60	0,57	0,55	0,53	0,5	0,48	0,45	0,42	0,39
1	1,32	1,28	1,23	1,19	1,14	1,09	1,05	1	0,95	0,89	0,84	0,78
1,6	2,11	2,05	1,97	1,90	1,82	1,74	1,68	1,6	1,52	1,42	1,34	1,25
2	2,64	2,56	2,46	2,38	2,28	2,18	2,10	2	1,90	1,78	1,68	1,56
4	5,28	5,12	4,92	4,76	4,56	4,36	4,20	4	3,80	3,56	3,36	3,12
6	7,92	7,68	7,38	7,14	6,84	6,54	6,30	6	5,70	5,34	5,04	4,68
10	13,2	12,8	12,3	11,9	11,4	10,9	10,5	10	9,50	8,90	8,40	7,80
13	17,2	16,6	16,0	15,5	14,8	14,2	13,7	13	12,4	11,6	10,9	10,1
16	21,1	20,5	19,7	19,0	18,2	17,4	16,8	16	15,2	14,2	13,4	12,5
20	26,4	25,6	24,6	23,8	22,8	21,8	21,0	20	19,0	17,8	16,8	15,6
25	33,0	32,0	30,8	29,8	28,5	27,3	26,3	25	23,8	22,3	21,0	19,5
32	42,2	41,0	39,4	38,1	36,5	34,9	33,6	32	30,4	28,5	26,9	25,0
40	52,8	51,2	49,2	47,6	45,6	43,6	42,0	40	38,0	35,6	33,6	31,2
50	66,0	64,0	61,5	59,5	57,0	54,5	52,6	50	47,5	44,5	42,0	39,0
63	83,2	80,6	77,5	75,0	71,8	68,7	66,2	63	59,9	56,1	52,9	49,1

Correction factor is valid for current with times over 30 s
I(x°C) - test current at x ambient temperature
I(30°C) - test current at 30°C ambient temperature

$$k = \frac{I(x°C)}{I(30°C)}$$

Resistance and power dissipation

characteristic	I_n [A]	R/pole [mΩ]	P/pole [w]
B, C	0,5	3587	1,16
	1	935	1,21
	1,6	382	1,26
	2	264	1,37
	3	*	*
	4	69,6	1,38
	6	40,3	1,96
	10	16,9	2,00
	13	11,4	2,08
	16	8,17	2,26
	20	6,73	2,53
	25	5,03	2,96
	32	3,92	3,44
	40	*	*
	50	2,22	3,57
	63	1,71	4,59
D	0,5	*	*
	1	1183	1,55
	1,6	*	*
	2	303	1,58
	3	135	1,52
	4	81,8	1,66
	6	40,0	1,78
	10	17,3	1,57
	13	11,3	2,04
	16	8,59	2,31
	20	7,17	2,73
	25	4,77	2,91
	32	3,92	3,44
	40	*	*
	50	*	*
	63	*	*

Selectivity

ETIMAT	gG NV										
	20	25	32	35	40	50	63	80	100	125	160
B 6	0,5	0,78	1,2	1,4	1,7	2,4	4,6	6,0	6,0	6,0	6,0
B 10/13	0,45	0,65	1,1	1,3	1,6	2,2	4,0	6,0	6,0	6,0	6,0
B 16		0,55	1,0	1,2	1,5	2,0	3,6	5,5	6,0	6,0	6,0
B 20			0,85	1,2	1,5	1,8	3,1	4,6	6,0	6,0	6,0
B 25				1,1	1,4	1,7	2,9	4,0	6,0	6,0	6,0
B 32					1,3	1,6	2,5	3,4	5,5	6,0	6,0
B 40						1,5	2,2	3,1	4,9	6,0	6,0
B 50							2,1	2,9	4,0	6,0	6,0
B 63								2,5	3,3	5,1	6,0

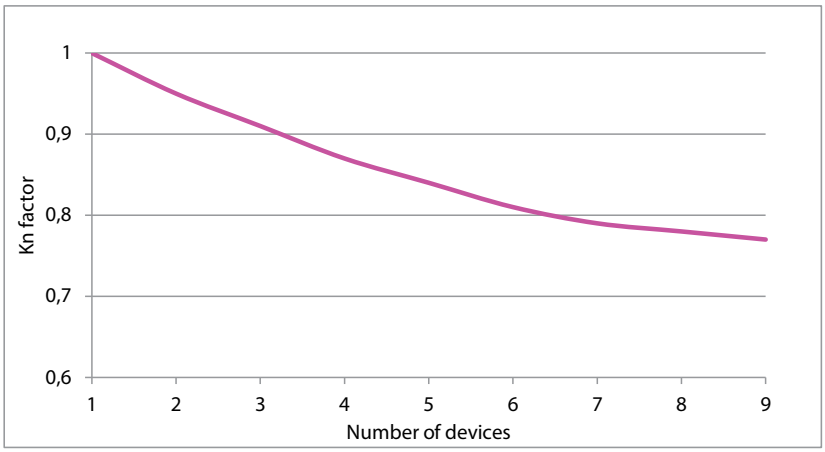
ETIMAT	gG NV										
	20	25	32	35	40	50	63	80	100	125	160
C,D 6	0,52	0,82	1,3	1,5	2,0	2,7	5,1	6,0	6,0	6,0	6,0
C,D 10/13	0,47	0,70	1,1	1,4	1,8	2,3	4,0	6,0	6,0	6,0	6,0
C,D 16		0,61	0,92	1,2	1,5	1,9	3,2	5,0	6,0	6,0	6,0
C,D 20			0,90	1,1	1,4	1,7	2,9	4,2	6,0	6,0	6,0
C,D 25				1,0	1,3	1,6	2,7	3,9	6,0	6,0	6,0
C,D 32					1,2	1,5	2,3	3,4	5,2	6,0	6,0
C,D 40						1,4	2,1	3,0	4,6	6,0	6,0
C,D 50							2,0	2,7	3,8	6,0	6,0
C,D 63								2,3	3,2	5,5	6,0

R: measured at 0.1*In
P: measured at In

Effect of number of poles on the tripping characteristic ETIMAT P6

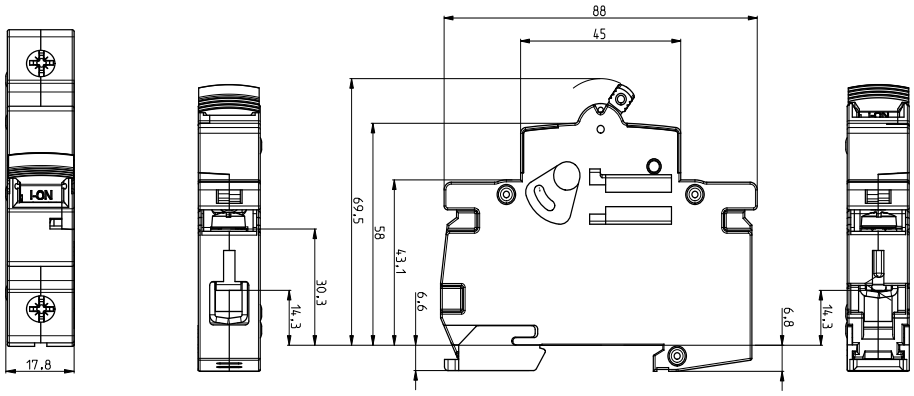
Correction factor K_n

Number of devices	Kn
1	1
2	0,95
3	0,91
4	0,87
5	0,84
6	0,81
7	0,79
8	0,78
9	0,77
>9	0,77

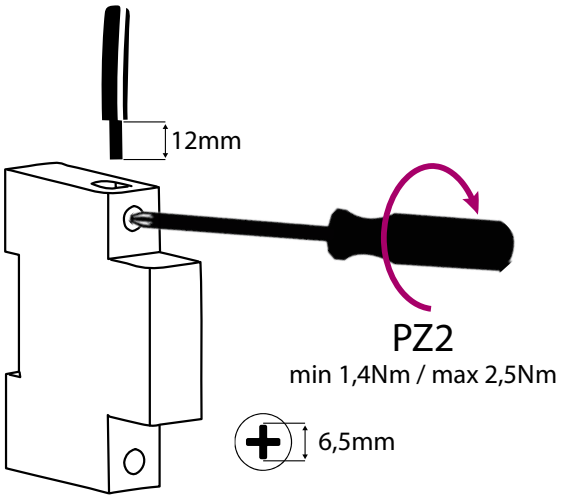


Miniature circuit breaker ETIMAT P10 - NEW GENERATION

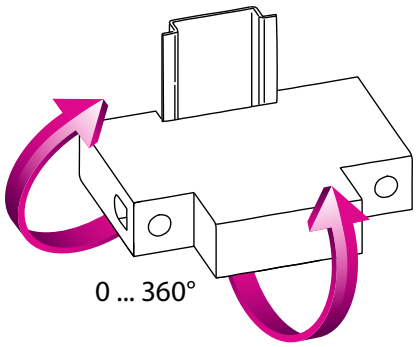
Technical data	
Rated voltage	240/415V AC; max 60V DC/pol
Min. operating voltage	12V AC/DC
Max operating voltage	250/440V AC
Rated current	B:1-63A, C:0.5-63A,D:0.5-63A, K&Z:0.5-32A
Rated frequency	50/60Hz
Rated insulation voltage	500V
Rated impulse withstand voltage	6kV (acc. to 60947-2)
Shock resistance	30g, min 2 shocks, t=13ms
Rated short-circuit capacity	10 kA
Energy limiting class	3; B,C
Tripping characteristic	B, C, D, K, Z
Back-up fuse	100A gG
Index of protection	IP 20 (IP 40)
Terminals	1-25mm^2, min 1,4Nm / max 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Mechanical endurance	20.000 op. cycles
Electrical endurance	20.000 op. cycles
Ambient temperature	max -40°C ... +70°C
Storage temperature	max -60°C ... +70°C
Supply possibility	top or bottom
Build-in width	18mm/pol
Insulating class	B
Overvoltage category	III
Pollution degree	2
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Contact position indicator	✓
Locking device	✓
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standards	IEC/EN 60898-1, IEC 60947-2

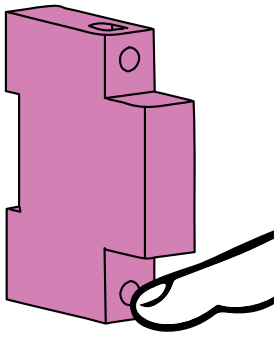


Tripping characteristics			
Characteristic	Test current	Tripping time	Result
B, C, D	1,13 I_n	t ≥ 3600 s	No tripping
B, C, D	1,45 I_n	t < 3600 s	Tripping
B, C, D	2,55 I_n	1s < t < 60 s	Tripping
B	3,00 I_n	t ≤ 0,1 s	No tripping
C	5,00 I_n	t ≤ 0,1 s	No tripping
D	10,00 I_n	t ≤ 0,1 s	No tripping
B	5,00 I_n	t < 0,1 s	Tripping
C	10,00 I_n	t < 0,1 s	Tripping
D	20,00 I_n	t < 0,1 s	Tripping
K, Z	1,05 I_n	t > 7200 s	No Tripping
K, Z	1,20 I_n	t < 7200 s	Tripping
K	8,00 I_n	t ≤ 0,2 s	No Tripping
K	12,00 I_n	t < 0,2 s	Tripping
Z	2,00 I_n	t ≤ 0,2s	No Tripping
Z	3,00 I_n	t < 0,2s	Tripping

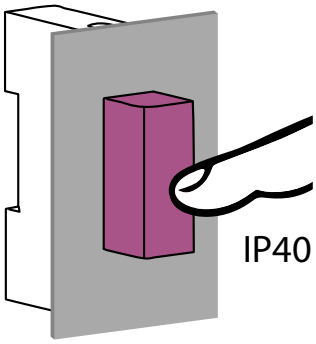


Any mounting position





IP20

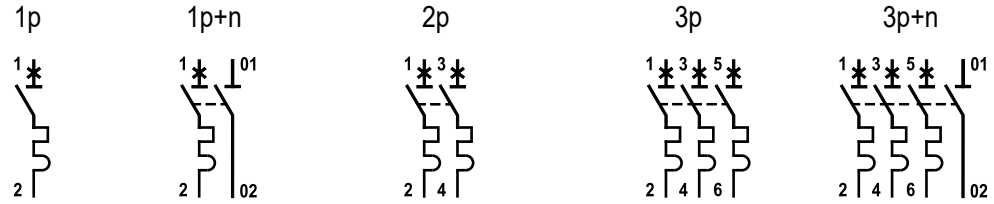


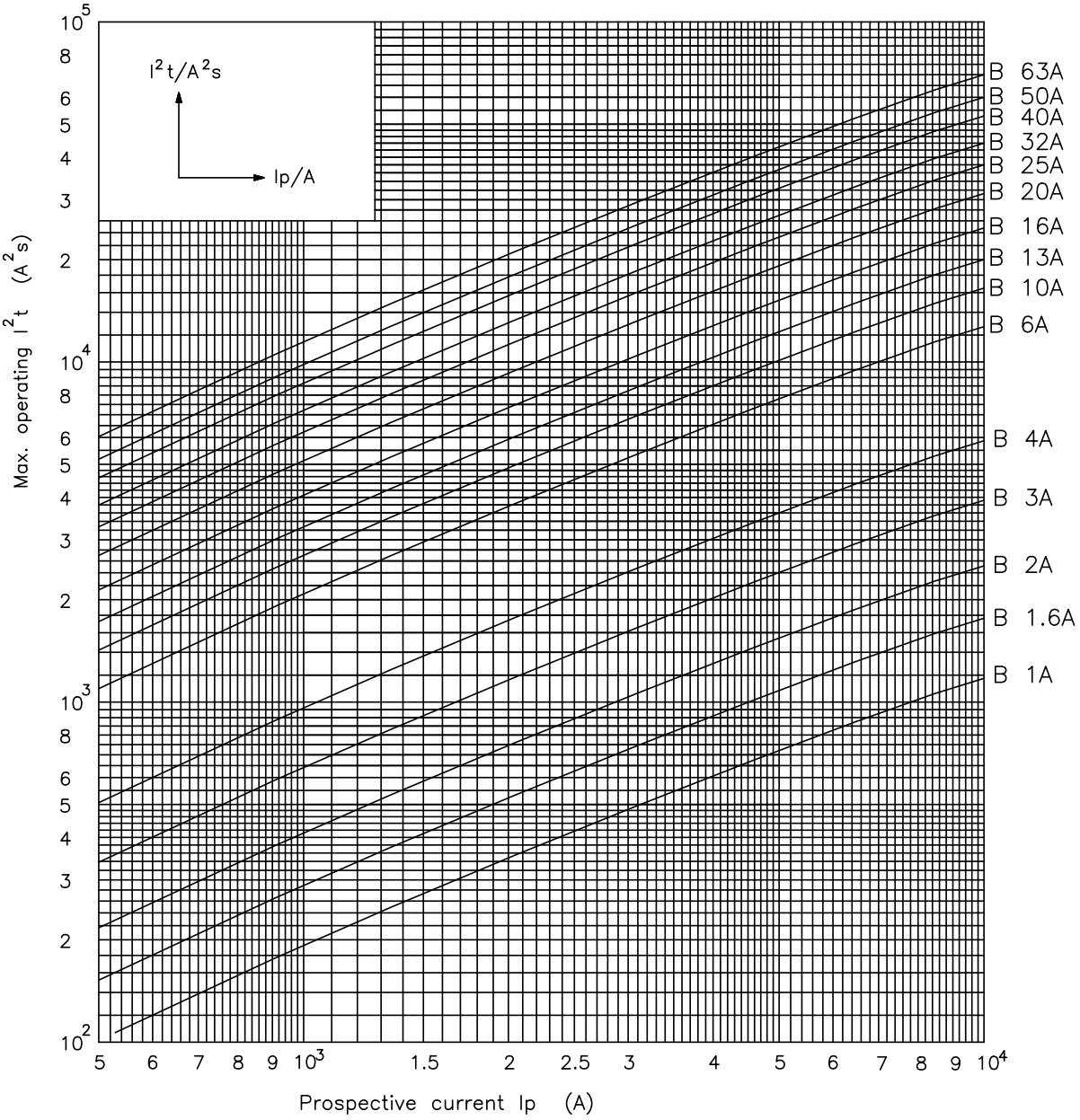
Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

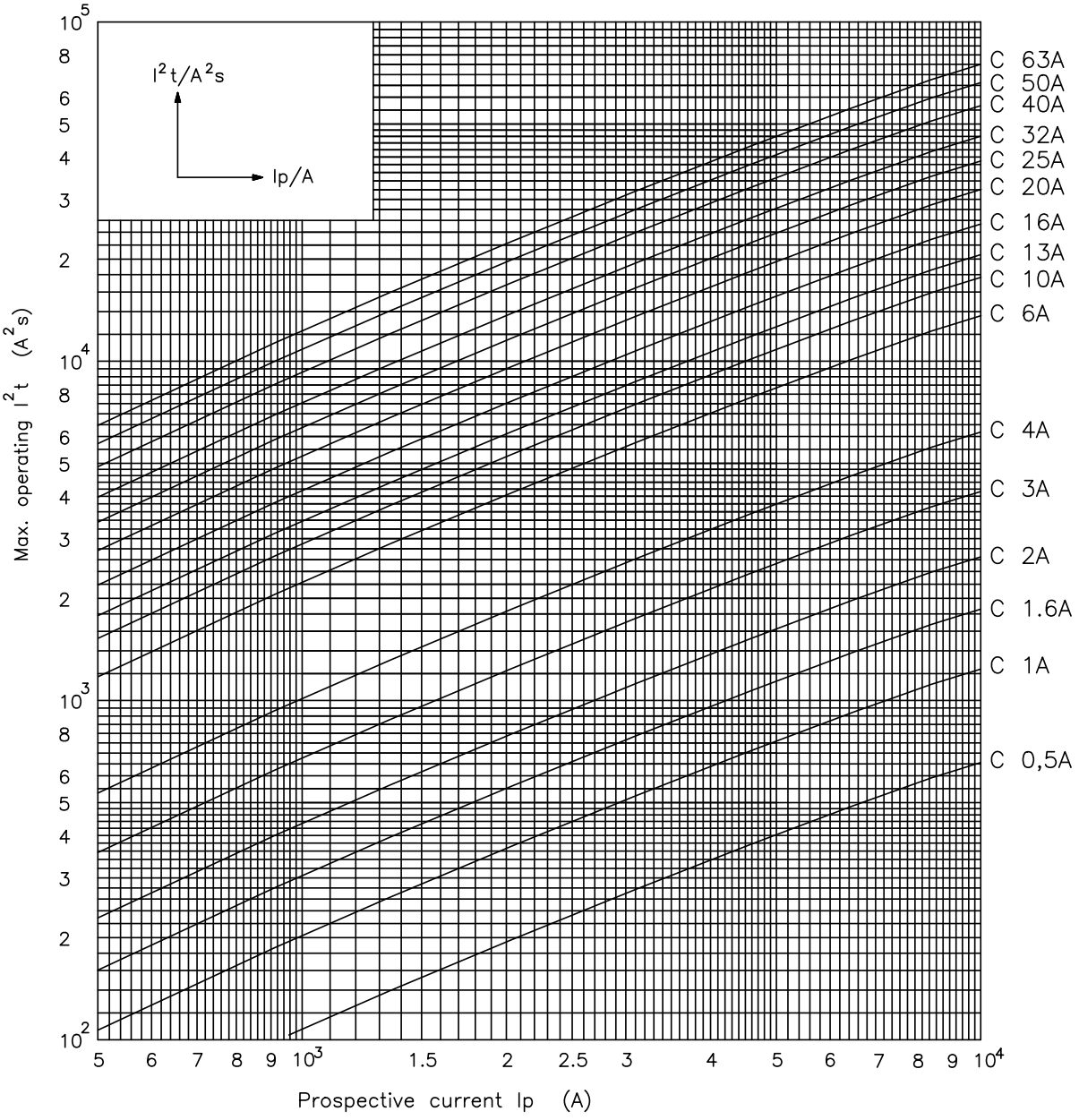
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

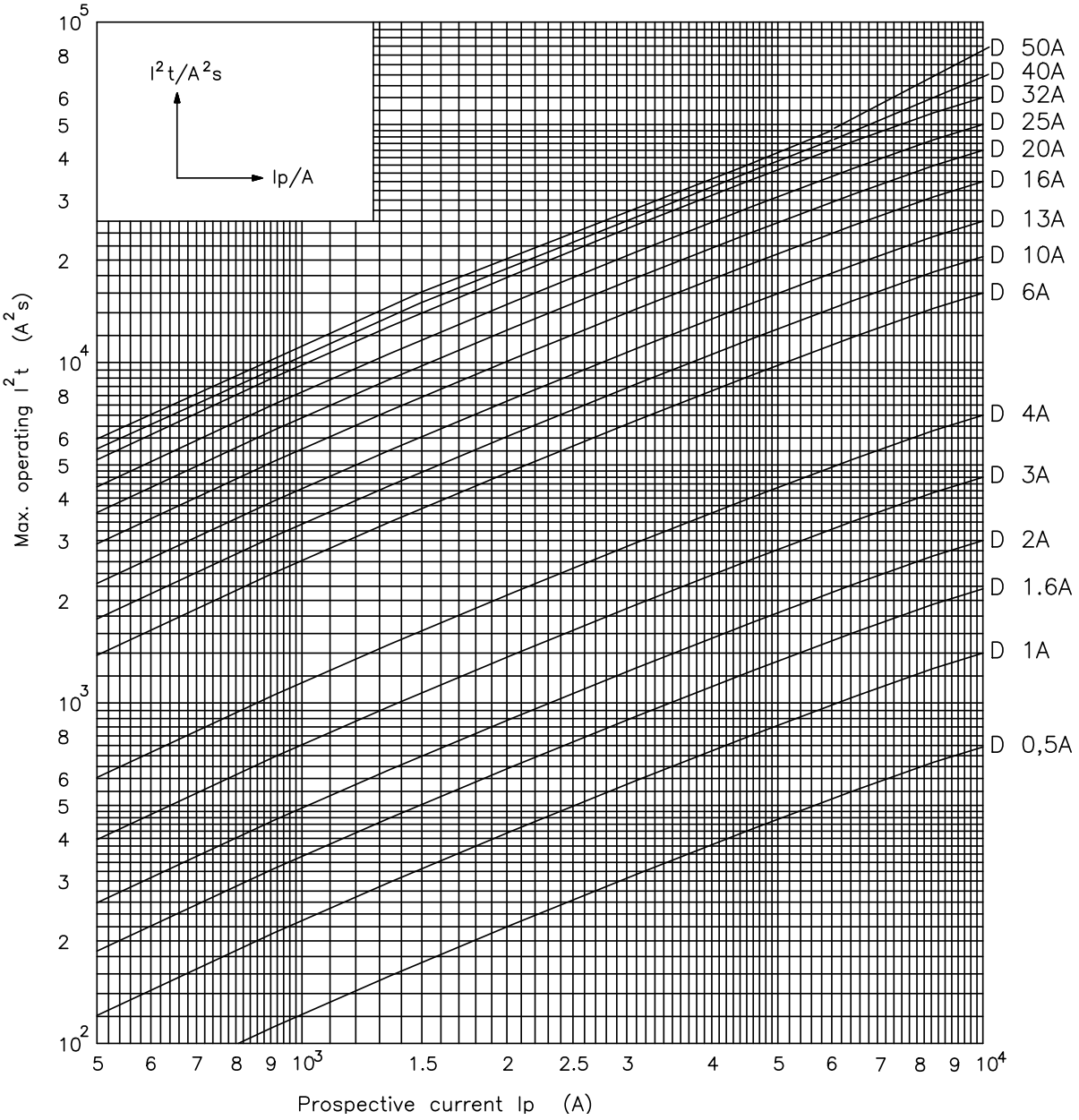
Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

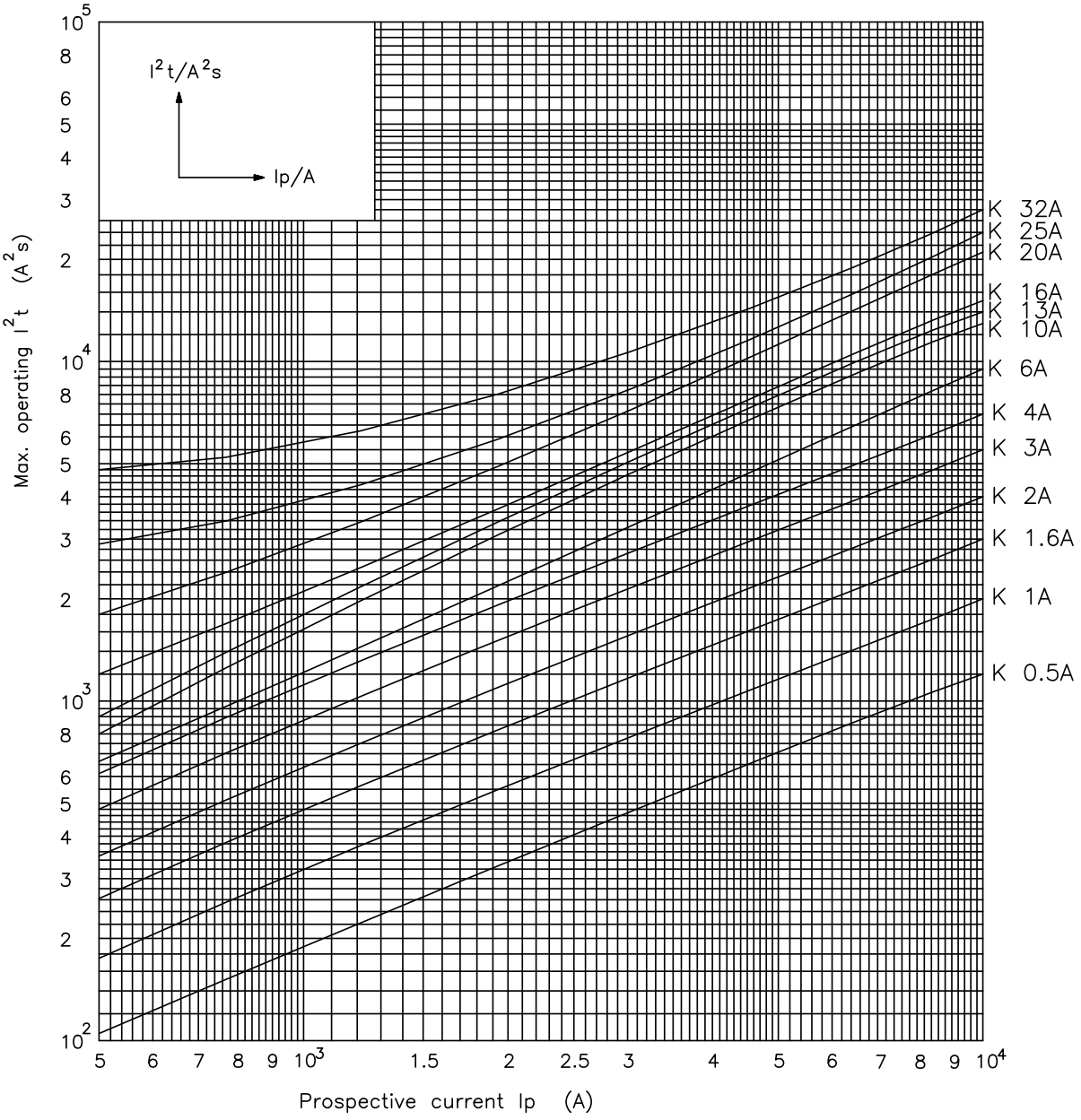
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

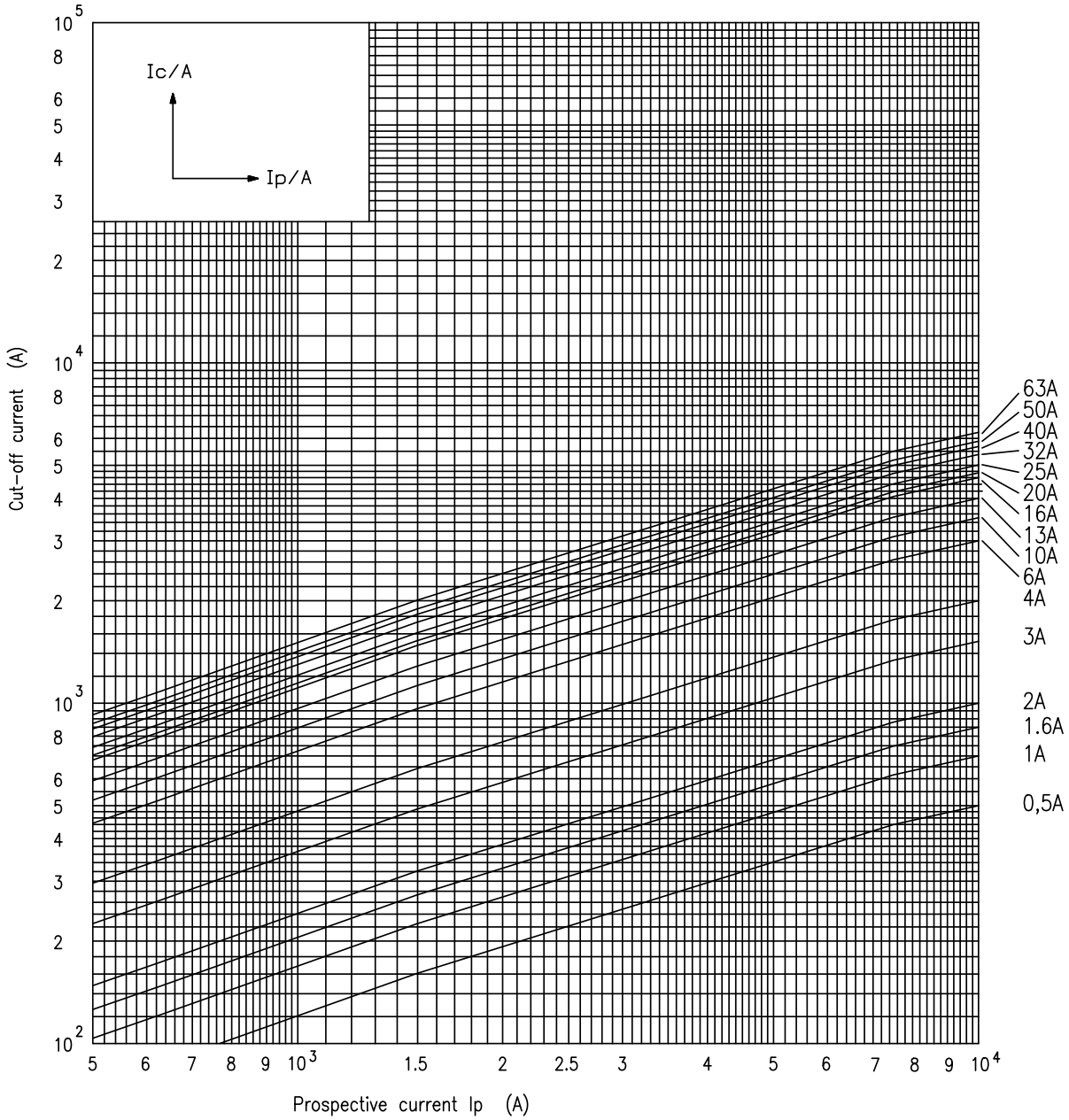

1p
1p+n
2p
3p
3p+n


I²t/A²s
Ip/A
Max. operating I²t (A²s)
Prospective current Ip (A)
B 63A
B 50A
B 40A
B 32A
B 25A
B 20A
B 16A
B 13A
B 10A
B 6A
B 4A
B 3A
B 2A
B 1.6A
B 1A

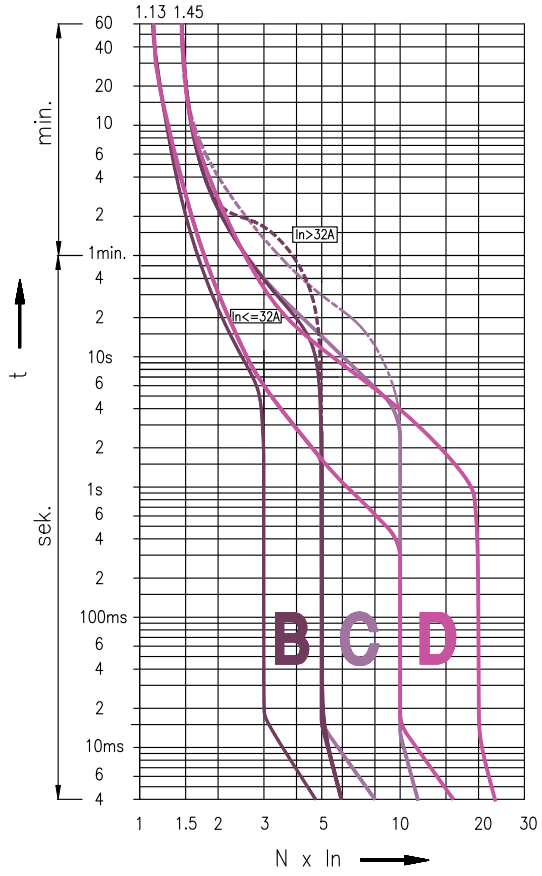

I^2t/A^2s
Ip/A
Max. operating I^2t (A^2s)
Prospective current Ip (A)
C 63A
C 50A
C 40A
C 32A
C 25A
C 20A
C 16A
C 13A
C 10A
C 6A
C 4A
C 3A
C 2A
C 1.6A
C 1A
C 0,5A

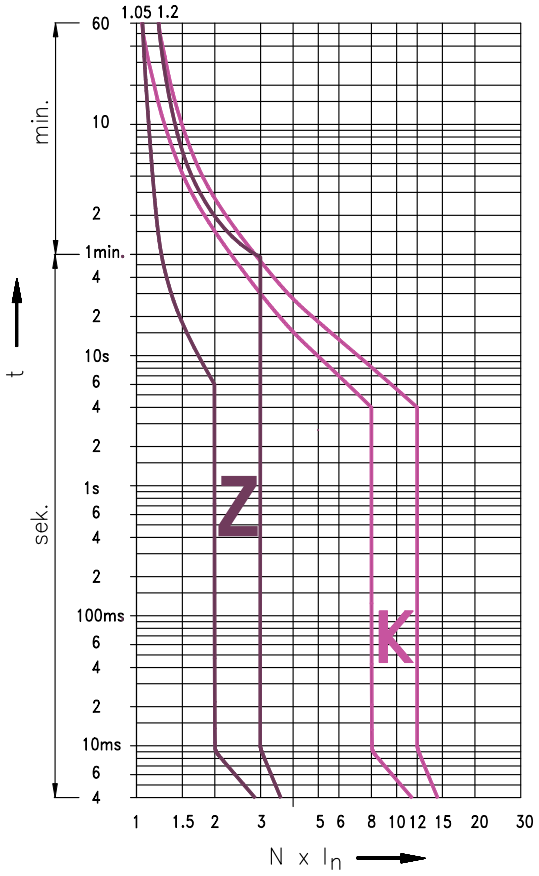

I^2t/A^2s
Ip/A
Max. operating I^2t (A^2s)
Prospective current Ip (A)
D 50A
D 40A
D 32A
D 25A
D 20A
D 16A
D 13A
D 10A
D 6A
D 4A
D 3A
D 2A
D 1.6A
D 1A
D 0,5A


I^2t/A^2s
Ip/A
Max. operating I^2t (A^2s)
10^5
8
6
5
4
3
2
10^4
8
6
5
4
3
2
10^3
8
6
5
4
3
2
10^2
5 6 7 8 9 10^3 1.5 2 2.5 3 4 5 6 7 8 9 10^4
Prospective current Ip (A)
K 32A
K 25A
K 20A
K 16A
K 13A
K 10A
K 6A
K 4A
K 3A
K 2A
K 1.6A
K 1A
K 0.5A

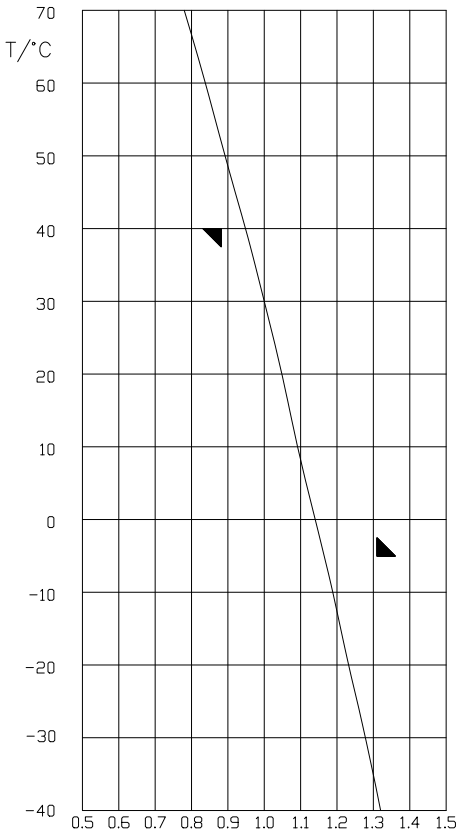

Ic/A
Ip/A
Cut-off current (A)
Prospective current Ip (A)
63A
50A
40A
32A
25A
20A
16A
13A
10A
6A
4A
3A
2A
1.6A
1A
0,5A

I/t characteristic at 50 and 60Hz





Effect of the ambient temperature on the tripping characteristic



Correction factor is valid for current with times over 30 s
I(x°C) - test current at x ambient temperature
I(30°C) - test current at 30°C ambient temperature

$$k = \frac{I(x°C)}{I(30°C)}$$

In (A)	Ambient temperature T/°C											
	−40	−30	−20	−10	0	10	20	30	40	50	60	70
0,5	0,66	0,64	0,62	0,60	0,57	0,55	0,53	0,5	0,48	0,45	0,42	0,39
1	1,32	1,28	1,23	1,19	1,14	1,09	1,05	1	0,95	0,89	0,84	0,78
1,6	2,11	2,05	1,97	1,90	1,82	1,74	1,68	1,6	1,52	1,42	1,34	1,25
2	2,64	2,56	2,46	2,38	2,28	2,18	2,10	2	1,90	1,78	1,68	1,56
4	5,28	5,12	4,92	4,76	4,56	4,36	4,20	4	3,80	3,56	3,36	3,12
6	7,92	7,68	7,38	7,14	6,84	6,54	6,30	6	5,70	5,34	5,04	4,68
10	13,2	12,8	12,3	11,9	11,4	10,9	10,5	10	9,50	8,90	8,40	7,80
13	17,2	16,6	16,0	15,5	14,8	14,2	13,7	13	12,4	11,6	10,9	10,1
16	21,1	20,5	19,7	19,0	18,2	17,4	16,8	16	15,2	14,2	13,4	12,5
20	26,4	25,6	24,6	23,8	22,8	21,8	21,0	20	19,0	17,8	16,8	15,6
25	33,0	32,0	30,8	29,8	28,5	27,3	26,3	25	23,8	22,3	21,0	19,5
32	42,2	41,0	39,4	38,1	36,5	34,9	33,6	32	30,4	28,5	26,9	25,0
40	52,8	51,2	49,2	47,6	45,6	43,6	42,0	40	38,0	35,6	33,6	31,2
50	66,0	64,0	61,5	59,5	57,0	54,5	52,6	50	47,5	44,5	42,0	39,0
63	83,2	80,6	77,5	75,0	71,8	68,7	66,2	63	59,9	56,1	52,9	49,1

Resistance and power dissipation

characteristic	I_n [A]	R/pole [mΩ]	P/pole [w]
B, C	0,5	3587	1,16
	1	935	1,21
	1,6	382	1,26
	2	264	1,37
	3	*	*
	4	69,6	1,38
	6	40,3	1,96
	10	16,9	2,00
	13	11,4	2,08
	16	8,17	2,26
	20	7,17	2,73
	25	4,77	2,91
	32	3,92	3,44
	40	*	*
	50	2,22	3,57
	63	1,71	4,59
D, K, Z	0,5	*	*
	1	1183	1,55
	1,6	*	*
	2	303	1,58
	3	135	1,52
	4	81,8	1,66
	6	40,0	1,78
	10	17,3	1,57
	13	11,3	2,04
	16	8,59	2,31
	20	7,17	2,73
	25	4,77	2,91
	32	3,92	3,44
	40	*	*
	50	*	*
	63	*	*

Selectivity

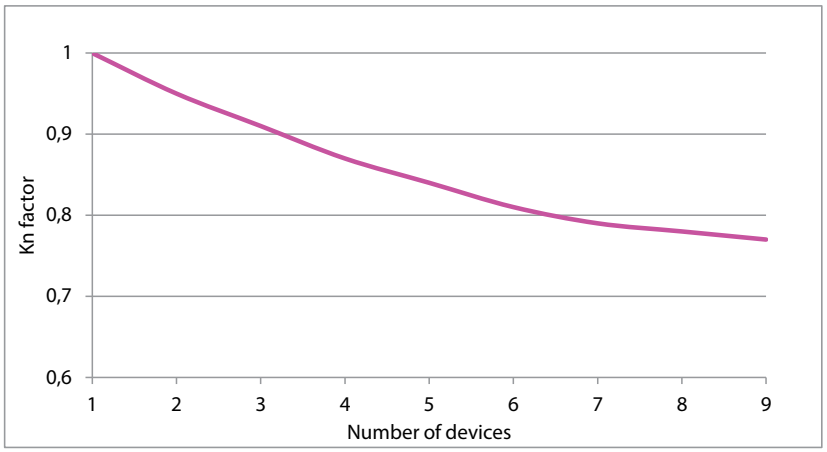
type	gG NV [kA]										
	20	25	32	35	40	50	63	80	100	125	160
B 6	0,5	0,78	1,2	1,4	1,7	2,4	4,6	7,0	10	10	10
B 10/13	0,45	0,65	1,1	1,3	1,6	2,2	4,0	6,5	10	10	10
B 16		0,55	1,0	1,2	1,5	2,0	3,6	5,5	9,5	10	10
B 20			0,85	1,2	1,5	1,8	3,1	4,6	9,0	10	10
B 25				1,1	1,4	1,7	2,9	4,0	8,0	10	10
B 32					1,3	1,6	2,5	3,4	5,5	9,0	10
B 40						1,5	2,2	3,1	4,9	8,0	10
B 50							2,1	2,9	4,0	6,2	10
B 63								2,5	3,3	5,1	8,0

type	gG NV [kA]										
	20	25	32	35	40	50	63	80	100	125	160
C,D,K,Z 6	0,52	0,82	1,3	1,5	2,0	2,7	5,1	9,0	10	10	10
C,D,K,Z 10/13	0,47	0,70	1,1	1,4	1,8	2,3	4,0	7,0	10	10	10
C,D,K,Z 16		0,61	0,92	1,2	1,5	1,9	3,2	5,0	9,0	10	10
C,D,K,Z 20			0,90	1,1	1,4	1,7	2,9	4,2	8,0	10	10
C,D,K,Z 25				1,0	1,3	1,6	2,7	3,9	6,0	10	10
C,D,K,Z 32					1,2	1,5	2,3	3,4	5,2	9,0	10
C,D 40						1,4	2,1	3,0	4,6	8,0	10
C,D 50							2,0	2,7	3,8	7,0	10
C 63								2,3	3,2	5,5	9,0

Effect of number of poles on the tripping characteristic ETIMAT P10

Correction factor K_n

Number of devices	Kn
1	1
2	0,95
3	0,91
4	0,87
5	0,84
6	0,81
7	0,79
8	0,78
9	0,77
>9	0,77



Miniature circuit breaker ETIMAT P10 DC - NEW GENERATION

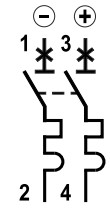
Technical data	
Rated voltage - for 1-pole U_n	220 V DC
- for 2-pole U_n	220 V /440 V DC
Rated time constant L/R	4 ms
Rated current I_n	0,5-32A (K & Z), 0,5-63A (C), 2-63A (B)
Rated short-circuit capacity	10 kA
Tripping characteristic	B, C, K, Z
Energy limiting class	3
Insulating class	B
Pollution degree	2
Back-up fuse	100 A gG
Ambient temperature	-40°C ... +70°C
Storage temperature	-60°C ... +70°C
Terminals	1-25mm^2, min 1,4Nm / max 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Contact position indicator	✓
Locking device	✓
Resistance to vibrations (IEC 60068-2-7)	5g (10,60 & 500Hz)
Standards	IEC 60898, EN 60898, DIN VDE 0641



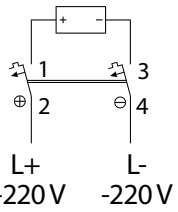
supply top or bottom, considering polarity

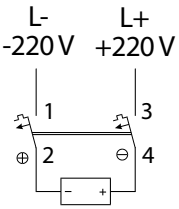


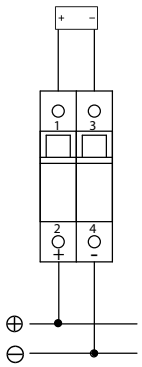
Supply bottom

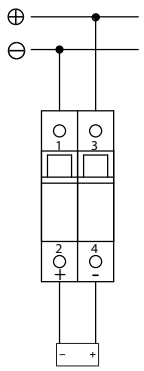


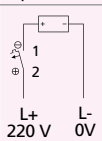
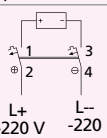
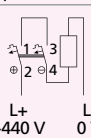
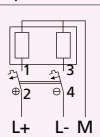
Supply top

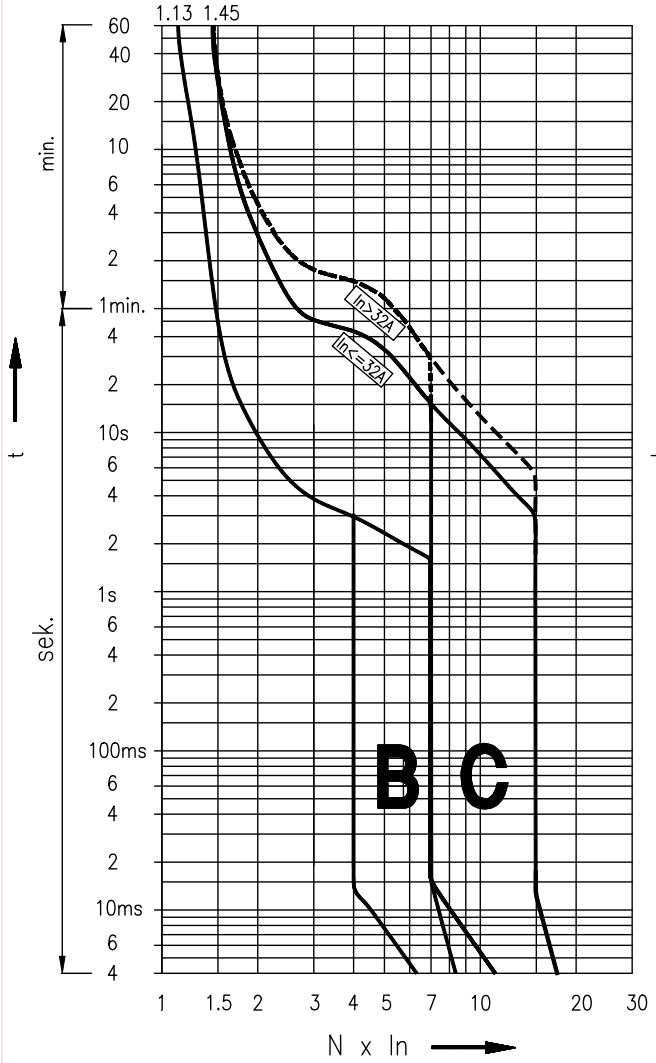


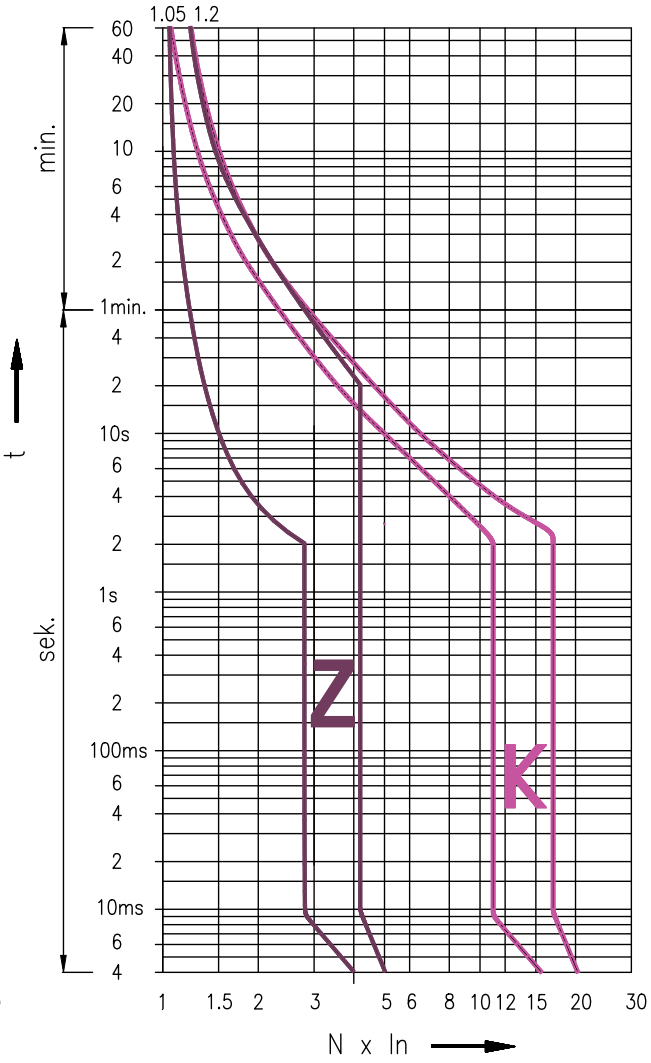






Connecting diagrams in direct current electric circuits				
Rated voltage of circuit breaker	220 V ⎓	220/440 V ⎓	220/440 V ⎓	220/440 V ⎓
Voltage between conductors - max.	220 V ⎓	440 V ⎓	440 V ⎓	440 V ⎓
Voltage between conductor and earth - max.	220 V ⎓	220 V ⎓	440 V ⎓	220 V ⎓
Circuit breaker	1-pole	2-pole	2-pole	2-pole
Connecting diagram				



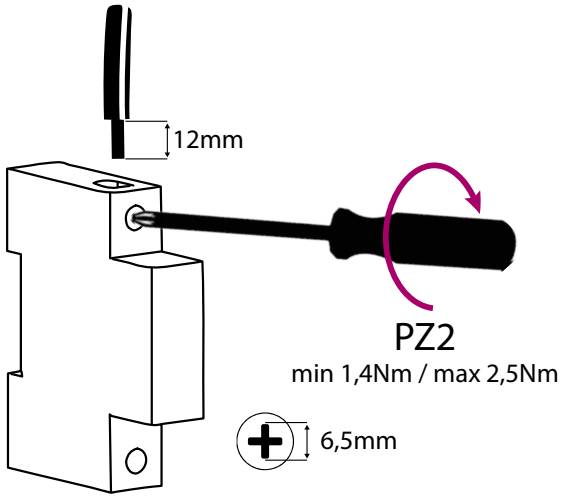


Conductor cross-section	Number of single conductors, rigid, single-wire CU conductor				
[mm²]	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

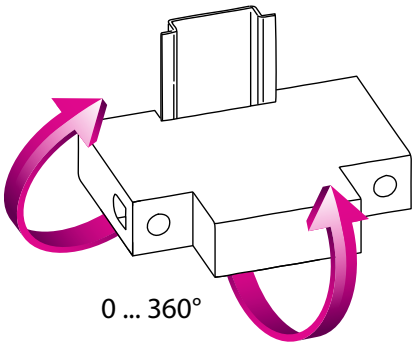
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

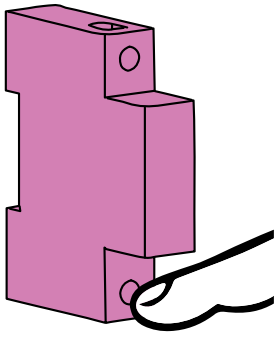
Conductor cross-section	Number of single conductors, flexible Cu conductors without cable ferrule					
[mm²]	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

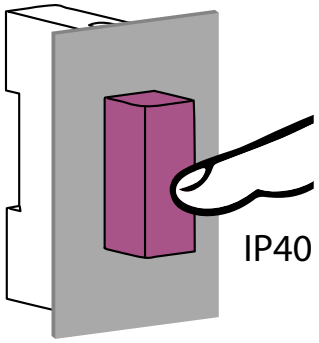


Any mounting position



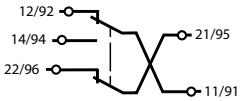


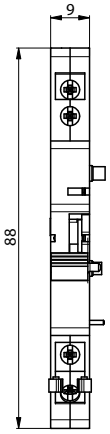
IP20



Auxiliary signal switch PS/SS

Technical data	
Function	Auxiliary or Signal Switch
Rated voltage	230V AC/DC, 110V DC
Rated current	6A (230V AC); 1A (110V DC); 0,5A (220V DC)
Rated frequency	50/60Hz, DC
Index of protection	IP 20 (IP 40)
Terminal capacity	1,5mm^2
Terminal Screw	M3 PH1
Terminal torque	max. 0,5Nm
Ambient temperature	-25°C ... +40°C
Storage temperature	-40°C ... +70°C
Contacts	1x NC , 1x NC/NO
Mounting position	any
Standards	EN 62019

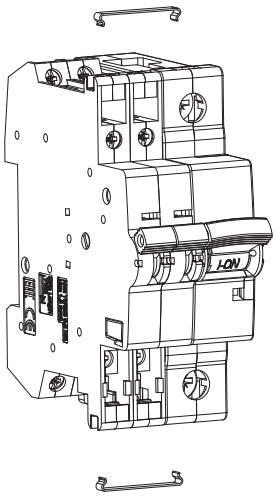




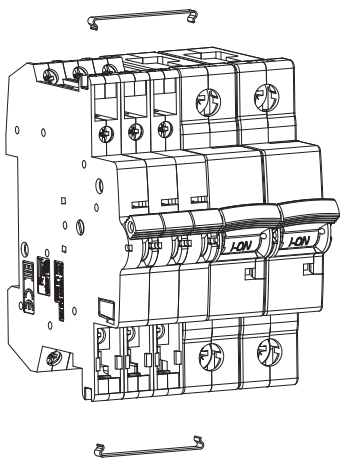
AUX switch connections	status of the breaker	
	ON	OFF
11-14 NO	1	0
11-12 NC	0	1
21-22 NC	0	1

Signal switch connections	status of the breaker		
	ON	manual trip	overcurrent trip
11-14 NO	1	1	0
11-12 NC	0	0	1
21-22 NC	0	0	1

NO - Normally open contact --> during the activation it makes a contact
NC - Normally closed contact --> during the activation it brakes the contact
1 - contact
0 - without a contact

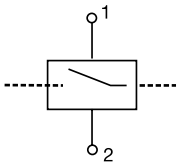


SS or AS	SS	MCB
AS	AS	MCB



SS or AS	SS	SS	2p MCB
AS	AS	SS	2p MCB
AS	AS	AS	2p MCB

Shunt trip release DA ETIMAT

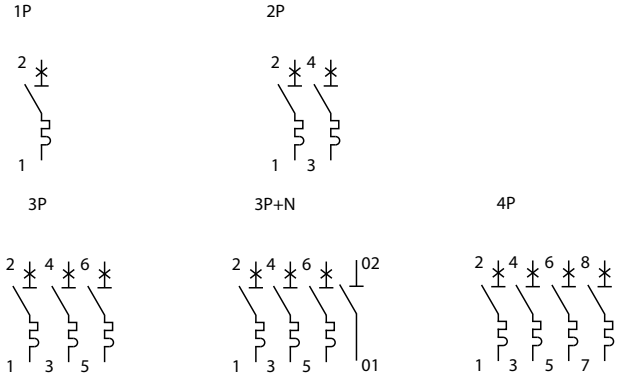


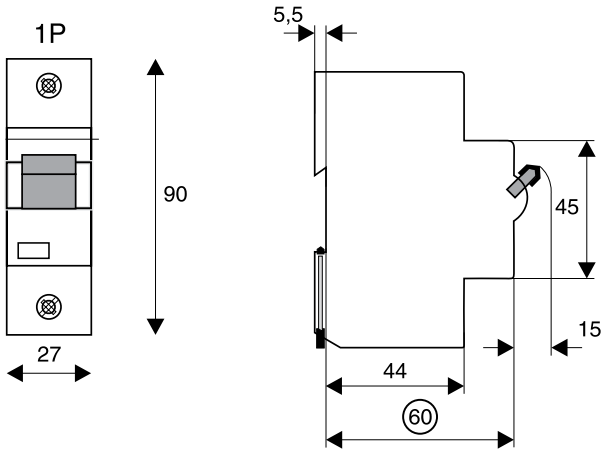
Note: Same dimensions as ETIMAT P10

Technical data	
Rated voltage	12-60V AC/DC, 110-250V AC/DC
Rated frequency	50/60Hz, DC
Max inrush current	3A
Index of protection	IP 20 (IP 40)
Terminals	1-25mm^2, min 1,4Nm / max 2,5Nm
Terminal screw	M5 (Pozidrive PZ2)
Ambient temperature	-40°C ... +70°C
Storage temperature	-60°C ... +70°C
Mounting on the rail	EN 60715
Mounting position	any
Sealing possibility	✓
Terminal cover	✓
Locking device	✓

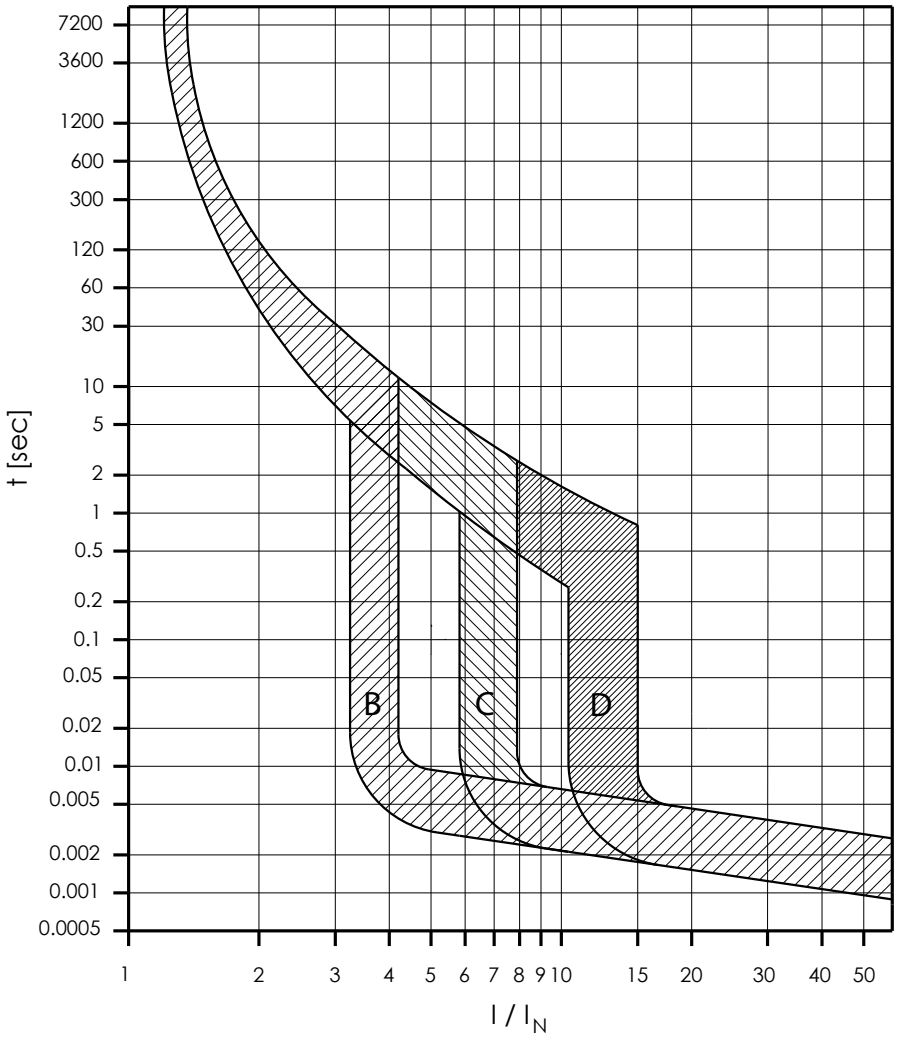
Miniature circuit breaker ETIMAT 10 80-125 A

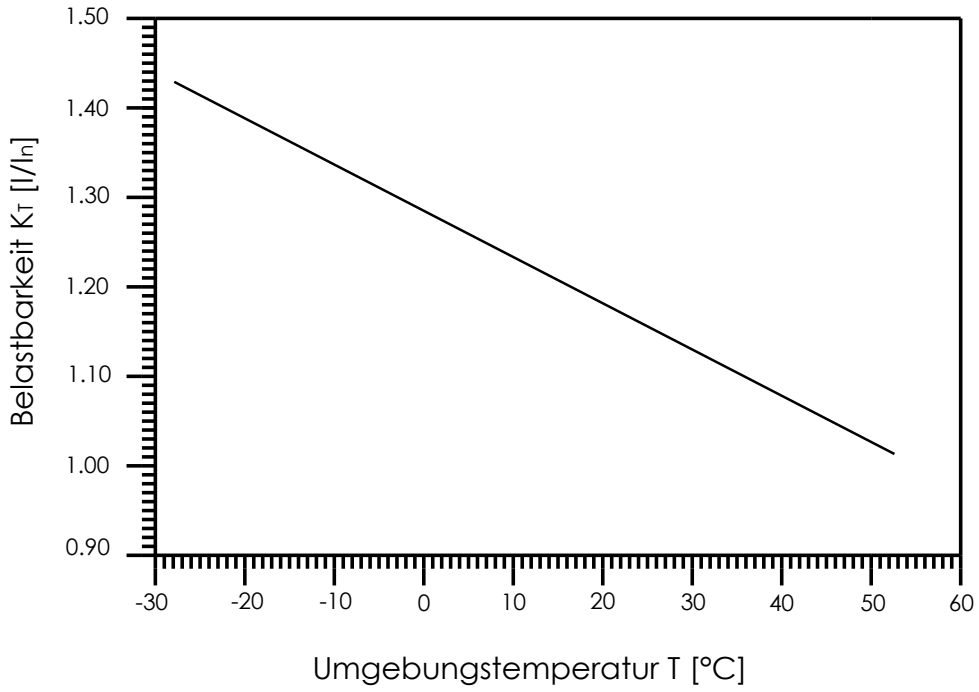
Technical data			
Rated voltage	80-125 A	240/415V AC, 60V DC/pole	
Rated current	80, 100, 125 A		
Tripping characteristics	B, C, D		
Rated frequency	50/60 Hz		
Rated insulation voltage	440V AC (80-125A)		
Rated impulse withstand voltage U_{imp}	4kV (80-125A)		
Rated short-circuit capacity:	Characteristic B, C	I_n=80, 100 A	20kA (EN 60947-2)
		I_n=125 A	15kA (EN 60947-2)
	Characteristic D	I_n=80 A	20kA (EN 60947-2)
		I_n=100 A	15kA (EN 60947-2)
Energy limiting class	3		
Terminals	80-125 A	2,5-50mm^2 / 2,5-3,0 Nm	
Build-in width	80-125 A	27mm/Pol	
Terminal screw	M6 PZ2		
Mounting on the rail	EN 60715 (EN 50022)		
Mounting position	any		
Ambient temperature	max -30°C ... +50°C		
Storage temperature	max -50°C ... +70°C		
Mechanical durability (cycles)	80-125 A	min. 20000	
Sealing possibility	ON / OFF		
Back-up fuse	max 200A gL		
Resistance to vibrations (IEC 60068-2-7)	5g (10,60 & 500Hz)		
Standards	EN 60898, EN 60947-2		





ETIMAT 10, 80-125 A,





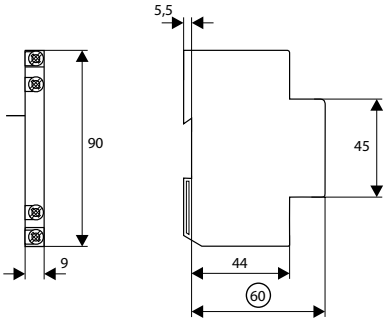
Zulässige Dauerbelastung IL bei Umgebungstemperatur T: $I_L(T) = I_n K_T(T)$

Resistance and power dissipation

characteristic	I_n [A]	R/pole [mΩ]	P/pole [w]
B, C, D	80	1,2	7,1
	100	0,9	9,1
	125	0,66	11,9

Auxiliary switch PSM 80 - 125 A

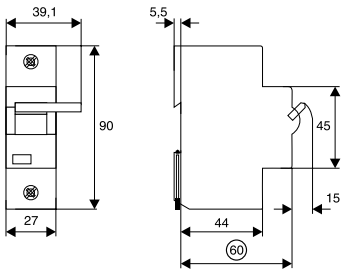
Technical data	
Rated current	6 A / AC13 (250 V AC)
Rated thermal current I_{th}	8 A
Rated insulation voltage	440 V AC
Max. back-up fuse	6A
Contacts	1x a-contact, 1x b-contact
Utilization category AC-13	6 A/250 V AC
	2 A/440 V AC
Utilization category DC-13	4 A/600 V DC
	2 A/110 V DC
	0,5 A/230 V DC
Ambient temperature	max -5°C ... +40°C
Build-in width	9 mm/Pol
Mounting position	any
Mounting on the rail	EN 60715 (EN 50022)
Terminals	1x1mm² ... 2x2,5mm²
Standard	EN 60947-5-1

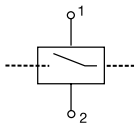




Shunt trip release DA ETIMAT 10 80 - 125A

Technical data		
	24V	230V
Responding limit	8 V AC / 11 V DC	70 V AC / 90 V DC
Operating voltage range	12 V...60 V AC / DC	110 V...415 V AC / 110 V...230 V DC
Max. current consumption at the moment of switching on	18 A (24 V)	2 A (230 V)
Duration of current flow at max consumption	4,5 ms (AC) / 2 ms (DC)	4,5 ms (AC) / 4 ms (DC)
Minimum pulse duration	15 ms	10 ms
Internal resistance	2,0 Ω	130 Ω
Duty	100 %	
Tripping time	< 20 ms	
Peak withstand voltage	2 kV	
Service live operating cycles	> 4000	
Upper / lower terminals	lift / lift	
Conductor cross section	2,5 mm² ... 50 mm²	

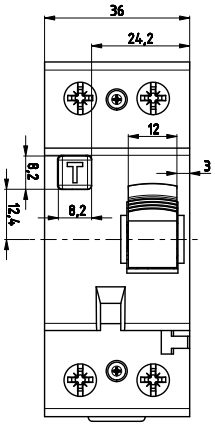


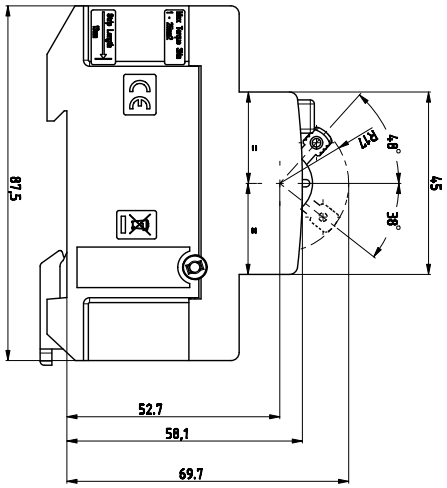


A and AC type residual current circuit breaker EFI-P2(R) & EFI-2

Technical data EFI-P2(R) Instantaneous type AC & A, EFI-2 Instantaneous type AC & A

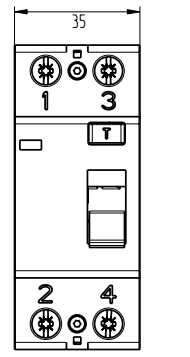
Type	EFI-P2, EFI-P2R	EFI-2 100A
Electrical		
Rated Voltage U_n	230 / 240 V AC	230 V AC
Rated current I_n	16, 25, 40, 63, 80A	100A
Rated frequency f_n	50/60Hz	50Hz
Rated insulation voltage U_i	440V	400V
Rated impulse withstand voltage (1,2/50µs)	4kV	4kV
Peak withstand current (8/20µs)	400A	
Electrical isolation	> 4mm contact space	
Rated residual operating current $I_{\Delta n}$	0,03; 0,1; 0,3 & 0,5A	0,03; 0,1 & 0,3
Rated conditional short-circuit current I_{cn}	10kA	10kA
Rated making and breaking capacity I_m	800A	1000A
Max back-up fuse for short circuit protection	80A gC	100A gG
Voltage range test circuit	150-264V	150-264V
Min. operating voltage	voltage independent	voltage independent
Insulating class	B	B
Standards	IEC/EN 61008	IEC/EN 61008
Mechanical Endurance (cycles)	> 10.000	> 5.000
Electrical endurance (cycles)	> 4.000	> 2.000
Shock resistance acc. to	IEC/EN 61008-1	IEC/EN 61008-1
Resistance to vibrations acc. To IEC 60068-2-7	5g (10, 60 & 500Hz)	5g (10, 60 & 500Hz)
Mechanical		
Frame size	45mm	45mm
Device height	68mm (DIN rail acc to EN6071)	
Device width	36mm (2 x Module units)	36mm (2 x Module units)
Degree of protection	IP20	IP20
Upper and lower terminals	open mounted/lift terminals	
Terminal capacity	1-25mm²	1-35mm²
Terminal screw	M5 (Pozidrive PZ2)	M5 (Pozidrive PZ2)
Terminal torque	max. 3Nm	2-2,5Nm
Busbar thickness	0,8 - 2 mm	0,8 - 2 mm
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage and transport temperature	-40°C ... +70°C	-40°C ... +70°C
Resistance to climatic conditions	IEC/EN 61008	IEC/EN 61008
Contact position indicator	mechanical red/green	
Mounting position	any	
Mounting on the rail	35mm acc to EN50022	
Supply possibility	top or bottom	

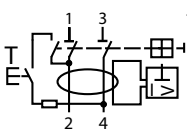


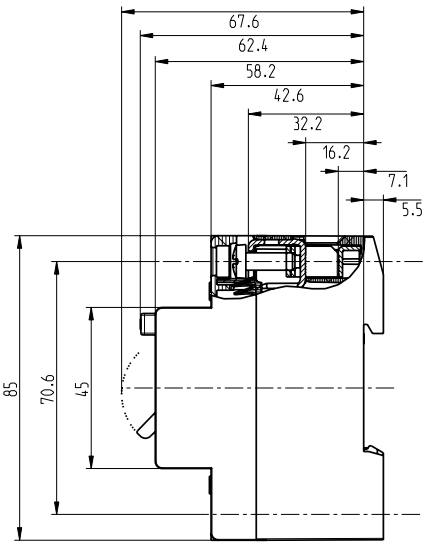


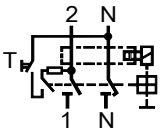
EFI-P2, EFI-P2R

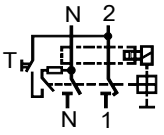
EFI-2 100 A







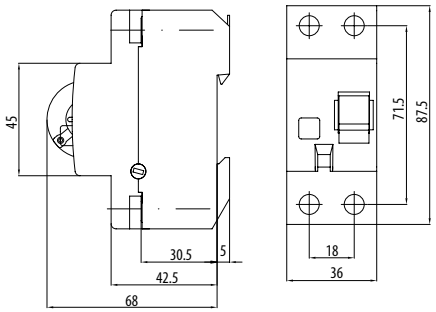




Version with N-pole on the left

In [A]	Power dissipation EFI-P2 P/pole [W]
16	0,46-0,51
25	1,22-1,27
40	3,48-3,72
63	2,14-2,58
80	3,53-3,82

Technical data		
Type	**G/KV type**	**S type**
Electrical		
Rated voltage U_n	230/240V AC	230/240V AC
Rated current I_n	25, 40, 63A	25, 40, 63, 100A
Rated Insulation voltage U_i	440V	440V
Rated frequency f_n	50/60Hz	50/60Hz
Peak withstand current	3kA (8/20ms) surge current proof	5kA (8/20ms) surge current proof
Electrical isolation	> 4mm contact space	> 4mm contact space
Rated residual operating current $I_{\Delta n}$	0,03; 0,1 & 0,3A	0,1 & 0,3A
Rated conditional short-circuit current I_{cn}	10kA	10kA
Rated making and breaking capacity I_m	630A	630A
Maximum back-up fuse	80A gG	80A gG
Insulating class	B	B
Standard	IEC/EN 61008, OVE E 8601	IEC/EN 61008
Mechanical endurance (op. c.)	> 4000	> 4000
Electrical endurance (op. c.)	> 2000	> 2000
Mechanical		
Frame size	45mm	45mm
Device height	68mm (DIN rail acc to EN60715)	68mm (DIN rail acc to EN60715)
Device width	36mm (2 x Module units 18mm)	36mm (2 x Module units 18mm)
Degree of protection	IP20	IP20
Upper and lower terminals	open mounted/lift terminals	open mounted/lift terminals
Terminal capacity	1-25mm^2	1-25mm^2
Terminal screw	M5 (Pozidrive PZ2)	M5 (Pozidrive PZ2)
Terminal torque	2-2,5Nm	2-2,5Nm
Busbar thickness	0,8 - 2 mm	0,8 - 2 mm
Operating temeprature	-25°C ... +55°C	-25°C ... +55°C
Storage and transport temperature	-40°C ... +70°C	-40°C ... +70°C
Resistance to climatic conditions	IEC/EN 61008	IEC/EN 61008
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)	5g (10,60 & 500Hz)
Contact position indicator	mechanical red/green	mechanical red/green
Supply possibility	Top or bottom	Top or bottom
Mounting position	any	any



I_n	Power dissipation EFI-2 G/KV & S type P / pole (W)
25A	1,29-1,43
40A	2,80 - 3,05
63A	4,28 - 5,34

Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

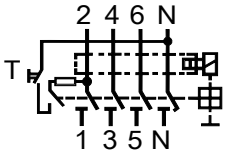
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

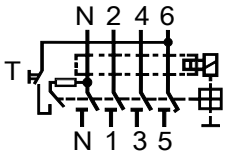
A and AC type residual current circuit breaker EFI-P4(R) & EFI-4

Technical data EFI-P4(R) Instantaneous type AC & A, EFI-4 Instantaneous type AC & A

Type	EFI-P4, EFI-P4R	EFI-4 80A, 100A
Electrical		
Rated Voltage U_n	400/415V AC	400/415V AC
Rated current I_n	16, 25, 40, 63A	80, 100A
Rated frequency f_n	50/60Hz	50/60Hz
Rated insulation voltage U_i	440V	440V
Rated impulse withstand voltage (1,2/50µs)	4kV	4kV
Peak withstand current (8/20µs)	400A	
Electrical isolation	> 4mm contact space	
Rated residual operating current $I_{\Delta n}$	0,03; 0,1; 0,3 & 0,5A	0,03; 0,1 & 0,3A
Rated conditional short-circuit current I_{cn}	10kA	10kA
Rated making and breaking capacity I_m	630A	800A (In=80A); 1000A (In=100A)
Max back-up fuse for short circuit protection	63A gG	80A (In=80A); 100A (In=100A)
Voltage range test circuit	150-264V	150-264V
Min. operating voltage	voltage independent	voltage independent
Insulating class	B	B
Standards	IEC/EN 61008	IEC/EN 61008
Mechanical Endurance (cycles)	> 10.000	> 4.000
Electrical endurance (cycles)	> 4.000	> 2.000
Shock resistance acc. to	IEC/EN 61008-1	IEC/EN 61008-1
Resistance to vibrations acc. To IEC 60068-2-7	5g (10, 60 & 500Hz)	5g (10, 60 & 500Hz)
Mechanical		
Frame size	45mm	45mm
Device height	68mm (DIN rail acc to EN6071)	
Device width	72mm (4 x Module Units)	72mm (4 x Module Units)
Degree of protection	IP20	IP20
Upper and lower terminals	open mounted/lift terminals	
Terminal capacity	1-25mm²	1-25mm² (In=80A), 1-35mm² (In=100A)
Terminal screw	M5 (Pozidrive PZ2)	M5 (Pozidrive PZ2)
Terminal torque	max. 3Nm	2-2,5Nm
Busbar thickness	0,8 - 2 mm	0,8 - 2 mm
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage and transport temperature	-40°C ... +70°C	-40°C ... +70°C
Resistance to climatic conditions	IEC/EN 61008	IEC/EN 61008
Contact position indicator	mechanical red/green	
Mounting position	any	
Mounting on the rail	35mm acc to EN50022	
Supply possibility	top or bottom	

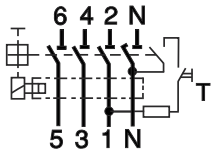
EFI-P4, EFI-P4R





Version with N-pole on the left

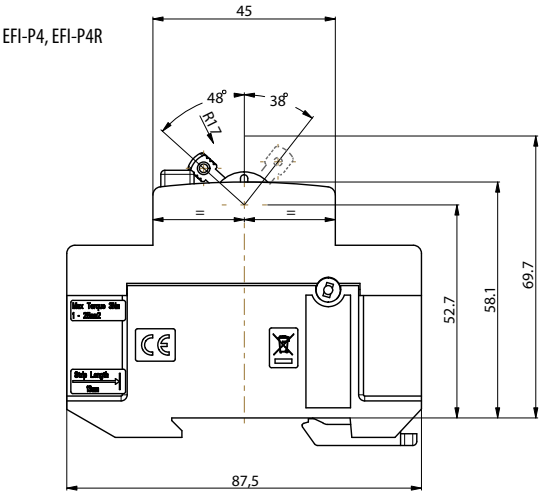
EFI-4 80A, 100 A

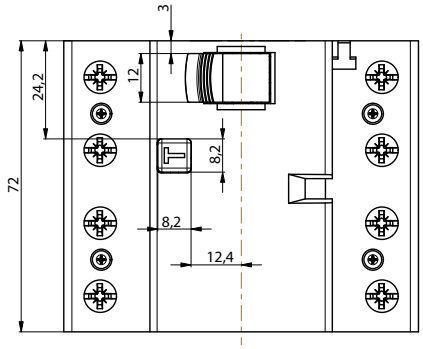


In [A]	Power dissipation EFI-P4 P/pole [W]
16	0,48-0,62
25	1,27-1,52
40	4,14-5,00
63	2,45-3,00

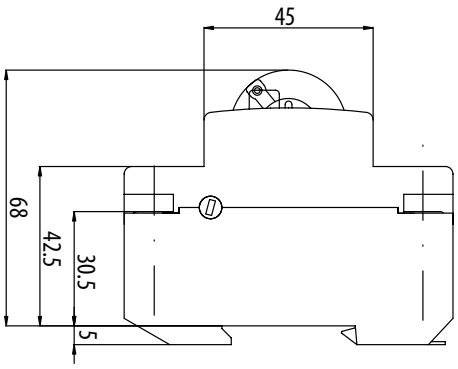
Technical data

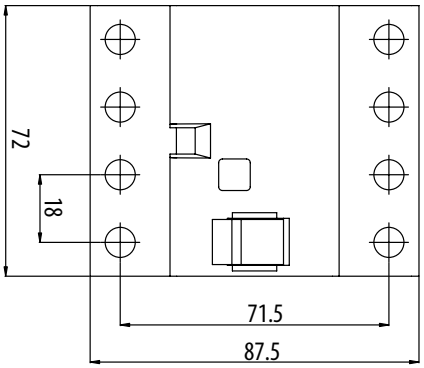
EFI-P4, EFI-P4R



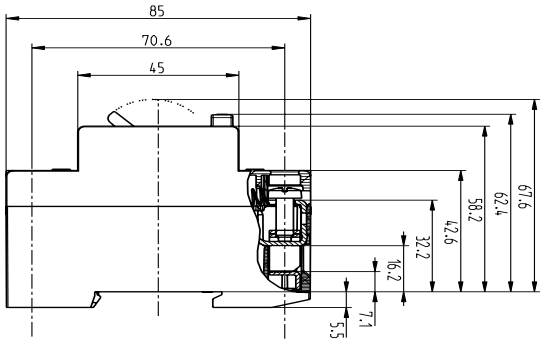


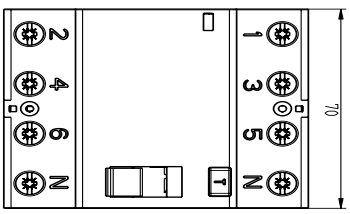
EFI-4 80A, G/KV, S

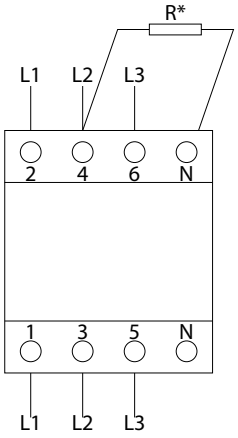




EFI-4 80A, 100 A







RCD EFI-P4 Type in 3-phase system without neutral conductor:

30mA: R=2k7/1W/500V
100mA: R=1k2/1W/500V
300mA: R=470Ω/2W/500V
500mA: R=270Ω/3W/500V

* Resistor (R) has to be connected between N and L1 as to ensure proper functionality of the test button.

Technical data		
Type	**G/KV type**	**S type**
Electrical		
Rated voltage U_n	400/415V AC	400/415V AC
Rated current I_n	25, 40, 63A	25, 40, 63, 100A
Rated Insulation voltage U_i	440V	440V
Rated frequency f_n	50/60Hz	50/60Hz
Peak withstand current	3kA (8/20ms) surge current proof	5kA (8/20ms) surge current proof
Electrical isolation	> 4mm contact space	> 4mm contact space
Rated residual operating current $I_{\Delta n}$	0,03; 0,1 & 0,3A	0,1 & 0,3A
Rated conditional short-circuit current I_{cn}	10kA	10kA
Rated making and breaking capacity I_m	630A	630A
Maximum back-up fuse	80A gG	80A gG
Insulating class	B	B
Standard	IEC/EN 61008, OVE E 8601	IEC/EN 61008
Mechanical endurance (op. c.)	> 4000	> 4000
Electrical endurance (op. c.)	> 2000	> 2000
Mechanical		
Frame size	45mm	45mm
Device height	68mm (DIN rail acc to EN60715)	68mm (DIN rail acc to EN60715)
Device width	72mm (4 x Module units 18mm)	72mm (4 x Module units 18mm)
Degree of protection	IP20	IP20
Upper and lower terminals	open mounted/lift terminals	open mounted/lift terminals
Terminal capacity	1-25mm^2	1-25mm^2
Terminal screw	M5 (Pozidrive PZ2)	M5 (Pozidrive PZ2)
Terminal torque	2-2,5Nm	2-2,5Nm
Busbar thickness	0,8 - 2 mm	0,8 - 2 mm
Operating temeprature	-25°C ... +55°C	-25°C ... +55°C
Storage and transport temperature	-40°C ... +70°C	-40°C ... +70°C
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)	5g (10,60 & 500Hz)
Resistance to climatic conditions	IEC/EN 61008	IEC/EN 61008
Contact position indicator	mechanical red/green	mechanical red/green
Supply possibility	Top or bottom	Top or bottom
Mounting position	any	any

I_n	Power dissipation EFI-4 G/KV & S type P / pole (W)
25A	1,40-1,61
40A	2,73 - 4,11
63A	4,76 - 5,69

Conductor cross-section [mm^2]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

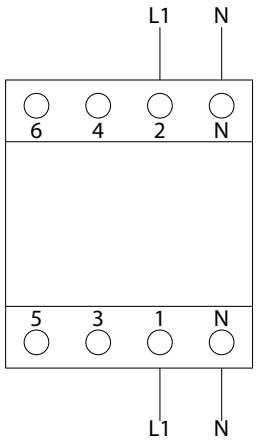
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm^2]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

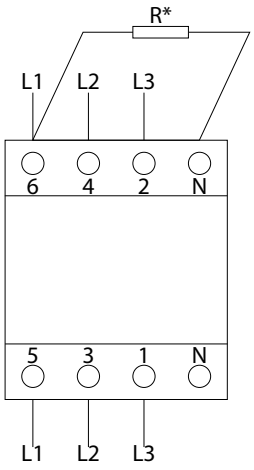
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

B and B+ type residual current circuit breaker EFI-4

Technical data		
Type		**B & B+**
Electrical		
Design according to		IEC/EN 61008, IEC/EN 62423
		B+ -> VDE 0664-400
Current test marks as printed onto the device		
Rated voltage U_n		230/400 V AC
Rated frequency f_n		50/60Hz
Mode of operation		"A type functionality: voltage independent B and B+ type functionality: voltage dependent"
Operation voltage electronic		50 – 253V AC
Voltage range test circuit		196 – 253V AC
Rated residual operating current $I_{\Delta n}$	Instantaneous	30, 100, 300 mA
	K - short time delayed	30, 100, 300 mA
	S - selective	100, 300 mA
Sensitivity		Alternating, pulsed and smooth direct currents
Rated insulation voltage U_i		440 V
Rated impulse withstand voltage U_{imp}		4 kV (1.2/50µs)
Rated conditional short-circuit current I_{cn}		10 kA
Rated making and breaking capacity I_m		800 A
Peak withstand current		3 kA (8/20 µs) surge current proof
Electrical isolation		> 4 mm contact space
Maximum back-up fuse I_n = 25-63A		Short circuit and overload protection 100 A gG/gL
Endurance (operating cycles)	electrical components	≥ 2000
	mechanical components	≥ 4000
Mechanical		
Frame size		45 mm
Device height		68 mm (DIN rail acc to EN60715)
Device width		72 mm (4xModule Units 18mm)
Degree of protection		IP20
Upper and lower terminals		open mounted/lift terminals
Terminal protection finger and hand touch safe		IEC/EN 61008
Terminal capacity		1 - 25 mm²
Terminal screw		M5 (Pozidrive PZ2)
Terminal torque		2 - 2.5 Nm
Busbar thickness		0.8 - 2 mm
Operating temperature		-25°C ... +55°C
Storage- and transport temperature		-40°C ... +70°C
Resistance to vibrations acc. to IEC 60068-2-7		5g (10,60 & 500Hz)
Resistance to climatic conditions		IEC/EN 61008
Contact position indicator		mechanical red / green
Supply possibility		top or bottom
Mounting position		any



RCD ETI Type B & B+ in 1-phase system U_n=230V



RCD ETI Type B & B+ in 3-phase system without neutral conductor - U_n=400V

30mA: R=2k7/1W (500V)

100mA: R=7k5/1W (500V)

300mA: R=2k7/1W (500V)

* Resistor (R) has to be connected between N and L3 as to ensure proper functionality of the test button.

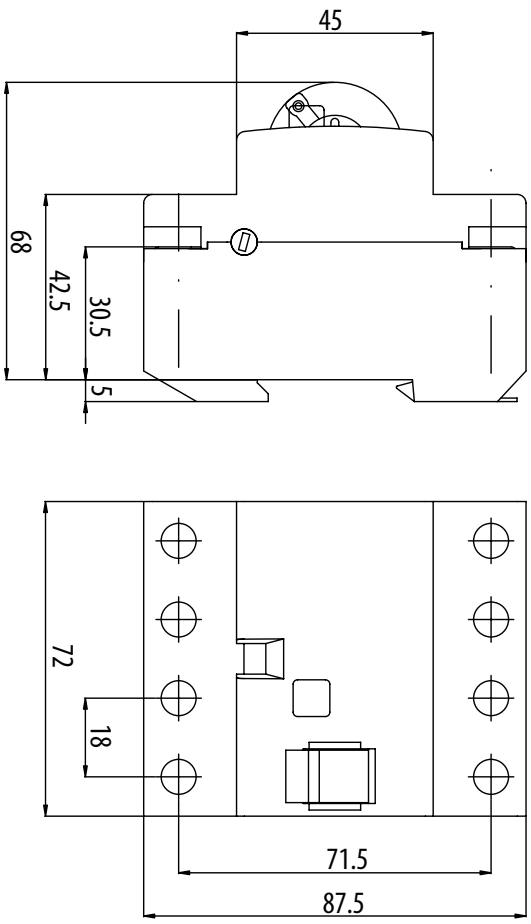
Conductor cross-section	Number of single conductors, rigid, single-wire CU conductor				
[mm²]	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

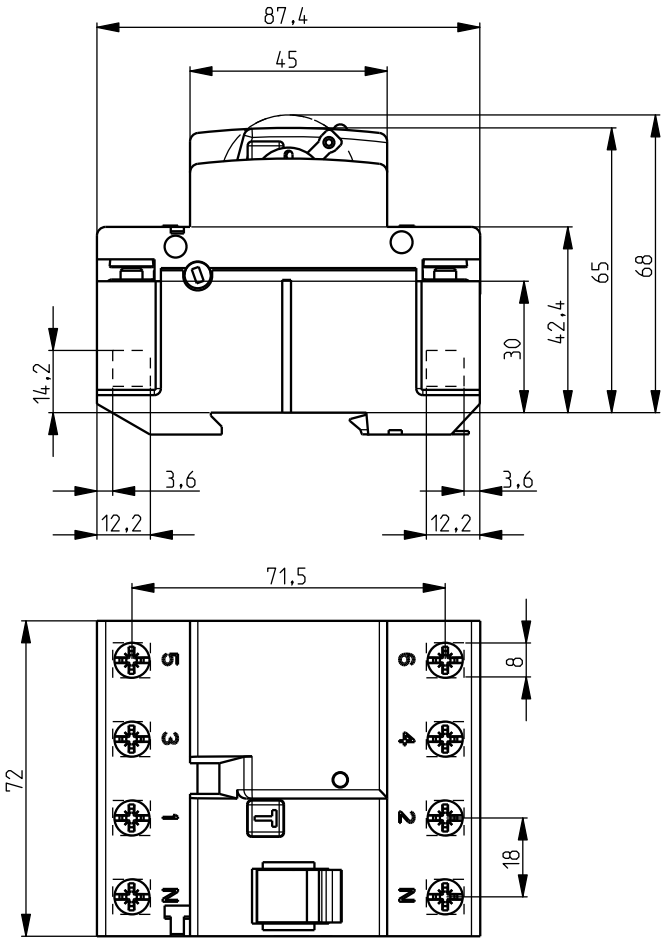
Conductor cross-section	Number of single conductors, flexible Cu conductors without cable ferrule					
[mm²]	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

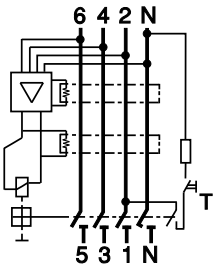
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

Instantanous

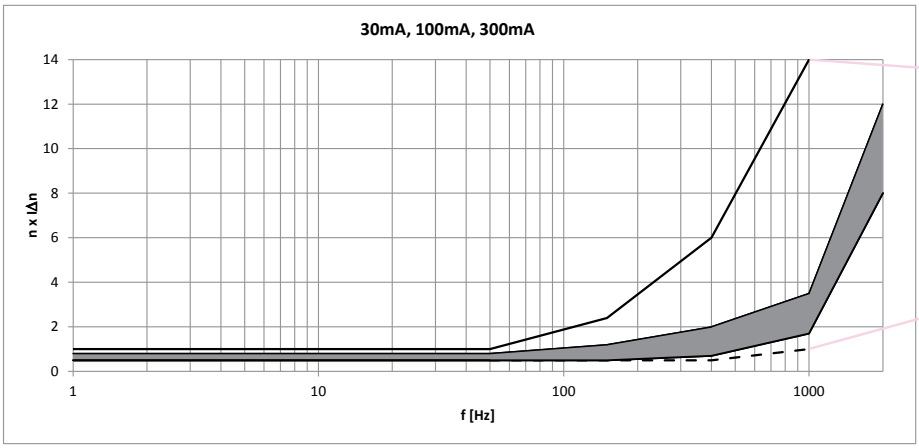


K-Short time delay, S-Selective

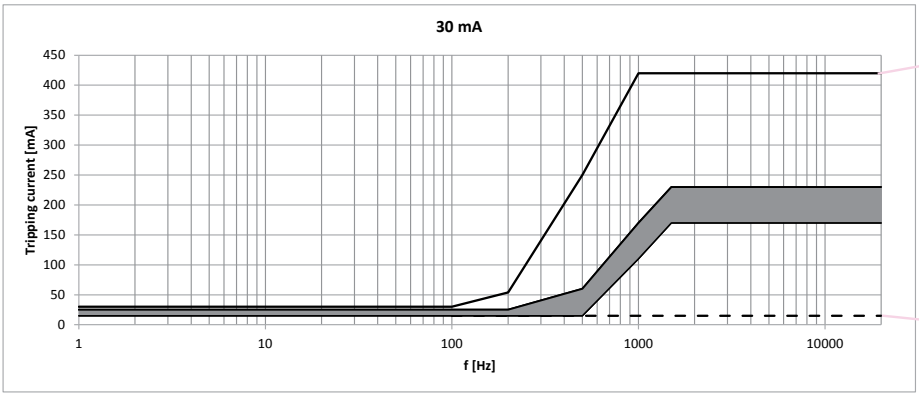


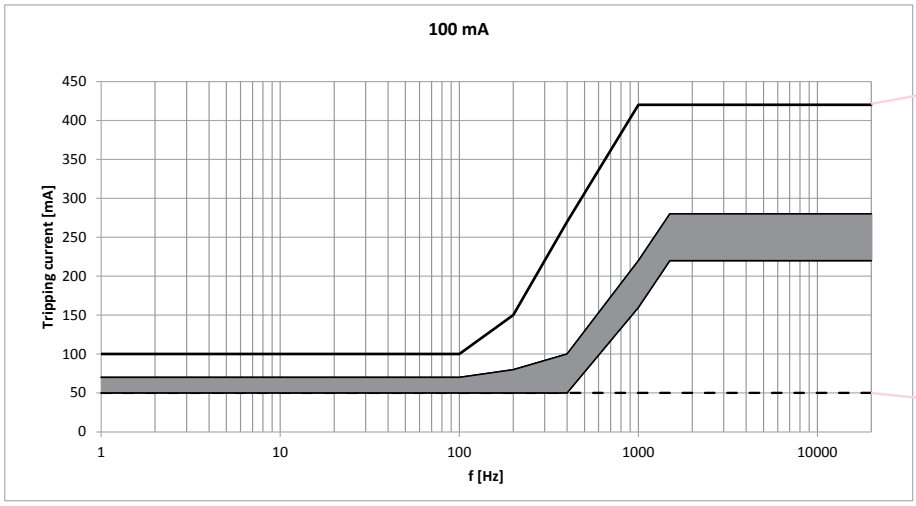


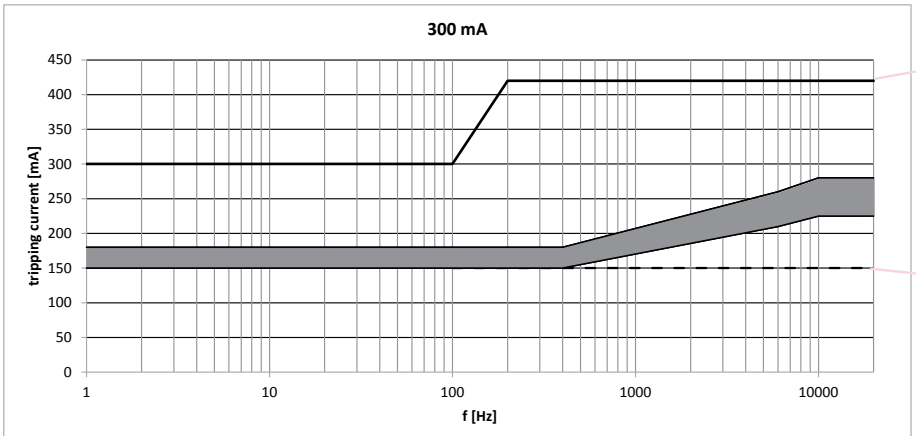
EFI B type



EFI B+ type

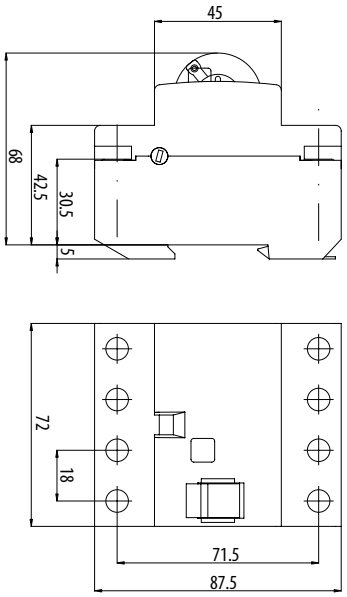


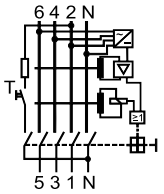




Residual Current Circuit Breakers for Protection of EV Charging Stations EFI eV

Technical data EFI-4 A eV	
Type	**EFI-4 A eV**
Electrical	
Rated Voltage U_n	400/415V AC
Rated current I_n	25, 40, 63 A
Rated frequency f_n	50/60Hz
Mode of operation	A type functionality : voltage independent DC functionality: voltage dependent
Sensitivity	Alternating, pulsed and smooth direct currents
Rated insulation voltage U_i	440V
Rated impulse withstand voltage (1,2/50µs)	4kV
Electrical isolation	> 4mm contact space
Rated residual operating current $I_{\Delta n}$	30 mA
DC tripping treshold	6 mA
Rated conditional short-circuit current I_{cn}	10kA
Rated making and breaking capacity I_m	630A
Max back-up fuse for short circuit protection	80A gG
Voltage range test circuit	196 – 253 V AC
Min. operating voltage	80 V
Standards	IEC/EN 61008, IEC 62955:2018
Mechanical Endurance (cycles)	10.000
Electrical endurance (cycles)	2.000
Shock resistance acc. to	IEC/EN 61008-1
Resistance to vibrations acc. To IEC 60068-2-7	5g (10, 60 & 500Hz)
Mechanical	
Frame size	45mm
Device height	68mm (DIN rail acc to EN6071)
Device width	72mm (4 x Module Units)
Degree of protection	IP20
Overvoltage category	III
Upper and lower terminals	open mounted/lift terminals
Terminal capacity	1-25mm^2
Terminal screw	M5 (Pozidrive PZ2)
Terminal torque	max. 3Nm
Busbar thickness	0,8 - 2 mm
Operating temperature	-25°C ... +65°C
Storage and transport temperature	-40°C ... +85°C
Resistance to climatic conditions	IEC/EN 61008
Contact position indicator	mechanical red/green
Mounting position	any
Mounting on the rail	35mm acc to EN50022
Supply possibility	top or bottom
Locking device	Locking is possible through button and cover





In [A]	Maximum power dissipation EFI-4 A eV P/pole [W]
25	1,33
40	3,12
63	6,62

conductor cross-section [mm²]	Number of single conductors, rigid, single-wire Cu conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

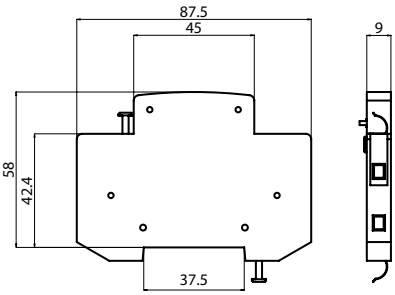
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

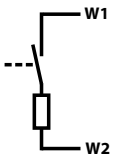
Auxiliary switch PS EFI

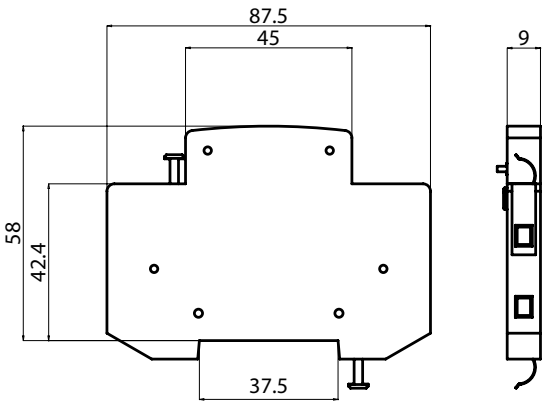
Technical data	
Rated current I_n	6 A (230 V AC), AC 12,
	1 A (110 V DC), DC 12
Conditional short-circuit current	1 kA with fuse-link 20 A
Terminals	1-2,5mm², max. 0,5Nm
Terminal Screw	M3 (PH1)
Mounting position	any
Standards	EN 62019



Shunt trip release DA EFI

Technical data	
Rated voltage	230V AC
Rated frequency	50/60Hz
Max inrush current	0,8A
Terminals	1-2,5mm², max. 0,5Nm
Terminal Screw	M3 (PH1)
Build-in width	9mm
Mounting position	any



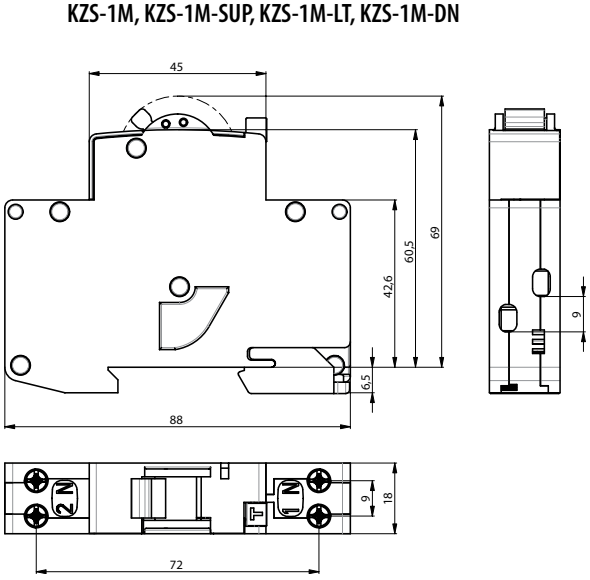


Residual current circuit breaker with integral overcurrent protection KZS -1M

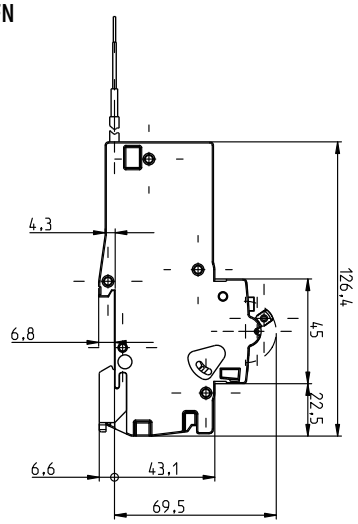
Technical data			
Type	KZS 1M	KZS 1M DN	KZS 1M FN
Rated voltage U_n		230 V AC	
Rated current I_n	6-25 A	6-25 A	6-45 A
Minimal supply voltage U_{min}		90 V	
Rated frequency f_n		50 Hz	
Rated short-circuit capacity	6.000 A	6.000 A	10.000 A
Back-up fuse		100 A gG	
Tripping characteristic		B, C	
Rated residual current $I_{\Delta n}$	10, 30, 100 mA	30 mA	30, 100 mA
Type of residual release		A, AC	
Rated residual making and breaking capacity $I_{\Delta m}$	1500A	1500A	4500A
Terminals	1-10 mm², max. 1,5Nm	1-10 mm², max. 1,5Nm	1-25 mm² / 1-16 mm²
Terminal screw	M4 (Pozidrive PZ2)	M4 (Pozidrive PZ2)	M5 (Pozidrive PZ2)
Width		18 mm	
Mounting position		any	
Standard	IEC 61009	IEC 61009, EN 50550	IEC 61009-1 / 61009-2
Length of neutral conductor	-	-	600 mm
Operating temperature		-25°C ... +40°C	

Voltage [V]	KZS 1M DN Tripping time [s]
255	/
275	3s<t<15s
300	1s<t<5s
350	0,25s<t<0,75s
400	0,07s<t<0,20s

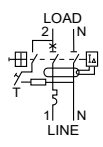
KZS-1M, KZS-1M-SUP, KZS-1M-LT, KZS-1M-DN



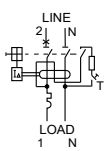
KZS 1M FN



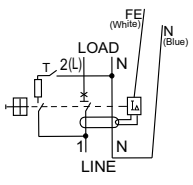
KZS-1M, KZS-1M-LT, KZS-1M-DN



KZS-1M SUP

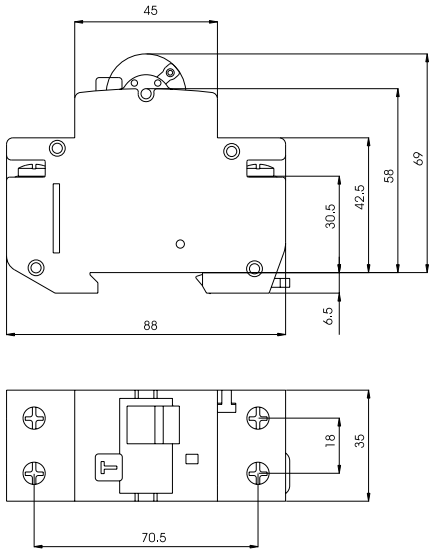


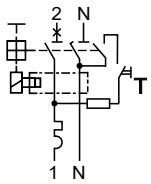
KZS-1M FN



Residual current circuit breaker with integral overcurrent protection KZS-2M

Technical data			
Type	INST	G/KV	120 V
Rated voltage U_n	230/240 V AC		
Rated current I_n	6-40 A		
Rated frequency f_n	50 Hz		60 Hz
Rated impulse withstand voltage U_{imp}	4 kV		
Rated short-circuit capacity	10.000 A		
Back-up fuse	100 A gG		
Voltage range test circuit	180-200 V		90-143 V
Tripping characteristic	B, C		
Energy limiting class	3		
Type	A, AC		A
Rated residual current $I_{\Delta n}$	10, 30, 100, 300, 500 mA	30 mA	
Peak withstand current	250 A	3 kA	
Rated residual making and breaking capacity $I_{\Delta m}$	10.000A		
Terminals	1-25 mm², max. 3Nm		
Terminal screw	M5 (Pozidrive PZ2)		
Width	36 mm		
Mounting position	any		
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)		
Standard	IEC 61009, EN 61009		





Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

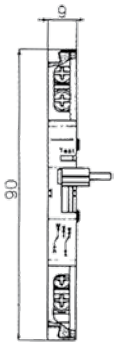
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

Auxiliary signal switch PS/SS KZS-R

Technical data	
Rated voltage	230V AC/DC, 110V DC
Rated current	6A (230V AC); 1A (110V DC); 0,5A (220V DC)
Rated frequency	50/60Hz, DC
Index of protection	IP 20 (IP 40)
Terminals	max. 1.5mm^2, max 0.8Nm
Ambient temperature	max. 35°C
Storage temperature	max. -40°C ... +70°C
Contacts	1x NC , 1x NC/NO
Mounting position	any
Standards	EN 62019





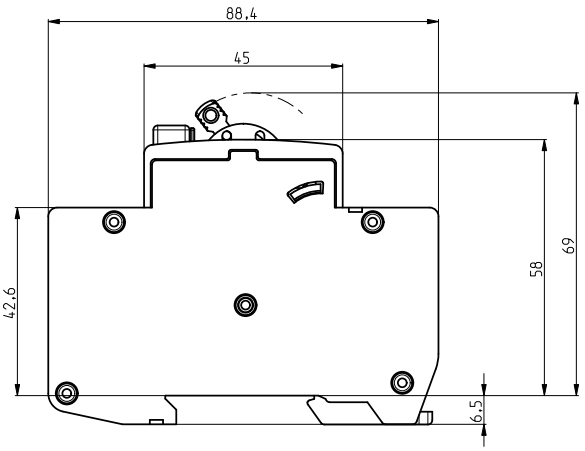
NO - Normally open contact --> during the activation it makes a contact
NC - Normally closed contact --> during the activation it brakes the contact
1 - contact
0 - without a contact

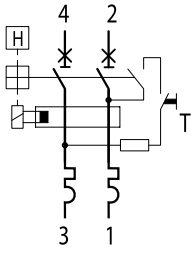
AUX switch connections	status of the breaker	
	ON	OFF
11-14 NO	1	0
11-12 NC	0	1
21-22 NC	0	1

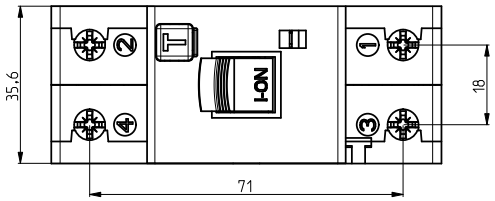
Signal switch connections	status of the breaker		
	ON	manual trip	overcurrent trip
11-14 NO	1	1	0
11-12 NC	0	0	1
21-22 NC	0	0	1

Residual current circuit breaker with integral overcurrent protection KZS-2M 2p

Technical data	
Rated voltage U_n	230 V AC
Rated current I_n	6-25 A
Rated frequency f_n	50 Hz
Rated short-circuit capacity	10.000 A
Back-up fuse	100 A gG
Tripping characteristic	B, C
Type	A
Rated residual current $I_{\Delta n}$	30, 100 mA
Rated residual making and breaking capacity $I_{\Delta m}$	1500A
Terminals	1-25 mm^2, max. 3Nm
Terminal screw	M5 (Pozidrive PZ2)
Width	36 mm
Mounting position	any
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standard	IEC 61009, EN 61009

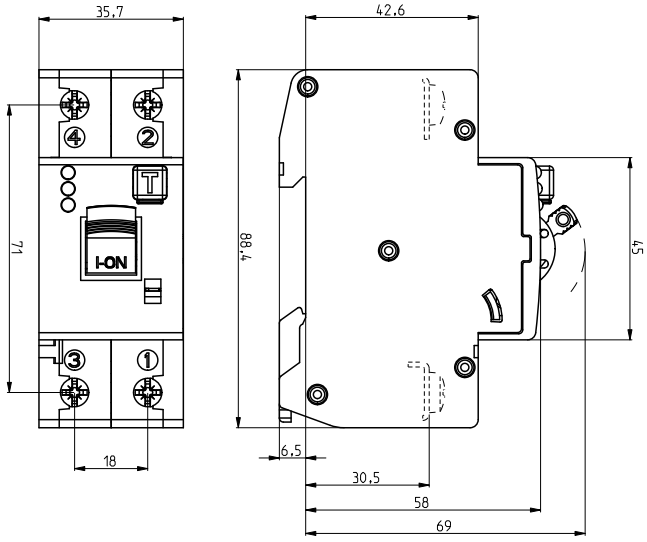


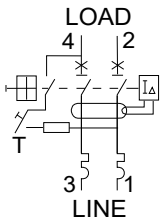




Residual current circuit breaker with integral overcurrent protection with LED status signalisation KZS 2M2p EDI

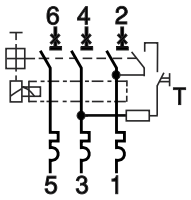
Technical data	
Rated voltage U_n	~230 V AC
Rated current I_n	6-25 A
Rated frequency f_n	50 Hz
Minimal supply voltage U_{min}	90 V
Min. LED operating voltage U_{min}	150 V
Rated short-circuit capacity	10.000 A
Back-up fuse	100 A gG
Tripping characteristic	B, C
Energy limiting class	3
Type of residual release	A
Rated residual current $I_{\Delta n}$	30 mA
Rated residual making and breaking capacity $I_{\Delta m}$	1500A
Index of protection	IP20
Overvoltage category	III
Ambient temperature	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C
Mounting position	any
Terminals	1-25 mm², max. 3 Nm
Terminal screw	M5 (Pozidrive PZ2)
Width	36 mm
Resistance to vibrations acc. to IEC 60068-2-7	5g (10,60 & 500Hz)
Standard	IEC 61009-2, IEC 61009-1

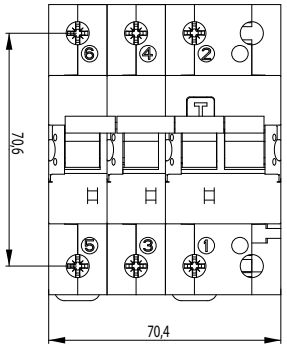


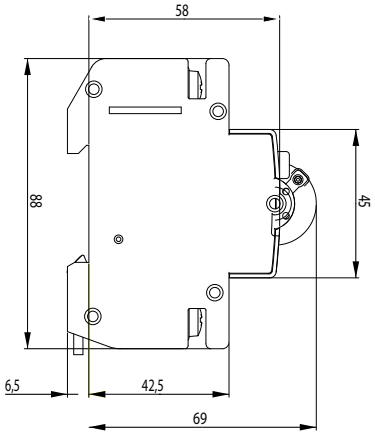


Residual current circuit breaker with integral overcurrent protection KZS-4M 3p

Technical data	
Rated voltage U_n	~400 V AC
Rated current I_n	6-32 A
Rated frequency f_n	50/60 Hz
Rated short-circuit capacity	10.000 A
Back-up fuse	100 A gG
Tripping characteristic	B, C
Type	AC, A
Rated residual current $I_{\Delta n}$	30, 100, 300, 500 mA
Rated residual making and breaking capacity $I_{\Delta m}$	4500A
Terminals	1-25 mm², max. 3 Nm
Terminal screw	M5 (Pozidrive PZ2)
Width	72 mm
Mounting position	any
Standard	EN 61009-1







Conductor cross-section [mm²]	Number of single conductors, rigid, single-wire CU conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

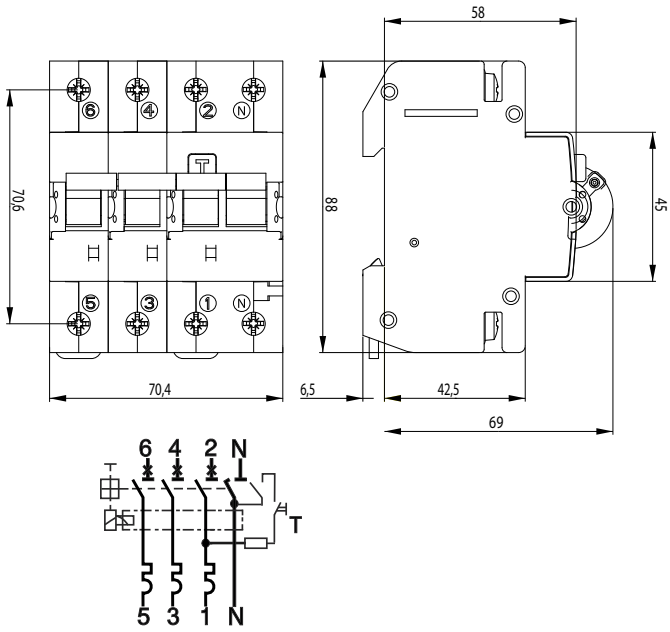
Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

Conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors without cable ferrule					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

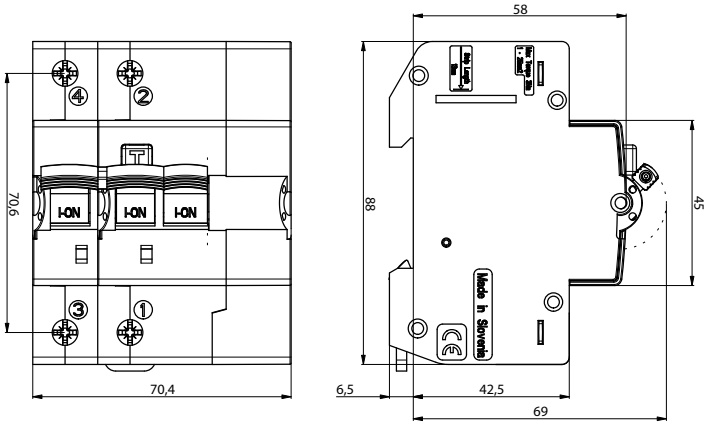
Residual current circuit breaker with integral overcurrent protection KZS-4M 3p+N

Technical data	
Rated voltage U_n	400/415V AC
Rated current I_n	6-32 A
Rated frequency f_n	50/60 Hz
Rated impulse withstand voltage U_{imp}	4 kV
Rated short-circuit capacity	6.000 A
Back-up fuse	100 A gG
Tripping characteristic	B, C
Energy limiting class	3
Type	AC, A
Rated residual current $I_{\Delta n}$	30, 100, 300, 500 mA
Rated residual making and breaking capacity $I_{\Delta m}$	4500A
Terminals	1-25 mm², max. 3 Nm
Terminal screw	M5 (Pozidrive PZ2)
Width	70 mm
Mounting position	any
Standard	EN 61009-1



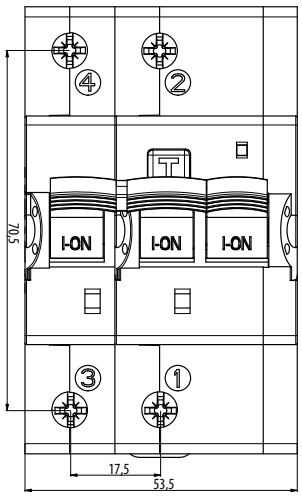
Residual current circuit breaker with integral overcurrent protection KZS-4M 2p B-type

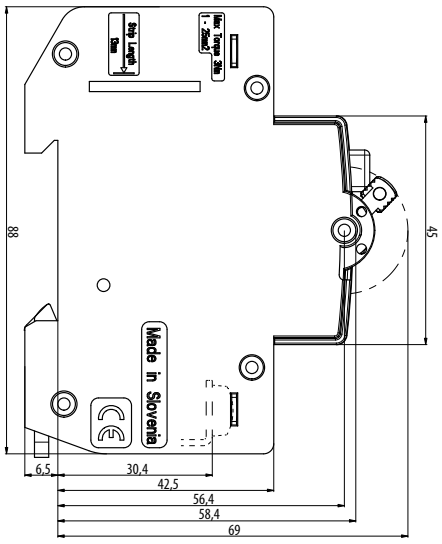
Technical data	
Electrical	
Rated voltage U_n	230 V AC
Rated current I_n	6, 10, 13, 16, 20, 25, 32, 40 A
Rated Insulation voltage U_i	440 V
Peak withstand current	3kA (8/20ms) surge current proof
Electrical isolation	> 4mm contact space
Rated residual operating current I_{Dn}	30, 100, 300mA
Rated short-circuit capacity	10kA
Maximum back-up fuse	100A gG
Insulating class	B
Standard	IEC/EN 61009-1, IEC/EN 62423
Mechanical endurance	20.000
Electrical endurance	10.000
Mechanical	
Frame size	45mm
Device height	69 mm
Device width	70 mm
Degree of protection	IP20
Upper and lower terminals	open mounted/lift terminals
Terminal capacity	1-25 mm²
Terminal screw	M5 (Pozidrive PZ2)
Terminal torque	max 3,0 Nm
Operating temperature	-25°C ... +60°C
Storage and transport temperature	-40°C ... +70°C
Resistance to climatic conditions	IEC/EN 61009
Contact position indicator	mechanical red/green
Supply possibility	Top or bottom

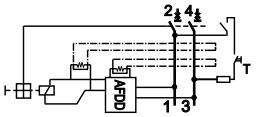


Arc Fault Detection Device AFDD

Technical data KZS - AFDD 3M2p	
Electrical	
Rated Voltage U_n	240 V AC
Rated current I_n	6, 10, 13, 15, 16, 20, 25, 32 A
Rated residual operating current $I_{\Delta n}$	30 mA
Rated frequency f_n	50Hz
Type	A
Tripping characteristic	B, C
Rated short-circuit capacity	10kA
Rated insulation voltage U_i	440 V
Rated impulse withstand voltage U_{imp}	4kV (1,2/50µs)
Peak withstand current	3kA (8/20µs) surge current proof
Voltage range test circuit	135-264V
Min operating voltage for AFDD function	180V
Rated residual making and breaking capacity $I_{\Delta m}$	4500A
Electrical isolation	> 4mm contact space
Max back-up fuse	100A gG
Insulating class	B
Standards	IEC/EN 61009-1, IEC/EN 62606
Mechanical Endurance (cycles)	20.000
Electrical endurance (cycles)	10.000
Mechanical	
Frame size	45mm
Device height	69 mm
Device width	53.5 mm
Degree of protection	IP20
Upper and lower terminals	open mounted/lift terminals
Terminal capacity	1-25 mm^2
Terminal screw	M5 (Pozidrive PZ2)
Terminal torque	max 3,0 Nm
Operating temperature	-25°C ... +50°C
Storage and transport temperature	-40°C ... +70°C
Resistance to climatic conditions	IEC/EN 61009-1
Shock resistance acc. to	IEC/EN 61009-1
Resistance to vibrations acc. to IEC60068-2-7	5g (10,60 & 500Hz)
Contact position indicator	mechanical red/green
Supply possibility	Top or bottom
Mounting on the rail	35mm acc to EN60715
Mounting position	any







I_n [A]	Power dissipation P/pole [W]	Rh [mΩ]	Rh/pole [mΩ]
6	1,5 - 1,7	126	63
10	1,6-1,8	86	43
13	1,8 - 2,0	60	30
16	1,9 - 2,2	48	24
20	2,2 - 2,4	40	20
25	2,8 - 3,1	34	17
32	4,0 - 4,4	24	12

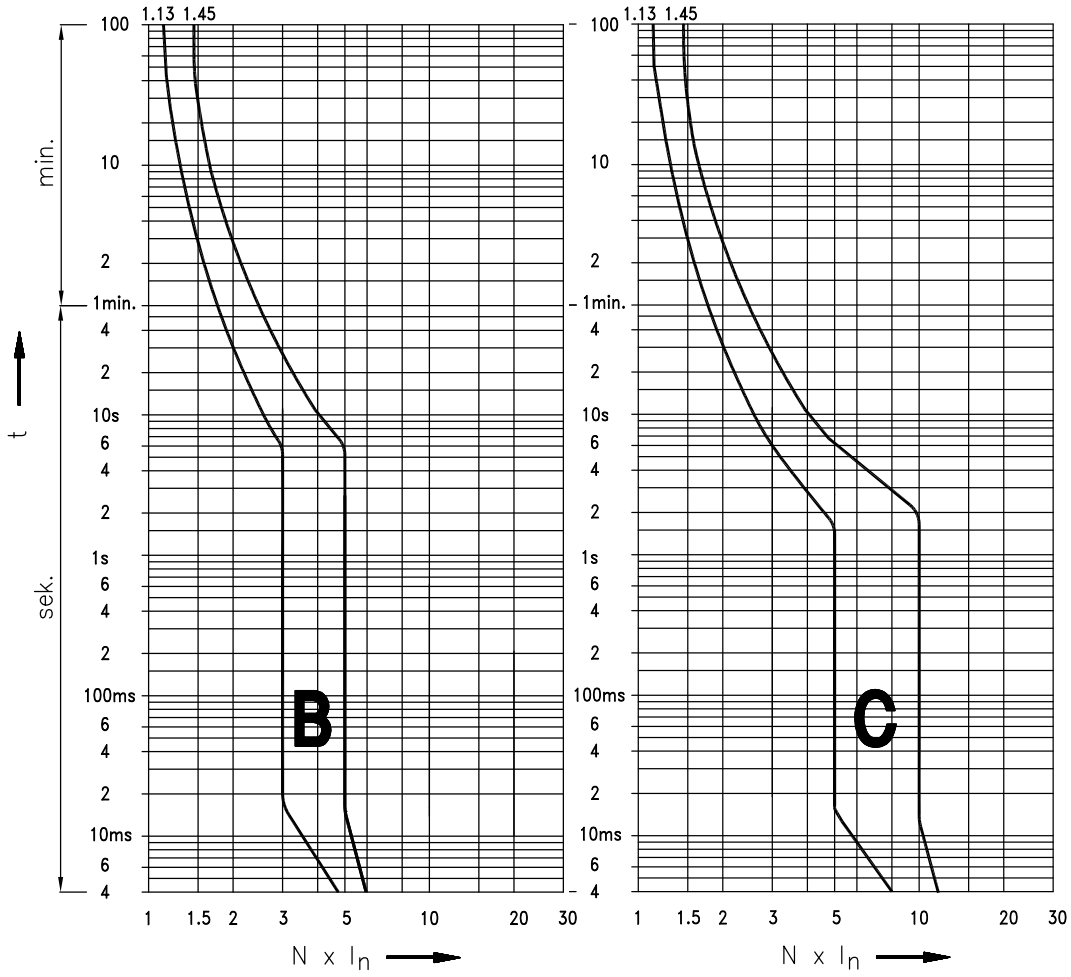
Voltage [V]	Tripping time [s]
255	/
275	5s<t<15s
300	1s<t<5s
350	0,3s<t<0,8
400	0,1s<t<0,2s

conductor cross-section [mm²]	Number of single conductors, rigid, single-wire Cu conductor				
	1	2	3	4	5
1,5	✓	✓	✓	✓	×
2,5	✓	✓	✓	×	×
4	✓	✓	✓	×	×
6	✓	✓	×	×	×
10	✓	✓	×	×	×
16	✓	×	×	×	×
25	✓	×	×	×	×

Remark: When you use more than 2 cables you have to be careful how those cables are inserted, due to insure proper presure on each cable

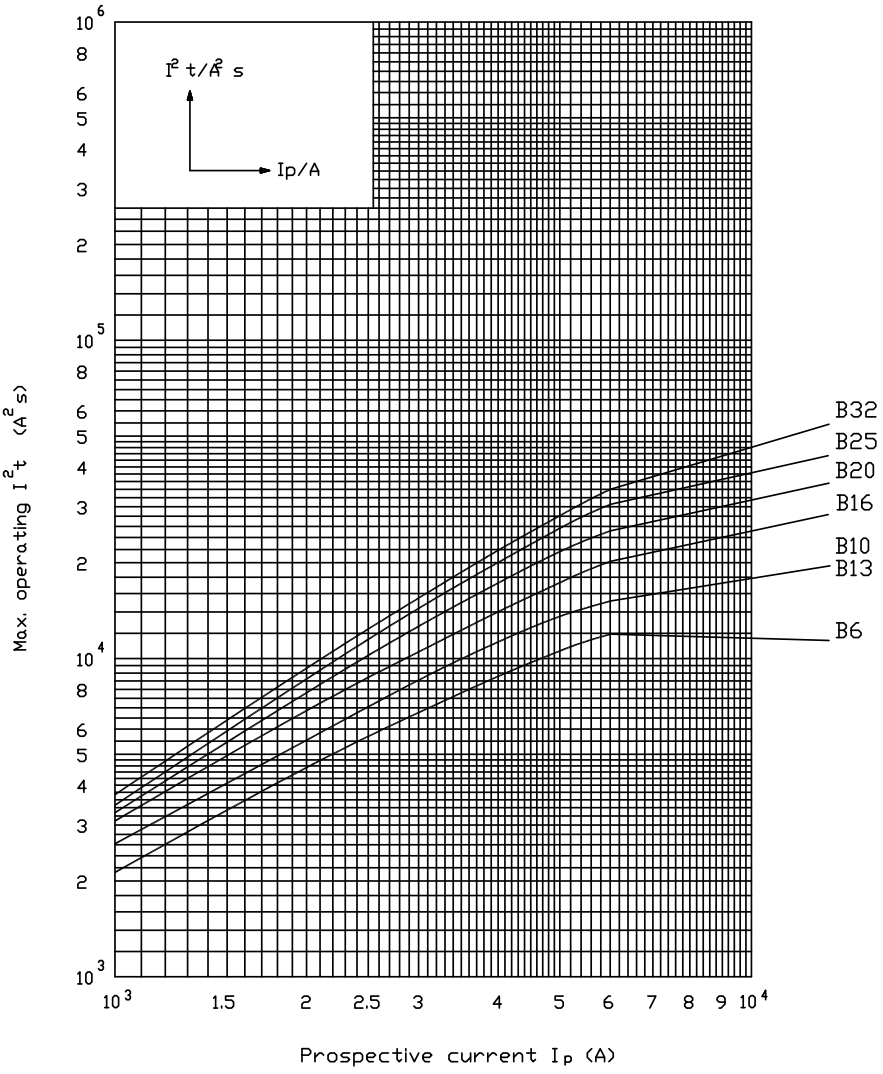
conductor cross-section [mm²]	Number of single conductors, flexible Cu conductors					
	1	2	3	4	5	6
1,5	✓	✓	✓	✓	✓	✓
2,5	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓
6	✓	✓	✓	×	×	×
10	✓	✓	×	×	×	×
16	✓	×	×	×	×	×
25	✓	×	×	×	×	×

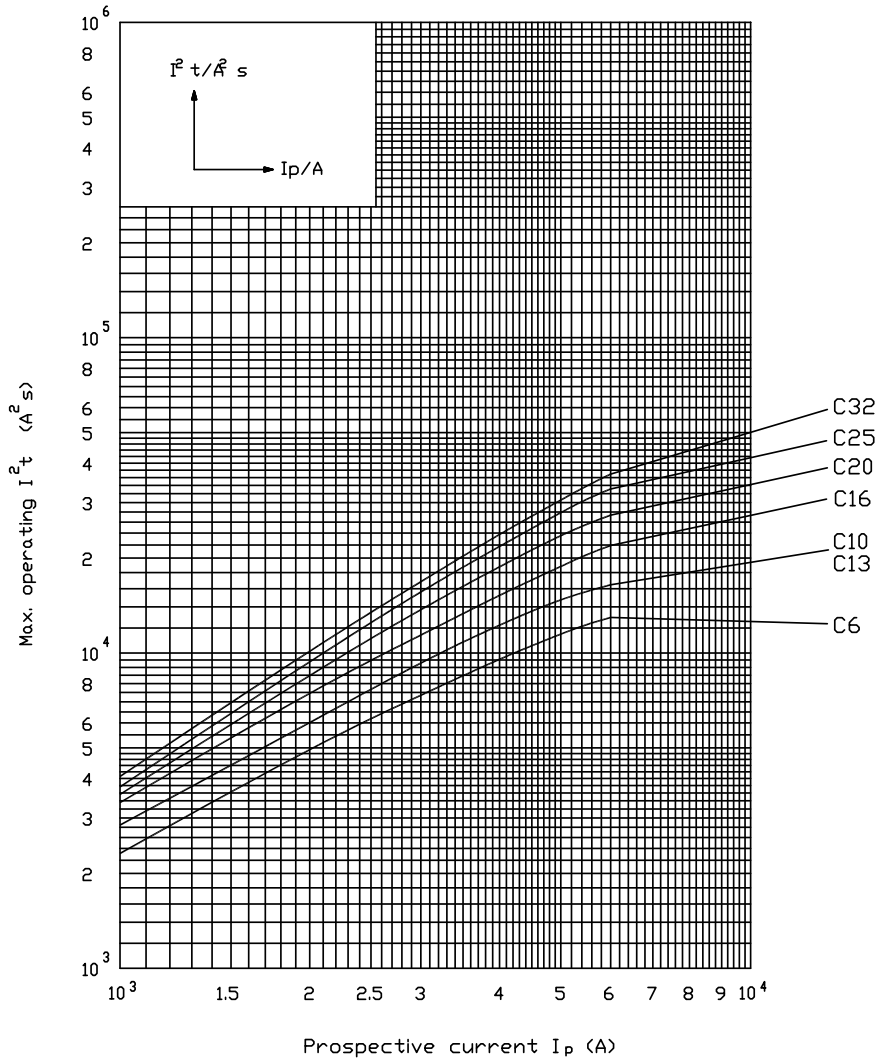
Combination of rigid single-wire and flexible multi-wire Cu conductors is not allowed

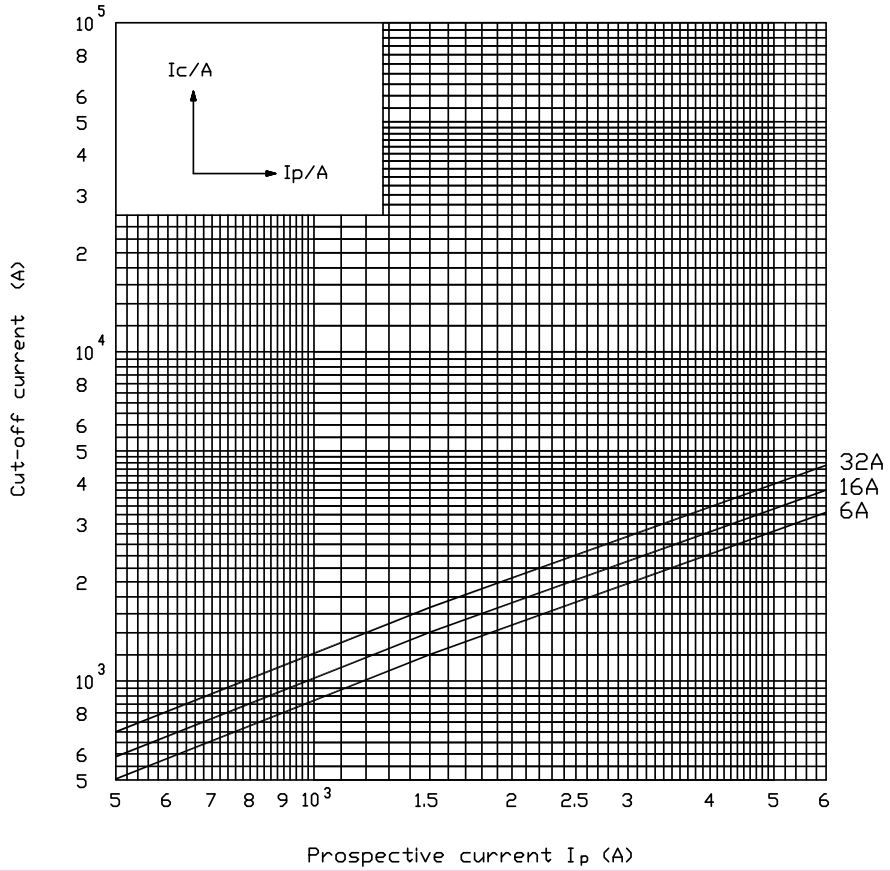


Self-Test function explanation

- How often does Self-test function perform on the AFDD?
  Every time it is powered and then once every minute while powered.
- What happens in the case that Self-test function is not positive, so if it fails this test, the AFD function does not work anymore?
  If the self-test (automatically initiated test function) fails then the AFDD outputs a trip command. The self test checks the AFD function so if it fails then the AFD function is not operating correctly.
- In the case of failing Self-test fault what happens further: Does the AFDD trip immediately or does it trip after relatching the switch, or does not trip and just signalizes?
  After a self-test failure the device will trip. Upon re-latching the AFDD signals the self-test fault by flashing the LED as described for the self-test fault below, it then does a self-test and if the result is a fail it will trip. If the AFDD cannot trip due because the tripping means is compromised (e.g. damaged PMR) it will continuously flash the LED (self-test fault) as long as it remains powered. If the self-test is a pass after re-latching then the flashing LED will cancel after 25 seconds.

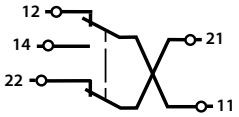



I² t/A² s
Ip/A
Max. operating I²t (A² s)
C32
C25
C20
C16
C10
C13
C6
Prospective current Ip (A)


Ic/A
Ip/A
Cut-off current (A)
32A
16A
6A
Prospective current Ip (A)

Auxiliary switch PS KZS-2M/4M

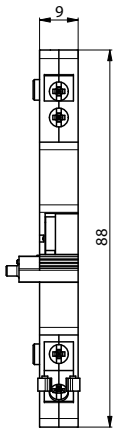
Technical data	
Function	Auxiliary Switch
Rated voltage	230V AC/DC, 110V DC
Rated current	6A (230V AC); 1A (110V DC); 0,5A (220V DC)
Rated frequency	50/60Hz, DC
Index of protection	IP 20 (IP 40)
Terminal capacity	1,5mm^2
Terminal Screw	M3 PH1
Terminal torque	max 0,5Nm
Ambient temperature	-25°C ... +40°C
Storage temperature	-40°C ... +70°C
Contacts	1x NC , 1x NC/NO
Mounting position	any
Standards	EN 62019



AUX switch connections	status of the breaker	
	ON	OFF
11-14 NO	1	0
11-12 NC	0	1
21-22 NC	0	1

NO - Normally open contact --> during the activation it makes a contact
NC - Normally closed contact --> during the activation it brakes the contact
1 - contact
0 - without a contact

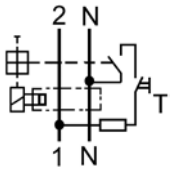
Suitable for use with:	
Type	Suitable
KZS-1M	×
KZS 1M-FN	×
KZS-2M	✓
KZS-2M2p	×
KZS-4M 3p	✓
KZS-4M 3p+N	✓
KZS-4M2p	×
KZS-R	×
AFDD	×

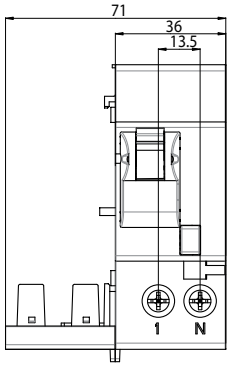


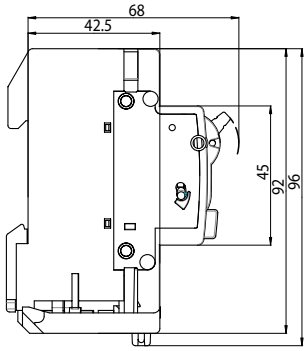
Add-on block for residual current protection DIFO

DIFO2

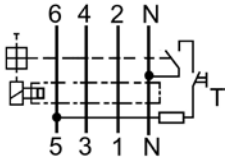
Technical data	
Rated voltage U_n	230/400 V AC
Rated current I_n	≤32 A ≥ 40 A
Rated frequency f_n	50 / 60 Hz
Rated residual current $I_{\Delta n}$	30, 100, 300 mA
Type of residual current tripping	AC, A
Terminals	1 – 25 mm^2, max. 3 Nm
Terminal screw	M5 (Pozidrive PZ2)
Mounting position	any
Standards	IEC 61009, EN 61009

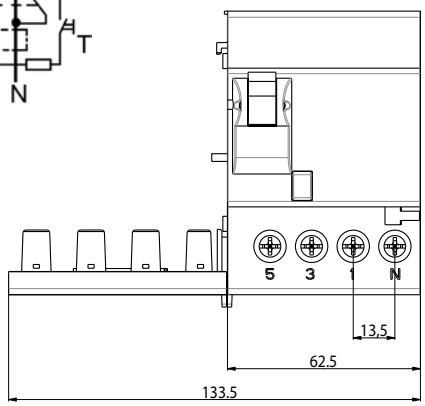


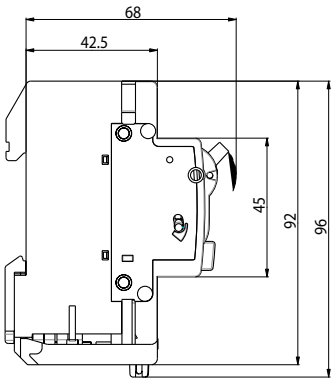




DIFO4







EVE - ETIREL

Build-in switch SV 118

Build-in devices EVESYS 119

Control equipment ETIREL 120

Electromechanical Relays 141

Technical data 149

SIQ HR

Modular and control devices



ETI Power needs control

Build-in switch SV

Build-in switch SV

Rated current **16 - 125 A**

Utilization category **AC-23B, AC-22B**

Application
Build-in switch SV is used as a main switch in distribution boxes in houses or as a switch for individual electric circuits. With a build-in switch we can completely replace the cam switch. Build-in switch SV can be sealed either in ON or OFF position.
Advantages
Build-in switch SV has a more robust and simple construction and therefore a more reliable operation. It also shows the status of the contacts. With an additional label the circuit in which the switch is built in can be marked. Switches with $I_n \leq$ 63A have a double switching OFF.



1-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 116	16	002423121	230/400	AC-23B	87	12/108
SV 125	25	002423122	230/400	AC-23B	89	12/108
SV 140	40	002423123	230/400	AC-23B	92	12/108
SV 163	63	002423114	230/400	AC-22B	90	12/108
SV 180	80	002423115	230/400	AC-22B	90	12/108
SV 1100	100	002423116	230/400	AC-22B	90	12/108
SV 1125	125	002423117	230/400	AC-22B	90	12/108



2-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 216	16	002423221	400	AC-23B	173	6/54
SV 225	25	002423222	400	AC-23B	178	6/54
SV 240	40	002423223	400	AC-23B	184	6/54
SV 263	63	002423214	400	AC-22B	180	6/54
SV 280	80	002423215	400	AC-22B	180	6/54
SV 2100	100	002423216	400	AC-22B	180	6/54
SV 2125	125	002423217	400	AC-22B	180	6/54



3-pole

Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 316	16	002423321	400	AC-23B	265	4/36
SV 325	25	002423322	400	AC-23B	270	4/36
SV 340	40	002423323	400	AC-23B	280	4/36
SV 363	63	002423314	400	AC-22B	270	4/36
SV 380	80	002423315	400	AC-22B	270	4/36
SV 3100	100	002423316	400	AC-22B	270	4/36
SV 3125	125	002423317	400	AC-22B	270	4/36

Technical data on page 149

4-pole						
Type	I_n [A]	Code No.	U_n [V]	utilization category	Weight [g]	Packaging [pcs]
SV 416	16	002423421	400	AC-23B	363	3/27
SV 425	25	002423422	400	AC-23B	365	3/27
SV 440	40	002423423	400	AC-23B	380	3/27
SV 463	63	002423414	400	AC-22B	360	3/27
SV 480	80	002423415	400	AC-22B	360	3/27
SV 4100	100	002423416	400	AC-22B	360	3/27
SV 4125	125	002423417	400	AC-22B	360	3/27



Build-in devices EVESYS

Build-in devices EVESYS

Rated current **25-40 A**

Utilization category **AC-22A**

Modular changeover switches SSQ I-0-II (network - generator) enable simple and trouble-free switching of power supply sources in case of emergency (e.g. mains voltage failure). They are designed for installation in switchgear equipped with TH35 rails adapted for mounting modular devices. Switches can be sealed for the selected positions: I or II.

Advantages:

- the family of SSQ changeover switches expands the EVE modular system range,
- all changeover switches are made in modular form - module width 18 mm,
- the distance between the changeover switch contacts in the open state is larger than 3 mm per one pair of contacts, (two pair of contacts in the current path of changeover switch)
- the changeover switches are equipped with terminals enabling connection of conductors of cross-section :
- 16 mm² for a "wire" type wire
- 10 mm² for a " stranded wire" type cable.

Three-position modular changeover switch I-0-II							
Type	I_n [A]	Code No.	U_n [V]	number of poles	utilization category	Weight [g]	Packaging [pcs]
SSQ 125	25	002421414	230	1	AC-22A	88	1/12
SSQ 225	25	002421424	400	2	AC-22A	176	1/6
SSQ 325	25	002421434	400	3	AC-22A	264	1/4
SSQ 425	25	002421444	400	4	AC-22A	352	1/3
SSQ 140	40	002421415	230	1	AC-22A	88	1/12
SSQ 240	40	002421425	400	2	AC-22A	176	1/6
SSQ 340	40	002421435	400	3	AC-22A	264	1/4
SSQ 440	40	002421445	400	4	AC-22A	352	1/3



SSQ 440

Modular indicators SON H				
Type	Color	Code No.	Weight [g]	Packaging [pcs]
SON H-1R	1x red	002471550	40	1/400
SON H-1G	1x green	002471551	40	1/400
SON H-3R	3x red	002471552	48	1/400
SON H-3K	1x red, 1x yellow, 1x green	002471553	48	1/400
SON H-3G	3x green	002471556	48	1/400
SON H-1Y	1x yellow	002471554	40	1/400
SON H-1B	1x blue	002471555	40	1/400



Technical data on page 151



Bell/Buzzer

Type	Code No.	U_n [V]	Weight [g]	Packaging [pcs]
Bell ZE 220	002412001	230	70	12/108
Bell ZE 8	002412002	8	70	12/108
Buzzer BE 220	002413001	230	54	12/108
Buzzer BE 8	002413002	8	54	12/108

Bell transformer

Type	I_n [A]	Code No.	P_n [VA]	U_{1n} [V]	U_{2n} [V]	Weight [g]	Packaging [pcs]
Zt 8/8	1	002411005	8	230	4, 6, 8	620	1/36
Zt 8/12	0,63	002411006	8	230	6, 8, 12	600	1/36
Zt 8/8 - 2M	1	002411010	8	230	8	314	1/54
Zt 8/12 - 2M	0,63	002411011	8	230	12	312	1/54

DIN socket

Type	Code No.	I_n [A]	U_n [V]	pole numbers	Weight [g]	Packaging [pcs]
T-2P+Z schuko	002414020	10A DC, 16A AC	250V AC	2+PE	77	15

Control equipment ETIREL

Power relays VS116K, VS316K



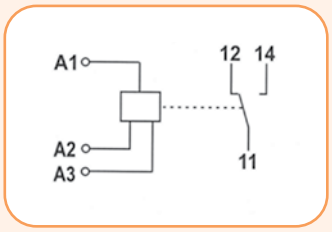
Application: Control signals in low-power circuits, combined with buttons, switches, for automation systems

Advantages:

- Voltage range AC230 or AC / DC 24V,
- 1 module, DIN rail mounting
- Changeover contact 1x16A or 3x16A,
- Output status LED indication

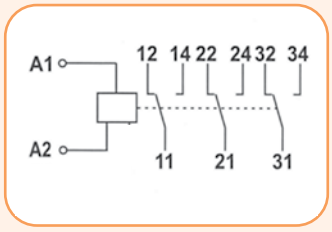
Power relays VS116K, VS316K

Type	Code No.	Voltage Un	Number of contacts	Weight [g]	Packaging [pcs]
VS116K	002471211	AC230V / AC/DC 24V	1P	58	1/10
VS316/230 V	002471220	AC230V	3P	84	1/10
VS316/24 V	002471225	AC/DC 24V	3P	84	1/10



VS116K

A1 - A2 230V AC
A1 - A3 24V AC/DC



VS316K

Delay OFF without supply voltage CRM-82TO

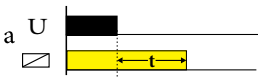
- „True OFF“ relay - relay timing without supply voltage
- Sample of use: back-up source for Delay OFF in case of voltage failure (emergency lighting, emergency respirator, or protection of el. controlled doors - in case of fire)
- 2 time functions adjustable by rotary switch:
  - a - Delayed return after disconnecting of supply
  - e - Delayed start
- Time range (adjustable by rotary switch and fine setting by potentiometer): 0.1 s - 10 min
- Universal supply voltage AC/DC 12 - 240 V
- Output contact: 2x changeover/DPDT 8 A
- Output status indicated by LED (only in case of supply voltage connection)
- Clamp terminals
- 1-MODULE, DIN rail mounting

Delay OFF without supply voltage CRM-82TO

Type	Code No.	Weight [g]	Packaging [pcs]
CRM-82TO	002470074	93	1/10



e - ON Delay



a - Delay OFF (S break) the power supply is switched off (min. time is 0.5 s)



Multifunction time relay CRM-91H, CRM-93H

Advantages
- 1-module, DIN rail mounted
- Universal supply voltage: AC/DC 12V - 240V
- 10 functions:
  - 5 time functions controlled via supply voltage
  - 4 time functions controlled via control input
  - 1 function of memory (latching) relay
- Time scale 0.1 s - 10 days divided into 10 ranges
- User-friendly setting of functions and time via rotary switch
- Output contact:
  CRM-91H 1x16A changeover
  CRM-93H 3x8A changeover
- Output indication: multifunction red LED, flashing at certain states

Multifunction time relay CRM-91H, CRM-93H

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-91H	16	002470001	68	1/10
CRM-93H	8	002470002	93	1/10



Technical data on page 154, 155

Functions

a) Delay ON after energisation

b) Delay OFF after energisation

c) Cycler beginning with pause after energisation

d) Cycler beginning with impulse after energisation

e) Delay OFF after de-energisation, instant make of output

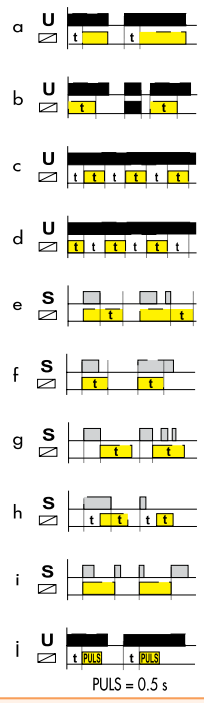
f) Delay OFF responding to make of control contact regardless its length

g) Delay OFF after break of control contact with instant output

h) Delay OFF after make and break of control contact

i) Memory (latching) relay

j) Pulse generator



Time relay CRM-2H

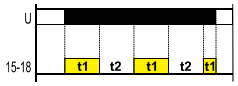
Advantages
- 1-module, DIN rail mounted
- Universal supply voltage: AC/DC 12V - 240V
- 2 time functions:
  - cycler beginning with pulse
  - cycler beginning with pause
- Time scale 0.1s - 100 days divided into 10 time ranges
- Rough time setting by rotary switch
- Output contact: 1x 16 A changeover
- Output indication: multifunction red LED



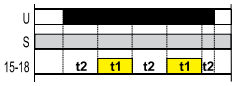
Time relay CRM-2H

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-2H	16	002470003	68	1/10

Cycler beginning with pulse



Cycler beginning with pause



Technical data on page 157

Delay ON star/delta relay CRM-2T

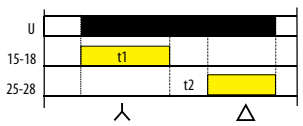
Advantages
- 1-module, DIN rail mounting
- Supply voltage: AC/DC 12V - 240 V
- Generates motor starting cycle star-delta
- Time t1 (star)
  - time scale 0.1 s - 100 days is divided into 10 time ranges
  - rough time setting by rotary switch
  - fine time setting by potentiometer (from 0,1 to1)
- Time t2 (delay) between star/delta:
  - time range 0.1 s - 1 s is set by potentiometer
- Output contact: 2x 16 A (AC1)
- Output indication: multifunction red LED



Delay ON star/delta relay CRM-2T

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-2T UNI	16	002470013	95	1/10

Delay ON star/delta



Staircase switch CRM-4

Advantages
- 1-module, DIN rail mounted
- Supply voltage: AC 230 V
- Protection against control push-button blocking
- Time range: 0,5 -10 min
- Selector switch:
  - AUTO: normal function acc. to set time
  - OFF: permanent off
  - ON: permanent on
- Time setting via potentiometer
- Output contact: 1x 16 A changeover (load up to 4000 VA/AC1)



Staircase switch CRM-4

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-4	16	002470012	53	1/10

Programmable staircase switch CRM-46



Description

Staircase switch enables delayed switching off of lighting on stairs, corridors, entrances, common areas or for delayed running of fans in the toilet or bathroom:

- 1 TE size, DIN rail mounted.
- Supply voltage: AC 230 V
- The intelligent staircase switch offers similar application possibilities as the CRM-4, while it is possible to extend the delay for functions a, b repeatedly by briefly pressing the control button (s). Each short press multiplies the time set by the potentiometer, i.e. setting the potentiometer to 2 minutes with three presses extends the delay up to 6 minutes. The maximum value of such an extended delay will always be 30 minutes, regardless of the number of presses:
  - Long press (> 2 s) can switch off the output prematurely and end the ongoing delay.
  - Control input with the possibility of loading up to 100mA load (glim lamp, LED in the button, etc.).

Function (selectable by potentiometer on the front panel):

a – STAIRCASE SWITCH, programmable with signalization
b – STAIRCASE SWITCH, programmable without signalization
c – MEMORY LATCH (press to switch on, press to switch off)
d – MEMORY LATCH with delay
ON (permanently closed) - e.g. during cleaning, moving
OFF (permanently open) - e.g. when replacing luminaires

- Adjustable time range 0.5... 10 minutes.
- Output contact 16A AC1 (4000VA), handles surge currents up to 80A.
- 3-wire or 4-wire connection (input S can be controlled by potential A1 or A2).

* For higher loads and frequent switching, it is recommended to strengthen the relay contact with a power contactor.

Programmable staircase switch CRM-46

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
CRM-46	16	002470295	72	1/10

Digital time switch SHT-1, SHT-1/2, SHT-3 and SHT-3/2



Advantages

- 2-modules, DIN rail mounting
- Daily, weekly program in one device (SHT-1; SHT-1/2)
- Daily, weekly, monthly, yearly program (SHT-3, SHT-3/2)
- Supply voltage AC230 V or AC/DC 12-240 V
- Switching: according to the program (AUTO)/constantly manual/ manually until next program change/random (CUBE)
- Automatic conversion summer/winter time
- Sealable cover of the front panel
- 100 memory places, clear LCD display
- Min. interval 1s
- Pulse/cyclic output
- Output contact: 1x 16A changeover → SHT-1, SHT-3.
- Output contact: 2x 16A changeover → SHT – 1/2, SHT-3/2.

Digital time switch SHT-1 and SHT-1/2

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
SHT-1 UNI	16	002470051	130	1
SHT-1 230V	16	002470050	110	1
SHT-1/2 UNI	16	002470054	130	1
SHT-1/2 230V	16	002470053	110	1
SHT-3 UNI	16	002470056	110	1
SHT-3 230V	16	002470055	130	1
SHT-3/2 UNI	16	002470058	110	1
SHT-3/2 230V	16	002470057	130	1

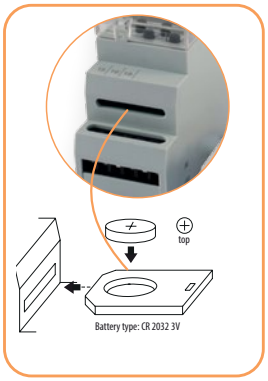
Technical data on page 160, 161

Digital time switch SHT-4

Description
Used to control diff erent loads according to sunrise and sunset time based on geo-graphical coordinates:

- preset coordinates for European cities incl. manual setting options
- hour meter for each channel
- two-channel design - each channel is programmed individually
- Sealable transparent front panel cover, easy to operate with 4 buttons.
- Real-time backup - up to 3 years with replaceable battery.
- Automatic winter/summer time changeover.
- Program: weekly, annually, astro
- Output: 2x CO, 16 A AC1
- Housing: 2-MODULE SIZE
- Supply voltage (frequency): AC 230 V (50/60 Hz)
- Mounting: DIN rail EN 60715





Digital time switch SHT-4

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
SHT-4 230	2xCO, 16A AC1	002470296	287	1

Analog electromechanical time switch APC-D1, APC-DR1

Advantages

- The APC time switch controls any electrical installation by means of daily programs.
- Without (D1) or with (DR1) battery backup.
- Manual switch with permanent ON position.
- Supply voltage : AC 230V
- Sealable cover of frontal panel
- Output contact : 1x NO 16A
- Simple dial time setting. Minimum switching time is 15 min.
- 1 module, DIN rail mounting.



Analog electromechanical time switch APC-D1, APC-DR1

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
APC-D1	16	002472001	87	1/10
APC-DR1	16	002472002	87	1/10

Technical data on page 162, 163

Analog electromechanical time switch ATS-1DR 230



Description

- The mechanical time switch is a simple and inexpensive alternative to digital time switches for controlling heating, ventilation, cooling, lighting systems or pumps depending on real time.
- Daily program.
- Selection of operating modes using the switch on the panel:
  - switches automatically according to the set program
- Power reserve after power off for up to 100 hours after fully charged.
- Sealable transparent front panel cover.
- Supply voltage: AC 230V (50/60 Hz)
- Power consumption (max): 1W (1,5 VA)
- Program: daily
- Minimum operating switching time: 15 min
- Power reserve: max. 100 hrs
- Number of contacts 1x NO (AgNi) 16A AC1
- Mounting: DIN rail EN 60715

Analog mechanical time switch ATS-1DR 230

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
ATS-1DR 230	1xNO, 16A AC1	002470297	73	1

Multifunction relay SMR-T, SMR-H, SMR-B







Advantages

- Multifunction relay designated for installation into a wiring box, under wall-switch into an existing installation (SMR-T doesn't need neutral to function)
- Fast solution for exchanging standard wall-switch for a switch controlled by time or for a memory relay controlled by a button

SMR-T

- 3-wire connection, works without neutral wire
- Output: 10-160 VA (resistive load)
- It cannot be used for fluorescent lights and energy saving lights (loads of capacitive type)

SMR-H

- 4-wire connection
- Output 0-200 VA
- It cannot be used for fluorescent lights and energy saving lights (loads of capacitive type)

SMR-B

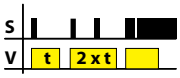
- 4-wire connection
- 10 functions
- Output contact 1x16A / 4000 VA, 250V AC1
- Enables switching of fluorescent lights and also energy saving lights (see instruction manual technical data)
- Independent galvanically separated input AC/DC 5-250 V (for example for control from a security system)

Multifunction relay SMR-T, SMR-H, SMR-B

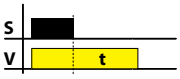
Type	Code No.	Weight [g]	Packaging [pcs]
SMR-T	002470004	29	1/14
SMR-H	002470005	31	1/14
SMR-B	002470021	53	1/14

Function

Function a - delay off on entering edge
output times when it is switched. Each following pressing (max. 5x) increases time
Long pressing switches output off



Function b - delay off on downward edge
output times after button is switched off , switches immediately



Function c - delay off on downward edge
after switching off output switches on and times.



Function d - cycler - flasher impulser
output cycles in regular interval, cycler starts with an impulse



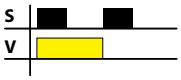
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off



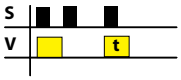
Function f - delay on
delay on after switch is switched on until it is switched off



Function g - pulse relay
switches on by a press, another pressing switches the output off . The length of pressing doesn't matter, it is possible to set reaction delay by a potentiometer and thus eliminate rebound of a button



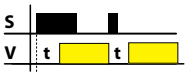
Function h - impulse relay with delay
one press switches on, another one switches the output off in case it is done before the end of timing



Function i - delay on after switched off
output cycles in regular intervals, cycler starts with a gap



Function j *- cycler starting with gap
delay on after switching on until it is de-energized or a switch is pressed again.



*function j is valid only for SMR-B

Memory and latching relays MR-41, MR-42

Advantages
- 1-module, DIN rail mounted
- Supply voltage:
  - UNI AC/DC 12V - 240V
  - 230 AC 230V
- Keeps state in memory when supply disconnected. When energized again, relay returns to the state before disconnecting.

MR-41
- Output contact: 1x changeover 16A/ AC1

MR-42
- Options - 2x paralel contacts or the other relay is latching
- Function selected via external wire link between B1-B2
- Output contact: 2x changeover 16A/ AC1



Memory & latching relays MR-41, MR-42

Type	Code No.	Weight [g]	Packaging [pcs]
MR-41 UNI	002470007	64	1/10
MR-42 UNI	002470008	89	1/10
MR-41 230	002470094	60	1/10
MR-42 230	002470095	85	1/10

In applications with long control cables and/or leading other connections in parallel MR-41/42 can be exposed to EM disturbances and unstable operation (random switching). We advice using RBS bistable switch instead.

Technical data on page 169

Dimmers - compatibility with various types of light bulbs

Product	automatically detects type of load	R Standard and halogen light bulbs	L Low voltage light bulbs (12-24V), wounded transformer	C Low voltage light bulbs (12-24V), electronic transformer	ESL Dimmable Energy Saving Lamps (ESL)	LED CATEGORY 1: „LOW COST" LED LAMPS - MULTILED SYSTEMS WITH INTEGRATED LINEAR POWER SUPPLY	LED CATEGORY 2: 1-3 DIMMABLE POWER LED LAMPS WITH INTEGRATED SWITCHING POWER SUPPLY
DIM-2	×	✓	✓	×	×	×	×
DIM-14	✓	✓	✓	✓	×	×	×
DIM-15	×	×	×	×	✓	✓	✓
SMR-M	×	×	×	×	✓	✓	✓
SMR-S	×	✓	✓	×	×	×	×
SMR-U	✓	✓	✓	✓	×	×	×

Staircase switch with dimming DIM-2



Advantages
- 1-module, DIN rail mounted
- Supply voltage AC 230V
- Function of gradual dim-up and dim-down, controlling inputs for push button and switch
- Protection against button dead locking
- Potentiometers adjust:
  - speed (fluency) of switching on
  - maximum intensity of light
  - time of maximum intensity light
  - speed (fluency) of switching off
- Contactless output: 1x triac
- Load AC1 2A / 500W

Staircase switch with dimming DIM-2			
Type	Code No.	Weight [g]	Packaging [pcs]
DIM-2	002470009	70	1/10

Technical data on page 170

Dimmer DIM-14

Advantages
- 1-module, DIN rail mounting
- Supply voltage: AC 230 V
- Designed for dimming of electrical bulbs and halogen lights with wound or electronic transformer
- For switching and dimming of lights, control inputs for a button
- Short pressing switches ON/OFF, longer pressing (more than 0.5 s) enables gradual light intensity setting when switched off, brightness level is stored in a memory and when switched on again last brightness level is restored
- Output without contacts: 2x MOSFET
- LED output indication (with any level of brightness)
- Possibility of parallel connection of control buttons
- Resistive, inductive or capacitive load, up to 300 W, for a short term up to 500 W
- Simultaneous connection of inductive and capacitive load is not allowed.
- Electronic overvoltage protection
- Protection against temperature overrun inside a device – output off and signalization of overheat by LED flashing



Dimmer DIM-14

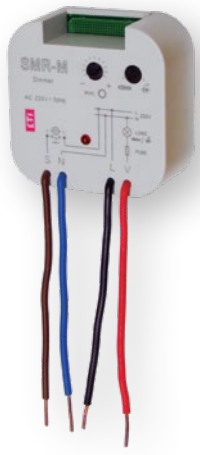
Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
DIM-14	2	002470023	58	1

Dimmers for LED bulbs and dimmable fluorescent lamps DIM-15 and SMR-M

Advantages
- Designated for dimming of:
  a) LED bulbs and LED light sources
  b) dimmable saving fluorescent lamps
- Enables gradual setting of luminance by push-button (non-detent) or parallel buttons
- Returns to last state upon re-energization
- Type of light source (LED or saving fluorescent lamp) is set by switch-over on the front panel of device
- Minimal luminance, set by potentiometer on the front panel, eliminates flashing of some types of saving fluorescent lamps

DIM-15
- Supply voltage 230V AC
- Output status is indicated by red LED:
  - shines when output is active
  -flashes while heating overload, at the same time output is disconnected
- 1-MODULE version, DIN rail mounting, saddle terminalh)

SMR - M
- Button-controlled dimmer intended to be installed in an installation box (e.g. KU-68) into the existing electrical wiring
- Protection against excessive temperature inside the device - switches off the output





Dimmer DIM-15, SMR-M

Type	Code No.	Weight [g]	Packaging [pcs]
DIM-15	002470290	57	1/10
SMR-M	002470291	38	1/14

Technical data on page 171, 172

Dimmer SMR-S, SMR-U



Advantages
- Button-controlled dimmers designated for flush mounting into a wiring box, into an existing installation (SMR-S doesn´t need neutral to function)
- Controlling lamp brightness
- Dimming, control from more places (parallel button connected), possible protection against temperature overrun inside the device – output off.
- By changing wall-switch for a switch with SMR-S/SMR-U installed below effective brightness control can be reached. SMR-S enables dimming of electrical bulbs and wound transformers 12V, halogen lights (inductive load), SMR-U also enables dimming of electronic transformers 12V, halogen lights (capacitive load). It cannot be used for dimming fluorescent lights or energy saving lights.

SMR-S
- 3-wire connection, functional without neutral
- Max. load: 300 VA (resistive loads)
- Contactless output -1x triac
- With exchangeable fuse

SMR-U
- 4-wire connection
- Max. load: 500 VA
- Contactless output - 2x MOSFET
- Electronic overload and overtemperature protection – output off in case of short-circuit or overvoltage

Dimmer SMR-S, SMR-U

Type	Code No.	Weight [g]	Packaging [pcs]
SMR-S	002470010	32	1/14
SMR-U	002470022	32	1/14

Twilight switch in IP65 ETS-16b



Application
Used for remote control of external lighting. time delay prevents accidental activation of the short-term changes in the intensity lighting. Designed to be mounted on a flat surface (eg a wall, disc).

Advantages:
- robust and simple design,
- adjustable-sensitivity threshold,
- IP 65

Twilight switch in IP65 TS-16b

Type	Code No.	Weight [g]	Packaging [pcs]
ETS-16b	002471102	160	1/10

Technical data on page 167, 168

Twilight switch SOU-1 + sensor

Advantages
- 1-module, DIN rail mounted
- Supply voltage: AC 230 V
- Switches according to level ambient light intensity
- Adjustable time pause to eliminate short-term illumination peaks
- Adjustable level of light intensity in 2 ranges 100-50000 Lx and 1-100 Lx
- Controlling input for additional control inputs, e.g. time switch
- External sensor, protection degree IP55, suitable for mounting on the wall (supplied by switch)
- Output contact: 1x changeover 16A / AC1
- LED output indication



Twilight switch SOU-1

Type	Code No.	Weight [g]	Packaging [pcs]
SOU-1	002470011	65	1

* Sensor for twilight switch SOU-1 also available separately (code No. 002470052)
Sensor tolerance ±33%

Twilight switch with digital time switch SOU-2 + sensor

Advantages
- 2-module, DIN rail mounting
- Supply voltage: AC 230 V
- Adjustable light intensity 1-50000 lx
- Serves for control of lights on the basis of ambient light intensity and real time (combination of SOU-1 and time switch clock SHT-1 in one device)
- The advantage of real time consists in the blocking function of the twilight switch in the case of an uneconomical use of lights (night hours, weekends etc.)
- Function of random switching enables simulation of presence when nobody is in the building
- Switching: according to the program (AUTO) /permanently manual / random (CUBE)
- External sensor IP56 is suitable for mounting on the wall/ in panel (cover and sensors are part of delivery)



Twilight switch with digital time switch SOU-2 + sensor

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
SOU-2 + senzor	16	002470020	130	1

* Sensor for twilight switch SOU-2 also available separately (code No. 002470302)
Sensor tolerance ±33%

Time switch ASTROCLOCK-2



Description

The ASTROCLOCK-2 is a time switch designed to control luminous loads in function of dawn and dusk times. It includes a program that automatically adjusts the dawn lighting-up and dusk switching-off times, without sensors and any need for maintenance. The geographic position location is set up by entering geographic coordinates of location where operating or with selecting nearest city from built in list. This product successfully replaces twilight switches with dusk(light) sensor (photo cell).

Its small size of only two modules makes it ideal for installation on distribution boards with little available space. The unit includes 40 memory spaces in two independent circuits that can be programmed in an astronomic or with fixed time operation or combination.

Advantages

- 2 module – DIN rail mounting.
- Supply voltage: 230V 50/60 Hz.
- Two independent programmable output contacts 2x16A (AC1).
- 40 daily and weekly programs with astronomical or fixed-time manoeuvres.
- Daily astronomical adjustment with offset possibility(±delay).
- Option of automatic switching between summer and winter time.
- Backup power supply: Repaceable CR2032 battery(included).
- High-contrast backlit display.
- Menu languages: ENG, SLO, HR/SRB/BiH, POL, RUS.
- Countries with biggest cities directly supported: Poland, Slovenia, Estonia, Lithuania, Latvia, Russia, Ukraine, Bosnia and Herzegovina, Croatia, Macedonia, Serbia.
- Other cities supported through entering geographic coordinates (zone latitude and longitude).

Time switch ASTROCLOCK-2

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
ASTROCLOCK-2	16	002472051	166	1/120

Digital time switch ETICLOCK-R1



Description

ETICLOCK-R1 is a digital time switch designed to control an electrical installation. Different types of operations: ON and OFF at a set time, shortterm operations or pulses (1 to 59 seconds) and repetitive cycles (1 to 59 seconds or 1 minute to 23 hours and 59 minutes) applied to one channel (C1). It includes a series of additional functions such as: automatic DST changes, 4 holiday periods, adjustable screen brightness. Menus can be displayed in several languages (ENG, SLO, HR/SRB/BiH, POL, RUS). One voltage free changeover output (channel) allows programming of up 40 operations (programs).

Advantages:

- Rated voltage and frequency: As indicated on the device (230 V AC 50-60Hz)
- Voltage free programmable changeover output contact: 1x16 (10) A / 250 V AC
- Automatic DST change by country can be disabled
- On-screen operating schedule
- Display screen: Back-lit LCD, Menu languages: English, Slovenian, HR/SRB/BiH , Polish, Russian.
- Memory spaces: 40 programs (operations)
- Power reserve:
  - 10 years (with 4 years replaceable CR2032 battery and no network connection)
  - 48 h (without battery or empty and no network connection)
- Types of operations: ON/OFF, PULSE (1 to 59 sec.) and CYCLES (1 to 59 sec. or 1 min to 23h and 59 min)
- Size: 2 DIN modules (35 mm)

Digital time switch ETICLOCK-R1

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
ETICLOCK-R1	16	002472053	136	1/10

Technical data on page 177, 178

Digital time relay EDIGI-R2

The EDIGI-R2 weekly digital switches with 2 relay outputs are equipped with a backlit display and programming is easy and intuitive. The ultimate solution to managing loads based on time or brightness and/or their combinations; EDIGI-R2 is universal device that consists of an ASTRONOMICAL TIME SWITCH, a TWILIGHT SWITCH and a TIME SWITCH in a single device. Ideally used in domestic buildings, industrial buildings, schools, offices, public areas, etc.; have a special Slot to insert the KEY-EDIGI (External Memory Device) that allows one or more programs to be read/saved/copied/run on different EDIGI-R2 digital switches of the same model.

Advantages:
Device dimensions (LxDxH): 35 x 60 x 90 (2 DIN modules)

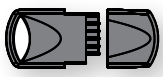
- Device with daily/weekly programming, guided by menus with the guidelines read on the white backlit display.
- Models with one or two relay control outputs.
- Smart relay piloting that "zero crossing" increases the load values and the duration of the relay as well as the connected load.
- Slot for external memory device to run, load Astro, lux, time programs and download/upload the holiday programs alone.
- Twilight sensor connection input.
- Calendar: year - month - day - hour and minutes.
- Date/time setting with automatic winter/summer time change.
- Multilingual menu: English - German – HRV/SRP/BOS
- Memory capacity: 45 ON/OFF programs that are free to be set.
- Minimum ON/OFF 1-minute time scheduling to a maximum of 1 week less 1 minute.
- Types of programs: Astronomical (ASTRO), Twilight (LUX), Timer (TIME), Holiday (suspension of programs for a preset period of time).
- Twilight operation 0.....1000 LUX.
- Possibility of entering 1 or more «Holiday programs», (suspension of Astro - Lux -Time programs - twilight override in progress) from a minimum of 1 day to a maximum of 12 months.
- Permanent memory for saving programs.
- Possibility of deleting the selected program rapidly.
- Program/s deletion menu.
- Possibility of permanent or temporary manual override (ON/OFF).
- Possibility of twilight override (Total / Partial).
- Scheduled maintenance of the connected loads.
- Hour counter function to monitor the operating hours of the load.
- Warranty menu: view the elapsed time from when the product was connected.
- White backlit display.
- Managing the backlighting of the display: timed at 6 seconds / Fixed ON / Fixed OFF.
- Ecological LITHIUM battery, which can be replaced without removing the device from its seat.
- Charge reserve guaranteed by the lithium battery (replaceable) is about 6 years.
- Key lock.
- Hinged and sealable cover.



EDIGI-R2



EDIGI-SN



EDIGI-KEY

Digital time relay EDIGI-R2

Type	Code No.	Description	Weight [g]	Packaging [pcs]
EDIGI-R2	002470400	Time relay - digital	227	1/30
EDIGI-SN	002470401	Sensor lx	35	1/50
EDIGI-KEY	002470402	Programming key	3	1/100

Technical data on page 179

Current monitoring relay PRI-51



Advantages

- To monitor heating of rods in shunts, heating of cables, to indicate current flowing, to monitor consumption of one-phase electrical loads
- 1-phase, 1-module, DIN rail mounting
- Universal supply voltage AC 24 V - 240 V and DC 24 V
- Output contact: 1x changeover 8 A/AC1

- Supply is galvanically separated from measured current
- Adjustable delay 0,5 - 10 s to eliminate short current peaks
- Fluent adjusting actuating current via potentiometer, choice of 5 ranges: AC 0.1-1 A, AC 0.2-2 A, AC 0.5-5 A, AC 0.8-8 A, AC 1.6-16 A, AC 0.1 - 10 A

Current monitoring relay PRI-51

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
PRI - 51/1	1	002471816	58	1/10
PRI - 51/2	2	002471817	58	1/10
PRI - 51/5	5	002471818	58	1/10
PRI - 51/8	8	002471819	58	1/10
PRI - 51/16	16	002470019	58	1/10
PRI-51/0.1-10	0,1 - 10	002470298	87	1/10

Voltage monitoring relay HRN-33, HRN-34, HRN-35



Advantages

- Serves to control/monitor supply voltage for appliances sensitive to supply tolerance, protects devices against under/over voltage
- 1-module, DIN rail mounting, 1-phase monitoring
- Supply from monitored voltage (monitors level of its own supply)
- 3-state indication - LEDs indicating normal state and 2 fault states
- Adjustable time delay for all types is 0 - 10 s (to eliminate short voltage drops or peaks) voltage U_{min} adjusted as % of U_{max}
- Time delay and voltage adjusted via potentiometer
- HRN-33
  - monitors voltage in range AC 48 - 276 V
  - U_{max} and U_{min} can be monitored independently
- HRN-34
  - like HRN-33, but voltage range is DC 6 - 30 V
  - monitoring of battery circuits (12, 24 V)
- HRN-35
  - like HRN-33, but independent output relays for each voltage level
  - switching of other loads possible

Voltage monitoring relay HRN-33, HRN-34, HRN-35

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-33	16	002470015	73	1/10
HRN-34	16	002471400	73	1/10
HRN-35	16	002471401	85	1/10

Technical data on page 180, 182

Over/undervoltage monitoring relay HRN-54, HRN-54N

Advantages
- Serves to monitor voltage , phase failure and sequence in switchboards, protection of devices in 3-phase mains
- 1-module, DIN rail mounting
- It is possible to set upper and lower level of monitoring voltage
- Adjustable time delay eliminates short voltage peaks and failures in the mains
- Faulty state is indicated by red LED and by breaking output relay contact
- Output contact: 1x changeover 8 A /250 V AC1
- If the supply voltage falls below 60 % U_n (U_{off} lower level) the relay immediately breaks with no delay
- HRN-54 - supply from all phases which means that the relay is functional also in case when one phase is faulty
- HRN-54N - supply L1-N, means that relay monitors also failure of neutral wire

Over/undervoltage monitoring relay HRN-54, HRN-54N

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-54	8	002471416	69	1/10
HRN-54N	8	002471412	67	1/10



Frequency and voltage monitoring relay HRN-100

Description:
Multifunction voltage and frequency monitoring relay with LCD display for protection of devices connected to 3 phase network.

Advantages:
- 3-wire or 4-wire connection (with or without neutral).
- Monitoring of upper and lower voltage & frequency in 3-phase circuits, phase sequence, failure and asymmetry incl. neutral fail (only in 4-wire connection).
- The device is supplied from monitored voltage.
- Both output contacts can be set individually.
- Measures real effective value of AC voltage (True RMS).
- Optional response delay of the output contact to the measured fault state or transition from the fault state to the OK state incl. delayed response of output contacts after connecting the power supply.
- Possibility of automatic or manual transition from fault state (memory).
- Optional closing or opening of the output contact when measuring a fault state (Fail Safe / Non Fail Safe).
- Password protection against unauthorized changes to settings.
- Digital backlit display with the possibility of monitoring the current state of the network, incl. possible failures.
- The last five fault states are stored in a history that can be viewed retrospectively.
- Sealable transparent cover for display and controls.

Technical data on page 184



Frequency and voltage monitoring relay HRN-100				
Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
HRN-100	2 x 5 A (AC1)	002470303	132	1

Level switch HRH-5

Advantages:

- Relay is designated for monitoring levels in wells, reservoirs, pools, tanks....
- In one device you can choose the following configurations:
  - one-level switch of conductive liquids (by connecting H and D)
  - two-level switch of conductive liquids
- One-state device monitors one level, two-state device monitors two levels (switches on one level and switches of on another level).
- Choice of function PUMP UP, PUMP DOWN
- Adjustable time delay on the output (0.5 - 10s)
- Sensitivity adjustable by a potentio-meter (5-100kΩ
- Measuring frequency 10Hz prevents polarization of liquid and raising oxidation of measuring probes
- Galvanically separated supply voltage UNI 24.. 240 VAC/DC
- Output contact 1xchangeover 8A/250V AC1
- 1-module type, mounting onto a DIN rail



Level switch HRH-5			
Type	Code No.	Weight [g]	Packaging [pcs]
HRH-5	002471715	72	1/8

Technical data on page 185, 187

Level switch HRH-8

Relay is designed to control the level of conductive liquids in wells, tanks, pools, tankers, reservoirs... (replacement for HRH-1)

- Galvanically isolated supply and guard circuits
- Within one device, the following configurations can be selected:
  - 2x one-level monitoring (in separate tanks)
  - 1x two-level monitoring (in one tank)
  - Pumping from one tank to another
- DIP switch selection on the front panel (8 functions)
- Adjustable probe sensitivity (for each probe separately)
- Adjustable relay switching delay (for each probe separately)
- 10Hz watch frequency prevents polarization of the liquid and increases resistance to interference by network frequency
- 2x output relay (with changeover contact 16A / 250V AC1)
- 3-MODULE design, mounting DIN rail mounting



HRH-8

Level switch HRH-8

Type	Code No.	Weight [g]	Packaging [pcs]
HRH-8 230 V AC	002470293	276	1
HRH-8 24V AC/DC	002470294	176	1

Sensors HRH

Sensors HRH

Type	Code No.	Description	Weight [g]	Packaging [pcs]
Sensor SHR-1-M	002471205	Brass sensor without cable, max. wire profile 2,5mm^2, op. temp.(-25 to...+60°C)	9,7	1
Sensor SHR-1-N	002471709	Stainless steel sensor without cable, max. wire profile 2,5mm^2, op. temp.(-25 to...+60°C)	9,7	1
Sensor SHR-2	002471203	Stainless steel sensor without cable, max. wire profile 2,5mm^2 - IP68, op. temp.(+1...+80°C)	48,6	1
Sensor SHR-3	002471230	Stainless steel sensor with 3m cable PVSC 2x0,75mm^2 - IP67, op. temp. (< 95°C)	239	1
Sensor HRH-10	002471703	Sensor with 10m cable	30	1
Sensor HRH-15	002471704	Sensor with 15m cable	35	1
Sensor HRH-20	002471705	Sensor with 20m cable	40	1
Sensor HRH-30	002471706	Sensor with 30m cable	48	1
Sensor HRH-40	002471707	Sensor with 40m cable	62	1

Thermostat relay TER-3 (A, B, C)





Advantages

- 1-module, DIN rail mounting
- Red LED indicates status of output, green LED indicates energization of the device
- Single thermostat for temperature monitoring and regulation in range of -30.. +70 °C in six ranges
- Can be used for monitoring temperature e.g. in switchboards, heating systems, cooling systems, liquids, radiators, motors, devices, open spaces etc.
- Function of short-circuit or sensor disconnection monitoring
- Possibility to set function"heating"/"cooling" (setting is done by DIP switch)
- Adjustable hysteresis (sensitivity) , switching by potentiometer in range 0.5 -5 K
- Universal supply AC/DC 24V -240 V, not galvanically separated
- Output contact: 1x NO 16 A /250 V AC1
- It is possible to place the sensor directly on terminal block – for temperature monitoring in a switchboard or in its surroundings
- Choice of external thermo sensors with double insulation in standard lengths 3, 6 and 12 m

Thermostat relay TER-3 (A, B, C)

Type	temp. range or sensor length	Code No.	Weight [g]	Packaging [pcs]
TER-3A	-30...+10 °C	002471801	73	1/10
TER-3B	0...+40 °C	002471813	73	1/10
TER-3C	+30...+70 °C	002471802	73	1/10

*Note: Order sensor TZ from the table below

Multifunction digital thermostat TER-9

Advantages

- Digital thermostat with 6 functions and in-built time switch clock, with daily and weekly program (as SHT-1). Thermo functions can be managed also in real time
- Complex control of heating and water heating in buildings, solar heating etc
- 2 thermostats in one, 2 temperature inputs, 2 outputs with potential free contact
- Functions: two independent thermostats, 1x dependent, differential thermostat, 2-stage thermostat, thermostat with dead zone, heating functions
- Program setting of output function, calibration of sensors according to reference temperature (off set)
- Thermostat is inferior to a program of digital switch clock
- 2 -module, DIN rail mounting
- Supply AC 230 V or AC/DC 24 V galvanically separated
- Output contact 1x changeover 8 A / 250 V AC1 for each output
- Memory for the most often used temperatures
- Well-arranged display of set and measured data, illuminated LCD by backlight
- Zero error when value setting
- Function of monitoring short-circuits or sensor disconnection

Technical data on page 191

Multifunction digital thermostat TER-9

Type	In [A]	Code No.	Weight [g]	Packaging [pcs]
TER-9 24V AC/DC	8	002471803	140	1
TER-9 230V AC	8	002471824	140	1

*Note: Order sensor TZ from the table below



Thermal sensors TZ

Type	lenght of sensor cable [A]	Code No.	Weight [g]	Packaging [pcs]
sensor TZ-0	0,11 m.	002471809	4,5	1
sensor TZ-3	3m.	002471810	103	1
sensor TZ-6	6m.	002471811	216	1
sensor TZ-12	12 m.	002471812	418	1



Thermostat for monitoring temperature of motor winding TER-7

Advantage:

- Monitors temperature of motor winding of motors with built in PTC sensor
- Fixed levels of switching
- MEMORY function - active by DIP switch
- RESET of faulty state:
  - button on the front panel
  - by external contact (remote by two wires)
- Function of short-circuit or sensor disconnection monitoring, red LED flashing indicates faulty sensor
- Output contact: 2x changeover 8 A /250 V AC1
- Red LED shines and indicates exceeded temperature
- Multivoltage supply AC/DC 24-240 V (UNI)
- 1-module, DIN rail assembly possible

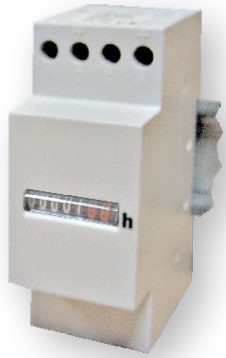


Termostat relay TER-7

Type	Code No.	Weight [g]	Packaging [pcs]
TER-7	002471804	65	1/10

Technical data on page 193, 192

Hour meter HM-1



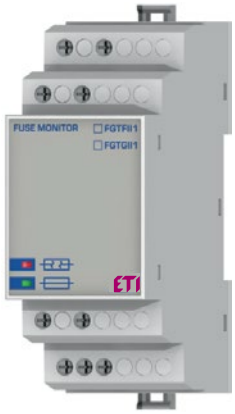
Aplications
- Gen-sets
- Compressors
- Pumps
- Medical equipment
- Control panels
- Air conditioning

Advantages
- 2-module size
- DIN rail mounting
- Long lifetime
- IP40 protection – front
- Operating voltage 230V AC

Hour meter HM1

Type	Supply voltage [U_e AC]	Code No.	Weight [g]	Packaging [pcs]
HM-1	230	002472045	35	1

Electronic fuse monitor EFM



- Recognize fuse failure in three-phase or mono-phase system
- Can be used for all sizes and types of fuses
- Signals operation even if loads are switched off
- Automatic reset after replacing the fuse
- Working properly even if:
  - Asymmetrical mains
  - Independence of phase sequence
  - Mains with harmonic waves
  - Motors providing feedback
- Internal resistance > 2000 Ω/v
- Output relay 1 pole changeover contact
- Size 2 modules - 35mm - DIN rail mounting EN50.022
- Self-extinguished material UL94 v0
- Typical application: fuses monitoring on 3-ph motor mains
- EU directives - CE marking:
  - 2014/30/UE - EMC
  - 2014/35/UE - LVD

Electronic fuse monitor EFM

Type	In [A]	Un [V AC]	Code No.	Description	Weight [g]	Packaging [pcs]
EFM230	8	230	002472213	Fuse Monitor 3X230 volts - 1 RelayCO 250VAC 8A	175	1
EFM400	8	400	002472214	Fuse Monitor 3X400 volts - 1 RelayCO 250VAC 8A	175	1

Technical data on page 196, 197

Electromechanical Relays

Electromechanical power relays RERM3

Application
Electromechanical relays RERM are designed for switching, control and signaling of auxiliary and power circuits.

Features
- 3 changeover contacts;
- Control voltages AC 24V, AC 230V;
- Test button without blocking
- Base for relay RERB3-S (DIN rail mounting TH-35);
- Accessories: (metal bracket-holder RER-CLIP-SP);

Electromagnetic Plugin Relays with Mechanical Indication Test Button

Type	Code	Uc rated coil voltage [V]	Indication	No. Of contacts	Weight [g]	Packaging [pcs]
RERM3-230AC	002473060	230 V AC	-	3 x CO In=16A AC1, 250V AC)	80	1/100
RERM3-230ACL	002473061	230 V AC	LED		80	1/100
RERM3-024AC	002473062	24 V AC	-		80	1/100
RERM3-024ACL	002473063	24 V AC	LED		80	1/100

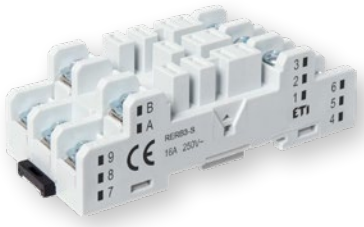


RERM3-230AC

- Screw terminals (max torque 0.7 Nm);

Plug-in Sockets (Base)

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
RERB3-S	002473064	RERM3	70	1/250



RERB3-S

Accessories

Type	Code	For use with	Single product weight [g]	Packaging [pcs]
RER-CLIP-SP	002473065	RERB3-S	-	1/1000



RER-CLIP-SP

Industrial Plugin Electromagnetic Relays

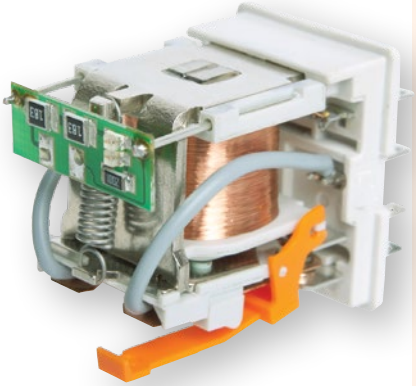
Description

Relays of general application - the new relays are distinguished by a modern design, high reliability and functionality. Modern technology ensures high quality and effectiveness

- ERM2 (2 pole CO »change over contact«) and ERM4 (4 pole CO »change over contact«)
- AC and DC coils (12, 24V), 230V AC only
- Two types of plug-in sockets (M type and T type)
- Accessories (connection terminals, retainer/retractor clips, description plates, RC modules...)
- Colour: grey

Features

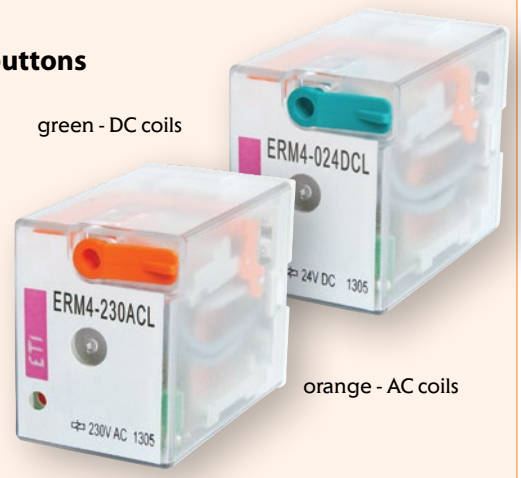
- Mechanical indicator with lockable test button as a standard version
- Optional: Light indication (with built in smd LED)
- Mounting on panel or 35 mm rail in accordance with EN60715
- Improved electromagnet efficiency
- Strong insulation between contacts (applied polyamide PA66)
- Cadmium - free contacts



Robust design

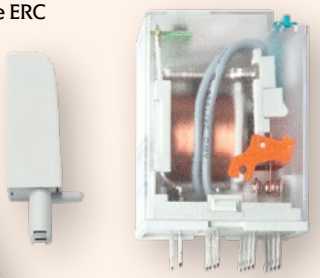
Test buttons

green - DC coils



orange - AC coils

Protecting module ERC



Electromagnetic relay ERM

Retainer / retractor clip - ER-CLIP





Description plate ER-PLATE



Screw terminals plug-in socket ERB



*All parts must be ordered separately

Electromagnetic Plugin Relays with Mechanical Indication and Lockable Test Button					
Type	Code	Uc rated coil voltage [V]	No. Of contacts	Weight [g]	Packaging [pcs]
ERM4-012DCL	002473021	12 V DC	4 x CO (6A, AC1)	33	10/100
ERM2-024DC	002473000	24 V DC	2 x CO (12A, AC1)	33	10/100
ERM2-024DCL	002473001	24 V DC	2 x CO (12A, AC1)	33	10/100
ERM2-024AC	002473002	24 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-024ACL	002473003	24 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-230AC	002473004	230 V AC	2 x CO (12A, AC1)	33	10/100
ERM2-230ACL	002473005	230 V AC	2 x CO (12A, AC1)	33	10/100
ERM4-024DC	002473006	24 V DC	4x CO (6A, AC1)	33	10/100
ERM4-024DCL	002473007	24 V DC	4x CO (6A, AC1)	33	10/100
ERM4-024AC	002473008	24 V AC	4x CO (6A, AC1)	33	10/100
ERM4-024ACL	002473009	24 V AC	4x CO (6A, AC1)	33	10/100
ERM4-230AC	002473010	230 V AC	4x CO (6A, AC1)	33	10/100
ERM4-230ACL	002473011	230 V AC	4x CO (6A, AC1)	33	10/100

*L - built in LED light indicator (red)
Other coil (control) voltages available upon special request:
V DC: 5, 6, 48, 60, 80, 110, 220
V AC: 6, 12, 42, 48, 60, 80, 110, 115, 120, 127, 220, 240



Ordering designation
ERMX-YYYYYZ

X – Number of contacts:
4: 4 CO (4 changeover)
2: 2 CO (2 changeover)

YYYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
024DC: 24 V DC
012DC: 12 V DC

Z – Additional features:
L – Light indicator (smd LED - red)

Example:
ERM4-024DCL Electromagnetic relay for plugin sockets with mechanical indication and lockable test button, four changeover contacts, coil voltage 24 V DC with light indicator.

Plug-in Sockets (Base)				
Type	Code	For use with	Single product weight [g]	Packaging [pcs]
ERB2-T	002473012	ERM2	60	10/100
ERB2-M	002473013	ERM2	71	10/80
ERB4-T	002473014	ERM4	60	10/100
ERB4-M	002473015	ERM4	71	10/80

T - T type
M - M type



ERB2-T, ERB4-T

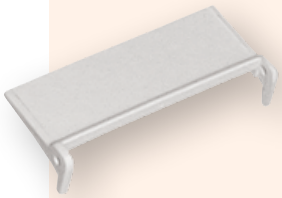


ERB2-M, ERB4-M

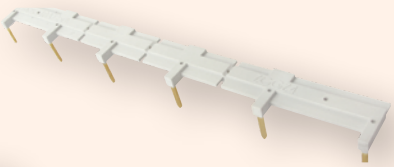
Accessories				
Type	**Code**	**For use with**	**Single product weight [g]**	**Packaging [pcs]**
ER-CLIP	002473016	ERB-T & ERB-M	4,5	10/300
ER-PLATE	002473017	ERB-T & ERB-M	0,5	10/400
ER-TERMINAL	002473018	ERB-T & ERB-M	1,3	2/20
ERC-024AC	002473019	ERB-T & ERB-M $U_c \leq 24V$ AC	2,6	20/100
ERC-230AC	002473020	ERB-T & ERB-M $U_c \leq 230V$ AC	2,6	20/100
ERC-024ACDCL	002473040	ERB-T & ERB-M $U_c = 6 \ldots 24$ V AC/DC	2,9	20/100
ERC-060ACDCL	002473041	ERB-T & ERB-M $U_c = 24 \ldots 60$ V AC/DC	2,9	20/100
ERC-230ACDCL	002473042	ERB-T & ERB-M $U_c = 110 \ldots 230$ V AC/DC	2,9	20/100



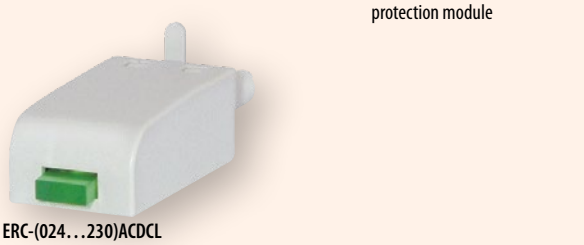
ER-CLIP
Mechanical lock of relay in socket



ER-PLATE
description

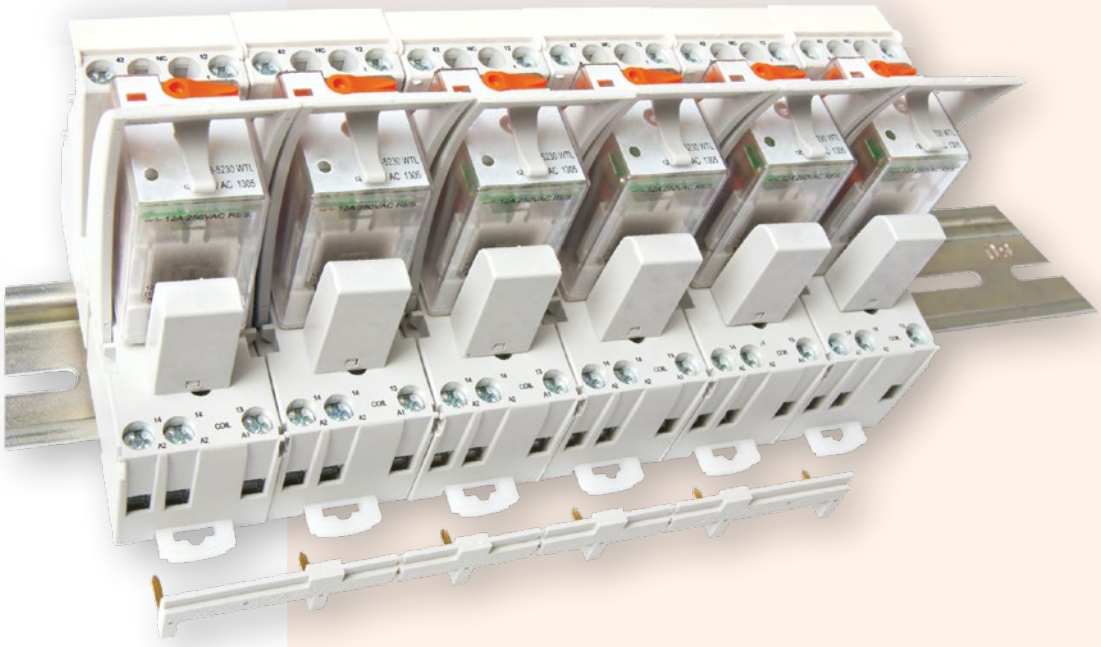


ER-TERMINAL
bridges common input signals (coil terminals A1 or A2) up to 6 relays



ERC
protection module

ERC-(024…230)ACDCL
MOV protection module with indication AC and DC.



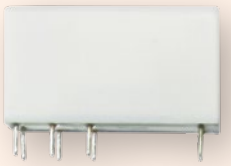
Technical data on page 200

Miniature Electromagnetic Relays

Description
Electromechanical relay with 2x CO contacts in miniature housing. Can be used in PCB or with plug-in sockets.

- MER2 (2 pole CO »change over contact«, 2x8A AC1)
- Wide range of control voltages (AC coils: 24V and 230V, DC coils: 5V, 12V, 24V)
- Two types of plugin sockets (M type and T type)
- Accessories (retainer/retractor clips, RC modules...)
- Color: Grey

Features
- Cadmium - free contacts; height 15,7 mm
- 5000V / 10 mm reinforced insulation
- For PCB and plug-in sockets
- AC and DC coils
- Compliance with standard EN 60335-1
- RoHS



Miniature electromechanical relay MER



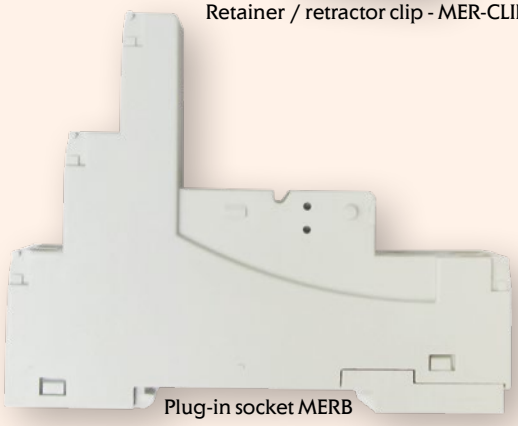
Retainer / retractor clip - MER-CLIP-PL



Protecting module ERC



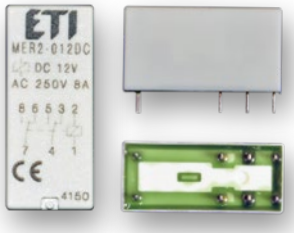
Description plate MER-PLATE



Plug-in socket MERB

*All parts must be ordered separetely





Miniature electromagnetic relays					
Type	Code	Uc rated coil voltage [V]	No. Of contacts	Weight [g]	Packaging [pcs]
MER2-005DC	002473030	5 V DC	2xCO (8A, AC1)	13	20/1000
MER2-012DC	002473031	12 V DC			
MER2-024DC	002473032	24 V DC			
MER2-024AC	002473033	24 V AC			
MER2-230AC	002473034	230 V AC			

By parallel connection of relay main circuit (joining 2 CO contacts), the nominal current of output is increased to 16A.
Other coil (control) voltages available upon special request:
V DC: 3, 6, 9, 18, 36, 48, 60, 110
V AC: 12, 48, 60, 110, 115, 120, 220, 240



MERB-T

Ordering designation
MER2-YYYYY

X – Number of contacts:
2: 2 CO (2 changeover)

YYYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
005DC: 5 V DC
012DC: 12 V DC
024DC: 24 V DC

Example:
MER2-024DC
Miniature electromagnetic relay, two changeover contacts, coil voltage 24 V DC.



MERB-M

Plug-in Sockets (Base)				
Type	Code	For use with	Single product weight [g]	Packaging [pcs]
MERB-T	002473035	MER2	44	10/100
MERB-M	002473036			10/80

T - T type
M - M type

Technical data on page 205

Accessories				
Type	**Code**	**For use with**	**Single product weight [g]**	**Packaging [pcs]**
MER-CLIP-SP	002473037	MERB-T & MERB-M	0,3	25/400
MER-CLIP-PL	002473038			
MER-PLATE	002473039		0,34	10/700
ERC-024AC	002473019	MER2-024AC	2,6	10/200
ERC-230AC	002473020	MER2-230AC		
ERC-024ACDCL	002473040	MERB-T & MERB-M U_c = 6 ... 24 V AC/DC	2,9	20/100
ERC-060ACDCL	002473041	MERB-T & MERB-M U_c=24 ... 60 V AC/DC	2,9	20/100
ERC-230ACDCL	002473042	MERB-T & MERB-M U_c=110 ... 230 V AC/DC	2,9	20/100
MER-TERMINAL	002473048	MERB-T, MERB-M	6	20/200

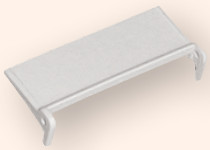


MER-CLIP-PL

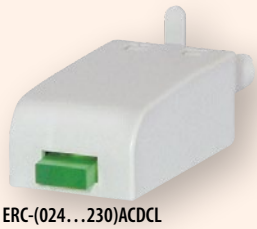


MER-CLIP-SP

Mechanical lock of relay in socket, two types
Standard plastic MS and spring wire type



MER-PLATE
description



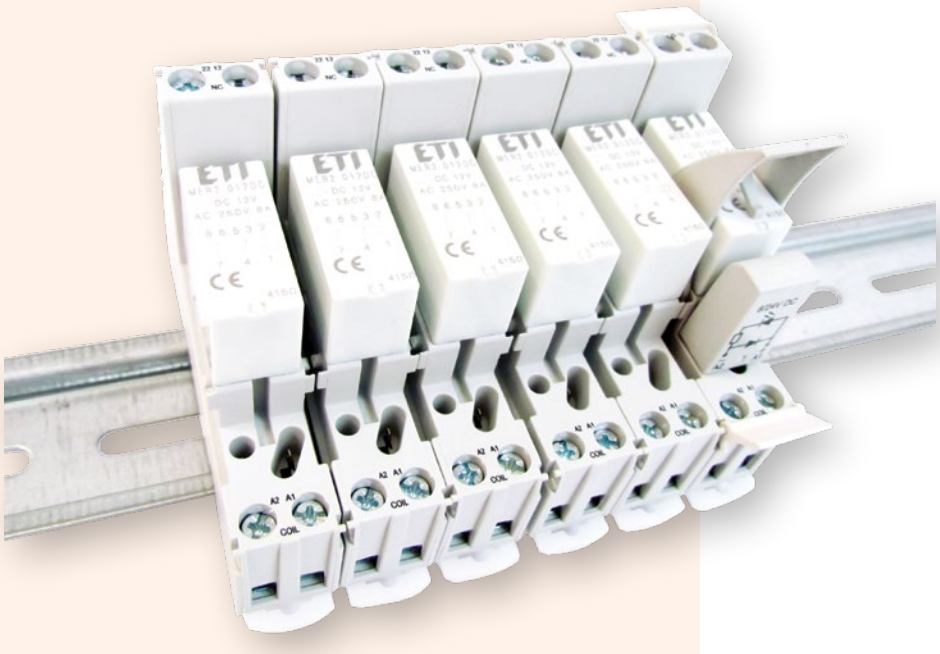
ERC-(024…230)ACDCL
MOV protection module with indication AC and DC.
*More data about ERC module can be found on page 204.



ERC
protection module
RC filter
*More data about ERC module can be found on page 204.



MER-TERMINAL

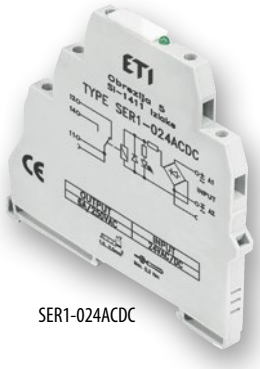


SLIM RELAYS SSR & SER, Electromagnetic and solid

Advantages:

- Width 6,2 mm;
- Interface relay SER1 - with 1 CO contact output;
- 35 mm rail mount acc. to PN-EN 60715;
- May be linked with interconnection strip type
- SR-TERMINAL;
- Equipped in LED green;

Mounting
Relays are designed for direct mounting on 35 mm rail mount acc. to PN-EN 60715. Connections: max. cross section of the cables: 1 x 2,5 mm2 / 2 x 1,5 mm2 (1 x 14 / 2 x 16 AWG), length of the cable deinsulation: 8 mm, max. tightening moment for the terminal: 0,3 Nm. Relays may be linked with interconnection strip type SR-TERMINAL bridges common input or output signals, maximum permissible current is 36 A / 250 V AC.



SER1-024ACDC



SSR1-024ACDC

Electromagnetic relays

Type	Code	Uc rated coil voltage [V]	No. Of contacts	I_n [A]	Weight [g]	Packaging [pcs]
SER1-024ACDC	002473052	24 V AC/DC	1xCO	AC1: 6 A / 250 V DC1: 6A/24 V; 0,15A/250 V	40	10/100
SER1-230ACDC	002473053	230 V AC/DC				

Solid state relay (triac output)

Type	Code	Uc rated coil voltage [V]	No. Of contacts	I_n [A]	Weight [g]	Packaging [pcs]
SSR1-024ACDC	002473050	24 V AC/DC	1xNO	AC1: 1,2 A/400 V	40	10/100
SSR1-230ACDC	002473051	230 V AC/DC				


SR-TERMINAL

Accessories

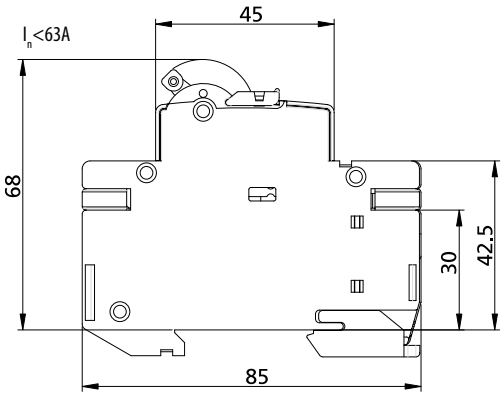
Type	Code	Colour	Description	Weight [g]	Packaging [pcs]
SR-TERMINAL	002473054	black	max 36A (250VAC) or Max permissible current	12,3	10/100


SR-TERMINAL: bridging of common input or output signals

Technical data on page 209

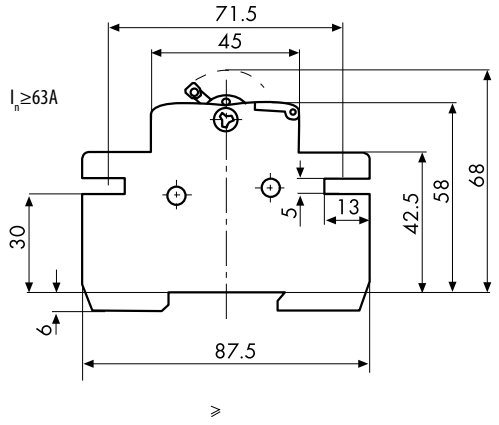
Build-in switch SV

Technical data	
Type	**16A-40A**
Electrical	
Number of poles	1p, 2p, 3p, 4p
Rated operational voltage Ue	230/400V AC (1p), 400V AC (2p, 3p 4p)
Rated current In	16, 25, 40A
Rated Insulation voltage Ui	1000V
Rated impulse withstand voltage Uimp	4 kV
Utilization category	AC-23B
Rated frequency	50/60Hz
Rated short-time withstand current Icw	800A
Rated short-circuit making capacity Icm	500A
Rated conditional short-circuit current	2000A (with 50A fuse)
Rated making capacity	400A
Rated breaking capacity	320A
Switch Type	Build-in switch
Standard	IEC/EN 60947-3
Mechanical	
Device height	68mm (DIN rail acc to EN60715)
Device width	18mm/p
Degree of protection	IP20
Terminal capacity	1-25mm^2
Terminal screw	M5 (Pozidrive PZ2)
Terminal torque	max. 3Nm
Operating temperature	-25°C ... +55°C
Storage- and transport temperature	-40°C ... +70°C
Contact position indicator	mechanical red/green
Supply possibility	Top or bottom





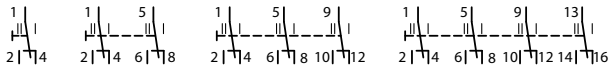
Technical data	
Type	**63-125A**
Electrical	
Number of poles	1p, 2p, 3p, 4p
Rated operational voltage Ue	1p: 230/400V AC, 24V DC 2p: 400V AC, 48V DC 3p, 4p: 400V AC
Rated current In	63, 80, 100, 125A
Rated Insulation voltage Ui	AC: 1000V; DC:1500V
Rated impulse withstand voltage Uimp	4 kV
Utilization category	AC-22B; DC-22B
Rated frequency	50/60Hz AC, DC
Rated short-time withstand current Icw	1500A / 1s
Rated short-circuit making capacity Icm (peak)	2200A
Rated conditional short-circuit current	4,0kA (with 100A fuse) / 2,5kA (with 125A fuse)
Rated making capacity	400A
Rated breaking capacity	320A
Switch Type	Build-in switch-disconnector
Standard	IEC/EN 60947-3
Mechanical	
Device height	68mm (DIN rail acc to EN60715)
Device width	18mm/pole
Degree of protection	IP20
Terminal capacity	1-50mm^2
Terminal screw	M6 (Pozidrive PZ2)
Terminal torque	max. 3Nm
Operating temperature	-25°C ... +55°C
Storage- and transport temperature	-40°C ... +70°C
Contact position indicator	mechanical red/green
Supply possibility	Top or bottom





Build-in devices "EVESYS"

Technical data	
Rated voltage U_n	230/400V AC
Rated current I_n	25A, 40A
Rated frequency f_n	50/60 Hz
Terminals	1,5 - 16 mm^2, max 1,8 Nm
Electrical insulation	>3mm contact space
Rated short-circuit making capacity	2,5 kA
Pollution degree	3 (for Switch)
Degree of protection	IP20
Width of the switch	18mm
Standards	PN-IEC 60947-3
Mounting position	any

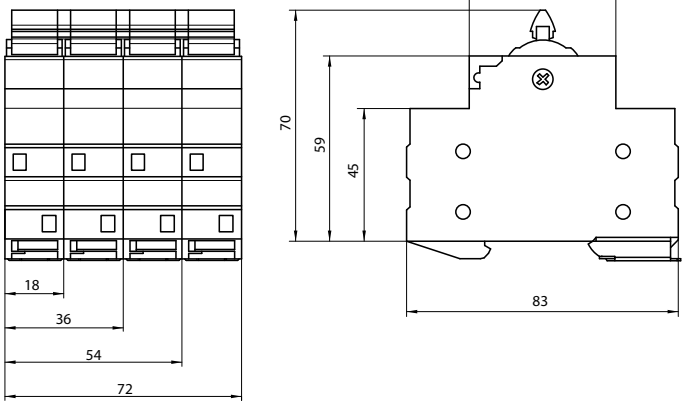


SSQ 125
SSQ 140

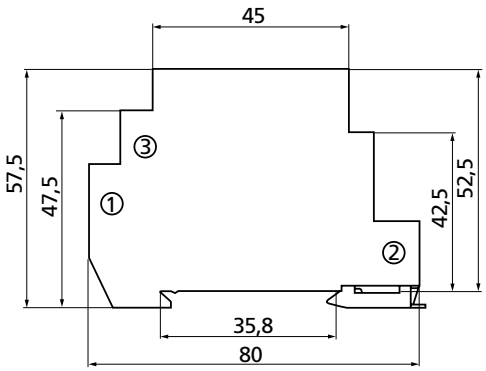
SSQ 225
SSQ 240

SSQ 325
SSQ 340

SSQ 425
SSQ 440

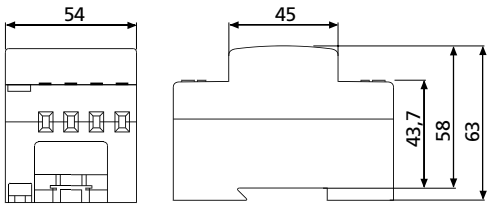


Technical data							
	SON H-1R	SON H-1G	SON H-1Y	SON H-1B	SON H-3R	SON H-3K	SON H-3G
Rated voltage U_n	240V AC				3x240V AC		
Voltage tolerance	-25%...+10%						
Rated frequency f_n	50/60Hz						
Power consumption	0,267W (240V AC)				1,04W (240V AC)		
Diode colour	1 red	1 green	1 yellow	1 blue	3 red	1 red, 1 yellow, 1 green	3 green
Protection class	Casing: IP40, terminals IP20						
Humidity	95% (without condansation)						
Material	Self-extinguished material UL94-V0						
Cross section	1-4 mm^2						
Torque	0,6 Nm						
Montage	TH35						
Width	1 Modul						
Standards	IEC EN 61000-3-2; IEC EN 61000-4						

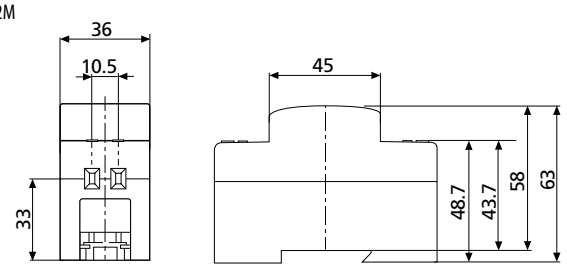


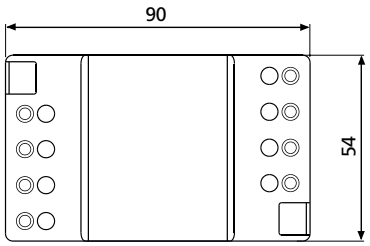
Bell/Buzzer

3M

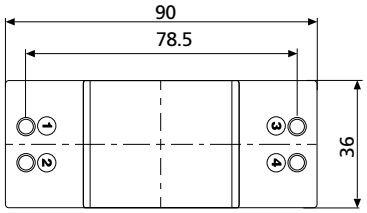


2M

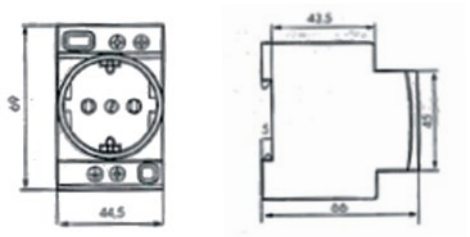




Bell transformer type 3M



Bell transformer type 2M



DIN socket

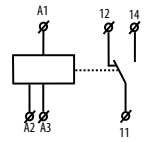
Power relays VS116K, VS316K

Technical data

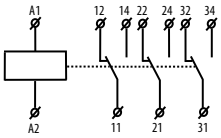
	VS116K	VS316/24	VS316/230
Supply terminals	A1 - A2		
Voltage range	230 V AC/50-60 Hz	24 V AC/DC/ 50-60 Hz	230 V AC/ 50-60 Hz
Burden	AC max. 7.5 VA/ 1W	1.6 VA/ 1.2 W	2.5 VA
Supply terminals	A1-A3	x	
Voltage range	24 V AC/DC (50-60 Hz)	x	
Burden	1 VA AC/ 1W DC	x	
Supply voltage tolerance	-15%; +10%		
Output			
Number of contacts	1 x changeover/ SPDT (AgSnO2)	3 x changeover/ 3PDT ($AgSnO_2$)	
Current rating	16 A/ AC1	16A/ AC1	
Breaking capacity	4000VA/ AC1, 384W/ DC	4000VA/ AC1, 384W/ DC	
Inrush current	30 A/ <3s	30 A/ <3s	
Switching voltage	250 V AC1/ 24 V DC		
Min. breaking capacity DC	500 mW		
Output indication	high intensity of LED		
Mechanical life	3x107	1x107	
Electrical life (AC1)	0.7x105	1x105	
Time between switching	min. 2s	20 ms	50 ms
Other information			
Operating temperature	-20 °C ... +55 °C (-4 °F ... 131 °F)		
Storage temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)		
Electrical strength	4 kV (supply-output)		
Operating position	any		
Mounting/DIN rail	DIN rail EN 60715		
Protection degree	IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Max. cable size (mm^2)	max.1x 2.5 / 2x1.5		
	max. 1x2.5 (AWG 12)		
Dimensions	90 x 17.6 x 64 mm (3.5˝ x 0.7˝ x 2.5˝)		
Weight	54 g (1.9 oz.)	90 g (3.17 oz.)	92 g (3.25 oz.)
Standards	EN 61810-1, EN 61010-1		

Symbol

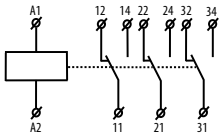
VS116K



VS316/24

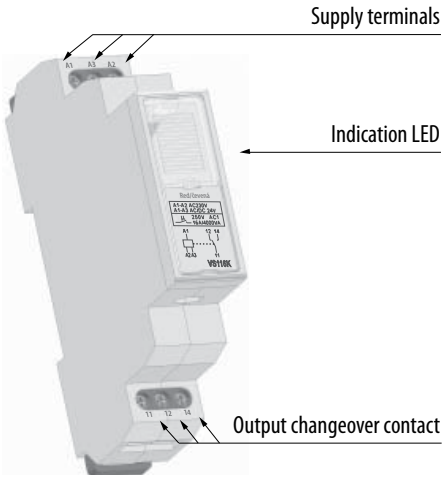


VS316/230



Description

VS116K

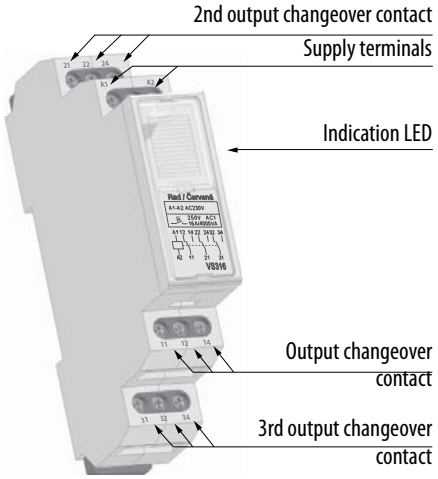


terminal A3 only for VS116K

Notes

Max. time of changeover of contact is 10ms.
VS316/24 and VS316/230 enable switching of different phases or 3 phase voltage.

VS316/24, VS316/230

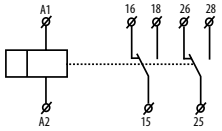


Delay OFF without supply voltage CRM-82TO

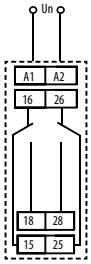
Technical data

	CRM-82TO
Number of functions	a - On Delay (Power On)/ e - Off Delay (S Break)
Supply terminals	A1 - A2
Voltage range	12 - 240 V AC/DC(AC 50 - 60 Hz)
Burden	0.7 - 3 VA AC/ 0.5 - 1.7 W DC
Supply voltage tolerance	-15 %; +10 %
Supply indication	green LED
Time ranges	0.1 s - 10 min
Time setting	potentiometer
Time deviation	5 % - mechanical setting
Repeat accuracy	0.2 % - set value stability
Temperature coeffi cient	0.01 % / °C, at = 20 °C (0.01 % / °F, at = 68 °F)
Output	
Number of contacts	2x changeover/SPDT (AgNi/ Silver Alloy)
Current rating	8 A / AC1
Breaking capacity	2000 VA / AC1, 192 W / DC
Inrush current	10 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	3x107
Electrical life (AC1)	0.7x105
Other information	
Operating temperature	-20 °C ... +55 °C (-4 °F ... 131 °F)
Storage temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)
Electrical strength	4 kV (supply-output)
Mounting/DIN rail	DIN rail EN 60715
Protection degree	IP 40 from front panel / IP 10 terminals
Operating position	any
Overvoltage category	III.
Pollution degree	2
Max. cable size(mm^2)	solid wire max. 2x2.5 or 1x4 (AWG 12)
	with sleeve max. 2x1.5 or 1x2.5 (AWG 12)
Dimensions	90 x 17.6 x 64 mm (3.5″ x 0.7″ x 2.5″)
Weight	93 g (3.3 oz.)
Standards	EN 61812-1, EN 61010-1

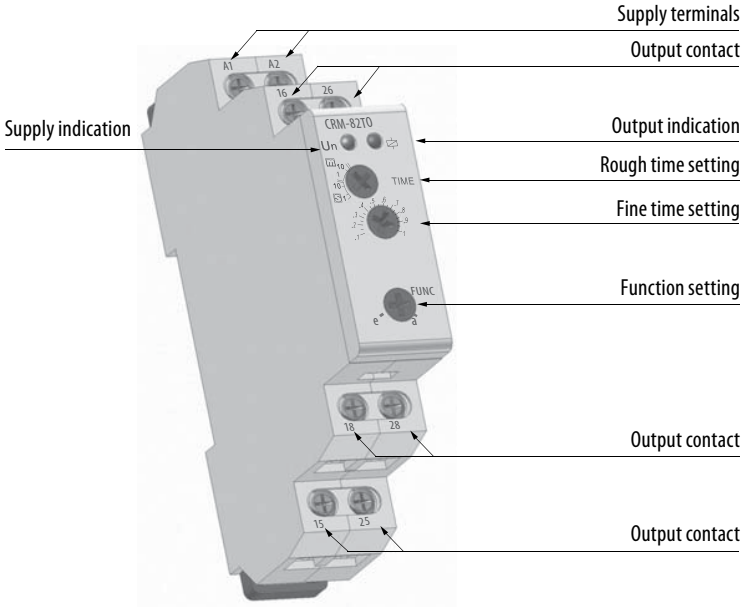
Symbol



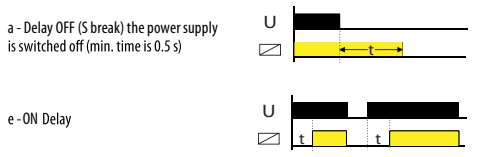
Connection



Description



Function



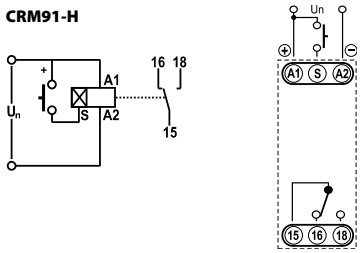
Multifunction time relay CRM-91H, CRM-93H

Technical data

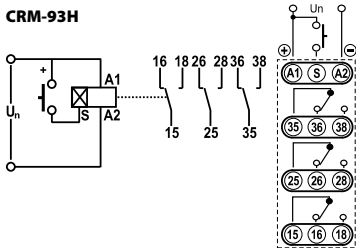
	CRM-91H	CRM-93H
Number of functions	10	
Supply	A1-A2	
Supply voltage	12-240 V AC/DC(50-60 Hz AC)	
Consumption	AC 0,7-3 VA / DC 0,5 - 1,7 W	
Supply indication	green LED	
Time ranges	0.1 s-10 days	
Time settings	rotary switch	
Time deviation	5%-mechanical setting	
Repeat accuracy	0,2%-set value stability	
Temperature coefficient	0,01% / °C at 20 °C	
Output		
Changeover contacts	1	3
Rated current	16 A / AC1	8 A / AC1
Breaking capacity	4000 VA / AC1,	2000 VA / AC1,
	384 W /DC	192 W / DC
Inrush current (duty factor 10%)	30 A / <3 s	10 A / <3 s
Switching voltage	250 V AC1 / 24 V DC	
Min. breaking capacity DC	500 mW	
Output indication	multifunction red LED	
Mechanical life	$3x10^7$	
Electrical life	$0,7x10^5$	
Controlling		
Controlling voltage	12-240 V AC/DC	
Consumption of output	0,025-0,2 VA AC/ 0,1-0,7 W DC	
Load between S-A2	✓	
Glow-tubes	×	
Control. terminals	A1-S	
Impulse length	min. 25 ms/ max. unlimited	
Reset time	max. 150 ms	
Operating temperature	-20...+55 °C	
Storing temperature	-30...+70 °C	
Electrical strength	4 kV	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 40 from frontal panel	
Overvoltage category	III.	
Pollution degree	2	
Max. cable size	2.5 mm^2	
Dimensions	90 x 17,6 x 64 mm	
Standards	EN 61812-1, EN 61010-1	

Connection

CRM91-H

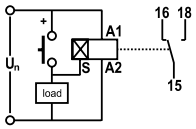


CRM-93H



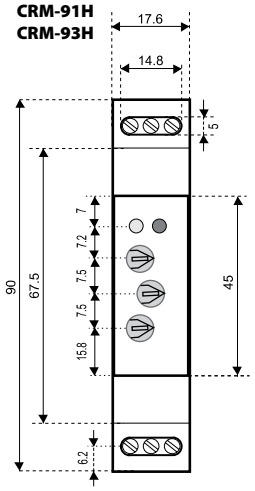
Load with control input possible.

Load between S-A2 possible to connect in parallel way, without disturbing of proper operation of the relay.

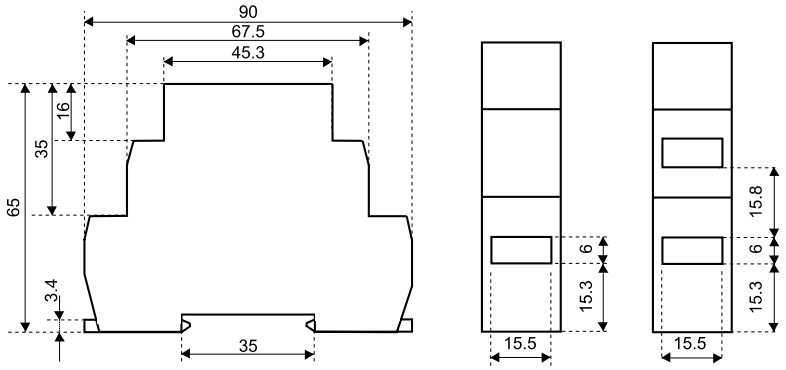


Dimensions

CRM-91H
CRM-93H



1-module design



Functions

a) Delay ON after energisation

b) Delay OFF after energisation

c) Cycler beginning with pause after energisation

d) Cycler beginning with impulse after energisation

e) Delay OFF after de-energisation, instant make of output

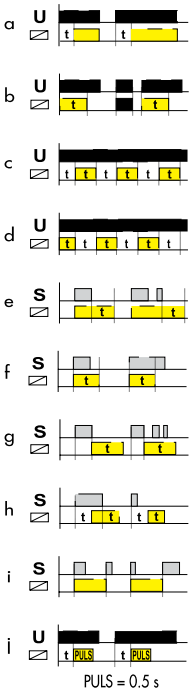
f) Delay OFF responding to make of control contact regardless its length

g) Delay OFF after break of control. contact with instant output

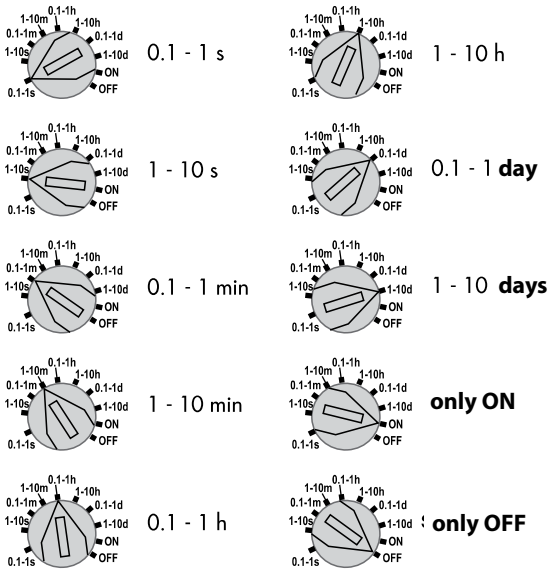
h) Delay OFF after make and break of control. contact

i) Memory (latching) relay

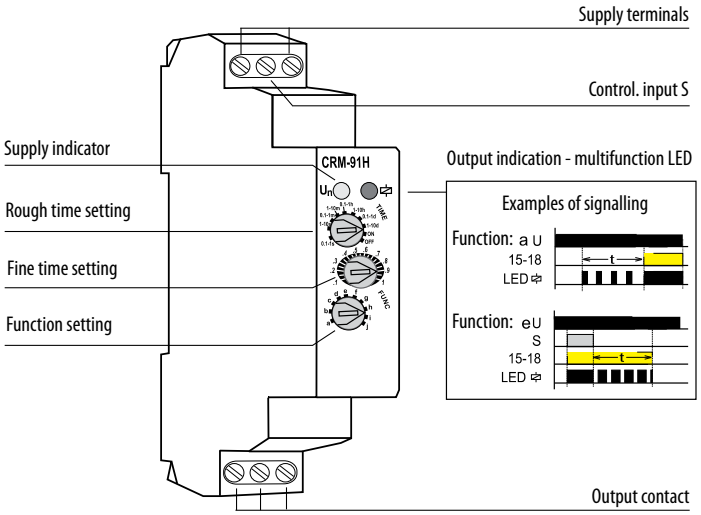
j) Pulse generator



Time ranges



Description



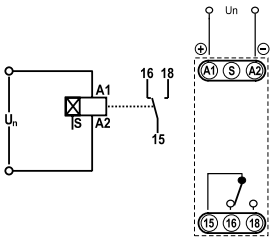
Time relay CRM-2H

Technical data

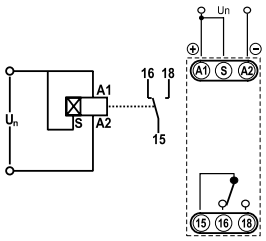
Number of functions	2
Supply	A1-A2
Supply voltage	12-240 V AC/DC (50-60 Hz AC)
Consumption	AC 0,7-3 VA / DC 0,5 - 1,7 W
Supply indication	green LED
Time ranges	0.1 s-100 days
Time setting	rotary switch and potentiometer
Time deviation	5% mechanical setting
Repeat accuracy	0,2% set value stability
Temperature coefficient	0,01% / °C -> 20 °C
Output	
Changeover contacts	1
Rated current	16A / AC1
Breaking capacity	4000 VA / AC1, 384 W /DC
Inrush current (duty factor 10%)	30 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	multifunction red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Reset time	max. 150 ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply-output)
Operating position	any
Mounting/DIN rail	EN 60715
Protection degree	IP 40 from frontal panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2,5 mm^2
Dimensions	90x17,6x64 mm^2
Standards	EN 61812-1, EN 61010-1

Connection

Cycler beginning with pulse

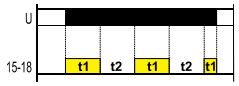


Cycler beginning with pause

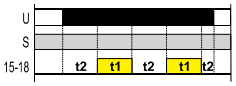


Functions

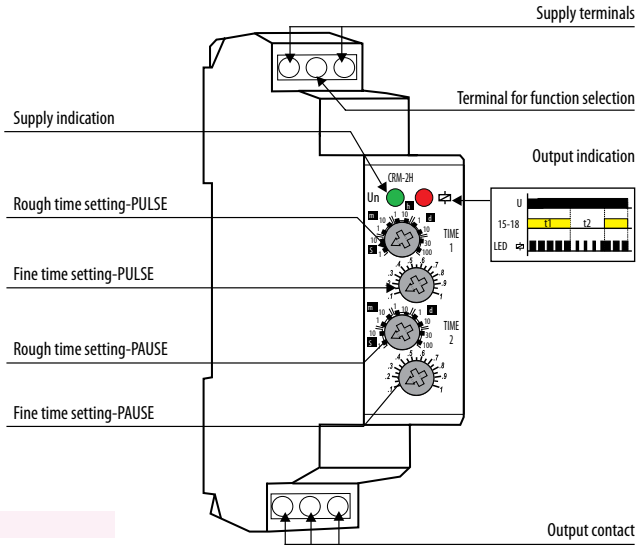
Cycler beginning with pulse



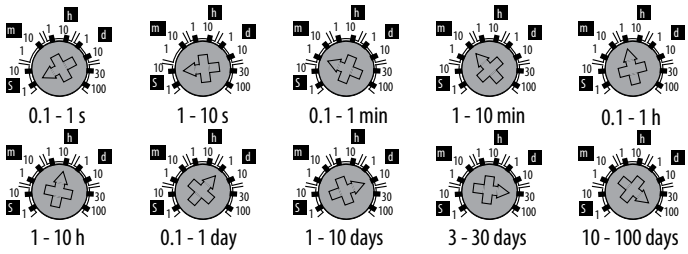
Cycler beginning with pause



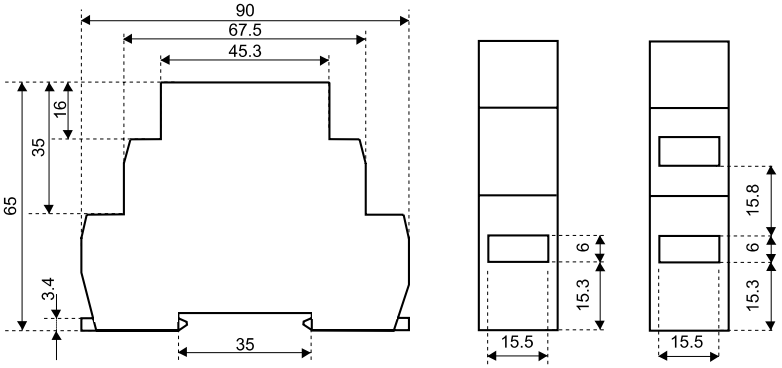
Description



Time ranges

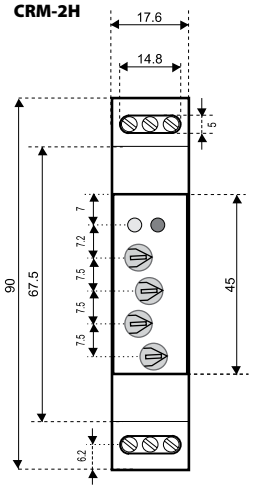


1-module design



Dimensions

CRM-2H

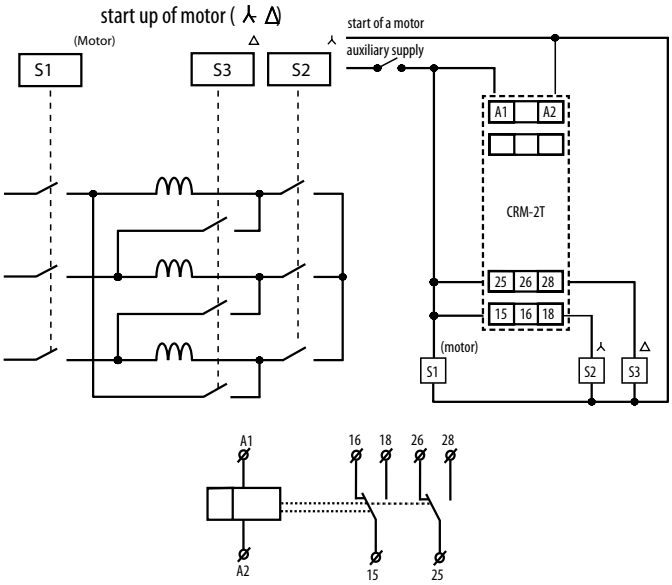


Delay ON star/delta CRM-2T

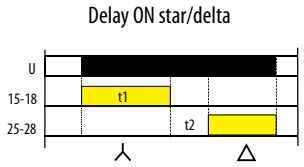
Technical data

	CRM-2T
Number of functions	1
Supply	A1-A2
Universal supply	AC/DC 12-240 V (AC 50-60 Hz)
Consumption	AC 0,7-3VA/DC 0,5-1,7 W
Supply voltage tolerance	-15% - +10%
Supply indication	green LED
Time ranges	t1: 0.1 s - 100 days
Time setting	rotary switch and potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	0,2%-set value stability
Temperature coefficient	0,01% / °C at 20 °C
Output	
Number of contacts	2 x changeover (AgNi)
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384 W / DC
Inrush current (duty factor 10%)	30A/<3s
Switching voltage	max. 250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	multifunction red LED
Mechanical life	$3x10^7$
Electrical life	$0.7x10^5$
Reset time	max. 150 ms.
Controlling	
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2.5 mm^2
Dimensions	90 x 17,6 x 64 mm
Standards	EN 61812-1, EN 61010-1

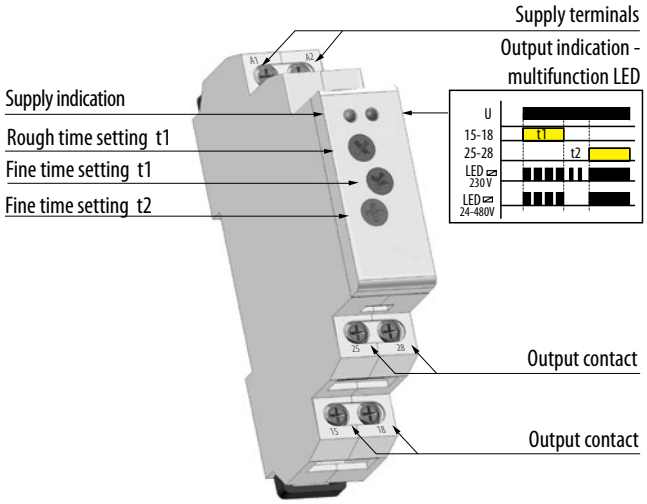
Connection



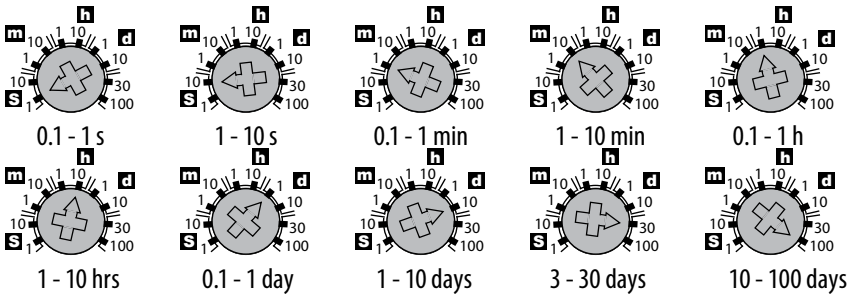
Functions



Description



Time ranges

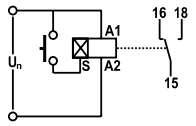


Staircase switch CRM-4

Technical data

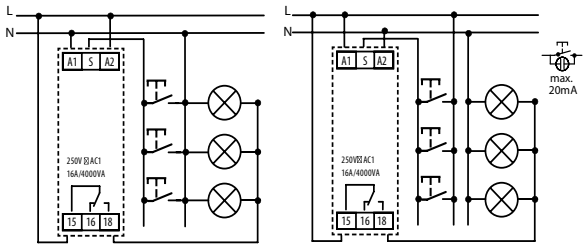
Function	delay OFF
Supply	A1-A2
Supply voltage	230 V AC/50-60 Hz
Consumption	max. 12 VA AC/1.8 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time ranges	0,5 - 10 min
Time setting	potentiometer
Time deviation	10% mechanical setting
Repeat accuracy	5% set value stability
Temperature coefficient	0,05% / °C -> 20 °C
Output	
Changeover contacts	1
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384 W /DC
Inrush current (duty factor 10%)	30 A / <3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Controlling	
Control. voltage	230 V AC
Consumption of input	0,53 VA AC
Load between S-A2	yes
Glow-tubes	yes, max. 20 pcs. (at 1 mA)
Control. terminals	A1-S
Impulse length	min. 25 ms/max. unlimited
Reset time	max. 150ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from frontal panel
Overvoltage category	III
Pollution degree	2
Max. cable size	$2,5\ mm^2$
Dimensions	90x17, 6x64 mm
Standards	EN 60669-2-3, EN 61010-1

Connection

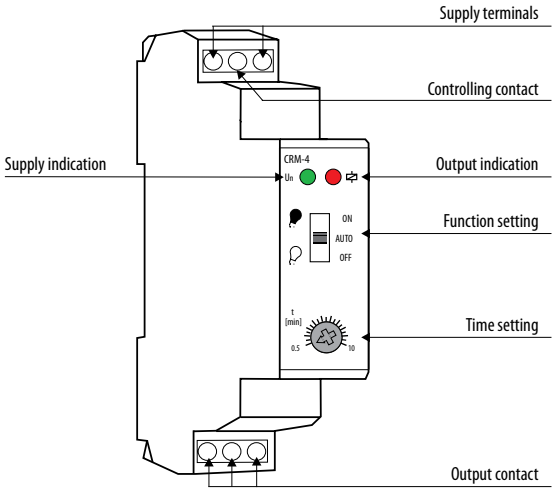


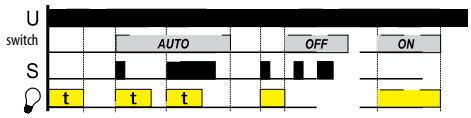
3-wire connection

4- wire connection



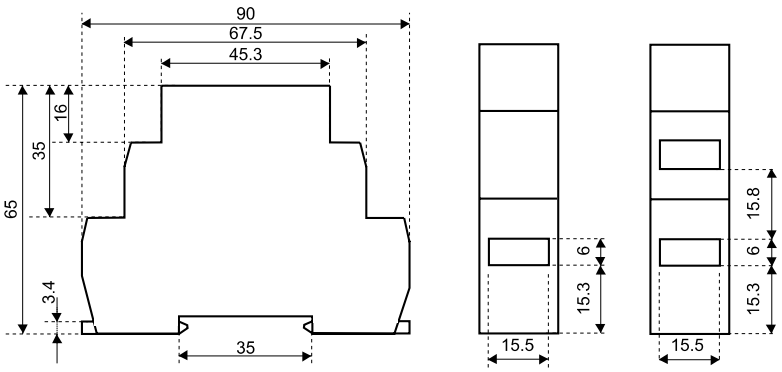
Description



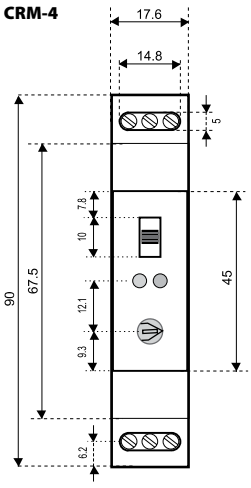


Dimensions

1-module design



CRM-4



Programmable staircase switch CRM-46

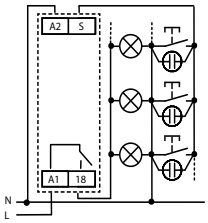
Technical data

	CRM-46
Number of functions	6
Supply	A1-A2
Supply voltage	230 V AC / 50-60Hz
Consumption	max. 3VA AC / 1.6 W
Max. dissipated power (U_n + terminals)	4 W
Supply voltage tolerance	-15% - +10%
Supply indication	green LED
Time ranges	0.5 - 10 min
Time setting	potentiometer
Time deviation	5%-mechanical setting
Repeat accuracy	5%-set value stability
Temperature coefficient	0.01 % / °C, at = 20 °C
Output	
Number of contacts	1x NO - SPST($AgSnO_2$), switching potential A1
Rated current	16 A / AC1
Breaking capacity	4000 VA / AC1, 384W / DC
Inrush current	30A / < 3s.
Switching voltage	max. 250 V AC / 24 V DC
Output indication	red LED
Mechanical life	10^7
Electrical life (AC1)*	$5x10^4$
Control	
Control Voltage	230 V AC
Power the control input max.	4.5 VA / 0.3 W
Glow tubes	✓
Max. current of connected glow lamps	100 mA
Control terminals	A1-S / A2-S
Impulse length	min 40ms. / max.unlimited
Reset time	max. 320 ms.
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel / IP10 terminals
Overvoltage category	III.
Pollution degree	2
Max. cable size	
- Solid wire max.	2x2.5 mm^2 / 1x4 mm^2
- with sleeve max.	1x2.5 mm^2 / 2x1.5 mm^2
Dimensions	90 x 17,6 x 64 mm
Standards	EN 61812-1

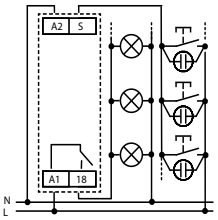
* For higher loads and frequent switching, it is recommended to strengthen the relay contact with a power contactor.

Connection

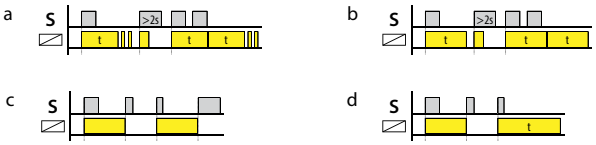
3-wire connection



4-wire connection



Functions



When switching between functions, the red LED flashes.

a - STAIRCASE SWITCH, programmable with signalization

The device timed the set time, 30 and 40s before the end of the time by double flashing of the luminaire announces the impending switch-off . You can increase the time interval by briefly pressing the button repeatedly. Suitable for resistive loads (e.g. bulbs).

b - STAIRCASE SWITCH, programmable without signalization

The device will timed the set time without flashing at the end of the interval. You can increase the time interval by briefly pressing the button repeatedly. The function is suitable for loads that can withstand frequent switching on and off (eg energy saving lamps, LED bulbs).

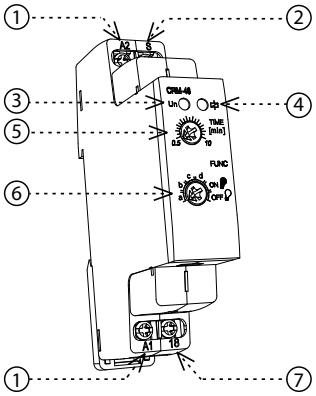
c - MEMORY LATCH (press to switch on, press to switch off)

By pressing the button the output relay closes and by pressing again the relay opens. This function is primarily intended for locations where long-term lighting (without timing) is desirable and the unit is controlled from multiple locations (e.g. in office buildings).

d - MEMORY LATCH with delay

Pressing the button switches the output on / off . If the output is not turned off during the set time "t", it turns off automatically after the timer. This function is suitable for places where lighting is often forgotten (e.g. toilets, corridors, cellars).

Description



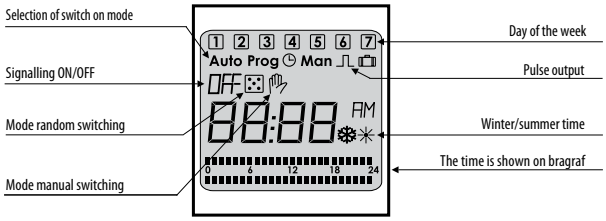
1. Supply terminal
2. Controlling input
3. Supply indication
4. Output contact timing / closing indication
5. Time delay setting 0.5 - 10 min
6. Function setting
7. Output contact

Type of load	AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	AC5b	AC6a	AC7b	AC12
mat. contacts $AgSnO_2$, contact 16A	250V / 16A	250V / 5A	250V / 3A	230V / 3A (690VA)	230V / 3A (690VA) max. input C=14uF	1000W	x	250V / 3A	x
Type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
mat. contacts $AgSnO_2$, contact 16A	x	250V / 6A	250V / 6A	24V / 10A	24V / 3A	24V / 2A	24V / 6A	24V / 2A	x

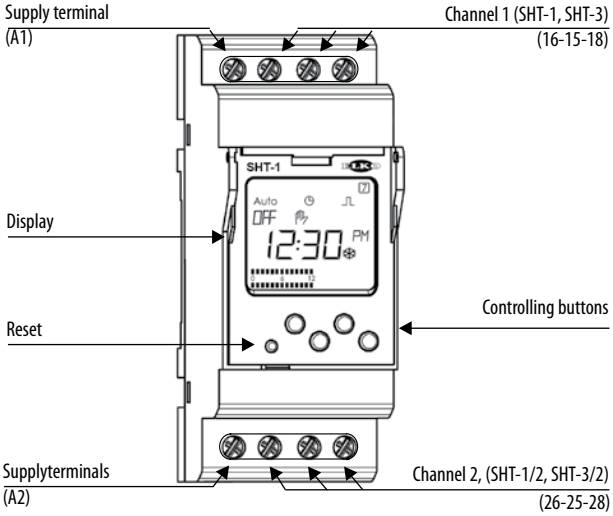
Digital time switch SHT-1, SHT-1/2, SHT-3 and SHT-3/2

Technical data		
Supply terminals	A1-A2	
Supply voltage	UNI	12 - 240 V AC/DC (50 AC - 60 Hz)
Consumption		0,5 - 2 VA AC/ 0,4 - 2 W DC
Supply voltage	230	230 V AC/50 - 60 Hz
Consumption		max. 14 VA AC / 2 W
Supply voltage tolerance	-15%; +10%	
Back-up supply	✓	
Summer/winter time	automatic	
Output		
Number of contacts	1x CO → SHT-1, SHT-3; 2X CO → SHT-1/2, SHT-3/2	
Rated current	16 A / AC1	
Breaking capacity	4000 VA /AC1, 384 W / DC	
Inrush current (duty factor 10%)	30 A / < 3 s	
Switching voltage	250 V AC1 /24 V DC	
Min. breaking capacity DC	500 mW	
Mechanical life	>3x10^7	
Electrical life (AC1)	>0,7x10^5	
Time circuit		
Power back-up	3 years	
Accuracy	max. +/-1s/day / 23°C	
Minimum interval	1 s	
Data stored for	min. 10 years	
Program circuit		
Program SHT-1, SHT-1/2	daily, weekly	
Program SHT-3, SHT-3/2	daily, weekly, monthly, yearly	
Data readout	LCD display	
Other information		
Operating temperature	-20...+55°C	
Storage temperature	-30...+70°C	
Electrical strength	4 kV (supply-output)	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 20	
Overvoltage category	III	
Pollution degree	2	
Max. cable size	max. 2x1,5 mm^2, 2x2,5 mm^2	
Dimensions	90x35, 6x64mm	
Standards	EN 61812-1, EN 61010-1	

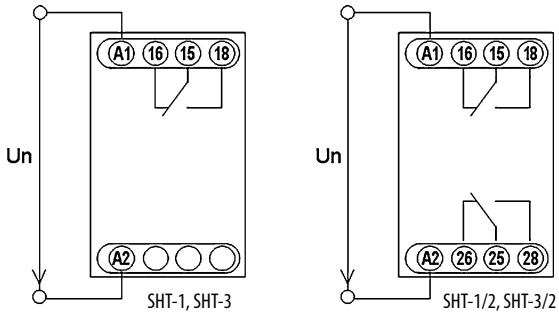
Controlling elements



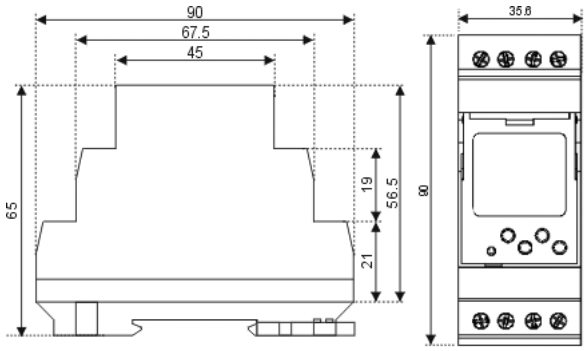
Description



Connection



Dimensions

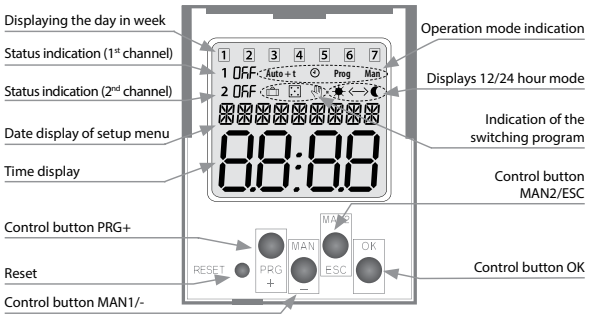


Digital time switch SHT-4

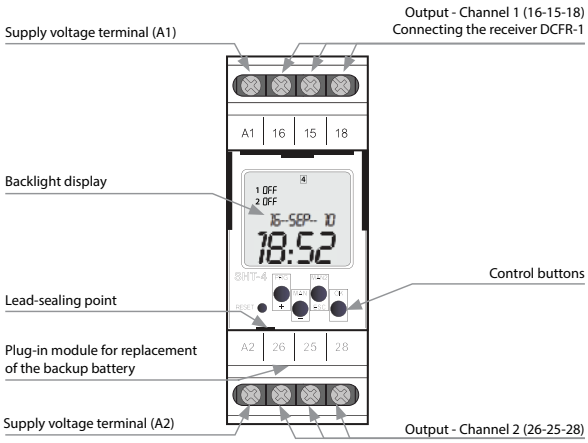
Technical data

Supply terminals	A1-A2
Supply voltage	AC 230 V (50/60 Hz)
Input power	AC max. 14 VA / 2 W
Max. dissipated power (Un + terminals)	5 W
Supply voltage tolerance	-15%; +10%
Real time back-up	✓
Backup battery type	CR 2032 (3V)
Summer/winter time	automatic
Output	
Number of contacts	2x CO SPDT ($AgSnO_2$)
Rated current	16 A / AC1
Breaking capacity	4000 VA /AC1, 384 W / DC
Inrush current	30 A / < 3 s
Switching voltage	250 V AC1 /24 V DC
Mechanical life	$>3x10^7$
Electrical life (AC1)	$>0,7x10^5$
Time circuit	
Power back-up	3 years
Accuracy	max. +/-1s/day / 23°C
Minimum interval	1 min
Data stored for	min. 10 years
Program circuit	
Number of memory locations	100
Program	daily, yearly
Data readout	LCD display, backlight
Other information	
Operating temperature	-20...+55°C
Storage temperature	-30...+70°C
Electrical strength	4 kV (supply-output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP10 terminals, IP40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	max. 2x 2,5 mm^2, max. 1x 4 mm^2, with sleeve max. 1x 2,5 mm^2, max. 2x 1,5 mm^2
Dimensions	90 x 35 x 64 mm
Standards	EN 61812-1

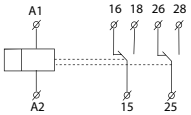
Controlling elements



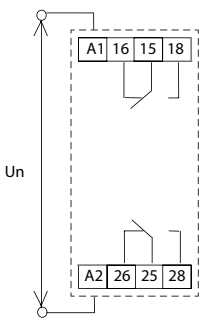
Description



Symbol



Connection

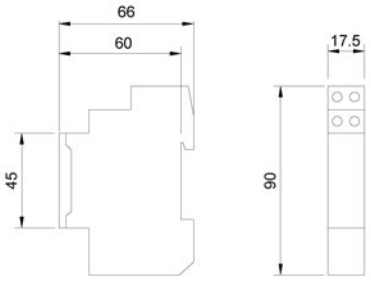


Analog electromechanical time switch APC-D1, APC-DR1

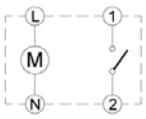
Technical data

	APC-DR1	APC-D1
Supply voltage	230V AC	230V AC
Power reserve	yes (100 hrs)	no
Dial/minimum switching time	**15 min**	**15 min**
Operating accuracy	+/- 1s/day at 22^{0}C	+/- 1s/day at 22^{0}C
Program	Daily	Daily
Output contact	1 x NO	1 x NO
Switching capability	16A 125/250V AC1	16A 125/250V AC1
Power consumption	0,5W	0,5W
Operating temperature	-25...+55^{0}C	-10...+45^{0}C
Mounting	DIN rail EN 60715	DIN rail EN 60715
Protection category	IP20	IP20
Overvoltage category	II	II
Dimensions	90 x 17,5 x 66	90 x 17,5 x 66
Standards	EN 60730-2-7	EN 60730-2-7

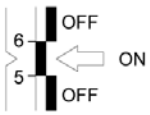
Dimensions



Connection



Programming

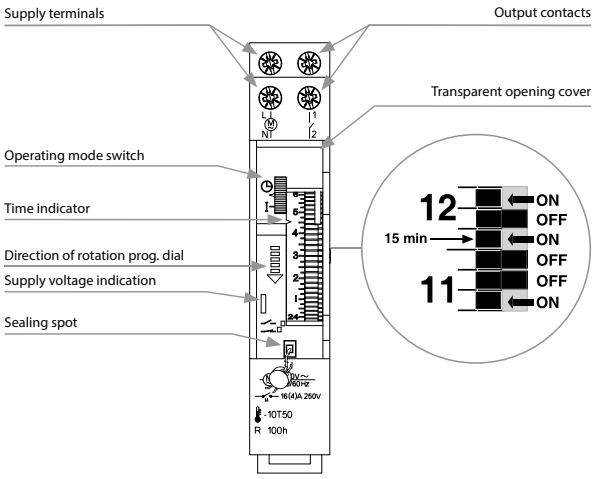


Analog electromechanical time switch ATS-1DR 230

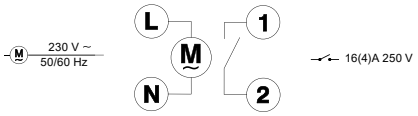
Technical data

Supply terminals	L, N
Supply voltage	AC 230 V (50/60 Hz)
Power consumption (max.)	1W (1.5 VA)
Supply voltage tolerance	-10%, +10%
Output	
Number of contacts	1x NO (AgNi)
Rated current	16 A / AC1
Breaking capacity	3500VA/AC1
Switching voltage	250V AC
Mechanical life	>1x10^6
Electrical life (AC1)	>5x10^4
Time circuit	
Program	daily
Number of switching segments	96
Minimum interval	15 min
Operating accuracy	+/- 1s / day
Power reserve	max. 100 hours
Other information	
Operating temperature	-10...+50°C
Storage temperature	-10...+50°C
Electrical strength	4 kV (supply-output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP20
Overvoltage category	III
Pollution degree	2
Max. cable size	max. 1x 4 mm^2, max. 2x 1,5 mm^2 / with sleeve max. 1x 4 mm^2, max. 2x 1,5 mm^2
Dimensions	90 x 17,5 x 64 mm
Standards	EN 61812-1, EN 60669-1, EN 63044-1

Description



Connection



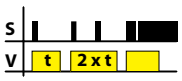
Multifunction relays SMR-T, SMR-H, SMR-B

Technical data

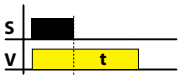
	SMR-T	SMR-H	SMR-B
Number of functions	9	9	10
Connection	3-wires, without neutral	4-wires, with neutral	4-wires, with neutral
Supply voltage	230 V AC / 50-60 Hz		
Consumption (no operation/make)	0,8/3 VA	0,8/3 VA	3 VA
Supply voltage tolerance	- 15%; + 10%		
Time ranges	0,1 s-10 days	0,1 s-10 days	x
Time setting via	via rotary switch and potentiometer	via rotary switch and potentiometer	x
Time deviation	10% mechanical setting	10% mechanical setting	x
Repeat accuracy	2% set value stability	2% set value stability	x
Temperature coefficient	0,1%, °C at 20 °C	0,1%, °C at 20 °C	x
Output	1x triac		1xNO (AgSnO2)
Resistive load	10-160 VA	0-200 VA	16A 125/250 V AC1
Inductive load	10-100 VA	0-100 VA	8A 250 V AC (cos fi > 0,4)
Controlling			
Voltage	230 V AC		
Current	3 mA		
Impulse length	min. 50 ms/ max. unlimited		
Operating temperature	0...+50 °C		
Operating position	any		
Mounting	free at connecting wires		
Protection degree	IP 30 from front panel		
Overvoltage category	III		
Pollution degree	2		
Fuse	F1 A / 250 V	F1 A / 250 V	F1,6 A / 250 V
Outlets	3 x solid wires 0,75 mm^2 length 90 mm		
Glow-laps in button (pcs)	max. 10		
Dimensions	48,5 x 48,5 x 13 mm		
Standards	EN 61010-1		

Function

Function a - delay off on entrering edge
output times when it is switched. Each following pressing (max. 5x) increases time
Long pressing switches output off



Function b - delay off on downward edge
output times after button is switched off , switches immediately



Function c - delay off on downward edge
after switching off output switches on and times.



Function d - cycler - flasher impulser
output cycles in regular interval, cycler starts with an impulse



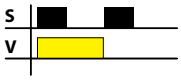
Function e - puls shift
delay on after the switch is switched on and delay on after it is switched off



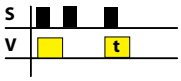
Function f - delay on
delay on after switch is switched on until it is switched off



Function g - pulse relay
switches on by a press, another pressing switches the output off . The length of pressing doesn't matter, it is possible to set reaction delay by a potentiometer and thus eliminate rebound of a button



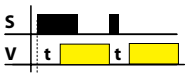
Function h - impulse relay with delay
one press switches on, another one switches the output off in case it is done before the end of timing



Function i - delay on after switched off
output cycles in regular intervals, cycler starts with a gap

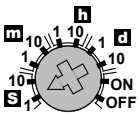


Function j *- cycler starting with gap
delay on after switching on until it is de-energized or a switch is pressed again.

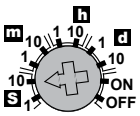


*function j is valid only for SMR-B

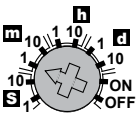
Time ranges



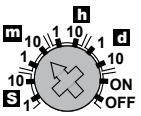
0.1 - 1 s



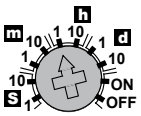
1 - 10 s



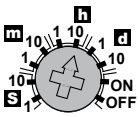
0.1 - 1 min



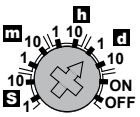
1 - 10 min



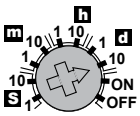
0.1 - 1 hrs



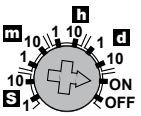
1 - 10 hrs



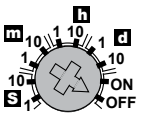
0.1 - 1 day



1 - 10 days

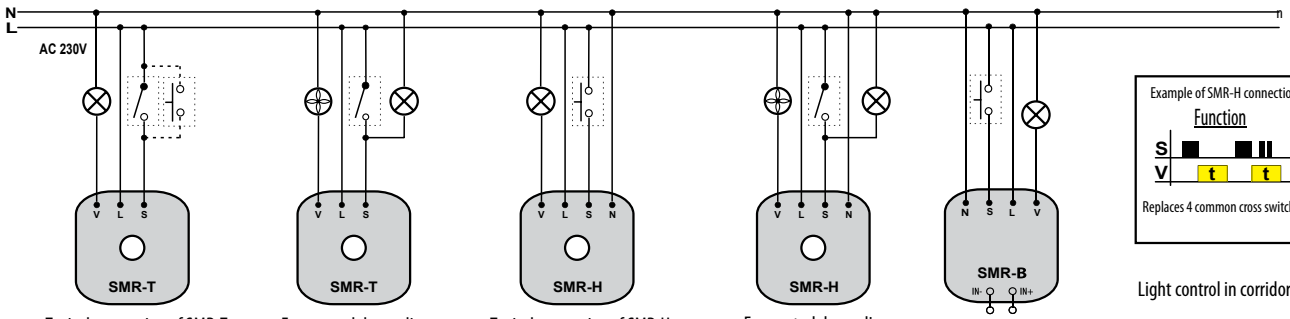


only ON



only OFF

Connection SMR-B, SMR-H, SMR-T



Typical connection of SMR-T - timer for light

Fan control depending on light

Typical connection of SMR-H - timer fot light

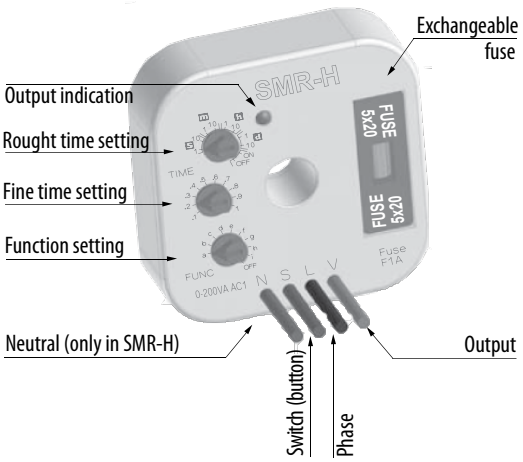
Fan control depending on light

Input for external control voltage AC/DC 5-250 V

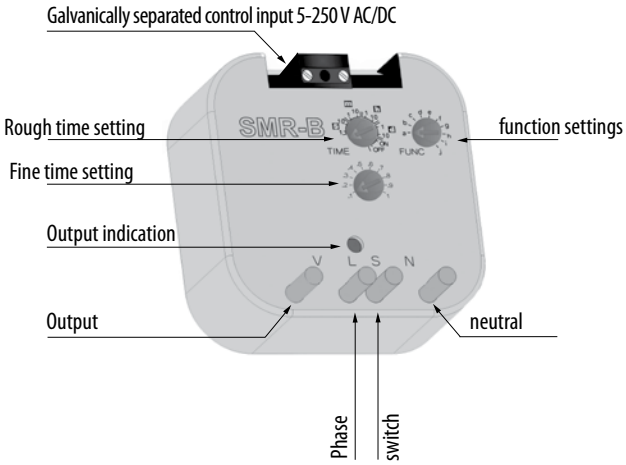
Light control in corridor

Description

SMR-T, H

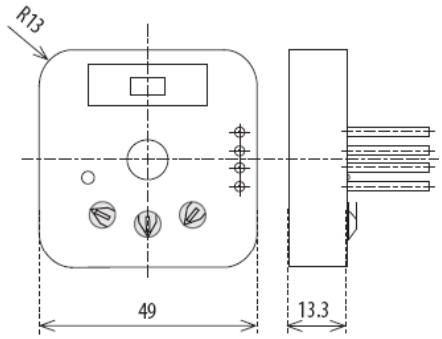


SMR-B

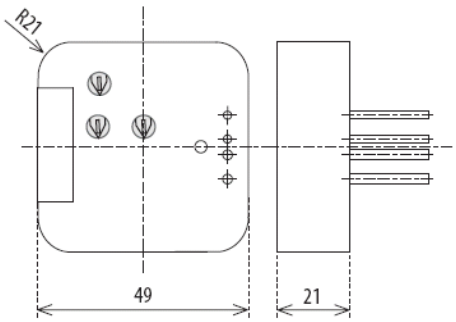


Dimension

SMR-T, SMR-H



SMR-B



Dimmer flush mounting SMR-S, SMR-U

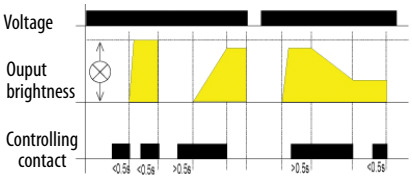
Technical data

	SMR-S	SMR-U
Connection	4-wire without neutral	4-wire with neutral
Supply voltage	AC 230 V / 50-60 Hz	
Consumption (no operation/make)	max. 3VA	
Supply voltage tolerance	- 15%; + 10%	
Output		
Resistive load	10-300 VA	500 VA*
Capacitive load	x	500 VA*
Inductive load	10 -150VA	500 VA*
Controlling		
Control Voltage	AC 230 V	
Current	3 mA	
Impulse length	min. 50 ms/ max. unlimited	
Operating temperature	0...+50 °C	
Operating position	any	
Mounting	free of connecting wires	
Protection degree	IP30 from front panel	
Overvoltage category	III	
Pollution degree	2	
Fuse	F 1.6A/ 250V	x
Output	solid 0,75 mm^2, length 90 mm	
Glow-lamps in control button	max. 10 pcs.	
Dimensions	49x49x13 mm	
Standards	EN 60669-2-1, EN 61010-1	

* When load is above 300 VA it is necessary to ensure sufficient cooling; see instruction manual technical data

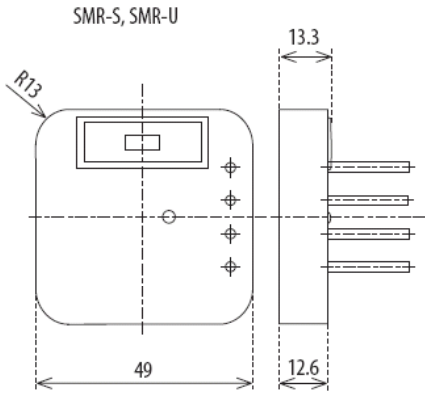
Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Functions

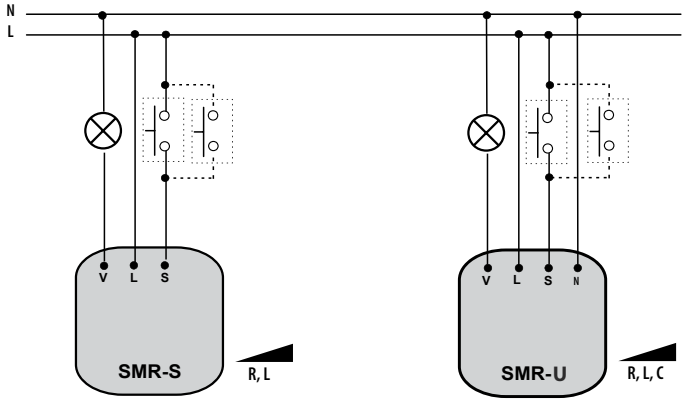


KA short press (<0.5s) turns a light on, another short press turns it off . A longer press (>0.5s) causes a gradual regulation of light intensity min-max-min round until the button is released. After releasing a set intensity is kept in memory, further short presses turn the light on/off keeping the set intensity. The intensity can be changed by further long press. After de-energising the relay remembers the set value.

Dimensions



Connection SMR-S, SMR-U

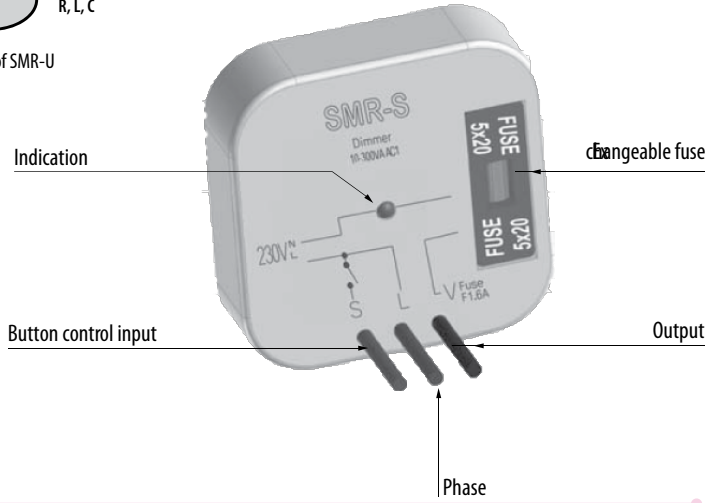


Typical connection of SMR-S - dimmer of lights

Typical connection of SMR-U - dimmer of lights

Warning: it cannot be used for fluorescent lights and energy saving lights!
SMR-U: It is not allowed to connect together loads of inductive and capacitive type at the same time

Description SMR-S

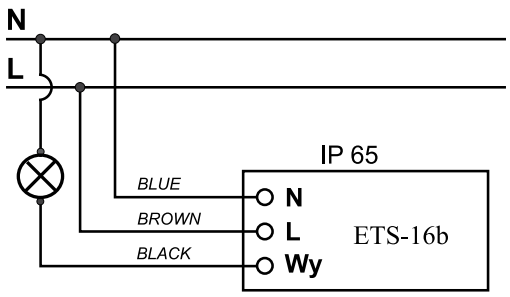


Twilight switch in IP65 ETS-16b

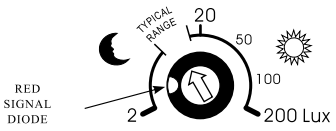
Technical data

	ETS-16b
Voltage	230 V AC
Time delay	cca 20 s
Light level	2-50 Lx
The number and types of contacts	1 NO - NO
Rated current contact	16A/AC1
Installation	on a flat surface
Standards	EN 61812-1, EN 50081, EN 61000
Power supply range	180 - 240 V AC 50Hz
Max load current (AC-1)	16 A
Switch ON treshold	10 lux
Switch off treshold	20 lux
Time delay of switch ON or OFF	cca 20 s
Adjustment range	cca 2 - 200 lux
Working temperature	- 40 °C ... +50 °C
Protection class	IP65

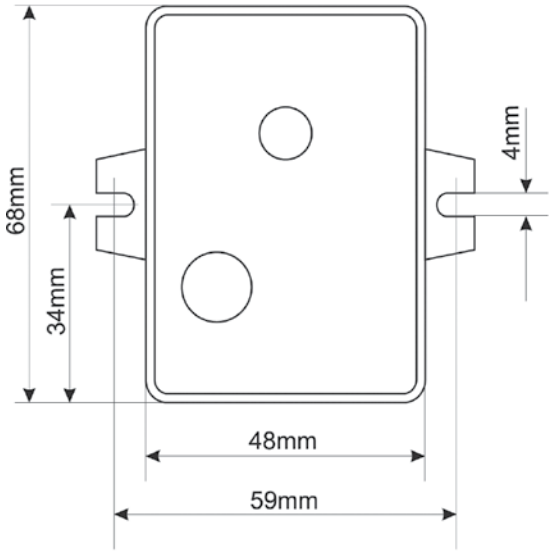
Connection

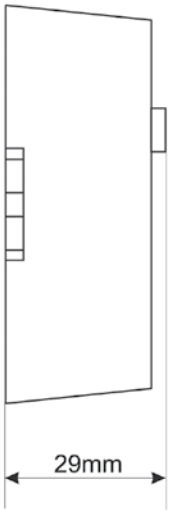


Setting



Dimensions



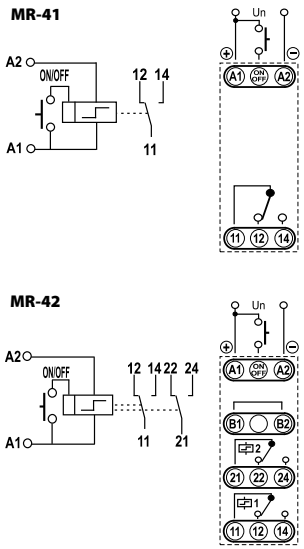


Memory and latching relays MR-41, MR-42

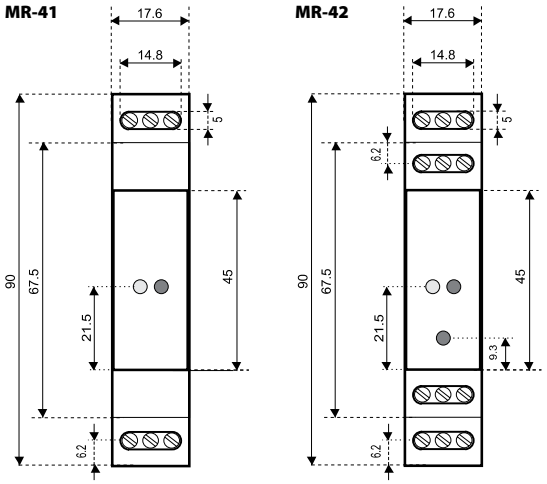
Technical data

	MR-41	MR-42
Number of functions	1	2
Supply	A1-A2	
Supply voltage UNI	12-240 V AC/DC (50-60 Hz AC)	
Consumption UNI	AC 0,17-3 VA / DC 0,5 - 1,2 W	AC 0,17-12 VA / DC 0,11 - 1,9 W
Supply voltage 230	230 V AC / 50-60 Hz	
Consumption 230	AC max. 12 VA / DC 1,2 W	AC max. 12 VA / DC 1,9 W
Supply indication	green LED	
Output		
Supply voltage tolerance	- 15%; + 10%	
Number of contacts	1xCO	2xCO
Rated current	16 A / AC1	2x16 A / AC1
Breaking capacity	4000 VA / AC1, 384 W /DC	4000 VA / AC1, 2x384 W / DC
Inrush current	30 A / <3 s	30 A / <3 s
Switching voltage	250 V AC1 / 24 V DC	250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW	500 mW
Output indication	red LED	red LED
Mechanical life	$3x10^7$	
Electrical life	$0,7x10^5$	
Controlling		
Voltage	12-240 V AC/DC	
Consumption of input	AC 0,025-0,2 VA / DC0,1-0,7 W (UNI) , AC 0,53 VA (AC 230V)	
Load between A2 ON/OFF	yes	
Glow-lamps	no (UNI) , yes -max. 4 pcs at 1mA (AC 230V)	
Control terminals	A1 ON/OFF	
Capacitance of cable control:		
-without connected glow lamps	12 nF (UNI), 12nF (230V)	
-with connected glow lamps	9nF (UNI), glow lamps cannot connected/NO 9nF (230V), max. 4pcs (1pc-1mA)	9nF (UNI), glow lamps cannot connected/NO 9nF (230V), max. 4pcs (1pc-1mA)
Impulse length	min. 25 ms/ max. unlimited	
Operating temperature	-20...+55°C	
Storage temperature	-30...+70°C	
Electrical strength	4 kV (supply - output)	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 40 from frontal panel	
Overvoltage category	III	
Pollution degree	2	
Max. cable size	2,5 mm^2	
Dimensions	90x17, 6x64 mm	
Standards	EN 60669-2-2, EN 61010-1	

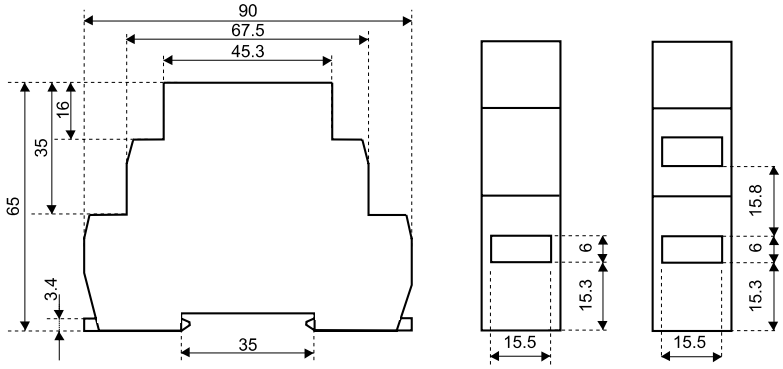
Connection



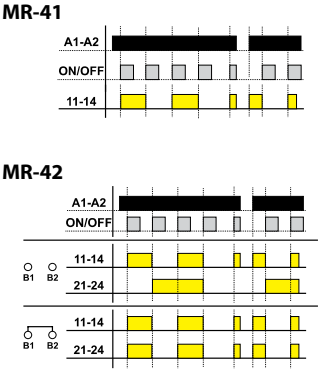
Dimensions



1-module design



Function

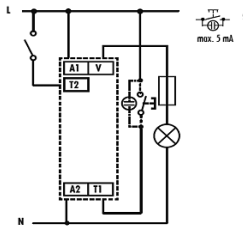


Staircase switch with dimming DIM-2

Technical data

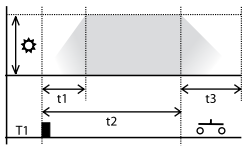
Supply	A1-A2
Supply voltage	230 V AC (50 Hz)
Consumption	max. 5 VA
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time setting via	potentiometer
Time deviation	10% mechanical setting
Repeat accuracy	5% set value stability
Temperature coefficient	0,01% / °C / 20 °C
Controlling T1	
Terminals	T1-A1
Voltage	230 V AC
Power on control input	max. 1,5 VA
Impulse length	min. 100 ms / max. unlimited
Glow-lamps	yes, max. 5 pcs (at 1 mA)
Controlling T2	
Terminals	T2-A1
Voltage	230 V AC
Power control input	max. 0,1 VA
Impulse length	min. 100 ms / max. unlimited
Glow-lamps	no
Output	contactless - triac
Rated current	2 A
Resistive load	10-500 VA
Inductive load	10-250 VA
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2,5 mm^2
Dimensions	90x17,6x64 mm
Standards	EN 60669-2-1, EN 61010-1

Connection

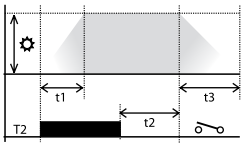


Function

Controlled via input T1 (button)



Controlled via input T2 (switch)



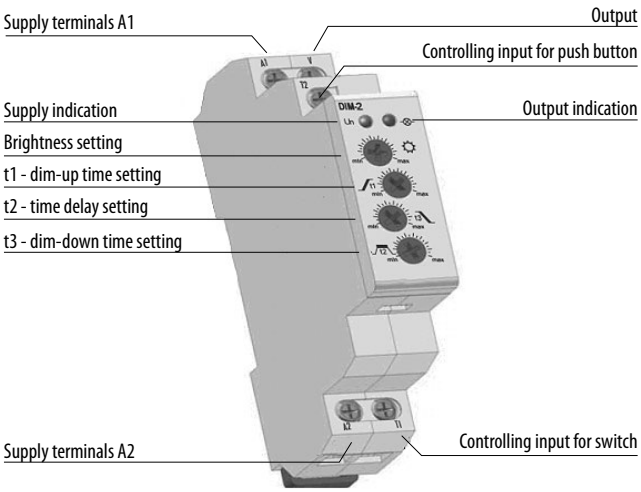
Cycle dim-up time is activated by pressing the button; By repressing the button (during the cycle) it is possible to prolong the time of the cycle.

Legend:

☼	Output / Brightness: 10-100%
t1	Dim-up time: 1-40 s
t2	Time delay: 0s-20min
t3	Dim-down time: 1-40s
T1/T2	Controlling contact

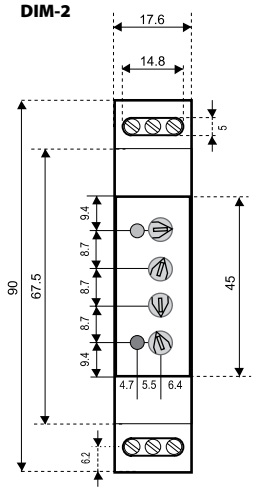
The cycle is started by activating the switch and breaks on max. adjusted brightness level. After the switch is turned off the switch cycle is complete.

Description

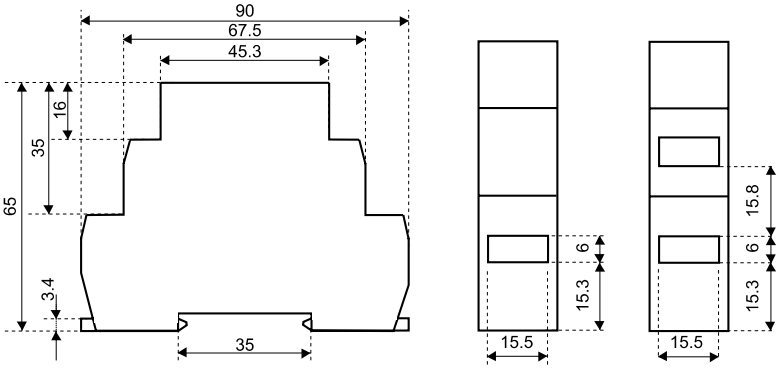


Dimensions

DIM-2



1-module design



Dimmer DIM-14

Technical data

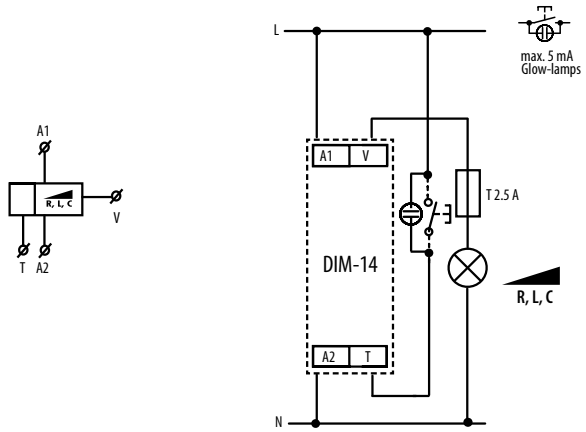
	DIM-14
Supply	A1-A2
Supply voltage	230 V AC (50 Hz)
Consumption	1,3 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Indication output	6 VA
Controlling	
Terminals	T1-A1
Control Voltage	230 V AC
Power control input	0,3 - 0,6 VA AC
Impulse length	min. 80 ms / max. unlimited
Glow-lamps in control button	yes, max. 5 pcs. (at 1 mA)
Output	2 x MOSFET
Rated current	2 A
Resistive load	500 VA*
Inductive load	500 VA*
Capacitive load	500 VA*
Output indication	red LED
Operating temperature	-20...+35 °C
Storage temperature	-20...+60 °C
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2,5 mm^2
Dimensions	90x17,6x64 mm
Standards	EN 60669-2-1, EN 61010-1

* When load is above 300 VA it is necessary to ensure sufficient cooling

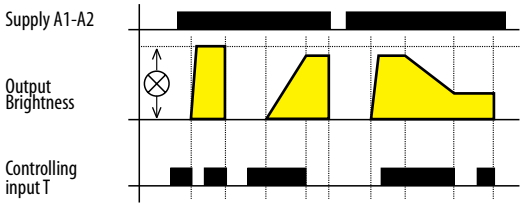
Recommendation for mounting: leave a gap of min. 0,5 module (approx. 9 mm) on side of the device to ensure better cooling of the device.

Warning for DIM-14: it is not allowed to connect together loads of inductive and capacitive type at the same time

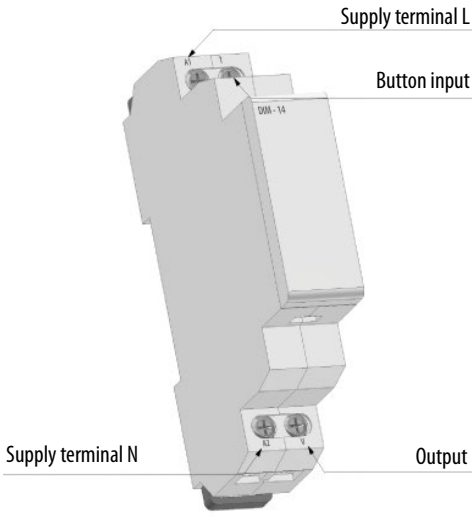
Connection



Functions



Description



Dimmers for LED bulbs and dimmable fluorescent lamps DIM-15 and SMR-M

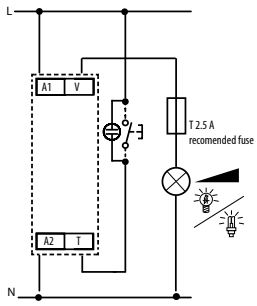
Technical data

	DIM-15	SMR-M
Supply voltage	230V AC / 50-60 Hz	
Supply voltage tolerance	-15%; +10%	
Apparent power	max. 1.5VA	
Loss power	max. 0.7W	
Supply indication	green LED	
Controlling		
Control wire	A1 - T	L - S
Control voltage	230V AC	
Control input power	AC 0.3-0.6 VA	
Control impulse length	min. 80 ms / unlimited	
Glow tubes connection	✓	
Max. amount of glow lamps connected to controlling input	230V - max. 15pcs (measured with glow lamp 0.68mA/230VAC)	230V - max. 10pcs (measured with glow lamp 0.68mA/230VAC)
Output		
Contactless	2 x MOSFET	
Load*	300W (at cos fi=1)	160W (at cos fi=1)
Output status indication	red LED	x
Other data		
Operating temperature	-20 ... +35°C	
Storing temperature	-20 ... +60°C	
Operating position	any	
Mounting	DIN rail EN 60715	free at connection wires
Protection degree	IP40 from front panel / IP10 terminals	IP30 in standard conditions
Overvoltage category	III	
Pollution level	2	
Terminal wires (mm^2)	max. 2x2.5; with sleeve 1x1.5	x
Dimensions	90 x 17.6 x 64 mm	49 x 49 x 21 mm
Weight	57 g	38 g
Standards	EN 60669-2-1, EN 61010-1	

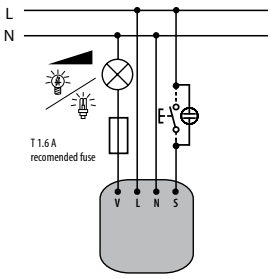
* Due to a large number of light source types, the maximum load depends on the internal construction of dimmable LEDs and ESL bulbs and their power factor cos φ.
The power factor of dimmable LEDs and ESL bulbs ranges from cos φ = 0.95 to 0.4.
An approximate value of maximum load may be obtained by multiplying the load capacity of the dimmer by the power factor of the connected light source.

Connection

DIM-15



SMR-M



Light source type setting

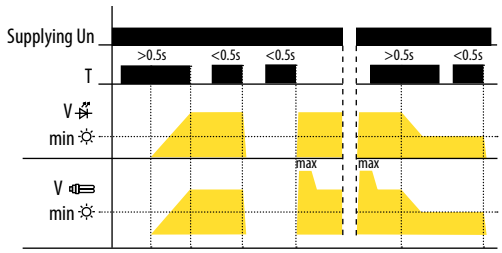
dimmable saving fluorescent lamps



LED bulbs

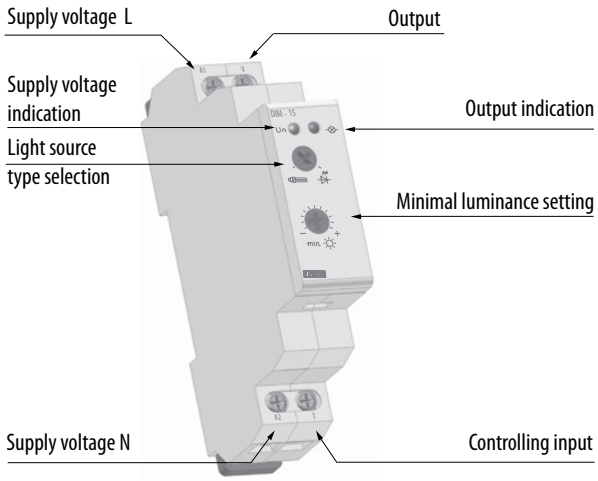


Functions and controlling



Controlling::
- short button press (<0.5s) turns the light off or on
- long press (>0.5s) enables slight regulation of light intensity
- setting of minimal luminance is possible only during decreasing of luminance by long button press

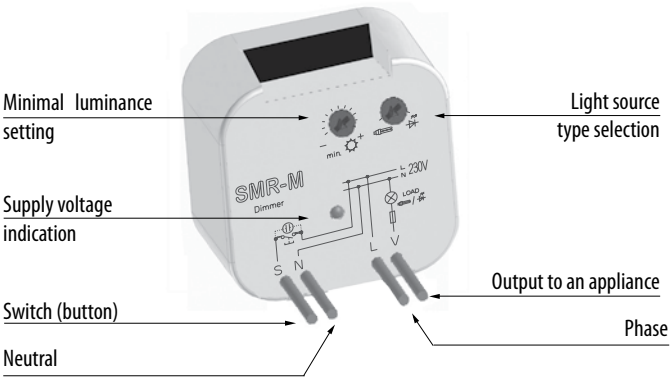
Devices description



Minimal luminance setting:
LED bulb:
- if the light is turned off, short press (<0.5s) switches the light onto last set luminance level

Saving fluorescent lamp:
- if the light is turned off, short press increases the luminance onto maximal level (saving fluorescent lamps fires up) and then luminance decreases onto set level
- setting of minimal luminance by saving fluorescent lamps serves for harmonizing of lowest light intensity prior its unprompted switching off

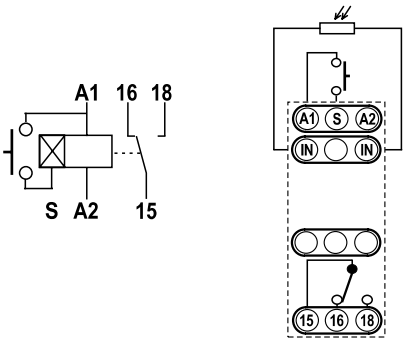
Additional information
- it is possible to dim only LED bulbs equipped with capacitator supplying
- it is not possible to dim saving fluorescent lamps without marking: dimmable
- an incorrect setting of light source has effect only on dimming range, it means neither dimmer or load get demaged
- maximal load is counting with usage of LC filter



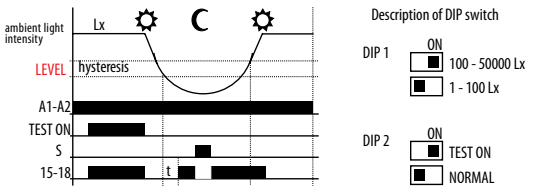
Twilight switch SOU-1 + sensor

Technical data	
Supply	A1-A2
Supply voltage AC 230	230 V AC (50-60 Hz)
Consumption AC 230	max. 12 VA AC / 1,8 W
Supply voltage tolerance	- 15%; + 10%
Supply indication	green LED
Time dwell	0-2 min
Time dwell setting	potentiometer
Measuring range 1)	1-100 Lx
Measuring range 2)	100-50000 Lx
Output	
Number of contacts	1xCO
Rated current	16/AC1
Breaking capacity	4000 VA/AC1, 384 W/DC
Inrush current (duty factor 10%)	30 A/<3 s
Switching voltage	250 V AC1/24 V DC
Min. breaking capacity DC	500 mW
Output indication	red LED
Mechanical life	$3x10^7$
Electrical life	$0,7x10^5$
Controlling	
Voltage	230 V AC
Consumption of input	0,8-530 mVA
Load between S-A2	yes
Glow-lamps	yes, max. 4 pcs (at 1 ms)
Terminals	A1-S
Impulse length	min. 25 ms/ max. unlimited
Reset time	150 ms
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from frontal panel
Connection cable length for sensor	max. 50 m (standard wire)
Overvoltage category	III
Pollution degree	2
Max. cable size	$2,5\ mm^2$
Dimensions	90x17, 6x64 mm
Standards	EN 60255-6, EN 61010-1

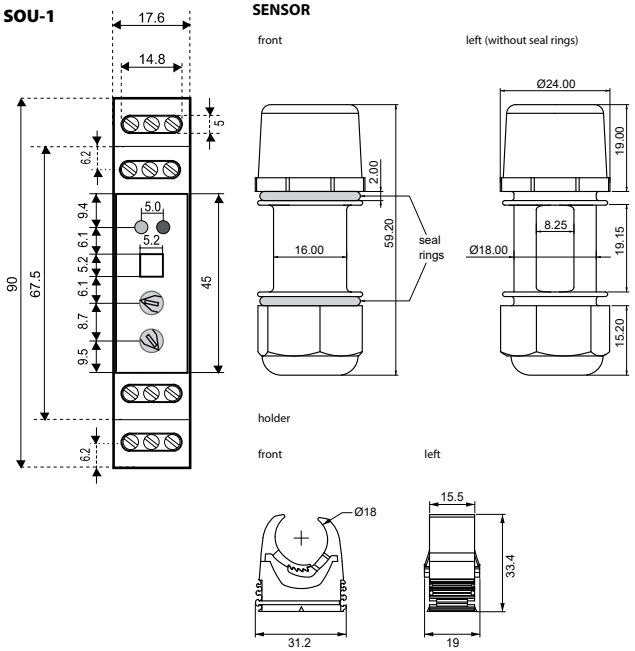
Connection



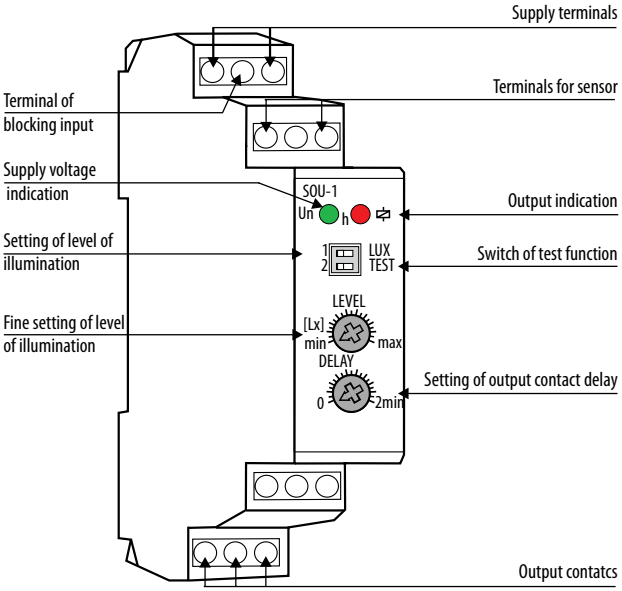
Function



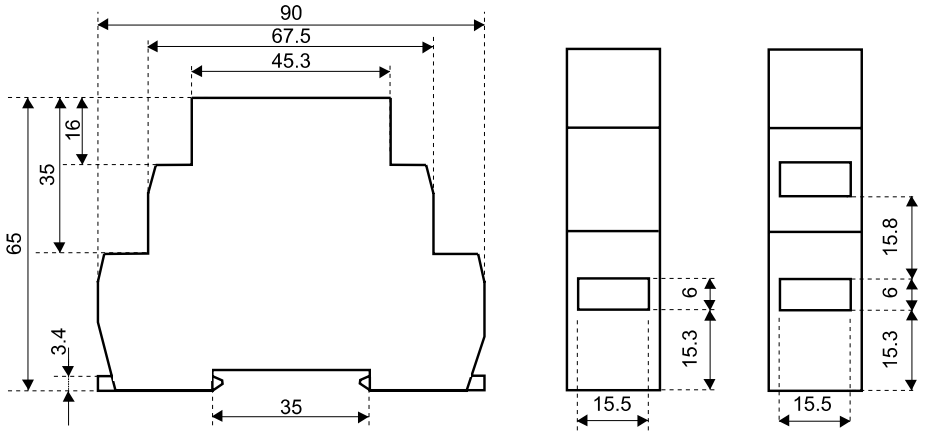
Dimensions



Description



1-module design

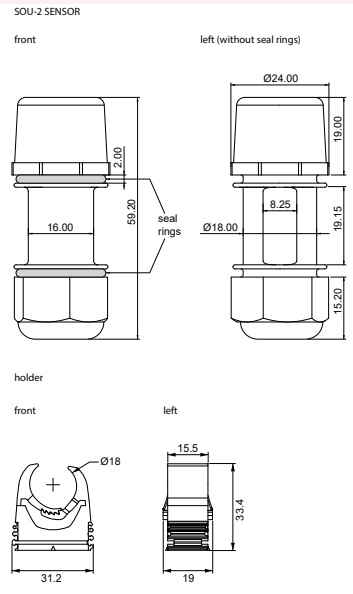


Twilight switch with digital time switch SOU-2 + sensor

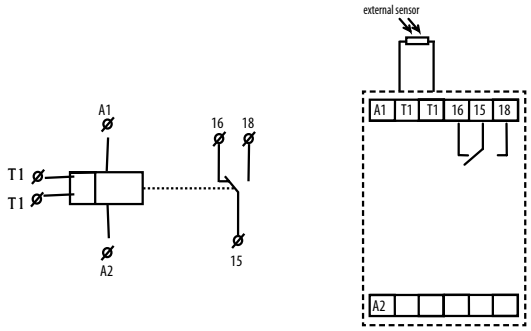
Technical data

	SOU-2
Supply	A1-A2
Supply voltage	230 V AC (50-60Hz)
Consumption	max. 3,5 VA
Supply voltage tolerance	-15% ; +10%
Back-up supply	yes
Summer/winter time	automatic
Output	
Number of contacts	1 changeover (AgNi)
Rated current	8 A / AC1
Breaking capacity	2500 VA / AC1, 240W / DC
Switching voltage	max. 250 V AC1 / 24 V DC
Min. breaking capacity DC	500 mW
Mechanical life	$1x10^7$
Electrical life	$1x10^5$
Time circuit	
Back-up supply	3 years
Accuracy	max. +/- 1s. day (23°C)
Minimal interval	1 min.
Data stored for	min. 10 years
Program circuit	
Illumination range	1-50000 Lx
Program place number	100
Program	daily, weekly
Data readout	LCD display
Controlling	
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 20 from front panel
Overvoltage category	III
Pollution degree	2
Max. cable size	2.5 mm^2
Dimensions	90 x 35,6 x 64 mm
Standards	EN 61812-1, EN 61010-1, EN 60255-6

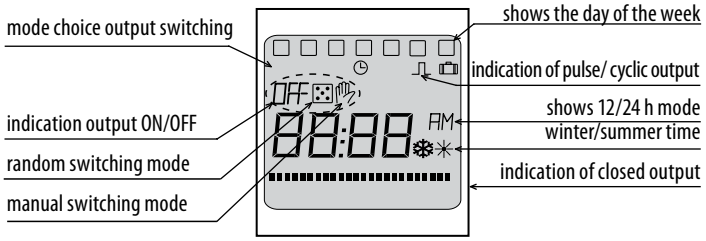
Dimensions



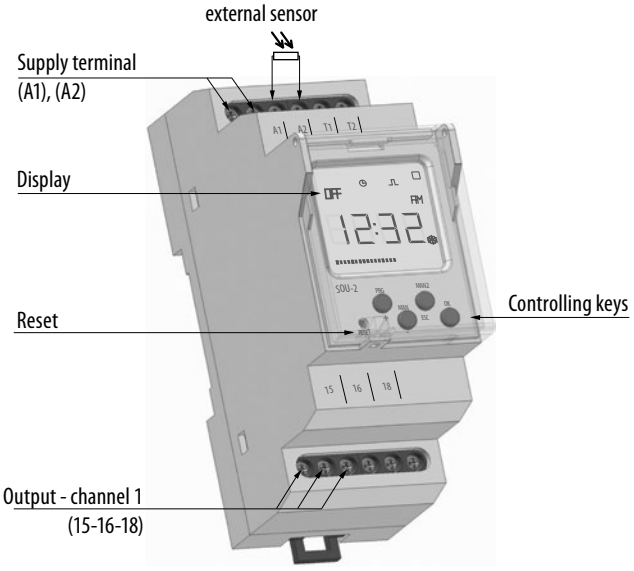
Connection



Controlling elements



Description

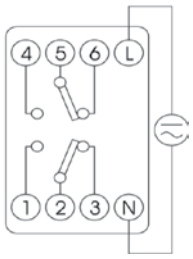


Time switch ASTROCLOCK-2

Technical data

Rated voltage As indicated in the device	230V~ /50-60Hz
Tolerance	± 10%
No. of output contacts	2
Rated current/switching voltage	2x 16A / 250 V~
Maximum recommended loads (N.A)	See Electrical scheme and parameters
Consumption	16 VA (1,3 W)
Display	back-lit liquid crystal display
Accuracy	± 1 s / day at 23 °C
Temperature effect on accuracy	± 0.15 s / °C / 24 h
Power reserve	4 years (without connection to mains), 48 h (without battery and without connection to mains)
Software class and structure	Class A
Memory spaces	40
Types of manoeuvres	SUNRISE, SUNSET, FIXED TIME: ON/ OFF, REDUC.
Astronomical adjustment	Daily
Operating temperature	-10 °C ... +45 °C
Transport and storage temperature	-20 °C ... +60 °C
Pollution degree	2
Protection level	IP 20 (EN60529)
Overvoltage category	Class II under correct mounting conditions
Transient impulse voltage	2.5 kV
Keyboard access cover	Sealable
Connection	With screw terminal for section conductors of 4mm^2 maximum section
Battery	CR2032 - 3 V - 220 mAh
Size	2 DIN modules (35 mm)
Standards	EN 60730-1:2011, EN 60730-2-7:2010 + AC:2011

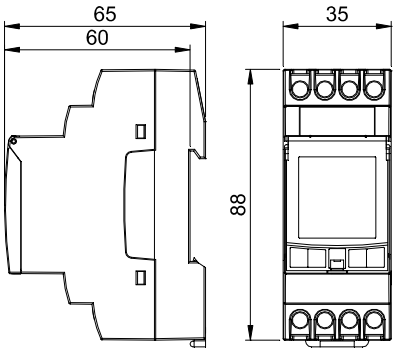
Electrical scheme and parameters

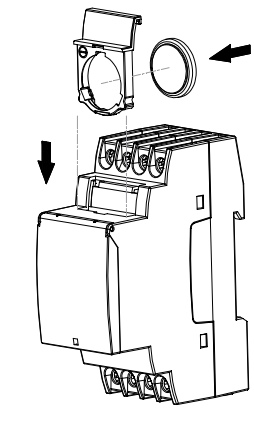


Incandescent	Fluorescent	Low voltage halogen (12 V AC)	Halogen (230 V AC)
3000 W	1200 VA	2000 VA	3000 W

Low consumption lamps	Downlights	LED
600 VA	400 VA	90 VA

Dimensions



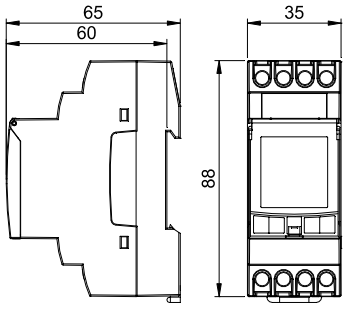


Digital time switch ETICLOCK-R1

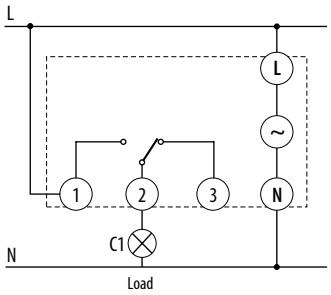
Technical data

	ETICLOCK-R1
Rated voltage and frequency As indicated on the device	(230 V~ 50-60Hz)
Breaking capacity	μ 1x16 (10) A / 250 V AC
Own consumption	16 VA (1.3 W) max.
Contact	AgSnO2 switched
Display screen	LCD
Running accuracy	± 1 s / day at 23 °C
Accuracy variation with temperature	± 0.15 s / °C / 24 h
Power reserve	4 years (with battery and no network connection)
	48 h (no battery and no network connection)
Memory spaces	40
No. of channels	1
Types of operations	ON/OFF, PULSE (1 ... 59 sec.) & CYCLES (1 ... 59 sec. / 1 min ... 23h, 59 min)
Operating temperature	-10 °C ... +45 °C
Transport and storage temperature	-20 °C ... +60 °C
Pollution degree	2
Protection level	IP 20 (EN60529)
Protection class	II under correct mounting conditions
Transient impulse voltage	2.5 kV
Temperature for the ball test	+ 80 °C (21.2.5)
Keyboard access cover	Sealable
Connection	With screw terminal for wire cross section of up to 4mm²
Battery	CR2032 - 3 V - 220 mAh
Size	2x DIN mod. (35 mm)
Standards	EN 60730-1:2011, EN 60730-2-7:2010 + AC:2011

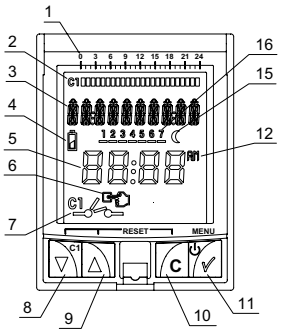
Dimensions



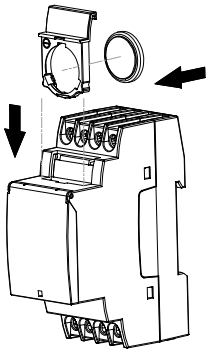
Connection



Controlling elements



1. Time scale
2. Schedules
3. Text line
4. Low-battery symbol
5. Hour / Date
6. C1 manual operation (blinking)/ C1 permanent manual (fixed)
7. C1 relay status symbol
8. Scroll down / C1 manual operation
9. Go up
10. Cancel option / Go back
11. Accept option / Enter the menu / Switch on the device without power
12. 12 H / 24 H
13. Days of the week



Maximum recommended loads

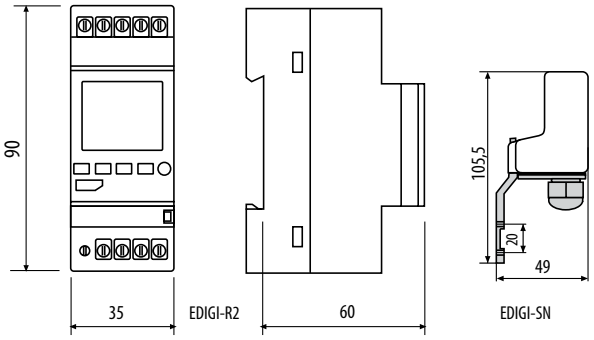
Load	Designation	Max. load
Incandescent		3000 W
Fluorescent		1200 VA
Low voltage halogen (12 V)		2000 VA
Halogen (230 V)		3000 W
Low consumption lamps		600 VA
Downlights		400 VA
LED	LED	90 VA

Digital time relay EDIGI-R2

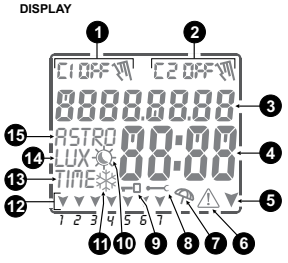
Technical data

		EDIGI-R2
Supply voltage		230 V c.a. +/- 10%
Frequency		50 Hz
Protection rating		IP20
Output type		
Potential-free changeover contact relay	N.O. contact Zero Crossing	16(10)A / 250V~
	N.C. contact	16(2)A / 250V~
Type of action, disconnection and unit		1 B S U / electronic
Section of the cables to the terminals		1...6mm²
Replaceable backup battery		3V lithium code CR2032
Power reserve in case of power failure		about 6 years from the first start-up, guaranteed by the lithium battery (replaceable)
Rated impulse voltage		4kV
Software class		A
Operating accuracy		+/- 1 sec/day at 25 °C
Consumption/Stand-by consumption		8 VA mono-channel / 6 VA dual-channel
Type of insulation		II
Rate of pollution		normal
Installation		DIN rail
Operating temperature		-20 °C ... +55 °C
Storage temperature		-30 °C ... +60 °C
CE marking regulation		LVD/EMC EN60730-2-7
Languages available in the device		ENG,DE, HRV/SRP/BOS

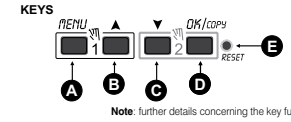
Dimensions



Controlling elements



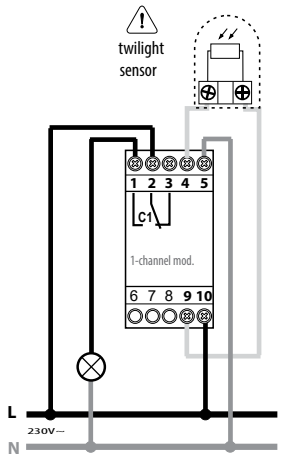
1. **Channel 1** Field (status of relay 1)
2. **Channel 2** Field (status of relay 2) *only dual-channel mod.*
3. Date / Text indication to browse or program
4. Hour and Minutes / Menu functions / Parameter values indication
5. Browsing arrow (menu o next sub-menu)
6. **ATTENTION!** icon
7. **Holiday** icon (suspension of programs in progress)
8. Icon for the set **Maintenance** of the connected load
9. "**Keypad lock**" icon
10. **Summer time** period icon (summer changeover) and/or **for Astro** and **Lux** **programs**
11. **Winter time** period icon (winter changeover)
12. **Day of the week** field
13. **Time programs setting** (TIME)
14. **Twilight programs setting** (LUX)
15. **Astronomical programs setting** (ASTRO)



A **Access / Exit** the menus and sub-menus
B Scroll list **upwards / increase the value**
C Scroll list **downwards / decrease the value**
D **Confirm setting** / copy program
E **Reset** (no setting entered is deleted - para. 1.6.3)

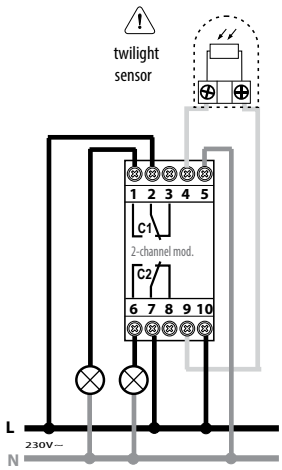
Note: further details concerning the key functions are described in the specific paragraphs of use.

Connection

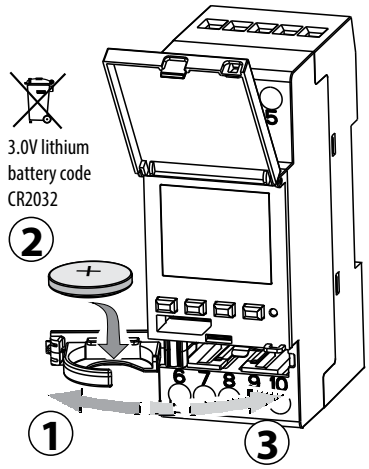


Maximum cable length to connect the twilight sensor: 50 m

Follow the instructions in the instruction sheet for information concerning the technical characteristics and assembly of the external twilight sensor.



The electrical connections must only be implemented after having disconnected the 230V~ power supply.



Maximum recommended loads

Load	Designation	Max. load
Incandescent		3000 W
Fluorescent		1100 W
Halogen (230 V)		3000 W
Low consumption lamps		7W ÷ 23W (max. 23 lamp.)

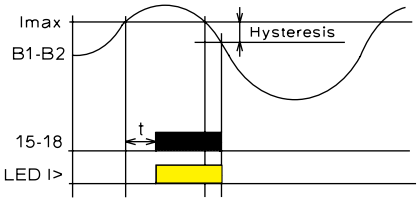
LED lighting: max inrush current 80A/20ms

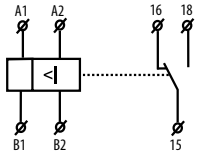
Current monitoring relay PRI-51

Technical data

	PRI-51					
Supply circuit						
Supply	A1-A2					
Universal supply	24-240V AC / 24 V DC (50-60 Hz AC)					
Consumption	max. 1,5 VA					
Supply voltage tolerance	-15% - +10%					
Measuring circuit						
Load	between B1 - B2					
Current ranges	PRI51/1	PRI51/2	PRI51/5	PRI51/8	PRI51/16	PRI-51/0.1-10
	AC 0.1-1 A	AC 0.2-2 A	AC 0.5-5 A	AC 0.8-8 A	AC 1.6-16A	AC 0.1 - 10A
Inrush overload <1ms	100 A					
Max. permanent current	1A	2A	5A	8A	16A	10A
Time setting	potentiometer					
Time ranges	0.5 s-10 s					
Setting accuracy - mechanical	5%					
Time deviation	< 1 %					
Limit values tolerance	5%					
Temperature coefficient	< 0.1 % / °C					
Hysteresis	5%					
Output						
Number of contacts	1 x changeover (AgNi)					
Rated current	8 A / AC1					
Breaking capacity	2500 VA / AC1, 240W / DC					
Output indication	green / red LED					
Controlling						
Operating temperature	-20...+55 °C					
Storage temperature	-30...+70 °C					
Electrical strength	4 kV (supply-output)					
Operating position	any					
Mounting	DIN rail EN 60715					
Protection degree	IP 40 from front panel					
Overvoltage category	III.					
Pollution degree	2					
Max. cable size	2,5 mm^2					
Dimensions	90 x 17,6 x 64 mm					
Standards	EN 60255-6, EN 61010-1					

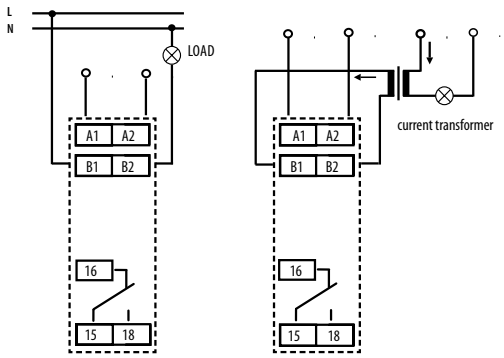
Functions



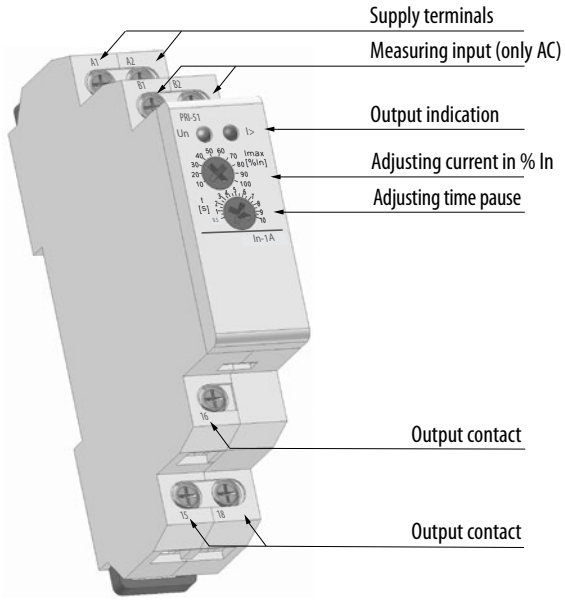


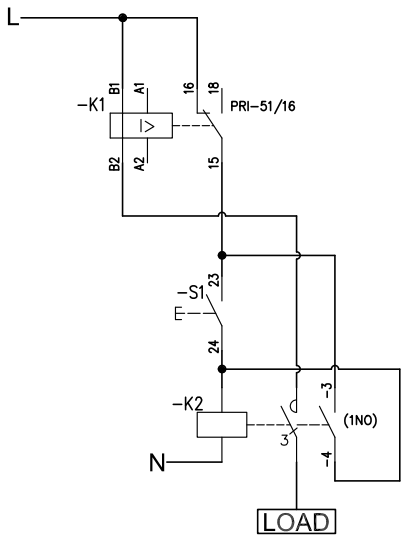
Connection

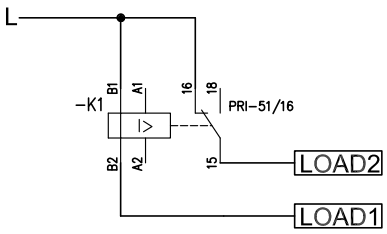
Example connection: PRI-51 with current transformer for current range increase



Description







LOAD1 -> Critical load - always available (Iset<ILOAD1)
LOAD2 -> Optional load - only when LOAD1 not operating

In case of overload, all the loads will shutdown.

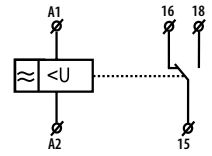
Voltage monitoring relay HRN-33, HRN-34, HRN-35

Technical data

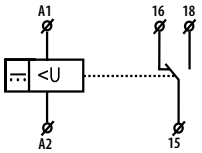
	HRN-33, HRN-34, HRN-35		
Type	HRN-33	HRN-34	HRN-35
Supply	A1-A2	A1-A2	A1-A2
Universal supply	monitoring voltage range	monitoring voltage range	monitoring voltage range
Consumption	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC	max. 1,2 VA AC / DC
Upper level Umax	160-276 V AC	18-30 V DC	160-276 V AC
Bottom level Umin	30-99% Umax.	30-99% Umax.	30-99% Umax.
Time delay	0 -10 s	0 -10 s	0 -10 s
Setting accuracy (mechanical)	5 %	5 %	5 %
Repeat accuracy	< 1 %	< 1 %	< 1 %
Temperature coefficient	< 0,1% / °C	< 0,1% / °C	< 0,1% / °C
Hysteresis	2-6 % of adjusted value	2-6 % of adjusted value	2-6 % of adjusted value
Output			
Number of contacts	1 x changeover (AgNi)	1 x changeover (AgNi)	1 x changeover (AgNi) for each voltage level
Rated current	16 A / AC1	16 A / AC1	16 A / AC1
Breaking capacity	4000VA / AC1, 384W / DC	4000VA / AC1, 384W / DC	4000VA / AC1, 384W / DC
Inrush current	30 / < 3s	30 / < 3s	30 / < 3s
Switching voltage	max. 250 V AC1 / 24V DC	max. 250 V AC1 / 24V DC	max. 250 V AC1 / 24V DC
Min. breaking capacity DC	500mW	500mW	500mW
Output indication	green / red LED	green / red LED	green / red LED
Mechanical life	$3x10^7$	$3x10^7$	$3x10^7$
Electrical life	$0.7x10^5$	$0.7x10^5$	$0.7x10^5$
Controlling			
Operating temperature	-20...+55 °C		
Storage temperature	-30...+70 °C		
Electrical strength	4 kV		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Max. cable size	2.5 mm^2		
Dimensions	90 x 17,6 x 64 mm		
Standards	EN 60255-6, EN 61010-1		

Symbols

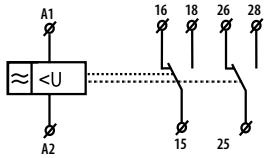
HRN-33



HRN-34



HRN-35



Functions

Legend:

Umax - upper adjustable level of voltage

Un - measured voltage

Umin - bottom adjustable level of voltage

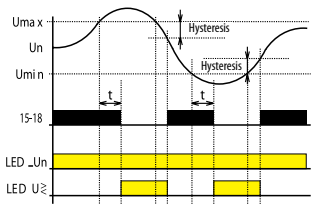
15-18 - switching contact of output relay No.1

25-28 - switching contact of output relay No. 2

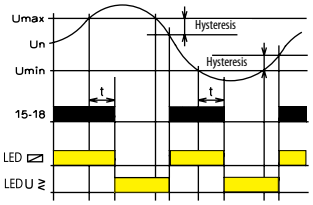
LED ≥ Un - indication green

LED U≤ - indication red

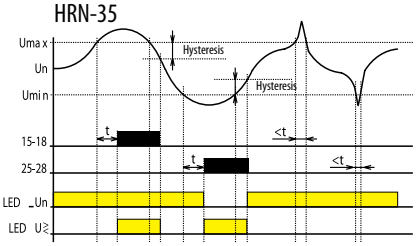
HRN-33



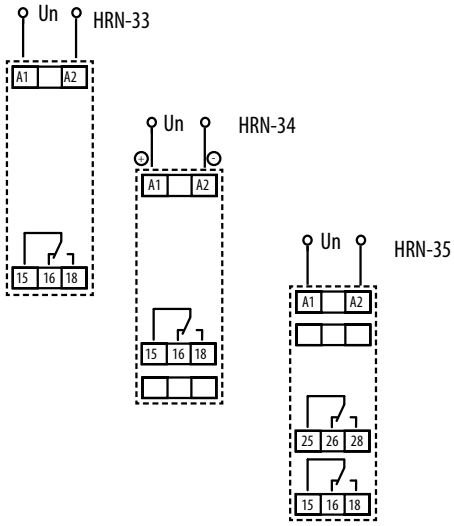
HRN-34



HRN-35

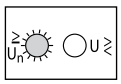


Connection

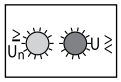


Indication LED

HRN-33

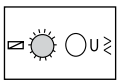


Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF

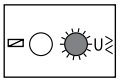


Exceeded Umax (overvoltage)
Drop below Umin (undervoltage)
Un>Umax or Un<Umin.
Green LED = ON
Red LED = ON

HRN-34

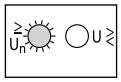


Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF

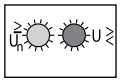


Exceeded Umax (overvoltage)
Drop below Umin (undervoltage)
Un>Umax or Un<Umin.
Green LED = OFF
Red LED = ON

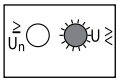
HRN-35



Normal state
Umin<Un<Umax
Green LED = ON
Red LED = OFF



Exceeded Umax (overvoltage)
Un>Umax
Green LED = ON
Red LED = ON



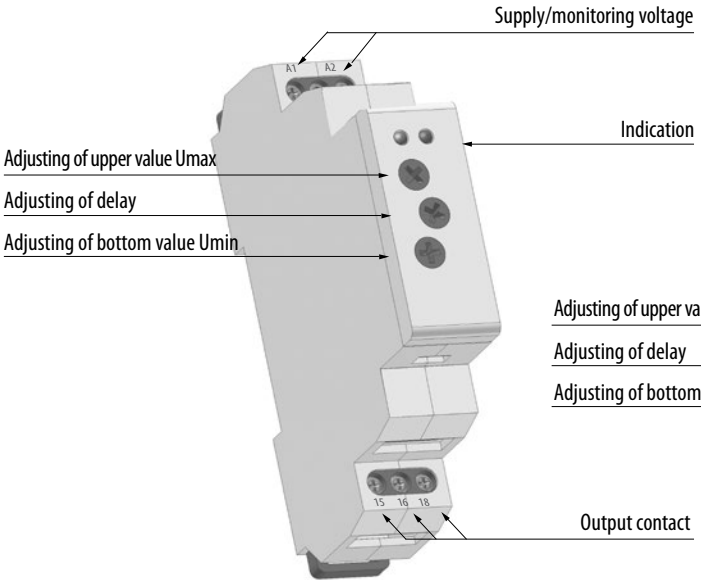
Drop below Umin (undervoltage)
Un<Umin
Green LED = OFF
Red LED = ON

Function description

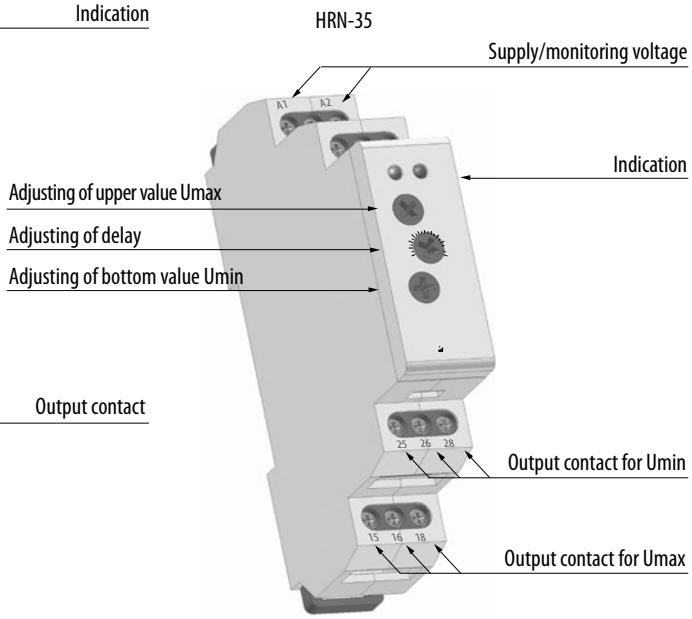
Monitoring relay series HRN-3 monitors level of voltage in single-phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two independent levels of voltage, when exceeded output is activated. HRN-33 and HRN-34 - in normal state the output relay is permanently switched on. It switches off when voltage is below or above deflection. This combination of linkage of the output relay is advantageous when the full failure of supply (monitored) voltage is considered to be a faulty state in the same way as a decrease of voltage within the set level. Output relay is in both situations always switched off. Differently HRN-35 version uses independent relay for each level, in normal state it is switched off . If the upper level is exceeded (for example overvoltage) 1st relay switches on, when the bottom level (e.g. undervoltage) is exceeded 2nd relay switches. It is thus possible to see the particular faulty state. To eliminate short peaks in the main, the time delay, which is possible to be set in range 0 - 10 s, is used. It functions when changing from normal to faulty state and prevents unavailing pulsation of the output relay caused by parasitive peaks. Time delay doesn´t apply when changing from faulty to normal state, but hysteresis (1-6% depends on the voltage setting) apply. Thanks to changeover contacts it is possible to get other configurations and functions according to actual requirements of the application.

Description

HRN-33, HRN-34



HRN-35

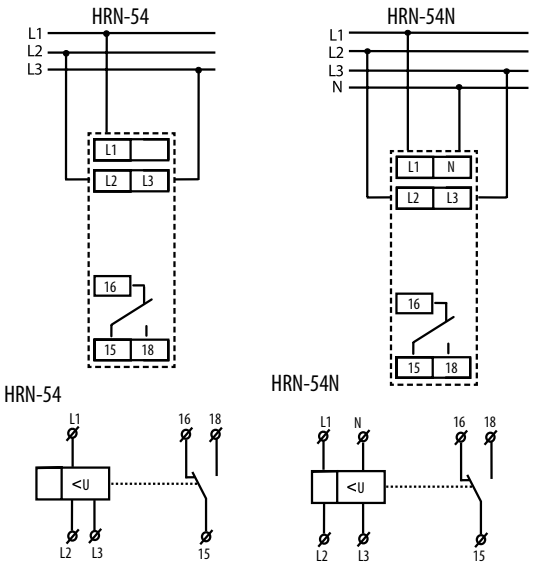


Over/undervoltage monitoring relay HRN-54, HRN-54N

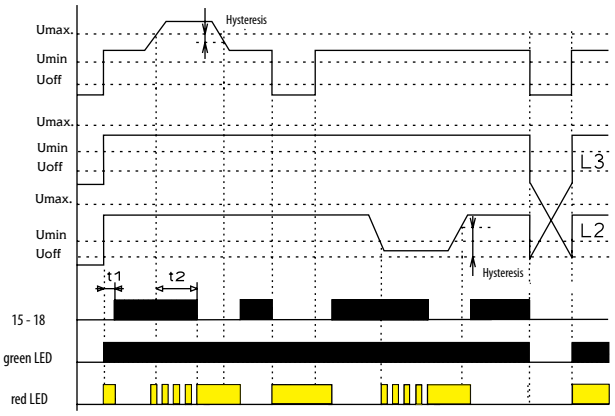
Technical data

	HRN-54	HRN-54N
Supply and measuring	L1,L2,L3	L1,L2,L3,N
Supply	L1,L2,L3	L1,N
Supply/measured voltage	3 x 400 V	3 x 400 V/ 230 V
Level U_{min}	75 - 95% Un	
Level U_{max}	105 - 125% Un	
Consumption	max. 2 VA	
Hysteresis	5 %	
Max. permanent overload	3 x 460V AC	3 x 265V AC
Peak overvoltage <1ms.	3 x 500V AC	3 x 288V AC
Time delayT1	max. 500 ms.	
Time delayT2	0.1 - 10 s.	
Output		
Number of contacts	1 x changeover (AgNi)	
Rated current	8 A / AC1	
Breaking capacity	2500 VA / AC1, 240W / DC	
Inrush current	10 A	
Switching voltage	max. 250 V AC1 / 24 V DC	
Min. breaking capacity DC	500mW	
Output indication	red LED	
Mechanical life	$1x10^7$	
Electrical life	$1x10^5$	
Reset time	max. 150 ms.	
Controlling		
Operating temperature	-20...+55 °C	
Storage temperature	-30...+70 °C	
Electrical strength	4 kV	
Operating position	any	
Mounting	DIN rail EN 60715	
Protection degree	IP 40 from front panel	
Overvoltage category	III	
Pollution degree	2	
Max. cable size	2.5 mm^2	
Dimensions	90 x 17,6 x 64 mm	
Standards	EN 60255-6, EN 61010-1	

Connection



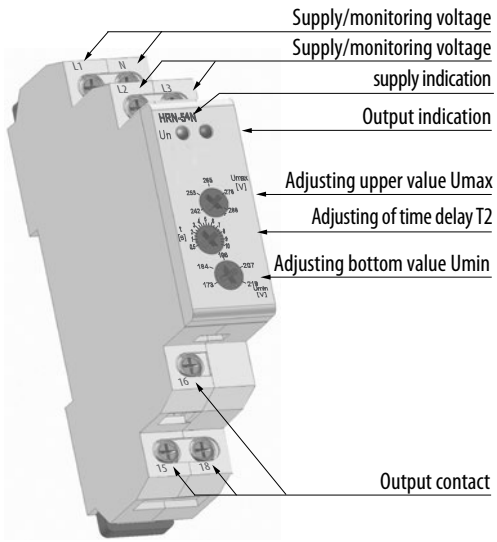
Functions



Function description

Relay in 3-phase main monitors size of phase voltage. It is possible to set two independent voltage levels and thus it is possible to set two independent voltage levels and monitor e.g. undervoltage and overvoltage independent. In normal state when voltage is within set levels, output relay is closed and red LED is off. In case voltage exceeds or falls below the set levels, output relay breaks and red LED shines (LED indicates faulty state – flashes when timing). In case of In case supply voltage falls below 60 % Un (U_{OFF} lower level) relay immediately breaks without delay and faulty state is indicated by red LED. In case timing is in progress and faulty state is indicated, timing is immediately stopped.

Description

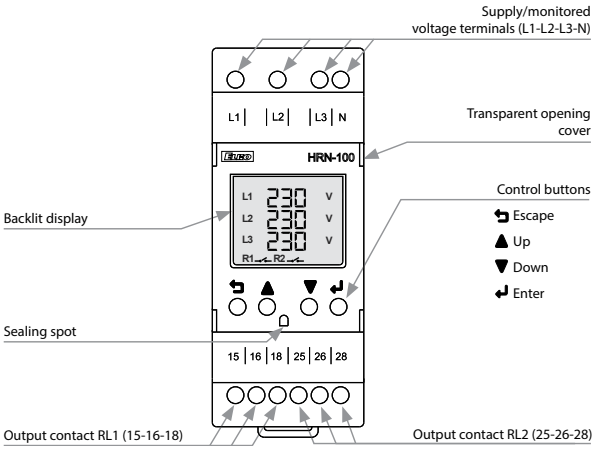


Frequency and voltage monitoring relay HRN-100

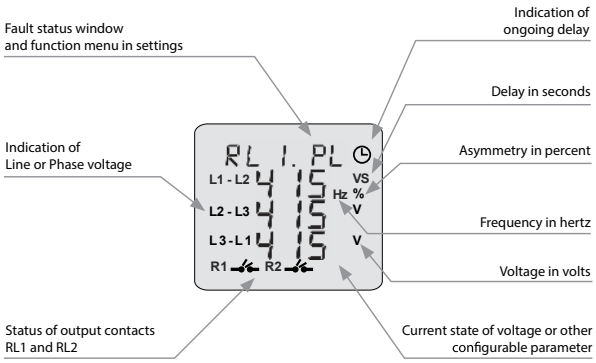
Technical data

	HRN-100
Supply	
Supply and measuring terminals	L1, L2, L3, (N)
Supply and monitored voltage	U_{LN} = 3 ~ 90 - 288 V, (AC 45-65 Hz) U_{LL} = 3 ~ 155 - 500 V, (AC 45-65 Hz)
Power consumption (max.)	5 VA
Measuring circuit	
Selection of the measured circuit	Phase voltage - 3 phase, 4 wire Line voltage - 3 phase, 3 wire
Adjustable upper (OV) and lower (UV) voltage levels	Phase voltage: 90 - 288 VAC Line voltage: 155 - 500 VAC
Upper (HC) / lower (LC) limit voltage	Phase voltage: 310 VAC / 85 VAC Line voltage: 535 VAC / 150 VA
Adjustable upper (OF) and lower (UF) frequency level	45 - 65 Hz
Adjustable asymmetry	5 - 99 VAC / 2 - 50%
Adjustable voltage and frequency hysteresis level	3 - 20 VAC (OV,UV, HC, LC) 0.5 - 2 Hz (OF, UF)
Adjustable hysteresis asymmetry	3 - 99 VAC / 2 - 15%
Accuracy of measured voltage	+/- 5V
Accuracy of measured frequency	+/- 0,3 Hz
Adjustable delay after supply connection P_{on}	1.5 sec 0 - 999 s (HW initialization 250 ms)
Adjustable delay T_{on}	0,5 - 999 s
Adjustable delay T_{off}	0,1 - 999 s
Fixed delay	<100 ms (phase sequence, failure) <200 ms (HC, LC), <500 ms (neutral fail)
Output	
Number of contacts	2x CO ($AgSnO_2$)
Rated current	5A/AC1
Switching power	1200VA/AC1, 150W/DC1
Switched voltage	240V AC/30V DC
Max. output power dissipation	5W
Mechanical life (AC1)	$1x10^7$
Electrical life	$1x10^5$
Other data	
Operating temperature	-10.. +60 °C
Storage temperature	-20.. +70 °C
Electrical strength	4kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP20 terminals/IP40 from front panel
Overvoltage category	III
Pollution degree:	2
Cable size	max. 1x 2,5 mm^2, max. 2x 1,5 mm^2/ with sleeve max. 1x 2,5 mm^2
Dimensions:	90 x 36 x 66,5 mm
Standards:	EN 61812-1, EN IEC 63044

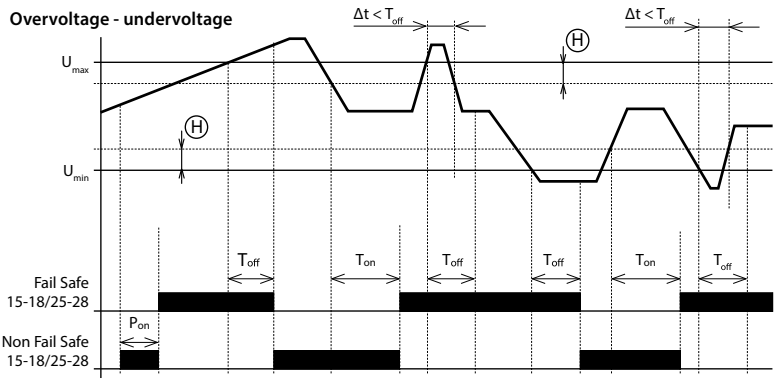
Description



Controlling elements



Overvoltage - undervoltage

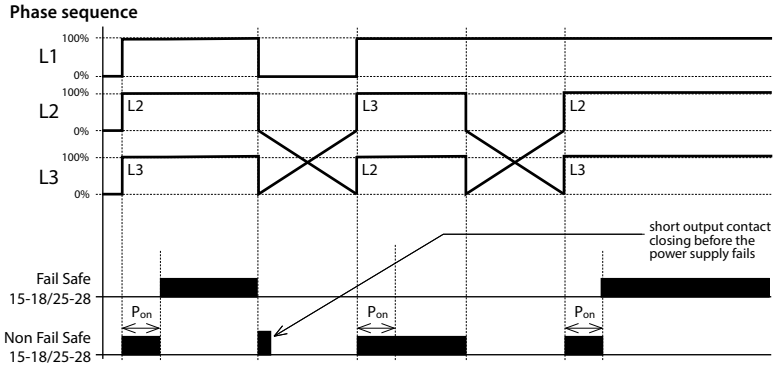


Graph legend:
P_{on} - Power ON delay (delay after power supply connection)
P_{on} = 0 - 999 s (min. 250 ms hardware initialization)
T_{on} - ON Delay (delay to OK state)
T_{on} = 0,5 - 999 s
T_{off} - OFF delay (delay to fault state)
T_{off} = 0,1 - 999 s
T_{off} - Adjustable for OV, UV, OF, UF & asymmetry faults
T_{off} - Phase sequence, failure <100ms;
Neutral fail <500ms

Δt - Duration of the fault state
Ⓗ Hysteresis

- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in the FAIL SAFE mode it is open. After the delay, if the monitored voltage is in the range U_{min}... U_{max}, the output contact closes.
- If the monitored voltage exceeds the set value U_{max}, the time delay to the fault state (T_{off}) starts. After the delay, the output contact opens.
- If the monitored voltage falls below the U_{max} value reduced by the set hysteresis, the time delay start to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off}, the status of the output contact does not change.
- If the monitored voltage falls below the value U_{min}, the time delay to the fault state (T_{off}) starts. After the delay, the output contact opens.
- If the monitored voltage exceeds the value U_{min} increased by the set hysteresis, the time delay start to the OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value (T_{off}), the status of the output contact does not change.

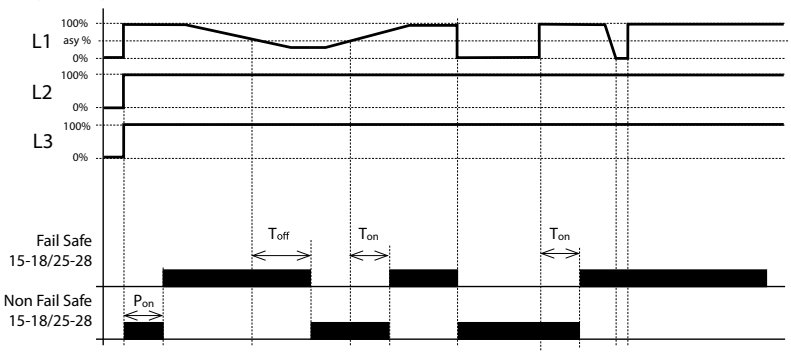
Phase sequence



Graph legend:
P_{on} - Power ON delay (delay after power supply connection)
P_{on} = 0 - 999 s (min. 250 ms hardware initialization)

- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in FAIL SAFE mode it is open. After the delay, if the phase sequence is correct, the output contact closes.
- If the phase sequence is incorrect after the P_{on} delay, the output contact remains open (fault state).

Asymmetry, phase failure



Graph legend:
P_{on} - Power ON delay (delay after power supply connection)
P_{on} = 0 - 999 s (min. 250 ms hardware initialization)
T_{on} - ON Delay (delay to OK state)
T_{on} = 0,5 - 999 s
T_{off} - OFF delay (delay to fault state)
T_{off} = 0,1 - 999 s
T_{off} - Adjustable for OV, UV, OF, UF & asymmetry faults
T_{off} - Phase sequence, failure <100ms;
Neutral fail <500ms

Δt - Duration of the fault state

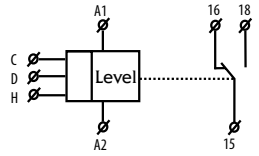
- After the supply/monitored voltage is connected, the delay P_{on} starts timing - during the timing the output contact is in a fault state - in the FAIL SAFE mode it is open. After the delay, if the phase asymmetry is lower than the set value (absolute or percentage), the output contact closes.
- If the phase asymmetry exceeds the set value, the time delay to the fault state (T_{off}) begins. After the delay, the output contact opens.
- If the phase asymmetry falls below the set value, the time delay starts to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off}, the status of the output contact does not change.
- If a phase failure occurs, the time delay to the fault state (T_{off}) begins. After the delay, the output contact opens.
- If the phase failure resumes, the time delay starts to OK state (T_{on}). After the delay, the output contact closes.
- If the duration of the fault state (Δt) is shorter than the set value T_{off}, the status of the output contact does not change.

Level switch HRH-5

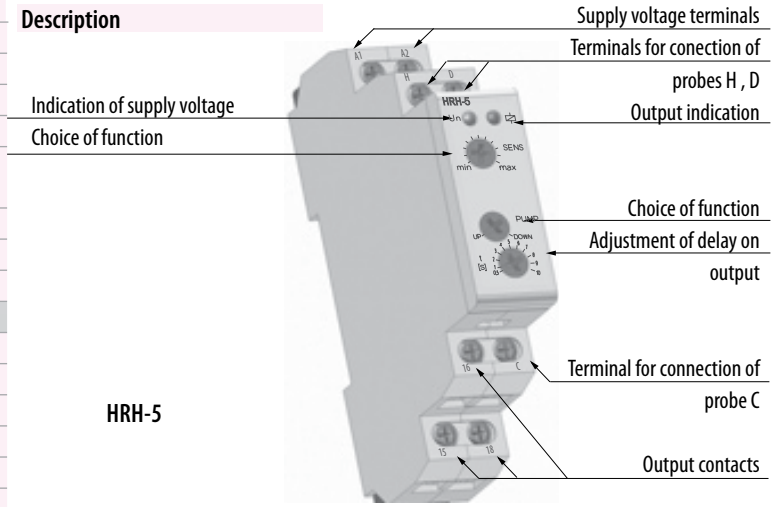
Technical data

	HRH-5
Functions:	2
Supply terminals:	A1 - A2
Supply voltage:	24... 240 V AC/ DC
Input:	max. 2 VA
Tolerance of supply voltage:	-15 %; +10 %
Measuring circuit	
Sensitivity (input resistance):	adjustable in range 5 kΩ -100 kΩ
Voltage in electrodes:	max. 3.5 V AC
Current in probes:	<0.1 mA AC
Time response:	max. 400 ms
Max. capacity of probe cable:	max. 400 ms
Time delay (t):	800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ)
Time delay after switching on (t1):	adjustable, 0.5 -10 sec
Accuracy	1.5 sec
Accuracy in setting (mechanical):	± 5 %
Output	
Number of contacts:	1x changeover (AgNi)
Rated current:	8 A / AC1
Switched output:	2500 VA , 240 W
Switched voltage:	250 V AC1 / 24 V DC
Min. switched output DC:	500 mW
Mechanical life (AC1):	$1x10^7$
Electrical life:	$1x10^5$
Other data	
Operational temperature:	-20.. +55 °C
Storing temperature:	-30.. +70 °C
Electrical strength:	3.75 kV (supply - sensors)
Operational position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP 40 from font panel
Overvoltage category:	III
Pollution degree:	2
Profile of connecting wires (mm^2)	max.1x 4, max.2x2.5/ with sleeve max. 1x2.5, 2x1.5
Dimensions:	90 x 17.6 x 64 mm
Weight:	72 g
Applicable standards:	EN 60255-6, EN 61010-1

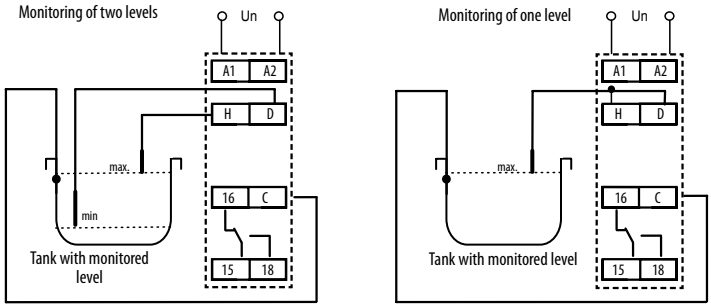
Symbol



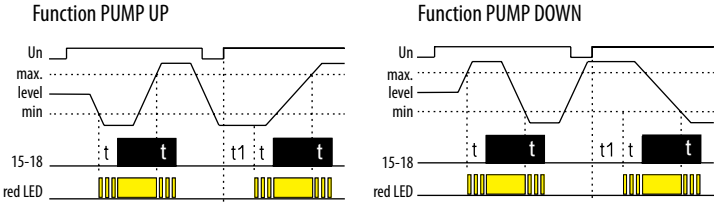
Description



Connection



Functions

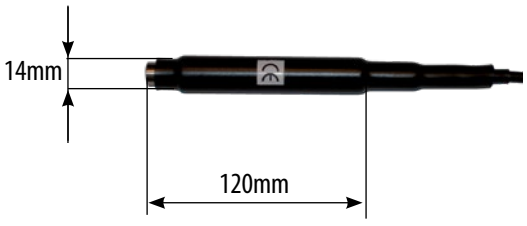


Technical data - Measuring probes HRH

	HRH-5-measuring probes
Cables	10m, 15m, 20m, 30m, 40m
Max. cable size	1,5 mm^2
Insulation voltage Ui	750 V
Fluids	Conductible, unaggressive *

* Special probes for aggressive fluids

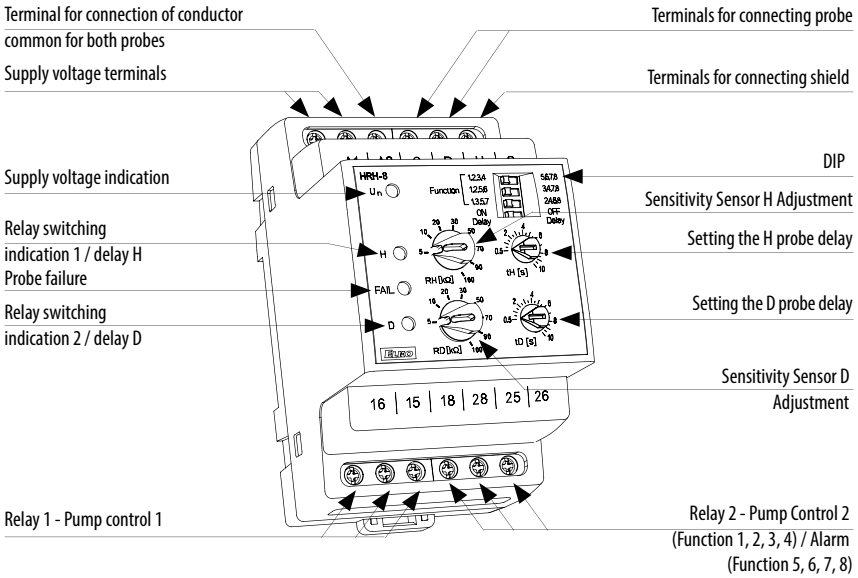
Relay is designated for monitoring of levels of conductive liquids with possibility of functions: PUMP UP or PUMP DOWN. To prevent polarization and liquid electrolysis of liquid, and undesirable oxidation of measuring probes, alternating current is used. For measuring use three measuring probes: H- upper level, D- lower level, C - common probe. In case you use a tank made of a conductive material, you can use it as probe C. In case you require monitoring of one level only, it is necessary to connect inputs H and D and connect them to one probe - in this case sensitivity is lowered by half (2.5... 50kΩ). Probe C can be connected with a protective wire of supply system (PE). To prevent undesirable switching out output contacts by various influences (sediment on probes, humidity...) it is possible to set sensitivity of the device according to conductivity of monitored liquid (corresponding to "resistance" of liquid) range 5 up to 100...kΩ. To reduce influences of undesirable switching of output contacts by liquid gorgle in tanks, it is possible to set delay of output reaction 0,5 - 10s.



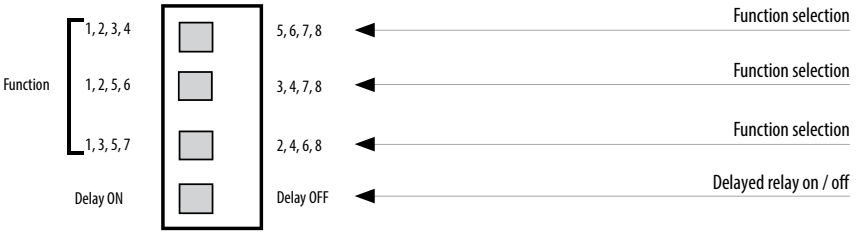
Level switch HRH-8

Technical data		
		HRH-8
Function		8
Supply terminals		A1-A2
Voltage range		AC 230 V, AC 110 V, AC 400 V, AC/DC 24 V (AC 50 - 60 Hz)
Max load		2,5 W / 5 VA (AC 230 V, AC 110V, AC 400 V), 1,4 W / 2 VA (AC/DC 24 V)
Supply voltage tolerance		-15 %; +10 %
Measuring circuit		
Hysteresis (input - opening)		5 kΩ - 100 kΩ
Voltage on electrode		max. AC 3,5 V
Current in probes		AC < 1 mA
Time reaction		max. 400 ms
Max. cable capacity		800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ)
Time delay t		0,5 -10 s
Accuracy		
Setting accuracy (mech.):		± 5 %
Output		
Number of contacts		2x changeover / SPDT (AgNi / Silver Alloy)
Current rating		16 A / AC1
Breaking capacity		4000 VA / AC1, 384 W / DC
Inrush current		30 A / < 3 s
Switching voltage		250 V AC1 / 24 V DC
Output indication		red LED
Mechanical life		$3x10^7$
Electrical life (AC1)		$0,7x10^5$
Other information		
Operating temperature		-20 ... +55 °C
Storage temperature		-30 ... +70 °C
Electrical strength		4 kV (supply - output)
Operating position		any
Mounting		DIN rail EN 60715
Protection degree		IP40 from front panel / IP20 terminals
Overvoltage category		III
Pollution degree		2
Max. cable size (mm^2)	solid wire	max. 1x 2,5 / 2x1,5
	with cavern	1x 1,5 (AWG 12)
Dimensions		90 x 52 x 65 mm
Standards		EN 60255-6, EN 61010-1

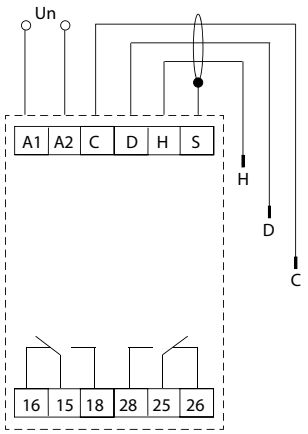
Description



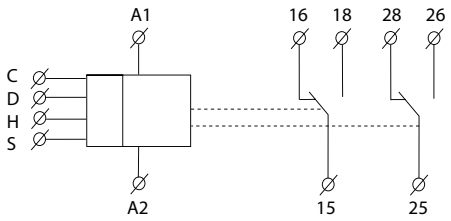
Description and importance of DIP switches



Connection



Symbol

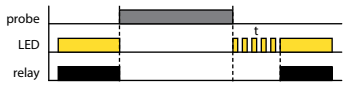


Measuring probes

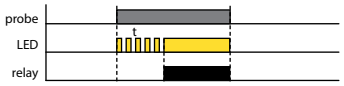
There can be any measuring probe (any conductive contact, it is recommended to use brass or stainless steel).
The probe wire does not need to be shielded, but it is recommended.
When using a shielded wire, the shielding is connected to terminal S.

Functions

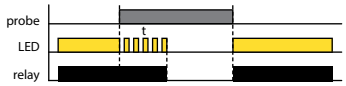
PUMP UP, ON DELAY (Function 1,3,4)



PUMP DOWN, ON DELAY (Function 2,3,4)



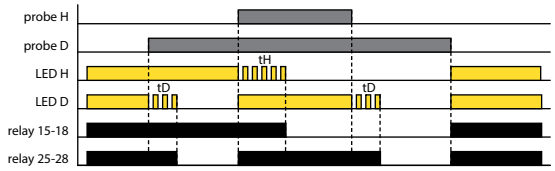
PUMP UP, OFF DELAY (Function 1,3,4)



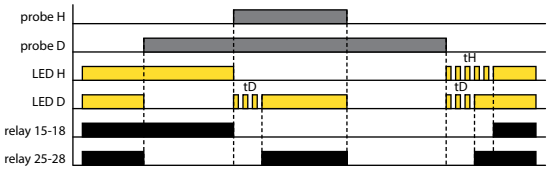
PUMP DOWN, OFF DELAY (Function 2,3,4)



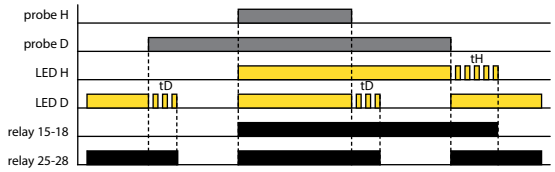
PUMP UP, OFF DELAY (Function 5)



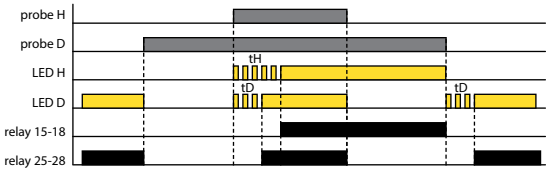
PUMP UP, ON DELAY (Function 5)



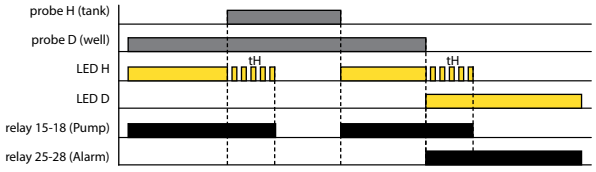
PUMP DOWN, OFF DELAY (Function 6)



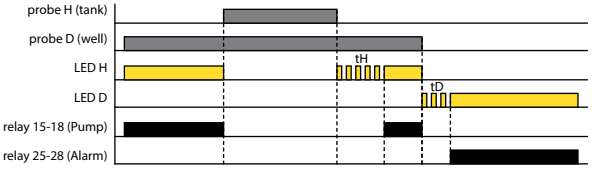
PUMP DOWN, ON DELAY (Function 6)



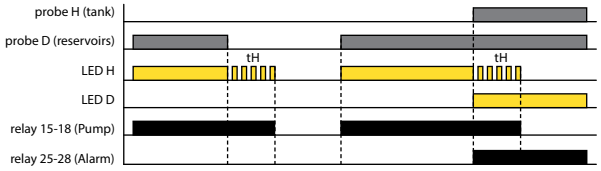
WELL - TANK, OFF DELAY (Function 7)



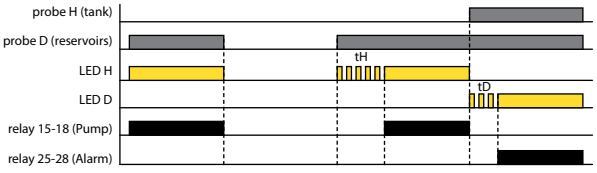
WELL - TANK, ON DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



RESERVOIRS - TANK, ON DELAY (Function 8)



Function description

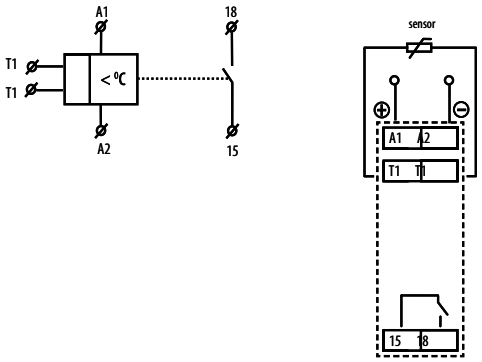
The relay is designed to monitor the level of conductive liquids with a choice of 8 functions:
1) - 2 separate tanks (each with 1 probe) - both PUMP UP (fi lling)
2) - 2 separate tanks (each with 1 probe) - both PUMP DOWN (emptying)
3) - 2 separate tanks (each with 1 probe) - H PUMP DOWN probe, D PUMP UP probe
4) - 2 separate tanks (each with 1 probe) - H PUMP UP probe, probe D PUMP DOWN
5) - both probes in one tank - PUMP UP - maintain level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (level is not between probes H and D)
6) - Both probes in one tank - PUMP DOWN - maintaining the level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (the level is not between probes H and D)
7) - Pumping from the well to the tank - probe D in the well, probe H in the tank. The pump only runs if the probe D is flooded (enough water in the well) and the tank is not full (probe H). The alarm reports a lack of water in the well (probe D is not flooded).
8) - Pumping from the reservoir to the tank - probe D in the reservoir, probe H in the tank. The pump only runs if the probe D is flooded (full reservoir) and the tank is not full (probe H). The alarm reports the status of full tank and reservoir (both probes are flooded).
LED indication:
The red LED lights up - the corresponding relay is switched on
Red LED flashes - delay timing
The yellow LED indicates probe failure - Functions 5, 6 probe H is flooded and probe D is not. At the same time both red LEDs flash.
To prevent polarization and electrolysis of the liquid and undesirable oxidation of the monitoring probes, an AC current of 10 Hz is used for monitoring.
The low frequency has a positive eff ect on suppression of interference by 50 (60) Hz. Three probes are used to monitor the level: H - upper level, D - lower level and C - common probe. In the case of the use of a conductive material tank, it is possible to use the tank itself as a C probe. Probe C can also be connected to the protective conductor of the power supply system (PE). To prevent undesired switching by various infl uences (soiling of dips, moisture ...), the sensitivity of the device can be set according to the conductivity of the liquid being monitored (corresponding to the "resistance" of the liquid) in the range of 5 to 100 kΩ. To limit the eff ect of undesired switching of output contacts by raising the liquid level in the tank, it is possible to set the output response delay 0,5 - 10 s.

Thermostat relay TER-3 (A, B, C)

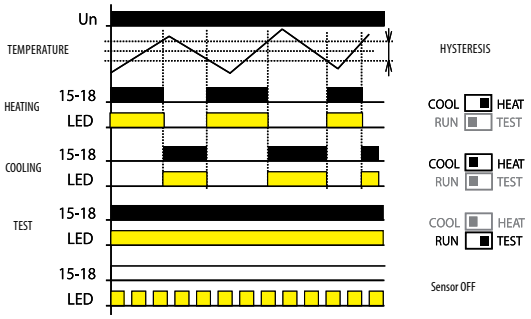
Technical data

	TER-3 (A, B, C)		
Function	single level		
Supply	A1-A2		
Universal supply	AC/DC 24-240 galvanically unseparated		
Consumption	2 VA		
Supply voltage tolerance	-15% - +10%		
Measuring circuit			
Measuring terminals	T1 - T1		
Temperature range	TER-3A	TER-3B	TER-3C
	-30..+10 °C	0..+40 °C	-30..+70 °C
Hysteresis	adjustable in range 0.5...5K		
Sensor	external, termistor NTC		
Sensor fault indication	flashing red LED		
Setting accuracy - mechanical	5%		
Switching difference	0,5°C		
Temperature coefficient	< 0.1 % / °C		
Output			
Number of contacts	1 x changeover (AgNi)		
Rated current	16 A / AC1, 10A/24 V DC		
Breaking capacity	4000 VA / AC1, 300W / DC		
Switching voltage	250V AC1/ 24V DC		
Min. breaking capacity DC	500 mW		
Output indication	red LED		
Mechanical life	$3x10^7$		
Electrical life	$0,7x10^5$		
Controlling			
Operating temperature	-20...+55 °C		
Storage temperature	-30...+70 °C		
Electrical strength	4 kV		
Operating position	any		
Mounting	DIN rail EN 60715		
Protection degree	IP 40 from front panel		
Overvoltage category	III.		
Pollution degree	2		
Max. cable size	2.5 mm^2		
Dimensions	90 x 17,6 x 64 mm		
Standards	EN 60730-2-9, EN 61010-1		

Connection

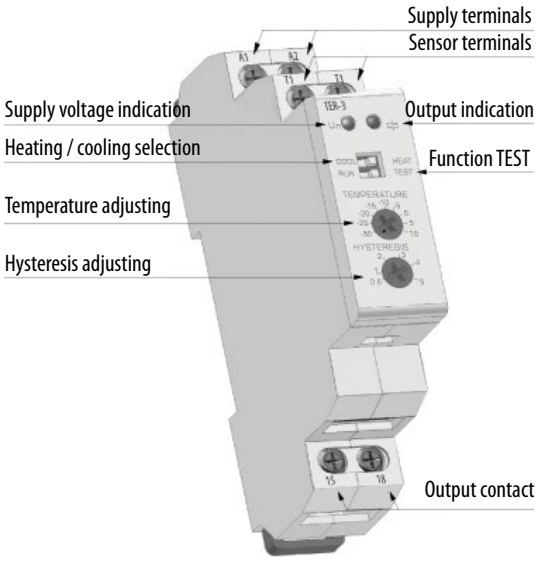


Functions



TER-3 It is a single but practical thermostat with a separated sensor for monitoring temperature. The device is placed in a switchboard and an external sensor senses temperature of required space, object or liquid. Supply is not galvanically separated from the sensor. The sensor is double insulated. Maximal length of a delivered sensor is 12m. device has in-built
indication of sensor damage, which means that in case of short-circuit or disconnection red LED flashes. Thanks to adjustable hysteresis , it is advantageous to regulate width of the range and thus define sensitivity of load switching. Sensed temperature is decreased by set hysteresis. When installing it is necessary to keep in mind that hysteresis is increased by temperature gradient between sensor's jacket and thermistor.

Description



Thermostat for monitoring temperature of motor winding TER-7

Technical data

	TER-7
Function	monitoring temperature of motor winding
Supply terminals	A1-A2
Supply voltage	24 - 240 V AC/DC
Consumption	max. 2 VA
Supply voltage tolerance	-15 %; +10 %
Measuring circuit	
Measuring terminals	Ta-Tb
Cold sensor resistance	50 Ω - 1.5 kΩ
Upper level	3.3 kΩ
Bottom level:	1.8 kΩ
Sensor:	PTC temperature of motor winding
Sensor failure indication	blinking red LED
Accuracy	< 5%
Accuracy in repetition	± 5 %
Temperature dependance	< 0.1 % / °C
Output	
Number of contacts	2x changeover (AgNi)
Rated current	8 A / AC1
Breaking capacity	2000 VA / AC1, 192 W / DC
Inrush current	10 A /< 3 s
Switching voltage	250 V AC1 / 24 V DC
Min. breaking capacity DC	500mW
Mechanical life	$3x10^7$
Electrical life	$0.7x10^5$
Other information	
Operating temperature	- 20 .. +55 °C
Storage temperature	- 30 .. +70 °C
Electrical strength	4 kV (supply - output)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40
Overvoltage category	III.
Pollution degree	2
Max. cable size (mm^2)	solid wire max.1x 2.5 or 2x1.5 with sleeve max. 1x2.5
Dimensions	90 x17.6 x 64 mm,
Weight	83 g
Standard	EN 60730-2-9, EN 61010-1

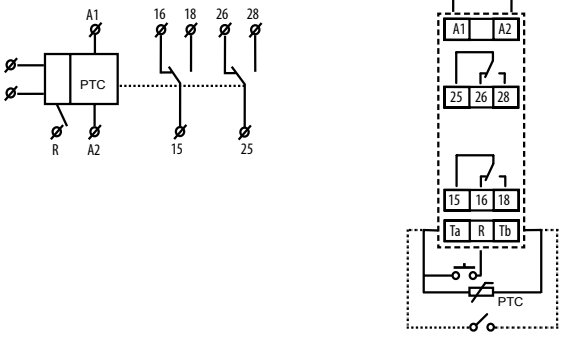
Note:

Sensors could be in series in abide with conditions in technical specifi cation - switching limit.

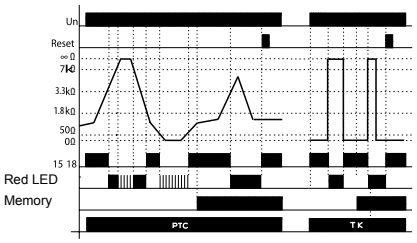
Warning!:

In case of supply from the main, neutral wire must be connected to terminal A2.

Symbol and connection

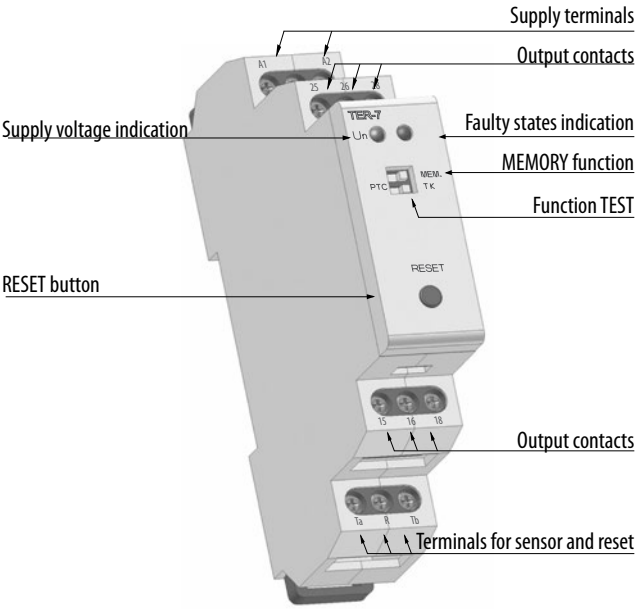


Function



The device controls temperature of motor winding with PTC thermistor which is mostly placed in motor winding or very close to it. Resistance of PTC thermistor run to max 1.5 kΩ in cold stage. By temperature increase the resistance goes strongly up and by overrun the limit of 3.3 kΩ the contact of output relay switch off - mostly contactor controlling a motor. By temperature decrease and thereby decrease of thermistor resistance under 1.8 kΩ the output contact of relay again switches on. The relay has function "Control of sensor fault". This controls interruption or disconnection of sensor. When switch is in position "TK" monitoring of faulty sensor is not functional - it is possible to connect bimetal sensor with only 2 states: ON or OFF. The device can work with bi-metal sensor in this position. Other safety unit is function "Memory". By temperature overrun (and output switches off) the output is hold in faulty stage until service hit. This bring the relay to normal stage (with RESET button) on front panel or by external contact (remote).

Description

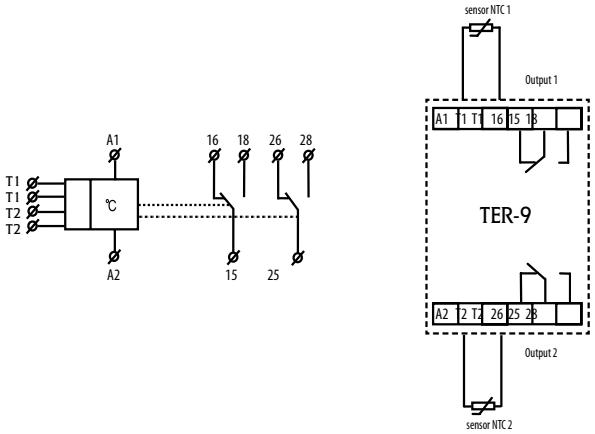


Multifunction digital thermostat TER-9

Technical data

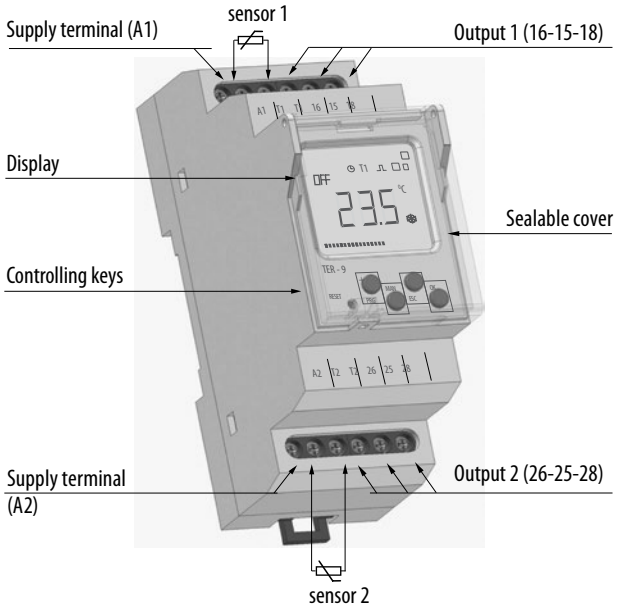
	TER-9
Number of functions	6
Supply	A1-A2
Supply voltage	AC 230V or AC/DC 24V, galvanically separated
Consumption	max. 3,5 VA
Supply voltage tolerance	-15% - +10%
Measuring circuit	
Measuring terminals	T1 - T1 in T2-T2
Temperature range	-40...+110 °C
Hysteresis (sensitivity):)	adjustable in range 0.5...5K
Difference temperature	adjustable 1.. 20 °C
Sensor	termistor NTC 12Ω at 25°C
Sensor fault indication	sign "Err"
Measuring accuracy	5 %
Repeat accuracy	<0,5 %
Temperature coefficient	< 0.1 % / °C
Output	
Number of contacts	1 x changeover for each output (AgNi)
Rated current	8 A / AC1
Breaking capacity	2500 VA / AC1, 240W / DC
Switching voltage	250V AC1/ 24V DC
Min. breaking capacity DC	500 mW
Output indication	ON / OFF
Mechanical life	$1x10^7$
Electrical life	$1x10^5$
Controlling	
Operating temperature	-20...+55 °C
Storage temperature	-30...+70 °C
Electrical strength	4 kV (supply - contact)
Operating position	any
Mounting	DIN rail EN 60715
Protection degree	IP 40 from front panel
Overvoltage category	III.
Pollution degree	2
Max. cable size	2.5 mm^2
Dimensions	90 x 35,6 x 64 mm
Standards	EN 60730-2-9, EN 61010-1, EN 61812-1

Connection

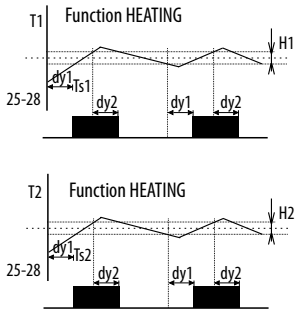


Note: It is possible to operate the device with one sensor. In such case it is necessary to connect resistor10kΩ. This resistor is a part of delivery.

Description



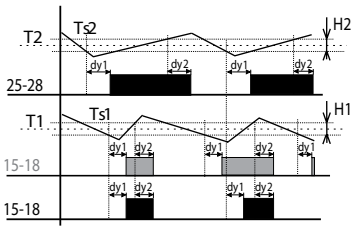
2 independent single-stage thermostat



Legend:
Ts1 - real (measured) temperature 1
Ts2 - real (measured) temperature 2
T1 - adjusted temperature T1
T2 - adjusted temperature T2
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1 - set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (for T1)
25-28 output contact (for T2)

Output contact switched until adjusted temperature is reached. Hysteresis eliminates frequent switching. Heating/cooling function adjusted in the menu.

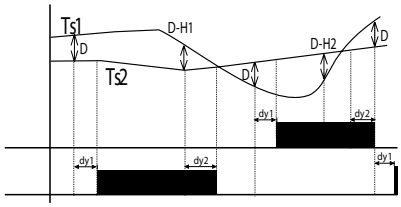
Dependent functions of 2 thermostats



Legend:
Ts1 - real (measured) temperature 1
Ts2 - real (measured) temperature 2
T1 - adjusted temperature T1
T2 - adjusted temperature T2
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
25-28 output contact (for T2)
15-18 output contact (intersection T1 and T2)

Output 15-18 is closed, if temperature of both thermostats is bellow an adjusted level. When any thermostat reaches adjusted level, the contact 15-18 open. Serial inner connection of thermostats (logic function AND).

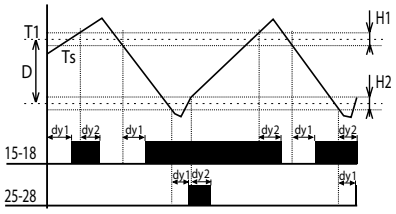
Differential thermostat



Legend:
Ts1 - real (measured) temperature T1
Ts2 - real (measured) temperature T2
D - adjusted difference
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (for T1)
25-28 output contact (for T2)

Switching of output corresponds with input, which has lower temperature when difference is exceeded differential thermostat is used for keeping two identical temperature e.g. in heating systems (boiler and reservoir), solar systems (collector - reservoir, exchanger), water heating (water heater, water distribution) etc.

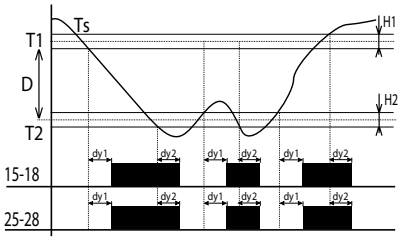
2-stage thermostat



Legend:
Ts - real (measured) temperature
T1 - adjusted temperature
D - adjusted diff erence
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Typical example of use for two-stage thermostat is e.g in boiler-room, where there are two boilers from which one is main and the other one is auxiliary. The main boiler is managed according to set temperature and auxiliary boiler is switched in case temperature falls under set difference.
Thus it helps to the main boiler in case outside temperature dramatically falls. In the range of difference (D) output 15-18 functions as normal thermostat to input 1 (type 1). In case temperature falls under set difference, output 2 switches.

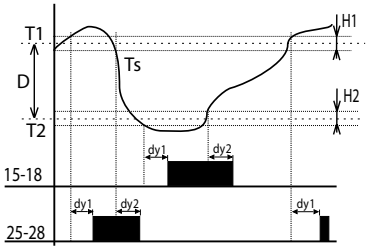
Thermostat with "WINDOW"



Legend:
Ts - real (measured) temperature
T1 - adjusted temperature MAX
T2 - adjusted temperature MIN (T2=T1-D)
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact
25-28 output contact

Output is closed (heating) only if temperature is within adjusted range. If temperature is out of range, the contact opens. T2 is set as T1-D.
The function is used for protection of gutters against freezing.

Thermostat with dead zone



Legend:
Ts - real (measured) temperature
T1 - adjusted temperature T1
T2- adjusted temperature T2 (T2=T1-D)
H1 - adjusted hysteresis for T1
H2 - adjusted hysteresis for T2
dy1- set switching delay of the output
dy2 - set delay on output breaking
15-18 output contact (heating)
25-28 output contact (cooling)

In case of thermostat with a „dead zone" , it is possible to set temperature T1 and a difference (respectively a width of dead zone D). In case the temperature with set hysteresis H1 is lower than T1, the output contact switches heating ON and when T1 is reached it opens. In case the temperature falls under T2, contact switches cools down and opens when T2 is reached. This function can be used for example for automatic air warming and cooling in ventilation so the sit is always within the range T1 and T2.

Thermal sensor TZ

Temperature sensors are made of thermistor NTC embedded in a metal sleeve by thermo-conductive sealer (TZ)

Sensor TZ : - cable V03SS-F 2Dx0,5mm with silicon insulation
- suitable mainly for use in extreme temperatures

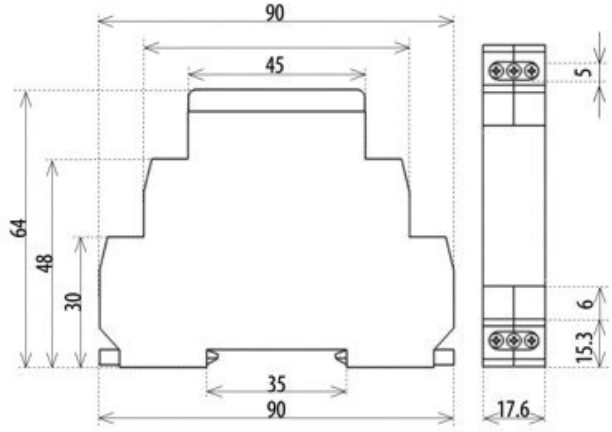
Technical parameters TZ	
Range:	-40...+125°C
Scanning element:	NTC 12K 2%
In air/in water:	(t65) 62s/8s
In air/in water:	(t95) 216s/23s
Cable material:	silicone
Terminal material:	nickel-couted copper
Protection degree:	IP 67
Protection class:	II (double insulation)

Resistive values of sensors in dependance on temperature	
Temperature (°C)	Sensor NTC (kΩ)
20	14,7
30	9,8
40	6,6
50	4,6
60	3,2
70	2,3

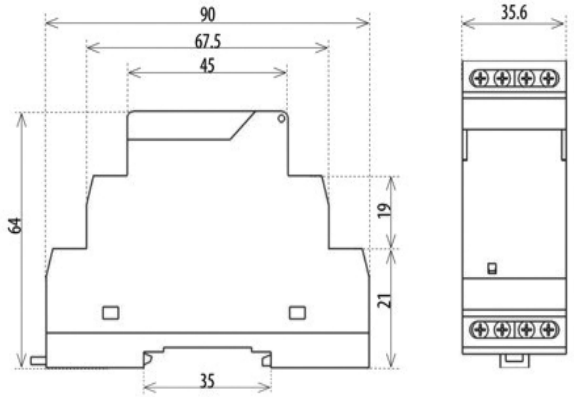
TZ: Thermal sensors for range -40...+125°
TZ-0 - Thermo sensor can be connected directly to terminal block (length of the sensor 110mm)
TZ-3 - Temperature sensor 3m, double isolation silicone
TZ-6 - Temperature sensor 6m, double isolation silicone
TZ-12 - Temperature sensor 12m, double isolation silicone

Dimensions

1-module devices



2-module devices



Product loadability

It is valid for following products: CRM-4, SHT-1, MR-41, MR-42, SOU-1, SHT-1/2, SHT-3, SHT-3/2, CRM-42, SMR-B

	Load								
relay contact 16 A						AC1	AC3	AC15	DC1 (24/110/220 V)
$AgSNO_2$	2000 W	1000 W	1000 W	750 W	500 W	4000 VA	0,9 kW	750 VA	16A/0,5A/0,35A

It is valid for following products: CRM-93H, SOU-2, HRN-54, HRN-54N, PRI-51, TER-9

	Load								
relay contact 8 A						AC1	AC3	AC15	DC1 (24/110/220 V)
AgNi	500 W	x	x	x	x	2000 VA		375 VA	8A/0,4A/0,25A

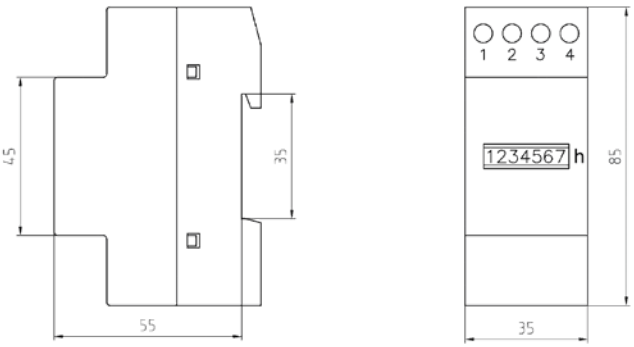
It is valid for following products: CRM-91H, CRM-2H, CRM-2T, HRN-33, HRN-34, HRN-35, TER-3

	Load								
relay contact 16 A						AC1	AC3	AC15	DC1 (24/110/220 V)
AgNi	1000 W	x	x	x	x	4000 VA	0,9 kW	750 VA	16A/0,5A/0,35A

Hour meter HM-1

Technical data	
Mechanical data	**description**
Display	5 integers, 2 decimals
Digit height	4mm
Counting range	99999,99
Reading accuracy	1/100 h (36sec)
Weight	32g
Electrical data	
Operating voltage	230V+/- 10%, 50Hz
Current consumption	max. 8mA
Accuracy	+/- 0,02%
IP protection	IP40
Ambient conditions	
Operating temperature	-25°C .. + 70°C
Storage temperature	-40°C .. + 70°C
Relative humidity	max. 80% / +25°C
Approvals	CE Mark RoHS compliant

Dimensions

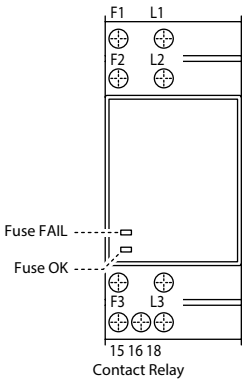


Electronic fuse monitor EFM

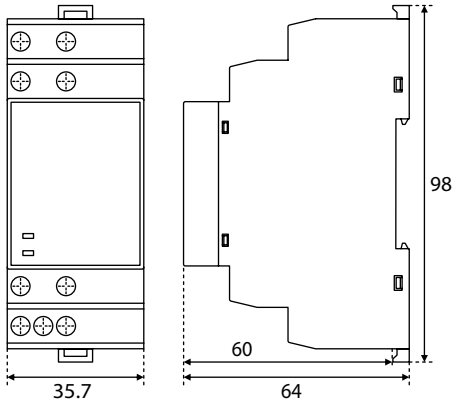
Technical data

		EFM230	EFM400
Input			
Supply voltage AC ±10%	V~	230	400
Nominal Frequency	Hz	50-60 (range:47-63)	
Power consumption (max. AC)	VA	3,6	1,5
Output relay			
Rating	-	8A-250V AC /24V DC	
Max switching power	VA	2000	
Max switching voltage	V~	400	
Min switching load	-	10mA 12V dc	
Contact life		$30x10^3$ ops / $100x10^3$ ops	
Changeover contacts	-	AgNiO.15	
Status indication			
Fuse OK	-	Green LED - Relay ON	
Fuse FAIL	-	Red LED - Relay OFF	
General			
Internal resistance paths	Ω/V	>2000	
Permissible feedback (Ue)	-	max. 90	
Response/Release Time:			
- After Breaking Fuse	ms	<30	
- After Restoring Fuse	ms	<500	
Working temperature	°C	-20...+50	
Storage temperature	°C	-30...+70	
Electrical Insulation	kV	4	
Overvoltage Category	-	III	
Protection degree	IP	20	
Pollution degree	-	2	
Climatic category	-	IEC 60068-1 (20/050/60), DIN 40040 (class D)	
Altitude up to	m	2000	
Dimensions	mm	98x35,7x64	

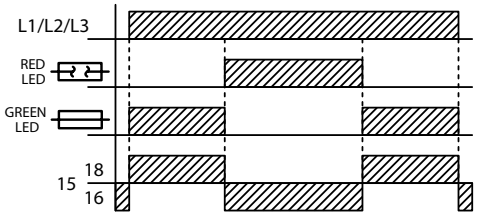
Description



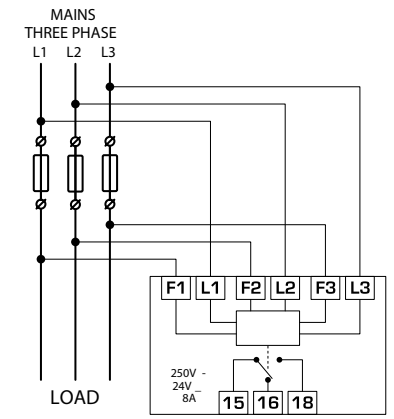
Dimensions

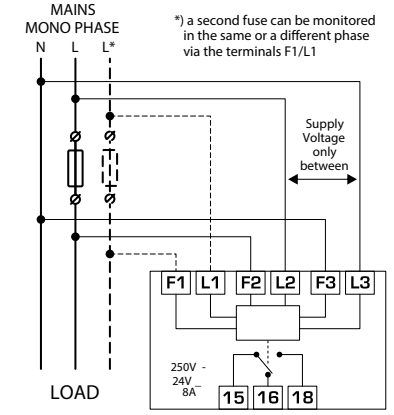


Function



Connection





Electromechanical power relays RERM3

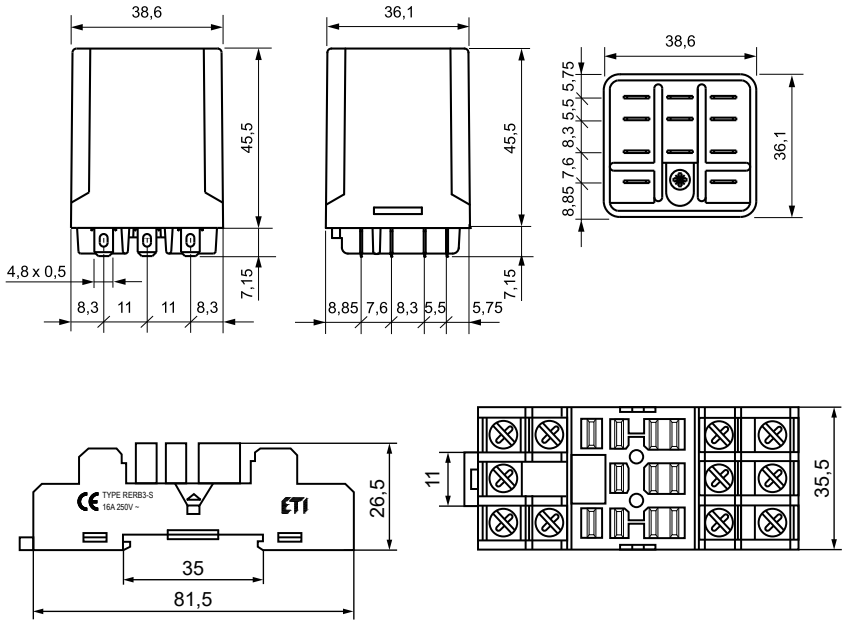
Table 1: Technical data

	RERM3	
Contact Data		
Number and type of contacts	3 CO	
Contact material	AgNi	
Rated / max. switching voltage AC	440 V	
Min. switching voltage	5V	
Rated load (capacity)	16 A / 250 V AC 10 A / 400 V AC	
Min. switching current	5 mA	
Max. inrush current	40A	
Rated current	16A	
Max. breaking capacity AC1	4000 VA	
Min. breaking capacity	0.3W	
Contact resistance	≤ 100 mΩ	
Max. operating frequency (cycles/hour)		
• at rated load AC1	1 200	
• no load	12 000	
Coil data		
Rated voltage	AC: 24V, 240V	
Must release voltage	AC: ≥ 0,15 Un	
Operating range of supply voltage	see next page	
Rated power consumption	2,8 VA (50Hz) / 2,5 VA (60Hz)	
Insulation according to EN 60664-1		
Insulation rated voltage	400 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	
Overvoltage category	III	
Insulation pollution degree	2	
Dielectric strength between coil and contacts (basic insulation)	2500 V AC	
Dielectric strength - contact clearance - micro disconnection - full disconnection with contact gap ≥3mm	 1500 V AC 2500 V AC	
Dielectric strength pole-pole (basic insulation)	2500 V AC	
Contact - coil distance		
- Clearance	≥ 5 mm 2CO, 2NO	≥ 4 mm 3CO, 3NO
- Creepage	≥ 8 mm 2CO, 2NO	≥ 5 mm 3CO, 3NO
General data		
Operating / release time (typical values)	20 ms / 15 ms	
Electrical life		
- Resistive AC1	$>10^5$ 16 A, 250 V AC / 10 A, 400 V AC	
- cos φ	See next page	
Mechanical life (cycles)	$>10^7$	
Dimensions	36,1 x 38,6 x 45,5 mm	
Ambient temperature		
- storage	- 40...+85°C	
- operating	- 40...+55°C	
Cover protection category	IP 00	
Environmental protection	RTI	
Shock resistance (NO/NC)	10 g	
Vibration resistance	5g 10...150 Hz	
Solder bath temperature	max. 270°C	
Soldering time	max. 5s	

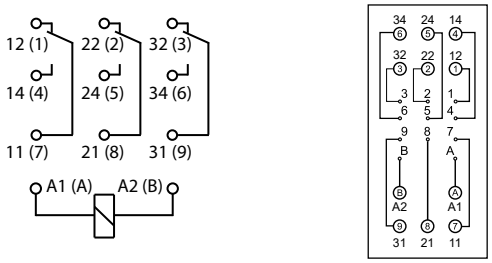
Table 2: Coil data

Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 55 °C)
024AC	24	75	± 15%	19,2	26,4
230AC	230	7080	± 15%	184,0	253,0

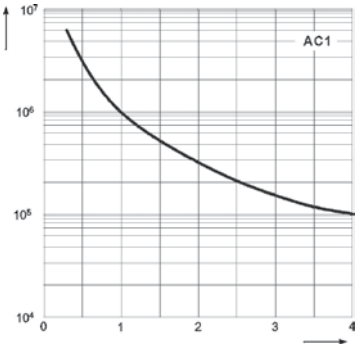
Dimensions



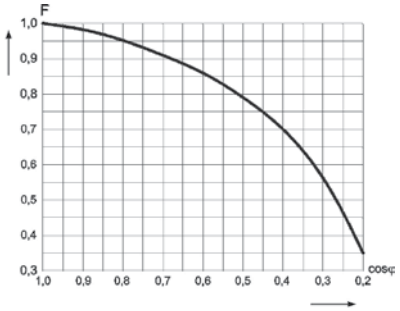
Connection diagram (pin side view)



Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour



Electrical life reduction factor at AC inductive load



Industrial plugin electromagnetic relays

Relays for general application
For plug-in sockets: 35 mm rail mount acc. to EN 60715; panel mounting
Miniature dimensions
Cadmium - free contacts
AC and DC coils
Recognitions, certifications, directives: RoHS, CE
Standards: EN61810-1:2008 (electromechanical relays); EN61984:2002, EN60998-2-1:2001, EN60664-1:2003 (sockets)

Table 1: Technical data

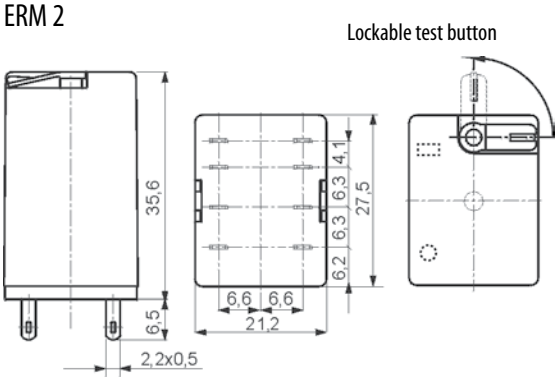
	ERM2	ERM4
Number and type of contacts	2 CO	4 CO
Contact material	AgNi	
Rated / max. switching voltage AC	250 V / 440 V	250 V / 250 V
Min. switching voltage	10 V	10 V AgNi, 10 V AgNi/Au 0,2 µm, 5 V AgNi/Au 5 µm
Rated load (capacity) AC1 AC15 AC3 DC1 DC13	 12 A / 250 V AC 3 A / 120 V 1,5 A / 240 V 370 W (single-phase motor) 12 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V	 6 A / 250 V AC 1,5 A / 120 V 0,75 A / 240 V (C300) 125 W (single-phase motor) 6 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V (R300)
Min. switching current	5 mA	
Max. inrush current	24 A	12 A
Rated current	12 A	6 A
Max. breaking capacity AC1	3 000 VA	1 500 VA
Min. breaking capacity	0,3 W	0,3 W AgNi, 0,3 W AgNi/Au 0,2 µm, 0,1 W AgNi/Au 5 µm
Contact resistance	≤ 100 mΩ	
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 1 200 18 000	
Coil data		
Rated voltage 50/60 Hz AC DC	See table 2	
Must release voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Operating range of supply voltage	see Table 2	
Rated power consumption AC DC	1,6 VA 0,9 W	
Insulation according to EN 60664-1		
Insulation rated voltage	250 V AC	
Rated surge voltage	4 000 V 1,2 / 50 µs	2 500 V 1,2 / 50 µs
Overvoltage category	III	II
Insulation pollution degree	3	2
Dielectric strength • between coil and contacts • contact clearance • pole - pole	 2 500 V AC type of insulation: basic 1 500 V AC type of clearance: micro-disconnection 2 500 V AC type of insulation: basic	
Contact - coil distance • clearance • creepage	 ≥ 2,5 mm ≥ 4 mm	 ≥ 1,6 mm ≥ 3,2 mm
General data		
Operating / release time (typical values)	AC: 10 ms / 8 ms DC: 13 ms / 3 ms	
Electrical life • resistive AC1 • cosΦ	 $> 10^5$ 12 A, 250 V AC see Fig. 2	 $> 10^5$ 6 A, 250 V AC see Fig. 2
Mechanical life (cycles)	> 2 x 107	
Dimensions (L x W x H)	27,5 x 21,2 x 35,6 mm	
Weight	35 g	
Ambient temperature • storage • operating	 -40...+85 °C AC: -40...+55 °C DC: -40...+70 °C	
Cover protection category	IP 40 EN 60529	
Environmental protection	RTI EN 116000-3	
Shock resistance (NO/NC)	10 g / 5 g	
Vibration resistance	5 g 10...150 Hz	

Table 2: Coil data

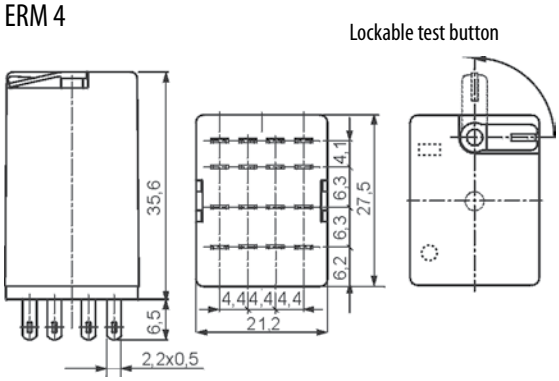
DC voltage version					
Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
012DC	12	160	± 10%	9,6	21,6
024DC	24	640	± 10%	19,2	43,2
048DC	48	2600	± 10%	38,4	86,4
110DC	110	13600	± 10%	88	198
220DC	220	54000	± 10%	176	250
AC voltage version					
Coil code	Rated voltage V AC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V AC	
				min. (at 20 °C)	max. (at 20 °C)
024AC	24	158	± 10%	19,2	25,3
230AC	230	16100	± 10%	184,0	253

Dimensions

ERM 2

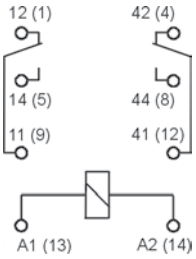


ERM 4

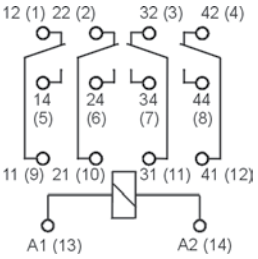


Connection diagram (pin side view)

ERM 2



ERM 4



Ordering designation
ERMX-YYYYYZ

X – Number of contacts:
4: 4 CO (4 changeover)
2: 2 CO (2 changeover)

YYYYY – Coil code:
024AC: 24 V AC 50/60 Hz
230AC: 230 V AC 50/60 Hz
024DC: 24 V DC
012DC: 12 V DC

Z – Additional features:
L – Light indicator (smd LED - red)

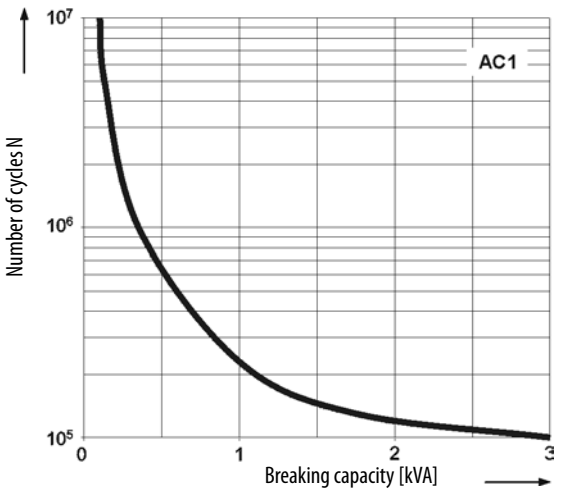
Example:
ERM4-024DCL Electromagnetic relay for plugin sockets with mechanical indication and lockable test button, four changeover contacts, coil voltage 24 V DC with light indicator.

Meaning of color codes:

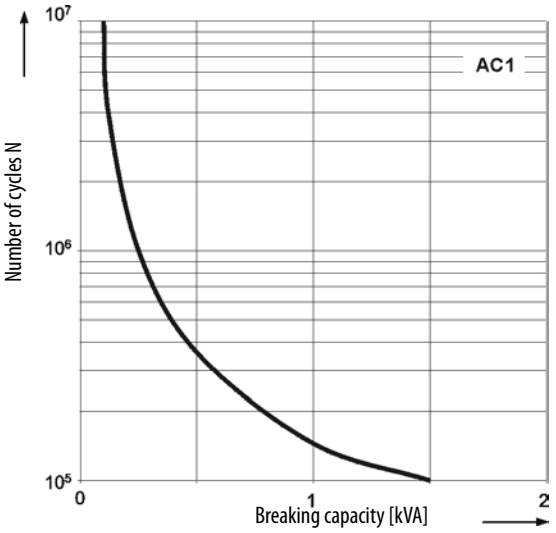


Electrical life at AC resistive load. Switching frequency: 1 200 cycles/hour Fig. 1

ERM 2

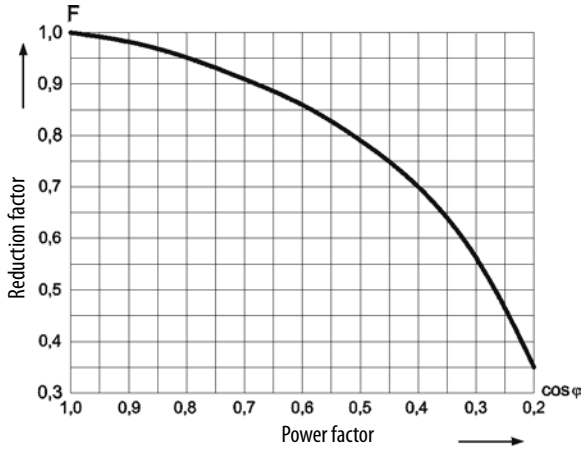


ERM 4



Electrical life reduction factor at AC inductive load Fig. 2

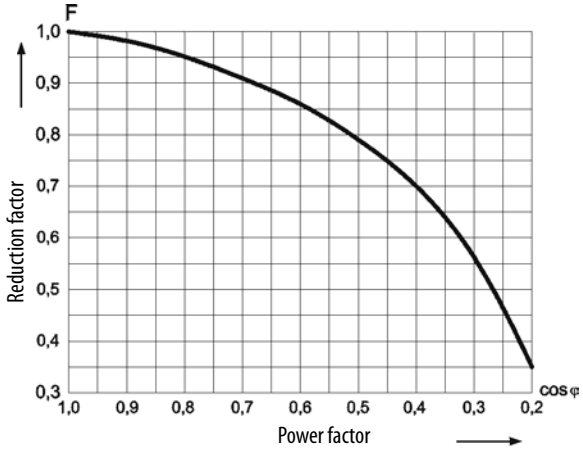
ERM 2



$N_{cos\varphi} = N \times F$

N - electrical life at AC1

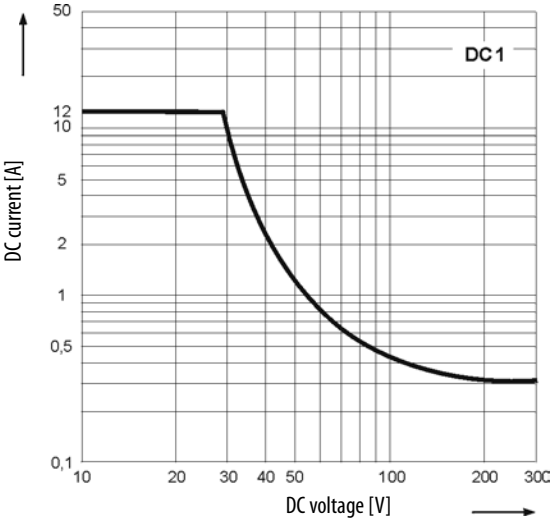
ERM 4



$N_{cos\varphi} = N \times F$

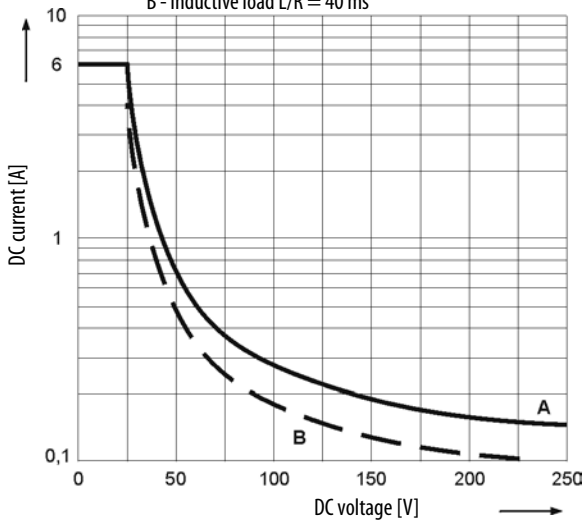
Max. DC resistive load breaking capacity Fig. 3

ERM 2



ERM 4

A - resistive load DC1
B - inductive load L/R = 40 ms



Contact material selection for different load types ERM2 and ERM4

AgNi - for resistive or inductive loads,

Mounting

ERM 2

Relays ERM2 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.
Relays ERM2 are designed for:

- screw terminals plug-in
- sockets ERB2-T*
- sockets ERB2-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB2-T and ERB2-M may be linked with interconnection strip type ER-TERMINAL

ERM 4

Relays ERM4 are designed for mounting in plug-in sockets, standard version includes mechanical indicator with lockable front test button.
Relays ERM4 are designed for:

- screw terminals plug-in
- sockets ERB4-T*
- sockets ERB4-M* with clip ER-CLIP
- 35 mm rail mount acc. to EN 60715 or
- panel mounting

protecting modules type ERC are available as accessories /sockets (see below)

*Plug-in sockets ERB4-T and ERB4-M may be linked with interconnection strip type ER-TERMINAL

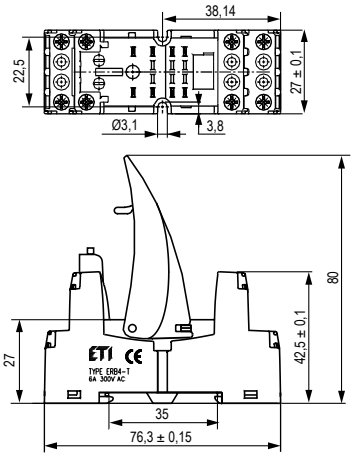
Plugin Sockets And Accessories

ERB2-T and ERB4-T
Plugin sockets (base) type T

- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 76,3 x 27 x 42,5(80) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

Dimensions



Two poles

12A, 300 V AC

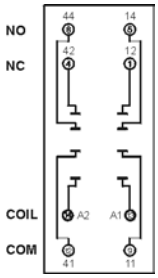
For ERM2

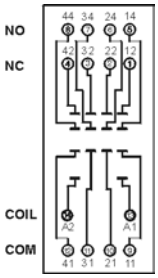
Four poles

6A, 300 V AC

For ERM4

Connection diagram



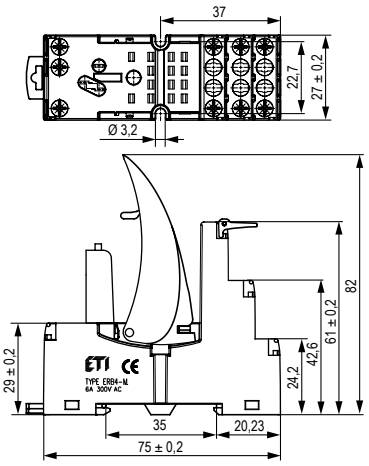


ERB2-M and ERB4-M
Plugin sockets (base) type M

- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75 x 27 x 61(82) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

Dimensions



Two poles

12A, 300 V AC

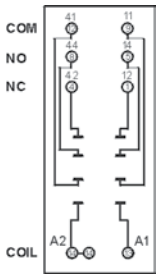
For ERM2

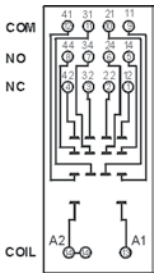
Four poles

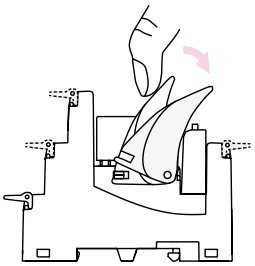
6A, 300 V AC

For ERM4

Connection diagram







Removing the relay from the socket with a retrainer / retractor clip

Protection RC modules type ERC_AC

It protects against EMC disturbance and limits overvoltage.	A2 / A1	6/24 V AC	ERC-024AC
		110/240 V AC	ERC-230AC

Protection RC modules type ERC_ACDCL

It limits overvoltage on AC and DC coils. Coil energizing indication.	= A2 / ± A1	6…24 V ACDC	ERC-024ACDCL
		24…60 V AC DC	ERC-060ACDCL
		110…230 V ACDC	ERC-230ACDCL



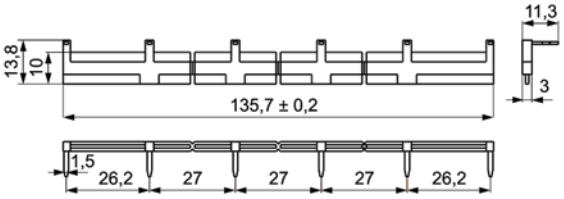
Modules are parallely connected with relay coil

Interconnection strip ER-CLIP

designed for the co-operation with plug-in sockets ERB of miniature industrial relays, which are equipped with screw terminals; sockets and relays are mounted on 35 mm rail mount acc. to EN 60715.

- bridges common input signals (coil terminals A1 or A2)
- maximum permissible current is 10 A / 250 V AC,
- possibility of connection of 6 sockets or relays

Dimensions



Miniature Electromagnetic Relays

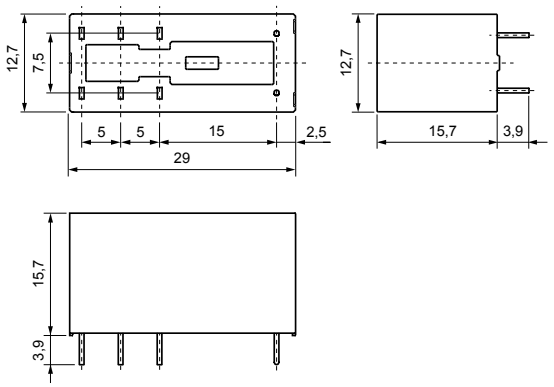
Table 1: Technical data

	MER2
Number and type of contacts	2 CO
Contact material	AgNi
Rated / max. switching voltage AC	250 V / 440 V
Min. switching voltage	5 V AgNi
Rated load (capacity) AC1 AC15 AC3 DC1 DC13	 8 A / 250 V AC 3 A / 120 V 1,5 A / 240 V (B300) 550 W (single-phase motor) 8 A / 24 V DC (see Fig. 3) 0,22 A / 120 V 0,1 A / 250 V (R300)
Min. switching current	5 mA Agni
Rated current	8 A
Max. breaking capacity AC1	2000 VA
Min. breaking capacity	0,3 W AgNi
Contact resistance	≤ 100 mΩ
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 600 72 000
Coil data	
Rated voltage 50/60 Hz AC DC	12 ... 240 V 3 ... 110 V
Must release voltage	AC: ≥ 0,15 U_n DC: ≥ 0,1 U_n
Operating range of supply voltage	See Tables 1, 2 and Fig. 4, 5
Rated power consumption AC DC	0,75 VA 0,4 ... 0,48 W
Insulation according to EN 60664-1	
Insulation rated voltage	400 V AC
Rated surge voltage	4000 V 1,2 / 50 µs
Overvoltage category	III
Insulation pollution degree	3
Dielectric strength • between coil and contacts • pole - pole	 5000 V AC type of insulation: reinforced 2500 V AC type of insulation: basic
Contact - coil distance • clearance • creepage	 ≥ 10 mm ≥ 10 mm
General data	
Operating / release time (typical values)	7 ms / 3 ms
Electrical life • resistive AC1 • cosØ • DC L/R = 40 ms	 > 10^5 8 A, 250 V AC see Fig. 2 > 10^5 0,15 A, 220 V DC
Mechanical life (cycles)	> $3x10^7$
Dimensions (L x W x H)	29 x 12,7 x 15,7 m
Weight	14 g
Ambient temperature • storage • operating	 -40 ... +85 °C AC: -40 ... +70 °C DC: -40 ... +85 °C
Cover protection category	IP40 / IP67
Environmental protection	RTII / RTIII
Shock resistance (NC)	20 g
Vibration resistance	5 g 10 ... 150 Hz
Solder bath temperature/ soldering time	max. 270 °C / max. 5 s

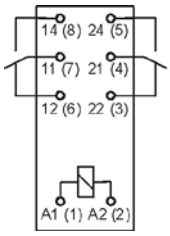
Table 2: Coil data

Coil code	Rated voltage V DC	Coil resistance at 20 °C Ω	Acceptable resistance	Coil operating range V DC	
				min. (at 20 °C)	max. (at 20 °C)
DC voltage version					
005DC	5	60	± 10%	3,5	12,7
012DC	12	360	± 10%	8,4	30,6
024DC	24	1440	± 10%	16,8	61,2
AC 50/60 Hz voltage version					
024AC	24	400	± 10%	19,2	28,8
230AC	230	38 500	± 10%	184,0	276,0

Dimensions



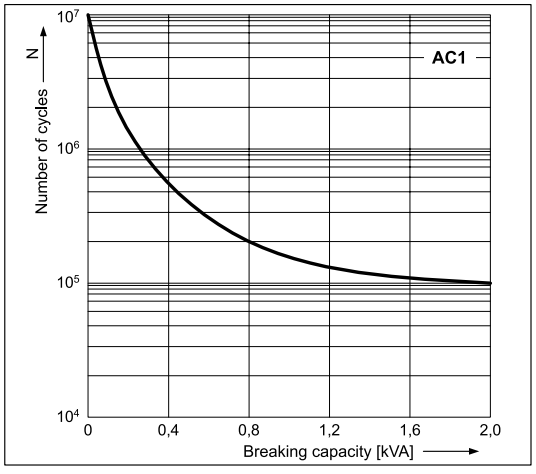
Connection diagram (pin side view)



Terminal (pin)	A1(1); A2(2)	22(3); 21(4); 24(5); 12(6); 11(7); 14(8)
[mm]	Ø 0,6	0,5 x 0,9
Drilling hole: • for relays • for sockets	 Ø 1,3 + 0,1 mm Ø 1,5 + 0,1 mm	

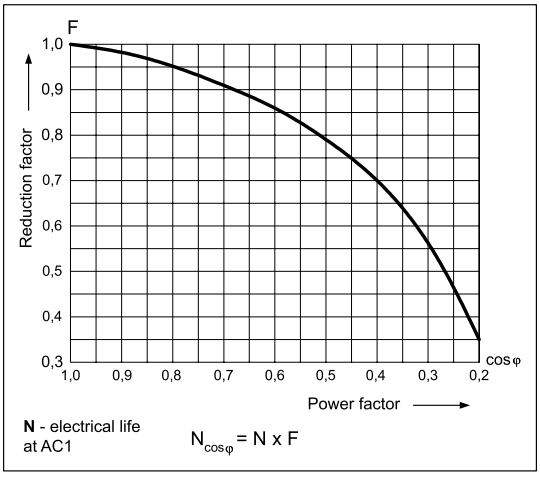
Electrical life at AC resistive load. Switching frequency: 600 cycles/hour

Fig. 1

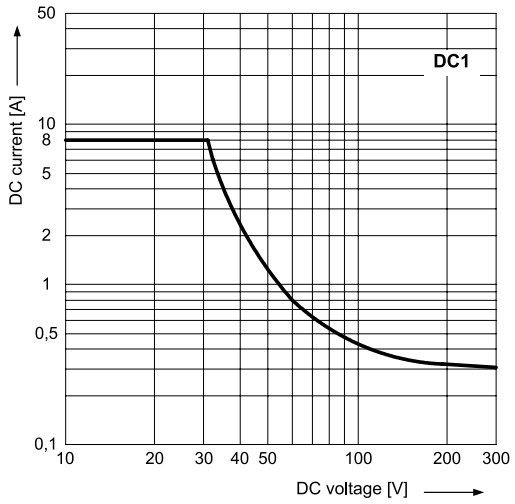


Electrical life reduction factor at AC inductive load

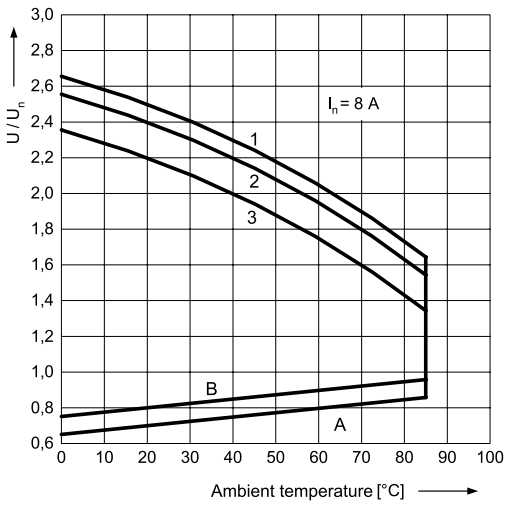
Fig. 2



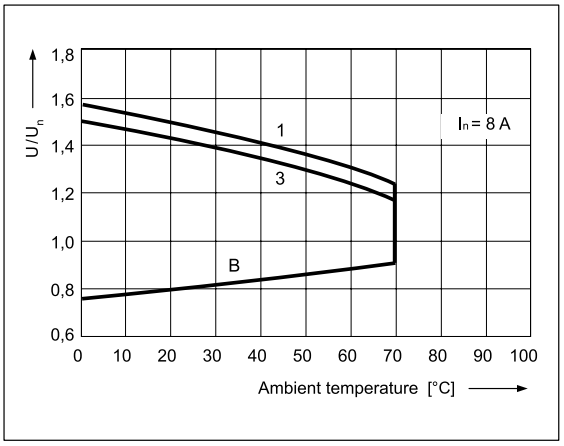
Max. DC resistive load breaking capacity
Fig. 3



Coil operating range = DC
Fig. 4



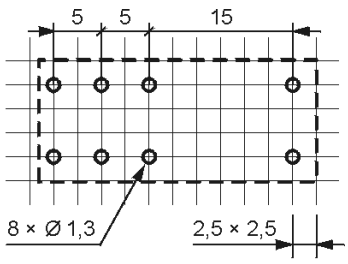
Coil operating range = AC 50 Hz
Fig. 5



Description of Fig. 4 and 5

A - relations between make voltage and ambient temperature at no load on contacts. Coil temperature and ambient temperature are equal before coil energizing. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
B - relations between make voltage and ambient temperature after initial coil heating up with 1,1 U_n, at continues load of I_n on contacts. Make voltage is not higher than the value read on Y axis (multiplication of rated voltage).
1, 2, 3 - values on Y axis represent allowed overvoltage on coil at certain ambient temperature and contact load:
1 - no load
2 - 50% of rated load
3 - rated load

Pinout (soldier side view)



Mounting

Relays MER2 are designed for:

- direct PCB mounting
- screw terminals plug-in sockets MERB-T and MERB-M

Plugin Sockets And Accessories

MERB-T
Plugin sockets (base) type T

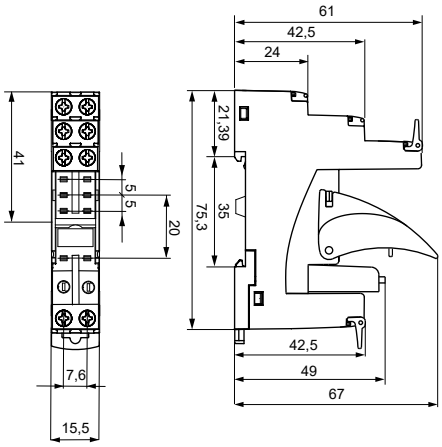
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 75,3 x 15,5 x 61(67) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

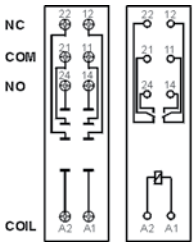
Two poles, 5mm pinout

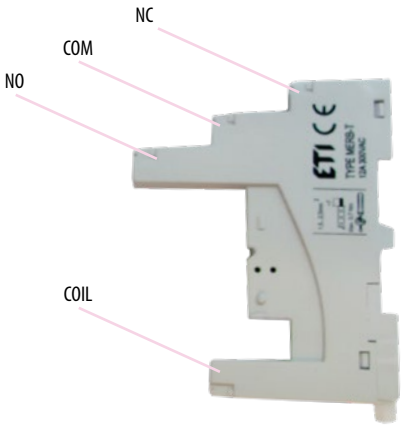
12A, 300 V AC

Dimensions



Connection diagram





MERB-M
Plugin sockets (base) type M

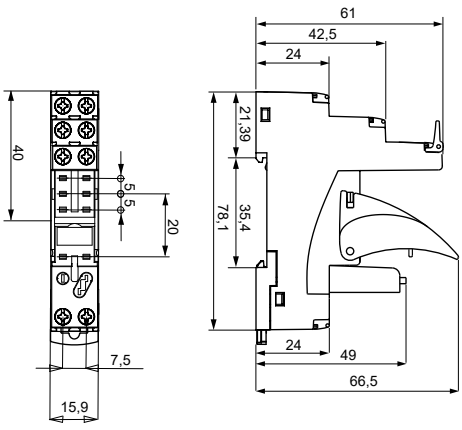
- Screw terminals
- Max. tightening moment for the terminal: 0,7 Nm
- 35 mm rail mount acc. to EN 60715
- or on panel mounting
- 78,1 x 15,9 x 61(66,5) mm*

*In the bracket the height of socket with retainer / retractor clip is shown.

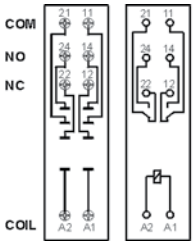
Two poles, 5mm pinout

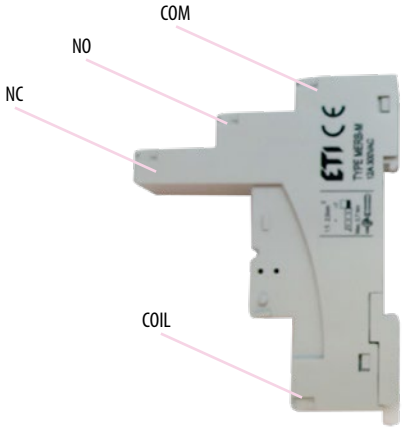
12A, 300 V AC

Dimensions



Connection diagram





SLIM RELAYS SSR & SER, Electromagnetic and solid

Table 1: Technical data

	SER1; Contact data	SSR1; Output circuit - Triac
Number and type of contacts	1 CO	1 NO
Contact material	AgSnO2	-
Rated / max. switching voltage AC	400 V AC / 250 V DC	400 V AC / 440 V AC
Min. switching voltage	10 V AC / DC	20 V AC
Rated load (capacity) AC1 DC1	 6 A / 250 V AC 6 A / 24 V DC; 0,15 A / 250 V DC	 1,2 A / 400 V AC -
Min. switching current	100 mA	10 mA
Max. inrush current / Max. non-repeat surge current	10 A (t=20 ms)	30 A (t=20 ms)
Rated current	6 A	1,2 A
Max. breaking capacity AC1	1 500 VA	-
Min. breaking capacity	1 W	-
Contact resistance	≤100 mΩ 100 mA, 24 V	-
Max. operating frequency (cycles/hour) • at rated load AC1 • no load	 360 72 000	-
I^2t for fusing	-	5,1 A^2s (t=1-10 ms)
dI/dt	-	50 A/µs
dV/dt	-	40 V/µs
Input circuit		
Rated voltage AC: 50/60 Hz AC/DC	24 V; 230 V	
Must release voltage / Turn-off voltage	AC: ≥ 0,2 Un DC: ≥ 0,1 Un	
Must operate voltage	AC & DC: ≤ 0,8 Un	-
Rated power consumption AC/DC AC/DC	0,3 ... 1,6 VA / 0,3 ... 1,6 W -	0,3 VA / 0,3 W 24 V AC/DC 1,6 VA / 1,6 W 230 V AC/DC
Insulation according to PN-EN 60664-1		
Insulation rated voltage	400 V AC	600 V AC
Rated surge voltage	4 000 V 1,2 / 50 µs	-
Overvoltage category	III	-
Insulation pollution degree	3	2
Dielectric strength • input - output • input - output • mass - input, output • contact clearance	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) 6 000 V 1,2 / 50 µs 2 500 V AC 50/60 Hz, 1 min. 1 000 V AC 50/60 Hz, 1 min. (type of clearance: micro-disconnection)	 4 000 V AC 50/60 Hz, 1 min. (type of insulation: reinforced) - - -
Input - output distance • clearance • creepage	 ≥ 6 mm ≥ 8 mm	-
General data		
Operating / release time (typical values)	AC: 7 ms DC: 6 ms / AC: 15 ms DC: 10 ms	10 ms max. (zero turn-on) / 10 ms max.
Electrical life • resistive AC1 (cos φ = 0,4) • resistive DC1	 > 0,6 x 105 6 A, 250 V AC; > 2 x 105 2 A, 250 V AC 105 6 A, 30 V DC	-
Mechanical life (cycles)	> 2 x 107	-
Dimensions (L x W x H)	93,8 x 6,2 x 80 mm	
Weight	40 g	
Ambient temperature • storage • operating	 -40...+70 °C -40...+55 °C (-40...+60 °C 24 V DC)	 -40...+70 °C -40...+55 °C
Protection category	IP 20 PN-EN 60529	
Environmental protection	RTI PN-EN 116000-3	
Shock resistance	10 g	
Vibration resistance	5 g 10...500 Hz	

Input data SER1

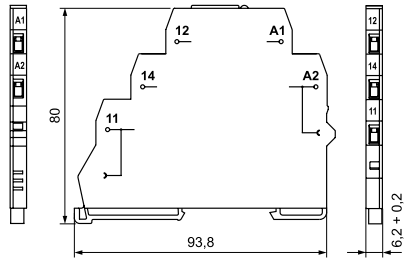
Interface relay code	Rated input voltage, Un	Power of input circuit	Input - voltage range, V	
			min. (20 °C)	max. (55 °C)
SER1-024ACDC	24 V AC/DC	0,5 VA / 0,5 W	19,2	26,4
SER1-230ACDC	230 V AC/DC	0,8 VA / 0,8 W	184,0	253,0

Input data SSR1

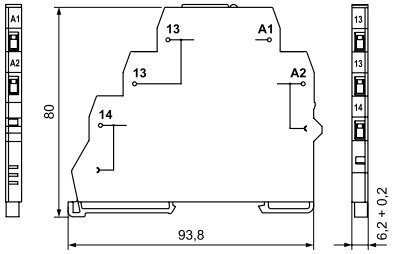
Interface relay code	Rated input voltage Un	Power of input circuit
SSR1-024ACDC	24 V AC/DC	0,3 VA / 0,3 W
SSR1-230ACDC	230 V AC/DC	1,6 VA / 1,6 W

Dimensions

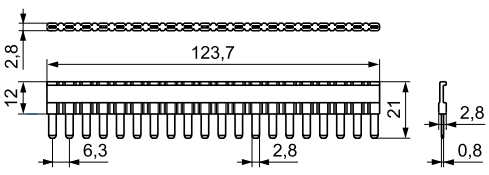
SER1-024ACDC / SER1-230ACDC



SSR1-024ACDC / SSR1-230ACDC

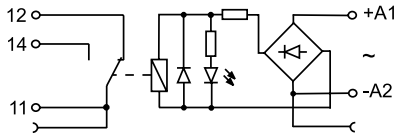


SR-TERMINAL

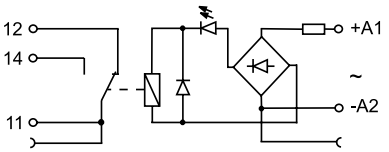


Connection diagram

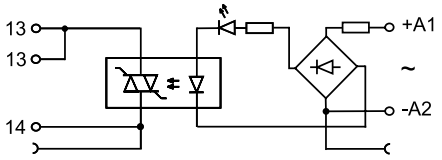
SER1-024ACDC



SER1-230ACDC



SSR1-024ACDC
SSR1-230ACDC



ETICONTROL

ATS Controller 212
Technical data 215

ATS Controller



ETI POWER NEEDS CONTROL

ATS controller

ATS controller (ATC-E, ATC-B)

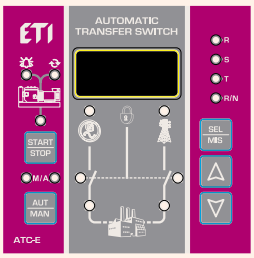
Applications - Intelligent Power Switch controller ATC is monitoring and controlling device for automatic changeover system ATS (ATS system
involves restoration of power consumers by automatically switching to alternative power supply when disconnecting from primary power supply in case of failure and switch back to the primary when stable) for voltages up to 400V. The device is intended for use in all types of industry and controls switching devices such as disconnectors with motor-driven circuit breakers or contactors.

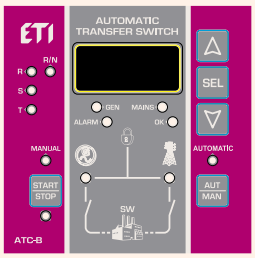


ATS controller

Type	U_N (V)	Description	Code	Weight [g]
ATC-E	DC 8-30V	ATS controller ATC-E with alarm contact block	004656574	230
ATC-B	DC 8-30V	ATS controller ATC-B	004656573	200

ATC-E





ATC-B

LED indication:

- Alarm;
- In function;
- Start generator;
- Manual mode;
- Automatic mode;
- Voltage measured at generator;
- Generator switching device ON;
- Power through generator;
- Voltage measured at grid;
- Grid switching device ON;
- Power through grid;
- L1 (R) indication
- L2(S) indication
- L3 (T) indication
- Running

Features:

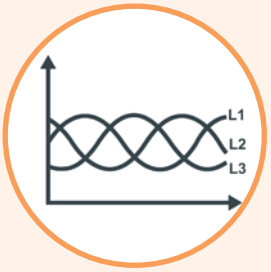
- LED display with three characters;
- Voltage measured at three phases on;
- network and generator;
- Relay outputs for controlling the switching devices;
- The front panel 96 × 96;
- LED indication - 15 functions;
- Manual or automatic;
- Remote start of the generator;
- Power supply 8-30 V DC

ATS controller (ATSC25)

Description
ATSC25 "ATS Controller" in association with an RTSE (Remote transfer switching equipment) forms an ATSE (Automatic transfer switching equipment), the ATSE formed by the association is designed for use in power systems for the safe transfer of a load supply between a normal and alternate source. As a standalone product the ATSC25 is compliant with IEC 61010-2-201.

Functions:

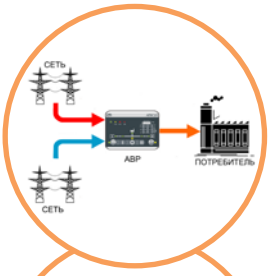
- Monitoring of the availability of a Normal and Alternate source
- Supply to the controller and switch from the Normal or Alternate source
- Transfer orders to the RTSE and position reception from the RTSE
- Intuitive HMI for emergency/local operation
- Clearly visible and indicated HMI
- Suitable for door mounting on the enclosure or DIN Rail mounting inside the enclosure
- Inherent electrical interlock between position orders
- Monitoring of the RTSE stable positions (I – 0 – II)
- Strait forward installation with effective ergonomics
- Power supply continuity for most Utility / Generator or Utility / Utility network applications when linked to an RTSE (Remotely operated transfer switches).
  * Programmable with DIP switch settings

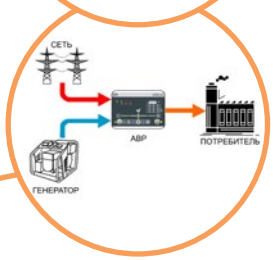


→ Voltage sensing on all phases and phase rotation checking



→ Miniature DIP switches make it quick and easy to program the controller as well as identify the current state of the controller settings





→ Ability to work in Main/Main or Main/Genset networks



→ Indication of controller status, RS communication, faults and emergency situations





→ 24 VDC aux power supply (for optional use)





→ Door or DIN rail mounting

→ Built-in double power supply to ensure uninterrupted operation of the motorised change over load break switch



→ Fire alarm puts controller in neutral

Technical data on page 217



Features:

- integrated power supply for MLBS(motorised changeover load break switch) control;
- voltage measurement in three phases @ two networks;
- possibility of power supply 24 V DC;
- Mounting the front panel / TH35 DIN rail;
- operating modes network / network or network / generator;
- input for emergency blocking of the controller (fire input);
- manual or automatic operation;
- visual indication of the connected network;
- self-testing function;
- supply voltage 184-300 V AC;
- Adjustable hysteresis for voltage and frequency.

ATS controller

Type	Description	Code	Weight [g]	Packaging [pcs]
ATSC25	Automatic transfer switch controller	004661922	1000	1/18

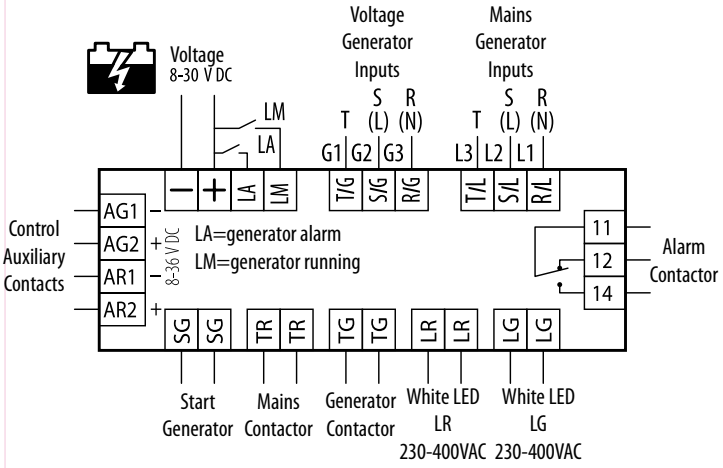
ATS Controller (ATC-E, ATC-B)

Technical data

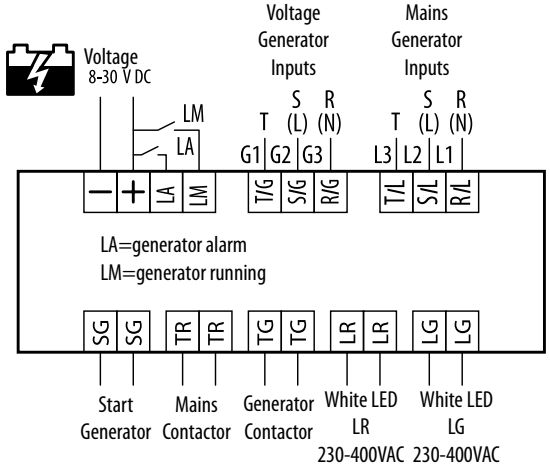
Specifications:		ATC-E	ATC-B
Supply voltage DC	V DC	8 - 30 V DC	
Power consumption (max. AC)	VA	4 VA	
Controlled voltage	V AC	230 V(1F) / 400 V(3F) / 440 V(3F)	
Switch control signal	-	✓	×
Display Type	-	3 digit, 7 segment	
Measurement type	-	RMS	
Measurement range Voltage	V AC	0 - 500 V AC	
Measurement range of frequency	Hz	45 - 65 Hz	
Accuracy	%	±2 %	
Operating temperature	°C	-10 / +50 °C	
Storage temperature	°C	-30 / +70 °C	
Degree of protection	IP	IP 20	
Max. cable size	mm^2	2,5 mm^2 (screw clips)	
Relative humidity	%	95 %	
Housing material	-	UL94 V0 (plastic)	
Type of housing	-	Standard dimensions - 96x96	
Dimensions H × W × D	mm	96 x 96 x 112	
Weight	g	230 g	200 g

Wiring Diagrams

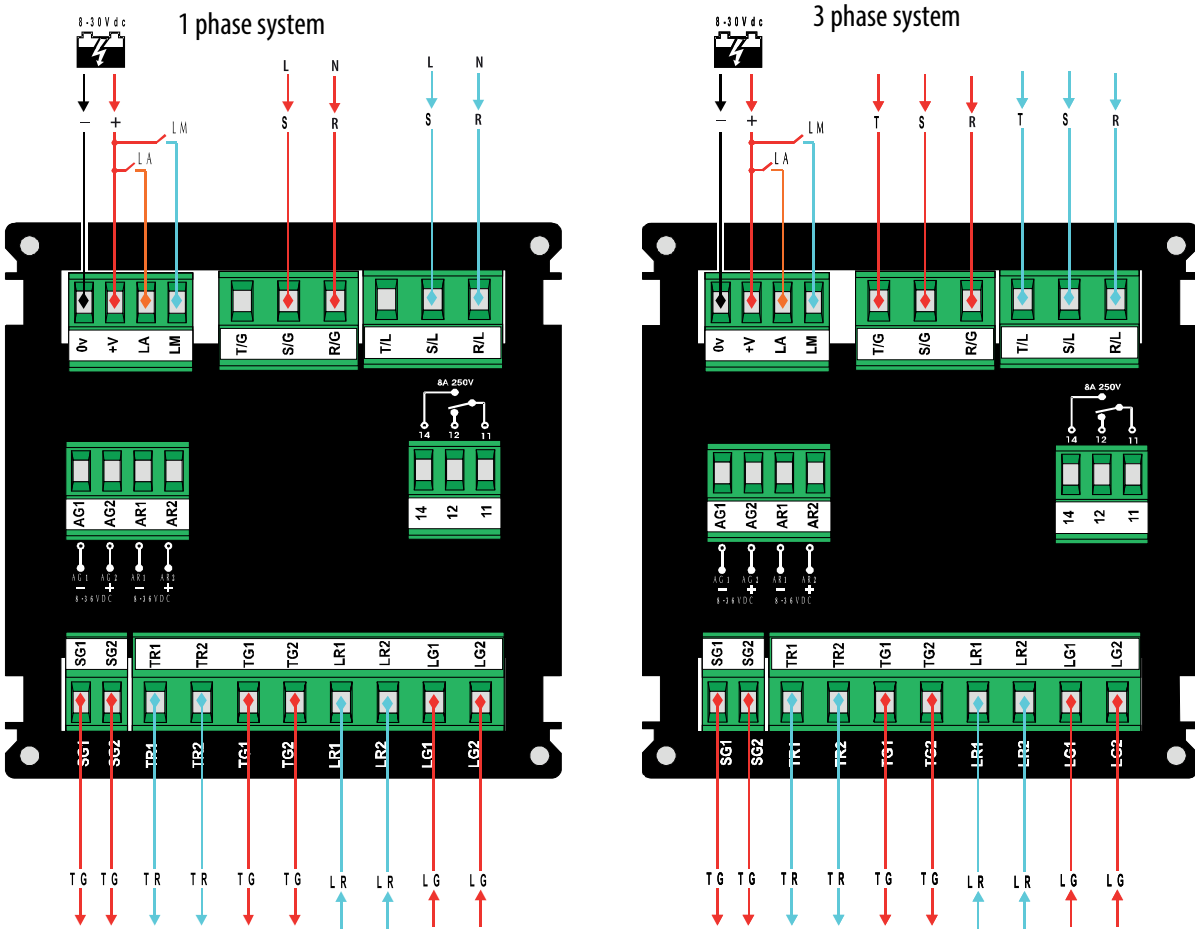
Wiring Diagram ATC-E



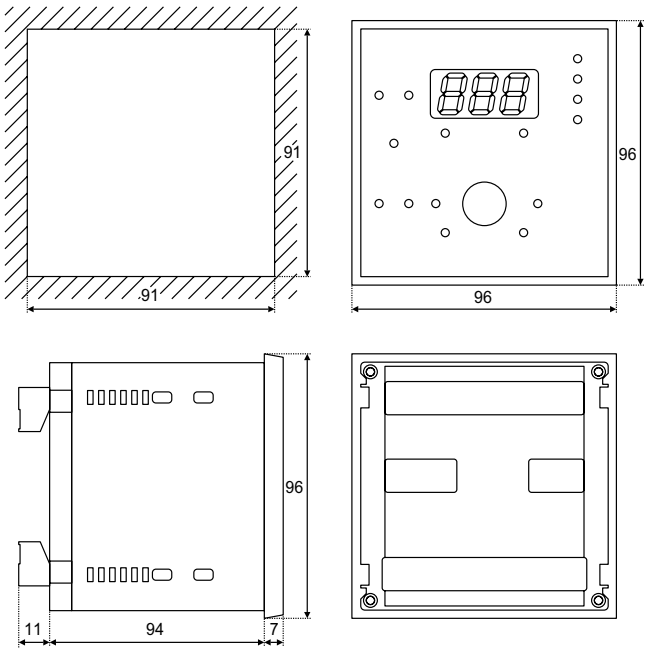
Wiring Diagram ATC-B



Connecting examples



Dimensions



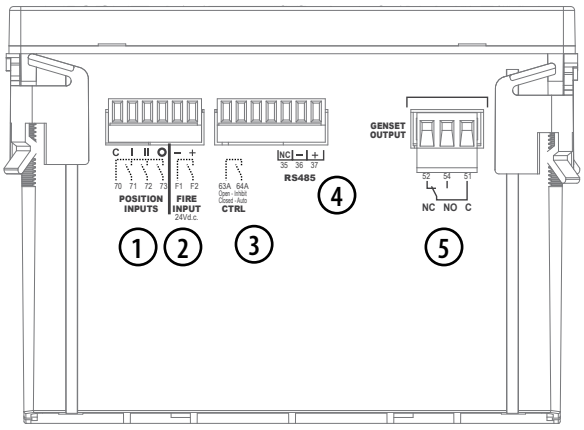
ATS Controller (ATSC25)

Technical data

Specifications:		ATSC25
Supplied from measurement circuit		184 - 300 VAC
Power consumption		10 W
Measurement range	linear	90 - 520 VAC
	phase	50 - 300 VAC
Frequency		45 - 65 Hz
Emergency input (fire) voltage, V DC		12 - 24 VDC
Communication interface		RS485
Conductor cross section		0,5 - 2,5 mm^2 (screw terminals)
Mounting		DIN rail / door
IP rating		IP 20 (IP40 for front mounting)
Operation temperature		-25 °C ... +60 °C
Operation humidity		80 % / 50 °C 95 % / 40 °C
Dimensions (H × W × D)		96 x 144 x 106
Measurement category		III
Standards		IEC 61010-2-201, IEC 60947-6-1, IEC 60947-1

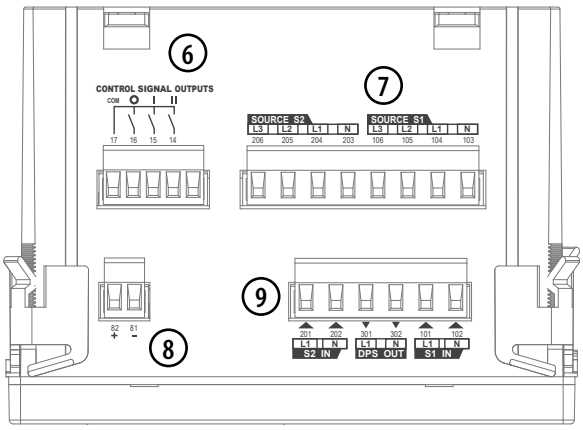
Description

Connectors top view



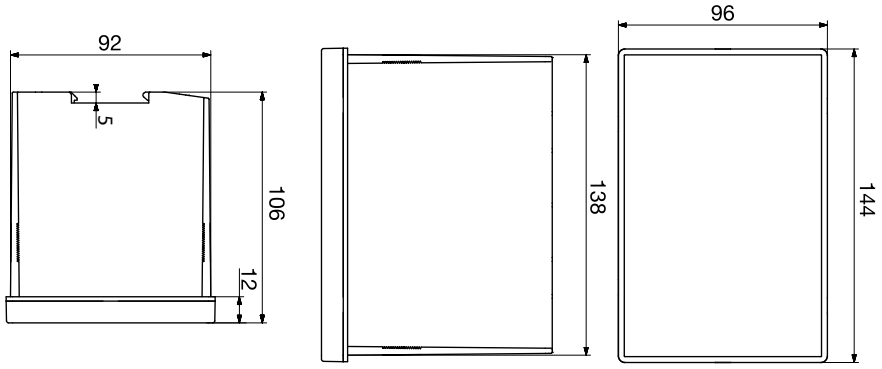
1. RTSE position feedback input
2. 24 V.d.c fire input
3. Enable control when closed / disable control when open
4. RS485 connections
5. Genset Start relay

Connectors bottom view



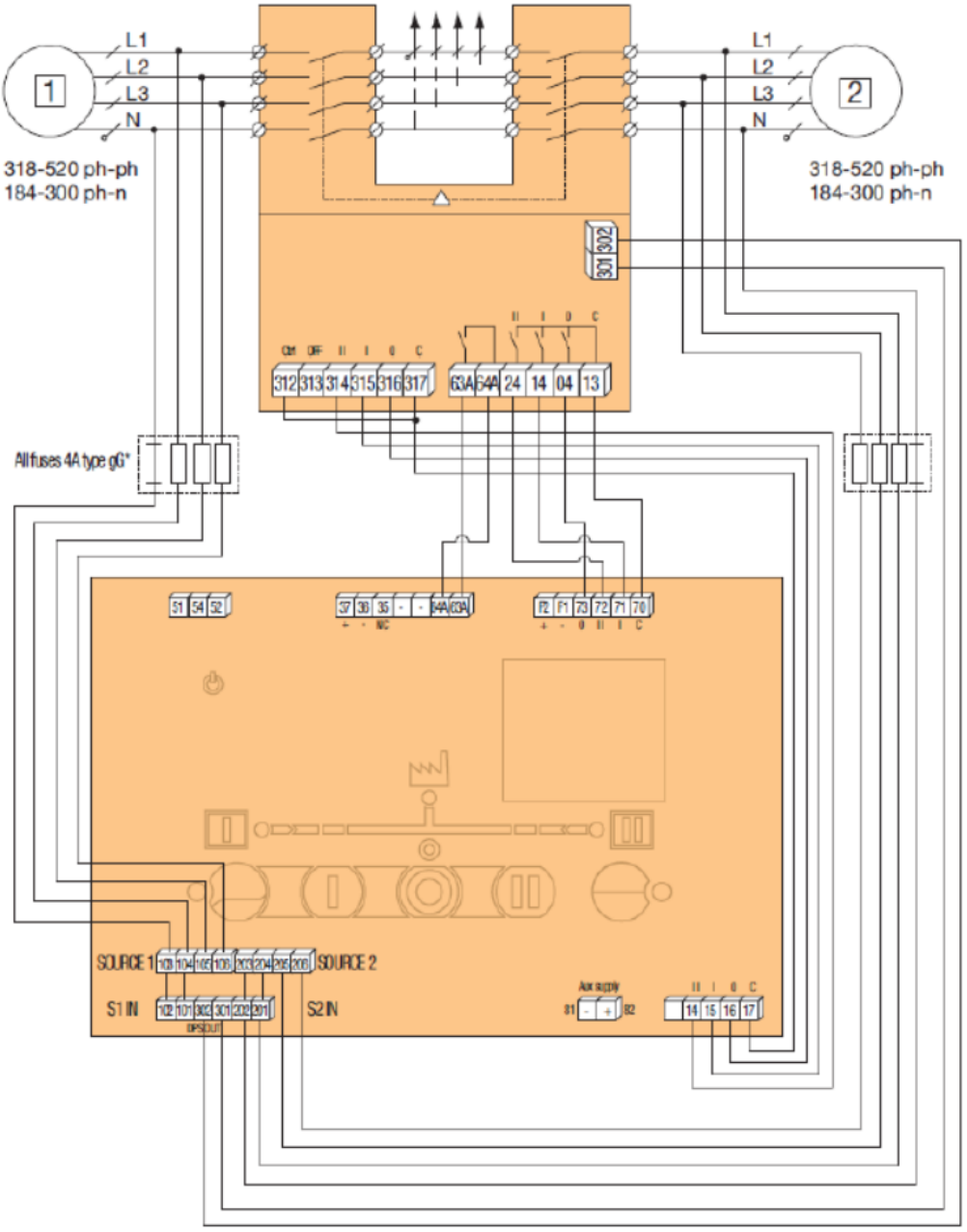
6. RTSE position control outputs
7. Source 1 and 2 voltage inputs
8. 24 V.d.c Aux supply
9. External DPS – Input / output

Dimensions

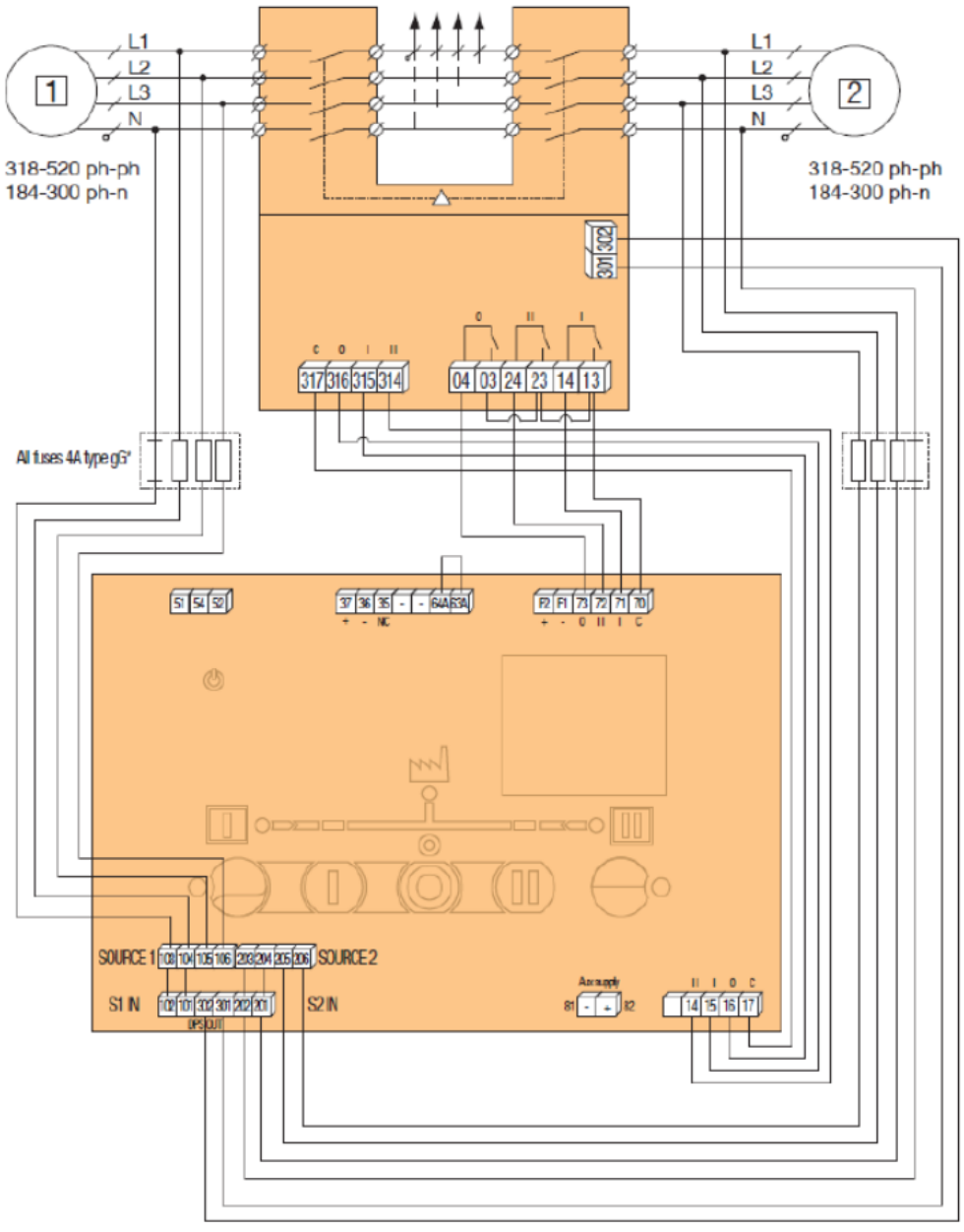


Wiring Diagrams

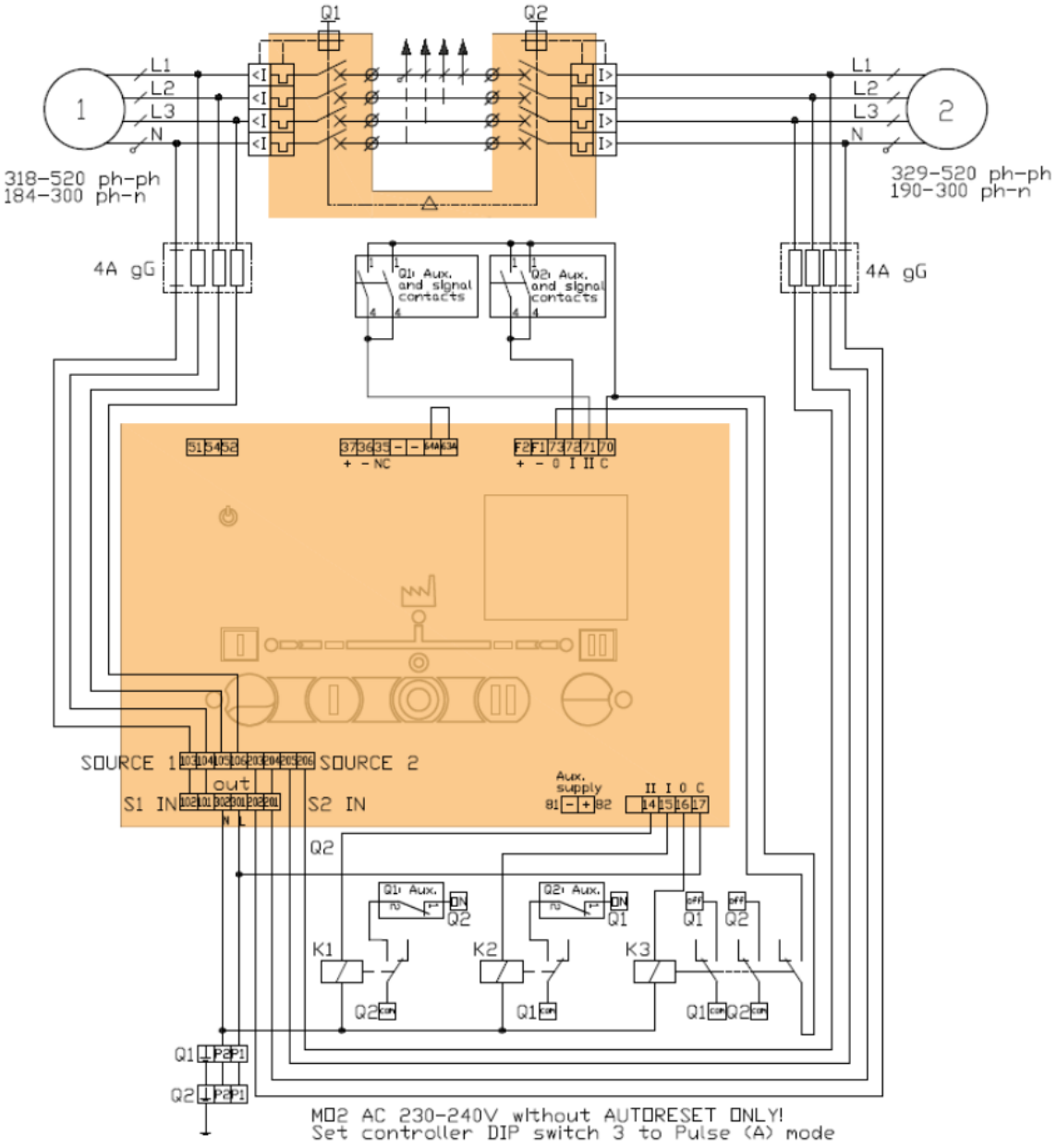
Connection diagrams with MLBS 3P/4P 250...630A



Connections with MLBS 4P 63...125

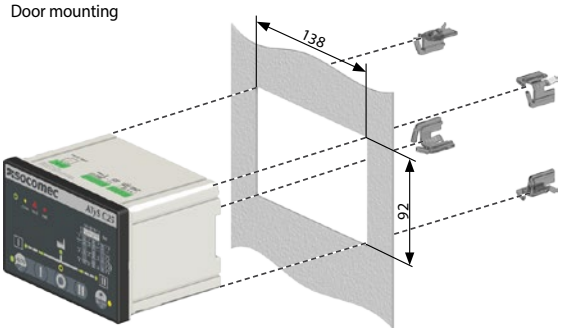


Connections with MCCBs EB2 and MO2



Mounting

Door mounting



Door cut-out of 93(+0.8) x138(+1) mm, door thickness 1.5- 3mm.
Remove all connectors and clip before inserting the controller in the cut-out then fix the controller in place using all 4 fixations clips

DIN rail mounting

1. Mounting



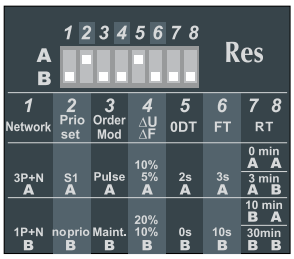
When mounting make sure both clips are pushed up, then clip on the DIN Rail.

2. Unmounting



To remove from the DIN Rail, drag the two mounting clips down before removing the product.

Settings



After changing DIP switch settings press RES button shortly (<3s) to validate.

To reset settings configured through communication long press on RES button > 10s.

DIP Switch		
DIP 1 A/B	A	Three phase network
	B	Single phase network
DIP 2 A/B	A	Prioritty source 1
	B	No priority
DIP3 A/B	A	Control mode impulse logic
	B	Control mode contactor logic
DIP 4 A/B	A	Overvoltage setting at 10% of nom voltage / overfrequency setting 5% of nominal frequency (hysteresis value is 20% of ΔU/ΔF)
	B	Overvoltage setting at 20% of nom voltage / overfrequency setting 10% of nominal frequency (hysteresis value is 20% of ΔU/ΔF)
DIP5 A/B	A	Load supply down time of 2 second (0DT = 02 sec)
	B	Load supply down time of 0 second (0DT = 0 sec)
DIP6 A/B	A	Wait time of 3s before source is lost (Fail timer = 3s)
	B	Wait time of 10s before source is lost (Fail timer = 10s)
DIP 7 & 8 A/B & A/B	AA	Wait time of 0min before source returns (retrun timer = 0min)
	AB	Wait time of 3min before source returns (retrun timer = 3min)
	BA	Wait time of 10min before source returns (retrun timer = 10min)
	BB	Wait time of 30min before source is lost returns (retrun timer = 30min)

Denomination	Terminal	Description	Characteristics
Control signal outputs (orders to RTSE)	14	Position II order	AC1 – General use – Ie :5A , Ue : 250V DC – General use – Ie 5A, Ue:30V
	15	Position I order	
	16	Position 0 order	
	17	Common point for position output	
RS485	35	NC – Not connected	RS485 Isolated bus
	36	Negative electrode	
	37	Positive electrode	
Genset output	51	Common point	AC1 – General use – Ie :3A , Ue : 250V DC – General use – Ie 3A, Ue:30V AC1 – General use – Ie :5A , Ue : 250V DC – General use – Ie 5A, Ue:30V 150W
	52	Normaly closed contact	
	54	Normaly open contact	
Controller inhibit input	63A	Controller is inhibited when this contact is open	Do not use external voltage - Power from common point
	64A		
Position iputs (return of informa-tion from RTSE)	70	Common point for position inputs	Do not use external voltage - Power from common point
	71	Position I RTSE	
	72	Position II RTSE	
	73	Position 0 RTSE	
Fire input	F1	Negative electrode of the 24 V.d.c	11-25 V.d.c
	F2	Positive electrode of the 24 V.d.c	
Optional Aux supply 24V.d.c	81	Negative electrode of the 24 V.d.c	19-30 V.d.c
	82	Positive electrode of the 24 V.d.c	
Source 1 and 2 voltage inputs	103	Source 1 N	Sensing range : 90-520 VAC (ph-n) 50-300 VAC L-N Supply range : 161-300 VAC (ph-n) Max consumption 10 W
	104	Source 1 L1	
	105	Source 1 L2	
	106	Source 1 L3	
	203	Source 2 N	
	204	Source 2 L1	
	205	Source 2 L2	
	206	Source 2 L3	
DPS output (RTSE power supply)	301	Phase output	AC1 – General use – Ie :8A , Ue : 250V DC – General use – Ie 5A, Ue:30V 150W
	302	Neutral output	

ETIMETER

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Network Analyzers



POWER NEEDS CONTROL

Network Analyzers

Network Analyzer END20LRS

END20LRS is distinguished by a high measurement accuracy, legible backlight LCD display and an attractive price in relation to offered measuring functions. It is the ideal tool to control and monitor energy quality parameters and energy consumption in all industry branches, public utilities or in public service buildings.
Application - The END20L-RS mains analyser is designed to monitor electrical parameters and quality in three-phase or single-phase low and high voltage networks. The analyser provides accurate measurements of all types of electricity and has a wide range of options for setting the parameters displayed on the screen. The analyser can be connected both directly and via current and voltage transformers. Modbus protocol and pulse output for electricity meters are used for data transfer.

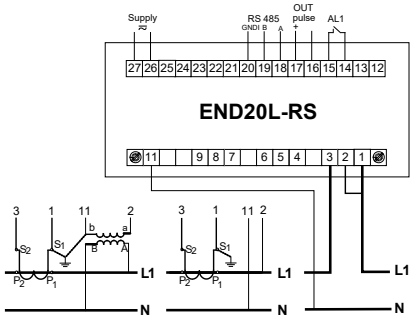


Network Analyzer END20LRS

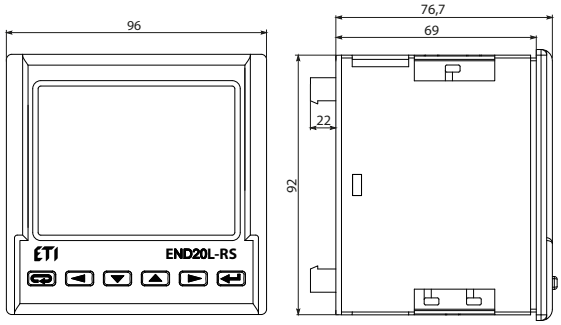
Type	Description	Code	Weight [g]	Packaging [pcs]
END20LRS	Analyzer with RS485 port	004656950	500	1

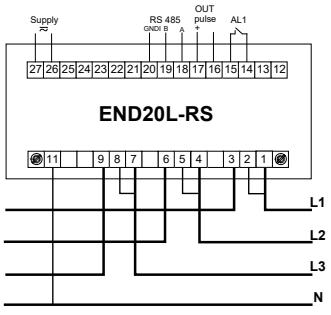
Features and measurements

- power network parameters in 4-wire balanced and unbalanced systems,
- Measurement of current and voltage THD distortion coefficients;
- indications considering values of programmed ratios,
- backlight LCD 3,5" screen,
- digital transmission to the master system through the RS-485 interface (MODBUS RTU).
- protection grade from the frontal side: IP65
- high accuracy class,
- 1x relay output for alarm and 1x pulse output
- programmable output relay;
- W-WH-VA-VAR-VARH power measurement;
- function for measuring the maximum consumption of each phase;
- password protection

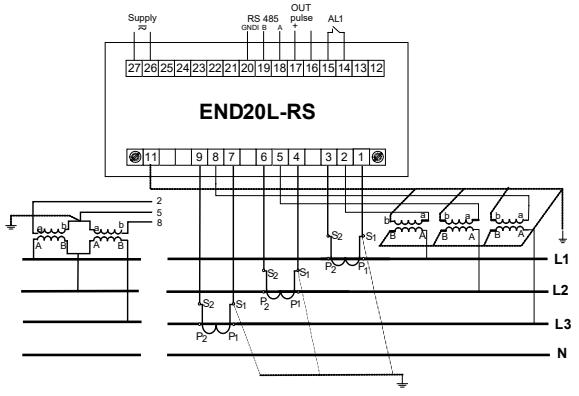


Connection to single-phase mains





Direct connection to three-phase mains



Indirect connection to three-phase mains

Technical data

	END20LRS
Power supply voltage	85 - 253V AC / 90 - 300V DC
Measurement voltage phase, AC	2,8 - 276V AC
Measuring voltage linear, AC	5 - 480V AC
Measured current	0,002 - 6000 A
Nominal Frequency	47 - 63 Hz
Maximum power input	6 VA
Maximum current input consumption	0,05 VA
Maximum voltage input consumption	0,05 VA
Relay output	potential-free 1 NO (0,5A, 250V AC)
Counter pulse output	NPN (18-27V, 10-27mA), 1000 - 20000 imp/kW
Communication protocol	RS-485 (Modbus RTU)
Communication speed	4.8 / 9.6 / 19.2 / 38.4 kB
Operating temperature	-25 ... +55 °C
Overvoltage Category	300 V, III
Pollution degree	II
Protection degree	IP65 - front panel; IP20 - from the connection side
Dimensions H x W x D	96 x 96 x 77 mm
Installation opening H x W	92,5 x 92,5 mm
Standards	EN 61010-1, 61326-1, 61000-6-4

Network Analyzer END25RS and END25ETH

END25RS and END25ETH meters measure important electrical parameters in 3 phase 4 wire,3 phase 3 wire and 1 phase 2 wire network. It measures electrical parameters like active / reactive / apparent energy , power and all basic parameter. The instrument has two optional outputs. It can be configured as pulse output for energy measurement, limit output, timer function and RTC relay.
END25RS is basic instrument with RS485 interface (MODBUS RTU) and 2 programmable outputs (Potential free, very fast acting relay contacts. Configurable as pulse output which can be used to drive an external counter for energy measurement. Configurable as limit (alarm) switch).
END25ETH is more advanced instrument, with ETHERNET interface (MODBUS TCP/IP), real time clock and data logging (8MB memory).

All devices can be configured and monitored via PC with free econ software.

Network Analyzer END20LRS

Type	Description	Code	Weight [g]	Packaging [pcs]
END25RS	Analyzer with RS485 port and 2x relay outputs	004656951	400	1
END25ETH	Analyzer with ETHERNET port, RTC and 8MB memory (data logging).	004656952	400	1

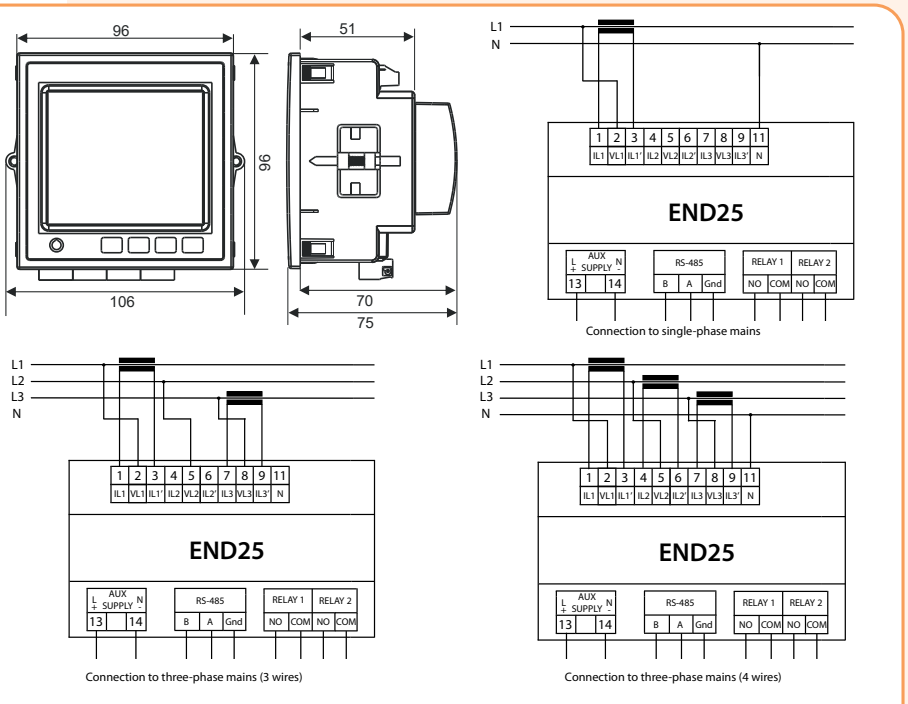


Features

- Measurement of 85 parameters, THD and harmonics up to 31st for voltage & current
- Fully configurable LCD screen - possibility of programming 28 independent screens
- Two optional outputs (END25RS only). It can be configured as pulse output for energy measurement , limit output and timer function
- RTC - real time clock (END25ETH only)
- Measurement archive – in-built 8MB Flash (END25RS only)
- Data logging for:
  - event logging
  - time based logging
  - load Profile logging
- LCD display with Back-light
- Remote access of measured parameter via RS-485 (Modbus RTU) or through Ethernet interface (Modbus TCP/IP)
- external dimension: 96 x 96m

Technical data

	END25-RS	END25-ETH
Power supply voltage	100 - 550V AC/DC	
Measurement voltage phase, AC	57,7 - 346,4V AC	
Measuring voltage linear, AC	100 - 600V AC	
Measuring current (primary winding)	1/5 A	
Measuring current (secondary winding)	1 - 9999 A	
Nominal Frequency	45 - 65 Hz	
Voltage measuring range	20 - 120 % of U_n	
Current measuring range	1 - 120 % of I_n	
Maximum current/voltage input consumption	<0,3 VA	
Relay output	potential free, 2 NO (5A, 240V AC)	-
Communication protocol	RS-485 (Modbus RTU)	Ethernet (Modbus TCP/IP)
Communication speed	4.8 / 9.6 / 19.2 / 38.4 / 57,6 kB	-
Operating temperature	-10 ... +60 °C	
Overvoltage Category	III	
Pollution degree	II	
Protection degree	IP54 - front panel; IP20 - from the connection side	
Dimensions H x W x D	96 x 96 x 75 mm	
Installation opening H x W	92 x 92 mm	
Standards	EN 61010-1-2010, 61326-1, 61000-4-3, 60529, 62053	



Note: The END25-ETH analyser has no relay outputs and instead of RS-485 terminals there is an RJ-45 connector for Ethernet protocol connection. The measurement and supply terminals are unchanged.

Network Analyzer ENA3, ENA3D

Application

Three phase network analyzer is intended for measuring electrical parameters of various loads in industry such as voltage, current, power factor (cos φ), power (W, VAr, VA), single and total harmonic distortion V-I, work hours, ambient temperature. Available in two versions, ENA3 for door mounting and ENA3D for DIN-rail mounting. Display integrated in device shows parameters for each phase separately. 3 independent programmable contact free output relays can be set up for different alarms. Programing is possible directly on device or with connecting to PC by using communication adapter SCUSB485 and free monitoring software not included in package, available on web.

Network Analyzer

Type	Description	Code	Weight [g]	Packaging [pcs]
ENA3	3-phase network analyzer for panel mounting	004656578	760	1/30
ENA3D	3-phase network analyzer for DIN-rail mounting	004656579	630	1/40

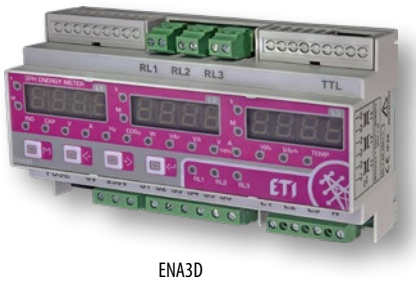
Communication adapter SCUSB485 is not included and must be ordered separately under reference code: 004656577

Technical data

		ENA3	ENA3D
Supply voltage AC ±10%	V ~	3x400 + N, 230 L/N	
Nominal Frequency	Hz	50 - 60 (45 - 65)	
Power consumption (max. AC)	VA	4	
Rated Current (CT)	A	5/1...50000	
Immunity Time For Microbreakings	ms	< 50ms	
Display Type	-	3 Display - 4 Digit - 7 Segment	
Measuring Type	-	True RMS	
Cosφ (L/L)	-	0.00 ... 1.00 ±1%	
Voltage (N/Lx)	VA ~	100 ... 280 ±1%	
Voltage (L/L)	VA ~	180 ... 490 ±1%	
Current (CT)	A	0.05 ... 5.5 ± 0.5%	
Active Power (Lx)	W	Class 1	
Reactive Power (Lx)	VAr	Class 1	
Apparent Power (Lx)	VA	Class 1	
THD of Volt or Current	%	0 ... 255	
Work Hours	h	0 to 9999 (with multiplier)	
Ambient Temperature	°C	0°C...+60°C (/ °F)	
Working temperature	°C	-20 ...+60	
Storage temperature	°C	-30 ...+70	
Electrical Insulation	kV	4	
Overvoltage Category	-	II	
Protection degree	IP	41 Front Cover - 20 Terminal Block	
Pollution degree	-	2	
Relative Humidity w/o cond.	%	95	
Altitude up to	m	2000	
Weight	g	680	550
Dimensions	mm	149 x 149 x 60	157 x 89 x 60
Standards	-	2006/95/EC - Low Voltage, 2004/108/EC - EMC	



ENA3



ENA3D

Advantages

- 3 independent programmable alarm relay outputs (NO)
- Programmable alarm relay (Under/ Overvoltage - Overcurrent - Frequency - Low power factor Cosφ - Total harmonic distortion)
- 144x144 panel mounting or 9 modules DIN
- Self-extinguished material UL94 V0

Measurements

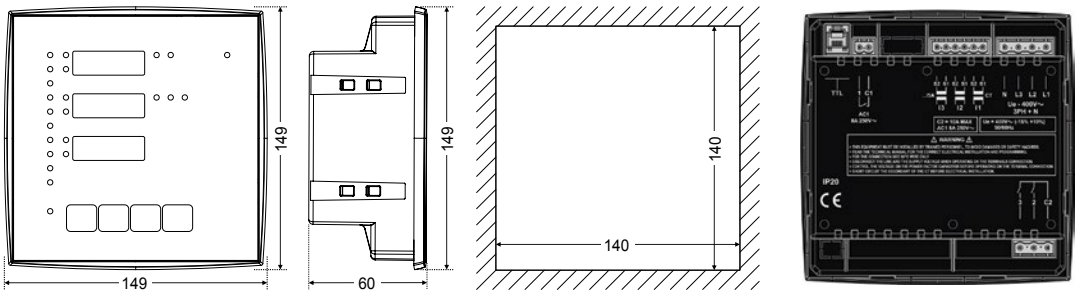
- Power factor cosφ inductive & capacitive (four quadrants)
- Three phase voltage & current
- Power: W - WH - VA - VAR - VARH
- Single and total harmonic distorsion (THDs) V/I
- Working hours
- Ambient temperature

Communication

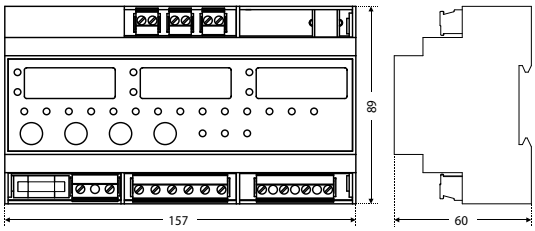
- serial interface: TTL, RJ11 connector
- protocol: Proprietary / MODBUS RTU

Dimensions

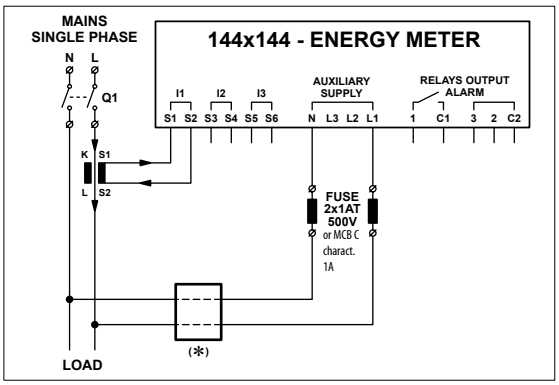
144x144 (mm)

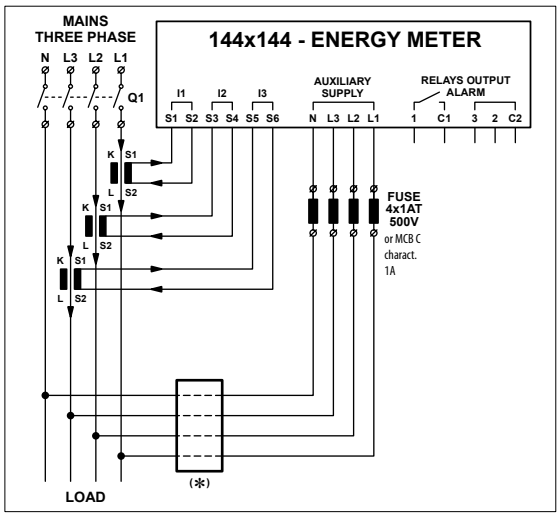


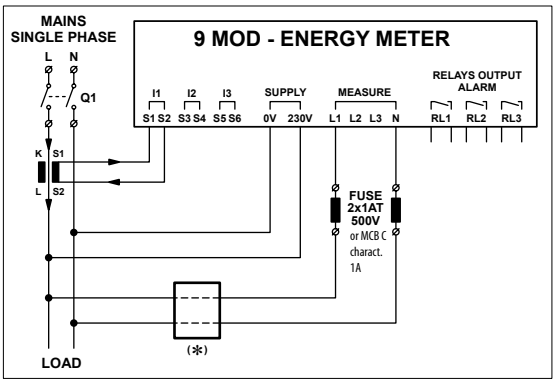
9 MOD (mm)



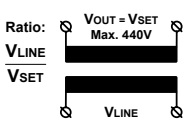
Wiring Diagrams

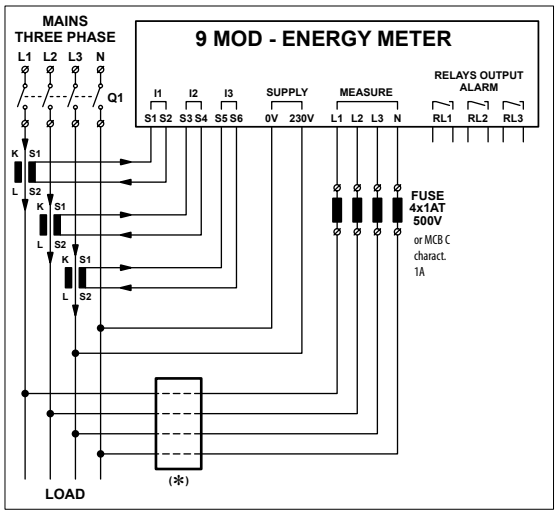






* Voltage adapter if needed (high voltage systems)





Adapter TTL<>USB<>RS485

Type	Description	Code	Weight [g]	Packaging [pcs]
SCUSB485	Adapter TTL<>USB<>RS485	004656577	390	1/30

Interface converter TTL > USB <> RS485 can be used with ENA3, ENA3D or PFC 8 DB, PFC 12 DB.
Software(monitoring and programming via PC) and drivers available (free) for Windows on ETI webpage

RoHS lead-free

Windows 8.1 Compatible

CE



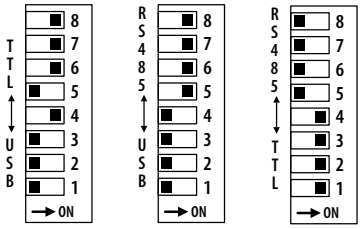
Features

- Self-extinguished material UL94 v0)
- USB and RS-485 serial interface with cables
- Surge protection on RS-485 line
- Connect remote serial device to a PC
- Power and data flow indicator for troubleshooting
- The RS-485 standard supports half-duplex (2 wire)
- Real time transfer ASCII protocol
- Compact size - 2 module - 35mm
- DIN rail mounting EN 50 022

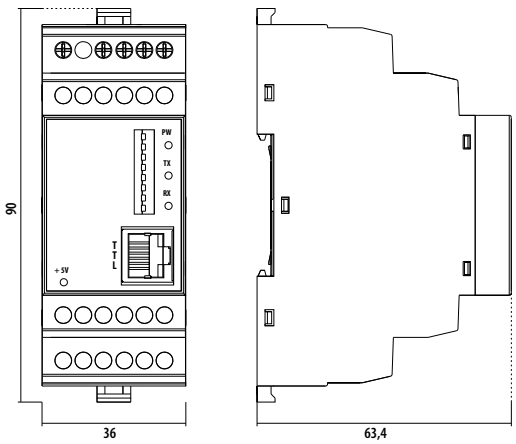
Technical data

Supply voltage AC -15/+10 %	V ~	230
Nominal Frequency	Hz	50 - 60 (range 47 - 63)
Power consumption (max. AC)	VA	0,5
Serial Interface	-	1 USB + 1 RS-485
Protocol Type	-	Owner - Modbus RTU - ASCII
Baud Rate	kbit/s	≤ 115,2
Max device connection (TTL/RS-485)	V ~	1...99
Working temperature	°C	-10 /+50
Storage temperature	°C	-30 /+70
Electrical Insulation (USB_TTL/RS485)	kV	1
Electrical Insulation (N_L/RS485)	kV	3
Overvoltage Category	-	II
Protection degree	IP	20
Pollution degree	-	2
Relative Humidity w/o cond.	RH %	95
Altitude up to	m	200
Weight	g	95
Dimensions	mm	90 x 36 x 63,4
Standards	-	2006/95/EC, 2004/108/EC

DIP-switch configuration

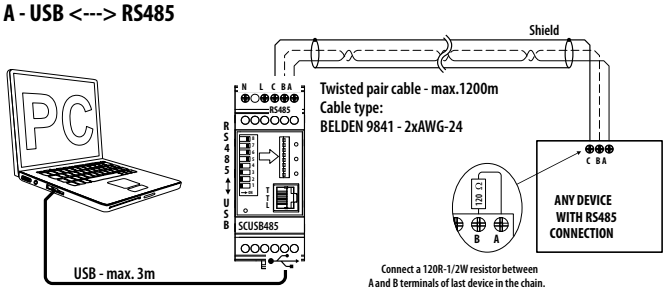


Dimensions

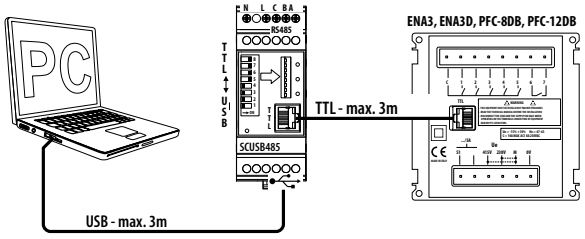


Wiring Diagrams

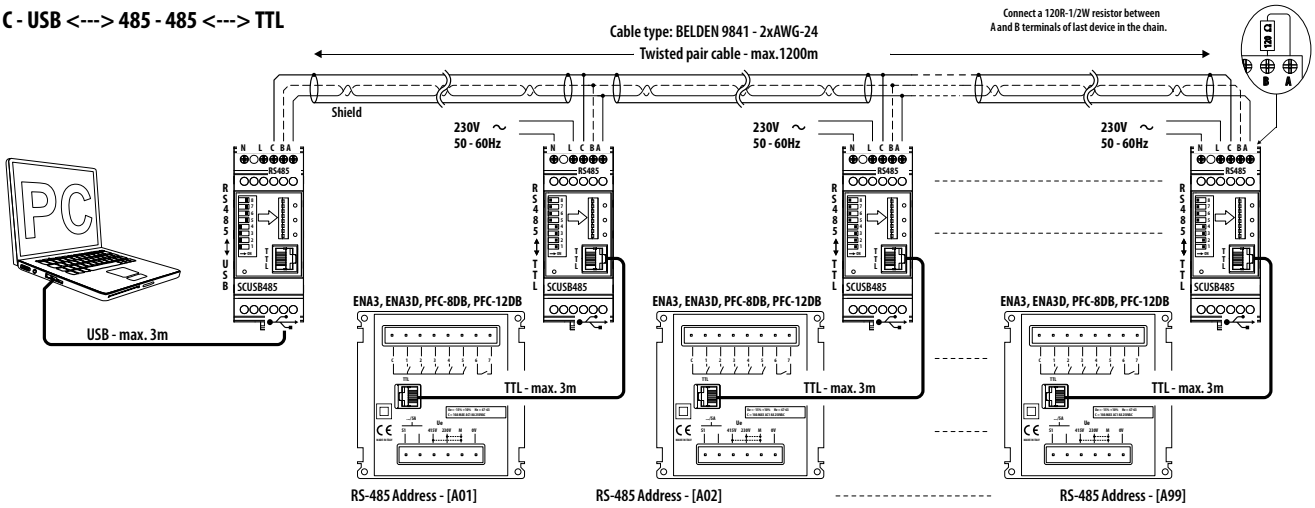
A - USB <---> RS485



B - USB <---> TTL



C - USB <---> 485 - 485 <---> TTL



Download Software and Driver on Website: www.etigroup.eu/support

Network Analyzer ENA33LCD

Description
The power line analyser for accurate monitoring of main electrical parameters in three-phase or single-phase networks. The instrument measures continuous voltage and current according to the norm EN 61000-4-30. Thanks to precise measurement and a high sampling rate, it is also ideal for particular measuring points in electrical energy monitoring systems. Integrated communication interface RS485 with Modbus RTU protocol allows using it as a measuring point in SCADA systems.



Universal Analyzer

Type	Description	Code	Weight [g]	Packaging [pcs]
ENA33LCD	Panel mounting 96x96	004656910	460	1

Advantages

- TN, TT, IT (virtual N) 3 phase networks
- 3 voltage and 3 current inputs
- calculated current of neutral wire
- continual sampling frequency 6,4 kHz
- THD U and THD I measurement
- odd harmonics of U and I till 19th order (L1, L2, L3)
- power factor (L1) and cosφ (L1, L2, L3)
- P+/-, Q+/-, S (L1, L2, L3, ∑)
- E active +/- , E reactive L +/- , E reactive C +/-
- measurement according the standard EN 61000-4-30
- measuring phase-phase voltage from 0 ... 520 VAC
- memory for maximums / minimums of avg values
- memory for recording of last 20 supply voltage interruptions
- real-time clock with supercap backup
- communication interface RS485 with Modbus RTU protocol

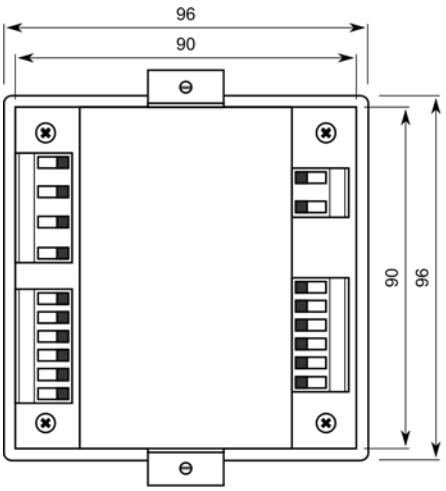
Measured parameters

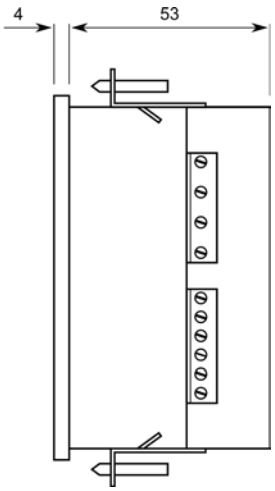
Parameter	L1	L2	L3	L1-L2	L2-L3	L3-L1	ΣL1-L3	Max	Min	AVG	Measuring range	Displayed range	Accuracy
Phase voltage, L – N	●	●	●					●	●	●	10 ... 600 V	0 ... 1 MV	±0.2 %
Line voltage, L – L				●	●	●		●	●	●	18 ... 1000 V	0 ... 1 MV	±0.2 %
Frequency	●							●	●	●	40 ... 70 Hz	40 ... 70 Hz	10 mHz
Current	●	●	●				●	●	●	●	0.01 ... 6 A	0 ... 1 MA	±0.2 %
cosφ	●	●	●					●	●	●	0.01 L ... 0.01 C	0.01L ... 0.01C	±1 %
Power factor	●	●	●					●	●	●	0.01 L ... 0.01 C	0.01L ... 0.01C	±1 %
THDU L-N	●	●	●					●	●	●	0 ... 999 %	0 ... 999 %	±5 %
THDU L-L				●	●	●		●	●	●	0 ... 999 %	0 ... 999 %	±5 %
Under and over deviation L	●	●	●					●	●	●			
Under and over deviation L-L	●	●	●					●	●	●			
Voltage unbalance u2, u0								●	●	●			
THDI	●	●	●					●	●	●	0 ... 999 %	0 ... 999 %	±5 %
TDD	●	●	●					●	●	●	0 ... 999 %	0 ... 999 %	±5 %
Voltage harm. (up to 40th)	●	●	●								0 ... 999 %	0 ... 999 %	cl. 1
Current harm. (up to 40th)	●	●	●								0 ... 999 %	0 ... 999 %	cl. 1
Voltage, current asymmetry								●	●	●	0 ... 100 %	0 ... 100 %	0.3 %
K-factor	●	●	●										
Current unbalance i2, i0								●	●	●	0 ... 99.9 %	0 ... 99.9 %	cl. 1
Active power	●	●	●				●	●	●	●	0 ... 15.3 kW	0 ... 999 MW	±0.4 %
Reactive power	●	●	●				●	●	●	●	0 ... 15.3 kvar	0 ... 999 MVAr	±0.4 %
Apparent power	●	●	●				●	●	●	●	0 ... 15.3 kVA	0 ... 999 MVA	±0.4 %
Distortion power	●	●	●				●	●	●	●			±0.5 %
Active energy +/-	●	●	●				●				0 ... 999 GWh	0 ... 999 GVh	cl. 0.5
Reactive ind. energy +/-	●	●	●				●				0 ... 999 Gvarh	0 ... 999 Gvarh	cl. 2
Reactive cap. energy +/-	●	●	●				●				0 ... 999 Gvarh	0 ... 999 Gvarh	cl. 2
Temperature											-40 … +125°C		1°C

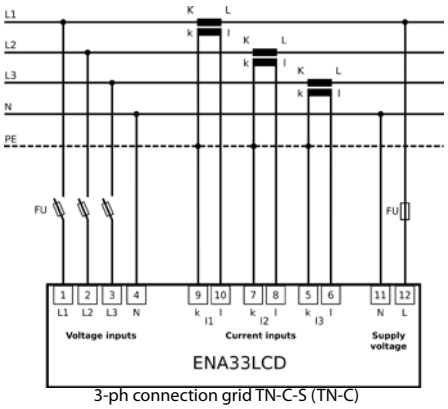
Technical data

		ENA33LCD
Supply voltage	VAC	85 ... 265
System frequency	Hz	50 / 60
Current measuring range	A	0.01 ... 8 A (max permanent current 10 A)
Voltage measuring range L - N	VAC	0 ... 600
Power consumption	VA	1,5
Sampling frequency 50/60Hz	kHz	25,6 / 30,72
Number of inputs / outputs	-	/
Primary voltage measuring transformer ratio		1 ... 750000
Primary current measuring transformer ratio		1 ... 10000
Maximum number of registered auxiliary supply power cuts		20
Communication port	-	RS485 insulated
Communication protocol	-	Modbus RTU
Communication speed	kBd	9.6 / 19.2 / 38.4 / 57.6 / 115
Overvoltage Category	V	300, III
Pollution degree	-	II
Protection degree	IP	IP20 rear panel / IP54 front panel
Dimensions H x W x D	mm	90 x 90 x 67
Panel cut-out dimensions	mm	92 x 92
Site depth	mm	90
Standards		EN 61010-1, EN 62586-1, EN 61000-6-2, EN 61000-6-3

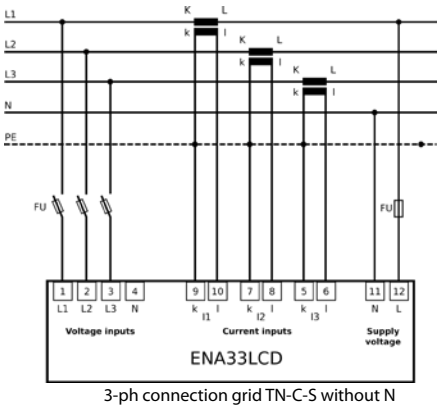
Dimensions



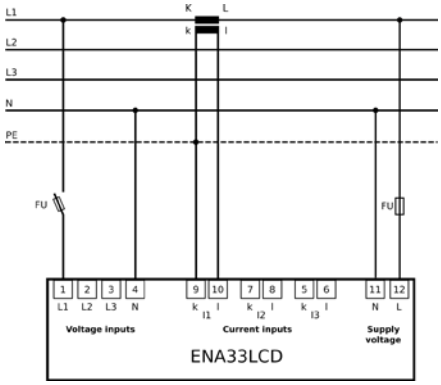




3-ph connection grid TN-C-S (TN-C)



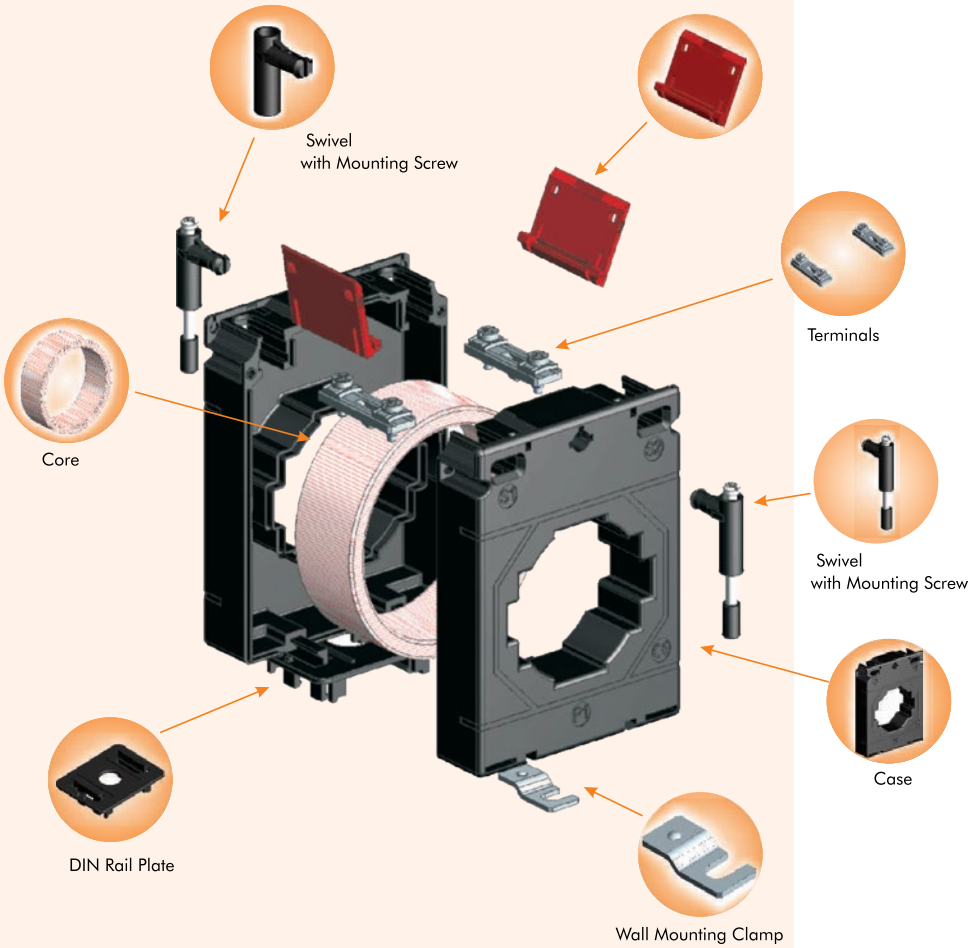
3-ph connection grid TN-C-S without N



1-ph connection

Metering Current transformers

Advantages of Metering Current transformers

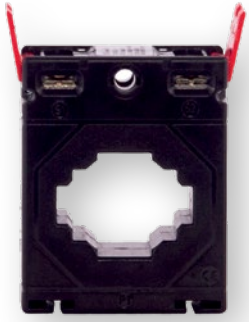


Applications
- Balanced systems: network analyzers, automatic power factor correction systems (PFCs)

Features
- Connection terminal with cover (IP20) for universal connection, no fork needed
- Bus bar or din rail mounting, included complete mounting set
- Standards: 61869-2

Metering Current transformers - Single Phase

Type	Code No.	Primary/ secondary	Power [VA]	Accuracy class	Weight [g]	Packaging [pcs]
CTR-30 50/5 CL.1	004805500	50/5	1,25	1	365	1/63
CTR-30 100/5 CL.0,5	004805504	100/5	1,5	0,5	365	1/63
CTR-30 150/5 CL.0,5	004805507	150/5	3,75	0,5	365	1/63
CTR-30 200/5 CL.0,5	004805508	200/5	5	0,5	365	1/63
CTR-30 250/5 CL.0,5	004805509	250/5	5	0,5	365	1/63
CTR-30 300/5 CL.0,5	004805510	300/5	5	0,5	365	1/63
CTR-30 400/5 CL.0,5	004805511	400/5	7,5	0,5	365	1/63
CTR-30 500/5 CL.0,5	004805512	500/5	10	0,5	365	1/63
CTR-30 600/5 CL.0,5	004805513	600/5	15	0,5	365	1/63





Busbar mounting

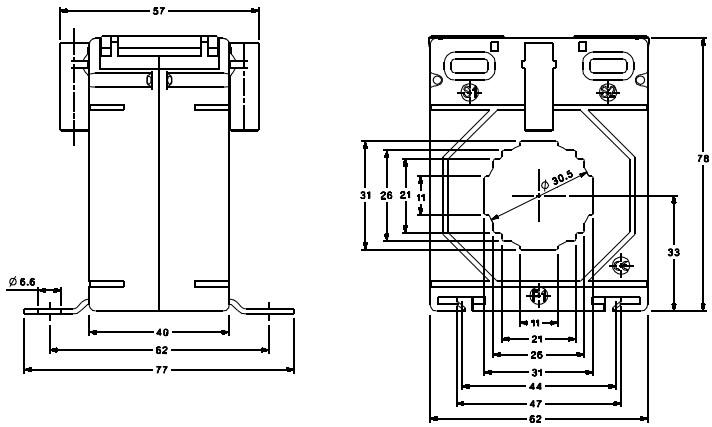


Wall mounting

Technical data

Applicable Standard	IEC 61869, IEC/EN 60044-1, BS 3938
Case	10% glass filled polycarbonate, flame retardant grades classified UL 94V-0
Insulation Class	E (120°C max.)
System voltage	720V max.
Test Voltage	
For Ring (Window) type CT	4kV 50 Hz / 1 min.
For Wound type er	3KV 50Hz / 1 min.
Operating frequency	50Hz or 60Hz Rated Primary rating:- 1A to 7500A
Rated secondary output	5A standard (1A on request)
Ambient temperature	-20°C ... +45°C
Storage temperature	-50°C ... +80°C
Thermal short circuit current (Ith)	60 x In for Busbar type
Dynamic short circuit current (Idyn)	2.5 x I_{th}

Dimensions



Current Transformers (LV Indoor Application)

Accuracy Class	+ / - percentage current (ration) error at percentage of rated current shown below				+ / - phase displacements at percentage of rated current shown below							
					Minutes				Centiradians			
	5	20	100	120	5	20	100	120	5	20	100	120
0.10	0.40	0.20	0.10	0.10	15	8	5	5	0.45	0.24	0.15	0.15
0.20	0.75	0.35	0.20	0.20	30	30	10	10	0.90	0.45	0.30	0.30
0.50	1.50	0.75	0.50	0.50	90	90	30	30	2.70	1.35	0.90	0.90
1	3	1.5	1	1	180	180	60	60	5.40	2.70	1.80	1.80

Limits of Current error and phase displacements for measuring current transformers (for special application)

Accuracy Class	+ / - percentage current (ration) error at percentage of rated current shown below					+ / - phase displacements at percentage of rated current shown below									
						Minutes					Centiradians				
	1	5	20	100	120	1	5	20	100	120	1	5	20	100	120
0.2S	0.75	0.35	0.20	0.20	0.20	30	15	10	10	10	0.90	0.45	0.30	0.30	0.30
0.5S	1.50	0.75	0.50	0.50	0.50	90	45	30	30	30	2.70	1.35	0.90	0.90	0.90

Limits of Current error and phase displacements for measuring current transformers (Class 3 and 5)

Accuracy Class	+ / - percentage current (ration) error at percentage of rated current shown below	
3	3	3
5	5	5

Limits of phase displacement are not specified for class 3 and 5.

Limits of current error and phase displacements for Protection Class CT (5P and 10P)

ETICON

Modular contactors for installation into distribution boards 236

Bistable switches RBS 243

Miniature and motor contactors,
auxiliary contactors and overload relays 247

Motor protective circuit breakers 282

Technical data 291

*Capacitor duty contactors are in the CP chapter, see page 378

Contactors



POWER NEEDS CONTROL

Modular contactors for installation into distribution boards

Modular contactor for installation into distribution board

Description
Modular contactors are used for installation in consumer units in dwellings, business premises, hotels, hospitals, shopping centres, sport centers, production halls, warehouses etc.

They are used for remote switching and automatic control of electric devices and equipment, such as:
- lightning
- all types of pumps
- air-conditioning
- electric heating
- single-phase and three-phase motors

They excel in silent operation, long mechanical life time and high quality.

The contactors are designed for mounting on 35 mm mounting rail in accordance with the EN 60715 standard and they can be leaded by means of lead covers. The auxiliary contact block is available for signalization and ventilation module is available for preventing exceeded heating when contactors are used side-by-side.

All contactors have degree of protection IP20.

Besides the basic AC controlled types R20, R25, R40 and R63, types with increased silent operation RD20, RD25, RD40 and RD63 are available. Due to DC magnet and rectifier enable DC and AC voltage control. Surge arrestor is built in for over voltage protection.

Types R20-R, RD20-R, R25-R and RD25-R are upgraded versions of basic types of modular contactors. Besides basic functions they enable manual control with a handle.
Description of the handle positions:
- A: the contactor functions as an installation contactor without manual control
- O: permanently OFF
- I: manual shifting the handle from position A to I causes the contactor to close; when control voltage is applied, the handle is automatically set to position A.

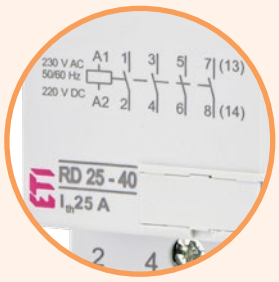
Types RD20-R and RD25-R are provided with a varistor for over voltage protection and a rectifier, which enables control with AC and DC voltage.

Contactors with manual control enable:
- switching depending on tariff (selection of the most convenient tariff)
- switching when control voltage is not applied

Technical specifications according to:
EN60947-4-1; EN60947-5-1; VDE 0660, IEC 947-4-1; IEC 947-5-1

Advantages

→ Contactors RD series are universal power supply AC/DC with built-in varistor surge protection. RD contactors produce less noise (DC coil inside)





→ Special terminals provide reliable connection with cables.



→ Spring-loaded latch ensures reliable mounting on DIN rail TH 35



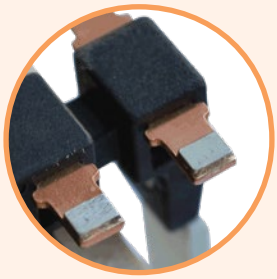
→ Contactors series R-R have operating mode switch:
- Automatic mode (normal operation with control circuit-coil)
- Manual mode (0 - permanently open, I - constantly closed).

In manual mode constantly close operation I presence of voltage on control circuit-coil returns contactor in automatic mode operation.





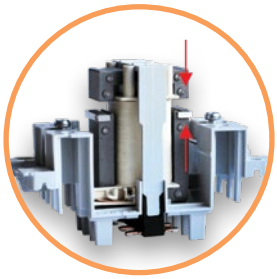
→ Contact status can be monitored visually or remote by auxiliary contacts



→ Silver contacts provide the best conductivity and lowest contact resistance



→ Spring loaded contacts to reduce bouncing effect and prolong contact life time



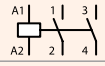
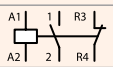
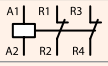
→ Specially designed mechanism consisting of two movable cores significantly reduces the noise level at switching



1-pole, 1 module (17,5 mm), 25 A (AC1, 230V)

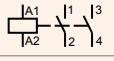
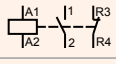
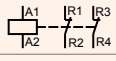
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-10-24V	002463507		130	12
R 25-10-230V	002463500		130	12

2-pole, 1 module (17,5 mm), 20 A (AC1, 230V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 20-20 230V	002461210		130	12
R 20-20 24 V	002461211		130	12
R 20-11 230 V	002461220		130	12
R 20-11 24 V	002461221		130	12
R 20-02 230 V	002461230		130	12
R 20-02 24 V	002461231		130	12



2-pole, 1 module (17,5 mm), 25 A (AC1, 230V)

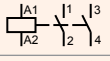
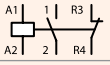
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-20-24V	002463501		130	12
R 25-20 230V	002463502		130	12
R 25-11 24V	002463503		130	12
R 25-11 230V	002463504		130	12
R 25-02 24V	002463505		130	12
R 25-02 230V	002463506		130	12

2-pole, 1 module (17,5 mm), 32 A (AC1, 230V)

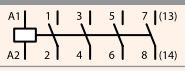
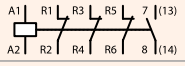
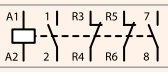
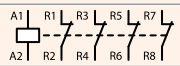
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 32-20 230V AC/DC	002464077		130	10/80



2 pole, 2 modules (35 mm), 63 A(AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 63-20 230V	002463482		240	6/60
R 63-20 24V	002463483		240	6/60
R 63-11 230V	002463484		240	6/60
R 63-11 24V	002463485		240	6/60

4-pole, 2 modules (35 mm), 25 A (AC1, 400 V)

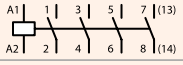
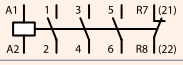
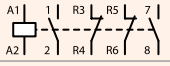
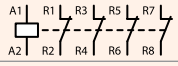
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-40 230 V	002462310		220	6
R 25-40 24 V	002462311		220	6
R 25-31 230 V	002462320		220	6
R 25-31 24 V	002462321		220	6
R 25-13 230 V	002462330		220	6
R 25-13 24 V	002462331		220	6
R 25-22 230 V	002462340		220	6
R 25-22 24 V	002462341		220	6
R 25-04 230 V	002462350		220	6
R 25-04 24 V	002462351		220	6



4-pole, 2 modules (35 mm), 32 A (AC1, 400 V)

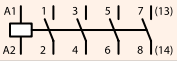
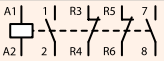
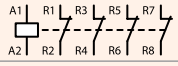
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 32-40 230V AC/DC	002464078		244	5/40

4-pole, 3 modules (52,5 mm), 40 A (AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 40-40 230 V	002463410		360	4
R 40-40 24 V	002463411		360	4
R 40-31 230 V	002463420		360	4
R 40-31 24 V	002463421		360	4
R 40-22 230 V	002463430		360	4
R 40-22 24 V	002463431		360	4
R 40-04 230 V	002463440		360	4
R 40-04 24 V	002463441		360	4



4 pole, 3 modules (52,5mm), 63 A(AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 63-40 230 V	002463450		360	4
R 63-40 24 V	002463451		360	4
R 63-31 230 V	002463460		360	4
R 63-31 24 V	002463461		360	4
R 63-22 230 V	002463470		360	4
R 63-22 24 V	002463471		360	4
R 63-04 230 V	002463480		360	4
R 63-04 24 V	002463481		360	4



Auxiliary contactor block for contactors R25, R40, R63 (max. 1 piece)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RH 11	002461101		26	3

*Not available for 1 modules size R contactors, only for 2 and above!



Sealing cover

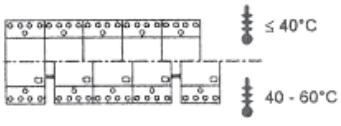
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
P721	002461110	R 25 (4p)	2	10
P690	002461120	R 40…, R 63…	3	10



Distance piece

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
P730	002461130	R20-R63	12	10

Distance piece



Distance piece is used where ambient temperature is higher than 40°C. Piece width is 1/2 module (8,8 mm)

Max 3 contactors can be side by side - use of distance piece is highly recommended.





1-pole, 1 module (17,5 mm), 20 A (AC1, 230 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 20-10-230V AC/DC	002464000		130	10
RD 20-10-24V AC/DC	002464001			
RD 20-01-230V AC/DC	002464002			
RD 20-01-24V AC/DC	002464003			
2-pole, 1 module (17,5 mm), 20 A (AC1, 230 V)				
RD 20-20-230V AC/DC	002464004		130	10
RD 20-20-24V AC/DC	002464005			
RD 20-11-230V AC/DC	002464006			
RD 20-11-24V AC/DC	002464007			
RD 20-02-230V AC/DC	002464008			
RD 20-02-24V AC/DC	002464009			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV



4-pole, 2 modules (35 mm), 25 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 25-40-230V AC/DC	002464010		240	5
RD 25-40-24V AC/DC	002464011			
RD 25-31-230V AC/DC	002464012			
RD 25-31-24V AC/DC	002464013			
RD 25-22-230V AC/DC	002464014			
RD 25-22-24V AC/DC	002464015			
RD 25-04-230V AC/DC	002464016			
RD 25-04-24V AC/DC	002464017			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

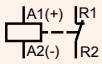
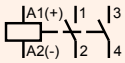
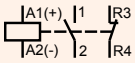
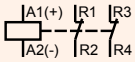


4-pole, 3 modules (52,5 mm), 40 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 40-40-230V AC/DC	002464018		420	5
RD 40-40-24V AC/DC	002464019			
RD 40-31-230V AC/DC	002464020			
RD 40-31-24V AC/DC	002464021			
RD 40-22-230V AC/DC	002464022			
RD 40-22-24V AC/DC	002464023			
RD 40-04-230V AC/DC	002464024			
RD 40-04-24V AC/DC	002464025			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

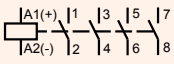
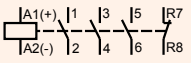
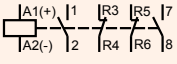
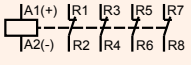
4 pole, 3 modules (52,5mm), 63 A(AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 63-40-230V AC/DC	002464026		420	5
RD 63-40-24V AC/DC	002464027			
RD 63-31-230V AC/DC	002464028			
RD 63-31-24V AC/DC	002464029			
RD 63-22-230V AC/DC	002464030			
RD 63-22-24V AC/DC	002464031			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

1-pole, ON - OFF - AUTO, 1 module (17,5 mm), 20 A (AC1, 230V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 20-10-R-230V AC	002464032		130	10
R 20-10-R-24V AC	002464033			
RD 20-10-R-230V AC/DC	002464034			
RD 20-10-R-24V AC/DC	002464035			
R 20-01-R-230V AC	002464036			
R 20-01-R-24V AC	002464037			
RD 20-01-R-230V AC/DC	002464038			
RD 20-01-R-24V AC/DC	002464039			
2-pole, ON - OFF - AUTO, 1 module (17,5 mm), 20 A (AC1, 230V)				
R 20-20-R-230V AC	002464040		130	10
R 20-20-R-24V AC	002464041			
RD 20-20-R-230V AC/DC	002464042			
RD 20-20-R-24V AC/DC	002464043			
R 20-11-R-230V AC	002464044			
R 20-11-R-24V AC	002464045			
RD 20-11-R-230V AC/DC	002464046			
RD 20-11-R-24V AC/DC	002464047			
R 20-02-R-230V AC	002464048			
R 20-02-R-24V AC	002464049			
RD 20-02-R-230V AC/DC	002464050			
RD 20-02-R-24V AC/DC	002464051			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV



4-pole, ON - OFF - AUTO, 2 modules (35 mm), 25 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-40-R-230V AC	002464052		240	5
R 25-40-R-24V AC	002464053			
RD 25-40-R-230V AC/DC	002464054			
RD 25-40-R-24V AC/DC	002464055			
R 25-31-R-230V AC	002464056			
R 25-31-R-24V AC	002464057			
RD 25-31-R-230V AC/DC	002464058			
RD 25-31-R-24V AC/DC	002464059			
R 25-22-R-230V AC	002464060			
R 25-22-R-24V AC	002464061			
RD 25-22-R-230V AC/DC	002464062			
RD 25-22-R-24V AC/DC	002464063			
R 25-04-R-230V AC	002464064			
R 25-04-R-24V AC	002464065			
RD 25-04-R-230V AC/DC	002464066			
RD 25-04-R-24V AC/DC	002464067			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV





Auxiliary contactor block for contactors RD, R...R, RD...R

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RN-20	002464068		30	1
RN-02	002464069		30	1
RN-11	002464070		30	1

* The auxiliary switch should not be applied in combination with RD20 and RD20-R.



Sealing cover

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
SC20	002464071	RD 20, R20...R	3	2
SC25	002464072	RD 25, R25...R	4	2
SC40/63	002464073	RD 40, RD 60	5	2



Distance piece

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
IKV	002464074	RD, R...R	6	1

Technical data on page 298

Bistable switches RBS

Bistable Switch RBS

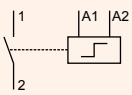
Description

REMOTE SWITCHING
AND AUTOMATIC CONTROL:
- Lightning
- Electric heating
- Electric motors
- Electric equipment

ADVANCED OPERATION:
- Impulse control
- Manual control

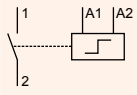
OTHER BENEFITS:
- Small switch on coil consumption
- No hold coil consumtion
- Wide application
- Mounting on 35 mm rail
- Sealing terminal covers

1-pole, 1 module (17,5 mm), 20A (AC1, 440V)

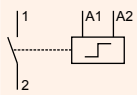
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS220-10-230V AC	002464100		130	8
RBS220-10-24V AC	002464112		130	8



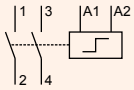
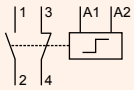
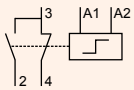
1-pole, 1 module (17,5 mm), 25A (AC1, 440V)

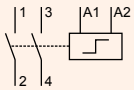
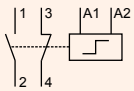
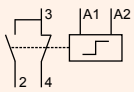
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS225-10-230V AC	002464101		130	8
RBS225-10-24V AC	002464113		130	8

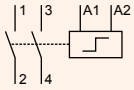
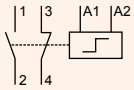
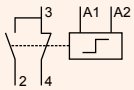
1-pole, 1 module (17,5 mm), 32A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS232-10-230V AC	002464102		130	8
RBS232-10-24V AC	002464114		130	8

Technical data on page 306

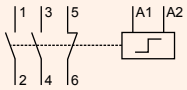
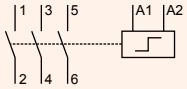
2-pole, 1 module (17,5 mm), 20A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS220-20-230V AC	002464103		130	8
RBS220-20-24V AC	002464115		130	8
RBS220-11-230V AC	002464106		130	8
RBS220-11-24V AC	002464118		130	8
RBS220-1C-230V AC	002464109		130	8
RBS220-1C-24V AC	002464121		130	8

2-pole, 1 module (17,5 mm), 25A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS225-20-230V AC	002464104		130	8
RBS225-20-24V AC	002464116		130	8
RBS225-11-230V AC	002464107		130	8
RBS225-11-24V AC	002464119		130	8
RBS225-1C-230V AC	002464110		130	8
RBS225-1C-24V AC	002464122		130	8

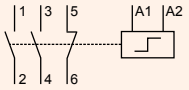
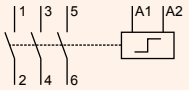
2-pole, 1 module (17,5 mm), 32A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS232-20-230V AC	002464105		130	8
RBS232-20-24V AC	002464117		130	8
RBS232-11-230V AC	002464108		130	8
RBS232-11-24V AC	002464120		130	8
RBS232-1C-230V AC	002464111		130	8
RBS232-1C-24V AC	002464123		130	8

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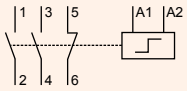
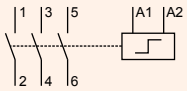
3-pole, 2 modules (35 mm), 20A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS420-21-230V AC	002464127		200	4
RBS420-21-24V AC	002464145		200	4
RBS420-30-230V AC	002464130		200	4
RBS420-30-24V AC	002464148		200	4

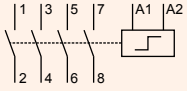
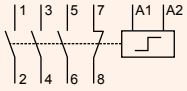
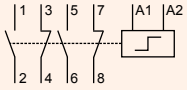
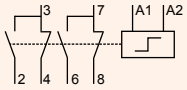
3-pole, 2 modules (35 mm), 25A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS425-21-230V AC	002464128		200	4
RBS425-21-24V AC	002464146		200	4
RBS425-30-230V AC	002464131		200	4
RBS425-30-24V AC	002464149		200	4

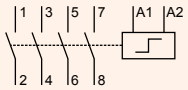
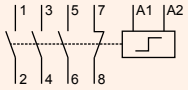
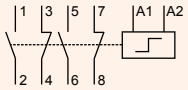
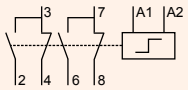
3-pole, 2 modules (35 mm), 32A (AC1, 440V)

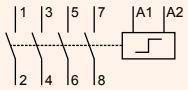
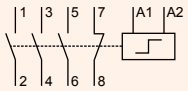
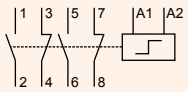
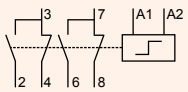
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS432-21-230V AC	002464129		200	4
RBS432-21-24V AC	002464147		200	4
RBS432-30-230V AC	002464132		200	4
RBS432-30-24V AC	002464150		200	4

4-pole, 2 modules (35 mm), 20A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS420-40-230V AC	002464124		200	4
RBS420-40-24V AC	002464142		200	4
RBS420-31-230V AC	002464133		200	4
RBS420-31-24V AC	002464151		200	4
RBS420-22-230V AC	002464136		200	4
RBS420-22-24V AC	002464154		200	4
RBS420-2C-230V AC	002464139		200	4
RBS420-2C-24V AC	002464157		200	4



4-pole, 2 modules (35 mm), 25A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS425-40-230V AC	002464125		200	4
RBS425-40-24V AC	002464143		200	4
RBS425-31-230V AC	002464134		200	4
RBS425-31-24V AC	002464152		200	4
RBS425-22-230V AC	002464137		200	4
RBS425-22-24V AC	002464155		200	4
RBS425-2C-230V AC	002464140		200	4
RBS425-2C-24V AC	002464158		200	4

4-pole, 2 modules (35 mm), 32A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS432-40-230V AC	002464126		200	4
RBS432-40-24V AC	002464144		200	4
RBS432-31-230V AC	002464135		200	4
RBS432-31-24V AC	002464153		200	4
RBS432-22-230V AC	002464138		200	4
RBS432-22-24V AC	002464156		200	4
RBS432-2C-230V AC	002464141		200	4
RBS432-2C-24V AC	002464159		200	4

Sealing cover			
Type	Code No.	Weight [g]	Packaging [pcs]
SC	002464160	3	2

*Size of one module - for covering 2-module sized RBS two pcs are needed, one for each side

Miniature and motor contactors, auxiliary contactors and overload relays

Advantages



→ Contactors CEI series (kit) with mechanical interlock - solution for Reversing the motor or implementation of schemes star delta



→ Miniature contactors CEC have possibility to be mounted on printed circuit board with special connection module.



→ Special socket for RC noise filters (surge supressors)





→ Additional time delay relays mounted on side of contactor



→ Mechanical interlock assures also mounting of auxiliary contacts



→ Overload protection relays (bimetal)



→ Front mounted auxiliary contact block

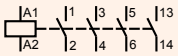
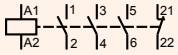
Miniature and auxiliary contactor CE, CAE, CEI7

Application:
Miniature contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 7,5kW (at 400V AC3 duty), and auxiliary contactors are used for realizing a wide range of control circuits.
Advantages:

- Mounting on DIN rail and mounting plates
- Small size and high technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Reversing starter with mechanical interlock
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC

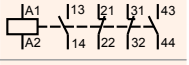
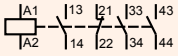
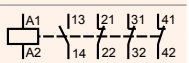
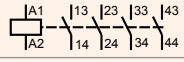


Miniature contactor CE07, 16 A (AC1), 7A, 3 kW (AC3)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CE07.10-24V-50/60Hz	004641020		130	1
CE07.10-48V-50/60Hz	004641021			
CE07.10-110V-50/60Hz	004641022			
CE07.10-230V-50/60Hz	004641023			
CE07.10-400V-50/60Hz	004641024			
CE07.01-24V-50/60Hz	004641010		130	1
CE07.01-48V-50/60Hz	004641011			
CE07.01-110V-50/60Hz	004641012			
CE07.01-230V-50/60Hz	004641013			
CE07.01-400V-50/60Hz	004641014			

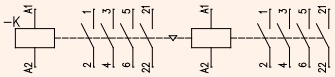


Miniature contactor relay CAE0; 6A (AC15, 230V)

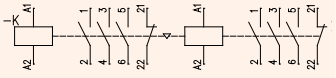
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CAE04.22-230V-50/60Hz	004641343		180	1
CAE04.22-24V-50/60Hz	004641340			
CAE04.31-230V-50/60Hz	004641363			
CAE04.31-24V-50/60Hz	004641360			
CAE04.13-230V-50/60Hz	004641353			
CAE04.13-24V-50/60Hz	004641350			
CAE04.40-230V-50/60Hz	004641383			
CAE04.40-24V-50/60Hz	004641380			

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Miniature contactor-reversing starter with mechanical interlock CEI07.10, 16A (AC1), 3,5A, 1,5 kW (AC3)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEI7.10-24V-50/60Hz	004641620		250	1
CEI7.10-48V-50/60Hz	004641621			
CEI7.10-110V-50/60Hz	004641622			
CEI7.10-230V-50/60Hz	004641623			
CEI7.10-400V-50/60Hz	004641624			

Miniature contactor-reversing starter with mechanical interlock CEI07.01, 16A (AC1), 3,5A, 1,5 kW (AC3)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEI7.01-24V-50/60Hz	004641610		250	1
CEI7.01-48V-50/60Hz	004641611			
CEI7.01-110V-50/60Hz	004641612			
CEI7.01-230V-50/60Hz	004641613			
CEI7.01-400V-50/60Hz	004641614			



Surge suppressor

Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
RCE01	004641701	24-48 VAC	CE07, CEI07	14	1
RCE06	004641702	110-220 VAC	CE07, CEI07	14	1
RCE10	004641703	380-400 VAC	CE07, CEI07	14	1

Technical data on page 319

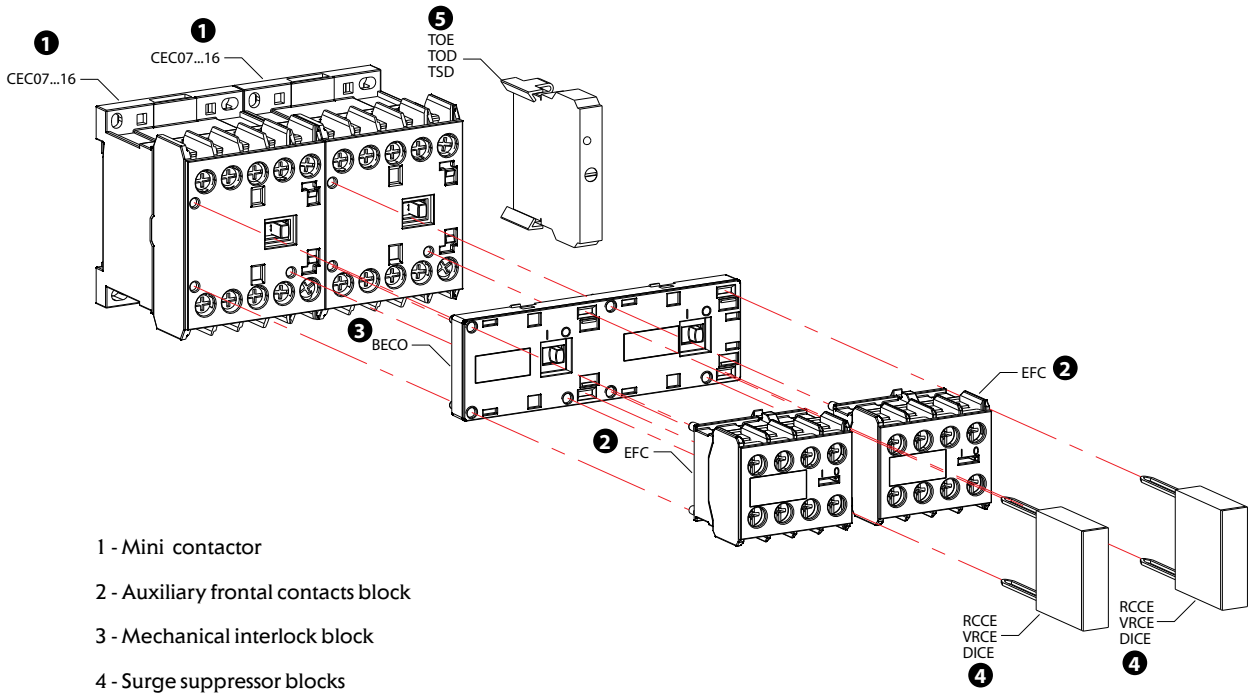
Miniature and auxiliary contactor CEC

Application:
Miniature contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 7,5kW (at 400V AC3 duty), and auxiliary contactors are used for realizing a wide range of control circuits.
Advantages:

- Mounting on DIN rail and mounting plates
- Small size and high technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Reversing starter with mechanical interlock
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC, 24 VDC, 48 VDC, 110 VDC, 220 VDC

Example of CEC configuration:





1 - Mini contactor

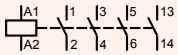
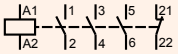
2 - Auxiliary frontal contacts block

3 - Mechanical interlock block

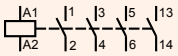
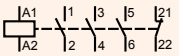
4 - Surge suppressor blocks

5 -Timer

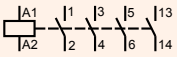
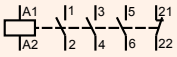


Miniature contactors CEC07; 18A(AC1); 7A,3kW(AC3 400V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC07.10-24V-50/60Hz	004641050		180	1
CEC07.10-42V-50/60Hz	004641051			
CEC07.10-48V-50/60Hz	004641052			
CEC07.10-110V-50/60Hz	004641053			
CEC07.10-230V-50/60Hz	004641054			
CEC07.10-400V-50/60Hz	004641055			
CEC07.10-24VDC	004641100			
CEC07.10-48VDC	004641130			
CEC07.10-110VDC	004641131			
CEC07.10-220VDC	004641132			
CEC07.01-24V-50/60Hz	004641056		180	1
CEC07.01-42V-50/60Hz	004641057			
CEC07.01-48V-50/60Hz	004641058			
CEC07.01-110V-50/60Hz	004641059			
CEC07.01-230V-50/60Hz	004641060			
CEC07.01-400V-50/60Hz	004641061			
CEC07.01-24VDC	004641101			
CEC07.01-48VDC	004641133			
CEC07.01-110VDC	004641134			
CEC07.01-220VDC	004641135			



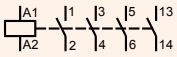
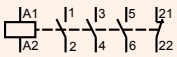
Miniature contactors CEC09; 20A(AC1); 9A,4kW(AC3, 400V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC09.10-24V-50/60Hz	004641062		180	1
CEC09.10-42V-50/60Hz	004641063			
CEC09.10-48V-50/60Hz	004641064			
CEC09.10-110V-50/60Hz	004641065			
CEC09.10-230V-50/60Hz	004641066			
CEC09.10-400V-50/60Hz	004641067			
CEC09.10-24VDC	004641102		218	1
CEC09.10-48VDC	004641136			
CEC09.10-110VDC	004641137			
CEC09.10-220VDC	004641138			
CEC09.01-24V-50/60Hz	004641068		180	1
CEC09.01-42V-50/60Hz	004641069			
CEC09.01-48V-50/60Hz	004641070			
CEC09.01-110V-50/60Hz	004641071			
CEC09.01-230V-50/60Hz	004641072			
CEC09.01-400V-50/60Hz	004641073			
CEC09.01-24VDC	004641103		218	1
CEC09.01-48VDC	004641139			
CEC09.01-110VDC	004641140			
CEC09.01-220VDC	004641141			

Miniature contactors CEC012; 22A(AC1); 12A,5,5kW(AC3 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC012.10-24V-50/60Hz	004641074		180	1
CEC012.10-42V-50/60Hz	004641075			
CEC012.10-48V-50/60Hz	004641076			
CEC012.10-110V-50/60Hz	004641077			
CEC012.10-230V-50/60Hz	004641078			
CEC012.10-400V-50/60Hz	004641079			
CEC012.10-24VDC	004641104		218	1
CEC012.10-48VDC	004641142			
CEC012.10-110VDC	004641143			
CEC012.10-220VDC	004641144			
CEC012.01-24V-50/60Hz	004641080		180	1
CEC012.01-42V-50/60Hz	004641081			
CEC012.01-48V-50/60Hz	004641082			
CEC012.01-110V-50/60Hz	004641083			
CEC012.01-230V-50/60Hz	004641084			
CEC012.01-400V-50/60Hz	004641085			
CEC012.01-24VDC	004641105		218	1
CEC012.01-48VDC	004641145			
CEC012.01-110VDC	004641146			
CEC012.01-220VDC	004641147			



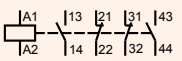
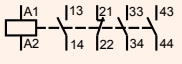
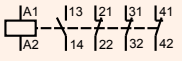
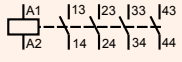
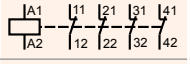
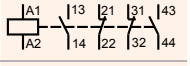
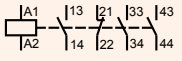
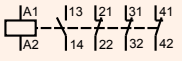
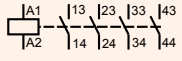
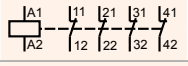
Miniature contactors CEC016; 22A(AC1); 16A,7,5kW(AC3 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC016.10-24V-50/60Hz	004641086		180	1
CEC016.10-42V-50/60Hz	004641087			
CEC016.10-48V-50/60Hz	004641088			
CEC016.10-110V-50/60Hz	004641089			
CEC016.10-230V-50/60Hz	004641090			
CEC016.10-400V-50/60Hz	004641091			
CEC016.10-24VDC	004641106		218	1
CEC016.10-48VDC	004641148			
CEC016.10-110VDC	004641149			
CEC016.10-220VDC	004641150			
CEC016.01-24V-50/60Hz	004641092		180	1
CEC016.01-42V-50/60Hz	004641093			
CEC016.01-48V-50/60Hz	004641094			
CEC016.01-110V-50/60Hz	004641095			
CEC016.01-230V-50/60Hz	004641096			
CEC016.01-400V-50/60Hz	004641097			
CEC016.01-24VDC	004641107		218	1
CEC016.01-48VDC	004641151			
CEC016.01-110VDC	004641152			
CEC016.01-220VDC	004641153			

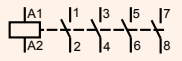
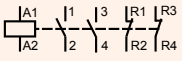


Technical data on page 319

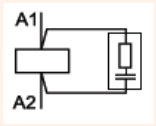
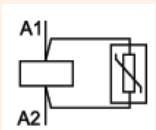
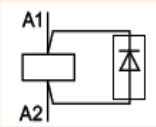


Miniature contactor relay CECA0; 10A (AC15, 230V)				
Type	**Code No.**	**Wiring diagram**	**Weight [g]**	**Packaging [pcs]**
CECA0.22-24V-50/60Hz	004641160		180	1
CECA0.22-230V-50/60Hz	004642390			
CECA0.31-24V-50/60Hz	004641161			
CECA0.31-230V-50/60Hz	004642391			
CECA0.13-24V-50/60Hz	004641162			
CECA0.13-230V-50/60Hz	004642392			
CECA0.40-24V-50/60Hz	004641163			
CECA0.40-230V-50/60Hz	004642393			
CECA0.04-24V-50/60Hz	004641164			
CECA0.04-230V-50/60Hz	004642394			
CECA0.22-24VDC	004646010		218	1
CECA0.22-220VDC	004641170			
CECA0.31-24VDC	004646011			
CECA0.31-220VDC	004641171			
CECA0.13-24VDC	004646012			
CECA0.13-220VDC	004641172			
CECA0.40-24VDC	004646013			
CECA0.40-220VDC	004641173			
CECA0.04-24VDC	004646014			
CECA0.04-220VDC	004641174			



4-pole miniature contactors				
Type	**Code No.**	**Wiring diagram**	**Weight [g]**	**Packaging [pcs]**
CEC07.4P-230V-50/60Hz	004641200		180	1
CEC09.4P-230V-50/60Hz	004641201			
CEC012.4P-230V-50/60Hz	004641202			
CEC016.4P-230V-50/60Hz	004641203			
CEC07.4P-24VDC	004641210			
CEC09.4P-24VDC	004641211			
CEC012.4P-24VDC	004641212			
CEC016.4P-24VDC	004641213			
CEC07.PR-230V-50/60HZ	004641204		180	1
CEC09.PR-230V-50/60HZ	004641205			
CEC012.PR-230V-50/60HZ	004641206			
CEC016.PR-230V-50/60HZ	004641207			
CEC07.PR-24V-DC	004641214			
CEC09.PR-24V-DC	004641215			
CEC012.PR-24V-DC	004641216			
CEC016.PR-24V-DC	004641217			

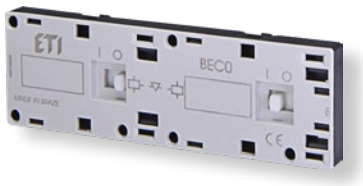
Technical data on page 319

Surge suppressor					
Type	Code No.	voltage	Wiring diagram	Weight [g]	Packaging [pcs]
RCCE-1	004641720	12-24V 50/60Hz		6	1
RCCE-2	004641721	24-48V 50/60Hz			
RCCE-3	004641722	48-127V 50/60Hz			
RCCE-4	004641723	127-250V 50/60Hz			
RCCE-5	004641724	250-380V 50/60Hz			
RCCE-6	004641725	380-510V 50/60Hz			
VRCE-1	004641726	12-48V AC/12-60V DC		6	1
VRCE-2	004641727	50-127V AC/60-180V DC			
VRCE-3	004641728	130-275V AC/180-300V DC			
VRCE-4	004641729	277-380V AC/300-510V DC			
VRCE-5	004641730	400-510V AC			
DICE-1	004641731	12-600V DC		6	1



Mechanical interlock			
Type	Code No.	Weight [g]	Packaging [pcs]
BEC0	004643603	15	1

For use with CEC



Printed circuit board adapter			
Type	Code No.	Weight [g]	Packaging [pcs]
CEC0	004642720	126	1

For use with CEC



Overload relay RE17D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE17D-0,4	004641400	0,28-0,4	CEC07 – CEC016	150	1
RE17D-0,63	004641401	0,4-0,63			
RE17D-0,8	004641402	0,56-0,8			
RE17D-1,2	004641403	0,8-1,2			
RE17D-1,8	004641404	1,2-1,8			
RE17D-2,8	004641405	1,8-2,8			
RE17D-4,0	004641406	2,8-4,0			
RE17D-6,3	004641407	4-6,3			
RE17D-8,0	004641408	5,6-8			
RE17D-10	004641409	7-10			
RE17D-12,5	004641410	8-12,5			
RE17D-15	004641411	10-15			
RE17D-17	004641412	15-17			



Technical data on page 320, 346



EFC0



EFCA

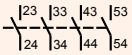
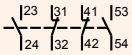
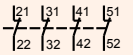
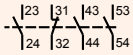
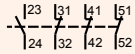
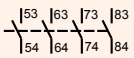
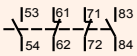
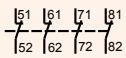
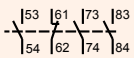
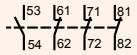
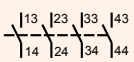
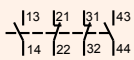
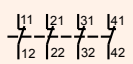
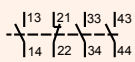
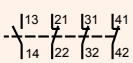


EFC4



Example of using EFC0 and RCCE

Auxiliary contact blocks

Type	Code No.	Wiring diagram	For use with	Weight [g]	Packaging [pcs]
EFC0-20	004641520		CEC0 3 pole	28	1
EFC0-11	004641521				
EFC0-02	004641522				
EFC0-40	004641523				
EFC0-22	004641524				
EFC0-04	004641525				
EFC0-31	004641526				
EFC0-13	004641527				
EFCA-20	004641530		CECA0	28	1
EFCA-11	004641531				
EFCA-02	004641532				
EFCA-40	004641533				
EFCA-22	004641534				
EFCA-04	004641535				
EFCA-31	004641536				
EFCA-13	004641537				
EFC4-20	004641540		CEC0 4 pole	28	1
EFC4-11	004641541				
EFC4-02	004641542				
EFC4-40	004641543				
EFC4-22	004641544				
EFC4-04	004641545				
EFC4-31	004641546				
EFC4-13	004641547				

Technical data on page 321

Electronic timing relays					
Type	Code No.	Time	Supply Voltage	Weight [g]	Packaging [pcs]
ON delay					
TOE-3-24-240	004642730	0,3-3 sec	24-240V AC/DC	126	1
TOE-10-24-240	004642731	1-10 sec			
TOE-30-24-240	004642732	3-30 sec			
TOE-60-24-240	004642733	6-60 sec			
TOE-100-24-240	004642734	10-100 sec			
TOE-300-24-240	004642735	30-300 sec			
TOE-1800-24-240	004642736	180-1800 sec			
OFF delay					
TOD-3-24-60	004642740	0,3-3 sec	24-60V AC/DC	126	1
TOD-10-24-60	004642741	1-10 sec			
TOD-30-24-60	004642742	3-30 sec			
TOD-60-24-60	004642743	6-60 sec			
TOD-100-24-60	004642744	10-100 sec			
TOD-300-24-60	004642745	30-300 sec			
TOD-1800-24-60	004642746	180-1800 sec			
TOD-3-100-240	004642747	0,3-3 sec	110-240V AC/DC	126	1
TOD-10-100-240	004642748	1-10 sec			
TOD-30-100-240	004642749	3-30 sec			
TOD-60-100-240	004642750	6-60 sec			
TOD-100-100-240	004642751	10-100 sec			
TOD-300-100-240	004642752	30-300 sec			
TOD-1800-100-240	004642753	180-1800 sec			
Star-delta					
TSD-30-24-28	004642760	3-30 sec	24-48V AC	126	1
TSD-30-110-130	004642761		110-130V AC		
TSD-30-220-240	004642762		220 - 240V AC		



Technical data on page 321

Motor contactor CES

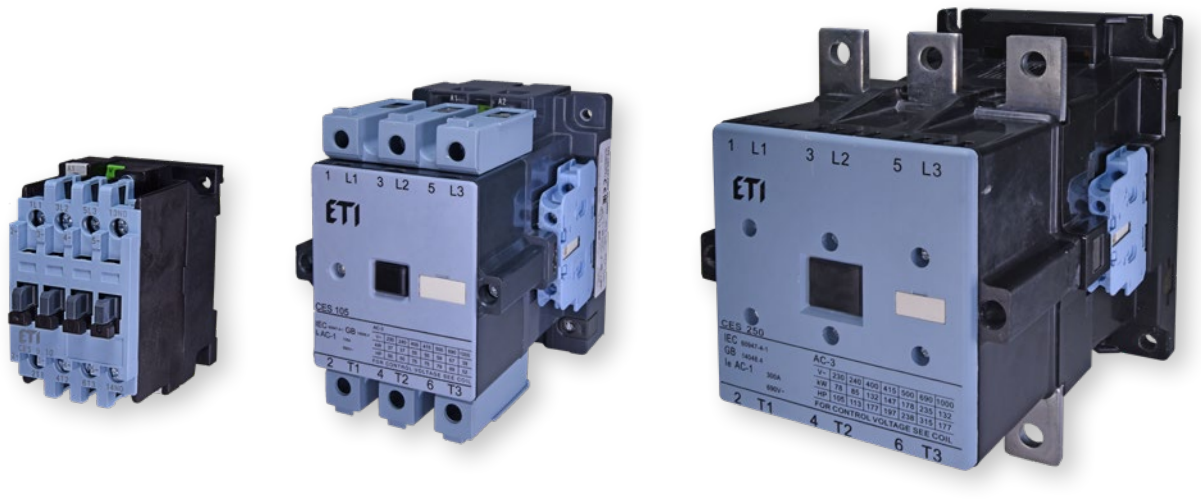
ETICON CES SERIES

IEC 60947-4-1
Contact reliability
Contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 200kW (at 400V AC3 duty)

Auxiliary contacts
CES 6 to CES 45:
Up to 4 auxiliary contact blocks with 1 NO or 1 NC contact can be snapped onto the basic units (front).
CES 65 to CES 105:
Maximum 4 auxiliary contact blocks with 1 NO + 1 NC contacts (lateral) assembled.

When the contactors are energized, the NC contacts open before the NO contacts close.

CES 65..400 NOT POSSIBLE TO MOUNT ON DIN RAIL

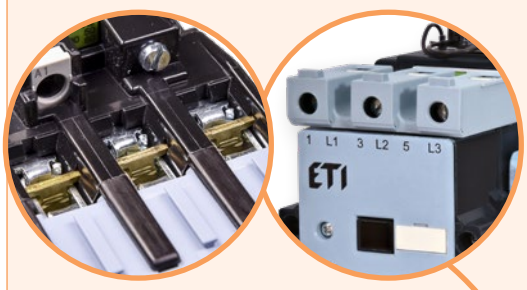


Ordering:

CES	9	.	0	1	-	230V	-	50/60Hz
1	2		3	4		5		6

1 - Contactor type
2 - Rated operational current I_e (AC3)
3 - Number and type NO auxiliary contacts
4 - Number and type NC auxiliary contacts
5 - Coil voltage
6 - Frequency

Advantages



→ CES 40...105 contactor terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.



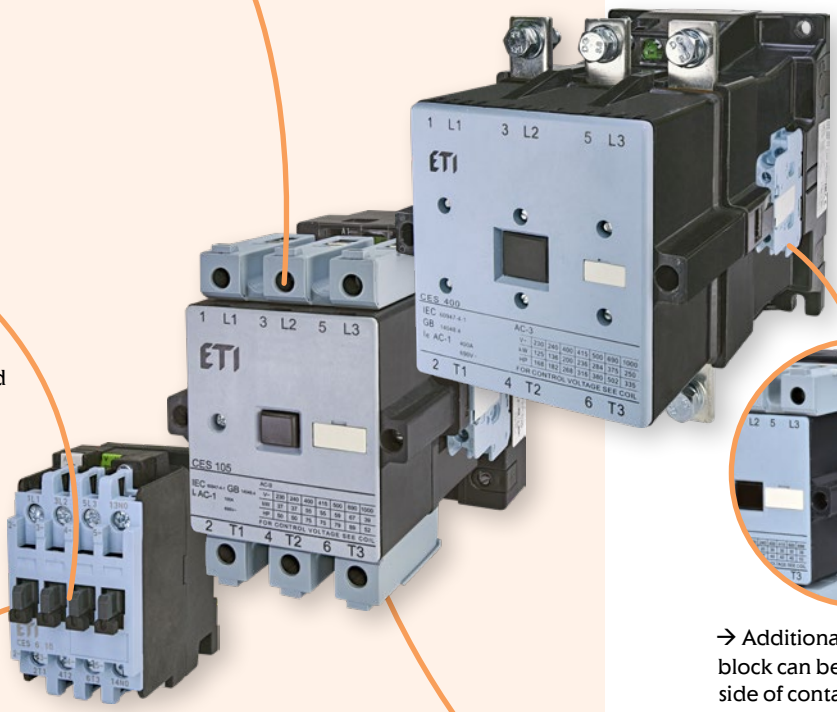
→ Additional EMC filters can be installed (CES 140...400 have already integrated).

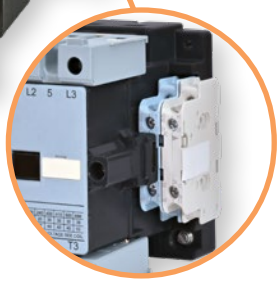


→ Voltage range control at 230 V AC: from 0.85 up to 1.15 x Us in accordance with IEC 60947.



→ CES 6...45 additional aux. contact blocks can be installed on front of device.





→ Additional 2nd aux. contact block can be installed on each side of contactor CES65...300.



→ Design allows to mount contactor on DIN rail TH 35 or directly on panel







→ Mechanical interlock can be installed between 2 contactors.



→ Possible to mount overload relay directly on contactor or DIN rail TH 35 with mounting adapter CES-AD-RT

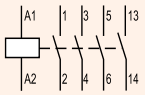
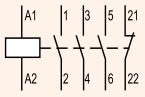


→ Overload relays (bimetal) tripping class 10



CES 6

Motor contactor CES 6; 25A(AC1); 6A/2,2kW(AC3, 400V)

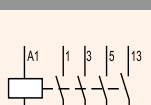
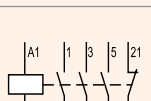
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 6.10-24V-50/60Hz	004646500		370	1
CES 6.10-110V-50/60Hz	004646503		370	1
CES 6.10-230V-50/60Hz	004646501		370	1
CES 6.10-400V-50Hz	004646502		370	1
CES 6.10-24V DC	004646504		0,58	1
CES 6.01-24V-50/60Hz	004646505		370	1
CES 6.01-110V-50/60Hz	004646508		370	1
CES 6.01-230V-50/60Hz	004646506		370	1
CES 6.01-400V-50Hz	004646507		370	1
CES 6.01-24V DC	004646509		580	1

CES 6.10 - Integrated auxiliary contact 1xNO; CES 6.01 - Integrated auxiliary contact 1xNC



CES 9

Motor contactor CES 9; 25A(AC1); 9A/4kW(AC3, 400V)

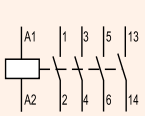
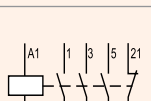
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 9.10-24V-50/60Hz	004646510		370	1
CES 9.10-110V-50/60Hz	004646511		370	1
CES 9.10-230V-50/60Hz	004646512		370	1
CES 9.10-400V-50Hz	004646513		370	1
CES 9.10-24V DC	004646514		580	1
CES 9.01-24V-50/60Hz	004646515		370	1
CES 9.01-110V-50/60Hz	004646516		370	1
CES 9.01-230V-50/60Hz	004646517		370	1
CES 9.01-400V-50Hz	004646518		370	1
CES 9.01-24V DC	004646519		580	1

CES 9.10 - Integrated auxiliary contact 1xNO; CES 9.01 - Integrated auxiliary contact 1xNC



CES 12

Motor contactor CES 12; 25A(AC1); 12A/5,5kW(AC3, 400V)

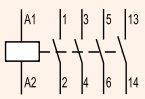
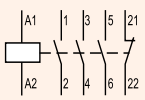
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 12.10-24V-50/60Hz	004646520		370	1
CES 12.10-110V-50/60Hz	004646521		370	1
CES 12.10-230V-50/60Hz	004646522		370	1
CES 12.10-400V-50Hz	004646523		370	1
CES 12.10-24V DC	004646524		580	1
CES 12.10-42V-50/60Hz	004646525		370	1
CES 12.01-24V-50/60Hz	004646526		370	1
CES 12.01-110V-50/60Hz	004646527		370	1
CES 12.01-230V-50/60Hz	004646528		370	1
CES 12.01-400V-50Hz	004646529		370	1
CES 12.01-24V DC	004646530		580	1

CES 12.10 - Integrated auxiliary contact 1xNO; CES 12.01 - Integrated auxiliary contact 1xNC



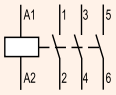
CES 18

Motor contactor CES 18; 25A(AC1); 18A/7,5kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 18.10-24V-50/60Hz	004646531		370	1
CES 18.10-110V-50/60Hz	004646532		370	1
CES 18.10-230V-50/60Hz	004646533		370	1
CES 18.10-400V-50Hz	004646534		370	1
CES 18.10-24V DC	004646535		580	1
CES 18.01-24V-50/60Hz	004646536		370	1
CES 18.01-110V-50/60Hz	004646537		370	1
CES 18.01-230V-50/60Hz	004646538		370	1
CES 18.01-400V-50Hz	004646539		370	1
CES 18.01-24V DC	004646540		580	1

CES 18.10 - Integrated auxiliary contact 1xNO; CES 18.01 - Integrated auxiliary contact 1xNC

Motor contactor CES 25; 42A(AC1); 25A/11kW(AC3, 400V)

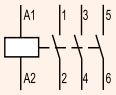
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 25.00-24V-50/60Hz	004646541		410	1
CES 25.00-110V-50/60Hz	004646542		410	1
CES 25.00-230V-50/60Hz	004646543		410	1
CES 25.00-400V-50Hz	004646544		410	1
CES 25.00-24V DC	004646545		660	1
CES 25.00-42V-50/60Hz	004646546		410	1

Auxiliary contacts top or side mounted must be ordered separately



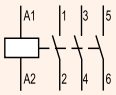
CES 25...32

Motor contactor CES 32; 42A(AC1); 32A/15kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 32.00-24V-50/60Hz	004646547		410	1
CES 32.00-110V-50/60Hz	004646548		410	1
CES 32.00-230V-50/60Hz	004646549		410	1
CES 32.00-400V-50Hz	004646550		410	1
CES 32.00-24V DC	004646551		660	1

Auxiliary contacts top or side mounted must be ordered separately

Motor contactor CES 40; 65A(AC1); 40A/18,5kW(AC3, 400V)

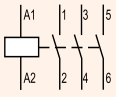
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 40.00-24V-50/60Hz	004646552		670	1
CES 40.00-110V-50/60Hz	004646553		670	1
CES 40.00-230V-50/60Hz	004646554		670	1
CES 40.00-400V-50Hz	004646555		670	1

Auxiliary contacts top or side mounted must be ordered separately



CES 40...45

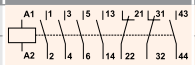
Motor contactor CES 45; 65A(AC1); 45A/22kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 45.00-24V-50/60 Hz	004646556		640	1
CES 45.00-230V-50/60 Hz	004646557		640	1
CES 45.00-400V-50Hz	004646558		640	1
CES 45.00-110V-50/60 Hz	004646559		640	1

Auxiliary contacts top or side mounted must be ordered separately

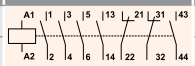
Technical data on page 330

Motor contactor CES 65; 90A(AC1); 65A/30kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 65.22-230V-50/60Hz	004646560		1.625	1
CES 65.22-24V-50/60Hz	004646561		1.625	1

Included side mounted auxiliary contacts 2xNO+2xNC

Motor contactor CES 75; 100A(AC1); 75A/37kW(AC3, 400V)

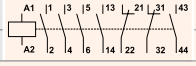
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 75.22-24V-50/60 Hz	004646562		2.530	1
CES 75.22-230V-50/60 Hz	004646563		2.530	1

Included side mounted auxiliary contacts 2xNO+2xNC



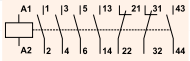
CES 65...105

Motor contactor CES 85; 120A(AC1); 85A/45kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 85.22-24V-50/60 Hz	004646564		2.530	1
CES 85.22-230V-50/60 Hz	004646565		2.530	1

Included side mounted auxiliary contacts 2xNO+2xNC

Motor contactor CES 105; 120A(AC1); 105A/55kW(AC3, 400V)

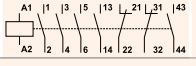
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 105.22-230V-50/60Hz	004646566		3.758	1
CES 105.22-24V-50/60Hz	004646567		3.758	1

Included side mounted auxiliary contacts 2xNO+2xNC



CES 140

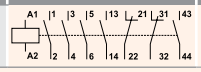
Motor contactor CES 140; 160A(AC1); 140A/75kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 140.22-230V-50/60Hz	004646568		3.300	1

Included side mounted auxiliary contacts 2xNO+2xNC

Technical data on page 330

Motor contactor CES 170; 210A(AC1); 170A/90kW(AC3, 400V)

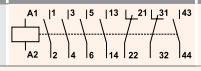
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 170.22-230V-50/60Hz	004646569		4.800	1

Included side mounted auxiliary contacts 2xNO+2xNC



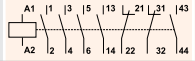
CES 170...205

Motor contactor CES 205; 220A(AC1); 205A/110kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 205.22-230V-50/60Hz	004646570		4.800	1

Included side mounted auxiliary contacts 2xNO+2xNC

Motor contactor CES 250; 300A(AC1); 250A/132kW(AC3, 400V)

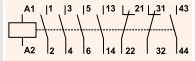
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 250.22-230V-50/60Hz	004646571		6.200	1

Included side mounted auxiliary contacts 2xNO+2xNC



CES 250...300

Motor contactor CES 300; 320A(AC1); 300A/160kW(AC3, 400V)

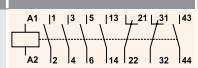
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 300.22-230V-50/60Hz	004646572		6.200	1

Included side mounted auxiliary contacts 2xNO+2xNC



CES 400

Motor contactor CES 400; 500A(AC1); 400A/200kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 400.22-230V-50/60Hz	004646573		6.800	1

Included side mounted auxiliary contacts 2xNO+2xNC

Technical data on page 330

Accessories



CES-BCF

Auxiliary contact block - front mounted; 5,6A(230V, AC-15/AC-14), 3,8A(400V, AC-15/AC-14)

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
CES-BCF 10	004646574	1 NO	CES 6…CES 45		20	10
CES-BCF 01	004646575	1 NC	CES 6…CES 45		20	10

Up to max. 4 contacts



CES-BCSU 11



CES-BCSS 11

Auxiliary contact block - lateral; 5,6A(230V, AC-15/AC-14), 3,8A(400V, AC-15/AC-14)

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
CES-BCSU 11	004646576	1 NO + 1 NC	CES65…CES 400		52	2
CES-BCSS 11	004646577	1 NO + 1 NC	CES65…CES 400		42	2

Up to max. 4 contacts, 2 per each side
BCSU - upgrade contact with screws
BCSS - spare part only, no mounting screws
Possible to order only multiples of 2pcs (2, 4, 6, 8…) due to the default packaging system



CES-MIL 6-45



CES-MIL 65-300

Mechanical interlock for mechanical locking of contactors

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CES-MIL 6-45	004646578	CES6…CES45	20	1
CES-MIL 65-300	004646579	CES65…CES300	130	1
CES-MIL 400	004646580	CES400	130	1



CES-DIC3

Surge suppressor

Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
CES-DIC3	004646581	24 - 250 VDC	CES6…CES32	15	1
CES-VR4	004646582	24-48 VAC	CES6…CES45	15	1
CES-VR5	004646583	127-240 VAC	CES6…CES45	15	1
CES-VR6	004646584	240-400 VAC	CES6…CES45	23	1
CES-VR7	004646585	24-48 VAC	CES65…CES400	14	1
CES-VR8	004646586	127-240 VAC	CES65…CES400	15	1

Already integrated in CES140…CES400

Technical data on page 333

Overload relay

Thermal overload relays

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
CES-RT0-0,4	004646587	0,25 - 0,4	CES6…CES18	140	1
CES-RT0-0,63	004646588	0,4 - 0,63	CES6…CES18	140	1
CES-RT0-1	004646589	0,63 - 1	CES6…CES18	140	1
CES-RT0-1,6	004646590	1 - 1,6	CES6…CES18	140	1
CES-RT0-2,5	004646591	1,6 - 2,5	CES6…CES18	140	1
CES-RT0-4.0	004646592	2,5 - 4	CES6…CES18	140	1
CES-RT0-6,3	004646593	4 - 6,3	CES6…CES18	140	1
CES-RT0-10	004646594	6,3 - 10	CES6…CES18	140	1
CES-RT0-12,5	004646595	8 - 12,5	CES6…CES18	140	1
CES-RT0-18	004646596	12,5 - 18	CES6…CES18	140	1
CES-RT1-16	004646597	10 - 16	CES25…CES32	200	1
CES-RT1-25	004646598	16 - 25	CES25…CES32	200	1
CES-RT1-32	004646599	25 - 32	CES25…CES32	200	1
CES-RT2-36	004646600	25 - 36	CES40…CES45	200	1
CES-RT2-45	004646601	36 - 45	CES40…CES45	200	1
CES-RT3-57	004646602	40 - 57	CES65…CES105	400	1
CES-RT3-70	004646603	57 - 70	CES65…CES105	400	1
CES-RT3-88	004646604	70 - 88	CES65…CES105	400	1
CES-RT3-105	004646605	88 - 105	CES65…CES105	400	1
CES-RT4-120	004646606	90 - 120	CES140…CES400	700	1
CES-RT4-135	004646607	110 - 135	CES140…CES400	700	1
CES-RT4-150	004646608	120 - 150	CES140…CES400	700	1
CES-RT4-160	004646609	135 - 160	CES140…CES400	700	1
CES-RT4-180	004646610	150 - 180	CES140…CES400	2.500	1
CES-RT4-250	004646611	160 - 250	CES140…CES400	2.500	1
CES-RT4-400	004646612	250 - 400	CES140…CES400	2.500	1

Overload relay mounting kits for rails TH35

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CES-AD-RT0	004646613	CES-RT0	50	1
CES-AD-RT1	004646614	CES-RT1	50	1
CES-AD-RT2	004646615	CES-RT2	132	1
CES-AD-RT3	004646616	CES-RT3	164	1



CES-AD-RT



CES-RT0 CES-RT1



CES-RT2



CES-RT3



CES-RT4 120, 135, 150



CES-RT4 160, 180



CES-RT4 250, 400

Technical data on page 335

Motor contactor CEM

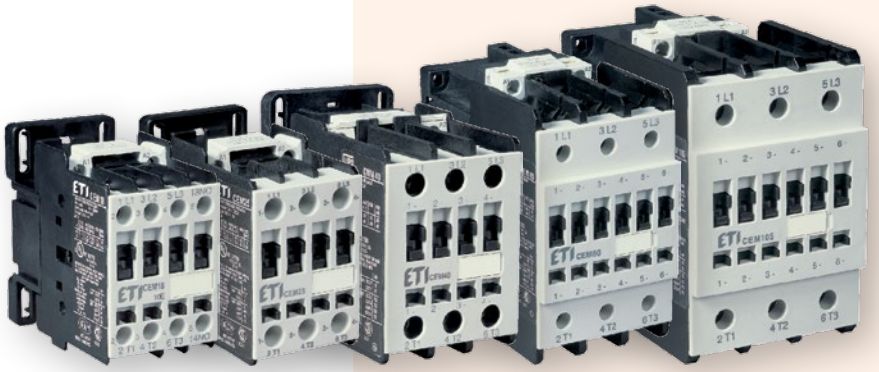
Application

Contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 300kW (at 400V AC3 duty).

Advantages

- Mounting on DIN rail and mounting plates
- High technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC

IE3 CONFORM







Ordering:

CEM9.01-230V-50/60Hz

I(AC3)[A] — Coil voltage

Nr. of NO — Nr. of NC - Number and type of auxiliary contacts

Advantages



AC



DC

→ Possible to exchange coils with different coil voltages.

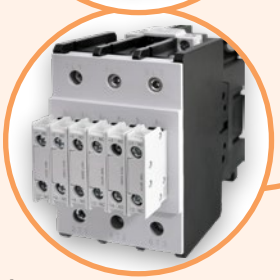


→ Additionaly EMC filter can be connected close to coil to supress RF signals and surges.



→ Lateral (side mounting) of auxiliary contacts.

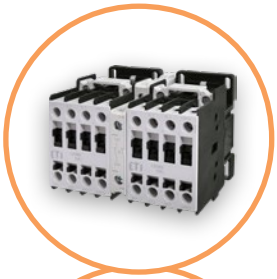




→ Front mounted auxiliary contacts







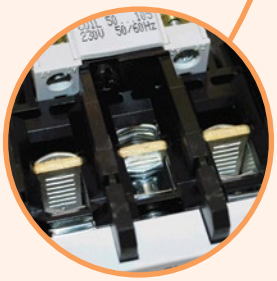


→ Mechanical interlock can lock two different size contactors
New: mechanical interlock with integrated aux. contacts BLIME 9-105 02.





→ Wide range of bimetal relays for overload protection. Possible to install directly on contactor or on DIN rail by using additional adapter BF.



→ CEM 32 ... CEM105 Contactor terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.

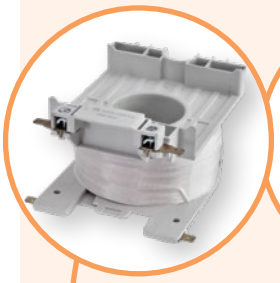


→ Mounting on DIN rail or directly on panel.





→ Built in Varistor (EMC filter).





→ Replacement control coils and electronics available.



→ Additional protection covers against touch.





→ Possibility to install additional 2nd aux. contact block on each side of contactor.





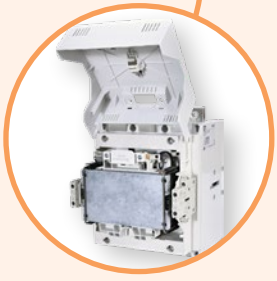
→ Additional TBE terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.







→ Possible to install mechanical interlock between 2 contactors.

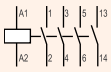


→ Easy access for maintenance and visual control of damages.



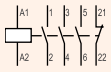
→ Overload bimetal relays for overload protection are available.

Motor contactor CEM9.10; 25A(AC1); 9A; 4kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM9.10-24V-50/60Hz	004642120		295	1
CEM9.10-48V-50/60Hz	004642121		295	1
CEM9.10-110V-50/60Hz	004642122		295	1
CEM9.10-230V-50/60Hz	004642123		295	1
CEM9.10-400V-50/60Hz	004642124		295	1
CEM9.10-24V DC	004642220		510	1
CEM9.10-220V DC	004642221		510	1

* Auxiliary contact 1NO integrated

Motor contactor CEM9.01; 25A(AC1); 9A; 4kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM9.01-24V-50/60Hz	004642110		295	1
CEM9.01-48V-50/60Hz	004642111		295	1
CEM9.01-110V-50/60Hz	004642112		295	1
CEM9.01-230V-50/60Hz	004642113		295	1
CEM9.01-400V-50/60Hz	004642114		295	1
CEM9.01-24V DC	004642210		510	1
CEM9.01-220V DC	004642211		510	1

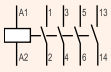
* Auxiliary contact 1NC integrated



For auxiliary contact blocks, see page 274

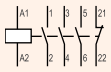


Motor contactor CEM12.10; 25A(AC1); 12A; 5.5kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM12.10-24V-50/60Hz	004643120		295	1
CEM12.10-48V-50/60Hz	004643121		295	1
CEM12.10-110V-50/60Hz	004643122		295	1
CEM12.10-230V-50/60Hz	004643123		295	1
CEM12.10-400V-50/60Hz	004643124		295	1
CEM12.10-24V DC	004643220		510	1
CEM12.10-220V DC	004643221		510	1

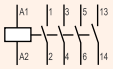
* Auxiliary contact 1NO integrated

Motor contactor CEM12.01; 25A(AC1); 12A; 5.5kW(AC3)*

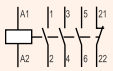
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM12.01-24V-50/60Hz	004643110		295	1
CEM12.01-48V-50/60Hz	004643111		295	1
CEM12.01-110V-50/60Hz	004643112		295	1
CEM12.01-230V-50/60Hz	004643113		295	1
CEM12.01-400V-50/60Hz	004643114		295	1
CEM12.01-24V DC	004643210		510	1
CEM12.01-220V DC	004643211		510	1

* Auxiliary contact 1NC integrated

Technical data on page 340

Motor contactor CEM18.10; 32A(AC1); 18A; 7.5kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM18.10-24V-50/60Hz	004644120		295	1
CEM18.10-48V-50/60Hz	004644121		295	1
CEM18.10-110V-50/60Hz	004644122		295	1
CEM18.10-230V-50/60Hz	004644123		295	1
CEM18.10-400V-50/60Hz	004644124		295	1
CEM18.10-24V DC	004644220		510	1
CEM18.10-220V DC	004644221		510	1

* Auxiliary contact 1NO integrated

Motor contactor CEM18.01; 32A(AC1); 18A; 7.5kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM18.01-24V-50/60Hz	004644110		295	1
CEM18.01-48V-50/60Hz	004644111		295	1
CEM18.01-110V-50/60Hz	004644112		295	1
CEM18.01-230V-50/60Hz	004644113		295	1
CEM18.01-400V-50/60Hz	004644114		295	1
CEM18.01-24V DC	004644210		510	1
CEM18.01-220V DC	004644211		510	1

* Auxiliary contact 1NC integrated



For auxiliary contact blocks, see page 274



Motor contactor CEM25.00; 45A(AC1); 25A; 11kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM25.00-24V-50/60Hz	004645100		295	1
CEM25.00-48V-50/60Hz	004645101		295	1
CEM25.00-110V-50/60Hz	004645102		295	1
CEM25.00-230V-50/60Hz	004645103		295	1
CEM25.00-400V-50/60Hz	004645104		295	1
CEM25.00-24V DC	004645200		510	1
CEM25.00-220V DC	004645201		510	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately.

Motor contactor CEM32.00; 60A(AC1); 32A; 15kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM32.00-24V-50/60Hz	004646100		520	1
CEM32.00-48V-50/60Hz	004646101		520	1
CEM32.00-110V-50/60Hz	004646102		520	1
CEM32.00-230V-50/60Hz	004646103		520	1
CEM32.00-400V-50/60Hz	004646104		520	1
CEM32.00-24V DC**	004646200		850	1
CEM32.00-220V DC**	004646201		850	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

Technical data on page 340

Motor contactor CEM40.00; 60A(AC1); 40A; 18.5kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM40.00-24V-50/60Hz	004647100		540	1
CEM40.00-48V-50/60Hz	004647101		540	1
CEM40.00-110V-50/60Hz	004647102		540	1
CEM40.00-230V-50/60Hz	004647103		540	1
CEM40.00-400V-50/60Hz	004647104		540	1
CEM40.00-24V DC**	004647200		850	1
CEM40.00-220V DC**	004647201		850	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately

** 24V DC (24...28 V DC), 220V DC (208...240V DC).



Motor contactor CEM50.00; 80A(AC1); 50A; 22kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM50.00-24V-50/60Hz	004648100		1105	1
CEM50.00-48V-50/60Hz	004648101		1105	1
CEM50.00-110V-50/60Hz	004648102		1105	1
CEM50.00-230V-50/60Hz	004648103		1105	1
CEM50.00-400V-50/60Hz	004648104		1105	1
CEM50.00-24V DC **	004648200		1240	1
CEM50.00-220V DC **	004648201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)



Motor contactor CEM65.00; 110A(AC1); 65A; 30kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM65.00-24V-50/60Hz	004649100		1120	1
CEM65.00-48V-50/60Hz	004649101		1120	1
CEM65.00-110V-50/60Hz	004649102		1120	1
CEM65.00-230V-50/60Hz	004649103		1120	1
CEM65.00-400V-50/60Hz	004649104		1120	1
CEM65.00-24V DC **	004649200		1240	1
CEM65.00-220V DC **	004649201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

For auxiliary contact blocks, see page 274



Motor contactor CEM80.00; 110A(AC1); 80A; 37kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM80.00-24V-50/60Hz	004650100		1130	1
CEM80.00-48V-50/60Hz	004650101		1130	1
CEM80.00-110V-50/60Hz	004650102		1130	1
CEM80.00-230V-50/60Hz	004650103		1130	1
CEM80.00-400V-50/60Hz	004650104		1130	1
CEM80.00-24V DC **	004650200		1240	1
CEM80.00-220V DC **	004650201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

** Range of operating voltages is shown in technical part of catalogue

Technical data on page 340

Motor contactor CEM95.00; 140A(AC1); 95A; 45kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM95.00-24V-50/60Hz	004651100		1450	1
CEM95.00-48V-50/60Hz	004651101		1450	1
CEM95.00-110V-50/60Hz	004651102		1450	1
CEM95.00-230V-50/60Hz	004651103		1450	1
CEM95.00-400V-50/60Hz	004651104		1450	1
CEM95.00-24V DC **	004651200		1500	1
CEM95.00-220V DC **	004651201		1500	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.
** 24V DC (24...28 V DC), 220V DC (208...240V DC)

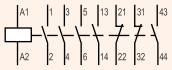


Motor contactor CEM105.00; 140A(AC1); 105A; 55kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM105.00-24V-50/60Hz	004652100		1470	1
CEM105.00-48V-50/60Hz	004652101		1470	1
CEM105.00-110V-50/60Hz	004652102		1470	1
CEM105.00-230V-50/60Hz	004652103		1470	1
CEM105.00-400V-50/60Hz	004652104		1470	1
CEM105.00-24V DC **	004652200		1500	1
CEM105.00-220V DC **	004652201		1500	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.
** 24V DC (24...28 V DC), 220V DC (208...240V DC)

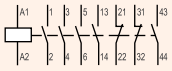
For auxiliary contact blocks, see page 274



Motor contactor CEM112.22(E); 180A(AC1); 112A; 55kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM112.22-24V-50/60Hz	004653140		2400	1
CEM112.22--48V-50/60Hz	004653141			
CEM112.22--110V-50/60Hz	004653142			
CEM112.22--230V-50/60Hz	004653143			
CEM112.22--400V-50/60Hz	004653144			
CEM112E.22-28V AC/DC **	004646018			
CEM112E.22-130V AC/DC **	004646019			
CEM112E.22-250V AC/DC **	004646020			
CEM112E.22-415V AC/DC **	004646021			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

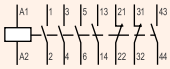


Motor contactor CEM150E.22; 225A(AC1); 150A; 75kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM150E.22-28V AC/DC **	004654240		2400	1
CEM150E.22-130V AC/DC **	004646023			
CEM150E.22-250V AC/DC **	004654241			
CEM150E.22-415V AC/DC **	004646025			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

Technical data on page 340

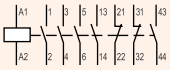
Motor contactor CEM180.22(E); 225A(AC1); 180A; 90kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM180.22-24V-50/60Hz	004655140		3900	1
CEM180.22--48V-50/60Hz	004655141			
CEM180.22--110V-50/60Hz	004655142			
CEM180.22--230V-50/60Hz	004655143			
CEM180.22--400V-50/60Hz	004655144			
CEM180E.22-28V AC/DC **	004646029			
CEM180E.22-130V AC/DC **	004646026			
CEM180E.22-250V AC/DC **	004646027			
CEM180E.22-415V AC/DC **	004646028			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated



Motor contactor CEM250.22(E); 350A(AC1); 250A; 132kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM250.22-24V-50/60Hz	004656140		6000	1
CEM250.22--48V-50/60Hz	004656141			
CEM250.22--110V-50/60Hz	004656142			
CEM250.22--230V-50/60Hz	004656143			
CEM250.22--400V-50/60Hz	004656144			
CEM250E.22-28V AC/DC **	004646030			
CEM250E.22-130V AC/DC **	004646031			
CEM250E.22-250V AC/DC **	004646032			
CEM250E.22-415V AC/DC **	004646033			

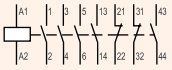
* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated
** Range of operating voltages is shown in the technical part of catalogue



For auxiliary contact blocks, see page 274



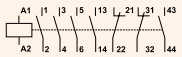
Motor contactor CEM300.22(E), 410A(AC1), 300A, 160kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM300E.22-28V AC/DC	004656300		6900	1
CEM300E.22-50V AC/DC	004656301			
CEM300E.22-72V AC/DC	004656302			
CEM300E.22-130V AC/DC	004656303			
CEM300E.22-250V AC/DC	004656304			
CEM300E.22-415V AC/DC	004656305			

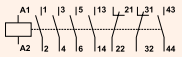
* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

Technical data on page 340



Motor contactor CEM450.22(E), 600A(AC1), 450A, 260kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM450E.22-255V AC/DC	004656306		12000	1

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
Surge suppressor is already integrated

Motor contactor CEM560.22(E), 700A(AC1), 560A, 300kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM560E.22-255V AC/DC	004656307		12000	1

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
Surge suppressor is already integrated

Accessories



Auxiliary contact block - front mounted						
Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
BCXMFE10	004641510	1 NO	CEM9-CEM105		15	1
BCXMFE01	004641501	1 NC	CEM9-CEM105		15	1
BCXMFAE10	004642510	1 NO - early-make	CEM9-CEM105		15	1
BCXMFRE01	004643510	1 NC - late-break	CEM9-CEM105		15	1
BCXMFE10S*	004646094	Special aux. Contact 1xNO	CEM9-CEM105		15	1
BCXMFE01S*	004646095	Special aux. Contact 1xNC	CEM9-CEM105		15	1

not for CEM7,5CN and CEM10CN!
available free aux. contact blocks places:
CEM 9 .... CEM 40: 4 contact blocks
CEM 50 .... CEM 105: 6 contact blocks
CEM 112 .... CEM 300: mounting not available - only lateral, see below

*Special aux. contacts (Au -gold) for low signals switching min. 1mA /17V

Technical data on page 341

Auxiliary contact block - lateral

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
BCXMLE11	004644511	1 NO - 1 NC (main)	CAEM4, CEM9-CEM250		15	1
BCXMLE20	004644520	2 NO (main)	CAEM4, CEM9-CEM250		15	1
BCXMRLE11	004645511	1 NO - 1 NC side mounted (upgraded)	CAEM4, CEM9-CEM250		15	1
BCXMRLE20	004645520	2 NO side mounted (upgraded)	CAEM4, CEM9-CEM250		15	1
BLRBE-11	004656308	1 NO - 1 NC side mounted (upgrade)	CEM450-CEM560		34	1
BLBE-11	004656325	1 NO - 1 NC side mounted (spare part)	CEM450-CEM560		34	1





not for CEM7,5CN and CEM10CN!
Main" lateral auxiliary contact block can be mounted on the front side of the contactor, it can be upgraded max. with one additional auxiliary contact block.

Max. number of auxiliary contacts together (top and side mounted):
max. 4: CEM9-CEM25, CAEM 4
max. 6: CEM32-CEM40
max. 8: CEM50-CEM105
max. 8: CEM112-CEM300

Mechanical interlock

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
BLIME 9-105	004643601	CEM9-CEM105	50	1
BLIME9-105 02*	004646093	CEM9-CEM105	69	1
BLIME 112-300E	004643602	CEM112(E)-CEM560(E)	150	1

*Mechanical interlock with integrated auxiliary contacts 2xNC





Technical data on page 341



Surge suppressor					
Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
BAMRCE4	004642701	24-48 VAC	CEM9-CEM40	14	1
BAMRCE5	004642702	50-127 VAC	CEM9-CEM40	14	1
BAMRCE6	004642703	130-250 VAC	CEM9-CEM40	14	1
BAMRCE7	004642705	24-48 VAC	CEM50-CEM105	14	1
BAMRCE8	004642706	50-127 VAC	CEM50-CEM105	14	1
BAMRCE9	004642707	130-250 VAC	CEM50-CEM105	14	1
BAMDIE10	004643701	12-600 VDC	CEM9-CEM105	14	1
BAMRCE13	004642708	24-48 VAC	CEM112-CEM250	14	1
BAMRCE14	004642711	50-250 VAC	CEM112-CEM250	14	1
BAMVE5 255V/ACDC	004656320	100-255VAC	CEM450E-CEM560E	18	1



Terminal blocks				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
TBE150	004646090	CEM112…CEM150	210	1
TBE180	004646091	CEM180	270	1
TBE300	004646092	CEM250…CEM300	575	1



Spare contacts*				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
SCCEM450	004656323	CEM450(E)	1120	1
SCCEM560	004656324	CEM560(E)	1120	1

*1(pc) reference code includes 3 spare contacts (1 pc = 3 spare contacts -> 3 moving parts and 6 fixed parts)



Terminal cover				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CCEM150	004646080	CEM150	231	1
CCEM180	004646081	CEM180	231	1
CCEM300	004646082	CEM300	231	1
CCEM560	004656309	CEM560	231	1

*1(pc) reference code includes 2 covers (1pc=top+bottom)

Overload relay

Overload relay RE27D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE27D-0,4	004642400	0,28-0,4	CEM09 ... CEM25	147	1
RE27D-0,63	004642401	0,4-0,63			
RE27D-0,8	004642402	0,56-0,8			
RE27D-1,2	004642403	0,8-1,2			
RE27D-1,8	004642404	1,2-1,8			
RE27D-2,8	004642405	1,8-2,8			
RE27D-4,0	004642406	2,8-4,0			
RE27D-6,3	004642407	4-6,3			
RE27D-8,0	004642408	5,6-8			
RE27D-10	004642409	7-10			
RE27D-12,5	004642410	8-12,5			
RE27D-15	004642411	10-15			
RE27D-17	004642412	11-17			
RE27D-23	004642413	15-23			
RE27D-32	004642414	22-32			



Overload relay RE67.1D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE67.1D-40	004643415	25-40	CEM32... CEM40	300	1
RE67.1D-50	004643416	32-50			



Overload relay RE67.2D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE67.2D-57	004644417	40-57	CEM50 ... CEM80	310	1
RE67.2D-63	004644418	50-63			
RE67.2D-70	004644419	57-70			
RE67.2D-80	004644420	63-80			

Technical data on page 346



Overload relay RE117.1D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE117.1D-97	004645421	75-97	CEM95... CEM105	520	1
RE117.1D-112	004645422	90-112			



Overload relay RE117.2D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE117.2D-97	004646421	75-97	CEM112(E)	550	1
RE117.2D-112	004646422	90-112			



Overload relay RE317.2D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE317D-150	004647423	100-150	CEM150(E) ... CEM250(E)	900	1
RE317D-215	004647424	140-215			
RE317D-310	004647425	200-310			
RE317D-420	004656312	275-420	CEM450(E)	2000	

Technical data on page 346

Overload relay RE407D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE407D-600	004656313	400-600	CEM560(E)	3600	1



Overload relay connection bars

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
GAE317-11D	004656310	CEM450(E)+RE317D-420	253	1
GAE407-1D	004656311	CEM560(E)+RE407D-600	461	1

*1(pc) reference code includes 3 bars for one 3 pole connection



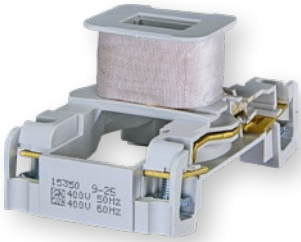
Overload relay mounting kits for rails TH35

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
BF27D	004641901	RE27D	50	1
BF67.1D	004641902	RE67.1,	95	1
BF67.2D	004641904	RE67.2	95	1
BF117D	004641903	RE117.1D	110	1



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Individual coil for control voltage contactor





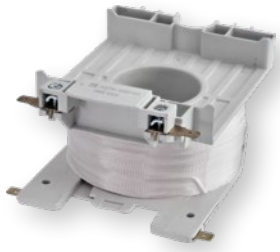


Individual coil for control voltage contactor					
Type	Code No.	AC; DC coil	For use with	Weight [g]	Packaging [pcs]
BCAE4-25-24 V-50/60 Hz*	004641810	AC	CEM9 - CEM 25	65	1
BCAE4-25-48 V-50/60 Hz*	004641811	AC			
BCAE4-25-110 V-50/60 Hz*	004641812	AC			
BCAE4-25-230 V-50/60 Hz*	004641813	AC			
BCAE4-25-400 V-50/60 Hz*	004641814	AC			
BCCE-25-24 V DC*	004642810	DC		120	
BCCE-25-48 V DC*	004642811	DC			
BCCE-25-110 V DC*	004642812	DC			
BCCE-25-220 V DC*	004642813	DC			
BCAE-40-24 V-50/60 Hz*	004641820	AC	CEM32 - CEM40	110	
BCAE-40-48 V-50/60 Hz*	004641821	AC			
BCAE-40-110 V-50/60 Hz*	004641822	AC			
BCAE-40-230 V-50/60 Hz*	004641823	AC			
BCAE-40-400 V-50/60 Hz*	004641824	AC			
BCCE-40-24 V DC*	004642820	DC		180	
BCCE-40-48 V DC*	004642821	DC			
BCCE-40-110 V DC*	004642822	DC			
BCCE-40-220 V DC*	004642823	DC			
BCAE-105-24 V-50/60 Hz	004641830	AC	CEM50 - CEM105	140	
BCAE-105-48 V-50/60 Hz	004641831	AC			
BCAE-105-110 V-50/60 Hz	004641832	AC			
BCAE-105-230 V-50/60 Hz	004641833	AC			
BCAE-105-400 V-50/60 Hz	004641834	AC			
BCCE-105-24 V DC	004642830	DC		220	
BCCE-105-48 V DC	004642831	DC			
BCCE-105-110 V DC	004642832	DC			
BCCE-105-220 V DC	004642833	DC			
BCAE-112-24 V-50/60 Hz	004641840	AC	CEM112	235	
BCAE-112-48 V-50/60 Hz	004641841	AC			
BCAE-112-110 V-50/60 Hz	004641842	AC			
BCAE-112-230 V-50/60 Hz	004641843	AC			
BCAE-112-400 V-50/60 Hz	004641844	AC			
BCAE-180-24 V-50/60 Hz	004641850	AC	CEM180	400	
BCAE-180-48 V-50/60 Hz	004641851	AC			
BCAE-180-110 V-50/60 Hz	004641852	AC			
BCAE-180-230 V-50/60 Hz	004641853	AC			
BCAE-180-400 V-50/60Hz	004641854	AC			
BCAE-250-24 V-50/60 Hz	004641860	AC	CEM250	675	
BCAE-250-48 V-50/60 Hz	004641861	AC			
BCAE-250-110 V-50/60 Hz	004641862	AC			
BCAE-250-230 V-50/60 Hz	004641863	AC			
BCAE-250-400 V-50/60 Hz	004641864	AC			

* Only AC coils can be fitted to AC controlled contactors & only DC coils can be fitted to DC controlled contactors.

Individual coil for control voltage contactor

Type	Code No.	AC/CD coil	For use with	Weight [g]	Packaging [pcs]
BCEE-150E-28 V	004646044	AC/DC	CEM112E - CEM150E	235	1
BCEE-150E-130 V	004646045				
BCEE-150E-250 V	004646046				
BCEE-150E-415 V	004646047				
BCEE-180E-28 V	004646048		CEM180E	400	
BCEE-180E-130 V	004646049				
BCEE-180E-250 V	004646050				
BCEE-180E-415 V	004646051				
BCEE-300E-28 V	004646052		CEM250E - CEM300E	670	
BCEE-300E-130 V	004646053				
BCEE-300E-250 V	004646054				
BCEE-300E-415 V	004646055				
BCEE-560E 255V-AC/DC	004656322		CEM450E - CEM560E	1360	1/16



Electronic modules for BCEE coils

Type	Code No.	AC/CD coil	For use with	Weight [g]	Packaging [pcs]
MEE-300 28V-AC/DC	004646070	AC/DC	BCEE-150E-28 V, BCEE-180E-28 V, BCEE-300E-28 V	96	1
MEE-300 110V-AC/DC	004646072		BCEE-150E-130 V, BCEE-180E-130 V, BCEE-300E-130 V		
MEE-300 250V-AC/DC	004646073		BCEE-150E-250 V, BCEE-180E-250 V, BCEE-300E-250 V		
MEE-300 415V-AC/DC	004646074		BCEE-150E-415 V, BCEE-180E-415 V, BCEE-300E-415 V		
MEE-560 255V-AC/DC	004656321		BCEE-560E-255V		



Motor protective circuit breakers

Motor protective circuit breakers MSP



MSP0



MSP1

Description
The MSP0, MSP1 motor starter protectors are compact motor starter protectors for currents up to 52 A which operate according to the current limiting principle. The devices are used for switching and protecting motors or other loads. They are fitted with instantaneous overcurrent releases and inverse-time delayed overload relay. Motor starter protectors and contactors can be combined to form fuseless starter combinations. The MSP0, MSP1 motor starter protectors are suitable for use in any climate.

Motor Starter Protectors
• for motor protection
- MSP0: 0,4...25 A
- MSP1: 22...52 A
The characteristic curves of these motor starter protectors are specially laid-out for the overload and short-circuit protection of motors. The inverse-time delayed releases ("a releases") are adjustable for setting the rated current of the motors to be protected. The instantaneous short-circuit releases ("n releases") are fixed-set to 12 times the value so as to assure faultless starting of the motors.

Motor protective circuit breaker MSP

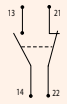
Type	Code No.	Rated current [A]	Thermal overload release [A]	Instantaneous overcurrent release [A]	Motor power [kW]	Weight [g]	Packaging [pcs]
MSP0-0,6	004646618	0,6	0,4…0,6	7,2	0,12/0,18	290	1
MSP0-1,0	004646619	1	0,6…1,0	12	0,25	290	1
MSP0-1,6	004646620	1,6	1,0…1,6	19	0,37/0,55	290	1
MSP0-2,4	004646621	2,4	1,6…2,4	29	0,75	290	1
MSP0-4,0	004646622	4	2,4…4,0	48	1,1/1,5	290	1
MSP0-6,0	004646623	6	4,0…6,0	72	2,2	290	1
MSP0-10	004646624	10	6,0…10	120	3/4	290	1
MSP0-16	004646625	16	10…16	190	7,5	290	1
MSP0-20	004646626	20	14…20	240	7,5	290	1
MSP0-25	004646627	25	18…25	300	11	290	1
MSP1-32	004646628	32	22…32	380	15	760	1
MSP1-40	004646629	40	28…40	480	18,5	760	1
MSP1-52	004646630	52	36…52	600	22	760	1

Technical data on page 352

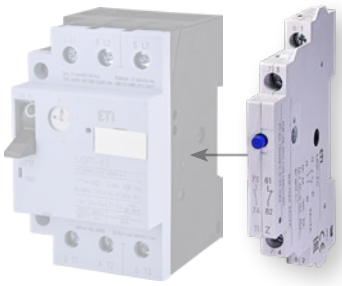
Accessories

Combinations:
Right hand side of MSP: An auxiliary contact and/or a short-circuit signalling contact
Left hand side of MSP: Undervoltage release or Shunt release

Short circuit trip indication

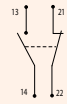
Type	Code No.	Description	Wiring diagram	Weight [g]	Packaging [pcs]
MSP-AS	004646617	1NO+1NC (AC-15: 3A/230V, 1.5A/400V, 1A/500V)		40	1

width= 9mm

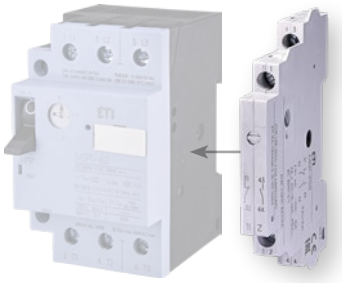


MSP-AS

Auxiliary contact

Type	Code No.	Description	Wiring diagram	Weight [g]	Packaging [pcs]
MSP-PS11	004646631	1NO+1NC (AC-15: 3A/230V, 1.5A/400V, 1A/500V)		40	1

width= 9mm

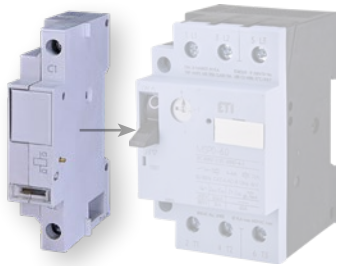


MSP-PS11

Shunt release

Type	Code No.	Rated voltage Un	Operation range	Weight [g]	Packaging [pcs]
MSP-A 230	004646632	230 VAC (220-230V 50Hz)	154-253 VAC	110	1
MSP-A 24	004646633	24 VAC (24V 50Hz, 24-60V DC)	16.8 - 26.4 VAC, 16.8 - 66VDC	110	1

width=18mm, operation range: 0.7-1.1*Un

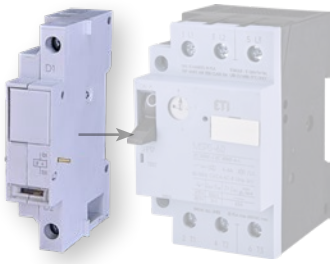


MSP-A 230

Undervoltage release

Type	Code No.	Rated voltage Un	Operation range (for keeping)	Weight [g]	Packaging [pcs]
MSP-U 240	004646634	240 V 50Hz	204-264 VAC	110	1

width=18mm, Falling(tripping) voltage: 0.35-0.7 Un, keeping voltage: 0.85-1.1Un.



MSP-U 240

Connection terminals

Type	Code No.	Description	Weight [g]	Packaging [pcs]
MSP-IZ2	004646635	busbar connection of 2 MSPs	50	1
MSP-IZ3	004646636	busbar connection of 3 MSPs	50	1
MSP-IZ4	004646637	busbar connection of 4 MSPs	100	1
MSP-TA1	004646638	3 phase line side terminal	110	1
MSP-TA2	004646639	3 phase line side terminal (in combination with MSP-IZ...)	50	1



MSP-IZ3



MSP-TA1



MSP-TA2

Technical data on page 352

Motor protective circuit breakers MPE

Rated current
0,16 - 32 A

Example of MPE configuration:



Advantages

- With overload and short circuit protection
- Fixed short circuit release 13 x Iu
- With phase-failure sensitivity according to IEC/EN 60947-4-1
- With temperature compensation
- Can be used as main switch
- MPE25 up to 10A at 400/415V are self-protected
- MPE25 above 10A provide a breaking capacity of 50kA at 400/415V according to IEC/EN 60947-2
- MPE80 provide a breaking capacity of 60kA at 380V according to IEC/EN 60947-2

IE3 CONFORM



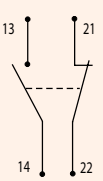




Motor protective circuit breaker MPE

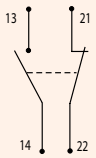
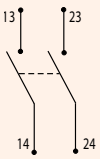
Type	Code No.	Operational inst. current Iu (A)	Setting overl. release Ir (A)	Short-circuit release Irm (A)	Weight [g]	Packaging [pcs]
MPE25-0,16	004648001	0,16	0,1-0,16	2,08	322	1
MPE25-0,25	004648002	0,25	0,16-0,25	3,25	322	1
MPE25-0,40	004648003	0,4	0,25-0,4	5,2	322	1
MPE25-0,63	004648004	0,63	0,4-0,63	8,2	322	1
MPE25-1,0	004648005	1	0,63-1,0	13	322	1
MPE25-1,6	004648006	1,6	1,0-1,6	20,8	322	1
MPE25-2,5	004648007	2,5	1,6-2,5	32,5	322	1
MPE25-4,0	004648008	4	2,5-4,0	52	322	1
MPE25-6,3	004648009	6,3	4,0-6,3	82	322	1
MPE25-10	004648010	10	6,3-10	130	322	1
MPE25-16	004648011	16	10-16	208	322	1
MPE25-20	004648012	20	16-20	260	322	1
MPE25-25	004648013	25	20-25	325	322	1
MPE25-32	004648014	32	25-32	416	322	1
MPE25-40	004648015	40	32-40	520	322	1
MPE80-50	004648016	50	40-50	650	1070	1
MPE80-65	004648017	65	50-65	845	1070	1
MPE80-80	004648018	80	65-80	1040	1070	1

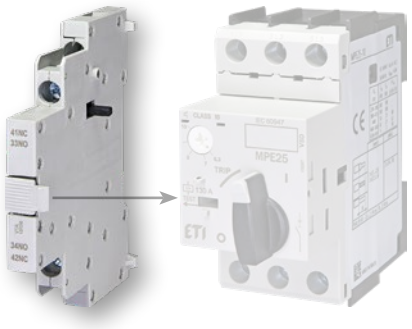
Front mountable auxiliary contact block, the 45mm widths - MPE remain unchanged

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
ACBFE-11	004648021		1, 1	20	1

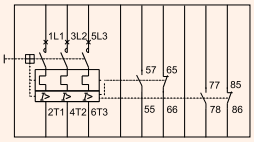
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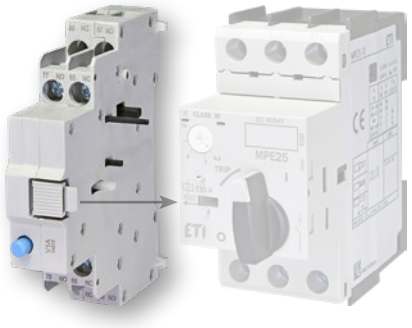
Left side mountable contact block, can be combined with front mountable auxiliary contact block

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
ACBSE-11	004648022		1, 1	38	1
ACBSE-20	004648023		2,0	38	1

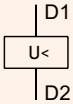


Trip indicating contact block, mounted on the left side

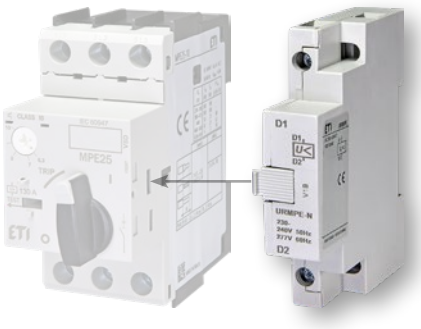
Type	Code No.	Wiring diagram	Notes	Weight [g]	Packaging [pcs]
TSBE	004648024		Separate tripped and short-circuit 1NC for each circuit. Allows mounting with lateral aux. contact block. Left side mounting. TBSE alarms, 1NO +	150	1



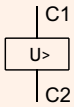
Undervoltage release, mounted on the right side

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
URMPE-N	004648027		230-240V AC	115	1
URMPE-U	004648028		400-415V AC		

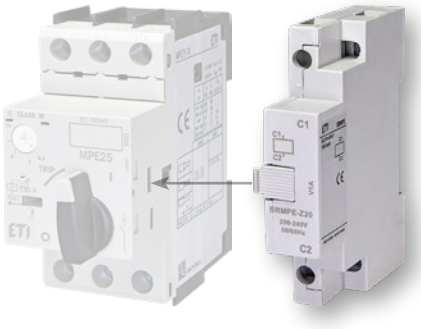
Pick-up voltage >0,85 x Ue Drop-out voltage 0,35-0,7 x Ue 100%DF



Shunt release, mounted on the right side

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
SRMPE-Z20	004648030		200-240V AC	115	1

Pick-up voltage 0,7 x Ue 100%DF



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Accessories

Type	Code No.	Description	Weight [g]	Packaging [pcs]
SCMPE	004648025	Scale cover	15	5
PLMPE	004648026	Push-in-lugs	25	2



Insulated enclosure with black/grey rotary handle, IP55

For use with	Code No.	Notes	Type	Weight [g]	Packaging [pcs]
MPE25 + ACBFE11 + ACBSE11 // ACBSE20 + PL..	004648032	with black/grey rotary handle with integrated PE(N) terminal lockable in OFF position with 3 padlocks two M25 metric cable entry knockout, top and bottom	MPEE55G	365	1
MPE25 + URMPE // SRMPE + ACBFE11 + ACBSE11 ali ACBSE20 + PL..	004648033		MLPEE55G	415	1



Insulated enclosure with red/yellow rotary handle, IP55

For use with	Code No.	Notes	Type	Weight [g]	Packaging [pcs]
MPE25 + ACBFE11 + ACBSE11 // ACBSE20 + PL..	004648034	with red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204 with integrated PE(N) terminal lockable in OFF position with 3 padlocks two M25 metric cable entry knockout, top and bottom	MPEE55G-E	365	1
MPE25 + URMPE // SRMPE + ACBFE11 + ACBSE11 or ACBSE20 + PL..	004648035		MLPEE55G-E	415	1

Neutral terminal

For use with	Code No.	Description	Type	Weight [g]	Packaging [pcs]
MPEE55G, MLPEE55G, MPEE55G-E & MLPEE55G-E	004648038	for connection of a 5th conductor	NL-MPEE	365	1

Flush mounting enclosure

Type	Code No.	colour	Description	Weight [g]	Packaging [pcs]
FMEE55	004648036	black	- for MPE mounting on panel door - degree of protection IP55 - moulded plastic front plate with rotary operating mechanism - lockable in OFF position - allows access. ACBFE-11, ACBSE-11 or ACBSE-20 and URMPE / SRMPE - allow installation of sig. lamp	200	1
FMEE55-E	004648037	red/yellow		200	1

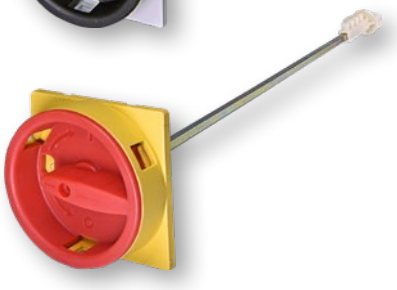




Door coupling rotary handle black/grey and red/yellow, IP55

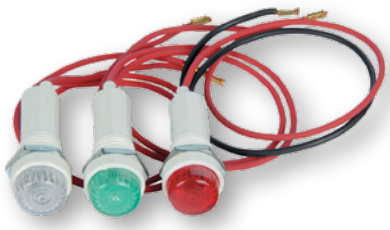
Type	Code No.	colour	Notes	Weight [g]	Packaging [pcs]
RMMPE130 (130 mm)	004648039	black	- extension shaft, length 130 to 155mm - extension shaft, length 330 to 355mm - door coupling rotary handle black/grey - extension shaft can be cut ot any required length min. 80mm - thickness of panel door 1 to 3,5mm - for use of main switch IEC/EN60204 - ON/OFF/Tripped position - lockable in OFF pos. with 3 padlocks - the MPE can also be used turned 90⁰	76	1
RMMPE330 (330 mm)	004648040			114	
RMMPE130E (130 mm)	004648041	red/yellow		76	1
RMMPE330E (330 mm)	004648042			114	





Indicator light

Type	Code No.	Notes	colour	Weight [g]	Packaging [pcs]
PLE230 PLE400	004648043 004648044	voltage: 210…230V voltage: 400…560V	red	17	10
PLE230G PLE400G	004648045 004648046	voltage: 210…230V voltage: 400…560V	green		
PLE230W PLE400W	004648047 004648048	voltage: 210…230V voltage: 400…560V	white		

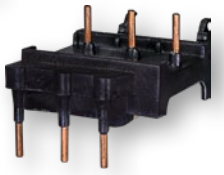


Circuit breaker-contactor link module

Type	Code No.	Notes	For use with	Weight [g]	Packaging [pcs]
ECCMPE07	004648052	for electrical and mechanical linking motor protective circuit breaker MPE25 and contactor	CE07	27	1
ECCMPE25*	004648053		CEM9…25		

*For contactors with AC coil only!





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Motor protective circuit breaker MS25

Main application field: control (start-up, protection and switch-off) of AC electric motors with powers up to 11 kW (380/400 V) or other consumers up to 25 A; it can also be used as the main switch according to EN 60204 or VDE 0113 standards.

Versions:
- MS25 - with overload and short circuit protection

Manual control:
- START, STOP, push-buttons
- Test of release function (TEST)

- Phase-failure sensitivity according to IEC/EN 60947-4-1
- Automatic switch-off with thermal or magnetic release
- Control with under-voltage release or shunt release
- Isolating distance between contacts: 4.5 mm per contact place
- Hard wire or fine wire connection
- Simple and fast mounting by snap fitting on 35 mm wide mounting rail in compliance with EN 60715; fixing with two screws is also possible
- Vertical or horizontal operation position



Motor protective circuit breaker MS25

Type	Code No.	Operational inst. current Iu (A)	Setting overl. release Ir (A)	Weight [g]	Packaging [pcs]
MS25-0,16	004600010	0.16	0,1-0,16	255	1
MS25-0,25	004600020	0.25	0,16-0,25	255	1
MS25-0,40	004600030	0.4	0,25-0,4	255	1
MS25-0,63	004600040	0.63	0,4-0,63	255	1
MS25-1,0	004600050	1	0,63-1,0	255	1
MS25-1,6	004600060	1.6	1,0-1,6	255	1
MS25-2,5	004600070	2.5	1,6-2,5	255	1
MS25-4,0	004600080	4	2,5-4,0	255	1
MS25-6,3	004600090	6.3	4,0-6,3	255	1
MS25-10	004600100	10	6,3-10	255	1
MS25-16	004600110	16	10-16	255	1
MS25-20	004600120	20	16-20	255	1
MS25-25	004600320	25	20-25	255	1

Auxiliary switch for lateral mounting PS

Auxiliary switch for lateral mounting PS

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
PS 20	004600160		2,0	30	1/10
PS 01	004600150		0,1	30	1/10
PS 10	004600140		1,0	30	1/10
PS 11	004600130		1,1	30	1/10



Shunt release

Shunt release

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
A 230	004600170		220V-240V	30	1/10



Undervoltage release

Undervoltage release

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
U 230	004600180		220V-240V	30	1/10



Enclosure O Front plate CP

Enclosure O Front plate CP

Type	Code No.	IP	Weight [g]	Packaging [pcs]
O - 41	004600190	41	25	1
O - 55	004600200	55	25	1
CP - 41	004600210	41	20	1
CP - 55	004600220	55	20	1



O-IP41/55



CP-IP41/55

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Emergency stop push-button



Emergency stop push-button			
Type	Code No.	Weight [g]	Packaging [pcs]
NAT	004600270	15	1/20
NAT-lock	004600280	20	1/20

Padlocking feature Z



Padlocking feature Z			
Type	Code No.	Weight [g]	Packaging [pcs]
Z	004600260	30	1/10

Neutral link NL



Neutral link NL			
Type	Code No.	Weight [g]	Packaging [pcs]
NL	004600330	10	1/10

Signal lamp SS



Signal lamp SS				
Type	Code No.	Colour	Weight [g]	Packaging [pcs]
SS B 400V	004600230	white	10	1/10
SS R 400V	004600240	red	10	1/10
SS Z 400V	004600250	green	10	1/10

Modular contactor for installation into distribution boards

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1								
Type				**R20**	**R25 (2p)**	**R25 (4p)**	**R40**	**R63**	**RH11**
Main Contacts									
Rated insulation voltage U_i			V AC	440[2)]	440[2)]	440[2)]	440[2)]	440[2)]	440[2)]
Rated operation voltage U_e			V AC	250	440	440	440	440	440
Frequency of operations with AC1, AC3			1/h	300	300	300	600	600	600
Mechanical life			S x 10^6	1	1	1	1	1	1
Utilization category AC1									
Rated operational current I_e (=I_{th})	open at 60°C		A	20	25	25	40	60	-
Contact life			S x 10^6	0,1	0,1	0,1	0,1	0,1	-
Minimum switch voltage			V/mA	24/100	24/100	24/100	24/100	24/100	17/5
Short time current	10s-current		A	72	72	72	216	240	-
Power loss per pole at I_e/AC1			W	2	3	2	3	7	0,5
Utilization category AC3 Switching of three-phase motors									
Rated operational current I_e			A	-	-	9	27	30	-
Rated operational power	220V		kW	-	-	2,2	7,5	8	-
of three-phase motors	230-240V		kW	1,1[4)]		2,5	8	8,5	-
50-60Hz	380-415V		kW	-	-	4	12,5	15	-
Contact life AC 3			S x 10^6	-	-	0,15	0,15	0,15	-
Power consumption of coils									
AC operated	inrush		VA	7-9	7-9	20-25	33-45	33-45	-
	sealed		VA	2,2-4,2	2,2-4,2	4-6	6-8	6-8	-
			W	0,8-1,6	0,8-1,6	1,5-2,5	2-3,3	2-3,3	
Operation range of coils in multiples of control voltage Us	**(-40...+40°C)**			0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	-
Short-circuit protection									
Coordination-type "1" according to IEC 947-4-1 max. fuse size	gG/gL		A	35	35	35	63	80	-
Cable cross-sections									
Main connector	solid or stranded		mm^2	1,5-10	1,5-10	1,5-10	2,5-25	2,5-25	0,5-2,5[3)]
	flexible		mm^2	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-2,5[3)]
	flexible with multicore cable end		mm^2	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-1,5
Clamps per pole				1	1	1	1	1	2
Magnetic coil	solid or stranded		mm^2	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	-
	flexible		mm^2	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	-
	flexible with multicore cable end		mm^2	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	-
Clamps per pole				1	1	1	1	1	-
Auxiliary Contacts									
Rated insulation voltage U_i[1)]			V AC	-	-	-	-	-	440[2)]
Thermal rated current I_{th}	40°C		[A]	-	-	-	-	-	10
Ambient temperature	60°C		[A]	-	-	-	-	-	6
Utilization category AC 15									
Rated operational current I_e	220-240V		[A]	-	-	-	-	-	3
	380-415V		[A]	-	-	-	-	-	2
	440V		[A]	-	-	-	-	-	1,6
Utilization category DC13									
Rated operational current I_e per pole	24-60V		[A]	-	-	-	-	-	2
	110V		[A]	-	-	-	-	-	0,4
	220V		[A]	-	-	-	-	-	0,1
Short circuit protection									
short-circuit current 1kA, contact welding not accepted max. fuse size	gG/gL		[A]	-	-	-	-	-	10
Switching time at control voltage U_s ±10%									
	make time		ms	7-16	7-16	9-15	11-15	11-15	-
	release time			6-12	6-12	4-8	6-13	6-13	-
	arc duration			10-15	10-15	10-15	10-15	10-15	-
Noise level (operation) acc. to EN ISO 3744 from front, distance 0,5 m			dB	16	16	8	<4	8	<4

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U_{imp} 8kV.
2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} 4kV.
3) Maximum cable cross-section with prepared conductor.
4) AC5b motor 2-pole 230 V 1,1 kW.

Utilization category DC1 (Switching of resisitive load, time constant L/R ≤ 1ms)

		NO contacts				NC contacts			
		1 pole	2 poles in series	3 poles in series	4 poles in series	1 pole	2 poles in series	3 poles in series	4 poles in series
		(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
R20	24V DC	20	20	-	-	15	15	-	-
	48V DC	18	20	-	-	13,5	15	-	-
	60V DC	17	20	-	-	12,5	15	-	-
	110V DC	4	10	-	-	3	7,5	-	-
	220V DC	0,4		-	-	0,3		-	-
R25	24V DC	25	25	25	25	18,5	18,5	18,5	18,5
	48V DC	22	25	25	25	16,5	18,75	18,5	18,5
	60V DC	18	25	25	25	13,5	18,75	18,5	18,5
	110V DC	5	16	25	25	3,5	12	18,5	18,5
	220V DC	0,5	4	10	15	0,4	3	7,5	11
R40	24V DC	40	40	40	40	30	30	30	30
	48V DC	25	40	40	40	18,5	30	30	30
	60V DC	19	30	40	40	14	24,5	30	30
	110V DC	7	17	31	40	5	12,5	23	30
	220V DC	0,7	5	15	20	0,5	3,5	11	15
R63	24V DC	63	63	63	63	47	47	47	47
	48V DC	26	44	63	63	19,5	33	47	47
	60V DC	21	36	63	63	15,5	27	47	47
	110V DC	8	18	34	63	6	13,5	25,5	47
	220V DC	0,7	6	16	21	0,5	4,5	12	15,5

Utilization category DC3 and DC5 (Switching of inductive loads, time constant L/R ≤ 15ms)

		NO contacts				NC contacts			
		1 pole	2 poles in series	3 poles in series	4 poles in series	1 pole	2 poles in series	3 poles in series	4 poles in series
		(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
R20	24V DC	10	20	-	-	7,5	15	-	-
	48V DC	4	15	-	-	3	11	-	-
	60V DC	3	12	-	-	2	9	-	-
	110V DC	0,8	4	-	-	0,6	3	-	-
	220V DC	-		-	-	-		-	-
R25	24V DC	15	25	25	25	11	18,5	18,5	18,5
	48V DC	5	17	25	25	3,5	12,75	18,5	18,5
	60V DC	4	13	25	25	3	9,5	18,5	18,5
	110V DC	1	5	15	25	0,7	3,5	11	18,5
	220V DC	0,1	0,5	10	8	0,075	0,375	2	6
R40	24V DC	23	40	40	40	17	30	30	30
	48V DC	10	23	40	40	7,5	17	30	30
	60V DC	5	15	30	40	3,5	11	22,5	30
	110V DC	1,5	5	15	40	1,1	3,5	11	30
	220V DC	0,3	1	4	10	0,2	0,75	3	7,5
R63	24V DC	25	45	63	63	18,5	33,5	47	47
	48V DC	10	25	45	63	7,5	18,5	33,5	47
	60V DC	5	15	30	63	3,5	11	22,5	47
	110V DC	1,5	5	15	45	1,1	3,5	11	33,5
	220V DC	0,3	1	4	10	0,2	0,75	3	7,5

Switching of Lamps

Lamp Type	Power	Current	Capacitors	Max. lamps per pole at 230V 50Hz			
	[W]	[A]	µF	R20	R25	R40	R63
Incandescent lamps	60	0,27	-	22	28	58	85
	100	0,45	-	13	17	35	51
	200	0,91	-	7	8	17	25
	300	1,36	-	4	5	11	16
	500	2,27	-	3	3	7	10
	1000	4,5	-	1	1	3	5
Fluoroscent lamps, uncompensated or serial compensated	11	0,16	-	60	75	210	310
	18	0,37	2,7	25	30	90	140
	24	0,35	2,5	25	30	90	140
	36	0,43	3,4	20	25	70	140
	58	0,67	5,3	14	17	45	70
	65	0,67	5,3	13	16	40	65
	85	0,8	-	11	14	35	60
Fluoroscent lamps, dual-connection	11	0,07	-	2x100	2x110	2x220	2x250
	18	0,11	-	2x50	2x55	2x130	2x200
	24	0,14	-	2x40	2x44	2x110	2x160
	36	0,22	-	2x30	2x33	2x70	2x100
	58	0,35	-	2x20	2x22	2x45	2x70
	65	0,35	-	2x15	2x16	2x40	2x60
	85	0,47	-	2x10	2x11	2x30	2x40
Fluoroscent lamps, parallel compensated	11	0,16	2,0	30	30	100	140
	18	0,37	2,0	20	20	70	90
	24	0,35	3,0	15	15	55	75
	36	0,43	4,5	10	10	38	51
	58	0,67	7,0	6	6	25	30
	65	0,67	7,0	5	5	24	28
	85	0,8	8,0	4	4	18	23
Fluoroscent lamps, with serial electronic	18	0,09	-	40	40	100	150
	36	0,16	-	20	20	50	75
	58	0,25	-	15	15	30	55
	2x18	0,17	-	2x20	2x20	2x50	2x60
	2x36	0,32	-	2x10	2x10	2x25	2x30
	2x58	0,49	-	2x7	2x7	2x15	2x20
Transformers for metal halid low voltage lamps	20		-	40	52	110	174
	50		-	20	24	50	80
	75		-	13	16	35	54
	100		-	10	12	27	43
	150		-	7	9	19	29
	200		-	5	5	14	23
	300		-	3	4	9	14
Mercury-vapour lamps (high pressure lamps), uncompensated e. g. HQL, HPL	50	0,61	-	16	18	38	55
	80	0,8	-	12	14	28	40
	125	1,15	-	8	9	20	28
	250	2,15	-	4	5	11	15
	400	3,25	-	3	4	7	10
	700	5,4	-	1	2	4	6
	1000	7,5	-	1	1	3	4

Switching of Lamps

Lamp Type	Power	Current	Capacitors	Max. lamps per pole at 230V 50Hz			
	[W]	[A]	µF	R20	R25	R40	R63
Mercury-vapour lamps (high pressure lamps), compensated e. g. HQL, HPL	50	0,28	7	7	7	32	46
	80	0,41	8	5	5	25	35
	125	0,65	10	3	3	16	22
	250	1,22	18	2	2	8	12
	400	1,95	25	1	1	5	7
	700	3,45	45	1	1	3	4
	1000	4,8	60	-	-	2	3
Metal halide lamps uncompensated e. g. HQI, HPI, CDM	35	0,53	-	22	24	45	65
	70	1	-	12	14	24	35
	150	1,8	-	6	8	13	18
	250	3	-	4	5	8	12
	400	3,5	-	3	4	6	10
	1000	9,5	-	1	1	2	4
	2000	16,5	-	-	-	1	2
400 V per pole	2000	10,5	-	-	-	1	2
	3500	18	-	-	-	-	1
Metal halide lamps compensated e. g. HQI, HPI	35	0,25	6	8	8	38	50
	70	0,45	12	4	4	20	28
	150	0,75	20	2	2	12	17
	250	1,5	33	1	1	7	10
	400	2,1	35	1	1	5	7
	1000	5,8	95	-	-	2	3
	2000	11,5	148	-	-	1	1
400 V per pole	2000	6,5	58	-	-	1	2
	3500	11,6	100	-	-	-	1
Metal halide lamps with serial electronic (e.g. PCI) 50 -125 x I_{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
Sodium-vapour lamps (low pressure lamps), uncompensated	35	1,5	-	7	9	22	30
	55	1,5	-	7	9	22	30
	90	2,4	-	4	6	13	19
	135	3,5	-	3	4	10	13
	150	3,3	-	3	4	10	13
	180	3,3	-	3	4	10	13
	200	3,3	-	3	4	10	13
Sodium-vapour lamps (low pressure lamps), compensated	35	0,31	20	3	3	12	16
	55	0,42	20	2	2	8	14
	90	0,63	30	1	1	5	9
	135	0,94	45	1	1	3	6
	150	1	40	1	1	3	6
	180	1,16	40	1	1	2	5
	200	1,32	25	-	-	2	4
Sodium-vapour lamps (high pressure lamps), uncompensated	150	1,8	-	5	6	11	22
	250	3	-	4	5	7	13
	330	3,7	-	3	4	6	10
	400	4,7	-	2	2	5	8
	1000	10,3	-	1	1	2	4
Sodium-vapour lamps (high pressure lamps), compensated	150	0,83	20	2	2	7	14
	250	1,5	33	1	1	4	8
	330	2	40	1	1	3	6
	400	2,4	48	1	1	2	5
	1000	6,3	106	-	-	1	2
Sodium-vapour lamps (high pressure lamps) with serial electronic (e.g. PCI) 50-125 x I_{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
LED Lamps	max. inrush current of contactor [A]			195	233	424	565

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Type						RD20	RD25	RD40	RD63
General	Standards					IEC/EN 61095 , IEC/EN 60947-4-1, IEC/EN 60947-5-1			
	Module width					1	2	3	
	Mechanical endurance				op. c.	3 x 106		3 x 106	
	Ambient temperature				°C	-25 … +70(2NO, 4NO) -15 … +70 (1NO, 1NO+1NC,3NO,3NO+1NC) -15 … +55 (2NC, 1NC, 2NO+2NC,4NC)			
	Storage temperature				°C	-40 … +80			
	No. of contactors (side-by-side)		≤ 40 °C			max. 3			
			40 - 55 °C			max. 2			
			55 - 70 °C			max. 1 (ventilation modules or least 9 mm free space on each side)			
	Contact reliability					17 V; ≥ 50 mA			
	Min. distance of open contacts				mm	3,6			
	Power dissipation per pole				W	1,7	2,2	4	8
	Overload current withstand capability: 10s				A	72	68	176	240
	Max. back-up fuse for short-circuit protection gL			I_v	A	20	25	63	80
	Coordination type 2								
	Noise level (operation)				dB	20	20	20	20
	Vibration resistance according to IEC/EN 60068-2-6			a	g	switched off: 2 (Z and X axis) / switched on: 3 (Z axis) and 1 (X axis)			
	Shock resistance according to IEC/EN 6068-2-27			a	g	switched off: 10 (Z and X axis) / switched on: 15 (Z axis) and 2 (X axis)			
	Max. operating frequency	DC-1			op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b				600			
		AC-15				1200			
		no load				3000			
Main circuit	Rated insulation voltage			U_i	V	440	440		
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	25	40	63
	Rated operational voltage			U_e	V	400[3]	400		
	Rated frequency			f	Hz	50/60			
	Max. thermal current up to +55 °C			I_{th}	A	20	25	40	63
	Max. thermal current @ +70 °C			I_{th}	A	16	20	40	50
	Rated operational current	AC-1/AC-7a		I_e	A	20	25	40	63
		AC-3/AC-7b		I_e	A	9	8,5	22	30
		AC-5a	230 V	I_e	A	8,8	11,2	20	32
		AC-5b	230 V	I_e	A	8,8	9,7	17,6	22
		AC-6a	230 V	I_e	A	4	2,8	10,8	17,2
	Operational power AC-1/AC-7a	single-phase	230 V			3,7	5,4	8,7	13,3[4]
		three-phase	230 V	P_e	kW	-	9	16	24
		three-phase	400 V			-	16	26	40
	Electrical endurance	AC-1 / AC-7a			op. c.	200.000		100.000	
		AC-3 / AC-7b			op. c.	300.000	500.000	150.000	
		AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op. c.	100.000			
	Operational power AC-3/AC-7b	single-phase motor	230 V			1.3 -> NO[1]	1.3[2]	3.7[2]	5[2]
		three-phase motor	230 V	P_e	kW	-	2,2	5,5	8,5
		three-phase motor	400 V			-	4	11	15
	Switching of capacitors	AC-6b / AC-7c	230 V	C	µF	30	36	220	330
	Maximum operating frequency	AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op.c./h	600			

1) Make contacts are marked NO
2) Data for single-phase power are valid for versions -22, -20 and -02
3) Rated operational voltage for versions of contacts -10 and-01 is 230 V
4) Rated power (AC-1) for IK63-04: single-phase 230 V = 10.9 kW; three-phase 230 V = 18.9 kW; three-phase 400 V = 32.9 kW

Technical data

Type							RD20	RD25	RD40	RD63
Main circuit	Rated operational current	DC-1								
	1 pole		Ue = 24 V DC				20	25	40	63
			Ue = 110 V DC	I_e	A		6	6	4	4
			Ue = 220 V DC				0,6	0,6	1,2	1,2
	2 poles connected in series		Ue = 24 V DC				20	25	40	63
			Ue = 110 V DC	I_e	A		10	10	10	10
			Ue = 220 V DC				6	6	8	8
	3 poles connected in series		Ue = 24 V DC				-	25	40	63
			Ue = 110 V DC	I_e	A		-	20	30	35
			Ue = 220 V DC				-	15	20	30
	4 poles connected in series		Ue = 24 V DC				-	25	40	63
			Ue = 110 V DC	I_e	A		-	20	40	63
			Ue = 220 V DC				-	15	40	63
	Electrical endurance	DC-1				op. c.	100.000			
	Maximum operating frequency	DC-1				op.c/h	300			
	Terminal capacity		rigid	S	mm²		1 … 10		1.5 … 25	
			flexible				1 … 6		1.5 … 16	
	Screw						M3.5		M5	
	Screw Head						PZ1		PZ2	
	Tightening torque					Nm	1,2		3,5	
Auxiliary circuit	Rated operational voltage			U_e	V		230	400	400	400
	Rated insulation voltage			U_i	V		230	440	440	440
	Rated impulse withstand voltage			U_{imp}	kV		4			
	Thermal current			I_{th}	A		20	25	40	63
	Rated operational current AC-15	single-phase	230 V	I_e	A		6			
		single-phase	400 V				-	4		
	Electrical endurance	AC-15				op. c.	300.000	500.000	150.000	
Control circuit	Range of control voltage			U_c	%		85 … 110			
	Control voltages			U_c	V		12 … 230			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5					kV	2			
	Coil consumption		switch-on			VA/W	2.1/2.1	2.6/2.6 [5]	5/5	5/5
			operation				2.1/2.1	2.6/2.6 [5]	5/5	5/5
	Make/break delays		make			ms	15 – 45	15 – 45	15 – 20	15 – 20
			break				20 – 50	20 – 70	35 – 45	35 – 45
	Terminal capacity		rigid	S	mm²		1 … 2.5		1 … 2.5	
			flexible				1 … 2.5		1 … 2.5	
	Screw						M 3.5		M3	
	Screw head						PZ1			
	Tightening torque					Nm	0,6			
Safety	MTTF - Mean time to failure MTTF = 1/λ = B10/(0,1 n_{op})					h	AC-1: 5.000 AC-3: 7.500	AC-1: 5.000 AC-3: 12.500	AC-1: 2.500 AC-3: 3.750	
	$MTTF_d$ - Mean time to failure dangerous $MTTF_d = 1/\lambda_d = B10_d/(0,1\ n_{op})$					h	AC-1: 6.666 AC-3: 10.000	AC-1: 6.666 AC-3: 16.666	AC-1: 3.333 AC-3: 5.000	
	B10 - Number of operating cycles until 10 % of devices fail					op. c.	AC-1: 150.000 AC-3: 225.000	AC-1: 150.000 AC-3: 375.000	AC-1: 75.000 AC-3: 112.500	
	$B10_d$ - Number of operating cycles until 10 % of device dangerous $B10_d$ = B10/ratio of dangerous failures					op. c.	AC-1: 200.000 AC-3: 300.000	AC-1: 200.000 AC-3: 500.000	AC-1: 100.000 AC-3: 150.000	
	λ - Failure rate λ = (0,1 n_{op})/B10					1/h	AC-1: 0,0002 AC-3: 0,000133	AC-1: 0,0002 AC-3: 0,00008	AC-1: 0,0004 AC-3: 0,000266	
	λ_d - Failure rate dangerous $\lambda_d = (0,1\ n_{op})/B10_d$					1/h	AC-1: 0,00015 AC-3: 0,0001	AC-1: 0,00015 AC-3: 0,00006	AC-1: 0,0003 AC-3: 0,0002	
	Ratio of dangerous failures					%	75			
	n_{op} - Operating cycles (operating cycles/h)					op.c/h	300			

5) Coil consumption for version -04 is 3.8 VA/3.8 W

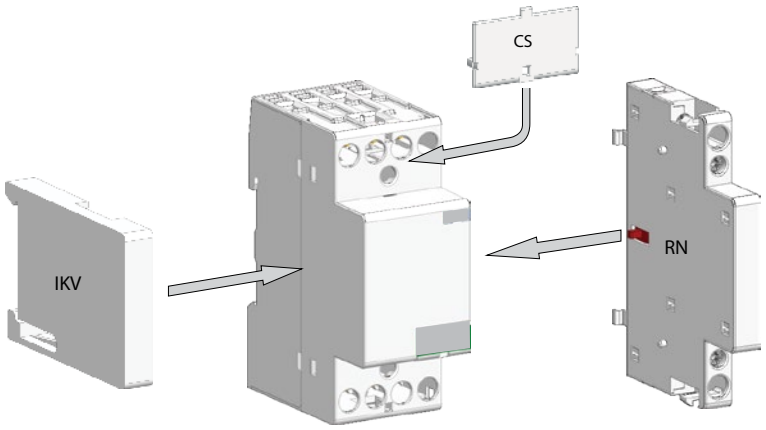
Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Type						R 20-R	RD 20-R	R 25-R	R D25-R
General	Standards					IEC/EN 61095 , IEC/EN 60947-4-1, IEC/EN 60947-5-1			
	Module width					1		2	
	Mechanical endurance				op. c.	3 x 106			
	Ambient temperature				°C	-25 … +70 (2NO, 4NO) -15 … +70 (1NO, 1NO+1NC,3NO,3NO+1NC) -15 … +55 (2NC, 1NC, 2NO+2NC,4NC)			
	Storage temperature				°C	-40 … +80			
	No. of contactors (side-by-side)		≤ 40 °C			max. 3	max. 3	no limit	max. 3
			40 - 55 °C			max. 2	max. 2		max. 2
			55 - 70 °C			max. 1 (ventilation modules or least 9 mm free space on each side)			
	Contact reliability					17 V; ≥ 50 mA			
	Min. distance of open contacts				mm	3,6			
	Power dissipation per pole				W	1,7	1,7	2,2	2,2
	Overload current withstand capability: 10s				A	72	72	68	68
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20	20	25	25
	Noise level (operation)				dB	30	20	30	20
	Vibration resistance according to IEC/EN 60068-2-6			a	g	switched off: 2 (Z and X axis) / switched on: 3 (Z axis) and 1 (X axis)			
	Shock resistance according to IEC/EN 6068-2-27			a	g	switched off: 10 (Z and X axis) / switched on: 15 (Z axis) and 2 (X axis)			
	Max. operating frequency	DC-1			op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b				600			
		AC-15				1200			
		no load				3000			
Main circuit	Rated insulation voltage			U_i	V	440		440	
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	20	25	25
	Rated operational voltage			U_e	V	400 [3]	400 [3]	400	400
	Rated frequency			f	Hz	50/60			
	Max. thermal current up to +55 °C			I_{th}	A	20	20	25	25
	Max. thermal current @ +70 °C			I_{th}	A	20	16	20	20
	Rated operational current	AC-1/AC-7a		I_e	A	20	20	25	25
		AC-3/AC-7b		I_e	A	NO: 9, NC: 6		8,5	
		AC-5a	230 V	I_e	A	8,8	8,8	11,2	11,2
		AC-5b	230 V	I_e	A	8,8	8,8	9,7	9,7
		AC-6a	230 V	I_e	A	4	4	2,8	2,8
	Operational power AC-1/AC-7a	single-phase	230 V			3,7	3,7	5,4	5,4
		three-phase	230 V	P_e	kW	-	-	9	9
		three-phase	400 V			-	-	16	16
	Electrical endurance	AC-1/AC-7a			op. c.	200.000			
		AC-3/AC-7b			op. c.	300.000		500.000	
		AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op. c.	100.000			
	Operational power AC-3/AC-7b	single-phase motor	230 V	P_e	kW	1.3 only for NO [1]	1.3 only for NO [1]	1.3 [2]	1.3 [2]
		three-phase motor	230 V			-	-	2,2	2,2
		three-phase motor	400 V			-	-	4	4
	Switching of capacitors	AC-6b	230 V	C	µF	30	30	36	36
	Maximum operating frequency	AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op.c./h	600			

1) Make contacts are marked NO
2) Data for single-phase power are valid for versions -22, -20 and -02
3) Rated operational voltage for versions of contacts -10 and-01 is 230 V
4) Rated power (AC-1) for IK63-04: single-phase 230 V = 10.9 kW; three-phase 230 V = 18.9 kW; three-phase 400 V = 32.9 kW

Technical data

Type							R 20-R	RD 20-R	R 25-R	RD 25-R
Main circuit	Rated operational current	DC-1								
	1 pole		Ue = 24 V DC				20	20	25	25
			Ue = 110 V DC	I_e	A		6			
			Ue = 220 V DC				0,6			
	2 poles connected in series		Ue = 24 V DC				20		25	
			Ue = 110 V DC	I_e	A		10			
			Ue = 220 V DC				6			
	3 poles connected in series		Ue = 24 V DC				-	-	25	25
			Ue = 110 V DC	I_e	A		-	-	20	20
			Ue = 220 V DC				-	-	15	15
	4 poles connected in series		Ue = 24 V DC				-	-	25	25
			Ue = 110 V DC	I_e	A		-	-	20	20
			Ue = 220 V DC				-	-	15	15
	Electrical endurance	DC-1				op. c.	100.000			
	Maximum operating frequency	DC-1				op.c./h	300			
	Terminal capacity		rigid	S		mm^2	1 … 10			
			flexible				1 … 6			
	Screw						M3.5			
	Screw Head						PZ1			
	Tightening torque					Nm	1,2			
Auxiliary circuit	Rated operational voltage			U_e		V	230	230	400	400
	Rated insulation voltage			U_i		V	230	230	440	440
	Rated impulse withstand voltage			U_{imp}		kV	4			
	Thermal current			I_{th}		A	20	20	25	25
	Rated operational current AC-15	single-phase	230 V	I_e		A	6			
		single-phase	400 V				4			
	Electrical endurance					op. c.	300.000		500.000	
Control circuit	Range of control voltage			U_c		%	85 … 110			
	Control voltages			U_c		V	12 … 230			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5					kV	2			
	Coil consumption	switch-on (handle in A)				VA/W	12/10	2.1/2.1	33/25	2.6/2.6
		switch-on (handle in 1)					6/3.8	2.1/2.1	10/5	2.6/2.6
		operation					2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6
	Make/break delays		make			ms	15 – 25	15 – 45	10 – 30	15 – 45
			break				10 – 30	20 – 50	10 – 30	20 – 70
	Terminal capacity		rigid	S		mm^2	1 … 2.5			
			flexible				1 … 2.5			
	Screw						M3			
	Screw head						PZ1			
	Tightening torque					Nm	0,6			
Safety	MTTF - Mean time to failure $MTTF = 1/\lambda = B10/(0,1\ n_{op})$					h	AC-1: 5.000 AC-3: 7.500		AC-1: 5.000 AC-3: 12.500	
	$MTTF_d$ - Mean time to failure dangerous $MTTF_d = 1/\lambda_d = B10_d/(0,1\ n_{op})$					h	AC-1: 6.666 AC-3: 10.000		AC-1: 6.666 AC-3: 16.666	
	B10 - Number of operating cycles until 10 % of devices fail					op. c.	AC-1: 150.000 / AC-3: 225.000		AC-1: 150.000 / AC-3: 375.000	
	$B10_d$ - Number of operating cycles until 10 % of device dangerous $B10_d$ = B10/ratio of dangerous failures					op. c.	AC-1: 200.000 AC-3: 300.000		AC-1: 200.000 AC-3: 500.000	
	λ - Failure rate $\lambda = (0,1\ n_{op})/B10$					1/h	AC-1: 0,0002 AC-3: 0,000133		AC-1: 0,0002 AC-3: 0,00008	
	λ_d - Failure rate dangerous $\lambda_d = (0,1\ n_{op})/B10_d$					1/h	AC-1: 0,00015 AC-3: 0,0001		AC-1: 0,00015 AC-3: 0,00006	
	Ratio of dangerous failures					%	75			
	n_{op} - Operating cycles (operating cycles/h)					op.c./h	300			



RA/RD 25

Technical data					
Type					**RN**
Standards					IEC/EN 60947-5-1
Module width					1/2
Rated insulation voltage U_i			U_i	V	500
Rated impulse withstand voltage U_{imp}			U_{imp}	kV	4
Thermal current			I_{th}	A	6
Rated operational voltage			U_e	V	230
					400
Rated operational current					
	AC-15	$U_e = 230$ V	I_e	A	6
		$U_e = 400$ V			4
Electrical endurance				op. c.	50.000
Mechanical endurance				op. c.	3×10^6
Min. distance of open contacts				mm	4
Contact reliability					12 V; ≥ 5 mA
Power loss per pole				W	0,3
Weight				kg	0,035
Max. back-up fuse for short-circuit protection gL					
Coordination type 2			I_v	A	6
Terminal capacity		rigid	S	mm^2	1...2.5
		flexible			1...2.5
Screw					M3
Screw head					PZ1
Tightening torque				Nm	0,6

Technical data

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Incandescent lamps (tungsten filament)	60	0,26	–	33	33	65	85
	100	0,44	–	20	20	40	50
	200	0,87	–	10	10	20	25
	500	2,17	–	3	3	8	10
	1000	4,35	–	1	1	4	5
Fluorescent lamps. uncorrected or series correction	18	0,37	2,7	22	24	90	140
	24	0,35	2,5	22	24	90	140
	36	0,43	3,4	17	20	65	95
	58	0,67	5,3	14	17	45	70
Fluorescent lamps. lead-lag circuit	2 x 18	0,11	–	2 x 30	2 x 40	2 x 100	2 x 150
	2 x 24	0,14	–	2 x 24	2 x 31	2 x 78	2 x 118
	2 x 36	0,22	–	2 x 17	2 x 24	2 x 65	2 x 95
	2 x 58	0,35	–	2 x 10	2 x 14	2 x 40	2 x 60
Fluorescent lamps. parallel correction	18	0,12	4,5	7	8	48	73
	24	0,15	4,5	7	8	48	73
	36	000	4,5	7	8	48	73
	58	0,32	7	4	5	31	47
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	–	25	35	100	140
	36	0,16	–	15	20	52	75
	58	0,25	–	14	19	50	72
	2 x 18	0,17	–	2 x 12	2 x 17	2 x 50	2 x 70
	2 x 36	0,32	–	2 x 7	2 x 10	2 x 26	2 x 38
	2 x 58	0,49	–	2 x 7	2 x 9	2 x 25	2 x 36
High-pressure mercury-vapour lamps. uncorrected	50	0,61	–	14	18	38	55
	80	001	–	10	13	29	42
	125	1,15	–	7	9	20	29
	250	2,15	–	4	5	10	15
	400	3,25	–	2	3	7	10
	700	005	–	1	2	4	6
	1000	008	–	1	1	3	4
High-pressure mercury-vapour lamps. parallel correction	50	0,28	7	4	5	31	47
	80	0,41	8	4	5	27	41
	125	0,65	10	3	4	22	33
	250	1,22	18	1	2	12	18
	400	1,95	25	1	1	9	13
	700	3,45	45	–	–	5	7
	1000	005	60	–	–	4	5
Halogen metal-vapour lamps. uncorrected	35	0,53	–	18	22	43	60
	70	001	–	10	12	23	32
	150	002	–	5	7	12	18
	250	003	–	3	4	7	10
	400	004	–	3	3	6	9
	1000	010	–	1	1	2	3
	2000	16,5	–	–	–	1	1
Halogen metal-vapour lamps, parallel correction	35	0,25	6	5	6	36	50
	70	0,45	12	2	3	18	25
	150	0,75	20	1	1	11	15
	250	002	33	–	1	6	9
	400	003	35	–	1	6	8
	1000	006	95	–	–	2	3
	2000	012	148	–	–	1	2

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Transformers for halogen metal-vapour lamps	20	–	–	40	52	110	174
	50	–	–	20	24	50	80
	75	–	–	13	16	35	54
	100	–	–	10	12	27	43
	150	–	–	7	9	19	29
	200	–	–	5	6	14	23
	300	–	–	3	4	9	14
High-pressure sodium-vapour lamps. uncorrected	150	002	–	5	6	17	22
	250	003	–	3	4	10	13
	400	005	–	2	2	6	8
	1000	10,3	–	–	1	3	3
High-pressure sodium-vapour lamps. parallel correction	150	0,83	20	1	1	11	16
	250	002	33	–	1	6	10
	400	002	48	–	–	4	6
	1000	006	106	–	–	2	3
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Low-pressure sodium-vapour lamps. uncorrected	18	0,35	–	22	27	71	90
	35	002	–	7	9	23	30
	55	002	–	7	9	23	30
	90	002	–	4	5	14	19
	135	004	–	3	4	10	13
	180	003	–	3	4	10	13
Low-pressure sodium-vapour lamps. parallel correction	18	0,35	5	6	7	44	66
	35	0,31	20	1	1	11	16
	55	0,42	20	1	1	11	16
	90	0,63	26	1	1	8	12
	135	0,94	45	–	–	5	8
	180	1,16	40	–	–	4	7

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	30	80	110
	40	0,21		12	15	40	60
	55	0,28		8	12	30	45
	14	0,08	HE	30	40	105	150
	21	0,11		22	30	80	115
	28	0,14		18	22	60	90
	35	0,18		14	18	48	70
	24	0,12	HO	20	26	70	100
	39	0,20		12	16	42	62
	49	0,24		10	14	35	52
	54	0,27		9	13	32	47
	80	0,39		6	8	22	32
	2 x 22	0,23	2 x FC	2 x 11	2 x 15	2 x 40	2 x 55
	2 x 40	0,42		2 x 6	2 x 7	2 x 20	2 x 30
	2 x 55	0,55		2 x 4	2 x 6	2 x 15	2 x 22
	2 x 14	0,15	2 x HE	2 x 15	2 x 20	2 x 52	2 x 75
	2 x 21	0,22		2 x 11	2 x 15	2 x 40	2 x 57
	2 x 28	0,28		2 x 9	2 x 11	2 x 20	2 x 45
	2 x 35	0,36		2 x 7	2 x 9	2 x 24	2 x 35
	2 x 24	0,24	2 x HO	2 x 10	2 x 13	2 x 35	2 x 50
	2 x 39	0,39		2 x 6	2 x 8	2 x 21	2 x 31
	2 x 49	0,48		2 x 5	2 x 7	2 x 17	2 x 26
	2 x 54	0,54		2 x 4	2 x 6	2 x 16	2 x 23
	2 x 80	0,74		2 x 3	2 x 4	2 x 11	2 x 16

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Incandescent lamp (tungsten filament)	60	0,26	–	33	33	33	33
	100	0,44	–	20	20	20	20
	200	0,87	–	10	10	10	10
	500	2,17	–	3	3	3	3
	1000	4,35	–	1	1	1	1
Fluorescent lamps uncorrected or series correction	18	0,37	2,7	22	22	24	24
	24	0,35	2,5	22	22	24	24
	36	0,43	3,4	17	17	20	20
	58	0,67	5,3	14	14	17	17
Fluorescent lamps lead-lag circuit	2 x 18	0,11	–	2 x 30	2 x 30	2 x 40	2 x 40
	2 x 24	0,14	–	2 x 24	2 x 24	2 x 31	2 x 31
	2 x 36	0,22	–	2 x 17	2 x 17	2 x 24	2 x 24
	2 x 58	0,35	–	2 x 10	2 x 10	2 x 14	2 x 14
Fluorescent lamps parallel correction	18	0,12	4,5	7	7	8	8
	24	0,15	4,5	7	7	8	8
	36	000	4,5	7	7	8	8
	58	0,32	7	4	4	5	5

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	–	25	25	35	35
	36	0,16	–	15	15	20	20
	58	0,25	–	14	14	19	19
	2 x 18	0,17	–	2 x 12	2 x 12	2 x 17	2 x 17
	2 x 36	0,32	–	2 x 7	2 x 7	2 x 10	2 x 10
	2 x 58	0,49	–	2 x 7	2 x 7	2 x 9	2 x 9
High-pressure mercury-vapour lamps uncorrected	50	0,61	–	14	14	18	18
	80	001	–	10	10	13	13
	125	1,15	–	7	7	9	9
	250	2,15	–	4	4	5	5
	400	3,25	–	2	2	3	3
	700	005	–	1	1	2	2
	1000	008	–	1	1	1	1
High-pressure mercury-vapour lamps. parallel correction	50	0,28	7	4	4	5	5
	80	0,41	8	4	4	5	5
	125	0,65	10	3	3	4	4
	250	1,22	18	1	1	2	2
	400	1,95	25	1	1	1	1
	700	3,45	45	–	–	–	–
	1000	005	60	–	–	–	–
Halogen metal-vapour lamps uncorrected	35	0,53	–	18	18	22	22
	70	001	–	10	10	12	12
	150	002	–	5	5	7	7
	250	003	–	3	3	4	4
	1000	010	–	1	1	1	1
	2000	16,5	–	–	–	–	–
Halogen metal-vapour lamps, parallel correction	35	0,25	6	5	5	6	6
	70	0,45	12	2	2	3	3
	150	0,75	20	1	1	1	1
	250	002	33	–	–	1	1
	400	003	35	–	–	1	1
	1000	006	95	–	–	–	–
	2000	11,5	148	–	–	–	–
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	9	9
	35	000	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	001	integrated	4	4	4	4
Transformers for halogen metal-vapour lamps	20	–	–	40	40	52	52
	50	–	–	20	20	24	24
	75	–	–	13	13	16	16
	100	–	–	10	10	12	12
	150	–	–	7	7	9	9
	200	–	–	5	5	6	6
	300	–	–	3	3	4	4
High-pressure sodium-vapour lamps, uncorrected	150	002	–	5	5	6	6
	250	003	–	3	3	4	4
	400	005	–	2	2	2	2
	1000	10,3	–	–	–	1	1

Technical data

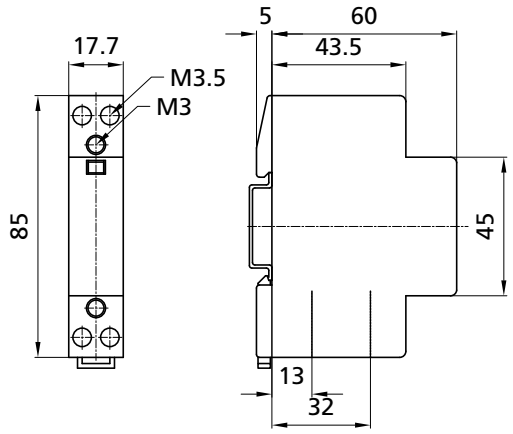
Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
High-pressure sodium-vapour lamps, parallel correction	150	0,83	20	1	1	1	1
	250	002	33	–	–	1	1
	400	002	48	–	–	–	–
	1000	006	106	–	–	–	–
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	9	9
	35	000	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	001	integrated	4	4	4	4
Low-pressure sodium-vapour lamps, uncorrected	18	0,35	–	22	22	27	27
	35	002	–	7	7	9	9
	55	002	–	7	7	9	9
	90	002	–	4	4	5	5
	135	004	–	3	3	4	4
	180	003	–	3	3	4	4
Low-pressure sodium-vapour lamps, parallel correction	18	0,35	5	6	6	7	7
	35	0,31	20	1	1	1	1
	55	0,42	20	1	1	1	1
	90	0,63	26	1	1	1	1
	135	0,94	45	–	–	–	–
	180	1,16	40	–	–	–	–
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	22	30	30
	40	0,21		12	12	15	15
	55	0,28		8	8	12	12
	14	0,08	HE	30	30	40	40
	21	0,11		22	22	30	30
	28	0,14		18	18	22	22
	35	0,18		14	14	18	18
	24	0,12	HO	20	20	26	26
	39	000		12	12	16	16
	49	0,24		10	10	14	14
	54	0,27		9	9	13	13
	80	0,39		6	6	8	8
	2 x 22	0,23	2 x FC	2 x 11	2 x 11	2 x 15	2 x 15
	2 x 40	0,42		2 x 6	2 x 6	2 x 7	2 x 7
	2 x 55	0,55		2 x 4	2 x 4	2 x 6	2 x 6
	2 x 14	0,15	2 x HE	2 x 15	2 x 15	2 x 20	2 x 20
	2 x 21	0,22		2 x 11	2 x 11	2 x 15	2 x 15
	2 x 28	0,28		2 x 9	2 x 9	2 x 11	2 x 11
	2 x 35	0,36		2 x 7	2 x 7	2 x 9	2 x 9
	2 x 24	0,24	2 x HO	2 x 10	2 x 10	2 x 13	2 x 13
	2 x 39	0,39		2 x 6	2 x 6	2 x 8	2 x 8
	2 x 49	0,48		2 x 5	2 x 5	2 x 7	2 x 7
	2 x 54	0,54		2 x 4	2 x 4	2 x 6	2 x 6
	2 x 80	0,74		2 x 3	2 x 3	2 x 4	2 x 4

LED lamps, Power supplies for LEDs

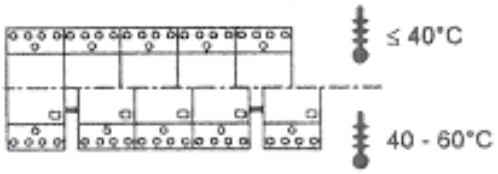
RD20, RD20-R, R20-R	RD25, RD25-R, R25-R	RD40	RD63
max. 2,4 A per pole	max. 3,8 A per pole	max. 11 A per pole	max. 18 A per pole

Dimensions

R20

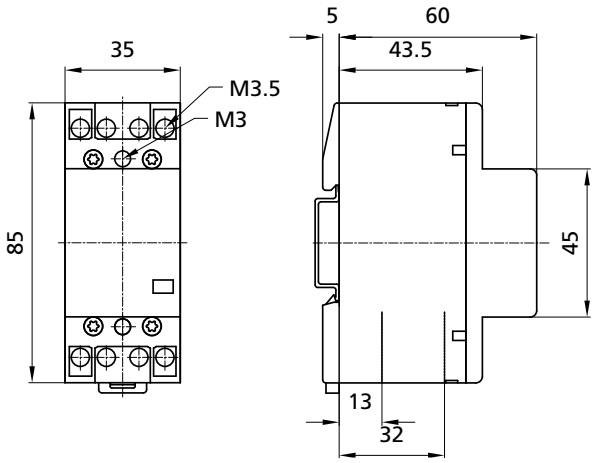


Distance piece

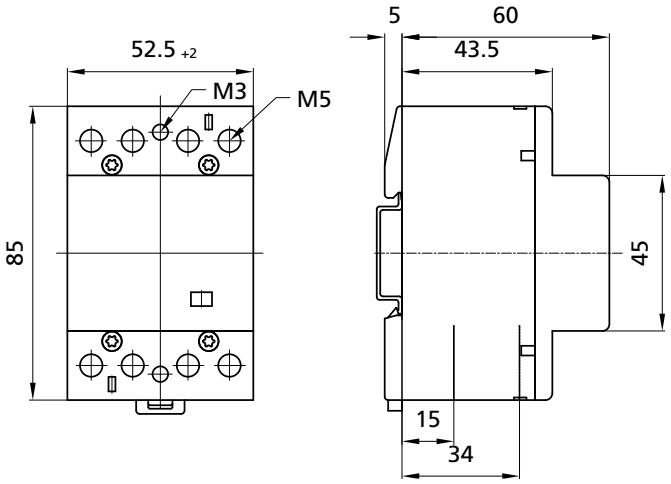


Distance piece is used where ambient temperature is higher than 40°C. Piece width is 1/2 module (8,8 mm)

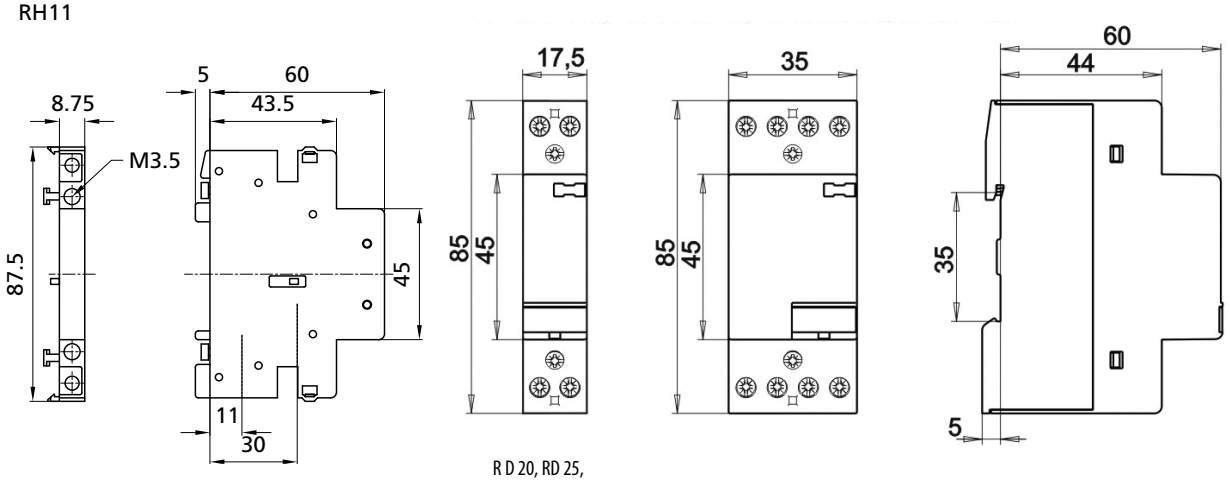
R25



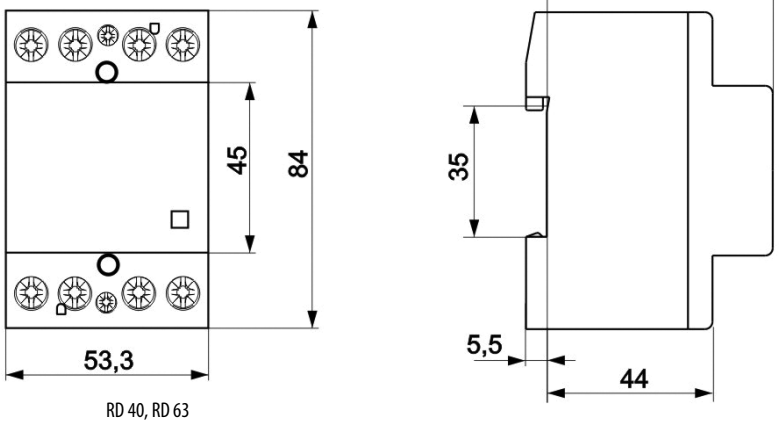
R40,R63



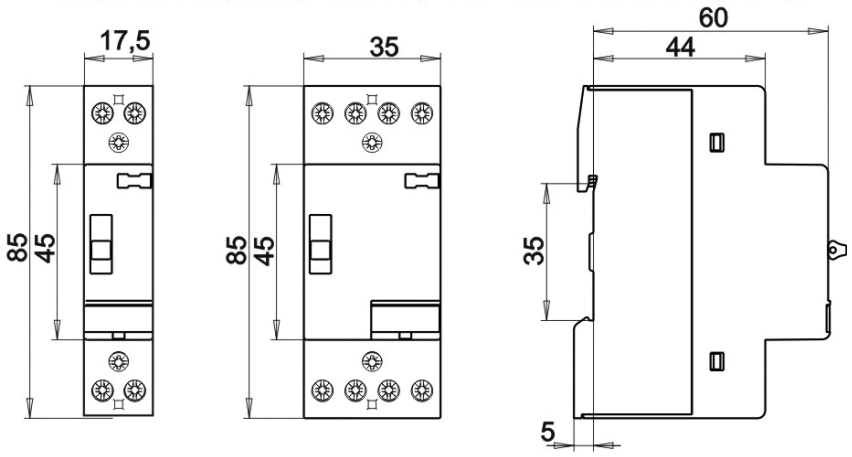
RH11



R D 20, RD 25,

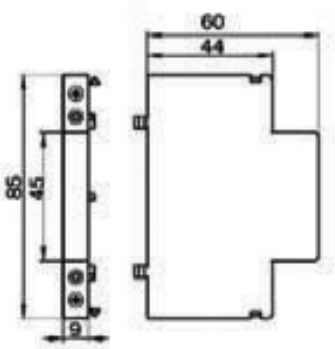


RD 40, RD 63

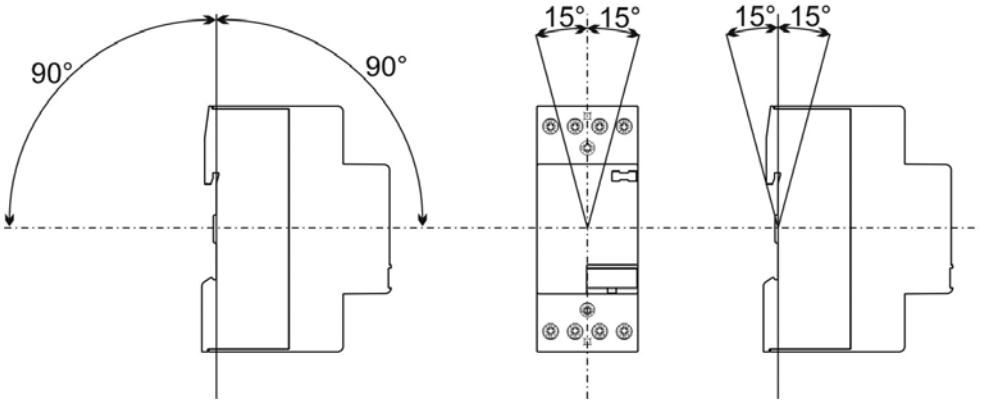


RD 20 - R, RD 25 - R

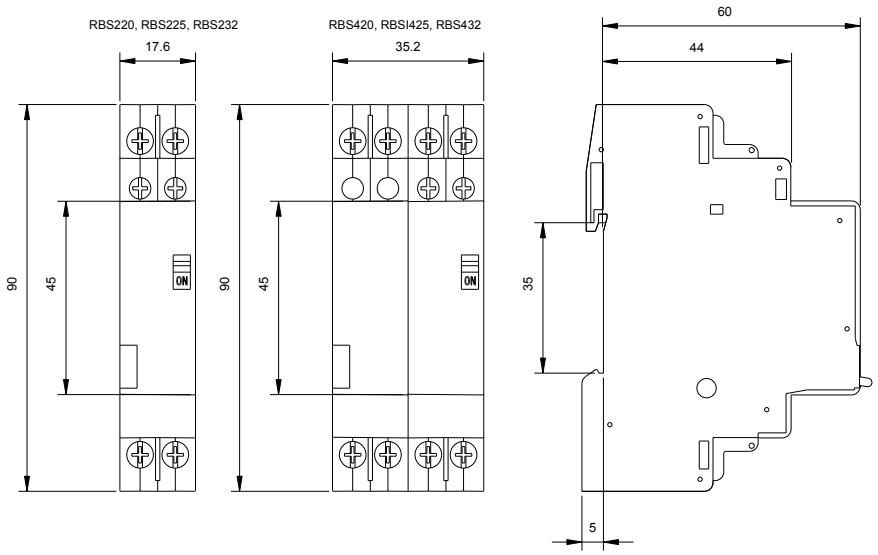
RN auxiliary switch

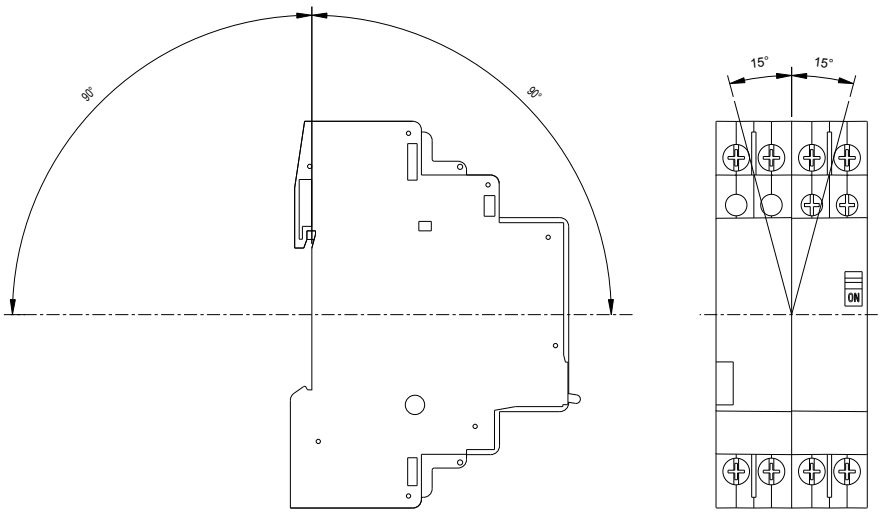


Mounting position



Bistable Switch RBS





Technical data								
Type			RBS220	RBS225	RBS232	RBS420	RBS425	BI432
Standards			IEC/EN 60669-2-2					
Manual control			✓					
Control with impulse voltage			✓					
Indication			With actuator					
Protection degree accordance to IEC/EN 60529			IP 20					
Module width			1			2		
Ambient temperature		°C	-25…+55					
Storage temperature		°C	-30…+80					
Max. resistance to humidity			95 % RH @ +55 °C					
Min. contact reliability			10 V / 100 mA					
Max. shock resistance accordance to IEC/EN 60068-2-27		g	15					
Max. vibration resistance accordance to IEC/EN 60068-2-6		g	3					
Min. distance of open contacts		mm	>3					
Distance between contacts and coil		mm	>6					
Mechanical endurance		cycles	106					
Max. back-up fuse for short-circuit protection (gL)		A	20	25	32	20	25	32
Power dissipation per pole		W	1,5	2	3	1,5	2	3
Rated control voltages	Uc	V	AC: 24, 230, other on request					
Rated frequency of control voltage	fc	Hz	50 / 60					
Range of control voltage	Uc	%	90…110					
Coil consumption – inrush		VA/W	18 / 13					
Coil consumption – hold		VA/W	9 / 4					
Min. impulse duration at Uc		ms	50					
Min. impulse duration at 0,85 Uc		ms	100					
Min. duration between two impulses		ms	150					
Max. number of impulses per minute			15		7,5	15		7,5
Max. impulse duration at Uc			1 hour					
Rated impulse voltage	Uimp	kV	4					
Thermal current	Ith	A	20	25	32	20	25	32
Rated insulation voltage	Ui	V	440					
Rated operational voltage	Ue	V	440					
Rated frequency	fe	Hz	50 / 60					
Rated operational current for cosφ = 0,6 acc. to IEC/EN 60669-2-2	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-1 acc. to IEC/EN 60947-4-1	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-7a acc. to IEC/EN 61095 – Slightly inductive loads in household appliances and similar applications	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-22 acc. to IEC/EN 60947-3			20 / 230 V	25 / 230 V	32 / 230 V	20 / 230 V	25 / 230 V	32 / 230 V
Switching of mixed resistive and inductive loads, including moderate overloads	Ie	A	16 / 440 V	20 / 440 V	25 / 440 V	16 / 440 V	20 / 440 V	25 / 440 V
Rated operational current for AC-23 acc. to IEC/EN 60947-3 Switching of motor loads or other highly inductive loads	Ie	A	16 / 230 V / 1-phase	20 / 230 V / 1-phase	25 / 230 V / 1-phase	16 / 230 V / 1-phase 16 / 230 V / 3-phase 16 / 400 V / 3-phase	20 / 230 V / 1-phase 20 / 230 V / 3-phase 20 / 400 V / 3-phase	25 / 230 V / 1-phase 25 / 230 V / 3-phase 25 / 400 V / 3-phase

Technical data

Type			RBS220	RBS225	RBS232	RBS420	RBS425	BI432
Rated operational current for AC-3 acc. to IEC/EN 60947-4-1 Squirrel-cage motors: starting, switching off motors during running	Ie	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-7b acc. to IEC/EN 61095 Motor-loads for household applications	Ie	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-6a acc. to IEC/EN 60947-4-1 Switching of transformers having inrush current peaks of not more than 30 times peak of rated current	Ie	A	3 / 230 V	3,6 / 230 V	4,5 / 230 V	3 / 230 V	3,6 / 230 V	4,5 / 230 V
			1,5 / 400 V	1,8 / 400 V	2,2 / 400 V	1,5 / 400 V	1,8 / 400 V	2,2 / 400 V
Rated operational current for AC-6b acc. to IEC/EN 60947-4-1 – Switching of capacitor banks	C	µF	100 µF / 230 V					
Rated operational current for DC-1 acc. to IEC/EN 60947-4-1 – Non-inductive or slightly inductive loads, resistance furnances	Ie	A	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 V / 1p
Rated operational current for DC-3 acc. to IEC/EN 60947-4-1 – Shunt-motors: starting, plugging, inching	Ie	A	10 / 24 V / 1p	15 / 24 V / 1p	25 / 24 V / 1p	10 / 24 V / 1p	15 / 24 V / 1p	25 / 24 V / 1p
Rated operational current for DC-5 acc. to IEC/EN 60947-4-1 – Series-motors: starting, plugging, inching	Ie	A	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p
Rated operational current for DC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	Ie	A	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 / V 1p	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 / V 1p
Rated operational current for DC-22 acc. to IEC/EN 60947-3 – Switching of mixed resistive and inductive loads, including moderate overloads	Ie	A	16 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p
Rated operational current for DC-23 acc. to IEC/EN 60947-3 – Switching of highly inductive loads (e.g. series motors)	Ie	A	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p
Rated operational current for AC-5a acc. to IEC/EN 60947-4-1 – Switching of electric discharge lamp controls	Ie	A	16 / 230 V					
Rated operational current for AC-5b acc. to IEC/EN 60947-4-1 – Switching of incandescent lamps	Ie	A	10 / 230 V					
Rated operational current for fluorescent lamps acc. to IEC/EN 60669-2-2	Ie	A	16 / 230 V					
Fluorescent / energy saving / compact lamps with electronic control gear	Ie	A	2 / 230 V					
Electrical endurance for all utilization categories		cycles	105					
Terminal capacity for main circuit	S	mm^2	1…10 rigid / flexible					
Screw for main circuit			M4					
Screw-head for main circuit			(±) PZ2					
Tightening torque for main circuit		Nm	1,2					
Terminal capacity for control circuit	S	mm^2	1…4 rigid / flexible					
Screw for control circuit			M3					
Screw-head for control circuit			(±) PZ1					
Tightening torque for control circuit		Nm	0,6					

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Incandescent lamps and halogen lamps	11	0,05	-				
	15	0,07	-	133	133	167	233
	18	0,08	-	111	111	139	194
	20	0,09	-	100	100	125	175
	25	0,11	-	80	80	100	140
	28	0,12	-	71	71	89	125
	30	0,13	-	67	67	83	117
	33	0,14	-	61	61	76	106
	35	0,15	-	57	57	71	100
	40	0,17	-	50	50	63	88
	42	0,18	-	48	48	60	83
	46	0,2	-	43	43	54	76
	48	0,21	-	42	42	52	73
	50	0,22	-	40	40	50	70
	53	0,23	-	38	38	47	66
	57	0,25	-	35	35	44	61
	60	0,26	-	33	33	42	58
	70	0,3	-	29	29	36	50
	75	0,33	-	27	27	33	47
	77	0,34	-	26	26	32	45
	80	0,35	-	25	25	31	44
	100	0,44	-	20	20	25	35
	116	0,5	-	17	17	22	30
	120	0,52	-	17	17	21	29
	150	0,65	-	13	13	17	23
	160	0,7	-	13	13	16	22
	200	0,87	-	10	10	13	18
	205	0,89	-	10	10	12	17
	230	1	-	9	9	11	15
	300	1,3	-	7	7	8	12
	400	1,74	-	5	5	6	9
	500	2,17	-	4	4	5	7
	750	3,26	-	3	3	3	5
	1000	4,35	-	2	2	3	4
	1500	6,52	-	1	1	2	2
	2000	8,7	-	1	1	1	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Transformators for low-voltage halogen lamps (electromagnetic and electronic)	10	0,04	-	100	100	200	300
	20	0,09	-	50	75	100	150
	30	0,13	-	33	50	67	100
	40	0,17	-	25	38	50	75
	50	0,22	-	20	30	40	60
	60	0,26	-	17	25	33	50
	70	0,3	-	14	21	29	43
	80	0,35	-	13	19	25	38
	90	0,39	-	11	17	22	33
	100	0,44	-	10	15	20	30
	150	0,65	-	7	10	13	20
	200	0,87	-	5	8	10	15
	300	1,3	-	3	5	7	10
	400	1,74	-	3	4	5	8
Compact fluorescent lamps with internal ballasts	3	0,04	-	133	167	250	333
	5	0,06	-	80	100	150	200
	6	0,07	-	67	83	125	167
	7	0,08	-	57	71	107	143
	8	0,09	-	50	63	94	125
	9	0,1	-	44	56	83	111
	10	0,11	-	40	50	75	100
	11	0,12	-	36	45	68	91
	12	0,13	-	33	42	63	83
	13	0,14	-	31	38	58	77
	14	0,15	-	29	36	54	71
	15	0,16	-	27	33	50	67
	16	0,18	-	25	31	47	63
	17	0,19	-	24	29	44	59
	18	0,2	-	22	28	42	56
	20	0,21	-	20	25	38	50
	21	0,22	-	19	24	36	48
	22	0,23	-	19	23	34	45
	23	0,24	-	17	22	33	43
	24	0,25	-	17	21	31	42
	25	0,26	-	16	20	30	40
	26	0,27	-	15	19	29	38
	27	0,124	-	15	19	28	37
	30	0,15	-	13	17	25	33
	33	0,155	-	12	15	23	30
	35	0,164	-	11	14	21	29
	40	0,2	-	10	13	19	25
	50	0,24	-	8	10	15	20
	70	0,312	-	6	7	11	14

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Compact fluorescent lamps with external electromagnetic ballasts - uncorrected	5	0,05	-	70	120	180	240
	2x5	0,07	-	50	86	129	171
	7	0,05	-	70	120	180	240
	2x7	0,07	-	50	86	129	171
	9	0,06	-	58	100	150	200
	2x9	0,08	-	44	75	113	150
	10	0,07	-	50	86	129	171
	11	0,08	-	44	75	113	150
	13	0,08	-	44	75	113	150
	16	0,1	-	35	60	90	120
	18	0,12	-	29	50	75	100
	2x18	0,21	-	17	29	43	57
	21	0,12	-	29	50	75	100
	22	0,2	-	18	30	45	60
	24	0,15	-	23	40	60	80
	26	0,15	-	23	40	60	80
	28	0,15	-	23	40	60	80
	32	0,22	-	16	27	41	55
	36	0,21	-	17	29	43	57
	38	0,21	-	17	29	43	57
	40	0,21	-	17	29	43	57
	58	0,32	-	11	19	28	38
Compast fluorescent lamps with external electromagnetic ballasts - parallel corrected	5	0,05	2	40	50	60	75
	2x5	0,07	2	40	50	60	75
	7	0,05	2	40	50	60	75
	2x7	0,07	2	40	50	60	75
	9	0,06	2	40	50	60	75
	2x9	0,08	2	40	50	60	75
	10	0,07	2	40	50	60	75
	11	0,08	2	40	50	60	75
	13	0,08	2	40	50	60	75
	16	0,1	2	40	50	60	75
	18	0,12	4,5	18	22	27	33
	2x18	0,21	4	20	25	30	38
	21	0,12	3	27	33	40	50
	22	0,2	4,5	18	22	27	33
	24	0,15	4,5	18	22	27	33
	26	0,15	4,5	18	22	27	33
	28	0,15	3,5	23	29	34	43
	32	0,22	4	20	25	30	38
	36	0,21	4,5	18	22	27	33
	38	0,21	4,5	18	22	27	33
	40	0,21	4,5	18	22	27	33
	58	0,32	7	11	14	17	21

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Compact fluorescent lamps with external electronic ballasts	5	0,03	-	100	200	300	400
	7	0,04	-	75	150	225	300
	9	0,05	-	60	120	180	240
	2x9	0,09	-	33	67	100	133
	10	0,05	-	60	120	180	240
	2x10	0,09	-	33	67	100	133
	11	0,07	-	43	86	129	171
	2x11	0,12	-	25	50	75	100
	13	0,07	-	43	86	129	171
	2x13	0,12	-	25	50	75	100
	14	0,08	-	38	75	113	150
	2x14	0,15	-	20	40	60	80
	16	0,07	-	43	86	129	171
	17	0,1	-	30	60	90	120
	2x17	0,18	-	17	33	50	67
	18	0,09	-	33	67	100	133
	2x18	0,17	-	18	35	53	71
	22	0,13	-	23	46	69	92
	2x22	0,21	-	14	29	43	57
	24	0,12	-	25	50	75	100
	2x24	0,23	-	13	26	39	52
	3x24	0,32	-	9	19	28	38
	4x24	0,43	-	9	14	21	28
	26	0,12	-	25	50	75	100
	2x26	0,24	-	13	25	38	50
	28	0,14	-	21	43	64	86
	32	0,16	-	19	38	56	75
	2x32	0,31	-	10	19	29	39
	36	0,16	-	19	38	56	75
	2x36	0,31	-	10	19	29	39
	38	0,17	-	18	35	53	71
	2x38	0,35	-	9	17	26	34
	40	0,2	-	15	30	45	60
	2x40	0,39	-	8	15	23	31
	42	0,2	-	15	30	45	60
	2x42	0,41	-	7	15	22	29
	55	0,27	-	11	22	33	44
	2x55	0,52	-	6	12	17	23
	57	0,28	-	11	21	32	43
	2x57	0,57	-	5	11	16	21
	60	0,31	-	10	19	29	39
	2x60	0,61	-	5	10	15	20
	70	0,34	-	9	18	26	35
	80	0,38	-	8	16	24	32
	2x80	0,76	-	4	8	12	16
	85	0,42	-	7	14	21	29
	100	0,46	-	7	13	20	26
	120	0,58	-	5	10	16	21
	150	0,69	-	4	9	13	17

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Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Fluorescent lamps with external electromagnetic ballasts - uncorrected	4	0,17	-	94	94	94	94
	6	0,16	-	100	100	100	100
	8	0,15	-	107	107	107	107
	10	0,17	-	94	94	94	94
	11	0,16	-	100	100	100	100
	13	0,17	-	94	94	94	94
	14	0,4	-	40	40	40	40
	15	0,33	-	48	48	48	48
	16	0,2	-	80	80	80	80
	18	0,37	-	43	43	43	43
	20	0,38	-	42	42	42	42
	22	0,37	-	43	43	43	43
	25	0,29	-	55	55	55	55
	30	0,37	-	43	43	43	43
	32	0,43	-	37	37	37	37
	36	0,43	-	37	37	37	37
	38	0,43	-	37	37	37	37
	40	0,43	-	37	37	37	37
	58	0,67	-	24	24	24	24
	65	0,67	-	24	24	24	24
	75	0,67	-	24	24	24	24
	80	0,8	-	20	20	20	20
	85	0,8	-	20	20	20	20
	100	0,96	-	17	17	17	17
	125	0,94	-	17	17	17	17
Fluorescent lamps with external electromagnetic ballasts - parallel corrected	4	0,09	2	40	50	60	75
	6	0,08	2	40	50	60	75
	8	0,08	2	40	50	60	75
	10	0,09	2	40	50	60	75
	11	0,08	2	40	50	60	75
	13	0,09	2	40	50	60	75
	14	0,2	4,5	18	22	27	33
	15	0,17	4,5	18	22	27	33
	16	0,1	2,5	32	40	48	60
	18	0,19	4,5	18	22	27	33
	20	0,19	4,5	18	22	27	33
	22	0,19	5	16	20	24	30
	25	0,15	3,5	23	29	34	43
	30	0,24	4,5	18	22	27	33
	32	0,29	5	16	20	24	30
	36	0,29	4,5	18	22	27	33
	38	0,29	4,5	18	22	27	33
	40	0,29	4,5	18	22	27	33
	58	0,46	7	11	14	17	21
	65	0,46	7	11	14	17	21
	75	0,46	6	13	17	20	25
	80	0,57	7	11	14	17	21
	85	0,57	8	10	13	15	19
	100	0,66	10	8	10	12	15
	125	0,65	18	4	6	7	8

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Series circuit for two fluorescent lamps with external electromagnetic ballast - uncorrected	2x4	0,34	-	47	47	47	47
	2x6	0,32	-	50	50	50	50
	2x8	0,3	-	53	53	53	53
	2x10	0,34	-	47	47	47	47
	2x11	0,32	-	50	50	50	50
	2x13	0,34	-	47	47	47	47
	2x14	0,8	-	20	20	20	20
	2x15	0,66	-	24	24	24	24
	2x16	0,4	-	40	40	40	40
	2x18	0,74	-	22	22	22	22
	2x20	0,76	-	21	21	21	21
	2x22	0,74	-	22	22	22	22
	2x25	0,58	-	28	28	28	28
	2x30	0,74	-	22	22	22	22
	2x32	0,86	-	19	19	19	19
	2x36	0,86	-	19	19	19	19
	2x38	0,86	-	19	19	19	19
	2x40	0,86	-	19	19	19	19
	2x58	1,34	-	12	12	12	12
	2x65	1,34	-	12	12	12	12
	2x75	1,34	-	12	12	12	12
	2x80	1,6	-	10	10	10	10
	2x85	1,6	-	10	10	10	10
	2x100	1,92	-	8	8	8	8
	2x125	1,88	-	9	9	9	9
Series circuit for two fluorescent lamps with external electromagnetic ballast - parallel corrected	2x4	0,17	2	40	50	60	75
	2x6	0,16	2	40	50	60	75
	2x8	0,15	2	40	50	60	75
	2x10	0,17	2	40	50	60	75
	2x11	0,16	2	40	50	60	75
	2x13	0,17	2	40	50	60	75
	2x14	0,4	4,5	18	22	27	33
	2x15	0,33	4,5	18	22	27	33
	2x16	0,2	2,5	32	40	48	60
	2x18	0,37	4,5	18	22	27	33
	2x20	0,38	4,5	18	22	27	33
	2x22	0,37	5	16	20	24	30
	2x25	0,29	3,5	23	29	34	43
	2x30	0,37	4,5	18	22	27	33
	2x32	0,43	5	16	20	24	30
	2x36	0,43	4,5	18	22	27	33
	2x38	0,43	4,5	18	22	27	33
	2x40	0,43	4,5	18	22	27	33
	2x58	0,67	7	11	14	17	21
	2x65	0,67	7	11	14	17	21
	2x75	0,67	6	13	17	20	25
	2x80	0,8	7	11	14	17	21
	2x85	0,8	8	10	13	15	19
	2x100	0,96	10	8	10	12	15
	2x125	0,94	18	4	6	7	8

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Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Lead-lag circuit for fluorescent lamps with external electromagnetic ballasts - series corrected	2x18	0,26	2,7	62	62	62	62
	2x36	0,48	4,5	33	33	33	33
	2x40	0,48	4,5	33	33	33	33
	2x58	0,78	7	21	21	21	21
	2x65	0,78	7	21	21	21	21
	2x80	0,96	9	17	17	17	17
	2x85	0,96	9	17	17	17	17
	2x125	1,2	18	13	13	13	13
Fluorescent lamps with external electronic ballasts	4	0,03	-	100	200	300	400
	6	0,033	-	91	182	273	364
	2x6	0,06	-	50	100	150	200
	8	0,04	-	75	150	225	300
	2x8	0,08	-	38	75	113	150
	10	0,05	-	60	120	180	240
	2x10	0,09	-	33	67	100	133
	11	0,06	-	50	100	150	200
	13	0,07	-	43	86	129	171
	14	0,08	-	38	75	113	150
	2x14	0,15	-	20	40	60	80
	3x14	0,21	-	14	29	43	57
	4x14	0,28	-	11	21	32	43
	15	0,08	-	38	75	113	150
	2x15	0,13	-	23	46	69	92
	16	0,07	-	43	86	129	171
	2x16	0,14	-	21	43	64	86
	3x16	0,2	-	15	30	45	60
	4x16	0,28	-	11	21	32	43
	18	0,09	-	33	67	100	133
	2x18	0,17	-	18	35	53	71
	3x18	0,24	-	13	25	38	50
	4x18	0,31	-	10	19	29	39
	19	0,11	-	27	55	82	109
	2x19	0,22	-	14	27	41	55
	20	0,11	-	27	55	82	109
	2x20	0,22	-	14	27	41	55
	21	0,11	-	27	55	82	109
	2x21	0,22	-	14	27	41	55
	22	0,11	-	27	55	82	109
	2x22	0,23	-	13	26	39	52
	24	0,12	-	25	50	75	100
	2x24	0,22	-	14	27	41	55
	3x24	0,33	-	9	18	27	36
	4x24	0,43	-	7	14	21	28
	25	0,15	-	20	40	60	80
	2x25	0,28	-	11	21	32	43
	28	0,14	-	21	43	64	86
	2x28	0,27	-	11	22	33	44
	30	0,14	-	21	43	64	86
	2x30	0,27	-	11	22	33	44
	32	0,17	-	18	35	53	71

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Fluorescent lamps with external electronic ballasts	2x32	0,35	-	9	17	26	34
	34	0,17	-	18	35	53	71
	2x34	0,35	-	9	17	26	34
	35	0,17	-	18	35	53	71
	2x35	0,34	-	9	18	26	35
	36	0,16	-	19	38	56	75
	2x36	0,31	-	10	19	29	39
	3x36	0,46	-	7	13	20	26
	38	0,15	-	20	40	60	80
	2x38	0,31	-	10	19	29	39
	39	0,19	-	16	32	47	63
	2x39	0,36	-	8	17	25	33
	40	0,21	-	14	29	43	57
	2x40	0,42	-	7	14	21	29
	45	0,24	-	13	25	38	50
	2x45	0,46	-	7	13	20	26
	49	0,24	-	13	25	38	50
	2x49	0,46	-	7	13	20	26
	50	0,25	-	12	24	36	48
	2x50	0,48	-	6	13	19	25
	51	0,22	-	14	27	41	55
	2x51	0,42	-	7	14	21	29
	54	0,26	-	12	23	35	46
	2x54	0,52	-	6	12	17	23
	55	0,28	-	11	21	32	43
	2x55	0,55	-	5	11	16	22
	58	0,25	-	12	24	36	48
	2x58	0,48	-	6	13	19	25
	65	0,25	-	12	24	36	48
	2x65	0,48	-	6	13	19	25
	70	0,3	-	10	20	30	40
	2x70	0,57	-	5	11	16	21
	73	0,38	-	8	16	24	32
	2x73	0,7	-	4	9	13	17
	80	0,4	-	8	15	23	30
	2x80	0,76	-	4	8	12	16
High pressure mercury vapour lamps with external electromagnetic ballasts - uncorrected	50	0,6	-	17	27	27	27
	80	0,8	-	13	20	20	20
	125	1,2	-	8	13	13	13
	250	2,2	-	5	7	7	7
	400	3,3	-	3	5	5	5
	700	5,4	-	2	3	3	3
	1000	7,5	-	1	2	2	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
High pressure mercury vapour lamps with external electromagnetic ballasts - parallel corrected	50	0,3	7	11	14	17	21
	80	0,4	8	10	13	15	19
	125	0,6	10	8	10	12	15
	250	1,2	18	4	6	7	8
	400	1,8	25	3	4	5	6
	700	3,4	40	2	3	3	4
	1000	4,8	60	1	2	2	3
High pressure mercury vapour lamps which do not require ballasts	160	0,8	-	10	11	14	20
	250	1,2	-	6	7	9	13
	500	2,4	-	3	4	5	7
Metal halide lamps with external electromagnetic ballasts - uncorrected	35	0,5	-	16	32	32	32
	70	1	-	8	16	16	16
	100	1,2	-	7	13	13	13
	150	1,8	-	4	9	9	9
	250	3	-	3	5	5	5
	400	4,6	-	2	3	3	3
	600	6,2	-	1	3	3	3
	1000	9,7	-	1	2	2	2
	2000	12,2	-	0	1	1	1
Metal halide lamps with external electromagnetic ballasts - parallel corrected	35	0,23	6	13	17	20	25
	70	0,42	12	7	8	10	13
	100	0,55	12	7	8	10	13
	150	0,77	20	4	5	6	8
	250	1,26	32	3	3	4	5
	400	2	45	2	2	3	3
	600	3	65	1	2	2	2
	1000	5	85	0	1	1	2
	2000	10,5	125	0	0	1	1
Metal halide lamps with external electronic ballasts	20	0,11	-	27	55	82	109
	35	0,21	-	14	29	43	57
	2x35	0,38	-	8	16	24	32
	50	0,29	-	10	21	31	41
	70	0,38	-	8	16	24	32
	2x70	0,71	-	4	8	13	17
	100	0,56	-	5	11	16	21
	150	0,72	-	4	8	13	17
	250	1,3	-	2	5	7	9
	400	2	-	1	3	5	6
	1000	5	-	0	1	2	2
	2000	6	-	0	1	2	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
High pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	35	0,53	-	25	30	30	30
	50	0,8	-	16	20	20	20
	70	1	-	13	16	16	16
	100	1,2	-	11	13	13	13
	150	1,8	-	7	9	9	9
	250	3	-	4	5	5	5
	400	4,4	-	3	4	4	4
	600	6,2	-	2	2	2	2
	1000	10,3	-	1	1	1	1
High pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	35	0,22	6	13	17	20	25
	50	0,3	8	10	13	15	19
	70	0,4	12	7	8	10	13
	100	0,55	12	7	8	10	13
	150	0,77	20	4	5	6	8
	250	1,26	32	3	3	4	5
	400	2	45	2	2	3	3
	600	2,9	65	1	1	2	2
	1000	5,1	100	0	0	1	1
High pressure sodium vapour lamps with external electronic ballasts	35	0,21	-	14	29	43	57
	50	0,25	-	12	24	36	48
	70	0,38	-	8	16	24	32
	100	0,56	-	5	11	16	21
	150	0,72	-	4	8	13	17
	250	1,3	-	2	5	7	9
	400	2	-	2	3	5	6
	600	3,1	-	1	2	3	4
	1000	5	-	0	1	2	2
Low pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	18	0,4	-	25	40	40	40
	35	0,6	-	15	27	27	27
	55	0,6	-	15	27	27	27
	90	0,9	-	10	18	18	18
	135	0,9	-	10	18	18	18
	180	0,9	-	10	18	18	18
Low pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	18	0,35	5	16	20	24	30
	35	0,28	20	4	5	6	8
	55	0,35	20	4	5	6	8
	90	0,55	26	3	4	5	6
	135	0,8	40	2	3	3	4
	180	1	40	2	3	3	4
Low pressure sodium vapour lamps with ECG	35	0,16	-	19	38	56	75
	55	0,25	-	12	24	36	48
LED lamps Power supplies for LEDs	-	-	-	max. 2 A per pole	max. 6 A per pole	max. 9 A per pole	max. 12 A per pole

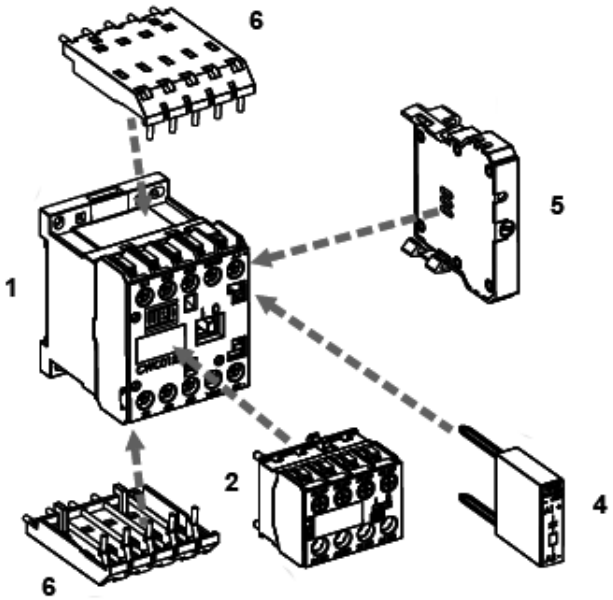
Miniature contactors CE and CEC

Technical data

Type			CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Standards			IEC/EN 60 947, DIN VDE 0660, UL, CSA						
Rated insulation voltage U_i according to IEC/EN 60947, DIN VDE 0660		V	415 V			690 V			415 V
Rated impulse withstand voltage U_{imp}			4 kV						
Rated operational frequency			25 - 400 Hz						
Degree of protection									
Main circuits			IP20						
Control circuits and auxiliary contacts			IP20						
Ambient temperature									
Operating temperature			-25 ... +55°C						
Storage temperature			-55 ... +80°C						
Altitude									
Normal values			< 3000 m						
90% I_e/80% U_e			3000 ... 4000 m						
80% I_e/75% U_e			4000 ... 5000 m						
Overvoltage category / Pollution degree			III/3						
Climatic proofing			IEC 60 680-2						
Number of main poles			3			3		4	4
Rated operational voltage U_e			400-415 V			690 V			400-415 V
Conv. thermal current I_{th} at < 55°C									
rated operational current I_e/AC-1			16 A	18 A	20 A	22 A	22 A	10 A	16 A
AC3 Utilization category									
Rated operational power									
230 V		kW	1,5	1,5	2,2	3	4	-	-
400/415 V		kW	3	3	4	5,5	7,5	-	-
440 V		kW	-	3,7	4,5	5,5	7,5	-	-
500 V		kW	-	3,7	4,5	5,5	7,5	-	-
690 V		kW	-	3,7	5,5	7,5	7,5	-	-
AC4 Utilization category									
Rated operational current I_e AC-4 ($U_e \leq 440V$)				2,8	3,5	4,5	5		
Short circuit rating, max. fuse gG (A)			16	20	20	25	25	6	6
Max. electrical operating frequency									
AC-1		Ops/h	50			300		-	-
AC-3		Ops/h	300			600		-	-
AC-4		Ops/h	250			300		-	-
no load		Ops/h	2000			2500		2500	2500
Mechanical life span		Ops x 10^6				10			
Electrical life span		Ops x 10^6	0,8	1,4	1,3	1,2	1,1	1	1
Maximum number of auxiliary contacts			-			5		-	-
Rated operational current I_e									
AC-15	220-230 V	A	-	-	-	-	-	10	6
	380-400 V	A	-	-	-	-	-	6	4
	415 V	A	-	-	-	-	-	5	-
	500 V	A	-	-	-	-	-	4	-
	690 V	A						2	
DC-13	24 V	A	-	-	-	-	-	6,0	2,5
	48 V	A	-	-		-	-	4,0	1,5
	110 V	A	-	-		-	-	2	0,7
	220 V	A	-	-		-	-	0,7	0,35
Auxiliary contacts reliability								U_e min=17 V, I_e min=5 mA	U_e min=24 V, I_e min=30 mA
Terminal capacity		mm^2	1 x / 2 x (0,5...2,5)						
Tightening torque		Nm	0,8			1...1,5			0,8

Technical data

Type				CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Terminal capacity										
			mm^2	1 x / 2 x (0,5...2,5)						
Tightening torque			Nm	0,8	1...1,5					0,8
Control circuit										
Power consumption of the coil	AC	Closing	VA	20	30					20
		Cos φ			0,8					
		Closed	VA	3,3...5,5	2...3					3,3...5,5
		Cos φ		0,2	0,27					0,2
	DC		W	-	2,6...3,7					-
Switching time	Closing/opening (AC)		ms	9...30 / 5...25	8...20 / 6...13					9...30 / 5...25
	Closing/opening (DC)		ms	-	35...45 / 7...12					-
	Coils rated voltage		V	12-660 VAC	12-660 VAC / 12-440 VDC					12-660 VAC
	Coil operational limits				0,85...1,1					



1 - Mini contactor

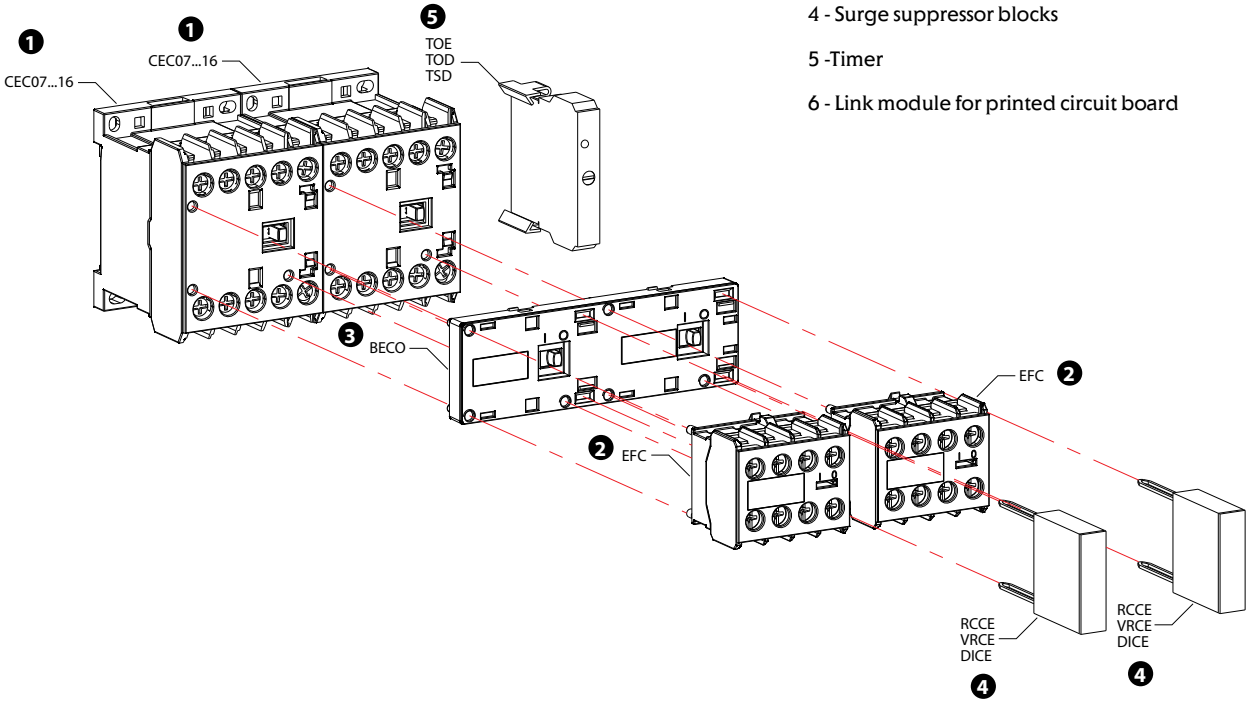
2 - Auxiliary frontal contacts block

3 - Mechanical interlock block

4 - Surge suppressor blocks

5 -Timer

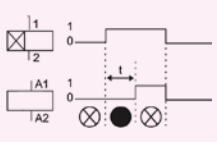
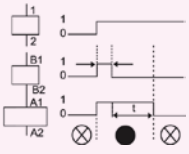
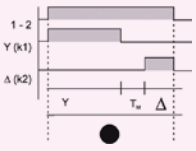
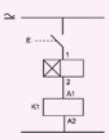
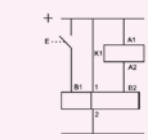
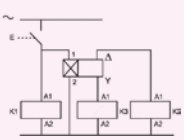
6 - Link module for printed circuit board



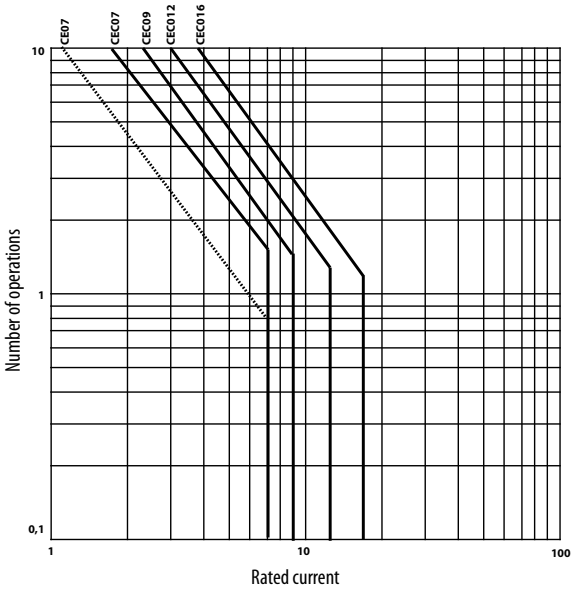
Auxiliary contact block			
Standards			IEC 60947-5-1, IEC 60947-4-1
Rated Insulation voltage Ui	IEC, VDE 0660		1000
Rated operational voltage Ue	IEC, VDE 0660	(V)	690
Conv. thermal current Ith		A	10
Rated operational current (Ie)			
AC-15(IEC 60947-5-1)	Ue ≤ 240V	(A)	10
	380-400V	(A)	6
	415-440V	(A)	6
	500V	(A)	4
	660-690V	(A)	-
UL, CSA 1)			A600
DC-13(IEC 60947-5-1)	24V	(A)	1,5
	60V	(A)	0,5
	110V	(A)	0,4
	220-240V	(A)	0,4
UL, CSA 1)			Q600
Short circuit protection max. fuse gL/gG		(A)	10
Control circuit reliability		(V / mA)	17 / 5
Electrical life span		c. op.	1.000.000
Mechanical life span		c. op.	10.000.000
Nr. of conductors and cross section	Stranded without end sleeve	mm^2	2x (0,5...2,5)
Tightening torque		Nm	0,8...1,5

Electronic timer blocks TOE, TOD, TSD				
Inputs	Rated insulation voltage (U_i)		V	300
	Supply voltage (U_e)	1 - 2 terminals	V	24...240 V AC/DC 50/60 Hz (TOE)
				24...60 V AC/DC 50/60 Hz (TOD)
				100...60 V AC/DC 50/60 Hz (TOD)
				220-240 V AC 50/60 Hz (TSD)
				110-130 V AC (TSD)
				24-28 V AC 50/60 Hz (TSD)
	Command (Uc) (only TOD)	2 - B1 terminals	V	24...60 V AC/DC 50/60 Hz (TOD)
				100...240 V AC/DC 50/60 Hz (TOD)
	Voltage limits			0,85 - 1,1 x U_c -> AC
				0,8 - 1,25 x U_c -> DC
	Consumption		mA	≤ 5
Time adjustment	Min. time for Reset		ms	100
	Min. command time (only TOD)		ms	50
	Setting accuracy (% of the full scale value)		%	+/-5
	Repeat accuracy		%	+/-1
	Changeover time Y - Δ		ms	50

Diagrams

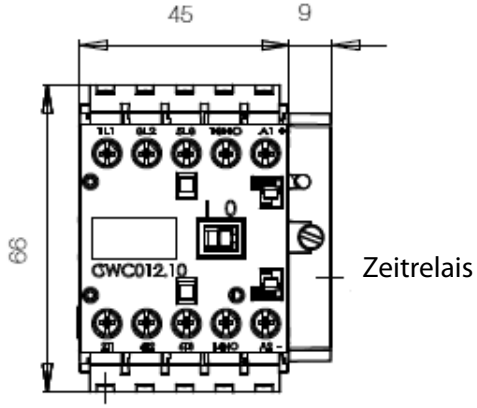
Function	ON Delay TOE		OFF Delay TOD		Star - delta TSD	
Functional diagram						
LED on ●						
LED off ⊗						
Schemes	Terminals		Terminals		Terminals	
	1		(+)1		1	
	2		B1		2	
			(-)2		D	
			B2		Y	

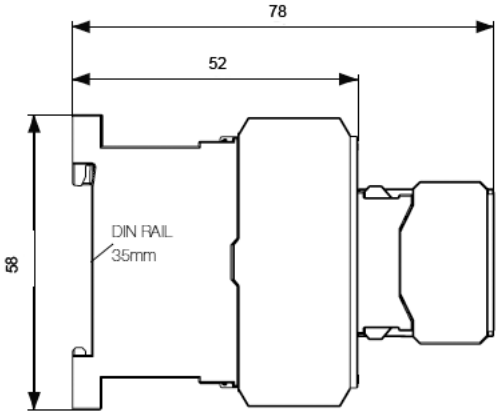
Diagram

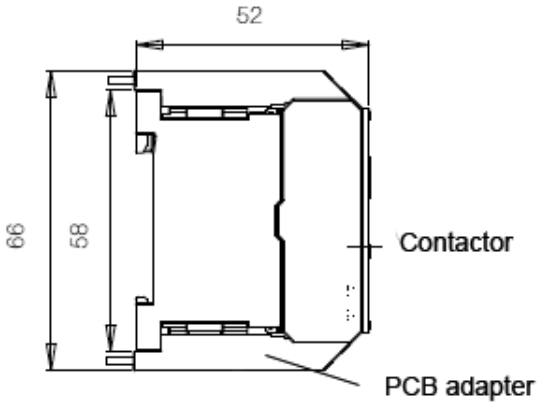


Dimensions

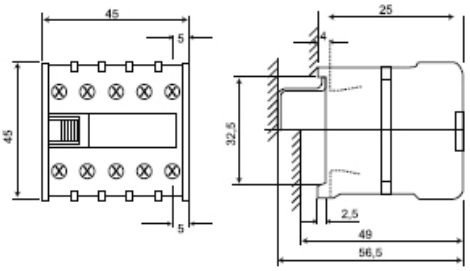
CEC - Dimensions with PCB adapter



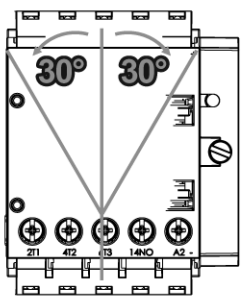


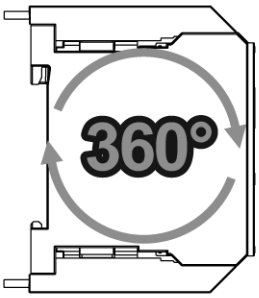


CE07



Mounting





Motor contactor CES

CES contactors

Contact endurance of the main contacts
The characteristic curves show the contact endurance of contactors when switching resistive and inductive three-phases loads (AC-1/AC-3) depending on the breaking current and the rated operational voltage. It is assumed that the control devices operate randomly, i.e. not in synchronism with the phase angle of the supply system.

The rated operational current I_e for AC-4 duty (breaking 6 times the rated operational current) is selected for a contact endurance of approximately 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e/ AC-4 can be increased.

If mixed operation is involved, i.e. normal switching (breaking of rated operational current in AC-3 duty) with intermittend inching (breaking multiples of the rated operational current in AC-4 duty) the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100}\left(\frac{A}{B} - 1\right)}$$

Legend to the equation:
X Contact endurance for mixed operation in operating cycles
A Contact endurance for normal operation (Ia=Ie) in operating cycles
B Contact endurance for inching (Ia= multiple of Ie) in operating cycles
C Percentage of inching operations in total operations

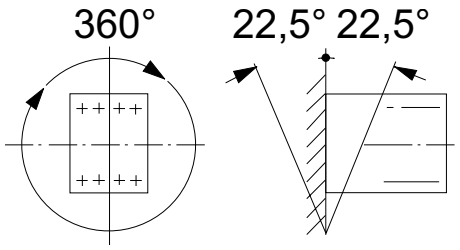
Short-circuit protection of CES 6 to CES 105 contactors without overload relay
Fuses, utilization category gG
or miniature circuit-breaker with C-characteristics

Technical data

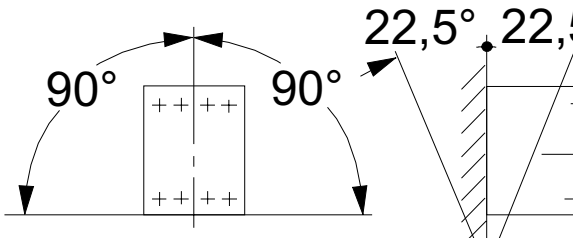
Contactor	Type		CES 6	CES 9	CES 12	CES 18	CES 25	CES 32
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1"[1]	A	32	32	32	32	63	63
	Type of coordination "2"[1]	A	20	20	25	25	40	40
- weld-free[2]	$I_k \geq 100 \times I_e$	A	10	10	10	10	16	16
With miniature circuit breaker	C-characteristic	A	16	16	25	25	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size		0 ... 1					
	Type		CES 6 ... CES 32					
With fuses		A	16					
		A	6, if overload relay auxiliary contacts are in the contactor coil circuit					
with miniature circuit-breaker		A	10					
with C-characteristics		A	3, if overload relay auxiliary contacts are in the contactor coil circuit					
Contactor	**Type**		**CES 40**	**CES 45**	**CES 65**	**CES 75**	**CES 85**	**CES 105**
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1"[1]	A	80	80	160	160	250	250
	Type of coordination "2"[1]	A	63	63	100	100	125	160
- weld-free[2]	$I_k \geq 100 \times I_e$	A	25	25	63	80	125	125
With miniature circuit breaker	C-characteristic	A	--	--	--	--	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size		0 ... 4					
	Type		CES 40 ... CES 105					
With fuses		A	16					
		A	6, if overload relay auxiliary contacts are in the contactor coil circuit					
with miniature circuit-breaker		A	10					
with C-characteristics		A	3, if overload relay auxiliary contacts are in the contactor coil circuit					

[1] In accordance with IEC 60947-4-1:
Type of coordination "1": Destruction of contactor and overload relay is admissible. Contactor and/or overload relay must be replaced if necessary.
Type of coordination "2": No damage can be tolerated on the overload relay, but contact welding on the contactor is permitted if the contacts can easily be separated.
[2] Test conditions according to IEC 60947-4-1.

Mounting position

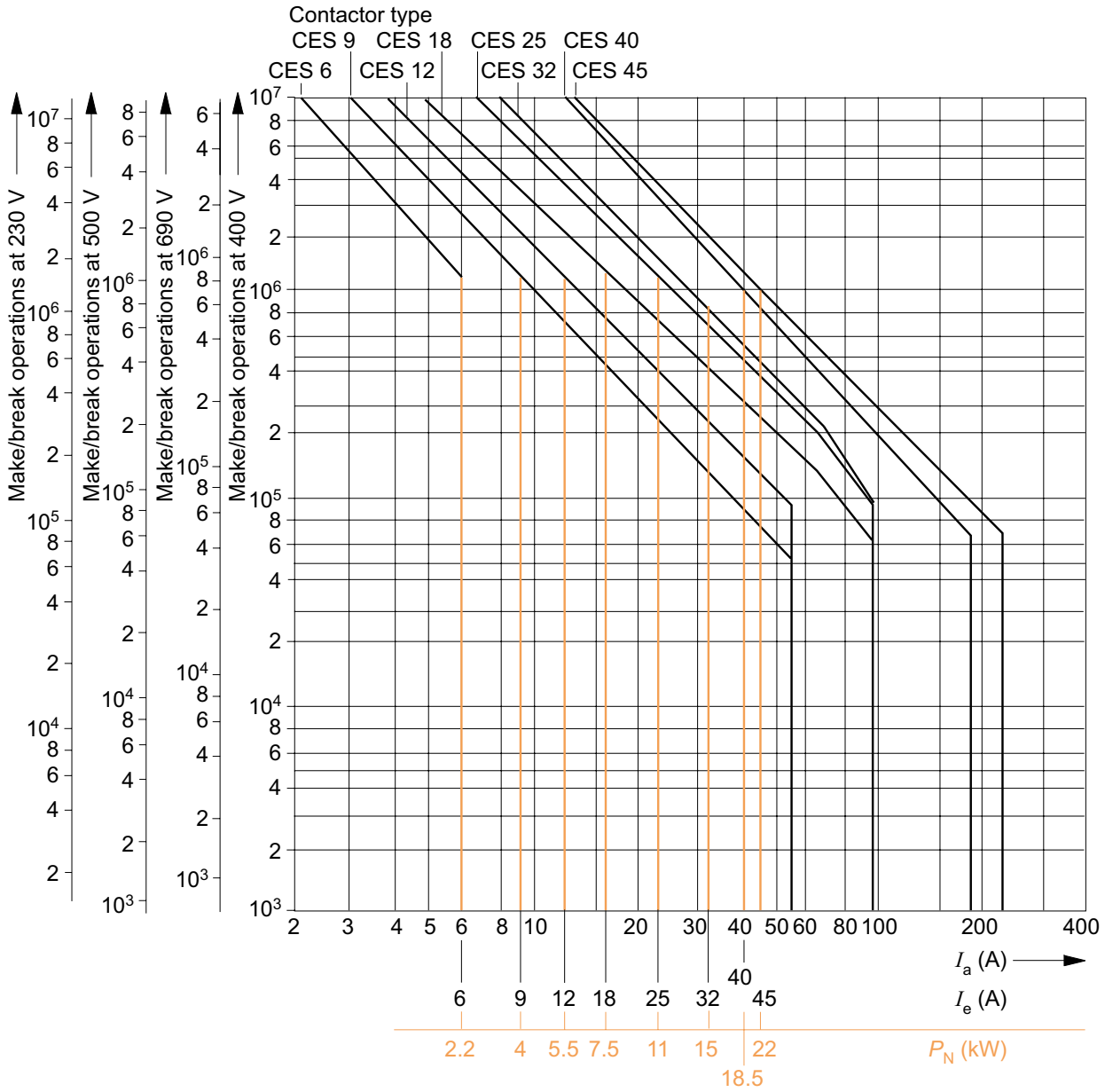


CES 6 to CES 32 (AC operation)



CES 6 to CES 32 (DC operation)
CES 40 to CES 105 (AC operation)

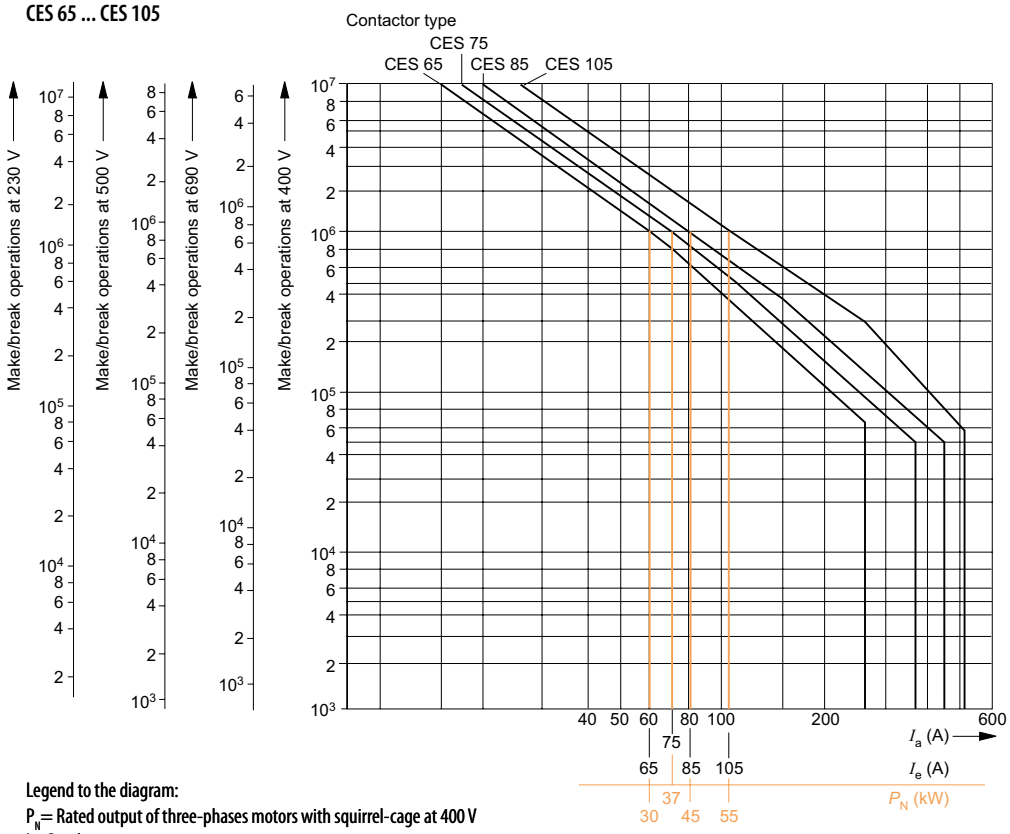
CES 6 ... CES 45



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

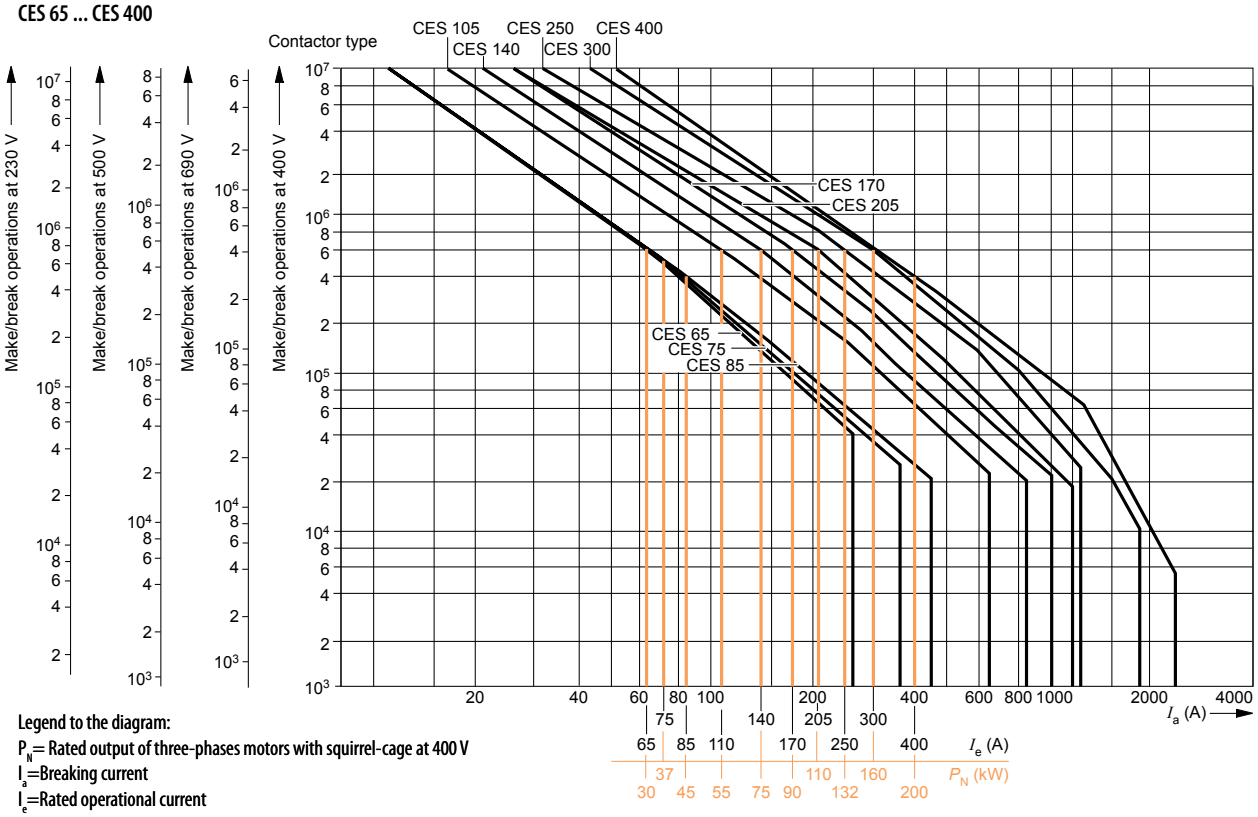
CES contactors

CES 65 ... CES 105



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

CES 65 ... CES 400



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

Technical data

Contactor	Type			CES 6 ... CES 18	CES 25, CES 32
General data					
Mechanical endurance	Basic units		Operating cycles	15 Mio	
	Auxiliary contact blocks			10 Mio	
Rated insulation voltage U_i (pollution degree 3)			V	690	
Rated impulse withstand voltage U_{imp}			kV	8	
Protective separation[1] **between coil and main contacts**			V	≤ 500	≤ 690
Permissible ambient temperature[2]			°C	-25 to +55 in operation, -50 to +80 when stored	
Degree of protection	acc. to IEC 60947-1			IP 20	
Power consumption of the coils				(with cold coil) and 1.0 x U_s	
AC operation			Hz	50/60	
	closing		VA	77/71	
	cos φ			0.81/0.75	
	closed		VA	11/9	
	cos φ			0.28/0.27	
DC operation	closing = closed		W	6.2	
Permissible residual current of the electronics (at 0-Signal)				$\leq 8\ mA \times \frac{220\ V}{U_s}$ AC operation	$\leq 1.25\ mA \times \frac{220\ V}{U_s}$ DC operation
Coil voltage tolerance				0.8 ... 1.1 x U_s	
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time			(Values are applicable with the coil in cold state and at operating temperature)	
AC operation	closing time		ms	8 ... 35	10 ... 35
	opening time		ms	4 ... 18	5 ... 20
DC operation	closing time		ms	20 ... 170	35 ... 180
	opening time		ms	10 ... 25	10 ... 25
Arcing time			ms	10	10
Operating times at 1.0 x U_s					
AC operation	closing time		ms	10 ... 25	10 ... 25
	opening time		ms	5 ... 18	5 ... 20
DC operation	closing time		ms	30 ... 70	40 ... 80
	opening time		ms	12 ... 20	10 ... 20
Shock resistance	Rectangular pulse	AC	g/ms	7.7/5 & 4.4/10	5.5/5 & 3.2/10
		DC	g/ms	9.3/5 & 5.4/10	5.8/5 & 3.4/10
	Sine pulse	AC	g/ms	12/5 & 6.8/10	8.7/5 & 5.1/10
		DC	g/ms	14.7/5 & 8.5/10	9/5 & 5.3/10
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible	**Main conductor:**				
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4	2 x (2.5 ... 6)
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)	2 x (0.5 ... 1); 2 x (1.5 ... 4)
	Pin-end connector (DIN 46 231)		mm^2	1 x (1 ... 2.5)	1 x (1 ... 6)
	solid or stranded		AWG	2 x (18 ... 12)	2 x (14 ... 10)
	Terminal screw			M3.5	M4
	Auxiliary conductor:				
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5)	2 x (0.5 ... 1); 2 x (1 ... 2.4)
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)
	Pin-end connector (DIN 46 231)		mm^2	2 x (1 ... 1.5)	2 x (1 ... 1.5)
	solid or stranded		AWG	2 x (18 ... 12)	2 x (18 ... 12)
Specified tightening torque of the terminal screws	**Main conductor:**			0.8 ... 1.4 Nm (7 ... 12 lb.in)	1 ... 1.5 Nm (8.8 ... 13 lb.in)
	Auxiliary conductor			0.8 ... 1.4 Nm (7 ... 12 lb.in)	0.8 ... 1.4 Nm (7 ... 12 lb.in)
Operating frequency z in operating cycles per hour (o.c./h)				Operation: AC	Operation: DC	Operation: AC	Operation: DC
Contactors without overload relay	No-load operating frequency		1/h	10000	1500	5000	1500
	Rated duty at AC-1		1/h	1500	1500	1500	1500
	at AC-2 and AC-3		1/h	1000	1000	750	750
	at AC-4		1/h	250	250	250	250
Contactor with overload relay (mean value)			1/h	15		15	

[1] Acc. to IEC 60947-1, Annex N.

[2] When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage is 1.1 x U_s, the ambient temperature ≥ 45 °C and the load factor of all relays is 100 %.

Technical data

Contactor	Type			CES 40		CES 45	
General data							
Mechanical endurance	Basic units		Operating cycles	10 Mio			
	Auxiliary contact blocks			10 Mio			
Rated insulation voltage U_i (pollution degree 3)			V	690			
Rated impulse withstand voltage U_{imp}			kV	8			
Protective separation[1] **between coil and main contacts**			V	≤ 415			
Permissible ambient temperature			°C	-25 to +55 in operation, -50 to +80 when stored			
Degree of protection	acc. to IEC 60947-1			IP 00			
Power consumption of the coils				(with cold coil) and 1.0 x U_s			
AC operation			Hz	50/60			
	closing		VA	121/117			
	p.f.			0.79/0.72			
	closed		VA	16.5/13			
	p.f.			0.27/0.28			
Coil voltage tolerance				0.8 ... 1.1 x U_s			
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time						
AC operation[2]	closing time		ms	13 ... 57			
	opening time		ms	5 ... 10			
Arcing time			ms	10			
Operating times at 1.0 x U_s							
AC operation[2]	closing time		ms	13 ... 32			
	opening time		ms	5 ... 10			
Shock resistance	Rectangular pulse	AC	g/ms	5.7/5 & 3.3/10			
		DC	g/ms	5.7/5 & 3.3/10			
	Sine pulse	AC	g/ms	9/5 & 5.2/10			
		DC	g/ms	9/5 & 5.2/10			
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	**Main conductor:**			Front terminal connected 	Back terminal connected 	Both terminal connected: Front terminal 	Back terminal
	solid		mm²	1 ... 16	1 ... 16	1 ... 16	1 ... 16
	finely stranded without end sleeve		mm²	2.5 ... 16	1.5 ... 16	2.5 ... 10	1.5 ... 16
	finely stranded with end sleeve		mm²	1 ... 16	1 ... 16	1 ... 10	1 ... 16
	standed		mm²	2.5 ... 25	1.5 ... 25	2.5 ... 10	1.5 ... 25
	Pin-end connector (DIN 46 231)		mm²	1 ... 6	1 ... 6	1 ... 6	1 ... 6
	solid or stranded		AWG	14 ... 3	16 ... 3	14 ... 6	16 ... 3
	Terminal screw			M5	M5	M5	M5
	Auxiliary conductor:						
	solid		mm²	2 x (0.5 ... 1); 2 x (1 ... 2.5)			
	finely stranded with end sleeve		mm²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)			
	Pin-end connector (DIN 46 231)		mm²	2 x (1 ... 1.5)			
	solid or stranded		AWG	2 x (18 ... 12)			
Specified tightening torque of the terminal screws	**Main conductor:**			2.5 ... 3.0 Nm (22 ... 26.5 lb.in)			
	Auxiliary conductor			0.8 ... 1.4 Nm (7 ... 12 lb.in)			
Operating frequency z in operating cycles per hour (o.c./h)				Operation:		Operation:	
				AC	DC	AC	DC
Contactors without overload relay	No-load operating frequency		1/h	5000	on request	5000	on request
	Rated duty at AC-1		1/h	1200	1200	1200	1200
	at AC-2		1/h	600	600	600	600
	at AC-3		1/h	600	600	600	600
	at AC-4		1/h	250	250	200	600
Contactor with overload relay (mean value)			1/h	15		15	

[1] Acc. to IEC 60947-4-1, Annex N.

[2] The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data

Contactor	Type			CES 65	CES 75	CES 85	CES 105
General data							
Mechanical endurance	Operating cycles			10 million (AC operation)			
Rated insulation voltage U_i (pollution degree 3)			V	1000			
Rated impulse withstand voltage U_{imp}			kV	8			
Protective separation[1] **between coil and main contacts**			V	≤ 500		≤ 690	
Permissible ambient temperature			°C	-25 to +55 in operation, -50 to +80 when stored			
Degree of protection	acc. to IEC 60947-1			IP 00/oper type, operating mechanism IP40			
Power consumption of the coils				(with cold coil) and 1.0 x U_s			
AC operation			Hz	50/60			
	closing		VA	225/192		398/345	
	p.f.			0.6/0.54		0.5/0.4	
	closed		VA	24/16		46/29	
	p.f.			0.29/0.29		0.23/0.24	
Coil voltage tolerance				0.8 ... 1.1 x U_s			
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time						
AC operation[2]	closing time		ms	15 ... 40		20 ... 50	
	opening time		ms	5 ... 25		5 ... 30	
Arcing time			ms	10 ... 15			
Operating times at 1.0 x U_s							
AC operation[2]	closing time		ms	17 ... 30		22 ... 35	
	opening time		ms	5 ... 25		5 ... 30	
Shock resistance	Rectangular pulse	AC	g/ms	11.2/5 & 6/10		8.4/5 & 4.8/10	
		DC	g/ms	10.7/5 & 6.2/10 (14.5 & 7.7/10)[1]		8.3/5 & 4.75/10	
	Sine pulse	AC	g/ms	17.6/5 & 10.3/10		13.2/5 & 7.5/10	
		DC	g/ms	16.8/5 & 9.7/10 (22/5 & 12/10)[1]		13/5 & 7.4/10	
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	**Main conductor:** - with box terminal			Front terminal connected 	Back terminal connected 	Both terminal connected: Front terminal  Back terminal	
	solid		mm^2	6 ... 16	1 ... 16	1 ... 16	1 ... 16
	finely stranded without end sleeve		mm^2	10 ... 35	1.5 ... 16	1.5 ... 16	1.5 ... 16
	finely stranded with end sleeve		mm^2	6 ... 35	1 ... 16	1 ... 16	1 ... 16
	standed		mm^2	16 ... 50	1.5 ... 25	1.5 ... 25	1.5 ... 25
	solid or stranded		mm^2	10 ... 1/0	16 ... 3	16 ... 3	16 ... 3
	Terminal screw			M6			
	Tightening torque - without box terminal			4 ... 6 Nm (36 ... 52 lb. in)			
	finely stranded with cable lug		mm^2	10 ... 35[2]			
	standed with cable lug		mm^2	10 ... 50[2]			
	solid or stranded		AWG	7 ... 1/0			
	Terminal bar (max. width)		mm	12			
	Terminal screw			M6 x 20			
	Tightening torque			4 ... 6 Nm (36 ... 52 lb. in)			
	Auxiliary conductor:						
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4			
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)			
	Pin-end connector (DIN 46 231)		mm^2	2 x (1 ... 1.5)			
	solid or stranded		AWG	2 x (18 ... 12)			
	Tightening torque		mm^2	0.8 ... 1.4 Nm (7 ... 12 lb. in)			

[1] In accordance with IEC 60947-1, Annex N.

[2] The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data

Contactors			Type	CES 140	CES 170	CES 205	CES 250	CES 300	CES 400
Rated power AC-3, 400V			KW	75	90	110	132	160	200
Rated operational current I_e	40° C AC-1		A	160	210	220	300	320	500
at 400V,	AC-3		A	140	170	205	250	300	400
at 400V,	AC-4		A	68	75	96	110	125	150
Conventional thermal current Ith	400V, +40° C		A	160	210	220	300	300	400
Ambient Temperature	Operation		°C	-25 ... +55					
	Storage		°C	-25 ... +70					
Humidity				+40°C no more than 50%, +25°C no more than 90%					
Altitude without derating			m	≤2000					
Mechanical Life			mil. cycles	4	4	4	4	4	4
Electrical Life			mil. cycles	0,6	0,6	0,6	0,6	0,6	0,4
Max. Operating Frequency without overload relay	at AC- 3		cycles/hr.	1200	600	600	600	600	600
	at AC- 4		cycles/hr.						
Rated insulation voltage U_i			V	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp}			kV	8	8	8	8	8	8
Power consumption of the coils	AC operation	Closing	VA	550	910	910	1430	1430	2450
		Cos φ		0,45	0,38	0,38	0,34	0,34	0,21
		Closed	VA	39	58	58	84	84	115
		Cos φ		0,24	0,26	0,26	0,24	0,24	0,33
Coil type				AC 50/60Hz 24V, 110V, 220V, 380V					
Operating range o f coil	at Us AC		x Us	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1
AC operation at 1xU_s	Opening		ms	8…30	8…30	8…30	8…30	8…30	8…20
	Closing		ms	20…50	20…50	20…50	20…50	20…50	17…65
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible	Main conductor:								
	finely stranded with cable lug		mm^2	35 ... 95		50 ... 240			
	stranded with cable lug		mm^2	50 ... 120		70 ... 240			
	solid or stranded		AWG	1/0 ... 250 MCM		2/0 ... 500 MCM			
	Terminal bar (max. with)		mm	20 x 3		25 x 3			
	Terminal screw			M8 x 25		M10 x 30			
	Tightening torque		Nm	10 ... 14		14 ... 24			
Degrees of Protection				IP00					
Short circuit protection without overload relay	Coordination type 2		A	225	315	315	355	450	460
Auxiliary switch block pre-mounted in side			1NO+1NC	√	√	√	√	√	√
			2NO+2NC	√	√	√	√	√	√
			4NO+4NC	√	√	√	√	√	√
Auxiliary switch block in addition - Top mounted			NO/NC	x					
Auxiliary switch block	Rated insulation voltage Ui		V	690					
	Rated impulse withstand voltage Uimp		kV	6					
	Rated current capacity			AC-15: 360VA; DC-13 33W					
	Conventional thermal current Ith		A	10					
Dimensions (AC - Operation) H / B; Width			mm	≤120 mm	≤ 135mm		≤ 145mm		≤ 160mm
Mounting				Screw mounted, Vertical +/- 22.5°C					
Main circuit Terminal screw type				Busbar - Hex head					
Certificates & Standards				CE, RoHS					

Technical data

Contactor	Type			CES 6	CES 9	CES 12	CES 18	CES 25	CES 32
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	90	90	96	96	176	176
Power loss per conducting path	at I_e/AC-3		W	0.6	0.6	1.1	1.1	1.6	1.6
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	25	25	25	25	38	38
	at 55 °C to	690 V	A	20	20	20	20	32	32
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	4	4	4	4	10	10
	at 55 °C		mm^2	4	4	4	4	10	10
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	400 V	A	6	9	12	18	25	32
		500 V	A	6	9	12	16	17	32
		690 V	A	6	6.6	8.8	12.2	12.2	27
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	1.5	2.4	3.3	4	5.5	8.5
		400 V	kW	2.2	4	5.5	7.5	11	15
		500 V	kW	3	5.5	7.5	9	11	21
		690 V	kW	4	5.5	7.5	11	11	23
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	400 V	A	3.1	3.3	4.3	7.7	8.5	15.6
		690 V	A	3.1	3.3	4.3	7.7	8.5	15.6
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	0.8	0.85	1.15	2	2.2	4.3
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	1.15	1.4	1.9	3.5	4	7.5
		690 V	kW	1.9	2.4	3.3	6	6.6	13
Contactor	**Type**			**CES 40**	**CES 45**	**CES 65**	**CES 75**	**CES 85**	**CES 105**
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	400	400	360	500	800	800
Power loss per conducting path	at I_e/AC-3		W	2.0	2.5	3.5	6	7.5	10
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	65	65	90	100	105	105
	at 55 °C to	690 V	A	55	55	80	90	100	105
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	16	16	35	35	50	50
	at 55 °C		mm^2	16	16	25	35	35	35
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	400 V	A	40	45	65	75	85	105
		500 V	A	32	38	40	63	75	85
		690 V	A	27	27	40	63	75	75
		1000 V	A	--	--	6	6	30	30
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	11	15	18.5	22	26	37
		400 V	kW	18.5	22	30	37	45	55
		500 V	kW	21	25	30	41	50	59
		690 V	kW	23	23	39	56	67	67
		1000 V	A	--	--	--	--	39	39
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	400 V	A	18.5	24	28	34	42	54
		690 V	A	18.5	24	28	34	42	54
		1000 V	A	--	--	--	23	23	34
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	5.2	7.3	8.5	10.3	12	16.3
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	9	12.6	14.7	17.9	22	28.4
		690 V	kW	15.5	20.8	24.3	29.5	38	49
		1000 V	kW	--	--	--	30	30	45
Contactor	**Type**			**CES 140**	**CES 170**	**CES 205**	**CES 250**	**CES 300**	**CES 400**
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	1140	1360	1640	2500	2500	3400
Power loss per conducting path	at I_e/AC-3		W	14	14	20	16	23	40
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	170	230	240	325	325	425
	at 55 °C to	690 V	A	160	210	220	300	300	400
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	70	120	120	185	185	2x150
	at 55 °C		mm^2	70	95	120	185	185	240
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	500 V	A	140	170	205	250	300	400
		690 V	A	110	170	170	250	250	400
		1000 V	A	42	68	68	95	95	180
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	45	56	66	82	96	131
		400 V	kW	75	95	115	142	168	232
		500 V	kW	98	118	145	178	210	289
		690 V	kW	105	163	163	245	245	397
		1000 V	A	65	90	90	132	132	250
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	690 V	A	68	75	96	110	125	150
		1000 V	A	34	42	42	57	57	80
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	21	23	30	35	40	49
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	36	40	52	61	69	85
		690 V	kW	63	69	90	105	119	147
		1000 V	kW	45	55	55	75	75	110

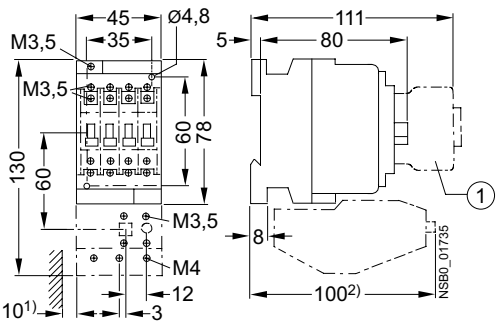
[1] Acc. to IEC 60947-4-1.

[2] Industrial furnaces and electric heaters with resistance heating for example (higher current during heating-up allowed for).

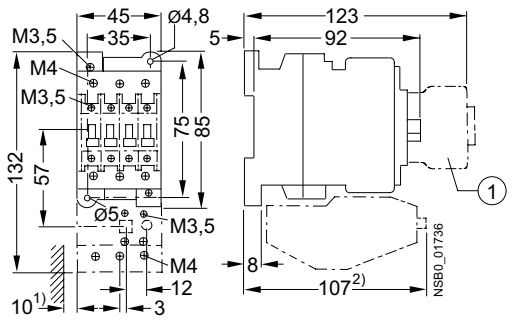
Dimensional drawings

AC operation

CES 6 ... CES 18



CES 25 ... CES 32



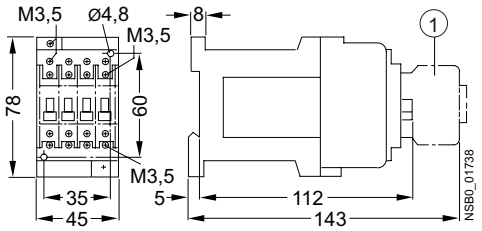
(1) Auxiliary switch block

1) Minimum clearance from the earthed parts.

2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

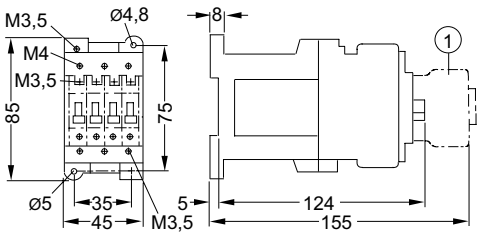
DC operation

CES 6 ... CES 18



(1) Auxiliary switch block

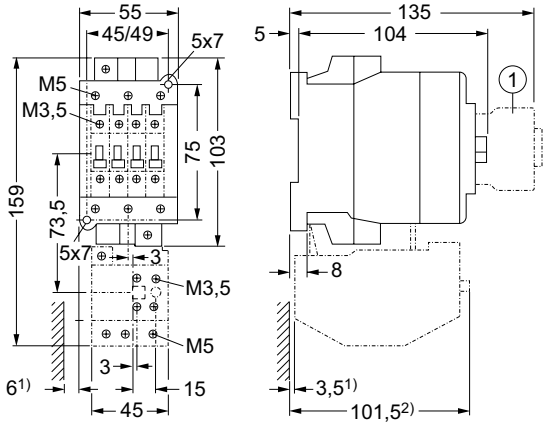
CES 25 ... CES 32



(1) Auxiliary switch block

- Clearance when mounted in rows:
  When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage 1.1 x U_s the ambient temperature ≥ 45 °C and the load factor of all relays is 100 %.

CES 40 ... CES 45

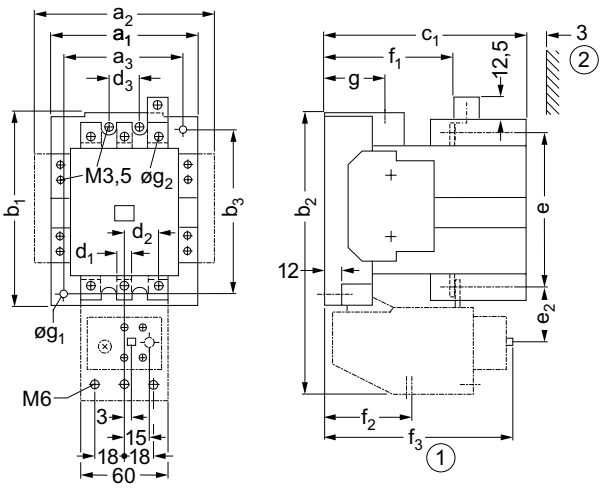


(1) Auxiliary switch block

1) Minimum clearance from the earthed parts.

2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

CES 65 ... CES 140

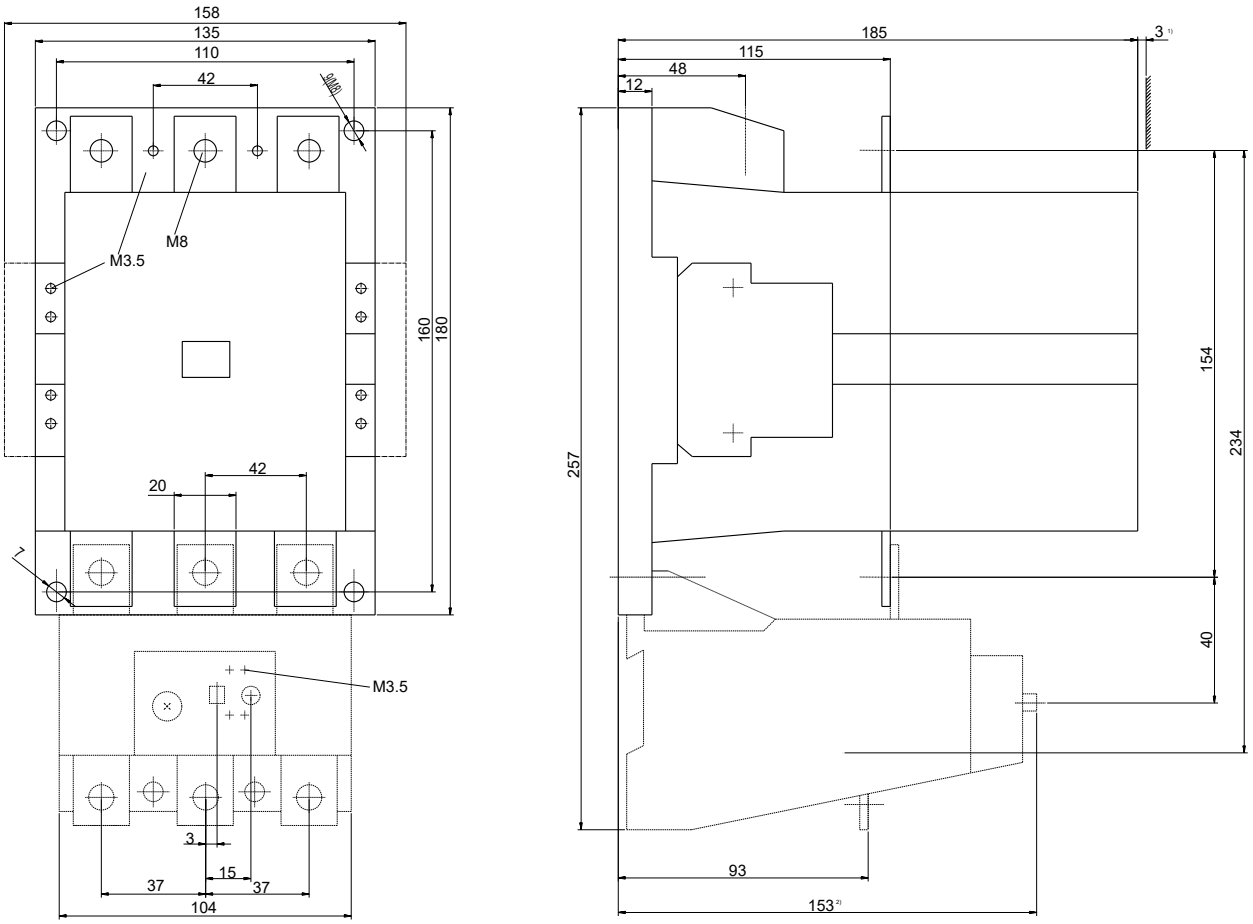


(1) Dimension for the square OFF-button (stroke 3 mm) Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

(2) Minimum clearance from insulated components 3 mm Minimum clearance from earthed components 10 mm

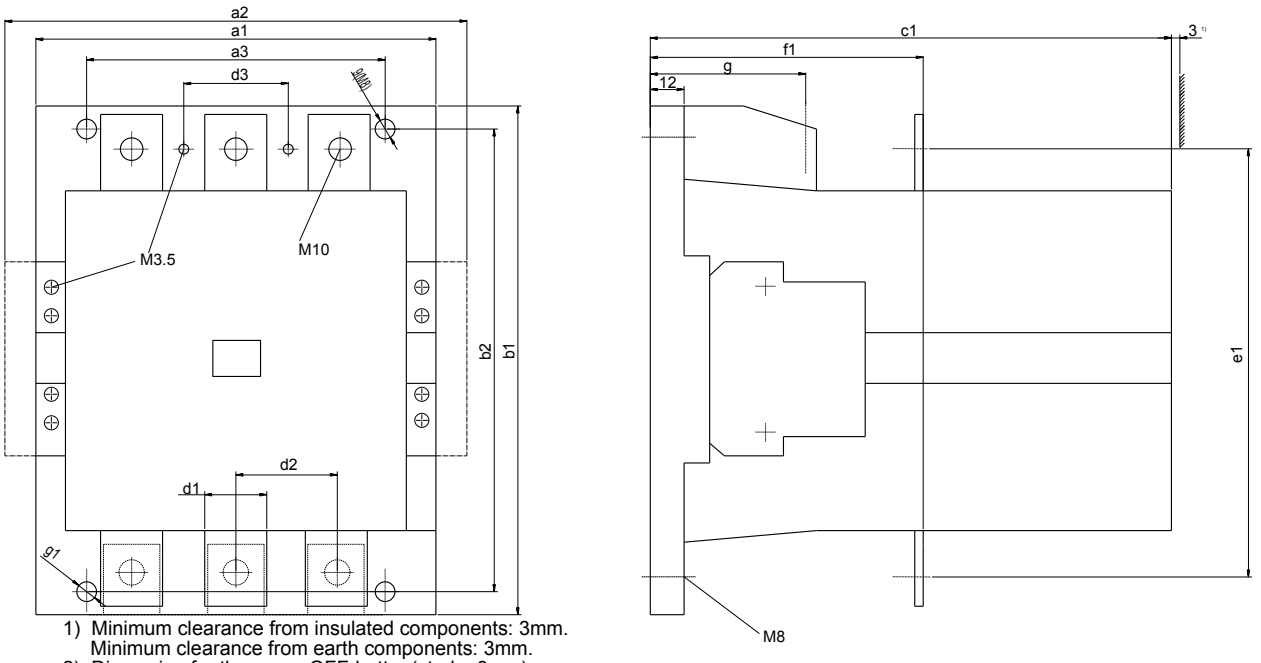
	a1	a2	a3	b1	b2	b3	c1	d1	d2	d3	e	e2	f1	f2	f3	g1	g2
CES 65 CES 75	90	113	70	117	175	100	123	8	26.5	25	94	80	63	122	28	4.8	6.1 (M6)
CES 85	100	123	80	133	194	110	140	8	26.5	25	107	89	63	122	39	5.5	6.1 (M6)
CES 105	100	123	80	133	194	110	140	10.5	26.5	25	116	89	63	122	39	5.5	6.1 (M6)
CES 140	120	143	100	150	232	130	150	20	42	37	139	40.5	93	80	146	6.3	9 (M)

CES 170 ... CES 205



1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

CES 250 ... CES 400



1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

	a1	a2	a3	b1	b2	c1	d1	d2	d3	(c1)[1]	e1	f1	g	g1
CES 250 - CES 300	145	168	120	200	180	198	25	48	48	198	168	132	58	9
CES 400	160	183	130	200	180	222	25	48	48	222	178	150	65	9

Only the same mechanical size contactors can be connected with mechanical interlock!		
	Mechanical interlock offset setting	
	Q1, Q2	Y (mm)
CES-MIL 65-300	CES 65...75	0
	CES 85...105	8
	CES 140	8
	CES 170...205	16
CES -MIL 400	CES400	-

Y (mm) mechanical interlock offset setting

Auxiliary contacts for CES contactors Technical Data

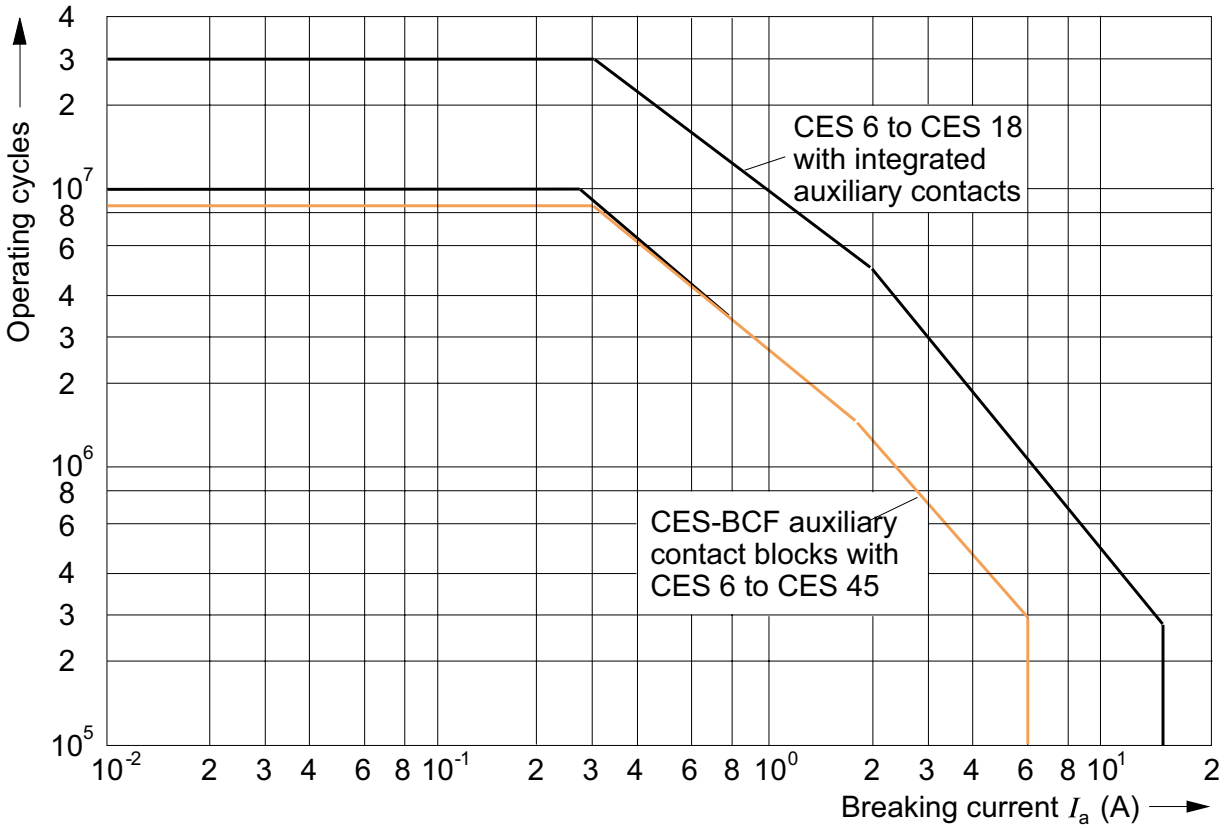
Type			CES 6 ... CES 32[1]	CES 6 ... CES 18[2]	CES 40, CES 45[1]	CES 65 ... CES 400
Rated insulation voltage U_i (pollution degree 3)		V	690	690	690	1000
Conventional free-air thermal current I_{th} = rated operational current I_e		A	10	10	10	10
AC duty **Rated operational current** I_e / AC-15/AC-14 at rated operational voltage U_e	24 V	A	6	10	10	10
	110 V	A	6	10	10	10
	125 V	A	6	10	10	10
	220 V	A	6	10	6	6
	230 V	A	5,6	9,6	5,6	5,6
	380 V	A	4	6	4	4
	400 V	A	3,8	5,5	3,6	3,6
	500 V	A	2,5	4	2,5	2,5
	660 V	A	2	2	2,5	2,5
	690 V	A	1,8	1,8	2,3	2,3
DC duty **Rated operational current I_e/DC-12** at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	10	10	--	--
	110 V	A	5,5	2,1	--	--
	125 V	A	--	--	--	--
	220 V	A	1,2	0,8	--	--
	440 V	A	0,28	0,6	--	--
	600 V	A	0,14	0,6	--	--
Rated operational current I_e/DC-13 at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	4,6	5	--	--
	110 V	A	0,8	0,9	--	--
	125 V	A	--	--	--	--
	220 V	A	0,3	0,45	--	--
	440 V	A	0,11	0,25	--	--
	600 V	A	0,08	0,2	--	--

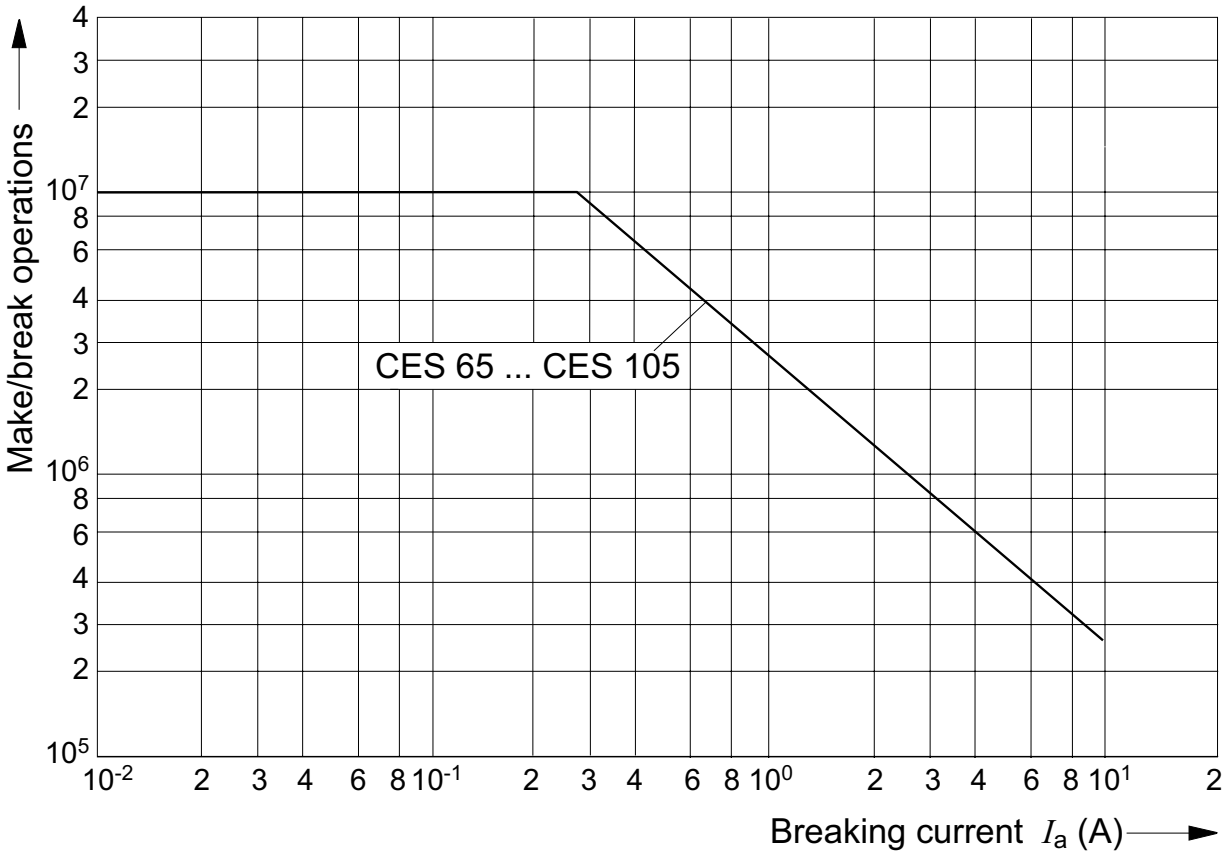
[1] Mountable auxiliary contact blocks.

[2] Integrated auxiliary contacts.

	AC operation for 0.8…1.1Us		DC operation for 0.85…1.1Us		Arcing time
	opening delay	closing delay	opening delay	closing delay	
CES 6	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 9	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 12	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 18	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 25	5 … 25	10 … 35	10 … 25	35 … 180	10
CES 32	5 … 25	10 … 35	10 … 25	35 … 180	10
CES 40	5 … 25	13 … 57	13 … 17	54 … 182	10
CES 45	5 … 25	13 … 57	13 … 17	54 … 182	10
CES 65	5 … 25	15 … 40	100 … 120	15 … 88	10 … 15
CES 75	5 … 25	15 … 40	100 … 120	15 … 88	10 … 15
CES 85	5 … 30	20 … 50	90 … 140	20 … 90	10 … 15
CES 105	5 … 30	20 … 50	90 … 140	20 … 90	10 … 15
CES 140	8 … 30	20 … 50	-	-	10 … 15
CES 170	8 … 30	20 … 50	-	-	10 … 15
CES 205	8 … 30	20 … 50	-	-	10 … 15
CES 250	8 … 30	20 … 50	-	-	10 … 15
CES 300	8 … 30	20 … 50	-	-	10 … 15
CES 400	8 … 20	17 … 65	-	-	10 … 15

Contact endurance of the auxiliary contacts





Thermal overload relays, CLASS 10A

According to IEC 60947-4-1

Type		CES-RT0	CES-RT1	CES-RT2	CES-RT3
General data					
Trip class		CLASS 10A (2s < t_A ≤ 10s at 7.2 x I_e from cold state)			
Phase failure sensitivity by differential phase shift		✓	✓	✓	✓
Changeover to automatic reset		✓	✓	✓	✓
RESET button with trip-free feature		✓	✓	✓	✓
Temperature compensation		✓	✓	✓	✓
Switch position indicator		✓	✓	✓	✓
Test button actuates the NO and NC contacts		✓	✓	✓	✓
Terminal for contactor coil		✓	✓	✓	✗ [1)]
Permissible ambient temperature	°C	-25 ... +55			
Degree of protection acc. to IEC 60947-1		IP00/open or IP20			
Shock resistance	g/ms	8/10			
Main circuit					
Rated insulation voltage U_i (Pollution degree 3)	AC/DC V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Type of current, frequency range		DC; AC ≤ 400 Hz			
Conductor cross-sections					
Terminal screw		M4	M5	M4	M5
solid or stranded	mm^2	2.5 ... 6	1.5 ... 25	1.5 ... 25	2.5 ... 35
finely stranded with end sleeve	mm^2	1.5 ... 4	1 ... 16	1 ... 16	1.5 ... 25
Flat bars	mm	--	--	--	--
Tightening torque	Nm	1 ... 1.5	2.5 ... 3	2.5 ... 3	2.5 ... 3
	lb.in	9 ... 13	22 ... 26.5	22 ... 26.5	22 ... 26.5
Power loss per conduction path (max.)					
at lowest value	W (VA)	0.9	1.2	1.2	2.6
at highest value of the setting range	W (VA)	2.25	3	3	4
Auxiliary circuit					
Auxiliary contacts		1 NO + 1 NC			
Conductor cross-sections					
Terminal screw		M3.5			
solid or stranded	mm^2	2 x (0.5 ... 1)/2 x (1 ... 2.5)			
finely stranded with end sleeve	mm^2	2 x (0.5 ... 1)/2 x (0.75 ... 2.5)			
Tightening torque	Nm	0.8 ... 1.4			
	lb.in	7 ... 12			
Rated insulation voltage Ui (pollution degree 3)		Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)	Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)
	V	400	690	400	690
Rated impulse withstand voltage U_{imp}	kV	6			
Switching capacity		AC-15:			
Rated operational voltage U_e	V	24; 60; 125; 230; 400; 500; 690;			
Rated operational current I_e	A	2; 1.5; 1.25; 1.15; 1.1; 1; 0.8			
Conventional thermal current I_{th}	A	6			
Short-circuit protection		Fuses, utilization category gG 6A or miniature circuit-breaker with C-characteristics 3A			

According to IEC 60947-4-1

Main circuit			CES-RT4							
Current seting [Suggested]		**A**	**90-120**	**110-135**	**120-150**	**135-160**	**150-180**	**170-205**	**160-250**	**250-400**
Tripping class		Class	10A							
Protection functions	Tripping due to overload		✓							
	Tripping due to phase unbalance		✓							
	Tripping due to phase failure		✓							
	Phase failure sensitivity by differential phase shift		✓ (according to IEC60947-4-1)							
	Temperature compensation		✓							
Functions	Test button		✓							
	Reset button		Manual and Automatic RESET							
	Switch position indicator		✓							
	Terminal A2 for contactor coil connection		×							
Functions	Operation	°C	-25 ... +55							
	Storage/transport	°C	-25 ... +70							
	Temperature compensation	°C	≤ 70							
Altitude without derating		m	≤2000							
Rated insulation voltage Ui (polution degree 3)		V	1000							
Rated impulse withstand voltage Uimp		kV	6							
Type of current, frequency range			DC, AC ≤ 400Hz							
Degree of protection			IP00							
Touch protection			Finger-safe (with accessories)							
Resistance to extreme climates - air humidity		%	< 90%, 25° C; < 50%, 40° C							
Mounting			stand-alone mounting (the terminal busbar should fit contactor terminal)							
Terminals	Main current terminals		Busbar - Hex head							
	Auxiliary contact terminal		Remain as existing							
Max. wire diameter size	Single wire	mm^2	50 ... 120						≤200 A: 185, >200 :240	
	Stranded wire	mm^2								
	finely stranded with end sleeve	mm^2	25 ... 95						- - - -	
	Terminal size	[mm x mm]	20 x 3						20 x 3 / 2 x 30 x 5	
Auxiliary circuit										
Number of NO contacts			1	1	1	1	1	1	1	1
Number of NC contacts			1	1	1	1	1	1	1	1
Rated insulation voltage Ui (polution degree 3)		V	≥400							
Rated impulse withstand voltage Uimp		kV	6							
Conventional thermal current Ith		A	6							
Rated operational current Ie AC-15		A	Ue=220V, Ie=1.15A;Ue=380V, Ie=1.1A							
Dimensions H / B / T ; Width		mm			≤ 104mm		≤ 104mm		≤ 150mm	
Certificates & Standards			CE, RoHS							

Thermal overload relays, CLASS 10A

Short circuit protection with fuses for motor feeders with short-circuit currents up to 50 kA at 690V, 50/60 Hz[1)]
Permissible short-circuit fuses for motor starters consisting of overload relay and contactor, contactor assembly

Technical data according to IEC 60947-4-1

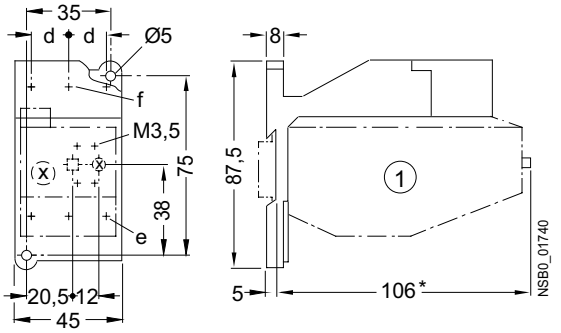
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination[2)]		Type of coordination[2)]	Type of coordination[2)]	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT0					
0.1 ... 0.16	35	0.5 slow[3)]	--	25	--
0.16 ... 0.25	35	1[3)]	--	25	
0.25 ... 0.4	35	1.6[3)]	--	25	
0.4 ... 0.63	35	2	--	25	2
0.63 ... 1	35	4	--	25	4
1 ... 1.6	35	6	--	25	6
1.6 ... 2.5	35	6	--	25	10
2.5 ... 4	35	10	--	25	10
4 ... 6.3	35	16	--	25	16
6.3 ... 10	35	25	--	25	20
8 ... 12.5	35	25	--	25	20
12.5 ... 18	35	25	--	25	25
CES-RT1					
6.3 ... 10	63	25		63	25
10 ... 16	63	35	20	63	35
16 ... 25	63	50	40	63	50
25 ... 32	63	50	50	63	50
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination[2)]		Type of coordination[2)]	Type of coordination[2)]	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT2					
16 ... 25	80	50		100	10
25 ... 36	80	80		100	10
36... 45	80	80	--	100	16
CES-RT3					
40 ... 57	160	125	63	160	100
57 ... 70	160	125	63	160	100
70 ... 88	250	160	100	160	125
88 ... 105	250	200	125	160	200
CES-RT4					
90 ... 120	315	224	125	315	224
110 ... 135	315	224	160	315	224
120 ... 150	315	224	160	315	224
135 ... 160	355	224	160	355	224
150 ... 180	355	224	200	355	224
160 ... 250	500	400	250	500	400
250 ... 400	800	500	400	800	500

[1)] Voltage tolerance +5 %.
[2)] Coordination of short-circuit equipment according to IEC 60947-4-1:
Type of coordination "1":
The contactor or starter must not endanger persons or the installation in the event of a short-circuit.
They do not need to be suitable for further operation without repair and the renewal of parts.
Type of coordination "2":
The contactor or starter must not endanger persons or the installation and must be suitable for further use.
There is a danger of contact welding.
[3)] D-fuse links $U_N = 500$ V

Thermal overload relays, CLASS 10A

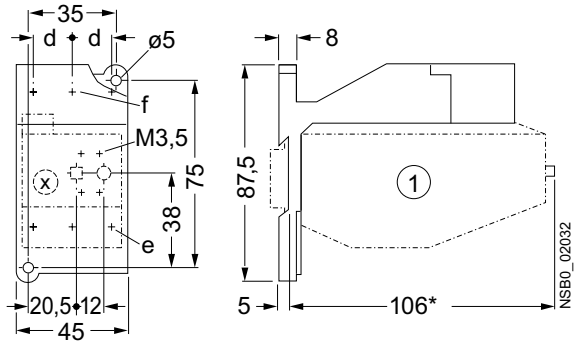
Dimensional drawings

CES-RT0, CES-RT1, with stand-alone adapter



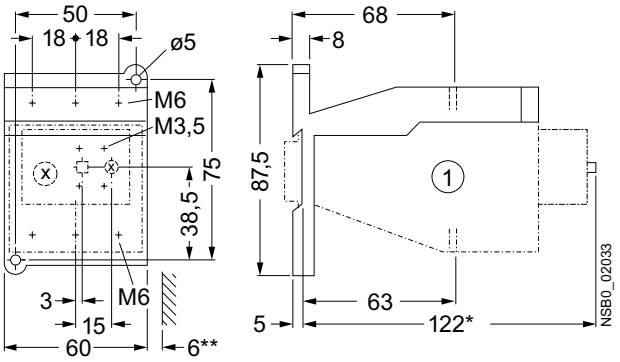
	d	e	f
CES-RT0 & CES-AD-RT0	10	M4	M3.5
CES-RT1 & CES-AD-RT1	14.3	M5	M4

CES-RT2 with CES-AD-RT2 stand-alone adapter

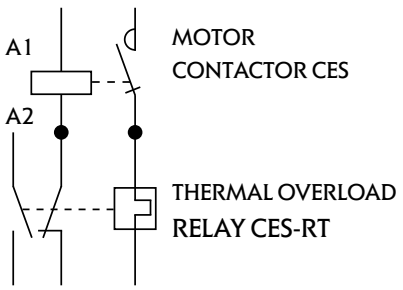


	d	e	f
CES-RT2 & CES-AD-RT2	18.5	M5	M5

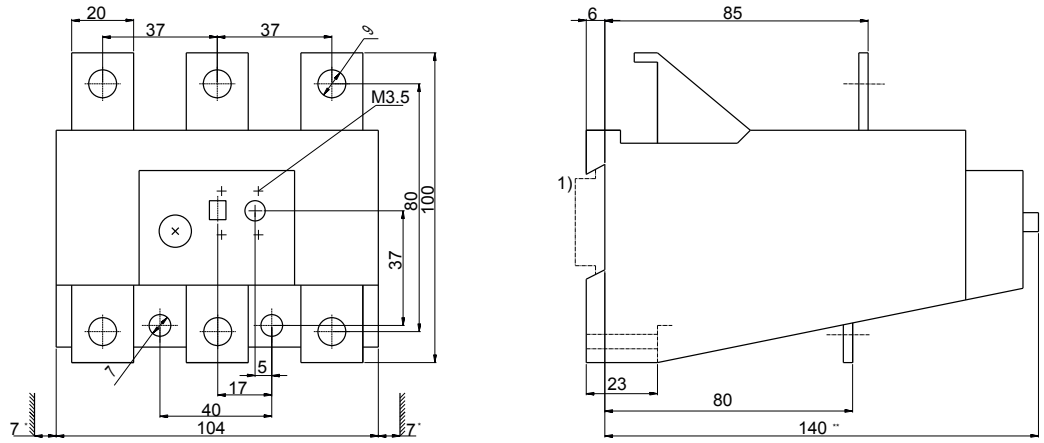
CES-RT3 with CES-AD-RT3 stand-alone adapter



APPLICATION NOTE:



CES-RT4 120, 135, 150

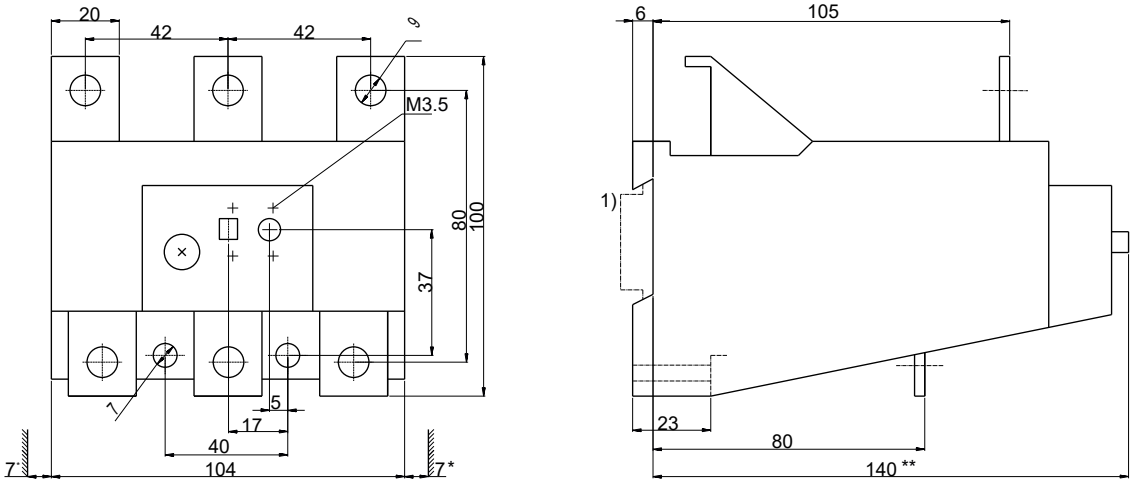


* Dimension for the ground engaging component

** Dimension for the suqre OFF-button(storke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

1) For 35mm standard (DIN) mounting rail

CES-RT4 160, 180

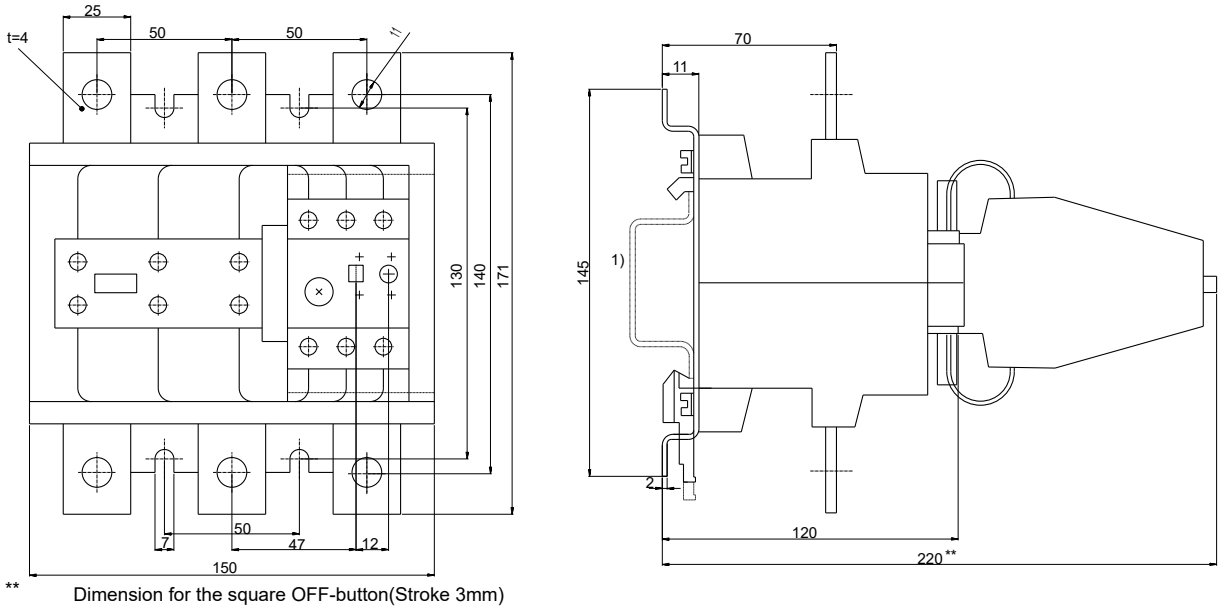


* Dimension for the ground engaging component

** Dimension for the suqre OFF-button(storke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

1) For 35mm standard (DIN) mounting rail

CES-RT4 250, 400



** Dimension for the square OFF-button(Stroke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

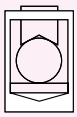
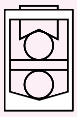
1) For 35mm standard (DIN) mounting rail

Motor contactor CEM

Contactors CEM up to 132 kW Technical Data

type		CEM 9	CEM 12	CEM 18	CEM 25	CEM 32	CEM 40	CEM 50	CEM 65	CEM 80	CEM 95	CEM 105	CEM 112E	CEM 150E	CEM 180E	CEM 250E	CEM 300E
Standards		IEC/EN 60 947, DIN VDE 0660															
Rated insulation voltage Ui (V) to IEC/EN 60 947, DIN VDE 0660		1000 V															
Rated impulse withstand voltage Uimp		6 kV						8 kV									
Rated operational frequency		25 - 400 Hz															
Degree of protection		Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)															
Main circuits		IP20				IP10							IP00				
Control circuits and auxiliary contacts		IP20															
Ambient temperature Operating temperature		-25 ... +55 °C															
Storage temperature		-55 ... +80 °C															
Altitude																	
Normal values 90 % Ie/80 % Ue 80 % Ie/75 % Ue		≤ 3000 m 3000 ... 4000 m 4000 ... 5000 m															
Overvoltage category/Pollution degree		III/3															
Climatic proofing		IEC 68-2															
Main circuits																	
Number of poles		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Rated operation voltage Ue		690 V						1000V									
Conv. thermal current Ith at ≤ 55°C																	
Rated operational current Ie/AC-1		25 A	25 A	32 A	45 A	60 A	60 A	90 A	110 A	110 A	140 A	140 A	180 A	225 A	225 A	350A	410A
AC-3 Duty																	
Rated operational power																	
230 V kW		2,2	3	4	6,5	9	11	15	18,5	22	25	30	30	45	55	75	90
400 V kW		**4**	**5,5**	**7,5**	**11**	**15**	**18,5**	**22**	**30**	**37**	**45**	**55**	**55**	**75**	**90**	**132**	**160**
415-440 V kW		4,5	5,5	9	12,5	15	22	30	37	45	55	55	55	90	110	150	185
500 V kW		5,5	7,5	10	15	18,5	25	30	40	45	55	65	75	90	110	160	200
690 V kW		5,5	7,5	10	15	18,5	30	33	45	45	55	65	80	80	132	200	200
Short circuit rating																	
max. fuse gG (A)		25	35	35	50	63	80	100	125	125	160	200	224	250	250	400	500
max. electrical operating frequency																	
AC-1	Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600	600
AC-3	Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600	600	600	600
AC-4	Ops/h	360	360	360	360	360	360	200	200	200	200	200	150	150	150	150	150
no load	Ops/h	9000	9000	9000	9000	9000	9000	5000	5000	5000	5000	5000	4000	4000	4000	4000	4000
Mechanical life span	Ops x 10^6	10															
Electrical life span	Ops x 10^6	1,6	1,8	1,2				1,1					1,0				
Control circuit																	
Rated insulation voltage	Ui (V)	1000 V															
Nominal voltages	Us 50 Hz (V)	24 - 690 V															
Nominal voltages	Us 60 Hz (V)	24 - 690 V															
Nominal voltages	Us DC (V)	12 - 440 V															
Pick-up and drop-out values																	
Pick-up x	Us (V)	0,8 - 1,1				0,8 - 1,1			0,8 - 1,1					0,8 - 1,1			
Drop-out x	Us (V)	0,35 - 0,55				0,4 - 0,6			0,4 - 0,6					0,3 - 0,5			
Power consumption of the coil	**50/60 Hz**																
Pick-up	(VA)	70				98			255				213		214	229	
	(cos φ)	0,85				0,69			0,32				0,71		0,68	0,73	
Sealing	(VA)	4...7,2				6,6...12,3			13,1...19,1				14,8		14,5	14,1	
	(cos φ)	0,28				0,34			0,54				0,26		0,27	0,26	
Power consumption of the coil, DC coils																	
Pick-up	(W)	3,8...7,5				240			340				166		154	171	
Sealing	(W)	3,8...7,5				6			6,5				2,4		2,4	2,5	
Power dissipations																	
PD per pole @ I_e AC-3	(W)	0,2	0,3	0,8	1	1,3	1,5	2,1	3,6	5,5	6,9	8,4	6,2	11,1	13,8	17,9	25,7
PD of coils, AC coils	(W)	2,0	2,0	2,0	2,0	4,2	4,2	10,3	10,3	10,3	10,3	10,3	3,9	3,9	3,9	3,7	3,7
PD of coils, DC coils	(W)	7,5	7,5	7,5	7,5	6	6	6,5	6,5	6,5	6,5	6,5	2,4	2,4	2,4	2,5	2,5

Contactors CEM up to 132 kW Technical Data

Type		CEM 9 to CEM 18	CEM25	CEM32 and CEM40	CEM50 and CEM80	CEM95 and CEM105	CEM112E and CEM 150E	CEM180E	CEM250E and CEM300E
Main terminal capacity (mm²)									
Solid, stranded and finely stranded without end sleeve		2x (1... 2,5) 2x (2,5...6) 2x (0,25...2,5)	2x (1... 2,5) 2x (2,5... 10) 2x (1...2,5)						
Finaly stranded with end sleeve		2x (2,5...6) 2x (13...16)	2x (2,5...10) 2x (13...17)						
One conductor on top									
Stranded				0,75...16	1...35	1,5...50			
Stranded with end sleeve				0,75...16	1...35	1,5...50			
Stranded without end sleeve				1...16	1,5...35	2,5...50			
Finaly stranded				1...16	1,5...35	2,5...50			
One conductor on bottom									
Solid				1...16	2,5...35	4...35			
Stranded with end sleeve				1... 16	2,5...35	4...35			
Stranded without end sleeve				1,5...16	6...35	6...35			
Finaly stranded				1,5...16	6...35	6...35			
Two conductors		**on top**							
Solid				0,75...16	1...35	1,5...50			
Stranded with end sleeve				0,75...16	1...35	1,5...50			
Stranded without end sleeve				1...16	1,5...35	2,5...50			
Finaly stranded				1...16	1,5...35	2,5...50			
Two conductors		**on bottom**							
Solid				1...16	2,5...35	4...35			
Stranded with end sleeve				1...16	2,5...35	4...35			
Stranded without end sleeve				1,5...16	6...35	6...35			
Finaly stranded				1,5...16	6...35	6...35			
Solid and stranded with end sleeve Bar							2 x (25...70) 2 x (15x3)	2 x (50...120) 2 x (20x3)	2 x (50...150) 2 x (30x5)
Tightening torque (N.m)		1...1,9	1,6...3	2,5...4	4...6	5...6,5	10	13	17

Auxiliary contacts

Type			CEM9	CEM12	CEM18	BCXMFE...	BCXMLE ...
Rated insulation voltage Ui							
acc. IEC/EN 60 947		(V)		1000		1000	
Rated operational voltage Ue		(V)		690		690	
Conv. thermal current Ith		(A)		20		10	
Rated operational current Ie							
AC-15	220 - 240 V	(A)		10		6	
	380 - 400 V	(A)		6		4	
	415 V	(A)		5		3,5	
	500 V	(A)		4		2,5	
DC-13	24 V	(A)		6		6	
	48 V	(A)		4		4	
	110 V	(A)		2		2	
	220 V	(A)		0,7		0,7	
Making capacity Im							
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)		250		90	
DC-13/DC-11	Ue ≤ 220 V DC	(A)		250		90	
Breaking capacity Ic							
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)		250		60	
DC-13/DC-11	Ue ≤ 220 V DC	(A)		2		0,95	
Short circuit protection							
max. fuse gG		(A)		16		10	
Control circuit reliability				Ie min. = 5 mA, Ue min. = 17 V			
Electrical life span		Ops		10^6			
Mechanical life span		Ops		15 x 10^6			
Impedance /pole		mR		2,5			

Power Circuit - CEM 450-560

Three pole version			CEM450	CEM560
Rated thermal current Ith (temp ≤ 55 °C)		(A)	600	700
Rated operational current Ie AC-3 (Ue ≤ 440V)		(A)	450	560
Rated operational voltage Ue	acc. IEC / VDE 0660	(V)	1000	1000
	acc. UL / CSA	(V)	-	-
Rated insulation voltage Ui (pollution degree 3)	acc. IEC / VDE 0660	(V)	1000	1000
	acc. UL / CSA	(V)	-	-
Rated impluse withstand voltage Uimp (acc. IEC 60947-1)		(kV)	8	8
Maximum continuous current AC-1 (temp ≤ 55 °C)		(A)	600	690
Rated operational current Ie AC-4 (Ue ≤ 440V)		(A)	280	345
Frequency limits		(Hz)	25...400	25...400
Making capacity (RMS) (IEC 60947)		(A)	5600	6300
Breaking capacity (RMS) (IEC 60947)	(Ue ≤ 400V)	(A)	4480	5040
	(Ue = 500V)	(A)	4480	5040
	(Ue = 550V)	(A)	4009	4511
	(Ue = 690V)	(A)	3000	3380
Short-time current	1 seg	(A)	8544	10626
	5 seg	(A)	5733	7128
	10 seg	(A)	4500	5600
	30 seg	(A)	2990	3726
	1 min	(A)	2208	2748
(at temp ≤ 40 °C)	3 min	(A)	1391	1716
No current flowing during recovery time.	Recovery time	(min.)	10	10
Electrical Endurance at Ie AC-3 (IEC 60947)		ops. (million)	0,6	0,6
Protection against short-circuits with fuses. Without TOR				
Coordination type "1"	gL/gG	(A)	1000	1260
Coordination type "2"	gL/gG	(A)	630	800
Without welding	gL/gG	(A)	500	500
Short-circuit Interrupting Capacity CSA	600V - acc. UL/	(kA)	-	
Impedance per pole		(mΩ)	0,2	0,2
Power dissipation per pole	AC-1	(W)	72	98
	AC-3	(W)	41	63
Insulation resistance between adjacent poles, poles and earth and between input and output			> 10MΩ	
Degree of protection (acc. VDE 0160 - Part 100)	Main terminals		IP00	
	Coil terminals		IP20	
Relative Humidity			5 to 95% at 40°C (non-condensing)	
Mounting			Screw to panel	

AC - Utilisation Category for CEM 450-560

Utilisation category AC-1			CEM450	CEM560
Rated thermal current Ith (temp ≤ 55 °C)		(A)	600	690
Max. Operational current at ambient temperature of. (up to 690V)"	55 °C	(A)	600	690
	70 °C	(A)	370	420
	75 °C	(A)	-	-
Max. Operational power (q ≤ 55 °C) (Three-phase resistors)	220 / 230 V	(kW)	228	263
	380 / 400 V	(kW)	395	454
	415 / 440 V	(kW)	431	496
	500 V	(kW)	520	597
	575 / 600 V	(kW)	598	687
	660 / 690 V	(kW)	685	788
Cable size		(mm^2)	2 x (50x5)	
Current values for connection of	2 poles in parallel		Ie x 1,7	
	3 poles in parallel		Ie x 2,4	
Percentage of the max. operational current at	600 ops./h	(%)	100	100
	1200 ops./h	(%)	80	80
	3000 ops./h	(%)	-	-

AC - Utilisation Category for CEM 450-560

Utilisation category AC-3			CEM450	CEM560
Operational current Ie (temp ≤ 55°C)	Ue ≤ 440 V	(A)	450	560
	500 V	(A)	415	465
	550 V	(A)	380	420
	690 V	(A)	315	397
	1000 V	(A)	200	235
"Max. Operational power Three-phase motors (50/60 Hz)"	220 / 230 V	(kW)	150	185
		(HP)	200	250
	380 / 400 V	(kW)	260	300
		(HP)	350	400
	415 / 440 V	(kW)	260	300
		(HP)	350	400
	500 V	(kW)	260	330
		(HP)	350	450
	660 / 690 V	(kW)	300	370
		(HP)	400	500
	1000 V	(kW)	260	330
		(HP)	350	450
Percentage of the max. operational current at	600 ops./h	(%)	100	100
	1200 ops./h	(%)	75	75
	3000 ops./h	(%)	-	-

Electronic Control Circuit - AC 50/60Hz / DC						
Coils with electronic module			CEM112 / 150	CEM180 / 215	CEM250 / 300	CEM450/560
Rated insulation voltage Ui (pollution degree 3)	acc. IEC / VDE 0660	(V)	1000			
	acc. UL / CSA	(V)	600			-
Standard voltages		(V)				110-255 V 50/60 Hz / DC
Voltage Operating limits - acc. IEC 60947-1						
Coil Operating Limits		xUs	0.8...1.1	0.8...1.1	0.8...1.1	0.8....1.1
	Pick-up	xUs	0.6 ... 0.75	0.6 ... 0.75	0.6 ... 0.75	0.6 ... 0.75
	Drop-out	xUs	0.4 ... 0.6	0.4 ... 0.6	0.4 ... 0.6	0.4 ... 0.6
Consumption - AC (at 1,0 x Us and cold coil)						
Electronic coils (at 60Hz)	Magnetic circuit closed	(VA)	16.3	21.5	35.2	38.5
	Power factor		0.26	0.27	0.26	0.26
	Thermal power dissipation	(W)	4.2	5.8	9.2	10.0
	Magnetic circuit closing	(VA)	322	426	518	700
	Power factor		0.71	0.68	0.73	-
Consumption - DC (at 1,0 x Us and cold coil)						
Electronic coils at DC	Magnetic circuit closed	(W)	12.5	12.5	12.5	25
	Magnetic circuit closing	(W)	415	375	380	780
Opening and closing times (Values at Us)						
Between coil energization and:	NO contact closing	(ms)	40...70	40...70	65...85	80...110
Between coil de-energization and:	NO contact opening	(ms)	50...70	55...75	40...65	50...90
Mechanical endurance		ops.	10 million	10 million	10 million	3 million
Maximum rate	No load	ops./h	1000	1000	1000	1000
	AC1 and AC3 at rated power	ops./h	600	600	600	300
	AC4 at rated power	ops./h	150	150	150	150

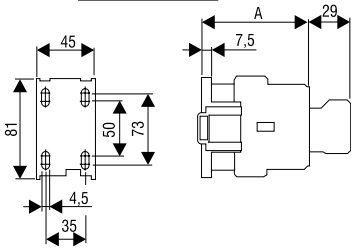
AC - Utilisation Category for CEM 450-560				
Utilisation category AC-4			**CEM450**	**CEM560**
Operational current Ie AC-4	Ue ≤ 440 V	(A)	280	345
	500 V	(A)	211	220
	690 V	(A)	160	195
	1000 V	(A)	100	125
Operational power Three-phase motors (50/60 Hz) (200.000 operations)	220 / 230 V	(kW)	75	90
		(HP)	100	125
	380 / 400 V	(kW)	150	185
		(HP)	200	250
	415 / 440 V	(kW)	150	185
		(HP)	200	250
	500 V	(kW)	130	185
		(HP)	200	250
	660 / 690 V	(kW)	150	185
		(HP)	200	250
	1000 V	(kW)	132	150
		(HP)	175	200
Max. Operational current Ie (Ue ≤ 400 V) (35.000 operations)		(A)	450	560
Max. Operational power (Ue ≤ 380/400 V)		(kW)	260	300
Maximum frequency of switching		(ops./h)	350	400

DC - Utilisation Category for CEM450-560			
Utilisation category DC-1 (L/R ≤ 1 ms)		**CEM450**	**CEM560**
Ue (V)	Poles in serie	Max. Operational current Ie (A)	
24V	1	450	560
	2	600	690
	3	600	690
110V	1	225	280
	2	450	560
	3	600	690
220V	1	45	56
	2	300	345
	3	600	690
440V	1	-	-
	2	150	172
	3	300	345

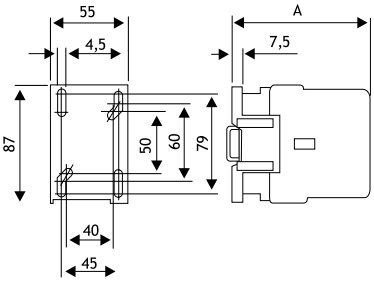
DC - Utilisation Category for CEM450-560			
Utilisation category DC-3 / DC-5 (L/R ≤ 15 ms)		**CEM450**	**CEM560**
Ue (V)	Poles in serie	Max. Operational current Ie (A)	
24V	1	350	450
	2	450	560
	3	450	560
110V	1	200	260
	2	350	400
	3	400	450
220V	1	30	35
	2	160	200
	3	300	345
440V	1	-	-
	2	50	65
	3	150	180

Dimensions

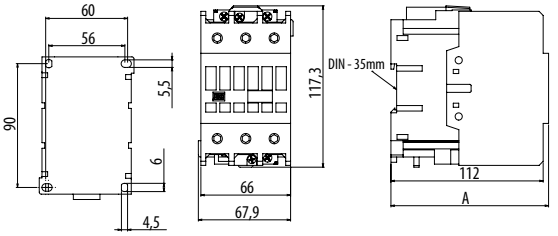
	AC	DC
CAEM4	A=85	A=115
CEM9	A=85	A=115
CEM12	A=85	A=115
CEM18	A=85	A=115
CEM25	A=87	A=117



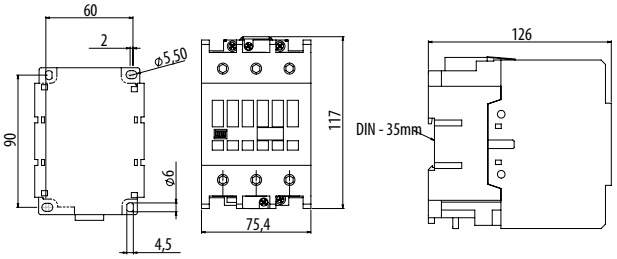
	AC	DC
CEM32	A=98	A=134
CEM40	A=98	A=134



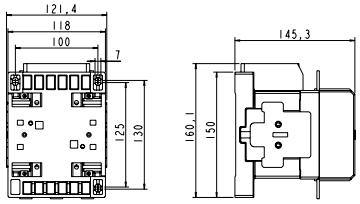
	AC/DC
CEM50	A=116
CEM65	A=116
CEM80	A=116



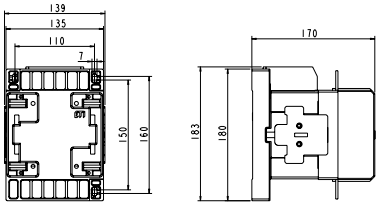
	AC/DC
CEM95	A=126
CEM105	A=126



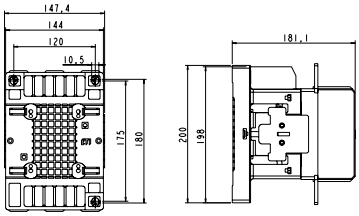
CEM112(E)
CEM150E



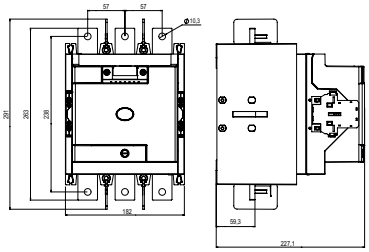
CEM180(E)

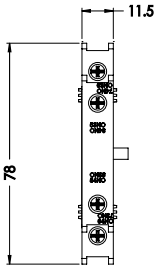


CEM250(E)
CEM300(E)

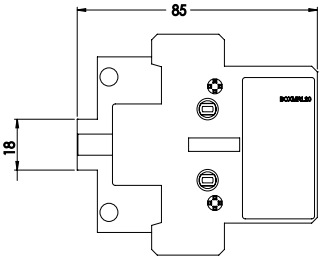


CEM 450(E)
CEM 560(E)

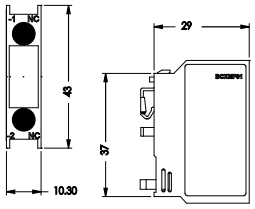




BCXMLE

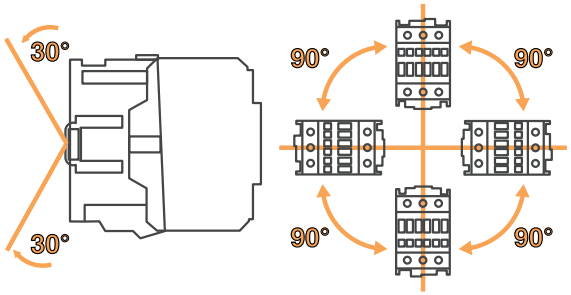


BCXMFE

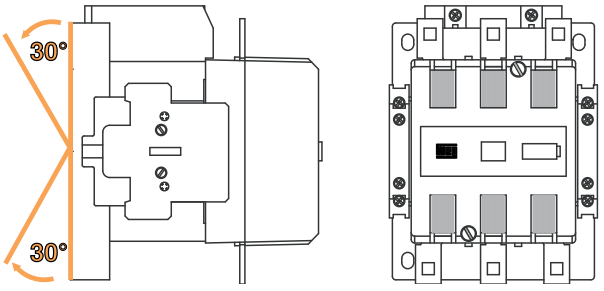


Mounting position

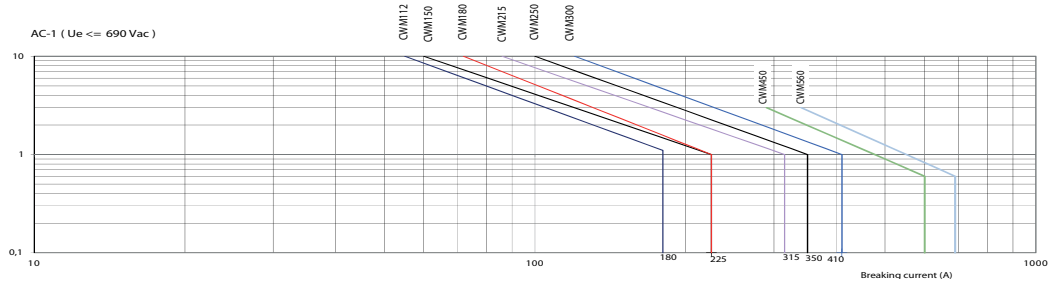
CEM9...105

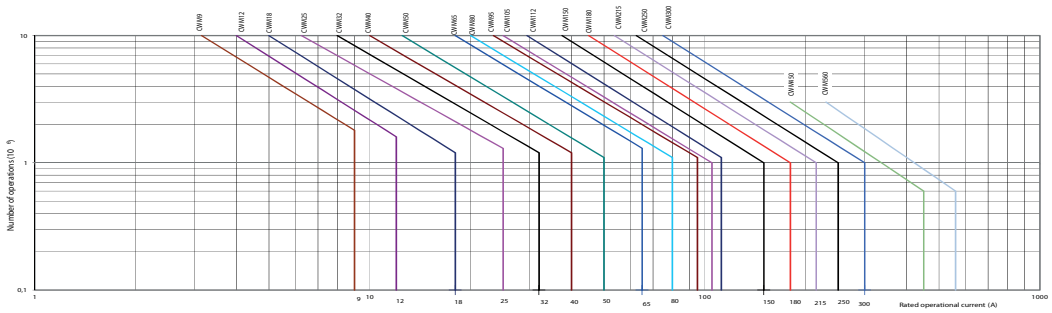


CEM112...300



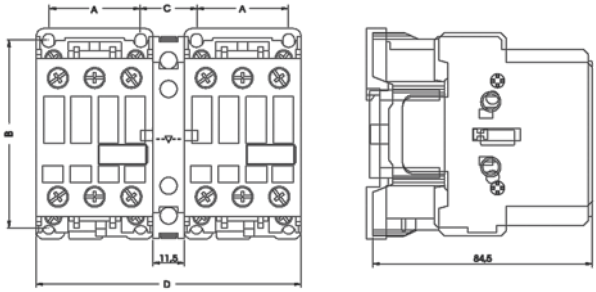
Diagram





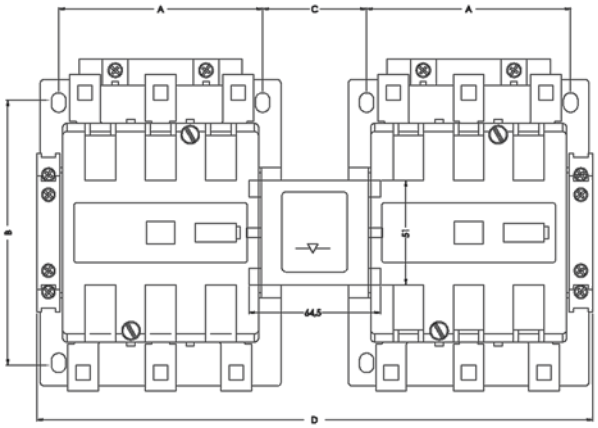
Dimensions

BLIME9-105



Contactors	A	B	C	D
CEM9...25	35	72,5	22	102
CEM32...40	45	79	22	122
CEM50...80	57	90	22	144
CEM95...105	57	90	29	162

BLIME 112-300E



Contactors	A	B	C	D
CEM112...150	100	130	51	272,5
CEM180	110	160	58,5	303,5
CEM250...300	120	180	57	325,4
CEM250...300	175	196	57	414

Mechanical interlocks BLIME: Contactor sizes & compatibility		
		Same size Q1=Q2
BLIME 9-105	004643601	CEM9…CEM105
BLIME 112-300E	004643602	CEM112(E)-CEM300(E)

AC coils		Different size	
		Q1	Q2
BLIME 9-105	004643601	CEM9…CEM105	CEM9…CEM105
BLIME 112-300E	004643602	CEM112…CEM150	CEM112…CEM150
		CEM250…300	CEM250…300

DC coils		Different size	
		Q1	Q2
BLIME 9-105	004643601	CEM9…18	CEM9…18
BLIME 9-105	004643601	CEM32…40	CEM32…40
BLIME 9-105	004643601	CEM50…CEM105	CEM50…CEM105

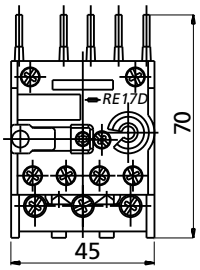
AC&DC coils		Different coil	
		C1	C2
BLIME 9-105	004643601	CEM50…105 DC coil	CEM9…105 AC coil

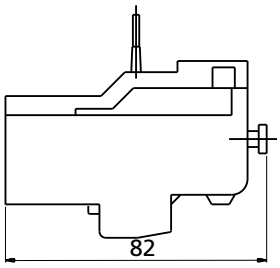
Overload relay

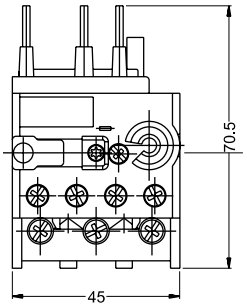
- phase-failure sensitivity to IEC/EN 60947-4-1, DIN VDE 0660T.102
- tripping class 10 according to standard 60947-4-1
- temperature compensation
- auxiliary contact 1NO/1NC
- hand/auto/reset

PIN from auxiliary contactor

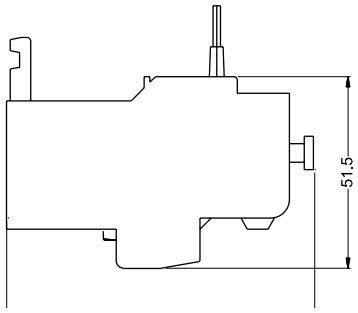
T1 T2 T3 PIN from coil from contactor



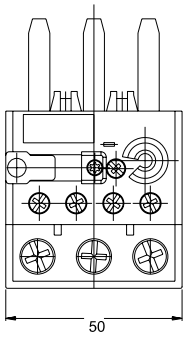


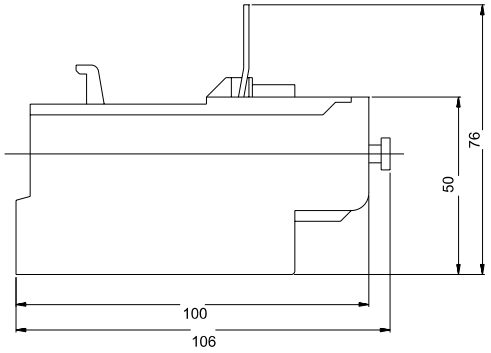


RE17D

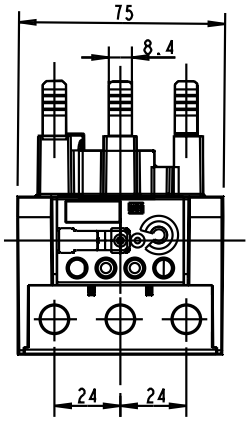


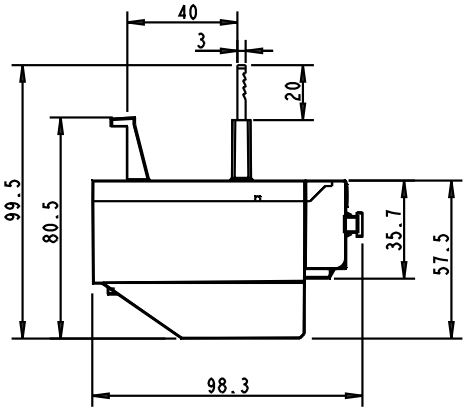
RE27D





RE67D





RE117.1D

RE Thermal Overload Relays in Contactor Assemblies for Wye-Delta Starters

When using thermal overload relays in conjunction with contactor assemblies for wye-delta starters, it should be taken into consideration that only 0.58 (√3 / 3) x the motor current flows through the main contactor. An overload relay mounted on the main contactor must be set to the same multiple of the motor current.

A second overload relay may be mounted on the wye contactor if it is desired the load to be optimally protected in wye operation. The wye current is 1/3 of the rated motor current. The relay must then be set to this current.

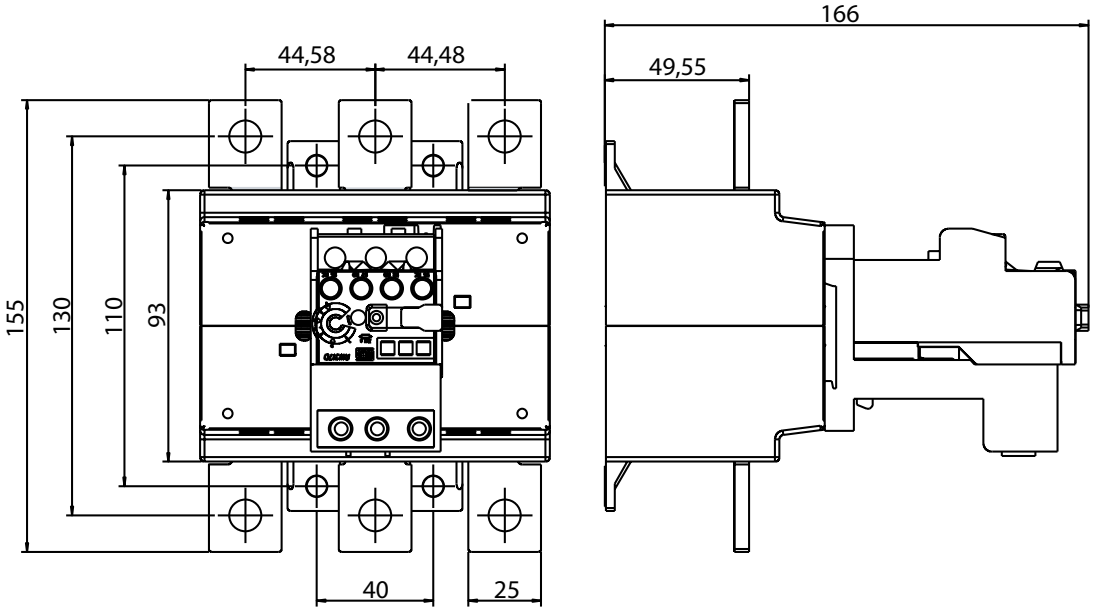
Protection Against Short-Circuit

The RE thermal overload relays must be protected against short-circuits by fuses or circuit breakers.

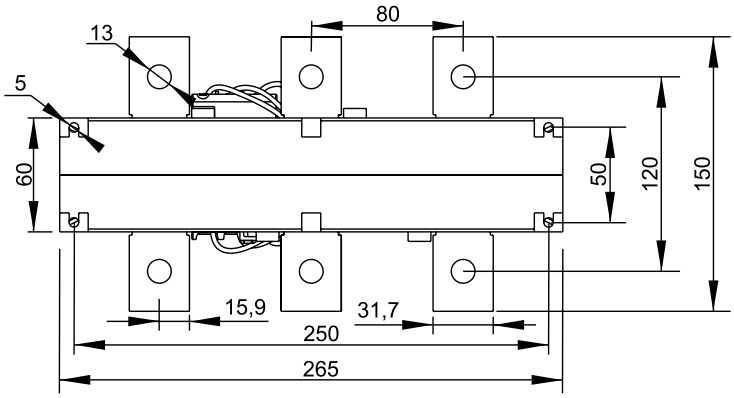
Ambient Air Temperature Compensation

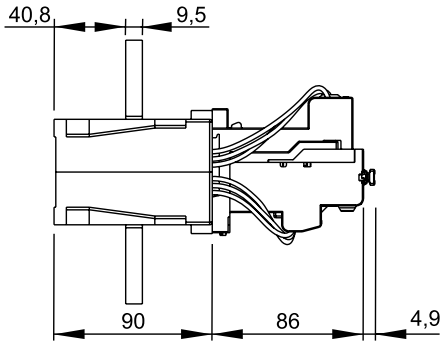
RE thermal overload relays are temperature compensated. Its trip point is not affected by temperature, and it performs consistently at the same value of current. The time-current characteristics of REs refer to a stated value of ambient air temperature within the range of -20 °C to +60 °C and are based on no previous loading of the overload relay (i.e. from an initial cold state). For ambient air temperature within the range of +60 °C up +80 °C (maximum ambient air temperature), the current correction factor shown in the table below should be applied:

Ambient air temperature [°C]	Current correction factor
65	0,94
70	0,87
75	0,81
80	0,73



RE317D

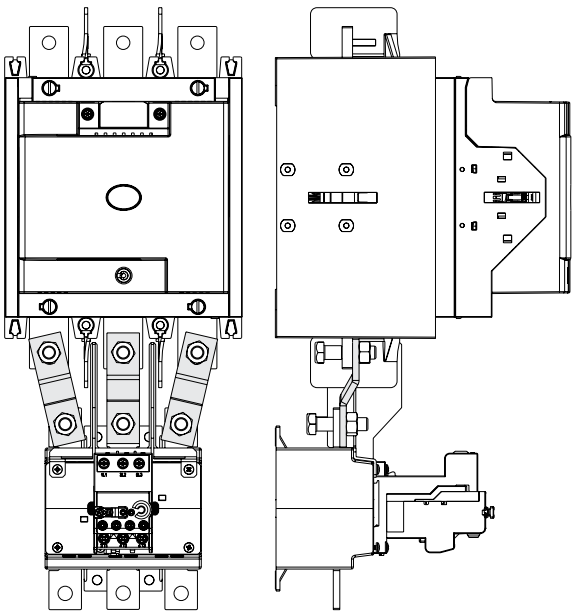




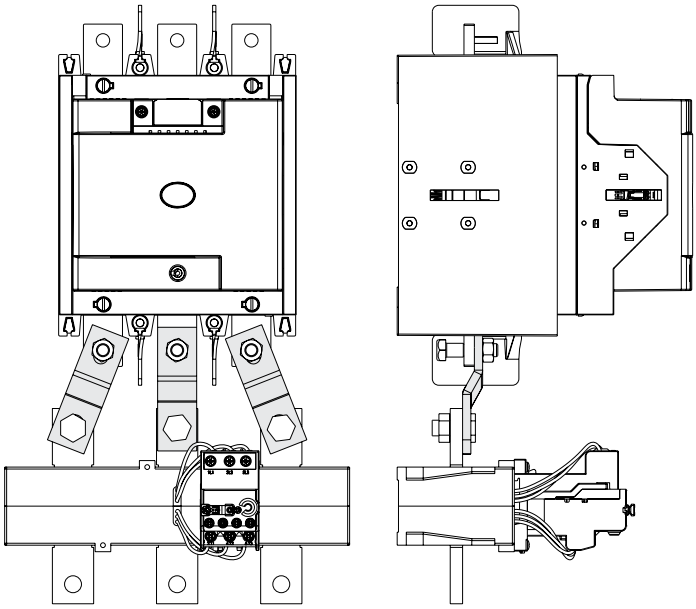
RE407D

overload relay current setting	recommended fuse gG (A)
0,28-0,4	2
0,4-0,63	2
0,56-0,8	2
0,8-1,2	4
1,2-1,8	6
1,8-2,8	6
2,8-4	10
4-6,3	16
5,6-8	20
7-10	25
8-12,5	25
10-15	35
11-17	35
15-23	50
22-32	63
25-40	80
32-50	100
40-57	100
50-63	100
57-70	125
63-80	125
75-97	200
90-112	250
100-150	315
140-215	355
200-310	500
275-420	710
400-600	1000

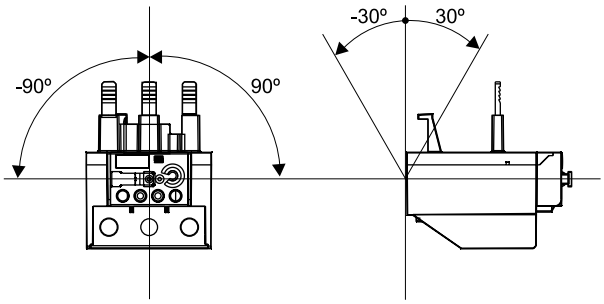
CEM450E/560E + RE317D (200...420A)



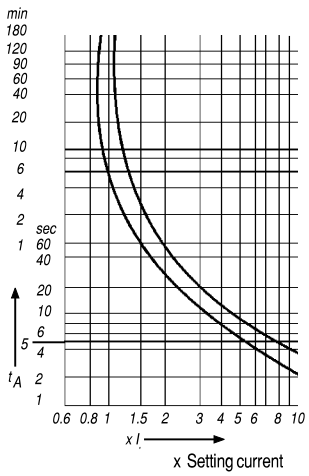
CEM450E/560E + RE407D (400...600A)



Mounting position for RE17D to RE117D



RE...D Tripping characteristic



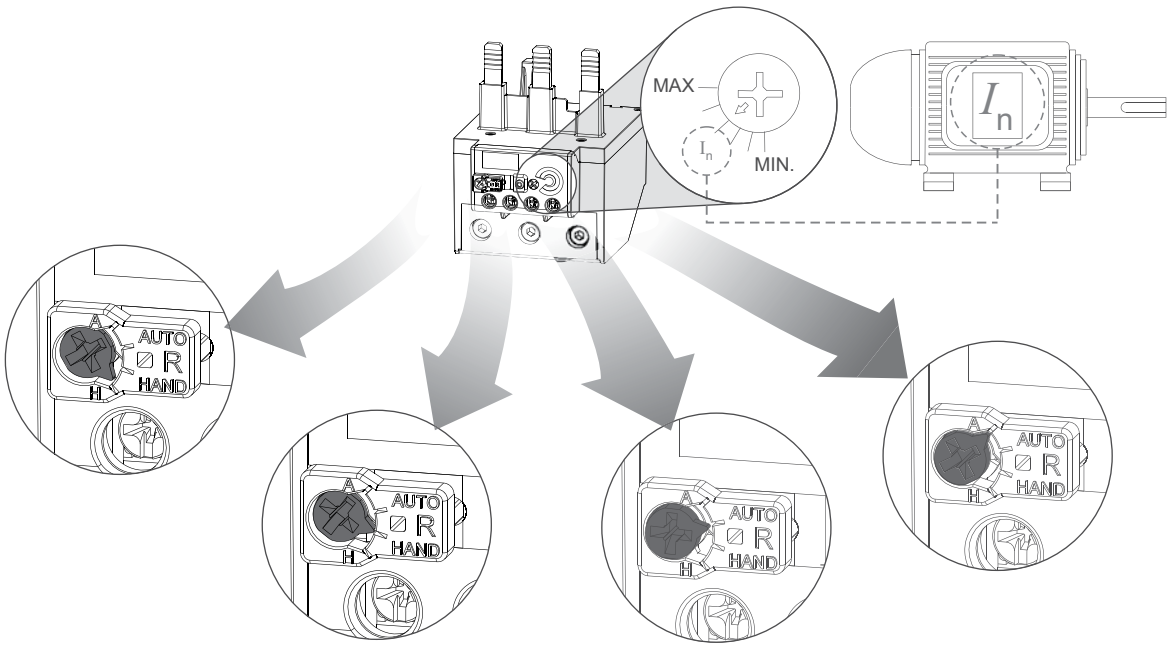
These tripping characteristics show mean values of the tolerance range at 20°C ambient temperature starting from cold. They show the tripping times in relation to the response current. At operational temperature, the tripping time of the overload relay drops to approximately 25 % of the shown.

Overload relay								
Type			**RE17D**	**RE27D**	**RE67D**	**RE117D**	**RE317D**	**RE407D**
General technical data								
Standards			IEC/EN 60 947, DIN VDE 0660					
Current setting		(A)	0,28 - 17	0,28 - 32	25 - 80	75 - 112	100 - 420	400 - 840
Tripping Class acc. to IEC 60947-4-1			10					
Temperature compensation			continuous					
Rated insulation voltage Ui acc. IEC/EN 60 947/DIN VDE 0660		(V)	690				1000	
Rated impulse withstand voltage Uimp		(kV)	6				8	
Rated operational frequency		(Hz)	0 - 400				50/60	
Degree of protection			IP 20					
Protection against direct contact from the front when actuated by a perpendicular test fi nger (IEC 536)			finger and back-of-hand proof					
Ambient temperature Operating temperature		°C	-25 ... +60					
Storage temperature		°C	-40 ... +70					
Power dissipation (value of setting range)	lower	(W)	**0,9**		1,5	2,3	1	
	higher	(W)	1,4	1,7	4,7		1,9	
Aux. Contacts impedance (pole)		mR	2,5					
Terminal capacity								
solid		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
flexible without cable		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
flexible with cable lug		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
stranded		mm^2	2x 1,5 - 10		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
busbar		mm	-		-	-	max 2x (25 x 5)	max 2x (60 x 10)
Tightening torque		Nm	2,3		4	6	141 (100-215A) 230 (200-420A)	230
Auxiliary contacts								
Rated insulation voltage Ui acc. IEC/EN 60 947/DIN VDE 0660		(V)	690					
Rated operational voltage Ue		(V)	690					
Rated thermal current Ith		(A)	6					
Rated operational current Ie AC-15	24 V	(A)	4					
	60 V	(A)	3,5					
	125 V	(A)	3					
	230 V	(A)	2					
	400 V	(A)	1,5					
	500 V	(A)	0,5					
	690 V	(A)	0,3					
Rated operational current Ie DC-13	24 VDC	(A)	1					
	60 VDC	(A)	0,5					
	110 VDC	(A)	0,25					
	220 VDC	(A)	0,1					
Terminal capacity	Terminal screw		M3,5 x 10 Philips					
	Cable size	mm^2	2 x 1-2,5					
	AWG-wire		16-12					
Tightening torque		Nm	1,5					

Minimum fuse size for the protection of three-phase motors.
The maximum size is governed by the requirements of the associated switchgear or overload relay.

Motor rating			230 V			400 V			500 V			690 V		
			Rated motor current	Fuse		Rated motor current	Fuse		Rated motor current	Fuse		Rated motor current	Fuse	
				Starting direct	Y/Δ		Starting direct	Y/Δ		Starting direct	Y/Δ		Starting direct	Y/Δ
[kW]	cosφ	η(%)	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
0,06	0,7	58	0,37	2	-	0,21	2	-	0,17	2	-	0,12	2	-
0,09	0,7	60	0,54	2	-	0,31	2	-	0,25	2	-	0,18	2	-
0,12	0,7	60	0,72	4	2	0,41	2	-	0,3	2	-	0,24	2	-
0,18	0,7	62	1,04	4	2	0,6	2	-	0,48	2	-	0,35	2	-
0,25	0,7	62	1,4	4	2	0,8	4	2	0,7	2	-	0,5	2	-
0,37	0,72	66	2	6	4	1,1	4	2	0,9	2	2	0,7	2	-
0,55	0,75	69	2,7	10	4	1,5	4	2	1,2	4	2	0,9	4	2
0,75	0,79	71	3,2	10	4	1,9	6	4	1,5	4	2	1,1	4	2
1,1	0,81	74	4,6	10	6	2,6	6	4	2,1	6	4	1,5	4	2
1,5	0,81	74	6,3	16	10	3,6	6	4	2,9	6	4	2,1	6	4
2,2	0,81	78	8,7	20	10	5	10	6	4	10	4	2,9	10	4
3	0,82	80	11,5	25	16	6,6	16	10	5,3	16	6	3,8	10	4
4	0,82	83	14,8	32	16	8,5	20	10	6,8	16	10	4,9	16	6
5,5	0,82	86	19,6	32	25	11,3	25	16	9	20	16	6,5	16	10
7,5	0,82	87	26,4	50	32	15,2	32	16	21,1	25	16	8,8	20	10
11	0,84	87	38	80	40	21,7	40	25	17,4	32	20	12,6	25	16
15	0,84	88	51	100	63	29,3	63	32	23,4	50	25	17	32	20
18,5	0,84	88	63	125	80	36	63	40	28,9	50	32	20,9	32	25
22	0,84	92	71	125	80	41	80	50	33	63	32	23,8	50	25
30	0,85	92	96	200	100	55	100	63	44	80	50	32	63	32
37	0,86	92	117	200	125	68	125	80	54	100	63	39	80	50
45	0,86	93	141	250	160	81	160	100	65	125	80	47	80	63
55	0,86	93	173	250	200	99	200	125	79	160	80	58	100	63
75	0,86	94	233	315	250	134	200	160	107	200	125	78	160	100
90	0,86	94	279	400	315	161	250	200	129	200	160	93	160	100
110	0,86	94	342	500	400	196	315	200	157	250	160	114	200	125
132	0,87	95	401	630	500	231	400	250	184	250	200	134	250	160
160	0,87	95	486	630	630	279	400	315	224	315	250	162	250	200
200	0,87	95	607	800	630	349	500	400	279	400	315	202	315	250
250	0,87	90	-	-	-	437	630	500	349	500	400	253	400	315
315	0,87	96	-	-	-	544	800	630	436	630	500	316	500	400
400	0,88	96	-	-	-	683	1000	800	547	800	630	396	630	400
450	0,88	96	-	-	-	769	100	800	615	800	630	446	630	630
500	0,88	97	-	-	-	-	-	-	-	-	-	491	630	630
560	0,88	97	-	-	-	-	-	-	-	-	-	550	800	630
630	0,88	97	-	-	-	-	-	-	-	-	-	618	800	630

The rated motor currents apply to normal, internal-ventilated and enclosed fan-cooled three-phase motors at 1500 rpm.
D.O.L. Starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 seconds.
Y/D-starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 seconds.
Set the overload relay in the phase lead to 0,58 x rated motor current.
Rated fuse currents for Y/D-starting also apply to three-phase motors with slip-ring rotors.
Use a larger fuse if the rated current or starting current is higher and/or if the starting time is longer.
The table applies to "slow" or "gL" fuse (VDE 0636)
By NH fuse with aM characteristics, select fuse size to match rated current.



	A AUTO HAND H	A AUTO HAND H	A AUTO HAND H	A AUTO HAND H
97-98 NO	MANUAL RESET - Device must be reset manualy after overload by pushing the button. Relay must cool down before reset. - Testing not available in this mode.	MANUAL RESET AND TEST - Device must be reset manualy after overload by pushing the button. Relay must cool down before reset. - Test function available in this mode.	AUTOMATIC RESET AND TEST - Automatic reset of thermal protection, after cool down. - Test circuit is available.	AUTOMATIC RESET - Automatic reset of thermal protection, after cool down. - Testing not available in this mode.
95-96 NC				

Motor protective circuit breaker MSP

Technical data		according to IEC 60947-1; IEC 60947-2; IEC 60947-4-1							
Type		MSP0				MSP1			
General data									
Number of poles		3				3			
Max. rated current I_n									
• motor protection	A	25				52			
Permissible ambient temperature									
• at full rated current	°C	-20 ... +55							
• in storage	°C	-50 ... +80							
Rated operational voltage U_e	V	690							
Rated frequency	Hz	50/60							
Rated insulation voltage U_i	V	750							
Rated impulse withstand voltage U_{imp}	kV	6							
Utilization category									
• to IEC 60947-2 (motor starter protectors)		A							
• to IEC 60947-4-1 (motor starters)		AC-3							
Mechanical endurance									
• up to 25 A	Operating cyles	100000				100000			
• 25 A upwards		--				30000			
Number of operating cycles/h (on load)	1/h	25				25			
Degree of protection with open terminals/with conductors connected		IP00/IP20							
Temperatures compensation to IEC 60947-4-1		✓							
Phase failure sensitivity to IEC 60947-4-1		✓							
Power loss P_v per breaker									
I_n	A	0,6	4	6	25	2,4	6	25	63
P_v	W	5	6	7	9	8	7	14	23

Auxiliary contacts				
Utilization category		AC-15		
Rated operational voltage U_e	AC V	230	400	500
Rated operational current I_e	A	3	1.5	1
Utilization category		DC-13		
Rated operational voltage U_e DC L/R200 ms	DC V	24	60	220
Rated operational current I_e	A	2.3	0.7	0.3

Type		MSP0	MSP1
Cross-section for main conductors			
Solid or stranded	mm^2	2 x (1 ... 6)	1 x 1.5 ... 2 x 16 or 1 x 25 + 1 x 10
Finely stranded with end sleeve	mm^2	2 x (1 ... 4)	1 x 1.5 ... 2 x 10 or 1 x 16 + 1 x 10
Cross-sections for auxiliary and control connecting leads			
Solid or stranded	mm^2	1 x 0.5 ... 2 x 2.5	--
Finely stranded with end sleeve	mm^2	1 x 0.5 ... 2 x 1.5	--

Rated short-circuit breaking capacity

The table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} for the MSP motor starter protectors with respect to rated current I_n and reated operational voltage U_e.

Infeed is permitted at top or bottom without reduction of rated data. In the short-circuit proof areas, I_{cu} is at least 100 kA. A backup fuse is therefore not necessary.

In the other areas, when the short-circuit current at the installation point exceeds the rated short-circuit breaking capacity given in the table for the motor starter protectors, the motor starter protector must be protected by a backup fuse. See the following table for the maximum reated current for the backup
fuse. With a backup fuse according to the table, the maximum short-circuit current is permitted to equal the rated breaking capacity of the backup fuse.

Motor Starter Protectors	Rated current In	Up to AC 240 V			Up to AC 415 V			Up to AC 440 V			Up to AC 500 V			Up to AC 690 V		
		I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MSP0	≤ 1 A	Short-circuit proof up to 100 kA, backup														
	1.6 A	fuse is not necessary												2	2	20
	2.4 A										10 (50)	10 (50)	35	2	2	35
	3.2 & 4 A							10 (50)	10 (50)	50	3 (50)	3 (50)	50	2	2	50
	5 & 6 A							5 (50)	5 (50)	63	3 (50)	3 (50)	63	2	2	63
	8 & 10 A				10 (50)	10 (50)	80	5 (50)	5 (50)	80	3 (5)	3 (5)	80	2	2	80
	13 & 16 A				6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
	20 & 25 A	10 (50)	10 (50)	100	6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
MSP1	≤ 2.4 A	Short-circuit proof up to 100 kA, backup														
	4 A	fuse is not necessary												4	4	80
	6 A											50		4	4	100
	10 A								50		10	5	160	4	4	125
	16 A							25	13	200	10	5	160	4	4	125
	25 A					50		25	13	200	10	5	200	4	4	160
	32 & 52 A				35	17	200	25	13	200	10	5	200	4	4	160

Relation between short-circuit breaking capacity I, related power factor and minimum short-circuit making capacity to IEC 60947-2.		
Short-circuit breaking capacity	Power factor cos φ	Short-circuit making capacity
A		
I ≤ 3000	0.9	1.42 x I
3000 < I ≤ 4500	0.8	1.47 x I
4500 < I ≤ 6000	0.7	1.5 x I
6000 < I ≤ 10000	0.5	1.7 x I
10000 < I ≤ 20000	0.3	2.0 x I
20000 < I ≤ 50000	0.25	2.1 x I
50000 < I	0.2	2.2 x I

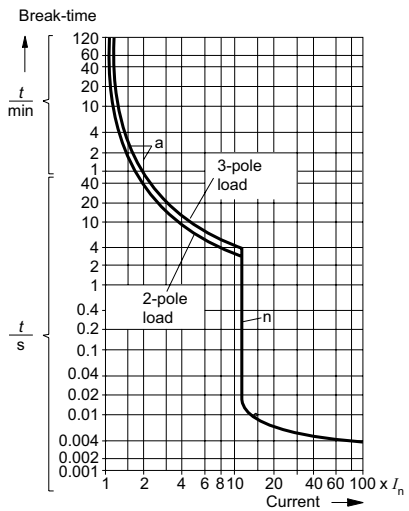
Curves

Characteristic curves

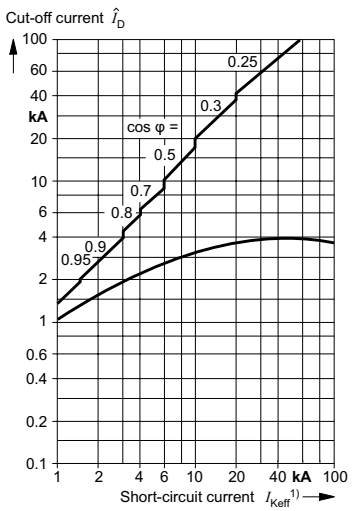
The characteristic curves are obtained in the cold state and 3-pole loading.
At operating temperature, the tripping time of the thermal releases drops by about 25 %. With 3-pole loading, the deviation in tripping time for 3 times the current and upwards is ±20 %.

Characteristic curves for MSP0

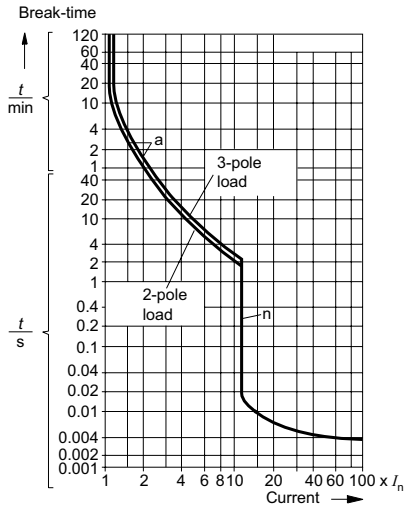
The characteristic curves shown here apply for a MSP0-6 motor starter protector with a rated current of 6 A, a current setting range of 4 to 6 A and a tripping current for the instantaneous overcurrent release of 72 A, at a rated voltage of AC 50 Hz, 400 V.



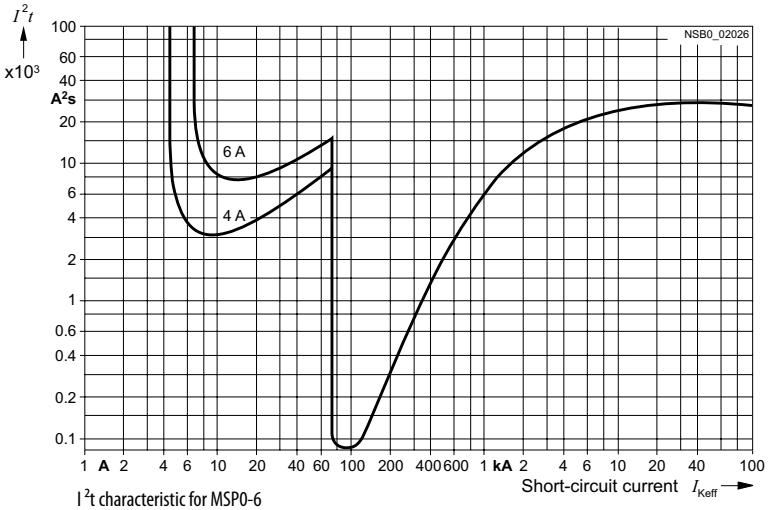
Schematic representation of the time/current characteristic for MSP0



Current limiting characteristic for MSP0-6



Schematic representation of the time/current characteristic for MSP1



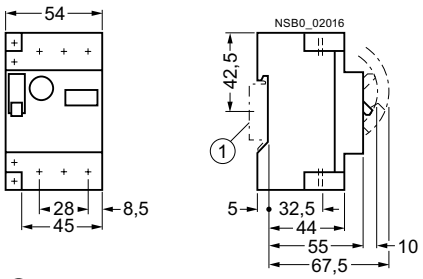
I²t characteristic for MSP0-6

Characteristic curves for MSP1

The characteristic curves shown here apply for a motor starter protector with a rated current of 25 A and a tripping current for the instantaneous overcurrent release of 300 A, at a rated voltage of AC 50 Hz, 400 V.

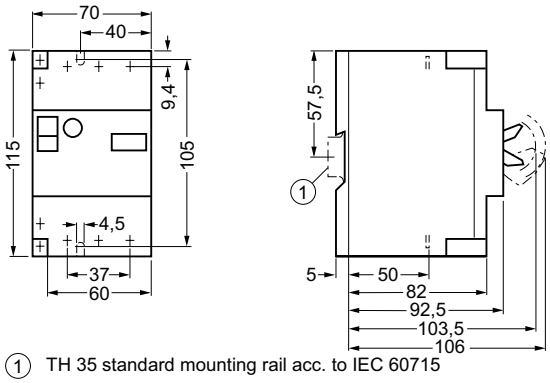
Dimensions

MSP0



1 TH 35 standard mounting rail acc. to IEC 60715

MSP1

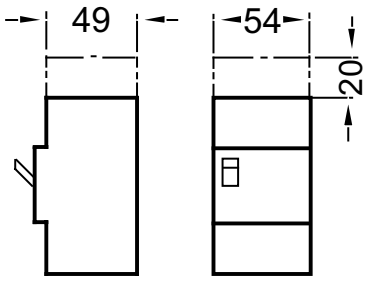


1 TH 35 standard mounting rail acc. to IEC 60715

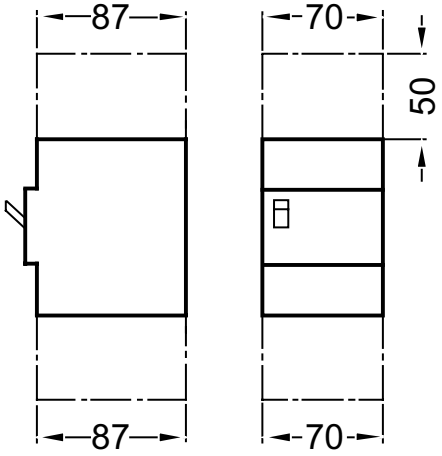
Space required above arc chutes

Minimum clearance with rated voltage to adjacent parts as well as non-insulated live parts.
The spacing of minimum 1 cm with MSP0 and minimum 2 cm with MSP1 between large-surface covers and arc openings should be observed.

MSP0



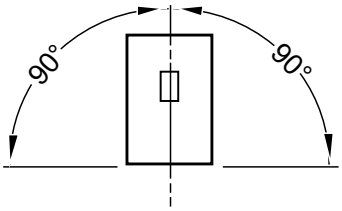
MSP1



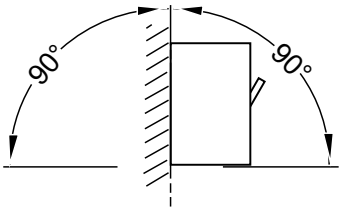
Uninsulated conductors must be insulated within the space required above arc chutes.

Permissible mounting position

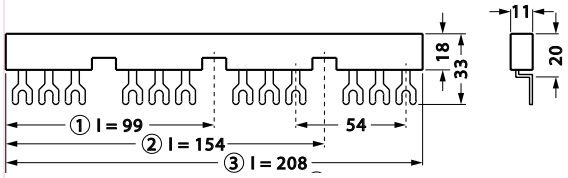
MSP0, MSP1 motor starter protectors permissible mounting position due to the position of the operating parts



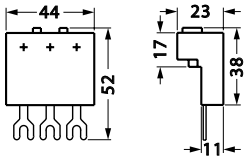
Front view



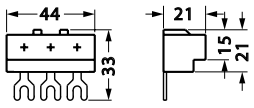
Lateral view



three-phase busbar
① For 2 devices: MSP-IZ2
② For 3 devices: MSP-IZ3
③ For 4 devices: MSP-IZ4



MSP-TA2
three-phase feed-in terminal, type I



MSP-TA1
three-phase feed-in terminal, type II

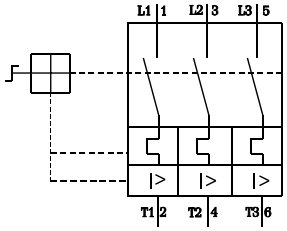
Motor protective circuit breaker MPE

General technical data

				MPE25	MPE80
Operational inst. current I_u			A	0,16 ... 40	50 ... 80
Rated short-circuit capacity			kA	50	60
Standards				IEC/EN 60 947	
Climatic proffing				damp heat, constant to IEC 60 068-2-3 damp heat, cyclical to IEC 60 068-2-30	
Ambient temperature	Storage		°C	-50 ... +80	
	Open		°C	-20 ... +70	
	Enclosed		°C	-20 ... +35	
Mounting position				any position	
Degree of protection				IP20	
Protection against direct contact				IP20	
Shock resistance to IEC 60 068-2-27			g	15	
Altitude			m	2000	
Conductor cross-section for main circuit	solid & stranded		mm^2	1 x (1,5 ... 6) / 2 x (1,5 ... 6)	1 x (1,5 ... 35) / 2 x (2,5 ... 35)
Tightening torque	main circuits		Nm	2,0...2,5	6
	control circuits		Nm	1,0...1,25	
Main contacts					
Rated impulse withstand voltage U_{imp}			kV	6	
Overvoltage categ./pollution degree				III/3	
Rated operational voltage U_e			V	690	
Rated operational current I_e			A	25 or setting current of overload release	
Rated frequency			Hz	50/60	
Current heat losses, 3-pole at oper. T			W	5 (MPE25-0,1 - MPE25-0,63)	
			W	6 (MPE25-1 - MPE25-6,3)	
			W	7 (MPE25-10)	
			W	8 (MPE25-16 - MPE25-25)	
			W	10 (MPE25-32)	
Life span, mechanical / electrical			Ops.	100.000 / 100.000	50.000 / 25.000
Maximum operating frequency			Ops./h	15	
Releases					
Temperature compensation			°C	-20 ... +60	
Adjustable overload releases			x Iu	0,6 - 1	
Fixed short circuit releases			x Iu	12	
Phase failure sensitivity				IEC/EN 60 947-4-1	
Auxiliary contacts					
Rated impulse withstand voltage			kV	6	
Overvoltage category/pollution degree				III/3	
Rated operational voltage			V	690 (250 -> ACBFE...)	
Rated operational current					
AC-15	24V	I_e	A	6 (2 -> ACBFE)	
	230V	I_e	A	4 (0,5 -> ACBFE)	
	380V-415V	I_e	A	3 (Ø -> ACBFE)	
	440V-500V	I_e	A	2 (Ø -> ACBFE)	
DC-13	24V	I_e	A	2 (1 -> ACBFE)	
	60V	I_e	A	0.5 (0,15 -> ACBFE)	
	110V	I_e	A	0.5 (Ø -> ACBFE)	
	220V	I_e	A	0.25 (Ø -> ACBFE)	
Control circuit reliability at U_e				U_{min} = 17V, I_{min} = 5mA	
	Fault probability			< 1 fault in 1 milion operations	
Short-circuit rating without welding	Fuse gG		A	10	
Conductors cross-section for auxiliary and control circuits	solid or stranded		mm^2	1 x (0,5 ... 2,5) / 2 x (0,5 ... 2,5)	

Max. operational power

type	max. operational power (kW) AC 3				operational inst. current Iu (A)	setting overl. release Ir (A)	short-circuit release Irm (A)
	400V 415V	440V	500V	690V			
MPE25-0,16	-	-	-	0.06	0.16	0,1-0,16	1.9
MPE25-0,25	0.06	0.06	0.06	0.12	0.25	0,16-0,25	3
MPE25-0,40	0.09	0.12	0.12	0.18	0.4	0,25-0,4	4,8
MPE25-0,63	0.12	0.18	0.25	0.25	0.63	0,4-0,63	7,5
MPE25-1,0	0.25	0.25	0.37	0.55	1	0,63-1,0	12
MPE25-1,6	0.55	0.55	0.75	1.1	1.6	1,0-1,6	19
MPE25-2,5	0.75	1.1	1.1	1.5	2.5	1,6-2,5	30
MPE25-4,0	1.5	1.5	2.2	3	4	2,5-4,0	48
MPE25-6,3	2.2	3	3	4	6.3	4,0-6,3	75
MPE25-10	4	4	4	7.5	10	6,3-10	120
MPE25-16	7.5	9	9	12.5	16	10-16	190
MPE25-20	9	11	12.5	15	20	16-20	240
MPE25-25	12.5	12.5	15	22	25	20-25	300
MPE25-32	15	15	18.5	30	32	25-32	384

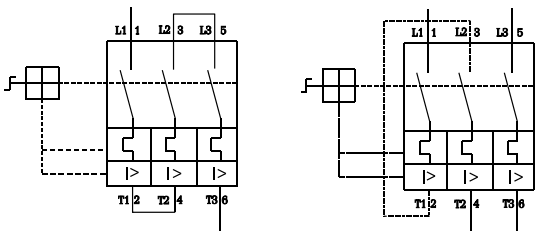


With 3 pole loading, deviation of short circuit release current can be +/-20% (acc. to 60947-2).

Technical data

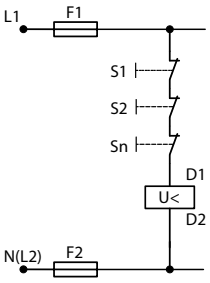
Tripping devices			
Rated operational voltage	Ue	V	200-415V
Conductor cross-section for main circuit	solid or stranded	mm^2	1 x (0,5 to 2,5) / 2 x (0,5 to 2,5)
Shunt Releases			
Operating range		x Us	0,7 - 1,1
Power consumption	Pull	VA	10
	Sealing	VA	4.5
Undervoltage Releases			
Pick-up voltage		x Us	0,85 - 1,1
Drop-out voltage		x Us	0,7 - 0,35

MPE25 wired 1- or 2-pole

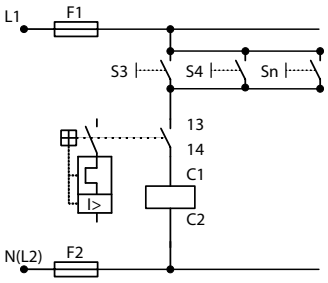


Typical circuits

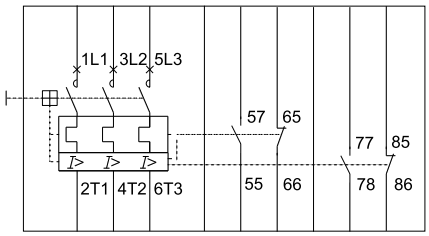
Undervoltage release
URMPE



Shunt release
SRMPE



Trip Signalling Block
TSBE

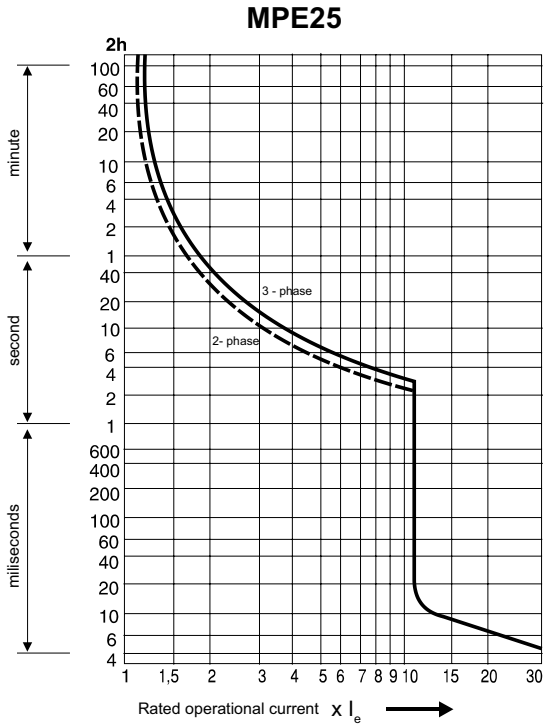


Altitude - Factor of Correction

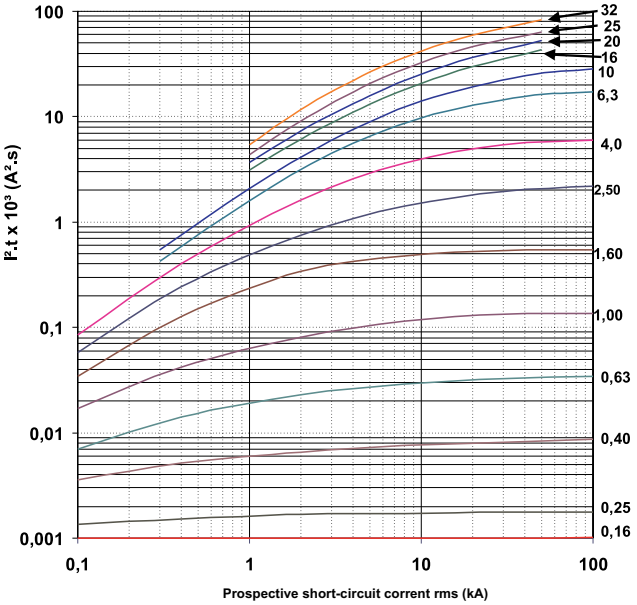
Altitude (above the sea level) - h	Rated operational voltage U_e	Factor of correction I_u
h < 2000m	690V	1 x I_n
2000m < h < 3000m	550V	0,96 x I_n
3000m < h < 4000m	480V	0,93 x I_n
4000m < h < 5000m	420V	0,90 x I_n

Curves

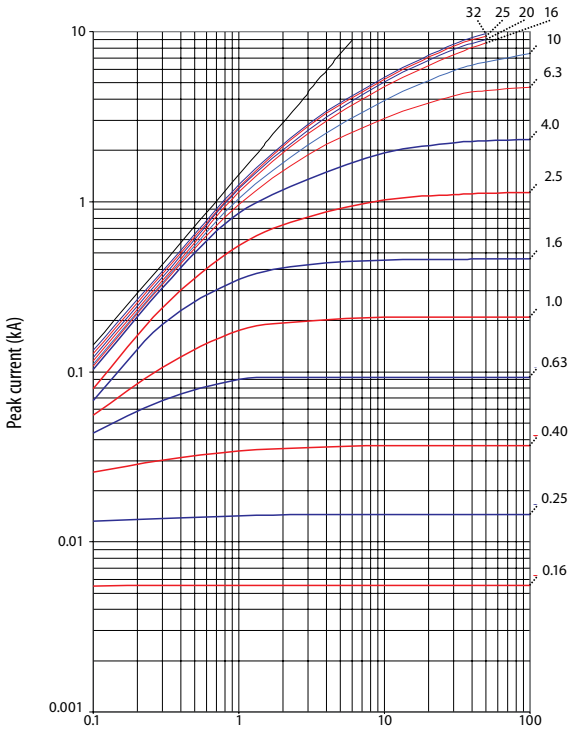
The tripping characteristics show the tripping time of the circuit-breakers in relation to the current. They show mean values of the tolerance ranges at an ambient temperature of 20 °C, starting from cold. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all three phases of the MPE25 should be loaded.

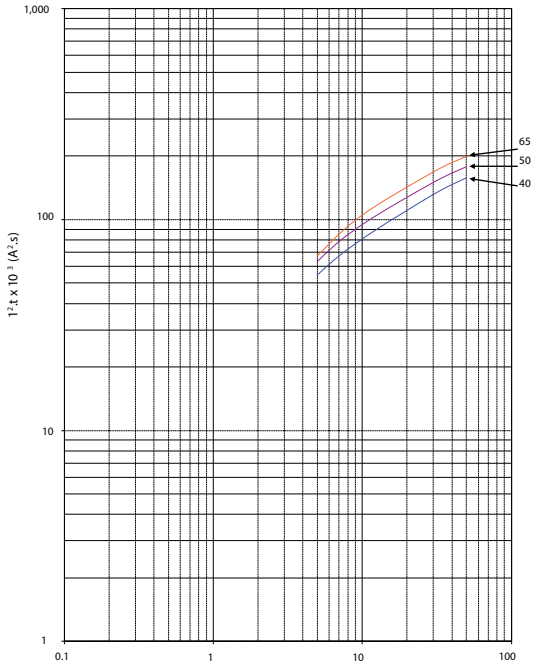


MPE25 I-t diagram



MPE25 Let-through characteristics at 415V





MPE80 Let-through characteristics at 415V

Breaking capacity of motor protective circuit breakers MPE25

Icc = Prospective short-circuit current
Icu = Rated ultimate short-circuit breaking capacity
Ics = Rated service short-circuit breaking capacity

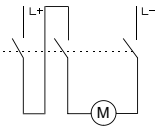
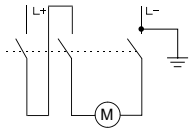
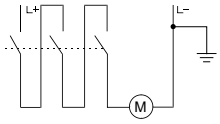
I_u	230V			400V			690V		
	Icu	Ics	max. fuse gG	Icu	Ics	max. fuse gG	Icu	Ics	max. fuse gG
A	kA	kA	A	kA	kA	A	kA	kA	A
0.16	100	100	-	100	100	-	100	100	-
0.25	100	100	-	100	100	-	100	100	-
0.4	100	100	-	100	100	-	100	100	-
0.63	100	100	-	100	100	-	100	100	-
1	100	100	-	100	100	-	100	100	-
1.6	100	100	-	100	100	-	100	100	-
2.5	100	100	-	100	100	-	8	8	25 (1)
4	100	100	-	100	100	-	6	3	32 (1)
6.3	100	100	-	100	100	-	6	3	50 (1)
10	100	100	-	100	100	-	6	3	50 (1)
16	100	100	-	50	25	100 (1)	4	3	63 (1)
20	100	100	-	50	25	125 (1)	4	3	63 (1)
25	100	100	-	50	25	125 (1)	4	3	63 (1)
32	100	100	-	50	25	125 (1)	4	3	63 (1)

Note: (1)Fuse required if the prospective short-circuit current exeeds the rated ultimate short circuit breaking capacity (Icc>Icu)

The MPE 25 switching of direct current

The MPE circuit breakers for alternating current are able to switch direct current. However, you are obliged to observe the maximum permissible DC voltage per conducting path. In case of higher voltages, series connection of 2 or 3 conducting parts is required. The response characteristics of the overload releases remain unchanged. The response thresholds of the short-circuit releases are increased with direct current by approximately 35%.

The following table shows suggestions for switching direct current:

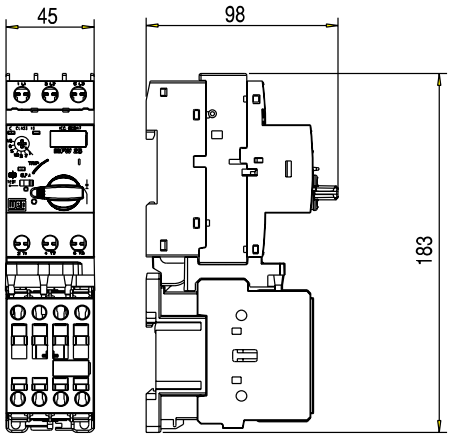
Recommended Connection	Highest Permissible Direct Voltage	Explanation
	150V DC	**2-poles switching** **Ungrounded system** If ground fault can be excluded, or if every ground is immediately corrected (via ground-fault monitoring), the maximum permissible DC voltage can be multiplied by 3
	300V DC	**2-poles switching** **Grounded system** The grounded pole should be assigned to the individual conducting path so that in the event of a ground fault there are always 2 conducting paths in series
	450V DC	**1-pole switching** **Grounded system** 3 conducting paths in series. The grounded pole should be assigned to the unswitched conducting path.

DC short-circuit breaking capacity (time constant <=5ms)

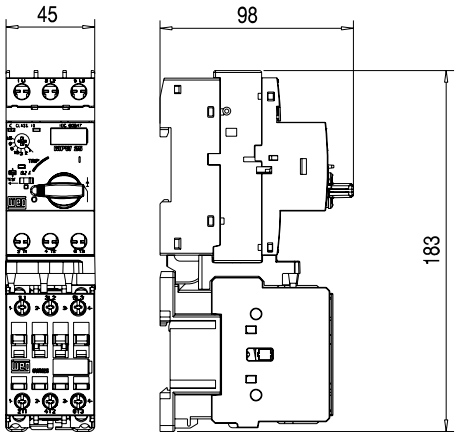
- 1 conducting path DC 150V	10kA
- 2 conducting paths in series DC 350V	10kA
- 3 conducting paths in series DC 350V	10kA

Dimensions

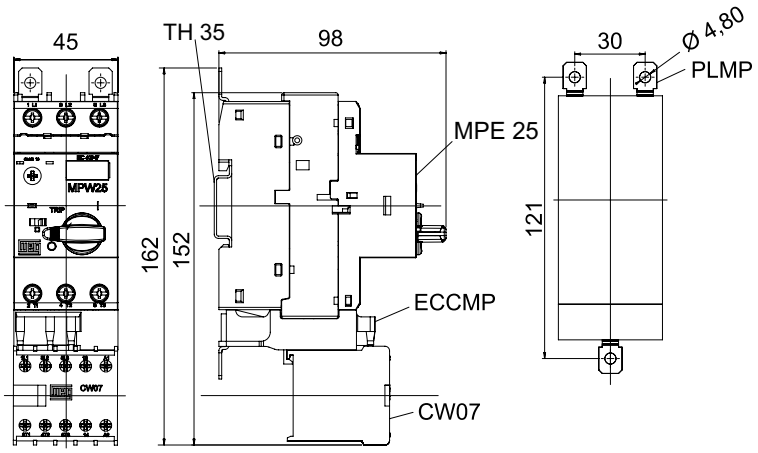
MPE25 + CEM9...CEM18



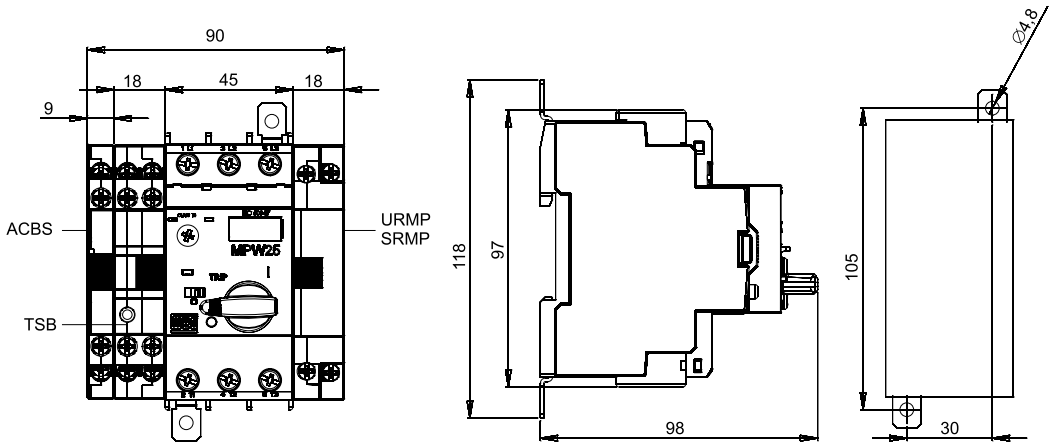
MPE25 + CEM25



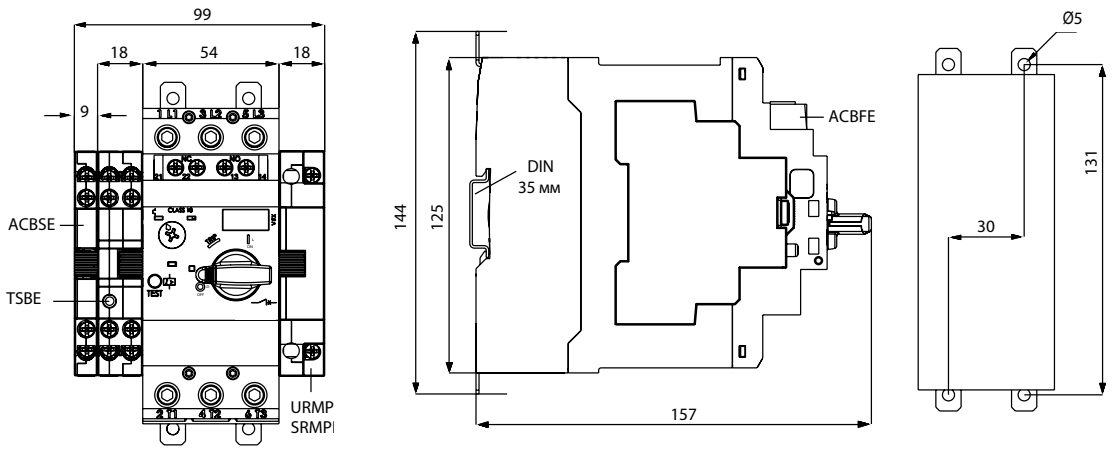
MPE25+ CE07



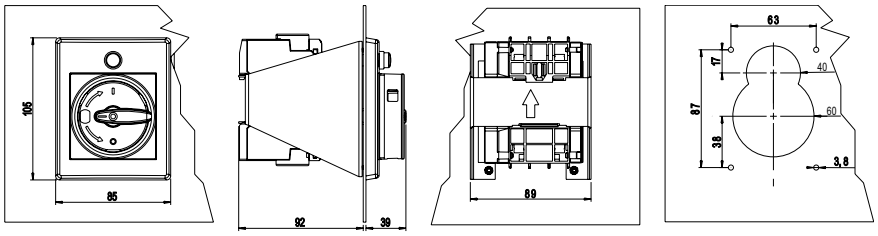
MPE25 + Accessories



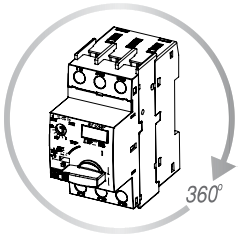
MPE80 + Accessories



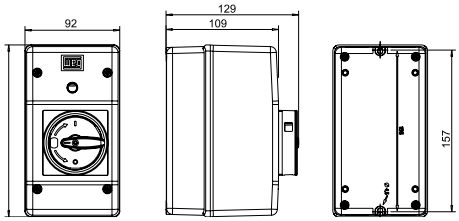
Frontal plate FMEE55E



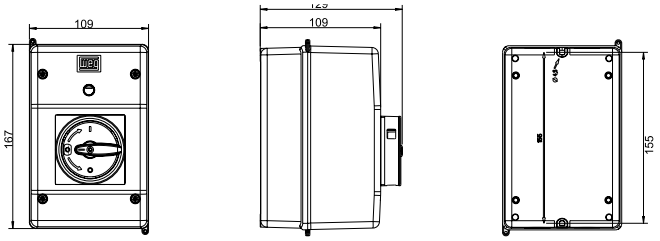
Mounting position



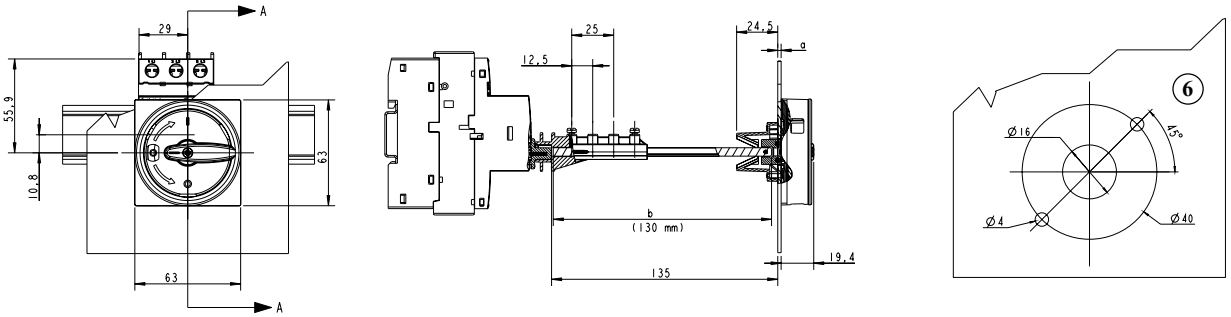
Insulated Enclosure - MPEE55



Insulated Enclosure - MLPEE55



Door coupling rotary handle RMMPE



Motor protective circuit breaker MS25

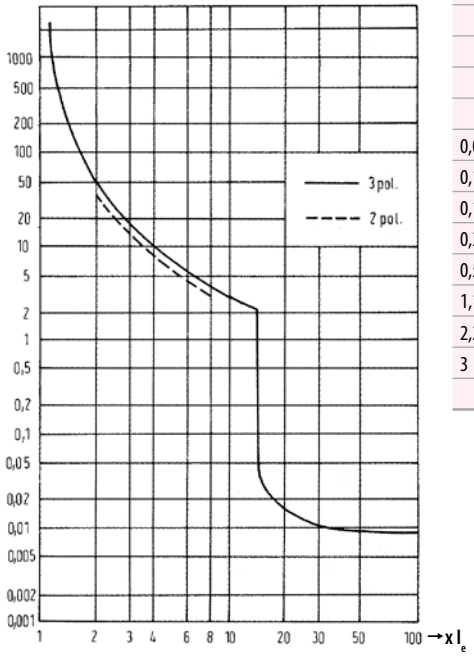
Technical data - General		
Standards		IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204
Climatic class		constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
Degree of protection		IP20, after terminals covering IP20
Ambient temperature	°C	-25 … +60
Storage temperature	°C	-25 … +70
Temperature range of thermal compensation for overload release	°C	-5 … +40
Mechanical and electrical endurance		100,000
Shock resistance acc. to IEC 68-2-27	g	20
Vibration resistance acc. to IEC 68-2-6		5 g - f = 5 … 150 Hz
Overvoltage category / pollution degree		III / 3
Rated insulation voltage Ui	V	690
Rated impulse withstand voltage Uimp	kV	6
Weight	kg	0.252

Technical data - Main circuit			
Designation of connection terminals			1 - L1 ; 3 - L2 ; 5 - L3 ; 2 - T1 ; 4 - T2 ; 6 - T3
Terminal capacity	rigid	S (mm^2)	0.75 … 6
	flexible		0.75 … 4
Screw			with self-lifting clamp, protected against falling out
Screw head			PZ2
Tightening torque		Nm	1,8
Max. operational voltage	Ue	V	690
Setting range		A	0.1 - 0.16 (MS25); 0.16 - 0.25 (MS25); 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 10 - 16; 16 - 20; 20 - 25
No. of poles			3
Operating current of thermal	I		1.05 Ir < I ≤ 1.20 Ir
overload release			Ir. …set value
Sensitivity to phase failure			✓
Operating current of magnetic	I		11 In< I ≤ 13 In ± 20 %
overload release			In…upper setting limit
Power dissipation on pole at load with In	P	W	2 - 2.5
Utilization category	IEC/EN 60947-4-1		AC-3
	IEC/EN 60947-2		A
Trip class acc. to IEC/EN 60947-4-1			10A

MS25 motor protection switches, rated ultimate short-circuit breaking capacity Icu and max. back-up fuses if prospective short-circuit current Icp exceeds Icu:

Type	Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity Icu (kA)				Max. back-up fuse, if Icp > Icu (gL) (A)			
		230 V	400 V	500 V	690 V	230 V	400 V	500 V	690 V
MS 25 - 0,16	2	50	50	50	50	No back-up fuse required			
MS 25 - 0,25	3	50	50	50	50				
MS 25 - 0,4	5	50	50	50	50				
MS 25 - 0,63	8	50	50	50	50				
MS 25 - 1	12	50	50	50	50				
MS 25 - 1,6	20	50	50	50	50				
MS 25 - 2,5	33	50	50	3	2,5			25	20
MS 25 - 4	44	50	50	3	2,5			35	25
MS 25 - 6,3	75	50	50	3	2,5			50	35
MS 25 - 10	120	50	6	3	2,5		80	50	35
MS 25 - 16	160	6	4	2,5	2	80	80	63	35
MS 25 - 20	230	6	4	2,5	2	80	80	63	50
MS 25 - 25	270	6	4	2,5	2	80	80	63	50

Tripping characteristic



Switch selection for motor protection

Standard motor power						Setting range
Single-phase	3-phase					
220 V	220 V	380 V				
230 V	230 V	400 V	440 V	500 V	660 V	
240 V	240 V	415 V			690 V	
kW						A
		0,02			0,06	0,1 ... 0,16
		0,06	0,06	0,06	0,09	0,16 ... 0,25
	0,06	0,09	0,12	0,12	0,18	0,25 ... 0,4
	0,09	0,12	0,18	0,25	0,25	0,4 ... 0,63
0,06 ... 0,09	0,09 ... 0,12	0,18 ... 0,25	0,25	0,37	0,37 ... 0,55	0,61 ... 1
0,12	0,18 ... 0,25	0,37 ... 0,55	0,37 ... 0,55	0,55 ... 0,8	0,75 ...1,1	1 ... 1,6
0,18 ... 0,25	0,37	0,75 ... 1,1	0,75 ... 1,1	1,1	1,5	1,6 ... 2,5
0,37	0,55 ... 0,8	1,1 ... 1,5	1,5	1,5 ... 2,2	2,2 ... 3	2,5 ... 4
0,55 ... 0,75	1,1 ... 1,5	2,2 ... 2,5	2,2 ... 3	3	4	4 ... 6,3
1,1 ... 1,5	1,5 ... 2,5	3 ... 4	4 ... 5	4 ... 5,5	5,5 ... 7,5	6,3 ... 10
2,2	3 ... 4	5 ... 7,5	5,5 ... 9	7,5 ... 9	11	10 ... 16
3	5,5	9	11	11 ... 12,5	15	16 ... 20
	5,5 ... 7,5	11 ... 12,5	12,5	15	18,5	20 ... 25

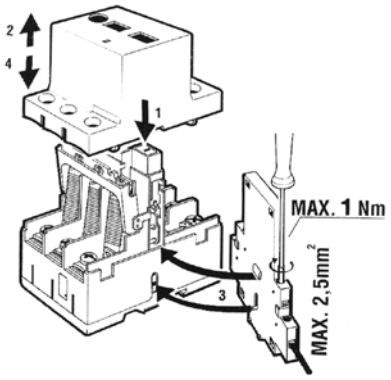
MST25 motor protection switches and max. back-up fuses for short-circuit protection:

Type	Max. back-up fuse Ue <400 V gL (A)
MST 25 - 0,4	1
MST 25 - 0,63	2
MST 25 - 1	2
MST 25 - 1,6	4
MST 25 - 2,5	6
MST 25 - 4	16
MST 25 - 6,3	20
MST 25 - 10	25
MST 25 - 16	35
MST 25 - 20	50
MST 25 - 25	50

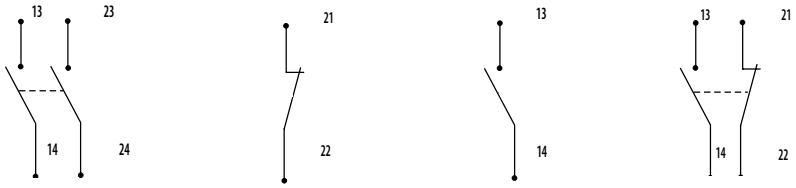
Accessories

Auxiliary switch for lateral mounting PS		
Rated insulation voltage U_i	V	500V
Thermal current I_{th}	A	6 A
Rated operational current at AC-15 230V/400V/500V I_e	A	3,5 A /2 A /1,5 A
Terminal capacity	mm^2	0,75 - 2,5 mm^2
Tightening torque	Nm	1

PS mounting

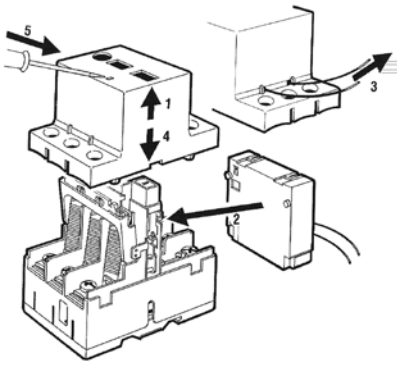


PS desigantion of contacts



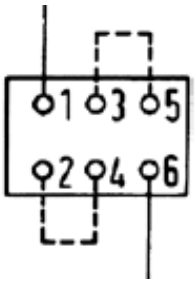
Under-voltage release U Shunt release A		
Control voltages Uc	V	220 - 240
Rated frequency f	Hz	50 - 60

Mounting of UV and shunt release

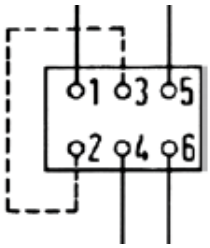


Connection diagram

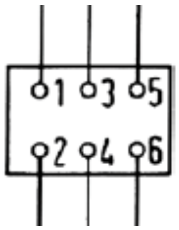
1-p



2-p

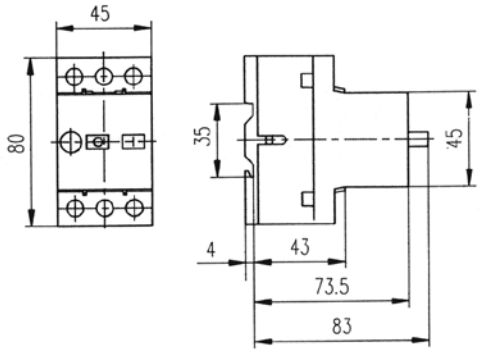


3-p

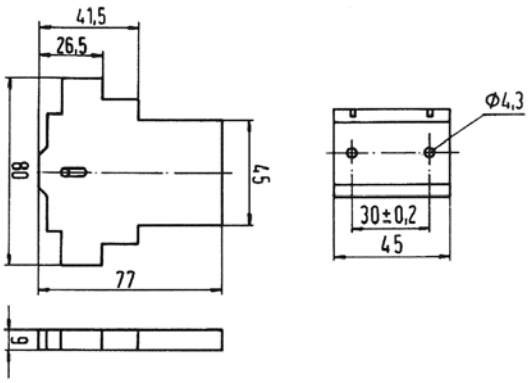


Dimensions

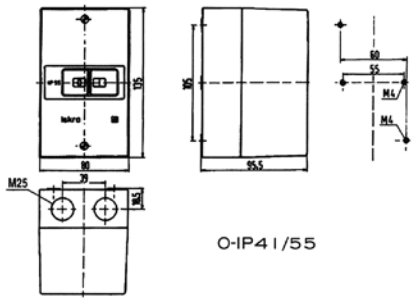
MS25, MST25



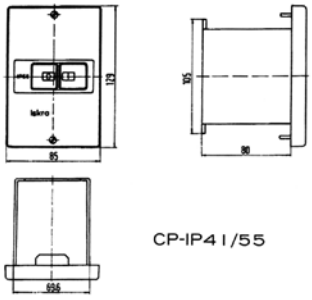
Auxiliary switch PS



Insulated Enclosure O,
Front plate CP



O-IP41/55



CP-IP41/55

CP

Three-phase capacitors 368

Capacitor duty contactors CEM_CN 378

Digital power factor controllers 381

Three-phase harmonic filters 385

Reactive Power Compensation Components

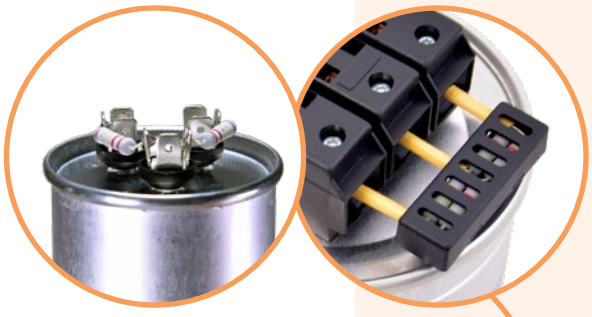


ETI Power needs control

Three phase low voltage power capacitors LPC

LPC 1..5 kVAr

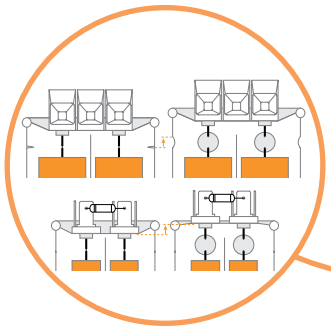
LPC 10..50 kVAr



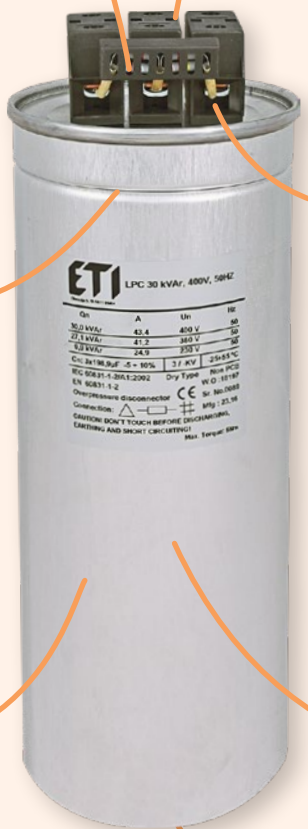
→ Equipped with discharge resistors (Discharge time ≤ 3 minutes to 75 V)

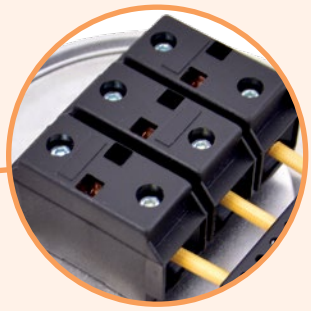


→ Capacitors 1 ... 5 kVar connected with a double FASTON connector Included protection cover for electrical parts)



→ Overpressure disconnection system





→ 10 ... 50 kVar capacitor terminals with universal screws (for slot "flat" screwdriver + Allen key "Imbus")



→Vertical use only



→ rated power range: 1kVAr to 50kVAr

→ Rated voltage range: 400, 440 460, 480, 525 V



→ Ground fixation with thread, for vertical use only.

Rated voltage: 400-525V, 50Hz (60Hz uppon request) Rated power: 1-50kVAr

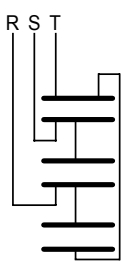
APPLICATION

The LPC capacitors are used for reactive power factor correction of inductive consumers (transformers, electric motors, rectifiers, fluorescent lamps and many others in industrial networks) individually or assembled into automatic capacitor banks.

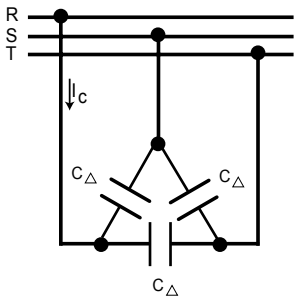
DESCRIPTION

LPC capacitors are manufactured with low loss metallized self-healing polypropylene film. Dry type capacitors are filled with a non-toxic an ecological polyurethane resin, this resin provides an excellent heat dissipation properties. This capacitors are mounted in aluminium housing with overpressure disconnection system. Two types of connectors, faston connector for capacitors with rated power up to 5kVAr, for higher values above 5kVAr screw terminal type.





DELTA CONNECTION



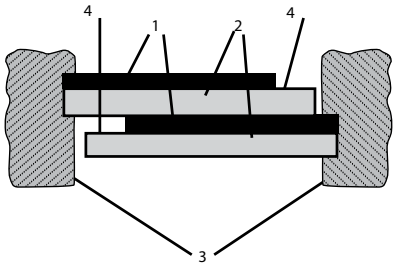
FEATURES:

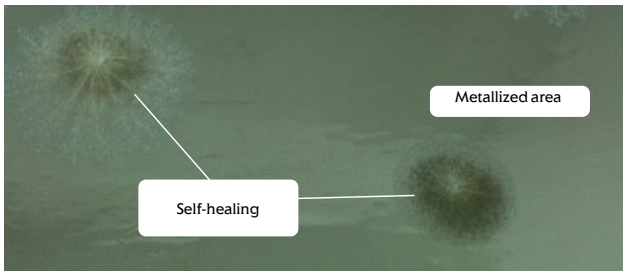
Self healing

Depending on the values of the constants of every dielectric, there is a limit potential difference, which all materials can manage throughout the thickness. This limit is defined as dielectric strength. Because of determined electric-power system conditions or extreme temperatures, inadmissible for the correct working of the capacitor, this voltage limit can be exceeded. Thus, the dielectric can break down and an electric arc will be formed between the plates.

The propylene film self-healing means that the electric arc will not generate a short circuit, but will evaporate the metal which surrounds the breakthrough point. This way, the isolation between plates is repaired in the latter breakthrough point. After this self-healing, the capacitor can work in normal conditions, with a capacitance leak inferior to 100 pF.

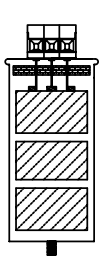
1 Electrodes (Metallized Film)
2 Prolypylene Film (Dielectric)
3 Electric connection
4 No metallized area

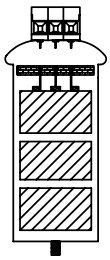




Overpressure disconnection system

In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. capacitors have been designed with an overpressure disconnection system. When the terminal cover expands, the internal connections are interrupted and disconnecting the capacitor.

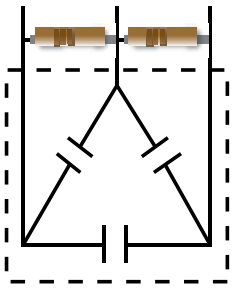




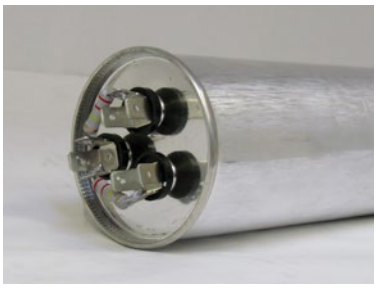


Discharge resistor

When handling a capacitor, there is a need of taking into account a series of security precautions. When a capacitor is disconnected off the voltage, it remains charged with the supply voltage. If the plates are shorten and touched, they can cause a dangerous accident due to the violent discharge of the capacitor. Three-phase capacitors must also be equipped with a discharge resistor, which can discharge voltage until its maximum value is 75V in an interval of 3 minutes as demanded by standard EN-60831-1/2. ETI's LPC capacitors already have discharge resistors, which ensure that this time is less than 2 minutes. It is therefore recommended that the reconnection time on the PFC controller should not be less than 120s. Except in case of using extra discharge resistors (page 375).



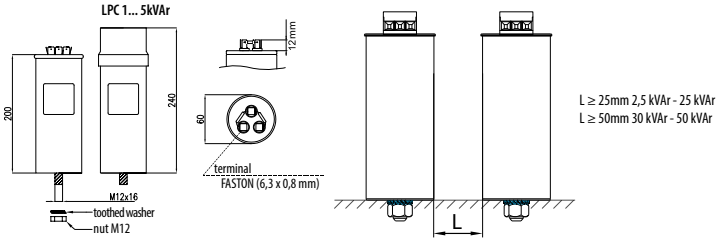




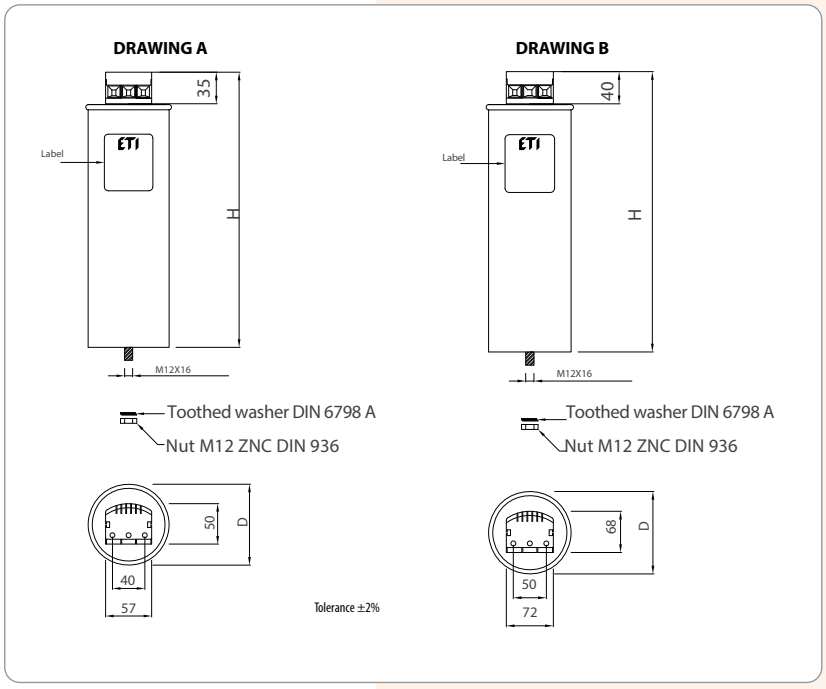
$$U_{(t)} = U_o e^{\frac{-t}{RC}}$$

Three phase low voltage power capacitors LPC

Rated voltage at 50Hz	Code No.	Type	Rated Power [kVAr]	Rated capacitance [uF]	Rated current [A]	D (diameter) x H (Height) [mm]	Terminal type	Weight [kg]	Packaging [pcs]
400	004656700	LPC 1 kVAr, 400V, 50Hz	1	3x 6,6	1,4	60x240	Faston	0,75	1
400	004656701	LPC 1.5 kVAr, 400V, 50Hz	1,5	3x 9,9	2,2		Faston	0,75	1
400	004656702	LPC 2.5 kVAr, 400V, 50Hz	2,5	3x 16,6	3,6		Faston	0,75	1
400	004656703	LPC 3 kVAr, 400V, 50Hz	3	3x 19,9	4,3		Faston	0,75	1
400	004656704	LPC 4 kVAr, 400V, 50Hz	4	3x 26,5	5,8		Faston	0,75	1
400	004656705	LPC 5 kVAr, 400V, 50Hz	5	3x 33,2	7,2		Faston	0,75	1
440	004656710	LPC 2.5 kVAr, 440V, 50Hz	2,5	3x 13,7	3,3		Faston	0,75	1
440	004656711	LPC 3 kVAr, 440V, 50Hz	3	3x 16,4	3,9		Faston	0,75	1
440	004656712	LPC 4 kVAr, 440V, 50Hz	4	3x 21,9	5,2		Faston	0,75	1
440	004656713	LPC 5 kVAr, 440V, 50Hz	5	3x 27,4	6,6		Faston	0,75	1
460	004656720	LPC 2.5 kVAr, 460V, 50Hz	2,5	3x 12,5	3,1		Faston	0,75	1
460	004656721	LPC 3 kVAr, 460V, 50Hz	3	3x 15,0	3,8		Faston	0,75	1
460	004656722	LPC 4 kVAr, 460V, 50Hz	4	3x 20,1	5,0		Faston	0,75	1
460	004656723	LPC 5 kVAr, 460V, 50Hz	5	3x 25,1	6,3		Faston	0,75	1
480	004656730	LPC 2.5 kVAr, 480V, 50Hz	2,5	3x 11,5	3,0		Faston	0,75	1
480	004656731	LPC 3 kVAr, 480V, 50Hz	3	3x 13,8	3,6		Faston	0,75	1
480	004656732	LPC 4 kVAr, 480V, 50Hz	4	3x 18,4	4,8		Faston	0,75	1
480	004656733	LPC 5 kVAr, 480V, 50Hz	5	3x 23,0	6,0		Faston	0,75	1
525	004656740	LPC 2.5 kVAr, 525V, 50Hz	2,5	3x 9,6	2,7		Faston	0,75	1
525	004656741	LPC 3 kVAr, 525V, 50Hz	3	3x 11,5	3,3		Faston	0,75	1
525	004656742	LPC 4 kVAr, 525V, 50Hz	4	3x 15,4	4,4		Faston	0,75	1
525	004656743	LPC 5 kVAr, 525V, 50Hz	5	3x 19,2	5,5		Faston	0,75	1





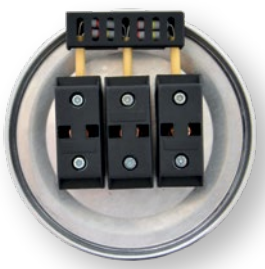


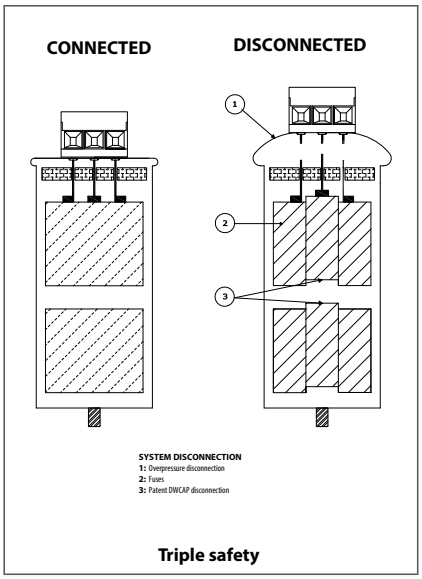


Three phase low voltage power capacitors LPC

Rated voltage at 50Hz	Code No.	Type	Rated Power [kVAr]	Rated capacitance [uF]	Rated current [A]	D (diameter) x H (Height) [mm]	Terminal type	Weight [kg]	Packaging [pcs]
400	004656750	LPC 10 kVAr, 400V, 50Hz	10	3x 66,3	14,4	85x260	Screw terminal	1,6	1
400	004656751	LPC 12.5 kVAr, 400V, 50Hz	12,5	3x 82,9	18,0	100x345	Screw terminal	2,2	1
400	004656752	LPC 15 kVAr, 400V, 50Hz	15	3x 99,5	21,7	100x345	Screw terminal	2,2	1
400	004656753	LPC 20 kVAr, 400V, 50Hz	20	3x 132,6	28,9	100x345	Screw terminal	2,2	1
400	004656754	LPC 25 kVAr, 400V, 50Hz	25	3x 165,8	36,1	120x345	Screw terminal	2,9	1
400	004656755	LPC 30 kVAr, 400V, 50Hz	30	3x 198,9	43,3	120x345	Screw terminal	3,9	1
400	004656756	LPC 40 kVAr, 400V, 50Hz	40	3x 265,3	57,7	136x345	Screw terminal	5,1	1
400	004656757	LPC 50 kVAr, 400V, 50Hz	50	3x 331,6	72,2	136x345	Screw terminal	5,1	1
440	004656760	LPC 10 kVAr, 440V, 50Hz	10	3x 54,8	13,1	85x260	Screw terminal	1,6	1
440	004656761	LPC 12.5 kVAr, 440V, 50Hz	12,5	3x 68,5	16,4	100x345	Screw terminal	2,2	1
440	004656762	LPC 15 kVAr, 440V, 50Hz	15	3x 82,2	19,7	100x345	Screw terminal	2,2	1
440	004656763	LPC 20 kVAr, 440V, 50Hz	20	3x 109,6	26,2	100x310	Screw terminal	2,9	1
440	004656764	LPC 25 kVAr, 440V, 50Hz	25	3x 137,0	32,8	100x310	Screw terminal	2,9	1
440	004656765	LPC 30 kVAr, 440V, 50Hz	30	3x 164,4	39,4	120x345	Screw terminal	3,9	1
440	004656766	LPC 40 kVAr, 440V, 50Hz	40	3x 219,2	52,5	136x345	Screw terminal	5,1	1
440	004656767	LPC 50 kVAr, 440V, 50Hz	50	3x 274,0	65,6	136x345	Screw terminal	5,1	1
460	004656770	LPC 10 kVAr, 460V, 50Hz	10	3x 50,1	12,6	85x260	Screw terminal	1,6	1
460	004656771	LPC 12.5 kVAr, 460V, 50Hz	12,5	3x 62,7	15,7	100x345	Screw terminal	2,2	1
460	004656772	LPC 15 kVAr, 460V, 50Hz	15	3x 75,2	18,8	100x345	Screw terminal	2,2	1
460	004656773	LPC 20 kVAr, 460V, 50Hz	20	3x 100,3	25,1	100x310	Screw terminal	2,9	1
460	004656774	LPC 25 kVAr, 460V, 50Hz	25	3x 125,4	31,4	100x310	Screw terminal	2,9	1
460	004656775	LPC 30 kVAr, 460V, 50Hz	30	3x 150,4	37,7	120x345	Screw terminal	3,9	1
460	004656776	LPC 30.8 kVAr, 460V, 50Hz	30,8	3x 154,4	38,7	120x345	Screw terminal	3,9	1
460	004656777	LPC 40 kVAr, 460V, 50Hz	40	3x 200,6	50,2	136x345	Screw terminal	5,1	1
460	004656778	LPC 50 kVAr, 460V, 50Hz	50	3x 250,7	62,8	136x345	Screw terminal	5,1	1
480	004656780	LPC 10 kVAr, 480V, 50Hz	10	3x 46,1	12,0	85x260	Screw terminal	1,6	1
480	004656781	LPC 12.5kVAr, 480V, 50Hz	12,5	3x 57,6	15,0	100x345	Screw terminal	2,2	1
480	004656782	LPC 15 kVAr, 480V, 50Hz	15	3x 69,1	18,0	100x345	Screw terminal	2,2	1
480	004656783	LPC 20 kVAr, 480V, 50Hz	20	3x 92,1	24,1	100x310	Screw terminal	2,9	1
480	004656784	LPC 25 kVAr, 480V, 50Hz	25	3x 115,1	30,1	120x345	Screw terminal	3,9	1
480	004656785	LPC 30 kVAr, 480V, 50Hz	30	3x 138,2	36,1	120x345	Screw terminal	3,9	1
480	004656786	LPC 40 kVAr, 480V, 50Hz	40	3x 184,2	48,1	136x345	Screw terminal	5,1	1
480	004656787	LPC 50 kVAr, 480V, 50Hz	50	3x 230,3	60,1	136x345	Screw terminal	5,1	1
525	004656790	LPC 10 kVAr, 525V, 50Hz	10	3x 38,5	11,0	85x260	Screw terminal	1,6	1
525	004656791	LPC 12.5kVAr, 525V, 50Hz	12,5	3x 48,1	13,7	100x345	Screw terminal	2,2	1
525	004656792	LPC 15 kVAr, 525V, 50Hz	15	3x 57,7	16,5	100x345	Screw terminal	2,2	1
525	004656793	LPC 20 kVAr, 525V, 50Hz	20	3x 77,0	22,0	100x310	Screw terminal	2,9	1
525	004656794	LPC 25 kVAr, 525V, 50Hz	25	3x 96,2	27,5	100x310	Screw terminal	2,9	1
525	004656795	LPC 30 kVAr, 525V, 50Hz	30	3x 115,5	33,0	120x345	Screw terminal	3,9	1
525	004656796	LPC 40 kVAr, 525V, 50Hz	40	3x 154,0	44,0	136x345	Screw terminal	5,1	1
525	004656797	LPC 50 kVAr, 525V, 50Hz	50	3x 192,5	55,0	136x345	Screw terminal	5,1	1







Triple safety

Temperature (IEC 60831-1/2)

Symbol	Ambient temperature °C		
	Maximum	Highest mean over any period of	
		24h	1 year
A	40	30	20
B	45	35	25
C	50	40	30
D	55	45	35

Dimensions

Dimensions	Connection terminal	DRAWING
DxH (mm)	Max. cable section 1 kV-RV (mm²)	
70x260	10	DRAWING A
85x260	10	
100x260	10	
120x265	35	DRAWING B
136x265	35	

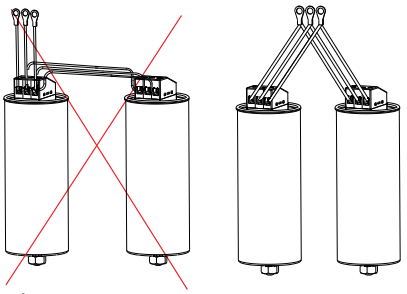
Technical data			
Standards	IEC 60831-1/2 EN 60831-1/2		
Capacitance tolerance	-5% +10%		
Frequency	50Hz (60Hz upon request)		
Temperature range	-25°C ... +55°C*		
Dielectric losses	≤0.2 W/kVAr		
Total losses	≤0.45 W/kVAr		
Maximum over voltage	1,1 x Un		
Maximum over current	1,5 x In		
Max. THD in voltage	2%		
Max. THD in current	25%		
Discharge resistance	Incorporated; ≤ 2 min to 75V		
Connection	Delta		
Casing	Aluminium case		
Disconnection system	Overpressure		
Dielectric	Metalized polypropylene film, self-healing		
Voltage test between terminals	2,15 x Un 2 sec.		
Voltage test terminals to case	3kV for 10 second. AC		
Terminal type	Connector		
Inrush current	200 x In		
Protection	IP 20, indoor mounting		
Humidity	max 95%		
Expected	120.000 Hrs. (Temp. level C)		
Altitude	Max. 2000 above sea level		
Screw terminal Tightening torque	≤ 20 kVAr 100Ncm ≥ 25kVAr 250Ncm		
Ambient temperature °C	Max	Highest mean over any period of	
		24h	1 year
	55	45	35

*Special declaration for lower temperature (-40°C) available on request

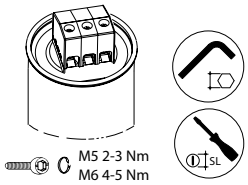
Cable cross section

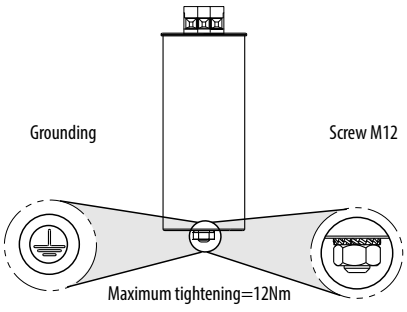
Q_N (kVAr)	Un 400V, 50Hz		Terminal	Connection
	I_N (A)	(mm², Cu)		
2,5	3,6	2,5		
5	7,4	2,5		
7,5	10,8	2,5		
10	14,4	4,0		
12,5	18,1	6,0		
15	21,6	6,0		
20	29,0	10,0		
25	36,0	10,0		
30	43,0	16,0		
40	58,0	25,0		
50	72,0	35,0		

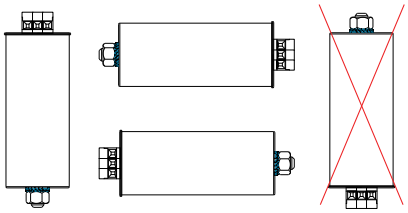
Cross – section values of the connection wires shown in the table are approximate and they are valid for normal operation conditions due to technical characteristics of the equipment.



⚠ ATTENTION! Parallel interconnection of two or more capacitors through the same terminals is prohibited.







Three phase low voltage power capacitors LPC with double winding

Advantages:
- Extra low size capacitors
- Triple safety
- Patented technology

Characteristics and utility:
- Three phase capacitor dual winding internally delta connected
- Discharge resistors incorporated
- Reactive power factor correction
- Dry type
- Connector type terminal
- Indoor mounting

Triple safety:
- Overpressure disconnection system
- Protection by internal fuses
- DWCAP system (patented) internal windings displacement

Construction and materials:
- Low losses metallized self-healing polypropylene film, high density, high temperature and greater dielectric resistance volt/µ
- Polyurethane self-extinguishing resin V0, developed under standard UL94
- Aluminium case with botton fixing M12x16

Standards:
- IEC 60831-1/2
- EN 60831-1/2

Certifications:

AENOR Certified Product B78/000001

CERTIFIED AND PATENTED PRODUCT • DWCAP Series

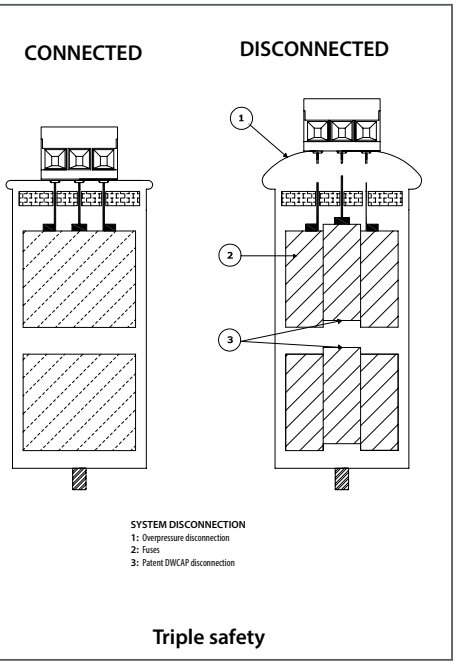
Three phase low voltage power capacitors LPC with double winding

Rated voltage at 50Hz	Code No.	Type	Rated Power [kVAr]	Rated capacitance [uF]	Rated current [A]	D (diameter) x H (Height) [mm]	Terminal type	Weight [kg]	Packaging [pcs]
400V	004656850	LPC-DW 7.5 kVAr, 400V, 50Hz	7,5	3x 49,74	10,83	70 x 260		1,1	1
400V	004656851	LPC-DW 10 kVAr, 400V, 50Hz	10	3x 66,31	14,43	85 x 260		1,62	1
400V	004656852	LPC-DW 12.5 kVAr, 400V, 50Hz	12,5	3x 82,89	18,04	85 x 260		1,62	1
400V	004656853	LPC-DW 15 kVAr, 400V, 50Hz	15	3x 99,47	21,65	100 x 260		2,11	1
400V	004656854	LPC-DW 20 kVAr, 400V, 50Hz	20	3x 132,63	28,87	120 x 265		3,23	1
400V	004656855	LPC-DW 25 kVAr, 400V, 50Hz	25	3x 165,79	36,08	120 x 265		3,13	1
400V	004656856	LPC-DW 30 kVAr, 400V, 50Hz	30	3x 198,94	43,3	136 x 265		4,01	1
400V	004656857	LPC-DW 35 kVAr, 400V, 50Hz	35	3x 232	50,5	136 x 265		4,2	1
400V	004656867	LPC-DW 40 kVAr, 400V, 50Hz	40	3x 265	57,7	136 x 265	Screw terminal	4,2	1
440V	004656858	LPC-DW 7.5 kVAr, 440V, 50Hz	7,5	3x 41,1	9,84	70x260		1,2	1
440V	004656859	LPC-DW 10 kVAr, 440V, 50Hz	10	3x 54,81	13,12	70x260		1,1	1
440V	004656860	LPC-DW 12.5 kVAr, 440V, 50Hz	12,5	3x 68,51	16,4	85x260		1,6	1
440V	004656861	LPC-DW 15 kVAr, 440V, 50Hz	15	3x 82,21	19,68	85x260		1,6	1
440V	004656862	LPC-DW 20 kVAr, 440V, 50Hz	20	3x 109,61	26,24	100x260		2,08	1
440V	004656863	LPC-DW 25 kVAr, 440V, 50Hz	25	3x 137,01	32,8	120x265		3,21	1
440V	004656864	LPC-DW 30 kVAr, 440V, 50Hz	30	3x 164,42	39,36	120x265		4,07	1
440V	004656865	LPC-DW 35 kVAr, 440V, 50Hz	35	3x 191,82	45,93	136x265		4,11	1
440V	004656866	LPC-DW 40 kVAr, 440V, 50Hz	40	3x 219,22	52,49	136x265		4	1









Triple safety

Temperature (IEC 60831-1/2)

Symbol	Ambient temperature °C		
	Maximum	Highest mean over any period of	
		24h	1 year
A	40	30	20
B	45	35	25
C	50	40	30
D	55	45	35

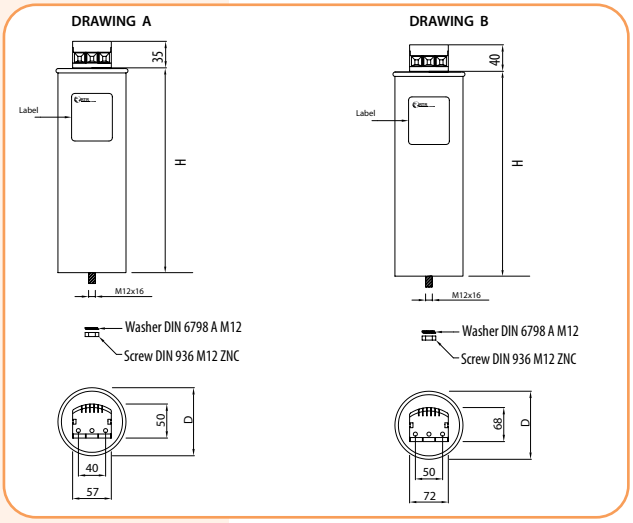
Dimensions

Dimensions	Connection terminal	DRAWING
D x H (mm²)	Max. cable section 1 kV-RV (mm²)	
70x230	10	DRAWING A
85x230	10	
100x230	10	
120x230	35	DRAWING B
136x230	35	

Three Phase Capacitors

Technical data			
Standards	IEC 60831-1/2 EN 60831-1/2		
Capacitance tolerance	-5% +10%		
Frequency	50Hz (60Hz upon request)		
Temperature range	-25°C ... +55°C*		
Dielectric losses	≤0.2 W/kVAr		
Total losses	≤0.45 W/kVAr		
Maximum over voltage	8 h/day: 1,10 x Un 30 min/day: 1,15 x Un 5 min/day: 1,20 x Un 1 min/day: 1,30 x Un		
Maximum over current	1,5 x In		
Max. THD in voltage	2%		
Max. THD in current	25%		
Discharge resistance	Incorporated		
Connection	Delta		
Voltage test between terminals	2,15 x Un 2 sec.		
Voltage test terminals to case	3kV for 10 second. AC		
Inrush current	≤ 200 x In		
Protection	IP 20		
Humidity	max. 95%		
Expected	100.000 Hrs. (Temp. level D) 120.000 Hrs. (Temp. level C)		
Altitude	Max. 2000 above sea level		
Mounting position	Universal		
Ambient temperature °C	max.	Highest mean over any period of	
		24h	1 year
	55	45	35

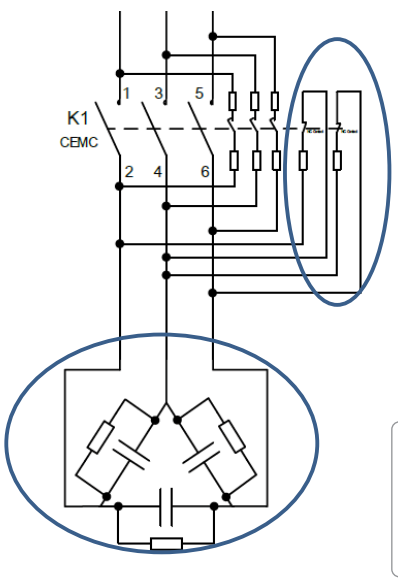
*without resistors



Extra discharge resistors for fast and secure discharge of capacitors

Set of 2 extra discharge resistors for fast and secure discharge of capacitors					
Type	Code No.	Resistance [ohm]	Power [W]	Weight [g]	Packaging [pcs]
LPC EDR 1K8, 10W	004656798	1K8	10	30	200

To connect extra discharge resistors, 2 auxiliary contacts NC on capacitor duty contactor must be used



Extra discharge resistors 1K8 10W with auxiliary NC contacts (capacitor empty in less then 5s)

Integrated discharge resistors already included with capacitor for slow discharge (≤2min to 75V demand by IEC 60831 - 1/2)



Individual Power Factor Correction for Low Voltage Motors

Rated motor power [kW]	Power rating of capacitor in (kvar) with respect to motor power, speed of rotation and load									
	3000 r / min		1500 r/min		1000 r/min		750 r/min		500 r/min	
	No load(kVAr)	Full load (kVAr)	No load(kVAr)	Full load (kVAr)	No load(kVAr)	Full load (kVAr)	No load(kVAr)	Full load (kVAr)	No load(kVAr)	Full load (kVAr)
5,5	2,2	2,9	2,4	3,3	2,7	3,6	3,2	4,3	4	5,2
7,5	3,4	4,4	3,6	4,8	4,1	5,4	4,6	6,1	5,5	7,2
11	5	6,5	5,5	7,2	6	8	7	9	7,5	10
15	6,5	8,5	7	9,5	8	10	9	12	10	13
18,5	8	11	9	12	10	13	11	15	12	16
22	10	12,5	11	13,5	12	15	13	16	15	19
30	14	18	15	20	17	22	22	25	22	28
37	18	24	20	27	22	30	26	34	29	39
45	19	28	21	31	24	34	28	38	31	43
55	22	34	25	37	28	41	32	46	36	52
75	28	45	32	49	37	54	41	60	45	68
90	34	54	39	59	44	65	49	72	54	83
110	40	64	46	70	52	76	58	85	63	98
132	45	72	53	80	60	87	67	97	75	110
160	54	86	64	96	72	103	81	116	91	132
200	66	103	77	115	87	125	97	140	110	160
250	75	115	85	125	95	137	105	150	120	175

It is useful to compensate rarely switched low voltage motors with a fixed connected capacitor due to technical and cost reasons.

Description - The required capacitor power is calculated with the following formula:
$Q_n = 0,9 \cdot U_n \cdot I_{mag} \cdot \sqrt{3}$
where:
Q_n - capacitor power (VAr)
U_n - rated voltage (V)
I_{mag} - motor magnetising current (A)

Quick discharging with a bigger capacitor can cause self-excitation. If quick discharging of the motor is not possible, the motor can compensate itself according to the actual consumption of reactive power.

Capacitor power versus working voltage

Capacitor working power depends on working voltage

$$(U_e / U_n)^2 \cdot Q_c = Q_f$$

where:
U_e - mains voltage;
U_n - capacitor rated voltage
Q_c - capacitor power at rated voltage
Q_f - capacitor actual power

Rated voltage	Rated capacity (µF)	Rated Power (kVAr) at $U_n = 380$ V	Rated Power (kVAr) at $U_n = 400$ V	Rated Power (kVAr) at $U_n = 420$ V	Rated Power(kVAr) at $U_n = 440$ V
400 V 50 Hz	3 x 16,6	2,3	2,5	-	-
	3 x 19,9	2,7	3	-	-
	3 x 26,5	3,6	4	-	-
	3 x 33,2	4,5	5	-	-
	3 x 66,3	9,0	10	-	-
	3 x 83,3	11,3	12,5	-	-
	3 x 100	13,6	15	-	-
	3 x 133,0	18,1	20	-	-
	3 x 165,8	22,6	25	-	-
	3 x 198,9	27,1	30	-	-
440 V 50 Hz	3 x 13,7	1,9	2,1	2,3	2,5
	3 x 16,5	2,2	2,5	2,7	3
	3 x 21,9	3,0	3,3	3,6	4
	3 x 27,4	3,7	4,1	4,6	5
	3 x 54,9	7,5	8,3	9,1	10
	3 x 68,6	9,3	10,3	11,4	12,5
	3 x 82,3	11,2	12,4	13,7	15
	3 x 110,0	14,9	16,5	18,2	20
	3 x 137,1	18,6	20,7	22,8	25
	3 x 164,4	22,4	24,8	27,3	30

Table definition of reactive power capacitor bank (kVAr), necessary to achieve a desired cos φ

The value of factor K read from table should be multiplied with the value of active power to determine kVAr required for power factor correction.

Capacitive reactive power is calculated by formula:

$$Q_c = P \cdot K$$

P – real power of the load
$\cos \varphi_0$ – $\cos \varphi$ the system without power factor correction
$\cos \varphi_1$ – required $\cos \varphi$ achieved with power factor correction
Q_c – reactive power of compensation system
K – factor read from table defined by $\cos \varphi_0$ and $\cos \varphi_1$ (see table bellow)

Existing power factor	Required power factor $\cos \varphi_1$												
$\cos \varphi_0$	0,7	0,75	0,8	0,82	0,84	0,86	0,88	0,9	0,92	0,94	0,96	0,98	1,00
0,5	0,71	0,85	0,98	1,03	1,09	1,14	1,19	1,25	1,31	1,37	1,44	1,53	1,73
0,52	0,62	0,76	0,89	0,94	1	1,05	1,1	1,16	1,22	1,28	1,35	1,44	1,64
0,54	0,54	0,68	0,81	0,86	0,91	0,97	1,02	1,07	1,13	1,2	1,27	1,36	1,56
0,56	0,46	0,6	0,73	0,78	0,83	0,89	0,94	1	1,05	1,12	1,19	1,28	1,48
0,58	0,38	0,52	0,65	0,71	0,76	0,81	0,86	0,92	0,98	1,04	1,11	1,2	1,4
0,6	0,31	0,45	0,58	0,64	0,69	0,74	0,79	0,85	0,91	0,97	1,04	1,13	1,33
0,62	0,25	0,38	0,52	0,57	0,62	0,67	0,73	0,78	0,84	0,9	0,97	1,06	1,27
0,64	0,18	0,32	0,45	0,5	0,55	0,61	0,66	0,72	0,77	0,84	0,91	1	1,2
0,66	0,12	0,26	0,39	0,44	0,49	0,54	0,6	0,65	0,71	0,78	0,85	0,94	1,14
0,68	0,06	0,2	0,33	0,38	0,43	0,48	0,54	0,59	0,65	0,72	0,79	0,88	1,08
0,7		0,14	0,27	0,32	0,37	0,43	0,48	0,54	0,59	0,66	0,73	0,82	1,02
0,72		0,08	0,21	0,27	0,32	0,37	0,42	0,48	0,54	0,6	0,67	0,76	0,96
0,74		0,03	0,16	0,21	0,26	0,32	0,37	0,42	0,48	0,55	0,62	0,71	0,91
0,76			0,11	0,16	0,21	0,26	0,32	0,37	0,43	0,49	0,56	0,65	0,86
0,78			0,05	0,1	0,16	0,21	0,26	0,32	0,38	0,44	0,51	0,6	0,8
0,8				0,05	0,1	0,16	0,21	0,27	0,32	0,39	0,46	0,55	0,75
0,82					0,05	0,1	0,16	0,21	0,27	0,34	0,41	0,49	0,7
0,84						0,05	0,11	0,16	0,22	0,28	0,35	0,44	0,65
0,86							0,05	0,11	0,17	0,23	0,3	0,39	0,59
0,88								0,06	0,11	0,18	0,25	0,34	0,54
0,9									0,06	0,12	0,19	0,28	0,48
0,92										0,06	0,13	0,22	0,43
0,94											0,07	0,16	0,36

Calculations

Three-phase capacitor power:

$$Q_c = C \cdot 3 \cdot V^2 \cdot 2 \cdot \pi \cdot f_n$$

Example: 3 x 331.5µF at 400V/50Hz
$0.0003315 \cdot 3 \cdot 400^2 \cdot 314.16 = 50$ kVAr

The resonant frequency (fr) and filtering factor (p) in systems with compensation filters:

$$f_r = f_n \cdot \sqrt{\frac{1}{p}} \quad \text{or} \quad p = \left(\frac{f_n}{f_r}\right)^2$$

Example: for p = 0.07 at 50 Hz; fr = 189 Hz

The calculation of the power factor $\cos \varphi$:

$$\cos \varphi = \frac{P}{S} \quad \text{or} \quad \cos \varphi = \sqrt{\frac{1}{1 + \tan \varphi^2}} \quad \text{or} \quad \cos \varphi = \sqrt{\frac{1}{1 + \left(\frac{Q}{P}\right)^2}}$$

Fuse selection (gG):
In=1,6*I
For Umain=400V, Un=min. 690V

Three-phase capacitor power with detuning reactor in series

$$Q_c = \frac{C \cdot 3 \cdot V^2 \cdot 2 \cdot \pi \cdot f_n}{1 - p}$$

Example: 3 x 331.5µF at 400V/50Hz at p = 7%
$0.0003315 \cdot 3 \cdot 400^2 \cdot 314.16 \,/\, 1 - 0.07 = 53.8$ kVAr

Phase current of capacitor:

$$I = \frac{Q_c}{V \cdot \sqrt{3}} \quad \text{or} \quad Q_c = I \cdot V \cdot \sqrt{3}$$

Example: 25 kVAr at 400V
25000 / (400 · 1.73) = 36 A

Example: Qc=25kVAr, Umain=400V.
In=1,6*36 = 57,6 => 63A , Un=690V, gG fuse.

V = Rated voltage (V)
I = Rated current (A)
fn = Line frequency (Hz)
fr = Resonance frequency (Hz)
p = Filtering factor
Qc= Capacitor power (VAr)
C = Capacitance (F, farad)
P = Active power (W)
S = Apparent power (VA)
Q = Reactive Power (VAr)
In = Rated current of fuse (A)
Un= Rated voltage of fuse (V)

Contactors for capacitor banks CEM CN



CEM 25CN



CEM 32CN



CEM 50CN



CEM 60CN



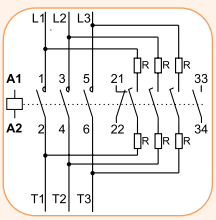
CEM 80CN

Application
Contactors for capacitor switching were specially designed for power factor correction capacitor operation (utilization category AC-6b).
Capacitors are pre-charged through resistors that reduce the peak current to the contactor when CEM_CN special contactors are switched on.
After the pre-charge, the main contactors close allowing passage of rated current.

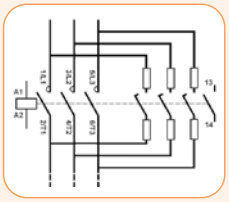
Advantages
- Mounting on DIN rails and on mounting plates
- Technical specification according to IEC 60947-4
- Built-in pre-charge resistors
- High reliability
- Reduced dimensions
- Standard control voltage 230V AC

Capacitor duty contactor CEM_CN

Type	Code No.	Rated oper. power 380/415V (kVAr)	Aux. contacts built-in	Weight [g]	Packaging [pcs]
CEM7,5CN.11-230V-50Hz	004643800	7,5	1NC+1NO	345	1
CEM10CN.11-230V-50Hz	004643801	10	1NC+1NO	345	1
CEM18CN.10-230V-50Hz	004644130	15	1NO	619	1
CEM25CN.10-230V-50Hz	004645130	20	1NO	619	1
CEM32CN.10-230V-50Hz	004646130	25	1NO	670	1
CEM50CN.10-230V-50Hz	004648140	40	1NO	1370	1
CEM65CN.10-230V-50Hz	004649140	50	1NO	1389	1
CEM80CN.10-230V-50Hz	004650140	61	1NO	1700	1



CEM7,5CN...CEM10CN



CEM18CN...CEM65CN

Operating principle:
When capacitor bank being switched on, the capacitors are uncharged and the system sees them as a short circuit for a quick period of time. The in-rush current is the result of this little short circuit and usually lasts for some milliseconds. It may reach 100 times the rated current, being one of the main reasons for the short life of a capacitor.

The CEM CN contactor is assembled with damping resistors which limit the high in-rush current when the capacitors are switched on. They are assembled with and early-make contact block, which is switched on before the main contacts, thus, limiting the in-rush current.

However, the damping resistors don't influence the final load, since they are switched off after 5 milliseconds, leaving only the capacitors in parallel with your inductive load, providing the proper power factor correction. This process increases the lifetime of the capacitors and also prevents net distortions.

Capacitor duty contactor CEM CN (230 V 50/60 Hz)

			CEM7,5CN.11-230V-50Hz	CEM10CN.11-230V-50Hz	CEM18CN.10-230V-50Hz	CEM25CN.10-230V-50Hz	CEM32CN.10-230V-50Hz	CEM50CN.10-230V-50Hz	CEM65CN.10-230V-50Hz	CEM80CN.10-230V-50Hz
Voltage(V)/ rated power (kVAr) AC-6b (t° = 55°C)	220-230V	kVAr	4 (230V)	5 (230V)	8	11	15	25	30	35
	380-415V	kVAr	7,5 (400V)	10 (400V)	15	20	25	40	50	61
	440V	kVAr	7,5	10	16	23	30	45	60	71
	480V	kVAr	9 (500V)	12,5	17	25	33	50	65	77
	660-690V	kVAr	11	22	25	34	45	65	87	106
AC-6b utilization category(I_e)	(55°C)	A	11	22	21	30	40	60	77	93
AC-6b utilization category(I_e)	(70°C)	A	-	-	15	22	34	50	62	67
Recommended max. fuse (gL/gG)		A	25	35	35	50	63	100	125	160
Cross section		mm^2	1,5...6	1,5...6	6	2 x 10	2 x 16	2 x 35	2 x 35	35
Tightening torque		Nm	1,2	1,2	1 ... 1,7	1,6 ... 3	2,5 ... 4	4 ... 6	4 ... 6	5 ... 6,5
Max electrical operating frequency op/h**			240		120					
Auxiliary contacts built-in			1xNO, 1xNC	1xNO, 1xNC	1xNO	1xNO	1xNO	1xNO	1xNO	1xNO
Electrical lifespan		$..x10^3$	250	250	100					
Dimensions (W/H/D)		mm	45/101/108	45/101/108	45/113/129	45/113/129	55/125/140	66/185/158	66/185/158	75/185/167
Code No.			004643800	004643801	004644130	004645130	004646130	004648140	004649140	004650140
Weight		g	345	345	619	619	670	1370	1389	1700

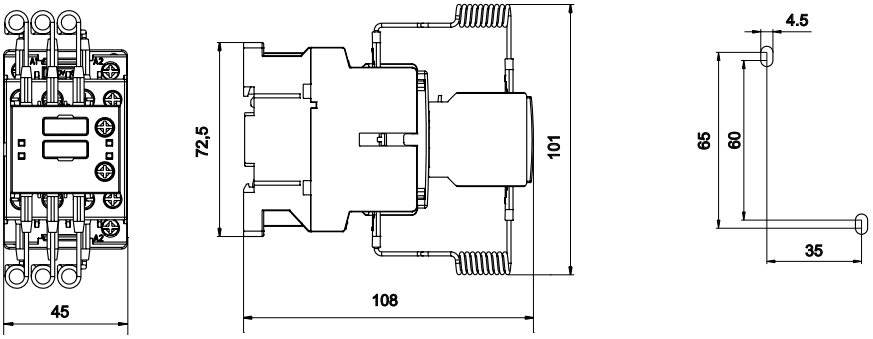
*Accessories (aux. contacts for CEM18CN - CEM80CN and other accessories) can be found in ETICON, page 274

**Recharge time should not be less than 1 minute

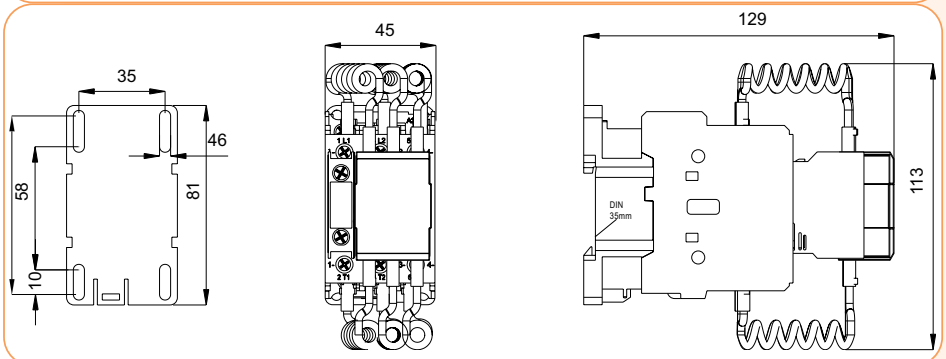
Auxiliary contact block - lateral - for CEM7,5 and CEM10CN

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
BCMLE11	004643802	1NO + 1NC	CEM7,5CN & CEM10CN		50	2

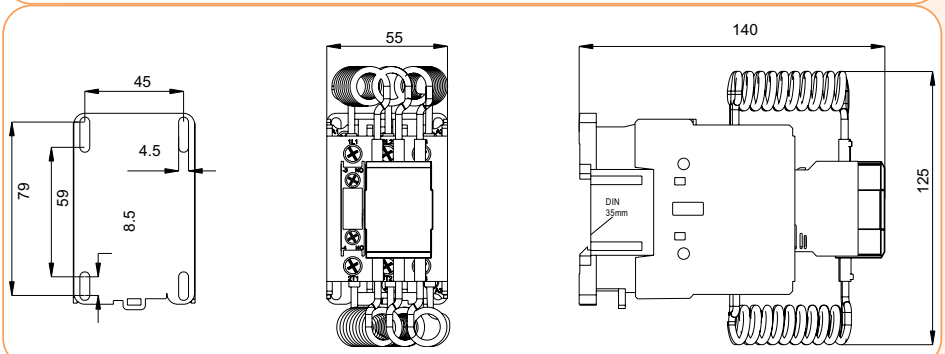
CEM 7,5CN, CEM 10CN



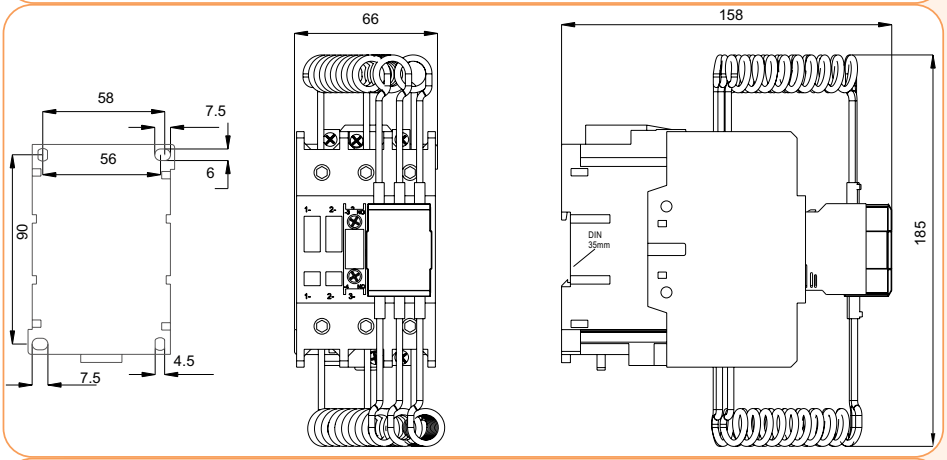
CEM 18CN, CEM 25CN



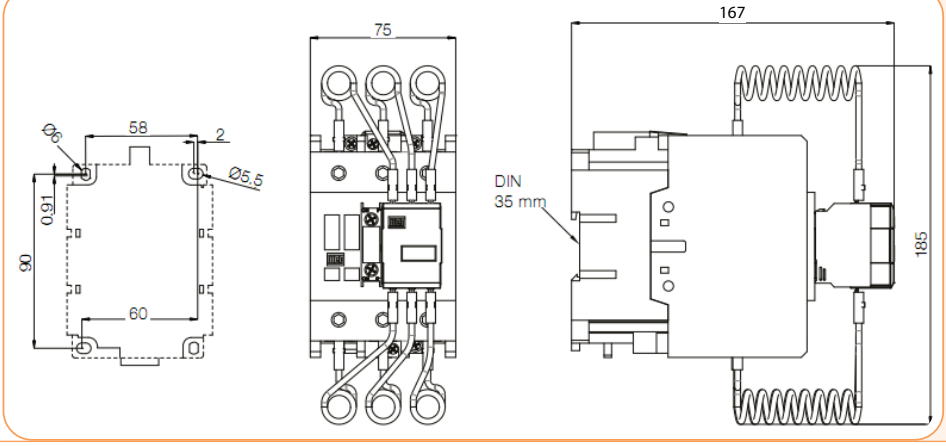
CEM 32CN



CEM 50CN, CEM 65CN



CEM 80CN



PFC power factor controllers

Automatic power factor correction controller series PFC 6, 8, 12 RS

DESCRIPTION
An essential way of electrical energy cost reduction is the compensation of the reactive power caused by various type of loads. The main part of central and group power factor correction in systems with a variable load is the power factor controller. A proper power factor controller and the correct design of PFC (Power factor correction) system are the key to the reduction of reactive energy costs. Nowadays, when four-quadrant energy meters are used, the right power factor controller is essential to achieve the highest efficiency of PFC system. Reliable, smart and advanced ETI controllers assure effective reduction of reactive energy and long working life of PFC systems.

MAIN ADVANTAGES
- Circular usage of steps: The controller switches all steps that have the same power circularly in order to use them equally and prolong their working life time.

- Fast action: Optimal regulation is achieved in one regulation cycle with a minimum number of switched stages. Since the controller knows the needed compensation power, it can connect or disconnect several steps in one cycle.

REGULATION METHODS:
The power factor controller digitalizes measured phase voltage and phase current in one or three phases. From these values the controller then calculates power factor, effective values of voltage, current and powers. On the basis of allowed reactive power, which is set as a requested power factor value, the controller calculates the requested compensation power. In accordance with its size and direction, the controller connects or disconnects the appropriate capacitor steps.

- APFR (average power factor regulation): The controller quantifies an average power factor from active and apparent power over a defined period. This method assures that the controller reacts smartly to load changes taking into account the size of load and cos φ. Thanks to the APFR system, the power factor controller reduces the number of switching operations together with a precisely kept requested power factor result.

- SHTD: This method uses the deceleration of time to reaction according to the size of the difference between the target power factor and instantaneous value. For every second of difference the time to the reaction is reduced by the square of difference until 0 (the moment of reaction).

- Instantaneous power factor: This method reacts to every change of the instantaneous power factor by the connection or disconnection of the exact size of reactive power step. This method is mainly used for the dynamic power factor correction system based on thyristor switching modules.

Advantages:
- monitoring of U, I, P, Q, S, cos φ, THDU, THDI, odd harmonics up to the 19th order, temperature
- three regulation methods (APFR default)
- small design 97 x 97 mm for pannel mounting, PFC 6 RS and PFC 8 RS
- automatic or manual configuration of measuring circuit connection (load must not vary during the auto-detection process).
- automatic or manual detection of connected capacitor steps
- universal current transformer input ../1A and ../5A
- internal temperature sensor
- temperature levels for ventilator control and steps disconnection
- ready for applications with de-compensation reactor steps
- monitoring of switching operations and operation time
- setting of discharging and min. operation time for each step
- memory for min. and max. values
- discharging time and min. operation time setting for each step
- last step output programmable for alarm purposes
- second tariff activation by external input, PFC 12 RS only
- programmable alarms and independent alarm output at PFC 12 RS only

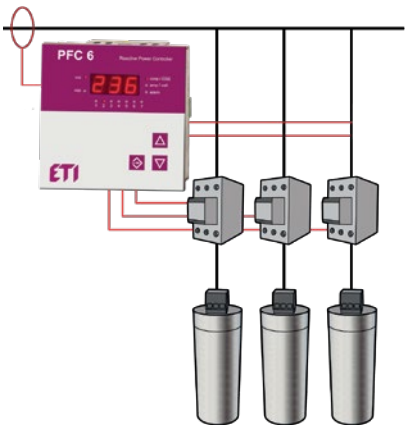
Controllers for compensation of 3 phase balanced loads (single phase current measurement)





Power factor controllers PFC 6 (6 outputs), PFC 8 (8 outputs) and PFC 12 (12 outputs) are designed for usage in standard LV and MV power factor correction applications operated by mechanical contactors. Despite the small size of power factor controllers, they offer four quadrant measurement and regulation, automatic detection of measuring circuits and capacitor steps, high sensitivity, reliability and design for the hardest conditions.

Technical data	
Supply and measuring voltage	400 VAC (+10%, -15%)
System frequency	50 Hz / 60 Hz
Power consumption	<3,2 VA
Current range	5mA - 6A
Current input accuracy	± 0,2%
Voltage input accuracy	± 0,5%
THD_U and THD_I accuracy	(U>10%UN) ±5% / (I>10%IN) ±5%
Phase error for I>3%In	± 3° (otherwise ±1°)
Switching power of relay output	250 V AC / 5 A
Range of requested power factor	0.8 inductive ÷ 0.8 capacitive
Step reconnection delay	5 ÷ 900 s
Step disconnection delay	5 ÷ 900 s
Step power setting	999 kVAr inductive ÷ 999 kVAr capacitive
System connection detection	manual / automatic
Communication interface	RS485 (Modbus RTU)
Working temperature	-40°C ÷ +70°C
IP rating	IP20 rear, IP54 front panel
Site depth	55mm
Related norms	EN 61010-1, EN50081-1, EN50082-1



Type	Code No.	Rated voltage Un	Description	Communication module	Weight (kg)	Packaging (pcs)
PFC 6 RS	004656905	400 V AC (+10%, -15%)	Single phase current measurement	RS485	0,65	1
PFC 8 RS	004656906				0,65	1
PFC 12 RS	004656907				1,2	1

Technical data

Type	Number of steps	Measuring and supply voltage	LED segment display	Tariff input	Alarm output	Last step alarm output	3-ph current measurment	RS 485 communication module	Front panel dimension	Panel cutout
PFC 6 RS	6	400 V AC	✓			•		•	97x97mm	91x91mm
PFC 8 RS	8					•		•	97x97mm	91x91mm
PFC 12 RS	12			•	•			•	144x144mm	138x138mm

Over temperature control
The controller offers the possibility of the temperature alarm working in two levels. The first level starts the ventilation of the cabinet. The second level disconnects all steps and gives an alarm notification on the display.

Symbol menu
Every parameter in the monitoring and service menu is represented by a three or four character symbol. Symbols are logical and assure user friendly experience and an easy understanding of all parameters and measured values shown on the segment display.

Dichromatic LED indication
Each step of the controller has an operation status indicated by a dichromatic LED. Different colours and logical signalization identify the operation status and settings of each step.

Last step alarm output PFC 6 RS, PFC 8 RS
The last step normally functions as a standard compensation step. Nevertheless it can be removed from the regulation algorithm and enabled for alarm purposes. The configuration of the last step operated as an alarm output is easily done in the setup menu.

RS485 interface
The power factor controllers are equipped with the RS485 communication interface with communication protocol Modbus RTU.

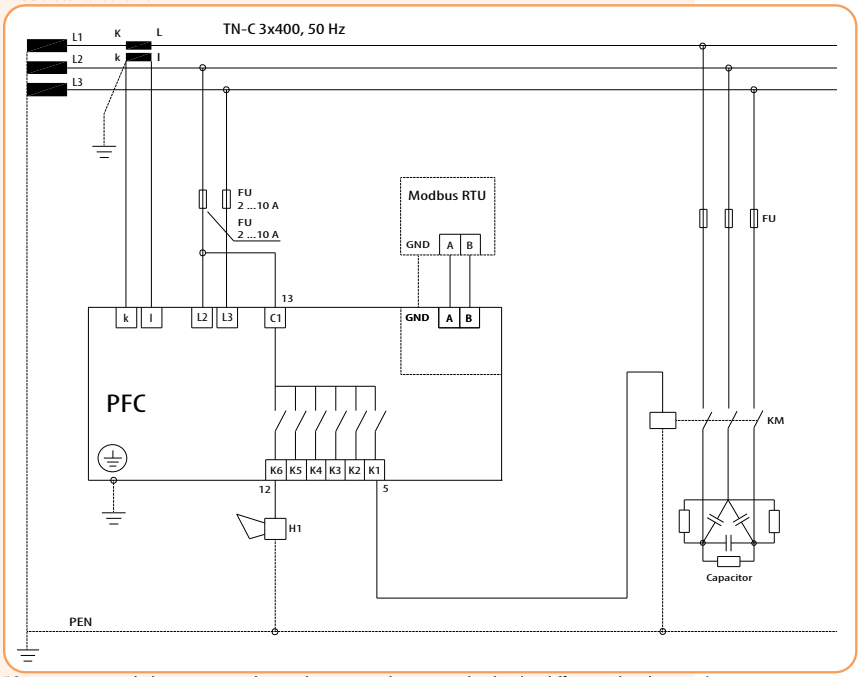
Harmonics measurement
The controllers offer a wide range of monitoring features which are enlarged by THDU, THDI and also the particular odd harmonics of U and I up to the 19th order.

De-compensation
The controllers have features for smart decompensation with several reactor steps operated in a similar way as capacitor steps or only one reactor that is tuned by capacitor steps.

Tariff input, PFC 12 RS
The power factor controller has an input for the second tariff of cos φ. The value of the second tariff cos φ can be defined in the controller's service menu. Applying the signal to input activates the second tariff of cos φ.

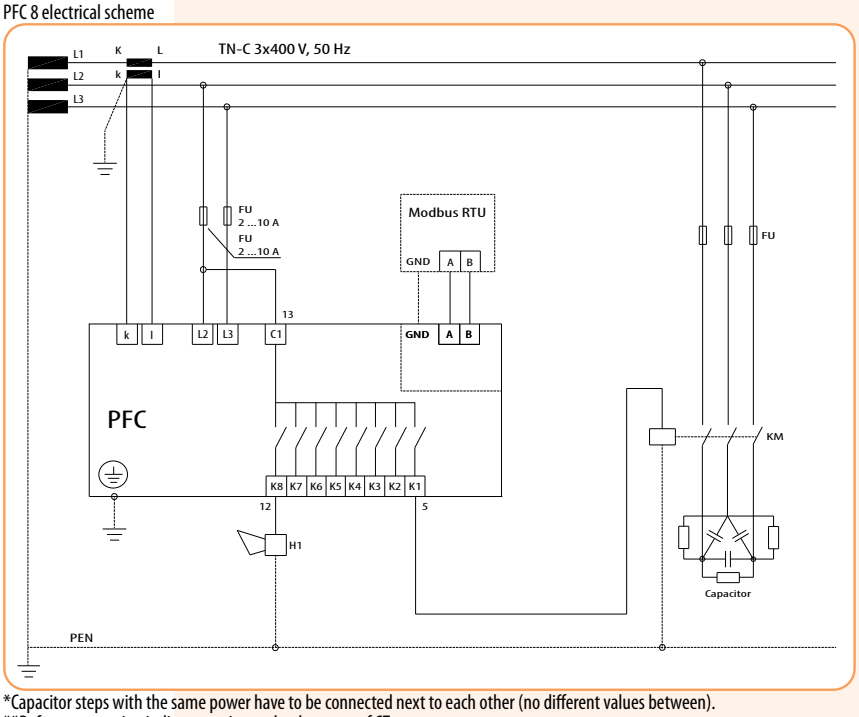
Wiring diagrams of automatic PFC system

PFC 6 electrical scheme



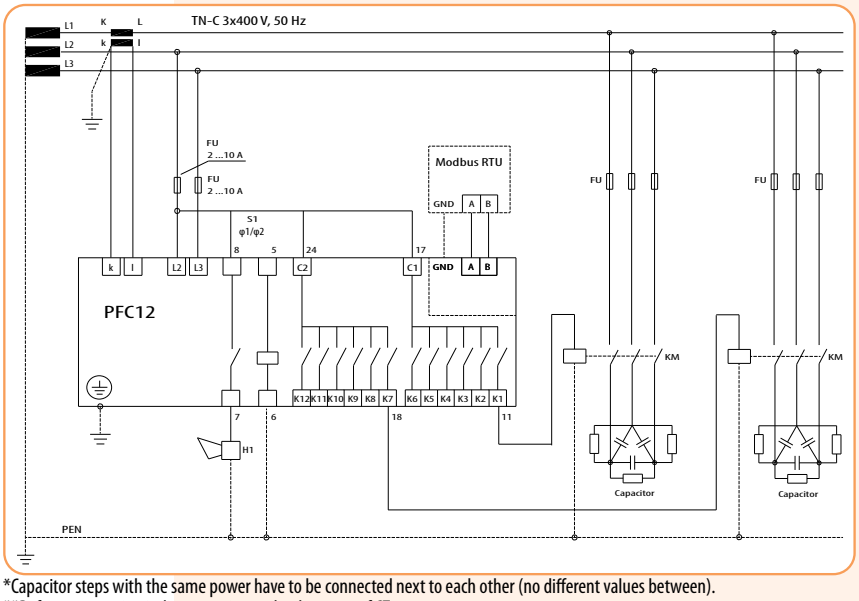
*Capacitor steps with the same power have to be connected next to each other (no different values between).
**Before current circuit disconnection make short-out of CT.

PFC 8 electrical scheme



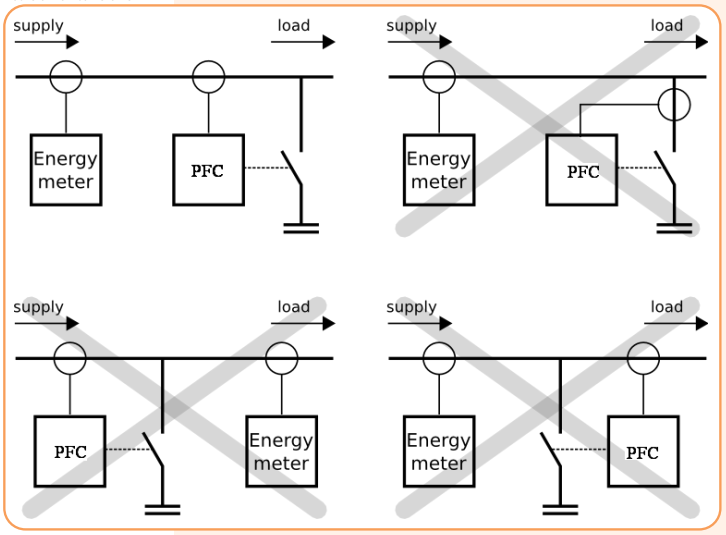
*Capacitor steps with the same power have to be connected next to each other (no different values between).
**Before current circuit disconnection make short-out of CT.

PFC 12 electrical scheme



*Capacitor steps with the same power have to be connected next to each other (no different values between).
**Before current circuit disconnection make short-out of CT.

Position of controller



Three-phase harmonic filters

Technical data	
Complince standard	IEC-60289;IEC-076
Tolerance "L"	3%
Permisible overload	1,07 x In
Linearity Inductance	1,60 x In
Heat insulation	F (155ºC)
Thermal protection	90ºC
Room temperature	45ºC
Proof stress	4KV
Protection degree	IP00
Detuning factor (p%)	7% - 14%

Constructive Characteristics - Three phase harmonic filters are made of low losses magnetic plates, permanent regime class F (155ºC) copper conductor and thermal protection relay.
With the purpose of increasing filters ventilation, windings are separated among them, improving thermal dissipation.
Available factor p is 7% and 14% with resonance frequency 189 Hz and 134 Hz for 50 Hz networks.
With this standard values in three phase networks and balanced loads, the 5th (250 Hz) harmonic and higher resonant phenomenons are eliminated avoiding resonance between inductive impedance and three phase capacitors for power factor correction and preventing network capacitors and capacitor banks for overloads, caused by harmonics.

Table selection of three-phase harmonic filters for capacitor banks

400V-50Hz-7%-189Hz Copper

Type	Reactive power (kVAr)	Code No.	Power loss (W)	Inductance (mH)	Suggested Capacitance µF	Rated current (A) I_{eff}	Weight (kg)	Capacitors
HFL 7/5 Cu	5	004656800	30	7,66	3x 30,84	7,2	7,5	2x LPC 3 kVAr, 460V, 50Hz
HFL 7/10 Cu	10	004656801	60	3,83	3x 61,67	14,4	8,5	LPC 12.5 kVAr, 460V, 50Hz
HFL 7/12,5 Cu	12,5	004656802	70	3,07	3x 77,09	18	9	LPC 15 kVAr, 460V, 50Hz
HFL 7/15 Cu	15	004656803	80	2,56	3x 92,51	21,7	9,5	LPC 20 kVAr, 480V, 50Hz
HFL 7/20 Cu	20	004656804	100	1,92	3x 123,35	28,9	16	LPC 25 kVAr, 460V, 50Hz
HFL 7/25 Cu	25	004656805	110	1,53	3x 154,18	36,1	16,5	LPC 30 kVAr, 460V, 50Hz
HFL 7/30 Cu	30	004656806	120	1,28	3x 185,02	43,3	17,5	LPC 40 kVAr, 480V, 50Hz
HFL 7/40 Cu	40	004656807	150	0,96	3x 246,69	57,7	28,5	LPC 50 kVAr, 460V, 50Hz
HFL 7/50 Cu	50	004656808	180	0,77	3x 308,36	72,2	30	2x LPC 30.8 kVAr, 460V, 50Hz
HFL 7/100 Cu	100	004656809	350	0,38	3x 616,73	144	43	4x LPC 30.8 kVAr, 460V, 50Hz

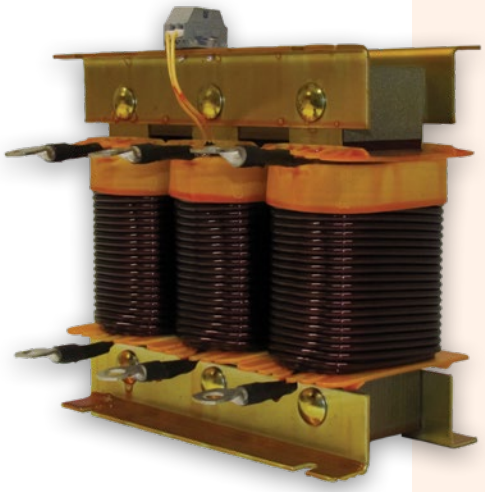
400V-50Hz-14%-134Hz Copper

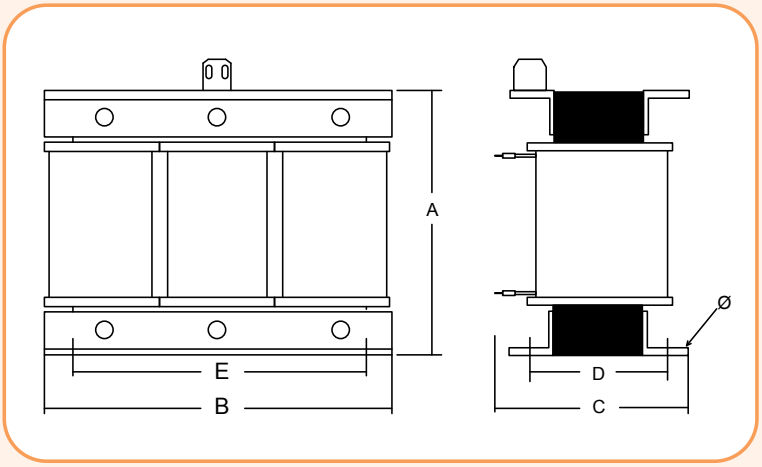
Type	Reactive power (kVAr)	Code No.	Power loss (W)	Inductance (mH)	Suggested Capacitance µF	Rated current (A) I_{eff}	Weight (kg)	Capacitors
HFL 14/5 Cu	5	004656810	60	16,58	3x 28,52	7,2	15	2x LPC 3 kVAr, 480V, 50Hz
HFL 14/10 Cu	10	004656811	90	8,29	3x 57,03	14,4	15	LPC 15 kVAr, 525V, 50Hz
HFL 14/12,5 Cu	12,5	004656812	120	6,63	3x 71,29	18	16	LPC 15 kVAr, 480V, 50Hz
HFL 14/15 Cu	15	004656813	150	5,53	3x 85,55	21,7	16	LPC 20 kVAr, 480V, 50Hz
HFL 14/20 Cu	20	004656814	150	4,15	3x 114,06	28,9	19,5	LPC 25 kVAr, 480V, 50Hz
HFL 14/25 Cu	25	004656815	190	3,32	3x 142,58	36,1	20,5	LPC 30 kVAr, 480V, 50Hz
HFL 14/30 Cu	30	004656816	220	2,76	3x 171,09	43,3	31	LPC 40 kVAr, 480V, 50Hz
HFL 14/40 Cu	40	004656817	290	2,07	3x 228,12	57,7	34,5	LPC 50 kVAr, 480V, 50Hz
HFL 14/50 Cu	50	004656818	330	1,66	3x 285,15	72,2	37	2x LPC 30 kVAr, 480V, 50Hz

400V-50Hz-7%-189Hz Aluminium

Type	Reactive power (kVAr)	Code No.	Power loss (W)	Inductance (mH)	Suggested Capacitance µF	Rated current (A) I_{eff}	Weight (kg)	Capacitors
HFL 7/20 Al	20	004656820	100	1,92	3x 123,35	28,9	14,5	LPC 25 kVAr, 460V, 50Hz
HFL 7/25 Al	25	004656821	120	1,53	3x 154,18	36,1	17	LPC 30 kVAr, 460V, 50Hz
HFL 7/30 Al	30	004656822	130	1,28	3x 185,02	43,3	26	LPC 40 kVAr, 480V, 50Hz
HFL 7/40 Al	40	004656823	160	0,96	3x 246,69	57,7	26,5	LPC 50 kVAr, 460V, 50Hz
HFL 7/50 Al	50	004656824	200	0,77	3x 308,36	72,2	27	2x LPC 30.8 kVAr, 460V, 50Hz

400V-50Hz-14%-134Hz Aluminium								
Type	Reactive power (kVAr)	Code No.	Power loss (W)	Inductance (mH)	Suggested Capacitance µF	Rated current (A) I_{eff}	Weight (kg)	Capacitors
HFL 14/20 Al	20	004656830	170	4,15	3x 114,06	28,9	27	LPC 25 kVAr, 480V, 50Hz
HFL 14/25 Al	25	004656831	200	3,32	3x 142,58	36,1	27	LPC 30 kVAr, 480V, 50Hz
HFL 14/30 Al	30	004656832	240	2,76	3x 171,09	43,3	44	LPC 40 kVAr, 480V, 50Hz
HFL 14/40 Al	40	004656833	290	2,07	3x 228,12	57,7	44,5	LPC 50 kVAr, 480V, 50Hz
HFL 14/50 Al	50	004656834	370	1,66	3x 285,15	72,2	45	2x LPC 30 kVAr, 480V, 50Hz





Copper Wire Reactors – Mechanical Dimensions						
Type	Dimensions mm					
Cu	A	B	C	D	E	Φ
HFL 7/5 Cu	170	180	80	70	140	9
HFL 7/10 Cu	170	180	90	80	140	9
HFL 7/12,5 Cu	170	180	90	80	140	9
HFL 7/15 Cu	170	180	90	80	140	9
HFL 7/20 Cu	220	240	100	90	200	9
HFL 7/25 Cu	220	240	100	90	200	9
HFL 7/30 Cu	220	240	100	90	200	9
HFL 7/40 Cu	270	300	120	100	200	9
HFL 7/50 Cu	270	300	120	100	200	9
HFL 7/100 Cu	320	360	150	125	300	9

Copper Wire Reactors – Mechanical Dimensions						
Type	Dimensions mm					
Cu	A	B	C	D	E	Φ
HFL 14/5 Cu	220	240	100	90	200	9
HFL 14/10 Cu	220	240	100	90	200	9
HFL 14/12,5 Cu	220	240	100	90	200	9
HFL 14/15 Cu	220	240	100	90	200	9
HFL 14/20 Cu	220	240	110	100	200	9
HFL 14/25 Cu	220	240	110	100	200	9
HFL 14/30 Cu	270	300	120	100	200	9
HFL 14/40 Cu	270	300	130	110	200	9
HFL 14/50 Cu	270	300	130	110	200	9

Aluminum Wire Reactors – Mechanical Dimensions						
Type	Dimensions mm					
Al	A	B	C	D	E	Φ
HFL 7/20 Al	220	240	100	90	200	9
HFL 7/25 Al	220	240	110	100	200	9
HFL 7/30 Al	270	300	120	100	200	9
HFL 7/40 Al	270	300	120	100	200	9
HFL 7/50 Al	270	300	120	100	200	9

Aluminum Wire Reactors – Mechanical Dimensions						
Type	Dimensions mm					
Al	A	B	C	D	E	Φ
HFL 14/20 Al	270	300	120	100	200	9
HFL 14/25 Al	270	300	120	100	200	9
HFL 14/30 Al	320	360	160	135	300	9
HFL 14/40 Al	320	360	160	135	300	9
HFL 14/50 Al	320	360	160	135	300	9

ETIBREAK

Low breaking capacity
moulded case circuit breakers EB2S 388

Low voltage moulded case circuit breakers
EB2 and low voltage switch disconnectors ED2 394

Low voltage moulded case circuit breakers
with residual current protection EB2R 401

Accessories 404

Technical data 413

Moulded case circuit breakers and switch disconnectors



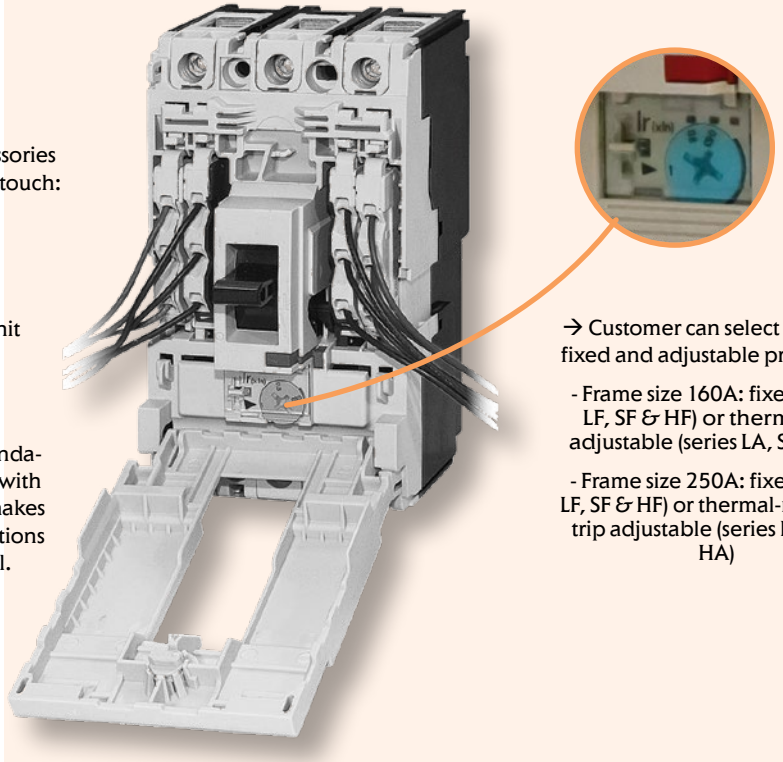
ETI POWER NEEDS CONTROL

Low breaking capacity moulded case circuit breakers

Advantages of low breaking capacity MCCBs

→ New series EB2S of MCCBs has excellent performances with reduced dimensions and new modern design.

→ Unique accessory cover opens with only one screw.



→ Practical internal accessories can be installed with one touch:

- auxiliary switch
- alarm switch
- shunt trip unit
- undervoltage trip unit

→ Customer can select between fixed and adjustable protection:

- Frame size 160A: fixed (series LF, SF & HF) or thermal trip adjustable (series LA, SA & HA)
- Frame size 250A: fixed (series LF, SF & HF) or thermal-magnetic trip adjustable (series LA, SA & HA)

→ EB2S series complies to safety recommendation standard IEC 60204-1. EB2S is marked with IEC symbol "direct opening action". This makes these devices also ideal for all OEM applications where safety and reliability are essential.

Legend: L -> economic, lower short-circuit breaking capacity
S -> standard short-circuit breaking capacity
H -> high short-circuit breaking capacity

EB2S 160 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3LF 16A 3p	16	004671801	3	16/8	fixed/fixed	0,80	1
EB2S 160/3LF 20A 3p	20	004671802					
EB2S 160/3LF 25A 3p	25	004671803					
EB2S 160/3LF 32A 3p	32	004671804					
EB2S 160/3LF 40A 3p	40	004671805					
EB2S 160/3LF 50A 3p	50	004671806					
EB2S 160/3LF 63A 3p	63	004671807					
EB2S 160/3LF 80A 3p	80	004671808					
EB2S 160/3LF 100A 3p	100	004671809					
EB2S 160/3LF 125A 3p	125	004671810					
EB2S 160/3LF 160A 3p	160	004671811					
EB2S 160/4LF 16A 4p	16	004671814	4			1,00	
EB2S 160/4LF 20A 4p	20	004671815					
EB2S 160/4LF 25A 4p	25	004671816					
EB2S 160/4LF 32A 4p	32	004671817					
EB2S 160/4LF 40A 4p	40	004671818					
EB2S 160/4LF 50A 4p	50	004671819					
EB2S 160/4LF 63A 4p	63	004671820					
EB2S 160/4LF 80A 4p	80	004671821					
EB2S 160/4LF 100A 4p	100	004671822					
EB2S 160/4LF 125A 4p	125	004671823					
EB2S 160/4LF 160A 4p	160	004671824					

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EB2S 160 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3SF 16A 3p	16	004671827	3	25/13	fixed/fixed	0,80	1
EB2S 160/3SF 20A 3p	20	004671828					
EB2S 160/3SF 25A 3p	25	004671829					
EB2S 160/3SF 32A 3p	32	004671830					
EB2S 160/3SF 40A 3p	40	004671831					
EB2S 160/3SF 50A 3p	50	004671832					
EB2S 160/3SF 63A 3p	63	004671833					
EB2S 160/3SF 80A 3p	80	004671834					
EB2S 160/3SF 100A 3p	100	004671835					
EB2S 160/3SF 125A 3p	125	004671836					
EB2S 160/3SF 160A 3p	160	004671837					
EB2S 160/4SF 16A 4p	16	004671840	4			1,00	
EB2S 160/4SF 20A 4p	20	004671841					
EB2S 160/4SF 25A 4p	25	004671842					
EB2S 160/3SF 32A 4p	32	004671843					
EB2S 160/4SF 40A 4p	40	004671844					
EB2S 160/4SF 50A 4p	50	004671845					
EB2S 160/4SF 63A 4p	63	004671846					
EB2S 160/4SF 80A 4p	80	004671847					
EB2S 160/4SF 100A 4p	100	004671848					
EB2S 160/4SF 125A 4p	125	004671849					
EB2S 160/4SF 160A 4p	160	004671850					



EB2S 160 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3HF 16A 3p	16	004671853	3	40/20	fixed/fixed	0,80	1
EB2S 160/3HF 20A 3p	20	004671854					
EB2S 160/3HF 25A 3p	25	004671855					
EB2S 160/3HF 32A 3p	32	004671856					
EB2S 160/3HF 40A 3p	40	004671857					
EB2S 160/3HF 50A 3p	50	004671858					
EB2S 160/3HF 63A 3p	63	004671859					
EB2S 160/3HF 80A 3p	80	004671860					
EB2S 160/3HF 100A 3p	100	004671861					
EB2S 160/3HF 125A 3p	125	004671862					
EB2S 160/3HF 160A 3p	160	004671863					
EB2S 160/4HF 16A 4p	16	004671866	4			1,00	
EB2S 160/4HF 20A 4p	20	004671867					
EB2S 160/4HF 25A 4p	25	004671868					
EB2S 160/4HF 32A 4p	32	004671869					
EB2S 160/4HF 40A 4p	40	004671870					
EB2S 160/4HF 50A 4p	50	004671871					
EB2S 160/4HF 63A 4p	63	004671872					
EB2S 160/4HF 80A 4p	80	004671873					
EB2S 160/4HF 100A 4p	100	004671874					
EB2S 160/4HF 125A 4p	125	004671875					
EB2S 160/4HF 160A 4p	160	004671876					

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EB2S 160 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3LA 25A 3p	25	004671879	3	16/8	adjustable (0.63-1)/ fixed	0,80	1
EB2S 160/3LA 40A 3p	40	004671880					
EB2S 160/3LA 63A 3p	63	004671881					
EB2S 160/3LA 80A 3p	80	004671882					
EB2S 160/3LA 100A 3p	100	004671883					
EB2S 160/3LA 125A 3p	125	004671884					
EB2S 160/3LA 160A 3p	160	004671885					
EB2S 160/4LA 25A 4p	25	004671889	4			1,0	
EB2S 160/4LA 40A 4p	40	004671890					
EB2S 160/4LA 63A 4p	63	004671891					
EB2S 160/4LA 80A 4p	80	004671892					
EB2S 160/4LA 100A 4p	100	004671893					
EB2S 160/4LA 125A 4p	125	004671894					
EB2S 160/4LA 160A 4p	160	004671895					

EB2S 160 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3SA 25A 3p	25	004671899	3	25/13	adjustable (0.63-1)/ fixed	0,80	1
EB2S 160/3SA 40A 3p	40	004671900					
EB2S 160/3SA 63A 3p	63	004671901					
EB2S 160/3SA 80A 3p	80	004671902					
EB2S 160/3SA 100A 3p	100	004671903					
EB2S 160/3SA 125A 3p	125	004671904					
EB2S 160/3SA 160A 3p	160	004671905					
EB2S 160/4SA 25A 4p	25	004671909	4			1,0	
EB2S 160/4SA 40A 4p	40	004671910					
EB2S 160/4SA 63A 4p	63	004671911					
EB2S 160/4SA 80A 4p	80	004671912					
EB2S 160/4SA 100A 4p	100	004671913					
EB2S 160/4SA 125A 4p	125	004671914					
EB2S 160/4SA 160A 4p	160	004671915					

EB2S 160 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 160/3HA 25A 3p	25	004671919	3	40/20	adjustable (0.63-1)/ fixed	0,80	1
EB2S 160/3HA 40A 3p	40	004671920					
EB2S 160/3HA 63A 3p	63	004671921					
EB2S 160/3HA 80A 3p	80	004671922					
EB2S 160/3HA 100A 3p	100	004671923					
EB2S 160/3HA 125A 3p	125	004671924					
EB2S 160/3HA 160A 3p	160	004671925					
EB2S 160/4HA 25A 4p	25	004671929	4			1,0	
EB2S 160/4HA 40A 4p	40	004671930					
EB2S 160/4HA 63A 4p	63	004671931					
EB2S 160/4HA 80A 4p	80	004671932					
EB2S 160/4HA 100A 4p	100	004671933					
EB2S 160/4HA 125A 4p	125	004671934					
EB2S 160/4HA 160A 4p	160	004671935					

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EB2S 250 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3LF 200A 3p	200	004671812	3	16/8	fixed/fixed	1,50	1
EB2S 250/3LF 250A 3p	250	004671813					
EB2S 250/4LF 200A 4p	200	004671825	4			1,90	
EB2S 250/4LF 250A 4p	250	004671826					



EB2S 250 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3SF 200A 3p	200	004671838	3	25/19	fixed/fixed	1,50	1
EB2S 250/3SF 250A 3p	250	004671839					
EB2S 250/4SF 200A 4p	200	004671851	4			1,90	
EB2S 250/4SF 250A 4p	250	004671852					

EB2S 250 fixed protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3HF 200A 3p	200	004671864	3	40/20	fixed/fixed	1,50	1
EB2S 250/3HF 250A 3p	250	004671865					
EB2S 250/4HF 200A 4p	200	004671877	4			1,90	
EB2S 250/4HF 250A 4p	250	004671878					

EB2S 250 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3LA 200A 3p	200	004671887	3	16/8	adjustable (0.63-1)/ adjustable (5-11)	1,50	1
EB2S 250/3LA 250A 3p	250	004671888					
EB2S 250/4LA 200A 4p	200	004671897	4			1,90	
EB2S 250/4LA 250A 4p	250	004671898					



EB2S 250 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3SA 200A 3p	200	004671907	3	25/19	adjustable (0.63-1)/ adjustable (5-11)	1,50	1
EB2S 250/3SA 250A 3p	250	004671908					
EB2S 250/4SA 200A 4p	200	004671917	4			1,90	
EB2S 250/4SA 250A 4p	250	004671918					

EB2S 250 adjustable protection

Type	I_n (A)	Code No.	Poles	I_{cu}/I_{cs} 400V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2S 250/3HA 200A 3p	200	004671927	3	40/20	adjustable (0.63-1)/ adjustable (5-11)	1,50	1
EB2S 250/3HA 250A 3p	250	004671928					
EB2S 250/4HA 200A 4p	200	004671937	4			1,90	
EB2S 250/4HA 250A 4p	250	004671938					

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Internal accessories


PS2S


SS2S


NA2S

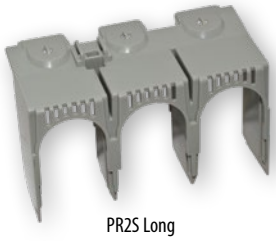

DA2S

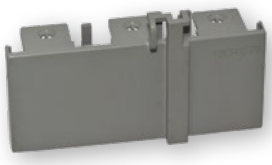
Accessories for EB2S 160 and 250

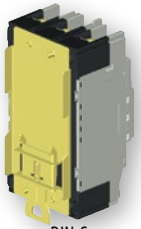
Internal accessories (can be mounted by customer)	Code No.	Description	Poles	Packaging [pcs]
Auxiliary switch, PS2S 160-250	004671950	1 changeover contact	3, 4	1
Alarm switch, SS2S 160-250	004671951	1 changeover contact		
Shunt trip unit, DA2S 160-250 AC 200-240V	004671953	AC 200-240V		
Shunt trip unit, DA2S 160-250 AC 380-450V	004671954	AC 380-450V		
Shunt trip unit, DA2S 160-250 DC 24V	004671955	DC 24V		
Undervoltage trip unit, NA2S 160-250 AC 200-240V	004671956	AC 200-240V		
Undervoltage trip unit, NA2S 160-250 AC 380-450V	004671957	AC 380-450V		
Undervoltage trip unit, NA2S 160-250 DC 24V	004671958	DC 24V		

External accessories


RO2S


PR2S Long


PR2S RC

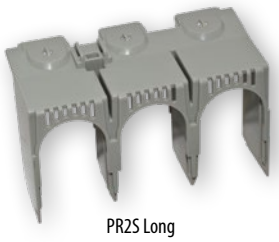

DIN-S

Accessories for EB2S 160

	Code No.	Poles	Packaging [pcs]
Breaker mounted handle, RO2S 160	004671970	3, 4	**1**
Panel mounted handle, RO2S 160P	004671971		
Attach busbar, ZB2S 160/3 Spread	004671972	3	set = 3pcs
Attach busbar, ZB2S 160/4 Spread	004671977	4	set = 4pcs
Interpole barrier, IZ2S 160	004671973	3	1
Terminal covers, PR2S 160/3 long	004671974	3	
Terminal covers, PR2S 160/4 long	004671990	4	
Terminal covers, PR2S 160/3 wide	004671991	3	
Terminal covers, PR2S 160/4 wide	004671992	4	
Terminal covers, PR2S 160/3 RC	004671993	3	
Terminal covers, PR2S 160/4 RC	004671994	4	
Din Rail Adaptor, DIN-S 160	004671975	3, 4	
Rear Connections, RC2S 160/3	004671978	3	set = 3pcs
Rear Connections, RC2S 160/4	004671979	4	set = 4pcs

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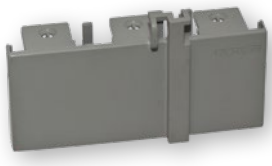
Accessories for EB2S 250			
	Code No.	Poles	Packaging [pcs]
Motor operator, MO2S 250 AC230-240V	004671980	3, 4	1
Motor operator, MO2S 250 DC24V	004671981		
Breaker mounted handle, RO2S 250	004671982		
Panel mounted handle, RO2S 250P	004671983		
Attach busbar, ZB2S 250/3 Spread	004671984	3	set = 3pcs
Attach busbar, ZB2S 250/4 Spread	004671995	4	set = 4pcs
Rear Connections, RC2S 250/3	004671996	3	set = 3pcs
Rear Connections, RC2S 250/4	004671997	4	set = 4pcs
Cable Clamps, SP2S 250/3	004671998	3	set = 3pcs
Cable Clamps, SP2S 250/4	004671999	4	set = 4pcs
Interpole barrier, IZ2S 250	004671985	3, 4	1
Terminal covers, PR2S 250/3 short	004671986	3	
Terminal covers, PR2S 250/4 short	004672000	4	
Terminal covers, PR2S 250/3 long	004672001	3	
Terminal covers, PR2S 250/4 long	004672002	4	
Terminal covers, PR2S 250/3 spread	004672003	3	
Terminal covers, PR2S 250/4 spread	004672004	4	
Terminal covers, PR2S 250/3 RC	004672005	3	
Terminal covers, PR2S 250/4 RC	004672006	4	
Terminal covers, PR2S 250/3 CC	004672007	3	
Terminal covers, PR2S 250/4 CC	004672008	4	
Busbar adapter 3p, DA-60/250/3/FE-5	001696162	3	
Busbar adapter 4p, DA-60/250/4/FE-5	001696163	4	
DIN 125 & 250	004671186	3, 4	



PR2S Long



PR2S Short



PR2S RC



MO2S



DA-60

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Low voltage moulded case circuit breakers and low voltage switch disconnectors

Low voltage moulded case circuit breakers are used for the switching and protection of power supply cables, motors and other electrical equipment against overloads and short circuit faults. They provide, beside protection function, other functions as remote ON/OFF operation, undervoltage protection, main switch etc.
They are available in range from 20 A up to1600 A in 3 and 4 pole versions.

Advantages:

- Small dimensions,modular sizes
- Possibility of field-instalable accessories – up to 1600A frame size series 2 (EB2)
- High short circuit breaking capacity (up to 125 kA)
- Fast break mechanism
- Reduced energy let through I^2t – minimises thermal stresses
- Reduced tripping time – minimises damage after fault
- Reduced peak short current ampacity – minimised electrodynamic stresses on conductors and protected equipment
- Installation on mounting plate, 125 & 250 A frame size also on DIN-rail
- Wide range of accessories
- Compact design with high mechanical strength
- High dielectric withstand voltages (8 kV a.c.)
- Voltage level up to 690 V a.c. and 250 V d.c. – only MCCB's with thermal-magnetic tripping unit
- Direct opening – recommendation according to standard IEC 60204-1 – up to 1600 A frame size series 2 (EB2)
- Common internal accessories – up to 1600 A frame size series 2 (EB2)
- Visual safety
- Unsurpassed flexibility

Moulded case circuit breaker ETIBREAK EB2

Thermal magnetic
Thermal magnetic MCCBs are available in frame sizes from 125A to 800A. All frame sizes have adjustable both thermal and magnetic trip settings. Overload protection is adjustable between 63 % and 100 % of In, meanwhile short-circuit between 6-13xIn (more details in the technical part of catalogue).

Legend: EB2 -> series 2
L -> economic, lower short-circuit breaking capacity
S -> standard short-circuit breaking capacity
H -> high short-circuit breaking capacity

ETIBREAK EB2 125							
Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 125/3L 20A 3p	20	004671021	3	25/19	0,63-1/ 6-12	1,1	1
EB2 125/3L 32A 3p	32	004671022			0,63-1/ 6-12		
EB2 125/3L 50A 3p	50	004671023			0,63-1/ 6-12		
EB2 125/3L 63A 3p	63	004671024			0,63-1/ 6-12		
EB2 125/3L 100A 3p	100	004671025			0,63-1/ 6-12		
EB2 125/3L 125A 3p	125	004671026			0,63-1/ 6-10		
EB2 125/4L 20A 4p	20	004671027	4		0,63-1/ 6-12	1,4	
EB2 125/4L 32A 4p	32	004671028			0,63-1/ 6-12		
EB2 125/4L 50A 4p	50	004671029			0,63-1/ 6-12		
EB2 125/4L 63A 4p	63	004671030			0,63-1/ 6-12		
EB2 125/4L 100A 4p	100	004671031			0,63-1/ 6-12		
EB2 125/4L 125A 4p	125	004671032			0,63-1/ 6-10		
EB2 125/3S 20A 3p	20	004671041	3	36/36	0,63-1/ 6-12	1,1	1
EB2 125/3S 32A 3p	32	004671042			0,63-1/ 6-12		
EB2 125/3S 50A 3p	50	004671043			0,63-1/ 6-12		
EB2 125/3S 63A 3p	63	004671044			0,63-1/ 6-12		
EB2 125/3S 100A 3p	100	004671045			0,63-1/ 6-12		
EB2 125/3S 125A 3p	125	004671046			0,63-1/ 6-10		
EB2 125/4S 20A 4p	20	004671047	4		0,63-1/ 6-12	1,4	
EB2 125/4S 32A 4p	32	004671048			0,63-1/ 6-12		
EB2 125/4S 50A 4p	50	004671049			0,63-1/ 6-12		
EB2 125/4S 63A 4p	63	004671050			0,63-1/ 6-12		
EB2 125/4S 100A 4p	100	004671051			0,63-1/ 6-12		
EB2 125/4S 125A 4p	125	004671052			0,63-1/ 6-10		
EB2 125/3H 20A 3p	20	004672101	3	65/36	0,63-1/ 6-12	1,1	1
EB2 125/3H 32A 3p	32	004672102			0,63-1/ 6-12		
EB2 125/3H 50A 3p	50	004672103			0,63-1/ 6-12		
EB2 125/3H 63A 3p	63	004672104			0,63-1/ 6-12		
EB2 125/3H 100A 3p	100	004672105			0,63-1/ 6-12		
EB2 125/3H 125A 3p	125	004672106			0,63-1/ 6-10		
EB2 125/4H 20A 4p	20	004672107	4		0,63-1/ 6-12	1,4	
EB2 125/4H 32A 4p	32	004672108			0,63-1/ 6-12		
EB2 125/4H 50A 4p	50	004672109			0,63-1/ 6-12		
EB2 125/4H 63A 4p	63	004672110			0,63-1/ 6-12		
EB2 125/4H 100A 4p	100	004672111			0,63-1/ 6-12		
EB2 125/4H 125A 4p	125	004672112			0,63-1/ 6-10		
EB2 125/3V 20A 3p 1000V	20	004671371	3	4/4*	0,63-1/ 6-12	1,1	1
EB2 125/3V 32A 3p 1000V	32	004671372			0,63-1/ 6-12		
EB2 125/3V 50A 3p 1000V	50	004671373		6/4*	0,63-1/ 6-12		
EB2 125/3V 63A 3p 1000V	63	004671374			0,63-1/ 6-12		
EB2 125/3V 100A 3p 1000V	100	004671375			0,63-1/ 6-12		
EB2 125/3V 125A 3p 1000V	125	004671376			0,63-1/ 6-10		

*1100V AC



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ETIBREAK EB2 160/250

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 250/3L 200A 3p	200	004671072	3	25/19	0,63-1/ 6-13	1,5	1
EB2 250/3L 250A 3p	250	004671073			0,63-1/ 6-10		
EB2 250/4L 200A 4p	200	004671075	4		0,63-1/ 6-13	1,9	
EB2 250/4L 250A 4p	250	004671076			0,63-1/ 6-10		
EB2 160/3S 160A 3p	160	004671061	3	36/36	0,63-1/ 6-13	1,5	1
EB2 250/3S 200A 3p	200	004671082			0,63-1/ 6-13		
EB2 250/3S 250A 3p	250	004671083			0,63-1/ 6-10		
EB2 160/4S 160A 4p	160	004671062	4		0,63-1/ 6-13	1,9	
EB2 250/4S 200A 4p	200	004671085			0,63-1/ 6-13		
EB2 250/4S 250A 4p	250	004671086			0,63-1/ 6-10		
EB2 160/3H 160A 3p	160	004672120	3	65/36	0,63-1 / 6-13	1,5	1
EB2 250/3H 160A 3p	160	004672130			0,63-1 / 6-13		
EB2 250/3H 200A 3p	200	004672131			0,63-1 / 6-13		
EB2 250/3H 250A 3p	250	004672132			0,63-1 / 6-10		
EB2 160/4H 160A 4p	160	004672121	4		0,63-1 / 6-13	1,9	
EB2 250/4H 160A 4p	160	004672133			0,63-1 / 6-13		
EB2 250/4H 200A 4p	200	004672134			0,63-1 / 6-13		
EB2 250/4H 250A 4p	250	004672135			0,63-1 / 6-10		
EB2 250/3V 160A 3p 1000V	160	004671377	3	6/4*	0,63-1 / 6-13	1,5	1
EB2 250/3V 250A 3p 1000V	250	004671378			0,63-1 / 6-10		

*1100V AC



ETIBREAK EB2 400

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 400/3LF 400A 3p	400A	004671105	3	25/25	fixed/fixed	4,2	1
EB2 400/3SF 400A 3p	400A	004671106		36/36	fixed/adjustable (6-12)	4,2	
EB2 400/4SF 400A 4p	400A	004671108	4			5,6	
EB2 400/3L 250A 3p	250	004671091	3	25/25	0,63-1/ 6-12	4,2	1
EB2 400/3L 400A 3p	400	004671092					
EB2 400/4L 250A 4p	250	004671093	4			5,6	
EB2 400/4L 400A 4p	400	004671094					
EB2 400/3S 250A 3p	250	004671101	3	50/50	0,63-1/ 6-12	4,3	1
EB2 400/3S 400A 3p	400	004671102					
EB2 400/4S 250A 4p	250	004671103	4			5,7	
EB2 400/4S 400A 4p	400	004671104					

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ETIBREAK EB2 630/800

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 800/3LF 630A 3p	630	004671117	3	36/36	fixed/adjustable (5-10)	8	1
EB2 800/3LF 800A 3p	800	004672204				8,5	
EB2 800/4LF 630A 4p	630	004671118	4			11	
EB2 800/4LF 800A 4p	800	004672205				11,5	
EB2 800/3L 630A 3p	630	004672150	3	36/36	0,63-1 / 5-10	8,5	1
EB2 800/3L 800A 3p	800	004672151					
EB2 800/4L 630A 4p	630	004672152	4			11,5	
EB2 800/4L 800A 4p	800	004672153					
EB2 800/3S 630A 3p	630	004672160	3	50/50	0,63-1 / 5-10	8,5	1
EB2 800/3S 800A 3p	800	004672161					
EB2 800/4S 630A 4p	630	004672162	4			11,5	
EB2 800/4S 800A 4p	800	004672163					
EB2 800/3H 630A 3p	630	004672170	3	70/50	0,63-1 / 5-10	8,5	1
EB2 800/3H 800A 3p	800	004672171					
EB2 800/4H 630A 4p	630	004672172	4			11,5	
EB2 800/4H 800A 4p	800	004672173					



Microprocessor's MCCBs

Microprocessor's MCCBs are available in frame sizes from 250 A up to 1600 A, with rated current from 40 A up to 1600 A. All frame sizes have adjustable thermal and magnetic protection.

Series 2: Protection against overload can be adjusted between 0,4 – 1 x In, meanwhile short-circuit protection has already preset different curves, which can be easily selected according to the type of load.

Optional Functions:

A - Standard relay with LSI Characteristic (where no letters are present then MCCB is A type)

P - Preferential Trip Alarm

G - Ground Fault

N - Neutral Protection

S - Phase rotation function

C - Comunication function

W - Electrical energy pulse

H - Harmonic current

ETIBREAK EB2 250

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 250/3LE 40A 3p	40	004671351	3	36/36	0,4-1/ adjustable	2,5	1
EB2 250/3LE 125A 3p	125	004671352					
EB2 250/3LE 160A 3p	160	004671353					
EB2 250/3LE 250A 3p	250	004671354					
EB2 250/4LE 40A 4p	40	004671355	4			3,3	
EB2 250/4LE 125A 4p	125	004671356					
EB2 250/4LE 160A 4p	160	004671357					
EB2 250/4LE 250A 4p	250	004671358					
EB2 250/3E 40A 3p	40	004671301	3	70/70	0,4-1/ adjustable	2,5	1
EB2 250/3E 125A 3p	125	004671302					
EB2 250/3E 160A 3p	160	004671303					
EB2 250/3E 250A 3p	250	004671304					
EB2 250/4E 40A 4p	40	004671305	4			3,3	
EB2 250/4E 125A 4p	125	004671306					
EB2 250/4E 160A 4p	160	004671307					
EB2 250/4E 250A 4p	250	004671308					



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ETIBREAK EB2 400

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 400/3E 250A 3p	250	004671111	3	50/50	0,4-1/ adjustable	4,3	1
EB2 400/3E 400A 3p	400	004671112					
EB2 400/3E 400A 3p APG	400	004671115					
EB2 400/4E 250A 4p	250	004671113	4			5,7	
EB2 400/4E 400A 4p	400	004671114					
EB2 400/4E 400A 4p APGN	400	004671116					



ETIBREAK EB2 400 LCD

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 400/3LCD 250A 3p A	250	004672144	3	50/50	0,4-1 / adjustable	4,3	1
EB2 400/3LCD 250A 3p APCWH	250	004672145					
EB2 400/3LCD 400A 3p A	400	004672146					
EB2 400/3LCD 400A 3p APCWH	400	004672147					
EB2 400/4LCD 250A 4p A	250	004672148	4			5,7	
EB2 400/4LCD 250A 4p AGN	250	004672290					
EB2 400/4LCD 250A 4p APGNS	250	004672154					
EB2 400/4LCD 250A 4p APCWH	250	004672155					
EB2 400/4LCD 250A 4p APGNSCWH	250	004672291					
EB2 400/4LCD 400A 4p A	400	004672156					
EB2 400/4LCD 400A 4p AGN	400	004672292					
EB2 400/4LCD 400A 4p APGNS	400	004672157					
EB2 400/4LCD 400A 4p APCWH	400	004672158					
EB2 400/4LCD 400A 4p APGNSCWH	400	004672293					
EB2 400/4HLCD 250A 4p AGN	250	004672295	4	70/70	0,4-1 / adjustable	5,7	1
EB2 400/4HLCD 250A 4p APGNSCWH	250	004672296					
EB2 400/4HLCD 400A 4p AGN	400	004672297					
EB2 400/4HLCD 400A 4p APGNSCWH	400	004672298					



ETIBREAK EB2 630

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 630/3LE 630A 3p	630	004671121	3	36/36	0,4-1/ adjustable	3,75	1
EB2 630/4LE 630A 4p	630	004671122	4			4,95	
EB2 630/4LE 630A 4p APGN	630	004671123	4			6,5	
EB2 630/3E 630A 3p	630	004671127	3	50/50	0,4-1/ adjustable	3,75	1
EB2 630/4E 630A 4p	630	004671128	4			4,95	
EB2 630/4E 630A 4p APGN	630	004671129	4			6,5	
EB2 630/3HE 630A 3p	630	004672140	3	70/70	0,4-1/ adjustable	3,75	1
EB2 630/4HE 630A 4p	630	004672141	4			4,95	

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ETIBREAK EB2 630 LCD

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 630/3LLCD 630A 3p A	630	004672122	3	36/36	0,4-1/ adjustable	5	1
EB2 630/3LLCD 630A 3p APCWH	630	004672123					
EB2 630/4LLCD 630A 4p A	630	004672124	4			6,5	
EB2 630/4LLCD 630A 4p AGN	630	004672125					
EB2 630/4LLCD 630A 4p APGNS	630	004672126					
EB2 630/4LLCD 630A 4p APCWH	630	004672127					
EB2 630/4LLCD 630A 4p APGNSCWH	630	004672128					
EB2 630/4LCD 630A 4p AGN	630	004672142	4	50/50	0,4-1/ adjustable	6,5	1
EB2 630/4LCD 630A 4p APGNSCWH	630	004672143					



ETIBREAK EB2 800

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 800/3LE 800A 3p	800	004672180	3	50/50	0,4-1 / adjustable	9,1	1
EB2 800/4LE 800A 4p	800	004672181	4			12,3	
EB2 800/4LE 800A 4p AGN	800	004672182	4			12,3	
EB2 800/4LE 800A 4p APGN	800	004672183	4			12,3	
EB2 800/3E 800A 3p	800	004672190	3	70/70	0,4-1 / adjustable	9,1	1
EB2 800/3E 800A 4p	800	004672191	4			12,3	
EB2 800/3HE 630A 3p	630	004672200	3	125/94	0,4-1 / adjustable	13,3	1
EB2 800/3HE 800A 3p	800	004672201				14,8	
EB2 800/4HE 630A 4p	630	004672202	4			16,8	
EB2 800/4HE 800A 4p	800	004672203				18,8	



ETIBREAK EB2 1000

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 1000/3LE 1000A 3p	1000	004672210	3	50/38	0,4-1 / adjustable	11	1
EB2 1000/4LE 1000A 4p	1000	004672211	4			14,8	
EB2 1000/4LE 1000A 4p APGN	1000	004672212	4			14,8	
EB2 1000/3E 1000A 3p	1000	004672220	3	70/50	0,4-1 / adjustable	11	1
EB2 1000/3E 1000A 4p	1000	004672221	4			14,8	
EB2 1000/4E 1000A 4p APGN	1000	004672222	4			14,8	



ETIBREAK EB2 1250

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 1250/3LE 1250A 3p	1250	004672230	3	50/38	0,4-1 / adjustable	19,8	1
EB2 1250/4LE 1250A 4p	1250	004672231	4			25	
EB2 1250/4LE 1250A 4p APGN	1250	004672232	4			25	
EB2 1250/3E 1250A 3p	1250	004672240	3	70/50	0,4-1 / adjustable	19,8	1
EB2 1250/3E 1250A 4p	1250	004672241	4			25	
EB2 1250/4E 1250A 4p APGN	1250	004672242	4			25	

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ETIBREAK EB2 1600							
Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} 400/415V [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2 1600/3LE-FC 1600A 3p	1600	004672250	3	50/38	0,4-1 / adjustable	27	1
EB2 1600/4LE-FC 1600A 4p	1600	004672251	4			35	
EB2 1600/4LE-FC 1600A 4p APGN	1600	004672252	4			35	
EB2 1600/3LE-RC 1600A 3p	1600	004672270	3			27	
EB2 1600/4LE-RC 1600A 4p	1600	004672271	4			35	
EB2 1600/4LE-RC 1600A 4p APGN	1600	004672272	4			35	
EB2 1600/3E-RC 1600A 3p	1600	004672280	3	100/75	0,4-1 / adjustable	27	1
EB2 1600/4E-RC 1600A 4p	1600	004672281	4			35	
EB2 1600/4E-RC 1600A 4p APGN	1600	004672282	4			35	
EB2 1600/3E-FC 1600A 3p	1600	004672260	3			27	
EB2 1600/3E-FC 1600A 4p	1600	004672261	4			35	
EB2 1600/4E-FC 1600A 4p APGN	1600	004672262	4			35	

FC - Front Conection
RC - Rear Conection

Low voltage switch disconnector ETIBREAK ED2



ETIBREAK ED2 125-1600							
Type	I_n [A]	Code No.	Poles	I_{cm} [kA peak]	U_e AC/DC [V]	Weight [kg]	Packaging [pcs]
ED2 125/3	125	004671271	3	3,6	690/250	1,1	1
ED2 160/3	160	004671272	3	6	690/250	1,5	1
ED2 250/3	250	004671273	3	6	690/250	1,5	1
ED2 400/3	400	004671274	3	9	690/250	4,2	1
ED2 630/3	630	004671275	3	9	690/250	4,4	1
ED2 800/3	800	004672370	3	17	690/250	8,5	1
ED2 1000/3	1000	004672373	3	17	690/250	10,4	1
ED2 1250/3	1250	004672371	3	32	690/250	18,2	1
ED2 1250/3 PI 3C	1250	004672374	3	32	690/250	18,2	1
ED2 1600/3 FC	1600	004672372	3	45	690/250	24,9	1
ED2 125/4	125	004671276	4	3,6	690/250	1,4	1
ED2 160/4	160	004671277	4	6	690/250	1,9	1
ED2 250/4	250	004671278	4	6	690/250	1,9	1
ED2 400/4	400	004671279	4	9	690/250	5,6	1
ED2 630/4	630	004671280	4	9	690/250	5,8	1
ED2 800/4	800	004672380	4	17	690/250	11,5	1
ED2 1000/4	1000	004672383	4	17	690/250	14,0	1
ED2 1250/4	1250	004672381	4	32	690/250	23,4	1
ED2 1600/4 FC	1600	004672382	4	45	690/250	32,9	1

Note:
All internal and external accessories for MCCBs can also be mounted to corresponding type of switch disconnectors.

ED2 1250/3 PI 3C:
This is an already prepared Plug-in version for ED2 with 3 AUX terminals on conversion side. Beside that you have to order base side (NPF) and AUX terminals for base side (please see accessories for 1250AF)

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Low voltage moulded case circuit breakers with residual current protection

Main features and advantages

Breaking capacities as on MCCBs







Adjustable residual current tripping thresholds between 30mA and 3A. Adjustable time delay for residual current protection between 60ms and 700ms including INST (instantaneous) and NT (No Trip).



Type A: Tripping is ensured for residual sinusoidal AC in the presence of residual pulsating DC.



Voltage Presence LED Indicator and Trip Indicator (the yellow button pops up to indicate tripping due to residual current)

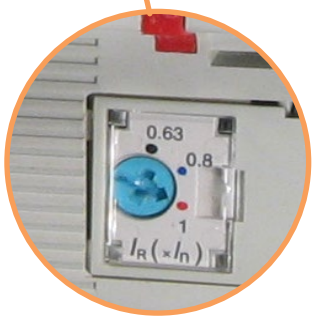


Test Button (to test the residual current detection and tripping system)



Dielectric test device plug (to allow dielectric testing with the EB2R closed – ON)

Adjustable overload protection Ir can be set between 63% and 100% of In



Low voltage moulded case circuit breaker with residual current protection EB2R

Main advantages:

- Combined protection against overloads, short circuits and earth leakage integrated in one device
- The new EB2R save the space
- The EB2R has the same dimensions and fixing as the EB2 MCCBs
- The EB2R eliminates the need for either an external relay with current transformers or add-on block
- Residual current is adjustable
- Earth leakage protection time delay is adjustable
- Wide range of accessories (as MCCB – only shunt/undervoltage trip units can not be fitted to EB2R)



ETIBREAK EB2R 125

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2R 125/3L 20A 3P	20	004671501	3	25/19	0.63-1/12	1,1	1
EB2R 125/3L 32A 3P	32	004671502	3	25/19	0.63-1/12	1,1	1
EB2R 125/3L 50A 3P	50	004671503	3	25/19	0.63-1/12	1,1	1
EB2R 125/3L 63A 3P	63	004671504	3	25/19	0.63-1/12	1,1	1
EB2R 125/3L 100A 3P	100	004671505	3	25/19	0.63-1/12	1,1	1
EB2R 125/3L 125A 3P	125	004671506	3	25/19	0.63-1/10	1,1	1
EB2R 125/4L 20A 4P	20	004671507	4	25/19	0.63-1/12	1,4	1
EB2R 125/4L 32A 4P	32	004671508	4	25/19	0.63-1/12	1,4	1
EB2R 125/4L 50A 4P	50	004671509	4	25/19	0.63-1/12	1,4	1
EB2R 125/4L 63A 4P	63	004671510	4	25/19	0.63-1/12	1,4	1
EB2R 125/4L 100A 4P	100	004671511	4	25/19	0.63-1/12	1,4	1
EB2R 125/4L 125A 4P	125	004671512	4	25/19	0.63-1/10	1,4	1

Note: all internal and external accessories can be used with EB2R – only exceptions are DA shunt trip unit and NA under-voltage trip unit (cannot be fitted to EB2R)

Residual current monitor and pre trip module - ETIBREAK EB2R 125

Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2R-M 125/3L 20A 3P	20	004671513	3	25/19	0,63-1/12	1,1	1
EB2R-M 125/3L 32A 3P	32	004671514			0,63-1/12	1,1	
EB2R-M 125/3L 50A 3P	50	004671515			0,63-1/12	1,1	
EB2R-M 125/3L 63A 3P	63	004671516			0,63-1/12	1,1	
EB2R-M 125/3L 100A 3P	100	004671517			0,63-1/12	1,1	
EB2R-M 125/3L 125A 3P	125	004671518			0,63-1/10	1,1	
EB2R-M 125/4L 20A 4P	20	004671519	4		0,63-1/12	1,4	
EB2R-M 125/4L 32A 4P	32	004671520			0,63-1/12	1,4	
EB2R-M 125/4L 50A 4P	50	004671521			0,63-1/12	1,4	
EB2R-M 125/4L 63A 4P	63	004671522			0,63-1/12	1,4	
EB2R-M 125/4L 100A 4P	100	004671523			0,63-1/12	1,4	
EB2R-M 125/4L 125A 4P	125	004671524				1,4	

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ETIBREAK EB2R 250							
Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2R 250/3L 160A 3P	160	004671581	3	25/19	0.63-1/13	1,5	1
EB2R 250/3L 250A 3P	250	004671582	3	25/19	0.63-1/10	1,5	1
EB2R 250/4L 160A 4P	160	004671583	4	25/19	0.63-1/13	1,9	1
EB2R 250/4L 250A 4P	250	004671584	4	25/19	0.63-1/10	1,9	1

Note: all internal and external accessories can be used with EB2R – only exceptions are DA shunt trip unit and NA under-voltage trip unit (cannot be fitted to EB2R)



Residual current monitor and pre trip module - ETIBREAK EB2R 250							
Type	I_n [A]	Code No.	Poles	I_{cu}/I_{cs} [kA]	Adjustment thermal/magnetic	Weight [kg]	Packaging [pcs]
EB2R-M 250/3L 160A 3P	160	004671585	3	25/19	0,63-1/13	1,5	1
EB2R-M 250/3L 250A 3P	250	004671586			0,63-1/10	1,5	
EB2R-M 250/4L 160A 4P	160	004671587	4		0,63-1/13	1,9	
EB2R-M 250/4L 250A 4P	250	004671588			0,63-1/10	1,9	

Residual current monitor and pre trip module (optional)

- normally open alarm contact (2A, 250V AC) closes on detection of residual current. Alarm treshold is adjustable.
- Green LED indicates voltage is present
- Red LED provides visual indications of residual current.
- Can be configured to provide trip + alarm or alarm only.
- Remote trip terminals allow tripping by push-button
- Can be configured to provide voltage drop protection.

Technical data on page 417

Accessories

Internal accessories



NA2

Undervoltage trip for EB2, ED2 125-630

Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
Undervoltage trip unit NA2 125-630AF AC200-240V	004671153	200-240 V AC	3, 4	1/1
Undervoltage trip unit NA2 125-630AF AC380-450V	004671154	380-450 V AC	3, 4	1/1
Undervoltage trip unit NA2 125-630AF DC24V	004671155	24 V DC	3, 4	1/1
Undervoltage trip unit NA2 125-630AF DC100-120V	004671156	100-120 V DC	3, 4	1/1
Undervoltage trip unit NA2 125-630AF DC200-240V	004671157	200-240 V DC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker



PS2

Undervoltage trip for EB2, ED2 800-1600

Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
Undervoltage trip unit NA2 800-1600AF AC380-415V	004672299	AC 380-415V	3, 4	1/1
Undervoltage trip unit NA2 800-1600AF AC220-240V	004672300	AC 220-240 V	3, 4	1/1
Undervoltage trip unit NA2 800-1600AF AC415-450V	004672301	AC 415-450 V	3, 4	1/1
Undervoltage trip unitNA2 800-1600AF DC24V	004672302	24 V DC	3, 4	1/1
Undervoltage trip unit NA2 800-1600AF DC100-120V	004672303	100-120 V DC	3, 4	1/1
Undervoltage trip unit NA2 800-1600AF DC200-240V	004672304	200-240 V DC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker

Undervoltage trip for EB2, ED2 125-630AF - Time Delay

Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
NA2 TD 125-630AF AC230-240V	004672341	230-240V AC	3, 4	1/1
NA2 TD 125-630AF AC380-415V	004672342	380-415V AC	3, 4	1/1
NA2 TD 125-630AF AC440-450V	004672343	440-450V AC	3, 4	1/1
NA2 TD 125-630AF DC24V	004672344	24V DC	3, 4	1/1
NA2 TD 125-630AF DC115-120V	004672345	115-120V DC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker
Time delay of 500ms
Time delay units are fitted to the outside of MCCBs

Undervoltage trip for EB2, ED2 400-630AF only 4p - Time Delay

Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
NA2 TD 4p 400-630AF AC230-240V	004672365	230-240V AC	4	1/1
NA2 TD 4p 400-630AF AC380-415V	004672366	380-415V AC	4	1/1
NA2 TD 4p 400-630AF AC440-450V	004672367	440-450V AC	4	1/1
NA2 TD 4p 400-630AF DC24V	004672368	24V DC	4	1/1
NA2 TD 4p 400-630AF DC115-120V	004672369	115-120V DC	4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker
Time delay of 500ms
Time delay units are fitted to the outside of MCCBs

Technical data on page 436

Undervoltage trip for EB2, ED2 800-1000AF - Time Delay				
Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
NA2 TD 800-1000AF AC230-240V	004672305	230-240V AC	3, 4	1/1
NA2 TD 800-1000AF AC380-415V	004672306	380-415V AC	3, 4	1/1
NA2 TD 800-1000AF AC440-450V	004672307	440-450V AC	3, 4	1/1
NA2 TD 800-1000AF DC24V	004672308	24V DC	3, 4	1/1
NA2 TD 800-1000AF DC115-120V	004672309	115-120V DC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker
Time delay of 500ms
Time delay units are fitted to the outside of MCCBs

Undervoltage trip for EB2, ED2 1250-1600AF - Time Delay				
Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
NA2 TD 1250-1600AF AC230-240V	004672390	230-240V AC	3, 4	1/1
NA2 TD 1250-1600AF AC380-415V	004672391	380-415V AC	3, 4	1/1
NA2 TD 1250-1600AF AC440-450V	004672392	440-450V AC	3, 4	1/1
NA2 TD 1250-1600AF DC24V	004672393	24V DC	3, 4	1/1
NA2 TD 1250-1600AF DC115-120V	004672394	115-120V DC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker
Time delay of 500ms
Time delay units are fitted to the outside of MCCBs

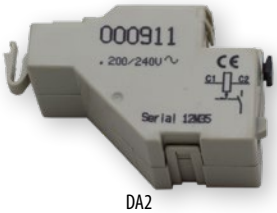
Auxiliary & Alarm switch for EB2, ED2 125-1600 AF				
Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
Auxiliary switch, PS2 125-1600AF	004671141	1 changeover contact	3, 4	1/1
Auxiliary switch, heavy duty PS2-NO 125-1600AF	004671142	1 contact, NO	3, 4	1/1
Auxiliary switch, heavy duty PS2-NC 125-1600AF	004671143	1 contact, NC	3, 4	1/1
Alarm switch SS2 125-1600AF	004671144	1 changeover contact	3, 4	1/1
Alarm switch, heavy duty SS2-NO 125-1600AF	004671145	1 contact, NO	3, 4	1/1
Alarm switch, heavy duty SS2-NC 125-1600AF	004671146	1 contact, NC	3, 4	1/1



SS2

Shunt trip for EB2, ED2 125-1000A				
Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
DA2 125-1000AF AC200-240V	004671147	AC200-240V	3, 4	1/1
DA2 125-1000AF AC380-450V	004671148	AC380-450V	3, 4	1/1
DA2 125-1000AF DC24V	004671149	DC24V	3, 4	1/1
DA2 125-1000AF DC48V	004671150	DC48V	3, 4	1/1
DA2 125-1000AF DC100-120V	004671151	DC110-120V	3, 4	1/1
DA2 125-1000AF DC 200-240V	004671152	DC 200-240V	3, 4	1/1
DA2 125-1000AF DC 12V	004671159	12V DC	3, 4	1/1
DA2 125-1000AF AC 24V	004671189	24V AC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker



DA2

Shunt trip for EB2, ED2 1250 & 1600A				
Internal accessories can be mounted by customer	Code No.	Description	Poles	Packaging [pcs]
DA2 1250-1600AF AC200-240V	004671135	AC200-240V	3, 4	1/1
DA2 1250-1600AF AC380-450V	004671136	AC380-450V	3, 4	1/1
DA2 1250-1600AF DC24V	004671137	DC24V	3, 4	1/1
DA2 1250-1600AF DC48V	004671138	DC48V	3, 4	1/1
DA2 1250-1600AF DC100-120V	004671139	DC110-120V	3, 4	1/1
DA2 1250-1600AF DC 200-240V	004671140	DC 200-240V	3, 4	1/1
DA2 1250-1600AF AC 24V	004671190	24V AC	3, 4	1/1

Important note: The shunt trip unit DA and undervoltage trip unit NA cannot be mounted in the same breaker

External accessories



PSPSS / PSHUV



PIO



ZB2 Straight



MO2



IP3X RO2

Accessories for EB2, ED2 125-1600 AF

	Code No	Poles	Packaging [pcs]
Plug for aux. And alarm switches PSPSS 125-630AF	004671457	3, 4	1/1
Plug for shunt trips and underv. trips PSHUV 125-630AF	004671458	3, 4	1/1
Socket – for internal accessories PIO 125-1000AF	004671459	3, 4	1/1
Mechanical interlock, MW cable 1m	004671178	3, 4	1/1
Mechanical interlock, MW cable 1,5m	004671179	3, 4	1/1
OCR checker 200-240V AC	004672310	3, 4	1/1
Terminal cover lock PZ 125-630AF	004672400	3, 4	1/1

Accessories for EB2, ED2 125

	Code No	Poles	Packaging [pcs]
Attach busbar, ZB2 125/3 Straight	004671161	3	3
Attach busbar, ZB2 125/4 Straight	004671162	4	3
Solderless Terminal, SP2 125/3	004671163	3	4
Solderless Terminal, SP2 125/4	004671164	4	4
Rear connections, RC2 125/3	004671187	3	3
Rear connections, RC2 125/4	004671188	4	4

Accessories for EB2, ED2 125

	Code No	Poles	Packaging [pcs]
Motor Operator, MO2 125 AC230-240V	004671165	3, 4	1
Motor Operator, MO2 125 AC100-110V	004671311	3, 4	1
Motor Operator, MO2 125 DC24V	004671313	3, 4	1
Motor Operator, MO2 125 DC48V	004671314	3, 4	1
Motor Operator, MO2 125 DC100V	004671315	3, 4	1
Motor Operator, MO2 125 AC230-240V, reset	004671166	3, 4	1
Motor Operator, MO2 125 AC100-110V, reset	004671316	3, 4	1
Motor Operator, MO2 125 DC24V, reset	004671318	3, 4	1
Motor Operator, MO2 125 DC48V, reset	004671319	3, 4	1
Motor Operator, MO2 125 DC100V, reset	004671320	3, 4	1
Motor Operator, MO2 125 DC220V, reset	004671327	3, 4	1

Accessories for EB2, ED2 125

	Code No	Poles	Packaging [pcs]
Door Flange, PR2 125-250	004671167	3, 4	1
Door Flange, PR2 - mot 125-250	004671472	3, 4	1
Breaker mounted handle IP3X, RO2 125, black	004671168	3, 4	1
Breaker mounted handle IP3X, RO2 125, keylock (cylindrical), black	004671169	3, 4	1
Breaker mounted handle IP3X, RO2 125, red	004671321	3, 4	1
Breaker mounted handle IP3X, RO2 125, keylock (cylindrical), red	004671322	3, 4	1
Door mounted handle IP55, RO2 125P, black	004671170	3, 4	1
Door mounted handle IP65, RO2 125P, keylock (cylindrical), black	004671171	3, 4	1
Door mounted handle IP55, RO2 125P, red	004671323	3, 4	1
Door mounted handle IP65, RO2 125P, keylock (cylindrical), red	004671324	3, 4	1

Handle operating mechanism can be padlocked in OFF

Technical data on page 439

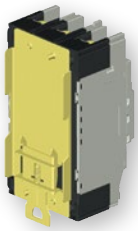
Accessories for EB2, ED2 125			
	Code No	Poles	Packaging [pcs]
Slide mechanical interlock, MS 125 3P, MO or RO assembly not possible	004671172	3	1
Slide mechanical interlock, MS 125 4P, MO or RO assembly not possible	004671173	4	1
Link mechanical interlock, MLR 125 right, MO or RO assembly possible	004671174	3, 4	1
Link mechanical interlock, MLL 125 left 3p, MO or RO assembly possible	004671175	3	1
Link mechanical interlock, MLL 125 left 4p, MO or RO assembly possible	004671176	4	1
Wire mechanical interlock, MW 125, mechanism, MO or RO assembly possible	004671177	3, 4	1

Link mechanical configuration; MLR_right + MLL_left
Wire mechanical configuration; 2x MW_mech. + MW_cable



MLR+MLL

Accessories for EB2, ED2 125			
	Code No	Poles	Packaging [pcs]
OCR sealing cover 125 & 250	004671160	3, 4	1
Handle locks, ZA2 125-250	004671180	3, 4	1
Terminal cover lock, PZ 125-630AF	004672400	3, 4	1
Terminal cover, PRS2 125/3, front	004671181	3	1
Terminal cover, PRS2 125/4, front	004671182	4	1
Terminal cover, PRS2-SP 125/3, cable clamps	004671183	3	1
Terminal cover, PRS2-SP 125/4, cable clamps	004671184	4	1
Terminal cover, PRS2-NPF 125/3, plug-in	004671473	3	1
Terminal cover, PRS2-NPF 125/4, plug-in	004671474	4	1
Interpol barrier, IZ2 125	004671185	3, 4	1
DIN rail adapter, DIN 125 & 250	004671186	3, 4	1



DIN 125, 250



PRS2

Accessories for EB2, ED2 125			
	Code No	Poles	Packaging [pcs]
Fixed plug-in 3-p, NPF 125	004671451	3	1
Fixed plug-in 4-p, NPF 125	004671452	4	1
Plug-in Conversion 3-p, NPI 125	004671453	3	1
Plug-in Conversion 4-p, NPI 125	004671454	4	1
Extension terminal for fixed Plug-in 3-p, SK3 125	004671455	3	3
Extension terminal for fixed Plug-in 4-p, SK4 125	004671456	4	4

- basic configuration: fixed plug-in + plug-in conversion
- extension terminals is used when fixed part of plug-in is under mounting plate - not used for basic configuration
- if additional accessories are installed in MCCB, plugs and sockets (PSPSS, PSHUV and PIO) are required

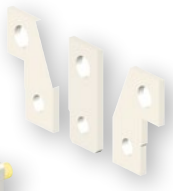


NPF

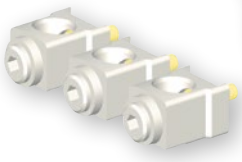


NPI

Accessories for EB2, ED2 160 and EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
Attach busbar ZB2 250/3 Offset	004671191	3	3
Attach busbar, ZB2 250/4 Straight	004671192	4	4
Attach busbar, ZB2 250/3 Straight	004671325	3	3
Solderless Terminal, SP2 250/3	004671193	3	3
Solderless Terminal, SP2 250/4	004671194	4	4
Rear connections, RC2 250/3S-L	004671477	3	3
Rear connections, RC2 250/3E	004671478	3	3
Rear connections, RC2 250/4S-L	004671479	4	4
Rear connections, RC2 250/4E	004671480	4	4
Busbar adapter 3p, DA-60/250/3/FE-5	001696162	3	1
Busbar adapter 4p, DA-60/250/4/FE-5	001696163	4	1



ZB2 Offset



SP2



RC2



DA-60

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M02

Accessories for EB2, ED2 160 and EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
Motor Operator, M02 250 AC230-240V	004671195	3, 4	1
Motor Operator, M02 250 AC100-110V	004671331	3, 4	1
Motor Operator, M02 250 DC24V	004671333	3, 4	1
Motor Operator, M02 250 DC48V	004671334	3, 4	1
Motor Operator, M02 250 DC100V	004671335	3, 4	1
Motor Operator, M02 250, AC230-240, reset	004671196	3, 4	1
Motor Operator, M02 250 AC100-110V, reset	004671336	3, 4	1
Motor Operator, M02 250 DC24V, reset	004671338	3, 4	1
Motor Operator, M02 250 DC48V, reset	004671339	3, 4	1
Motor Operator, M02 250 DC100V, reset	004671340	3, 4	1
Motor Operator, M02 250 DC 200-220V, reset	004671328	3, 4	1


IP3X RO2

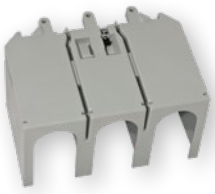
Accessories for EB2, ED2 160 and EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
Door Flange, PR2 125-250	004671167	3, 4	1
Door Flange, PR2 - mot 125-250	004671472	3, 4	1
Breaker mounted handle IP3X, RO2 250, black	004671197	3, 4	1
Breaker mounted handle IP3X, RO2 250, keylock (cylindrical), black	004671198	3, 4	1
Breaker mounted handle IP3X, RO2 250, red	004671341	3, 4	1
Breaker mounted handle IP3X, RO2 250, keylock (cylindrical), red	004671342	3, 4	1
Door mounted handle IP55, RO2 250P, black	004671199	3, 4	1
Door mounted handle IP65, RO2 250P, black	004671200	3, 4	1
Door mounted handle IP55, RO2 250P, red	004671343	3, 4	1
Door mounted handle IP65, RO2 250P, red	004671344	3, 4	1

Handle operating mechanism can be padlocked in OFF


MS

Accessories for EB2, ED2 160 in EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
Slide mechanical interlock, MS 250 3P, MO or RO assembly not possible	004671201	3	1
Slide mechanical interlock, MS 250 4P, MO or RO assembly not possible	004671202	4	1
Link mechanical interlock, MLR 250 right, MO or RO assembly possible	004671203	3, 4	1
Link mechanical interlock, MLL 250 left 3p, MO or RO assembly possible	004671204	3	1
Link mechanical interlock, MLL 250 left 4p, MO or RO assembly possible	004671205	4	1
Wire mechanical interlock, MW 250, mechanism, MO or RO assembly possible	004671206	3, 4	1

Link mechanical interlock configuration; MLR_right + MLL_left
Wire mechanical interlock configuration; 2xMW_mech. + MW_cable


PRS2


PRS2 SP

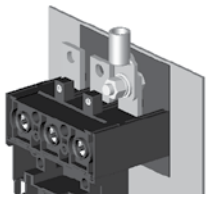
Accessories for EB2, ED2 160 and EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
OCR sealing cover 125 & 250	004671160	3, 4	1
Handle locks, ZA2 125-250	004671180	3, 4	1
Terminal cover lock, PZ 125-630AF	004672400	3, 4	1
Terminal cover, PRS2 250/3, front	004671207	3	1
Terminal cover, PRS2 250/4, front	004671208	4	1
Terminal cover, PRS2-SP 250/3, cable clamps	004671209	3	1
Terminal cover, PRS2-SP 250/4, cable clamps	004671210	4	1
Terminal cover, PRS2-NPF 250/3, plug-in	004671475	3	1
Terminal cover, PRS2-NPF 250/4, plug-in	004671476	4	1
DIN rail adapter, DIN 125 & 250	004671186	3, 4	1

Accessories for EB2, ED2 160 and EB2, ED2 250			
	Code No	Poles	Packaging [pcs]
Interpol barrier, IZ2 250	004671211	3, 4	1
Lateral block, LTBL 250, left	004671212	3. 4	1
Lateral block, LTBR 250, right	004671213	3, 4	1
Fixed plug-in 3-p, NPF 250	004671460	3	1
Fixed plug-in 4-p, NPF 250	004671461	4	1
Plug-in Conversion 3-p, NPI 250 for use with EB2 160/3S, 250/3L_S	004671462	3	1
Plug-in Conversion 4-p, NPI 250 for use with EB2 160/4S, 250/4L_S	004671463	4	1
Plug-in Conversion 3-p, NPI 250_E for use with EB2 250/3E	004671485	3	1
Plug-in Conversion 4-p, NPI 250_E for use with EB2 250/4E	004671486	4	1
Extension terminal for fixed Plug-in 3-p, SK3 250	004671464	3	set = 3 pcs
Extension terminal for fixed Plug-in 4-p, SK4 250	004671465	4	set = 4 pcs

- basic configuration: fixed plug-in + plug-in conversion
- extension terminals is used when fixed part of plug-in is under mounting plate - not used for basic configuration
- if additional accessories are installed in MCCB, plugs and sockets (PSPSS, PSHUV and PIO) are required,



IZ2

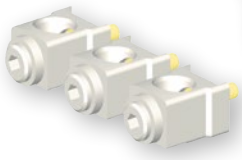


SK3

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Attach busbar, ZB2 400/3 Offset	004671221	3	set = 3 pcs
Attach busbar, ZB2 400/4 Offset	004671222	4	set = 4 pcs
Attach busbar, ZB2 400/3 Straight	004671326	3	set = 3 pcs
Attach busbar, ZB2 630/3 Straight	004671223	3	set = 3 pcs
Attach busbar, ZB2 ZB2 630/3 Offset	004671220	3	set = 3 pcs
Attach busbar, ZB2 630/4 Offset	004671224	4	set = 4 pcs
Solderless Terminal, SP2 400/3	004671225	3	set = 3 pcs
Solderless Terminal, SP2 400/4	004671226	4	set = 4 pcs
Rear connections, RC2 400/3	004671247	3	3
Rear connections, RC2 400/4	004671248	4	4
Rear connections, RC2 630/3	004671249	3	3
Rear connections, RC2 630/4	004671250	4	4



ZB2 Offset



SP2



RC2

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Motor Operator, MO2 630, AC100-240V	004671227	3, 4	1
Motor Operator, MO2 630 DC24V	004671441	3, 4	1
Motor Operator, MO2 630 DC100-120V	004671442	3, 4	1
Motor Operator, MO2 630, AC100-240V, reset	004671228	3, 4	1
Motor Operator, MO2 630 DC24V, reset	004671443	3, 4	1
Motor Operator, MO2 630 DC100-120V, reset	004671444	3, 4	1
Motor Operator, MO2 630 DC200-220V, reset	004671329	3, 4	1



MO2

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Breaker mounted handle IP3X, RO2 630, black	004671229	3, 4	1
Breaker mounted handle IP3X, RO2 630, keylock, black	004671230	3, 4	1
Breaker mounted handle IP3X, RO2 630, red	004671445	3, 4	1
Breaker mounted handle IP3X, RO2 630, keylock, red	004671446	3, 4	1
Door mounted handle IP55, RO2 630 P, black	004671231	3, 4	1
Door mounted handle IP65, RO2 630P, black	004671232	3, 4	1
Door mounted handle IP55, RO2 630P, red	004671447	3, 4	1
Door mounted handle IP65, RO2 630P, red	004671448	3, 4	1

Handle operating mechanism can be padlocked in OFF



IP55, RO2P

Technical data on page 439



MW

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Slide mechanical interlock, MS 630 3P, MO or RO assembly not possible	004671233	3	1
Slide mechanical interlock, MS 630 4P, MO or RO assembly not possible	004671234	4	1
Link mechanical interlock, MLR 630 right , MO or RO assembly possible	004671235	3, 4	1
Link mechanical interlock, MLL 630 left 3p, MO or RO assembly possible	004671236	3	1
Link mechanical interlock, MLL 630 left 4p, MO or RO assembly possible	004671237	4	1
Wire mechanical interlock, MW 630, mechanism, MO or RO assembly possible	004671238	3, 4	1

Link mechanical interlock configuration; MLR_right + MLL_left
Wire mechanical interlock configuration; 2xMW_mech. + MW_cable



PRS2

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Handle locks, ZA2 400/1000	004671239	3, 4	1
Terminal cover lock, PZ 125-630AF	004672400	3, 4	1
Terminal cover, PRS2 630/3, front	004671240	3	1
Terminal cover, PRS2 630/4, front	004671241	4	1
Terminal cover, PRS2-SP 630/3, cable clamps	004671242	3	1
Terminal cover, PRS2-SP 630/4, cable clamps	004671243	4	1
Interpol barrier, IZ2 400-1600	004671244	3, 4	1
Lateral block, LTBL 400-1000, left	004671245	3, 4	1
Lateral block, LTBR 400-1000, right	004671246	3, 4	1
Door Flange , PR2 400-630	004671449	3, 4	1



NPI

Accessories for EB2, ED2 400 and EB2, ED2 630			
	Code No	Poles	Packaging [pcs]
Fixed plug-in 3-p, NPF 400-630	004671466	3	1
Fixed plug-in 4-p, NPF 400-630	004671467	4	1
Plug-in Conversion 3-p, NPI 400-630AF - 400A 3p	004671468	3	1
Plug-in Conversion 4-p, NPI 400-630AF - 400A 4p	004671469	4	1
Plug-in Conversion 3-p, NPI 400-630AF - 630A 3p	004671487	3	1
Plug-in Conversion 4-p, NPI 400-630AF - 630A 4p	004671488	4	1
Extension terminal for fixed Plug-in 3-p, SK3 400-630	004671470	3	set = 3 pcs
Extension terminal for fixed Plug-in 4-p, SK4 400-630	004671471	4	set = 4 pcs

- at 630A plug-in Conversion is max Rated current 504A at 50°C and 535,5A at 30°C and 40°C

- basic configuration: fi xed plug-in + plug-in conversion
- extension terminals is used when fi xed part of plug-in is under mounting plate - not used for basic configuration
- if additional accessories are installed in MCCB, plugs and sockets (PSPSS, PSHUV and PIO) are required,



ZB2 Straight

Accessories for EB2, ED2 800			
	Code No	Poles	Packaging [pcs]
Attach busbar, ZB2 S800-630/3 Straight	004672320	3	set = 3 pcs
Attach busbar, ZB2 S800-630/4 Straight	004672321	4	set = 4 pcs
Attach busbar, ZB2 S800-800/3 Straight	004672322	3	set = 3 pcs
Attach busbar, ZB2 S800-800/4 Straight	004672323	4	set = 4 pcs

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Accessories for EB2, ED2 800 and EB2, ED2 1000			
	Code No	Poles	Packaging [pcs]
Motor Operator, MO2 800-1000, AC100-240V	004672324	3, 4	1
Motor Operator, MO2 800-1000 DC24-48V	004672325	3, 4	1
Motor Operator, MO2 800-1000 DC100-120V	004672326	3, 4	1

Accessories for EB2, ED2 800 and EB2, ED2 1000			
	Code No	Poles	Packaging [pcs]
Handle Operating Mechanism, RO2 800-1000, black	004672327	3, 4	1
Handle Operating Mechanism, RO2 800-1000, key lock, black	004672328	3, 4	1
Handle Operating Mechanism, RO2 800-1000, red	004672329	3, 4	1
Handle Operating Mechanism, RO2 800-1000, key lock, red	004672330	3, 4	1
External Handle Operating Mechanism, RO2 800-1000 P, black	004672331	3, 4	1
External Handle Operating Mechanism, RO2 800-1000P, red	004672332	3, 4	1
Toggle Extension, PRO2 800-1600A	004672319	3, 4	1



Door mounted handle
(door interlock handle)

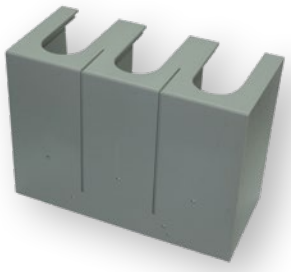
Accessories for EB2, ED2 800 and EB2, ED2 1000			
	Code No	Poles	Packaging [pcs]
Slide mechanical interlock, MS 800 3P, MO or RO assembly not possible	004672333	3	1
Slide mechanical interlock, MS 800 4P, MO or RO assembly not possible	004672334	4	1
Link mechanical interlock, MLR 800-1000 right , MO or RO assembly possible	004672335	3, 4	1
Link mechanical interlock, MLL 800-1000 left 3p, MO or RO assembly possible	004672336	3	1
Link mechanical interlock, MLL 800-1000 left 4p, MO or RO assembly possible	004672337	4	1
Wire mechanical interlock, MW 800-1000, mechanism, MO or RO assembly possible	004672338	3, 4	1

Link mechanical interlock configuration; MLR_right + MLL_left
Wire mechanical interlock configuration; 2xMW_mech. + MW_cable



MW_cable

Accessories for EB2, ED2 800 and EB2, ED2 1000			
	Code No	Poles	Packaging [pcs]
Handle locks, ZA2 400/1000	004671239	3, 4	1
Terminal cover, PRS2 800-1000/3, front	004672339	3	1
Terminal cover, PRS2 800-1000/4, front	004672340	4	1
Interpol barrier, IZ2 400-1600	004671244	3, 4	1
Lateral block, LTBL 400-1000, left	004671245	3	1
Lateral block, LTBR 400-1000, right	004671246	4	1



PRS2

Accessories for EB2, ED2 800			
	Code No	Poles	Packaging [pcs]
Fixed, Plug-in 3-p, NPF 800/3 AB	004672402	3	1
Fixed, Plug-in 4-p, NPF 800/4 AB	004672404	4	1
Plug-in Conversion 3-p, NPI 800/3	004672405	3	1
Plug-in Conversion 4-p, NPI 800/4	004672406	4	1
3 flat bars for Plug-in mount blocks, ZB2 800/3 NPF	004672407	3	set = 3 pcs
4 flat bars for Plug-in mount blocks, ZB2 800/4 NPF	004672408	4	set = 4 pcs
Plug for aux. and alarm switches PSPSS 800-1000AF	004671491	3, 4	1
Plug for shunt trips and underv. trips PSHUV 800-1000AF	004671492	3, 4	1

- basic configuration: fi xed plug-in + plug-in conversion
- extension terminals is used when fi xed part of plug-in is under mounting plate - not used for basic configuration
- if additional accessories are installed in MCCB, plugs and sockets (PSPSS, PSHUV and PIO) are required,
- AB suitable for attach bars



NPF



NPI

Technical data on page 439



Handle Operating Mechanism

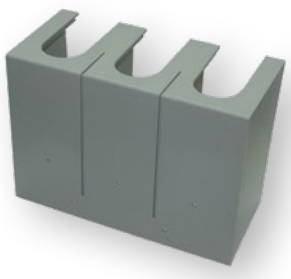
Accessories for EB2, ED2 1250 and EB2, ED2 1600			
	Code No	Poles	Packaging [pcs]
Motor Operator, MO2 1250-1600, AC240V	004672350	3, 4	1
Motor Operator, MO2 1250-1600 DC24-48V	004672351	3, 4	1
Motor Operator, MO2 1250-1600 DC100-110V	004672352	3, 4	1

Accessories for EB2, ED2 1250 and EB2, ED2 1600			
	Code No	Poles	Packaging [pcs]
Handle Operating Mechanism, RO2 1250-1600, black	004672353	3, 4	1
Handle Operating Mechanism, RO2 1250-1600, key lock, black	004672354	3, 4	1
Handle Operating Mechanism, RO2 1250-1600, red	004672355	3, 4	1
Handle Operating Mechanism, RO2 1250-1600, key lock, red	004672356	3, 4	1
External Handle Operating Mechanism, RO2 1250-1600 P, black	004672357	3, 4	1
External Handle Operating Mechanism, RO2 1250-1600P, red	004672358	3, 4	1
Toggle Extension, PRO2 800-1600A	004672319	3, 4	1

Accessories for EB2, ED2 1250			
	Code No	Poles	Packaging [pcs]
Slide mechanical interlock, MS 1250 3P, MO or RO assembly not possible	004672359	3	1
Slide mechanical interlock, MS 1250 4P, MO or RO assembly not possible	004672360	4	1

Accessories for EB2, ED2 1250			
	Code No	Poles	Packaging [pcs]
Fixed plug-in 3-p, NPF 1250/3	004672411	3	1
Fixed plug-in 4-p, NPF 1250/4	004672412	4	1
Plug-in Conversion 3-p, NPI 1250/3	004672413	3	1
Plug-in Conversion 4-p, NPI 1250/4	004672414	4	1
AUX terminal 1250A Base Side	004672415	3, 4	1

- Plug in version of MCCB has to be assembled by ETI
- max 3 AUX terminals can be used and each has 5 connections



Terminal Cover

Accessories for EB2, ED2 1250			
	Code No	Poles	Packaging [pcs]
Terminal cover, PRS2 1250/3, front	004672361	3	1
Terminal cover, PRS2 1250/4, front	004672362	4	1
Interpol barrier, IZ2 400-1600	004671244	3, 4	3/4

Technical data on page 439

Low voltage moulded case circuit breaker EB2

Product series	description	unit	condition	EB2 125				EB2 160	
Model-type				L	S	H	V	S	H
Number of poles				3, 4			3	3, 4	
Nominal current ratings									
	I_n	(A)	50°C	20,32,50, 63,100,125				160	
Electrical characteristics									
Rated operational voltage	U_e	(V)	AC 50/60 Hz	690	690	690	1100	690	690
			DC	250	250	250	-	250	250
Rated insulation voltage	U_i	(V)		800	800	800	1100	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8
Ultimate breaking capacity	I_{cu}	(kA)	1100V AC	-	-	-	4*/6**	-	-
(IEC, JIS, AS/NZS)			690V AC	-	6	6		7.5	7.5
			525V AC	8	22	25		25	25
			440V AC	15	25	50		25	50
			400/415V AC	25	36	65		36	65
			220/240V AC	35	50	85		65	85
			250V DC	25	25	40		40	40
Service breaking capacity	I_{cs}	(kA)	1100V AC	-	-	-	4	-	-
(IEC, JIS, AS/NZS)	I_{cs}	(kA)	690V AC	-	6	6		7.5	7.5
			525V AC	6	22	22		25	25
			440V AC	12	25	25		25	25
			400/415V AC	19	36/30	36/33		36	36
			220/240V AC	27	50	85		65	85
			250V DC	19	19	40		40	40
Rated breaking capacity (NEMA)		(kA)	480V AC	8	22	25		22	25
			240VAC	35	50	85		65	85
Protection									
Adjustable thermal, adjustable magnetic				■	■		■	■	
Fixed thermal, fixed magnetic				■					
Microprocessor									
Utilisation category				A	A		A	A	
Installation									
Front connection				■	■		■	■	
Attached flat bar				•	•		•	•	
Solderless terminal (cable clamp)				•	•		•	•	
Rear connection				•	•		•	•	
Plug-in				•	•		•	•	
Draw- out				-	-			-	
DIN rail mounting				•	•		-	-	
Dimensions	h	(mm)		155	155		155	165	
	w	(mm)	3 pole	90	90		90	105	
			4 pole	120	120			140	
	d	(mm)		68	68		68	68	
Weight		(kg)	3 pole	1.1	1.1		1.1	1.5	
			4 pole	1.4	1.4			1.9	
Operation									
Direct Opening Action				■	■		■	■	
Toggle operation				■	■		■	■	
Variable depth / direct mount operating handle				•	•		•	•	
Motor operator				•	•		•	•	
Endurance	Electrical	cycles	415V AC	30000	30000			20000	
			1100V AC				1000		
	Mechanical	cycles		30000	30000		7000	30000	
Standards	IEC 60947-2, EN 60947-2								

■ Standard • Optional - Not Available

*20, 32A

**50, 63, 100, 125A

Product series	description	unit	condition	EB2 250				EB2 250	
Model-type				L	S	H	V	LE	E
Number of poles					3, 4		3	3, 4	
Nominal current ratings									
	I_n	(A)	50°C		200, 250		160, 250	40, 125, 160, 250	
Electrical characteristics									
Rated operational voltage	U_e	(V)	AC 50/60 Hz	690	690	690	1100	690	690
			DC	250	250	250	-	-	-
Rated insulation voltage	U_i	(V)		800	800	800	1100	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8
Ultimate breaking capacity	I_{cu}	(kA)	1100V AC	-	-	-	6	-	-
(IEC, JIS, AS/NZS)			690V AC	-	7.5	7.5		7,5	20
			525V AC	10	25	25		25	35
			440V AC	15	25	50		25	50
			400/415V AC	25	36	65		36	70
			220/240V AC	35	65	85		65	125
			250V DC	25	40	40		-	-
Service breaking capacity	I_{cs}	(kA)	1100V AC	-	-	-	4	-	-
(IEC, JIS, AS/NZS)			690V AC	-	7.5	7.5		7,5	15
			525V AC	7.5	25	25		25	35
			440V AC	12	25	25		25	50
			400/415V AC	19	36	36		36	70
			220/240V AC	27	65	85		65	125
			250V DC	19	40	40		-	-
Rated breaking capacity (NEMA)		(kA)	480V AC	10	22	25		25	35
			240VAC	35	65	85		65	125
Rated short-time withstand current	I_{cw}	(kA)	0.3 s	-	-		-	-	-
Protection									
Adjustable thermal, adjustable magnetic				■	■		■	-	-
Fixed thermal, fixed magnetic								-	-
Microprocessor								■	■
Utilisation category				A	A		A	A	A
Installation									
Front connection				■	■		■	■	■
Attached flat bar				•	•		•	•	•
Solderless terminal (cable clamp)				•	•		•	•	•
Rear connection				•	•		•	•	•
Plug-in				•	•		•	•	•
Draw- out				-	-			-	-
DIN rail mounting				-	-		-	-	-
Dimensions	h	(mm)		165	165		165	165	165
	w	(mm)	3 pole	105	105		105	105	105
		(mm)	4 pole	140	140			140	140
	d	(mm)		68	68		68	103	103
Weight		(kg)	3 pole	1.5	1.5		1.5	2.3	2.5
			4 pole	1.9	1.9			3.1	3.3
Operation									
Direct Opening Action				■	■		■	■	■
Toggle operation				■	■		■	■	■
Variable depth / direct mount operating handle				•	•		•	•	•
Motor operator				•	•		•	•	•
Endurance	Electrical	cycles	415V AC	10000	10000			10000	10000
			1100V AC				10000		
	Mechanical	cycles		30000	30000		70000	30000	30000
Standards				IEC 60947-2, EN 60947-2					

■ Standard • Optional - Not Available

Technical data

Product series	description	unit	condition	EB2 400		EB2 400		EB2 630		
Model-type				L	S	E, LCD	HLCD	LE, LLCD	E, LCD	HE
Number of poles				3, 4	3, 4	3, 4	4	3, 4	3, 4	3, 4
Nominal current ratings										
	I_n	(A)	50°C	250, 400	250, 400	250, 400		630	630	630
Electrical characteristics										
Rated operational voltage	U_e	(V)	AC 50/60 Hz	525	690	690	690	690*	690*	690*
			DC	250	250	-	-	-	-	-
Rated insulation voltage	U_i	(V)		800	800	800	800	800	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8	8
Ultimate breaking capacity	I_{cu}	(kA)	690V AC	-	20	20	20	10*	20*	20*
(IEC, JIS, AS/NZS)			525V AC	15	30	30	30	15	30	30
			440V AC	22	45	45	65	25	45	65
			400/415V AC	25	50	50	70	36	50	70
			220/240V AC	35	85	85	100	50	85	100
			250V DC	25	40	-	-	-	-	-
Service breaking capacity	I_{cs}	(kA)	690V AC	-	15	15	15	10*	15*	15*
(IEC, JIS, AS/NZS)			525V AC	15	30	30	30	15	30	30
			440V AC	22	45	45	50	25	45	50
			400/415V AC	25	50	50	50	36	50	50
			220/240V AC	35	85	85	85	50	85	85
			250V DC	19	40	-	-	-	-	-
Rated breaking capacity (NEMA)		(kA)	480V AC	15	25	25	30	15	25	30
			240VAC	35	85	85	100	50	85	100
Rated short-time withstand current	I_{cw}	(kA)	0.3 s	-	-	5	5	-	-	
Protection										
Adjustable thermal, adjustable magnetic				■	■					
Fixed thermal, fixed magnetic										
Microprocessor						■	■	■	■	■
Utilisation category				A	A	B	B	A	A	A
Installation										
Front connection				■	■	■	■	■	■	■
Attached flat bar				•	•	•	•	•	•	•
Solderless terminal (cable clamp)				•	•	•	•	-	-	-
Rear connection				•	•	•	•	-	-	-
Plug-in				•	•	•	•			
Draw- out				•	•	•	•	-	-	-
DIN rail mounting				-	-	-	-	-	-	-
Dimensions	h	(mm)		260	260	260	260	260	260	260
	w	(mm)	3 pole	140	140	140	-	140	140	140
		(mm)	4 pole	185	185	185	185	185	185	185
	d	(mm)		103	103	103	103	103	103	103
Weight		(kg)	3 pole	4.2	4.2	4.3	-	5.0	5.0	5.0
			4 pole	5.6	5.6	5.7	5.7	6.5	6.5	6.5
Operation										
Direct Opening Action				■	■	■	■	■	■	■
Toggle operation				■	■	■	■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•	•	•	•
Motor operator				•	•	•	•	•	•	•
Endurance	Electrical	cycles	415V AC	4500	4500	4500	4500	4500	4500	4500
	Mechanical	cycles		15000	15000	15000	15000	15000	15000	15000
Standards	IEC 60947-2, EN 60947-2									

■ Standard • Optional - Not Available

* MCCB can not be used in IT system at this voltage

Product series	description	unit	condition	EB2 800			EB2 800			EB2 1000		EB2 1250		EB2 1600	
Model-type				L	S	H	LE	E	HE	LE	E	LE	E	LE	E
Number of poles				3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Nominal current ratings															
	I_n	(A)	50°C	630, 800	630, 800	630, 800	800	800	800	1000	1000	1250	1250	1600	1600
Electrical characteristics															
Rated operational voltage	Ue	(V)	AC 50/60 Hz	690	690	690	690	690	690	690	690	690	690	690	690
			DC	250	250	250	-	-		-	-	-	-	-	-
Rated insulation voltage	Ui	(V)		800	800	800	800	800	800	800	800	800	800	800	800
Rated impulse withstand voltage	Uimp	(kV)		8	8	8	8	8	8	8	8	8	8	8	8
Ultimate breaking capacity	Icu	(kA)	690V AC	10*	20*	25*	20*	25*	25*	20*	25*	20*	25*	20*	45*
(IEC, JIS, AS/NZS)			525V AC	15*	30	45	30	35	40	30	45	30	45	30	65
			440V AC	30	50	65	50	65	125	45	65	45	65	45	85
			400/415V AC	36	50	70	50	70	125	50	70	50	70	50	100/85
			220/240V AC	50	85	100	85	100	150	85	100	85	100	85	125
			250V DC	50	50	50	-	-	-	-	-	-	-	-	-
Service breaking capacity	Ics	(kA)	690V AC	10*	20*	20*	20*	20*	20*	15*	20*	15*	20*	15*	34*
(IEC, JIS, AS/NZS)			525V AC	15*	30	34	30	30	34	23	34	23	34	23	50
			440V AC	30	50	50	50	50	94	34	50	34	50	34	65
			400/415V AC	36	50	50	50	50	94	38	50	38	50	38	75/65
			220/240V AC	50	85	75	85	75	150	65	75	65	75	65	94
			250V DC	50	50	50	-	-	-	-	-	-	-	-	-
Rated breaking capacity (NEMA)		(kA)	480V AC	15	30	45	30	35	40	30	45	30	45	30	65
			240V AC	50	85	100	85	100	150	85	100	85	100	85	125
Rated short-time withstand current	Icw	(kA)	0,3 sec	-	-	-	10	10	10	-	-	15	15	20	20
Protection															
Adjustable thermal, adjustable magnetic				■	■	■	-	-	-	-	-	-	-	-	-
Fixed thermal, fixed magnetic				-	-	-	-	-	-	-	-	-	-	-	-
Microprocessor				-	-	-	■	■	■	■	■	■	■	■	■
Utilisation category				A	A	A	B	B	B	A	A	B	B	B	B
Installation															
Front connection				■	■	■	■	■	-	-	-	-	-	-	-
Attached flat bar				•	•	•	•	•	■	■	■	■	■	■	■
Solderless terminal (cable clamp)				•	•	•	-	-	-	-	•	-	-	-	-
Rear connection				•	•	•	-	-	•	•	-	-	-	•	•
Plug-in				•	•	•	-	-	•	-	-	-	-	-	-
Draw- out				-	-	-	-	-	-	-	-	-	-	-	-
DIN rail mounting				-	-	-	-	-	-	-	-	-	-	-	-
Dimensions	h	(mm)		273	273	273	273	273	273	273	273	370	370	370	370
	w	(mm)	3 pole	210	210	210	210	210	210	210	210	210	210	210	210
		(mm)	4 pole	280	280	280	280	280	280	280	280	280	280	280	280
	d	(mm)		103	103	103	103	103	140	103	103	120	120	140	140
Weight		(kg)	3 pole	8,5	8,5	8,5	9,1	9,1	12,3	11	11	19,8	19,8	27	27
			4 pole	11,5	11,5	11,5	12,3	12,3	14,8	14,8	14,8	25	25	35	35
Operation															
Direct Opening Action				■	■	■	■	■	■	■	■	■	■	■	■
Toggle operation				■	■	■	■	■	■	■	■	■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•	•	•	•	•	•	•	•	•
Motor operator				•	•	•	•	•	•	•	•	•	•	•	•
Endurance	Electrical	cycles	690	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	2000	2000
	Mechanical	cycles		10000	10000	10000	10000	10000	10000	10000	10000	5000	5000	5000	5000
Standards	IEC 60947-2, EN 60947-2														

■ Standard • Optional - Not Available

* MCCB can not be used in IT system at this voltage

Technical data

Product series	description	unit	condition	EB2R	EB2R
Model-type				125L	250L
Number of Poles				3, 4	3, 4
Nominal current ratings					
	I_n	(A)	50°C	20, 32, 50	160, 250
				63, 100, 125	
Electrical characteristics					
Rated operational voltage	U_e	(V)	AC 50/60 Hz	525	525
Rated impulse withstand voltage	U_{imp}	(kV)		8	8
Ultimate breaking capacity	I_{cu}	(kA)	525V AC	8	10
(IEC, JIS, AS/NZS)			440V AC	15	15
			400/415V AC	25	25
			220/240V AC	35	35
Service breaking capacity	I_{cs}	(kA)	525V AC	6	7.5
(IEC, JIS, AS/NZS)			440V AC	12	12
			400/415V AC	19	19
			220/240V AC	27	27
Protection					
Adjustable thermal, adjustable magnetic				■	■
Residual current protection, Type A				■	■
Utilization category				A	A
Installation					
Front connection				■	■
Attached flat bar				•	•
Solderless terminal (cable clamp)				•	•
Rear connection				•	•
Plug-in				-	-
DIN rail mounting				•	-
Dimensions	h	(mm)		155	165
	w	(mm)	3 pole	90	105
			4 pole	120	140
	d	(mm)		68	68
Weight		(kg)	3 pole	1.1	1.5
			4 pole	1.4	1.9
Operation					
Direct Opening Action				■	■
Toggle operation				■	■
Variable depth / direct mount operating handle				•	•
Mechanical interlocks				-	-
Motor operator				•	•
Endurance	Electrical	cycles	440V AC	30000	30000
	Mechanical	cycles		30000	30000
Standards	IEC 60947-2, EN 60947-2				

■ Standard • Optional - Not Available

Product series	description	unit	condition	EB2 400		EB2 800	
Model-type				LF	SF	LF	LF
Number of poles				3	3, 4	3, 4	
Nominal current ratings							
	I_n	(A)	50°C	400 (45°C)	400 (45°C)	630 (45°C)	800 (45°C)
Electrical characteristics							
Rated operational voltage	U_e	(V)	AC 50/60 Hz	690	690	690	690
			DC	250	250	250	250
Rated insulation voltage	U_i	(V)		690	690	690	690
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8
Ultimate breaking capacity (IEC, JIS, AS/NZS)	I_{cu}	(kA)	3,817	10	15	10	10
			525V AC	15	22	15	15
			440V AC	22	30	30	30
			400/415V AC	25	36	36	36
			220/240V AC	35	50	50	50
			250V DC	35	40	50	50
Service breaking capacity (IEC, JIS, AS/NZS)	I_{cs}	(kA)	690V AC	10	15	10	10
			525V AC	15	22	15	15
			440V AC	22	30	30	30
			400/415V AC	25	36	36	36
			220/240V AC	35	50	50	50
			250V DC	35	40	50	50
Rated breaking capacity (NEMA)		(kA)	480V AC				
			240VAC				
Rated short-time withstand current							
Protection							
Fixed thermal, adjustable magnetic				-	■		
Fixed thermal, fixed magnetic				■		-	-
Microprocessor				-	-	-	-
Utilisation category				A	A	A	A
Installation							
Front connection				■	■	-	-
Attached flat bar				•	•	■	■
Solderless terminal (cable clamp)				•	•	•	•
Rear connection				•	•	•	•
Plug-in				•	•	•	•
Draw- out						-	-
DIN rail mounting				-	-	-	-
Dimensions	h	(mm)		260	260	273	273
	w	(mm)	3 pole	140	140	210	210
		(mm)	4 pole	-	185	280	280
	d	(mm)		103	103	103	103
Weight		(kg)	3 pole	4.2	4.2	8	8,5
			4 pole	-	5.6	11	11,5
Operation							
Direct Opening Action				■	■	■	■
Toggle operation				■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•
Motor operator				•	•	•	•
Endurance	Electrical	cycles	415V AC	4500	4500	4000	4000
	Mechanical	cycles		15000	15000	10000	10000
Standards	IEC 60947-2, EN 60947-2						

■ Standard • Optional - Not Available

Low voltage switch disconnector

Product series	desc.	unit	condition	ED2	ED2	ED2	ED2	ED2	ED2	ED2	ED2	ED2
Model-type				125	160	250	400	630	800	1000	1250	1600
Number of Poles				3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Nominal current ratings												
	I_n	(A)		125	160	250	400	630	800	1000	1250	1600
Electrical characteristics												
Rated operational voltage	U_e	(V)	AC 50/60 Hz	690	690	690	690	690	690	690	690	690
			DC	250	250	250	250	250	250	250	250	250
Rated insulation voltage	U_i	(V)		800	800	800	800	800	800	800	800	800
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8	8	8	8
Rated short-circuit making capacity	I_{cm}	(kA peak)		3,6	6	6	9	9	17	17	32	45
Rated short-time withstand current	I_{cw}	(kA rms)	0.3s	2	3	3	5	5	10	10	10	10
			AC	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A
			DC	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A
Installation												
Front connection				■	■	■	■	■	■	-	-	-
Attached flat bar				•	•	•	•	•	•	■	■	•
Solderless terminal				•	•	•	•	•	-	-	-	-
Rear connection				•	•	•	•	•	•	•	•	■
Plug-in				•	•	•	•	•	•	-	•	-
Draw- out				•	•	•	•	•	•	-	•	•
DIN rail mounting				•	-	-	-	-	-	-	-	-
Dimensions	h	(mm)		155	165	165	260	260	273	273	370	370
	w	(mm)	3 pole	90	105	105	140	140	210	210	210	210
		(mm)	4 pole	120	140	140	185	185	280	280	280	280
	d	(mm)		68	68	68	103	103	103	103	120	140
Weight		(kg)	3 pole	1.1	1.5	1.5	4.2	4.4	8,5	10,4	18,2	24,9
			4 pole	1.4	1.9	1.9	5.6	5.8	11,5	14,0	23, 4	32,9
Operation												
Direct Opening Action				■	■	■	■	■	■	■	■	■
Toggle operation				■	■	■	■	■	■	■	■	■
Variable depth / direct mount operating handle				•	•	•	•	•	•	•	•	•
Motor operator				•	•	•	•	•	•	•	•	•
Endurance	Elec.	cycles	415V AC	30000	10000	10000	4500	4500	4000	4000	4000	2000
	Mech.	cycles		30000	30000	30000	15000	15000	10000	10000	5000	5000
Standards				IEC 60947-2, EN 60947-2						IEC 60947-3, EN 60947-3		

Thermal magnetic adjustments and characteristics

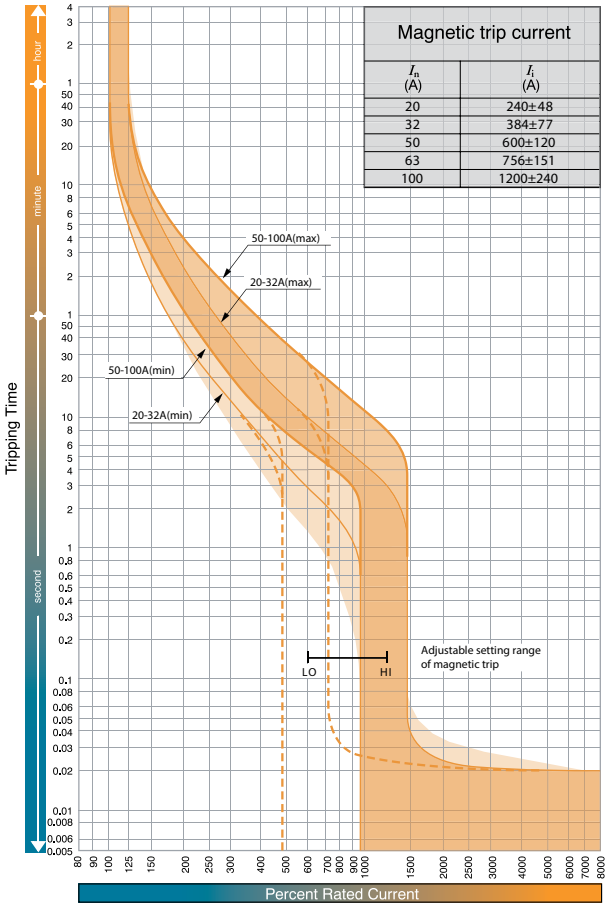
Thermal adjustment

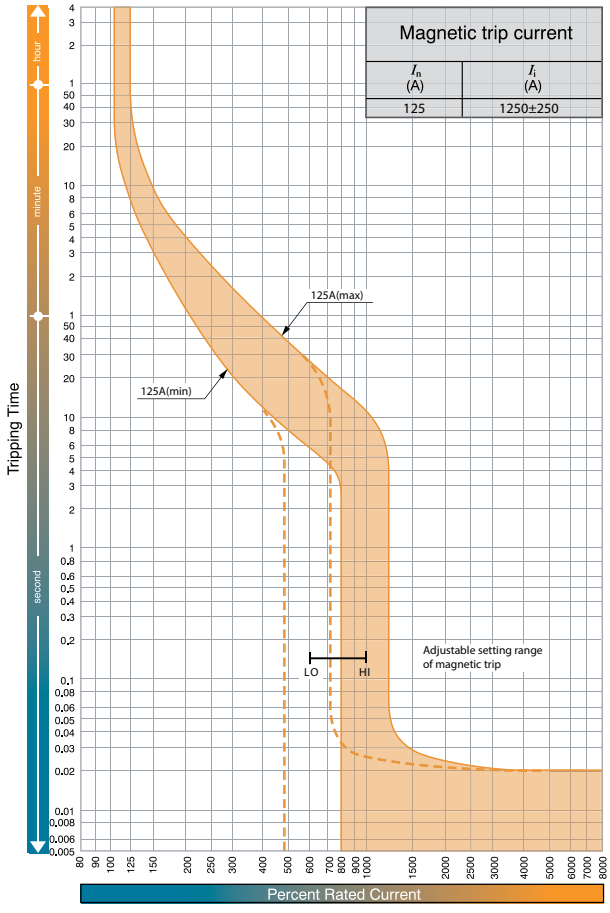
Low voltage moulded case circuit breakers have a wide thermal adjustment range, one of the largest on the market. The rated current 'I_r' is continuously adjustable from 63% to 100% of this nominal current 'I_n'. There are three main points of calibration marked at 63%, 80% and 100%.

Magnetic adjustment

An adjustable magnetic characteristics allows short-circuit protection to be matched to the load and supply characteristics, for example motor inrush current or generator short-circuit current.

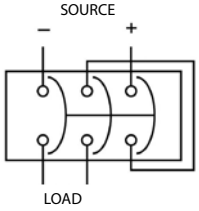
Time, current characteristics curves
EB2 125



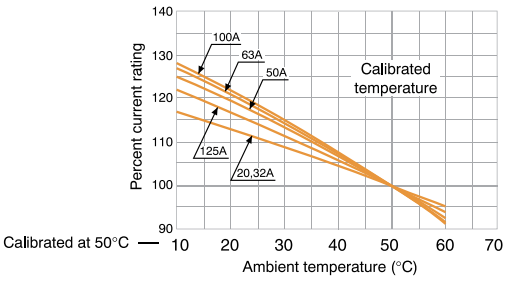


Special applications of thermal magnetic MCCBs

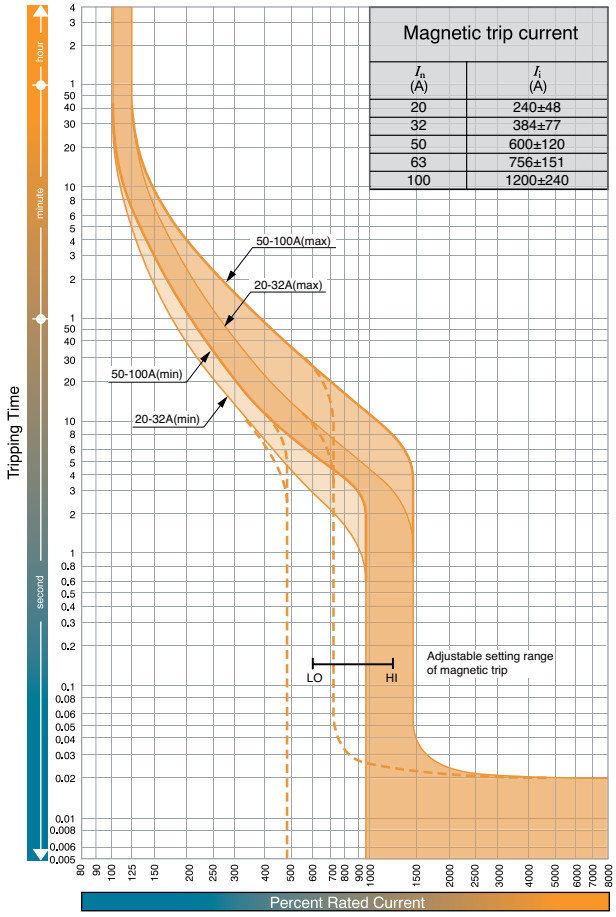
All standard thermal magnetic MCCBs are suitable for DC application up to 250 V DC.

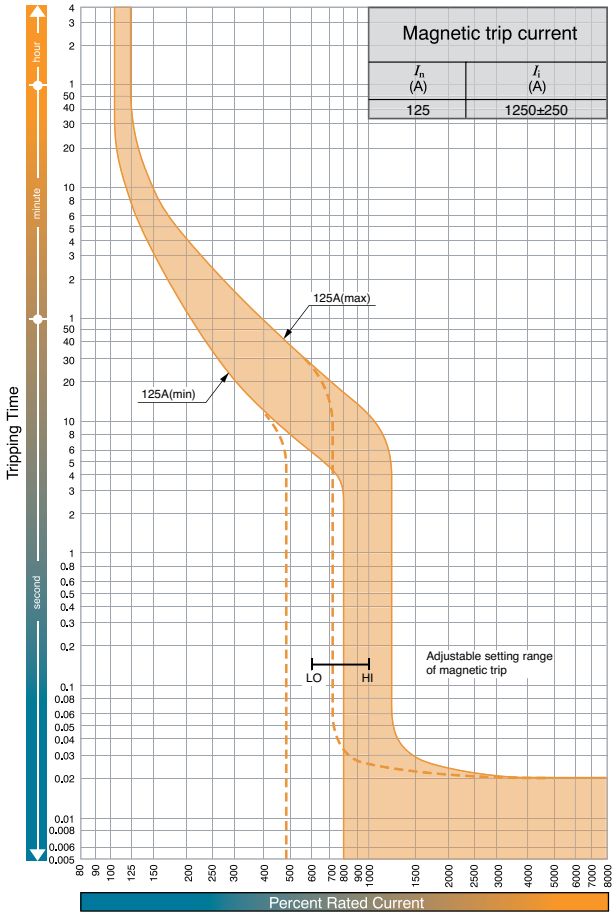


Ambient compensating curves

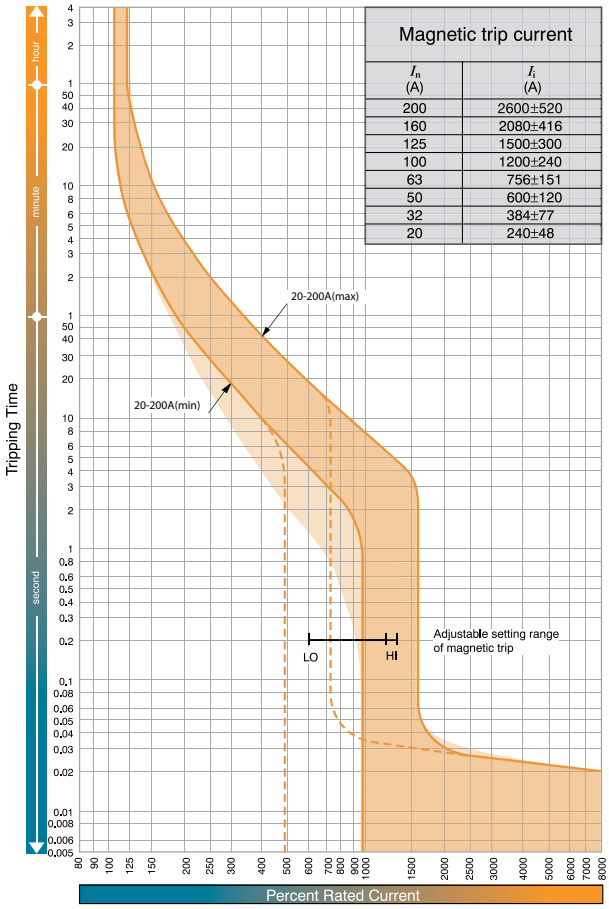


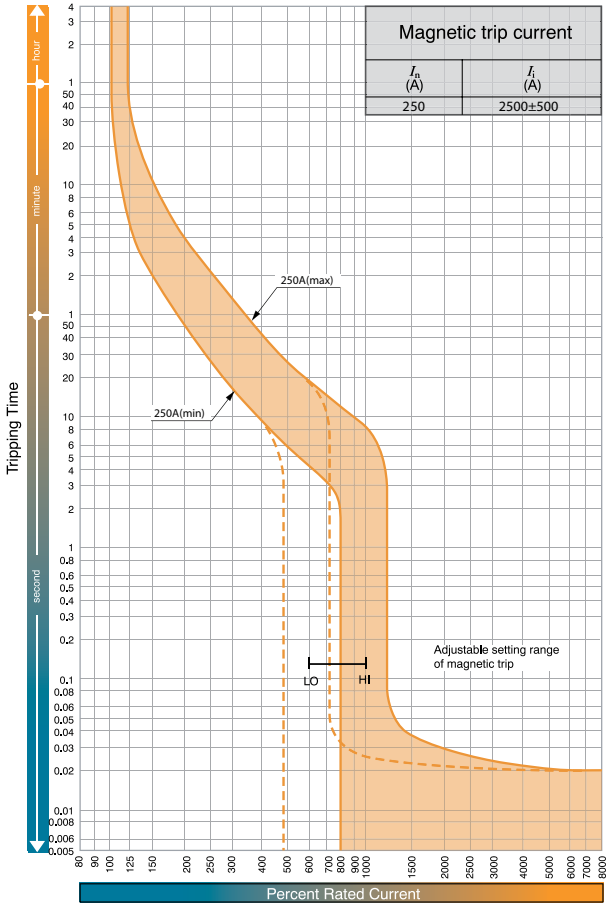
Time, current characteristics curves
EB2 125 1000V



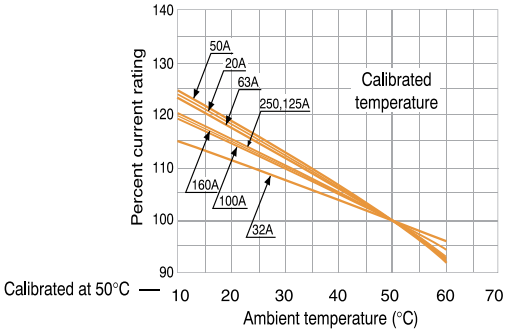


Time, current characteristics curves
EB2 160 and EB2 250



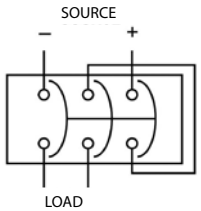


Ambient compensating curves

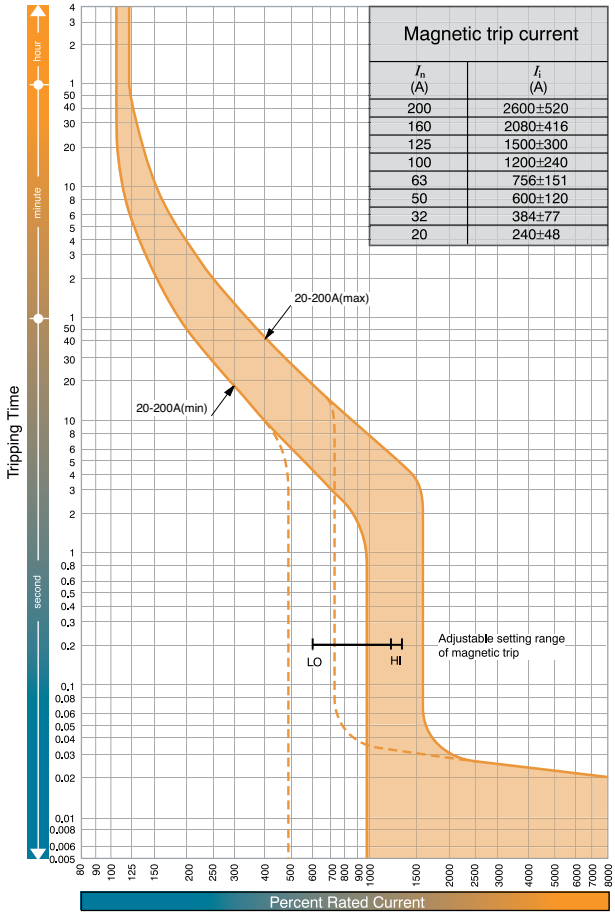


Special applications of thermal magnetic MCCBs

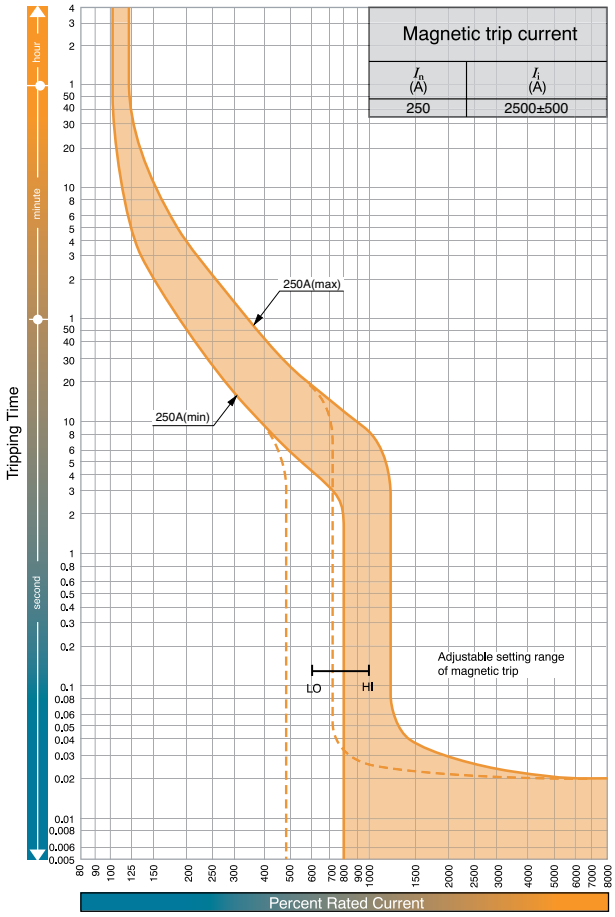
All standard thermal magnetic MCCBs are suitable for DC application up to 250 V DC.



Time, current characteristics curves
EB2 250 1000V

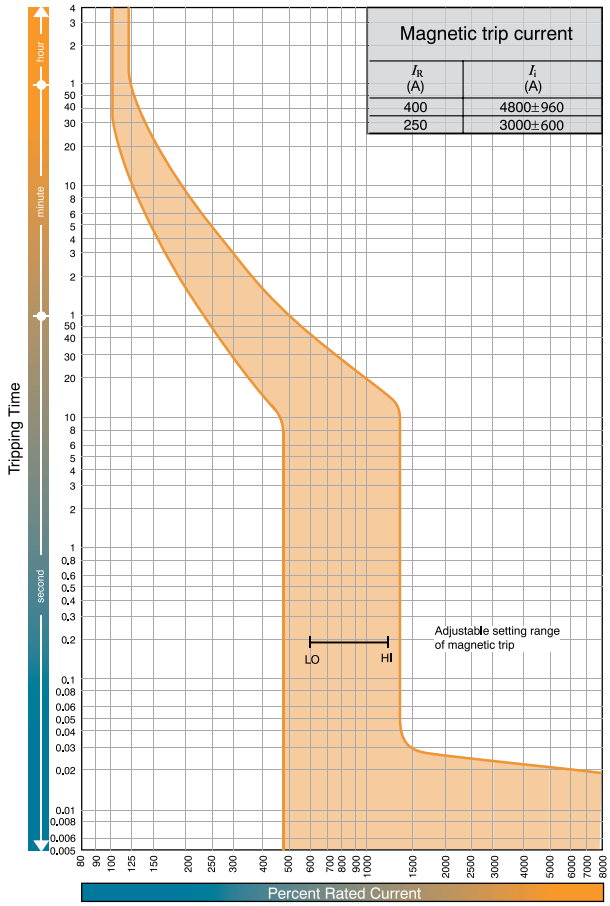


Magnetic trip current	
I_n (A)	I_i (A)
200	2600±520
160	2080±416
125	1500±300
100	1200±240
63	756±151
50	600±120
32	384±77
20	240±48

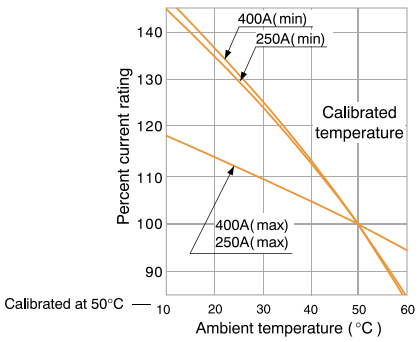


Magnetic trip current	
I_n (A)	I_i (A)
250	2500±500

Time, current characteristics curves
EB2 400

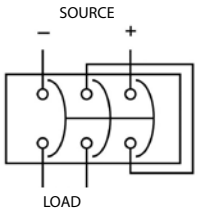


Ambient compensating curves

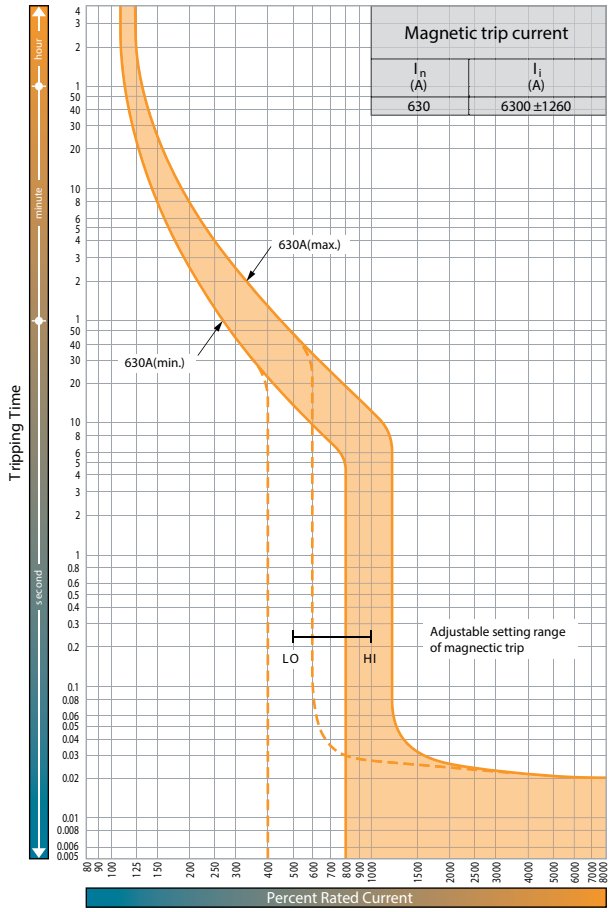


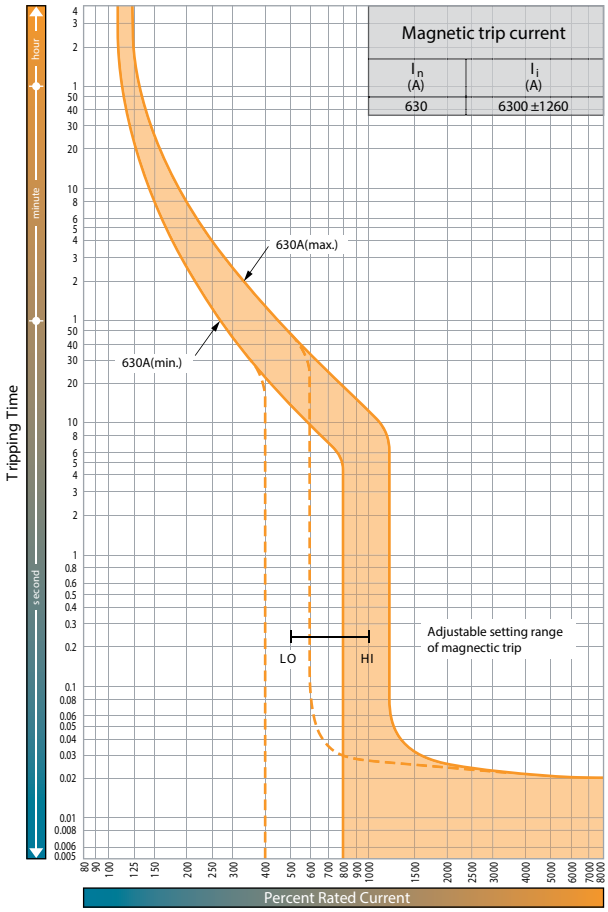
Special applications of thermal magnetic MCCBs

All standard thermal magnetic MCCBs are suitable for DC application up to 250 V DC.

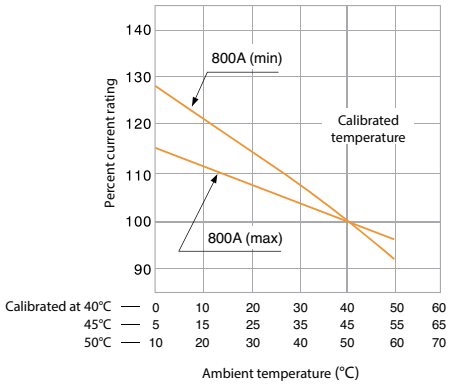


Time, current characteristics curves
EB2 630 and EB2 800



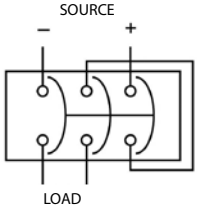


Ambient compensating curves

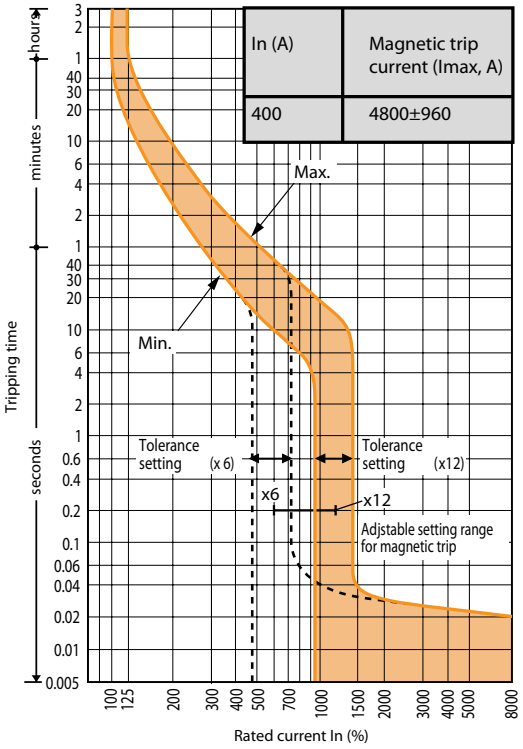


Special applications of thermal magnetic MCCBs

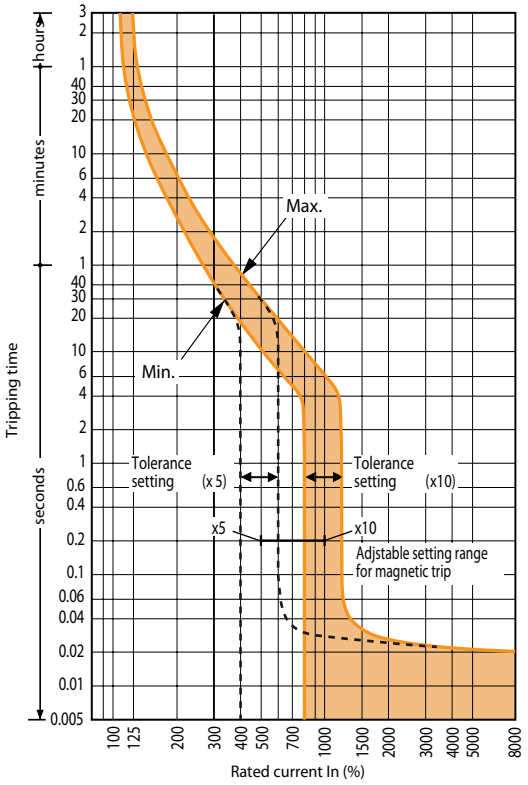
All standard thermal magnetic MCCBs are suitable for DC application up to 250 V DC.



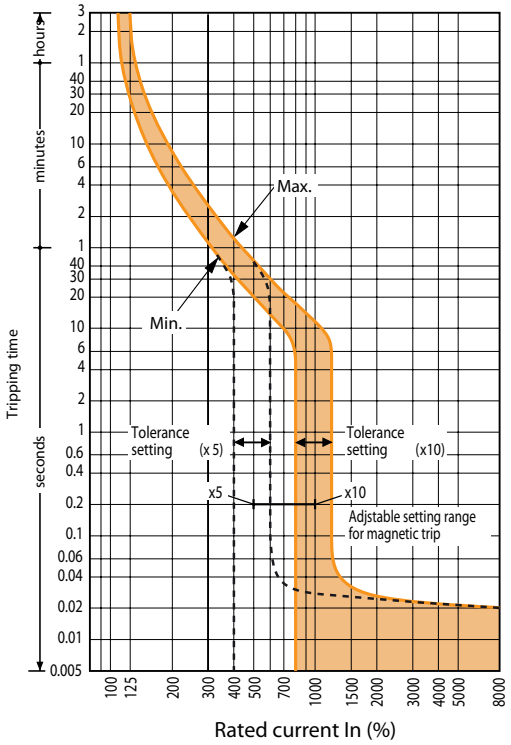
Time, current characteristics curves EB2 400 SF



Time, current characteristics curves EB2 800/LF 630A

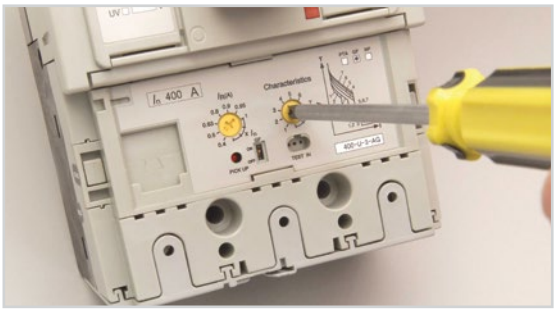


Time, current characteristics curves EB2 800/LF 800A

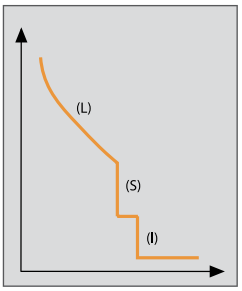


Microprocessor (electronic) based characteristics and adjustments EB2 series

Etibreak 2 MCCBs from 250A to 1600A frame sizes are available with electronic protection units. Current ratings, In, of 40A, 125A, 160A, 250A, 400A, 630A, 800A, 1000A, 1250A and 1600A are available. These offer great flexibility as their characteristics can be set to suit a wide range of application conditions. Overload protection can be set between 0.4 and 1.0 times In.

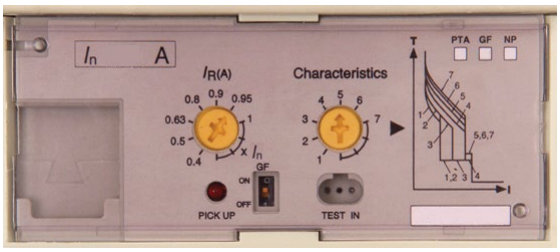


Selecting a Preset Characteristic for a 400A Etibreak 2 MCCB with Electronic Protection



Electronic protection characteristic

Every Etibreak electronic protection unit includes overload protection (L), delayed short-circuit protection (S) and instantaneous protection (I) as standard.



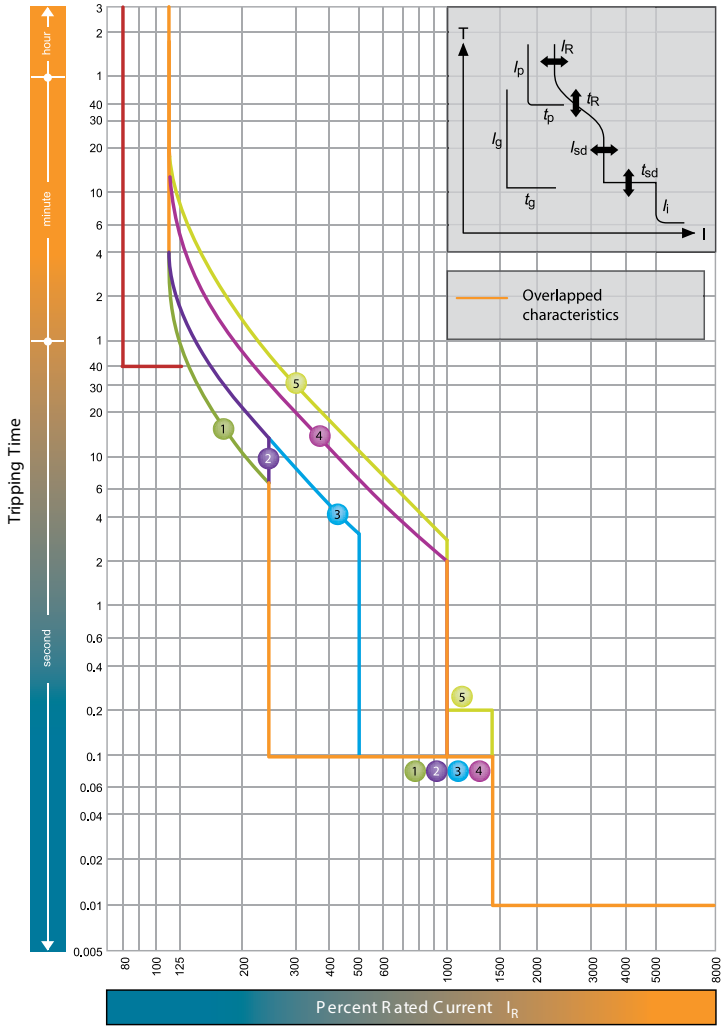
Adjustment dials

The left adjustment dial sets the rated current to match the conductor rating. The right adjustment dials select one of six on 630A models preset characteristics. The effects of the left adjustment dial (labelled IR(A)), and the right adjustment dial (labelled Characteristics) are detailed in the tables shown underneath each time/current graph.

Tolerances of Characteristics

Characteristics		Tolerance
Long Time Delay (LTD)	t_R	+/- 20%
Short Time Delay (STD)	I_{sd}	+/- 15%
	t_{sd}	Total clearnig time +50ms, resettable time - 20ms
Instantaneous (INST)	I_i	+/- 20%

EB2 250 LE &E



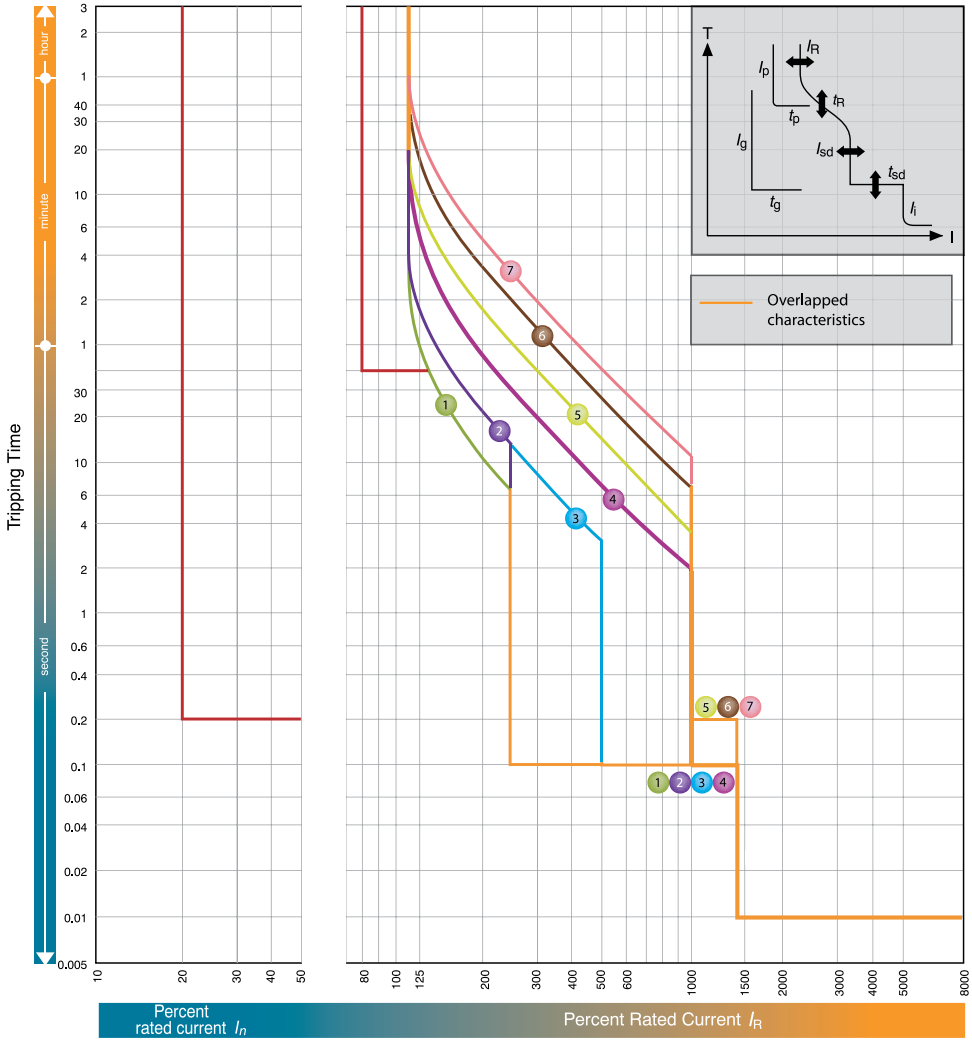
I_n = 40, 125, 160, 250

I_R (A)								
LTD Pick-up current I_R	**xI_n**	0.4	0.5	0.63	0.8	0.9	0.95	1.0

	Characteristics		No.	1	2	3	4	5
Standard	LTD	Index t_R	Index (s)	11	21	21	5	7,5
				@ 200 % x I_R			@ 200 % x I_R	
	STD	Index I_{sd}	Index x I_R	2,5		5	10	
		Index t_{sd}	Index (s)	0,1				0,2
	INST	Index I_i	Index x I_R	14 (Max: 13 x I_n) Note (1)				

Note: (1) I_i max. = 12 x I_n.

EB2 400 E, LCD, HLCD

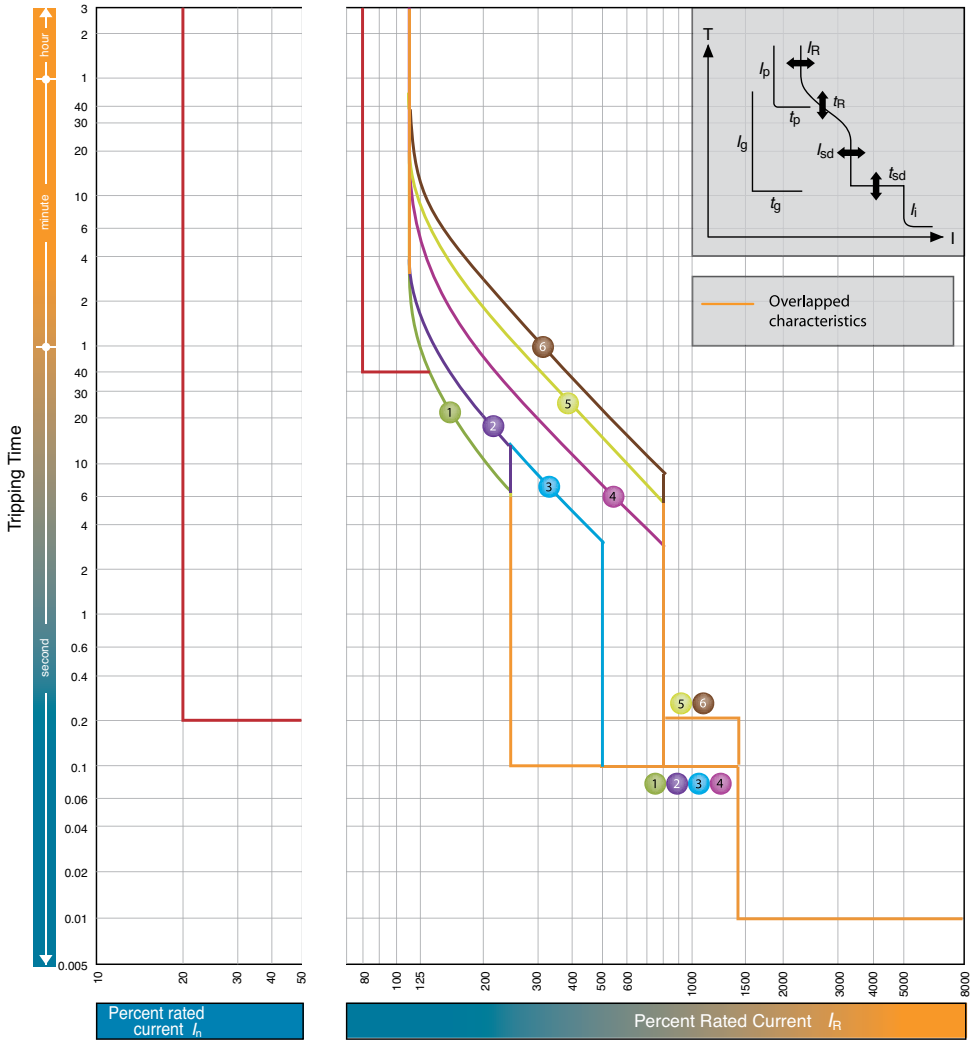


$I_n = 250^*, 400$

			I_R (A)							
			LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0
			Characteristics	No.	1	2	3	4	5	6	7
Standard	LTD	Index t_R	Index (s)		11	21	21	5	10	19	29
					@ 200 % x I_R			@ 600 % x I_R			
	STD	Index I_{sd}	Index x I_R		2.5		5	10			
		Index t_{sd}	Index (s)		0.1				0.2		
	INST	Index I_i	Index x I_R		14 (Max: 13 x I_n)**						
Option	PTA	Index I_p	Index x I_R		0,8						
		Index t_p	Index (s)		40						
	GF	Index I_g	Index x I_n		0,2						
		Index t_g	Index (s)		0,2						
	NP	Index I_N	Index x I_R		1,0/0,5***						
		Index t_N	Index (s)		$t_N = t_R$						

Notes:
*GF is not available when In is 250A.
**I_i max. = 13 x I_n.
***1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
****When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

EB2 630 LE, E, LCD, HLCD



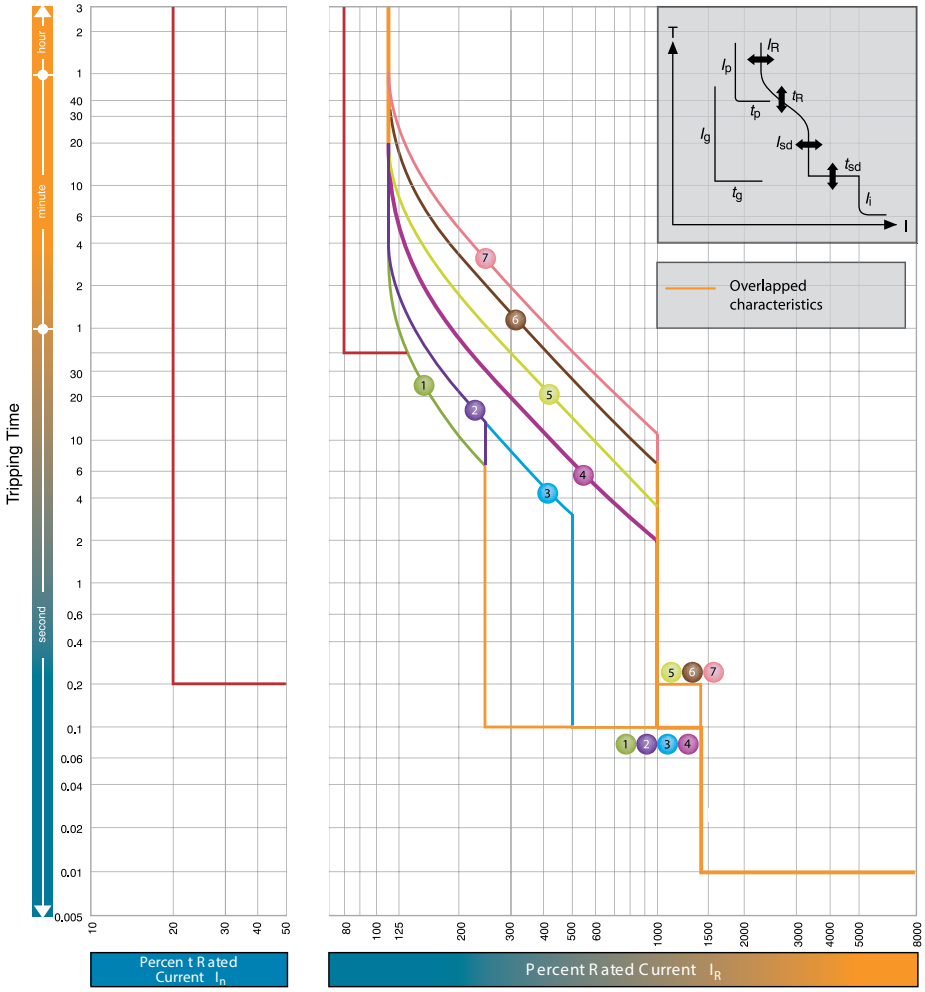
$I_n = 630A$

I_R (A)										
LTD Pick-up current I_R		xI_n	0.4	0.5	0.63	0.8	0.85	0.9	0.95	1.0

	Characteristics		No.	1	2	3	4	5	6
Standard	LTD	Index t_R	Index (s)	11	21	21	5	10	16
				@ 200 % x I_R			@ 600 % x I_R		
	STD	Index I_{sd}	Index x I_R	2.5		5	8		
		Index t_{sd}	Index (s)	0.1			0.2		
	INST	Index I_i	Index x I_R	14 (Max: 10 x I_n)*					
Option	PTA	Index I_p	Index x I_R	0,8					
		Index t_p	Index (s)	40					
	GF	Index I_g	Index x I_n	0,2					
		Index t_g	Index (s)	0,2					
	NP	Index I_N	Index x I_R	1,0/0,5**					
		Index t_N	Index (s)	$t_N = t_R$					

Notes:
*I_i max. = 10 x I_n.
**1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
***When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

EB2 800 LE, E, HE



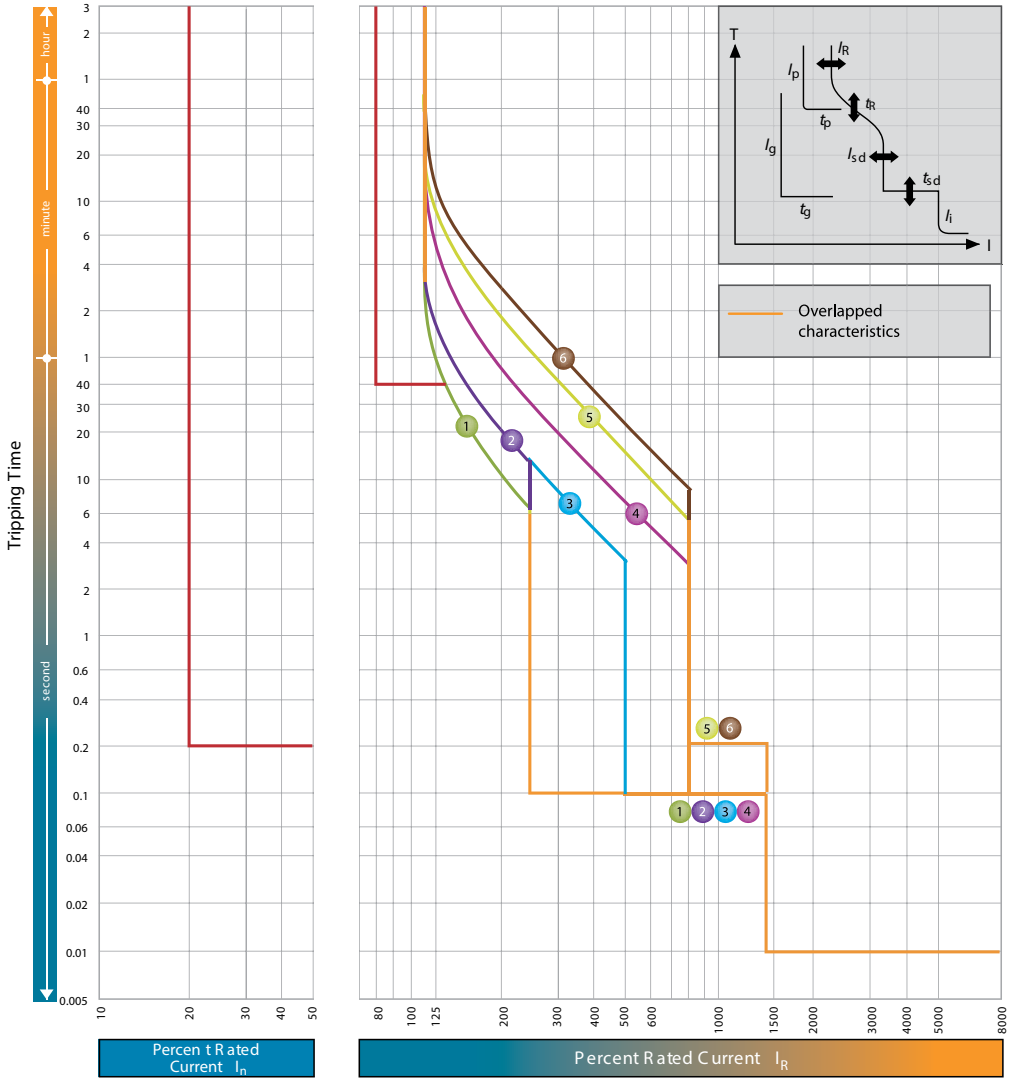
$I_n = 800$

I_R (A)								
LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0

	Characteristics		No.	1	2	3	4	5	6	7
Standard	LTD	Index t_R	Index (s)	11	21	21	5	10	19	29
				@ 200 % x I_R			@ 600 % x I_R			
	STD	Index I_{sd}	Index x I_R	2.5		5	10			
		Index t_{sd}	Index (s)	0.1				0.2		
	INST	Index I_i	Index x I_R	14 (max.: 12 x I_n)*						
Option	PTA	Index I_p	Index x I_R	0,8						
		Index t_p	Index (s)	40						
	GF	Index I_g	Index x I_n	0,2						
		Index t_g	Index (s)	0,2						
	NP	Index I_N	Index x I_R	1,0/0,5***						
		Index t_N	Index (s)	$t_N = t_R$						

Notes:
*I_i max. = 12 x I_n.
**1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
***When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

EB2 1000 LE, E



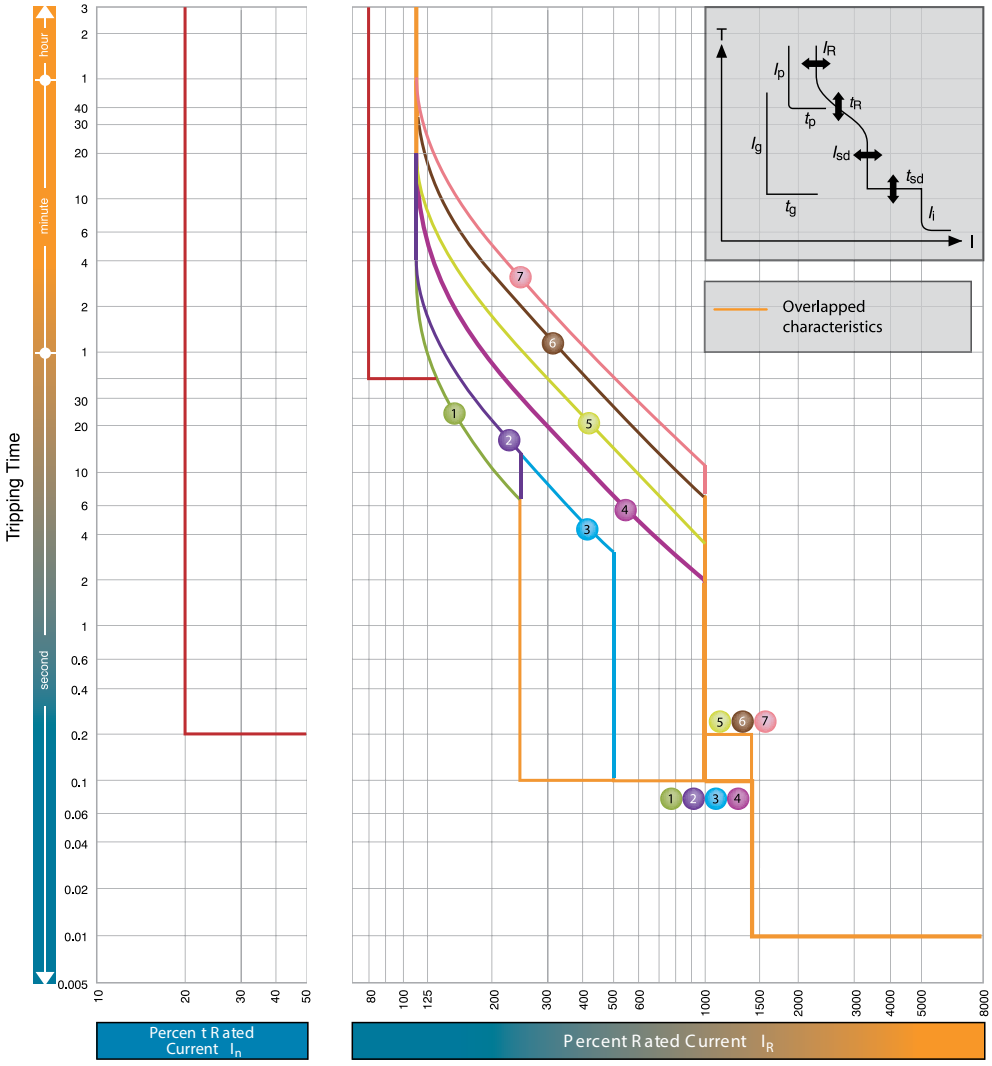
$I_n = 1000A$

I_R (A)										
LTD Pick-up current I_R		xI_n	0.4	0.5	0.63	0.8	0.85	0.9	0.95	1.0

	Characteristics		No.	1	2	3	4	5	6
Standard	LTD	Index t_R	Index (s)	11	21	21	5	10	16
				@ 200 % x I_R			@ 600 % x I_R		
	STD	Index I_{sd}	Index x I_R	2.5		5	8		
		Index t_{sd}	Index (s)	0.1					0.2
	INST	Index I_i	Index x I_R	14 (max.: 10 x I_n)*					
Option	PTA	Index I_p	Index x I_R	0,8					
		Index t_p	Index (s)	40					
	GF	Index I_g	Index x I_n	0,2					
		Index t_g	Index (s)	0,2					
	NP	Index I_N	Index x I_R	1,0/0,5***					
		Index t_N	Index (s)	$t_N = t_R$					

Notes:
*I_i max. = 10 x I_n.
**1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
***When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

EB2 1250 LE, E



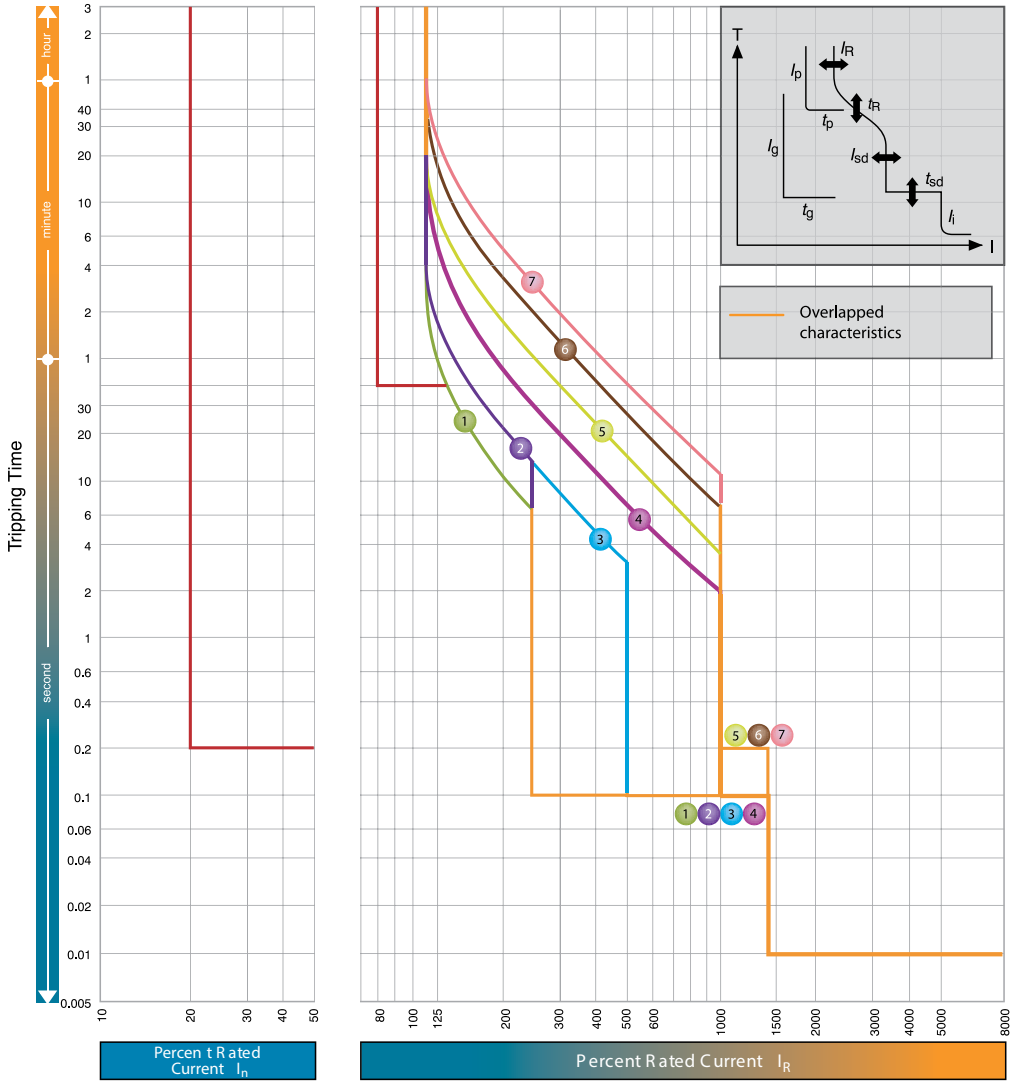
I_n = 1250

I_R (A)								
LTD Pick-up current I_R	xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0

Characteristics			No.	1	2	3	4	5	6	7
Standard	LTD	Index t_R	Index (s)	11	21	21	5	10	19	29
				@ 200 % x I_R			@ 600 % x I_R			
	STD	Index I_{sd}	Index x I_R	2.5		5	10			
		Index t_{sd}	Index (s)	0.1				0.2		
	INST	Index I_i	Index x I_R	14 (max.: 12 x I_n)*						
Option	PTA	Index I_p	Index x I_R	0,8						
		Index t_p	Index (s)	40						
	GF	Index I_g	Index x I_n	0,2						
		Index t_g	Index (s)	0,2						
	NP	Index I_N	Index x I_R	1,0/0,5***						
		Index t_N	Index (s)	t_N=t_R						

Notes:
*I_i max. = 12 x I_n.
**1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
***When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

EB2 1600 LE, E



I_n = 1600A

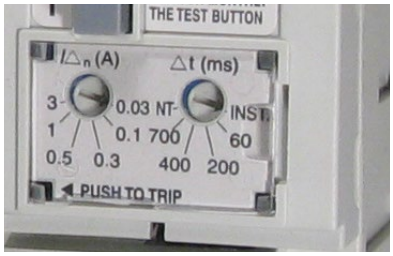
I_R (A)									
LTD Pick-up current I_R		xI_n	0.4	0.5	0.63	0.8	0.9	0.95	1.0

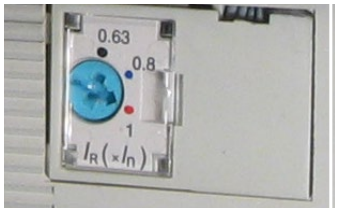
Characteristics			No.	1	2	3	4	5	6	7
Standard	LTD	Index t_R	Index (s)	11	21	21	5	10	19	29
				@ 200 % x I_R			@ 600 % x I_R			
	STD	Index I_{sd}	Index x I_R	2.5		5	10			
		Index t_{sd}	Index (s)	0.1				0.2		
	INST	Index I_i	Index x I_R	14 (max.: 12 x I_n)*						
Option	PTA	Index I_p	Index x I_R	0,8						
		Index t_p	Index (s)	40						
	GF	Index I_g	Index x I_n	0,2						
		Index t_g	Index (s)	0,2						
	NP	Index I_N	Index x I_R	1,0/0,5***						
		Index t_N	Index (s)	t_N=t_R						

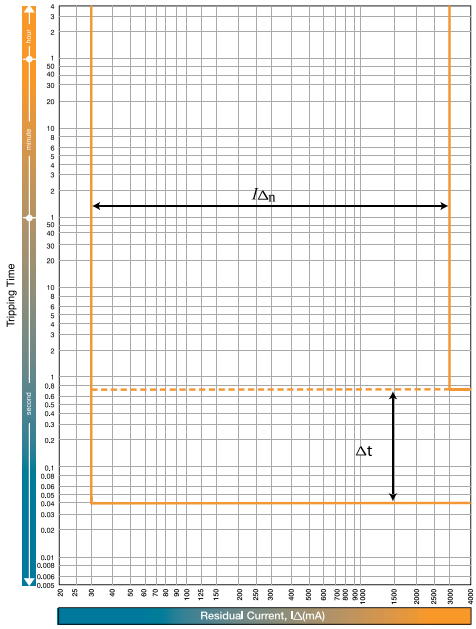
Notes:
*I_i max. = 12 x I_n.
**1,0 x I_R or 0,5 x I_R can be selected. Characteristic of neutral protection (t_N vs. I_N) is identical to characteristic of phase protection (t_R vs. I_R).
***When you specify gF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 4.

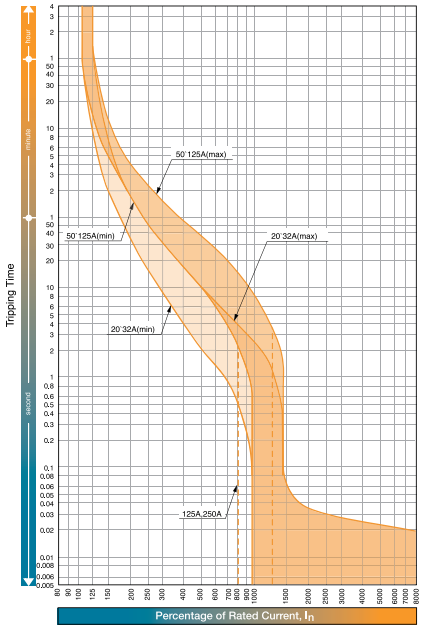
EB2R adjustments

	Residual current I_Δ is the adjustable tripping threshold for earth leakage protection. It can be set between 30mA and 3A. Available settings are 30mA, 100mA, 300mA, 500mA, 1000mA and 3000mA. Available settings are shown below	Time delay Δt is introduced to the residual current (earth leakage) protection characteristic. Available settings are; INST, 60ms, 200ms, 400ms, 700ms and NT. INST means EB2R set to time delay 0 (max. actual tripping time is 40ms) NT means No trip (tripping time is 0) The maximum breaking time is shown in brackets. Note that $I\Delta_n$ is set at 30mA, Δt defaults 0.	I_R is the adjustable tripping threshold for overload protection. It can be set between 0,63 and 1,0 times I_n. Available I_n ratings are shown below	I_i is the tripping threshold for short-circuit protection. It is fixed at the values shown below
Model	$I_{\Delta n}$	Δt (ms)	I_n (A)	I_i
EB2R 125	0.03, 0.1, 0.3, 0.5, 1, 3	0(40), 60(195), 200(365), 400(620), 700(950), NT (∞)	20, 32, 50, 63, 100	12 x I_n (+/- 20%)
EB2R 125	0.03, 0.1, 0.3, 0.5, 1, 3	0(40), 60(195), 200(365), 400(620), 700(950), NT (∞)	125	10 x I_n (+/- 20%)
EB2R 250	0.03, 0.1, 0.3, 0.5, 1, 3	0(40), 60(195), 200(365), 400(620), 700(950), NT (∞)	160	13 x I_n (+/- 20%)
EB2R 250	0.03, 0.1, 0.3, 0.5, 1, 3	0(40), 60(195), 200(365), 400(620), 700(950), NT (∞)	250	10 x I_n (+/- 20%)





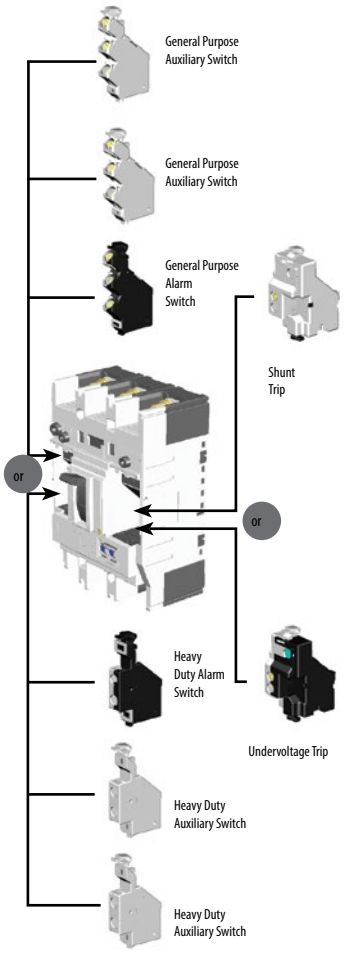




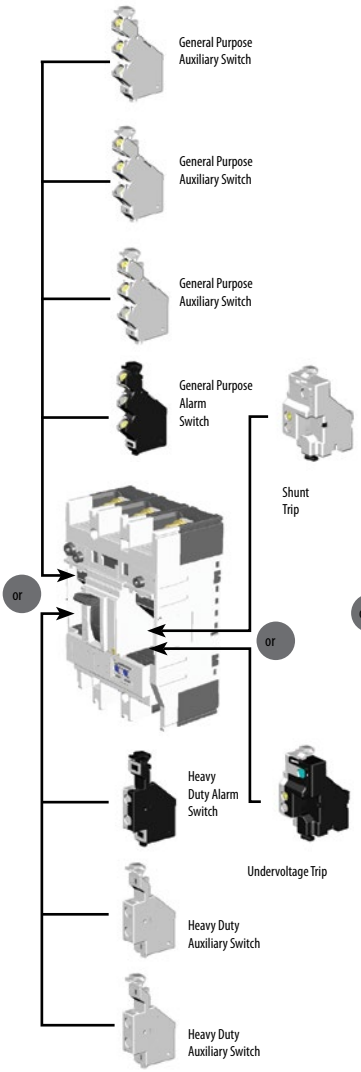
Internal accessories – series EB2

Ampere Frame size (A):

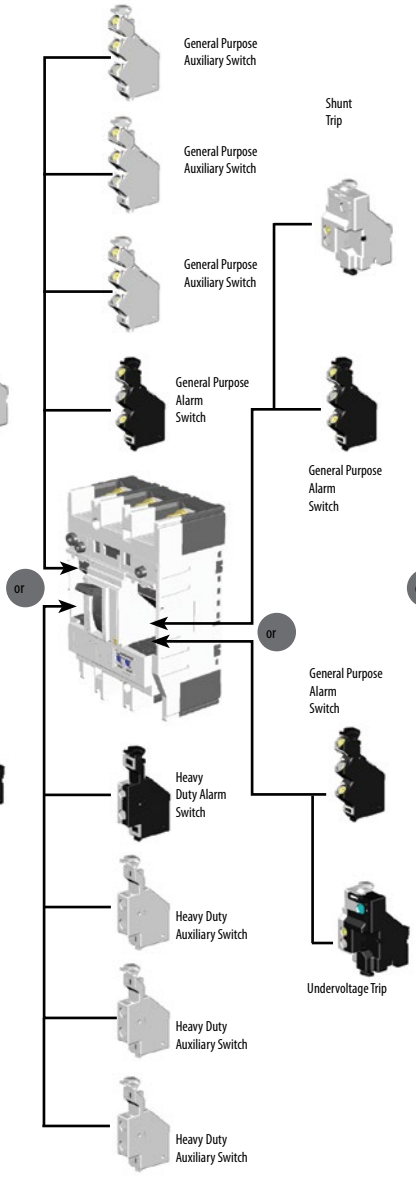
125, 160, 250



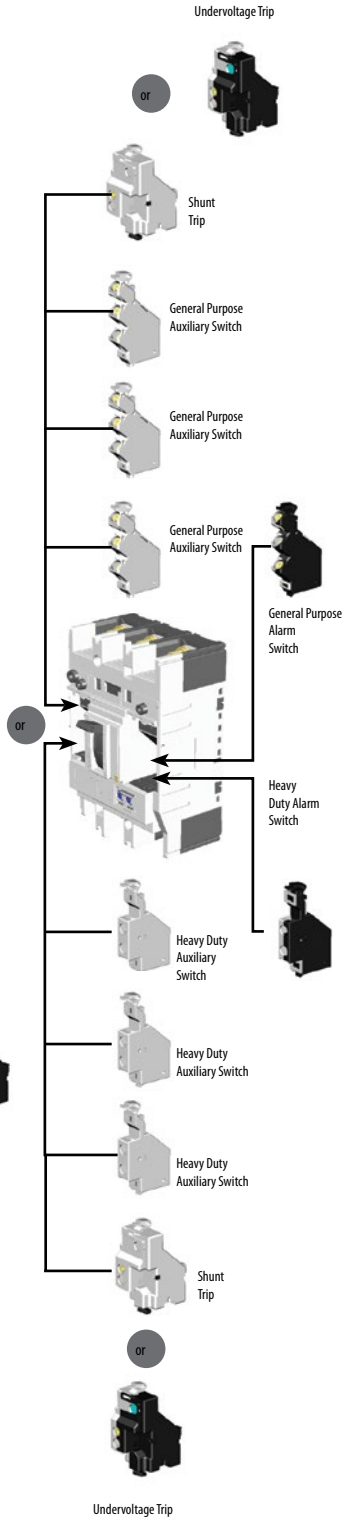
400, 630



800, 1000



1250, 1600

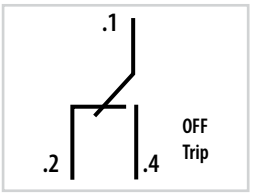


- Status indication switches mount in the left side of the MCCB. General purpose and heavy duty status indication switches cannot be mixed in the same MCCB. Only one alarm switch can be fitted to an MCCB.
- Shunt trips and undervoltage trips mount in the right side of the MCCB.
- It is not possible to install a shunt trip and an undervoltage trip in an MCCB as they occupy the same location. Undervoltage trips can provide remote tripping if necessary by wiring a normally closed contact or pushbutton in series with the protected supply.
- Undervoltage trips with time delays require an external time delay controller which clips to the side of the MCCB.

Internal accessories – series EB2



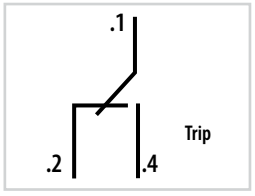
General Purpose Auxiliary Switch



Terminal Designations and Function of General Purpose Auxiliary Switch



General Purpose Alarm Switch



Terminal Designations and Function of General Purpose Alarm Switch

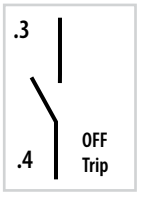
General purpose auxiliaries and alarm switch ratings

Volts (V)	AC Amperes (A)		Volts (V)	DC Amperes (A)		Minimum Load
	Resistive Load	Inductive Load		Resistive Load	Inductive Load	
440	-	-	250	-	-	100mA -> 15V DC.
240	3	2	125	0.4	0.05	
110	3	2	30	3	2	

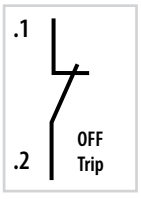
Amperes (A)



Heavy Duty Auxiliary Switch



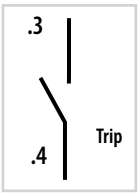
Terminal Designations and Function of Heavy Duty Auxiliary Switch NO contact



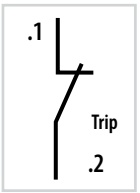
Terminal Designations and Function of Heavy Duty Auxiliary Switch, NC contact



Heavy Duty Alarm Switch



Terminal Designations and Function of Heavy Duty Alarm Switch, NO contact



Terminal Designations and Function of Heavy Duty Alarm Switch, NC contact

Ratings of Heavy Duty Auxiliary and Alarm switches

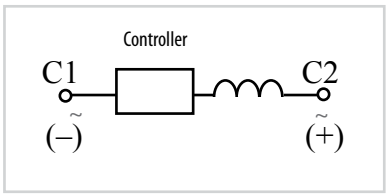
Volts (V)	AC Amperes (A)		Volts (V)	DC Amperes (A)	
	Resistive Load	Inductive Load		Resistive Load	Inductive Load
440	3	3	250	0.5	0.5
240	4	4	125	1	1
110	5	5	48	3	2.5
48	6	6	24	6	2.5



Shunt Trips

Ratings of Shunt Trips

Rated Voltage	Voltage AC		Voltage DC			
	200-240	380-450	24	48	100-120	200-240
Excitation Current (A)	0.014	0.0065	0.03	0.03	0.011	0.011



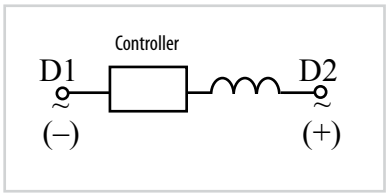
Terminal Designations of Shunt Trips



Undervoltage Trips

Ratings of Undervoltage Trips

Rated Voltage	Power supply capacity (VA) Voltage AC		Excitation current (mA) Voltage DC		
	200-240	380-450	24	100-120	200-240
Power Supply Capacity (A)	1.4	2.28	23	10	10



Terminal Designations of Undervoltage Trips

External accessories

IZ – Interpole barrier. Installed between MCCB teminal, which increases the distance between poles to reduce the possibility of creepage.

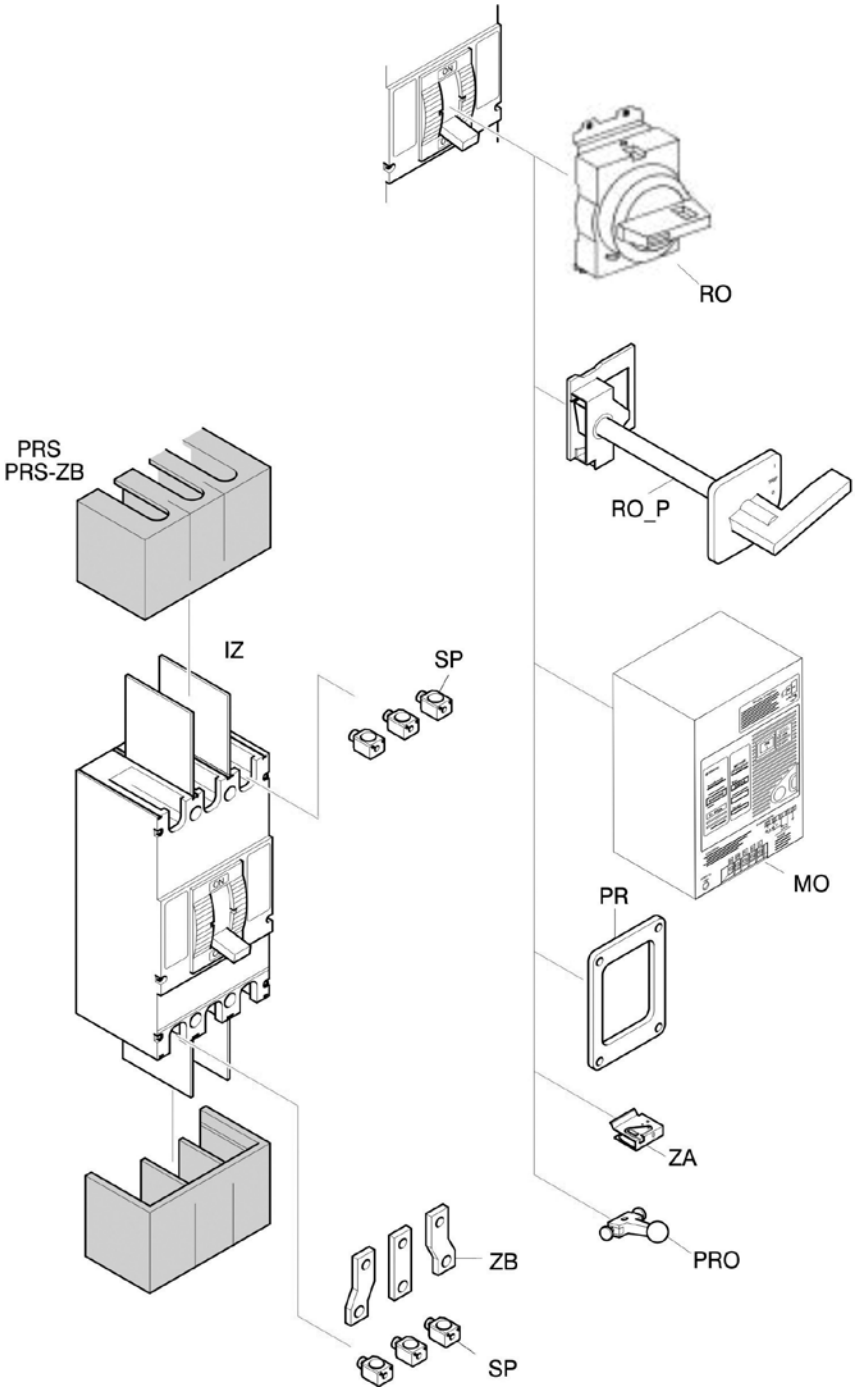
PRS – Terminal cover. The terminal covers are applied to the MCCB to prevent accidental contact with live parts and thereby protection against direct contact.

PRS-ZB – Terminal cover for att. Busbar. The terminal covers are applied to the MCCB to prevent accidental contact with live parts and thereby protection against direct contact. The width is different because of attach busbar.

SP – Solderless terminal

RO – Operating handle, breaker mounted. It's used when MCCB is installed in control centre/ switchboard

RO_P – Operating handle, panel mounted, variable depth. This consists of an operating mechanism mounted on the breaker, an operating handle mounted on the panel door and a square shaft to connect the mechanism with the handle.



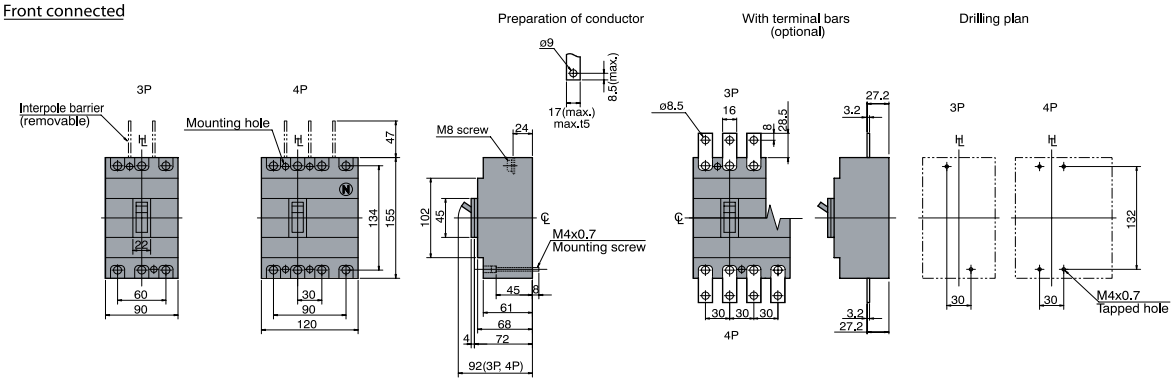
MO – Motor operator. Enabling to switch MCCB ON or OFF remotly.
PR – Door flange. Accessory for mounting on panel door.
ZA – Handle lock. Enables the MCCB to be padlocked in neither the ON or OFF position.

ZB – Attach busbar. Used for easier instalation on busbar systems (widen terminals).
PRO – Handle extension. Used for easier manipulation ON/OFF at bigger MCCB's.

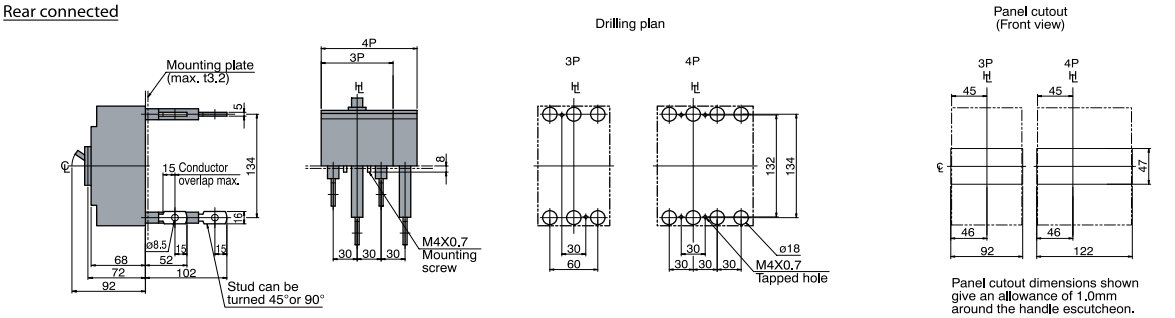
Dimensions

EB2 & EB2R 125

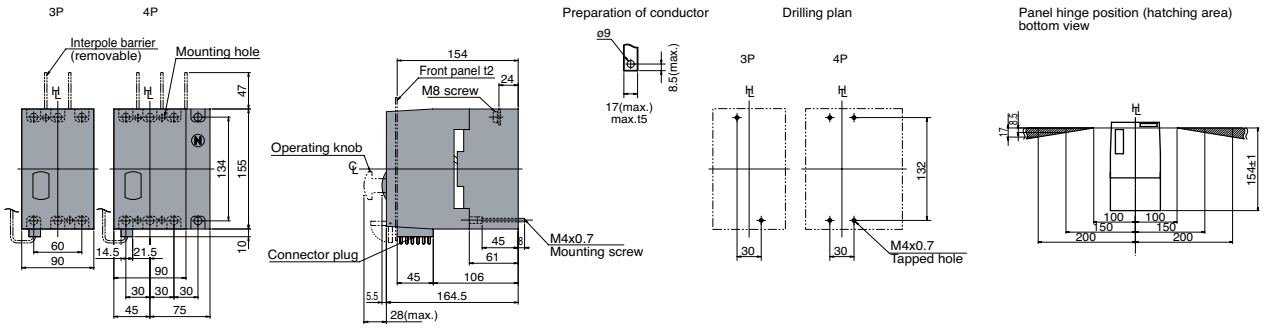
Front connected



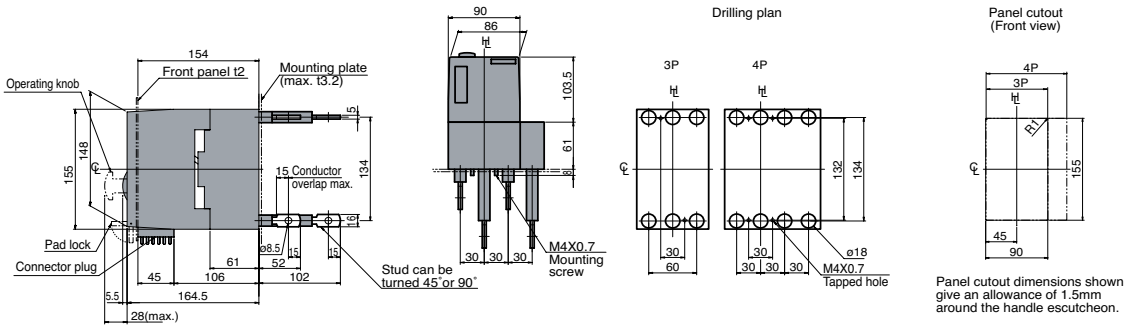
Rear connected



Front connected with Motor Operator

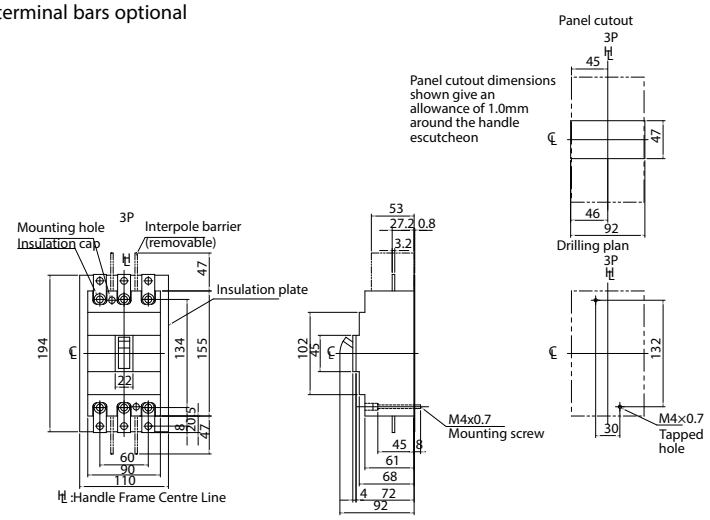


Rear connected with Motor Operator

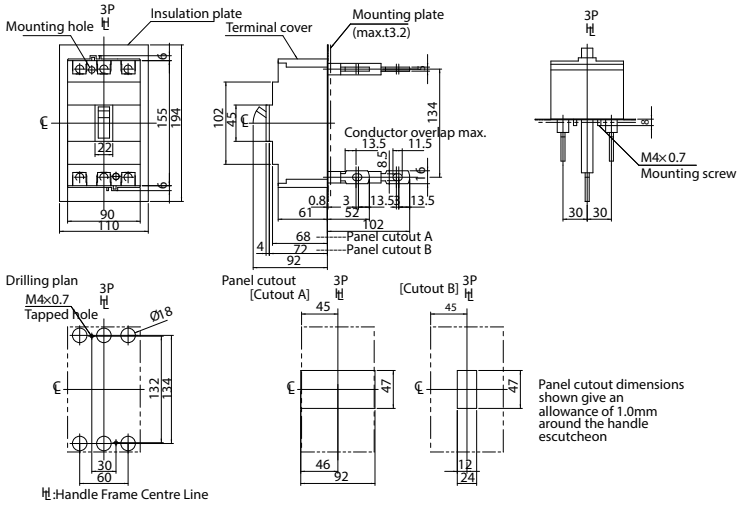


EB2 125 1000V

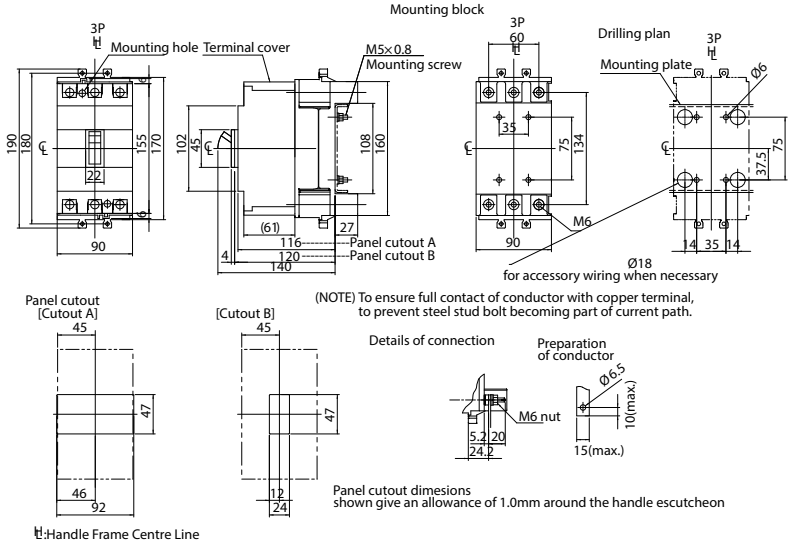
Front connected with terminal bars optional



Rear connected

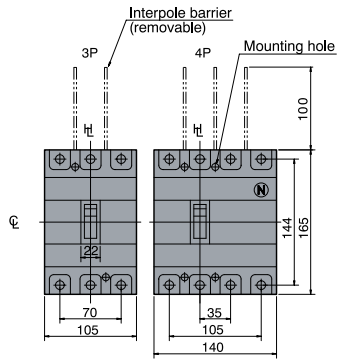


Plug in (PMB)

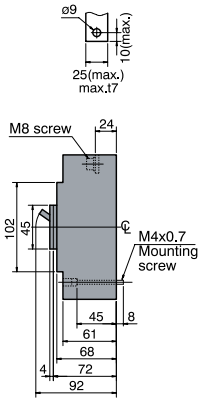


EB2 160, EB2 250 & EB2R 250

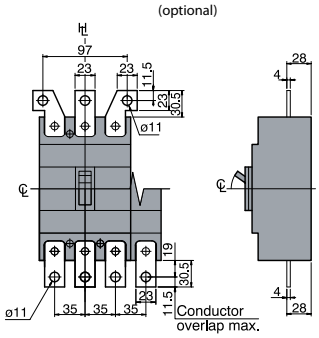
Front connected



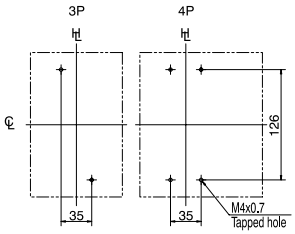
Preparation of conductor



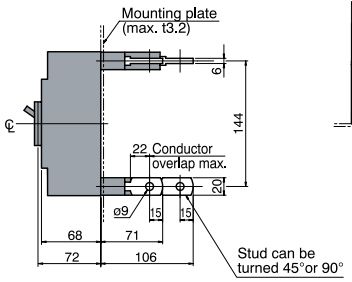
With terminal bars
(optional)

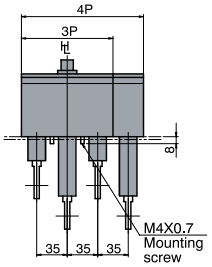


Drilling plan

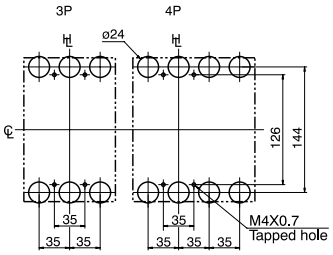


Rear connected

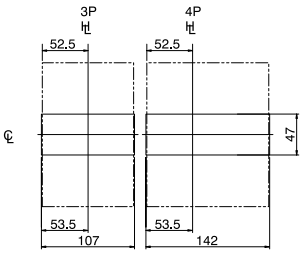




Drilling plan

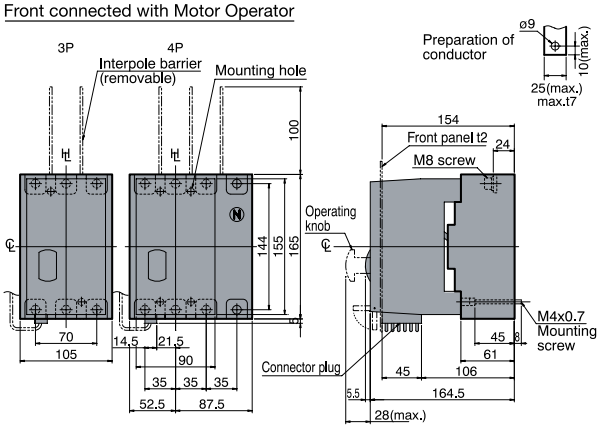


Panel cutout
(Front view)



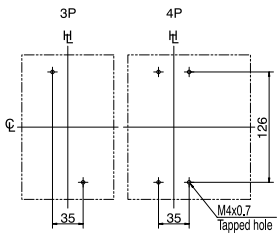
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Front connected with Motor Operator

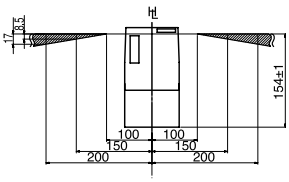


Preparation of
conductor

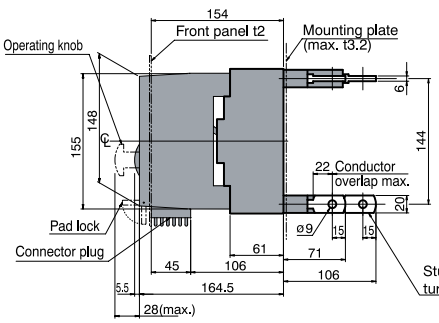
Drilling plan

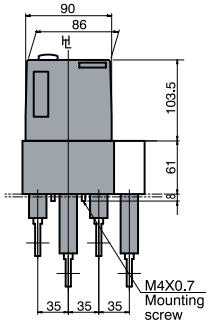


Panel hinge position (hatching area)
bottom view

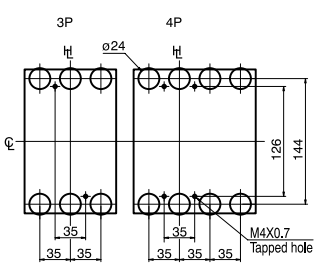


Rear connected with Motor Operator

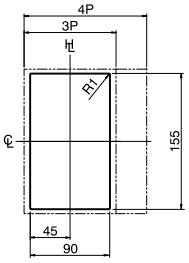




Drilling plan



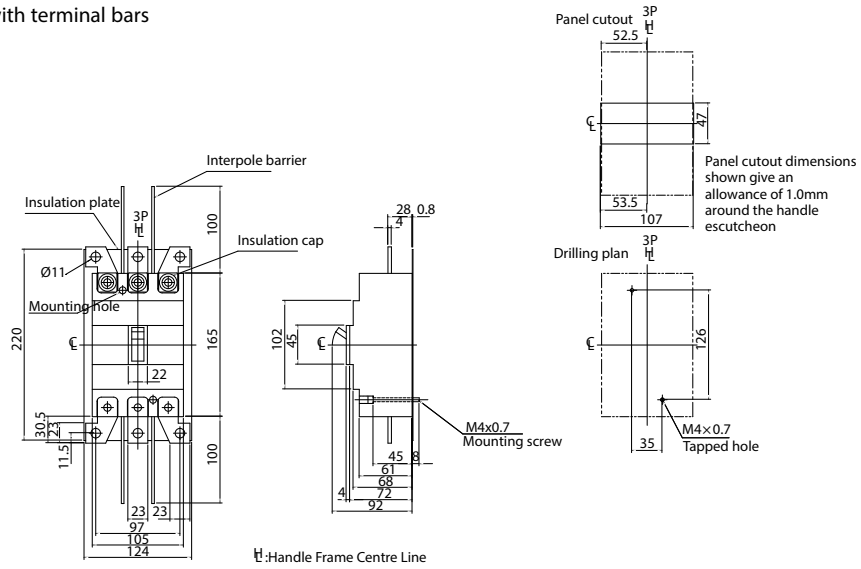
Panel cutout
(Front view)



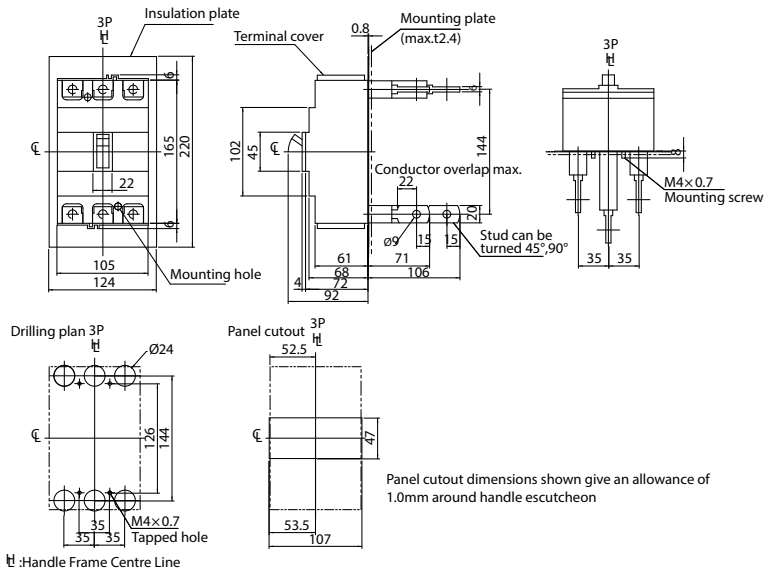
Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

EB2 250 1000V

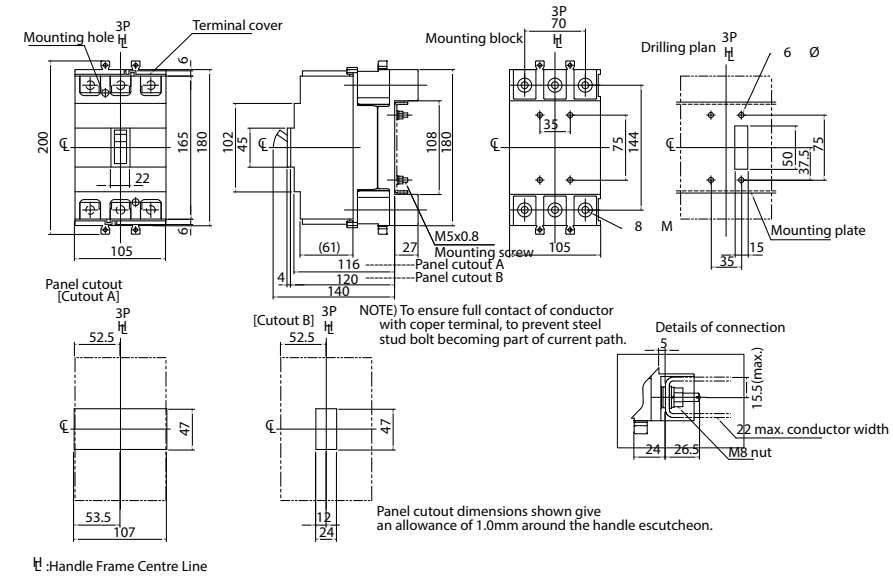
Front connected with terminal bars



Rear connected

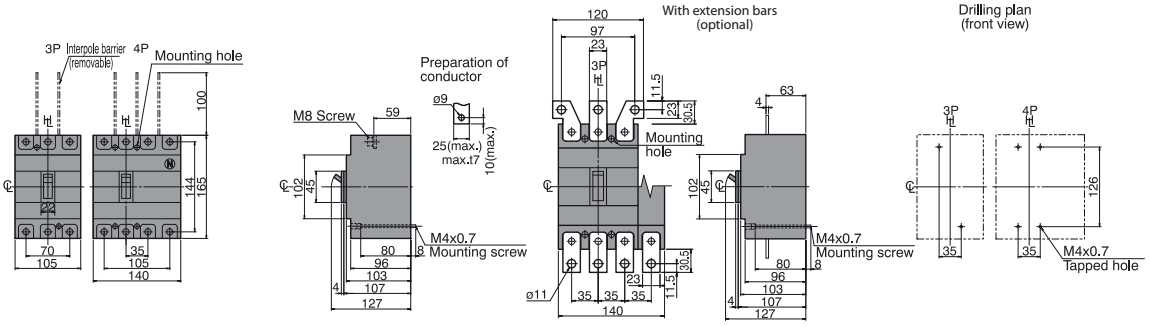


Plug in (PMB)

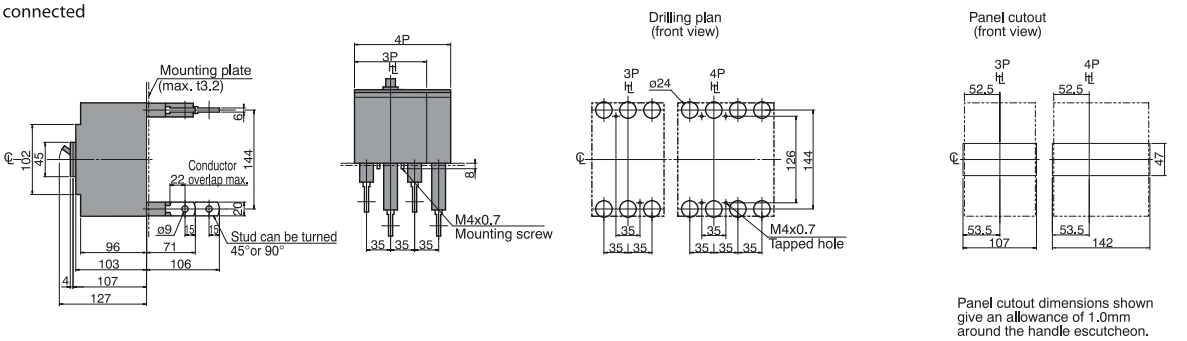


EB2 250/_E (Microprocessor's MCCBs)

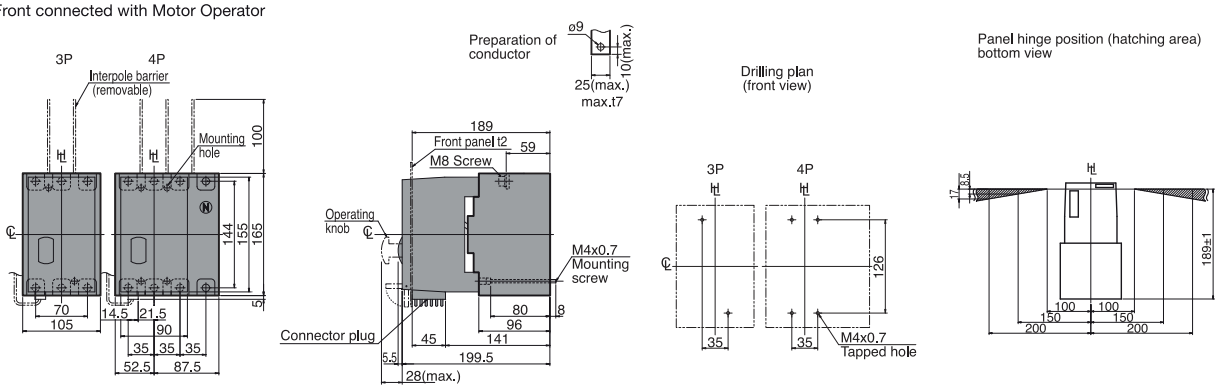
Front connected



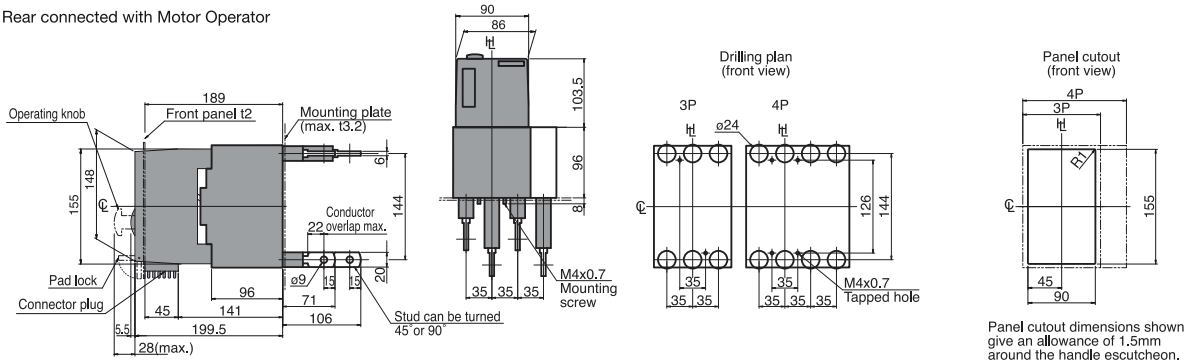
Rear connected



Front connected with Motor Operator

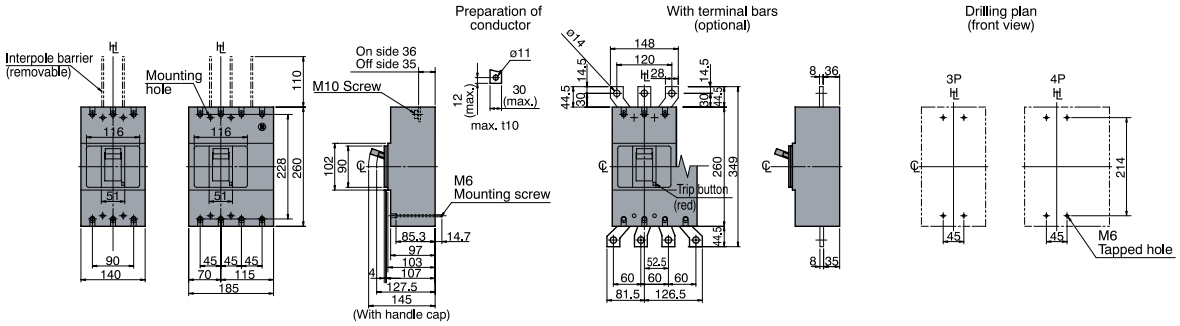


Rear connected with Motor Operator

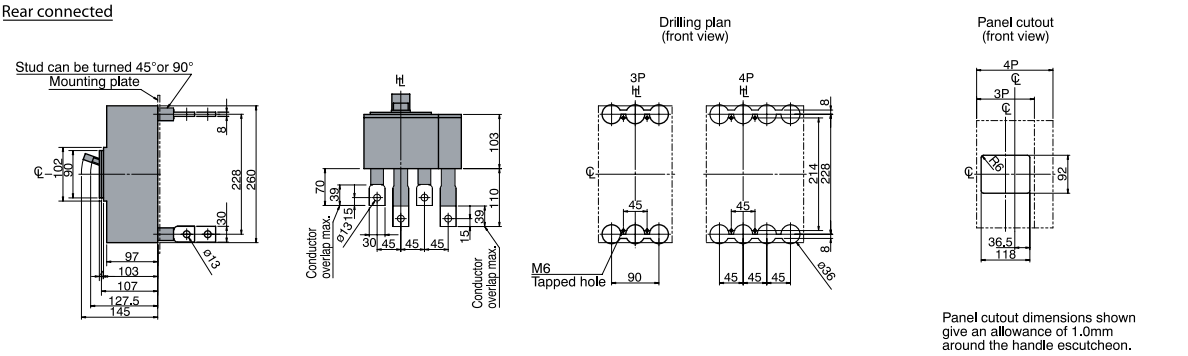


EB2 400

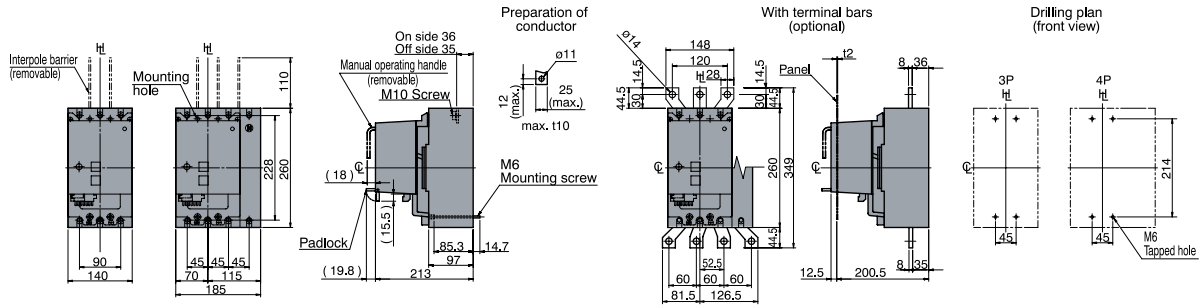
Front connected



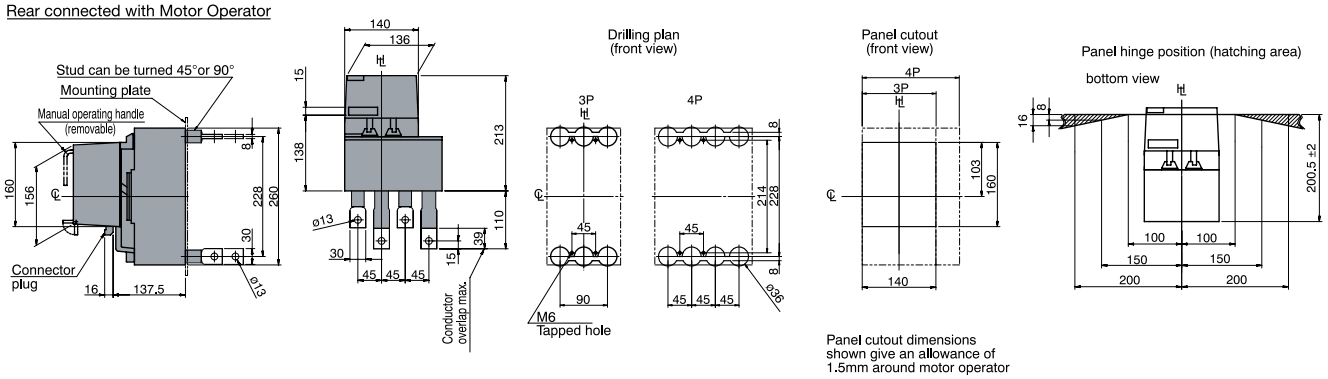
Rear connected



Front connected with Motor Operator

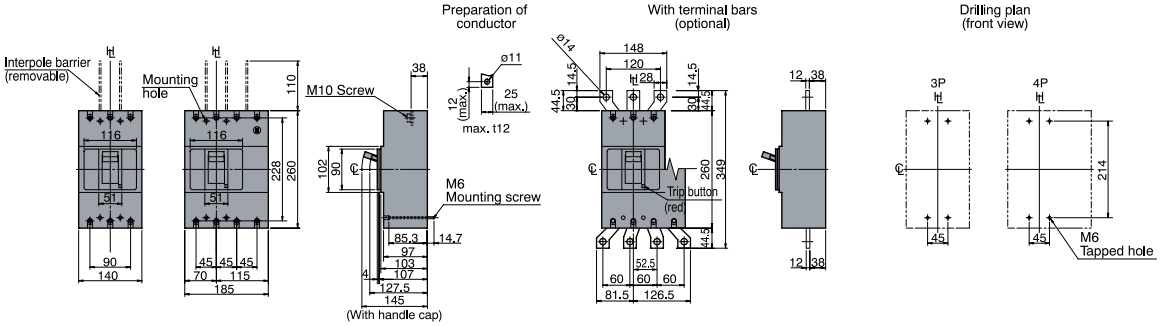


Rear connected with Motor Operator

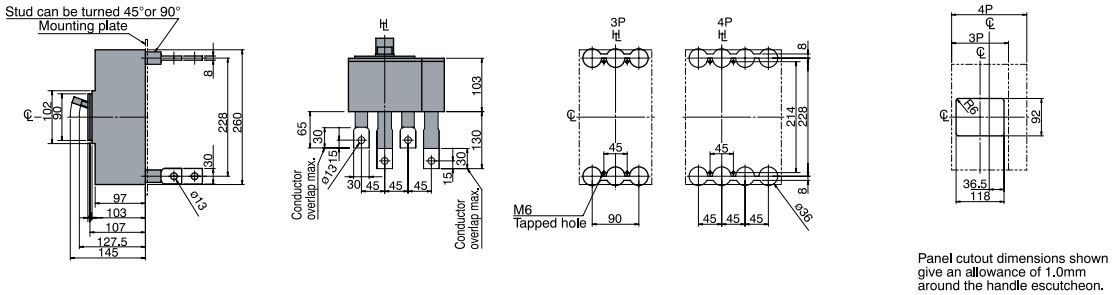


EB2 630

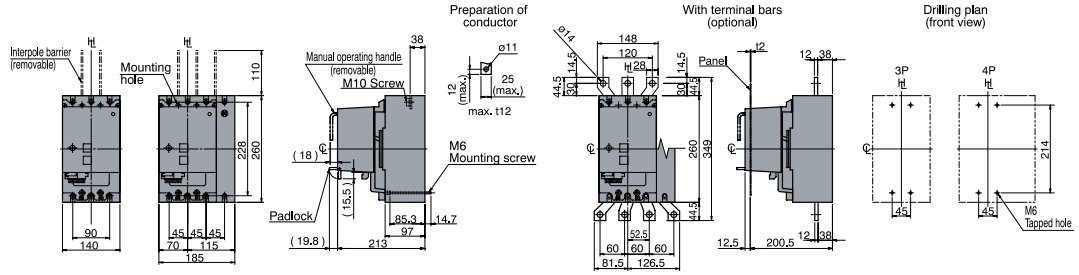
Front connected



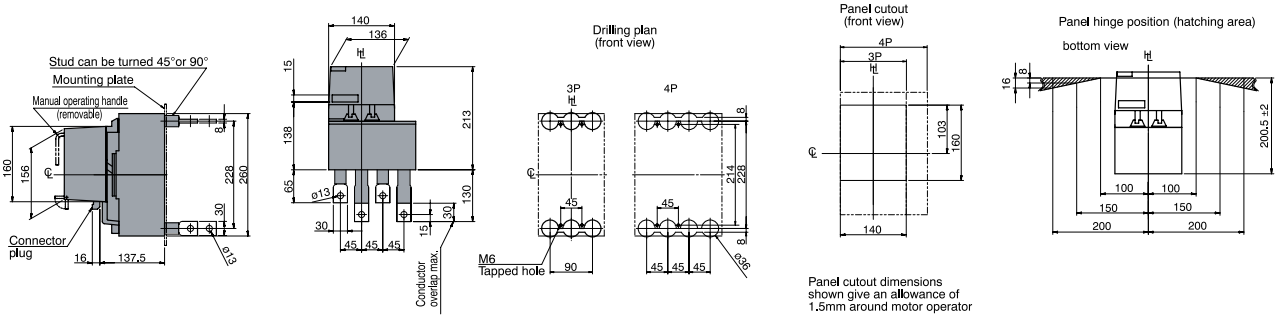
Rear connected



Front connected with Motor Operator

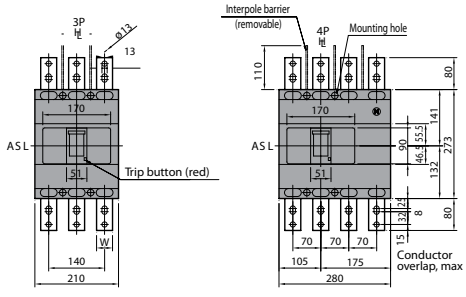


Rear connected with Motor Operator

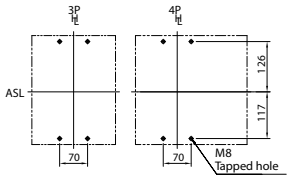


EB2 800

Front connected with extension bars (optional)

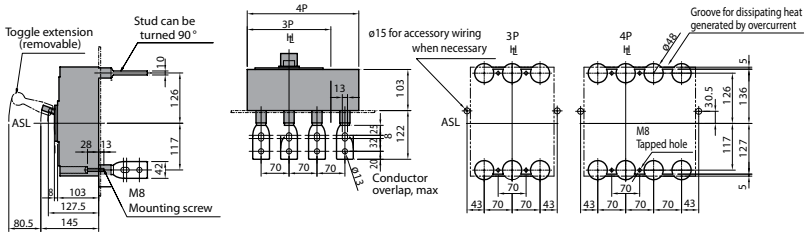


Drilling plan (front view)



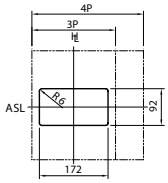
Breaker Type	Rated Current	t1	t2	L1	L2	W
EB2 800 Thermal magnetic	630A	8	8	32	34	40
	800A	10	10	32	35	40
EB2 800 Electronic	630A	8	8	32	36	40
	800A	10	10	32	36	40

Rear connected



Drilling plan (front view)

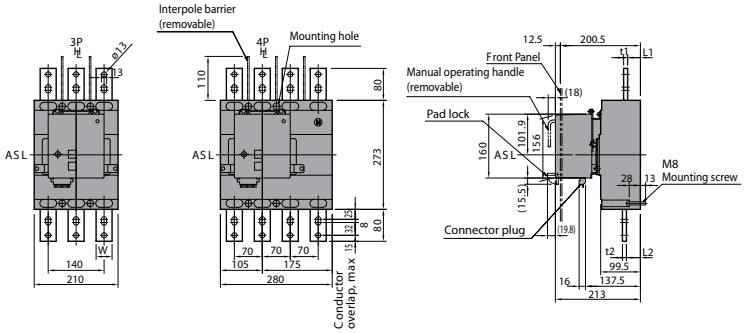
Panel cutout (front view)



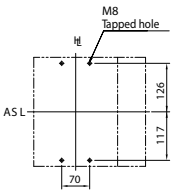
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: Studs are factory installed in horizontal direction both on the line and load sides.

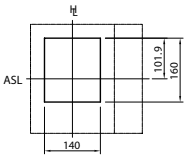
Front connected with Motor Operator



Drilling plan (front view)

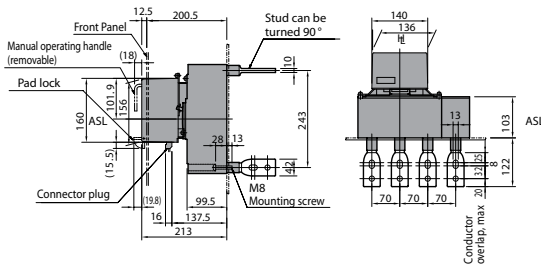


Panel cutout (front view)

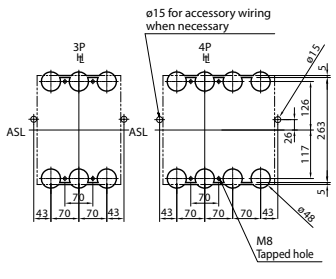


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

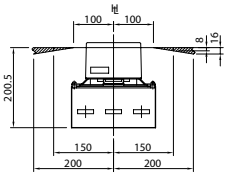
Rear connected with Motor Operator



Drilling plan (front view)



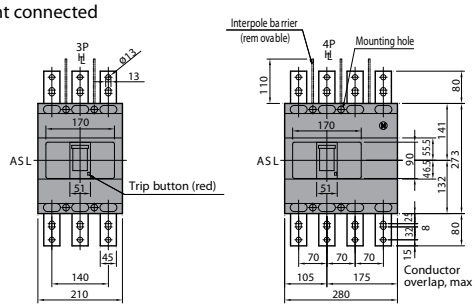
Panel hinge position (hatching area) (bottom view)

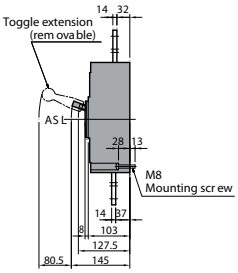


Note: Studs are factory installed in horizontal direction both on the line and load sides.

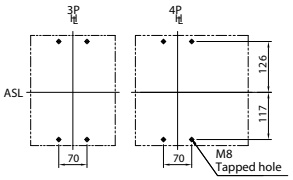
EB2 1000

Front connected

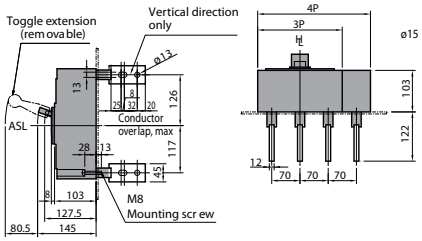




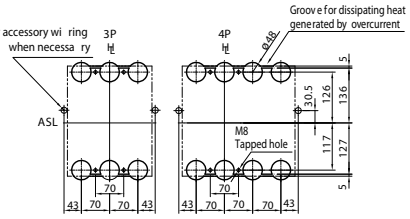
Drilling plan (front view)



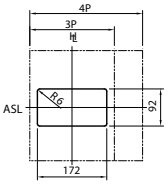
Rear connected



Drilling plan (front view)

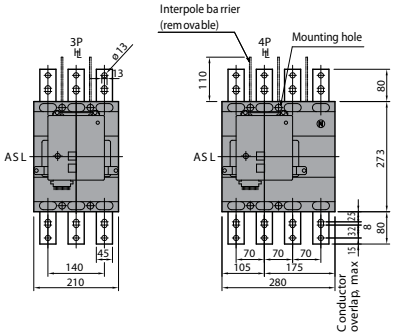


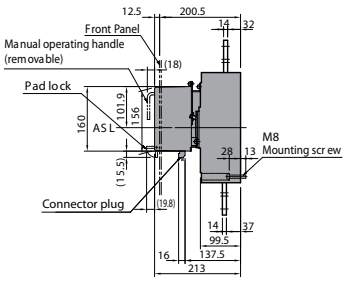
Panel cutout (front view)



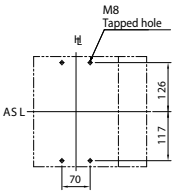
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Front connected with Motor Operator

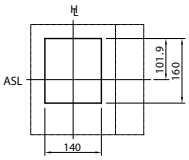




Drilling plan (front view)

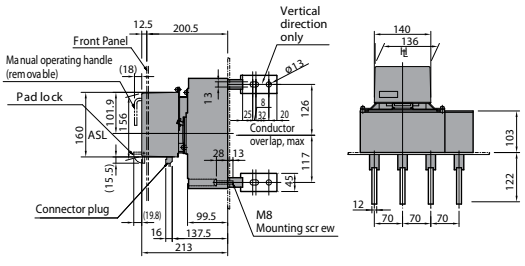


Panel cutout (front view)

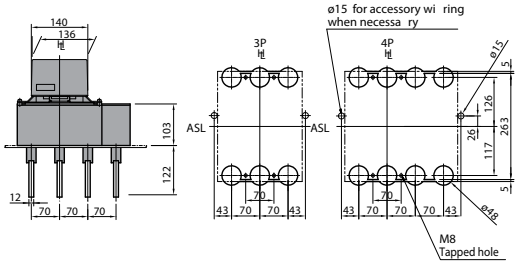


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

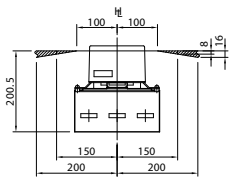
Rear connected with Motor Operator



Drilling plan (front view)



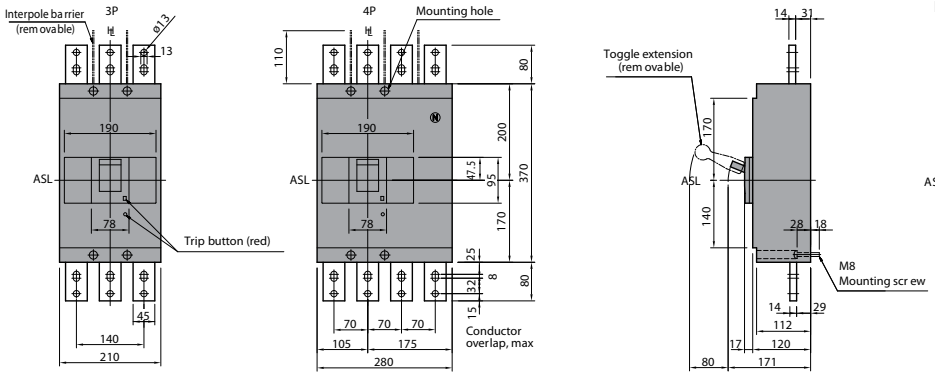
Panel hinge position (hatching area) (bottom view)



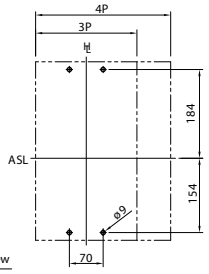
Note: Studs are factory installed in horizontal direction both on the line and load sides.

EB2 1250

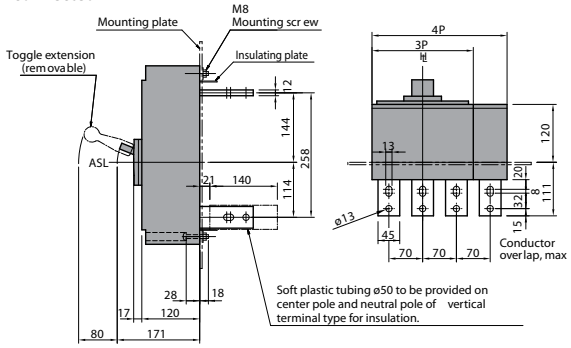
Front connected



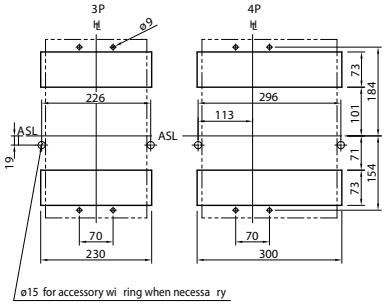
Drilling plan (front view)



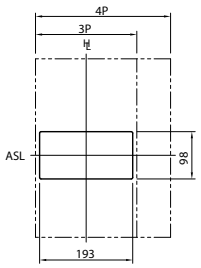
Rear connected



Drilling plan (front view)



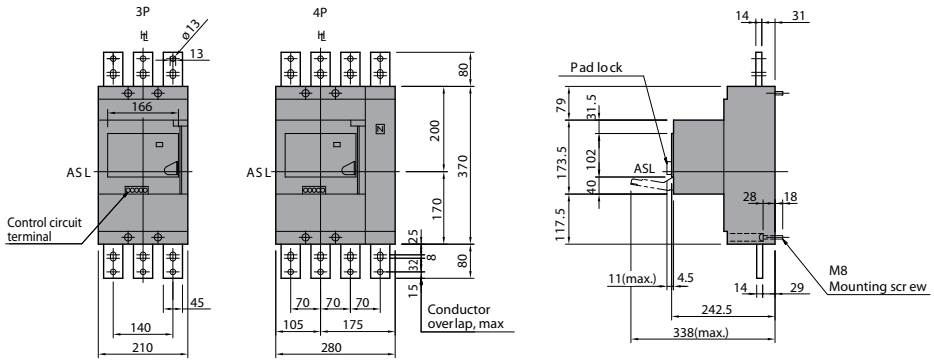
Panel cutout (front view)



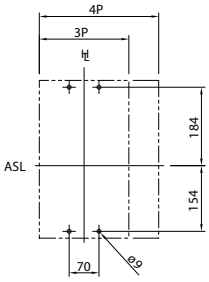
Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

Note: Studs are factory installed in horizontal direction both on the line and load sides.

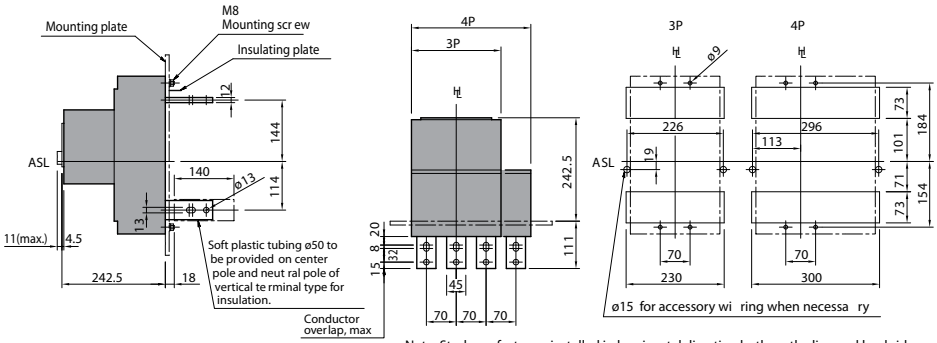
Front connected with Motor Operator



Drilling plan (front view)

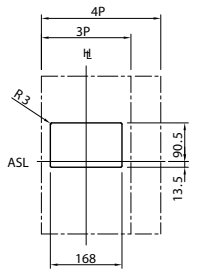


Rear connected with Motor Operator



Drilling plan (front view)

Panel cutout (front view)

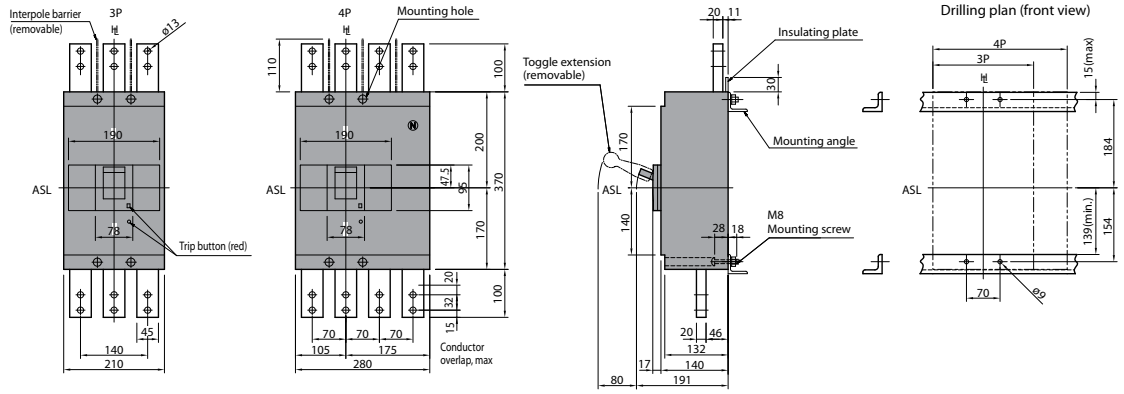


Panel cutout dimensions shown give an allowance of 1.0mm around motor operator.

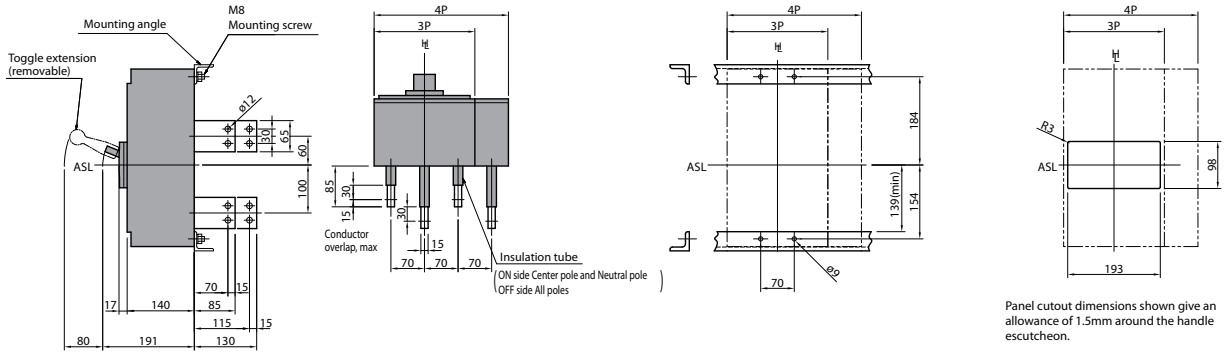
Note: Studs are factory installed in horizontal direction both on the line and load sides.

EB2 1600

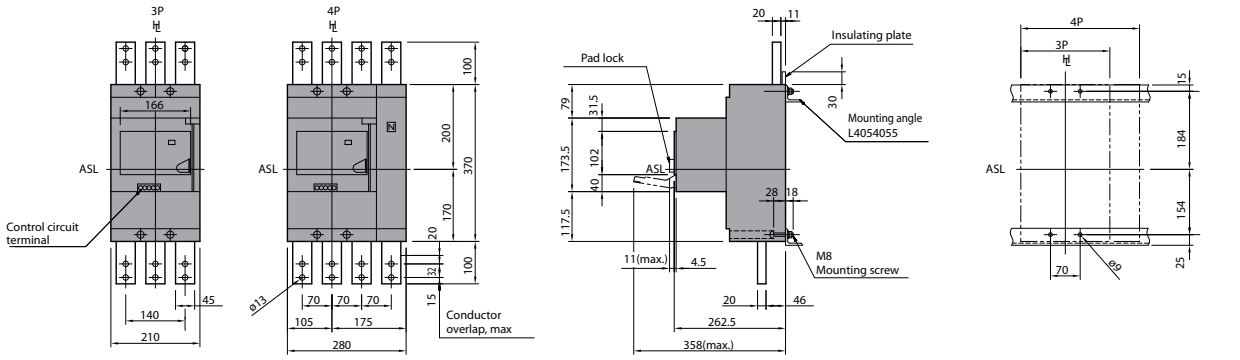
Front connected



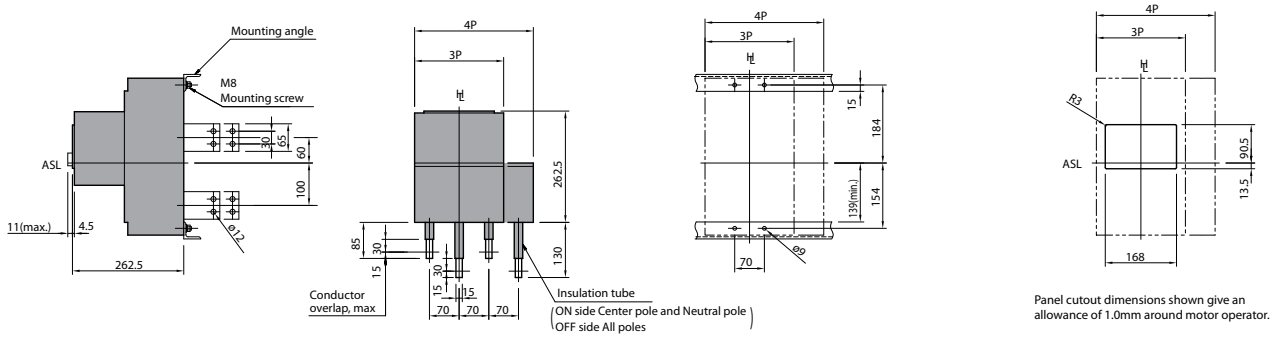
Rear connected



Front connected with Motor Operator

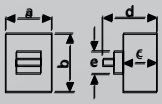


Rear connected with Motor Operator



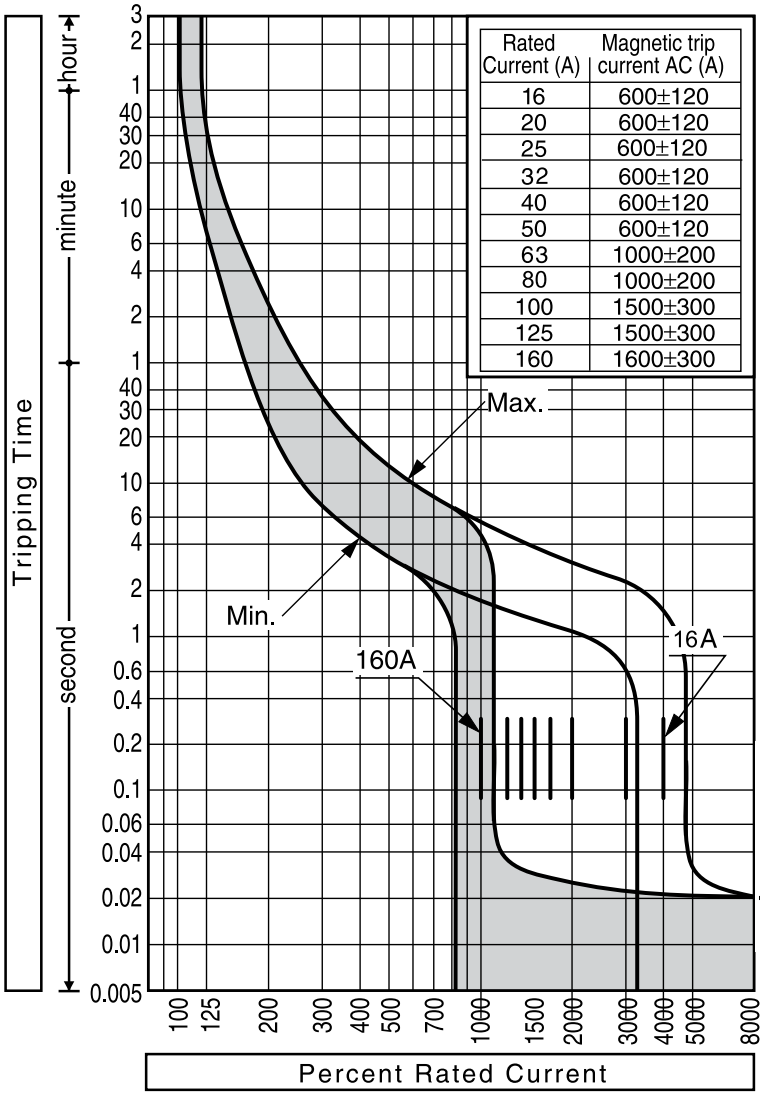
Low breaking capacity moulded case circuit breakers EB2S

*F - fixed, A - adjustable

Product series	description	unit	condition	EB2S 160 F			EB2S 160 A			EB2S 250 F			EB2S 250 A		
Model-type				LF	SF	HF	LA	SA	HA	LF	SF	HF	LA	SA	HA
Number of poles				3, 4											
Nominal current ratings															
	I_n	(A)	50°C	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160			25, 40, 63, 80, 100, 125, 160			200, 250			200, 250		
Electrical characteristics															
Rated insulation voltage	U_i	(V)		690	690	690	690	690	690	690	690	690	690	690	690
Rated impulse withstand voltage	U_{imp}	(kV)		8	8	8	8	8	8	8	8	8	8	8	8
Ultimate breaking capacity	I_{cu}	(kA)	690V AC	-	-	6	-	-	6	-	-	4	-	-	4
(IEC, JIS, AS/NZS)			525V AC	6	7,5	10	6	7,5	10	6	10	25	6	7,5	10
			440V AC	10	15	25	10	15	25	10	15	30	10	15	30
			380/400/415V AC	16	25	40	16	25	40	16	25	40	16	25	40
			240V AC	25	35	50	25	35	50	25	35	85	25	35	85
			250V DC	13	20	25	13	20	25	13	15	25	13	15	25
			125V DC	20	30	40	20	30	40	20	25	40	20	25	40
Service breaking capacity	I_{cs}	(kA)	690V AC	-	-	3	-	-	3	-	-	2	-	-	2
(IEC, JIS, AS/NZS)			525V AC	3	4	7,5	3	4	7,5	3	7,5	13	3	6	7,5
			440V AC	5	7,5	13	5	7,5	13	5	12	15	5	12	15
			380/400/415V AC	8	13	20	8	13	20	8	19	20	8	19	20
			240V AC	13	18	25	13	18	25	13	27	43	13	27	43
			250V DC	7	10	13	7	10	13	7	12	13	7	12	13
			125V DC	10	15	20	10	15	20	10	19	20	10	19	20
Rated short-circuit making capacity	I_{cm}	(kA)	peak	33	33	33	33	33	33	33	33	33	33	33	33
Rated short-circuit withstand current	I_{cw}	(kA)	rms	-	-	-	-	-	-	-	-	-	-	-	-
Protection															
Fixed thermal, fixed magnetic					✓			-			✓			-	
Adjustable thermal, fixed magnetic					-			✓			-			-	
Adjustable thermal, adjustable magnetic					-			-			-			✓	
Utilization category					A			A			A			A	
Outline dimensions															
	height (b)	(mm)		130			130			165			165		
	width (a)	(mm)	3 pole	75			75			105			105		
	width (a)	(mm)	4 pole	100			100			140			140		
	depth (c)	(mm)		68			68			68			68		
	depth (d)	(mm)		93			93			95			95		
	toggle cutout(e)	(mm)		45			45			45			45		
Weight		(kg)	3 pole	0.8			0.8			1.5			1.5		
			4 pole	1.0			1.0			1.9			1.9		
Operation															
Direct Opening Action					✓			✓			✓			✓	
Trip button					✓			✓			✓			✓	
Suitable for isolation					✓			✓			✓			✓	
Standards	IEC 60947-2, EN 60947-2														

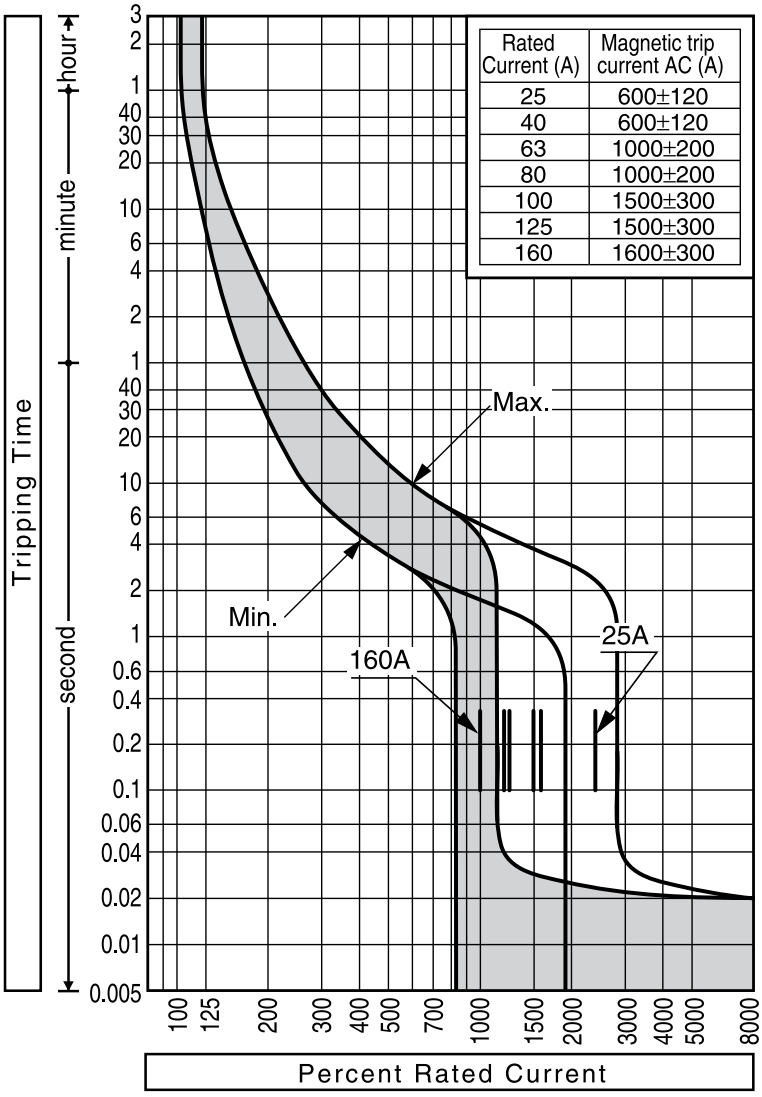
I-t

EB2S 160 LF, EB2S 160 SF, EB2S 160 HF



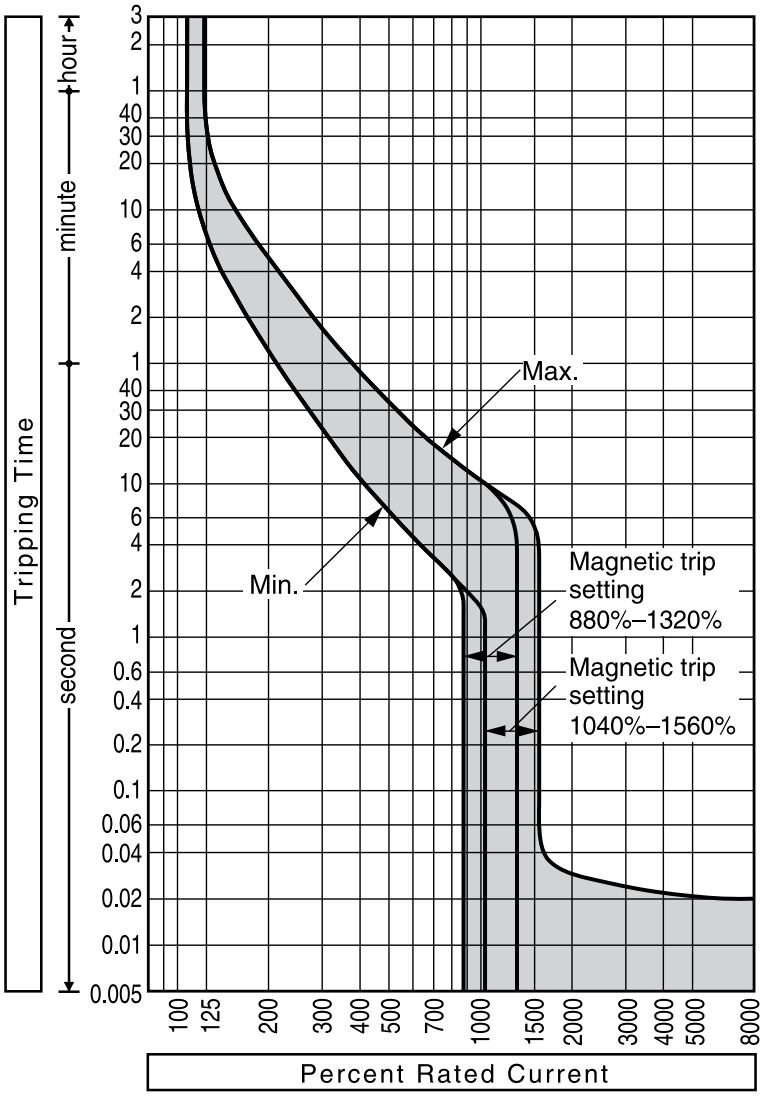
Rated Current (A)	Magnetic trip current AC (A)
16	600±120
20	600±120
25	600±120
32	600±120
40	600±120
50	600±120
63	1000±200
80	1000±200
100	1500±300
125	1500±300
160	1600±300

EB2S 160 LA, EB2S 160 SA, EB2S 160 HA



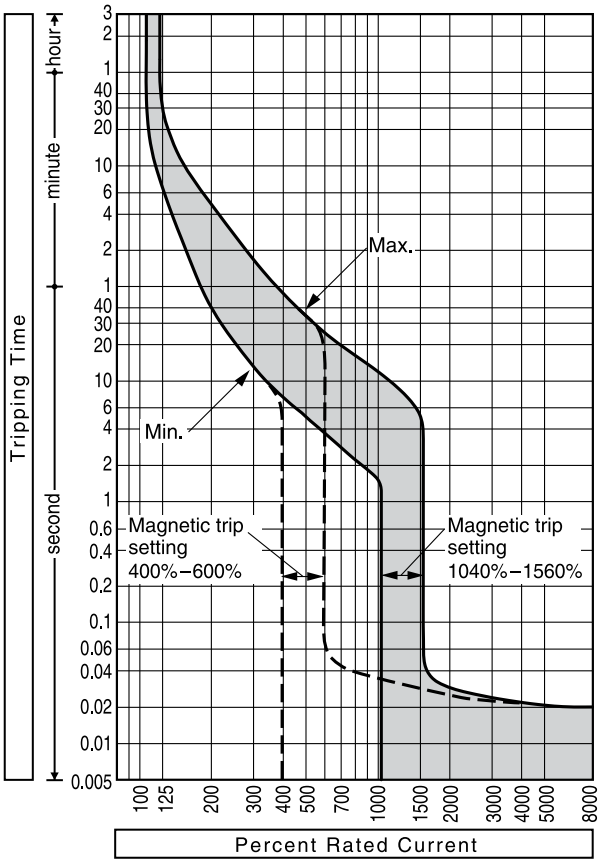
Rated Current (A)	Magnetic trip current AC (A)
25	600±120
40	600±120
63	1000±200
80	1000±200
100	1500±300
125	1500±300
160	1600±300

EB2S 250 LF, EB2S 250 SF, EB2S 250 HF

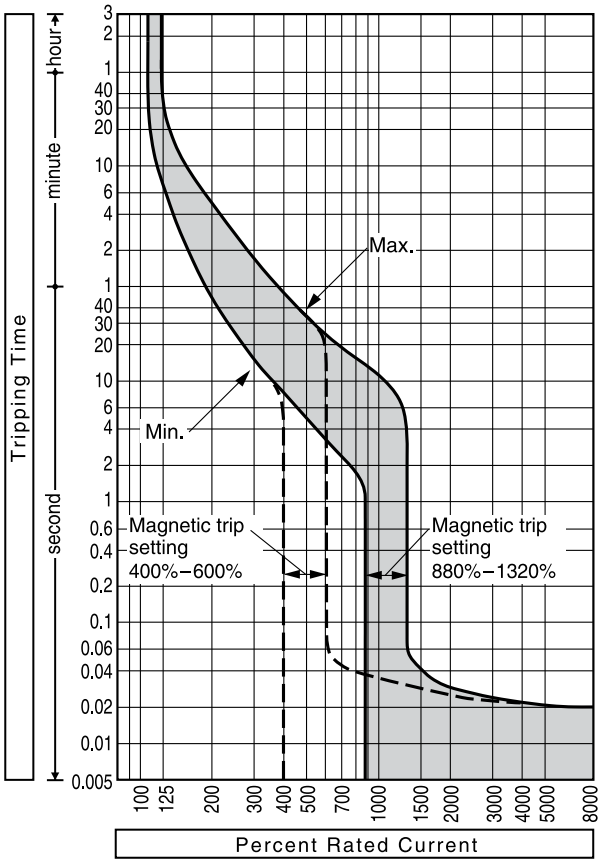


EB2S 250 LA, EB2S 250 SA, EB2S 250 HA

200A

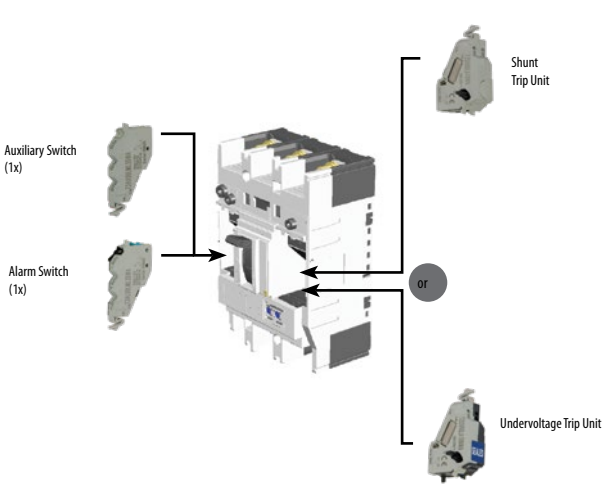


250A

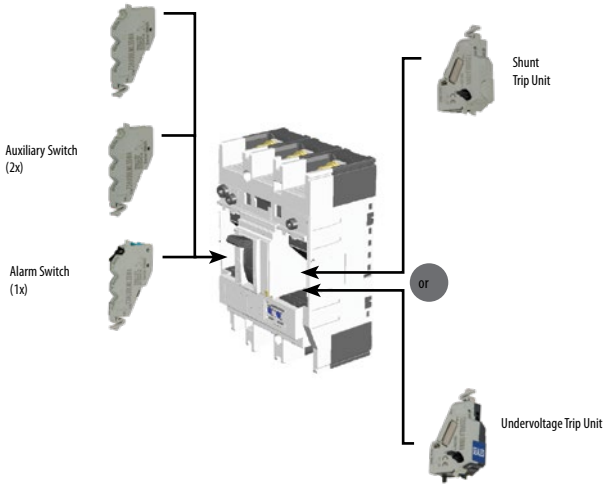


Internal accessories

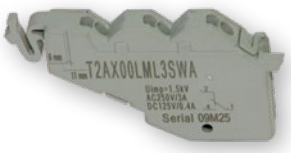
EB2S 160 F&A



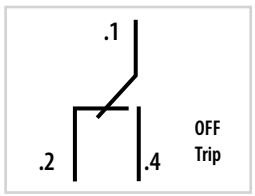
EB2S 250 F&A



- Status indication switches mount in the left side of the MCCB.
- Only one alarm switch can be fitted to an MCCB.



Auxiliary Switch



Terminal designations and function

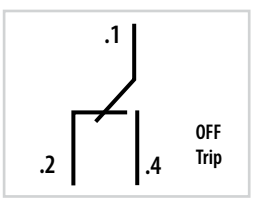
Ratings of Auxiliary switch

Volts (V)	AC Amperes (A)		DC Amperes (A)	
	Resistive Load	Inductive Load	Resistive Load	Inductive Load
480	-	-	-	-
250	3	2	0.4	0.05
125	3	2	3	2

The inductive load means power factor of no smaller than 0.4 and time constant of no larger than 7 ms.



Alarm Switch



Terminal designations and function

Ratings of Alarm switch

Volts (V)	AC Amperes (A)		DC Amperes (A)	
	Resistive Load	Inductive Load	Resistive Load	Inductive Load
480	-	-	-	-
250	3	2	0.4	0.05
125	3	2	3	2

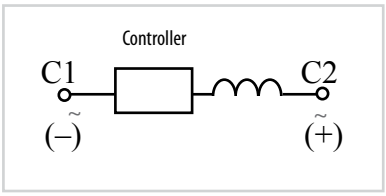
The inductive load means power factor of no smaller than 0.4 and time constant of no larger than 7 ms.



Shunt Trip Unit

Ratings of Shunt Trip

Rated Voltage	Voltage AC		Voltage DC
	200-240	380-450	24
Excitation Current (A)	0.014	0.0065	0.03



Terminal Designations of Shunt Trips

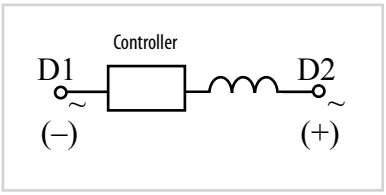
The permissible voltage is from 85% to 110% of the rated voltage for AC or 75% to 125% thereof for DC.
Ensure that the voltage does not drop exceeding the permissible voltage range when SHT is actuated.
Breaker contacts usually start opening within 30 ms after the rated voltage is applied to the breaker.



Undervoltage Trips

Ratings of Undervoltage Trips

Rated Voltage	Power supply capacity (VA) Voltage AC		Excitation current (mA) Voltage DC
	200-240	380-450	24
Power Supply Capacity (A)	2.8	2.3	23



Terminal Designations of Undervoltage Trips

External accessories



Features

- Installation and removal ease: Simply rotate two knobs allows the motor operator to be installed on or removed from the breaker.
- High-speed, stable actuation: The operating time as short as up to 0.1 second makes it possible to use the motor operators for synchronized closing of breakers.
- Silent operation: MO2S use a direct drive system, providing operational silence.
- "Lock-in off" capability: This capability allows the breaker to be padlocked in the OFF state. Up to thee padlocks with a 5 to 8 mm hasp diameter can be used. Padlocks are not supplied.

Ratings and specifications		
Rated operational voltage (1*)		230-240V AC
		24V DC
Peak steady-state/starting current, A (2*)	230-240V AC	3.5/7
	24V DC	18/26
Operation method		Motor driven (direct drive system)
Operating time, s at rated voltage	ON	0.1
	OFF/RESET	0.1 (3*, 4*)
Operating switch ratings		100V 0.1A (open voltage/current: 44V/4 mA) (*5)
Power supply required		300VA or higher
Dielectric withstand voltage (for one minute)		1500V AC(1000V AC -> 24V DC)
Weight		1.4kg

1*: Permissible operating range is 85% to 110%.

2*: The currents shown are at the maximum rated operational voltage.

3*: The operating time is the value when the rated operational voltage is supplied. Allow the longer time for the motor operator to complete the operation.

4*: The motor operator is of a short time duty. Do not subject it to more than 10 continuous ON-OFF operations. If this occurs, allow the motor operator to cool for at least 15 minutes.

5*: When the rated operational voltage is DC24V the open voltage will be DC22V.

Motorized operation

The motor operator has an input-signal self-hold circuit; closing the ON or OFF switch (see circuit diagrams shown bellow) momentarily allows activating the motor operator. To reset the tripped breaker to the OFF position, close the OFF (RESET) switch. The voltage presence LED indication is on when the power is supplied to the motor operator.

■ Auto reset feature (optional)
The auto reset feature allows the breaker to be automatically reset approx. 1.5 seconds after the breaker trips open. This option contains auto-reset switches and does not require to use auxiliary or alarm switches installed in the breaker.

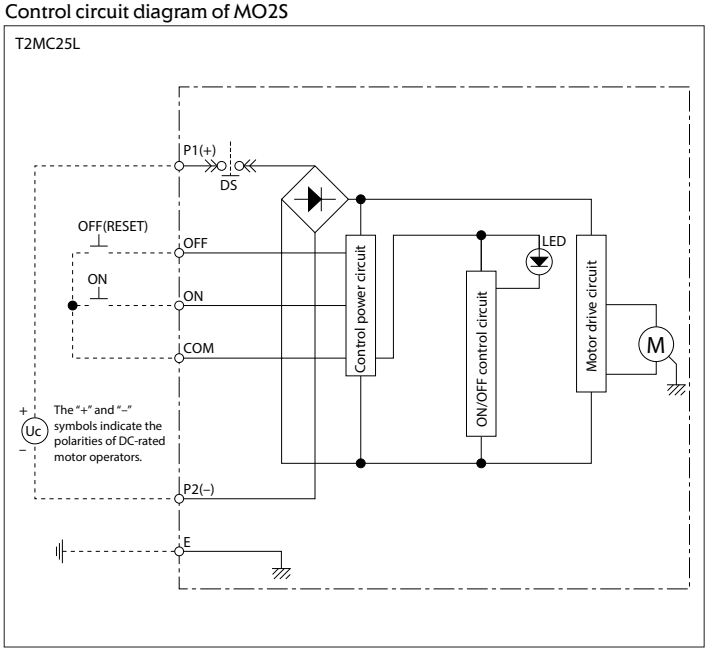
Note : that after the thermal OCR trips a thermal-magnetic breaker, the breaker cannot be immediately closed though it can be auto-reset. Wait for a few minutes after the tripping and provide a close signal to the breaker. This option resets the tripped breaker automatically, regardless of the cause of the tripping.

Manual operation

Pull the operating handle out. Rotating the handle counterclockwise turns ON the breaker and clockwise turns OFF or resets the breaker.

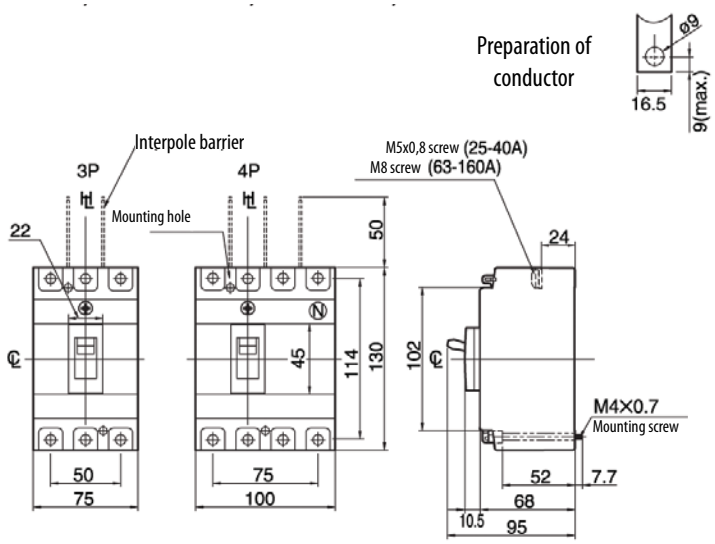
Operation precautions
1. Ensure that the actual operation voltage ranges from 85% to 110% of the rated one.
2. Use operation switches whose ratings and power capacity is as specified in the “Ratings and Specifications” table on the previous page.
3. Use noise filters if the control power supply of the motor operator is shared by peripheral devices. Otherwise, power supply noise may cause malfunction of the peripheral devices.
4. When the motors are used in conjunction with the mechanical interlock the electrical interlock should be provided between the motors in order to avoid the simultaneous closing. The followings are the available electrical interlock cables.

Control circuit diagram of MO2S

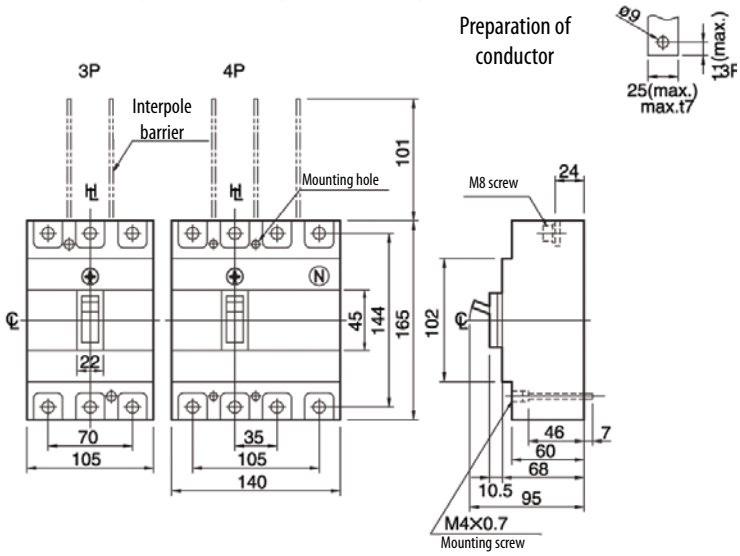


Dimensions

EB2S 160 F & A



EB2S 250 F & A



ETIPOWER

Air Circuit Breakers 462

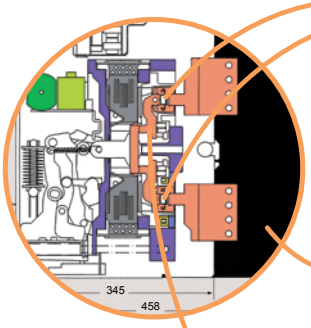
Air Circuit Breakers



Power needs control

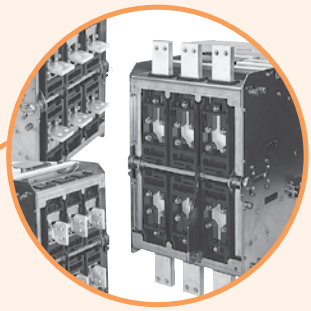
Air circuit breakers

Advantages of Air Circuit Breakers ETIPOWER



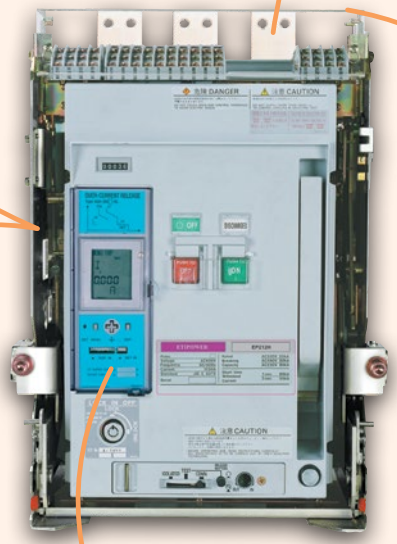
→ ETIPOWER is the world's first "Double Break" ACB, having two breaking contacts per phase, what means that the short time withstand rating (I_{CW}, 1sec) is equal to I_{CS} for all models.

→ ETIPOWER ACBs have the world's smallest depth resulting in space saving in switchboards.

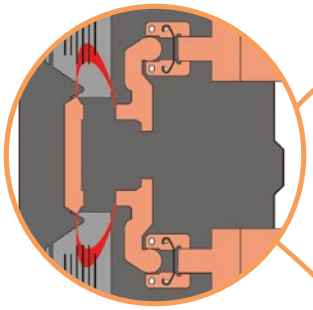


→ Three types of main circuit terminal arrangements are available:
- vertical terminals,
- horizontal terminals,
- front connections.

Different types of terminal arrangements can be specified for the line and load sides.



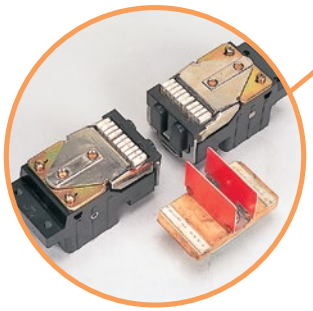
"Double Break" system



→ The unique "Double Break" main contact system ensures extremely fast interruption of short circuit currents and substantially reduces main contacts wear, what accordingly increase service life.

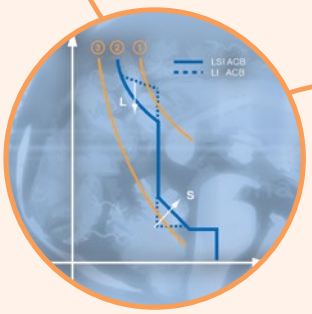


→ The ETIPOWER ACB dissipates all arc energy within its unique "Double Break" arc chamber. The internal energy dissipation within the ACB allows the clearance distance of the ACB to nearby earthed metal to be zero. This will assist in minimizing switchboard height and costs.



→ The fixed and moving main contacts can easily be replaced in the field (changing each pole takes around 15 minutes).

there are no clamp screws or flexible leads in the main circuit contact units, what improves the reliability in ON-OFF operation.



→ Our protection relays have LSI characteristics as standard.

This provides an adjustable time delay on overload (L) and also the I2t ramp characteristic (S).

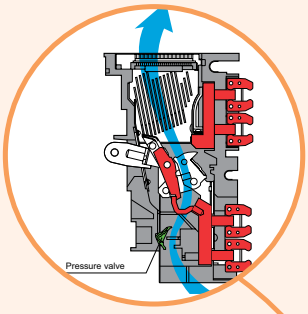
The settings of these characteristics allow a wide range of selectivity when grading with other protective devices.

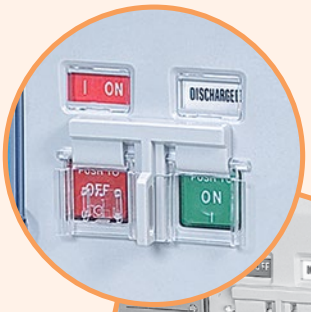


→ The ETIPOWER series is equipped with RMSD sensing over-current release (OCR) having a wide range of protection functions and capabilities.

- Type L: protection of industrial equipment and transformers;
- Type S: protection of generators;
- Type R: general circuit protection

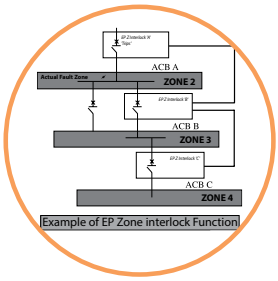
→ The EP6 ACB interrupts the current at two points on the line side while dissipating heat from contacts or terminals by efficient air convection through a pressure valve.







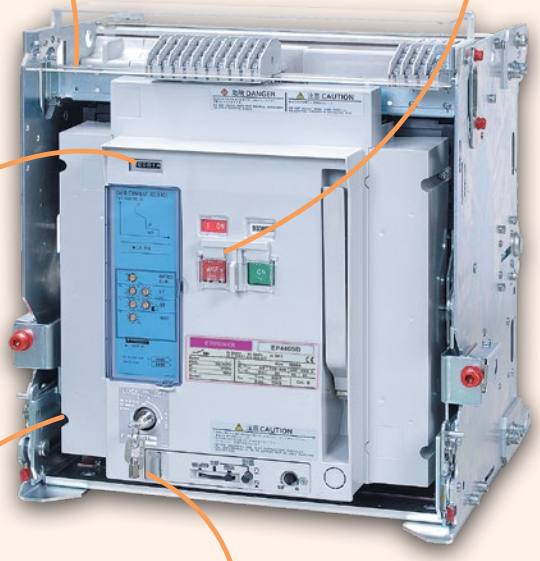
→ An ON-OFF button cover prevents inadvertent or unauthorized operation of the ON or OFF button. It can be locked with up to three padlocks.



→ In conventional discrimination systems, short time delays are used to allow a short-circuit current to be tripped by the circuit breaker nearest the fault. With the ETIPOWER Z Interlock system the breaker nearest the fault irrespective of the short time delay setting will trip first.

→ The ON-OFF Cycle Counter is a mechanical 5-bit readout that shows the number of ON-OFF cycles the ACB has performed.







→ Double Opening and closing Coils provides extended control system redundancy to an ACB. It provides the end user with ultimate reliability on critical UPS circuits connected to critical loads.

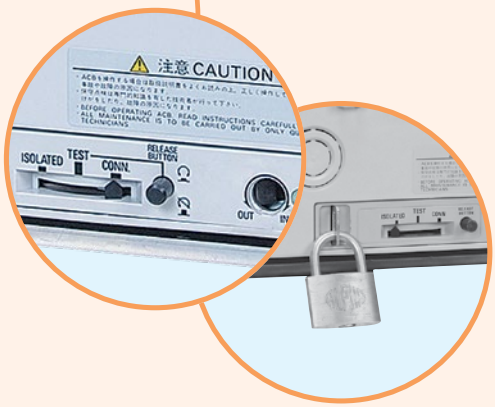


→ The unique design of ETIPOWER ACBs allows for the earthing of either the busbar or the circuit of a low voltage system.



→ The key lock is available in two types: the lock-in ON type that locks the ACB in the closed position, and the lock-in OFF type that locks the ACB in the open position.

When the ACB is fitted with a key lock, the operator cannot operate the ACB unless using a matched key.



→ Using the position padlock lever prevents the breaker body from inadvertently being drawn out. The position padlock lever in the pulled-out position locks the breaker body in the CONNECTED, TEST, or ISOLATED position. Up to three padlocks can be installed.



→ A door flange provides IP20 protection. For IP31 protection you have to specify the door flange with a gasket.

An IP cover provides an IP55 grade of protection (IEC 60529). Even if the breaker body is on the ISOLATED position, IP cover can still be fitted on the ACB.

Air Circuit Breakers ETIPOWER

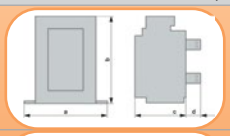
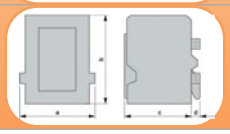


Application - Air circuit breakers ETIPOWER are used for protection of distribution lines, generators and other electrical equipment from effects of overload and short-circuit currents.

Air circuit breakers ETIPOWER are available in 3 frame sizes from 800A to 6300A, with a voltage up to 690V:
- size 1: current from 800 to 2000A
- size 2: current 2500 to 3200A (Type SB at 4000A made in 2 sizes)
- size 3: current 4000A - 6300A

Sizes 1 and 2 have two versions, draw-out and fixed. There are many options for connecting and wide range of accessories.

Two types of level breaking capacity:
- Type S (standard) from 65kA to 100kA
- Type H (high breaking capacity) from 80kA to 120kA (optional)

technical specifications / Type		EP 208 S	EP 212 S	EP 216 S	EP 220 S	EP 325 S	EP 332 S	EP 440 SB	EP 650 S	EP 663 S
Number of poles		3p / 4p	3p / 4p	3p / 4p	3p / 4p	3p / 4p	3p / 4p	3p / 4p	3p / 4p	3p / 4p
Rated Current I_n (A)		800	1250	1600	2000	2500	3200	4000	5000	6300
Neutral pole amperes frame (4pole) I_n (A)		800	1250	1600	2000	2500	3200	4000	5000	6300
Rated operational voltage U_n (V)		690	690	690	690	690	690	690	690	690
Rated breaking capacity, kA (I_{CS}=I_{CU})	U_n=690V AC	50	50	50	50	65	65	85	85	85
	U_n=440V AC	65	65	65	65	85	85	100	120	120
Rated breaking capacity, kA (I_{CU})	U_n=600V DC	40	40	40	40	40	40	40	40	40
	U_n=250V DC	40	40	40	40	40	40	40	40	40
Rated short time withstand current, kA (I_{CW})	t=1s	65	65	65	65	85	85	100	120	120
	t=3s	50	50	50	50	65	65	75	85	85
Mechanical life	with maintenance	30000	30000	30000	25000	20000	20000	15000	10000	10000
	without maintenance	15000	15000	15000	12000	10000	10000	8000	5000	5000
Electrical life	without maintenance (U_n=460V AC)	12000	12000	12000	10000	7000	7000	3000	1000	1000
	(U_n=690V AC)	10000	10000	10000	7000	5000	5000	2500	500	500
Total breaking time (s)		0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,05	0,05
Type of Mounting		Fixed / Drawout							Drawout	
Total Fixed Weight (kg)		53/59	53/59	54/60	54/60	80/92	80/92	-/-	-/-	-/-
Total Draw-Out Weight (kg)		73 / 86	73 / 86	76 / 90	79 / 94	105 / 125	105 / 125	126 / 158	200/260	220/285
Outline Dimension (mm)										
Fixed Type 	a	360 / 445	360 / 445	360 / 445	360 / 445	466 / 586	466 / 586	- / -	- / -	- / -
	b	460	460	460	460	460	460	-	-	-
	c	290	290	290	290	290	290	-	-	-
	d	75	75	75	75	75	75	-	-	-
Draw-out Type 	a	354 / 439	354 / 439	354 / 439	354 / 439	460 / 580	460 / 580	460 / 580	799/1034	799/1034
	b	460	460	460	460	460	460	460	460	460
	c	345	345	345	345	345	345	345	380	380
	d	40	40	40	40	40	40	140	60	60

Air circuit breakers ETIPOWER are available with three types of OCRs (over-current release):
AGR-11: Standard OCR with adjustment dial serves as the current protection and overload ground fault protection, neutral protection and signalling overload. AGR-21 / 22B LCD Type provides protection & measurement of current (only) and has trip signal for each function, the signal is permanent. It has a possibility of communications on the M-bus protocol.
AGR-31B Enhanced OCR with backlit. It provides protection & measurement of current, voltage, Power etc... It has permanent trip signal for each function.

Standard Specification includes:
- Padlockable Mechanical Close & Open Buttons
- Mechanical Close & Open Indicators
- Mechanical Indication of spring Charged/Discharged State
- 4AB Auxiliary contacts
- Terminal Cover
- IP20 Door Flange
- Horizontal or Vertical Busbar Connections
- Spring Charged main Circuit Shutters
- Control Circuit Shutters
- Position Indicator
- Drawout Handle

Note: A full description and specifications of Air circuit breakers are in the catalogue ETIPOWER 2010.

ETISWITCH

Compact Load Break Switch CLBS 466
Compact Load Break Switch with Visible break - CLBSV 471
Compact Load Break Switch with Visible break CO - CLBSV..CO 473
Load Break Switch LBS 475
Load Break Change Over Switch LBS..CO 479
Motorised Change Over Load Break Switch MLBS..CO (1-0-2) 482
Fuse Load Break Switch FLBS 484
Rotary Cam Switches 486
Rotary Cam Switches in Insulated Enclosures 492
Modular Rotary Cam Switches 496
Technical data 497

Switch disconnectors



ETI Power needs control

Compact Load Break Switch CLBS



Possibility of direct, remote front and side control



Special type of mounting on the TH 35 busbar (no tools required)



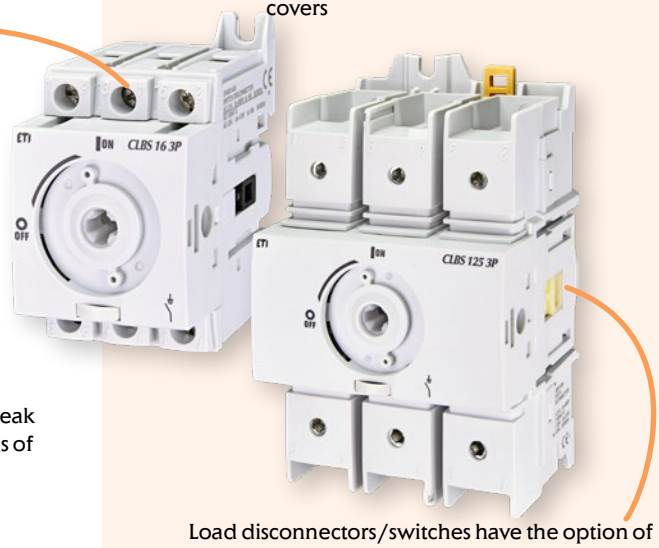
Terminal covers provide protection against accidental contact and phase separation of the switch, while perforation allows temperature monitoring of the contacts without removing the covers



Compact load break switch CLBS 100-125A have sealing option terminal covers



Handle position in load-break switches indicates the status of the contact group



Load disconnectors/switches have the option of installing optional accessories, such as

Additional pole, 4th pole



Auxiliary contact





Neutral pole N



Protective earth module PE





→ Padlocking the handle



Possibility of self-assembly of 1-0-2 load disconnectors using two CLBS load disconnectors and CLBS-CK conversion kit.

Compact Load Break Switch CLBS

Description
CLBS are manually operated and modular multipolar load break switches in range 16A-125A. They make and break under load conditions and provide safety isolation for any low voltage circuit, particularly for machine control circuits. Through the use of accessories, CLBS can be transformed into multipolar load break or 3/4 pole changeover switches. CLBS change over switches provide on load changeover switching between two sources or two low voltage power circuits, as well as their safety isolation. CLBS switches have been designed, qualified and tested according to the criteria defined by standard IEC 60947-3.

CLBS body (no handle included) 3 POLES 16 - 125 A

Type	Code No.	I_n [A]	Number of poles	Weight [g]	Packaging [pcs]
CLBS 16 3P	004661400	16	3	230	1/24
CLBS 25 3P	004661401	25	3	228	1/24
CLBS 40 3P	004661402	40	3	228	1/24
CLBS 63 3P	004661403	63	3	320	1/24
CLBS 80 3P	004661404	80	3	322	1/24
CLBS 100 3P	004661405	100	3	600	1/12
CLBS 125 3P	004661406	125	3	624	1/12

Front(direct and external) and right side operation

CLBSCD series (CLBS switch with reduced short circuit current capability)

Type	Code No.	I_n [A]	Number of poles	Weight [g]	Packaging [pcs]
CLBSCD 63 3P	004661910	63	3	210	1/24
CLBSCD 100 3P	004661911	100	3	310	1/24

With CLBSCD 63 3P can be applied with the same accessories as with CLBS 40 3P (CLBS40 body)
With CLBSCD 100 3P can be applied with the same accessories as with CLBS 80 3P (CLBS 80 body)



CLBS 16 3p

CLBS 125 3p

Accessories

Direct handle for direct operation

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-DH80/B	Direct handle, black	004661410	CLBS 16-80A 3P	10	1/200
CLBS-DH125/B	Direct handle, black	004661411	CLBS 100-125A 3P	8	1/200
CLBS-DH80/YR	Direct handle, red	004661412	CLBS 16-80A 3P	10	1/200

Type definition: Handle type / color initials



CLBS-DH80/B



CLBS-DH125/B



CLBS-DH80Y/R

Door interlocked front and right side handle IP65 (shaft not included)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-EH80/G	Door interlocked handle, grey front	004661415	CLBS 16-80A 3P	101	1/45
CLBS-EH125/G	Door interlocked handle, grey front	004661416	CLBS 100-125A 3P	103	1/45
CLBS-EH125/01G	Door interlocked handle, grey front	004661417	CLBS 16-125A 3P	190	1/25

Type definition: Handle type / color initials



CLBS-EH80/G



CLBS-EH125/G



CLBS-EH125/01G

The products' colour or shape may be different as on picture

Technical data on page 497, 501



CLBS-EH80/YR CLBS-EH125/YR CLBS-EH125/01YR

Door interlocked front and right side handle IP65 (shaft not included).

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-EH80/YR	Door interlocked handle, red front	004661418	CLBS 16-80A 3P	102	1/45
CLBS-EH125/YR	Door interlocked handle, red front	004661419	CLBS 100-125A 3P	104	1/45
CLBS-EH125/01YR	Door interlocked handle, red front	004661420	CLBS 16-125A 3P	200	1/25

Type definition: Handle type / color initials



CLBS-S

Shaft for door interlocked front and right side handle

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-S200	Shaft, 200 mm	004661422	CLBS-EH80 CLBS-EH125	60	1/110
CLBS-S320	Shaft, 320 mm	004661423	CLBS-EH80 CLBS-EH125	80	1/90
CLBS-S400/01	Shaft, 400 mm	004661424	CLBS-EH125/01	125	1/25

For 3/4 pole switches, shaft extensions are for external front and side operation.
Not for use with Change over kit and handles



CLBS-GC EH125/01

Guiding cone

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-GC EH80, 125	Guiding cone	004661421	CLBS-EH80 CLBS-EH125	130	1/240
LBS-GC (CLBS-EH125/01)	Guiding cone	004661489	CLB-EH125/01	29	1/25

To guide the shaft extension into the external handle. This accessory enables handle to engage extension shaft with a misalignment of up to 15 mm. Required for shaft lengths over 320 mm.



CLBS-DMK80 CLBS-DMK125

Door mounting kit (handle not included)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-DMK80	Compact version	004661413	CLBS 16-80A 3P	60	1/50
CLBS-DMK125	Steel support	004661414	CLBS 100-125A 3P	120	1/20

This kit enables the direct mounting of the switch on the panel door, or on the left or right side of the panel. The connection clamps of the switch are always accessible. The external handle is quick and easy to install with the supplied locking nut mounted on the inside of the enclosure.
Not compatible with CLBS-EH125/01 handles

Technical data on page 501

Additional pole, 4th pole CLBS-4P

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-4P/16	Additional pole	004661432	CLBS 16A 3P	72	1/36
CLBS-4P/25	Additional pole	004661433	CLBS 25A3P	72	1/36
CLBS-4P/40	Additional pole	004661434	CLBS 40A 3P	72	1/36
CLBS-4P/63	Additional pole	004661435	CLBS 63A 3P	100	1/36
CLBS-4P/80	Additional pole	004661436	CLBS 80A 3P	102	1/36
CLBS-4P/100	Additional pole	004661437	CLBS 100 A 3P	200	1/16
CLBS-4P/125	Additional pole	004661438	CLBS 125 A 3P	205	1/16

Installation of 4th pole converts 3 pole CLBS to 4 pole load break switch or 3 pole CLBS changeover switch into a 4 pole changeover switch.


CLBS-4P
16..80


CLBS-4P
100-125

Solid neutral pole CLBS-N

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-N/40	Solid neutral pole	004661443	CLBS 16-40A 3P	200	1/36
CLBS-N/80	Solid neutral pole	004661444	CLBS 63-80A 3P	200	1/36
CLBS-N/125	Solid neutral pole	004661445	CLBS 100-125A 3P	200	1/16

Neutral pole is fixed and can not be switched.


CLBS-N
100-125


CLBS-N
16..80

Protective earth pole CLBS-PE

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-PE/40	Protective earth pole	004661446	CLBS 16-40A 3P	200	1/36
CLBS-PE/80	Protective earth pole	004661447	CLBS 63-80A 3P	200	1/36
CLBS-PE/125	Protective earth pole	004661448	CLBS 100-125A 3P	200	1/16

Protective earth pole is fixed and can not be switched.


CLBS-PE
16..80


CLBS-PE
100-125

Auxiliary contact

Type	I [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-PS11	10	Auxiliary contact NO+NC	004661425	CLBS 16-125A	44	1/52

Pre-break and signalisation of positions 0 and 1 by NO+NC. Auxiliary switch allows to anticipate switching of the main poles.
It can be mounted on the left or on the right side of the device.


CLBS-PS11

Change over kit (direct handle included) I-0-II

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-CK80	Change over kit, black handle 1-0-2	004661439	2xCLBS 16-80A 3P	74	1/42
CLBS-CK125	Change over kit, black handle 1-0-2	004661440	2xCLBS 100-125A 3P	240	1/10

Two CLBS bodies must be ordered separetely for one Change over kit


CLBS-CK80


CLBS-CK125

The products' colour or shape may be different as on picture

Change over kit (direct handle included) I-I+II-II

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-CKI+II80	Change over kit, black handle 1-1+2-2	004661522	2xCLBS 16-80A 3P	90	1/42
CLBS-CKI+II125	Change over kit, black handle 1-1+2-2	004661523	2xCLBS 100-125A 3P	240	1/10

Two CLBS bodies must be ordered separetely for one Change over kit



CLBS-EH80/G CO



CLBS-EH125/G CO

Door interlocked front handle IP65 (shaft not included) for change over switch - External front operation

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-EH80/G CO	Door interlocked front handle, grey front 1-0-2	004661441	CLBS-CK80	101	1/45
CLBS-EH125/G CO	Door interlocked front handle, grey front 1-0-2	004661442	CLBS-CK125	101	1/45

Type definition: Handle type / color initials



CLBSV-S200

Shafts for door interlocked front handle on change over switches

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBSV-S200	Shaft, 200mm	004661886	CLBS-EH125/G CO	0,05	1/100
CLBS-S200		004661422	CLBS-EH80/G CO		
CLBSV-S320	Shaft, 320mm	004661887	CLBS-EH125/G CO	0,09	1/240
CLBS-S320		004661423	CLBS-EH80/G CO		

For front operation only.

Applications
Top and bottom protection against direct contact with the terminals or connection parts. An opening on each terminal cover makes it possible to insert a temperature measurement probe.



CLBS-TS80 3P



CLBS-TS80 1P

Terminal shrouds (covers)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
CLBS-TS40 3P	Terminal shroud 3P 16-40A	004661426	CLBS 16-40A	20	1/110
CLBS-TS80 3P	Terminal shroud 3P 63-80A	004661427	CLBS 63-80A	20	1/125
CLBS-TS125 3P	Terminal shroud 3P 100-125A	004661428	CLBS 100-125A	63	1/22
CLBS-TS40 1P	Terminal shroud 1P 16-40A	004661429	CLBS 16-40A	8	1/200
CLBS-TS80 1P	Terminal shroud 1P 63-80A	004661430	CLBS 63-80A	6	1/200
CLBS-TS125 1P	Terminal shroud 1P 100-125A	004661431	CLBS 100-125A	22	1/120

One reference code includes 2 pcs 1 for top and 1 for bottom contacts.

The products' colour or shape may be different as on picture

Technical data on page499

Compact Load Break Switch with Visible break - CLBSV



Possibility to connect additional contacts with pre-break function



Double-visible chain break ensures safe maintenance



Special type of mounting on the TH 35 rail (does not require special tools)

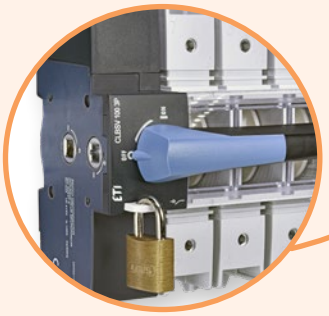


The position of the handle indicates the status of the contact group

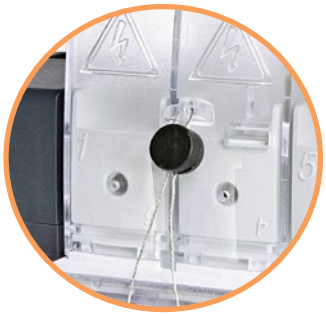




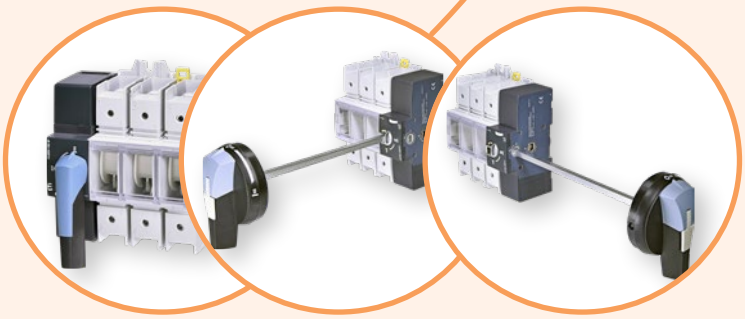
Terminal covers provide protection against accidental contact and phase separation of the switch, and Perforated holes allow for contact temperature monitoring without removing the covers



Handle can be locked with a padlock



Ability to seal terminal covers



Possibility of direct, external front and side control



Universal mounting system allows mounting on the TH-35 bus and mounting plate

Compact Load Break Switch with Visible break - CLBSV (0-1)



CLBSV 100 3P

Applications - CLBSV are manually operated multi-pole devices for switching low voltage electrical circuits with currents up to 160A. The CLBSV line of load switches has been designed and tested in full compliance with the criteria defined in IEC 60947-3.

0-1 load switch with visible break CLBSV 100 - 160 A

Type	Code No	Description	I_n [A]	Number of poles	Weight [g]	Packaging [pcs]
CLBSV 100 3P	004661880	Load switch 0-1	100	3	840	1/28
CLBSV 125 3P	004661881	Load switch 0-1	125	3	820	1/28
CLBSV 160 3P	004661882	Load switch 0-1	160	3	820	1/28

Фронтальное (прямое или выносное) и боковое (выносное) управление. Рукоятка в комплект поставки не входит.

Accessories



CLBSV-DH160/BL

Direct control knobs for mounting on switches CLBSV

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-DH160/BL	004661883	Handle on switch body, blue	CLBSV 100-160A 3P	20	1/25

Direct frontal control



CLBSV-EH160/B CLBSV-EH160/YR

Door interlocked front handle IP65 (shaft not included). IP65

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-EH160/B	004661884	Remote handle, black	CLBSV 100-160A 3P	90	1/45
CLBSV-EH160/YR	004661885	Remote handle, red	CLBSV 100-160A 3P	90	1/45

Remote front control. The stem is not included in the delivery.
With the possibility of opening the door when the door is on.



CLBSV-S200

External control shaft

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-S200	004661886	Shaft, 200mm	CLBSV-EH160/B, CLBSV-EH160/YR	50	1/100
CLBSV-S320	004661887	Shaft, 320mm		90	1/240

The stem is used for external front and side control.



CLBS-PS11

Contact block

Type	Code No	Description	I_n [A]	For use with	Weight [g]	Packaging [pcs]
CLBS-PS11	004661425	Contact block, 1NO+1NC	10	CLBS 16-125A	44	1/52

Application: Pre-opening and signaling of position 0 and I by additional NO+NO contacts. Up to two additional contact blocks can be installed



CLBS-TS125 3P



CLBS-TS125 1P

Terminal cover for CLBSV

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBS-TS125 3P	004661428	Terminal cover 3P	CLBSV 100-160A	63	1/22
CLBS-TS125 1P	004661431	Terminal cover 1P		22	1/120

Note: One set must be ordered for protection of upper and lower terminals.

Application - Protection against direct contact with upper and lower terminals.
Openings are provided on the cover for the installation of temperature sensors.

Technical data on page 504

Compact Load Break Switch with Visible break CO - CLBSV..CO



The clamping terminal screws are locked in the housing (when fully unscrewed, they remain in the terminal)



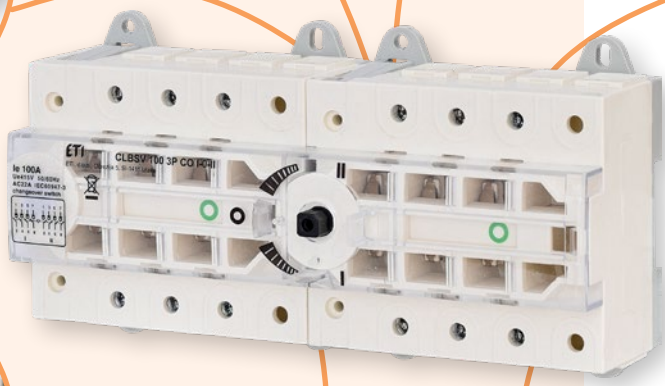
Universal mounting system allows mounting on the TH-35 busbar and mounting plate



Special type of mounting on the TH 35 busbar (no special tools required)



Possibility to connect me auxiliary contacts with pre-break function





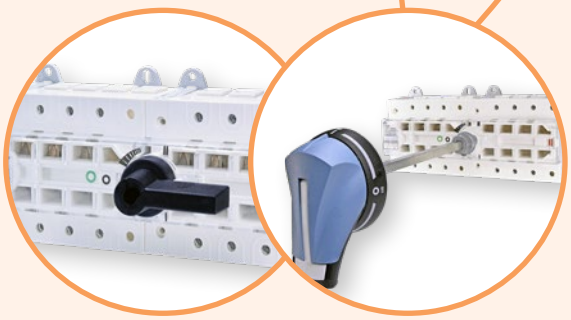
Double visible chain break ensures safe maintenance



Possibility to lock the handle with a padlock



The connection bar allows the switch outputs to be interconnected

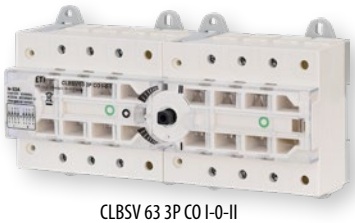


Possibility of direct and remote frontal control



Position indicator for circuit breaker power contacts

Compact Load Break Switch with Visible break CO - CLBSV..CO



CLBSV 63 3P CO I-0-II



CLBSV 125 3P CO I-I+II-II

Load disconnectors 1-0-2 with visible break CLBSV..CO 63 - 125 A

Type	Code No	Description	I_n [A]	Number of poles	Weight [g]	Packaging [pcs]
CLBSV 63 3P CO I-0-II	004661890	Load-break switch 1-0-2	63	3	1250	1
CLBSV 100 3P CO I-0-II	004661891	Load-break switch 1-0-2	100	3	1360	1
CLBSV 125 3P CO I-0-II	004661892	Load-break switch 1-0-2	125	3	1360	1

Front (direct or remote) control. The handle is not included

Load disconnectors 1-1+2-2 with visible break CLBSV..CO 63 - 125 A

Type	Code No	Description	I_n [A]	Number of poles	Weight [g]	Packaging [pcs]
CLBSV 63 3P CO I-I+II-II	004661893	Load switch 1-1+2-2	63	3	1360	1
CLBSV 100 3P CO I-I+II-II	004661894	Load switch 1-1+2-2	100	3	1360	1
CLBSV 125 3P CO I-I+II-II	004661895	Load switch 1-1+2-2	125	3	1360	1

Front (direct or remote) control. The handle is not included

Accessories



CLBSV-DH125/B I-0-II

Direct handle for direct operation CLBSV..CO

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-DH125/B I-0-II	004661896	Handle on switch housing I-0-II, black	CLBSV..CO I-0-II	30	1/50
CLBSV-DH125/B I-I+II-II	004661897	Handle on switch housing I-I+II-II, black	CLBSV..CO I-I+II-II	40	1/50

Direct frontal control



CLBSV-EH125/B I-0-II

Door interlocked front handle IP65 (shaft not included). IP65

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-EH125/B I-0-II	004661898	Handle remote I-0-II, black	CLBSV..CO I-0-II	220	1/20
CLBSV-EH125/B I-I+II-II	004661899	Handle remote I-I+II-II, black	CLBSV..CO I-I+II-II	220	1/20

Remote front control. The stem is not included in the scope of delivery. With possibility of opening the door when switched on.

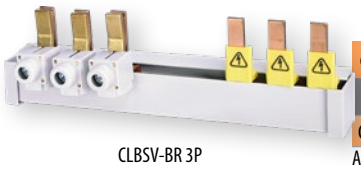


CLBSV-S200 I-0-II

External control shaft

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-S200 I-0-II	004661900	Shaft, 200mm	CLBSV..CO I-0-II	190	1/30
CLBSV-S320 I-0-II	004661901	Shaft, 320mm		250	1/25
CLBSV-S200 I-I+II-II	004661902	Shaft, 200mm	CLBSV..CO I-I+II-II	191	1/25
CLBSV-S320 I-I+II-II	004661903	Shaft, 320mm		214	1

The stem is used for external frontal control.



CLBSV-BR 3P

Connecting busbar IP20

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-BR 3P	004661904	Connection busbar IP20, 3p	CLBSV..CO	30	1/100

Application: To create a common connection between devices I and II at the top or bottom of the switch.



CLBSV-PS11

Contact block (flip-flop)

Type	Code No	Description	For use with	Weight [g]	Packaging [pcs]
CLBSV-PS11	004661905	Contact block, 1NO/NC ((change-over)	CLBSV..CO I-0-II	30	1/25

Application: Pre-opening and signalling of positions I and II, 1NO/NC additional contact per position.

Technical data on page 506

Load Break Switch LBS

Ability to connect auxiliary contacts



Position of the handle indicates the status of the contact group



Terminal covers provide protection against accidental contact and phase separation of the switch, while perforated holes allow temperature monitoring of the contacts without removing the covers





The use of glass fibre reinforced polyester provides high mechanical and temperature resistance of the LBS load disconnector enclosure





Possibility to lock the handle with a padlock



Load disconnectors up to 630A are supplied with screws for connection



Position indicator for circuit breaker power contacts

Load Break Switch LBS

Description
LBS is manually operated 3 pole or 4 pole load break switch in range 160-3200A. It makes and breaks under load conditions and provides safety isolation. LBS is designed for 415 VAC and DC low voltage electrical circuits. LBS switches have been designed, qualified and tested according to the criteria defined by standard IEC 60947-3.



LBS 160A 3P / LBSCD 200A 3P



LBS 800A - 1000A 3P



LBS 2000A-3200A 3P

LBS body (no handle included) 3/4 POLES

Type	Code No.	I_n [A]	Number of poles	Weight [kg]	Packaging [pcs]
LBS 160 3P	004661450	160	3	1,11	1
LBS 250 3P	004661451	250	3	1,71	1
LBS 400 3P	004661452	400	3	4,00	1
LBS 630 3P	004661453	630	3	4,36	1
LBS 800 3P	004661454	800	3	8,63	1
LBS 1000 3P	004661455	1000	3	9,70	1
LBS 1250 3P	004661456	1250	3	9,15	1
LBS 1600 3P	004661457	1600	3	12,70	1
LBS 2000 3P	004661458	2000	3	22,08	1
LBS 2500 3P	004661459	2500	3	22,37	1
LBS 3200 3P	004661460	3200	3	27,54	1
LBS 160 4P	004661461	160	4	1,25	1
LBS 250 4P	004661462	250	4	2,07	1
LBS 400 4P	004661463	400	4	4,87	1
LBS 630 4P	004661464	630	4	5,39	1
LBS 800 4P	004661465	800	4	11,75	1
LBS 1250 4P	004661466	1250	4	12,32	1
LBS 1600 4P	004661467	1600	4	15,89	1
LBS 2500 4P	004661468	2500	4	28,85	1
LBS 3200 4P	004661469	3200	4	33,80	1

In front direct or external front operation

LBSCD series (LBS switch with reduced short circuit current capability) 3/4 POLES

Type	Code No.	I_n [A]	Number of poles	Weight [kg]	Packaging [pcs]
LBSCD 200 3P	004661912	200	3	0,47	1
LBSCD 315 3P	004661913	315	3	1,76	1
LBSCD 400 3P	004661914	400	3	1,85	1
LBSCD 200 4P	004661915	200	4	1,2	1
LBSCD 315 4P	004661916	315	4	2,2	1
LBSCD 400 4P	004661917	400	4	2,28	1

With LBSCD 200 can be applied the same accessories as with LBS 160 (LBS 160 body)
With LBSCD 315 can be applied the same accessories as with LBS 250 (LBS 250 body)
With LBSCD 400 can be applied the same accessories as with LBS 250 (LBS 250 body)

Accessories



LBS-DH160/B



LBS-DH630/B

Direct handle for direct operation

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-DH160/B	Direct handle, black	004661480	LBS 160A	91	1/25
LBS-DH630/B	Direct handle, black	004661481	LBS 250-630A	100	1/25
LBS-DH3200/B (CO)	Direct handle, black	004661482	LBS 800-3200A	295	1/20

Type definition: Handle type / color initials

Technical data on page 508, 511

Door interlocked handle IP65 (shaft not included).

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-EH630/G...400/G FLBS	Door interlocked handle, grey front	004661483	LBS 160-630A	250	1/20
LBS-EH1600/G	Door interlocked handle, grey front	004661484	LBS 800-1600A	340	1/10
LBS-EH3200/BL	Door interlocked handle, blue front	004661485	LBS 2000-3200A	1.500	1

Type definition: Handle type / color initials



LBS-EH630/G...400/G FLBS LBS-EH1600/G LBS-EH3200/BL

Door interlocked handle IP65 (shaft not included).

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-EH630/YR	Door interlocked handle, red front	004661486	LBS 160-630A	250	1/20
LBS-EH1600/YR	Door interlocked handle, red front	004661487	LBS 800-1600A	340	1/10
LBS-EH3200/YR	Door interlocked handle, red front	004661488	LBS 2000-3200A	1.500	1

Type definition: Handle type / color initials



LBS-EH630/YR LBS-EH1600/YR LBS-EH3200/YR

Shaft for door interlocked handle

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-S200/630 (CO)...400 FLBS	Shaft, 200mm, 10x10mm	004661490	LBS-EH630A	160	1/25
LBS-S200/1600 (CO)	Shaft, 200mm, 15x12mm	004661491	LBS-EH1600A	360	1/25
LBS-S200/3200 (CO)	Shaft, 200mm, 15x15mm	004661492	LBS-EH3200A	350	1/10
LBS-S320/630 (CO)...400 FLBS	Shaft, 320mm, 10x10mm	004661493	LBS-EH630A	250	1/50
LBS-S320/1600 (CO)	Shaft,320mm, 15x12mm	004661494	LBS-EH1600A	490	1/25
LBS-S320/3200 (CO)	Shaft, 320mm, 15x15mm	004661495	LBS-EH3200A	376	1/15
LBS-S500/630 (CO)...400 FLBS	Shaft, 500mm, 10x10mm	004661496	LBS-EH630A	390	1/20
LBS-S400/1600(CO)	Shaft, 400mm, 15x12mm	004661497	LBS-EH1600A	580	1/20
LBS-S450/3200(CO)	Shaft, 450mm, 15x15mm	004661498	LBS-EH3200A	971	1/20

15x12mm: one side with 12x12mm, second side with 15x15mm.



LBS-S320/1600 (CO)

Guiding cone

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-GC (CLBS-EH125/01)	Guiding cone	004661489	LBS-EH630-3200	29	1/25

To guide the shaft extension into the external handle. This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm. Required for shaft lengths over 320 mm.



LBS-GC (CLBS-EH80, 125)

Technical data on page 511



LBS-PS11

Auxiliary contact

Type	I [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-PS11	16	Auxiliary contact (CO)	004661499	LBS 160-3200A	26	1/30
LBS-2PS11	16	2nd auxiliary contact (CO)	004661918	LBS 160-3200A	26	1/30

Pre-break and signalling of positions 0 and I. Connection to the control circuit 6.35 mm fast-on terminal.
Electrical characteristics 30 000 operations. Only one auxiliary contact can be mounted to each switch body



LBS-TS160 3P (CO)

Terminal shrouds (covers)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS160 3P (CO)	Terminal shrouds, 3P	004661500	LBS 160A 3P	79	1/20
LBS-TS250 3P (CO)	Terminal shrouds, 3P	004661501	LBS 250A 3P	121	1/10
LBS-TS630 3P (CO)	Terminal shrouds, 3P	004661502	LBS 400-630A 3P	242	1/5
LBS-TS4P/160 (CO)	Terminal shrouds, 4P	004661506	LBS 160A 4P	100	1/15
LBS-TS4P/250 (CO)	Terminal shrouds, 4P	004661507	LBS 250A 4P	157	1/8
LBS-TS4P/630 (CO)	Terminal shrouds, 4P	004661508	LBS 400-630A 4P	311	1/4

Perforations allow remote thermographic inspection without the need to remove the shrouds.
The terminal shrouds also provide phase separation for LBS 160 to 630 A.
Terminal covers assure top and bottom protection against direct contact with terminals or connection parts.
One reference includes 3 pcs (3pole)/ 4 pcs (4pole) for top or bottom contacts , to protect all 2 references shall be ordered



LBS-TS1250 3P

Terminal screen

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS1250 3P	Terminal screen, 3P	004661503	LBS 800-1250A 3P	127	1/25
LBS-TS1600 3P	Terminal screen, 3P	004661504	LBS 1600A 3P	163	1/20
LBS-TS3200 3P	Terminal screen, 3P	004661505	LBS 2000-3200A 3P	266	1/1
LBS-TS4P/1250	Terminal screen, 4P	004661509	LBS 800-1250A 4P	161	1/20
LBS-TS4P/1600	Terminal screen, 4P	004661510	LBS 1600A 4P	223	1/30
LBS-TS4P/3200	Terminal screen, 4P	004661511	LBS 2000-3200A 4P	350	1/1

Top or bottom, to protect all 2 references shall be ordered

Technical data on page 512

Load Break Change Over Switch LBS..CO

Description

LBS CO is manual 3 pole or 4 pole changeover switch with positive break indication in range 160-3200A. It provides changeover under load for two low voltage power circuits, as well as it's safety isolation by double breaking per pole. LBS CO switches have been designed, qualified and tested according to the criteria defined by standard IEC 60947-3 and IEC 60947-6-1. It can be utilised with a direct front or external operation handle.

Advantages

Double breaking per pole, achieved through its sliding bar contact system, is a proven design that offers very high durability and short-circuit withstand. The position indicator is located directly on the sliding bar contact mechanism, ensuring it can be seen in all circumstances. The use of glass fibre reinforced polyester gives the LBS high mechanical and thermal resistance.

General characteristics

- Double positive break indication given through a position indication window, located directly on the product, and by the operating handle.
- Severe utilisation categories (AC-22 and AC-23).
- High resistance to damp heat (supplied "tropicalised").
- A good centre-to-centre terminal distance (up to 120 mm).
- Connection up to 6x185 mm^2.
- Connection accessories which facilitate connection, both flat and edgewise connections.

Applications

- Generator manufacturers
- Heating
- Air conditioning
- Ventilation
- Power distribution
- Telecommunications

Load Break Change Over Switch LBS..CO

LBS CO body (no handle included) 3/4 POLES

Type	Code No.	I_n [A]	Number of poles	Weight [kg]	Packaging [pcs]
LBS 160 3P CO	004661550	160	3	3,19	1
LBS 250 3P CO	004661551	250	3	4,68	1
LBS 400 3P CO	004661552	400	3	4,87	1
LBS 630 3P CO	004661553	630	3	10,89	1
LBS 800 3P CO	004661554	800	3	28,20	1
LBS 1000 3P CO	004661555	1000	3	20,00	1
LBS 1250 3P CO	004661556	1250	3	34,25	1
LBS 1600 3P CO	004661557	1600	3	38,80	1
LBS 2000 3P CO	004661558	2000	3	54,30	1
LBS 2500 3P CO	004661559	2500	3	45,00	1
LBS 3200 3P CO	004661560	3200	3	69,00	1
LBS 160 4P CO	004661561	160	4	3,73	1
LBS 250 4P CO	004661562	250	4	5,60	1
LBS 400 4P CO	004661563	400	4	5,87	1
LBS 630 4P CO	004661564	630	4	13,12	1
LBS 800 4P CO	004661565	800	4	36,60	1
LBS 1250 4P CO	004661566	1250	4	38,15	1
LBS 1600 4P CO	004661567	1600	4	43,85	1
LBS 2500 4P CO	004661568	2500	4	66,00	1
LBS 3200 4P CO	004661569	3200	4	82,00	1

In front direct or external front operation



LBS 160A 3P CO



LBS 630A 3P CO



LBS 1600A 3P CO

Technical data on page 514

Accessories



LBS-DH630/B CO

Direct handle for direct operation

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-DH630/B (CO)	Direct handle, black	004661580	LBS 160-630A CO	153	1/25
LBS-DH1600/B (CO)	Direct handle, black	004661581	LBS 800-1600A CO	238	1/15
LBS-DH3200/B (CO)	Direct handle, black	004661482	LBS 2000-3200A CO	295	1/20

Type definition: Handle type / color initials



LBS-EH630/G CO LBS-EH1600/G CO LBS-EH3200/BL

Door interlocked handle IP65 (shaft not included)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-EH630/G CO	Door interlocked handle, grey front	004661582	LBS 160-630A CO	250	1/20
LBS-EH1600/G CO	Door interlocked handle, grey front	004661583	LBS 800-1600A CO	340	1/10
LBS-EH3200/BL CO	Door interlocked handle, blue front	004661584	LBS 2000-3200A CO	1.500	1

Type definition: Handle type / color initials



LBS-S320/1600 (CO)

Shaft for door interlocked handle

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-S200/630 (CO).../400 FLBS	Shaft, 200mm, 10x10mm	004661490	LBS-EH630/G CO	160	1/25
LBS-S200/1600 (CO)	Shaft, 200mm, 15x12mm	004661491	LBS-EH1600/G CO	360	1/25
LBS-S200/3200 (CO)	Shaft, 200mm, 15x15mm	004661492	LBS-EH3200/BL CO	350	1/10
LBS-S320/630 (CO).../400 FLBS	Shaft, 320mm, 10x10mm	004661493	LBS-EH630/G CO	250	1/50
LBS-S320/1600 (CO)	Shaft, 320mm, 15x12mm	004661494	LBS-EH1600/G CO	490	1/25
LBS-S320/3200 (CO)	Shaft, 320mm, 15x15mm	004661495	LBS-EH3200/BL CO	376	1/15
LBS-S500/630 (CO).../400 FLBS	Shaft, 500mm, 10x10mm	004661496	LBS-EH630/G CO	390	1/20
LBS-S400/1600(CO)	Shaft, 400mm, 15x12mm	004661497	LBS-EH1600/G CO	580	1/20
LBS-S450/3200(CO)	Shaft, 450mm, 15x15mm	004661498	LBS-EH3200/BL CO	971	1/20

15x12mm: one side with 12x12mm, second side with 15x15mm



LBS-GC (CLBS-EH80, 125)

Guiding cone

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-GC (CLBS-EH125/01)	Guiding cone	004661489	LBS-EH630-3200	29	1/25

To guide the shaft extension into the external handle. This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm. Required for shaft lengths over 320 mm.



LBS-PS11 CO

Auxiliary contact

Type	I [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-PS11 CO	16	Auxiliary contact (CO)	004661585	LBS 160-1600A CO	25	1/30

Pre-break and signalling of positions 0 and I. Connection to the control circuit 6.35 mm fast-on terminal. Electrical characteristics 30 000 operations. One reference code includes 1 set of aux. contacts (one for position 1 + one for position 2), max 2 sets can be mounted in switch body. At LBS2000...3200 CO 2 sets of auxiliary contacts are included 2 pcs for position 1 and 2 pcs for position 2.

Technical data on page 516

Terminal shrouds (covers)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS160 3P (CO)	Terminal shroud	004661500	LBS 160 3P CO	79	1/20
LBS-TS250 3P (CO)	Terminal shroud	004661501	LBS 250-400A 3P CO	121	1/10
LBS-TS630 3P (CO)	Terminal shroud	004661502	LBS 630A 3P CO	242	1/5
LBS-TS4P/160 (CO)	Terminal shroud	004661506	LBS 160A 4P CO	100	1/15
LBS-TS4P/250 (CO)	Terminal shroud	004661507	LBS 250-400A 4P CO	157	1/8
LBS-TS4P/630 (CO)	Terminal shroud	004661508	LBS 630A 4P CO	311	1/4

Perforations allow remote thermographic inspection without the need to remove the shrouds.
The terminal shrouds also provide phase separation for LBS 160...630 CO.Terminal covers assure top and bottom protection against direct contact with terminals or connection parts. One reference includes 3 pcs (3pole)/ 4 pcs (4pole) for top or bottom contacts , to protect all, 2 references shall be ordered.


LBS-TS160 3P (CO)

Terminal screens

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS1250 3P CO	Terminal screen	004661586	LBS 800-1250A CO	257	1
LBS-TS1600 3P CO	Terminal screen	004661587	LBS 1600A CO	520	1
LBS-TS1250 4P CO	Terminal screen	004661588	LBS 800-1250A CO	328	1
LBS-TS1600 4P CO	Terminal screen	004661589	LBS 1660A CO	632	1

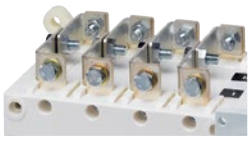
At LBS2000...3200A terminal screens are included
One reference includes 1pc for top or bottom contacts , to protect all, 2 references shall be ordered.

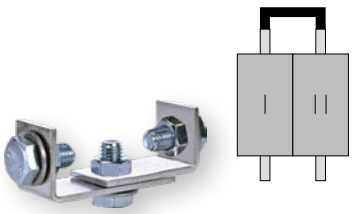

LBS-TS1250 3P CO

Bridging bars

Type	I_n [A]	Description	Code No.	For use with	Section [mm]	Weight [g]	Packaging [pcs]
LBS-BR160 1P CO	160A	Bridging bar	004661590	LBS 160 CO 3P/4P	20x2,5	187	1/50
LBS-BR250 1P CO	250A	Bridging bar	004661591	LBS 250 CO 3P/4P	25x25	173	1/25
LBS-BR400 1P CO	400A	Bridging bar	004661592	LBS 400 CO 3P/4P	32x5	296	1/25
LBS-BR630 1P CO	630A	Bridging bar	004661593	LBS 630 CO 3P/4P	50x5	644	1/25
LBS-BR1000 1P CO	800-1000A	Bridging bar	004661594	LBS 800-1000 CO 3P/4P	50x6	429	1
LBS-BR1250 1P CO	1250A	Bridging bar	004661595	LBS 1250 CO 3P/4P	60x8	730	1/5
LBS-BR1600 1P CO	1600A	Bridging bar	004661596	LBS 1600 CO 3P/4P	90x10	2.778	1

One reference code includes 1 pc of item, order for each pole separately

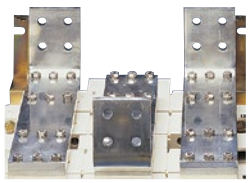

LBS-BR160 1P CO


LBS-BR250 1P CO

Bridging bars

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-BR2000-2500 CO (con. A)	Bridging bar part A	004661597	LBS 2000-2500 CO 3P/4P	863	1
LBS-BRB2000-3200 CO (bolt B)	Bolt set - part B	004661598	LBS 2000-3200 CO 3P/4P	332	1
LBS-BRC2000-3200 CO (T-pc C)	T piece - part C	004661599	LBS 2000-3200 CO 3P/4P	2.523	1
LBS-BRD2000-3200 CO (brack. D)	Right angle - part D	004661600	LBS 2000-3200 CO 3P/4P	943	1
LBS-BRE2000-2500 CO (bar E)	Bar - piece E	004661601	LBS 2000-2500A CO	3.500	1
LBS-BRE3200 CO (bar E)	Bar - piece E	004661602	LBS 3200A CO	3.500	1

One reference code includes 1 pc of item, for correct qty see technical data, page 518


LBS-BR1600 1P CO

Use
Enables:
- To allow connection between the two power terminals from a same pole for 2000 to 3200A ratings (Fig. 1 and Fig. 2 on page 518). ;
- Top or bottom bridging connection (Fig. 3 on page 518).

For 3200 A rating, the connection pieces (part A) are delivered bridged from factory. Bolt sets must be ordered separately.

Motorised Change Over Load Break Switch MLBS..CO (1-0-2)

Description
MLBS CO is motorised changeover switch with positive break indication in range 63 to 125A (4 pole) and 250 to 630A (3 pole). It enables the on load transfer of two three-phase supplies via remote volt-free contacts, from either an external automatic controller, using pulse logic, or a switch. It is intended for use in low voltage power systems where interruption of the load supply is acceptable during transfer. MLBS CO switches have been designed, qualified and tested according to the criteria defined by standard IEC 60947-3 and IEC 60947-6-1. It can be utilised with a direct front or external operation handle.

Advantages
MLBS CO uses stable position technology, ensuring constant pressure on the contacts and preventing premature faults. In addition, they do not require a power supply to maintain position, thus protecting their loads from voltage fluctuations. The control and motorisation section can be replaced simply by removing 4 screws, with no work required on the installation cabling.Their design and compact size, enables integration within most 200 mm deep enclosures. Maintenance can be carried out easily under load, with manual operation still available. The MLBS CO is available in two supply versions, each with a broad range (+/-30%):

- 230 VAC single power supply
- 12 VDC power supply

Applications

- Generator manufacturers
- Heating
- Air conditioning
- Ventilation
- Telecommunications

Motorised Change Over Load Break Switch MLBS..CO (1-0-2)



4p Motorised Change Over Load Break Switch MLBS..CO 63 A - 125 A

Type	Description	Code No.	I_n [A]	Weight [g]	Packaging [pcs]
MLBS 63 4P CO 12VDC	1-0-2 (12V DC)	004661650	63	3.240	1
MLBS 100 4P CO 12VDC	1-0-2 (12V DC)	004661651	100	3.250	1
MLBS 125 4P CO 12VDC	1-0-2 (12V DC)	004661652	125	3.250	1
MLBS 63 4P CO 230VAC	1-0-2 (230V AC)	004661653	63	3.340	1
MLBS 100 4P CO 230VAC	1-0-2 (230V AC)	004661654	100	3.350	1
MLBS 125 4P CO 230VAC	1-0-2 (230V AC)	004661655	125	3.350	1
MLBS 250 4P CO 230VAC	1-0-2 (230V AC)	004661919	250	9,720	1
MLBS 400 4P CO 230VAC	1-0-2 (230V AC)	004661920	400	10,200	1
MLBS 630 4P CO 230VAC	1-0-2 (230V AC)	004661921	630	17,980	1

3p Motorised Change Over Load Break Switch MLBS..CO 250 - 630 A

Type	Description	Code No.	I_n [A]	Weight [g]	Packaging [pcs]
MLBS 250 3P CO 230VAC	1-0-2 (230 VAC)	004661870	250	8,93	1
MLBS 400 3P CO 230VAC	1-0-2 (230 VAC)	004661871	400	9,16	1
MLBS 630 3P CO 230VAC	1-0-2 (230 VAC)	004661872	630	15,56	1

Technical data on page 519

Accessories for 4 pole MLBS..CO 63 - 630A

Bridging bars

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
MLBS-BR125 4P CO	Bridging bars	004661700	MLBS 63-125A 4P	160	1/100

For bridging power terminals on the top or bottom side of the switch, one reference code includes complete set of 4 pcs



MLBS-BR125 4P CO

Terminal shrouds for source side

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
MLBS-TSIN 4P CO	Terminal shrouds for source side	004661701	MLBS 63-125A 4P	120	1/50

IP2X protection against direct contact with terminals or connecting parts. Under one reference code 2 pcs are included for source or for load side



MLBS-TSIN 4P CO

Terminal shrouds for load side

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
MLBS-TSOUT 4P CO	Terminal shrouds for load side	004661702	MLBS 63-125A 4P	140	1/40

IP2X protection against direct contact with terminals or connecting parts. Under one reference code 2 pcs are included for source or for load side

Bridging bars

Type	I_n [A]	Description	Code No.	For use with	Section [mm]	Weight [g]	Packaging [pcs]
LBS-BR250 1P CO	250A	Bridging bar	004661591	MLBS 250 4P	25x25	173	1/25
LBS-BR400 1P CO	400A	Bridging bar	004661592	MLBS 400 4P	32x5	296	1/25
LBS-BR630 1P CO	630A	Bridging bar	004661593	MLBS 630 4P	50x5	644	1/25

One reference code includes 1 pc of item, order for each pole separately

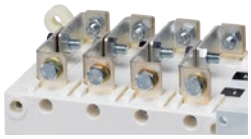


LBS-TS160 3P (CO)

Terminal shrouds (covers)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS4P/250 (CO)	Terminal shroud	004661507	MLBS 250-400 4P	157	1/8
LBS-TS4P/630 (CO)	Terminal shroud	004661508	MLBS 630 4P	311	1/4

Perforations allow remote thermographic inspection without the need to remove the shrouds.
The terminal shrouds also provide phase separation for LBS 160...630 CO.Terminal covers assure top and bottom protection against direct contact with terminals or connection parts. One reference includes 3 pcs (3pole)/ 4 pcs (4pole) for top or bottom contacts , to protect all, 2 references shall be ordered.



LBS-BR160 1P CO

Auxiliary contacts

Type	I_n [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
MLBS-PS11	16	Auxiliary contact CO	004661873	MLBS 250…630	120	1/100

*MLBS are already supplied with 1 NO aux contact for all three positions as standard.
** Pre-break and signalling of positions I and II: each reference provides 1 NO/NC auxiliary contact for positions I and II.



MLBS-PS11

Accessories for 3 pole MLBS..CO 250 - 630A

Terminal shrouds

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-TS250 3P (CO)	004661501	MLBS 250, 400 3P CO 230VAC	121	1/10
LBS-TS630 3P (CO)	004661502	MLBS 630 3P CO 230VAC	242	1/5

To fully shroud: front, rear, top and bottom, 4 pcs shall be ordered. To shroud front top and bottom, 2 pcs shall be ordered.



LBS-TS250 3P CO

Bridging bars

Type	I_n [A]	Description	Code No.	For use with	Section [mm]	Weight [g]	Packaging [pcs]
LBS-BR630 1P CO	630A	Bridging bar	004661593	MLBS 250...630	50x5	644	1/25

One reference code includes 1 pc of item, order for each pole separately



LBS-BR630 1P CO

Auxiliary contacts

Type	I_n [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
MLBS-PS11	16	Auxiliary contact CO	004661873	MLBS 250…630	120	1/100

*MLBS are already supplied with 1 NO aux contact for all three positions as standard.
** Pre-break and signalling of positions I and II: each reference provides 1 NO/NC auxiliary contact for positions I and II.



MLBS-PS11

Technical data on page 519

Fuse Load Break Switch FLBS

Description
FBLS is manually operated 3 pole fuse combination switch in range 125 to 630A. It makes and breaks on load and provides safety isolation and protection against overcurrent for any low voltage electrical circuit. FLBS have been designed, qualified and tested according to the criteria defined by standards: IEC(EN) 60947-3, IEC 60269-1, IEC 60269-2

Advantages
- Complete isolation of the fuse with double breaking per pole (top and bottom of fuse).
- Positive break indication.
- IP2X protection with terminal shrouds front panel.
- High breaking capacity. Protection against overloads and shortcircuits thanks to high breaking capacity fuses (100 kA rms).
- TEST position for testing control circuits without power using auxiliary contacts. In TEST position, the enclosure door can be opened.

Applications
- Motor load break.
- Protection of industrial cabinet.

Fuse Load Break Switch FLBS



FLBS 160 3P

FLBS body (no handle included) 3 POLES

Type	Code No.	I_n [A]	Number of poles	Fuse size	Weight [g]	Packaging [pcs]
FLBS 125 3P	004661800	125	3	NV/NH 00/00C	1.830	1
FLBS 160 3P	004661801	160	3	NV/NH 00/00C	1.830	1
FLBS 250 3P	004661802	250	3	NV/NH 1	3.660	1
FLBS 400 3P	004661803	400	3	NV/NH 2	6.250	1
FLBS 630 3P	004661804	630	3	NV/NH 3	16.760	1

In front direct or external front operation

Accessories



FLBS-DH400/B



FLBS-DH630-B



LBS-EH630/G ...400/G FLBS



FLBS-EH630/G

Direct handle for in front direct operation

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-DH400/B	Direct handle, black	004661824	FLBS 125-400A 3P	267	1/25
FLBS-DH630/B	Direct handle, black	004661825	FLBS 630A 3P	471	1

Type definition: Handle type / color initials

Door interlocked handle IP65 (shaft not included).

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-EH630/G...400/G FLBS	Door interlocked handle, grey front	004661483	FLBS 125 - 400A 3P	253	1/20
FLBS-EH630/G	Door interlocked handle, grey front	004661823	FLBS 630A 3P	280	1/15

Type definition: Handle type / color initials

Technical data on page 523

Shaft for door interlocked handle

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-S200/630 (CO)...400 FLBS	Shaft, 200mm, 10x10mm	004661490	FLBS 125 - 400A 3P	160	1/25
FLBS-S320/630 (CO)...400 FLBS	Shaft, 320mm, 10x10mm	004661493	FLBS 125 - 400A 3P	250	1/50
FLBS-S500/630 (CO)...400 FLBS	Shaft, 500mm, 10x10mm	004661496	FLBS 125 - 400A 3P	390	1/20
FLBS-S200/630	Shaft, 200mm, 12x12mm	004661820	FLBS 630A 3P	226	1/25
FLBS-S320/630	Shaft, 320mm, 12x12mm	004661821	FLBS 630A 3P	359	1/50
FLBS-S500/630	Shaft, 500mm, 12x12mm	004661822	FLBS 630A 3P	564	1/20

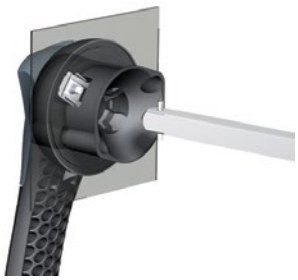


LBS-S320/630 (CO) .../400 FLBS

Guiding cone

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
LBS-GC (CLBS-EH125/01)	Guiding cone	004661489	FLBS-EH630	29	1/25

Guiding cone: To guide the shaft extension into the external handle. This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm, required for shaft lengths over 320 mm.



LBS-GC (CLBS-EH80, 125)

Shaft holder

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-SH/400	Shaft holder	004661831	shaft > 320mm	293	1

This support maintains shaft position for extension shafts greater than 320 mm in length.



FLBS-SH/400

Auxiliary contact

Type	I_n [A]	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-PS10	16	Auxiliary contact, NO	004661826	FLBS 125-630A	14	1/50
FLBS-PS01	16	Auxiliary contact, NC	004661827	FLBS 125-630A	14	1/50

Compact universal type auxiliary contacts which can be configured for operation in either, or both, ON and TEST positions.
FLBS (125-160A) max. 2 aux. contactcs, FLBS (250-630A) max. 4 aux. contacts can be mounted.
Pre-break and signalling of positions 0, I and TEST. Connection to the control circuit by terminals with max. section 2 x 2.5 mm^2.



FLBS-PS

Terminal shrouds (covers)

Type	Description	Code No.	For use with	Weight [g]	Packaging [pcs]
FLBS-TS160 3P	3 pole terminal shroud	004661828	FLBS 125-160A 3P	43	1
FLBS-TS250 3P	3 pole terminal shroud	004661829	FLBS 250 3P	240	1
FLBS-TS400 3P	3 pole terminal shroud	004661832	FLBS 400A 3P	240	1
FLBS-TS630 3P	3 pole terminal shroud	004661830	FLBS 630A 3P	570	1

Top or bottom IP20 protection (on the front) against direct contact with terminals or connection parts.
One reference includes 3 pcs (3pole) for top or bottom contacts , to protect all, 2 references shall be ordered.



FLBS-TS

Technical data on page 524, 526

Rotary Cam Switches

Rotary cam switches series CS are intended for multiple switching operations in main as well as in auxiliary circuits:

■ As motor switches they are designed for direct-online starting and stopping of single- phase and three-phase motors. They also come out as star-delta switches, reversing switches, pole-change over motor switches.

■ In auxiliary circuits they are assembled in compliance with the switching programme according to preference:

- switches for control, signalling and measuring circuits.
- switches, selector switches and step switches e.g. for transformers and welding apparatuses.
- Group switches e.g. for switching operations of resistors and heaters.
- Control switch with automatic return

Advantages

■ high making and breaking capacities
■ electrical and mechanical endurance
■ small dimensions.

Rotary cam switches comply with international and national standards such as: IEC/EN 60947-3, VDE 0660,TS EN 60947-3, BS 5419 etc.

Designation

CS XX(I_{th}[A]) YY(diagram) Z_(design)

ON-OFF switches with 60^0 switching angle

Thermal current
16 -100 A



1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 90 U	16A	004773001	0-1	75	
CS 25 90 U	25A	004773002		90	
CS 32 90 U	32A	004773003		115	
CS 40 90 U	40A	004773004		180	1
CS 63 90 U	63A	004773005		290	
CS 80 90 U	80A	004773006		405	
CS 100 90 U	100A	004773007		470	

Connection diagram in technical data



2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 91 U	16A	004773009	0-1	80	
CS 25 91 U	25A	004773010		90	
CS 32 91 U	32A	004773011		115	
CS 40 91 U	40A	004773012		180	1
CS 63 91 U	63A	004773013		290	
CS 80 91 U	80A	004773014		405	
CS 100 91 U	100A	004773015		470	

Connection diagram in technical data



3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 10 U	16A	004773017	0-1	95	
CS 25 10 U	25A	004773018		115	
CS 32 10 U	32A	004773019		160	
CS 40 10 U	40A	004773020		260	1
CS 63 10 U	63A	004773021		415	
CS 80 10 U	80A	004773022		590	
CS 100 10 U	100A	004773023		685	

Connection diagram in technical data

Technical data on page 528

4-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 92 U	16A	004773025	0-1	100	1
CS 25 92 U	25A	004773026		120	
CS 32 92 U	32A	004773027		175	
CS 40 92 U	40A	004773028		275	
CS 63 92 U	63A	004773029		435	
CS 80 92 U	80A	004773030		600	
CS 100 92 U	100A	004773031		690	



Connection diagram in technical data

Multistep Switches With 60° Switching Angle

Thermal current
16 -100 A

1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 107 U	16A	004773033	0-1-2	80	1
CS 25 107 U	25A	004773034		90	
CS 32 107 U	32A	004773035		115	
CS 40 107 U	40A	004773036		180	
CS 63 107 U	63A	004773037		290	
CS 80 107 U	80A	004773038		405	
CS 100 107 U	100A	004773039		470	



Connection diagram in technical data

2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 123 U	16A	004773041	0-1-2	120	1
CS 25 123 U	25A	004773042		150	
CS 32 123 U	32A	004773043		180	
CS 40 123 U	40A	004773044		270	
CS 63 123 U	63A	004773045		430	
CS 80 123 U	80A	004773046		590	
CS 100 123 U	100A	004773047		680	



Connection diagram in technical data

3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 135 U	16A	004773049	0-1-2	125	1
CS 25 135 U	25A	004773050		155	
CS 32 135 U	32A	004773051		220	
CS 40 135 U	40A	004773052		375	
CS 63 135 U	63A	004773053		500	
CS 80 135 U	80A	004773054		840	
CS 100 135 U	100A	004773055		845	



Connection diagram in technical data

Technical data on page 528

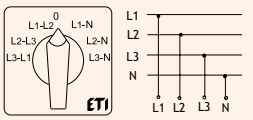
Voltmeter Switches

Thermal current
16 - 32 A



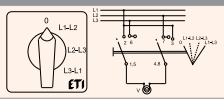


3 line and 3 phase

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 66 U	16A	004773089		140	1
CS 25 66 U	25A	004773090		160	
CS 32 66 U	32A	004773091		220	

Connection diagram in technical data

3 line

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 67 U	16A	004773093		120	1
CS 25 67 U	25A	004773094		150	

Connection diagram in technical data

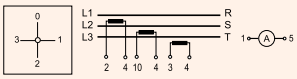
Ammeter Switches

Thermal current
16 - 40 A



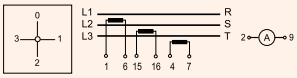


1 pole 3 current with transformer

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 98 U	16A	004773095		165	1
CS 25 98 U	25A	004773096		185	
CS 32 98 U	32A	004773097		260	
CS 40 98 U	40A	004773098		455	

Connection diagram in technical data

2 pole 3 current with transformer

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 97 U	16A	004773099		200	1
CS 25 97 U	25A	004773100		220	
CS 32 97 U	32A	004773101		295	
CS 40 97 U	40A	004773102		490	

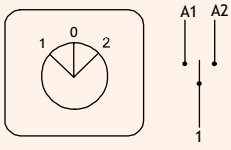
Connection diagram in technical data

Changeover Switches with 60° Switching Angle

Thermal current
16 - 100 A



1-pole

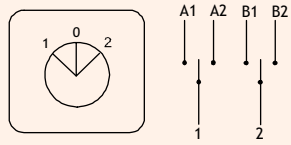
Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 51 U	16A	004773104	1-0-2 	80	1
CS 25 51 U	25A	004773105		105	
CS 32 51 U	32A	004773106		140	
CS 40 51 U	40A	004773107		205	
CS 63 51 U	63A	004773108		315	
CS 80 51 U	80A	004773109		430	
CS 100 51 U	100A	004773110		495	

Connection diagram in technical data

Technical data on page 528

2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 52 U	16A	004773112	1-0-2	100	
CS 25 52 U	25A	004773113		120	
CS 32 52 U	32A	004773114		180	
CS 40 52 U	40A	004773115		275	1
CS 63 52 U	63A	004773116		435	
CS 80 52 U	80A	004773117		600	
CS 100 52 U	100A	004773118		690	

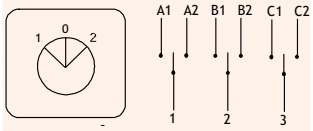




Connection diagram in technical data

3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 53 U	16A	004773120	1-0-2	140	
CS 25 53 U	25A	004773121		160	
CS 32 53 U	32A	004773122		220	
CS 40 53 U	40A	004773123		375	1
CS 63 53 U	63A	004773124		500	
CS 80 53 U	80A	004773125		840	
CS 100 53 U	100A	004773126		845	





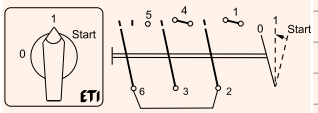
Connection diagram in technical data

Start and Run Switches - One Phase Motor

Thermal current
16 - 63 A

0-start-1

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 15 U	16A	004773127		95	
CS 25 15 U	25A	004773128		110	
CS 32 15 U	32A	004773129		160	1
CS 40 15 U	40A	004773130		260	
CS 63 15 U	63A	004773131		415	





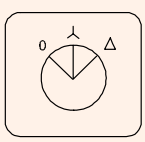
Connection diagram in technical data

Star - Delta Switches

Thermal current
16 - 100 A

0-star-delta

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 12 U	16A	004773132		175	
CS 25 12 U	25A	004773133		190	
CS 32 12 U	32A	004773134		300	
CS 40 12 U	40A	004773135		465	1
CS 63 12 U	63A	004773136		650	
CS 80 12 U	80A	004773137		1140	
CS 100 12 U	100A	004773138		1180	





Connection diagram in technical data

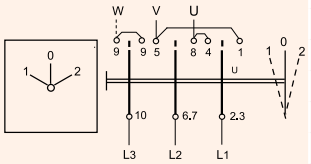
Technical data on page 528

Motor Reversing Switches

Thermal current
16 - 100 A



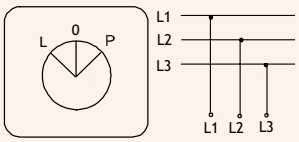
1-0-2

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 11 U	16A	004773139		140	1
CS 25 11 U	25A	004773140		160	
CS 32 11 U	32A	004773141		220	
CS 40 11 U	40A	004773142		375	
CS 63 11 U	63A	004773143		500	
CS 80 11 U	80A	004773144		840	
CS 100 11 U	100A	004773145		845	

Connection diagram in technical data



L-0-P

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 11 U L0P	16A	004773146		145	1
CS 25 11 U L0P	25A	004773147		165	
CS 32 11 U L0P	32A	004773148		225	
CS 40 11 U L0P	40A	004773149		380	
CS 63 11 U L0P	63A	004773150		505	
CS 80 11 U L0P	80A	004773151		845	
CS 100 11 U L0P	100A	004773152		850	

Connection diagram in technical data

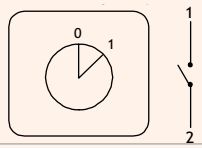
General Emergency ON-OFF switches version LK with padlocking in "0"

Thermal current
25 -100 A

- Emergency switch makes an electrical separation between electrical supply and electrical equipment
- Control handle is red according to standards, and the plate behind is yellow
- Emergency switch can be locked in open position "0" with up to three padlocks.



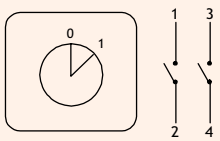
1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 90 U LK	25A	004773056	0-1 	130	1
CS 32 90 U LK	32A	004773057		155	
CS 40 90 U LK	40A	004773058		220	
CS 63 90 U LK	63A	004773059		340	
CS 80 90 U LK	80A	004773060		455	
CS 100 90 U LK	100A	004773061		520	

Connection diagram in technical data



2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 91 U LK	25A	004773062	0-1 	130	1
CS 32 91 U LK	32A	004773063		155	
CS 40 91 U LK	40A	004773064		220	
CS 63 91 U LK	63A	004773065		340	
CS 80 91 U LK	80A	004773066		455	
CS 100 91 U LK	100A	004773067		520	

Connection diagram in technical data

Technical data on page 529

3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 32 10 U LK	32A	004773069	0-1	200	1
CS 40 10 U LK	40A	004773070		300	
CS 63 10 U LK	63A	004773071		465	
CS 80 10 U LK	80A	004773072		640	
CS 100 10 U LK	100A	004773073		735	

Connection diagram in technical data



4-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 92 U LK	25A	004773074	0-1	160	1
CS 32 92 U LK	32A	004773075		205	
CS 40 92 U LK	40A	004773076		305	
CS 63 92 U LK	63A	004773077		470	
CS 80 92 U LK	80A	004773078		650	
CS 100 92 U LK	100A	004773079		740	

Connection diagram in technical data



General Emergency On-Off Switch

Thermal current
16 -100 A

3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 10 U ES	16A	004773081	0-1	95	1
CS 25 10 U ES	25A	004773082		115	
CS 32 10 U ES	32A	004773083		160	
CS 40 10 U ES	40A	004773084		260	
CS 63 10 U ES	63A	004773085		415	
CS 80 10 U ES	80A	004773086		590	
CS 100 10 U ES	100A	004773087		685	

Connection diagram in technical data



Rotary cam switches for DIN rail mounting

Thermal current
16 A

Rotary cam switches for DIN rail mounting

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 51 L	16	004773250	1-0-2	65	1
CS 16 90 L	16	004773251	0-1		





Technical data on page 528

Rotary Cam Switches in Insulated Enclosures

Rotary cam switches in insulated enclosures with:
- IP65 degree of protection (PN, PNG and PNG LK housing)
- IP55 degree of protection (PN1 and PN2 housing)
- IP54 degree of protection (PN3 and PN4 housing)

Color of enclosures is grey (RAL 7035)

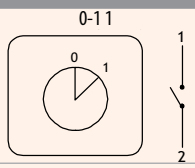
ON-OFF switches in housing with 60° switching angle

Thermal current
16 - 40 A



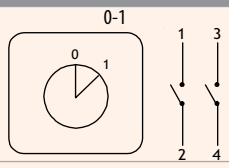


1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 90 PN	16A	004773154		175	1
CS 25 90 PN	25A	004773155		190	
CS 32 90 PNG	32A	004773156		305	
CS 40 90 PNG	40A	004773157		370	

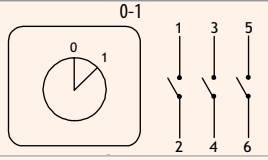
Connection diagram in technical data

2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 91 PN	16A	004773159		180	1
CS 25 91 PN	25A	004773160		190	
CS 32 91 PNG	32A	004773161		210	
CS 40 91 PNG	40A	004773162		370	

Connection diagram in technical data

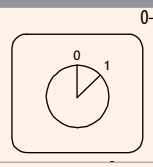
3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 10 PN	16A	004773164		195	1
CS 25 10 PN	25A	004773165		215	
CS 32 10 PNG	32A	004773166		350	
CS 40 10 PNG	40A	004773167		450	

Connection diagram in technical data

Technical data on page 533

4-pole

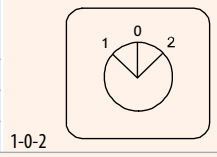
Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 92 PN	16A	004773169		200	1
CS 25 92 PN	25A	004773170		220	
CS 32 92 PNG	32A	004773171		355	
CS 40 92 PNG	40A	004773172		455	

Connection diagram in technical data

Changeover Switches in Housing with 60° Switching Angle

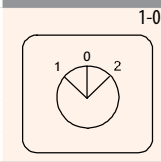
Thermal current
16 - 40 A

1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 51 PN	16A	004773186		185	1
CS 25 51 PN	25A	004773187		235	
CS 32 51 PNG	32A	004773188		330	
CS 40 51 PNG	40A	004773189		395	

Connection diagram in technical data

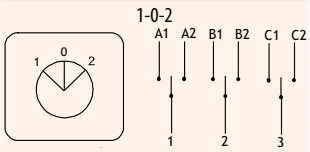
2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 52 PN	16A	004773191		200	1
CS 25 52 PN	25A	004773192		220	
CS 32 52 PNG	32A	004773193		375	
CS 40 52 PNG	40A	004773194		455	

Connection diagram in technical data



3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 53 PN	16A	004773196		240	1
CS 25 53 PN	25A	004773197		260	
CS 32 53 PNG	32A	004773198		400	
CS 40 53 PN2	40A	004773199		875	

Connection diagram in technical data

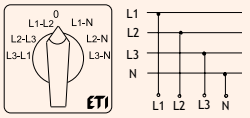
Technical data on page 533

Voltmeter Switches in Housing

Thermal current
16 - 32 A

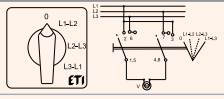


3 line and 3 phase

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 66 PN	16A	004773201		240	1
CS 25 66 PN	25A	004773202		260	
CS 32 66 PNG	32A	004773203		400	

Connection diagram in technical data

3 line

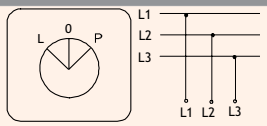
Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 67 PN	16A	004773205		220	1
CS 25 67 PN	25A	004773206		250	

Connection diagram in technical data

Motor Reversing Switches in Housing

Thermal current
16 - 100 A

L-0-P

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 11 U L0PPN	16A	004773207		245	1
CS 25 11 U L0PPN	25A	004773208		265	
CS 32 11 U L0PPNG	32A	004773209		405	
CS 40 11 U LP0PN2	40A	004773210		560	

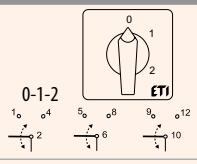
Connection diagram in technical data

Multistep Switches in Housing with 60⁰ Switching Angle

Thermal current
16 - 40 A



3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 135 PN	16A	004773212		225	1
CS 25 135 PN	25A	004773213		255	
CS 32 135 PNG	32A	004773214		400	
CS 40 135 PN2	40A	004773215		555	

Connection diagram in technical data

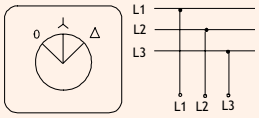
Technical data on page 533

Star - Delta Switches in Housing

Thermal current
16 - 40 A



0-star-delta

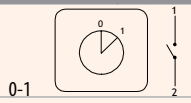
Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 16 12 PN1	16A	004773216		275	1
CS 25 12 PN1	25A	004773217		290	
CS 32 12 PN2	32A	004773218		480	
CS 40 12 PN2	40A	004773219		645	

Connection diagram in technical data

General Emergency ON-OFF switches version LK in housing

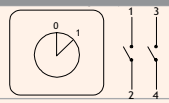
Thermal current
25 - 40 A

1-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 90 PNGLK	25A	004773173		230	1
CS 32 90 PNGLK	32A	004773174		345	
CS 40 90 PNGLK	40A	004773175		410	

Connection diagram in technical data

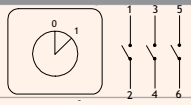
2-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 91 PNGLK	25A	004773176		230	1
CS 32 91 PNGLK	32A	004773177		345	
CS 40 91 PNGLK	40A	004773178		410	

Connection diagram in technical data

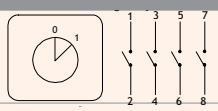


3-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 10 PNGLK	25A	004773179		255	1
CS 32 10 PNGLK	32A	004773180		390	
CS 40 10 PNGLK	40A	004773181		490	

Connection diagram in technical data

4-pole

Type	Thermal current I_{th}	Code No.	Type, layout and symbol	Weight [g]	Packaging [pcs]
CS 25 92 PNGLK	25A	004773182		260	1
CS 32 92 PNGLK	32A	004773183		395	
CS 40 92 PNGLK	40A	004773184		495	

Connection diagram in technical data

Technical data on page 533

Modular Rotary Cam Switches

Modular Rotary Cam Switches ModLBS

ModLBS IP40(front) switches for mounting in modular enclosures with DIN rail. Easy manipulation - low force switching, designed for AC23 category of use.



Modular rotary cam switch 0-1

Type	Code No.	In [A]	Number of poles	Weight [g]	Packaging [pcs]
ModLBS 16 1p	004664250	16	1	130	1/30
ModLBS 16 3p	004664251	16	3	141	



Modular emergency switch 0-1 with padlocking possibility

Type	Code No.	In [A]	Number of poles	Weight [g]	Packaging [pcs]
ModLBS 40 3p ES	004664252	40	3	173	1/36

Technical data on page 535, 537

Compact Load Break Switch CLBS

Characteristics according to IEC 60947-3

Type				CLBS 16	CLBS 25	CLBS 40	CLBS 63	CLBS 80	CLBS 100	CLBS 125
Current		(I_n)		16A	25A	40A	63A	80A	100A	125A
Rated insulation voltage		(U_i)	(V)	800	800	800	800	800	800	800
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	8	8	8	8	8
Thermal current 40°C		(I_{th})	(A)	16	25	40	63	80	100	125
Rated operational currents (I_e)	AC-20 A/B	415V AC	(A)	16	25	40	63	80	100	125
	AC-21 A/B	415V AC	(A)							
	AC-22 A/B	415V AC	(A)							
	AC-23 A/B	415V AC	(A)							
	AC-20 A/B	500V AC	(A)							
	AC-21 A/B	500V AC	(A)							
	AC-22 A/B	500V AC	(A)							
	AC-23 A/B	500V AC	(A)			25		63	80	100
	AC-20 A/B	690V AC	(A)			40		80	100	125
	AC-21 A/B	690V AC	(A)							
	AC-22 A/B	690V AC	(A)			32/40	40/63	63/80	80/100	100/125
	AC-23 A/B	690V AC	(A)			25	40	40	63	63
	DC-20 A/B	110V DC	(A)							
	DC-21 A/B[1]	110V DC	(A)							
	DC-20 A/B	250V DC	(A)			40	63	80	100	125
	DC-21 A/B[2]	250V DC	(A)							
	DC-20 A/B	400V DC	(A)							
	DC-21 A/B[3]	400V DC	(A)			25	40	40	63	63
Operational power in AC 23 [4]		400V AC	(kW)	7,5	11	18,5	30	37	45	55
		500V AC	(kW)	7,5	11	18,5	30	37	45	55
		690V AC	(kW)	7,5	15	15	30	37	45	55
Short-circuit capacity I_{cw}		1 s.	(kA)	1,26	1,26	1,26	1,5	1,5	2,75	2,75
		0,25 s.	(kA)	1,8	1,8	1,8	2,1	2,1	3,9	3,9
Fuse protected short-circuit withstand (kA rms prospective) [5]										
Associated fuse rating			(A)	16	25	40	63	80	100	125
Prospective short-circuit current			(kA)	50	50	50	50	50	25	25
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s										
Rated short-time withstand current		0,3 s.	(kA)	2,5	2,5	2,5	3	3	5	5
Connection										
Minimum Cu cable cross-section		mm^2		1,5	1,5	1,5	2,5	2,5	10	10
Maximum Cu cable cross-section		mm^2		16	16	16	35	35	70	70
Tightening torque min/max		Nm		2/2,2	2/2,2	2/2,2	3,5/3,85	3,5/3,85	4/4,4	4/4,4
Durability (number of operating cycles)		cycles		100 000	100 000	100 000	100 000	100 000	100 000	100 000
Operating effort - 3 pole device		Nm		1	1	1	1,4	1,4	1,6	1,6
Operating effort - 4 pole device		Nm		1,2	1,2	1,2	1,6	1,6	2	2
Power dissipation		W/pole		0,15	0,4	0,9	1,5	2,4	4,3	7,1

Category with index A = frequent operation
Category with index B = infrequent operation.
[1] - one pole per polarity.
[2] - 3-pole device with 2 poles in series for the "+" and 1 pole for the "-".
[3] - 4-pole device with 2 poles in series per polarity.
[4] - The power value is given for information only, the current values vary from one manufacturer to another.
[5] - For a rated operational voltage U_e = 415 VAC.

Technical data

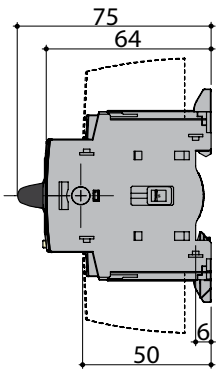
Type				CLBSCD 63 3P	CLBSCD 100 3P
Thermal current 40°C		(I_{th})	(A)	63	100
Rated insulation voltage		(U_i)	(V)	800	800
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8
Rated operational currents (I_e)	AC-21A/B	415V	(A)	63/63	100/100
	AC-22A/B	415V	(A)	63/63	100/100
	AC-23A/B	415V	(A)	63/63	100/100
	AC-21A/B	690V	(A)	63/63	100/100
Rated short-time withstand current I_{cw}		1 s.	(kA)	-	1,5
Rated short-circuit making capacity I_{cm}			(kA)	-	2,1
Rated conditional short-circuit					
Associated gG fuse rating			(A)	-	100
Prospective short-circuit			(kA)	-	25
Limited cut off current			(kA)	-	8,6

Dimensions

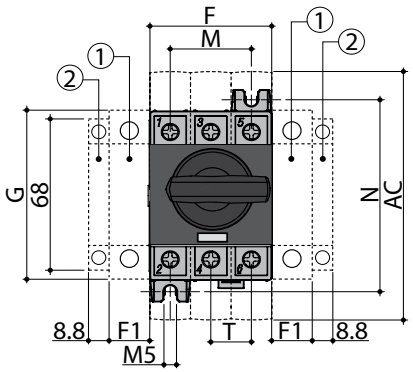
CLBS 16 - CLBS 80 3P, CLBSCD 63 3P, CLBSCD 100 3P - direct operation with handle

1. Location for: 1 switched fourth pole module (1 per device max.)
or 1 unswitched neutral pole
or 1 protective earth module
or 1 auxiliary contact.
2. Position for 1 auxiliary contact only.
Note: max 2 additional blocks.
More information about acceptable combinations of auxiliary switches and additional poles on the following page.

Side view



Front view

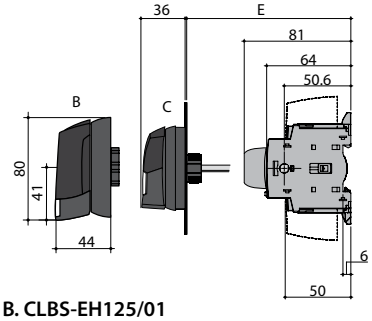


CLBS 16 - CLBS 80 3P, CLBSCD 63 3P, CLBSCD 100 3P

External front operation

1. Location for: 1 switched fourth pole module (1 per device max.)
or 1 unswitched neutral pole
or 1 protective earth module
or 1 auxiliary contact.
2. Position for 1 auxiliary contact only.
Note: max 2 additional blocks.
More information about acceptable combinations of auxiliary switches and additional poles on the following page.

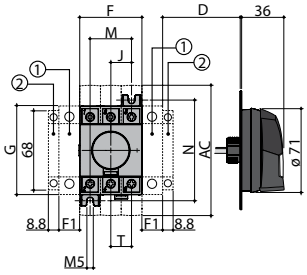
Side view



B. CLBS-EH125/01
C. CLBS-EH80

External side operation

Front view

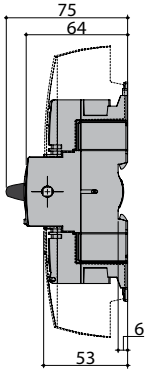


Rating	Overall dimensions, (mm)				Terminal shrouds, (mm)	Switch body, (mm)				Switch mounting, (mm)		Connection, (mm)
(A)	D min	D max	E min	E max	AC	F	F1	G	J	M	N	T
16-40	30	235	100	372	110	45	15	68	15	30	75	15
63-80	30	235	100	372	110	52.5	17.5	76	17.5	35	85	17.5

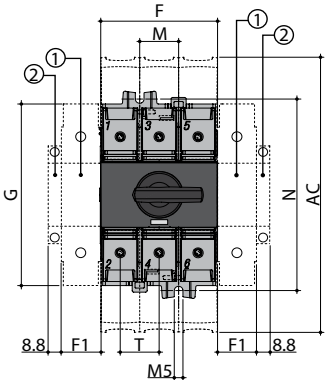
CLBS 100-CLBS 125 3P - direct operation with handle

1. Location for: 1 switched fourth pole module (1 per device max.)
or 1 unswitched neutral pole
or 1 protective earth module
or 1 auxiliary contact.
2. Position for 1 auxiliary contact only.
Note: max 2 additional blocks.
More information about acceptable combinations of auxiliary switches and additional poles on the following page.

Side view



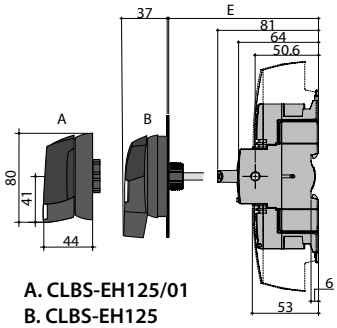
Front view



CLBS 100-CLBS 125

External front operation

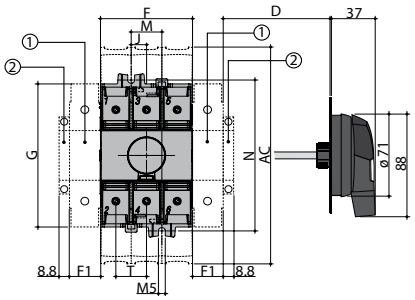
Side view



A. CLBS-EH125/01
B. CLBS-EH125

External side operation

Front view



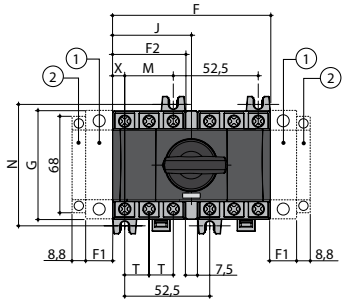
1. Location for: 1 switched fourth pole module (1 per device max.)
or 1 unswitched neutral pole
or 1 protective earth module
or 1 auxiliary contact.
2. Position for 1 auxiliary contact only.
Note: max 2 additional blocks.
More information about acceptable combinations of auxiliary switches and additional poles below.

Rating	Overall dimensions, (mm)				Terminal shrouds, (mm)	Switch body, (mm)				Switch mounting, (mm)		Connection, (mm)
(A)	D min	D max	E min	E max	AC	F	F1	G	J	M	N	T
100-125	30	201	100	372	189	78	26	124.6	13	26	131.4	26

Direct operation

CLBS 16 - CLBS 80 3P, CLBSCD 63 3P, CLBSCD 100 3P - with change over kit

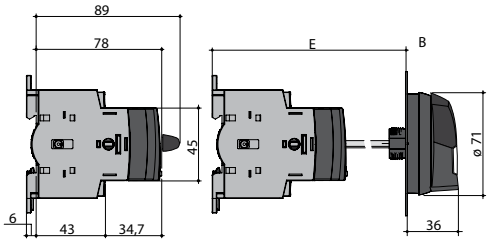
Side view



External front operation

CLBS 16 - CLBS 80 3P, CLBSCD 63 3P, CLBSCD 100 3P - with change over kit

Front view

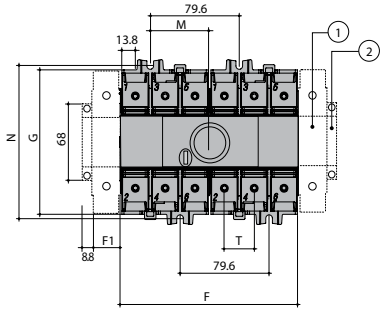


Rating	Overall dimensions, (mm)		Switch body, (mm)					Switch mounting, (mm)		Connection, (mm)	
(A)	E min	E max	F	F1	F2	G	J	M	N	T	X
16-40	105	372	97.5	15	45	68	48.75	30	75	15	7.5
63-80	105	372	105	17.5	52.5	76	52.5	35	85	17.5	8.75

Direct front operation

CLBS 100 - CLBS 125 -with change over kit

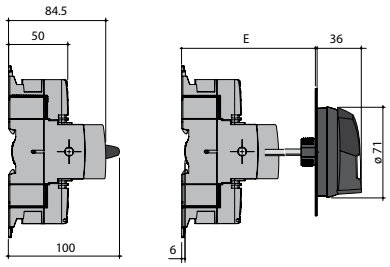
Side view



External front operation

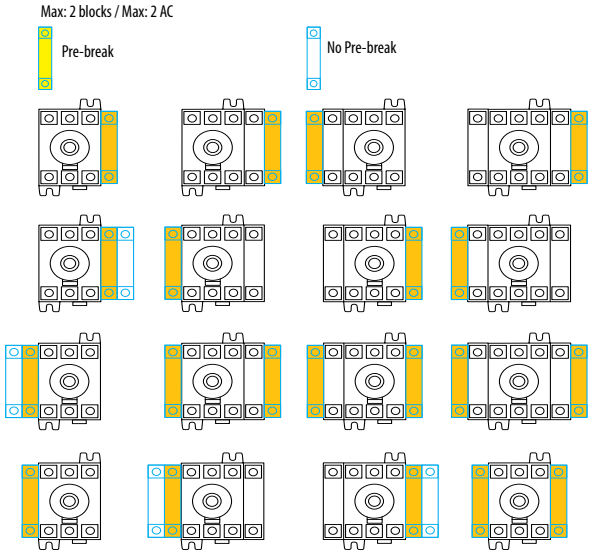
CLBS 100 - CLBS 125 -with change over kit

Front view



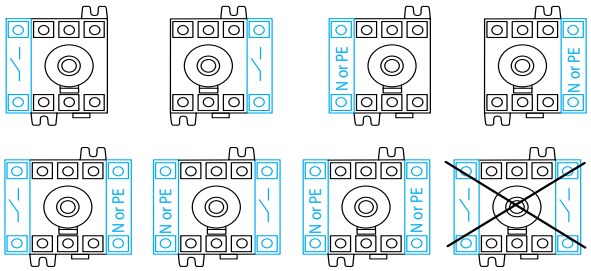
Rating	Overall dimensions, (mm)		Switch body, (mm)			Switch mounting, (mm)		Connection, (mm)
(A)	E min	E max	F	F1	G	M	N	T
100-125	105	372	159	26	124.5	52.8	131.5	26

Auxiliary contact configurations CLBS-PS11 (NO+NC)

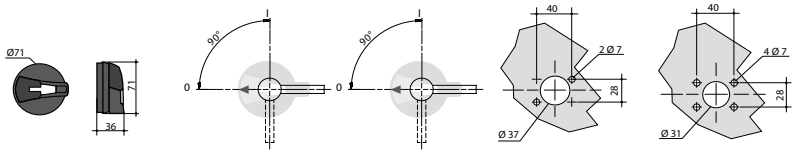


Contact type	Nominal current	Operating current I_e (A), 230V AC	
	(A)	AC-13	AC-15
NO+NC	10	10	6

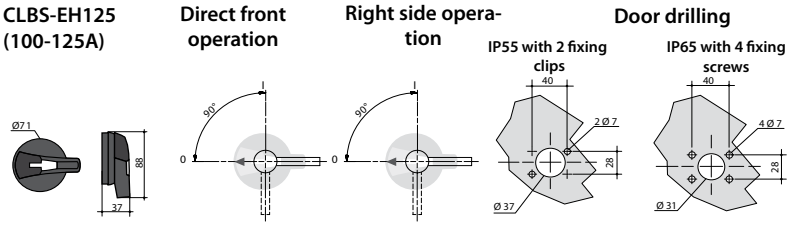
Configuration additional pole, solid neutral pole and protective earth pole



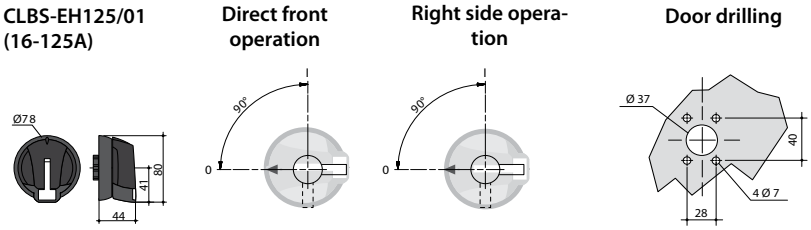
CLBS-EH80 (16-80A)



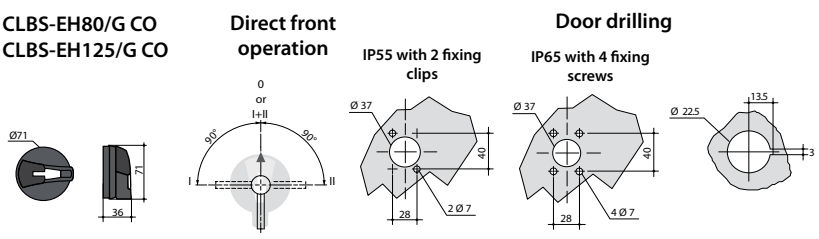
CLBS-EH125 (100-125A)



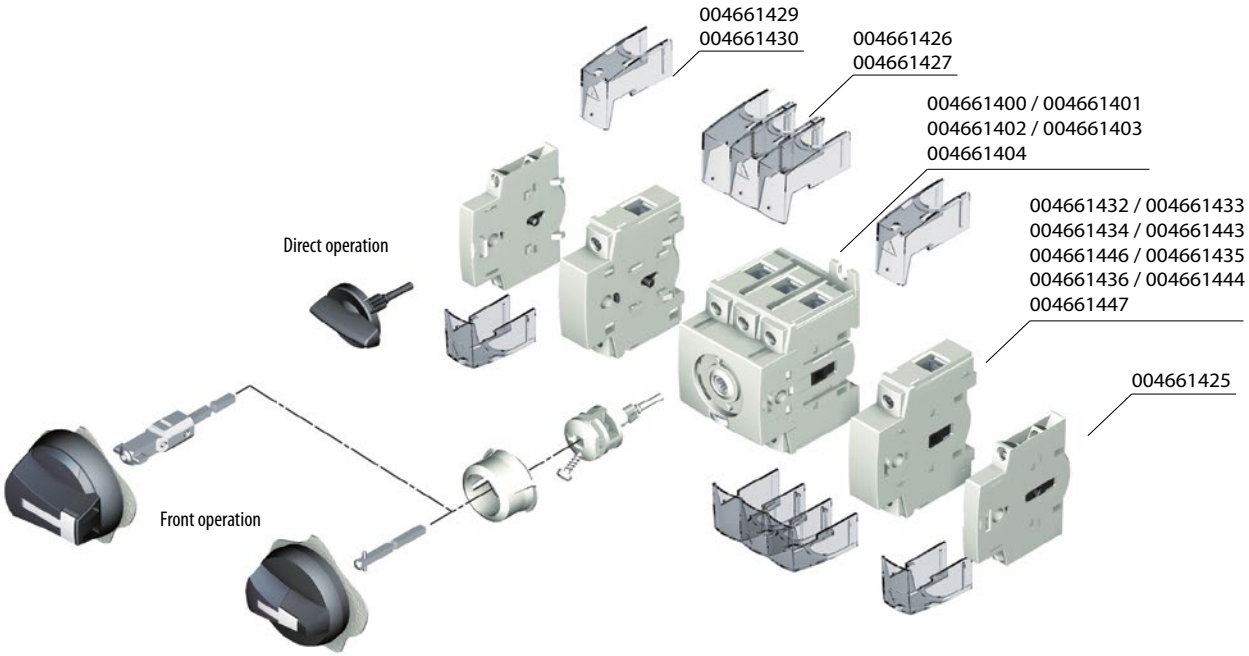
CLBS-EH125/01 (16-125A)



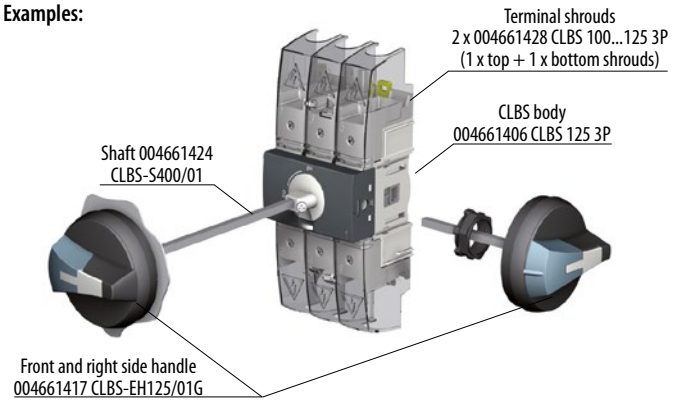
CLBS-EH80/G CO
CLBS-EH125/G CO

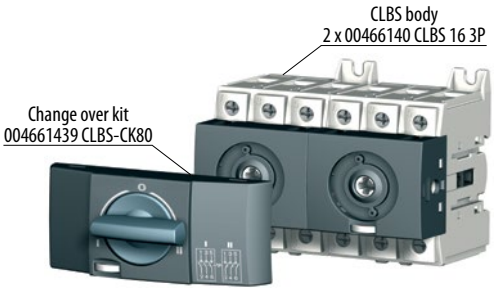


Installation of accessories

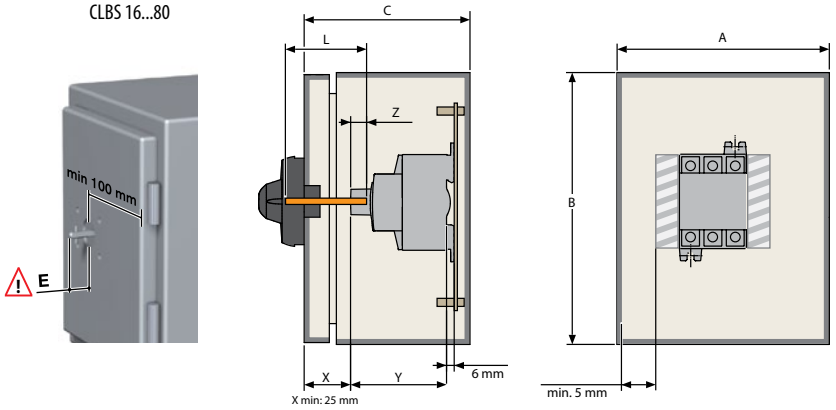


Examples:





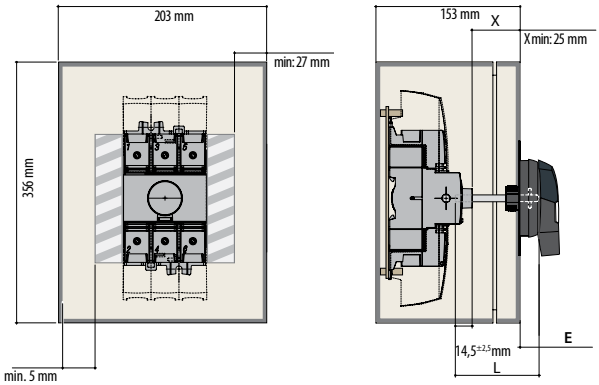
CLBS 16...80



	16A - 40A mm	60A - 80A mm
A	152	203
B	203	254
C	102	102
Y	75	75

	16-125A	E min.	E max.
CLB-EH80, CLBS-EH125	L=X+32 mm	13 mm	15mm
CLBS-EH125/01	L=X+38,5 mm	17,5 mm	21,5 mm

CLBS 100...125



Shafts and GT enclosures (ETIBOX) Z (depth of enclosure, mm)	X(mm)	Default shaft length used with handle(mm) CLB-EH80, CLBS-EH125	CBLS-EH125/01
150mm	49	200	400
200mm	99	200	400
250mm	149	200	400
300mm	199	320	400

CLBS and ETIBOX, DIDO-E COMPATIBILITY:
CLBS 0-1 up to 125A + CO (changeover kits CLBS-CK I-0-II, I-I+II-II): SOLID GT, GSX, HXS, DIDO ECH (IP65)
CLBS 0-1 up to 125A: DIDO ECT, ECM, ACT (IP40), ECG

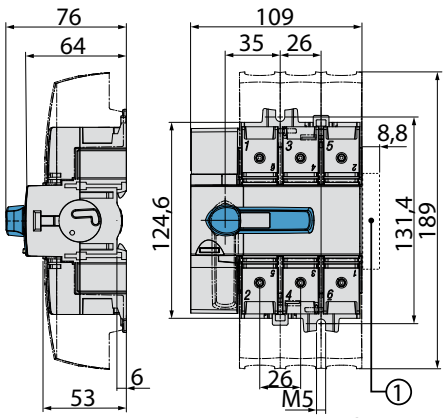
Compact Load Break Switch with Visible break - CLBSV (0-1)

Characteristics according to IEC 60947-3

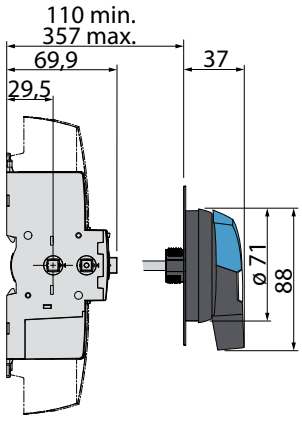
Type				CLBSV 100	CLBSV 125	CLBSV 160
Rated Current		(I_n)		100A	125A	160A
Rated insulation voltage		(U_i)	(V)	800	800	800
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	8
Thermal current 40°C		(I_{th})	(A)	100	125	160
Rated operational currents (I_e)	AC-20 A/B	415V AC	(A)	100	125	160
	AC-21 A/B	415V AC	(A)			160
	AC-22 A/B	415V AC	(A)			160
	AC-23 A/B	415V AC	(A)			125/160
	AC-20 A/B	500V AC	(A)			160
	AC-21 A/B	500V AC	(A)			160
	AC-22 A/B	500V AC	(A)			125/160
	AC-23 A/B	500V AC	(A)	80	100	100
	AC-20 A/B	690V AC	(A)	100	125	160
	AC-21 A/B	690V AC	(A)			
	AC-22 A/B	690V AC	(A)	63/80	80/100	100/125
	AC-23 A/B	690V AC	(A)	63	80	80
	DC-20 A/B	110V DC	(A)	100	125	160
	DC-21 A/B[1]	110V DC	(A)	100/100[1]	125/125[1]	160/160[1]
	DC-20 A/B	250V DC	(A)	100	125	160
	DC-21 A/B[2]	250V DC	(A)	100/100[2]	125/125[2]	160/160[2]
	DC-20 A/B	400V DC	(A)	100	125	160
	DC-21 A/B[3]	400V DC	(A)	100/100[3]	125/125[3]	160/160[3]
Operational power in AC 23 [4]		400V AC	(kW)	45	55	75
		500V AC	(kW)	45	55	75
		690V AC	(kW)	45	55	75
Short-circuit capacity I_{cw}		1 s.	(kA)		4	
		0,25 s.	(kA)		4	
Fuse protected short-circuit withstand (kA rms prospective) [5]						
Associated fuse rating			(A)	100	65	50
Prospective short-circuit current			(kA)	100	125	160
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s						
Rated short-time withstand current		0,3 s.	(kA)		7	
Connection						
Minimum Cu cable cross-section		mm^2		10	10	10
Maximum Cu cable cross-section		mm^2		70	70	70
Tightening torque min/max		Nm		4/4,4	4/4,4	4/4,4
Mechanical life		cycles		50 000	50 000	50 000
Operating effort - 3 pole device		Nm			4	
Operating effort - 4 pole device		Nm			4,2	

Category with index A = frequent operation
Category with index B = infrequent operation.
[1] - one pole per polarity.
[2] - 3-pole device with 2 poles in series for the "+" and 1 pole for the "-".
[3] - 4-pole device with 2 poles in series per polarity.
[4] - The power value is given for information only, the current values vary from one manufacturer to another.
[5] - For a rated operational voltage U_e = 415 VAC.

Direct control, frontal

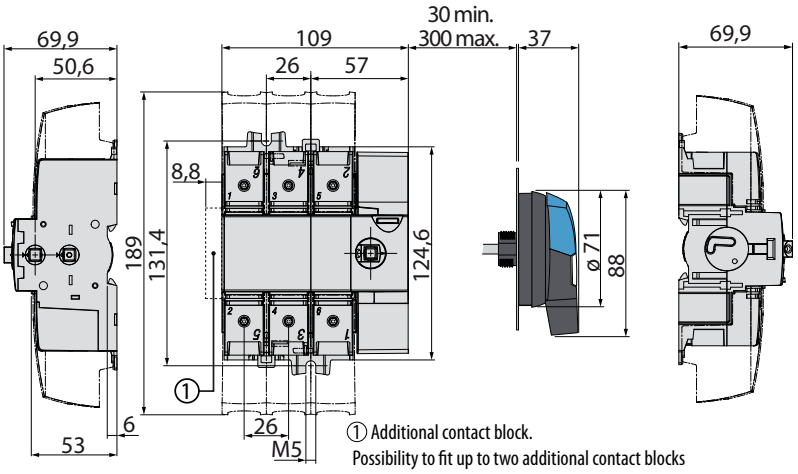


External control, frontal



① Additional contact block.
Possibility to fit up to two additional contact blocks

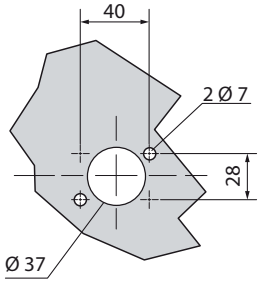
External control, lateral



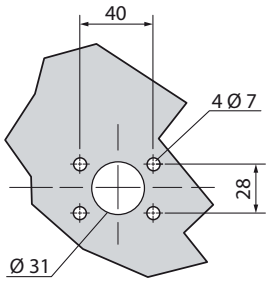
① Additional contact block.
Possibility to fit up to two additional contact blocks

Mounting hole

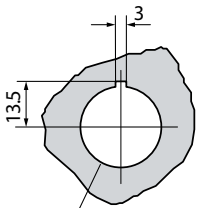
IP55 with two mounting clips



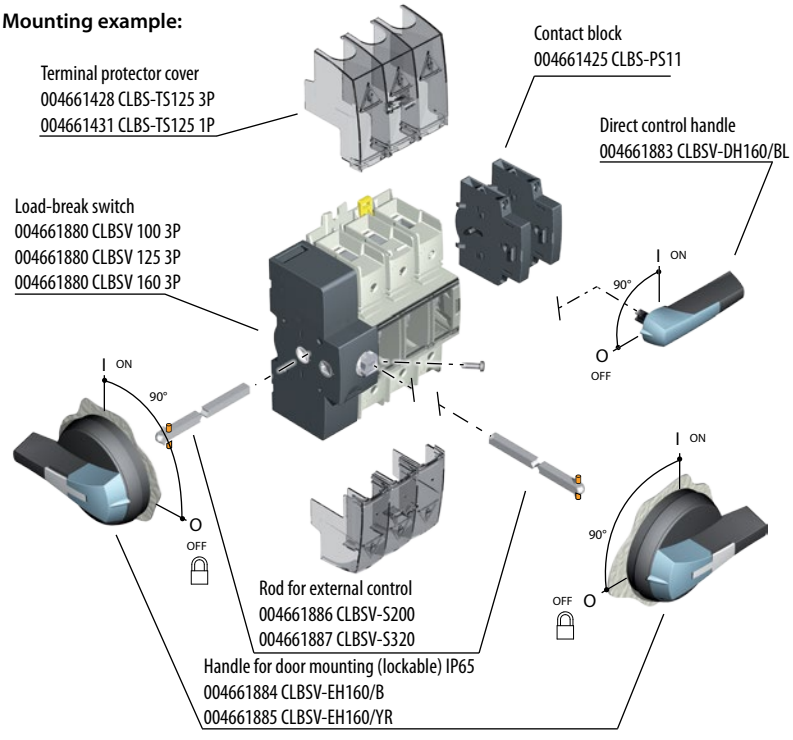
IP65 with 4 fixing screws



With fastening nut



Mounting example:



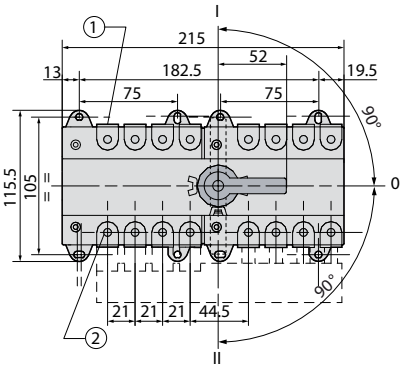
Compact Load Break Switch with Visible break CO - CLBSV..CO

Characteristics according to IEC 60947-3

Type				CLBSV 63 CO	CLBSV 100 CO	CLBSV 125 CO
Rated Current		(I_n)		63A	100A	125A
Rated insulation voltage		(U_i)	(V)	800	800	800
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	8
Thermal current 40°C		(I_{th})	(A)	63	100	125
Rated operational currents (I_e)	AC-20 A/B	415V AC	(A)	63	100	125
	AC-21 A/B	415V AC	(A)			
	AC-22 A/B	415V AC	(A)			
	AC-23 A/B	415V AC	(A)			
	AC-20 A/B	690V AC	(A)		100	125
	AC-21 A/B	690V AC	(A)			
	AC-22 A/B	690V AC	(A)	40/63	80/100	100/125
	AC-23 A/B	690V AC	(A)	40	63	63
Operational power in AC 23 [4]		400V AC	(kW)	30	45	55
		500V AC	(kW)	30	45	55
		690V AC	(kVAr)	30	45	55
Reactive power		400V AC	(kA)	1,5	2,75	2,75
Short-circuit capacity I_{cw}		1 s.	(kA)	1,5	2,75	2,75
		0,25 s.	(kA)	2,1	3,9	3,9
Fuse protected short-circuit withstand (kA rms prospective) [5]						
Associated fuse rating			(A)	63	100	125
Prospective short-circuit current			(kA)	50	25	25
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s						
Rated short-time withstand current		0,3 s.	(kA)	3	5	5
Connection						
Minimum Cu cable cross-section		mm^2		2,5	10	10
Maximum Cu cable cross-section		mm^2		35	70	70
Tightening torque min/max		Nm		3,5/3,85	4/4,4	4/4,4
Durability (number of operating cycles)		cycles		100 000	100 000	100 000
Operating effort - 3 pole device		Nm		1,4	1,6	1,6

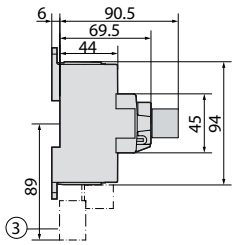
Category with index A = frequent operation
Category with index B = infrequent operation.
[1] - one pole per polarity.
[2] - 3-pole device with 2 poles in series for the "+" and 1 pole for the "-".
[3] - 4-pole device with 2 poles in series per polarity.
[4] - The power value is given for information only, the current values vary from one manufacturer to another.
[5] - For a rated operational voltage U_e = 415 VAC.

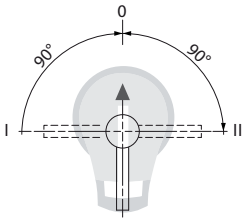
Direct control

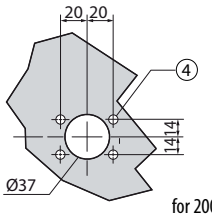


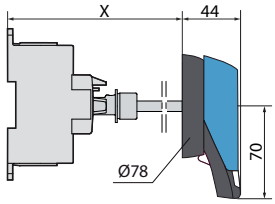
1. Max. connection
   - solid conductor: 50 mm²;
   - Stranded conductor: 35 mm²

External control





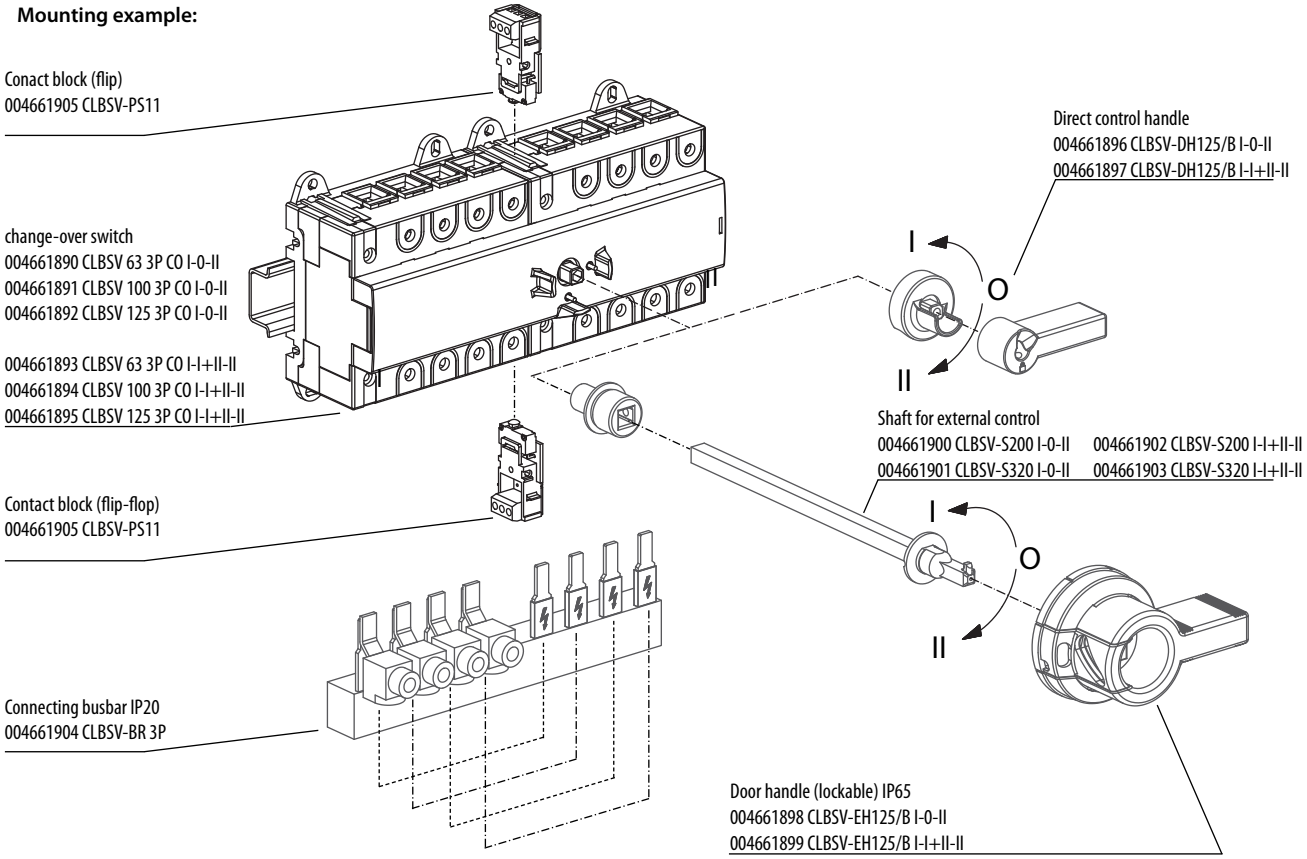




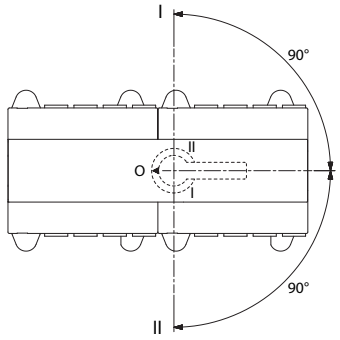
2. Hexagon socket No. 51 4.5 mm
3. Connecting busbar
4. Mounting with 2 or 4 7 mm screws

for 200mm stem - X = Min. 128mm, Max. 290mm
for 320mm rod - X = Min. 128mm, Max. 410mm

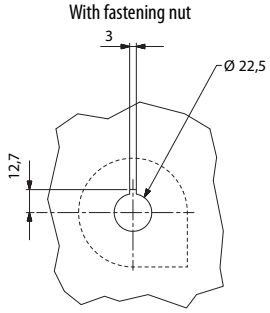
Mounting example:



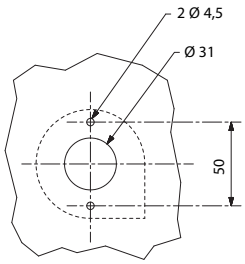
Mounting hole



With fastening nut



With fixing screws



Load Break Switch LBS

Characteristics according to IEC 60947-3

Type				LBS 160	LBS 250	LBS 400	LBS 630	LBS 800	LBS 1000	LBS 1250	LBS 1600	LBS 2000	LBS 2500	LBS 3200
Current		(I_n)	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
Rated insulation voltage		(U_i)	(V)	800	800	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	12	12	12	12	12	12	12	12	12
Thermal current 40°C		(I_{th})	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
Rated operational currents (I_e)	AC-20 A/B[1]	415V AC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	3200/3200
	AC-21 A/B[1]	415V AC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	3200/3200
	AC-22 A/B[1]	415V AC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	2500/3200
	AC-23 A/B[1]	415V AC	(A)	160/160	250/250	400/400	500/500	800/800	1000/1000	1250/1250	1250/1250	1600/1600	1600/1600	1600/1600
	DC-20 A/B[1]	220V DC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	3200/3200
	DC-21 A/B[1]	220V DC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1250/1600	2000/2000	2000/2500	2000/2500
	DC-22 A/B[1]	220V DC	(A)	160/160	250/250	400/400	500/500	800/800	1000/1000	1250/1250	1250/1250	1250/1600	1250/1600	1250/1600
	DC-23 A/B[1]	220V DC	(A)	125/125	200/200	400/400	500/500	800/800	1000/1000	1250/1250	1250/1250	1250/1250	1250/1250	1250/1250
	DC-20 A/B[1]	440V DC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	3200/3200
	DC-21 A/B[1]	440V DC	(A)	160[3]/160[3]	200[3]/200[3]	400[3]/400[3]	500[3]/500[3]	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1600[4]	2000[4]/2000[4]	2000[4]/2500[4]	2500[4]/3200[4]
	DC-22 A/B[1]	440V DC	(A)	125[3]/125[3]	200[3]/200[3]	400[3]/400[3]	500[3]/500[3]	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]
	DC-23 A/B[1]	440V DC	(A)	125[4]/125[4]	200[4]/200[4]	400[4]/400[4]	500/500	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]
	DC-20 A/B[1]	500V DC	(A)	160/160	250/250	400/400	630/630	800/800	1000/1000	1250/1250	1600/1600	2000/2000	2500/2500	3250/3250
	DC-21 A/B[1]	500V DC	(A)	125[3]/125[3]	200[3]/200[3]	400[3]/400[3]	500[3]/500[3]	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1600[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]
	DC-22 A/B[1]	500V DC	(A)	125[4]/125[4]	200[4]/200[4]	315[4]/400[4]	500[4]/500[4]	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]	1250[4]/1250[4]
	DC-23 A/B[1]	500V DC	(A)	125[4]/125[4]	200[4]/200[4]	315[4]/400[4]	500[4]/500[4]	800[4]/800[4]	1000[4]/1000[4]	1250[4]/1250[4]	1250[4]/1250[4]	1000[4]/1000[4]	1000[4]/1000[4]	1000[4]/1000[4]
Operational power in AC 23 [1] [5]		415V AC	(kW)	80/80	132/132	220/220	280/280	450/450	560/560	710/710	710/710	710/710	710/710	710/710
Reactive power[5]		400 V	(kVAr)	75	115	185	290	365	460	-	-	-	-	-
Short-circuit capacity I_{cw}		1 s.	(kA)	7	9	13	13	35	35	35	50	50	50	50
		0,25 s.	(kA)	11,9	15,3	26	26	73,5	73,5	73,5	75	80	80	80
Fuse protected short-circuit withstand (kA rms prospective)														
Associated fuse rating[6]			(A)	160	250	400	630	800	1000	1250	2x800	2x1000	2x1250	-
Prospective short-circuit current			(kA)	100	50	100	70	50	100	100	100	100	100	-
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s														
Rated short-time withstand current I_{cw}		0,3 s.	(kA)	15	17	25	25	50	65	65	100	100	100	100
Connection														
Minimum Cu cable cross-section		mm^2		50	95	185	2x150	2x185	2x240	-	-	-	-	-
Maximum Cu cable cross-section		mm^2		95	150	240	2x300	2x300	4x185	4x185	4x185	-	-	-
Minimum Cu busbar cross-section		mm		-	-	-	2x30x5	2x40x5	2x50x5	2x60x5	2x80x5	3x100x5	4x100x5	4x100x5
Maximum Cu busbar width		mm		25	32	40	50	63	63	63	100	100	100	100
Tightening torque min/max		Nm		9/-	20/-	20/-	20/-	40/45	40/45	40/45	40/45	40/45	40/-	40/-
Operating effort		Nm		6,5	10	14,5	14,5	37	37	37	56	75	75	75
Durability (number of operating cycles)		cycles		10 000	10 000	10 000	10 000	3 000	3 000	3 000	4 000	3 000	3 000	3 000
Power dissipation		W/pole		3	5,8	10,8	30,9	39,7	42	80	122	140	205	340

[1] Category with index A = frequent operation - Category with index B = infrequent operation.
[2] With terminal shrouds or phase barrier.
[3] 3-pole device with 2 pole in series for the «+» and 1 pole for the «-».
[4] 4-pole device with 2 poles in series per polarity.
[5] The power value is given for information only, the current values vary from one manufacturer to another.
[6] For a rated operational voltage Ue = 415 VAC.

Characteristics according to IEC 60947-3

Type				LBSCD 200	LBSCD 315	LBSCD 400
Current		(I_n)	(A)	200	315	400
Rated insulation voltage		(U_i)	(V)	800	800	800
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	8
Thermal current 40°C		(I_{th})	(A)	200	315	400
Rated operational currents (I_e)	AC-21 A/B[1]	400V AC	(A)	200/200	315/315	400/400
	AC-22 A/B[1]	400V AC	(A)	200/200	315/315	400/400
	AC-23 A/B[1]	400V AC	(A)	160/160	250/250	250/250
	AC-21 A/B[1]	500V AC	(A)	160/160	250/250	250/250
	AC-22 A/B[1]	500V AC	(A)	125/125	250/250	250/250
	AC-23 A/B[1]	500V AC	(A)	100/100	200/250	200/250
	AC-20 A/B[1]	690V AC	(A)	200/200	315/315	400/400
	AC-21 A/B[1]	690V AC	(A)	160/160	200/250	200/250
	AC-22 A/B[1]	690V AC	(A)	125/125	125/160	125/160
	AC-23 A/B[1]	690V AC	(A)	63/80	100/125	100/125
	DC-20 A/B[1]	220V DC	(A)	200/200	315/315	400/400
	DC-21 A/B[1]	220V DC	(A)	160/160	250/250	250/250
	DC-22 A/B[1]	220V DC	(A)	160/160	250/250	250/250
	DC-23 A/B[1]	220V DC	(A)	125/125	200/200	200/200
	DC-20 A/B[1]	400V DC	(A)	200/200	315/315	400/400
	DC-21 A/B[1]	400V DC	(A)	160/160	250/250	250/250
	DC-22 A/B[1]	400V DC	(A)	125[3]/125[3]	200[3]/200[3]	200[3]/200[3]
	DC-23 A/B[1]	400V DC	(A)	125[3]/125[3]	200[3]/200[3]	200[3]/200[3]
	DC-20 A/B[1]	500V DC	(A)	200/200	315/315	400/400
	DC-21 A/B[1]	500V DC	(A)	125[3]/125[3]	200[3]/200[3]	200[3]/200[3]
	DC-22 A/B[1]	500V DC	(A)	125[3]/125[3]	200[3]/200[3]	200[3]/200[3]
	DC-23 A/B[1]	500V DC	(A)	125[3]/125[3]	200[3]/200[3]	200[3]/200[3]
Operational power in AC 23 [1] [5]		400V AC	(kW)	80/80	132/132	132/132
		500V AC	(kW)	63/63	140/160	140/160
		690V AC	(kW)	55/75	150/185	150/185
Reactive power[5]		400V AC	(kVAr)	75	115	145
Fuse protected short-circuit withstand (kA rms prospective)						
Associated fuse rating[6]			(A)	200	315	400
Prospective short-circuit current			(kA)	50	30	18
Short-circuit operation						
Rated short-time withstand current I_{cw}		1 s	(kA)	7	9	9
Dynamic short-circuit withstand current			(kA)	18	23	23
Connection						
Minimum Cu cable cross-section		mm^2		50	95	185
Maximum Cu cable cross-section		mm^2		95	185	240
Minimum Cu busbar cross-section		mm		-	-	-
Maximum Cu busbar width		mm		25	32	32
Tightening torque min/max		Nm		9	20	20
Operating effort		Nm		6,5	10	14,5
Durability (number of operating cycles)		cycles		10 000	10 000	5 000

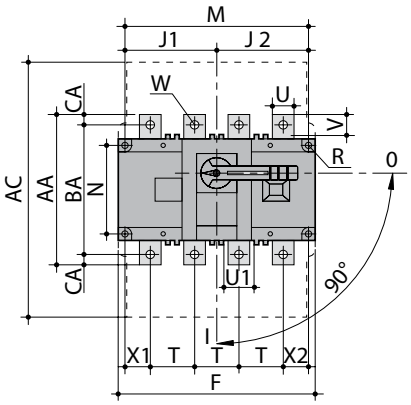
[1] Category with index A = frequent operation - Category with index B = infrequent operation.
[2] With terminal shrouds or phase barrier.
[3] 3-pole device with 2 pole in series for the «+» and 1 pole for the «-».
[4] 4-pole device with 2 poles in series per polarity.
[5] The power value is given for information only, the current values vary from one manufacturer to another.
[6] For a rated operational voltage Ue = 415 VAC.

Dimensions

LBS 160 - LBS 630
LBS CD

Direct front operation

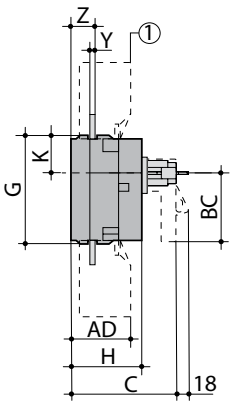
Front view

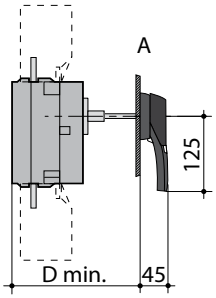


I. Terminal shrouds

External front operation

Side view





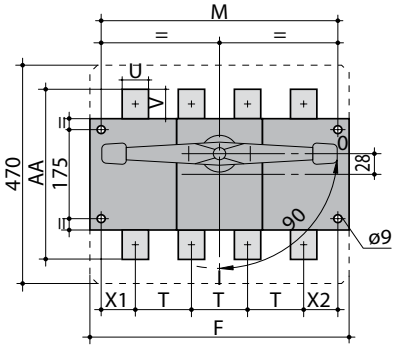
A.Handle type: LBS-EH630

Rating	Overall dimensions (mm)		Terminal shrouds, (mm)		Switch body, (mm)									Switch mounting, (mm)				Connection, (mm)													
(A)	C	D min	AC	AD	F (3p)	F (4p)	G	H	J1 (3p)	J1 (4p)	J2	K	BC	M (3p)	M (4p)	N	R	T	U	U1	V	W	X1 (3p)	X1 (4p)	X2	Y	Z	AA	BA	CA
160, CD 200			235	50	140	170	93	65	45	75	75	31.5	80	120	150	65	5.5	36	20	20.5	25	9	28	22	20	3.5	20.5	135	115	10
250, CD 315, CD 400	115	125	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	20	25.5	21.5	11	33	33	27	3.5	22.5	160	130	15
400	160	165	401	89	230	290	170	110	75	135	135	55	115	210	270	140	7	65	32	45.5	29	11	42.5	37.5	37.5	5	36	235	205	15
630																			45		41.5	13						260	220	20

LBS 800 - LBS 1600

Direct front operation

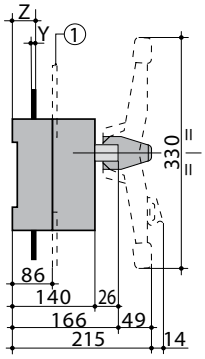
Front view

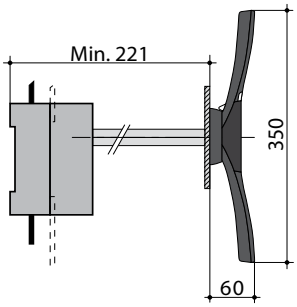


I. Terminal shrouds

External front operation

Side view





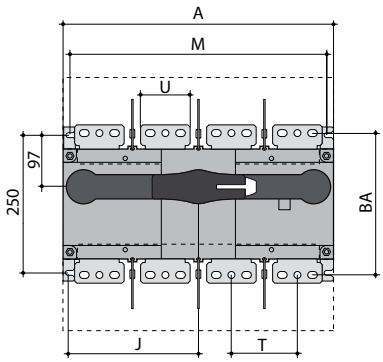
B. Handle type: LBS-EH1600

Rating	Switch body, (mm)		Switch mounting, (mm)		Connection, (mm)							
(A)	F (3p)	F (4p)	M (3p)	M (4p)	T	U	V	Y	X1	X2	Z	AA
800 - 1000	280	360	255	335	80	50	60.5	7	47.5	47.5	46.5	321
1250						60	65					330
1600	372	492	347	467	120	90	44	8	53.5	53.5	47.5	288

LBS 2000 - LBS 3200

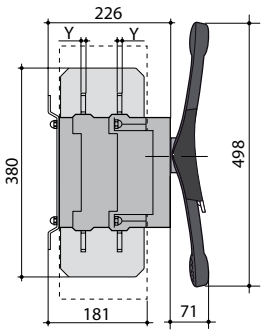
Direct front operation

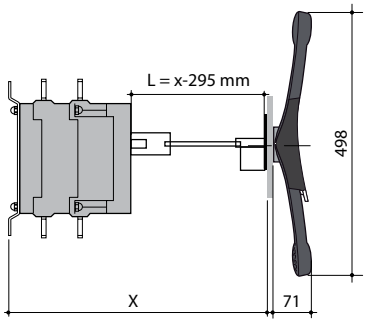
Front view



External front operation

Side view

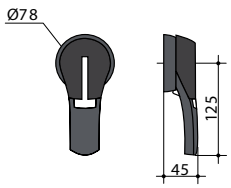




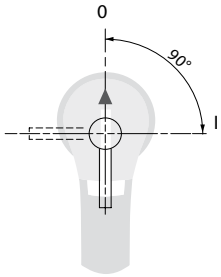
Handle type: LBS-EH3200

Rating	Overall dimensions, (mm)		Switch body, (mm)		Switch mounting, (mm)		Connection, (mm)			
(A)	A (3p)	A (4p)	J (3p)	J (4p)	M (3p)	M (4p)	T	U	Y	BA
2000-3200	372	492	173.5	233.5	347	367	120	90	8	258

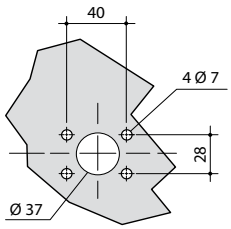
Handle type LBS-EH630



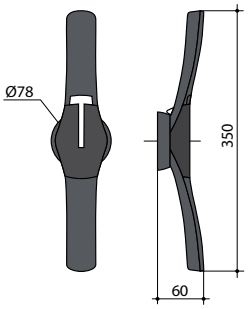
Direct front operation



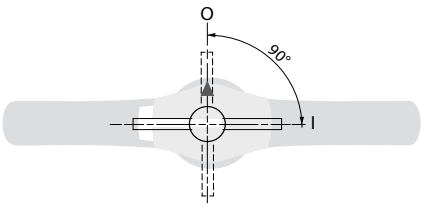
Door drilling



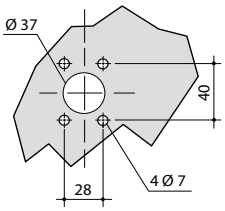
Handle type LBS-EH1600



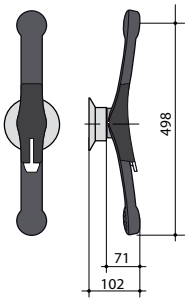
Direct front operation



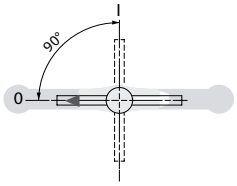
Door drilling



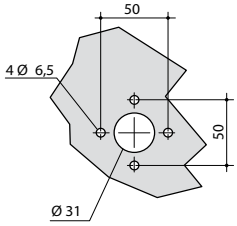
Handle type LBS-EH3200



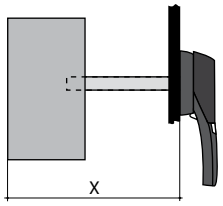
Direct front operation



Door drilling

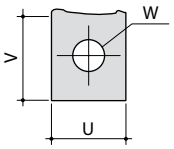


Rating (A)	Dimension X (mm)	Shaft length (mm)
LBS 160	125 - 250	200
	125 - 370	320
	125 - 550	500
LBS 250	135 - 265	200
	135 - 385	320
	135 - 565	500
LBS 400-630	165 - 295	200
	165 - 415	320
	165 - 595	500
LBS 800-1600	221 - 343	200
	221 - 463	320
	221 - 543	400
LBS 2000-3200	415 - 570	200
	415 - 690	320
	415 - 820	450



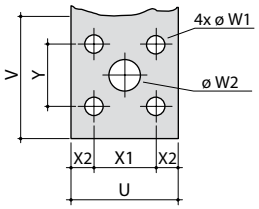
Rating (A)	U (mm)	V (mm)	W (mm)
160	20	25	9
250	25	21.5	11
400	32	29	11
630	45	41.5	13

Connection terminal dimensions:



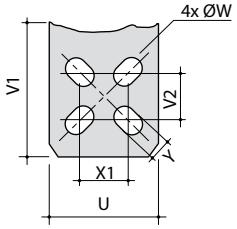
LBS-160-630

Rating (A)	U (mm)	V (mm)	W1 (mm)	W2 (mm)	X1 (mm)	X2 (mm)	Y (mm)
800 - 1000	50	60.5	9	16	28.5	11	33



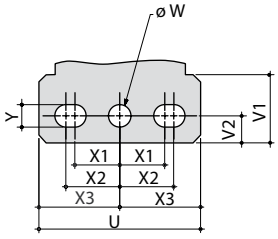
LBS-800-1000

Rating (A)	U (mm)	V1 (mm)	V2 (mm)	W (mm)	X1 (mm)	Y (mm)
1250	60	65	28.5	16	28.5	11



LBS-1250

Rating (A)	U (mm)	V1 (mm)	V2 (mm)	W (mm)	X1 (mm)	X2 (mm)	X3 (mm)	Y (mm)
1600-3200	90	35.8	15	12.5	25	30	45	12.5

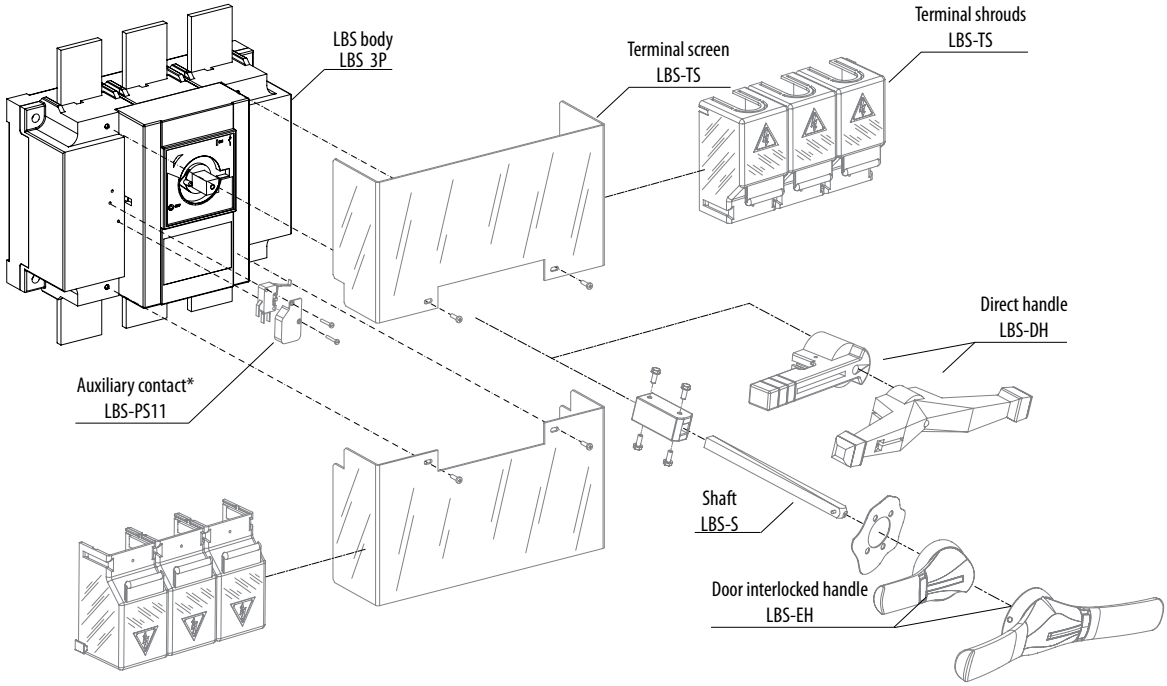


LBS-1600-3200

LBS-PS11 Auxiliary contact (change over NO/NC)

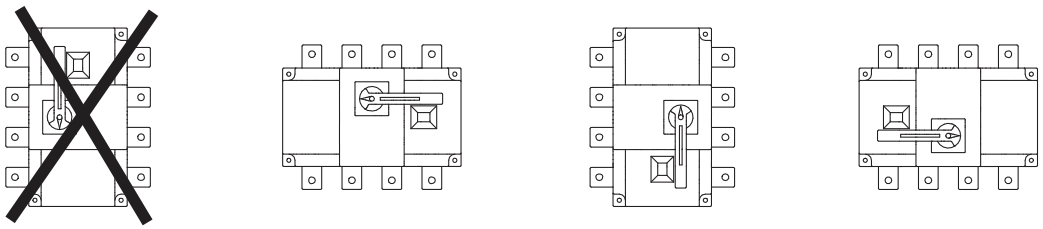
Rating (A)	Contact type	Current nominal (A)	Operating current I_e (A)									
			230 V AC		400 V AC		24 V DC			48 V DC		
			AC-12	AC-13/15	AC-12	AC-13/15	DC-12	DC-13	DC-14	DC-12	DC-13	DC-14
160-3200	CO	16	16	4	12	3	2,5	2,5	1	2,5	1,2	0,2

Installation of accessories



*Only one auxiliary contact can be mounted to each switch body

LBS 160…3200 mounting positions:



Connection

Current (A)	Piece	Quantity to order per pole (1)	Code No.
3200	Bridging bar part A		included
3200	Bolt set - part B	2	004661598
3200	Bar - piece E	1	004661602
3200	T piece - part C	1	004661599

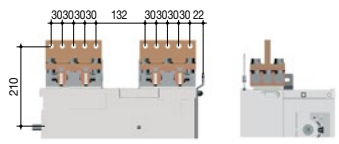
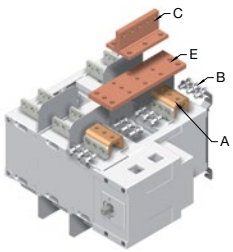


Fig. 2



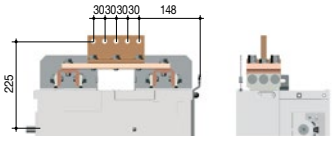


Fig. 3

Load Break Change Over Switch LBS..CO

Characteristics according to IEC 60947-3, IEC 60947-6-1:

Type				LBS 160	LBS 250	LBS 400	LBS 630	LBS 800	LBS 1000	LBS 1250	LBS 1600	LBS 2000	LBS 2500	LBS 3200
Current		(I_n)		160A	250A	400A	630A	800A	1000A	1250A	1600A	2000A	2500A	3200A
Rated insulation voltage		(U_i)	(V)	800	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage		(U_{imp})	(kV)	8	12	12	12	12	12	12	12	12	12	12
Thermal current 40°C		(I_{th})	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
Rated operational currents (I_e) IEC 60947-3	AC-20 A/B	415V AC	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
	AC-21 A/B	415V AC	(A)											
	AC-22 A/B	415V AC	(A)											
	AC-23 A/B	415V AC	(A)		200						1250	1600	1600	1600
	AC-20 A/B	500V AC	(A)		250						1600	2000	2500	3200
	AC-21 A/B	500V AC	(A)											
	AC-22 A/B	500V AC	(A)		200/250	200/400	500	630	800	1000		-	-	-
	AC-23 A/B	500V AC	(A)	80	200	200	400	400	630	800	1000	-	-	-
	AC-20 A/B	690V AC	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
	AC-21 A/B	690V AC	(A)		200	200	500							
	AC-22 A/B	690V AC	(A)	125	160	160	400	630	800	1000	1000	-	-	-
	AC-23 A/B	690V AC	(A)	63/80	125	125		400	630	800	800	-	-	-
	DC-20 A/B[1]	220V DC	(A)	160	250	400	630	800	1000	1250	1600	-	-	-
	DC-21 A/B[1]	220V DC	(A)			250					1250	-	-	-
	DC-22 A/B[1]	220V DC	(A)									-	-	-
	DC-23 A/B[1]	220V DC	(A)	125	200	200						-	-	-
	DC-20 A/B[1]	440V DC	(A)	160	250	400					1600	-	-	-
	DC-21 A/B[1]	440V DC	(A)	125	200	200					1250	-	-	-
	DC-22 A/B[1]	440V DC	(A)									-	-	-
	DC-23 A/B[1]	440V DC	(A)				500					-	-	-
Rated operational currents (I_e) IEC 60947-6-1	AC-31 A/B	415V AC	(A)	160	250	400	630	800	1000	1250	1600	2000	2500	3200
	AC-32 A/B	415V AC	(A)		200	400	500	800	1000	1250	1600	2000	2000	2000
	AC-33 A/B	415V AC	(A)		200	200	400	800	800	800	1000	1250	1250	1250
Short-circuit capacity I_{cw}, 690 V AC		1 s.[4]	(kA)	7	8	8	10	26	35	35	50	50	50	50
		0,25 s.	(kA)	11,9	22	22	17	48	73,5	73,5	110	110	110	110
I_{cw}, 415 V AC according to IEC 60947-6-1		0,06 s.[5]	(kA)		10	10	12,6	16	20	25	32	40	50	50
Operational power in AC 23[2]		(400V)	(kW)	80	132	280	450	450	560	710	710	710	-	-
		(690V)	(kW)	55/75	90/110	150/185	185/220	185/220	475	475	750	750	-	-
Reactive power		400 V	(kVAr)	75	115	185	290	365	460	575	-	-	-	-
Fuse protected short-circuit withstand (kA rms prospective), 690 V AC														
Associated fuse rating			(A)	160	250	400	630	800	1000	1250	2x800	-	-	-
Prospective short-circuit current			(kA)	100	50	50	50	50	100	100	100	100	100	-
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s [3]														
Rated short-time withstand current I_{cw}		0,3 s.	(kA)	12	15	15	17	47	64	64	78	78	78	78
Connection														
Minimum Cu cable cross-section		mm^2		50	95	185	2x150	2x185	2x240	-	-	-	-	-
Maximum Cu cable cross-section		mm^2		95	150	240	2x300	2x300	4x185	4x185	4x185	-	-	-
Minimum Cu busbar cross-section		mm		-	-	-	2x30x5	2x40x5	2x50x5	2x60x5	2x80x5	2x100x10	2x100x10	4x100x10
Maximum Cu busbar width (Cu)		mm		25	32	32	50	63	63	63	100	100	100	100
Tightening torque min/max		Nm		9/13	20/26	20/26	20/26	20/26	20/26	20/26	40/45	40/45	40/45	40/45
Durability (number of operating cycles)		cycles		10 000	8 000	5 000	5 000	4 000	4 000	4 000	3 000	3 000	3 000	3 000
Power dissipation		W/pole		3,2	6	15,5	35	40	52,2	80	95	-	-	-

Category with index A = frequent operation

Category with index B = infrequent operation.

[1] 3-pole device with 2 poles in series for the „+" and 1 pole for the „-", 4-pole device with 2 poles in series per polarity.

[2] The power value is given for information only, the current values vary from one manufacturer to another.

[3] Value for coordination with any circuit breaker that ensures tripping in less than 0.3s.

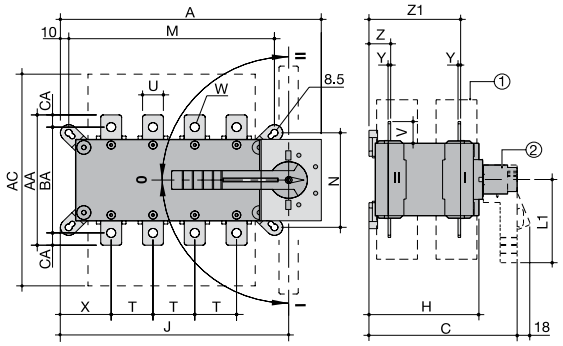
[4] Data at 415 VAC

[5] Data at 30 ms

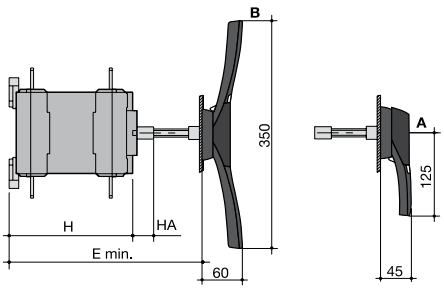
Dimensions

LBS 160 CO - LBS 1600 CO 3/4 p

Direct front operation
Front view



External front operation
Side view



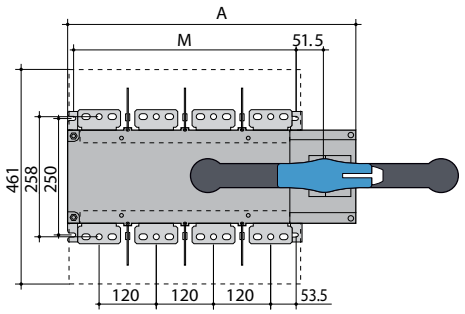
A. Handle type LBS-EH630 CO for external operation: 160 to 630 A
B. Handle type LBS-EH1600 CO for external operation: 800 to 1600 A

I. Terminal shrouds
II. Direct handle operation:
- L1 = 140 mm: 160 to 630 A;
- L1 = 210 mm: 800 to 1600 A;

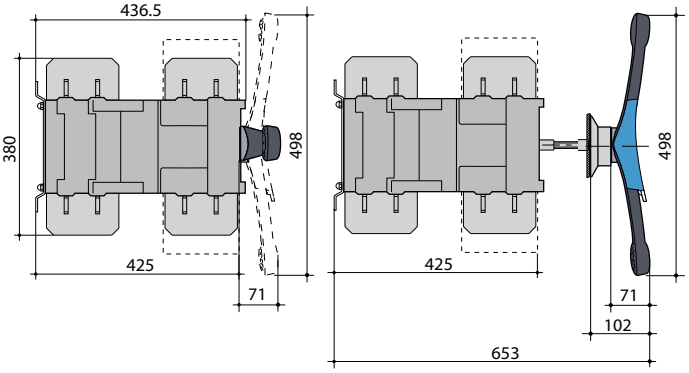
Rating	Overall dimensions, (mm)				Terminal shrouds, (mm)	Switch body, (mm)				Switch mounting, (mm)			Connection, (mm)									
(A)	A (3p)	A (4p)	C	E min	AC	H	HA	J (3p)	J (4p)	M (3p)	M (4p)	N	T	U	V	W	X (3p)	X (4p)	Y	Z	Z1	AA	BA	CA
160	221	251	218	208 - 436	235	148	25	182	212	156	186	101	36	20	25	8.5	56	50	3.5	28	124	135	115	10
250	262	312	218	208 - 436	280	148	25	223	273	196	246	116	50	25	30	11	61	61	3.5	30	124	160	130	15
400	262	312	218	208 - 436	280	148	25	223	273	196	246	116	50	35	35	11	61	61	3.5	30	124	170	140	15
630	319	379	295	285 - 513	400	225	25	272	332	246	306	176	65	45	50	13	70.5	65.5	5	43	180	260	220	20
800	386	466	375	425 - 577	459	298	29	306.5	386.5	255	336	250	80	50	60.5	15	48	48	7	66.5	253.5	321		26.5
1000	386	466	375	425 - 577	459	298	29	306.5	386.5	255	336	250	80	50	60.5	15	48	48	7	66.5	253.5	321		26.5
1250	386	466	375	425 - 577	459	298	29	306.5	386.5	255	336	250	80	60	65	16x11	48	48	7	66.5	255.5	330		29.5
1600	478	598	375	425 - 577	461	298	29	388.5	518.5	347	467	250	120	90	43.5	12.5x5	54	54	8	66.5	255.5	288		15

LBS 2000 CO - LBS 3200 CO 3/4 P

Direct front operation
Front view



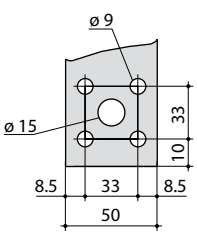
Side view



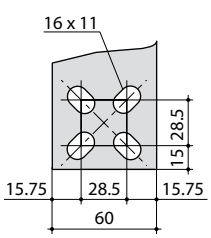
Rating (A)	A (mm) (3p)	A (mm) (4p)	M (mm) (3p)	M (mm) (4p)
2000-3200	478	598	347	467

Connection terminals

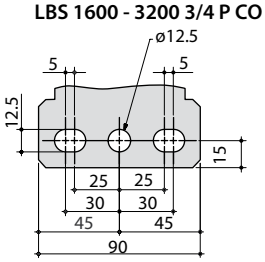
LBS 800 3/4 P CO



LBS 1250 3/4 P CO

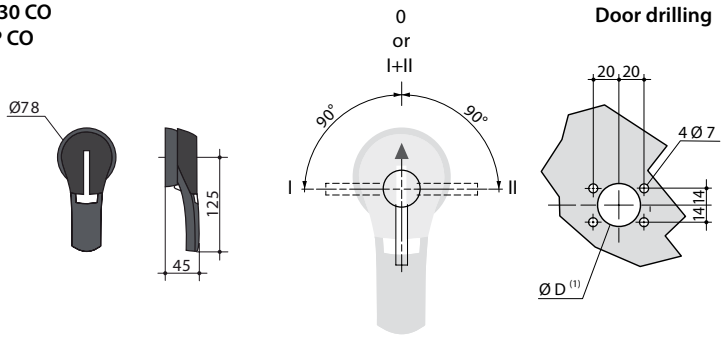


LBS 1600 - 3200 3/4 P CO



Handle type LBS-EH630 CO
for LBS 160 - 630 3/4P CO

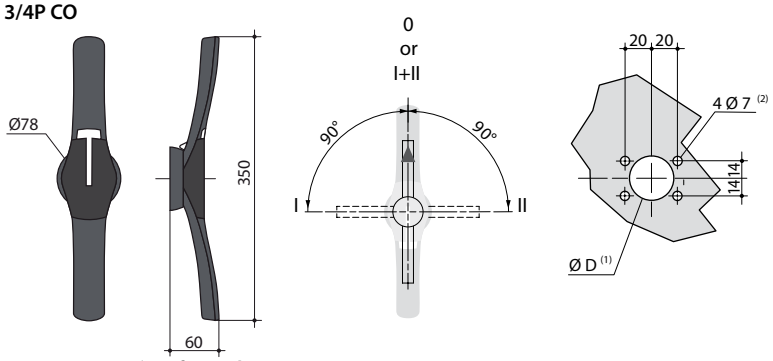
Direct front operation



(1) Ø31 to Ø37: rear screw mounting Ø37: front clip mounting

Handle type LBS-EH1600 CO
for LBS 800 - 1600 3/4P CO

Direct front operation

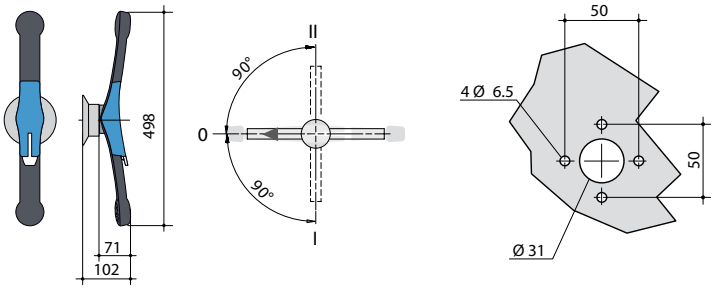


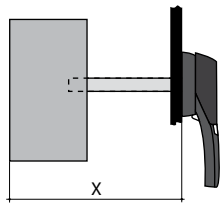
(1) Ø31 to Ø37: rear screw mounting Ø37: front clip mounting
(2) Ø6 to Ø7: clip mounting

Handle type LBS-EH3200 CO
for LBS 2000 - 3200 3/4P CO

Direct front operation

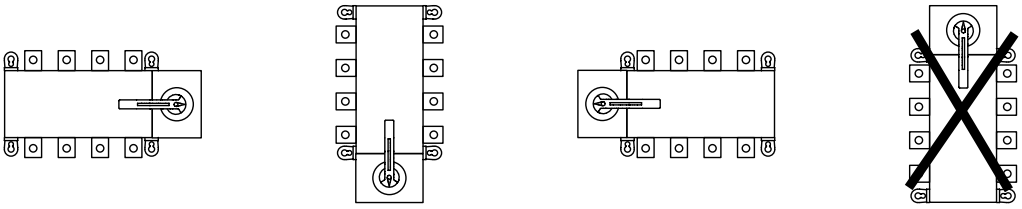
Door drilling



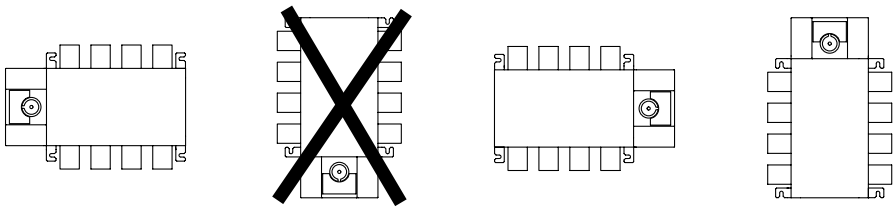


Rating (A)	Dimension X (mm)	Length (mm)
160 - 400	210 - 310	200
	210 - 430	320
500 - 630	280 - 390	200
	280 - 510	320
800 - 1800	425 - 577	200
	425 - 697	320
2000 - 3200	653 - 803	320
	653 - 923	320
	653 - 1053	450

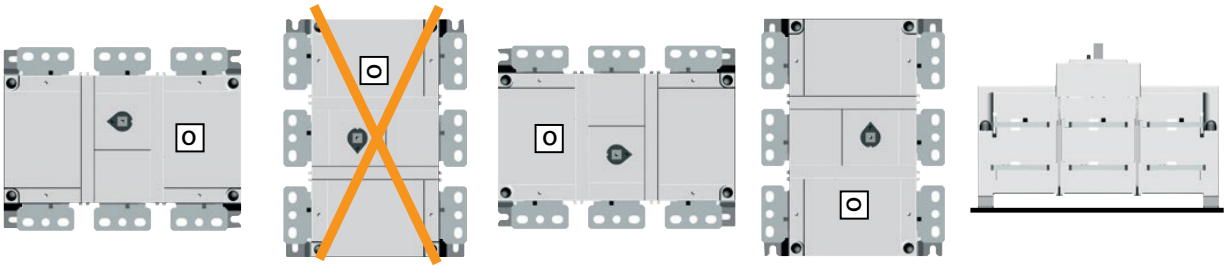
LBS 160…630 CO mounting positions



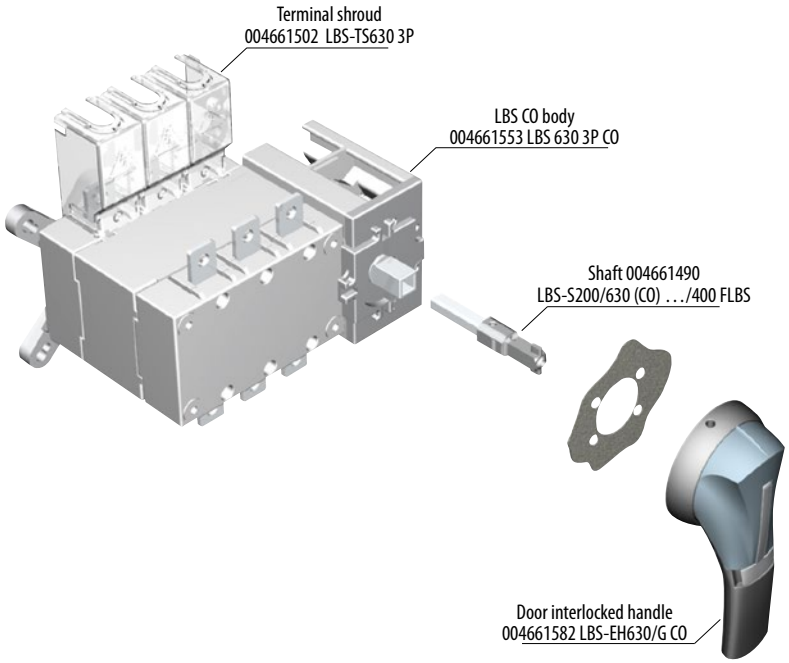
LBS 800…1600 CO mounting positions



LBS 2000…3200 CO mounting positions



Installation of accessories

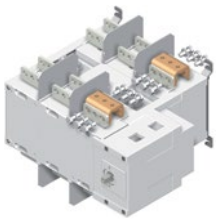


Connection LBS 2000-3200A CO

Enables:

- To allow connection between the two power terminals from a same pole for 2000 to 3200A ratings (Fig. 1 and Fig 2)
- Top or bottom bridging connection (Fig. 3).

For 3200 A rating, the connection pieces (part A) are delivered bridged from factory. Bolt sets must be ordered separately.



Current (A)	Piece	Quantity to order per pole (1)	Code No.
2000 - 2500	Bridging bar part A	2	004661597
2000 - 2500	Bolt set - part B	2	004661598
3200	Bridging bar part A		included
3200	Bolt set - part B	2	004661598

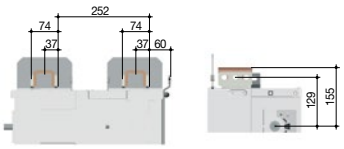
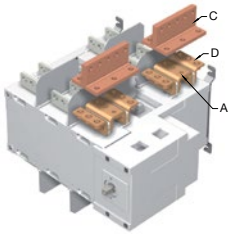


Fig. 1

Current (A)	Piece	Quantity to order per pole (1)	Code No.
2000 - 2500	Bridging bar part A	2	004661597
2000 - 2500	T piece - part C	2	004661599
2000 - 2500	Right angle - part D	2	004661600
3200	Bridging bar part A		included
3200	T piece - part C	2	004661599
3200	Right angle - part D	2	004661600



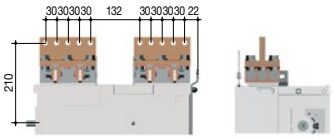
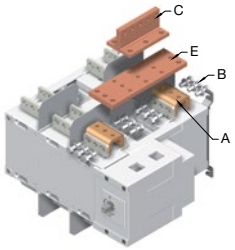


Fig. 2

Current (A)	Piece	Quantity to order per pole (1)	Code No.
2000 - 2500	Bridging bar part A	2	004661597
2000 - 2500	Bolt set - part B	2	004661598
2000 - 2500	Bar - piece E	1	004661601
2000 - 2500	T piece - part C	1	004661599
3200	Bridging bar part A		included
3200	Bolt set - part B	2	004661598
3200	Bar - piece E	1	004661602
3200	T piece - part C	1	004661599



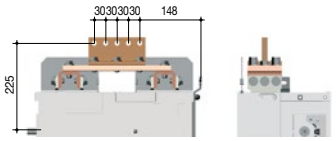


Fig. 3

Motorised Change Over Load Break Switch MLBS..CO (1-0-2)

Characteristics according to IEC 60947-3, IEC 60947-6-1

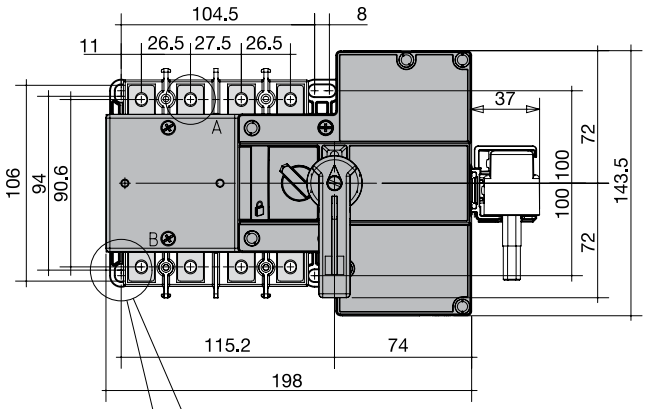
Type				MLBS 63 CO	MLBS 100 CO	MLBS 125 CO
Current		(I_n)	(A)	63A	100A	125A
Rated insulation voltage (power circuit)		(U_i)	(V)	800	800	800
Rated insulation voltage (operation circuit)		(U_i)	(V)	300	300	300
Rated impulse withstand voltage (power circuit)		(U_{imp})	(kV)	6	6	6
Rated impulse withstand voltage (operation circuit)		(U_{imp})	(kV)	4	4	4
Thermal current 40°C		(I_{th})	(A)	63	100	125
Rated operational currents (I_e) according to IEC 60947-3	AC-20A/B	415V	(A)	63	100	125
	AC-21A/B	415V	(A)			100/125
	AC-22A/B	415V	(A)			100
	AC-23A/B	415V	(A)	-/63	-/63	-/63
Rated operational currents (I_e) according to IEC 60947-6-1	AC-31B	415V	(A)	63	100	125
	AC-32B	415V	(A)	63	80	80
Short-circuit capacity I_{cw}		1 s.	(kA)	2,5	2,5	2,5
		0,25 s.	(kA)	4,5	4,5	4,5
Fuse protected short-circuit withstand (kA rms prospective)						
Associated fuse rating			(A)	63	100	125
Prospective short-circuit current			(kA)	50	25	15
Circuit breaker protected short-circuit withstand with any circuit breaker that ensures tripping in less than 0.3s[1]						
Rated short-time withstand current I_{cw}		0,3 s.	(kA)	3,5	3,5	3,5
Connection						
Maximum Cu cable cross-section			mm^2	50	50	50
Tightening torque min/max			Nm	1,2/3	1,2/3	1,2/3
Switching time (Standard setting)						
1-0 or 2-0			(ms)	500	500	500
1-2 or 2-1			(ms)	1000	1000	1000
Duration of "'electrical blackout' 1-2 minimum			(ms)	500	500	500
Power supply						
Power supply 12 V DC min/max			(V)	9/15	9/15	9/15
Power supply 230 V AC min/max			(V)	160/310	160/310	160/310
Control supply power demand						
Power supply 12 V DC inrush/nominal			(VA)	200/40	200/40	200/40
Power supply 230 V AC inrush/nominal			(VA)	200/40	200/40	200/40
Durability (number of operating cycles)			cycles	10 000	10 000	10 000
Power dissipation			W/pole	1,7	4,5	6

[1] Value for coordination with any circuit breaker that ensures tripping in less than 0.3s.

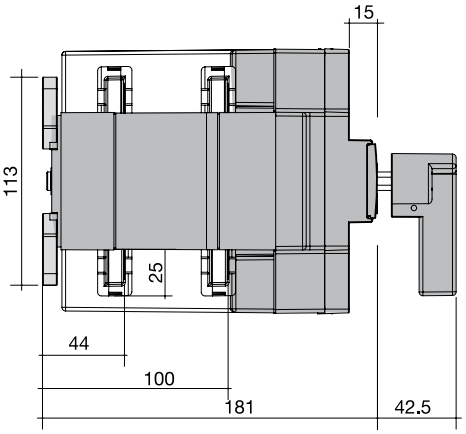
Dimensions

MLBS 63 4P CO - MLBS 125 4P CO

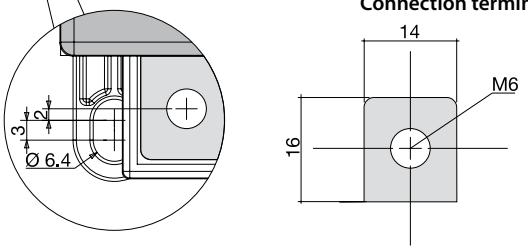
Front view

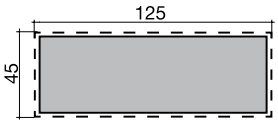


Side view



Connection terminal

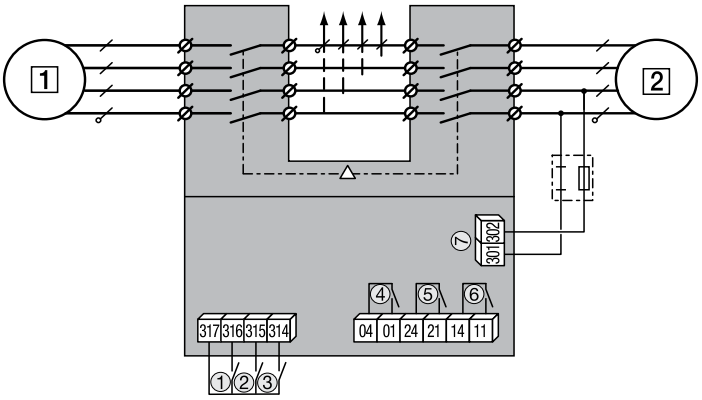




Power supply MLBS 63 - MLBS125 4P CO 230VAC

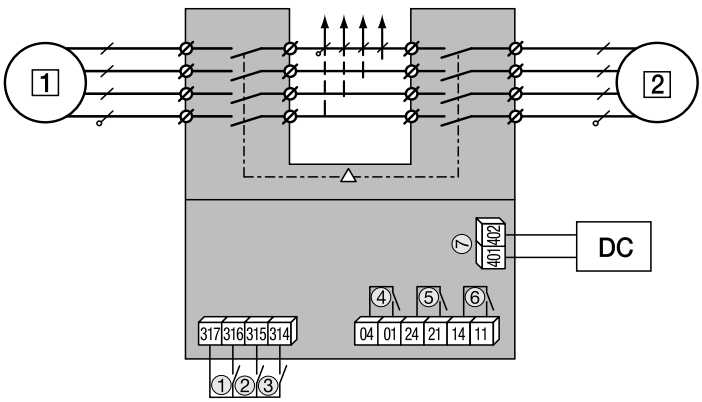
1 - preferred source
2 - alternate source
1 - position 0 control
2 - position I control
3 - position II control
4 - auxiliary contact, closed when the switch is in position 0
5 - auxiliary contact, closed when the switch is in position II
6 - auxiliary contact, closed when the switch is in position I
7 - power supply kit: 230 V AC (160 - 310 V AC)

MLBS 63...125 4P CO 230VAC



MLBS 63...125 4P CO 12VDC

1 - preferred source
2 - alternate source
1 - position 0 control
2 - position I control
3 - position II control
4 - auxiliary contact, closed when the switch is in position 0
5 - auxiliary contact, closed when the switch is in position II
6 - auxiliary contact, closed when the switch is in position I
7 - power supply kit: 12 V DC (9 - 15 V DC)



Characteristics according to IEC 60947-3, IEC 60947-6-1

Type				MLBS 250 C0	MLBS 400 C0	MLBS 630 C0
Current		(I_n)	(A)	250	400	630
Rated insulation voltage (power circuit)		(U_i)	(V)		1000	
Rated insulation voltage (operation circuit)		(U_i)	(V)		300	
Rated impulse withstand voltage (power circuit)		(U_{imp})	(kV)		12	
Rated impulse withstand voltage (operation circuit)		(U_{imp})	(kV)		4	
Thermal current 40°C		(I_{th})	(A)	250	400	630
Rated operational currents (I_e) according to IEC 60947-3	AC-21 A / AC-21 B	415 VAC	(A)	250/250	400/400	630/630
	AC-22 A / AC-22 B	415 VAC	(A)	250/250	400/400	630/630
	AC-23 A / AC-23 B	415 VAC	(A)	200/200	400/400	500 /630
	AC-21 A / AC-21 B	500 VAC	(A)	250/250	400/400	630/630
	AC-22 A / AC-22 B	500 VAC	(A)	200/250	200/400	500/500
	AC-23 A / AC-23 B	500 VAC	(A)	200/200	200/200	400/400
	AC-21 A / AC-21 B	690 VAC[3]	(A)	200/200	200/200	500/500
	AC-22 A / AC-22 B	690 VAC[3]	(A)	160/160	160/160	400/400
	AC-23 A / AC-23 B	690 VAC[3]	(A)	125/125	125/125	400/400
	DC-21 A / DC-21 B	220 VDC	(A)	250/250	250/250	630/630
	DC-22 A / DC-22 B	220 VDC	(A)	250/250	250/250	630/630
	DC-23 A / DC-23 B	220 VDC	(A)	200/200	200/200	630/630
	DC-21 A / DC-21 B	440 VDC [2]	(A)	200/200	200/200	630/630
	DC-22 A / DC-22 B	440 VDC [2]	(A)	200/200	200/200	630/630
	DC-23 A / DC-23 B	440 VDC [2]	(A)	200/200	200/200	630/630
Rated operational currents (I_e) according to IEC 60947-6-1	AC-31 B	415 VAC	(A)	250	400	630
	AC-32 B	415 VAC	(A)	200	400	500
	AC-33 B	415 VAC	(A)	200	200	400
Current rated as conditional short-circuit with fuse gG DIN, according to IEC 60947-3						
Prospective fuse protected short-circuit withstand		415 VAC	(kA)		50	
Prospective fuse protected short-circuit withstand		690 VAC	(kA)		50	
Associated fuse rating			(A)	250	400	630
Short-circuit withstand without protection as per IEC 60947-3						
Rated short-time withstand current I_{cw} at 415 VAC		0,3 s	(kA)		15[4]	17[4]
Rated short-time withstand current I_{cw} at 415 VAC		1s	(kA)		8[4]	10[4]
Rated peak withstand current at 415 VAC			(kA)		30	45
Short-circuit withstand without protection as per IEC 60947-6-1						
Rated short-time withstand current I_{cw} at 415 VAC		30 ms	(kA)		10	
Rated short-time withstand current I_{cw} at 415 VAC		60 ms	(kA)			12,6
Connection						
Minimum Cu cable cross-section as per IEC 60947-1			(mm^2)	95	185	2x120
Recommended Cu busbar cross-section			(mm^2)			2x40x5
Maximum Cu cable cross-section			(mm^2)	150	240	2x300
Maximum Cu busbar width			(mm)		32	50
Min./max. tightening torque			Nm		20/26	40/45
Switching time (rated voltage, after receiving command)						
Transfer time I-II or II-I			(s)		0,9	0,95
I-0 or II-0			(s)		0,5	0,55
Contact transfer time ("black-out" I-II) minimum			(s)		0,4	
Power supply						
Min./max. power		VAC			166/332	
Control supply power demand						
Demand/rated power		(VA)			276/115	276/150
Durability (number of operating cycles)		cycles			8.000	5.000

[1] Category with index A = frequent operation - Category with index B = infrequent operation.

[2] 3-pole device with 2 pole in series for the "+" an 1 pole for the "-".

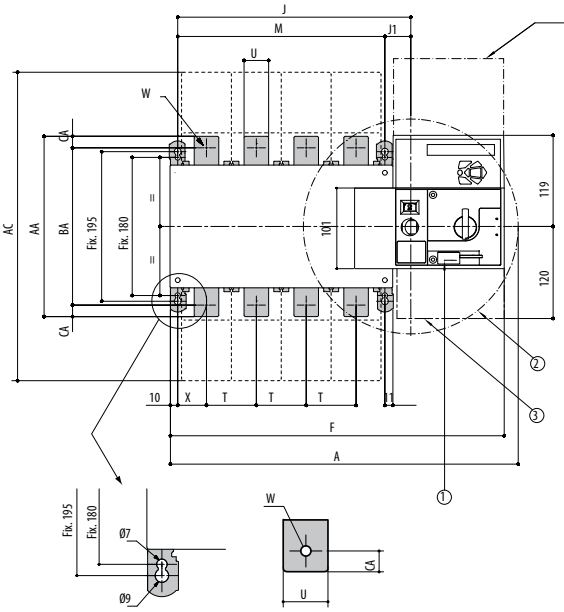
[3] Interphase barriers must be installed on the products.

[4] Values given at 690 VAC.

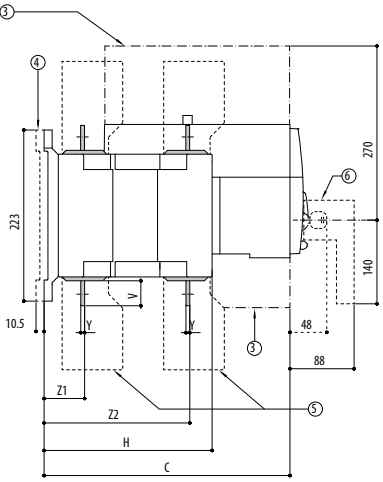
Dimensions

MLBS 250 CO - MLBS 630 CO

Front view



Side view



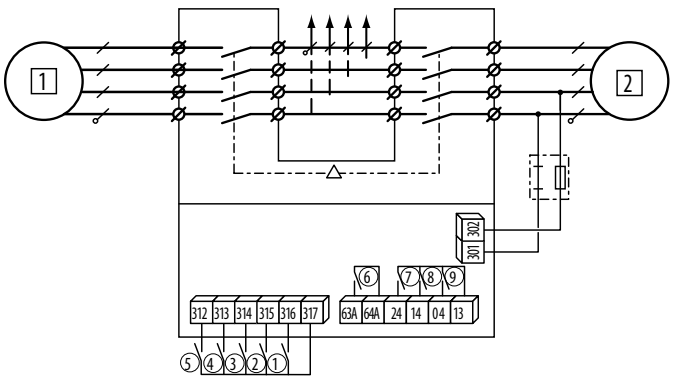
1. Triple padlock tab
2. Max. handle turn at an angle of 2 x 90°
3. Control connection and disconnection area
4. Spacers
5. Terminal shrouds
6. Handle

Rating	Overall dimensions, (mm)			Terminal shrouds, (mm)	Switch body, (mm)						Switch mounting, (mm)		Connection, (mm)											
(A)	A (3p)	A (4p)	C	AC	F (3p)	F (4p)	H	J (3p)	J (4p)	J1	M (3p)	M (4p)	T	U	V	W	X (3p)	X (4p)	Y	Z1	Z2	AA	BA	AC
250	345	395	244	288	328	378	152	195	245	35	160	210	50	25	30	11	33	33	3,5	39,5	133,5	160	130	15
400	345	395	244	288	328	378	152	195	245	35	160	210	50	35	35	11	33	33	3,5	39,5	133,5	170	140	15
630	394	454	320,5	402	377	437	221	244	304	34	210	270	65	45	50	13	42,5	37,5	5	53	190	260	220	20

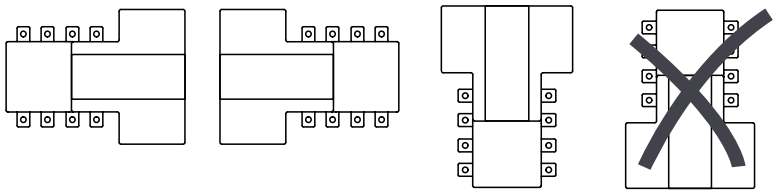
Connections and terminals

1 - primary source (network or genset)
2 - backup source (mains network or genset)
1 - position 0 control (contact or logic if closed)
2 - position I control
3 - position II control
4 - primary control position 0
5 - closing this contact allows position control commands
6 - product availability relay
7 - auxiliary contact - closed when the switch is in position II
8 - auxiliary contact - closed when the switch is in position I
9 - auxiliary contact - closed when the switch is in position 0

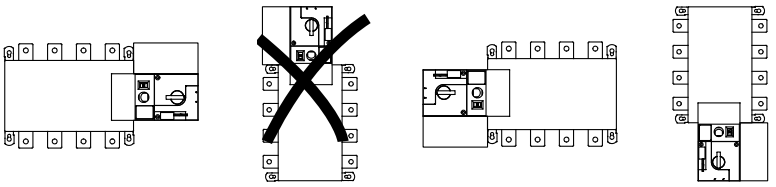
MLBS 250 CO - MLBS 630 CO



MLBS 63…125 CO mounting positions



MLBS 250…630 CO mounting positions



Fuse Load Break Switch FLBS

Characteristics according to IEC 60947-3

Type				FLBS 125	FLBS 160	FLBS 250	FLBS 400	FLBS 630
Current		(I_n)	(A)	125A	160A	250A	400A	630A
Rated insulation voltage		(U_i)	(V)	750	750	750	1000	1000
Rated impulse withstand voltage		(U_{imp})	(kV)	8	8	8	12	12
NFC/DIN fuse size				00/00 C	00/00 C	1	2	3
Thermal current 40°C		(I_{th})	(A)	125	160	250	400	630
Rated operational currents (I_e)	AC-22A/B	400V	(A)	125	160	250	400	630
	AC-23A/B	400V	(A)					
	AC-22A/B[1]	690V	(A)					500/630
	AC-23A/B[1]	690V	(A)	100	125		315/400	315/400
	DC-20A/B	220V	(A)	125	160		400	400/630
	DC-21A/B	220V	(A)				315	
	DC-22A/B	220V	(A)					315/630
	DC-23A/B	220V	(A)	100	125	200	200/315	400/630
	DC-20A/B [2] [3]	440V	(A)	125	160	250	400	
	DC-21A/B [2] [3]	440V	(A)				315	
	DC-22A/B [2] [3]	440V	(A)					315/630
	DC-23A/B [2] [3]	440V	(A)	100	125	200	250/315	400/630
Operational power in AC 23[4]		400V AC	kW	63	80	132	220	355
		690V AC	kW	90	110	220	220/295	295/400
Reactive power[4]		400 V AC	(kVAr)	55	75	115	185	290
Fuse protected short-circuit withstand (kA rms prospective)								
Associated fuse rating[5]			(A)	125	160	250	400	630
Prospective short-circuit current[5]			(kA)	100	50	100	100	100
Short-circuit capacity								
Rated peak withstand current		0,3 s.	(kA)	20	20	32,5	40	70
Connection								
Minimum Cu cable cross-section		mm^2		35	35	95	185	2x150
Maximum Cu cable cross-section		mm^2		95	95	240	240	2x300
Maximum Cu busbar width (Cu)		mm		20	20	32	45	63
Tightening torque min/max		Nm		8.3/13	8.3/13	20/26	20/26	40/45
Durability (number of operating cycles)		cycles		10 000	10 000	10 000	10 000	80 000
Power dissipation		W/pole		20,3	21,6	41,1	57,4	122
Frame pitch		(mm)		36	36	60	66	94

Category with index A = frequent operation; Category with index B = infrequent operation.

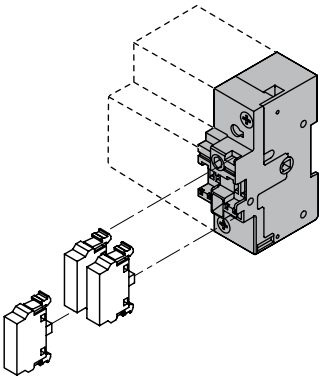
[1] - With terminal shrouds or terminal screen.

[2] - Poles cannot be juxtaposed.

[3] - 4-pole device with 2 poles in series per polarity.

[4] - The power value is given for information only, the current values vary from one manufacturer to another.

[5] - For a rated operational voltage Ue = 415 VAC.

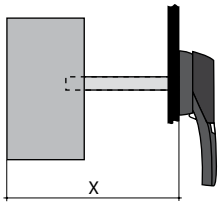


Characteristics FLBS-PS

Rating (A)	Operating current I_e (A)			
	250 V AC AC-15	400 V AC AC-15	24 V DC DC-13	48 V DC DC-13
125-630	3	1,8	2,8	1,4

Shaft lenghts

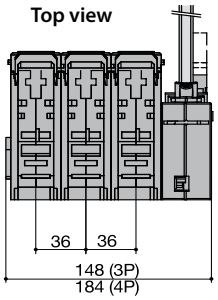
Rating (A)	125-160	250-400	630
Fuse size	00	1/2	3
Shaft length (mm)	X	X	X
200	135 - 230	160 - 230	270 - 304
320	135 - 350	160 - 350	270 - 424
400	135 - 430	160 - 430	270 - 504
500	135 - 530	160 - 530	270 - 604



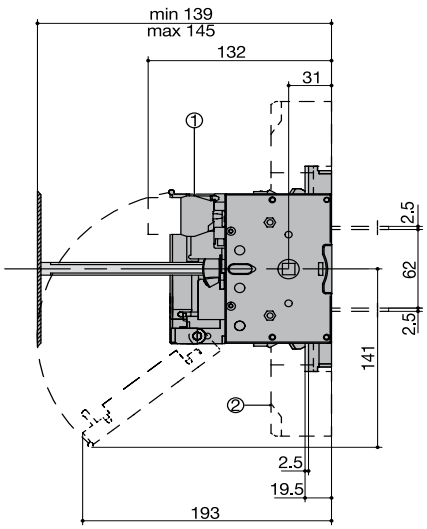
Dimensions

FLBS 125...160 3P

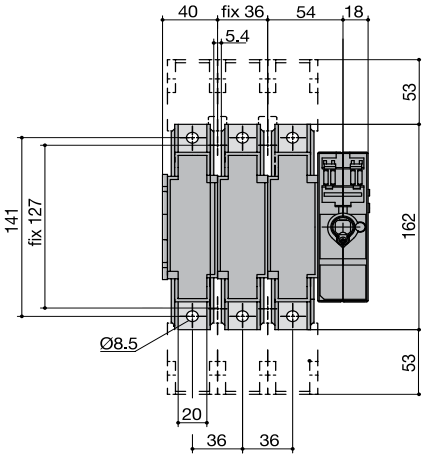
Top view



Side view



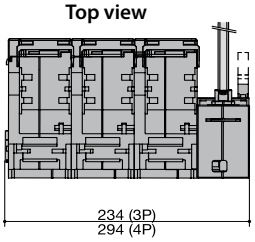
Front view



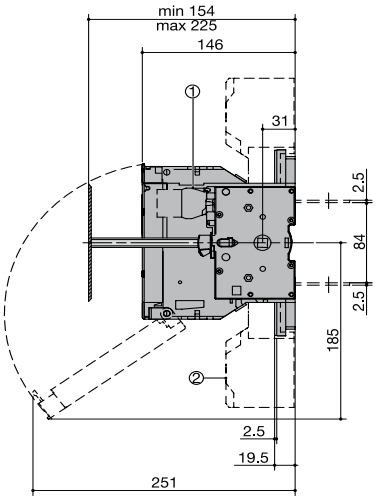
1 - Auxiliary contact
2 - Terminal shrouds

FLBS 250 3P

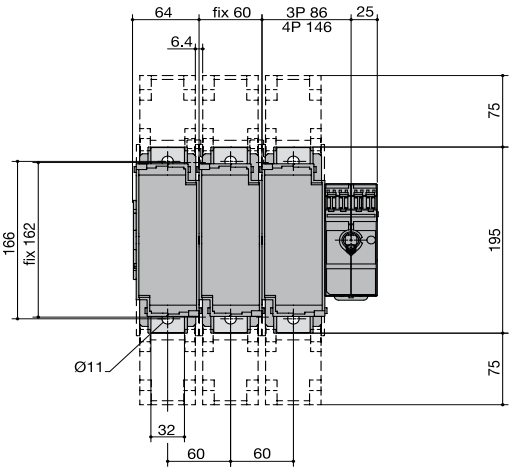
Top view



Side view



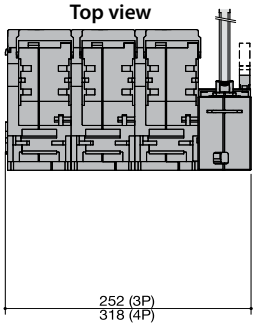
Front view



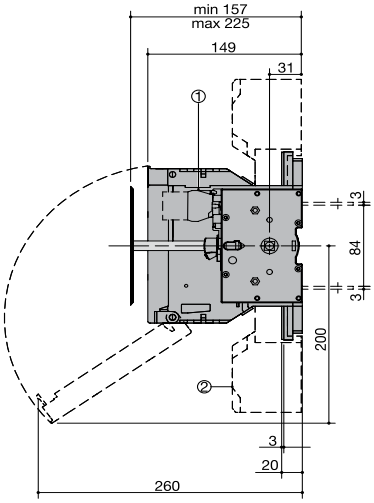
1 - Auxiliary contact
2 - Terminal shrouds

FLBS 400 3P

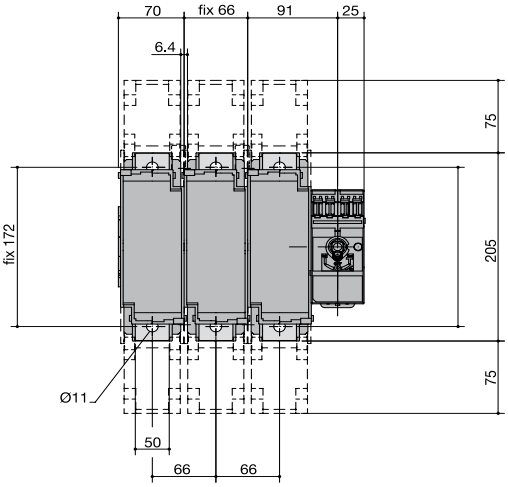
Top view



Side view



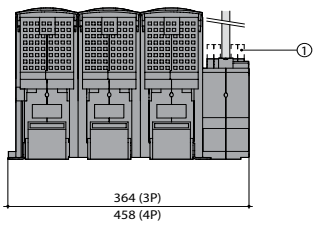
Front view



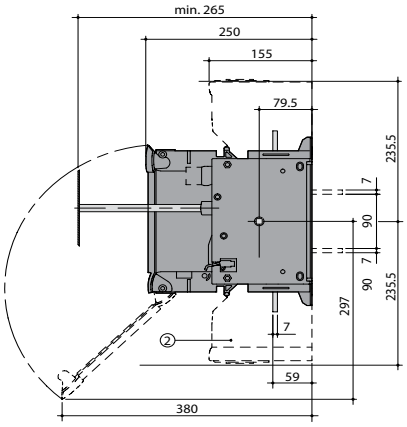
1 - Auxiliary contact
2 - Terminal shrouds

FLBS 630 3P

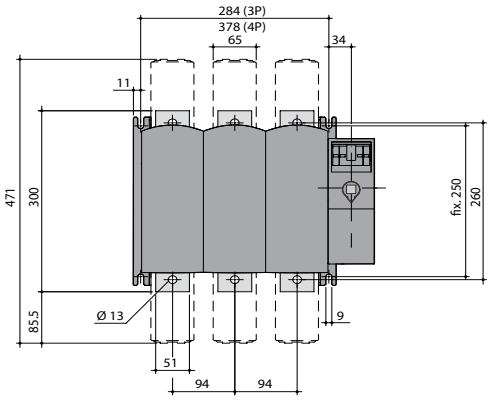
Top view



Side view

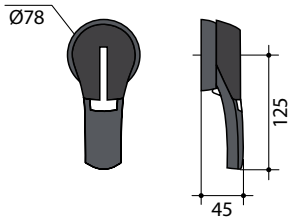


Front view

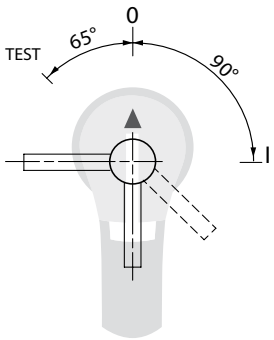


1 -Auxiliary contact
2 - Terminal shrouds

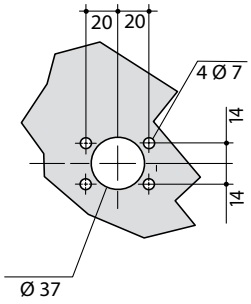
Handle type LBS-EH630/G ...400/G FLBS



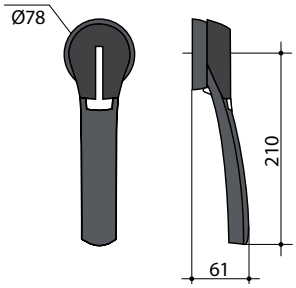
Direct front operation



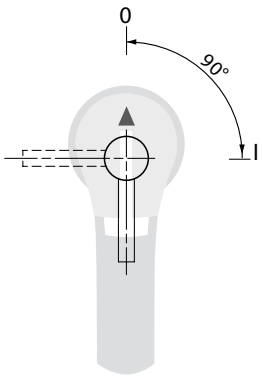
Door drilling



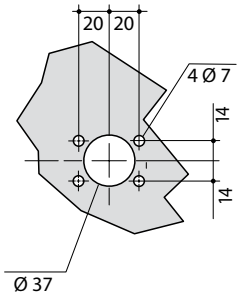
Handle type LBS-EH630/G



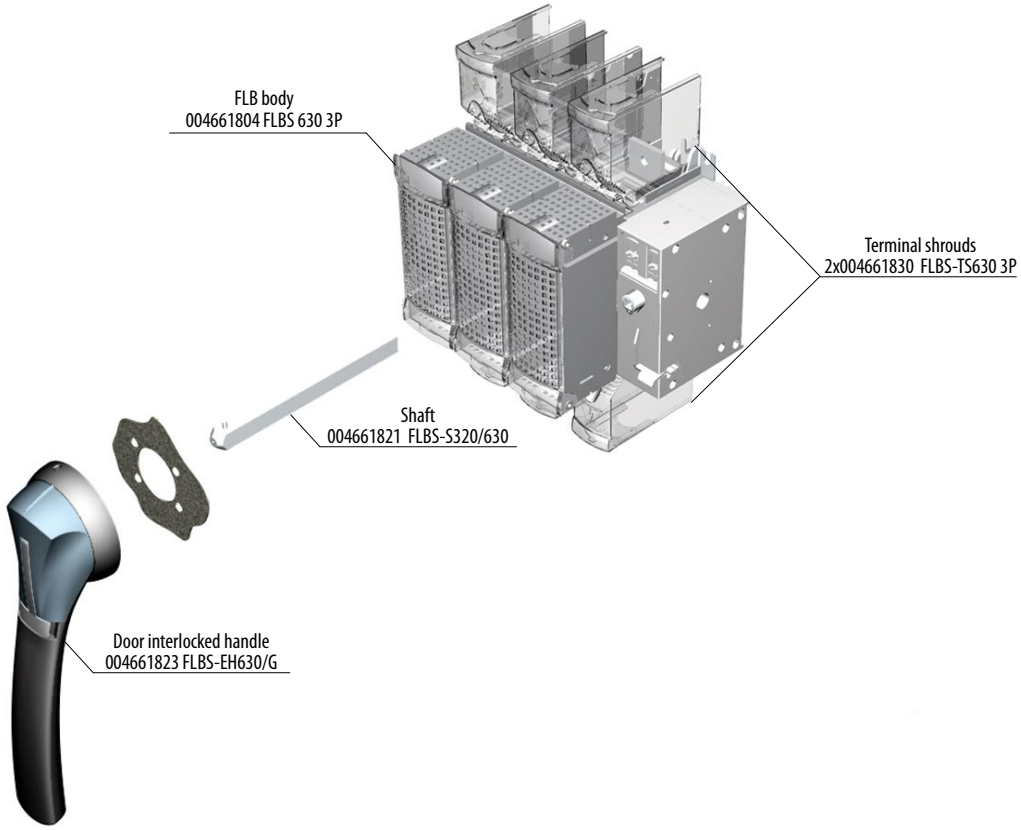
Direct front operation



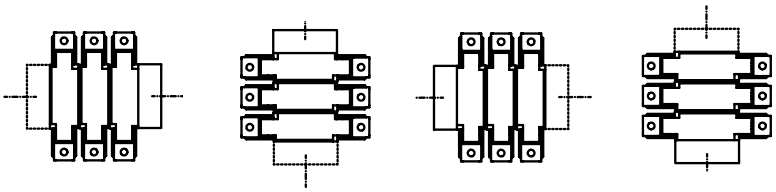
Door drilling



Installation of accessories



FLBS 125…630 mounting positions

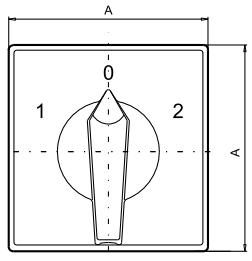


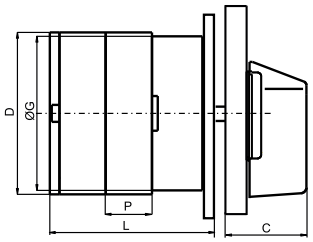
Rotary Cam Switches

Technical data

Type				CS 16	CS 25	CS 32	CS 40	CS 63	CS 80	CS 100
Rated insulation voltage		U_i	V	690	690	690	690	690	690	690
Rated impulse withstand voltage		U_{imp}	kV	4	6	6	6	6	6	6
Rated thermal current		I_{th}	A	20	25	32	50	70	85	100
Main switch IEC 60947 (III/3)	Max. value of rated operational voltage		V	400	480	480	480	480	480	480
	Rated impulse withstand voltage		kV	4	4	4	4	4	4	4
Max. fuse size for short-circuit protection gL 10kA			A	20	25	32	40	63	80	100
Rated short-time withstand current I_{cw}	1 sec		A	250	400	600	800	800	1000	1800
	3 sec		A	10	250	400	530	700	800	900
	10 sec		A	80	140	240	290	350	400	450
	30 sec		A	50	90	150	200	250	250	300
	60 sec		A	40	70	120	150	150	160	200
Rated operational current I_e AC1/AC21			A	16	25	32	40	63	80	85
Rated operational current I_e AC15	110/120 V		A	10	20	25	40	50		
	220/230 V		A	8	20	25	30	40		
	380/400 V		A	6	16	20	25	40		
	660/690 V		A		8	8,5	8,5	10		
Motor switch in utilisation category AC3/AC23	3 phase	220/230 V	kW	3/5	5,6/6,5	7,6/8	9/9	11/15	12/18,5	19/22
		380/400 V	kW	5/7,5	7,5/11	11/15	15/18,5	18,5/22	22/32	32/37
		500/690 V	kW		11/11	15/18,5	19/22	22/30	28/45	42/55
	1 phase 2 poles	110/120 V	kW	0,8/0,8	1,5/1,5	2,5/2,5	2,5/3	3/3,5		
		220/230 V	kW	2,2/2,5	3/3,7	4,8/5	5,5/6	6/9		
		380/400 V	kW	3/3,7	5,5/5,5	6,5/7,5	7,5/9	11/15		
Motor switch in utilisation category AC4	3 phase	220/230 V	kW	1,5	2,5	3	5	6	7	9,5
		380/400 V	kW	3	4	5,5	8	11	12	16
		500/690 V	kW		4	7,5	8	11	12	16
Mechanical endurance	switching cycles		10^6	3	3	3	3	2	2	2
Terminal screw				M3.5	M35	M4	M5	M5	2xM5	2xM5
Screw head						(+,-) PZ2			(-)	
Tightening torque				0,8	0,8	1,2	1,8	2	2	2
Cable cross-section		Rigid	mm^2	2x(1-2,5)	2x(1-4)	2x(2,5-6)	2x(2,5-10)	2x(4-16)	10-25	
		Flexible	mm^2	2x(1-2,5)	2x(1-4)	2x(2,5-6)	2x(2,5-6)	2x(4-16)	6-25, 2x(6-10)	
Protection degree of terminals						IP20			IP00	
Permissible ambient temperature			°C			-25 ... +55				
Standards						IEC 60947-3, VDE 0660, EN 60947 - 3				

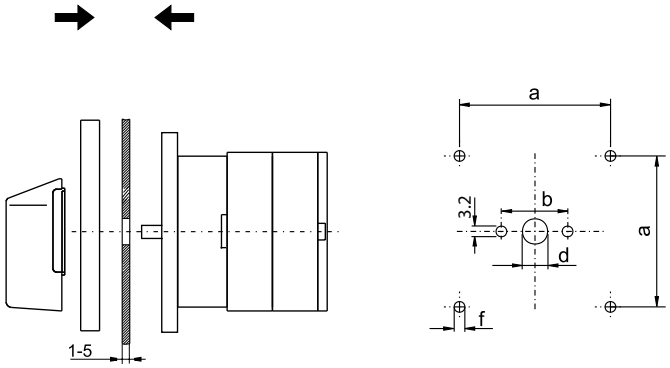
Dimensions





Type	Marking					Number of elements (L/mm)											
	A	C	D	ØG	P	1	2	3	4	5	6	7	8	9	10	11	12
CS 16	48	26	45,2	38,6	12,8	32,5	45,3	58,1	70,9	83,7	96,5	109,3	122,1	134,9	147,7	160,5	173,3
CS 25	48	26	45,2	38,6	12,8	32,5	45,3	58,1	70,9	83,7	96,5	109,3	122,1	134,9	147,7	160,5	173,3
CS 32	65	33	53	38,6	12,8	37	49.8	62.6	75,4	88,2	101	113,8	126,6	139,4	152,2	165	177,8
CS 40	65	33	61	56,4	17,5	50,6	68,1	85,6	103,1	120,6	138,1	155,6	173,1	190,6	208,1	225,6	243,1
CS 63	65	33	61	56,4	17,5	50,6	68,1	85,6	103,1	120,6	138,1	155,6	173,1	190,6	208,1	225,6	243,1
CS 80	90	41	84	80	25	67,5	92,5	117,5	142,5	167,5	192,5	217,5	242,5	267,5	292,5	317,5	342,5
CS 100	90	41	84	80	25	67,5	92,5	117,5	142,5	167,5	192,5	217,5	242,5	267,5	292,5	317,5	342,5

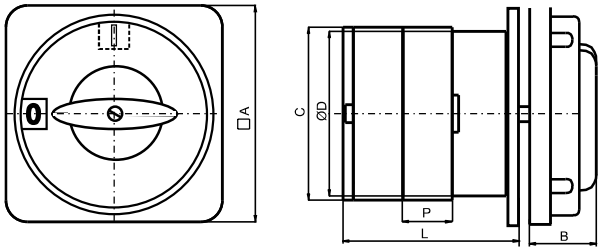
Drilling plan



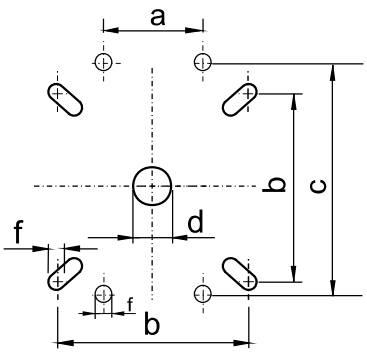
TYPE	a*	b**	d	f
CS 16 CS 25	36	30	10	4.2
CS 32 CS 40 CS 63	48	45	10	4.2
CS 80 CS 100	72	40	14	5.3

a*- *for 5 and more then 5 elements*
b**- *up to 4 elements*

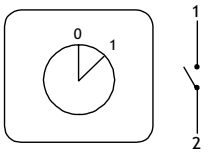
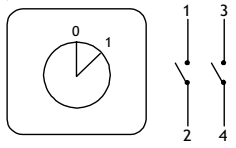
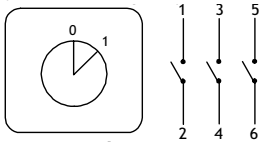
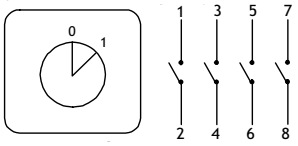
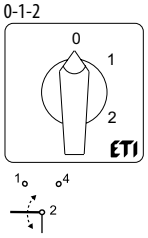
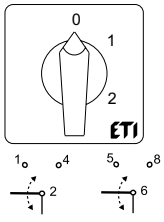
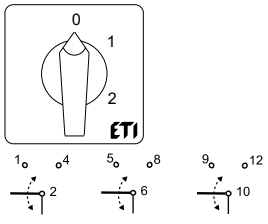
Dimensions LK (General Emergency)

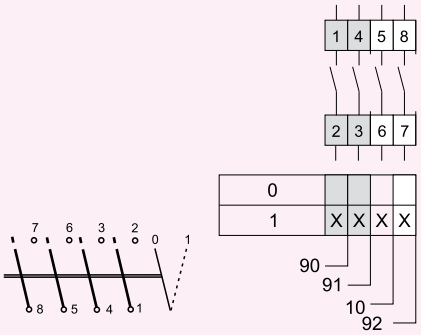


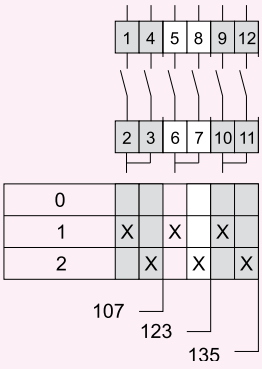
Drilling plan LK (General Emergency)

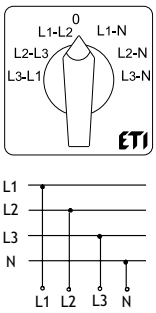
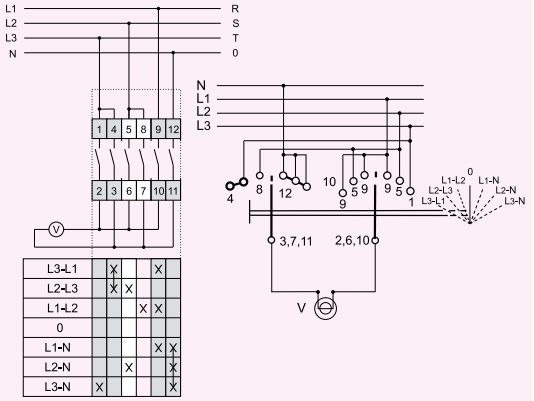
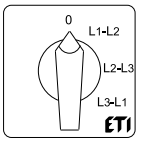
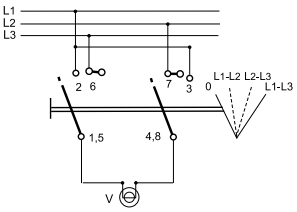
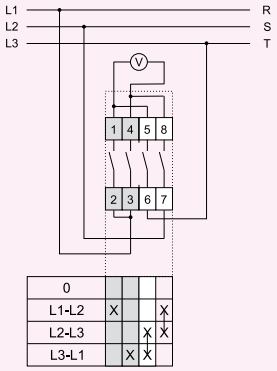
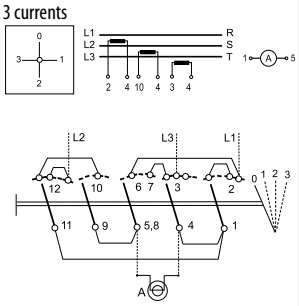
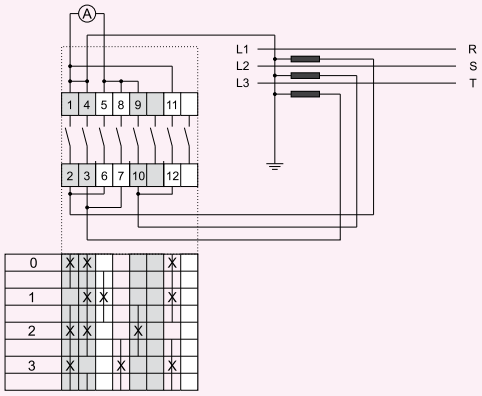
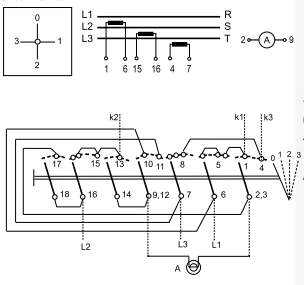
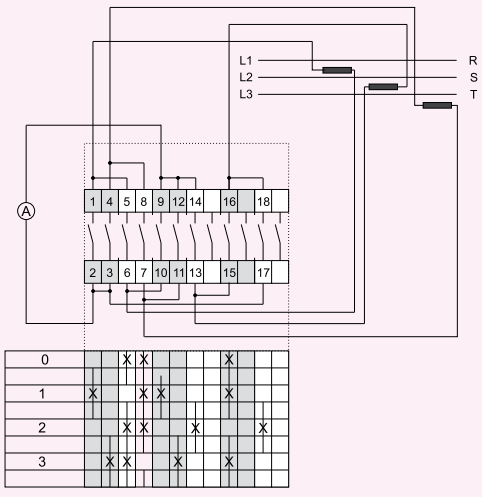


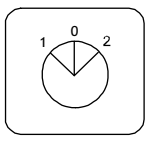
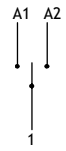
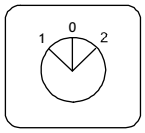
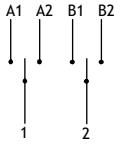
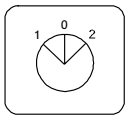
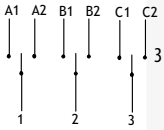
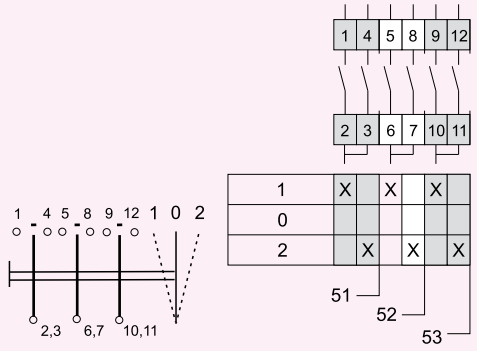
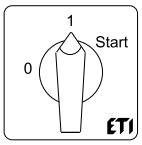
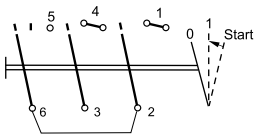
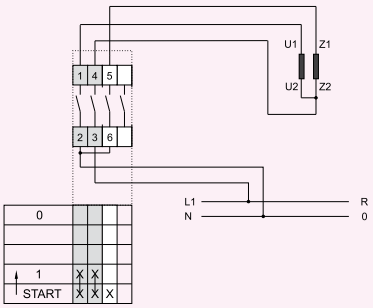
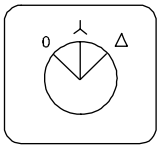
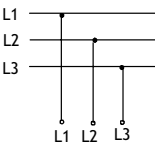
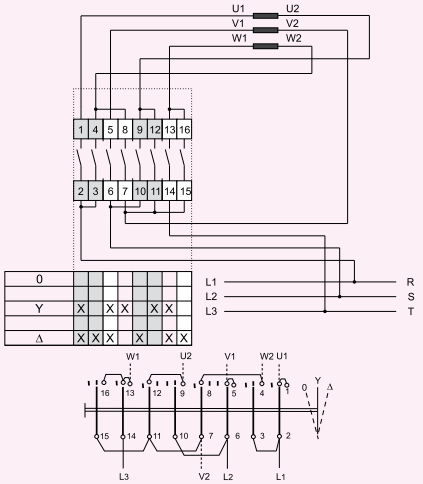
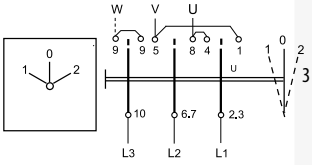
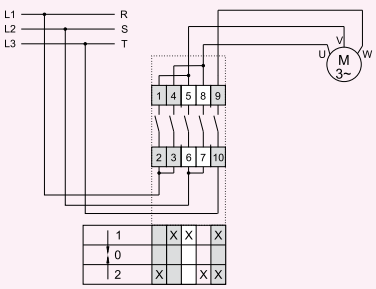
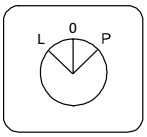
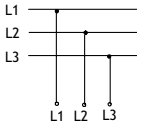
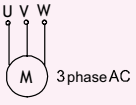
/(mm)	□A	C	ØD	P	B	L/2	b	d	f	a	c
CS 25 LK	49	45,2	38,6	12,8	35	45,3	36	10	3,2		
CS 32 LK	72	53	38,6	12,8	32	49,8	58	10	4,2		
CS 40 LK	72	61	56,4	17,5	32	68,1	58	10	4,2		
CS 50 LK CS 63 LK	72	68,6	56,4	20,5	32	63	58	10	4,2		
CS 80 LK	105	84	80	25	44	92,5	85	14	5,3		
CS 100KLK											
CS 125LK CS 200 LK	130		110	39	62	100		18	5,3	30	90

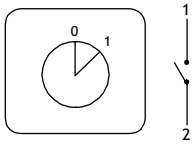
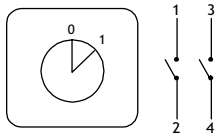
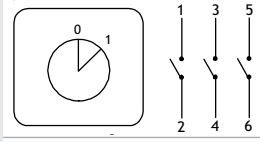
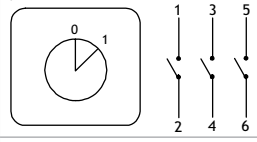
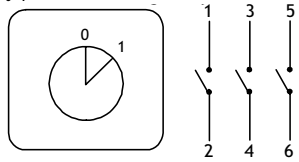
	Type, layout and symbol	Nr of poles / elements	Connection diagram
ON-OFF switches with 60° switching angle	0-1 	1 / 1	90
	0-1 	2 / 2	91
	0-1 	3 / 3	10
	0-1 	4 / 4	92
Multistep Switches With 60° Switching Angle	0-1-2 	1 / 1	107
	0-1-2 	2 / 2	123
	0-1-2 	3 / 3	135

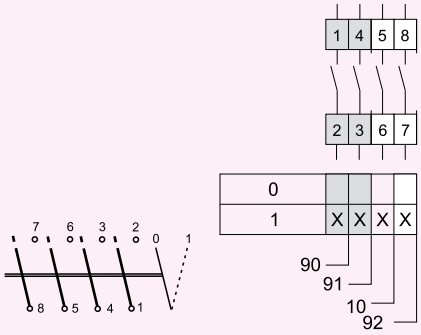




	Type, layout and symbol	Nr of poles / elements	Connection diagram	
Voltmeter Switches	3 line and 3 phase 	3 LINE AND 3 PHASE / 3	66	
	3 line  	3 LINE / 2	67	
	3 currents 	1 POLE 3 CURRENT WITH TRANSFORMER / 4	98	
Ammeter Switches	3 currents 	2 POLE 3 CURRENT WITH TRANSFORMER / 6	97	

	Type, layout and symbol		Nr of poles / elements	Connection diagram
Changeover Switches with 60° Switching Angle	1-0-2	 	1 / 1	51
	1-0-2	 	2 / 2	52
	1-0-2	 	3 / 3	53
				
Start and Run Switches	0-start-1	 	2 / 2	15
				
Star - Delta Switches	0-star-delta	 	4 / 4	12
				
Motor Reversing Switches	1-0-2		3 / 3	11
				
	L-0-P	 	3 / 3	11
				

	Type, layout and symbol	Nr of poles / elements	Connection diagram
General Emergency ON-OFF switches version LK	0-1 	1	10
	0-1 	2	91
	0-1 	3	10
	0-1 	4	92
General Emergency On-Off Switch	0-1 	3	10

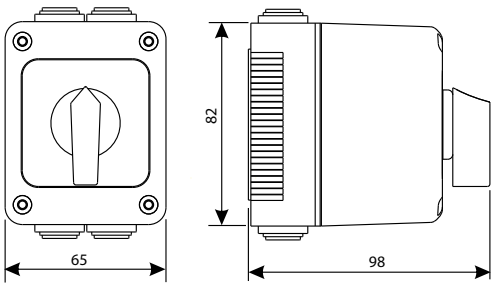


Rotary Cam Switches in insulated enclosures

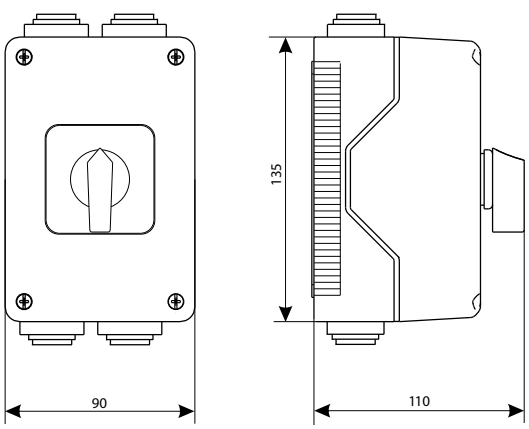
Technical data and connection diagrams for switches in insulated enclosures are the same as for those without enclosures.

Dimensions

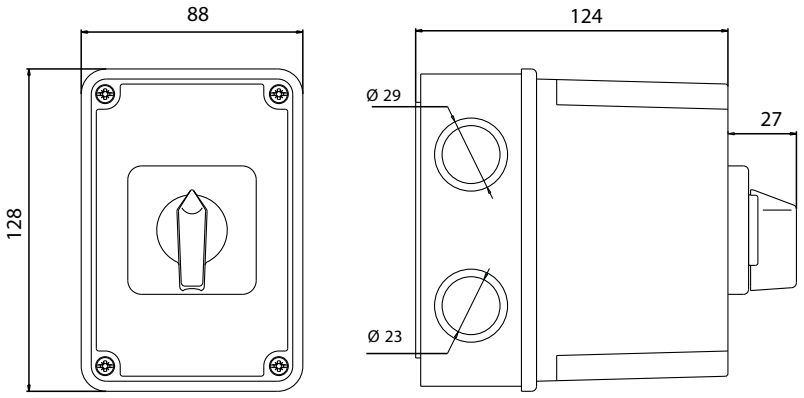
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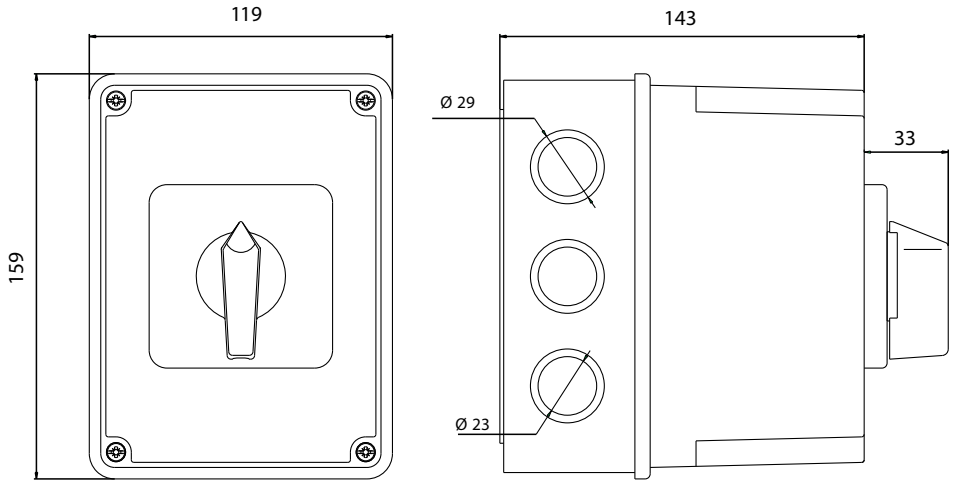
PNG



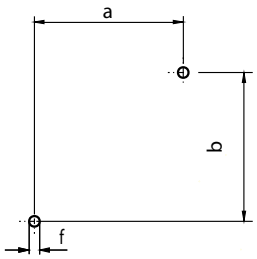
PN1



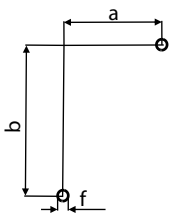
PN2



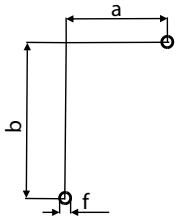
Drilling plan



	a	b	f
PN	44	48	4,3
PNG	48	100	4,3



	a	b	f
PN1	42	82	4,3



	a	b	f
PN2 32	72	112	4,5

Modular switches ModLBS

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1					
Type					**ModLBS 16 1p / ModLBS 16 3p**
Rated thermal current I_{th} open				A	20
Rated thermal current I_{the} enclosed				A	20
Rated operational voltage U_e				V	690*
Disconnection property ** acc. to VDE, IEC up to				V	440
Breaking capacity			3x220-240V	A	160
			3x500V	A	100
			3x660-690V	A	120
Utilization categ. AC21A, AC21B	Switching of resistive loads including moderate overloads				
	Rated operational current I_e			A	20
Utilization categ. AC23A, AC23B	Switching of motor loads or other highly inductive loads				
	Rated current I_e		400V	A	16
	Power rating 3-phase 3-pole		220-240V	kW	4
			380-440V	kW	7,5
			500V	kW	7,5
			660-690V	kW	7,5
Star-Delta-Switches	for squirrel cage motors				
	Power rating 3-phase 3-pole		220-240V	kW	3,7
			380-415V	kW	7,5
Utilization category AC3	Switching of three-phase motors				
	Rated current I_e		400V	A	12
	Power rating 3-phase 3-pole		220-240V	kW	3
			380-440V	kW	5,5
			500V	kW	5,5
			660-690V	kW	5,5
Utilization category AC4	squirrel cage motors, inching				
	Power rating 3-phase 3-pole		220-240V	kW	0,55
			380-440V	kW	1,5
			500V	kW	1,5
			660-690V	kW	1,5
Utilization category AC15	Control of electromagnetic loads, contactors				
	Rated current I_e		≤ 240V	A	6
			380 -440V	A	4
	2-pole in series		500V	A	5
Utilization categ. DC21A, DC21B	Switching of resistive loads Time constant L/R≤1ms				
	Rated current I_e 1-pole		30V	A	20
			60V	A	4
			110V	A	0,6
			220V	A	0,3
			440V	A	-
Utilization category DC3 - DC5	Switching of shunt motors and series motors Time constant L/R≤15ms				
	Rated current I_e 1-pole		30V	A	8
			60V	A	1
			110V	A	0,3
Protection class ot terminals					IP20

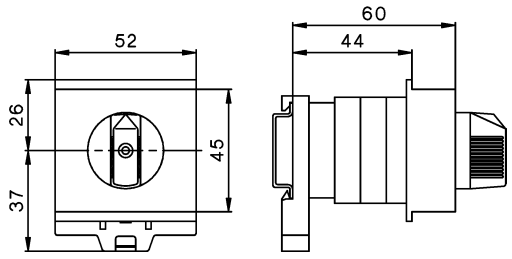
* suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 6kV. Data for other conditions on request

** valid for lines with grounded common neutral termination, overvoltage category III , pollution degree 3.

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1				
Type				**ModLBS 16 1p / ModLBS 16 3p**
Cable cross sections	solid or stranded		mm^2	1-2,5*
	flexible		mm^2	0,75-2,5*
	flexible (+ multicore cable end)		mm^2	0,75-1,5
	Conductors to clamp per pole			2
	Size of terminal screw			M3,5
	Tightening torque		Nm	0,8-1,4
			lb.inch	7-12
Short circuit protection	Max. fuse size gL (gG)		A	20
	Rated short-time withstand current (1sec. current)		A	250
	Rated conditional short-circuit current		kA_{eff}	10
Short-time capacity	Load duration Note: Ratings applies to contacts already closed	3s	A	100
		10s	A	60
		30s	A	35
		60s	A	25
Power loss at AC21A per pole			A	20
			W	0,5
Switching of capacitive loads	maximum making capacity up to 500V		A	140

* Maximum cable cross-section with prepared conductor

Dimensions

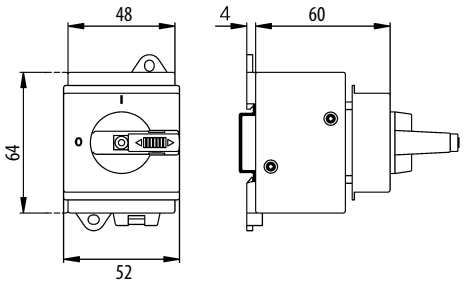


Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1					
Type					**ModLBS 40 3p ES**
Main contacts		Rated thermal current I_{th} open		A	40
		Rated thermal current I_{the} enclosed		A	40
Rated insulation voltage U_i *				V	690
Rated operational current I_e		AC21A		A	40
Rated operational voltage U_e max.		AC21A		V	690
Making capacity I_{eff}		3x380-440V		A	300
Breaking capacity		3x220-240V		A	250
		3x380-440V		A	250
		3x660-690V		A	170
Disconnection property performed up to				V	690
Motor Switch	AC3	3x400V		A	30
Motor Switch	AC3	3x220-240V		kW	7,5
Direct switching of single motors		3x380-440V		kW	15
		3x660-690V		kW	15
Main Switch	AC23	3x400V		A	32
Motor Switch	AC23A	3x220-240V		kW	9
Main Switch	AC23B	3x380-440V		kW	16
Safety Switch		3x660-690V		kW	15
Rated conditional short-circuit current		400V		kAeff	10
Max. fuse size gL (gG)		400V		A	40
Rated conditional short-circuit current		690V		kAeff	1
Max. fuse size gL (gG)		690V		A	40
A Mechanical life				$x10^3$	200
Rated short-time withstand current (1sec. current)				A	500
Power loss per pole AC21 = I_{th}	P/pole	E, Z		W	1,288
		V, SMA, PF		W	1,458
	R/pole	E, Z		mOhm	0,805
		V, SMA, PF		mOhm	0,911
Maximum ambient temperature	Operation	open			-40°C ... +60°C (90°C)**
		enclosed			-40°C ... +40°C
	Storage				-50°C ... +90°C
Cable cross sections	solid or stranded			mm^2	0,5 - 10
				AWG	20 - 8 (10)
	flexible			mm^2	0,5 - 6
				AWG	20 - 10
	flexible (+ multicore cable end)			mm^2	0,5 - 6
				AWG	20 - 10
	Size of terminal screw				M3,5
	Tightening torque			Nm	1,7 - 2,3
Auxiliary contacts	Rated insulation voltage U_i *			V	690
	Rated thermal current I_{th}, I_{the}			A	10
	Switching capacity	AC15	380-450V	A	2,5/1,5
		DC13	60-110V	A	2/0,4
	Rated conditional short-circuit current			kA_{eff}	3
	Max. short circuit protection gL (gG)			A	10
Cable cross sections	solid or stranded			mm^2	0,75 - 2,5
				AWG	14 - 12
	flexible (+ multicore cable end)			mm^2	0,75 - 2,5 (1,5)
				AWG	18 - 14

* suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 6kV.
** Derating acc. to cable cross sections

Data according to UL and cUL			
Type			**ModLBS 40 3p ES**
Rated voltage		V	600
Ampere-Rating "General use"		A	40
DOL-Rating 3-phase	110-120V	HP	2
	220-240V	HP	5
	440-480V	HP	10
	550-600V	HP	15
DOL-Rating 1-phase	110-120V	HP	1
	200-208V	HP	2
	220-240V	HP	3
Fuse size (RK5)	Manual Motor Controller	A	70
5kA / 600V	Motor Disconnect	A	50
Tightening torque		Nm	1,7-2,3
		lb.inch	15-20

Dimensions



ETISIG

Pushbutton Actuators and LED Indicators 540

Pushbutton Stations 548

Technical Data 567

Pushbutton Actuators and LED Indicators



ETI Power needs control

Pushbutton Actuators and LED Indicators

Actuators and indicators are used in control circuits for direct and remote management of operations, vital for industries, commercial establishments and domestic installations. The range offers reliability, critical to operational control, together with flexibility so important to panel assemblers, with the standardised modular construction. The actuators and indicators together with contact blocks, LED holders, integral indicators and actuators conform to international standards 60947-5-1.

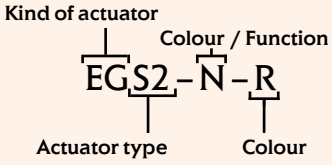
- All Actuators are supplied with First Row Clip as shown.
- All Actuators except LED Indicators have black collar made of ABS material. There is an option to buy chrome collar.
- The Actuator and Indicator fronts are IP65 .
- The key is withdrawable in 'O' position for Lock & Key Head Actuators as a standard feature.
- Symmetrical Head, Lever Head and Lock & Key Actuators are supplied with anti rotation ring (for mounting, see drill plan in continuation).
- The Integral Indicators are suitable for 24V AC/DC and 240V AC.
- The illuminated Actuators do not include LED Holders. There are need to be chosen separately.

Application:
- panel control and signaling system
- control panels

Advantages:
- segmental construction
- simplicity of assembly and dismantling
- mounting in standardized control panel holes Ø 22,5 mm
- snap mounting system components for brackets
- the ability to cascade system expansion of connectors structure (horizontal and vertical);
- degree of protection IP65
- LVGP (Low Voltage Glow Protection) protects against unwanted illumination of LED in case of low voltage of supply (below 60 V) or appearance of leakage currents

CE

Type Designation:



Type description

Kind of actuator	Actuator type	Colour / Function:	Colour:
EG – Non-Illuminated Actuators	F – Flush Head P – Projecting Head	R – Red G – Green Y – Yellow C – Black B – Blue A – Orange (Amber) W – White	
	T – Twin touch	C – Black	
	M – Mushroom	P – Push Type T – Push-Turn	R – Red
	S2 – Selector actuator – symemetric head – 2 position	N – Without Self Return S – With Self Return N90* – deflection of 90 ° between the extreme positions without self return	R – Red G – Green C – Black W– White
	S3 – Selector actuator – symemetric head – 3 position	NN – Without self return from both sides SS – With self return from both sides SN – Self return from left side NS – Self return from right side	R – Red G – Green C – Black W– White
	K2 – Key – 2 position	XY45* – deflection of 90 ° between the extreme positions XZ90* – deflection of 90 ° between the extreme positions XY90* – deflection of 90 ° between the extreme positions XY – Without Self Return XZ – With Self Return	C – Black
	K3 – Key – 3 position	ZXZ – With self return from both sides YXY – Without self return from both sides ZXY – Self return from left side YXZ – Self return from right side	C – Black
EG – Illuminated Actuators	PI – Projecting Head Illum. FI – Flush Head Illum.	R - Red G - Green Y - Yellow C - Black B - Blue A - Amber W-White	
	TI – Twin touch Illum.	B - Blue A - Amber S - Colourless	
	S2I – Selector actuator – symemetric head – 2 position illum.	N - Without self return S - With self return N90* - deflection of 90 ° between the extreme positions without self return	R – Red G – Green W– White
	S3I – Selector actuator – symemetric head – 3 position illum.	NN - Without self return from both sides SS - With self return from both sides	R – Red G – Green W– White
EC – Non-Illuminated integrated actuators	F – Flush Head	10 - 1 NO 01 - 1 NC 11 - 1 NO and 1 NC contacts	R – Red G – Green Y – Yellow C – Black B – Blue A – Orange (Amber) W– White
	M – Mushroom	P10 - Monostable with 1 NO contact P01 - Monostable with 1 NC contact T10 - Push-Turn with 1 NO contact T01 - Push-Turn with 1 NC contact	R – Red
EC – Illuminated integrated actuators	LI – LED indicator	024C - 24 V AC/DC 240A - 240 V AC	R – Red G – Green Y – Yellow B – Blue A – Orange (Amber) W– White

Note:
***X – Position of removing the key; *Y – Position you can't remove the key; *Z – Position of self returning**

*In standard actuators (selector and key actuator) in which after first dash you haven't got any number (for example EGK2-XY-C) then the deflection is 45° and position looks like this



* In two positions key actuators in which after first dash you have got "45" number (for example EGK2-XY45-C) then the deflection is 90° and position looks like this:



* In standard actuators (selector and key actuator) in which after first dash you have got "90" number (for example EGK2-XY90-C) then the deflection is 90° and position looks like this:



Non-illuminated actuators



Flush head pushbutton

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGF-R	Red	004771240	0,02	10/140
EGF-G	Green	004771241	0,02	10/140
EGF-C	Black	004771242	0,02	10/140
EGF-Y	Yellow	004771243	0,02	10/140
EGF-W	White	004771244	0,02	10/140
EGF-B	Blue	004771245	0,02	10/140
EGF-A	Amber	004771246	0,02	10/140



Projecting head actuator

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGP-R	Red	004771260	0,02	10/140
EGP-G	Green	004771261	0,02	10/140
EGP-C	Black	004771262	0,02	10/140
EGP-Y	Yellow	004771263	0,02	10/140
EGP-W	White	004771264	0,02	10/140
EGP-B	Blue	004771265	0,02	10/140
EGP-A	Amber	004771266	0,02	10/140



Mushroom pushbutton, Push function

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGM-P-R	Red	004771280	0,024	10/140
EGM-P-RCh	Red / Chrome	004771281	0,024	10/140



Mushroom pushbutton, Push-Turn function

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGM-T-R	Red	004771290	0,024	10/140
EGM-T-RCh	Red / Chrome	004771291	0,024	10/140



Symetric head actuator, 2 position with non spring return 0-1, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2-N-R	Red	004771300	0,019	10/140
EGS2-N-G	Green	004771301	0,019	10/140
EGS2-N-C	Black	004771302	0,019	10/140
EGS2-N-Y	Yellow	004771303	0,019	10/140
EGS2-N-W	White	004771304	0,019	10/140



Symetric head actuator, 2 position with spring return 0-1, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2-S-R	Red	004771310	0,019	10/140
EGS2-S-G	Green	004771311	0,019	10/140
EGS2-S-C	Black	004771312	0,019	10/140
EGS2-S-W	White	004771313	0,019	10/140



Symetric head actuator, 3 position with non spring return 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3-NN-R	Red	004771340	0,019	10/140
EGS3-NN-G	Green	004771341	0,019	10/140
EGS3-NN-C	Black	004771342	0,019	10/140
EGS3-NN-W	White	004771343	0,019	10/140



Selector actuator -symmetric head, 2pos. Non spring Return 0-90° deg.

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2-N90-R	Red	004771320	0,019	10/140
EGS2-N90-G	Green	004771321	0,019	10/140
EGS2-N90-C	Black	004771322	0,019	10/140
EGS2-N90-W	White	004771323	0,019	10/140

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Selector actuator -symmetric head, 3pos. Spring Return

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3-SS-R	Red	004771344	0,019	10/140
EGS3-SS-G	Green	004771345	0,019	10/140
EGS3-SS-C	Black	004771346	0,019	10/140
EGS3-SS-W	White	004771347	0,019	10/140



Symetric head actuator, 3 position with spring return from left 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3-SN-R	Red	004771348	0,019	10/140
EGS3-SN-G	Green	004771349	0,019	10/140
EGS3-SN-C	Black	004771350	0,019	10/140
EGS3-SN-W	White	004771351	0,019	10/140



Symetric head actuator, 3 position with spring return from right 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3-NS-R	Red	004771352	0,019	10/140
EGS3-NS-G	Green	004771353	0,019	10/140
EGS3-NS-C	Black	004771354	0,019	10/140
EGS3-NS-W	White	004771355	0,019	10/140



Key actuator, 2 position 0-1, 45°

Type	Colour	Code number	Function	Weight [kg]	Packaging [pcs]
EGK2-XY-C	Black	004771370	Without self return	0,05	10/140
EGK2-XZ-C	Black	004771372	With self return	0,05	10/140



Key actuator, 2 position 0-1, 90°

Type	Colour	Code number	Function	Weight [kg]	Packaging [pcs]
EGK2-XY45-C	Black	004771373	Without self return	0,05	10/140
EGK2-XY90-C	Black	004771371	Without self return	0,05	10/140
EGK2-XZ90-C	Black	004771374	With self return	0,05	10/140



Key actuator, 3 position 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGK3-ZXZ-C	Black	004771380	0,05	10/140
EGK3-YXY-C	Black	004771381	0,05	10/140
EGK3-ZXY-C	Black	004771382	0,05	10/140
EGK3-YXZ-C	Black	004771383	0,05	10/140



Twin touch actuator

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGT-C	Black	004771390	0,024	10/140

Integral Pushbuttons

Flush head integral pushbutton - 1 NO

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECF-10-R	Red	004771450	0,021	20/300
ECF-10-G	Green	004771451	0,021	20/300
ECF-10-Y	Yellow	004771452	0,021	20/300
ECF-10-C	Black	004771453	0,021	20/300
ECF-10-B	Blue	004771454	0,021	20/300
ECF-10-W	White	004771455	0,021	20/300
ECF-10-A	Amber	004771456	0,021	20/300



Flush head integral pushbutton - 1 NC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECF-01-R	Red	004771460	0,021	20/300
ECF-01-G	Green	004771461	0,021	20/300
ECF-01-Y	Yellow	004771462	0,021	20/300
ECF-01-C	Black	004771463	0,021	20/300
ECF-01-B	Blue	004771464	0,021	20/300
ECF-01-W	White	004771465	0,021	20/300
ECF-01-A	Amber	004771466	0,021	20/300



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Flush head integral pushbutton - 1 NO + 1 NC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECF-11-R	Red	004771470	0,025	20/300
ECF-11-G	Green	004771471	0,025	20/300
ECF-11-Y	Yellow	004771472	0,025	20/300
ECF-11-C	Black	004771473	0,025	20/300
ECF-11-B	Blue	004771474	0,025	20/300
ECF-11-W	White	004771475	0,025	20/300
ECF-11-A	Amber	004771476	0,025	20/300



Mushroom integral actuator, Push functiom, 1 NO

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECM-P10-R	Red	004771480	0,028	10/150

Mushroom integral actuator, Push functiom, 1 NC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECM-P01-R	Red	004771481	0,028	10/150



Mushroom integral actuator, Push-Turn functiom, 1 NO

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECM-T10-R	Red	004771482	0,028	10/150

Mushroom integral actuator, Push-Turn functiom, 1 NC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECM-T01-R	Red	004771483	0,028	10/150

Illuminated actuators



Flush head pushbutton

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGFI-R	Red	004771250	0,02	10/140
EGFI-G	Green	004771251	0,02	10/140
EGFI-Y	Yellow	004771252	0,02	10/140
EGFI-W	White	004771253	0,02	10/140
EGFI-B	Blue	004771254	0,02	10/140
EGFI-A	Amber	004771255	0,02	10/140



Projecting head actuator

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGPI-R	Red	004771270	0,02	10/140
EGPI-G	Green	004771271	0,02	10/140
EGPI-Y	Yellow	004771272	0,02	10/140
EGPI-W	White	004771273	0,02	10/140
EGPI-B	Blue	004771274	0,02	10/140
EGPI-A	Amber	004771275	0,02	10/140



Symetric head actuator, 2 position with spring return 0-1, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2I-S-R	Red	004771330	0,019	10/140
EGS2I-S-G	Green	004771331	0,019	10/140
EGS2I-S-W	White	004771332	0,019	10/140



Symetric head actuator, 2 position with non spring return 0-1, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2I-N-R	Red	004771333	0,019	10/140
EGS2I-N-G	Green	004771334	0,019	10/140
EGS2I-N-W	White	004771335	0,019	10/140

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Symetric head actuator, 2 position with non spring return 0-1, 90°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS2I-N90-R	Red	004771336	0,019	10/140
EGS2I-N90-G	Green	004771337	0,019	10/140
EGS2I-N90-W	White	004771338	0,019	10/140



Symetric head actuator, 3 position with spring return 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3I-SS-R	Red	004771360	0,019	10/140
EGS3I-SS-G	Green	004771361	0,019	10/140
EGS3I-SS-W	White	004771362	0,019	10/140



Symetric head actuator, 2 position with non-spring return 1-0-2, 45°

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGS3I-NN-R	Red	004771363	0,019	10/140
EGS3I-NN-G	Green	004771364	0,019	10/140
EGS3I-NN-W	White	004771365	0,019	10/140



Twin touch actuator

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EGTI-A	Amber	004771391	0,024	10/140
EGTI-Y	Yellow	004771392	0,024	10/140
EGTI-S	Colourless	004771393	0,024	10/140



ETISIG

Integral LED indicators

LED indicators 24 V AC/DC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECLI-024C-R	Red	004771210	0,018	20/300
ECLI-024C-G	Green	004771211	0,018	20/300
ECLI-024C-Y	Yellow	004771212	0,018	20/300
ECLI-024C-B	Blue	004771213	0,018	20/300
ECLI-024C-A	Amber	004771214	0,018	20/300
ECLI-024C-W	White	004771215	0,018	20/300



LED indicators 240 V AC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
ECLI-240A-R	Red	004771230	0,018	20/300
ECLI-240A-G	Green	004771231	0,018	20/300
ECLI-240A-Y	Yellow	004771232	0,018	20/300
ECLI-240A-B	Blue	004771233	0,018	20/300
ECLI-240A-A	Amber	004771234	0,018	20/300
ECLI-240A-W	White	004771235	0,018	20/300



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Accessories



Contacts

Type	Function	Code number	Weight [kg]	Packaging [pcs]
E-NO	Normally open contact - NO	004771500	0,008	20/1000
E-NC	Normally closed contact - NC	004771501	0,008	20/1000



LED holder 24 V AC/DC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAHI-024C-R	Red	004771508	0,01	30/450
EAHI-024C-G	Green	004771509	0,01	30/450
EAHI-024C-Y	Yellow	004771510	0,01	30/450
EAHI-024C-A	Amber	004771511	0,01	30/450
EAHI-024C-B	Blue	004771512	0,01	30/450
EAHI-024C-W	White	004771513	0,01	30/450



LED holder 240 V AC

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAHI-240A-R	Red	004771502	0,01	30/450
EAHI-240A-G	Green	004771503	0,01	30/450
EAHI-240A-Y	Yellow	004771504	0,01	30/450
EAHI-240A-A	Amber	004771505	0,01	30/450
EAHI-240A-B	Blue	004771506	0,01	30/450
EAHI-240A-W	White	004771507	0,01	30/450



Lens cap, for non-illuminated Flush head pushbuttons

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAF-R	Red	004771518	0,002	50
EAF-G	Green	004771520	0,002	50
EAF-Y	Yellow	004771522	0,002	50
EAF-A	Amber	004771526	0,002	50
EAF-B	Blue	004771524	0,002	50
EAF-W	White	004771515	0,002	50



Lens cap, for illuminated Flush head pushbuttons

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAFI-S	Colourless	004771514	0,002	50
EAFI-R	Red	004771519	0,002	50
EAFI-G	Green	004771521	0,002	50
EAFI-Y	Yellow	004771523	0,002	50
EAFI-A	Amber	004771527	0,002	50
EAFI-B	Blue	004771525	0,002	50



Adaptor Rings from 30 to 22mm

Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAR-F/R-Gr	Grey	004771530	0,002	50
EAR-R-Gr	Grey	004771531	0,002	50
EAR-F/R-C	Black	004771535	0,002	50
EAR-F-C	Black	004771536	0,002	50
EAR-F/R-Ch	Chrome	004771540	0,002	50
EAR-R-Ch	Chrome	004771541	0,002	50



Blanking Plugs

Typ	Colour	Code number	Weight [kg]	Packaging [pcs]
EAB-C-Gr	Grey	004771532	0,004	50
EAB-F-Gr	Grey	004771533	0,004	50
EAB-C-C	Black	004771537	0,004	50
EAB-F-C	Black	004771538	0,004	50
EAB-C-Ch	Chrome	004771542	0,004	50
EAB-F-Ch	Chrome	004771543	0,004	50

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Collar				
Type	Colour	Code number	Weight [kg]	Packaging [pcs]
EAC-C	Black	004771528	0,002	50
EAC-Ch	Chrome	004771529	0,002	50

Antirotation ring			
Type	Code number	Weight [kg]	Packaging [pcs]
EAA	004771534	0,002	50

Other				
Type	Function	Code number	Weight [kg]	Packaging [pcs]
EAX	Fixing device	004771539	0,029	50
EALP	Legend plate	004771544	0,002	50



LS LED indicators

Application:
- signaling the operating states of: electrical circuits, devices (switched off / switched on) and technological processes
- control panels
- replace incandescent lamps, neon and more

Advantages:
- LED long life
- ease of installation
- reliability



LS LED indicators			
Type	Code number	Name	Packaging [pcs]
LED indicator d=5 mm 24 V AC			
LS LED 5 G 24	004770801	LED indicator d=5 mm green 24 V AC	25/50/100
LS LED 5 R 24	004770802	LED indicator d=5 mm red 24 V AC	25/50/100
LS LED 5 Y 24	004770803	LED indicator d=5 mm yellow 24 V AC	25/50/100
LED indicator d=5 mm 230 V AC			
LS LED 5 G 230	004770804	LED indicator d=5 mm green 230 V AC	25/50/100
LS LED 5 R 230	004770805	LED indicator d=5 mm red 230 V AC	25/50/100
LS LED 5 Y 230	004770806	LED indicator d=5 mm yellow 230 V AC	25/50/100
LED indicator d=10 mm 24 V AC			
LS LED 10 G 24	004770807	LED indicator d=10 mm green 24 V AC	25/50/100
LS LED 10 R 24	004770808	LED indicator d=10 mm red 24 V AC	25/50/100
LS LED 10 Y 24	004770809	LED indicator d=10 mm yellow 24 V AC	25/50/100
LED indicator d=10 mm 230 V AC			
LS LED 10 G 230	004770810	LED indicator d=10 mm green 230 V AC	25/50/100
LS LED 10 R 230	004770811	LED indicator d=10 mm red 230 V AC	25/50/100
LS LED 10 Y 230	004770812	LED indicator d=10 mm yellow 230 V AC	25/50/100
LED indicator d=20 mm 24 V AC			
LS LED 20 G 24	004770813	LED indicator d=20 mm green 24 V AC	25/50/100
LS LED 20 R 24	004770814	LED indicator d=20 mm red 24 V AC	25/50/100
LS LED 20 Y 24	004770815	LED indicator d=20 mm yellow 24 V AC	25/50/100
LED indicator d=20 mm 230 V AC			
LS LED 20 G 230	004770816	LED indicator d=20 mm green 230 V AC	25/50/100
LS LED 20 R 230	004770817	LED indicator d=20 mm red 230 V AC	25/50/100
LS LED 20 Y 230	004770818	LED indicator d=20 mm yellow 230 V AC	25/50/100

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Push–button stations and enclosures

Push–button stations

















Pushbutton stations

Type	Description	Function	Scheme	Code number	Weight [kg]	Packaging [pcs]
ESE1-V2	Single station Flush head pushbutton - Red - STOP - 1,NC'	STOP (Red)	11 12	004771440	0,073	1/50
ESE1-V3	Single station Flush head pushbutton - Green - START - 1,NO	START (Green)	23 24	004771441	0,073	1/50
ESE2-V4	Two station - Flush head pushbutton - Green - START - 1,NO'; Flush head pushbutton - Red - STOP - 1,NC'	START (Green) STOP (Red)	23 24 11 12	004771442	0,127	1/50
ESE2-V5	Two station - Flush head pushbutton - Green - START - 1,NO'; Mushroom Head Actuator - Red - STOP - 1,NC'	ON (Green) OFF (Red)	23 24 11 12	004771443	0,135	1/50
ESE3-V6	Three station - Flush head pushbutton - Green - FORWARD - 1 ,NO'; Flush head pushbutton - Red - STOP - 1,NC' Flush head pushbutton - Green - REVERSE - 1,NO'	FORWARD (Green) STOP (Red) REVERSE (Green)	23 24 11 12 23 24	004771444	0,169	1/50
ESE3-V7	Three station - Flush head pushbutton - Green - UP - 1,NO'; Flush head pushbutton - Red - STOP - 1,NC'; Flush head pushbutton - Green - DOWN - 1,NO'	UP (Green) STOP (Red) DOWN (Green)	23 24 11 12 23 24	004771445	0,169	1/50
ESE3-V8	Three station - Red LED indicator 240V; Flush head pushbutton - Green - START - 1,NO'; Flush head pushbutton - RED - STOP - 1,NC'	LED indicator (Red) START (Green) STOP (Red)	23 24 11 12	004771446	0,172	1/50
ESE1Y-V1	Emergency STOP - Yellow cover, black base - Red Actuator	STOP (Red)	11 12	004771447	0,073	1/50

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Application:
Pushbutton stations are designed to control and operate gantries, cranes and lifts. They ensure easy and trouble-free operation in a variaty of weather conditions.

Advantages:
- Protection class IP65
- Possibility of mounting integral pushbuttons and LED indicators
- Durability and reliability

Enclosures

Empty enclosures

Type	Description	Code number	Weight [kg]	Packaging [pcs]
ESE1	Single station enclosure	004771545	0,054	1/50
ESE2	Two station enclosure	004771546	0,093	1/40
ESE3	Three station enclosure	004771547	0,11	1/30
ESE1Y	Single station enclosure, yellow cover/ black base	004771548	0,054	1/50

For empty enclosures can be mounted only integral pushbuttons and LED indicators





Technical data on page 571

Pushbuttons, selector switches, lights and control station enclosures

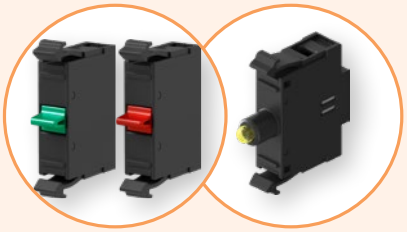




→ Standard device includes: the module itself, rubber seal, nut

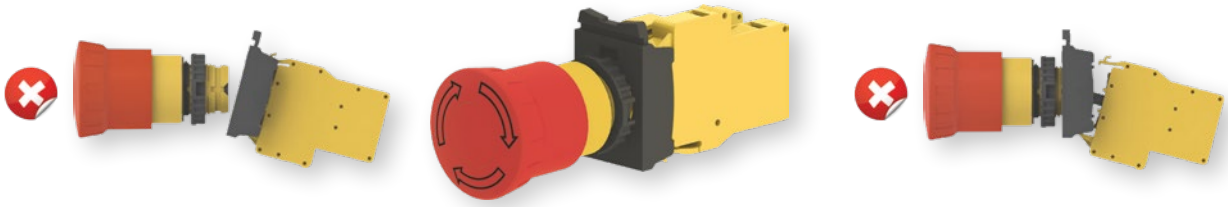


→ Cascade installation option for up to three levels



→ Possibility to mount contact blocks as well as LED module

Emergency STOP pushbutton with monitoring contact block



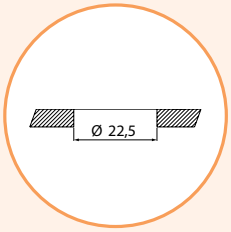
→ Latch module for set-reset function. Changes the position of the contacts of contact block by pressing once - latch function



→ Protection against accidental emergency pushbutton



→ Standard mounting diameter Ø22.5mm



→ Protective silicone cap for extra protection against dust and moisture



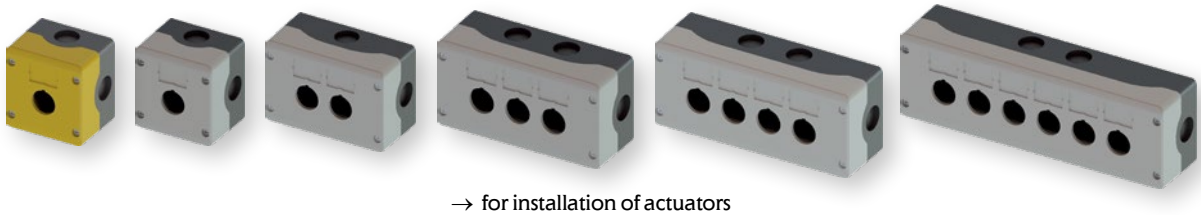
→ Adaptor for mounting actuators on the DIN rail



→ Label plates



Empty control stations enclosures



→ for installation of actuators

Actuators and enclosures

Pushbuttons, switches and signal lamps	
Standards	IEC 60947-5-1, ISO 13850 (EN 418), IEC 60947-5-5
Certificates	CE
Base material	Polyamide (PA66) or polycarbonate (PC)
Degree of protection IP	IP66 and IP52 (PB2I-F/RG) according to IEC 60529
Mechanical life	
Pushbuttons	3 x 10^6 cycles
Twin pushbuttons	2 x 10^6 cycles
Mushroom pushbuttons	3 x 10^5 cycles
Emergency STOP pushbuttons	1 x 10^5 cycles
Switch selectors	1 x 10^6 cycles
Applications	Outside or inside

Features:
- modular design,
- standard mounting diameter Ø22.5mm,
- snap fastening system,
- cascade installation possibility,
- IP66 degree of protection,
- silicone antidust covers.

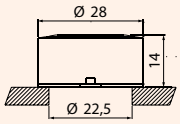
Contact blocks				
Rated insulation voltage Ui	690 V			
Rated insulation voltage pulse Uimp	4 kV			
IP degree of protection (IEC 60529)	IP20			
Conventional thermal current Ith	10 A			
Conformity to standards	IEC 60947-5-1, ISO 13850 (EN 418), IEC 60947-5-5			
Certifications	CE			
Electrical characteristics according to IEC 60947-5-1				
	BC...CS-NO/NC		BC-NC-PBM	
Application Category AC-15	**Ue (V AC)**	**Ie (A)**	**Ue (V AC)**	**Ie (A)**
	24	10	24	6
	48	10	48	6
	60	10	60	6
	110	6	110	6
	220	3	220	3
	380	2	380	2
	500	1,5	500	1,5
	600	1,2	600	1,2
Category of DC-13 application	**Ue (V DC)**	**Ie (A)**	**Ue (V DC)**	**Ie (A)**
	24	2,5	24	2,5
	48	1,4	48	1,4
	60	1	60	1
	110	0,55	110	0,55
	220	0,27	220	0,27
	300	0,2	300	0,2
	600	0,1	600	0,1
UL and CSA compliant design	AC/Heavy duty mode (A600) and DC/Standard mode (Q600)		-	
Contact resistance (IEC 60255)	≤ 25m Ω			
Protection against electric shock (IEC 60536)	Class II			
Cross-section of connectable conductors	1 x 0,5 mm^2 ... 2 x 2,5 mm^2			
Terminal torque	0,8 Nm			
Operational temperature	-25°C ... 70°C			
Vibration resistance (IEC 60068-2-6)	16 g for a frequency range of 40 to 500 Hz. Maximum gap of 0.75 mm (peak to peak)			
Mechanical life	1 x 10^6 cycles			

LED module	
Standards	IEC 60947-5-1
Operating voltage range	0,85...1,10 x Ue
Degree of protection IP (IEC 60529)	IP20
Consumption (V AC/V DC)	10 mA
Rated insulation voltage Ui (IEC 60947-1)	2,5 kV
Operational temperature range	-25°C ... 70°C
Lifetime	at least 100,000 hours
The power of light	Red 70 mcd
	Yellow 115 mcd
	White 275 mcd
	Blue 64 mcd
	Green 150 mcd
Cross-section of conductors to be connected	1 x 0,5 mm^2 ... 2 x 2,5 mm^2
Terminal torque	0,8 Nm

Non-illuminated actuators



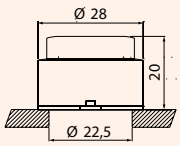
Flush head pushbutton (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBF-W	White	004774000		0,021	1/10
NSE-PBF-R	Red	004774001		0,021	1/10
NSE-PBF-G	Green	004774002		0,021	1/10
NSE-PBF-Y	Yellow	004774003		0,021	1/10
NSE-PBF-B	Blue	004774004		0,021	1/10
NSE-PBF-C	Black	004774005		0,021	1/10

* Important: The holder and contact block are not included



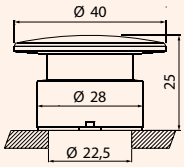
Extended head pushbutton (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBP-W	White	004774010		0,021	1/10
NSE-PBP-R	Red	004774011		0,021	1/10
NSE-PBP-G	Green	004774012		0,021	1/10
NSE-PBP-Y	Yellow	004774013		0,021	1/10
NSE-PBP-B	Blue	004774014		0,021	1/10
NSE-PBP-C	Black	004774015		0,021	1/10

* Important: The holder and contact block are not included

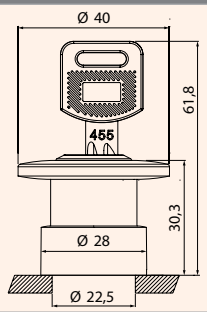


Mushroom pushbutton Ø 40 mm (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBM-R	Red	004774020		0,024	1/10
NSE-PBM-G	Green	004774021		0,024	1/10
NSE-PBM-C	Black	004774022		0,024	1/10

* Important: The holder and contact block are not included

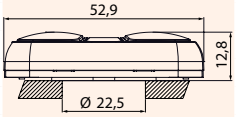
Mushroom pushbutton Ø 40 mm (latch, with key to release, non-illuminated)

Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBM-R-K	Red mushroom pushbutton (latch, with key to release)	004774023		0,09	1/10

* Important: The holder and contact block are not included

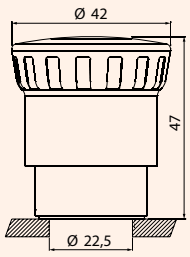
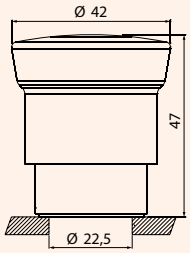


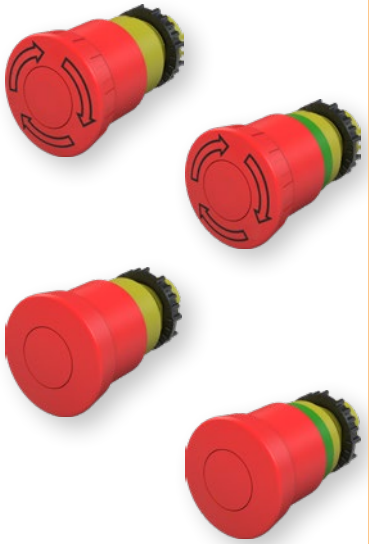
Twin pushbutton (spring return, non-illuminated)

Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PB2/RG-IO	Green/Red (I/O)	004774030		0,025	1/25
NSE-PB2/RG-STSP	Green/Red (START/STOP)	004774031		0,025	1/25
NSE-PB2/RG	Green/Red	004774032		0,025	1/25
NSE-PB2/WC-IO	White/Black (I/O)	004774033		0,025	1/25
NSE-PB2/WC-STSP	White/Black (START/STOP)	004774034		0,025	1/25
NSE-PB2/WC	White/Black	004774035		0,025	1/25
NSE-PB2/CC-PN	Black/Black (+/-)	004774036		0,025	1/25
NSE-PB2/CC-FR	Black/Black (↑/↓)	004774037		0,025	1/25

* Important: The holder and contact block are not included

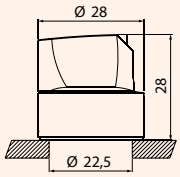
Emergency STOP mushroom pushbutton Ø 42 mm (latch, non-illuminated)

Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBM-T-R	Red (turn to release)	004774040		0,049	1/10
NSE-PBM-T-RG	Red (turn to release,with indication)	004774042			
NSE-PBM-P-R	Red (pull to release)	004774041		0,049	1/10
NSE-PBM-P-RG	Red (pull to release, with indication)	004774043			



* Important: The holder and contact block are not included

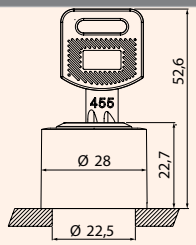
Two-position switch selector "0-1" (non-illuminated)

Type	Colour / description	Scheme	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-S2-F45	Black 45° (latch)		004774080		0,025	1/10
NSE-S2-F90	Black 90° (latch)		004774081		0,025	
NSE-S2-R45	Black 45°(spring return)		004774082		0,025	
NSE-S2-R90	Black 90°(spring return)		004774083		0,025	



* Important: The holder and contact block are not included

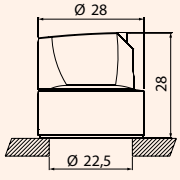
Switch key selector "0-1" (latch, non-illuminated)

Type	Colour / description	Scheme	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-S2K-F45	Black 45° (latch)		004774088		0,087	1



* Important: The holder and contact block are not included

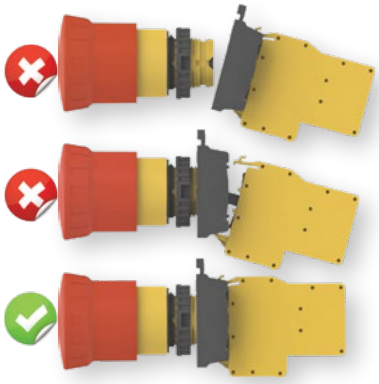
Three-position switch selector "1-0-2" (non-illuminated)

Type	Colour / description	Scheme	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-S3-F45	Black 45° (latch)		004774084		0,025	1/10
NSE-S3-R45	Black 45°(spring return)		004774085		0,025	
NSE-S3-RL45	Black, 45° (spring return left side)		004774086		0,025	
NSE-S3-RR45	Black, 45°(spring return right side)		004774087		0,025	



* Important: The holder and contact block are not included

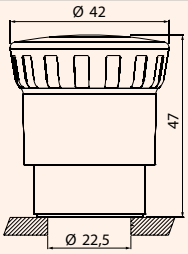
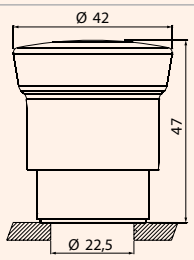
Mushroom pushbuttons for emergency STOP with monitoring function



Application - metering and signalling panels, control panels.
Emergency Mushroom pushbuttons are one of the most common and important devices for emergency shutdown and indication in case of emergency situations arising in electrical equipment circuits and control panels.
Warning: if the components are not installed correctly, the function of the appliance may be impaired. This can result in an emergency shutdown blockage, exposing users to additional risks.

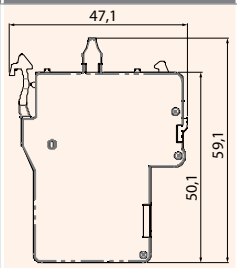
- The NSE-BC-NC-PBM self-monitoring contact block is designed to provide a higher level of installation safety and control. Its use with the NSE-PBM-T-RGM/NSE-PBM-P-RGM range of Emergency STOP pushbuttons provides electrical interlocking in the event of incomplete or incorrectly assembled Emergency Stop button components.
- Developed in accordance with international standards IEC 60947-5-5 and UL 508

Emergency STOP mushroom pushbutton Ø 42 mm, self-monitoring function (latch, non-illuminated)

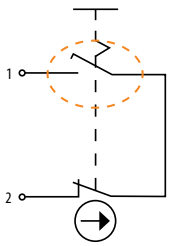
Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
 NSE-PBM-T-RGM	Red (turn to release,with indication, self monitoring option)	004774044		0,058	1/10
 NSE-PBM-P-RGM	Red (pull to release, with indication, self monitoring option)	004774045		0,058	1/10

* Important: The holder and contact block are not included

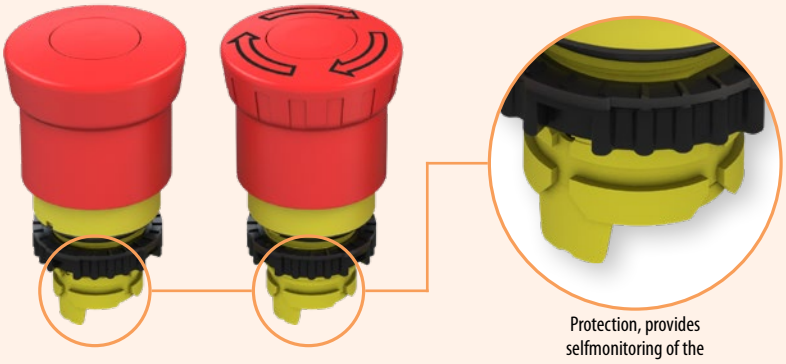
Contact block with self-monitoring function

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
 NSE-BC-NC-PBM	1NC contact block	004774114		0,023	1/10

Circuit diagram



NO contact closes when the mechanical connection is made correctly

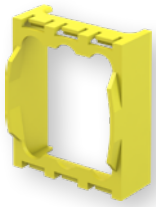


Protection, provides selfmonitoring of the mechanical assembly.

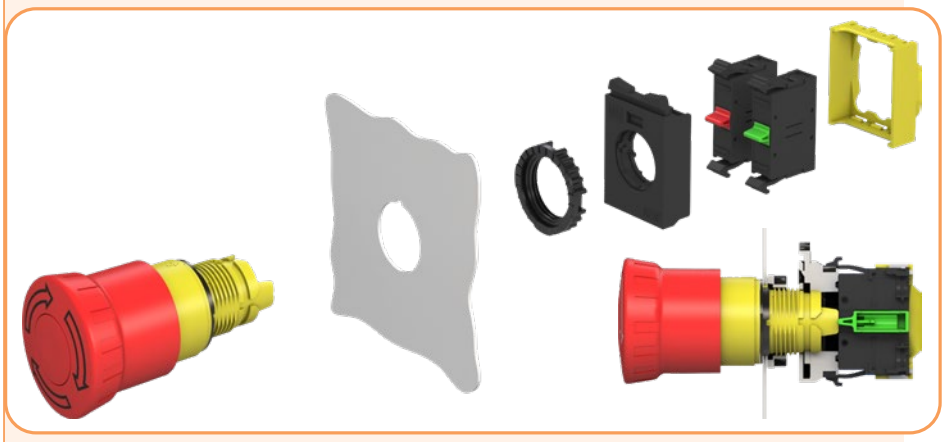
When using standard contact blocks, the NSE-PBMH retainer must be used. The contact block retainer allows all elements to be assembled into a single unit, provides greater safety and reduces the possibility of operating errors.

Contact block retainer

Type	Description	Code no	Compatibility	Weight [kg]	Packaging [pcs]
NSE-PBMH	Contact block retainer for checking the mechanical assembly.	004774046	Max number of contact blocks: 3 NSE-BC/CS-NO/NC blocks. Note: Does not allow overlapping of contacts	0,002	1/1

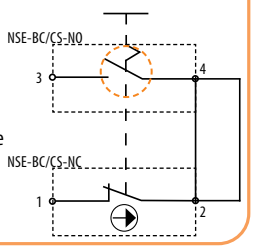


Installation of standard contact blocks for panel mounting



Wiring diagram for mounting standard contact blocks to ensure correct installation

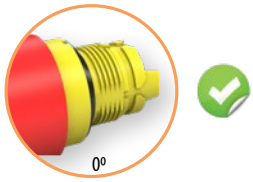
NO contact closes when the mechanical connection is made correctly

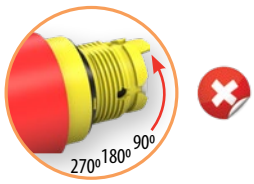


Installation of standard contact blocks for enclosure mounting



When installing the emergency STOP pushbuttons, this installation makes it possible to check the correct assembly

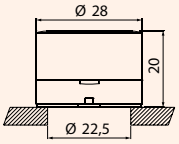




Illuminated actuators



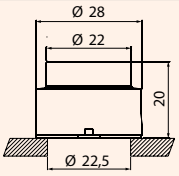
Flush head pushbutton (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBFI-W	White	004774050		0,021	1/10
NSE-PBFI-R	Red	004774051		0,022	1/10
NSE-PBFI-G	Green	004774052		0,022	1/10
NSE-PBFI-Y	Yellow	004774053		0,022	1/10
NSE-PBFI-B	Blue	004774054		0,022	1/10

* Important: The holder and contact block are not included



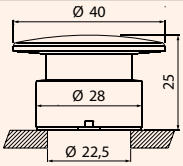
Extended head pushbutton (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBPI-R	Red	004774060		0,021	1/10
NSE-PBPI-G	Green	004774061		0,021	1/10

* Important: The holder and contact block are not included



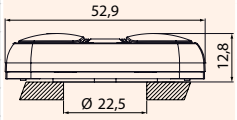
Mushroom pushbutton Ø 40 mm (spring return, non-illuminated)

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PBMI-R	Red	004774062		0,026	1/10

* Important: The holder and contact block are not included



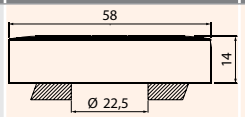
Twin pushbutton (spring return, non-illuminated)

Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PB2I/RG-IO	Green/Red (I/O)	004774070		0,025	1/25
NSE-PB2I/RG-STSP	Green/Red (START/STOP)	004774071		0,025	1/25
NSE-PB2I/RG	Green/Red	004774072		0,025	1/25
NSE-PB2I/WC-IO	White/Black (I/O)	004774073		0,025	1/25
NSE-PB2I/WC-STSP	White/Black (START/STOP)	004774074		0,025	1/25
NSE-PB2I/WC	White/Black	004774075		0,025	1/25
NSE-PB2I/CC-PN	Black/Black (+/-)	004774076		0,025	1/25
NSE-PB2I/CC-FR	Black/Black (↑/↓)	004774077		0,025	1/25

* Important: The holder and contact block are not included



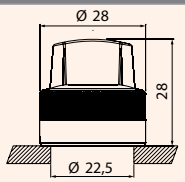
IP52 twin pushbutton (spring return, non-illuminated)

Type	Colour / description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PB2I-F/RG-IO	Green/Red (I/O)	004774078		0,025	1/10

* Important: The holder and contact block are not included



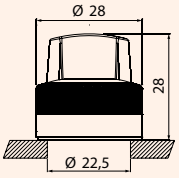
Two-position switch selector "0-1" (illuminated)

Type	Colour / description	Scheme	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-S2I-F90-R	Red 90° (latch)		004774090		0,02	1/10
NSE-S2I-F90-G	Green 90° (latch)		004774091		0,02	

* Important: The holder and contact block are not included



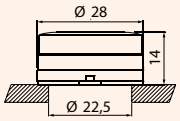
Three-position switch selector "1-0-2" (illuminated)

Type	Colour / description	Scheme	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-S3I-F45-R	Red 45° (latch)		004774092		0,02	1/10
NSE-S3I-F45-G	Green 45° (latch)		004774093		0,02	
NSE-S3I-F45-Y	Yellow 45° (latch)		004774094		0,02	

* Important: The holder and contact block are not included

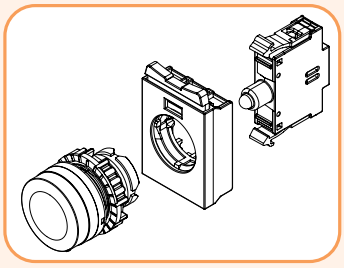
Caps for LED module

Caps for LED module

Type	Colour	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-ILM-HD-W	White	004774130		0,016	1/10
NSE-ILM-HD-R	Red	004774131		0,016	1/10
NSE-ILM-HD-G	Green	004774132		0,016	1/10
NSE-ILM-HD-Y	Yellow	004774133		0,016	1/10
NSE-ILM-HD-B	Blue	004774134		0,016	1/10
NSE-ILM-HD-O	Orange	004774135		0,016	1/10

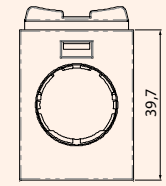
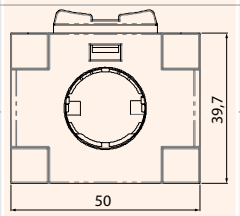


* Important: The holder and LED module are not included.



Accessories

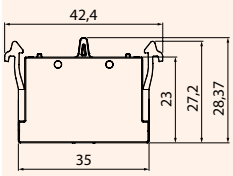
Holder for contact blocks and LED modules

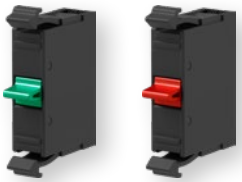
Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-FL3/10	3 module holder (10 pcs)	004774100		0,013	10
NSE-FL3	3 module holder (1 pc)	004774101		0,013	1/25
NSE-FL5/5	5 module holder (5 pcs)	004774102		0,02	5
NSE-FL5	5 module holder (1 pc)	004774103		0,02	1



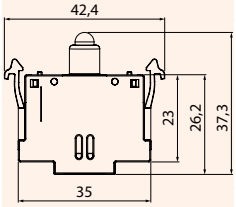


Contact block

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-BC-NO/10	1NO contact block (10 pcs)	004774110		0,015	10
NSE-BC-NO	1NO contact block (1 pc)	004774111		0,015	1/25
NSE-BC-NC/10	1NC contact block (10 pcs)	004774112		0,015	10
NSE-BC-NC	1NC contact block (1 pc)	004774113		0,015	1/25



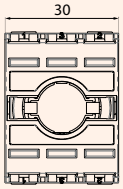
LED module

Type	Colour	Voltage	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-ILM-024U-W	White	24V AC/DC	004774120		0,016	1/10
NSE-ILM-024U-R	Red	24V AC/DC	004774121			
NSE-ILM-024U-G	Green	24V AC/DC	004774122			
NSE-ILM-024U-Y	Yellow	24V AC/DC	004774123			
NSE-ILM-024U-B	Blue	24V AC/DC	004774124			
NSE-ILM-240V-W	White	240 V AC	004774125			
NSE-ILM-240V-R	Red	240 V AC	004774126			
NSE-ILM-240V-G	Green	240 V AC	004774127			
NSE-ILM-240V-Y	Yellow	240 V AC	004774128			
NSE-ILM-240V-B	Blue	240 V AC	004774129			





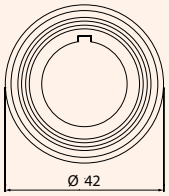
Latch module

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-BC-LF	For set-reset function. Changes the position of the contacts of contact block by pressing once - latch funkcion	004774115		0,019	1

* Important:
Mechanical push-on/push-off block for contact blocks mounted on buttons: CSW-BF, CSW-BFI, CSW-BS, CSW-BSI, CSW-BGA, CSW-BC, CSW-BCI
Note: use ONLY with contact block NSE-BC-NC (1NC) and NOT with NO contact block!!!



Adaptor ring

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-RR-30/22	Ø 30 mm ... Ø 22,5 mm	004774140		0,006	1

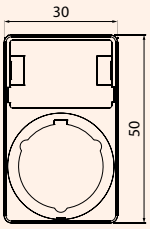
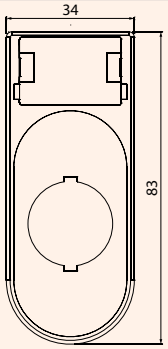

NSE-PH-SB+MP


NSE-PH-SB


NSE-PH-DB+MP

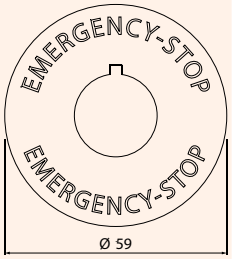

NSE-PH-DB

Label plates

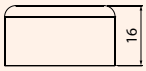
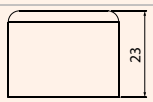
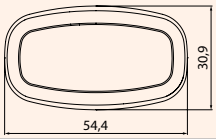
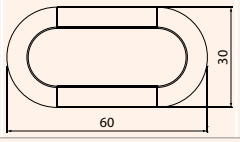
Type	Description / Compatibility	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PH-SB+MP	Label plate for marking plate (27 x 18 mm) with transparent cover	004774141		0,004	5
NSE-PH-SB	Label plate for marking plate (27 x 18 mm) without transparent cover	004774143			
NSE-PH-DB+MP	Label plate for marking plate (27 x 18 mm) with transparent cover, for IP52 twin pushbutton module	004774142		0,004	5
NSE-PH-DB	Label plate for marking plate (27 x 18 mm) with transparent cover, for IP52 twin pushbutton module without transparent cover	004774144			



Nameplate ring

Type	Colour / Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PL-EMG	Emergency STOP	004774145		0,009	5

Protective silicone cap

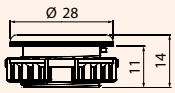
Type	Compatibility	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-SPC-PBF	Flush head non-illuminated pushbuttons and caps for LED module	004774170		0,005	5
NSE-SPC-PBP	Extended head and non-illuminated flush head pushbuttons	004774171		0,005	5
NSE-SPC-PB2*	Twin pushbuttons	004774172		0,005	5
NSE-SPC-PB2-F*	IP52 twin pushbutton, to ensure IP66 degree of protection	004774173		0,006	5





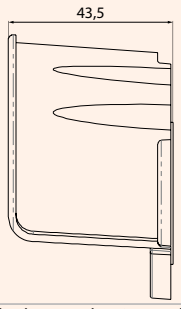
** Important: Not compatible with pushbutton in control station enclosures

Plug

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-HP	Plug Ø 22,5 mm	004774174		0,008	5



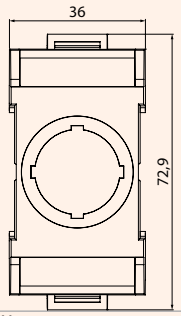
ES protection

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-PC-PBM	Protection against accidental pressing of the emergency STOP pushbutton	004774175		0,027	1



* Important: Only applicable for NSE-CS1-Y. You could install this accessory with other control stations models but you will need to disenable one hole closer this accessory

Adaptor for mounting actuators on DIN rail

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-ADR-1M	Allows the pushbutton/signal lamp/switch to be mounted on a 35mm DIN rail. Note: Does not allow the following accessories to be used: - Self-monitoring contact block (BCM01F-CSW); - 5-module contact block holder.	004774176		0,033	1



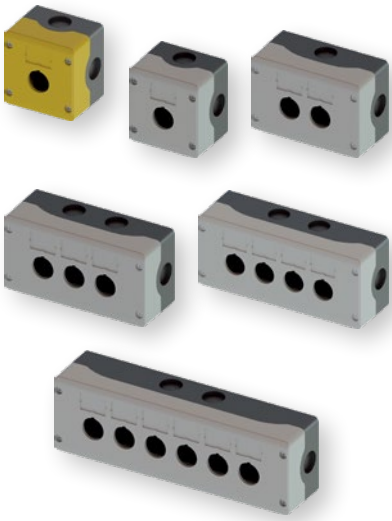
*Important: Not compatible with self-monitoring contact block NSE-BC-NC-PBM
*Important: Not compatible with the 5 module holder NSE-FL5

Assembly tool

Type	Description	Code no	Weight [kg]	Packaging [pcs]
NSE-FRT	Assembly tool for ring	004774177	0,025	1



Empty control station enclosures

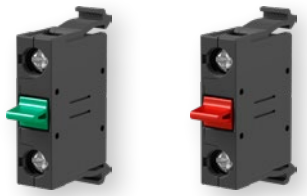


Control station enclosures	
Standards	IEC 60947-5-1, IEC 50102, IEC 60529, UL 508, UL 50
Certificates	CE
Degree of protection IP (IEC 60529)	IP66 (NEMA 4X)
Operating temperature	-25°C ... 70°C
Material	Polycarbonate (cover and base)
Colour	Grey (RAL 7035) or yellow (RAL 1003)
Base colour	Black (RAL 9005)
Cable entry	ØM20 / PG13,5 / 1/2" e ØM16 / 3/8"
Application	External/internal

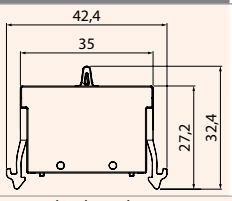
Empty control station enclosures

Type	Description	Colour	Code no	Weight [kg]	Packaging [pcs]
NSE-CS1-Y	Housing with 1 hole, emergency	Yellow-black	004774150	0,13	1
NSE-CS1-GR	1-hole housing	Grey-black	004774151	0,13	1
NSE-CS2-GR	2-hole housing	Grey-black	004774152	0,17	1
NSE-CS3-GR	3-hole housing	Grey-black	004774153	0,2	1
NSE-CS4-GR	4-hole housing	Grey-black	004774154	0,25	1
NSE-CS6-GR	6-hole housing	Grey-black	004774155	0,32	1

Accessories for enclosures



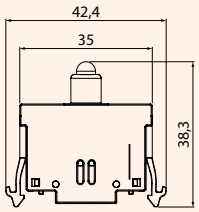
Contact block for enclosure mounting

Type	Description	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-BC/CS-NO	1NO contact module	004774156		0,15	1
NSE-BC/CS-NC	1NC contact module	004774157		0,15	1

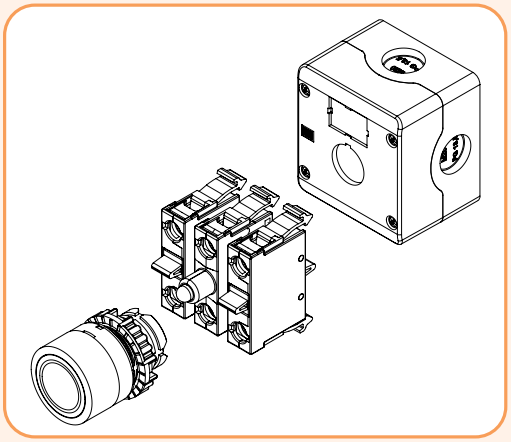
* Important: The contact blocks do not require a contact block holder to be mounted in the enclosure.
The contact blocks are fixed into the base of the enclosure.



LED module for enclosure mounting

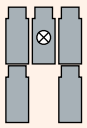
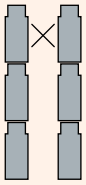
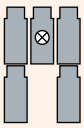
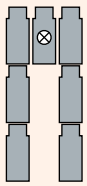
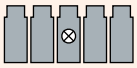
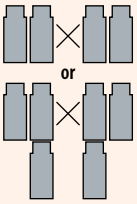
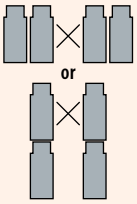
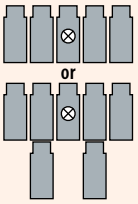
Type	Colour	Voltage	Code no	Dimensions	Weight [kg]	Packaging [pcs]
NSE-ILM-CS-024U-W	White	24V AC/DC	004774158		0,016	1/10
NSE-ILM-CS-024U-R	Red	24V AC/DC	004774159			
NSE-ILM-CS-024U-G	Green	24V AC/DC	004774160			
NSE-ILM-CS-024U-Y	Yellow	24V AC/DC	004774161			
NSE-ILM-CS-024U-B	Blue	24V AC/DC	004774162			
NSE-ILM-CS-240V-W	White	240 V AC	004774163			
NSE-ILM-CS-240V-R	Red	240 V AC	004774164			
NSE-ILM-CS-240V-G	Green	240 V AC	004774165			
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NSE-ILM-CS-240V-B	Blue	240 V AC	004774167			

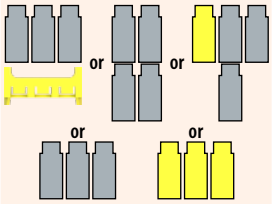
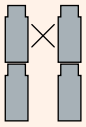
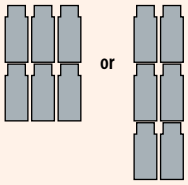
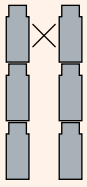
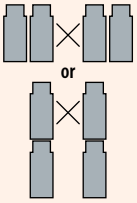
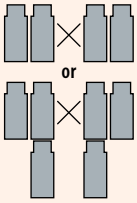
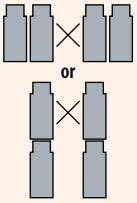
* Important: The module holder is not required for fitting the LED modules into the enclosure. The modules are fixed into the base of the enclosure.



Assembly configurations

Assembly configurations

Type	Illuminated switch selectors	Non-illuminated switch selectors	Illuminated pushbuttons	
	NSE-S2I / S3I	NSE-S2 / S3 / S2K	NSE-PB2I	NSE-PBMI, NSE-PB2I-F, NSE-PBFI, NSE-PBPI
Max. number of contacts	Max. 4	Max. 6	Max. 4	Max. 6
3-module holder NSE-FL3				
Max. number of contacts	Max. 4	Max. 6	Max. 4	Max. 6
5-module holder[1] NSE-FL5				

Type	Non-illuminated pushbuttons			
	NSE-PBM-T/P	NSE-PB2	NSE-PBF	NSE-PBM, NSE-PBP
Max. number of contacts	Max. 4	Max. 4	Max. 6	Max. 6
3-module holder NSE-FL3				
Max. number of contacts	-	Max. 4	Max. 6	Max. 6
5-module holder[2] NSE-FL5	-			

[1] LED modules for illumination can only be used in the middle position of the NSE-FL5 holder
[2] Do not use self-controlling contact blocks with the NSE-FL5 holder;
[2] Do not use emergency buttons with the NSE-FL5 flange


NSE-BC contact blocks


Mushroom button contact block with self-monitoring function NSE-BC-NC-PBM

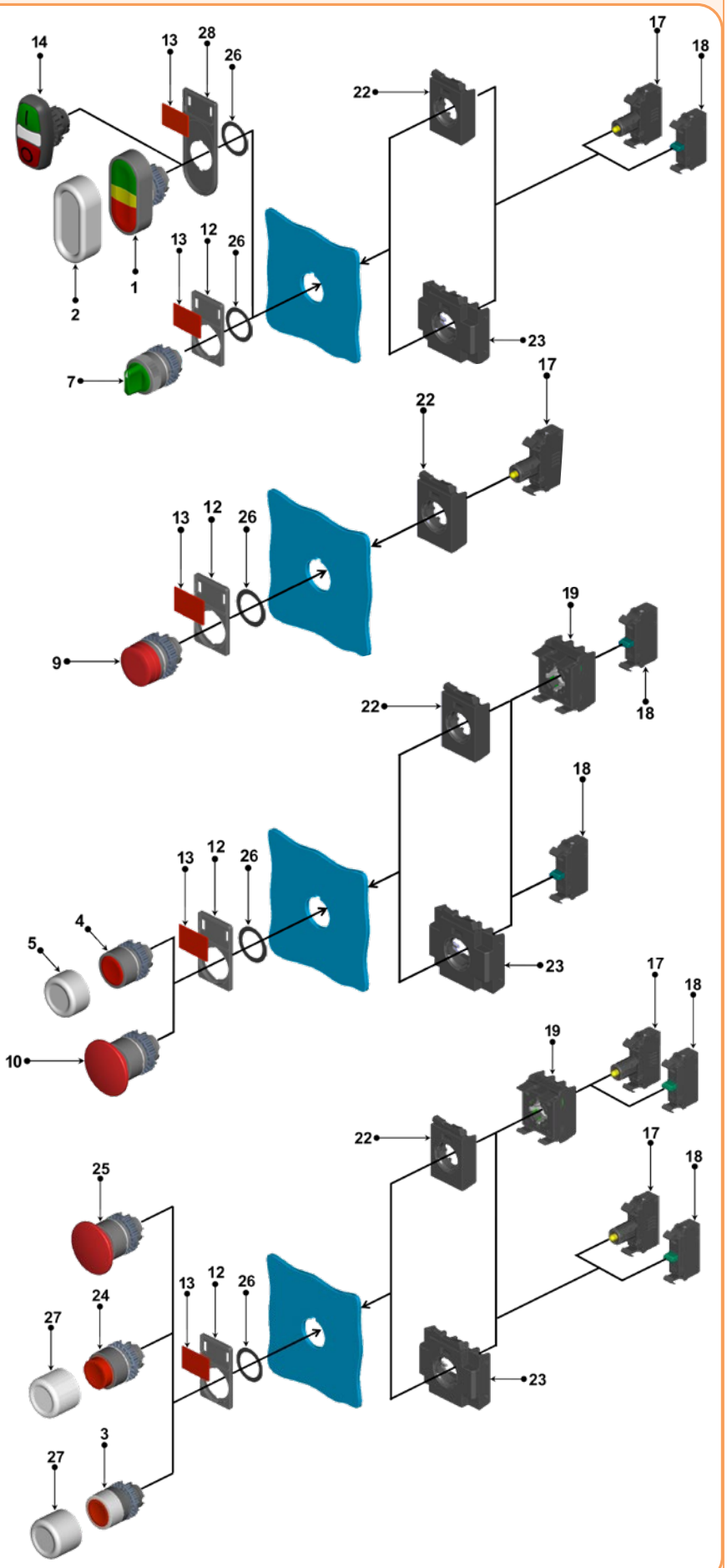

LED module NSE-ILM

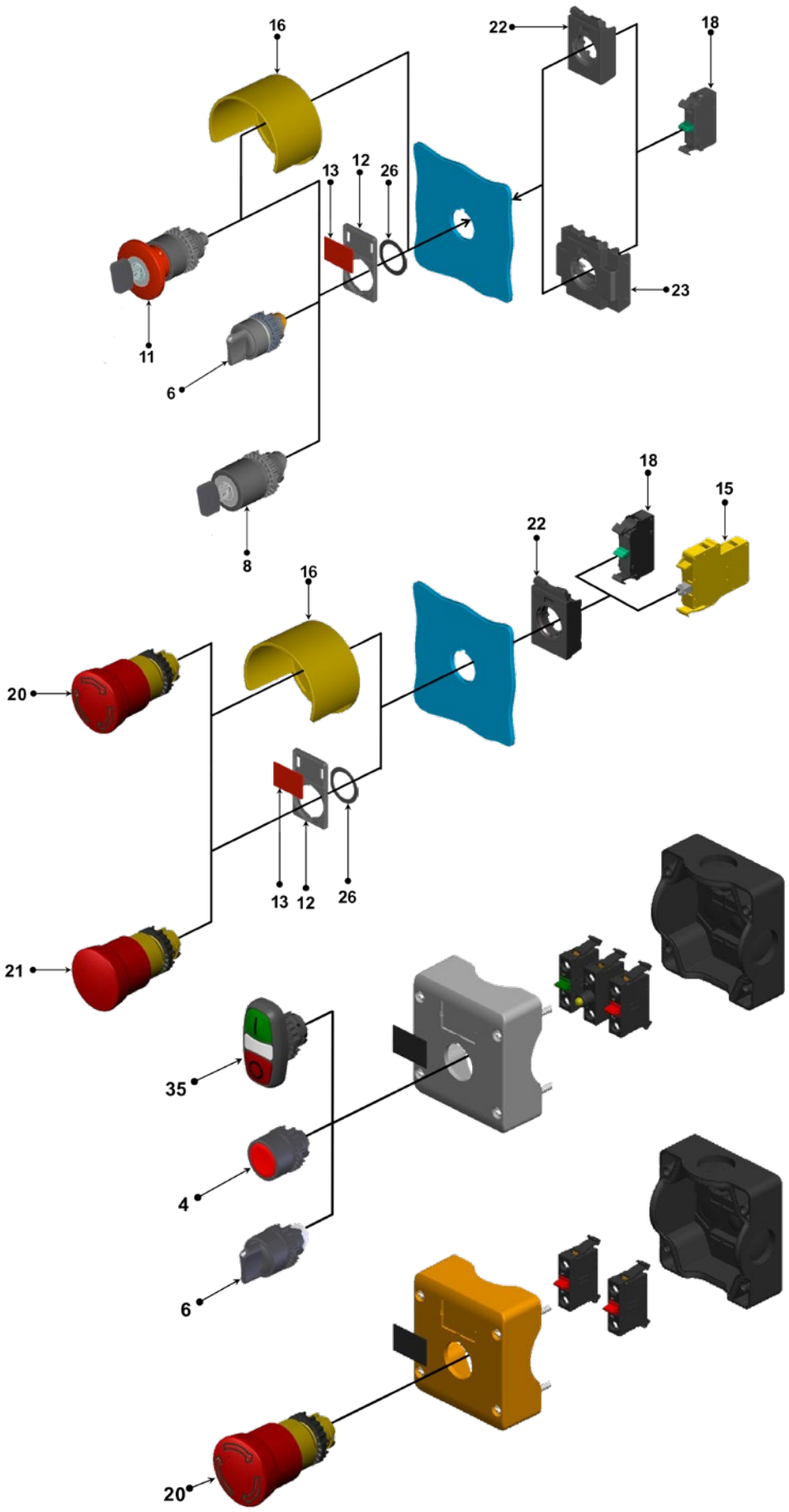

Pin block retainer


Installation is not allowed

Mounting

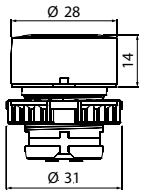
Legend	
№	Description
1	IP52 twin pushbutton
2	Protective silicone cap for twin pushbutton
3	Illuminated pushbutton
4	Flush head pushbutton
5	Protective silicone cap for flush head pushbutton
6	Switch/switch selector
7	Illuminated switch/switch selector
8	Switch key selector
9	Cap for LED module
10	Mushroom pushbutton
11	Mushroom pushbutton with key
12	Label plate
13	Marking plate (27 x 18 mm)
14	IP52 twin pushbutton
15	Mushroom pushbutton contact block with self-monitoring function
16	Protection against accidental pressing of the emergency STOP pushbutton
17	LED module
18	Contact block
19	Latch module
20	Emergency STOP mushroom pushbutton (turn to release)
21	Emergency STOP mushroom pushbutton (pull to release)
22	3-module holder for contact blocks and LED modules
23	5-module holder for contact blocks and LED modules
24	Extended head pushbutton, illuminated
25	Mushroom pushbutton, illuminated
26	Adaptor ring
27	Protective silicone cap for illuminated flush head and extended head pushbutton
28	Label plate for IP52 twin pushbutton



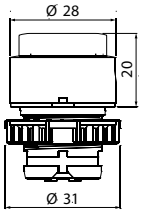

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Dimensions, mounting

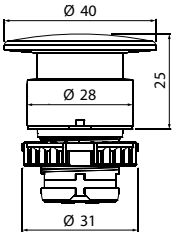
Non-illumitated flush head pushbutton



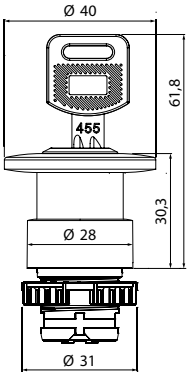
Non-illumitated extended head pushbutton



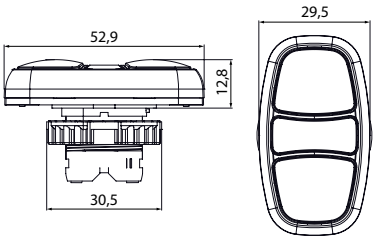
Mushroom pushbutton Ø 40 mm (illuminated)



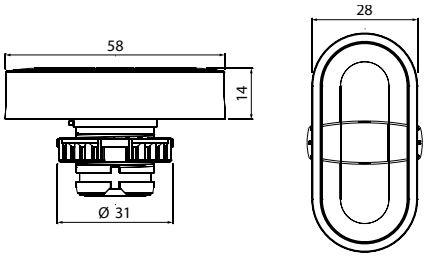
Mushroom pushbutton Ø 40 mm (with key)



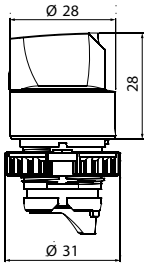
Twin pushbutton



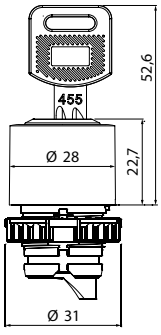
IP52 twin pushbutton



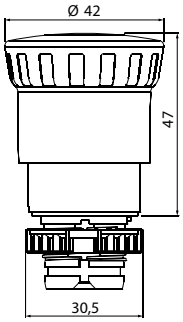
Non-illuminated two-position „0-1" and three-position „1-0-2" switch selector



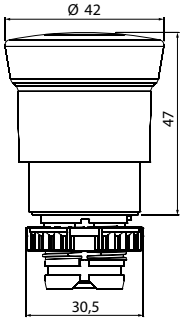
Two-position switch key selector „0-1"



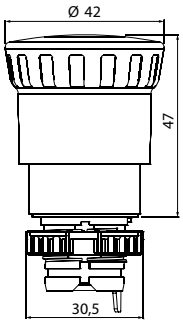
Emergency STOP mushroom pushbutton Ø 42 mm (turn to release)



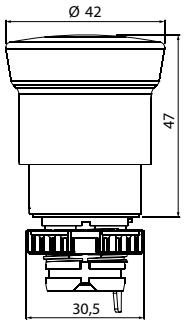
Emergency STOP mushroom pushbutton Ø 42 mm (pull to release)



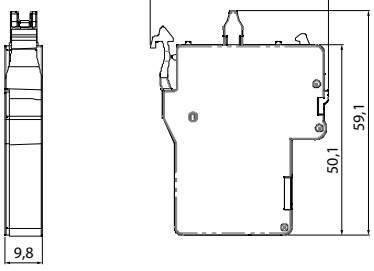
Emergency STOP mushroom pushbutton Ø 42 mm, self-monitoring function (turn to release)



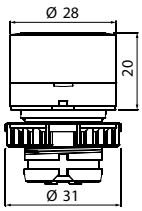
Emergency STOP mushroom pushbutton Ø 42 mm, self-monitoring function (pull to release)



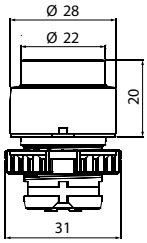
Contact block for Mushroom pushbutton with self-monitoring function



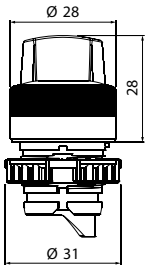
Illuminated flush head pushbutton



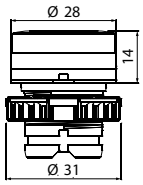
Illuminated extended head pushbutton



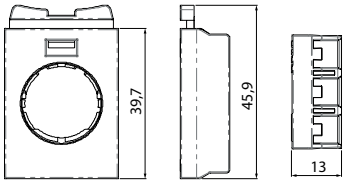
Illuminated two-position „0-1" and three-position „1-0-2" switch selector



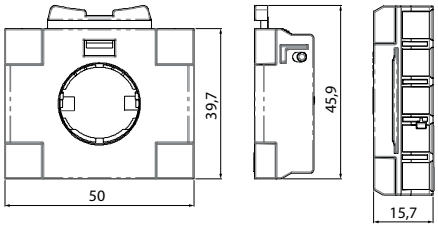
Cap for LED module



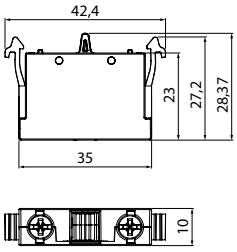
3-module holder for contact blocks and LED modules



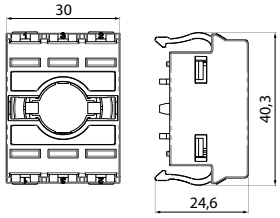
5-module holder for contact blocks and LED modules



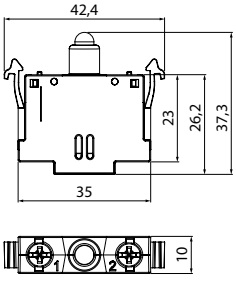
Contact block with screw terminals



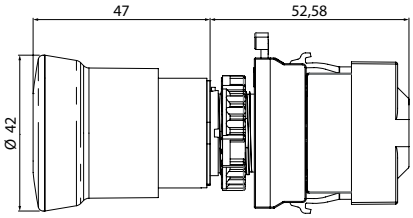
Latch module



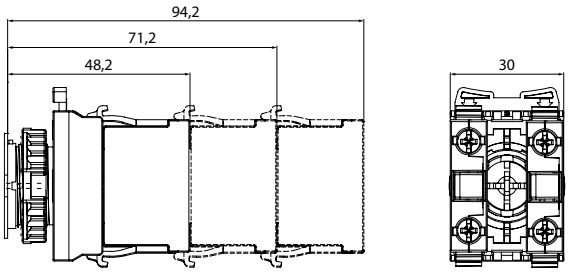
LED module

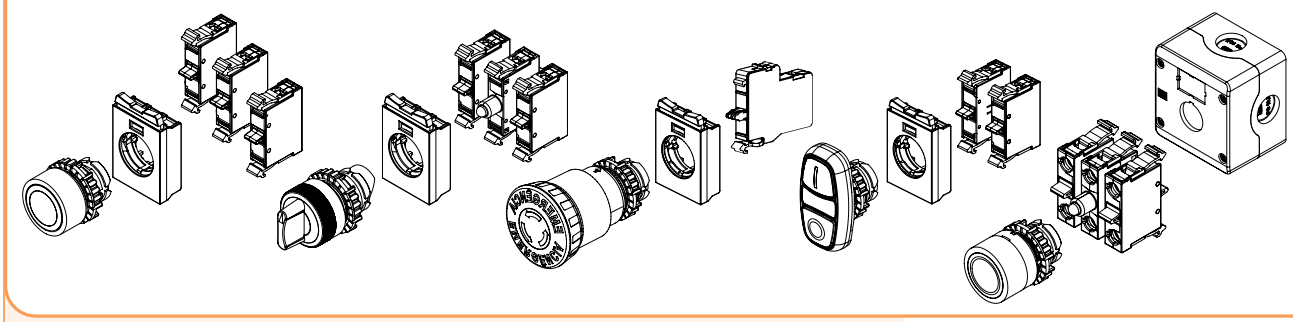


Mushroom emergency pushbutton kit:
- Emergency STOP mushroom pushbutton
- 3 modular contact block holder
- Contact blocks
- Module retainer

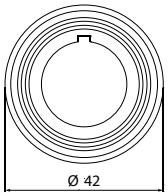


Installation of contact blocks 1, 2, 3 level

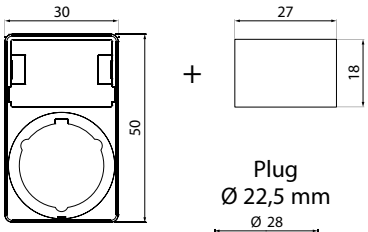




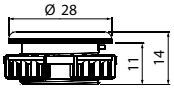
Adaptor ring



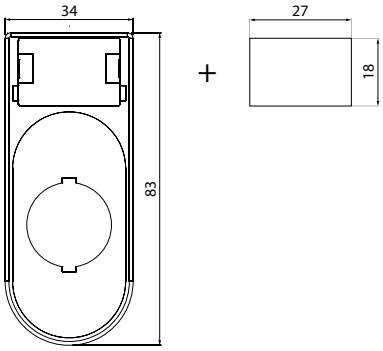
Label plate + marking plate (27 x 18 mm)



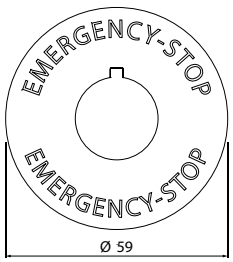
Plug
Ø 22,5 mm



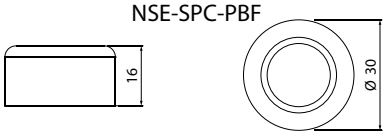
Label plate + marking plate (27 x 18 mm) for IP52 twin pushbutton module



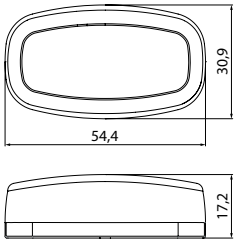
Name plate ring



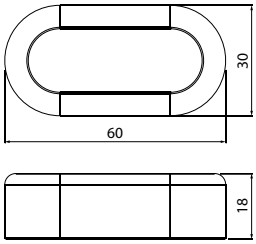
Protective silicone cap
NSE-SPC-PBF



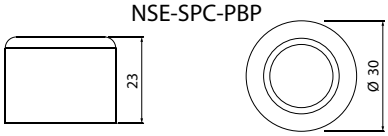
Protective silicone cap
NSE-SPC-PB2



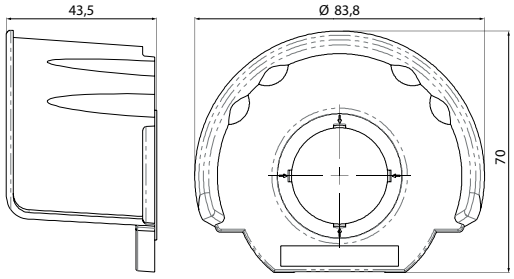
Protective silicone cap
NSE-SPC-PB2-F



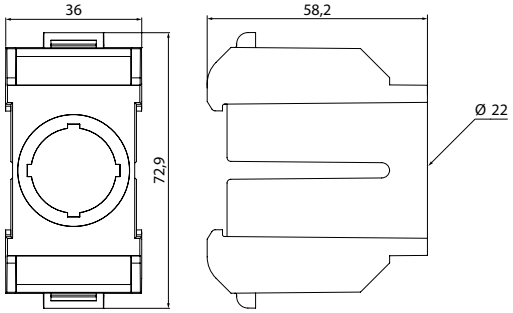
Protective silicone cap
NSE-SPC-PBP

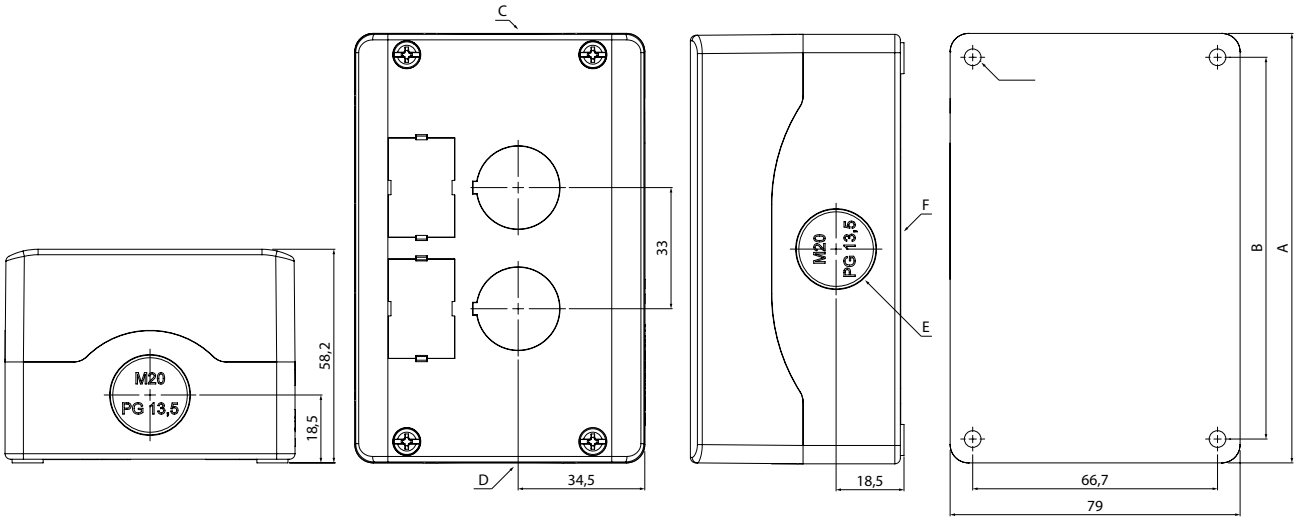


Protection against accidental pressing of the emergency STOP pushbutton



Adaptor for mounting on DIN rail





Enclosures

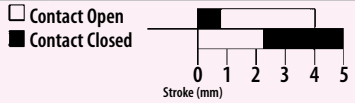
No. of holes	A	B	Cable entry			
			C (bottom)	D (above)	E (sideways)	F (with base)
1	74	66,7	1x ØM20/PG13,5	1x ØM20/PG13,5	1x ØM20/PG13,5	2x ØM16
2	117	104	1x ØM20/PG13,5	1x ØM20/PG13,5	1x ØM20/PG13,5	2x ØM16
3	150	137	1x ØM20/PG13,5	1x ØM20/PG13,5	2x ØM20/PG13,5	2x ØM16
4	183	170	1x ØM20/PG13,5	1x ØM20/PG13,5	2x ØM20/PG13,5	2x ØM16
6	249	236	1x ØM20/PG13,5	1x ØM20/PG13,5	2x ØM20/PG13,5	2x ØM16

Actuators and LED indicators

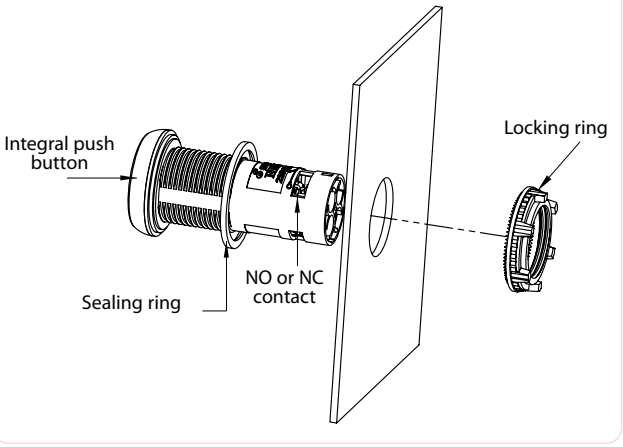
Non-illuminated actuators and LED indicators

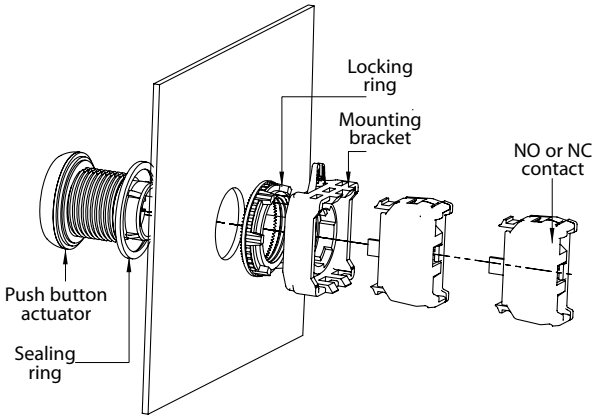
Product	22.5 mm Gen Next LED Indicators
Rated Voltage U_n	24 V AC/DC 240 V AC
Operating Voltage	-20% U_n ... +10% U_n
Type of LED	SMD LEDS
Available Colours	RED/GREEN/YELLOW/AMBER/BLUE/WHITE
Life	0.1 milion burning hour
Operating Temperature	-30°C ... 60°C
Storage Temperature	-25°C ... 70°C
Wire Termination Capacity	0.5mm², 1.5 - 2.5 mm²
Terminal Torque	0.5 Nm
LVGP	✓
Surge Test	2 kV
HV test for 60 sec.	1.5 kV
Degree of Protection	Above panel : IP65 For terminals : IP20
International Approvals	CE

Push button actuators and integral push buttons

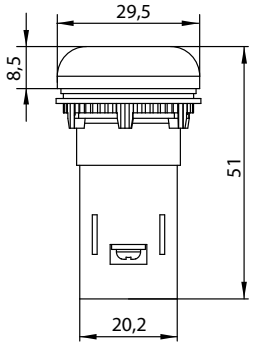
Utilization category	Supply	IEC - 60947-5-1	ITH / Thermal Current
	AC	AC-15	10 A
	DC	DC-13	
Contact	NO & NC		
Rated Voltage	230 V AC	24 V AC	
Rated Current	2 A	1.5 A	
Frequency	50-60 Hz		
Electrical Life for Contact	0.5 milion cycle		
HV Test for 60 sec	2.5kV (All Terminals Shorted Together)		
Rated insulation Voltage	600 V AC		
Terminals	Suitable for flexible or solid conductors from 2x1 mm² to 2x2.5 mm²		
Current Carrying Material	Brass		
Contacts Type	Make & Break		
Contact Material	AgNi		
Insulation Resistance at 500 VDC	> 50 Mohm		
Contact Resistance	>20 Mohm		
Function	Push, Push - Turn, Selector, Key		
Colour	RED/GREEN/YELLOW/ORANGE/BLACK/BLUE/WHITE		
Disposition of Contact			
Environmental Rating			
Operating Temperature	-30°C ... 60°C		
Storage Temperature	-25°C ... 70°C		
IP Rating	IP65 above panel (As per IEC/EN - 60529) & IP20 for Terminals NEMA 1,2,3,4,4X class 12 & 13		
RoHS Compliance	✓		
Mechanical Life for Actuators			
Momentary (Push Button with Push Function)	1 mio ops		
Emergency Stop (Turn to Release)	0.1 mio ops		
Selector	0.5 mio ops		

Mounting possibilities

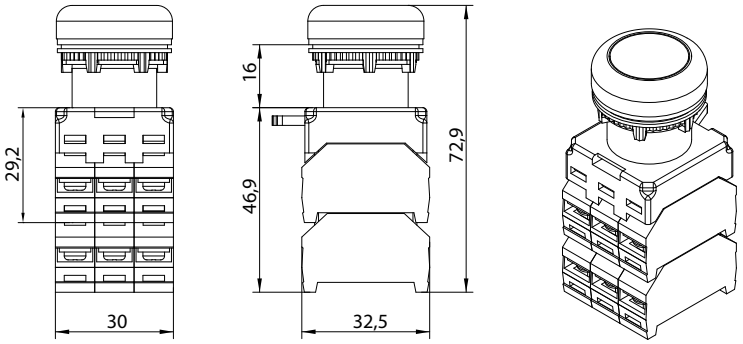




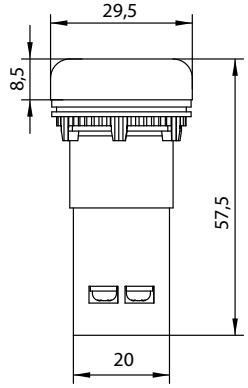
LED indicator



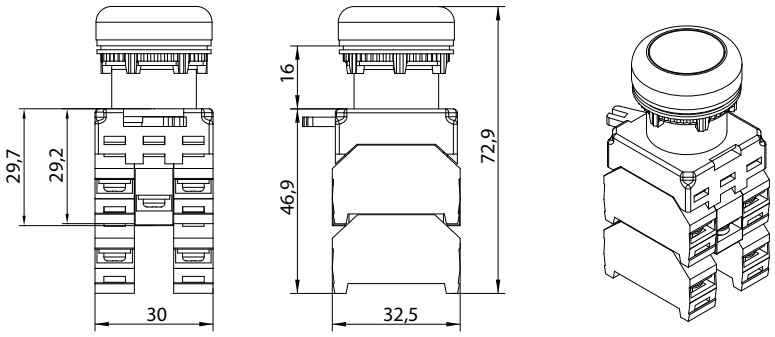
Push button actuator with 3 contacts in first row + 3 contacts in second row



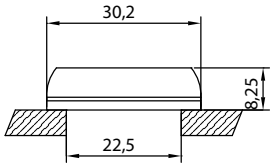
Integral push button



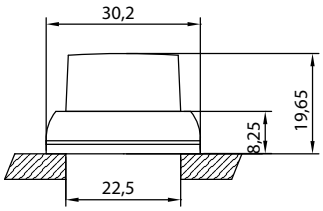
Push button actuator with 4 contacts and one LED holder



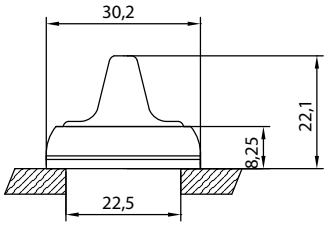
To one push button actuator can be applicated 3 contacts or 2 contacts and one LED holder (in one row of accessories)
To one push button actuator can be applicated 6 contacts or 4 contacts and one LED holder (in two rows of accessories)



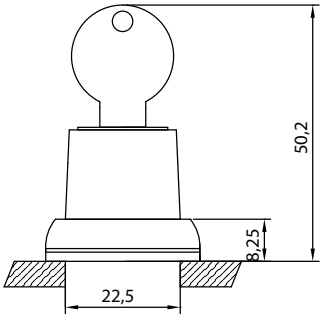
Flush head push button actuator



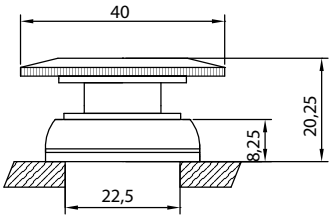
Projecting head push button actuator



Napęd pokrętny piórkiem



Key actuator

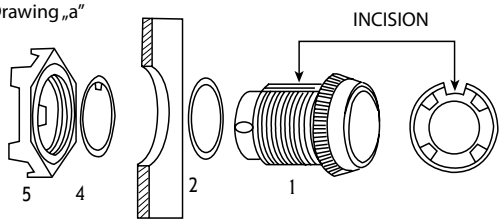


Mushroom head actuator

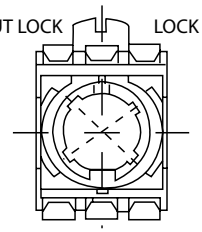
Above drawings apply to both Integral pushbuttons and pushbutton actuators.

Mounting holes for modular block assemblies

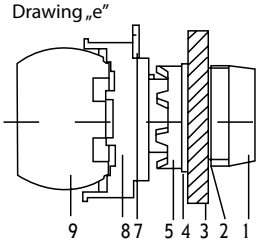
Drawing „a"



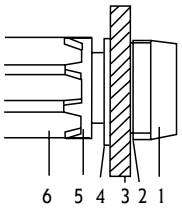
Drawing „d"



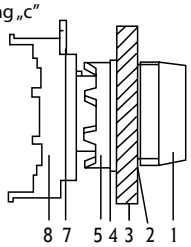
Drawing „e"



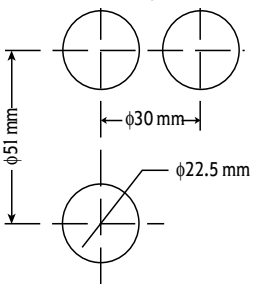
Drawing „b"



Drawing „c"

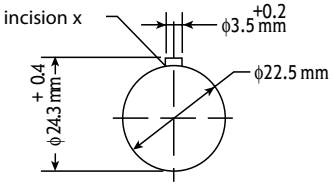


Drawing „f"



Openings plan for more than one actuator

Drawing „g"

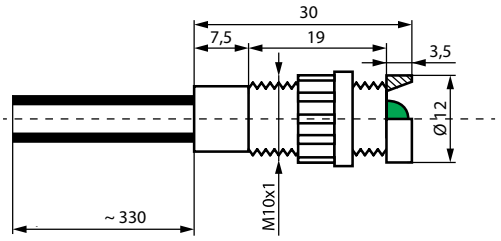


Opening plan for actuators with antirotating ring

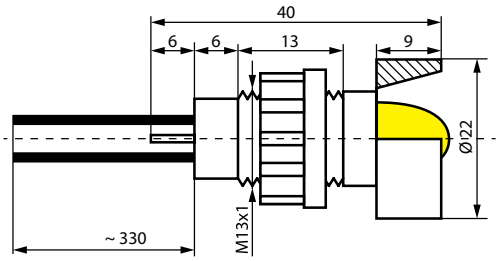
1) Drawing a and b - unscrew locking ring (5) from actuator (1)
2) Mount actuator with sealing ring (2) in mounting panel openings
3) Place antirotating ring (4) with incision on actuator and slide it to the opening with x incesion according to drawing g
4) Using a fixing device (6) tighten locking ring
5) Drawings c and d - switch locking ring (7) for first mounting bracket in OPEN position
6) Slide first moinnting bracket. Check if mounting bracket is oriented according to incision on actuator
7) Switch locking ring in CLOSED position
8) Drawing e - mount contacts or LED holders to the mounting bracket by latching them on the bracket

LS LED indicators

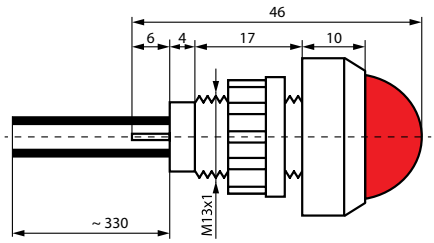
Technical data	
Operating voltage	230 V AC (with 230 V AC voltage - cord in lamps light colour)
Power consumption	1,0 W
Power cord	LGY 0,5 mm^2
Protection class	IP 20
Lamps are manufactured in various sizes	5 mm miniature, 10 mm medium, 20 mm giant
Colour	G - green, R - red, Y - yellow



MINIATURE - ø5 mm



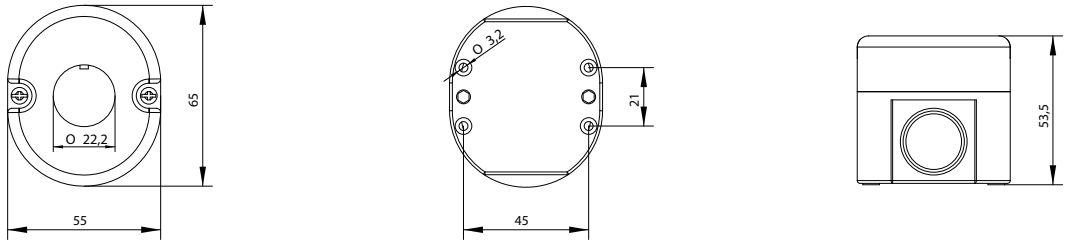
MEDIUM - ø10 mm



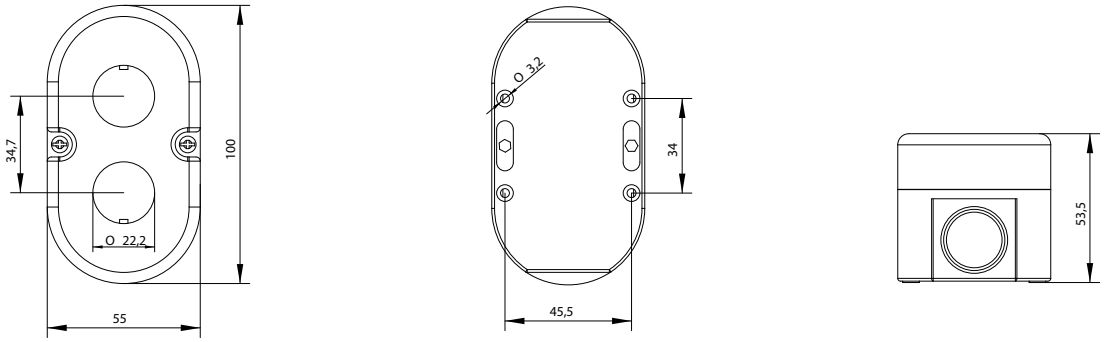
GIANT - ø20 mm

Enclosure

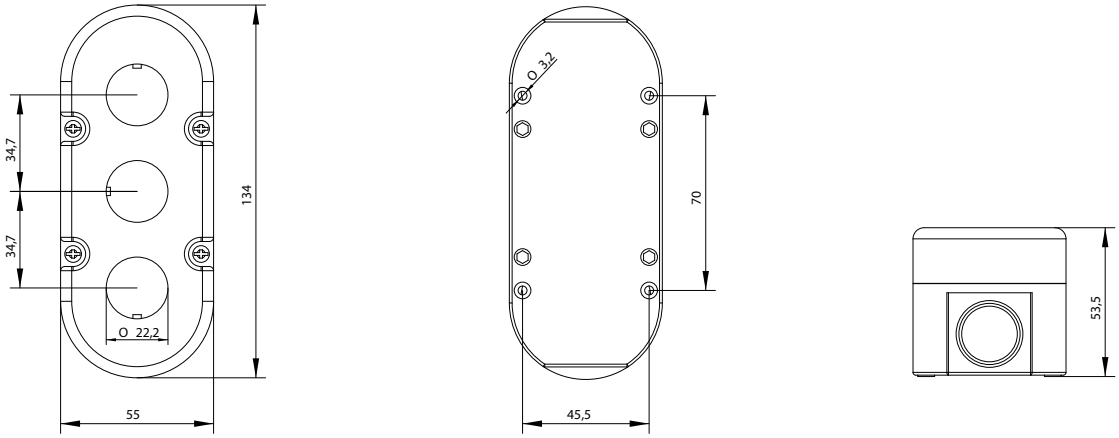
Single station enclosure



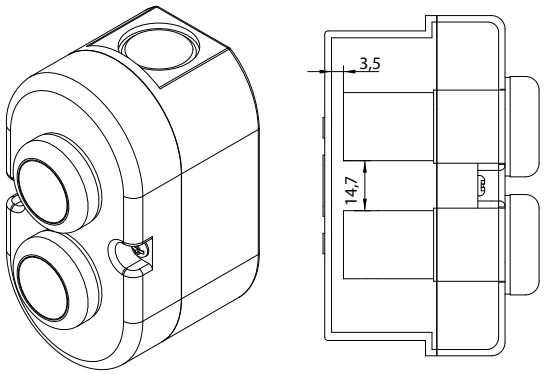
Two station enclosure



Three station enclosure



Two station push-button with integral push buttons



ETITEC

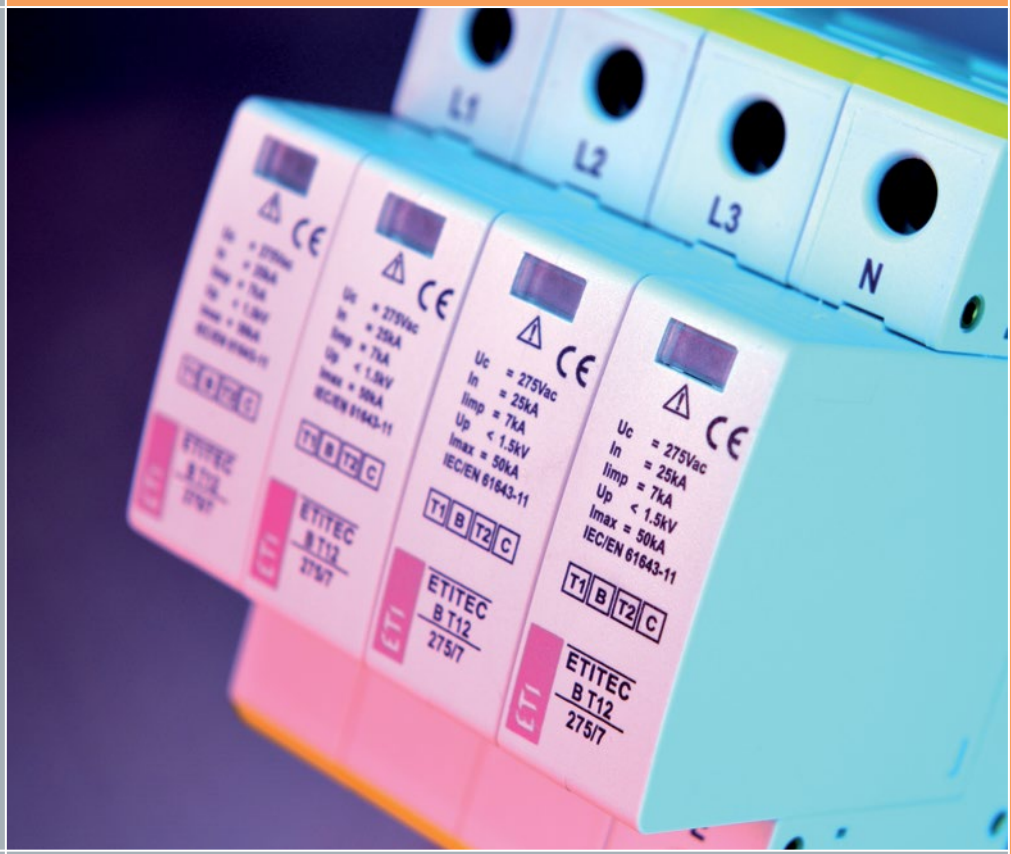
Surge arresters ETITEC V 574

Surge arresters ETITEC 580

Technical data 587

*Surge arresters for PV systems are in the Green Protect catalogue

Surge arresters



POWER NEEDS CONTROL

Surge arresters ETITEC V

Surge arrester ETITEC V T12

EN/IEC/VDE: T1,T2/I,II/B,C

Description
- Type 1 + 2 AC power surge protector
- I_n : 20 kA
- I_{imp} : 12,5 kA
- Pluggable module for each phase
- Remote signaling (option)
- EN 61643-11 and IEC 61643-11 compliant

Type designation:
ETITEC V T12 xxx/12,5 p+c RC

xxx - Uc voltage (max. AC operating voltage), must be above network voltage.
12.5 - 12,5kA(Iimp at 10/350µs)
p - number of poles with MOV
c - 0 for MOV at NPE pole, 1 for GDT (TT systems)
RC - remote contact (change over contact) for fault signalisation



ETITEC V T12 440/12,5 3+1

ETITEC V T12

Type	Code No.	I_{imp} (10/350) [kA]	I_n/I_{max} (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC V T12 280/12,5 1+0	002442900	12,5	20/50	280	TNC	129	1/72
ETITEC V T12 440/12,5 1+0	002442901	12,5	20/50	440	IT	129	1/72
ETITEC V T12 280/12,5 2+0	002442902	12,5	20/50	280	TNC-S	260	1/36
ETITEC V T12 280/12,5 1+1	002442903	12,5	20/50	280	TT	235	1/36
ETITEC V T12 440/12,5 2+0	002442904	12,5	20/50	440	IT	260	1/36
ETITEC V T12 280/12,5 3+0	002442905	12,5	20/50	280	TNC	390	1/24
ETITEC V T12 440/12,5 3+0	002442906	12,5	20/50	440	IT	390	1/24
ETITEC V T12 280/12,5 4+0	002442907	12,5	20/50	280	TNC-S	490	1/18
ETITEC V T12 280/12,5 3+1	002442908	12,5	20/50	280	TT	492	1/18
ETITEC V T12 440/12,5 4+0	002442909	12,5	20/50	440	IT	490	1/18
ETITEC V T12 280/12,5 1+0 RC	002442910	12,5	20/50	280	TNC	129	1/72
ETITEC V T12 440/12,5 1+0 RC	002442911	12,5	20/50	440	IT	129	1/72
ETITEC V T12 280/12,5 2+0 RC	002442912	12,5	20/50	280	TNC-S	260	1/36
ETITEC V T12 280/12,5 1+1 RC	002442913	12,5	20/50	280	TT	235	1/36
ETITEC V T12 440/12,5 2+0 RC	002442914	12,5	20/50	440	IT	260	1/36
ETITEC V T12 280/12,5 3+0 RC	002442915	12,5	20/50	280	TNC	390	1/24
ETITEC V T12 440/12,5 3+0 RC	002442916	12,5	20/50	440	IT	390	1/24
ETITEC V T12 280/12,5 4+0 RC	002442917	12,5	20/50	280	TNC-S	490	1/18
ETITEC V T12 280/12,5 3+1 RC	002442918	12,5	20/50	280	TT	492	1/18
ETITEC V T12 440/12,5 4+0 RC	002442919	12,5	20/50	440	IT	490	1/18

TT configurations: 1+1 and 3+1 housing size (height=82mm)...
Housing size (height=82mm) not compatible with all modular enclosures. It complies only to ECH series and SOLID GSX.

NOT COMPATIBLE WITH ECG, ECM, ACT and ECT series!

Technical data on page 587

Surge arrester ETITEC V T2

EN/IEC/VDE: T2/II/C

Description
- Type 2 AC surge protector
- I_n : 20 kA
- I_{max} : 40 kA
- Pluggable module for each phase
- Remote signaling option
- IEC 61643-11 and EN 61643-11 compliance
- UL1449 ed.4

Type designation:
ETITEC V T2 xxx/20 p+c RC

xxx - Uc voltage (max. AC operating voltage), must be above network voltage.
20 - 20kA(In at 8/20µs)
p - number of poles with MOV
c - 0 for MOV at NPE pole, 1 for GDT (TT systems)
RC - remote contact (Change over contact) for fault signalisation

ETITEC V T2

Type	Code No.	I_n/I_{max} (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC V T2 255/20 1+0	002442952	20/40	255	TNC	107	1/72
ETITEC V T2 255/20 2+0	002442953	20/40	255	TNC-S	263	1/36
ETITEC V T2 255/20 1+1	002442954	20/40	255	TT	216	1/36
ETITEC V T2 255/20 3+0	002442955	20/40	255	TNC	319	1/24
ETITEC V T2 255/20 4+0	002442956	20/40	255	TNC-S	420	1/18
ETITEC V T2 255/20 3+1	002442957	20/40	255	TT	431	1/18
ETITEC V T2 255/20 1+0 RC	002442958	20/40	255	TNC	107	1/72
ETITEC V T2 255/20 2+0 RC	002442959	20/40	255	TNC-S	263	1/36
ETITEC V T2 255/20 1+1 RC	002442960	20/40	255	TT	216	1/36
ETITEC V T2 255/20 3+0 RC	002442961	20/40	255	TNC	319	1/24
ETITEC V T2 255/20 4+0 RC	002442962	20/40	255	TNC-S	420	1/18
ETITEC V T2 255/20 3+1 RC	002442963	20/40	255	TT	431	1/18
ETITEC V T2 440/20 1+0 RC	002442964	20/40	440	TNC	107	1/72
ETITEC V T2 440/20 2+0 RC	002442965	20/40	440	TNC-S	263	1/36
ETITEC V T2 440/20 3+0 RC	002442966	20/40	440	TNC	319	1/24
ETITEC V T2 440/20 4+0 RC	002442967	20/40	440	TNC-S	420	1/18



ETITEC V T2 255/20 3+0

Technical data on page 589

Type 2 multipole SPDs

Description
- Compact single-phase Type 2 / Compact 3-phase Type 2
- I_n : 20 kA
- I_{max} : 40 kA
- Pluggable module
- Remote signaling contact (option)
- EN 61643-11 and IEC 61643-11 compliant

Type designation:
ETITEC V 2T2 xxx/20 p+c RC

xxx - Uc voltage (max. AC operating voltage), must be above network voltage.
20 - 20kA(In at 8/20µs)
p - number of poles with MOV
c - 0 for MOV at NPE pole, 1 for GDT (TT systems)
RC - remote contact (Change over contact) for fault signalisation



ETITEC V 2T2 255/20 2+0 RC



ETITEC V 2T2 255/20 4+0

ETITEC V 2T2

Type	Code No.	I_n/I_{max} (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC V 2T2 255/20 2+0	002442940	20/40	255	TNC-S	131	1/72
ETITEC V 2T2 440/20 2+0	002442941	20/40	440	TNC-S	131	1/72
ETITEC V 2T2 255/20 1+1	002442942	20/40	255	TT	140	1/72
ETITEC V 2T2 255/20 4+0	002442943	20/40	255	TNC-S	380	1/36
ETITEC V 2T2 440/20 4+0	002442944	20/40	440	TNC-S	380	1/36
ETITEC V 2T2 255/20 3+1	002442945	20/40	255	TT	240	1/36
ETITEC V 2T2 255/20 2+0 RC	002442946	20/40	255	TNC-S	131	1/72
ETITEC V 2T2 440/20 2+0 RC	002442947	20/40	440	TNC-S	131	1/72
ETITEC V 2T2 255/20 1+1 RC	002442948	20/40	255	TT	140	1/72
ETITEC V 2T2 255/20 4+0 RC	002442949	20/40	255	TNC-S	380	1/36
ETITEC V 2T2 440/20 4+0 RC	002442950	20/40	440	TNC-S	380	1/36
ETITEC V 2T2 255/20 3+1 RC	002442951	20/40	255	TT	240	1/36

Technical data on page 591

Type 3 (weak type2) multipole SPDs

Description
- Compact single-phase SPD / Compact 3-phase SPD
- I_n : 5 kA
- I_{max} : 15 kA
- Pluggable module
- Remote signaling contact (option)
- IEC 61643-11 and EN 61643-11 compliant

Type designation:
ETITEC V 2T3 xxx/5 p+c RC

xxx - Uc voltage (max. AC operating voltage), must be above network voltage.
5 - 5kA(In at 8/20µs)
p - number of poles with MOV
c - 0 for MOV at NPE pole, 1 for GDT (TT systems)
RC - remote contact (Change over contact) for fault signalisation

Hard-wired AC Surge Protectors

Description - ETITEC L3 255/3/6
- Ultra Compact Type 3 surge protectors for 230 Vac networks
- Mounting on plate or terminal
- Disconnection signaling by buzzer or Led system
- 24 V AC or DC version available
- EN 61643-11, IEC 61643-11 and UL1449 4ed. compliant

ETITEC L3 255/3/6

These very compact surge protectors can be integrated in the very small volumes of certain lights (linear LEDs). The surge protection circuit is equipped with an end of life indicator buzzer in order to indicate the disconnection of the surge protector.

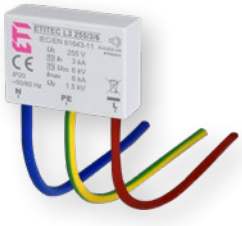
Description - ETITEC L3 255/3/10
- Compact Type 2 and 3 surge protectors
- Wall mounting and hard wired connection
- UL1449 4ed. and IP 66
- Status indicators
- EN 61643-11, IEC 61643-11 and UL1449 4ed. compliant

ETITEC V 2T3

Type	Code No.	I_n/I_{max} (8/20) [kA]	U_{oc} [kV]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC V 2T3 255/5 2+0	002442968	5/15	10	255	TNC-S	104	1/72
ETITEC V 2T3 440/5 2+0	002442969	5/15	10	440	TNC-S	104	1/72
ETITEC V 2T3 255/5 1+1	002442970	5/15	10	255	TT	111	1/72
ETITEC V 2T3 255/5 4+0	002442971	5/15	10	255	TNC-S	218	1/36
ETITEC V 2T3 440/5 4+0	002442972	5/15	10	440	TNC-S	218	1/36
ETITEC V 2T3 255/5 3+1	002442973	5/15	10	255	TT	218	1/36
ETITEC V 2T3 255/5 2+0 RC	002442974	5/15	10	255	TNC-S	104	1/72
ETITEC V 2T3 440/5 2+0 RC	002442975	5/15	10	440	TNC-S	104	1/72
ETITEC V 2T3 255/5 1+1 RC	002442976	5/15	10	255	TT	111	1/72
ETITEC V 2T3 255/5 4+0 RC	002442977	5/15	10	255	TNC-S	218	1/36
ETITEC V 2T3 440/5 4+0 RC	002442978	5/15	10	440	TNC-S	218	1/36
ETITEC V 2T3 255/5 3+1 RC	002442979	5/15	10	255	TT	218	1/36
ETITEC L3 255/3/6	002442987	3/6	6	255	TNC-S 1ph.	20	1/72



ETITEC V 2T3 255/5 3+1



ETITEC L3 255/3/6

LED lighting protection

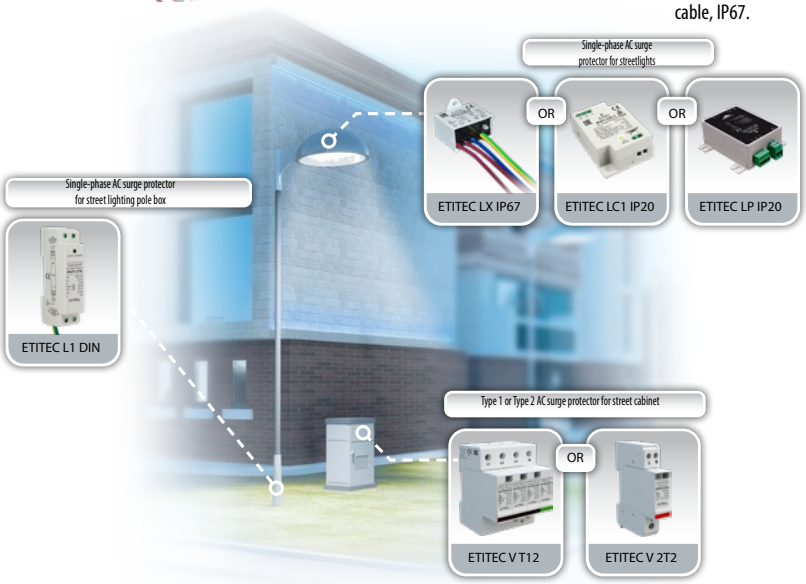
ETITEC LC1 IP20 range is a compact solution surge protectors to be installed in small spaces. These devices are available in 2 types of connectors (screw terminal or spring) and in two orientations wiring (input / output opposite or input / output on the same side) in order to adapt to the installation as much as possible. In cases of extreme aggression, lightning LC1 will be in a state of safe end of life: the indication of failure (disconnection) of the surge protector is performed by the extinction of an indicator and switching off the AC (extinction street luminaire) inform the user of the need for maintenance.

ETITEC LX range is an ultra compact surge protection solution for installation in extremely tight spaces. These surge protectors are available with an output by drivers and fixing bracket. In the end of life of security the LX indicates its failure (disconnection) by the extinction of an indicator and AC power supply switching off (extinction of the candelabra) inform the user of the need for maintenance. They are available in IP67.

ETITEC LP range is a complete range of AC surge protectors specifically designed for the protection of LED lighting systems at the lantern. Many versions have been proposed to meet the various existing configurations : surge protection devices are available in different isolation classes (Class 1, Class 2) and connection type (wire or screw terminal). Some versions are equipped with additional protection for data line option (RS485,DALI, 0-10V) to provide a complete solution for LED systems with control lines. In cases of extreme aggression, the surge protector will be in a state of retirement security: according to the different versions available, an indication of the failure of the surge protector is performed by the extinction of an indicator, a AC power supply failure and / or through a remote signalisation.

ETITEC L1 DIN device is installed inside the bottom of the lighting pole: its very compact dimension allows a easy integration with the connection box, on DIN rail . L1 is based on a powerful association of MOV and GDT components, secured by thermal disconnector and connection light indicator.

Type		Description	Characteristics	Properties	Network
ETITEC L1 DIN		DIN surge protector type 2 or 3	Compact. Montage DIN	Type 2+3, CM/DM, mounted in connection box on DIN rail.	Supply 230 V AC
ETITEC LP1 IP20 ETITEC LP2 IP20		Hard-wired surge protector type 2 or 3	Remote signaling and data in option	Type 2 + 3, protection class I (GDT to earth), screw terminal. Type 2 + 3, protection class II, screw terminal for double insulated fixtures.	
ETITEC LC1 IP20		Compact, hard-wired surge protector type 2 and type 3	Compact. Many configurations	Type 2 + 3, protection class I (GDT to earth), screw terminal, very compact	
ETITEC LX1 IP67 ETITEC LX2 IP67		Ultra-compact hard-wired surge protector type 2+3	Ultra compact IP67 VG Technology	Type 2 + 3, protection class I (GDT to earth), connection cable, IP67. Type 2 + 3, protection class II for double insulated fixtures, connection cable, IP67.	



ETITEC LC1 IP20
- Type 2 (or 3) surge protectors for LED lighting
- Very compact
- Plate mounting
- Screw terminal or spring terminal connection
- Status indicator
- End of life AC Disconnection
- IEC 61643-11 and EN 61643-11 compliance

ETITEC LP1 and LP2
- Type 2 (or 3) surge protector
- Class I or Class II configurations
- Comprehensive range for all configurations
- Compact dimensions
- IP65 version
- Combined AC/Dataline version
- Wire connection
- Max. discharge current 10 kA
- IEC 61643-11 and EN 61643-11 compliant

ETITEC LX
- Ultra compact Type 2 + 3 surge protector for 230 Vac networks
- For Classe I and Classe II
- Wall mounting and hard wired connection
- Breakable mounting bracket
- Protection rating : IP67
- Disconnection signaling by indicator
- AC disconnection in case of end of life

ETITEC L1 DIN
- Type 2 (or 3) surge protectors for Led
- Very compact (low profile)
- DIN rail mounting
- Screw terminal connection
- Status indicator
- Disconnection AC end of life
- IEC 61643-11 and EN 61643-11 compliance

LED lighting protection

Type	Code No.	I_n/I_{max} (8/20) [kA]	Uoc [kV]	U_c [V AC]	I_L [A]	Weight [g]	Packaging [pcs]
ETITEC LC1 IP20	002442980	5/10	10	320	5	35	1/36
ETITEC LP1 IP20	002442981	5/10	10	305	2,5	79	1/36
ETITEC LP2 IP20	002442982	5/10	10	305	2,5	79	1/36
ETITEC LX1 IP67	002442983	5/10	10	320	10	52	1/36
ETITEC LX2 IP67	002442984	5/10	10	320	10	52	1/36
ETITEC L1 DIN	002442985	5/10	10	320	10	107	1/72


ETITEC LC1 IP20


ETITEC LP2 IP20


ETITEC LX1 IP67


ETITEC LP1 IP20


ETITEC L1 DIN


ETITEC LX1 IP67

Surge arresters ETITEC

Surge arrester ETITEC T WENT group B, EN/IEC/VDE: T1, T2/I,II/B+C

Advantages:
- remote signalisation - auxiliary contact (only RC type)
- mounting on DIN rail
- connection up to 35mm²
- high discharge currents
- high degree of protection
- varistor is the protective element
- IEC/EN 61643-11
- RoHS compliant

Description
ETITEC T WENT is surge arrester for indoor installation, internal protection of electrical system. Group WENT surge protection is in accordance with VDE class B, C. This protection corresponds to IEC category I, II. The protection is made on the main distribution box, as the first level of protection against lightning strikes and partial direct or indirect strikes. It's compact design demands small requirement for space for a complete 3-phase protection . It can be used in single or three phase network systems: TT, TNC, TNC-S. In case of permanent arrestor damage, thermal protection is activated which signalizes faulty arrester.
*Note: First number of designation 1+0, 2+0, 3+1 etc. indicates the number of varistors. Second one means the following: number 0 indicates there is no gas discharge tube (GDT), number 1 indicates there is. GDT element is required in TT systems.

ETITEC T WENT I_{imp}=25kA

Type	Code No.	I_{imp} (10/350) [kA]	I_n/I_{max} (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC T WENT 320/25 1+0	002440364	25	25/100	320	TNC	295	1/7
ETITEC T WENT 320/25 2+0	002440366	25	25/100	320	TNC-S	560	1/3
ETITEC T WENT 320/25 1+1	002440367	25	25/100	320	TT	490	1/3
ETITEC T WENT 320/25 3+0	002440368	25	25/100	320	TNC	840	1/3
ETITEC T WENT 320/25 3+1	002440369	25	25/100	320	TT	1050	1/2
ETITEC T WENT 320/25 4+0	002440370	25	25/100	320	TNC-S	1120	1/2
ETITEC T WENT 320/25 1+0 RC	002440365	25	25/100	320	TNC	300	1/7
ETITEC T WENT 320/25 2+0 RC	002440371	25	25/100	320	TNC-S	570	1/3
ETITEC T WENT 320/25 1+1 RC	002440372	25	25/100	320	TT	490	1/3
ETITEC T WENT 320/25 3+0 RC	002440373	25	25/100	320	TNC	860	1/3
ETITEC T WENT 320/25 3+1 RC	002440374	25	25/100	320	TT	1060	1/2
ETITEC T WENT 320/25 4+0 RC	002440375	25	25/100	320	TNC-S	1140	1/2

* RC → remote signalisation



ETITEC T WENT 320/25 3+1 RC

Technical data on page 597

Surge arrester ETITEC ML T123 EN/IEC/VDE: T1, T2,T3 /I, II,III /B+C+D

ETITEC ML T123 is a surge arrester for complete overvoltage protection in standard modular housing. Protection corresponds to all categories of overvoltage protections: IEC categories I, II, III and EN Type 1, Type 2, Type 3. Groups B, C, D by VDE. It's intended for installation in main distribution board or in power distribution enclosure in front of energy meter, as the first level of protection against lightning strikes, partial direct, indirect atmospheric discharges and induced surges. Due to the housing of standard modular size, it can be installed also in any sub-distribution board.
In case of permanent arrestor damage, thermal protection is activated which signalizes faulty arrester. Consequently only the SPD module has to be replaced, while base unit remains fixed on DIN rail.
Compliance: IEC 61643-11:2011, EN 61643-11:2012+A11:2018

Advantages:

- remote signalisation (RC version only)
- DIN rail mounting (EN 60715)
- spring-loaded fixing for easy mounting on DIN rail
- latching mechanism for extra reliable module holding
- High performance MOV inside
- The earth connection terminal allows additional connection 2nd earth conductor (V connection type)
- Coding system prevents wrong module insertion
- Each module is equipped with a thermal disconnection system which disconnects faulty device from power supply in case of MOV overload due to high energy surge, TOV or ageing
- connection up to 35mm^2

ETITEC ML T123

Type	Code No.	I_{imp} (10/350) [kA]	I_n / I_{max} L-N/N-PE (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC ML T123 300/12,5 1+0	002440661	12,5	20/40	300	TNC	161	1/12
ETITEC ML T123 300/12,5 1+0 RC	002440662	12,5	20/40	300	TNC	182	1/12
ETITEC ML T123 300/12,5 2+0	002440663	12,5	20/40	300	TNC-S	344	1/7
ETITEC ML T123 300/12,5 2+0 RC	002440664	12,5	20/40	300	TNC-S	353	1/7
ETITEC ML T123 300/12,5 3+0	002440665	12,5	20/40	300	TNC	553	1/5
ETITEC ML T123 300/12,5 3+0 RC	002440666	12,5	20/40	300	TNC	562	1/5
ETITEC ML T123 300/12,5 4+0	002440667	12,5	20/40	300	TNC-S	680	1/4
ETITEC ML T123 300/12,5 4+0 RC	002440668	12,5	20/40	300	TNC-S	689	1/4
ETITEC ML T123 300/12,5 1+1	002440669	12,5	20/40+50/100	300	TN, TT	332	1/7
ETITEC ML T123 300/12,5 1+1 RC	002440670	12,5	20/40+50/100	300	TN, TT	338	1/7
ETITEC ML T123 300/12,5 3+1	002440671	12,5	20/40+50/100	300	TN, TT	667	1/4
ETITEC ML T123 300/12,5 3+1 RC	002440672	12,5	20/40+50/100	300	TN, TT	676	1/4

* RC -> remote signalisation.
**The first digit of the value (1+0), (1+1), (2+0), (3+0), (3+1), (4+0) indicates the number of varistors (MOVs); the second digit of the value (1+0), (1+1), (2+0), (3+0), (3+1), (4+0) shows the presence (1) or absence (0) of the GDT element (TT network systems);
note: the values of limp and In/Imax - indicated per one pole



ETITEC ML T123 300/12,5 2+0



ETITEC ML T123 300/12,5 3+0



ETITEC ML T123 300/12,5 3+1

Technical data on page 600

Surge arrester ETITEC group C T2

EN/IEC/VDE: T2/II/C

Advantages:

- optical indication of faulty device (green ok, red false)
- remote signalisation (RC version only)
- DIN rail mounting (EN 60715)
- high discharge currents
- high degree of protection
- varistor is the protective element
- metal snapper, new way of mounting on DIN rail (easier, quicker)
- round-off shape compatible with ETIMAT
- modular design
- IEC/EN 61643-11
- RoHS compliant
- connection up to 35mm^2

Description

ETITEC C T2 is surge arrester for indoor application. Group C surge protection is in accordance with VDE class C. This protection corresponds to IEC class II. The protection is made at the subdistribution board, as the second level of protection against overvoltage indirect lightning strikes. In case of permanent arrester damage, thermal protection is activated which signalize faulty arrester. ETITEC C T2 255/20 G is an overvoltage arrester with gas discharge tube for protection against indirect lightning strikes. It is used as a galvanic separation between N-PE conductor in TT network systems.

*Note: First number of designation 1+0, 2+0, 3+1 etc. indicates the number of varistors. Second one means the following: number 0 indicates there is no gas discharge tube, number 1 indicates there is.



ETITEC C T2 275/20 1+0 ETITEC C T2 275/20 1+0 RC



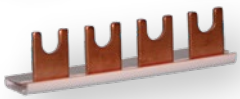
ETITEC C T2 275/20 4+0



MODUL ETITEC C T2 275/20



IZ16/1F/2/ETITEC IZ16/1F/3/ETITEC



IZ16/1F/3/ETITEC

ETITEC C T2

Type	Code No.	I_n/I_{max} (8/20) [kA]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC C T2 275/20 1+0	002440393	20/40	275 VAC	TNC	128	1/12
ETITEC C T2 275/20 1+0 RC	002440394	20/40	275 VAC	TNC	133	1/12
ETITEC C T2 275/20 4+0	002440395	20/40	275 VAC	TNC-S	456	1/3
ETITEC C T2 275/20 4+0 RC	002440396	20/40	275 VAC	TNC-S	471	1/3
ETITEC C T2 275/20 2+0	002440397	20/40	275 VAC	TNC-S	244	1/7
ETITEC C T2 275/20 2+0 RC	002440398	20/40	275 VAC	TNC-S	249	1/7
ETITEC C T2 275/20 3+0	002440399	20/40	275 VAC	TNC	352	1/5
ETITEC C T2 275/20 3+0 RC	002440400	20/40	275 VAC	TNC	357	1/5
ETITEC C T2 275/20 1+1	002440401	20/40	275 VAC	TT	225	1/7
ETITEC C T2 275/20 1+1 RC	002440402	20/40	275 VAC	TT	230	1/7
ETITEC C T2 275/20 3+1	002440403	20/40	275 VAC	TT	441	1/3
ETITEC C T2 275/20 3+1 RC	002440404	20/40	275 VAC	TT	446	1/3
ETITEC C T2 440/20 1+0	002440405	20/40	440 VAC	IT	130	1/12
ETITEC C T2 440/20 1+0 RC	002440406	20/40	440 VAC	IT	145	1/12
ETITEC C T2 440/20 4+0	002440407	20/40	440 VAC	IT	466	1/3
ETITEC C T2 440/20 4+0 RC	002440408	20/40	440 VAC	IT	471	1/3
ETITEC C T2 440/20 2+0	002440409	20/40	440 VAC	IT	247	1/7
ETITEC C T2 440/20 2+0 RC	002440410	20/40	440 VAC	IT	252	1/7
ETITEC C T2 440/20 3+0	002440411	20/40	440 VAC	IT	356	1/5
ETITEC C T2 440/20 3+0 RC	002440412	20/40	440 VAC	IT	,361	1/5
ETITEC C T2 255/20 G	002440413	20/40	255 VAC		118	1/12
MODUL ETITEC C T2 275/20	002440414	20/40	275 VAC		56	12/12
MODUL ETITEC C T2 440/20	002440415	20/40	440 VAC		58	12/12
MODUL ETITEC C T2 255/20 G	002440416	20/40	255 VAC		36	12/12

* RC -> remote signalisation Note: In - defined per single pole

Connection terminals

Type	code No.	weight [g]	packaging [pcs]	Connection terminals for
IZ16/1F/2/ETITEC	002921081	9	50/600	2 modules connection
IZ16/1F/3/ETITEC	002921082	15	50/600	3 modules connection
IZ16/1F/4/ETITEC	002921083	20	50/600	4 modules connection

For module width 17,8 mm.

Technical data on page 601

Surge arrester ETITEC group CM T2+T3

EN/IEC/VDE: T2,T3/II,III/C,D

Description
Compact single-phase Type 2 / Compact 3-phase Type 2
I_n : 20 kA
I_{max} : 40 kA
Location of Use: Sub-distribution Boards
Mode of Protection: L-PE, N-PE
IEC/EN Category: Class II+III / Type 2+3
Housing: Modular Design, Pluggable module (possible to replace)
Mounting: 35mm DIN rail
Compliance: IEC 61643-11:2011 EN 61643-11:2012+A11:2018
Fault indication: visual - red flag (false)
Remote signaling contact as an option (RC)

Type designation:
ETITEC CM T23 xxx/20 p+c RC
xxx - U_c voltage (max. AC operating voltage), must be above network voltage.
20 - 20kA (I_n at 8/20us)
p - number of poles with MOV
c - 0 for MOV at NPE pole, 1 for GDT (TT systems)
RC - remote contact (Change over contact) for fault signalisation

Advantages:

- space saving (reduces required space in distribution board by 50%)
- remote signalisation (RC version only)
- DIN rail mounting (EN 60715)
- varistor is the protective element
- metal snapper, new way of mounting on DINrail (easier, quicker)
- modular design
- IEC/EN 61643-11
- RoHS compliant
- connection up to 35mm²

ETITEC CM

Type	Code No.	I_n/I_{max} (8/20) [kA]	U_{oc} [kV]	U_c [V AC]	Network	Weight [g]	Packaging [pcs]
ETITEC CM T23 275/20 2+0	002440650	20/40	6	275	TNS	152	1/15
ETITEC CM T23 275/20 2+0 RC	002440651	20/40	6	275	TNS	157	1/15
ETITEC CM T23 275/20 4+0	002440652	20/40	6	275	TNS	281	1/8
ETITEC CM T23 275/20 4+0 RC	002440653	20/40	6	275	TNS	287	1/8
ETITEC CM T23 275/20 1+1	002440654	20/40	6	275	TT/TNS	207	1/15
ETITEC CM T23 275/20 1+1 RC	002440655	20/40	6	275	TT/TNS	212	1/15
ETITEC CM T23 275/20 3+1	002440656	20/40	6	275	TT/TNS	413	1/8
ETITEC CM T23 275/20 3+1 RC	002440657	20/40	6	275	TT/TNS	419	1/8
MOD.ETITEC CM T23 275/20	002440658	20/40	6	275	-	78,5	1/24
MOD.ETITEC CM T23 275/20 G	002440659	20/40	6	255	-	65,5	1/24

* RC -> remote signalisation. Note: In/Imax - defined per single pole



ETITEC CM T23 275 20 (4+0, 2p, TNC-S)

ETITEC

Technical data on page 603

Surge arrester ETITEC group D T3

EN/IEC/VDE: T3/III/D



ETITEC D T3 275/3 1+0 RC

Description
ETITEC D T3 is a surge arrester for indoor application. Group D surge protection is in accordance with VDE class D. This protection corresponds to IEC category III, EN Type 3 . The protection should be installed immediately before the protected load. This is protection against indirect lightning strikes. In case of permanent arrester damage, thermal protection is activated, which signalizes faulty arrester. Consequently only the SPD module has to be replaced, while base unit remains fixed on DIN rail.

Advantages:
- optical indication of faulty device (green ok, red false)
- remote signalisation (RC version only)
- DIN rail mounting (EN 60715)
- high discharge currents
- high degree of protection
- varistor is the protective element
- metal snapper, new way of mounting on DIN rail (easier, quicker)
- round-off shape compatible with ETIMAT
- modular design
- IEC/EN 61643-11
- RoHS compliant
- connection up to 35mm^2



MODUL ETITEC D T3 275/3

ETITEC D T3

Type	Code No.	U_{oc}/I_n (8/20) [kA]	U_c [V AC]	Weight [g]	Packaging [pcs]
ETITEC D T3 275/3 1+0	002440417	10kV/3kA	275	130	1/12
ETITEC D T3 275/3 1+0 RC	002440418	10kV/3kA	275	135	1/12
ETITEC D T3 440/3 1+0	002440419	10kV/3kA	440	132	1/12
ETITEC D T3 440/3 1+0 RC	002440420	10kV/3kA	440	137	1/12
MODUL ETITEC D T3 275/3	002440421	10kV/3kA	275	58	12
MODUL ETITEC D T3 440/3	002440422	10kV/3kA	440	60	12

* RC -> remote signalisation
Note: In - defined per single pole



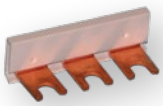
Connection terminals

Type	code No.	weight [g]	packaging [pcs]	Connection terminals for
IZ16/1F/2/ETITEC	002921081	9	50/600	2 modules connection
IZ16/1F/3/ETITEC	002921082	15	50/600	3 modules connection
IZ16/1F/4/ETITEC	002921083	20	50/600	4 modules connection

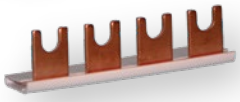
For module width 17,8 mm.



IZ16/1F/2/ETITEC



IZ16/1F/3/ETITEC



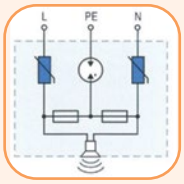
IZ16/1F/3/ETITEC

Application: Connection terminals are designed to connect modular surge ETITEC for multi-module assemblies (multi). Connections are made at the terminals ground - PE

Technical data on page 605

ETITEC D 255/3 MINI			
Type	Code No.	Weight [g]	Packaging [pcs]
ETITEC D 255/3 MINI	002441632	25	1





ETITEC FILT D 20/275F 8A G is an electromagnetic interference (EMI) and overvoltage protective device of class III. It is designed for complete protection and is installed directly in front of protected devices on DIN rail. Protected electrical device is safe against effects of overvoltage, electrostatic voltage and electromagnetic interferences. These disturbances, which are present in all electrical systems, are caused by other electrical devices, by switching manoeuvres, by defects in electrical network and by other activities, such as welding.
Applications: Protecting devices such as: TV, PC, Server, Control and regulation devices,..

ETITEC FILT D			
Type	Code No.	Weight [g]	Packaging [pcs]
ETITEC FILT D 20/275F 8A G	002441712	94	1



Technical data on page 606

Notes

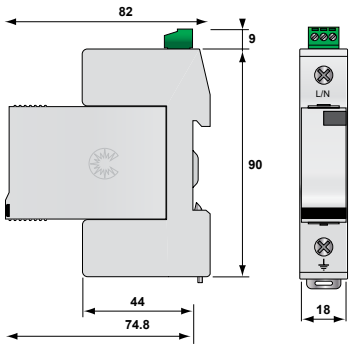
Surge arrester ETITEC V T12

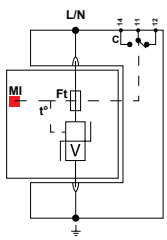
EN/IEC/VDE: T1,T2/I,II/B,C

ETITEC V T Iimp=12,5kA			
Type		**ETITEC V T12 280**	**ETITEC V T12 400**
Description		1+2 AC surge protector - 1-pole	
Rated. AC voltage	Uo	230/400	230/400 V
Max. AC operating voltage	Uc	280 VAC	440 VAC
Temporary Over Voltage (TOV) Characteristics - 5 sec.	UT	335 Vac withstand	580 Vac withstand
Temporary Over Voltage (TOV) Characteristics -120 min	UT	440 Vac disconnection	770 Vac disconnection
Residual current - Leakage current at Uc	Ipe	< 1 mA	< 1 mA
Follow current	If	x	x
Nominal discharge current - 15 x 8/20 µs impulses	In	20 kA	20 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	Imax	50 kA	50 kA
Impulse current by pole - max. withstand 10/350µs	Iimp	12,5 kA	12,5 kA
Specific energy by pole	W/R	40 kJ/ohm	40 kJ/ohm
Protection level	Up	1,3 kV	1,7 kV
Admissible short-circuit current	Isccr	25000 A	25000 A
Current Source generator		1mA	
Un min (MOV)		387 V AC	
Un max (MOV)		473 V AC	
Associated disconnectors			
Thermal disconnector		internal	
Fuses		Fuses Type gG - 125 A	
Installation ground fault breaker		Type "S" or delayed	
Mechnical characteristics			
Dimensions		see diagram	
Connection to Network		By screw terminals: 2,5-25 mm^2 / by bus	
Disconnection indicator		1 mechanical indicator	
Remote signaling of disconnection		output on changeover contact	
Mounting		Symmetrical rail 35 mm (EN60715)	
Operating temperature		-40 ... +85°C	
Protection rating		IP20	
Housing material		Thermoplast UL94-V0	
Standards compliance		IEC 61643-11 / EN 61643-11	

Dimensions

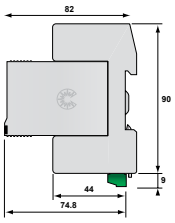
1+1, 3+1: 82mm
1+0, 2+0, 3+0, 4+0: 67mm

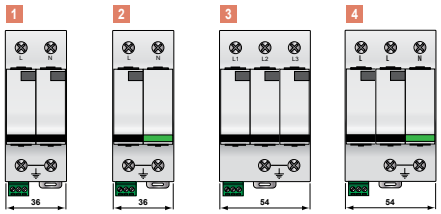


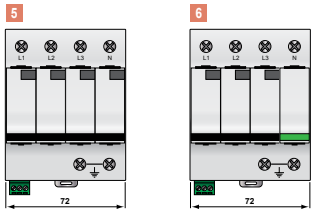


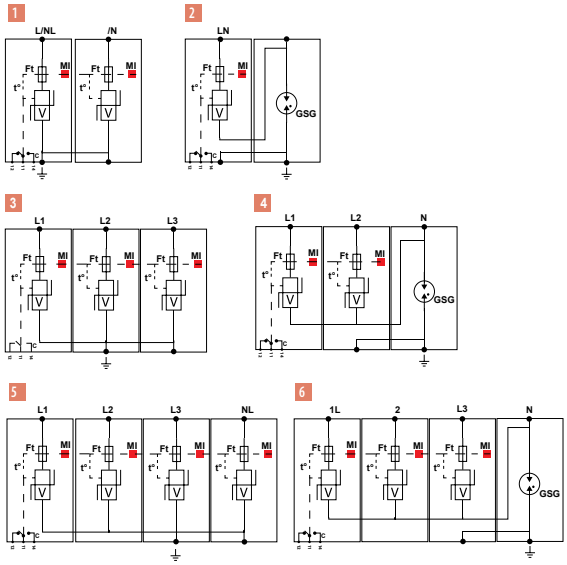
V: High energy MOV
Mi: Disconnection indicator
Ft: Thermal fuse
t°: Thermal disconnection mechanism
C: contact for remote signal

1+1, 3+1: 82mm
1+0, 2+0, 3+0, 4+0: 67mm









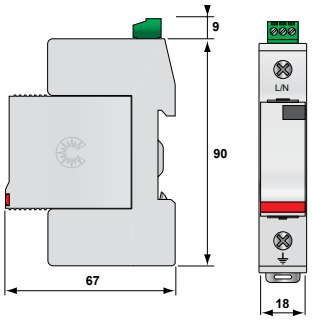
V: High energy MOV
GSG: Specific gas tube
Mi: Disconnection indicator
Ft: Thermal fuse
t°: Thermal disconnection mechanism
C: Contact for remote signal

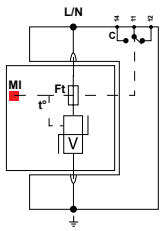
Surge arrester ETITEC V T2

EN/IEC/VDE: T2/II/C

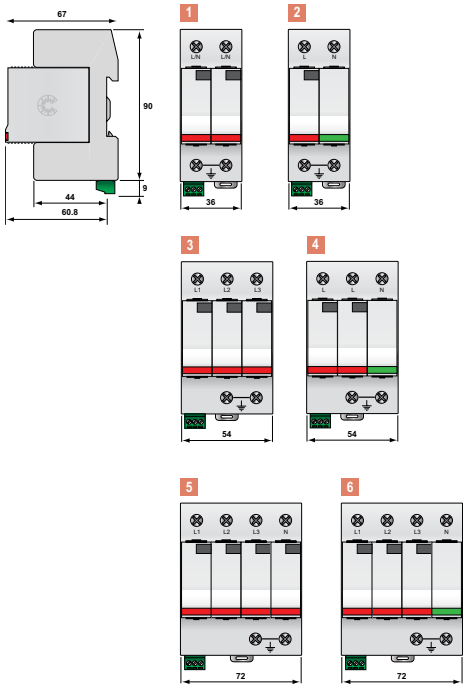
ETITEC V T2			
Type		**ETITEC V T2 255**	**ETITEC V T2 440**
Description		Type 2 AC surge protector - one-phase - pluggable	
Network	Uo	230/400 V	230/400 V
Max. AC operating voltage	Uc	255 VAC	440 VAC
Temporary Over Voltage (TOV) Characteristics - 5 sec.	UT	335 Vac withstand	580 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	UT	440 Vac disconnection	770 Vac disconnection
Residual current - Leakage current at Uc	Ipe	< 1 mA	< 1 mA
Follow current	If	x	x
Nominal discharge current - 15 x 8/20 µs impulses	In	20 kA	20 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	Imax	40 kA	40 kA
Protection level	Up	1,25 kV	1,8 kV
Admissible short-circuit current	Isccr	25000 A	25000 A
Current Source generator		1mA	
Un min (MOV)		387 V AC	
Un max (MOV)		473 V AC	
Associated disconnectors			
Thermal disconnector		internal	
Fuses		gG 125 A	
Installation ground fault breaker		Type "S" or delayed	
Mechnical characteristics			
Dimensions		see diagram	
Connection to Network		By screw terminals: 2,5-25 mm^2 / by bus	
Disconnection indicator		1 mechanical indicator	
Remote signaling of disconnection		output on changeover contact	
Mounting		Symmetrical rail 35 mm (EN60715)	
Operating temperature		-40 ... +85°C	
Protection rating		IP20	
Housing material		Thermoplast UL94-V0	
Standards compliance		IEC 61643-11 / EN 61643-11	

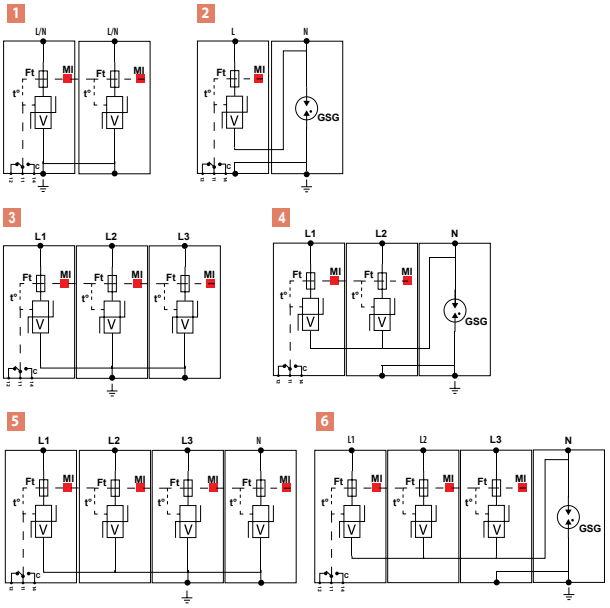
Dimensions





V: High-energy varistor
Ft: Thermal fuse
C: Remote signaling contact
t°: Thermal disconnection system
Mi : Disconnection indicator



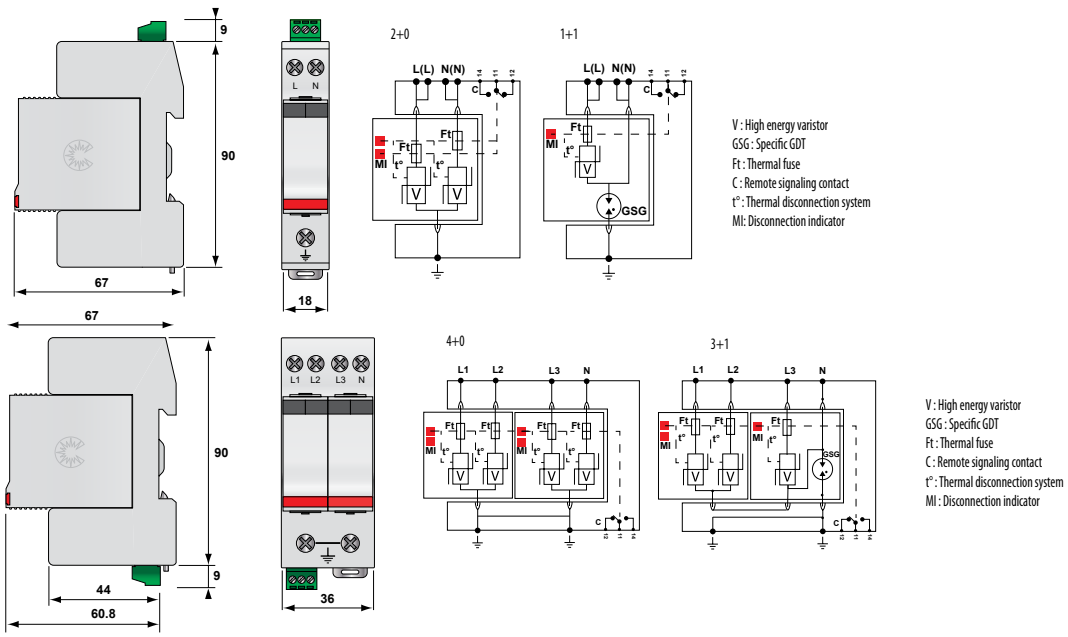


V: High-energy varistor
GSG: Specific gas tube
Ft: Thermal fuse
C: Remote signaling contact
t°: Thermal disconnection system
Mi: Disconnection indicator

Type 2 multipole SPDs

ETITEC V 2T2							
Description		Compact 1-phase Type 2 Surge Protector - 230 V - Pluggable			Compact 3-phase+N Type 2 surge protector - 230/400 V - Pluggable		
Network	Uo	230 V 1-ph	230 V 1-ph	230 V 1-ph	230/400 V 3-ph	230/400 V 3-ph	230/400 V 3-ph
Connection mode		L/PE & N/PE	L/PE & N/PE	L/N & N/PE	L/PE & N/PE	L/PE & N/PE	L/N & N/PE
AC system		IT	TN	TT-TN	IT	TN	TT-TN
Max. AC operating voltage	U_c	440 VAC	255 VAC	255 VAC	440 VAC	255 VAC	255 VAC
Temporary Over Voltage (TOV) Characteristics - 5 sec.	U_T	580 Vac withstand	335 Vac withstand	335 Vac withstand	580 Vac withstand	335 Vac withstand	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	U_T	770 Vac disconnection	440 Vac disconnection	440 Vac disconnection	770 Vac disconnection	440 Vac disconnection	440 Vac disconnection
Temporary Over Voltage N/PE (TOV HT)	U_T	-	-	1200 V/300A/200 ms withstand	-	-	1200 V/300A/200 ms withstand
Residual current - Leakage current at Uc	I_{pe}	< 1 mA	< 1 mA	x	< 1 mA	< 1 mA	x
Max. Load current (if connection serie)	I_L	20 A	20 A	20 A	-	-	-
Nominal discharge current - 15 x 8/20 µs impulses	I_n	20 kA	20 kA	20 kA	20 kA	20 kA	20 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	I_{max}	40 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Protection level CM/DM* @In (8/20µs) and @ 6kV (1.2/50µs)	U_p	1,8 kV	1,25 kV	1,5/1,25 kV	1,8 kV	1,25 kV	1,5/1,25 kV
Admissible short-circuit current	I_{sccr}	10000 A	10000 A	10000 A	10000 A	10000 A	10000 A
Current Source generator		1mA	1mA	1mA	1mA	1mA	1mA
Un min (MOV)		387 V AC	387 V AC	387 V AC	387 V AC	387 V AC	387 V AC
Un max (MOV)		473 V AC	473 V AC	473 V AC	473 V AC	473 V AC	473 V AC
Associated disconnectors							
Thermal disconnector		internal					
Fuses		Fuses Type gG - 50 A					
Installation ground fault breaker		Type "S" or delayed					
Mechnical characteristics							
Dimensions		see diagram					
Connection to Network		by screw terminals: 1,5-10mm² (L/N) or 2,5-25mm² (PE)					
Disconnection indicator		2 mechanical indicators					
Remote signaling of disconnection		output on changeover contact					
Mounting		Symmetrical rail 35 mm (EN60715)					
Operating temperature		-40 ... +85°C					
Protection rating		IP20					
Housing material		Thermoplast UL94-V0					
Standards compliance		IEC 61643-11 / EN 61643-11					

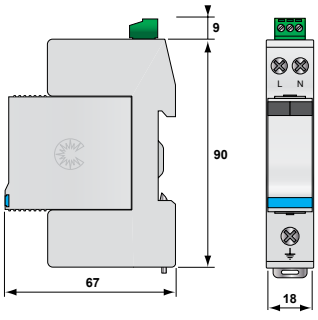
Dimensions

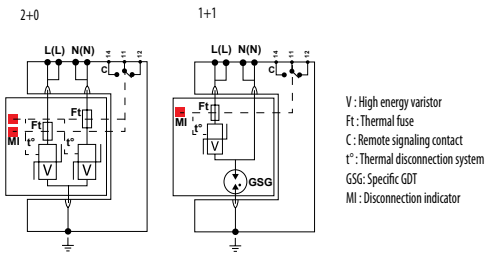


Type 3 (weak type2) multipole SPDs

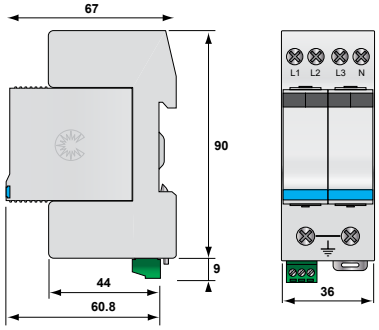
ETITEC V 2T3							
Description		Compact 1-phase Type 2 (and 3) surge protector - 230 V -Pluggable			Compact 3-phase+N Type 2 (and 3) surge protector - 230/400 V - Pluggable		
Network	Uo	230 V 1-ph	230 V 1-ph	230 V 1-ph	230/400 V 3-ph	230/400 V 3-ph	230/400 V 3-ph
Connection mode		L/PE & N/PE	L/PE & N/PE	L/N & N/PE	L/N & N/PE	L/N & N/PE	L/N & N/PE
AC system		IT	TN	TT-TN	IT	TN	TT-TN
Max. AC operating voltage	U_c	440 VAC	255 VAC	255 VAC	440 VAC	255 VAC	255 VAC
Temporary Over Voltage (TOV) Characteristics - 5 sec.	U_T	580 Vac withstand	335 Vac withstand	335 Vac withstand	580 Vac withstand	335 Vac withstand	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	U_T	770 Vac disconnection	440 Vac disconnection	440 Vac disconnection	770 Vac disconnection	440 Vac disconnection	440 Vac disconnection
Temporary Over Voltage N/PE (TOV HT)	U_T	-	-	1200 V/300A/200 ms withstand	-	-	1200 V/300A/200 ms withstand
Residual current - Leakage current at Uc	I_{pe}	< 1 mA	< 1 mA	x	< 1 mA	< 1 mA	x
Max. Load current (if connection serie)	I_L	20 A	20 A	20 A	-	-	-
Nominal discharge current - 15 x 8/20 µs impulses	I_n	5 kA	5 kA	5 kA	5 kA	5 kA	5 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	I_{max}	15 kA	15 kA	15 kA	15 kA	15 kA	15 kA
Withstand on overvoltages IEEE C62.41.1	U_{oc}	10 kV	10 kV	10 kV	10 kV	10 kV	10 kV
Protection level CM/DM* @In (8/20µs) and @ 6kV (1.2/50µs)	U_p	1.3 kV	0.9 kV	1.5/0.9 kV	1.3 kV	0.9 kV	1.5/0.9 kV
Admissible short-circuit current	I_{sccr}	10000 A	10000 A	10000 A	10000 A	10000 A	10000 A
Associated disconnectors							
Thermal disconnector		internal					
Fuses		Fuses Type gG - 20 A					
Installation ground fault breaker		Type "S" or delayed					
Mechnical characteristics							
Dimensions		see diagram					
Connection to Network		by screw terminals: 1,5-10mm² (L/N) or 2,5-25mm² (PE)					
Disconnection indicator		4 mechanical indicators					
Remote signaling of disconnection		output on changeover contact					
Mounting		Symmetrical rail 35 mm (EN60715)					
Operating temperature		-40 ... +85°C					
Protection rating		IP20					
Housing material		Thermoplast UL94-V0					
Standards compliance		IEC 61643-11 / EN 61643-11					

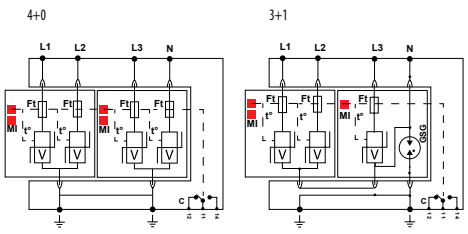
Dimensions





V : High energy varistor
Ft : Thermal fuse
C : Remote signaling contact
t° : Thermal disconnection system
GSG: Specific GDT
MI : Disconnection indicator



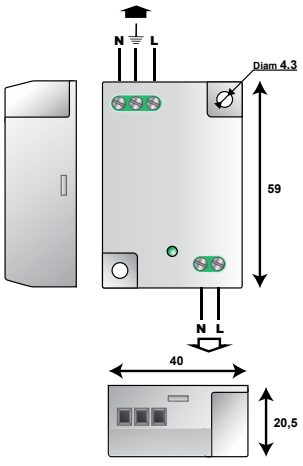


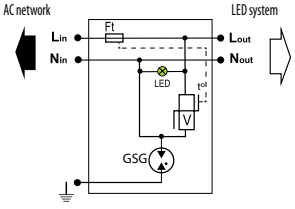
V : High energy varistor
Ft : Thermal fuse
C : Remote signaling contact
t° : Thermal disconnection system
GSG: Specific GDT
MI : Disconnection indicator

LED lighting protection

ETITEC LC1 IP20		
Description		**Surge protectors for LED lighting system Class 1**
Network	Uo	220-240 V single phase
AC system		TT/TN
Protection mode(s)		CM/DM
Max. AC operating voltage	U_c	320 VAC
Max. Load current	I_L	5 A
Residual current - Leakage current at Uc	I_{pe}	x
Temporary Over Voltage (TOV) Characteristics - 5 sec.	U_T	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	U_T	440 Vac disconnection
Temporary Over Voltage N/PE (TOV HT)	U_T	1200 V/300A/200 ms disconnection
Nominal discharge current - 15 x 8/20 µs impulses	I_n	5 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	I_{max}	10 kA
Total lightning current - max. total withstand @ 8/20 µs	I_{total}	20 kA
Withstand on Combination waveform - Class III test	U_{oc}	10 kV/5 kA
Withstand on overvoltages IEEE C62.41.1		10 kV/10 kA
Protection level CM/DM @In (8/20µs) and @ 6kV (1.2/50µs)	U_p	1.5 kV/ 1.5 kV
Admissible short-circuit current	I_{sccr}	10000 A
Associated disconnectors		
Thermal disconnector		internal
Installation ground fault breaker		Type "S" or delayed
Mechnical characteristics		
Dimensions		see diagram
Connection to Network		Screw (2.5 mm^2 max) contact terminal
Voltage/operating indicator		Green Led ON
Disconnection indicator		Disconnection
Failsafe behavior		Led green OFF and AC network cut-off
Remote signaling of disconnection		x
Mounting		on plate
Operating temperature		-40 ... +85°C
Protection rating		IP20
Housing material		Thermoplast UL94-V0
Standards compliance		EN 61643-11 / IEC 61643-11

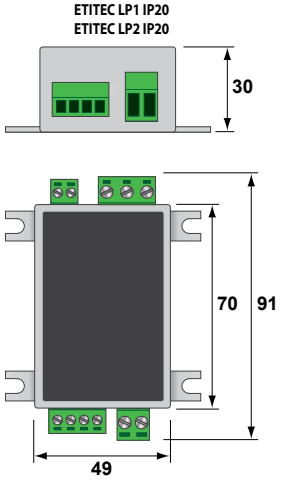
ETITEC LC1 IP20

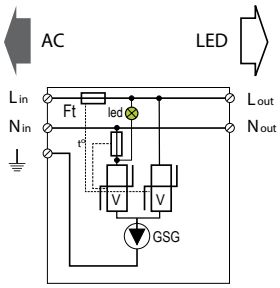




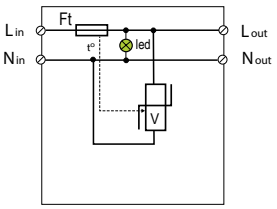
Ft: Thermal fuse
Led: Status indicator
V: MOV
GSG: Specific Gas Tube
t°: Thermal system disconnection

ETITEC LP		
Type	**ETITEC LP1 IP20**	**ETITEC LP2 IP20**
Network	220-240 V single phase	
Protection mode(s)	CM/DM	
Max. AC operating voltage	305 VAC	
Max. Load current	2,5 A	
Residual current - Leakage current at Uc	x	
Nominal discharge current - 15 x 8/20 µs impulses	5 kA	
Max. discharge current -max. withstand @ 8/20 µs by pole	10 kA	
Total lightning current - max. total withstand @ 8/20 µs	20 kA	
Withstand on Combination waveform - Class III test	10 kV/5 kA	
Withstand on overvoltages IEEE C62.41.1	10 kV/10 kA	
Protection level CM/DM @In (8/20µs) and @ 6kV (1.2/50µs)	1.5 kV/ 1.5 kV	
Admissible short-circuit current	10000 A	
Mechnical characteristics		
Connection to Network	Screw terminal - 1.5 mm^2 max	
Voltage/operating indicator	Green Led ON	
Failsafe behavior	Led green OFF and AC network cut-off	
Disconnection indicator	Led green OFF and AC network cut-off or remote signal (option)	
Remote signaling of disconnection	Option	
Standards compliance	IEC 61643-11 / EN 61643-11 / UL1449 ed.4	
Description	Surge protector for LED lighting system Class 1	Surge protector for LED lighting system Class 2
AC voltage specifications		
Description	220-240 V single phase	220-240 V single phase
AC system	TT-TN	TT-TN
Protection mode(s)	CM/DM	DM
Max. AC operating voltage	305 Vac	305 Vac
Max. Load current	2,5 A	2,5 A
Residual current - Leakage current at Uc	x	x
Temporary Over Voltage (TOV) Characteristics - 5 sec.	335 Vac withstand	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	440 Vac disconnection	440 Vac disconnection
Nominal discharge current - 15 x 8/20 µs impulses	5 kA	5 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	10 kA	10 kA
Total lightning current - max. total withstand @ 8/20 µs	20 kA	20 kA
Withstand on Combination waveform - Class III test	10 kV/5 kA	10 kV/5 kA
Withstand on overvoltages IEEE C62.41.1	10 kV/10 kA	10 kV/10 kA
Protection level CM/DM @In (8/20µs) and @ 6kV (1.2/50µs)	1.5 kV/ 1.5 kV	1.5 kV
Admissible short-circuit current	10000 A	10000 A
Connection to Network	screw 1.5mm^2 max	screw 1.5mm^2 max
Voltage/operating indicator	Green Led ON	Green Led ON
Failsafe behavior	Disconnection from AC line	Disconnection from AC line
Disconnection indicator	Green Led OFF and AC line cut-off	Green Led OFF and AC line cut-off
Remote signaling of disconnection	none	yes : output on contact NO
Associated disconnectors		
Thermal disconnector	internal	internal
Installation ground fault breaker	Type "S" or delayed	Type "S" or delayed
Mechnical characteristics		
Dimensions	see diagram	see diagram
Mounting	on plate	on plate
Operating temperature	-40/+85°C	-40/+85°C
Protection rating	IP65	IP20
Housing material	Thermoplastic UL94-V0	Thermoplastic UL94-V0
Standards compliance	IEC 61643-11 / EN 61643-11	





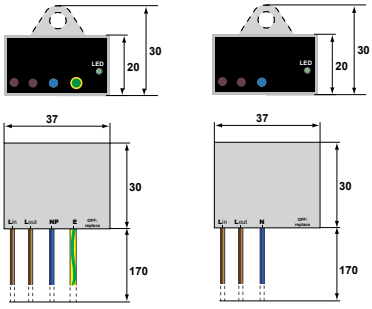
ETITEC LP1 IP20



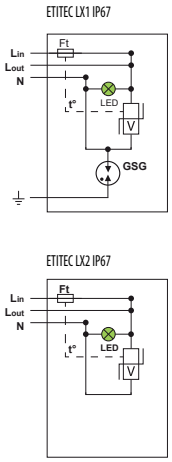
ETITEC LP2 IP20

Ft : Thermal fuse
Led : Status indicator
V : MOV
GSG : Specific Gas Tube
t° : Thermal disconnection system

ETITEC LX		
Type	**ETITEC LX1 IP67**	**ETITEC LX2 IP67**
Description	Compact Type 2 +3 hard-wired surge protector	
Application (Classe)	I	II
Network	230-277 V single phase	230-277 V single phase
AC system	TT/TN	TT/TN
Protection mode(s)	CM/DM	DM
Max. AC operating voltage	320 VAC	320 VAC
Max. Load current	10A	10A
Temporary Over Voltage (TOV) Characteristics - 5 sec.	335 Vac withstand	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	440 Vac disconnection	440 Vac disconnection
Temporary Over Voltage N/PE (TOV HT)	1200 V/300A/200 ms disconnection	x
Nominal discharge current - 15 x 8/20 µs impulses	5 kA	5 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	10 kA	10 kA
Total max. discharge current - max. total withstand @ 8/20 µs	20 kA	NA
Withstand on Combination waveform - Class III test	10 kV	10 kV
Withstand on overvoltages IEEE C62.41.1	10 kV/10 kA	10 kV/10 kA
Protection level CM/DM @In (8/20µs) and @ 6kV (1.2/50µs)	1.5 kV/1.5 kV	1.5 kV
Admissible short-circuit current	10000 A	10000 A
Associated disconnectors		
Thermal disconnector	internal	
Installation ground fault breaker	Type "S" or delayed	
Mechnical characteristics		
Dimensions	see diagram	
Connection to Network	by wires :1.5 mm^2 (L/N) & 2.5 mm^2 (PE)	by wires :1.5 mm^2 (L/N)
Voltage/operating indicator	Green Led ON	
Disconnection indicator	Disconnection	
Failsafe behavior	Led green OFF and AC network cut-off	
Remote signaling of disconnection	x	
Mounting	wall or plate	
Operating temperature	-40/+85°C	
Protection rating	IP67	
Housing material	Thermoplastic UL94-V0	
Standards compliance	EN 61643-11 / IEC 61643-11	

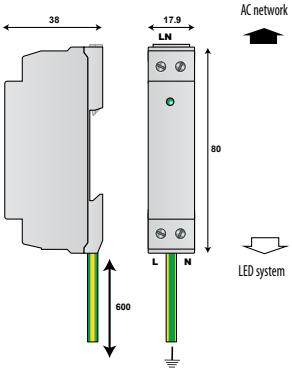


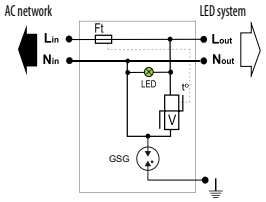
ETITEC LX1 IP67 ETITEC LX2 IP67



V : Varistor
GSG: Specific gas tube
Ft : Thermal fuse
LED : Disconnection indicator
t° : Thermal system disconnection

ETITEC L1 DIN	
Description	Surge protectors for LED lighting system Class 1
Network	220-240 V single phase
AC system	TT/TN
Protection mode(s)	CM/DM
Max. AC operating voltage	320 VAC
Max. Load current	10A
Residual current - Leakage current at Uc	x
Temporary Over Voltage (TOV) Characteristics - 5 sec.	335 Vac withstand
Temporary Over Voltage (TOV) Characteristics - 120 min	440 Vac disconnection
Temporary Over Voltage N/PE (TOV HT)	1200 V/300A/200 ms disconnection
Nominal discharge current - 15 x 8/20 µs impulses	5 kA
Max. discharge current -max. withstand @ 8/20 µs by pole	10 kA
Total lightning current - max. total withstand @ 8/20 µs	20 kA
Withstand on Combination waveform - Class III test	10 kV / 5 kA
Withstand on overvoltages IEEE C62.41.1	10 kV/10 kA
Protection level CM/DM @In (8/20µs) and @ 6kV (1.2/50µs)	1.5 kV/ 1.5 kV
Admissible short-circuit current	10000 A
Associated disconnectors	
Thermal disconnector	internal
Installation ground fault breaker	Type «S» or delayed
Mechnical characteristics	
Dimensions	see diagram
Connection to Network	Screw terminal 2.5 mm^2 max., Earthing conductor 2 mm^2 - length 60 cm
Voltage/operating indicator	Led green ON
Disconnection indicator	Disconnection and AC line cut-off
Failsafe behavior	Led green OFF and AC network cut-off
Remote signaling of disconnection	x
Mounting	Symmetrical rail 35mm (EN60715)
Operating temperature	-40 ... +85°C
Protection rating	IP20
Housing material	Thermoplastic UL94-V0
Standards compliance	EN 61643-11 / IEC 61643-11





V: Varistor
Ft: Thermal fuse
LED: Disconnection indicator
MI: Mechanical disconnection indicator
t°: Thermal system disconnection
GSG: Specific Gas Tube

Surge arrester ETITEC T WENT group B — EN/IEC/VDE: T1, T2/I,II/B+C

ETITEC T WENT	
Type	**320/25**
In accordance with	IEC/EN 61643-11
Category IEC/EN/VDE	I, II/ T1, T2 / B+C
Max. continuous operating voltage (AC) U_c	320 V
Nominal AC voltage U_o	230V 50-60 Hz
TOV immunity U_T (AC)	334 V/5s withstand
	438 V/120 min safe failure
Impulse current (10/350) I_{imp}	25 kA
Nominal discharge current (8/20) I_n	25 kA
Max. discharge current (8/20) I_{max}	100 kA
Protection level Up - at I_n	<1,5 kV
Follow current I_{fi}	100 A_{RMS}
Response time t_A	< 25 ns
Residual current I_{pe} at U_{ref}	< 0,3 mA
Current source generator	1 mA
Un min (MOV)	459
Un max (MOV)	561 V
Voltage step generator	100 V/s
Un min (GDT)	480 V
Un max (GDT)	720 V
Thermal decoupler	✓
Torque	3,0 Nm
Back-up fuse (if mains > 160A)	250 A gG
Short-circuit current rating I_{SCCR}	50 kA / 50 Hz
Temperature range	- 40°C ...+70°C
Cross-section of connection wire	min. 6mm²; max. solid, rigid strended 35mm²; flexible 25mm²
Mounting	indoors on top hat fixing rail 35 mm (EN 60715)
Degree of protection	IP 20
Casing material	PA
Dimensions	2 TE ... 8 TE
Indication of disconnector operation	
Permissible humidity	5% - 95%
Additional data for ETITEC T WENT-RC	
Remote signalisation (RC)	✓
Switching capability (RC)	AC: 250V/0,5A; DC:125V/0,2A
Cross-section of connection wire (RC)	max. 1.5 mm²
Torque (RC)	0,25 Nm

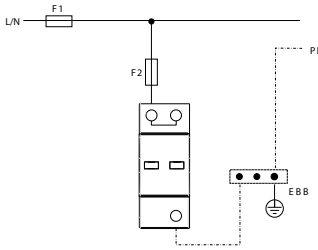
Type of network and nr. of SPD poles	
Network	**Nr of poles (SPD configuration)**
TNC 1 phase	1+0
TNC 3 phase	3+0
TNS 1 phase	2+0 / 1+1
TNS 3 phase	4+0 / 3+1
TT 1 phase	1+1
TT 3 phase	3+1

At TNC, TNS, TT systems with Un=230V, recommended Uc value of SPD is 275V.

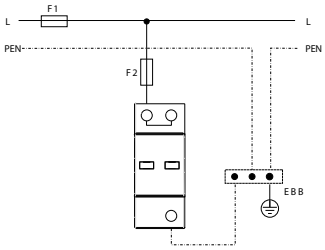
Protection configurations for various power systems

ETITEC T WENT Iimp=25 kA

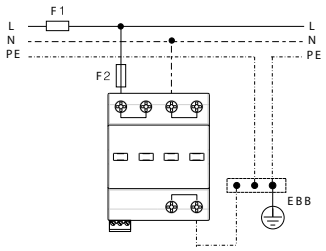
TN-S Network - Single-phase, 1+0 (T-connection)



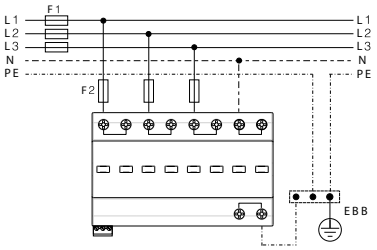
TN-C Network - Single-phase, 1+0 (T-connection)



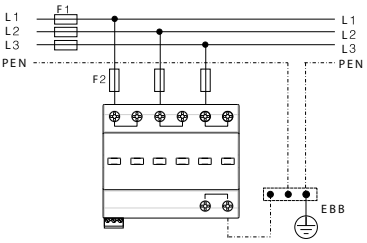
TN-S Network - Single-phase, 2+0 (T-connection)



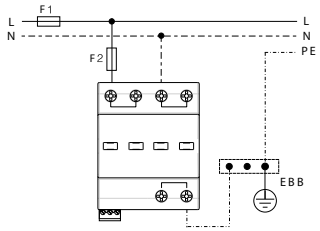
TN-S Network - Three-phase, 1+0 (T-connection)



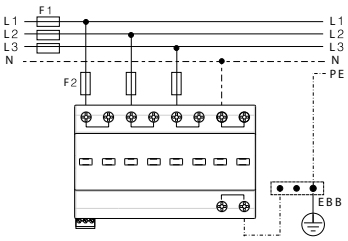
TN-C Network - Three-phase, 1+0 (T-connection)



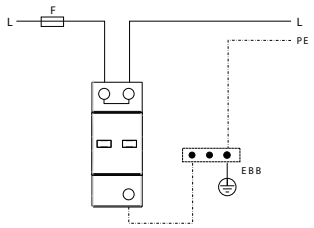
TT Network - Single-phase, 1+0 (T-connection)



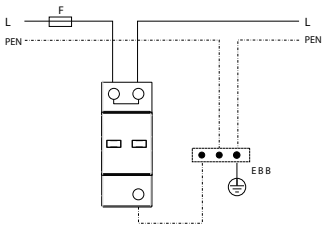
TT Network - Three-phase, 1+0 (T-connection)



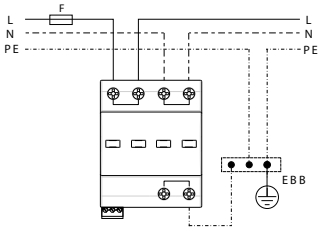
TN-S Network - Single-phase, 1+0 (V-connection)



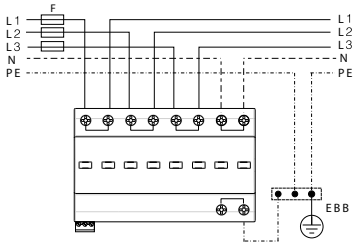
TN-C Network - Single-phase, 1+0 (V-connection)



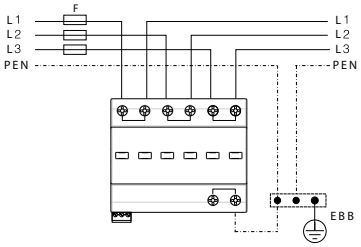
TN-S Network - Single-phase, 2+0 (V-connection)



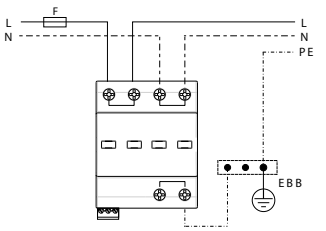
TN-S Network - Three-phase, 4+0 (V-connection)



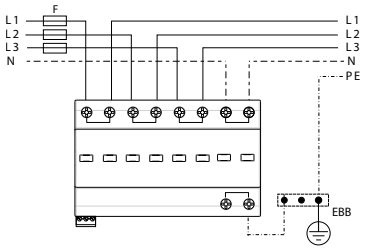
TN-C Network - Three-phase, 3+0 (V-connection)



TT Network - Single-phase, 1+1 (V-connection)



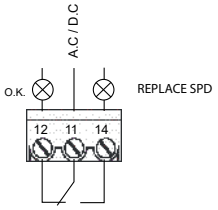
TT Network - Three-phase, 3+1 (V-connection)



Remote signalization connection / Back-up fuse

Back-up fuse
F1 > 250 A gG → F2 = 250 A gG
F1 ≤ 250 A gG → F2 = not needed
F ≤ 100 A gG

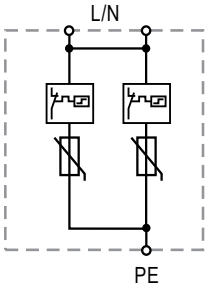
A.C.	250V / 0.5A
D.C.	250V / 0.1A
	125V / 0.2A
	75V / 0.5A



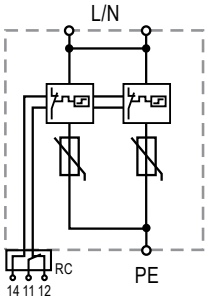
Connection diagram

ETITEC T WENT Iimp=25 kA

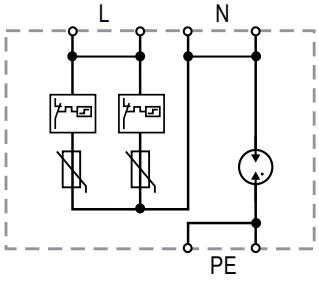
ETITEC T WENT 320/25 1+0



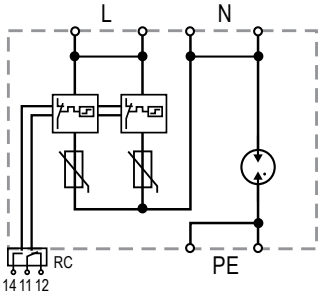
ETITEC T WENT 320/25 1+0 RC



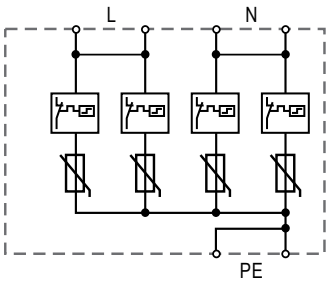
ETITEC T WENT 320/25 1+1 RC



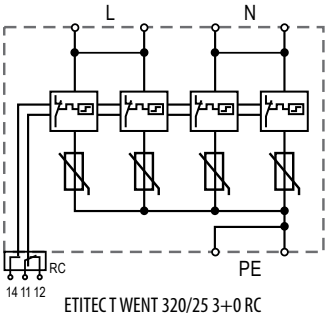
ETITEC T WENT 320/25 1+1 RC



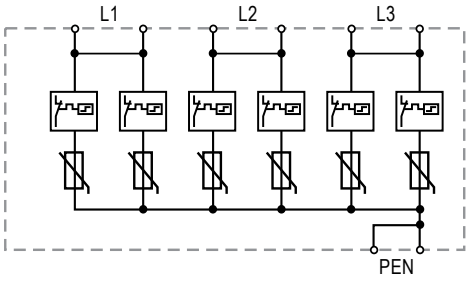
ETITEC T WENT 320/25 2+0 RC



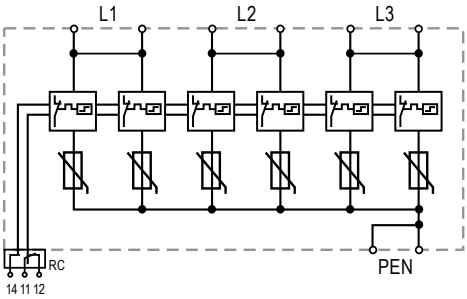
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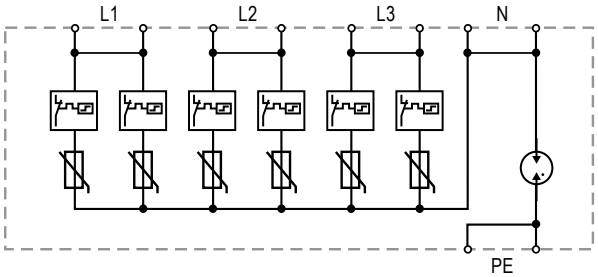
ETITEC T WENT 320/25 3+0



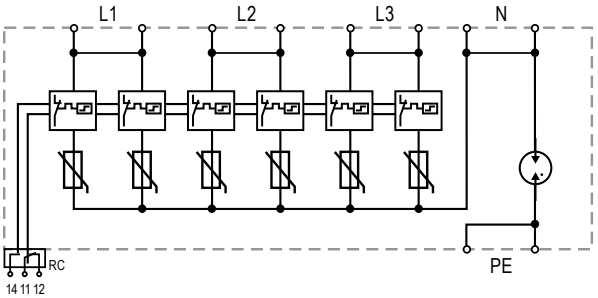
ETITEC T WENT 320/25 3+0 RC



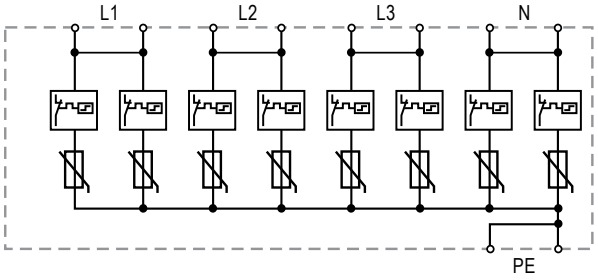
ETITEC T WENT 320/25 3+1



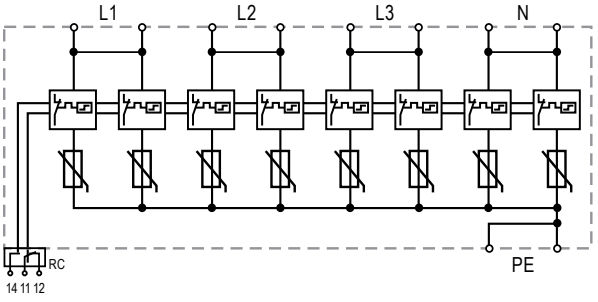
ETITEC T WENT 320/25 3+1 RC



ETITEC T WENT 320/25 4+0



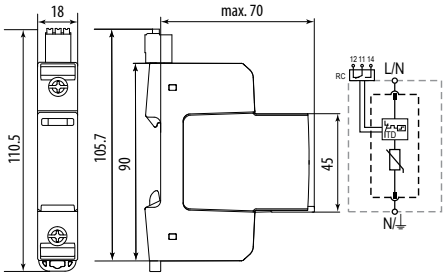
ETITEC T WENT 320/25 4+0 RC



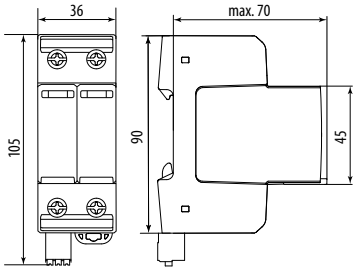
Surge arrester ETITEC ML T123 EN/IEC/VDE: T1, T2,T3 /I, II,III /B+C+D

ETITEC ML T123		
Type	**ETITEC ML T123 300/12,5 (1+0), (2+0), (3+0)**	**ETITEC ML T123 300/12,5 (1+1), (3+1)**
In accordance with	IEC 61643-11:2011, EN 61643-11:2012+A11:2018	
Category IEC/EN/VDE	T1, T2, T3/I, II, III/B+C+D	
Nominal AC voltage (50/60Hz) U_o	240V	
Max. continuous operating voltage (AC) Uc	300 V (L-N)	300 V (L-N) / 305 (N-PE)
Impulse discharge current per pole (10/350) I_{imp}	12,5 kA	12,5 kA/50 kA
Nominal discharge current (8/20) I_n	20 kA	20 kA (L-N)/50 kA(N-PE)
Max. discharge current (8/20) I_{max}	40 kA	40 kA (L-N)/100 kA(N-PE)
TOV immunity U_T (AC)	337 V (L-N)/5s withstand	
	442V/120 min (L-N) safe fail	442V/120 min (L-N) Safe fail, 1200V (N-PE) withstand 200ms
Charge		
Voltage Protection level for Type2 / for Type 3 U_p	1500 V / 900V	1500 V / 900V (L-N)/(N-PE)
Open circuit voltage Type 3 test U_{oc}	6 kV	
Follow current I_{fi}	-	100 A_{RMS} (N-PE)
Response time t_A	< 25 ns	<25 ns (L-N) / < 100 ns (N-PE)
Residual current I_{pe} at U_{ref}	< 0,3 mA	
Thermal decoupler	✓	
Torque	4,5 Nm	
Back-up fuse (if mains > 160A)	160 A gG	
Short-circuit current rating I_{SCCR}	25 kA / 50 Hz	
Temperature range	- 40°C ...+85°C	
Cross-section of connection wire	35 mm² (solid, stranded) / 25 mm² (flexible)	
Mounting	indoors on top hat fixing rail 35 mm (EN 60715)	
Degree of protection	IP 20	
Casing material	thermoplastic; extinguishing degree UL 94 V-0	
Dimensions	1 TE ... 4 TE	
Fault indication (visual)	OK - green indicator / faulty - RED indicator	
Fault indication (remote contacts)	✓ (version with RC contact)	
Additional data for ETITEC B-RC		
Remote signalisation (RC)	✓	
Switching capability (RC)	AC: 250V/1A; DC: 48V/0,5A; 24V/0,5A; 12V/0,5A	
Cross-section of connection wire (RC)	max. 1.5 mm² (single-core)	

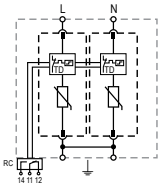
ETITEC ML T123
300/12,5 (1+0) RC



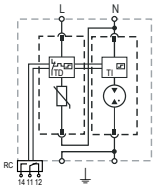
ETITEC ML T123
300/12,5 (2+0) RC/ ...(1+1) RC



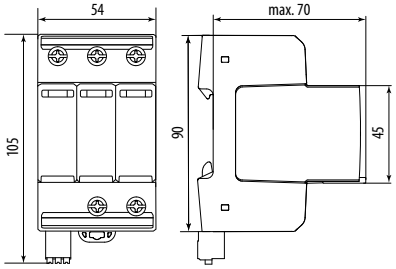
ETITEC ML T123
300/12,5 (2+0) RC



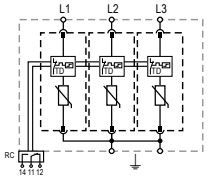
ETITEC ML T123
300/12,5 (1+1) RC



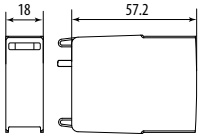
ETITEC ML T123
300/12,5 (3+0) RC



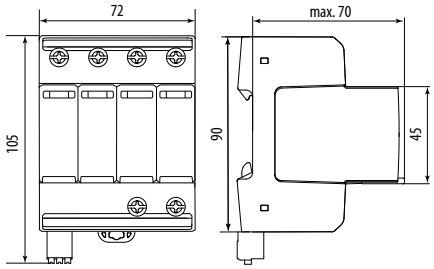
ETITEC ML T123
300/12,5 (3+0) RC



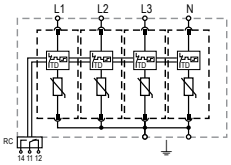
Modification module
ETITEC ML T123
300/12,5



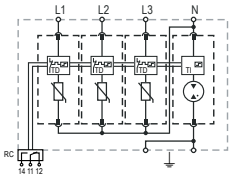
ETITEC ML T123
300/12,5 (4+0) RC/ ...(3+1) RC



ETITEC ML T123
300/12,5 (4+0) RC



ETITEC ML T123
300/12,5 (3+1) RC



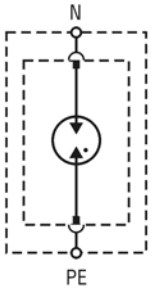
Surge arrester ETITEC group C T2

EN/IEC/VDE: T2/II/C

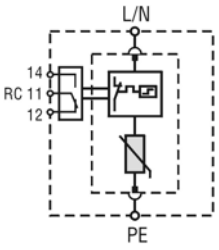
ETITEC C T2			
Type	**275/20**	**440/20**	**255/20 G**
In accordance with	IEC/EN 61643-11		
Category IEC/EN/VDE	II/T2/C		
Max. continuous operating voltage (AC) Uc	275	440	255
Nominal AC voltage Uo	230 V 50-60 Hz		
TOV immunity UT (AC)	335 V/5s withstand	335 V/5s withstand	1200 V
	440 V/120 min safe disconnection	440 V/120 min withstand	-
Nominal discharge current (8/20) In	20 kA		
Max. discharge current (8/20) Imax	40 kA		
Charge			
Protection level Up - at In (8/20)	<1,5 kV	<2,0 kV	<1,5 kV
Follow current If	x		>100 A
Response time tA	< 25 ns		< 100 ns
Residual current Ipe at Uref	< 0,2 mA		-
Current source generator	1mA		
U_n min (MOV)	459V		
U_n max (MOV)	561V		
Voltage step generator	100V/s		
U_n min(GDT)	480V		
U_n max (GDT)	720V		
Thermal decoupler	✓		-
Torque	3,0 Nm		
Back-up fuse (if mains > 125A)	125 A gG		-
Short-circuit current rating ISCCR	25 kA / 50 Hz		-
Temperature range	- 40°C ...+70°C		
Cross-section of connection wire	min. 6mm², max. single strand 35mm², multi-strand 25mm²		
Mounting	indoors on top hat fixing rail 35 mm (EN 60715)		
Degree of protection	IP 20		
Casing material	thermoplastic; extinguishing degree UL 94 V-0		
Dimensions	1 TE ... 4 TE		
Indication of disconnector operation	red flag		
Permissible humidity	5% - 95%		
Additional data for ETITEC C-RC			
Remote signalisation (RC)	✓		-
Switching capability (RC)	AC: 250V/0.5A; 125V/3A		-
Cross-section of connection wire (RC)	max. 1.5 mm²		-
Torque (RC)	0,25 Nm		-

Type of network and nr. of SPD poles	
Network	**Nr of poles (SPD configuration)**
TNC 1phase	1+0
TNC 3 phase	3+0
TNS 1 phase	2+0 / 1+1
TNS 3 phase	4+0 / 3+1
TT 1 phase	1+1
TT 3 phase	3+1
IT 1 phase	2+0
IT 3 phase	4+0

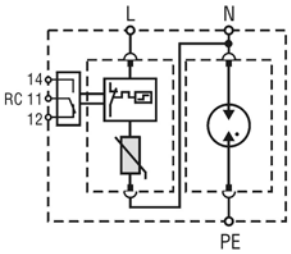
At TNC, TNS, TT systems with Un=230V, recommended Uc value of SPD is 275V.
At IT system, recommended Uc value of SPD is 440V.



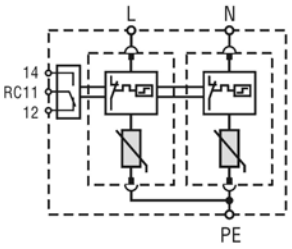
ETITEC C T2 G



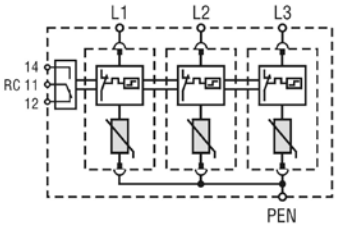
ETITEC C T2 1+0 RC



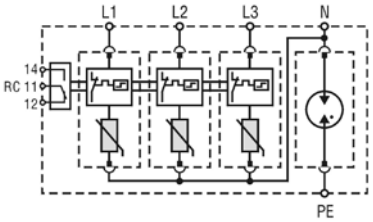
ETITEC C T2 1+1 RC



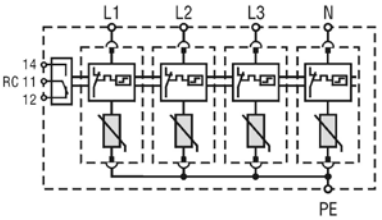
ETITEC C T2 2+0 RC



ETITEC C T2 3+0 RC

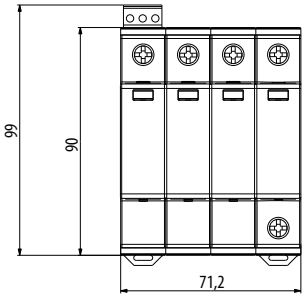


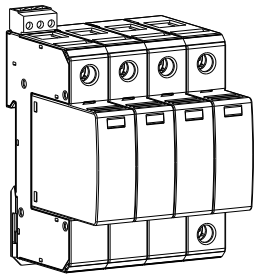
ETITEC C T2 3+1 RC



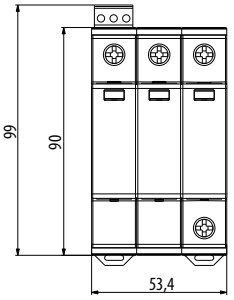
ETITEC C T2 4+0 RC

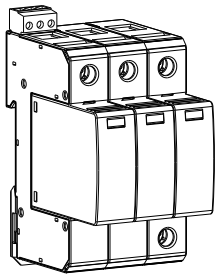
ETITEC C T2 275/20 4+0 RC
ETITEC C T2 275/20 3+1 RC



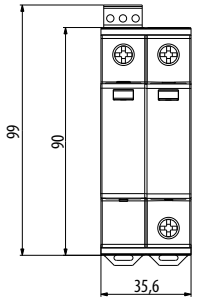


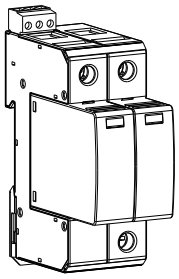
ETITEC C T2 275/20 3+0 RC



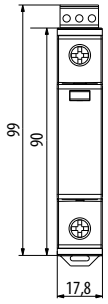


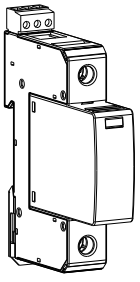
ETITEC C T2 275/20 2+0 RC
ETITEC C T2 275/20 1+1 RC

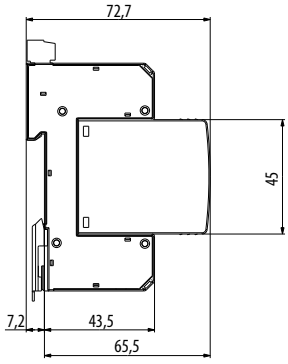




ETITEC C T2 275/20 1+0 RC

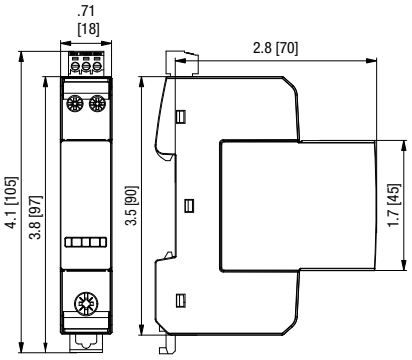




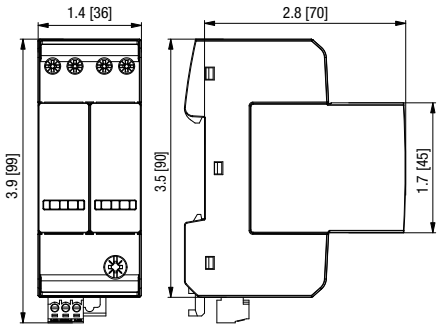


Surge arrester ETITEC group CM T2+T3 EN/IEC/VDE: T2,T3/II,III/C,D

ETITEC CM T2+T3		
Type	**ETITEC CM T23 275/20 2+0 (RC), 4+0 (RC)**	**ETITEC CM T23 275/20 1+1 (RC), 3+1 (RC)**
In accordance with	IEC/EN 61643-11	
Category IEC/EN/VDE	II,III/T2,T3/C,D	
Max. continuous operating voltage (AC) U_c	275	L-N: 275; N-PE: 255V
Nominal AC voltage U_o	230 V 50-60 Hz	
TOV immunity U_t (AC)	335 V/5s withstand	335 V/5s withstand
	440 V/120 min safe disconnection	440 V/120 min safe disconnection
Nominal discharge current (8/20) I_n	20 kA	
Max. discharge current (8/20) I_{max}	40 kA	
Charge		
Protection level U_p T2+T3	1,5 kV	1,5 kV
Protection level U_p T3 only	1,0 kV	L-N: 1,0 kV; N-PE: 0,3 kV
Open Circuit Voltage of Combination Wawe Generator (1.2/50 µs) U_{oc}	6 kV	
Short Circuit Current of Combination Wawe Generator (8/20 µs) I_{cw}	3 kA	
Response time tA	< 25 ns	L-N: < 25 ns; N-PE: < 100 ns
Number of ports	1	
Thermal decoupler	✓	
Torque	L, N: 1,2 Nm, PE: 2,0 Nm	
Back-up fuse	100 A gG	
Short-circuit current rating I_{SCCR}	25 kA	
Temperature range	- 40°C ...+85°C	
Cross-section of connection wire	L, N: 10 mm² (Solid, Stranded) / 6 mm² (Flexible); PE: 35 mm² (Solid,Stranded) / 25 mm² (Flexible)	
Mounting	indoors on top hat fixing rail 35 mm (EN 60715)	
Degree of protection	IP 20B (built-in)	
Dimensions	1 TE ... 2 TE	
Indication of disconnector operation	red flag	
Permissible humidity	5% - 95%	
Additional data for ETITEC CM-RC		
Remote signalisation (RC)	✓	
Switching capability (RC)	AC: 250V/0.5A; DC: 250V/0.5A, 125V/0,2A, 75V/0,5A	
Cross-section of connection wire (RC)	max. 1.5 mm²	
Torque (RC)	0,4 Nm	

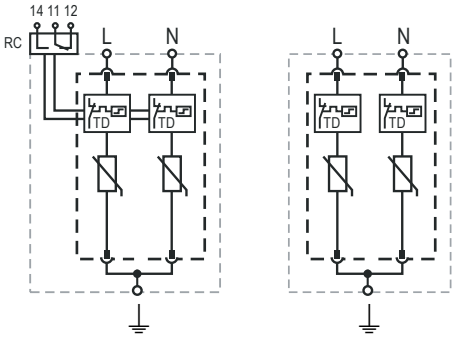


ETITEC CM T23 275/20 2+0 (RC), ETITEC CM T23 275/20 1+1 (RC)



ETITEC CM T23 275/20 4+0 (RC), ETITEC CM T23 275/20 3+1 (RC)

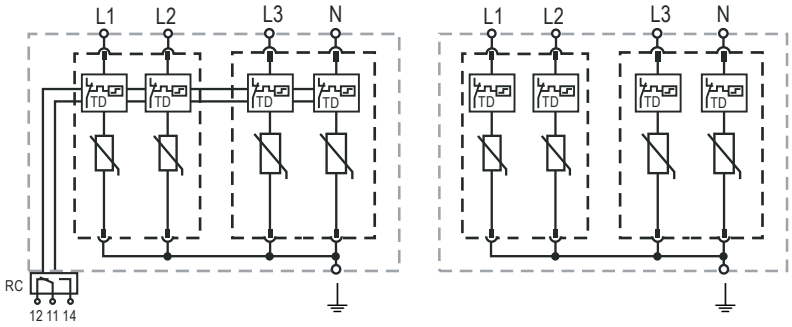
ETITEC CM T23 275/20 2+0 (RC)



Legend

L	Line Conductor Terminal
N	Neutral Conductor Terminal
Z	PE Conductor Terminal
RC	Remote Contacts Terminal
TD	Thermal Disconnector

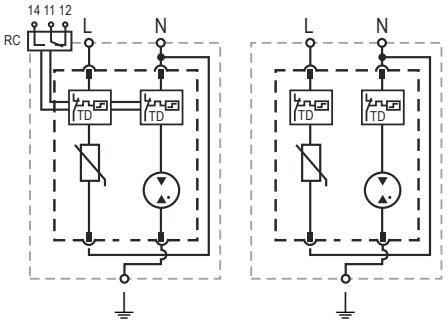
ETITEC CM T23 275/20 4+0 (RC)



Legend

L	Line Conductor Terminal
N	Neutral Conductor Terminal
Z	PE Conductor Terminal
RC	Remote Contacts Terminal
TD	Thermal Disconnector

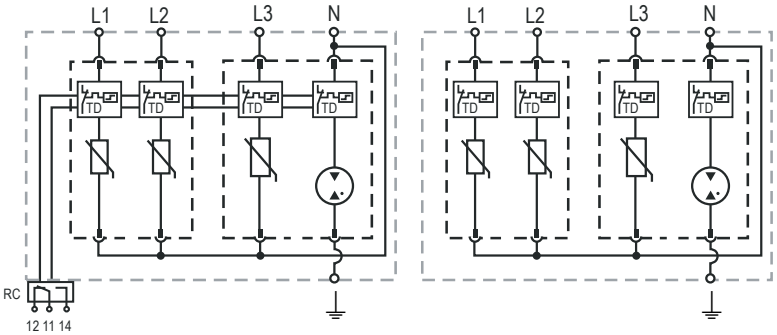
ETITEC CM T23 275/20 1+1 (RC)



Legend

L	Line Conductor Terminal
N	Neutral Conductor Terminal
Z	PE Conductor Terminal
RC	Remote Contacts Terminal
TD	Thermal Disconnector

ETITEC CM T23 275/20 3+1 (RC)



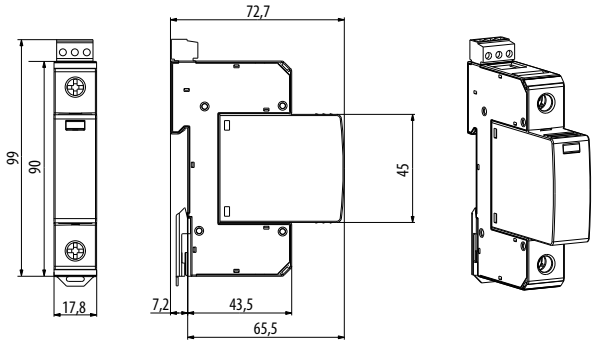
Legend

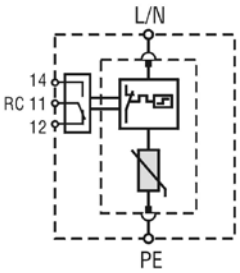
L	Line Conductor Terminal
N	Neutral Conductor Terminal
Z	PE Conductor Terminal
RC	Remote Contacts Terminal
TD	Thermal Disconnector

Surge arrester ETITEC group D T3 EN/IEC/VDE: T3/III/D

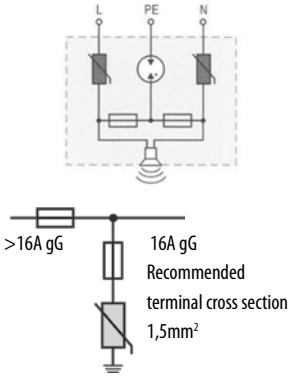
ETITEC D T3		
Type	**275/3**	**440/3**
In accordance with	IEC/EN 61643-11	
Category IEC/EN/VDE	III/T3/D	
Max. continuous operating voltage (AC) U_c	275	440
Nominal AC voltage U_o	230 V 50-60 Hz	
TOV immunity U_T (AC)	335 V/5s withstand	335 V/5s withstand
	440 V/120 min safe disconnection	440 V/120 min withstand
U_{oc}	10 kV	
Max. discharge current (8/20) I_{max}	10 kA	
Charge		
Protection level Up - at I_n (8/20)	<1,4 kV	<1,6 kV
Follow current I_{fi}	x	
Response time t_A	< 25 ns	
Residual current I_{pe} at U_{ref}	< 0,3 mA	
Thermal decoupler	✓	
Torque	3,0 Nm	
Back-up fuse (if mains > 63A)	125 A gG	
Short-circuit current rating I_{SCCR}	25 kA / 50 Hz	
Temperature range	- 40°C ...+70°C	
Cross-section of connection wire	min. 6mm², max. single strand 35mm², multi-strand 25mm²	
Mounting	indoors on top hat fixing rail 35 mm (EN 60715)	
Degree of protection	IP 20	
Casing material	thermoplastic; extinguishing degree UL 94 V-0	
Dimensions	1 TE	
Indication of disconnector operation	red flag	
Permissible humidity	5% - 95%	
Additional data for ETITEC D-RC		
Remote signalisation (RC)	✓	
Switching capability (RC)	AC: 250V/0.5A; 125V/3A	
Cross-section of connection wire (RC)	max. 1.5 mm²	
Torque (RC)	0,25 Nm	

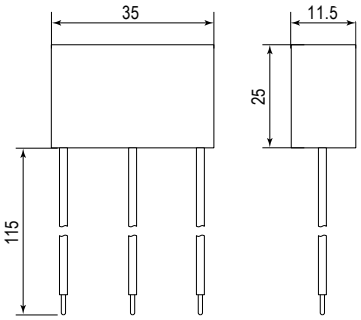
ETITEC D T3 275/3 1+0 RC



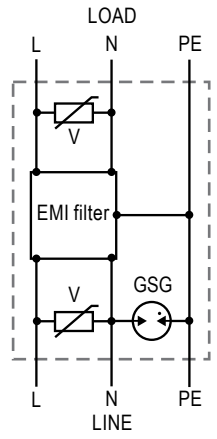


ETITEC D 255/3 MINI	
Electrical	
Nominal AC voltage U_0	230V
Max. continuous operating voltage (AC) U_c	275V
Open Circuit Voltage of the Combination Wave Generator (1,2/50 µs) Uoc	U_{oc}=6kV
	(L+N-PE) $U_{oc\ total}$=10kV
Short-Circuit Current of the Combination Wave Generator (8/20 µs) Icw	3kA
Protection level Up - at I_n (8/20)	(L-N) U_p=1,5kV
	(L-PE)/(N-PE) U_p=1,7kV
Response time t_A	<100ns
Back-up fuse (if mains > 16A)	B 16 A
Short-circuit current rating I_{SCCR}	1 kA
TOV immunity U_T (AC)	337 V/5s withstand
Mechanical and Environmental	
Temperature range	-40°C ... +85°C
Permissible humidity	5% ... 95%
Cross-section of connection wire	1 mm²(stranded)
Mounting	cable ducts
Degree of protection	IP 20
Housing material	thermoplastic; extinguishing degree UL 94 V-0
Thermal decoupler	✓
Fault Indication	Buzzer





Technical data ETITEC FILT D	
In accordance with	IEC-61643-1
Category IEC / VDE	III / D
Connection:	TN-S, TT
Protecting:	L/N-PE
Protective elements:	GSG, MOV & EMI filter
Max. continuous operating voltage (AC/DC) U_c	275/50 Hz
Combination wave(1.2/50-8/20)Uoc/Isc	6kV/3kA
Max. Load current I_L	8A
Protection level U_p	≥800V
Asymetrical attenuation	<70 dB at 5MHz
Terminal cross section	1,5 mm²(stranded)
Indication	Light
Housing	Thermoplastic
Dimensions (w*h*d)	33 x 90 x 57 mm



V : Varistor
GSG: Specific gas tube

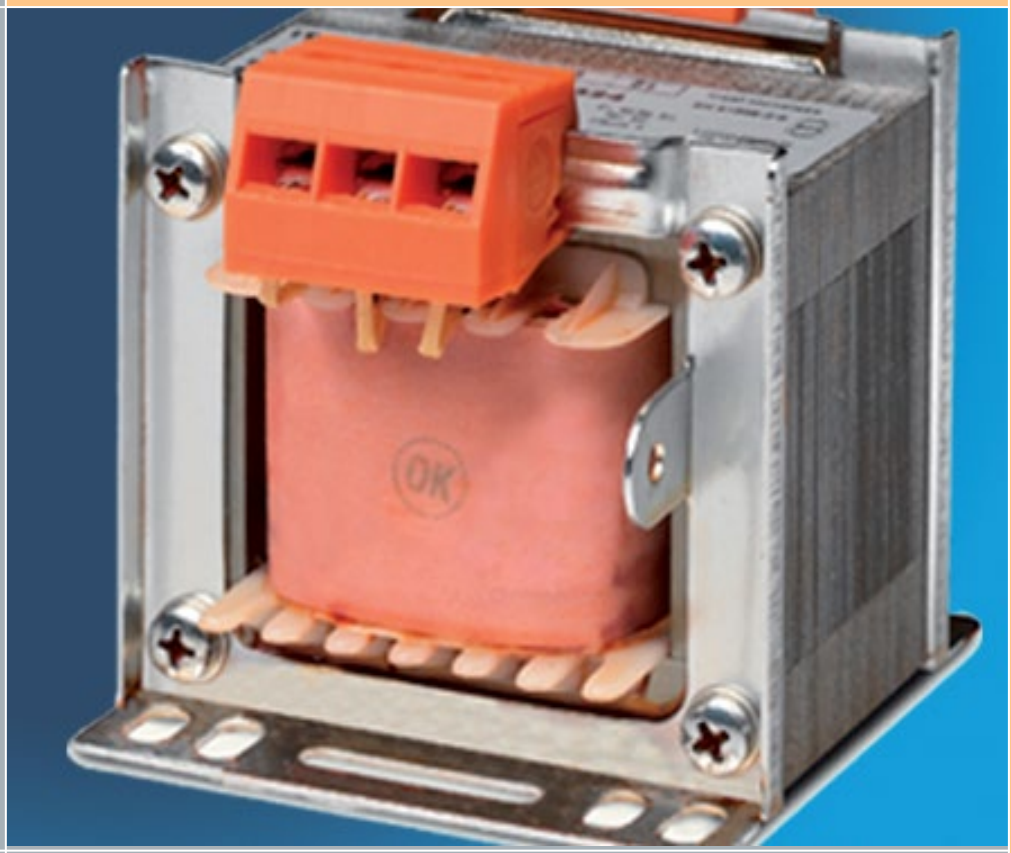
ETITRAFO

Single phase safety and insulating transformers 608

AC/DC power supplies 614

Technical data 615

TRANSFORMERS AND POWER SUPPLIES



POWER NEEDS CONTROL

Single phase safety and insulating transformers

Safety transformer:
It is an insulating transformer designed to supply circuit at a maximum of 50V (safety extra-low voltage).
Insulating transformer:
It is a transformer in which the primary and secondary windings are separated by a double or reinforced insulation, in order to limit, in the circuit supplied by the secondary winding, any risk due to accidental contacts with active parts or parts that can become active in case of an insulation fault.
Impregnation:
The transformers are completely impregnated with a inorganic resin. This operation improves the characteristics of the used materials, prevents the penetration of humidity inside the core and the windings, reduces greatly the noises caused by the vibration.

Single phase safety and insulating transformers IP00

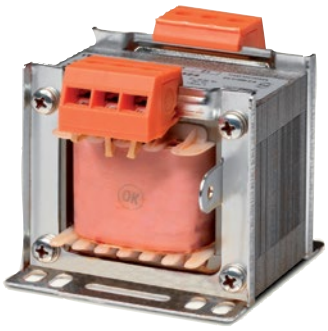


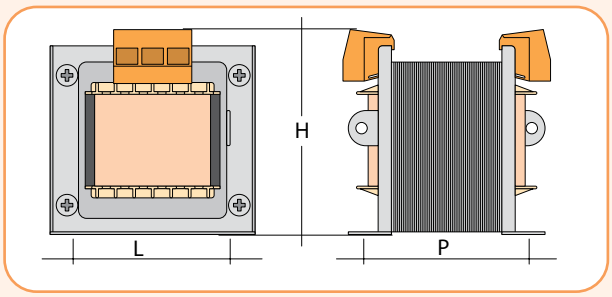
Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 24V (12V-0-12V). Thermal class B

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging. (pcs)
TRANSF 1f B 12-0-12V 30VA	Single phase safety transf. 12-0-12V 30VA	003801001	30	77x77x78	1,00	12
TRANSF 1f B 12-0-12V 50VA	Single phase safety transf. 12-0-12V 50VA	003801002	50	77x77x83	1,45	12
TRANSF 1f B 12-0-12V 75VA	Single phase safety transf. 12-0-12V 75VA	003801003	75	77x77x93	1,65	12
TRANSF 1f B 12-0-12V 100VA	Single phase safety transf. 12-0-12V 100VA	003801004	100	85x85x93	1,88	12
TRANSF 1f B 12-0-12V 150VA	Single phase safety transf. 12-0-12V 150VA	003801005	150	98x95x93	2,40	6
TRANSF 1f B 12-0-12V 200VA	Single phase safety transf. 12-0-12V 200VA	003801006	200	98x95x103	2,93	6
TRANSF 1f B 12-0-12V 250VA	Single phase safety transf. 12-0-12V 250VA	003801007	250	123x108x91	3,90	4
TRANSF 1f B 12-0-12V 300VA	Single phase safety transf. 12-0-12V 300VA	003801008	300	123x108x95	4,00	4
TRANSF 1f B 12-0-12V 400VA	Single phase safety transf. 12-0-12V 400VA	003801009	400	123x108x108	5,10	4
TRANSF 1f B 12-0-12V 500VA	Single phase safety transf. 12-0-12V 500VA	003801010	500	123x130x120	7,20	4
TRANSF 1f B 12-0-12V 630VA	Single phase safety transf. 12-0-12V 630VA	003801011	630	153x130x135	8,90	4
TRANSF 1f B 12-0-12V 800VA	Single phase safety transf. 12-0-12V 800VA	003801012	800	153x130x145	11,70	1
TRANSF 1f B 12-0-12V 1000VA	Single phase safety transf. 12-0-12V 1000VA	003801013	1000	153x130x160	12,50	1
TRANSF 1f B 12-0-12V 1600VA	Single phase safety transf. 12-0-12V 1600VA	003801014	1600	195x187x150	17,00	1
TRANSF 1f B 12-0-12V 2000VA	Single phase safety transf. 12-0-12V 2000VA	003801015	2000	195x187x160	19,10	1
TRANSF 1f B 12-0-12V 2500VA	Single phase safety transf. 12-0-12V 2500VA	003801016	2500	195x187x190	23,00	1
TRANSF 1f B 12-0-12V 3000VA	Single phase safety transf. 12-0-12V 3000VA	003801017	3000	195x187x210	30,00	1
TRANSF 1f B 12-0-12V 4000VA	Single phase safety transf. 12-0-12V 4000VA	003801018	4000	240x270x270	40,00	1
TRANSF 1f B 12-0-12V 5000VA	Single phase safety transf. 12-0-12V 5000VA	003801019	5000	240x270x280	44,00	1
TRANSF 1f B 12-0-12V 6000VA	Single phase safety transf. 12-0-12V 6000VA	003801020	6000	240x270x290	46,00	1
TRANSF 1f B 12-0-12V 8000VA	Single phase safety transf. 12-0-12V 8000VA	003801021	8000	320x430x270	60,00	1
TRANSF 1f B 12-0-12V 10000VA	Single phase safety transf. 12-0-12V 10000VA	003801022	10000	320x430x280	75,00	1

Features:

- → Electrolytic copper: Class F/H
- → Impregnated with insulating resin
- → Admissible voltage tolerance +/- 15%

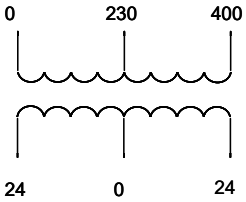


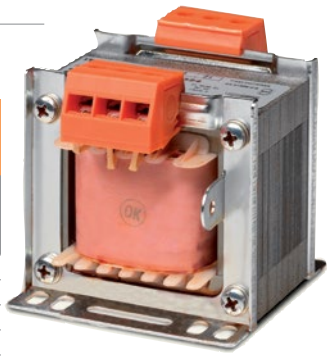


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Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 48V (24V-0-24V). Thermal class B

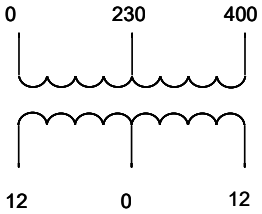
Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging. (pcs)
TRANSF 1f B 24-0-24V 30VA	Single phase safety transf. 24-0-24V 30VA	003801031	30	77x77x78	1,00	12
TRANSF 1f B 24-0-24V 50VA	Single phase safety transf. 24-0-24V 50VA	003801032	50	77x77x83	1,45	12
TRANSF 1f B 24-0-24V 75VA	Single phase safety transf. 24-0-24V 75VA	003801033	75	77x77x93	1,65	12
TRANSF 1f B 24-0-24V 100VA	Single phase safety transf. 24-0-24V 100VA	003801034	100	85x85x93	1,88	12
TRANSF 1f B 24-0-24V 150VA	Single phase safety transf. 24-0-24V 150VA	003801035	150	98x95x93	2,40	6
TRANSF 1f B 24-0-24V 200VA	Single phase safety transf. 24-0-24V 200VA	003801036	200	98x95x103	2,93	6
TRANSF 1f B 24-0-24V 250VA	Single phase safety transf. 24-0-24V 250VA	003801037	250	123x108x91	3,90	4
TRANSF 1f B 24-0-24V 300VA	Single phase safety transf. 24-0-24V 300VA	003801038	300	123x108x95	4,00	4
TRANSF 1f B 24-0-24V 400VA	Single phase safety transf. 24-0-24V 400VA	003801039	400	123x108x108	5,10	4
TRANSF 1f B 24-0-24V 500VA	Single phase safety transf. 24-0-24V 500VA	003801040	500	123x130x120	7,20	4
TRANSF 1f B 24-0-24V 630VA	Single phase safety transf. 24-0-24V 630VA	003801041	630	153x130x135	8,90	4
TRANSF 1f B 24-0-24V 800VA	Single phase safety transf. 24-0-24V 800VA	003801042	800	153x130x145	11,70	1
TRANSF 1f B 24-0-24V 1000VA	Single phase safety transf. 24-0-24V 1000VA	003801043	1000	153x130x160	12,50	1
TRANSF 1f B 24-0-24V 1600VA	Single phase safety transf. 24-0-24V 1600VA	003801044	1600	195x187x150	17,00	1
TRANSF 1f B 24-0-24V 2000VA	Single phase safety transf. 24-0-24V 2000VA	003801045	2000	195x187x160	19,10	1
TRANSF 1f B 24-0-24V 2500VA	Single phase safety transf. 24-0-24V 2500VA	003801046	2500	195x187x190	23,00	1
TRANSF 1f B 24-0-24V 3000VA	Single phase safety transf. 24-0-24V 3000VA	003801047	3000	195x187x210	30,00	1
TRANSF 1f B 24-0-24V 4000VA	Single phase safety transf. 24-0-24V 4000VA	003801048	4000	240x270x270	40,00	1
TRANSF 1f B 24-0-24V 5000VA	Single phase safety transf. 24-0-24V 5000VA	003801049	5000	240x270x280	44,00	1
TRANSF 1f B 24-0-24V 6000VA	Single phase safety transf. 24-0-24V 6000VA	003801050	6000	240x270x290	46,00	1
TRANSF 1f B 24-0-24V 8000VA	Single phase safety transf. 24-0-24V 8000VA	003801051	8000	320x430x270	60,00	1
TRANSF 1f B 24-0-24V 10000VA	Single phase safety transf. 24-0-24V 10000VA	003801052	10000	320x430x280	75,00	1





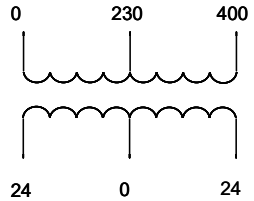
Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 24V (12V-0-12V). Thermal class F

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging. (pcs)
TRANSF 1f 12-0-12V 40VA	Single phase safety transf. 12-0-12V 40VA	003801121	40	77x77x78	1,00	12
TRANSF 1f 12-0-12V 63VA	Single phase safety transf. 12-0-12V 63VA	003801123	63	77x77x83	1,45	12
TRANSF 1f 12-0-12V 75VA	Single phase safety transf. 12-0-12V 75VA	003801124	75	77x77x83	1,45	12
TRANSF 1f 12-0-12V 100VA	Single phase safety transf. 12-0-12V 100VA	003801125	100	85x85x93	1,88	12
TRANSF 1f 12-0-12V 150VA	Single phase safety transf. 12-0-12V 160VA	003801126	160	98x95x93	2,44	6
TRANSF 1f 12-0-12V 200VA	Single phase safety transf. 12-0-12V 200VA	003801127	200	98x95x103	2,93	6
TRANSF 1f 12-0-12V 250VA	Single phase safety transf. 12-0-12V 250VA	003801128	250	123x108x91	3,90	4
TRANSF 1f 12-0-12V 300VA	Single phase safety transf. 12-0-12V 300VA	003801129	300	123x108x95	4,00	4
TRANSF 1f 12-0-12V 400VA	Single phase safety transf. 12-0-12V 400VA	003801130	400	123x108x108	5,10	4
TRANSF 1f 12-0-12V 500VA	Single phase safety transf. 12-0-12V 500VA	003801131	500	123x130x120	7,20	4
TRANSF 1f 12-0-12V 630VA	Single phase safety transf. 12-0-12V 630VA	003801132	630	153x130x135	8,90	4
TRANSF 1f 12-0-12V 800VA	Single phase safety transf. 12-0-12V 800VA	003801133	800	153x130x135	10,00	1
TRANSF 1f 12-0-12V 1000VA	Single phase safety transf. 12-0-12V 1000VA	003801134	1000	153x130x160	12,50	1
TRANSF 1f 12-0-12V 1600VA	Single phase safety transf. 12-0-12V 1600VA	003801135	1600	195x187x150	17,00	1
TRANSF 1f 12-0-12V 2000VA	Single phase safety transf. 12-0-12V 2000VA	003801136	2000	195x187x160	19,10	1
TRANSF 1f 12-0-12V 2500VA	Single phase safety transf. 12-0-12V 2500VA	003801137	2500	195x187x190	23,00	1

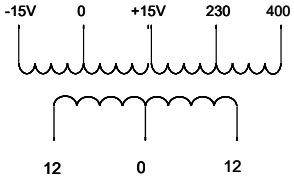


Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 48V (24V-0-24V). Thermal class F

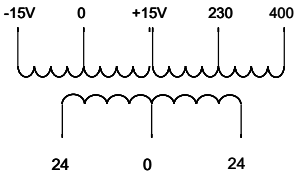
Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging. (pcs)
TRANSF 1f 24-0-24V 40VA	Single phase safety transf. 24-0-24V 40V	003801141	40	77x77x78	1,00	12
TRANSF 1f 24-0-24V 63VA	Single phase safety transf. 24-0-24V 63V	003801142	63	77x77x83	1,45	12
TRANSF 1f 24-0-24V 75VA	Single phase safety transf. 24-0-24V 75V	003801143	75	77x77x83	1,45	12
TRANSF 1f 24-0-24V 100VA	Single phase safety transf. 24-0-24V 100V	003801144	100	85x85x93	1,88	12
TRANSF 1f 24-0-24V 160VA	Single phase safety transf. 24-0-24V 160V	003801145	160	98x95x93	2,44	6
TRANSF 1f 24-0-24V 200VA	Single phase safety transf. 24-0-24V 200V	003801146	200	98x95 x103	2,93	6
TRANSF 1f 24-0-24V 250VA	Single phase safety transf. 24-0-24V 250V	003801147	250	123x108x91	3,90	4
TRANSF 1f 24-0-24V 300VA	Single phase safety transf. 24-0-24V 300V	003801148	300	123x108x95	4,00	4
TRANSF 1f 24-0-24V 400VA	Single phase safety transf. 24-0-24V 400V	003801149	400	123x108x108	5,10	4
TRANSF 1f 24-0-24V 500VA	Single phase safety transf. 24-0-24V 500V	003801150	500	123x130x120	7,20	4
TRANSF 1f 24-0-24V 630VA	Single phase safety transf. 24-0-24V 630V	003801151	630	153x130x135	8,90	4
TRANSF 1f 24-0-24V 1000VA	Single phase safety transf. 24-0-24V 1000V	003801152	1000	153x130x160	12,50	1
TRANSF 1f 24-0-24V 1600VA	Single phase safety transf. 24-0-24V 1600V	003801153	1600	195x187x160	17,00	1
TRANSF 1f 24-0-24V 2500VA	Single phase safety transf. 24-0-24V 2500V	003801154	2500	195x187x190	23,00	1



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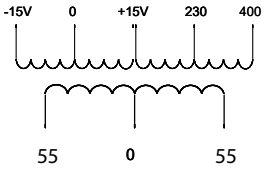


Single phase safety transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 24V (12-0-12V). Thermal class F. Type EURO

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF EU 1f 12-0-12V 50VA	Single phase safety trans. +/-15V 12-0-12V 50VA	003801341	50	77x77x83	1,45	12
TRANSF EU 1f 12-0-12V 100VA	Single phase safety trans. +/-15V 12-0-12V 100VA	003801342	100	85x85x93	1,88	12
TRANSF EU 1f 12-0-12V 160VA	Single phase safety trans. +/-15V 12-0-12V 160VA	003801343	160	98x95x93	2,44	12
TRANSF EU 1f 12-0-12V 200VA	Single phase safety trans. +/-15V 12-0-12V 200VA	003801344	200	98x95x103	2,93	12
TRANSF EU 1f 12-0-12V 250VA	Single phase safety trans. +/-15V 12-0-12V 250VA	003801345	250	123x108x91	3,90	6
TRANSF EU 1f 12-0-12V 300VA	Single phase safety trans. +/-15V 12-0-12V 300VA	003801346	300	123x108x95	4,00	6
TRANSF EU 1f 12-0-12V 400VA	Single phase safety trans. +/-15V 12-0-12V 400VA	003801347	400	123x108x108	5,10	4
TRANSF EU 1f 12-0-12V 630VA	Single phase safety trans. +/-15V 12-0-12V 630VA	003801348	630	153x130x135	8,90	4
TRANSF EU 1f 12-0-12V 1000VA	Single phase safety trans. +/-15V 12-0-12V 1000VA	003801349	1000	153x130x160	12,50	1
TRANSF EU 1f 12-0-12V 1600VA	Single phase safety trans. +/-15V 12-0-12V 1600VA	003801350	1600	195x187x150	17,00	1
TRANSF EU 1f 12-0-12V 2500VA	Single phase safety trans. +/-15V 12-0-12V 2500VA	003801351	2500	195x187x190	23,00	1

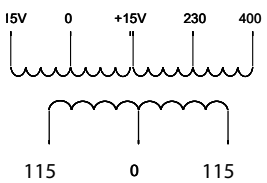
Single phase safety transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 48V (24-0-24V). Thermal class F. Type EURO

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF EU 1f 24-0-24V 50VA	Single phase safety trans. +/-15V 24-0-24V 50VA	003801361	50	77x77x83	1,45	12
TRANSF EU 1f 24-0-24V 100VA	Single phase safety trans. +/-15V 24-0-24V 100VA	003801362	100	85x85x93	1,88	12
TRANSF EU 1f 24-0-24V 160VA	Single phase safety trans. +/-15V 24-0-24V 160VA	003801363	160	98x95x93	2,44	12
TRANSF EU 1f 24-0-24V 200VA	Single phase safety trans. +/-15V 24-0-24V 200VA	003801364	200	98x95x103	2,93	12
TRANSF EU 1f 24-0-24V 250VA	Single phase safety trans. +/-15V 24-0-24V 250VA	003801365	250	123x108x91	3,90	6
TRANSF EU 1f 24-0-24V 300VA	Single phase safety trans. +/-15V 24-0-24V 300VA	003801366	300	123x108x95	4,00	6
TRANSF EU 1f 24-0-24V 400VA	Single phase safety trans. +/-15V 24-0-24V 400VA	003801367	400	123x108x108	5,10	4
TRANSF EU 1f 24-0-24V 630VA	Single phase safety trans. +/-15V 24-0-24V 630VA	003801368	630	153x130x135	8,90	4
TRANSF EU 1f 24-0-24V 1000VA	Single phase safety trans. +/-15V 24-0-24V 1000VA	003801369	1000	153x130x160	12,50	1
TRANSF EU 1f 24-0-24V 1600VA	Single phase safety trans. +/-15V 24-0-24V 1600VA	003801370	1600	195x187x150	17,00	1
TRANSF EU 1f 24-0-24V 2500VA	Single phase safety trans. +/-15V 24-0-24V 2500VA	003801371	2500	195x187x190	23,00	1



Single phase insulating transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 110V (55-0-55V). Thermal class F. Type EURO

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF EU 1f 55-0-55V 50VA	Single phase insulating trans. +/-15V 55-0-55V 50VA	003801381	50	77x77x83	1,45	12
TRANSF EU 1f 55-0-55V 100VA	Single phase insulating trans. +/-15V 55-0-55V 100VA	003801382	100	85x85x93	1,88	12
TRANSF EU 1f 55-0-55V 160VA	Single phase insulating trans. +/-15V 55-0-55V 160VA	003801383	160	98x95x93	2,44	12
TRANSF EU 1f 55-0-55V 200VA	Single phase insulating trans. +/-15V 55-0-55V 200VA	003801384	200	98x95x103	2,93	12
TRANSF EU 1f 55-0-55V 250VA	Single phase insulating trans. +/-15V 55-0-55V 250VA	003801385	250	123x108x91	3,90	6
TRANSF EU 1f 55-0-55V 300VA	Single phase insulating trans. +/-15V 55-0-55V 300VA	003801386	300	123x108x95	4,00	6
TRANSF EU 1f 55-0-55V 400VA	Single phase insulating trans. +/-15V 55-0-55V 400VA	003801387	400	123x108x108	5,10	4
TRANSF EU 1f 55-0-55V 630VA	Single phase insulating trans. +/-15V 55-0-55V 630VA	003801388	630	153x130x135	8,90	4
TRANSF EU 1f 55-0-55V 1000VA	Single phase insulating trans. +/-15V 55-0-55V 1000VA	003801389	1000	153x130x160	12,50	1
TRANSF EU 1f 55-0-55V 1600VA	Single phase insulating trans. +/-15V 55-0-55V 1600VA	003801390	1600	195x187x150	17,00	1
TRANSF EU 1f 55-0-55V 2500VA	Single phase insulating trans. +/-15V 55-0-55V 2500VA	003801391	2500	195x187x190	23,00	1



Single phase insulating transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 230V (115-0-115V). Thermal class F. Type EURO

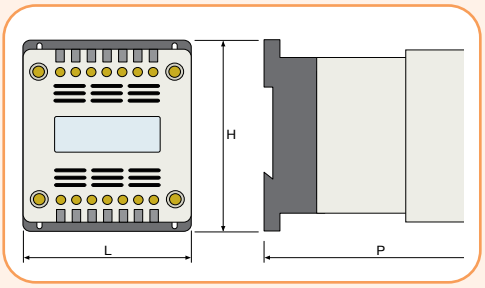
Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF EU 1f 115-0-115V 50VA	Single phase insulating trans. +/-15V 115-0-115V 50VA	003801401	50	77x77x83	1,45	12
TRANSF EU 1f 115-0-115V 100VA	Single phase insulating trans. +/-15V 115-0-115V 100VA	003801402	100	85x85x93	1,88	12
TRANSF EU 1f 115-0-115V 160VA	Single phase insulating trans. +/-15V 115-0-115V 160VA	003801403	160	98x95x93	2,44	12
TRANSF EU 1f 115-0-115V 200VA	Single phase insulating trans. +/-15V 115-0-115V 200VA	003801404	200	98x95x103	2,93	12
TRANSF EU 1f 115-0-115V 250VA	Single phase insulating trans. +/-15V 115-0-115V 250VA	003801405	250	123x108x91	3,90	6
TRANSF EU 1f 115-0-115V 300VA	Single phase insulating trans. +/-15V 115-0-115V 300VA	003801406	300	123x108x95	4,00	6
TRANSF EU 1f 115-0-115V 400VA	Single phase insulating trans. +/-15V 115-0-115V 400VA	003801407	400	123x108x108	5,10	4
TRANSF EU 1f 115-0-115V 630VA	Single phase insulating trans. +/-15V 115-0-115V 630VA	003801408	630	153x130x135	8,90	4
TRANSF EU 1f 115-0-115V 1000VA	Single phase insulating trans. +/-15V 115-0-115V 1000VA	003801409	1000	153x130x160	12,50	1
TRANSF EU 1f 115-0-115V 1600VA	Single phase insulating trans. +/-15V 115-0-115V 1600VA	003801410	1600	195x187x150	17,00	1
TRANSF EU 1f 115-0-115V 2500VA	Single phase insulating trans. +/-15V 115-0-115V 2500VA	003801411	2500	195x187x190	23,00	1

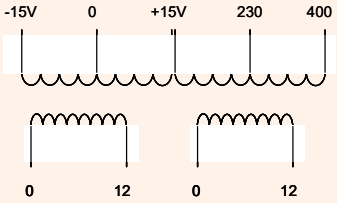
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Single phase safety and insulating transformers IP20 DIN rail mounted

Single phase safety transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 0-12 0-12V. Thermal class B. Type EURO. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f EU 0-12 0-12V 30VA TH	Single phase safety trans. +/-15V 0-12 0-12V 30VA	003801811	30	90 x 96 x106	1,55	1
TRANSF 1f EU 0-12 0-12V 40VA TH	Single phase safety trans. +/-15V 0-12 0-12V 40VA	003801812	40	90 x 96 x106	1,55	1
TRANSF 1f EU 0-12 0-12V 50VA TH	Single phase safety trans. +/-15V 0-12 0-12V 50VA	003801813	50	90 x 96 x106	1,60	1
TRANSF 1f EU 0-12 0-12V 63VA TH	Single phase safety trans. +/-15V 0-12 0-12V 63VA	003801814	63	90 x106 x106	1,90	1
TRANSF 1f EU 0-12 0-12V 75VA TH	Single phase safety trans. +/-15V 0-12 0-12V 75VA	003801815	75	90 x106 x106	2,00	1
TRANSF 1f EU 0-12 0-12V 100VA TH	Single phase safety trans. +/-15V 0-12 0-12V 100VA	003801816	100	90 x116 x106	2,45	1
TRANSF 1f EU 0-12 0-12V 160VA TH	Single phase safety trans. +/-15V 0-12 0-12V 160VA	003801817	160	126 x113 x135	2,85	1
TRANSF 1f EU 0-12 0-12V 200VA TH	Single phase safety trans. +/-15V 0-12 0-12V 200VA	003801818	200	126 x113 x135	4,00	1
TRANSF 1f EU 0-12 0-12V 250VA TH	Single phase safety trans. +/-15V 0-12 0-12V 250VA	003801819	250	126 x123 x135	5,00	1
TRANSF 1f EU 0-12 0-12V 300VA TH	Single phase safety trans. +/-15V 0-12 0-12V 300VA	003801820	300	126 x123 x135	5,20	1





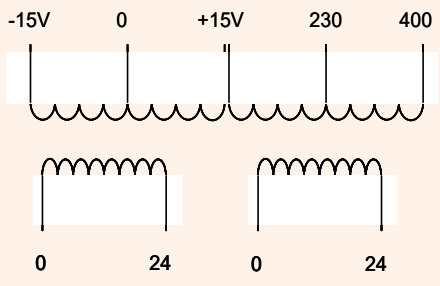


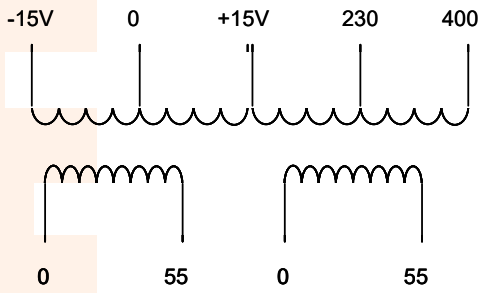
Single phase safety transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 0-24 0-24V. Thermal class B. Type EURO. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f EU 0-24 0-24V 30VA TH	Single phase safety trans. +/-15V 0-24 0-24V 30VA	003801821	30	90 x 96 x106	1,55	1
TRANSF 1f EU 0-24 0-24V 40VA TH	Single phase safety trans. +/-15V 0-24 0-24V 40VA	003801822	40	90 x 96 x106	1,55	1
TRANSF 1f EU 0-24 0-24V 50VA TH	Single phase safety trans. +/-15V 0-24 0-24V 50VA	003801823	50	90 x 96 x106	1,60	1
TRANSF 1f EU 0-24 0-24V 63VA TH	Single phase safety trans. +/-15V 0-24 0-24V 63VA	003801824	63	90 x106 x106	1,90	1
TRANSF 1f EU 0-24 0-24V 75VA TH	Single phase safety trans. +/-15V 0-24 0-24V 75VA	003801825	75	90 x106 x106	2,00	1
TRANSF 1f EU 0-24 0-24V 100VA TH	Single phase safety trans. +/-15V 0-24 0-24V 100VA	003801826	100	90 x116 x106	2,45	1
TRANSF 1f EU 0-24 0-24V 160VA TH	Single phase safety trans. +/-15V 0-24 0-24V 160VA	003801827	160	126 x113 x135	2,85	1
TRANSF 1f EU 0-24 0-24V 200VA TH	Single phase safety trans. +/-15V 0-24 0-24V 200VA	003801828	200	126 x113 x135	4,00	1
TRANSF 1f EU 0-24 0-24V 250VA TH	Single phase safety trans. +/-15V 0-24 0-24V 250VA	003801829	250	126 x123 x135	5,00	1
TRANSF 1f EU 0-24 0-24V 300VA TH	Single phase safety trans. +/-15V 0-24 0-24V 300VA	003801830	300	126 x123 x135	5,20	1

Single phase insulating transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 0-55 0-55V. Thermal class B. Type EURO. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f EU 0-55 0-55V 30VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 30VA	003801831	30	90 x 96 x106	1,55	1
TRANSF 1f EU 0-55 0-55V 40VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 40VA	003801832	40	90 x 96 x106	1,55	1
TRANSF 1f EU 0-55 0-55V 50VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 50VA	003801833	50	90 x 96 x106	1,60	1
TRANSF 1f EU 0-55 0-55V 63VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 63VA	003801834	63	90 x106 x106	1,90	1
TRANSF 1f EU 0-55 0-55V 75VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 75VA	003801835	75	90 x106 x106	2,00	1
TRANSF 1f EU 0-55 0-55V 100VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 100VA	003801836	100	90 x116 x106	2,45	1
TRANSF 1f EU 0-55 0-55V 160VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 160VA	003801837	160	126 x113 x135	2,85	1
TRANSF 1f EU 0-55 0-55V 200VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 200VA	003801838	200	126 x113 x135	4,00	1
TRANSF 1f EU 0-55 0-55V 250VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 250VA	003801839	250	126 x123 x135	5,00	1
TRANSF 1f EU 0-55 0-55V 300VA TH	Single phase insulating trans. +/-15V 0-55 0-55V 300VA	003801840	300	126 x123 x135	5,20	1

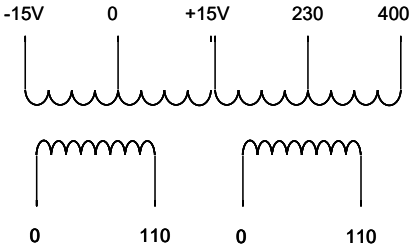


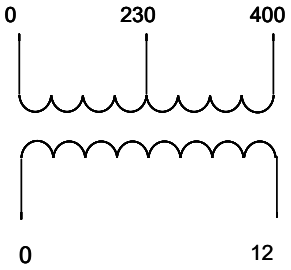


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Single phase insulating transformers
Primary voltage 230, 400V: +/- 15V. Secondary voltage 0-110 0-110V. Thermal class B. Type EURO. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f EU 0-110 0-110V 30VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 30VA	003801841	30	90 x 96 x106	1,55	1
TRANSF 1f EU 0-110 0-110V 40VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 40VA	003801842	40	90 x 96 x106	1,55	1
TRANSF 1f EU 0-110 0-110V 50VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 50VA	003801843	50	90 x 96 x106	1,60	1
TRANSF 1f EU 0-110 0-110V 63VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 63VA	003801844	63	90 x106 x106	1,90	1
TRANSF 1f EU 0-110 0-110V 75VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 75VA	003801845	75	90 x106 x106	2,00	1
TRANSF 1f EU 0-110 0-110V 100VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 100VA	003801846	100	90 x116 x106	2,45	1
TRANSF 1f EU 0-110 0-110V 160VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 160VA	003801847	160	126 x113 x135	2,85	1
TRANSF 1f EU 0-110 0-110V 200VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 200VA	003801848	200	126 x113 x135	4,00	1
TRANSF 1f EU 0-110 0-110V 250VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 250VA	003801849	250	126 x123 x135	5,00	1
TRANSF 1f EU 0-110 0-110V 300VA TH	Single phase insulating trans. +/-15V 0-110 0-110V 300VA	003801850	300	126 x123 x135	5,20	1

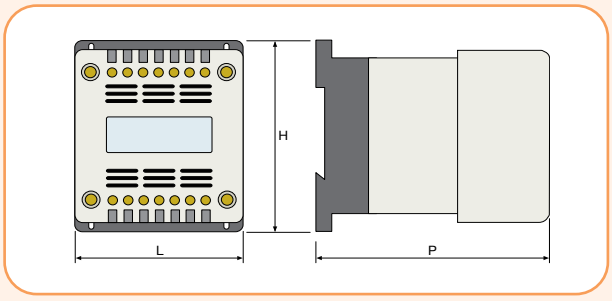


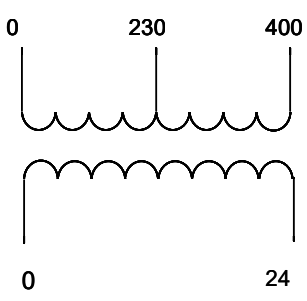


Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 0-12V. Thermal class B. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f 0-12V 30VA TH	Single phase safety trans. 0-12V 30VA	003801851	30	90 x 96 x106	1,35	1
TRANSF 1f 0-12V 40VA TH	Single phase safety trans. 0-12V 40VA	003801852	40	90 x 96 x106	1,35	1
TRANSF 1f 0-12V 50VA TH	Single phase safety trans. 0-12V 50VA	003801853	50	90 x 96 x106	1,40	1
TRANSF 1f 0-12V 63VA TH	Single phase safety trans. 0-12V 63VA	003801854	63	90 x106 x106	1,70	1
TRANSF 1f 0-12V 75VA TH	Single phase safety trans. 0-12V 75VA	003801855	75	90 x106 x106	1,80	1
TRANSF 1f 0-12V 100VA TH	Single phase safety trans. 0-12V 100VA	003801856	100	90 x116 x106	2,25	1
TRANSF 1f 0-12V 160VA TH	Single phase safety trans. 0-12V 160VA	003801857	160	126 x113 x135	3,65	1
TRANSF 1f 0-12V 200VA TH	Single phase safety trans. 0-12V 200VA	003801858	200	126 x113 x135	3,80	1
TRANSF 1f 0-12V 250VA TH	Single phase safety trans. 0-12V 250VA	003801859	250	126 x123 x135	4,80	1
TRANSF 1f 0-12V 300VA	Single phase safety trans. 0-12V 300VA	003801860	300	126 x123 x135	5,00	1







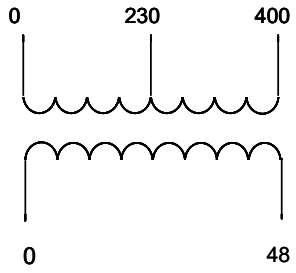
Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 0-24V. Thermal class B. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f 0-24V 30VA TH	Single phase safety trans. 0-24V 30VA	003801861	30	90 x 96 x106	1,35	1
TRANSF 1f 0-24V 40VA TH	Single phase safety trans. 0-24V 40VA	003801862	40	90 x 96 x106	1,35	1
TRANSF 1f 0-24V 50VA TH	Single phase safety trans. 0-24V 50VA	003801863	50	90 x 96 x106	1,40	1
TRANSF 1f 0-24V 63VA TH	Single phase safety trans. 0-24V 63VA	003801864	63	90 x106 x106	1,70	1
TRANSF 1f 0-24V 75VA TH	Single phase safety trans. 0-24V 75VA	003801865	75	90 x106 x106	1,80	1
TRANSF 1f 0-24V 100VA TH	Single phase safety trans. 0-24V 100VA	003801866	100	90 x116 x106	2,25	1
TRANSF 1f 0-24V 160VA TH	Single phase safety trans. 0-24V 160VA	003801867	160	126 x113 x135	3,65	1
TRANSF 1f 0-24V 200VA TH	Single phase safety trans. 0-24V 200VA	003801868	200	126 x113 x135	3,80	1
TRANSF 1f 0-24V 250VA TH	Single phase safety trans. 0-24V 250VA	003801869	250	126 x123 x135	4,80	1
TRANSF 1f 0-24V 300VA	Single phase safety trans. 0-24V 300VA	003801870	300	126 x123 x135	5,00	1

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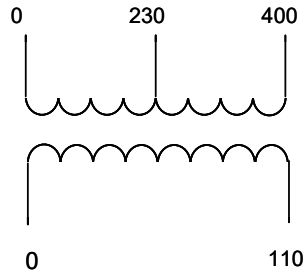
Single phase safety transformers
Primary voltage 230, 400V. Secondary voltage 0-48V. Thermal class B. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f 0-48V 30VA TH	Single phase safety trans. 0-48V 30VA	003801871	30	90 x 96 x106	1,35	1
TRANSF 1f 0-48V 40VA TH	Single phase safety trans. 0-48V 40VA	003801872	40	90 x 96 x106	1,35	1
TRANSF 1f 0-48V 50VA TH	Single phase safety trans. 0-48V 50VA	003801873	50	90 x 96 x106	1,40	1
TRANSF 1f 0-48V 63VA TH	Single phase safety trans. 0-48V 63VA	003801874	63	90 x106 x106	1,70	1
TRANSF 1f 0-48V 75VA TH	Single phase safety trans. 0-48V 75VA	003801875	75	90 x106 x106	1,80	1
TRANSF 1f 0-48V 100VA TH	Single phase safety trans. 0-48V 100VA	003801876	100	90 x116 x106	2,25	1
TRANSF 1f 0-48V 160VA TH	Single phase safety trans. 0-48V 160VA	003801877	160	126 x113 x135	3,65	1
TRANSF 1f 0-48V 200VA TH	Single phase safety trans. 0-48V 200VA	003801878	200	126 x113 x135	3,80	1
TRANSF 1f 0-48V 250VA TH	Single phase safety trans. 0-48V 250VA	003801879	250	126 x123 x135	4,80	1
TRANSF 1f 0-48V 300VA TH	Single phase safety trans. 0-48V 300VA	003801880	300	126 x123 x135	5,00	1



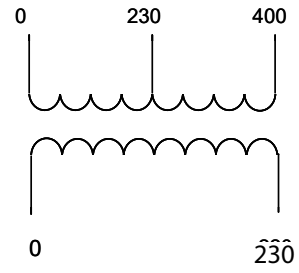
Single phase insulating transformers
Primary voltage 230, 400V. Secondary voltage 0-110V. Thermal class B. DIN rail

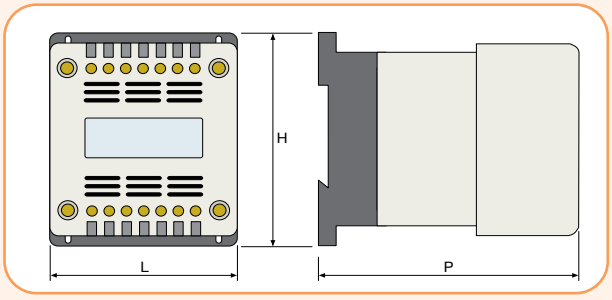
Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f 0-110V 30VA TH	Single phase insulating trans. 0-110V 30VA	003801881	30	90 x 96 x106	1,35	1
TRANSF 1f 0-110V 40VA TH	Single phase insulating trans. 0-110V 40VA	003801882	40	90 x 96 x106	1,35	1
TRANSF 1f 0-110V 50VA TH	Single phase insulating trans. 0-110V 50VA	003801883	50	90 x 96 x106	1,40	1
TRANSF 1f 0-110V 63VA TH	Single phase insulating trans. 0-110V 63VA	003801884	63	90 x106 x106	1,70	1
TRANSF 1f 0-110V 75VA TH	Single phase insulating trans. 0-110V 75VA	003801885	75	90 x106 x106	1,80	1
TRANSF 1f 0-110V 100VA TH	Single phase insulating trans. 0-110V 100VA	003801886	100	90 x116 x106	2,25	1
TRANSF 1f 0-110V 160VA TH	Single phase insulating trans. 0-110V 160VA	003801887	160	126 x113 x135	3,65	1
TRANSF 1f 0-110V 200VA TH	Single phase insulating trans. 0-110V 200VA	003801888	200	126 x113 x135	3,80	1
TRANSF 1f 0-110V 250VA TH	Single phase insulating trans. 0-110V 250VA	003801889	250	126 x123 x135	4,80	1
TRANSF 1f 0-110V 300VA TH	Single phase insulating trans. 0-110V 300VA	003801890	300	126 x123 x135	5,00	1



Single phase insulating transformers
Primary voltage 230, 400V. Secondary voltage 0-230V. Thermal class B. DIN rail

Type	Description	Code No.	Power (VA)	Dimensions LxHxP (mm)	Weight (kg)	Packaging (pcs)
TRANSF 1f 0-230V 30VA TH	Single phase insulating trans. 0-230V 30VA	003801891	30	90 x 96 x106	1,35	1
TRANSF 1f 0-230V 40VA TH	Single phase insulating trans. 0-230V 40VA	003801892	40	90 x 96 x106	1,35	1
TRANSF 1f 0-230V 50VA TH	Single phase insulating trans. 0-230V 50VA	003801893	50	90 x 96 x106	1,40	1
TRANSF 1f 0-230V 63VA TH	Single phase insulating trans. 0-230V 63VA	003801894	63	90 x106 x106	1,70	1
TRANSF 1f 0-230V 75VA TH	Single phase insulating trans. 0-230V 75VA	003801895	75	90 x106 x106	1,80	1
TRANSF 1f 0-230V 100VA TH	Single phase insulating trans. 0-230V 100VA	003801896	100	90 x116 x106	2,25	1
TRANSF 1f 0-230V 160VA TH	Single phase insulating trans. 0-230V 160VA	003801897	160	126 x113 x135	3,65	1
TRANSF 1f 0-230V 200VA TH	Single phase insulating trans. 0-230V 200VA	003801898	200	126 x113 x135	3,80	1
TRANSF 1f 0-230V 250VA TH	Single phase insulating trans. 0-230V 250VA	003801899	250	126 x123 x135	4,80	1
TRANS 1f 0-230V 300VA TH	Single phase insulating trans. 0-230V 300VA	003801900	300	126 x123 x135	5,00	1







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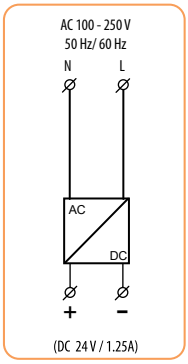
AC/DC power supplies

AC/DC modular power supplies PS-30



Description
- galvanically separated
- AC/DC switching stabilized power supplies, 3-module size, DIN rail mounting
- PS-30-24 - stabilized power supply with fixed output voltage 24 V/30 W (1,25A)

Advantages
- Output current is limited by electronic fuse, in case maximal current is exceeded, the device switches off and after a shot time interval it again switches on.
- Indication of output voltage by green LED on front panel
- Temperature protection – if temperature is exceeded, the device switches off and after cooled down, it switches on again.



Switching power supply PS 30W

Type	I_{out}[A]	U_{out}[V]	Code No.	Weight [g]	Packaging [pcs]
PS-30-24	1,25	24	002470133	160	1

AC/DC DIN rail power supplies



Description
- High efficiency up to 90%
- 150% Peak load capability
- 105 °C long life capacitors
- Metal housing, IP20
- DIN rail mounting (en50.022)

Protection:
- Short circuit
- Overload
- Overvoltage
- Overtemperature (PS-240-24 & PS-480-24)

EU Directives - CE Marking:
- > 2014/30/UE - EMC
- > 2014/35/UE - LVD

Switching power supply

Type	I_{out}[A]	U_{out}[V]	Code No.	Weight [g]	Packaging [pcs]
PS-48-24	2	24-28	004656680	310	1
PS-72-24	3	24-28	004656681	360	1
PS-120-24	5	24-28	004656682	540	1
PS-240-24	10	24-28	004656683	810	1
PS-480-24	20	24-28	004656684	1600	1

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Single phase safety and insulating transformers IP00

Technical data:	
Frequency	50 Hz
Thermal class	B & F
Losses in the core sheets	1,3 - 1,5 W/kg
Insulation voltage	4000V between coils 2000V between coils and ground
Primary voltage	230 V/50 Hz 230 V +/- 15V 50 Hz - type EURO
Standard	EN 61558-2-4
Service type	Continuous
Protection index	IP00

Technical features chart of single phase safety and insulating transformers. Thermal class B

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
30	2,4	3,9	9,9	79%
40	3	5,7	10	79%
50	2,9	7,1	10,6	80%
63	3,8	7,1	9,6	82%
75	4,3	9,4	9,2	82%
100	4,6	10,1	9,1	85%
150	5,7	16,2	7,5	85%
200	7,2	22	7,3	86%
250	8,9	23,7	6,5	87%
300	9,8	24	5,6	89%
400	11	27	5,3	90%
500	16,2	28,2	4,2	91%
630	18,9	43	4,3	90%
800	20	46	4,1	92%
1000	28	45	3,2	93%
1600	35	65	3,1	94%
2000	30	88	2,7	94%
2500	60	67	2,1	95%
3000	70	85	3	95%
4000	50	158	3,2	95%
5000	50	250	2,8	94%
6000	60	280	2,8	94%
8000	100	240	2,9	96%
10000	137	200	1,6	97%

Technical features chart of single phase safety and insulating transformers. Thermal class F

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
40	3	7	12	75%
63	3,9	8	10,5	81%
100	4,9	11	9,5	84%
160	6,1	16,8	8,5	86%
200	7,7	23	8	85%
250	9,1	25	6,5	86%
300	10	25,4	6	88%
400	12,8	32,5	5,5	89%
500	16,5	35,5	4,8	90%
630	19,1	44,2	4,6	90%
1000	28,5	48	4,5	93%
1600	38	70	3,5	93%
2000	36	76	3,5	94%
2500	65	75	2,5	94%

Single phase safety and insulating transformers IP20 DIN rail mounted

Technical data	
Primary voltage	0 - 230V - 400V +/- 15V (50-60 Hz)
Thermal class	F
Cable section	10 mm²
Protection	IP20
Fixing	on DIN rail
Standard	EN 61558-1
Service type	Continuous

Technical parameters for insulating transformers. Thermal class F. Fixed on DIN rail.

Fall secondary windigs power (VA)	No-load losse s Δ P (W)	Losses (short circuit) Δ P (W)	Ucc (cos φ=1) (%)	Efficiency (cos φ=1) (%)
30	7,6	4,2	11,0	0,89
40	7,8	5,0	9,0	0,88
50	8,0	6,0	8,0	0,88
63	8,0	7,0	7,8	0,86
75	8,2	7,2	7,5	0,85
100	8,3	9,1	7,2	0,83
160	8,2	14,8	6	0,92
200	8,3	15,2	5,7	0,92
250	9,3	17	5,3	0,92
300	9,4	18,3	5,0	0,91

Generally about transformers

The transformers must be protected against possible overloads and short circuits. Our transformers belong to the non-short-circuit-proof type and so they must be protected using external fuses. Rated current of the suggested fuse is always indicated on our labels. However the protection can be also obtained using Miniature Circuit Breakers - ETIMAT. Selected protection of the input winding of the transformer must be chosen taking into account that at the starting phase of the transfomer, a high value of inrush current is generated, a value that can reach 25 times the value of the input rated current, for about 10 milliseconds. Hence, time delay fuses (T or aM type) or MCB - ETIMAT having D or K characteristic must be used for a correct protection. The protection of the secondary side can be realized using fuses of F or gG type, or MCB - ETIMAT having B or C characteristic. Here below there is a table with all the suggested protection fuses for the input and output windings (all the values are in Ampere):

General rules for choosing a transformers protection

Fall secondary windigs power (VA)	Rated value of aM or T fuse for secondary side protection (A)				Rated value of aM or T fuse for primary side protection (A)	
	Voltage U_2 24V	Voltage U_2 48V	Voltage U_2 110V	Voltage U_2 220V	Voltage U_1 230V	Voltage U_1 400V
30	1,25	0,63	0,315	0,16	0,5	0,5
50	2,0	1,0	0,4	0,2	1,0	0,5
75	3,15	1,6	0,63	0,315	1,0	1,0
100	4,0	2,0	1,0	0,5	1,0	1,0
150	6,0	3,15	1,25	0,63	1,0	1,0
200	8,0	4,0	2,0	1,0	1,0	1,0
250	10,0	6,0	2,0	1,0	2,0	1,0
300	12,0	6,0	2,5	1,25	2,0	1,0
400	16,0	8,0	4,0	2,0	4,0	2,0
500	20,0	10,0	4,0	2,0	4,0	2,0
630	25,0	12,0	6,0	3,15	4,0	2,0
800	32,0	16,0	6,3	4,0	4,0	4,0
1000	40,0	20,0	10,0	5,0	10,0	6,0
1600	63,0	32,0	12,0	6,0	10,0	10,0
2500	100,0	50,0	20,0	10,0	16,0	10,0

Transformer thermal class

Thermal class	Over temperature °C
A	75
E	90
B	95
F	115
H	140

The above over temperature values are referred to an ambient temperature of 25°C

Thermal class: The transformers have some level of power loss that causes a rising in the temperature of the metallic parts and of the windings. High temperatures cause deterioration of the materials and shorten the “average life” of the transformer itself. For this reason the international standards define some thermal classes, with a maximum over temperature value for each one. The thermal classes established by EN 61558 standard are.

Rated power:

It is the value resulting from the rated secondary winding voltage multiplied by the rated secondary current. In case of a n-phases transformers, it is the value corresponding to n times the result of rated secondary voltage multiplied by rated secondary current. If a transformer is used in a non-continuous work cycle, its power can be lower.

Power supplies PS-30

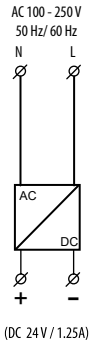
Technical data

	PS-30-24
Input	
Voltage range	AC 100-250V / 50 - 60Hz
Burden without load (max)	10VA/1.5W
Burden with full load (max)	70VA / 37W
Protection	fuse T2A
Output	
Output voltage DC / max. current	24.2V/1.25A
Tolerance of output voltage:	± 2%
Output indication	green LED
Wave of off-load output voltage	30mV
Wave of output voltage with max load	80mV
Time delay after connection	max. 5s
Time delay after over-load	max. 1s
Efficiency	>82%
Electronic fuse	electronic protections short-circuit, over load, over voltage (from 120% of rated output)
Other information	
Working humidity	20 .. 90% RH
Operating temperature	-20 °C ... +40 °C
Storage temperature	-25 °C ... +70 °C
Electrical strength input- output	4kV
Protection degree	IP40 device/ IP20 in-built in distribution board
Overvoltage category:	II.
Pollution degree	2
Max. cable size (mm²)	solid wire max.1x2.5 or 2x1.5/ with sleeve max.1x1.5
Dimensions	90 x 52 x 65 mm
Weight	158 g
Standards	EN 61204-1, EN 61204-3, EN 61204-7

PS-30: switching stabilized power supplies, version 3-module

- PS-30-24 - stabilized power supply with fixed output voltage 24 V/30 W

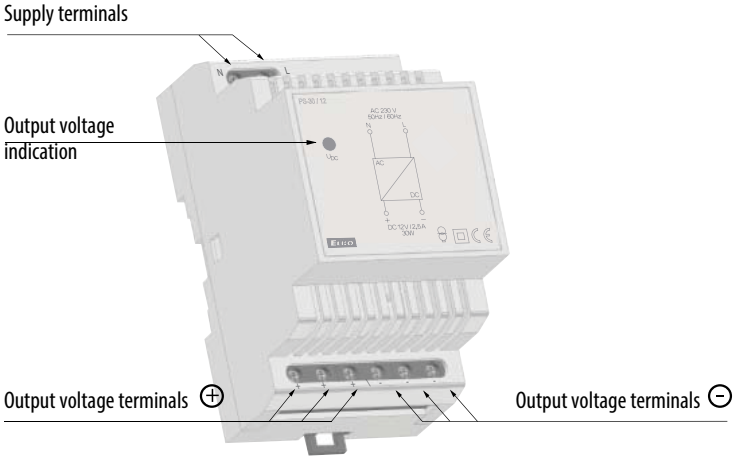
Connection



(DC 24 V / 1.25A)

Description

PS-30-24



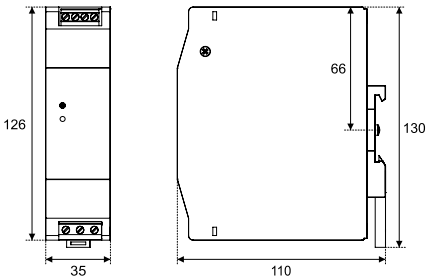
Switching Power Supply

Technical data

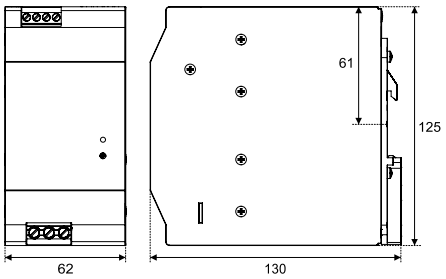
		PS-48-24	PS-72-24	PS-120-24	PS-240-24	PS-480-24
Input						
Supply voltage AC	V AC	100 - 240				
Nominal frequency	Hz	50 - 60 (range: 47 - 63)				
Supply voltage DC	V DC	140 - 340				
Input current at 230VAC	A	0,4	0,97	0,6	1,4	2,4
In-rush current at 230VAC	A	15	20	25	30	50
Input overload protection T-type fuse (internal)	A	2	3,15	5	5	6,3
Power Factor at 230VAC	-	0,5	0,5	0,96	0,92	0,97
Output						
Output adjustable voltage DC	V DC	24 - 28 (±2%)				
Max. continuos output current	A	2	3	5	10	20
Max. continuos output power	W	45	75	120	240	480
Ripple BW 20MHz at max. load	mV	120	120	80	100	150
Hold-up time at rated V AC and max. load	ms	20				
Rise time at rated V AC	ms	200			60	
Parallel connection	-	×				✓
Output overvoltage protection min. % of Vout	%	120 - 135	120 - 135	110 - 140	120 - 150	110 - 140
Output overload protection % of max. load	%	110 - 150				
Power good relay	%	×	×	×	×	✓
General						
Efficiency at rated V AC	%	88,5	89,5	92	93	93
Working temperature - free convection	°C	-25 ... +70				
De-rating 2,5% In/°C	°C	> 55				
Storage temperature	°C	-40 ... +85				
Electrical Insulation	kV	3 (IN/OUT) 1,5 (IN/⏚) 0,5 (OUT/⏚)				
Over-temperature protection	-	✓				
Protection degree	IP	20				
Relative Humidity w/o cond.	RH%	90				
Altitude up to	m	2000				
Dimensions	mm	130x35x110	130x35x110	130x40x120	130x62x125	138x86x125

Dimensions

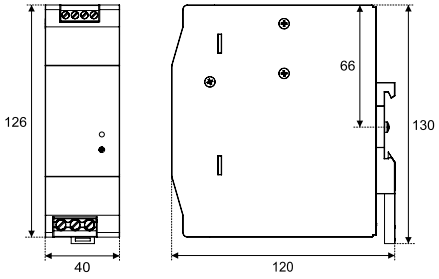
PS-48-24 & PS-72-24



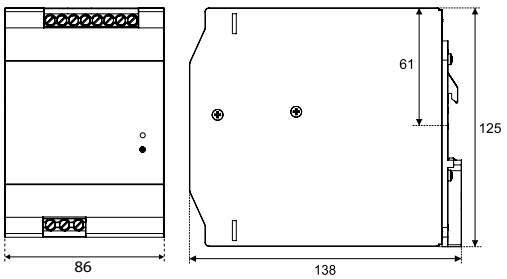
PS-240-24



PS-120-24

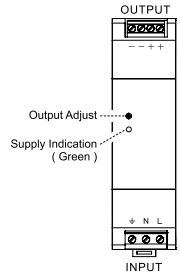


PS-480-24

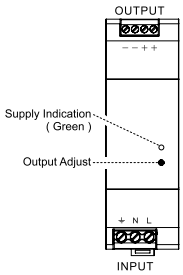


Description

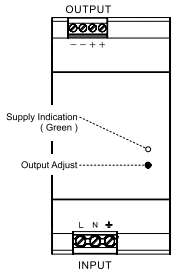
PS-48-24 & PS-72-24



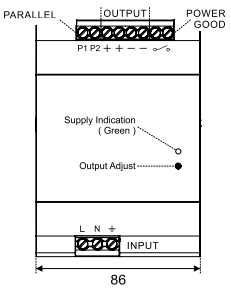
PS-120-24



PS-240-24

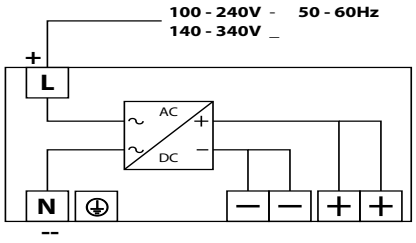


PS-480-24

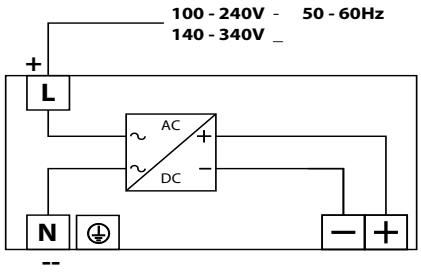


Connection

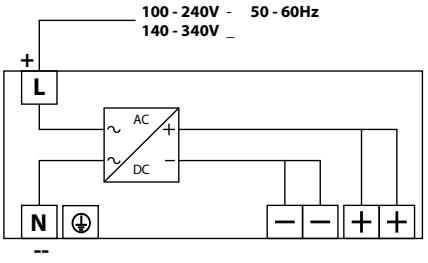
PS-48-24 & PS-72-24



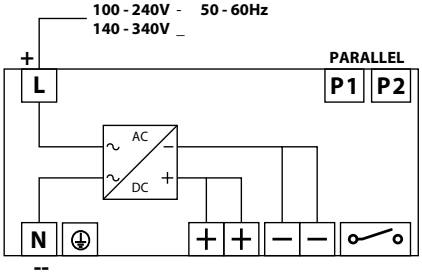
PS-120-24

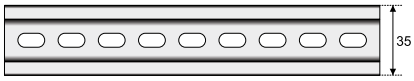


PS-240-24



PS-480-24





Install rail: TS35/7.5 or TS35/15

POWER GOOD:
Relay closed: power supply (Output) is stable and within the tolerance limits.
Relay opened: power supply (Output) out of tolerance limits. Power cut off – to prevent damages on sensitive loads.

PARALLEL P1 P2:
Parallel connection of up to 10 power supplies. Connect P1s with P1s, P2s with P2s of each power supply wired in parallel (+ and – outputs in parallel). Each power supply unit must have connection to supply (Input)

D

Low voltage fuse-links 622

Fuse bases 624

Accessories 626

Technical data 628

Low voltage fuses



ETI Power needs control

Low voltage fuse-links

Fuse-link D

Rated current **2 - 200 A**

Fusing characteristics **gG, TDZ, DZ**

D fuse-links for use by unskilled persons for domestic and similar applications are used as the most reliable protection of electrical installation, control and signal circuits against overload and short-circuit currents.
The whole system D contains a complete range of five physical sizes DI, DII, DIII, DIV and DV fuse-links, standard ceramic and new plastic fuse bases and all necessary accessories. It is dimensioned for rated voltages 500 V, 690 V, 750 V and 1200 V a.c. resp. 500 V or 600 V d.c. with AC 50 kA and DC 8 kA rated breaking capacity.
The system D is intended to be used in residential, business and similar buildings. When it is used in industrial installations, it is necessary to take into account the requirements of the standard IEC 60664-1 concerning the insulation coordination for equipment within low-voltage systems .
All fuse-links have blown-fuse indicators which are visible through the Screw cap when mounted. Fuse-links, fuse bases, caps and fuse-disconnectors are tested and certified according to IEC 60269-3-1, DIN EN 60269-3, DIN VDE 0636-301, HD 630.3.1 and DIN EN 60269-1.







DI for fuse base E 16

I_n [A]	Colour	Code No. DZ*	Code No. gG, TDZ*	Weight [g]	Packaging [pcs]
2	pink	002311101	002311401	12	10/500
4	brown	002311102	002311402	12	10/500
6	green	002311103	002311403	12	10/500
10	red	002311104	002311404	13	10/500
16	grey	002311105	002311405	14	10/500
20	blue	002311106	002311406	15	10/500
25	yellow	002311107	002311407	16	10/500

DII for fuse base E 27

I_n [A]	Colour	Code No. DZ*	Code No. gG, TDZ*	Weight [g]	Packaging [pcs]
2	pink	002312101	002312401	27	5/500
4	brown	002312102	002312402	27	5/500
6	green	002312103	002312403	27	5/500
10	red	002312104	002312404	27	5/500
13	black		002312409	27	5/500
16	grey	002312105	002312405	28	5/500
20	blue	002312106	002312406	29	5/500
25	yellow	002312107	002312407	30	5/500

DIII for fuse base E 33

I_n [A]	Colour	Code No. DZ*	Code No. gG, TDZ*	Weight [g]	Packaging [pcs]
32	black		002313404	48	5/250
35	black	002313101	002313401	48	5/250
40	black		002313405	48	5/250
50	white	002313102	002313402	49	5/250
63	copper	002313103	002313403	52	5/250

* DZ and TDZ time-current characteristics correspond to standard CEE16 from 1970 as date of issue. DZ refers to a "fast" or in German "flink" fuse, in the meantime TDZ refers to a "slow" or in German "Traege" fuse.
In accordance with the development of standards, TDZ time-current characteristics were uniformed with gG time-current characteristic according to IEC 60269-2 and VDE 0636-301, so now both characteristics are unified and their meaning stays the same - "slow" means TDZ and gG at the same time.
DZ time-current characteristics remain unchanged. It is faster than TDZ, but in any case DZ characteristics should not be compared with gR or aR time-current characteristis which are designed for power semiconductor protection.

Technical data on page 628

DIII AC 690V, DC 600V

I_n [A]	Colour	Code No. gG	Weight [g]	Packaging [pcs]
2	pink	002313501	68	5/200
4	brown	002313502	68	5/200
6	green	002313503	68	5/200
10	red	002313504	69	5/200
16	grey	002313505	69	5/200
20	blue	002313506	71	5/200
25	yellow	002313507	72	5/200
35	black	002313508	78	5/200
50	white	002313509	80	5/200
63	copper	002313510	80	5/200

These fuse links require fuse carriers with special dimensions. Please contact support for more information.



DIII 750V gF

I_n [A]	Colour	Code No. gF	Weight [g]	Packaging [pcs]
2	pink	002313601	68	5/200
4	brown	002313602	68	5/200
6	green	002313603	68	5/200
10	red	002313604	69	5/200
16	grey	002313605	69	5/200
20	blue	002313606	71	5/200
25	yellow	002313607	72	5/200
35	black	002313608	78	5/200
50	white	002313609	80	5/200
63	copper	002313610	80	5/200

These fuse links require fuse carriers with special dimensions. Please contact support for more information.



DIII AC 1200V 3-channel gF

I_n [A]	Colour	Code No. gF	Weight [g]	Packaging [pcs]
2	pink	002313620	68	5/200
4	brown	002313621	68	5/200
6	green	002313622	68	5/200
10	red	002313623	69	5/200
16	grey	002313624	69	5/200
20	blue	002313625	71	5/200
25	yellow	002313626	72	5/200
35	black	002313627	78	5/200

These fuse links require fuse carriers with special dimensions and special fuse bases. Please contact support for more information.



DIV for fuse base R1 1/4"

I_n [A]	Colour	Code No. DZ*	Code No. gG, TDZ*	Weight [g]	Packaging [pcs]
80	silver	002314101	002314401	105	3/48
100	red	002314102	002314402	110	3/48



DV for fuse base R 2"

I_n [A]	Colour	Code No. DZ*	Code No. gG, TDZ*	Weight [g]	Packaging [pcs]
125	yellow	002315101	002315401	185	10/60
160	copper	002315102	002315402	210	10/60
200	blue	002315103	002315403	215	10/60



Technical data on page 628

Fuse bases

1-pole fuse base

Rated current
25, 63 A



Fuse base EZN, EZV

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [psc]
EZN 25®	25	002322009	E27	104	15/120
EZV 25	25	002322011	E27	102	15/105
EZN 25-ZP*	25	002322016	E27	120	10/70
EZV 25-ZP*	25	002322017	E27	112	10/60
EZN 63®	63	002323008	E33	148	15/90
EZV 63	63	002323010	E33	146	15/90
EZN 63-ZP*	63	002323028	E33	163	10/60
EZV 63-ZP*	63	002323029	E33	153	10/60
EZN 63-M6®	63	002323013	E33	148	15/90
EZV 63-M6	63	002323020	E33	146	15/90

* EZV - for mounting with Screws
* EZN - for mounting on rail
* ZP - base with protection cover

At request, vibration-tested EZN 25, 63, 63-M6 fuse bases are available according to the LRS-Loyd's register of Shipping 1961 Vibration Test 2.

3-pole fuse base

Rated current
25, 63 A



Fuse base EZN/3, EZV/3 - LINEAR

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [pcs]
EZN 25/3	25	002322025	E 27	352	4/60
EZV 25/3	25	002322026	E 27	346	4/60
EZN 63/3	63	002323016	E33	488	6/24
EZV 63/3	63	002323017	E33	484	6/24

Technical data on page 633

D fuse base - new generation

Fuse base EZR

Type	I_n [A]	Code No.	Screw	Packaging [pcs]
EZR 25	25	002322027	E27	15/105
EZR 63	63	002323031	E33	15/90



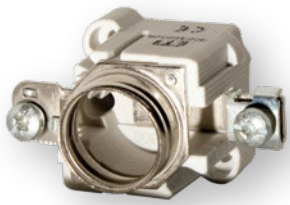
Set EZR 25

Type	I_n [A]	Code No.	Screw	Packaging [pcs]
SET EZR 25 2p-GEG 25.2	25	002322100	E27	-/112
SET EZR 25 3p-GEG 25.3	25	002322101	E27	-/80
SET EZR 25 4p-GEG 25.4	25	002322102	E27	-/56
SET EZR 25 5p-GEG 25.5	25	002322103	E27	-/50
SET EZR 25 6p-GEG 25.6	25	002322104	E27	-/40
SET EZR 25 7p-GEG 25.7	25	002322105	E27	-/32
SET EZR 25 8p-GEG 25.8	25	002322106	E27	-/28
SET EZR 25 9p-GEG 25.9	25	002322107	E27	-/24
SET EZR 25 10p-GEG 25.10	25	002322108	E27	-/25



Set EZR 63

Type	I_n [A]	Code No.	Screw	Packaging [pcs]
SET EZR 63 2p-GEG 63.2	63	002323110	E33	-/81
SET EZR 63 3p-GEG 63.3	63	002323111	E33	-/54
SET EZR 63 4p-GEG 63.4	63	002323112	E33	-/36
SET EZR 63 5p-GEG 63.5	63	002323113	E33	-/31
SET EZR 63 6p-GEG 63.6	63	002323114	E33	-/27



Fuse base EZV GS

Type	I_n [A]	Code No.	Screw	Packaging [pcs]
EZV 25 GS	25	002322028	E27	15/105
EZV 63 GS	63	002323032	E33	15/90

Accessories

Type	Code No.	Packaging [pcs]
Protective cover GB 25.1	002352005	100/500
Protective cover GB 25.3	002352006	50/200
Protective cover GB 63-52	002353005	100/400
Protective cover GB 63-60	002353006	100/400
Plastic mounting plate GSA 25	002352007	100/500
Plastic mounting plate GSA 63	002353007	100/400



Technical data on page 634

Accessories

Gauge piece



VD II for fuse base E 27

I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
2	pink	002342001	13	25/450
4	brown	002342002	13	25/450
6	green	002342003	13	25/450
10	red	002342004	11	25/450
16	grey	002342005	11	25/450
20	blue	002342006	11	25/450
25	yellow	002342007	11	25/450



VD III for fuse base E33

I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
35	black	002343001	19	25/300
50	white	002343002	18	25/300
63	copper	002343003	16	25/300

Fuse carrier D



Fuse carrier K DII

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [pcs]
K DII	25	002332003	E 27	35	50/600

Fuse carrier K DIII

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [pcs]
K DIII	63	002333002	E 33	59	30/360

Protection cover



1-pole protection cover for fuse base

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [pcs]
EZN, EZV	25	002352001	E 27	16	30/390
EZN, EZV	63	002353002	E 33	12	30/360



3-pole protection cover for fuse base

Type	Code No.	Weight [g]	Packaging [pcs]
EZN, EZV 25/3	002352003	40	12/120
EZN, EZV 63/3	002353004	40	12/120

Technical data on page 636

Busbar system for 1-pole fuse base EZR

Busbar for fuse base EZR

Type	I_n [A]	Code No.	Screw	Weight [g]	Packaging [pcs]
EZR	25	002923032	E 27	380	50
EZR	63	002923033	E 33	380	50



Terminal for neutral terminal and busbar EZR

Code No.	For cross section [mm²]	Weight [g]	Packaging [pcs]
002923040	16	9	100/2200
002923041	35	21	100/2200



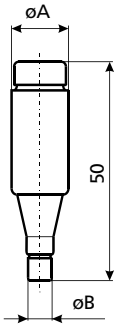
Technical data on page 637

Fuse-link D

Technical data		
Rated voltage U_n	500 V AC, 600 V AC, 750 V AC, 1200 V AC, 400 V DC	
Rated current I_n	DI, DII 2 - 25 A, DIII 32 - 63 A DIV 80 - 100 A, DV 125 - 200 A	
Breaking capacity at 1,1 U_n	50 kA AC 8 kA DC	cosϕ =0,2 T=15 ms
Fusing characteristics	gG, TDZ, DZ	
Insulating class	C - VDE 0110	
Standards	DIN EN 60269-1, IEC 60269-1:2005-04 (VDE 0636 Teil 10): 1999-11	
	DIN EN 60269-3, IEC 60269-3:2003 (VDE 0636 Teil 30): 1995-12	
	DIN EN 60269-3-1, IEC 60269-3-1: 2004-07	
	(VDE 0636 Teil 301): 1998-01	
	DIN VDE 0635/02.84	

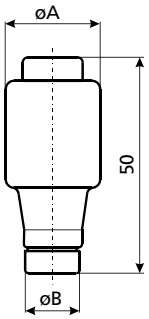
DI for fuse base E 16

I_n [A]	dimension ØA	ØB
2	13,2	6
4	13,2	6
6	13,2	6
10	13,2	8
16	13,2	10
20	13,2	12
25	13,2	14



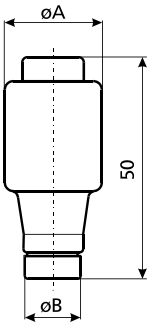
DII for fuse base E 27

I_n [A]	dimension ØA	ØB
2	21,5	6
4	21,5	6
6	21,5	6
10	21,5	8
13	21,5	8
16	21,5	10
20	21,5	12
25	21,5	14



DIII for fuse base E 33

I_n [A]	dimension ØA	ØB
32	27	16
35	27	16
40	27	16
50	27	18
63	27	20

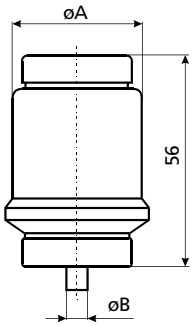


DIV for fuse base R1 1/4"

I_n [A]	dimension ØA	ØB
80	33	5
100	33	7

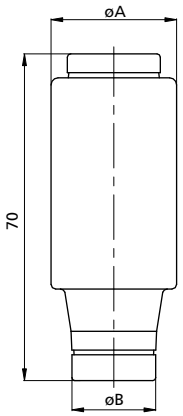
DV for fuse base R 2"

I_n [A]	dimension ØA	ØB
125	46	5
160	46	7
200	46	9



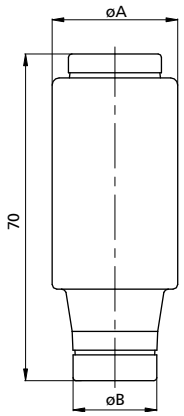
DIII gG, 690 V a.c., 600 V d.c.

I_n [A]	dimension ØA	ØB
2	27	6
4	27	6
6	27	6
10	27	8
16	27	10
20	27	12
25	27	14
35	27	16
50	27	18
63	27	20



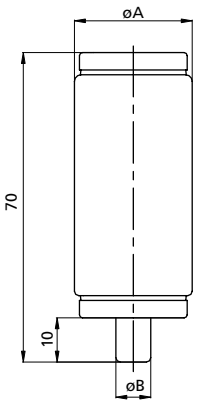
DIII gF, 750V a.c.

I_n [A]	dimension ØA	ØB
2	27	6
4	27	6
6	27	6
10	27	8
16	27	10
20	27	12
25	27	14
35	27	16

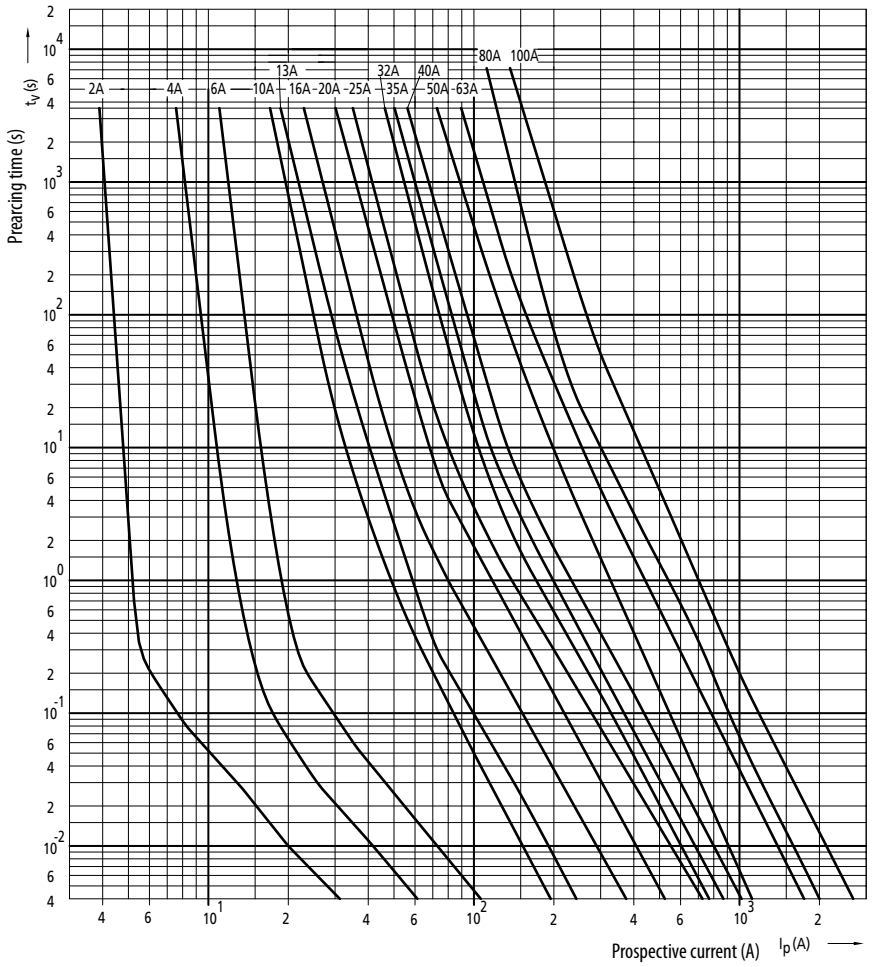


DIII gF, 1200 V a.c.

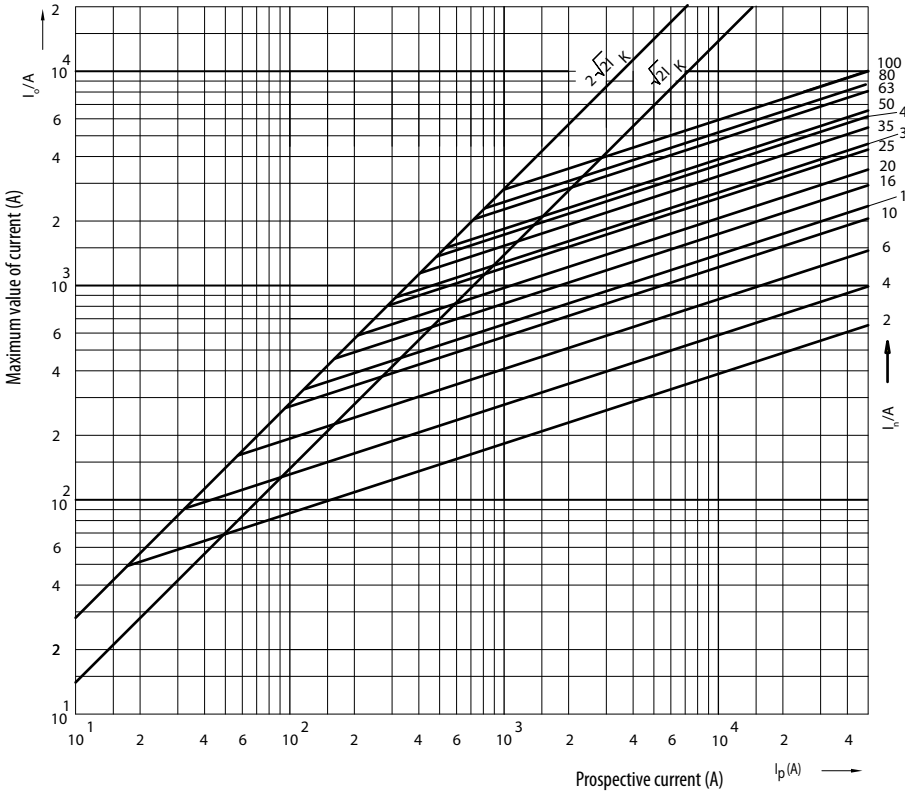
I_n [A]	dimension ØA	ØB
2	27	6
4	27	6
6	27	6
10	27	8
16	27	10
20	27	12
25	27	14
35	27	16



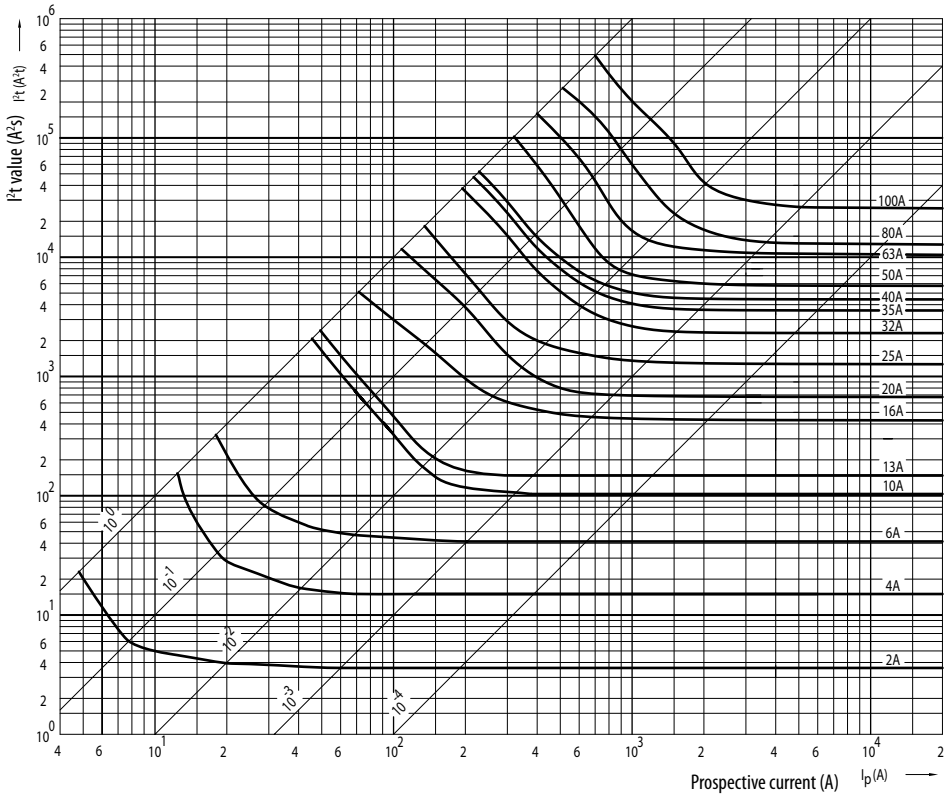
Time current characteristics I/t, gG



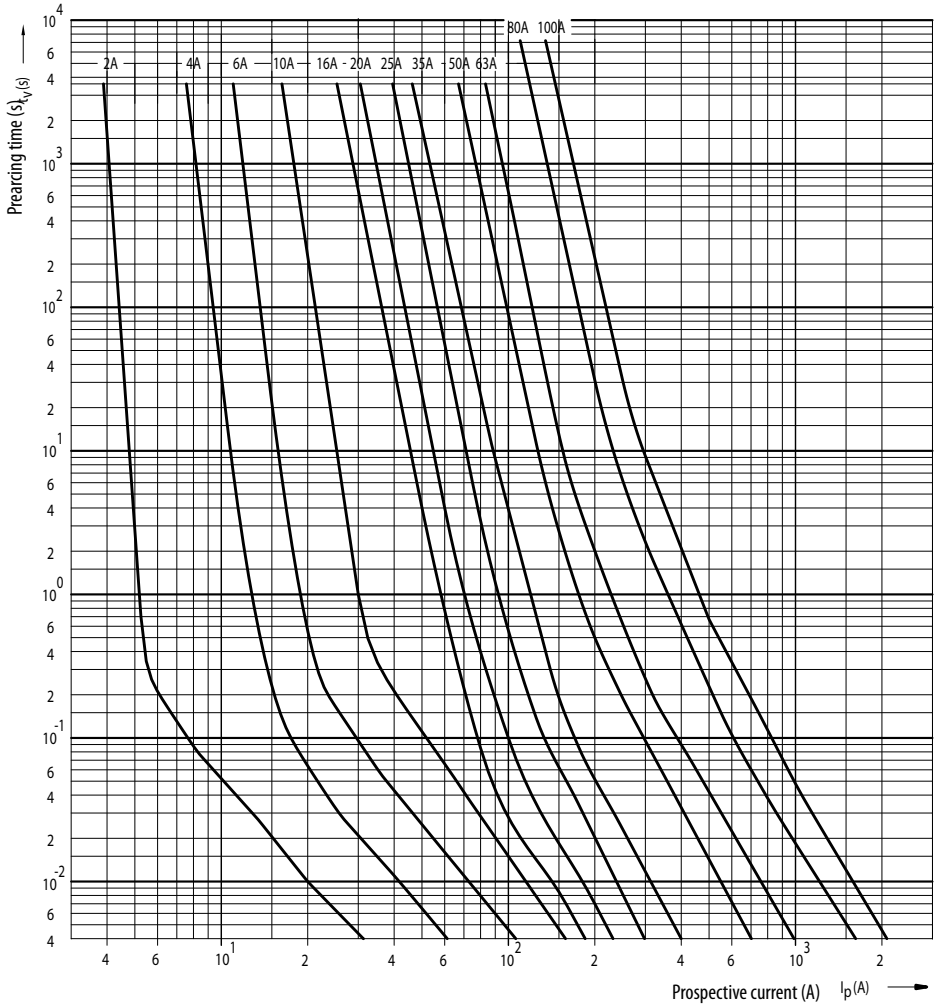
Cut-off current characteristics



Melting energy characteristics I^2t

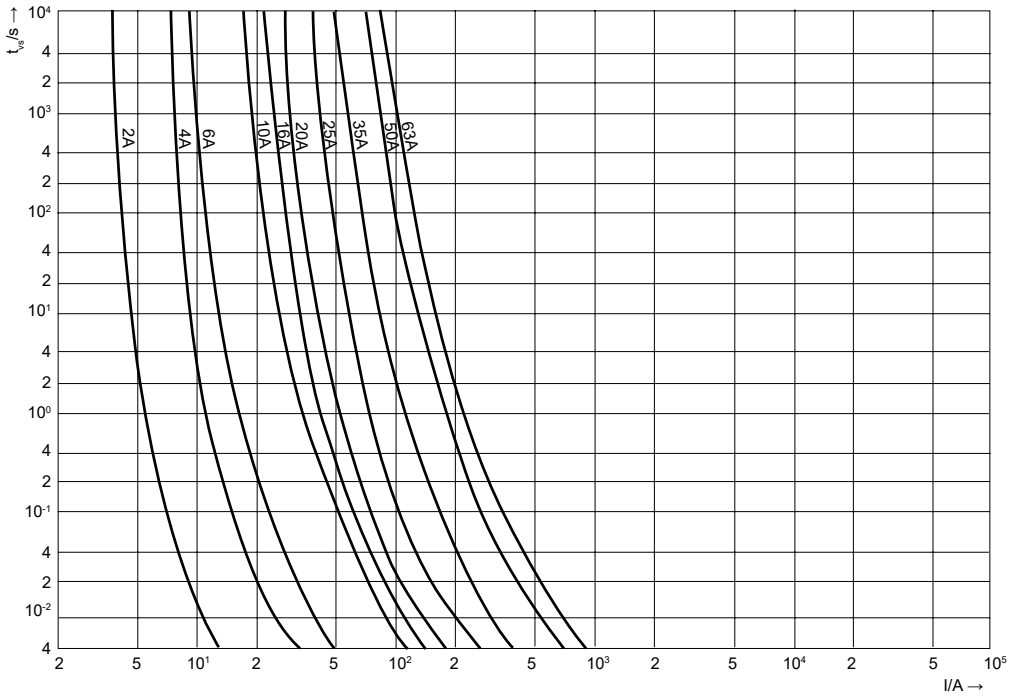


Time current characteristics I/t DZ

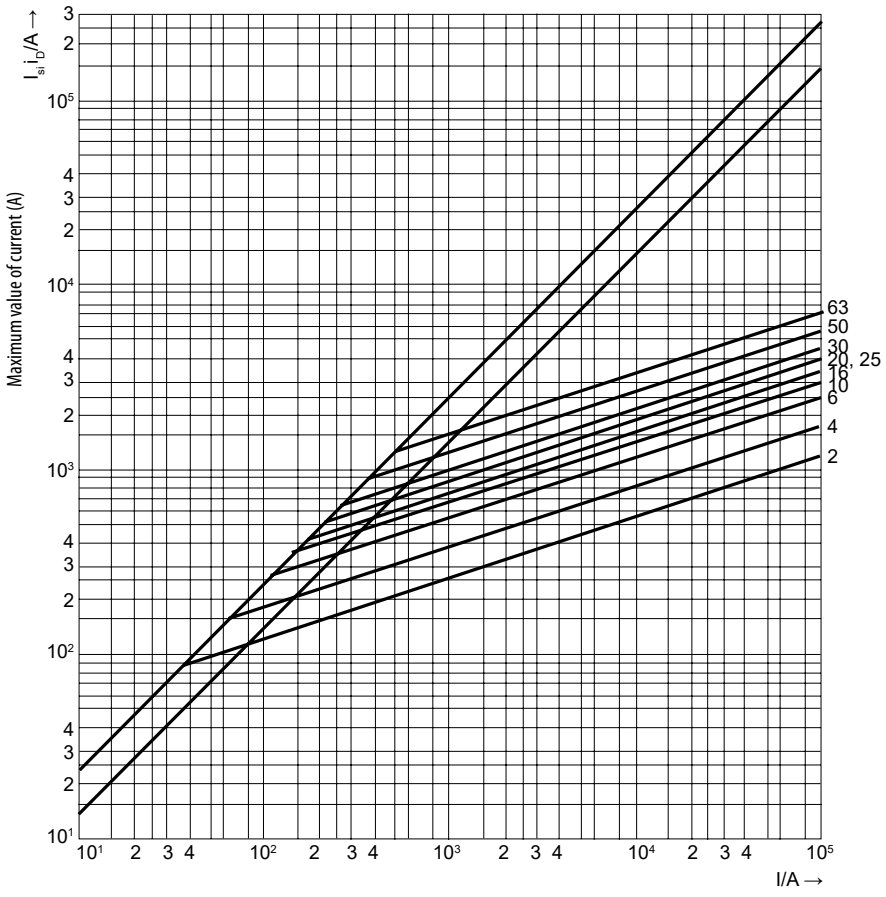


D

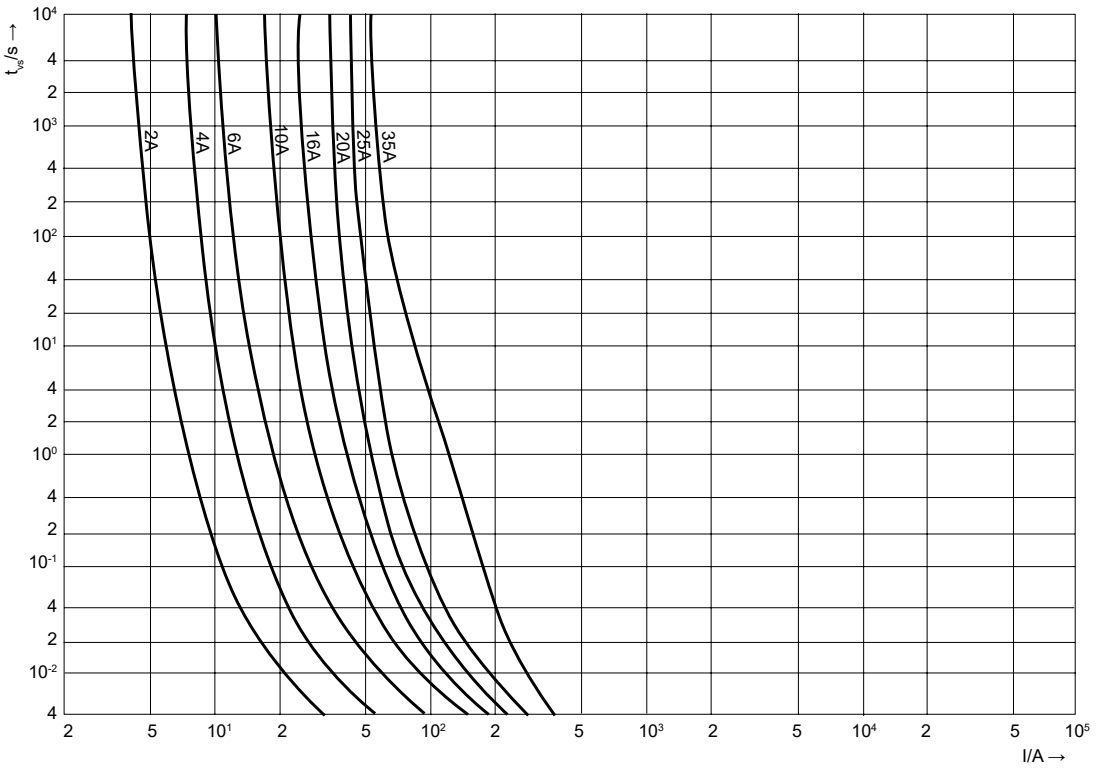
Time current characteristics I/t, gF, 750V



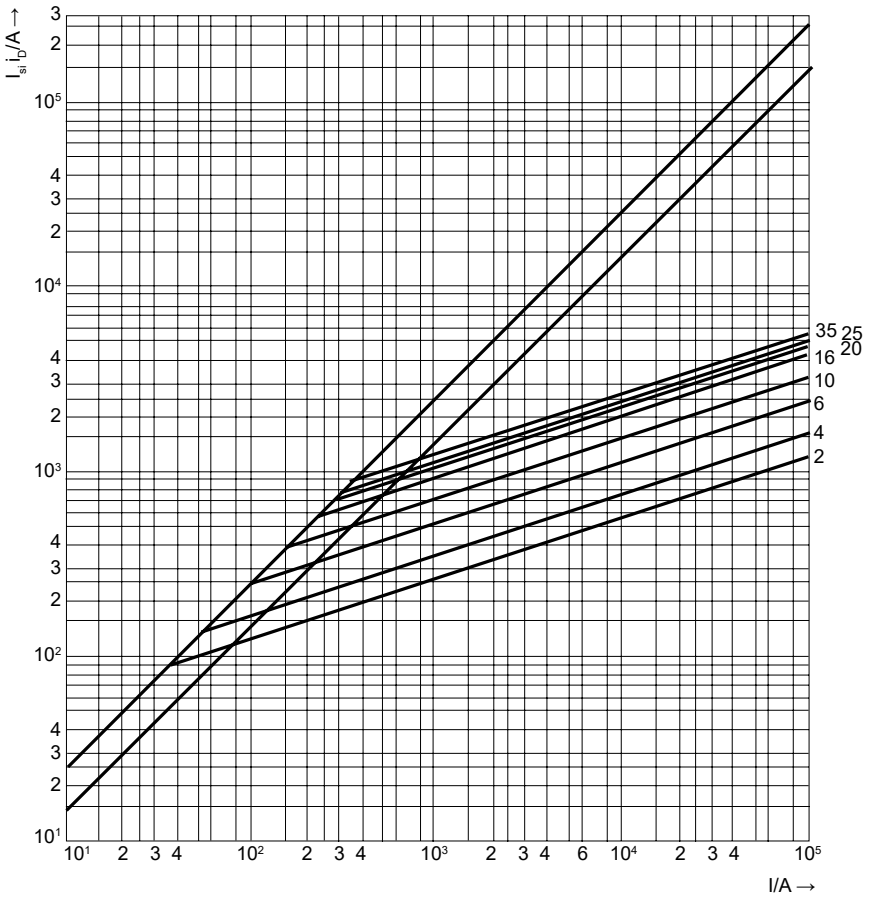
Cut-off current characteristics gF, 750V



Time current characteristics I/t, gF, 1200V



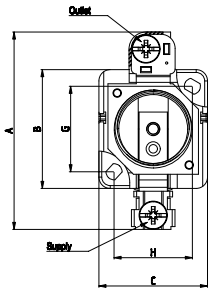
Cut-off current characteristics gF, 1200V

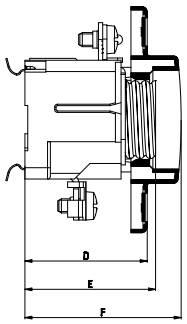


D

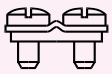
1-pole fuse base

Technical data:	
Rated voltage U_n	500 V, 690 V
Rated current I_n	DII 25 A, DIII 63 A
Insulating class	according to IEC 60664-1
Cross-section of connecting lead	DII 1 to 10 mm^2 DIII 2,5 to 25 mm^2
Standards, publications	IEC 60269, EN 60269, DIN VDE 0636



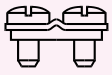


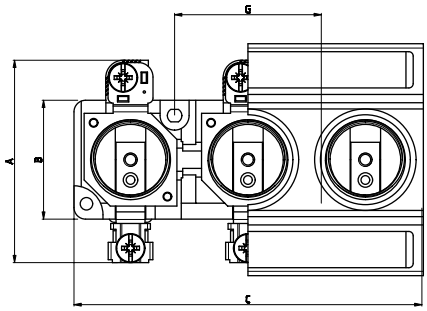
Fuse base EZN, EZV

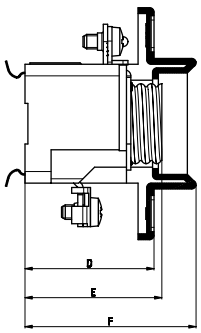
type	[A]	Connection		dimension							
		Supply	Outlet	A	B	C	D	E	F	G	H
EZN 25	25	 M5	 M5	70	42	39	44	47	56	30	27
EZV 25	25			70	42	39	44	47	56	30	27
EZN 25-ZP	25			70	42	39	44	47	56	30	27
EZV 25-ZP	25			70	42	39	44	47	56	30	27
EZN 63	63	 2x M5	 2x M5	80	46	46	44	47	56	35	35
EZV 63	63			80	46	46	44	47	56	35	35
EZN 63-ZP	63			80	46	46	44	47	56	35	35
EZV 63-ZP	63			80	46	46	44	47	56	35	35
EZN 63-M6	63	 M6	 2x M5	80	46	46	44	47	56	35	35
EZV 63-M6	63			80	46	46	44	47	56	35	35

3-pole fuse base

Fuse base EZN/3, EZV/3 - LINEAR

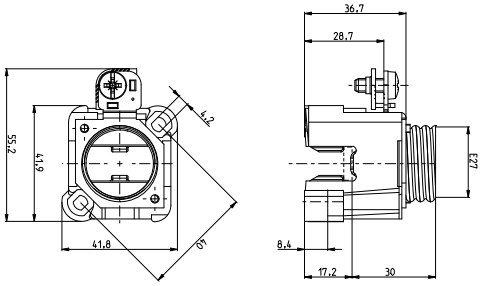
type	[A]	Connection		dimension						
		Supply	Outlet	A	B	C	D	E	F	G
EZN 25/3	25	 M5	 M5	70	41	121	44	47	59	50
EZN 25/3-ZP	25			70	41	121	44	47	59	50
EZN 63/3	63	 2x M5	 2x M5	80	43	148	44	47	56	62
EZN 63/3-ZP	63			80	43	148	44	47	56	62



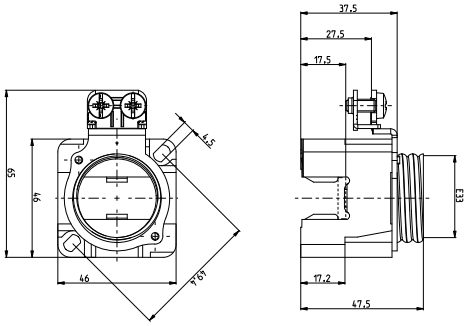


D fuse base - new generation

Fuse base EZR 25



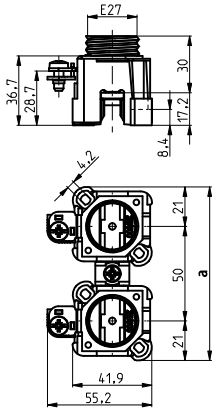
Fuse base EZR 63



Fuse base EZR

type	Connection		Cross-section of connecting lead	
	Supply	Outlet	Supply [mm²]	Outlet [mm²]
EZR 25	M9	M5	35	1 - 10
EZR 63	2x M5	2x M5	35	2.5 - 25

SET EZR 25 2p - 10p

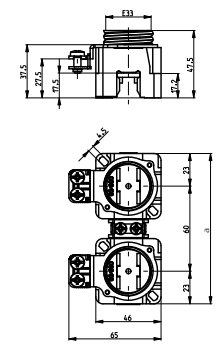


SET EZR 25 2p

Fuse base EZR 25

type	connection		Cross-section of connecting lead		Dimen-sion a
	Supply	Outlet	Supply [mm²]	Outlet [mm²]	
SET EZR 25 2p-GEG 25.2	M9	M5	35	1 - 10	92
SET EZR 25 3p-GEG 25.3			35	1 - 10	142
SET EZR 25 4p-GEG 25.4			35	1 - 10	192
SET EZR 25 5p-GEG 25.5			35	1 - 10	242
SET EZR 25 6p-GEG 25.6			35	1 - 10	292
SET EZR 25 7p-GEG 25.7			35	1 - 10	342
SET EZR 25 8p-GEG 25.8			35	1 - 10	392
SET EZR 25 9p-GEG 25.9			35	1 - 10	442
SET EZR 25 10p-GEG 25.10			35	1 - 10	491

SET EZR 63 2p - 6p

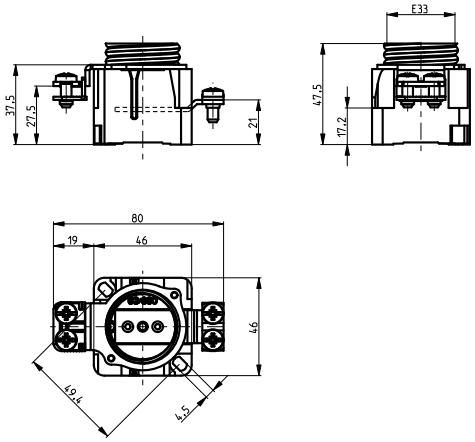


SET EZR 63 2p

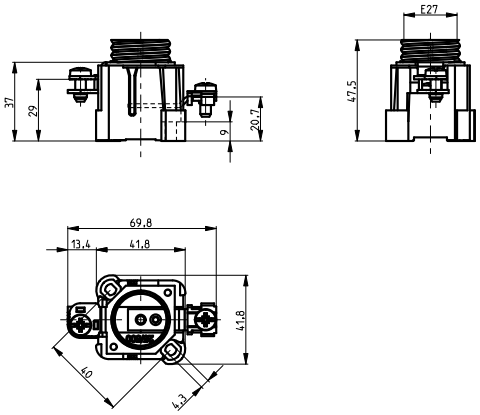
Fuse base EZR 63

type	Connection		Cross-section of connecting lead		Dimen-sion a
	Supply	Outlet	Supply [mm²]	Outlet [mm²]	
SET EZR 63 2p-GEG 63.2	2x M5	2x M5	35	2.5 - 25	106
SET EZR 63 3p-GEG 63.3			35	2.5 - 25	166
SET EZR 63 4p-GEG 63.4			35	2.5 - 25	226
SET EZR 63 5p-GEG 63.5			35	2.5 - 25	286
SET EZR 63 6p-GEG 63.6			35	2.5 - 25	346

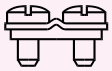
Fuse base EZV 63 GS



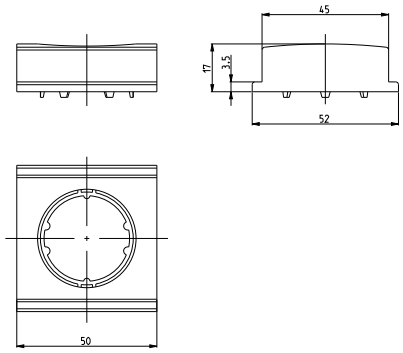
Fuse base EZV 25 GS



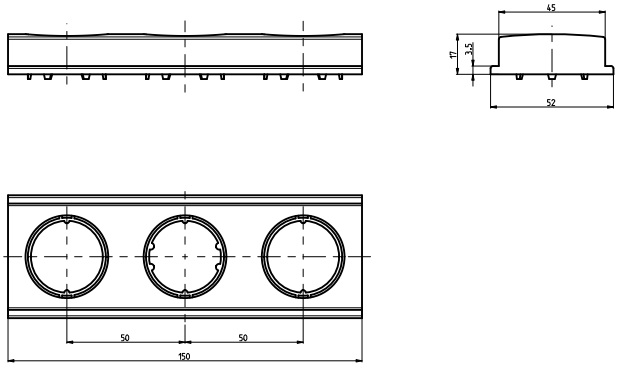
Fuse base EZV

type	Connection		Cross-section of connecting lead	
	Supply	Outlet	Supply [mm²]	Outlet [mm²]
EZV 25 GS	 M5	 M5	1 - 10	1 - 10
EZV 63 GS	 2x M5	 2x M5	2.5 - 25	2.5 - 25

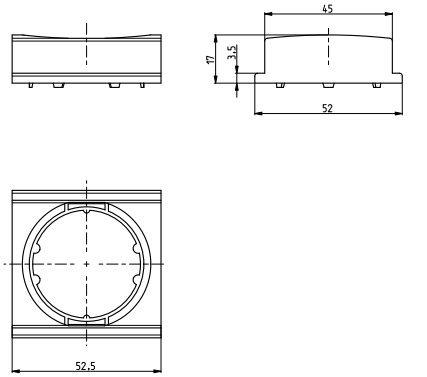
Protective cover GB 25.1



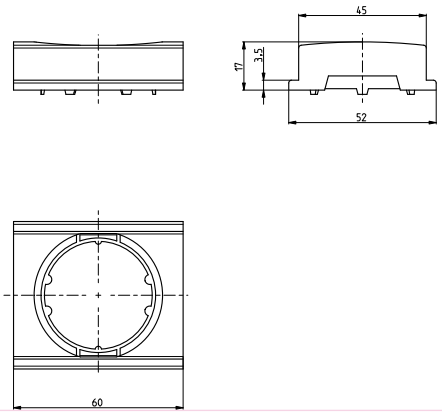
Protective cover GB 25.3



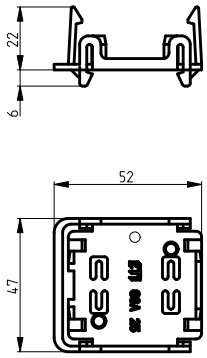
Protective cover GB 63-52



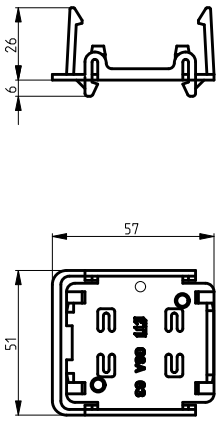
Protective cover GB 63-60



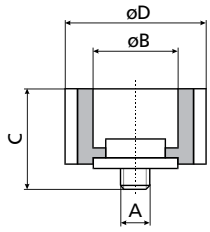
Plastic mounting plate GSA 25



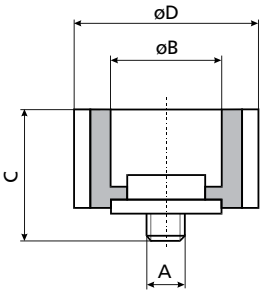
Plastic mounting plate GSA 63



Gauge Piece



VD II for fuse base E 27



VD III for fuse base E33

VD II for fuse base E 27

I_n [A]	dimension A	B	C	D
2	3/16″	6,5	17	24
4	3/16″	6,5	17	24
6	3/16″	6,5	17	24
10	3/16″	8,5	17	24
16	3/16″	10,5	17	24
20	3/16″	12,5	17	24
25	3/16″	14,5	17	24

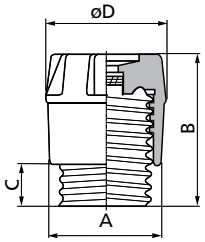
VD III for fuse base E 33

I_n [A]	dimension A	B	C	D
35	3/16″	16,5	17	30
50	3/16″	18,5	17	30
63	3/16″	20,5	17	30

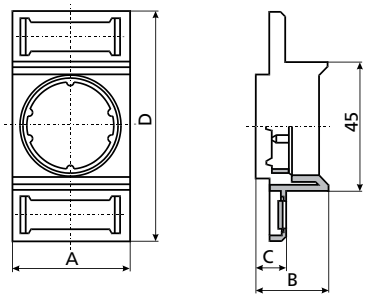
Fuse carrier D

Fuse carrier

type	dimension A	B	C	D
K DII	34	44	12	35
K DIII	43	44	12	43

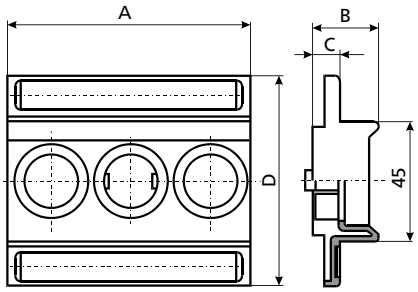


Protection cover



1-pole protection for fuse base

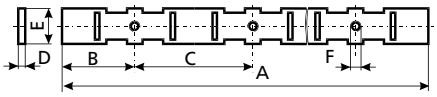
type	I_n [A]	dimension A	B	C	D
EZN, EZV	25	40	24	10,8	80
EZN, EZV	63	49	21	9	80



3-pole protection cover for fuse base

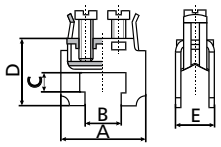
type	dimension A	B	C	D
EZN, EZV 25/3	121	24	10,8	80
EZN, EZV 63/3	148	21	9	80

Busbar system for 1-pole fuse base EZR



Busbar for fuse base EZR

type	I_n [A]	dimension A	B	C	D	E	F
EZR	25	1000	32	52	3	16	3/16"
EZR	63	1000	38	62	3	16	3/16"



Terminals for neutral terminals and busbars EZR

for cross section [mm²]	dimension A	B	C	D	E
16	25	12,5	3,5	17	7,3
35	28	12,5	6,5	21,5	12,6

D0

Low voltage fuse–links 640

Fuse bases 641

Accessories 644

Fuse–disconnection units 646

Technical data 650

HR

Low voltage fuses



ETI POWER NEEDS CONTROL

Low voltage fuse-links

Fuse-link D0

Rated current **2 - 100 A**

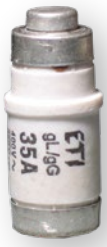
Fusing characteristics **gG**

D0 fuse-links are used as the most reliable protection of electrical installation, control and signal circuits against overload and short-circuit currents.
The whole system D0 contains a complete range of three physical sizes D01, D02 and D03 fuse-links, standard ceramic and new plastic bases, fuse disconnectors and all necessary accessories. It is dimensioned for rated voltages 400 V a.c. resp. 250 V d.c. with AC 50kA and DC 8kA rated breaking capacity.
The system D0 is intended to be used in residential, business and similar buildings. When it is used in industrial installations, it is necessary to take into account the requirements of the standard IEC 60664-1 concerning the insulation coordination for equipment within low-voltage systems .
All fuse-links have blown-fuse indicators which are visible through the screw cap when mounted. Fuse-links, fuse-bases, caps and fuse-disconnectors are tested and certified according to IEC 60269-3-1, DIN EN 60269-3, DIN VDE 0636-301, HD 630.3.1, DIN EN 60269-1, EN 60947-1 and EN 60947-3.



D01 for fuse base E 14

I_n [A]	Colour	Code No. gG	Weight [g]	Packaging [pcs]
2	pink	002211001	6	10/500
4	brown	002211002	6	10/500
6	green	002211003	6	10/500
10	red	002211004	6	10/500
13	black	002211006	6	10/500
16	grey	002211005	6	10/500



D02 for fuse base E 18

I_n [A]	Colour	Code No. gG	Weight [g]	Packaging [pcs]
20	blue	002212001	11	10/500
25	yellow	002212002	12	10/500
32	black	002212006	13	10/500
35	black	002212003	13	10/500
40	black	002212007	13	10/500
50	white	002212004	13	10/500
63	copper	002212005	15	10/500



D03 for fuse base M 30 x 2

I_n [A]	Colour	Code No. gG	Weight [g]	Packaging [pcs]
80	silver	002213001	35	10/400
100	red	002213002	35	10/400

Technical data on page 650

Fuse bases

Advantages of plastic fuse base PFB D0

→ Compact housing design without additional covers – IP 20 protection class, faster assembling

→ All parts are made of firestop material (GW 960 °C)

→ Two position snapper - enables easy replacement





→ More grip area for screwing caps



→ Modular design - availability of assembling multi-pole versions on construction site



→ Front print – product data visible after installation in the cabinet



→ LED indication when fuse link operates - working also in case of open circuit at minimal wire capacitance

→ LED indication flashes when a fuse is blown



→ Double input terminal - availability of connecting wire and isolated Busbar

→ Contact material Cu - lower temperature rise, very lower power dissipation

New! LED Version

Plastic fuse base PFB D0





Fuse base PFB D01

Type	I_n [A]	Code No.	Number of poles	Weight [g]	Packaging [pcs]
PFB D01 1p	16	002510011	1	58	15/180
PFB D01 1p LED	16	002510012	1	58,5	15/180
PFB D01 3p	16	002510013	3	178	5/60
PFB D01 3p LED	16	002510014	3	179,5	5/60

Fuse base PFB D02

Type	I_n [A]	Code No.	Number of poles	Weight [g]	Packaging [pcs]
PFB D02 1p	63	002510021	1	64	15/180
PFB D02 1p LED	63	002510022	1	64,5	15/180
PFB D02 3p	63	002510023	3	194	5/60
PFB D02 3p LED	63	002510024	3	195,5	5/60



Connection kit

Type	Code No.	Weight [g]	Packaging [pcs]
Connection kit	002510001	30	300

Technical data on page 652

Ceramic fuse base

Rated current
16, 63 A

The fuse bases D0 are planned to be built into distribution boxes in domestic and public installations. Total security against parts under voltage is achieved by installing D0 fuse bases into domestic or industrial distribution boards. Ceramic fuse-bases are tested and certified according to IEC 60269-3-1, DIN EN 60269-1, DIN EN 60269-3 and DIN VDE 0636-301.

Advantages

- modular construction
- smaller weight and smaller height (66 mm) provide installation into the flush-mounting distribution boxes, the depth of which is 80 mm only
- by the use of gauge-piece key it is possible to change the gauge rings under voltage
- the possibility of simple substitution of base D0 1 with D0 2

1-pole fuse base D0

Type	I_n [A]	Code No.	Screw	With protection cover	Without protection cover	Click-on mounting	Screw mounting	Weight [g]	Packaging [pcs]
D01N - K	16	002221011	E14	0		X		68	15/300
D01V - K	16	002221012	E14	0			X	66	15/300
D02N - K	63	002222011	E18	0		X		87	15/120
D02V - K	63	002222012	E18	0			X	80	15/120
D02N M5 - K	63	002222016	E18	0		X		82	15/120
D02V M5 - K	63	002222015	E18	0			X	80	15/120
D01N	16	002221001	E14		0	X		56	15/150
D01V	16	002221002	E14		0		X	59	15/150
D02N	63	002222001	E18		0	X		80	60/180
D02V	63	002222002	E18		0		X	77	60/180
D02N M5	63	002222006	E18		0	X		75	60/180
D02V M5	63	002222005	E18		0		X	72	60/180



Technical data on page 653



3-pole fuse base D0									
Type	I_n [A]	Code No.	Screw	With protection cover	Without protection cover	Click-on mounting	Screw mounting	Weight [g]	Packaging [pcs]
D01N/3 - K	16	002221021	E14	0		X		216	5/100
D01V/3 - K	16	002221020	E14	0			X	187	5/100
D02N/3 - K	63	002222021	E18	0		X		252	5/40
D02V/3 - K	63	002222020	E18	0			X	246	5/40
D02N/3 M5 - K	63	002222023	E18	0		X		237	5/40
D02V/3 M5 - K	63	002222022	E18	0			X	231	5/40
D01N/3	16	002221031	E14		0	X		176	5/50
D01V/3	16	002221030	E14		0		X	170	5/50
D02N/3	63	002222031	E18		0	X		235	5/50
D02V/3	63	002222030	E18		0		X	229	5/50
D02N/3 M5	63	002222033	E18		0	X		220	5/50
D02V/3 M5	63	002222032	E18		0		X	214	5/50

Accessories

Protection cover



1-pole protection cover for fuse base			
Type	Code No.	Weight [g]	Packaging [pcs]
D01V, D01N	002251006	8	50/700
D02V, D02N	002251005	8	50/700



3-pole protection cover for fuse base			
Type	Code No.	Weight [g]	Packaging [pcs]
D01V/3, D01N/3	002251004	17	14/280
D02V/3, D02N/3	002251002	16	14/280

Technical data on page 653

Gauge piece

V D01 for fuse base E 14				
I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
2	pink	002241001	1	50/500
4	brown	002241002	1	50/500
6	green	002241003	1	50/500
10	red	002241004	1	50/500



V D02 for fuse base E 18				
I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
2*	pink	002243001	1	50/500
4*	brown	002243002	1	50/500
6*	green	002243003	1	50/500
10*	red	002243004	1	50/500
16*	grey	002243005	1	50/500
20	blue	002242001	1	50/500
25	yellow	002242002	1	50/500
35	black	002242003	1	50/500
50	white	002242004	1	50/500

* For using fuse-links D01 and fuse bases D02.



Gauge piece key		
Code No.	Weight [g]	Packaging [pcs]
002241000	17	20/120



Fuse carrier D0

Fuse carrier D0				
Type	Code No.	Screw	Weight [g]	Packaging [pcs]
KN D01	002231003	E 14	14	20/500
KN D02	002232003	E 18	17	20/500



Fuse carrier D0 - plastic				
Type	Code No.	Screw	Weight [g]	Packaging [pcs]
PLK D01	002231008	E 14	9	10/500
PLK D02	002232008	E 18	11	10/500



Technical data on page 654

Special holder



Special holder		
Code No.	Weight [g]	Packaging [pcs]
002231000	1	25/300

Fuse–disconnection units

Fuse–switch disconnector VLD01

Rated current **2 - 6, 10, 16 A**

Utilization category **AC22**

Fuse-switch disconnector is a protection device with an exchangeable for D01 fuse link. This system enables the following protecting advantages, concerning the D0 fuse:

- Replacement of the fuse-link can be done with a movable holder, without danger of direct contact to the parts under voltage.
- The device can be switched on without screwing, contact pressure is applied automatically by a spring.
- Complete protection against touch by VBG 4.
- In position 1 and 0, the fuse-link operation indicator is visible through a transparent window.



1-pole				
I_n [A]	U_n [V]	Code No.	Weight [g]	Packaging [pcs]
6	230/400	002261001	67	12/108
10	230/400	002261002	67	12/108
13	230/400	002261004	67	12/108
16	230/400	002261003	67	12/108



1-pole + N				
I_n [A]	U_n [V]	Code No.	Weight [g]	Packaging [pcs]
6	230	002261016	135	6/54
10	230	002261017	135	6/54
13	230	002261019	135	6/54
16	230	002261018	135	6/54

Technical data on page 654, 655

2-pole

I_n [A]	U_n [V]	Code No.	Weight [g]	Packaging [pcs]
6	400	002261006	135	6/54
10	400	002261007	135	6/54
13	400	002261009	135	6/54
16	400	002261008	135	6/54



3-pole

I_n [A]	U_n [V]	Code No.	Weight [g]	Packaging [pcs]
6	400	002261011	203	4/36
10	400	002261012	203	4/36
13	400	002261014	203	4/36
16	400	002261013	203	4/36



3-pole + N

I_n [A]	U_n [V]	Code No.	Weight [g]	Packaging [pcs]
6	400	002261021	270	3/27
10	400	002261022	270	3/27
13	400	002261024	270	3/27
16	400	002261023	270	3/27

Accessories for fuse-switch disconnector VLD01

Holder

Accessories	Code No.	Weight [g]	Packaging [pcs]
holder/2-6A	002261028	6	15/600
holder/10A	002261029	6	15/600
holder/13A	002261027	6	15/600
holder/16A	002261030	6	15/600



Technical data on page 655

Switch–disconnector–fuse STVD02

Rated current **63 A**

Utilization category **AC 22**

Switch-disconnector-fuse is a device which combines the functions of the switch and of the fuse D0.
The system enables the following advantages of protection in comparison with the fuse D0:

- The changing of the fuse-link without danger of direct touch of parts under voltage.
- Snap-on mounting on rail according to EN 60715.
- The complete protection against touch according to VBG 4.
- The possibility of connecting supply from the upper or from the lower side.
- It can be used as a main switch and tariff fuse in a single device.
- Possibility of sealing in ON or OFF positions with or without fuse-link.





STVD02

Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
STV D02-1	63	002271001	119	12/96
STV D02-1N	63	002271002	238	6/48
STV D02-2	63	002271003	238	6/48
STV D02-3	63	002271004	357	4/32
STV D02-3N	63	002271005	476	3/24

D0

Accessories for switch - disconnector - fuse STVD02



Auxiliary switch PS STV

Type	Code No.	Contacts	Weight [g]
PS STV - MD	002279001	1 x b, 1 x a	50
PS STV - 2M	002279002	2 x b	50
PS STV - 2D	002279003	2 x a	50

a... make contact
b... breake contact

Auxiliary switch PS STV is intended to be mounted with switches of series STV D02. The width of apparatus is 9 mm, other dimensions comply with STV D02 series switches.
Auxiliary switch PS STV D02 serves for distant signalization of the state of contacts (on/off) of STV D02 switch, or for circuit control.

Technical data on page 655

Gauge piece

I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
20	blue	002243010	0,8	15/300
25	yellow	002243011	0,6	15/300
35	black	002243012	0,5	15/300
50	white	002243013	0,4	15/300

Their function is to limit the use of D0 fuse-links to user prescribed rated currents. The gauge piece can be inserted into the holder, when the fuse holder is extracted from the housing.



Adapter

I_n [A]	Colour	Code No.	Weight [g]	Packaging [pcs]
6	green	002243018	2,5	20/200
10	red	002243019	2,5	20/200
16	grey	002243020	2,5	20/200

Its function is to allow the use of D01 fuse-links (2-16A) with the fuse-switch-disconnector STV D02.



STVD02 set

STVD02 set includes a switch-disconnector-fuse, gauge pieces of all sizes and adapters of all sizes.

STVD02 set

title	Code No.	Packaging [pcs]
STV D02 1p set	002271101	12/96
STV D02 1p+N set	002271102	6/48
STV D02 2p set	002271103	6/48
STV D02 3p set	002271104	4/32
STV D02 3p+N set	002271105	3/24

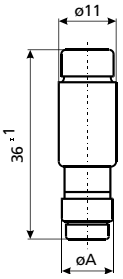
Technical data on page 655

Fuse-link D0

Technical data	
Rated voltage U_n	400 V AC, 250 V DC
Rated current I_n	D01 2 - 16 A, D02 20 - 63 A, D03 80 - 100 A
Breaking capacity at 1,1 U_n	50 kA AC cos ϕ = 0,1
	8 kA DC T = 15 ms
Fusing characteristics	gG
Standards	DIN EN 60269-1, IEC 60269-1:2005-04 (VDE 0636 Teil 10): 1999-11
	DIN EN 60269-3, IEC 60269-3:2003 (VDE 0636 Teil 30): 1995-12
	DIN EN 60269-3-1, IEC 60269-3-1: 2004-07
	(VDE 0636 Teil 301): 1998-01
	DIN VDE 0635/02.84

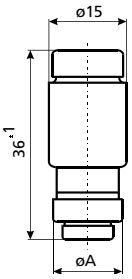
D01 gG for fuse base E 14

I_n [A]	dimension ØA
2	7,3
4	7,3
6	7,3
10	8,5
13	8,5
16	9,7



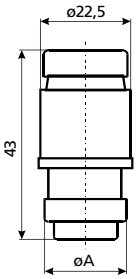
D02 gG for fuse base E 18

I_n [A]	dimension ØA
20	10,9
25	12,1
32	13,3
35	13,3
40	13,3
50	14,5
63	15,9

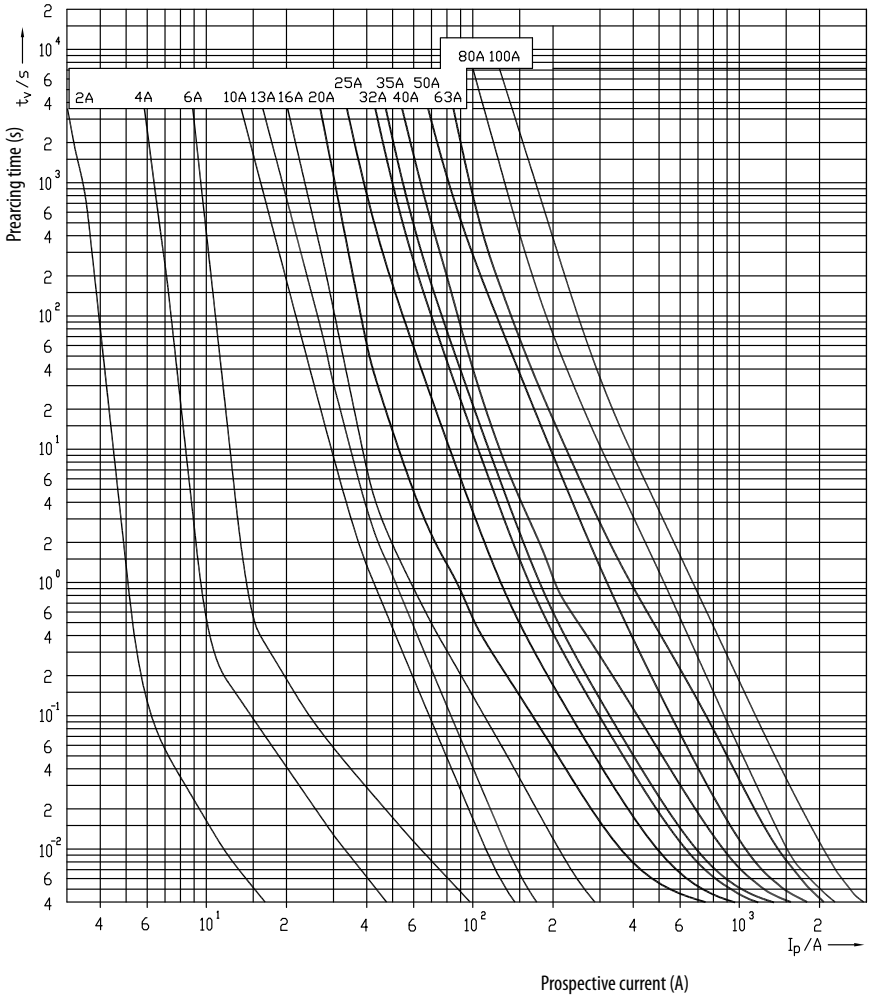


D03 gG for fuse base M 30 x 2

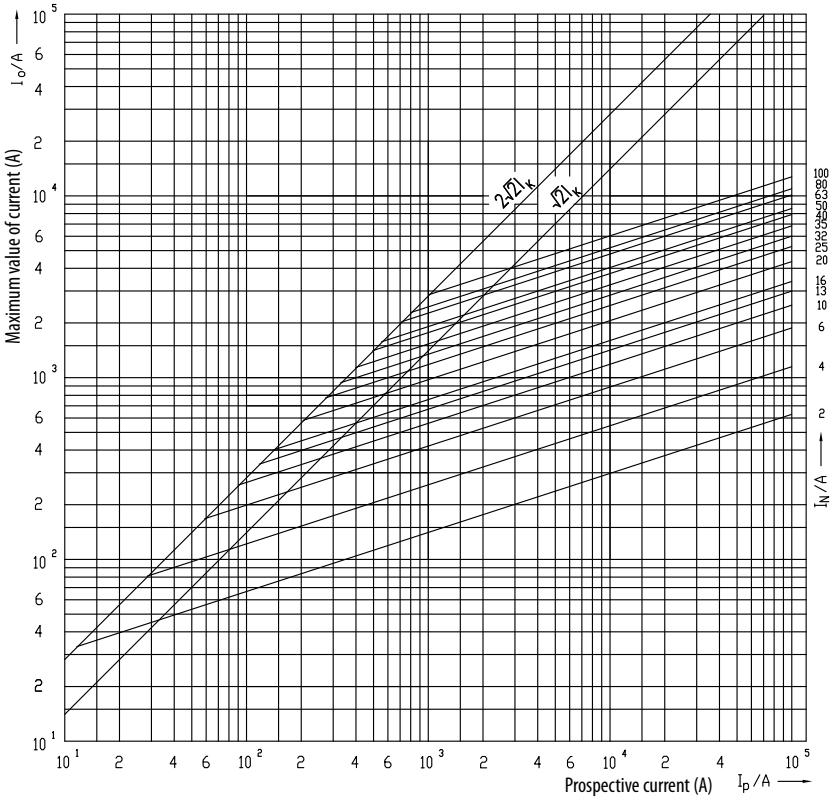
I_n [A]	dimension ØA
80	21,4
100	21,4



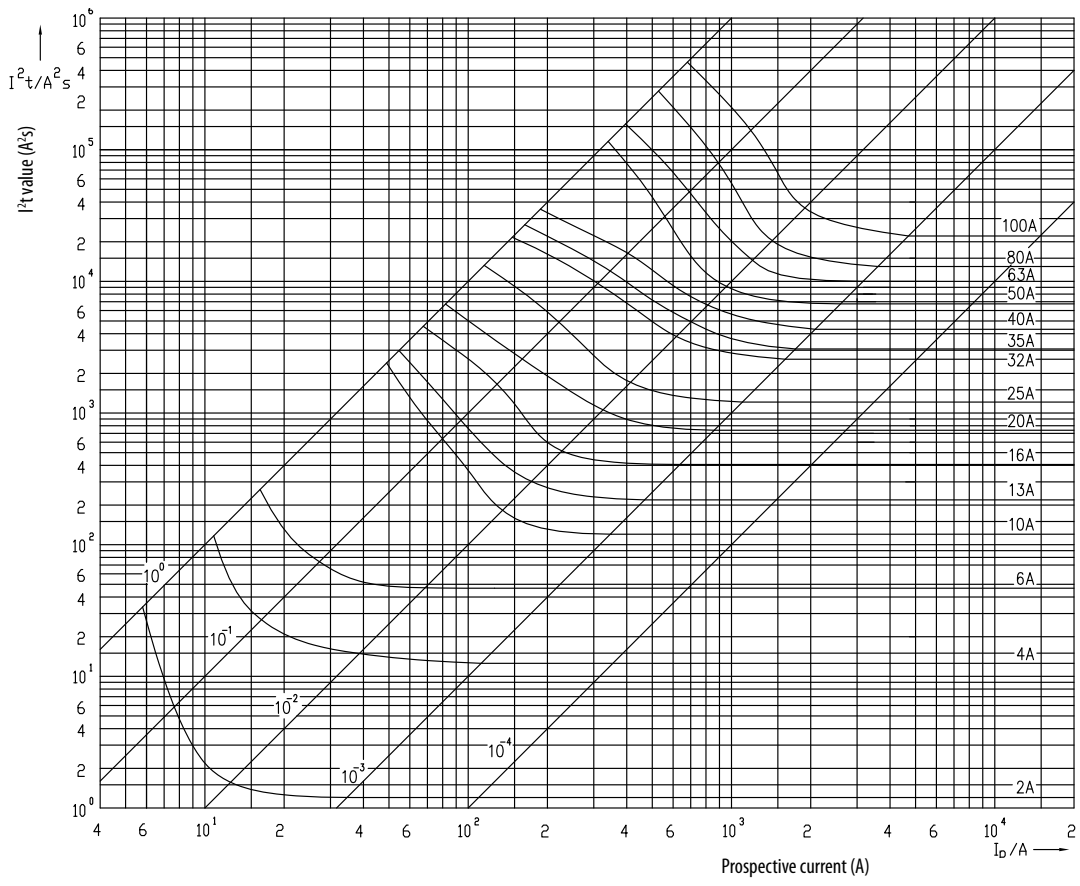
Time current characteristics I/t gG



Cut-off current characteristics

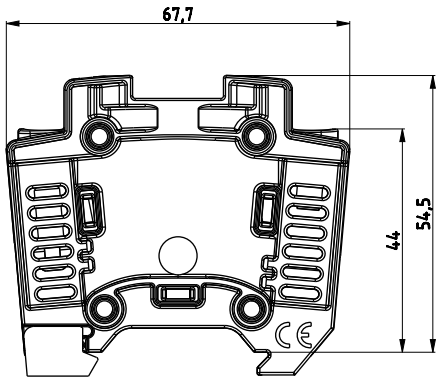


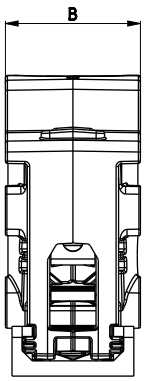
Melting energy characteristics I^2t



Plastic fuse base PFB D0

Technical data		
	PFB D01	PFB D02
Fuse type	D01	D02
Versions	w/o indicator, LED indicator version	
Number of poles	1p, 3p	
Thread	E14	E18
Rated operational voltage Ue	400V a.c. / 250V d.c.	
Rated operational current Ie	16A	63A
Rated frequency	45-62Hz	
Rated conditional short-circuit current	50kA a.c. / 8kA d.c.	
Max power dissipation of the fuse-link (W)	2,5W	5,5W
LED indicator operating range	50V-400V a.c./ 50V-250V d.c.	
Glow wire test (GWFI)	960°C	
Terminals		
Screw	PZ2 M5	
Torque	2Nm	2,5Nm
Input terminal	1 ... 35mm^2 + Busbar 16mm^2	
Output terminal	1 ... 25mm^2	
Humidity	90% / 20°C	
Operating ambient temperature	-5°C ... +40°C	
Store ambient temperature	-25°C ... +55°C	
Degree of protection (IEC 60529) with fuse - carrier	IP 20	
Mounting on EN 60715 rail	35mm	
Standards	IEC 60269-3, VDE0636-3	
Approvals	VDE, OVE	





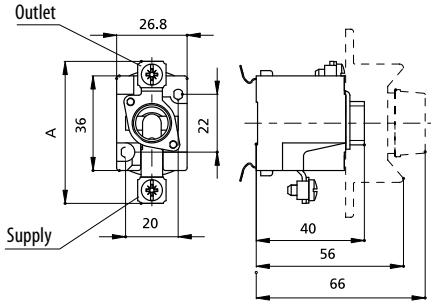
type	B [mm]
1p	26,8
3p	80,4

Ceramic fuse base

Technical data	
Rated voltage U_n	400 V AC
Rated current I_n	D01 16 A, D02 63 A
Cross-section of connecting lead	D01 1 - 4 mm² D02 1,5 - 25 mm²
Connection clamp	with screw +- PZ
Standards	IEC 60269, EN 60269,
	DIN VDE 0636, SIST EN 60269

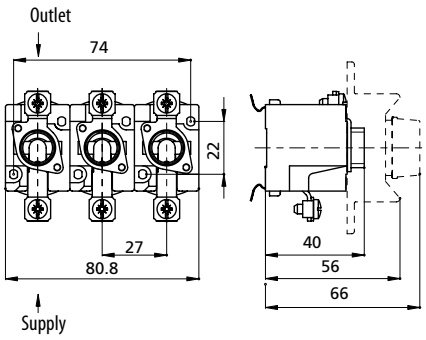
1-pole fuse base D0

type	connections		cross-section of connecting lead	dimension
	outlet	supply	[mm²]	A [mm]
D01N - K	M4	M4	1,5 - 4	53
D01V - K			1,5 - 4	53
D02N - K	2xM5	2xM5	2,5 - 25	57
D02V - K			2,5 - 25	57
D02N M5 - K	2xM5	M5	2,5 - 25	57
D02V M5 - K			2,5 - 25	57
D01N	M4	M4	1,5 - 4	53
D01V			1,5 - 4	53
D02N	2xM5	2xM5	2,5 - 25	57
D02V			2,5 - 25	57
D02N M5	2xM5	M5	2,5 - 25	57
D02V M5			2,5 - 25	57



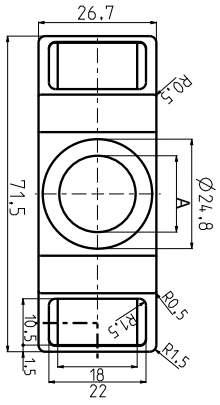
3-pole fuse base D0

type	connections		cross-section of connecting lead	dimension
	outlet	supply	[mm²]	A [mm]
D01N/3 - K	M4	M4	1,5 - 4	53
D01V/3 - K			1,5 - 4	53
D02N/3 - K	2xM5	2xM5	2,5 - 25	57
D02V/3 - K			2,5 - 25	57
D02N/3 M5 - K	2xM5	M5	2,5 - 25	57
D02V/3 M5 - K			2,5 - 25	57
D01N/3	M4	M4	1,5 - 4	53
D01V/3			1,5 - 4	53
D02N/3	2xM5	2xM5	2,5 - 25	57
D02V/3			2,5 - 25	57
D02N/3 M5	2xM5	M5	2,5 - 25	57
D02V/3 M5			2,5 - 25	57

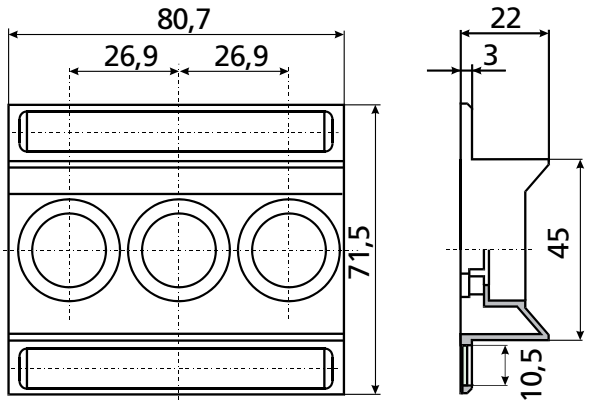


Protection cover

	A [mm]
ZP D01	17,3
ZP D02	21,1



D01, D02

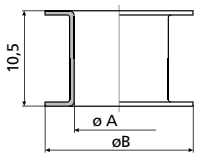


D01/3, D02/3

Gauge piece

V D01 for fuse base E 14

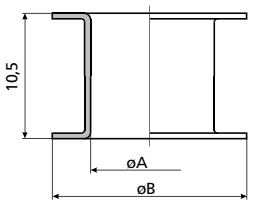
I_n [A]	dimension ØA	ØB
2	7,9	12
4	7,9	12
6	7,9	12
10	9,1	12



V D02 for fuse base E 18

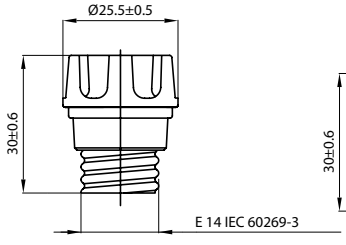
I_n [A]	dimension ØA	ØB
2*	7,9	16,6
4*	7,9	16,6
6*	7,9	16,6
10*	9,1	16,6
16*	10,3	16,6
20	11,5	16,6
25	12,7	16,6
35	13,9	16,6
50	15,1	16,6

*For using fuse-links D01 and fuse bases D02.

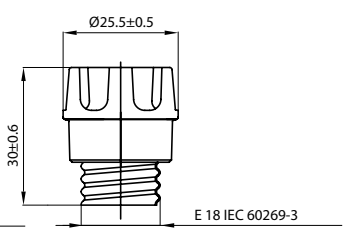


Fuse carrier D0

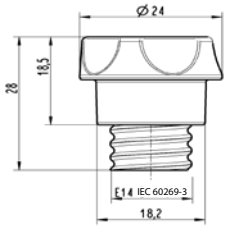
KND01



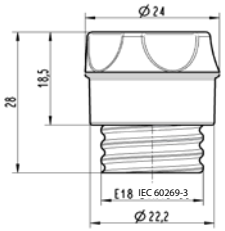
KND02



PLKD01

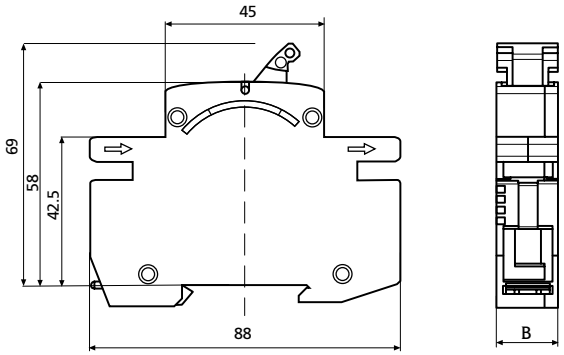


PLKD02



Fuse - switch disconnector VLD01

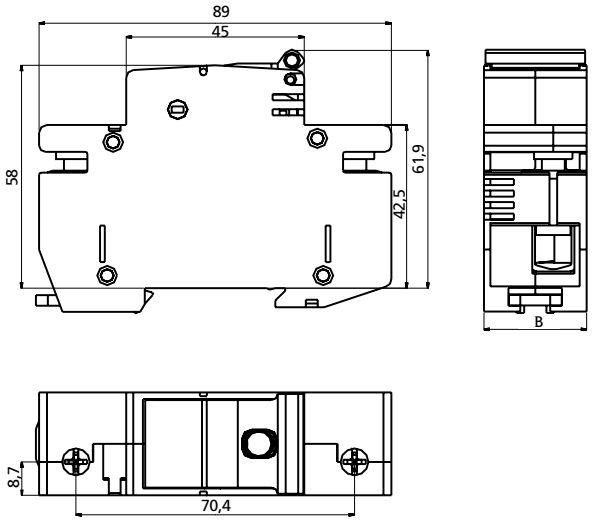
Technical data:	
Rated voltage U_n	230 V, 230/400 V, 400 V a.c.
Rated current I_n	2-6 A, 10 A, 13 A, 16 A
Rated frequency f_n	45-62 Hz
Utilization category	AC-22 A
Mechanical life	10.000 cycles
Electrical life	1500 cycles
Poles	1p, 1p+N, 2p, 3p, 3p+N
Standards	IEC/EN 60947-1 IEC/EN 60947-3 DIN EN 60947-1 VDE 0660-100 DIN EN 60947-3 VDE 0660-107 IEC 60269-1 Ed. 4.1 2009-07 IEC 60269-3 Ed. 4.0 2010-05
Terminal capacity	1,5 -25mm^2



type	B [mm]
1p	17,5
1p+N	35
2p	35
3p	52,5
3p+N	70

Switch - disconnector - fuse STVD02

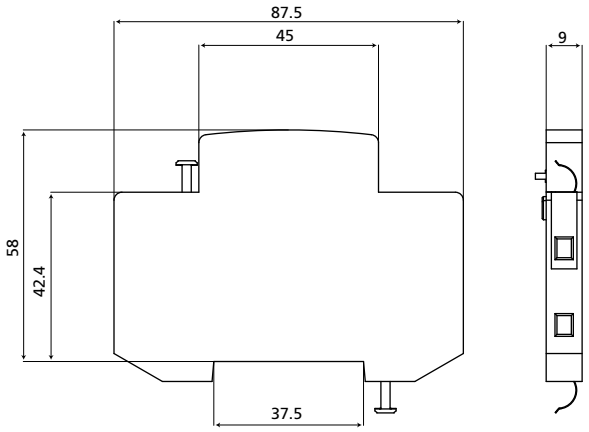
Technical data	
Number of poles	1p, 1p+N, 2p, 3p, 3p+N
Rated voltage	230/400 V a.c., 110 V (2p) d.c.
Rated current	63 A
Rated breaking capacity	50 kA
Rated insulation voltage	400 V
Rated impulse resistance voltage	6000 V
Category of use according to DIN VDE 0638	AC 22(63 A), AC 23(35 A), DC 22 (63 A)
Category of use according to DIN E 60 947-3	AC-22A (63A/400V AC), AC-23A (35A/400V AC), DC-22B (63A/110V DC)
Mechanical life	8.500 cycles
Electrical life	1.500 cycles
Temperature of environment	-5^{0}C ... +40^{0}C
Air humidity	90%
Degree of protection	IP 00 according to DIN 40 050 IP 20 when mounted in distribution board
Standards	IEC/EN 60947-1 IEC/EN 60947-3 DIN EN 60947-1 VDE 0660-100 DIN EN 60947-3 VDE 0660-107 IEC 60269-1 Ed. 4.1 2009-07 IEC 60269-3 Ed. 4.0 2010-05
Terminal capacity	1,5 - 35mm^2
Possibility of sealing	in ON or OFF position



type	B [mm]
1p	26,8
1p+N	53,6
2p	53,6
3p	80,4
3p+N	107,2

Auxiliary switch PS STV

Technical data:	
Rated current I_n	AC12 (6A/230V AC)
	DC12 (1A/110V DC)
Rated conditional short circuit current	1 kA at 20 A fuse link
Standards	EN 62019



C

Cylindrical fuse–links 658

Fuse-switch disconnectors for cylindrical fuse–links 660

Technical data 671

* DC and PV fuses are in Special Purpose Fuses and Green Protect catalogues

Low voltage cylindrical fuses



ETI Power needs control

Cylindrical fuse-links

Cylindrical fuse-link CH

Rated current **1-100 A**

Fusing characteristics **gG, aM**

Application: Cylindrical fuse-links are used as the most secure protection of electrical installations, control, and signal circuits against overloads and short circuit currents. Their dimensions comply with IEC 60269-1 and IEC 60269-2. They are used mainly in industrial areas, since their dimensions allow voltages of up to 690 V. The most common sizes are the following four: 8x32, 10x38, 14x51 and 22x58.



CH8

Rated current/Rated voltage	Code No. gG	Code No. aM	Weight [g]	Packaging [pcs]
1A, 400V	002610000	002611000	4	10/1000
2A, 400V	002610001	002611001		
4A, 400V	002610003	002611003		
6A, 400V	002610005	002611005		
8A, 400V	002610006	002611006		
10A, 400V	002610007	002611007		
12A, 400V	002610008	002611008		
16A, 400V	002610009	002611009		
20A, 400V	002610011	002611011		
25A, 400V	002610013	002611013		



CH10

Rated current/Rated voltage	Code No. gG	Code No. aM	Weight [g]	Packaging [pcs]
0.5A, 500V	002620017	002621017	7,5	10/500
1A, 500V	002620000	002621000		
2A, 500V	002620001	002621001		
4A, 500V	002620003	002621003		
6A, 500V	002620005	002621005		
8A, 500V	002620006	002621006		
10A, 500V	002620007	002621007		
12A, 500V	002620008	002621008		
16A, 500V	002620009	002621009		
20A, 400V	002620011	002621011		
25A, 400V	002620013	002621013		
32A, 400V	002620015	002621015		

Technical data on page 671

CH14

Rated current/Rated voltage	Code No. gG	Code No. gG with striker pin	Code No. aM	Code No. aM with striker pin	Weight [g]	Packaging [pcs]
2A, 690V	002630001	006711015*	002631001	006711029*	18,6	10/500
4A, 690V	002630003	006711005*	002631003	006711030*		
6A, 690V	002630005	006711016*	002631005	006711031*		
8A, 690V	002630006	006711017*	002631006	006711032*		
10A, 690V	002630007	006711018*	002631007	006711033*		
12A, 690V	002630008	006711006*	002631008	006711034*		
16A, 690V	002630009	006711001*	002631009	006711035*		
20A, 690V	002630011	006711002*	002631011	006711036*		
25A, 690V	002630013	006711003*	002631013	006711037*		
32A, 500V	002630015	006711019	002631015	006711038		
40A, 500V	002630017	006711004	002631017	006711039		
50A, 500V	002630019	006711020**	002631019	006711040**		

* 500V
**400V



CH22

Rated current/Rated voltage	Code No. gG	Code No. gG with striker pin	Code No. aM	Code No. aM with striker pin	Weight [g]	Packaging [pcs]
4A, 690V		006711008			51	10/500
6A, 690V		006711009		006711041		
8A, 690V		006711021		006711042		
10A, 690V		006711010		006711043		
12A, 690V		006711022		006711044		
16A, 690V	002640009	006711023	002641009	006711045		
20A, 690V	002640011	006711024	002641011	006711046		
25A, 690V	002640013	006711025	002641013	006711047		
32A, 690V	002640015	006711011	002641015	006711048		
40A, 690V	002640017	006711026	002641017	006711049		
50A, 690V	002640019*	006711027	002641019	006711050		
63A, 690V	002640021*	006711012	002641021*	006711051		
80A, 500V	002640023	006711013	002641023	006711052		
100A, 500V	002640025	006711014	002641025	006711053		

* 500V



Technical data on page 671

Fuse-switch disconnectors for cylindrical fuse-links

Advantages of fuse-switch disconnector PCF

→ 1-pole + N in one module



→ Double connection clamps





→ New method of mounting on the DIN rail and simple replacement



→ LED indicator version





→ Extraction of entire fuse-link when changing

→ Chamber for spare fuse-link



→ Sealing possibility

Fuse-switch disconnector PCF 8

Rated current	Rated operational voltage	Utilization category
max. 20 A	**400 V**	**AC 22B**

1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400	20	002530001	-	58	12/108
		002530011	LED		
		*002531001	-	58	12/108
		*002531011	LED		

*Connection clamp on the right side "French version"



1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400	20	002530002	-	70	12/108
		002530012	LED		
		*002531002	-	70	12/108
		*002531012	LED		

*Connection clamp on the right side, N pole on the left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400	20	002530003	-	120	6/54
		002530013	LED		
		*002531003	-	120	6/54
		*002531013	LED		

*Connection clamp on the right side "French version"



3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400	20	002530004	-	180	4/36
		002530014	LED		
		*002531004	-	180	4/36
		*002531014	LED		

*Connection clamp on the right side "French version"



3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400	20	002530005	-	195	4/36
		002530015	LED		
		*002531005	-	195	4/36
		*002531015	LED		

*Connection clamp on the right side, N pole on the left "French version"

Technical data on page 680

Fuse-switch disconnector PCF 10

Rated current	Rated operational voltage	Utilization category
max. 32 A	**690 V a.c.**	**AC 22B**



1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	32	002550001	-	58	12/108
		002550011	LED		
		*002551001	-	58	12/108
		*002551011	LED		

*Connection clamp on the right side "French version"



1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
400/690	32	002550002	-	70	12/108
		002550012	LED		
		*002551002	-	70	12/108
		*002551012	LED		

*Connection clamp on the right side, N pole on the left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	32	002550003	-	120	6/54
		002550013	LED		
		*002551003	-	120	6/54
		*002551013	LED		

*Connection clamp on the right side "French version"



3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	32	002550004	-	180	4/36
		002550014	LED		
		*002551004	-	180	4/36
		*002551014	LED		

*Connection clamp on the right side "French version"

3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	32	002550005	-	195	4/36
		002550015	LED		
		*002551005	-	195	4/36
		*002551015	LED		

*Connection clamp on the right side, N pole on the left "French version"

Technical data on page 680

Accessories

Auxiliary switch PS PCF

U_n [V]	I_n [A]	Code No. PCF8	Code No. PCF10	Weight [g]	Packaging [pcs]	Contact
230	6	002559001	002559001	35	1/10	1 x b 1 x a/b



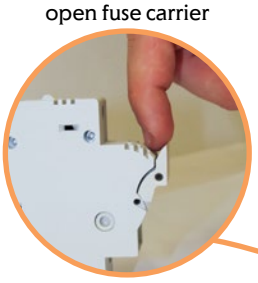
Technical data on page 680

NEW Fuse-switch disconnector

Advantages of cylindrical fuse-switch disconnector EFD

→ Compliance with IEC 60947-1, IEC 60947-3, UL 4248-1, UL 4248-4, UL 4248-8 and UL 486E

→ More space for finger to open fuse carrier



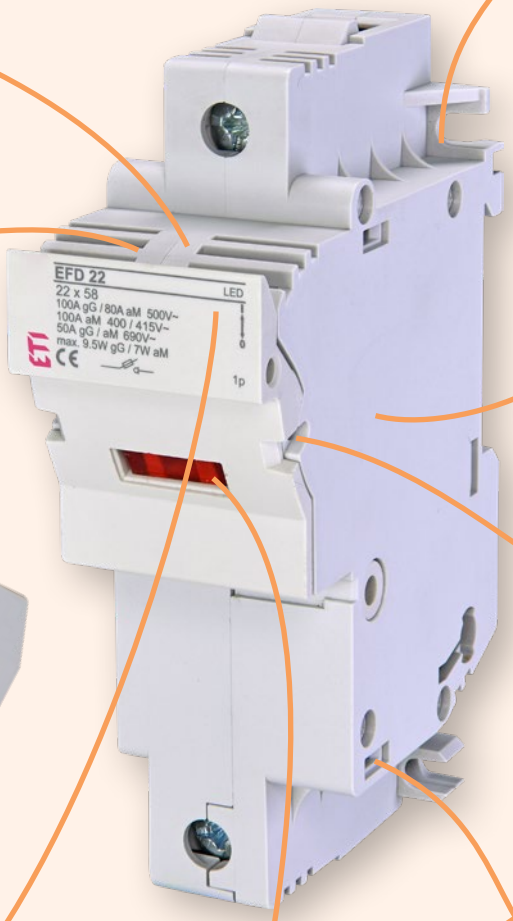


→ Complete protection against touch according to IP20

→ Changing of a fuse-link without danger of direct touch of parts under voltage



→ All plastic parts are made of material resistant to extremely high temperatures. Fuse carrier assures that a fuse link is not in touch with a housing



→ Mounting on standard DIN 35 mm rail (DIN EN60715). The sizes 22x58 can be also fixed with screws on a flat base

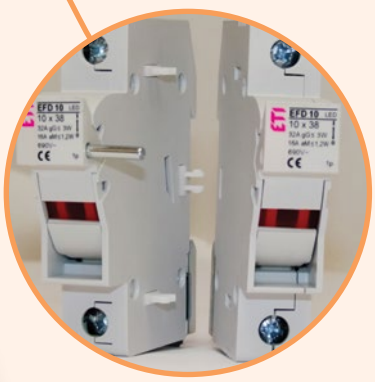


→ All contact surfaces are silver plated





→ Possibility of sealing in ON or OFF positions



→ Modular design – it is possible to assemble multi-pole versions at the building site for EFD 8, EFD 10, EFD 14 and EFD 22

→ For all sizes a **version with electronic indicator** is available. **L (LED)** with built–in LED diode which blinks after the fuse-link operates. The indicator is capable of operating in conditions of open circuit with minimum capacitance between connection cables. Operating voltage range from 50V to 690V.



Fuse-switch disconnector EFD 8

Rated current	Rated operational voltage	Utilization category	For fuse-links size
max. 20 A	**400 V**	**AC 22B**	**8x32**



1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400	20	002520001	-		63	12/108
		002520011	L-LED		64	
		002520301	-	✓	68	
		002520311	L-LED	✓	69	

1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400	20	002520002	-		128	6/54
		002520012	L-LED		129	
		002520302	-	✓	138	
		002520312	L-LED	✓	139	
		*002520007	-		128	
		*002520017	L-LED		129	
		*002520307	-	✓	138	
		*002520317	L-LED	✓	139	

*N pole on left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400	20	002520003	-		123	6/54
		002520013	L-LED		125	
		002520303	-	✓	134	
		002520313	L-LED	✓	135	



3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400	20	002520004	-		184	4/36
		002520014	L-LED		186	
		002520304	-	✓	200	
		002520314	L-LED	✓	201	

Technical data on page 678



3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400	20	002520005	-		252	3/27
		002520015	L-LED		254	
		002520305	-	✓	273	
		002520315	L-LED	✓	274	
		*002520008	-		252	
		*002520018	L-LED		254	
		*002520308	-	✓	273	
		*002520318	L-LED	✓	274	

*N pole on left "French version"

Fuse-switch disconnector EFD 10

Rated current	Rated operational voltage	Utilization category	For fuse-links size
max. 32 A	**690 V**	**AC 22B**	**10x38**



1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
690	32	002540001	-		63	12/108
		002540011	L-LED		64	
		002540301	-	✓	68	
		002540311	L-LED	✓	69	

1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
400/690	32	002540002	-		128	6/54
		002540012	L-LED		129	
		002540302	-	✓	138	
		002540312	L-LED	✓	139	
		*002540007	-		128	
		*002540017	L-LED		129	
		*002540307	-	✓	138	
		*002540317	L-LED	✓	139	

*N pole on left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
690	32	002540003	-		123	6/54
		002540013	L-LED		125	
		002540303	-	✓	134	
		002540313	L-LED	✓	135	

Technical data on page 678

3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
690	32	002540004	-		184	4/36
		002540014	L-LED		186	
		002540304	-	✓	200	
		002540314	L-LED	✓	201	



3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
690	32	002540005	-		252	3/27
		002540015	L-LED		254	
		002540305	-	✓	273	
		002540315	L-LED	✓	274	
		*002540008	-		252	
		*002540018	L-LED		254	
		*002540308	-	✓	273	
		*002540318	L-LED	✓	274	

*N pole on left "French version"



Fuse-switch disconnector EFD CC

Rated current **max. 30 A** | Rated operational voltage **600 V** | For fuse-links **Class CC acc to UL4248-4**

1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
600	30	002540101	-		63	12/108
		002540111	L-LED		64	
		002540401	-	✓	68	
		002540411	L-LED	✓	69	

2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
600	30	002540103	-		123	6/54
		002540113	L-LED		125	
		002540403	-	✓	134	
		002540413	L-LED	✓	135	

3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Adapter	Weight [g]	Packaging [pcs]
600	30	002540104	-		184	4/36
		002540114	L-LED		186	
		002540404	-	✓	199	
		002540414	L-LED	✓	201	



Technical data on page 678

Fuse-switch disconnector EFD 14

Rated current	Rated operational voltage	Utilization category	For fuse-links size
max. 50 A	**690 V**	**AC 22B**	**14x51**



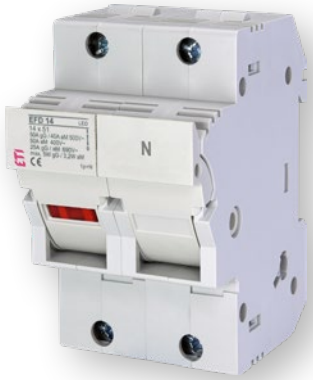
1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	50	002560001	-	102	12/96
		002560011	L-LED	103	

1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	50	002560002	-	226	6/48
		002560012	L-LED	227	
		*002560007	-	226	
		*002560017	L-LED	227	

*N pole on left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	50	002560003	-	206	6/48
		002560013	L-LED	208	

3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	50	002560004	-	310	4/32
		002560014	L-LED	313	



3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	50	002560005	-	434	3/24
		002560015	L-LED	437	
		*002560008	-	434	
		*002560018	L-LED	437	

*N pole on left "French version"

Fuse-switch disconnector EFD 22

Rated current	Rated operational voltage	Utilization category	For fuse-links size
max. 100 A	**690 V**	**AC 21B**	**22x58**

1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	100	002570001	-	156	3/105
		002570011	L-LED	158	

Technical data on page 678

Fuse-switch disconnectors for cylindrical fuse-links

1-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	100	002570002	-	351	2/48
		002570012	L-LED	353	
		*002570007	-	351	
		*002570017	L-LED	353	

*N pole on left "French version"



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	100	002570003	-	317	2/48
		002570013	L-LED	321	



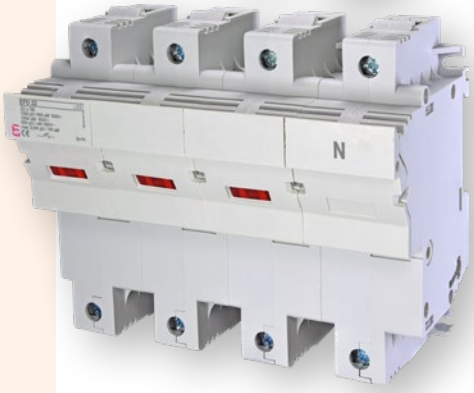
3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	100	002570004	-	476	1/35
		002570014	L-LED	485	

3-pole + N

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
690	100	002570005	-	671	1/24
		002570015	L-LED	677	
		*002570008	-	671	
		*002570018	L-LED	677	

*N pole on left "French version"



Fuse-switch disconnector EFD J30

Rated current **max. 30 A**

Rated operational voltage **600 V**

For fuse-links **Class J acc to UL4248-8**

1-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
600	30	002570101	-	156	3/105
		002570111	L-LED	158	



2-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
600	30	002570103	-	317	2/48
		002570113	L-LED	321	

3-pole

U_e/U_i [V]	I_{max} [A]	Code No.	Indicator	Weight [g]	Packaging [pcs]
600	30	002570104	-	476	1/35
		002570114	L-LED	485	

Technical data on page 678

Accessories



Auxiliary switch PS EFD

U_n [V]	I_n [A]	Code No. EFD14	Code No. EFD22	Weight [g]	Packaging [pcs]	Contact
250	5	002569001	002579001	50	1/10	1 x make 1 x break

*Can be used with VLC 14 and VLC 22 Fuse-switch disconnectors

Auxiliary switch PS EFD is intended to be mounted with disconnectors EFD 14 and EFD 22 for all versions (1p, 2p, 1p+N, 3p, 3p+N). The width of apparatus is 9 mm, other dimensions comply with EFD 14 and EFD 22 series switches. Auxiliary switch PS EFD signals the operation of CH14 or CH 22 fuse-links only in the case a fuse-link is fitted with striking pin - see IEC 60 269-2 Figure 1a (III).



Connection kit

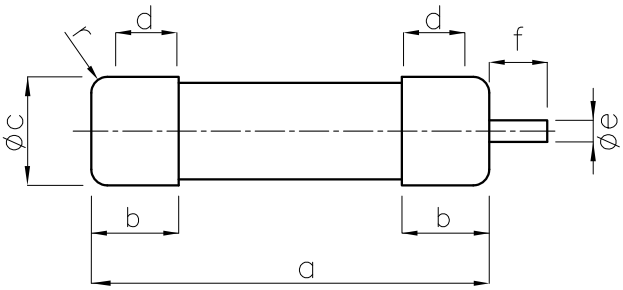
Description	Code No.	For use with	Weight [g]	Packaging [pcs]
Connection kit 2p	002540948	EFD 8, EFD 10, EFH 10, PCF 8, PCF 10	96	1*/20
Connection kit 3p	002540949	EFD 8, EFD 10, PCF 8, PCF 10	162	1*/20
Connection kit 2p	002560948	EFD 14, EFH 14	144	1*/20
Connection kit 3p	002560949	EFD 14	217	1*/20
Connection kit 2p	002570948	EFD 22, EFD J30	191	1*/20
Connection kit 3p	002570949	EFD 22, EFD J30	300	1*/20

*Note: 1 kit suffices for the assembly of 50 sets

Technical data on page 680

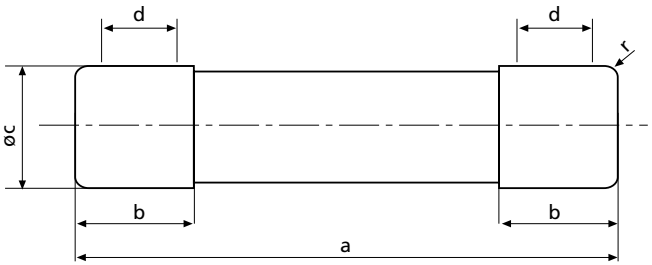
Cylindrical fuse-link

Technical data		
Rated voltage	400 V AC, 500 V AC, 690 V AC	
Rated current	CH 8	1-25 A/400 V
	CH 10	0,5-16 A/500 V, 20-32 A/400 V
	CH 14	2-25 A/690 V, 32-50 A/500 V
	CH 22	16-40 A/690 V (50 A/690 V aM), 50-100 A/500 V
Rated frequency	50 Hz	
Rated breaking capacity	CH 8	50 kA
	CH 10	100 kA
	CH 14	2-25 A/80 kA, 32-50 A/120 kA
	CH 22	16-40 A/80 kA (50 A/80 kA aM), 50-100 A/120 kA
Characteristics	gG, aM	
Body material	ceramic	
Material of contact parts	CuZn28, gal.Ag	



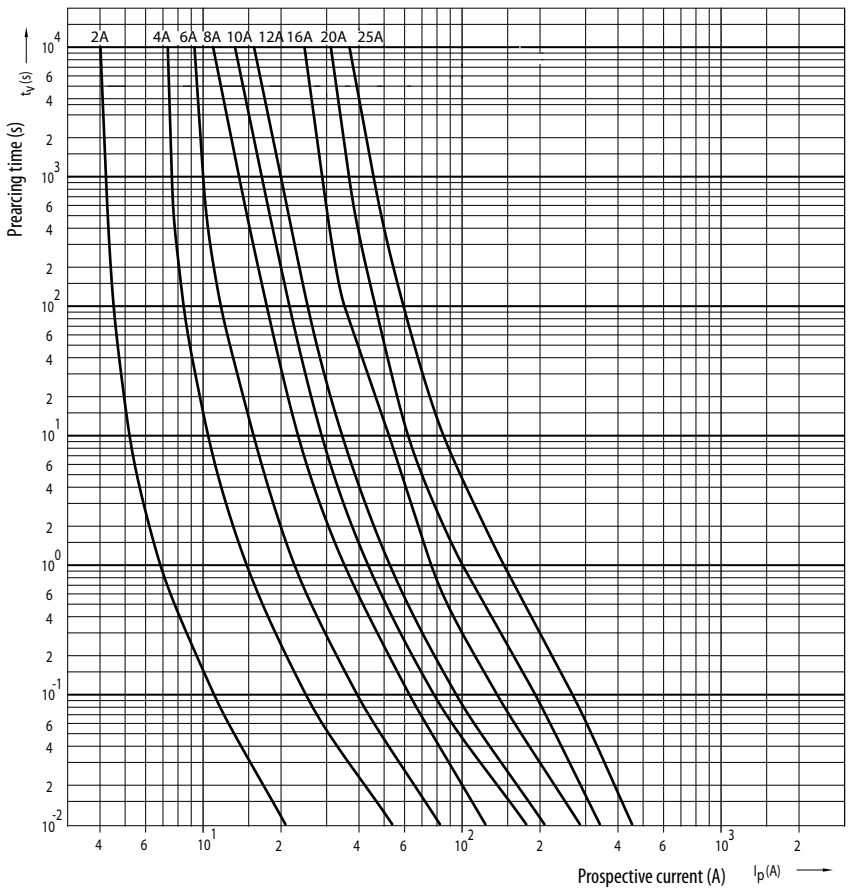
With striker pin

size	e	f
14 x 51	3,8	7,5
22 x 58	3,8	7,5

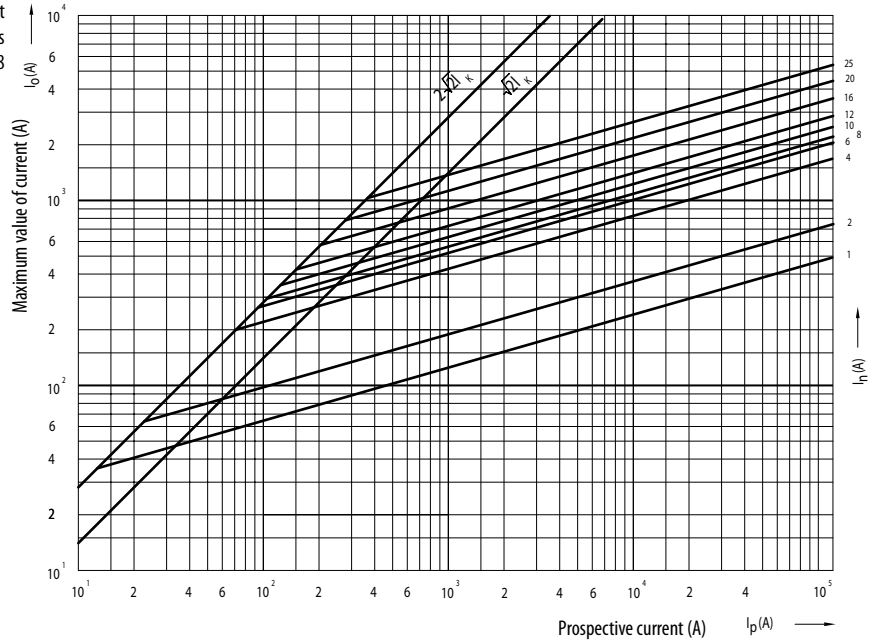


size	a	$b_{max.}$	c	d_{min^*}	r
8 x 32	31,5±0,5	6,7	8,5±0,1	4	1±0,5
10 x 38	38,0±0,6	10,5	10,3±0,1	6	1,5±0,5
14 x 51	51,0+0,6/-1	13,8	14,3±0,1	7,5	±1
22 x 58	58,0+0,1	16,2	22,2±0,1	11	±1

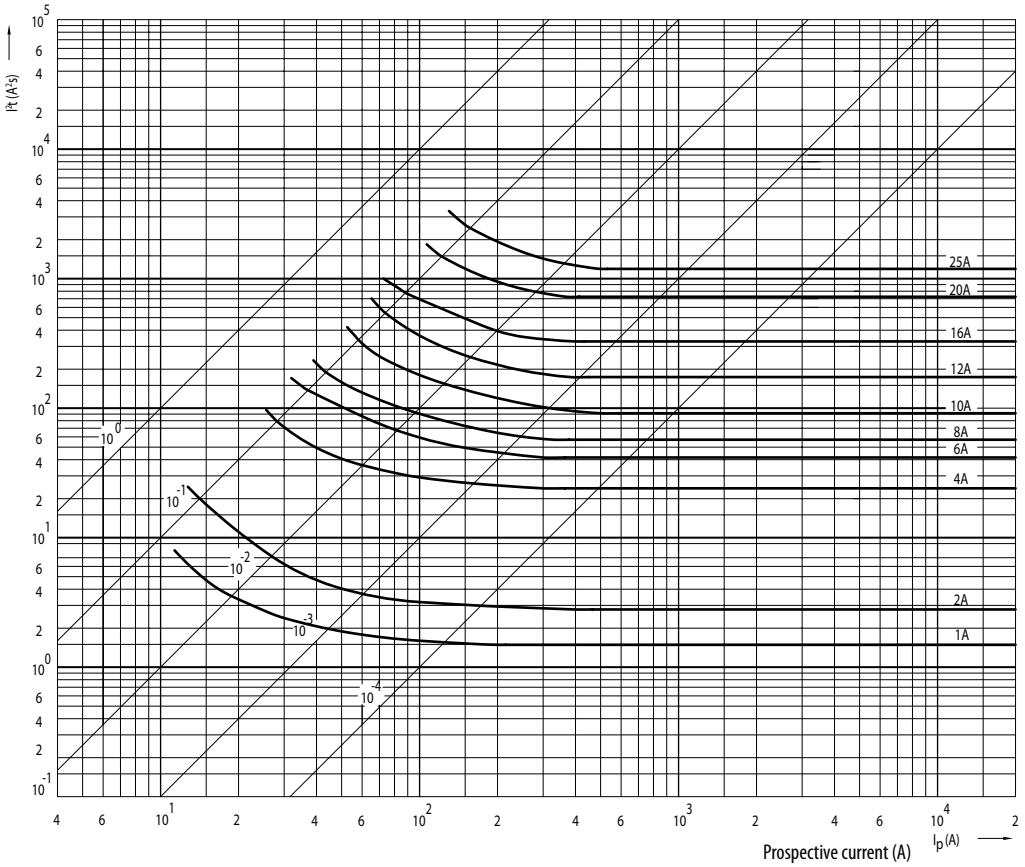
Time current characteristics
I/t, gG
CH8



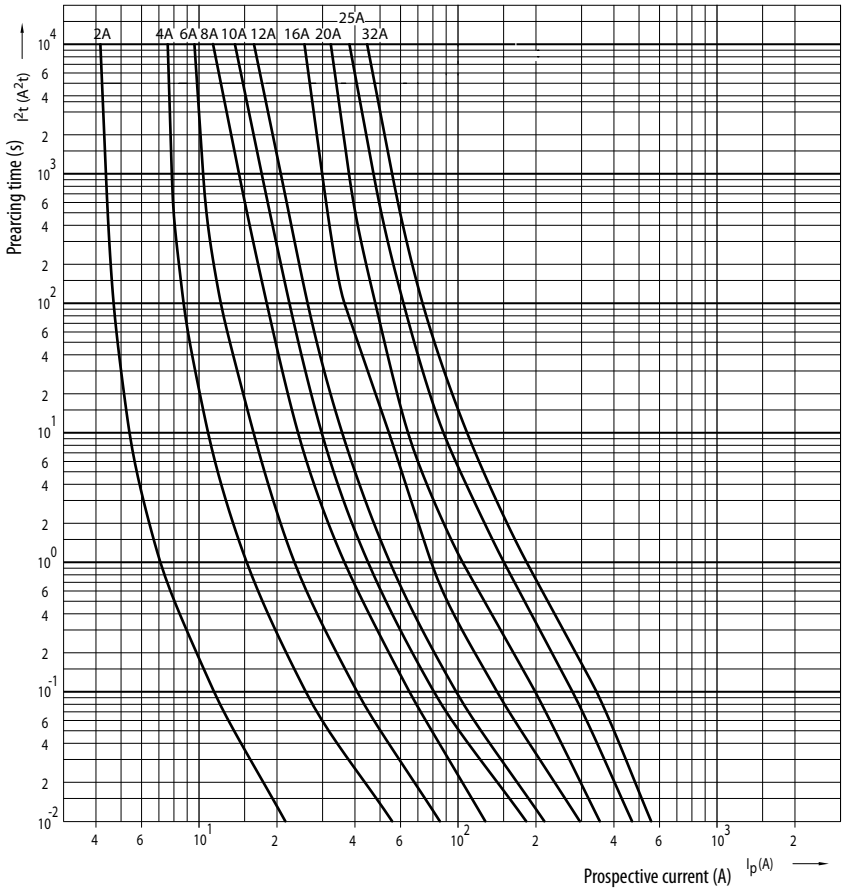
Cut-off current characteristics CH8



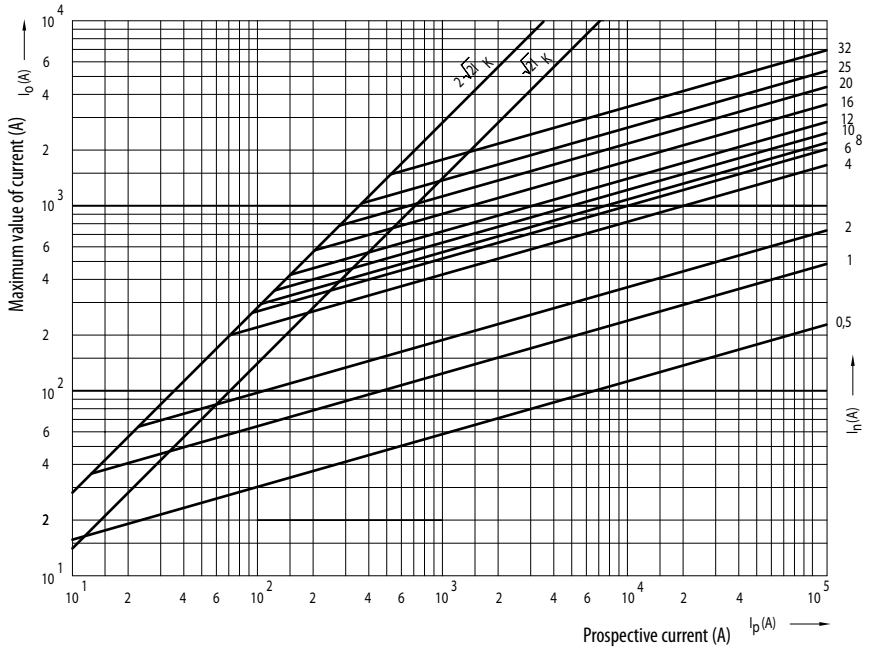
Melting energy characteristics I^2t CH8



Time current characteristics
I/t, gG
CH10

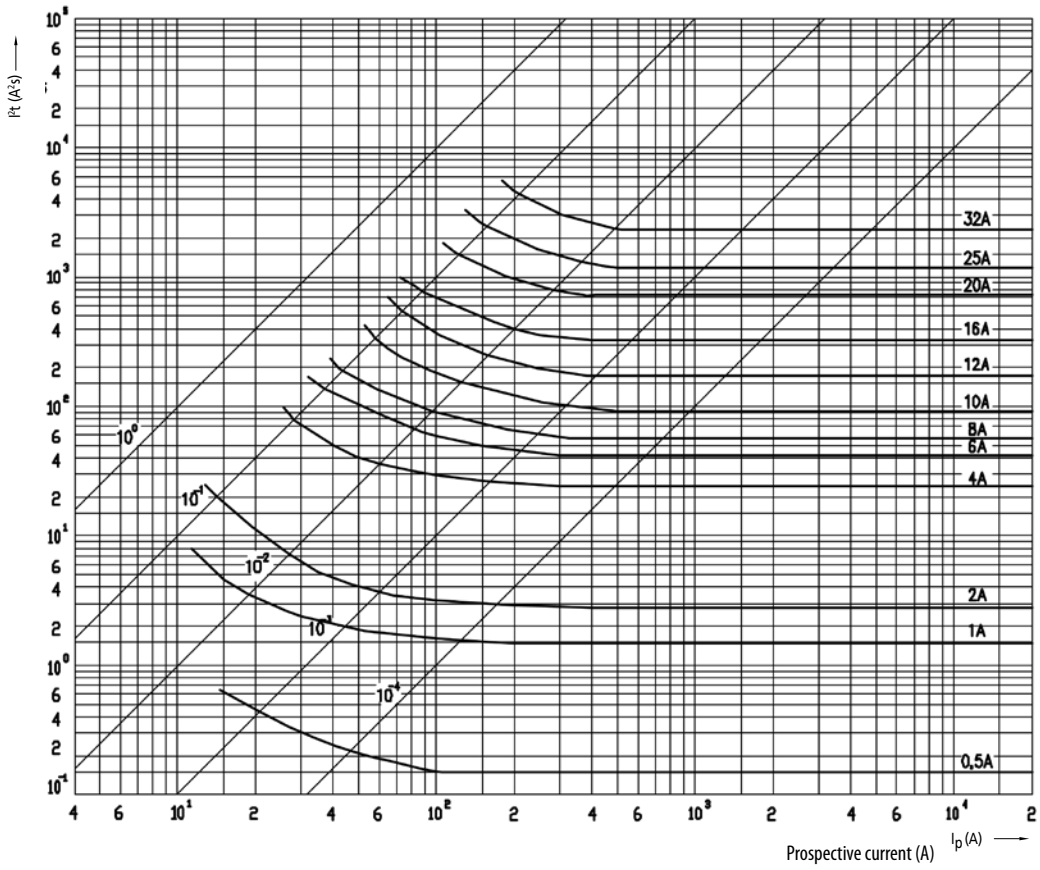


Cut-off current
characteristics
CH10

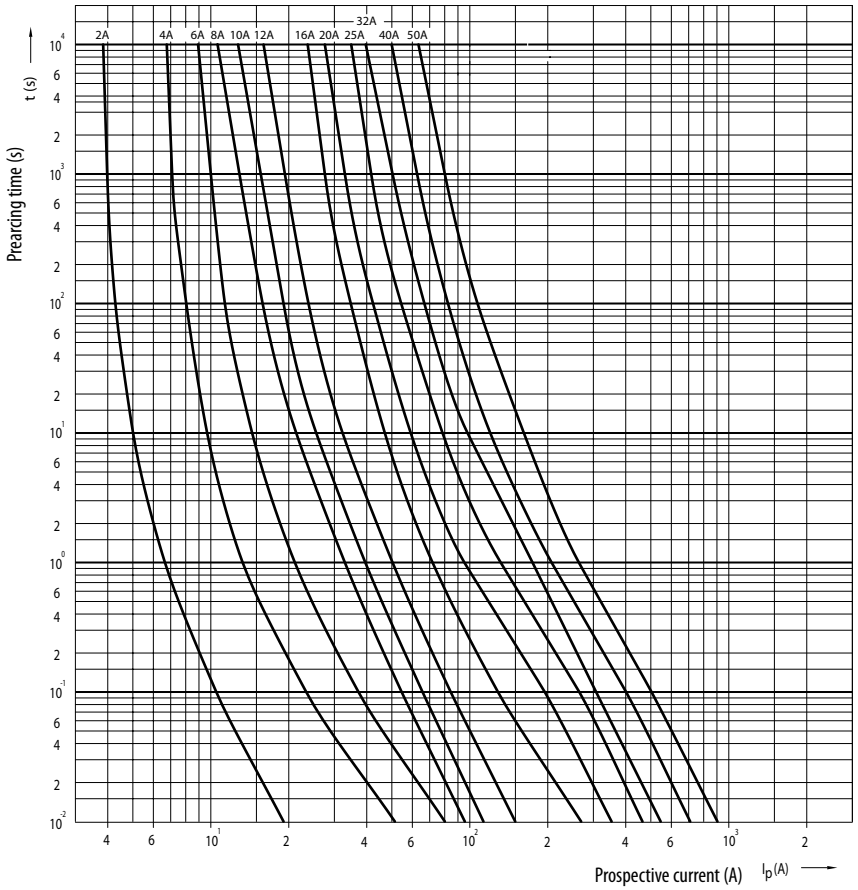


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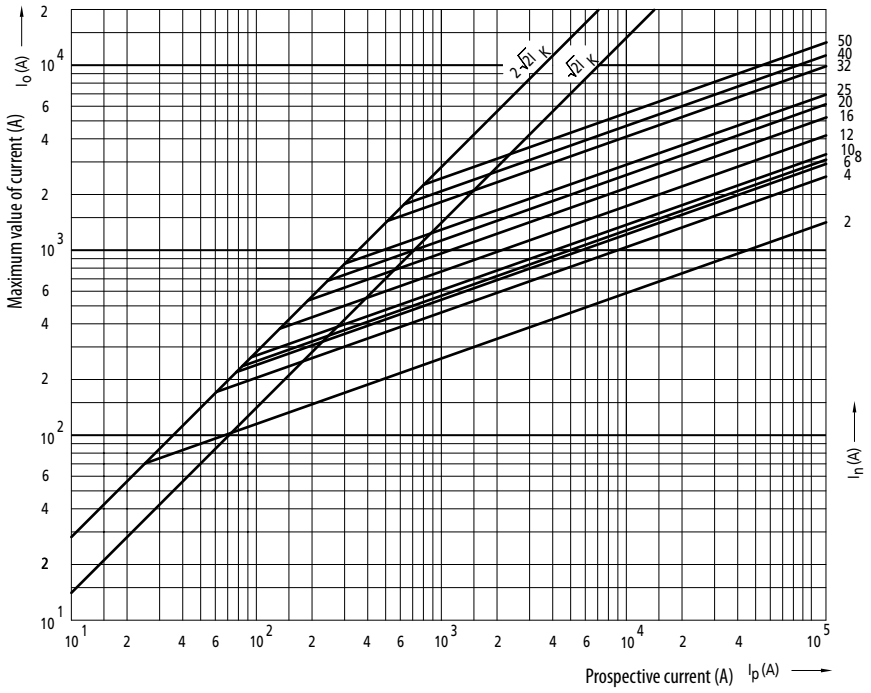
Melting energy characteristics I^2t CH10



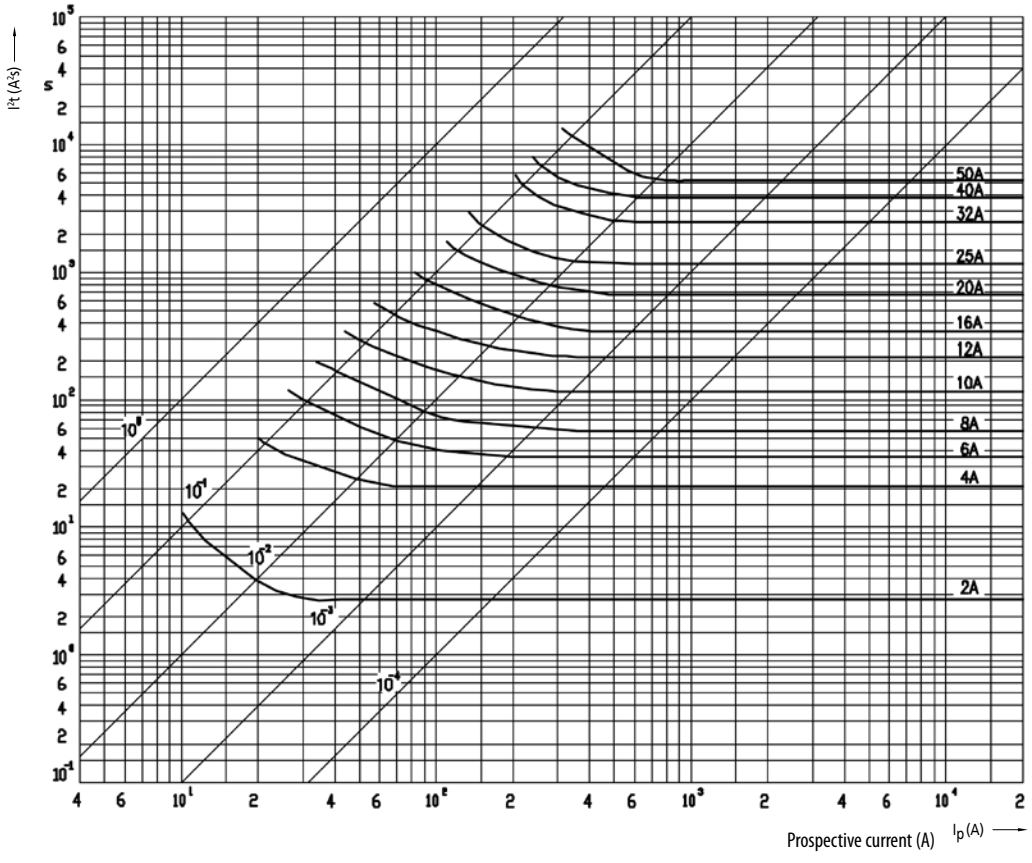
Time current characteristics I/t, gG CH14



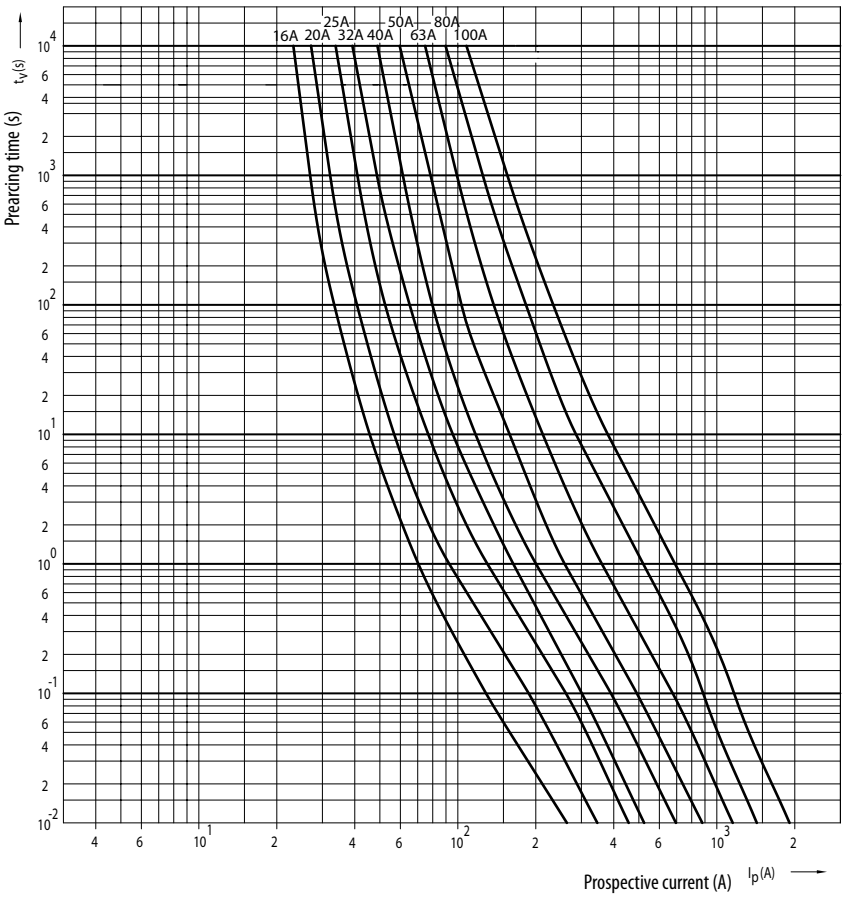
Cut-off current characteristics CH14



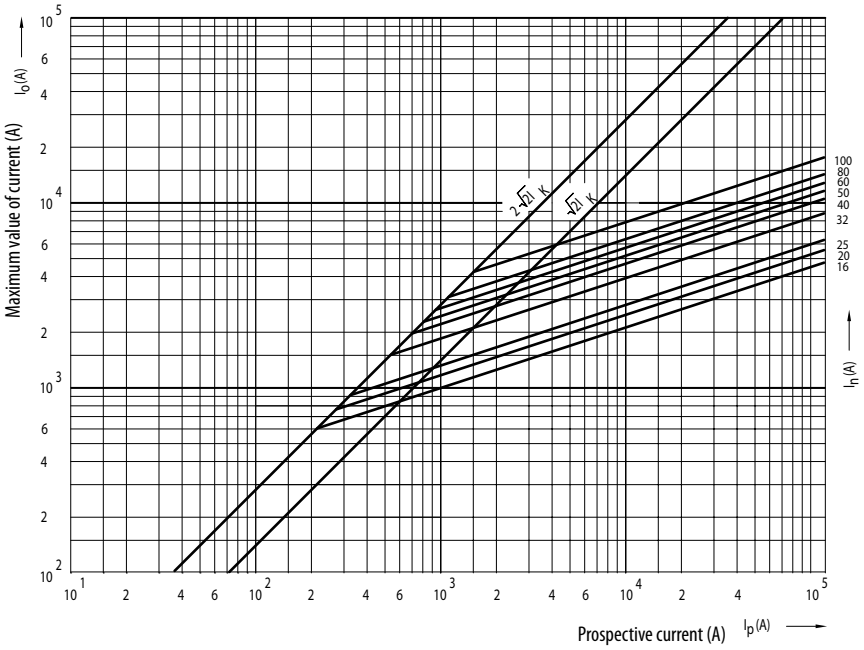
Melting energy characteristics I^2t CH14



Time current characteristics
I/t, gG
CH22

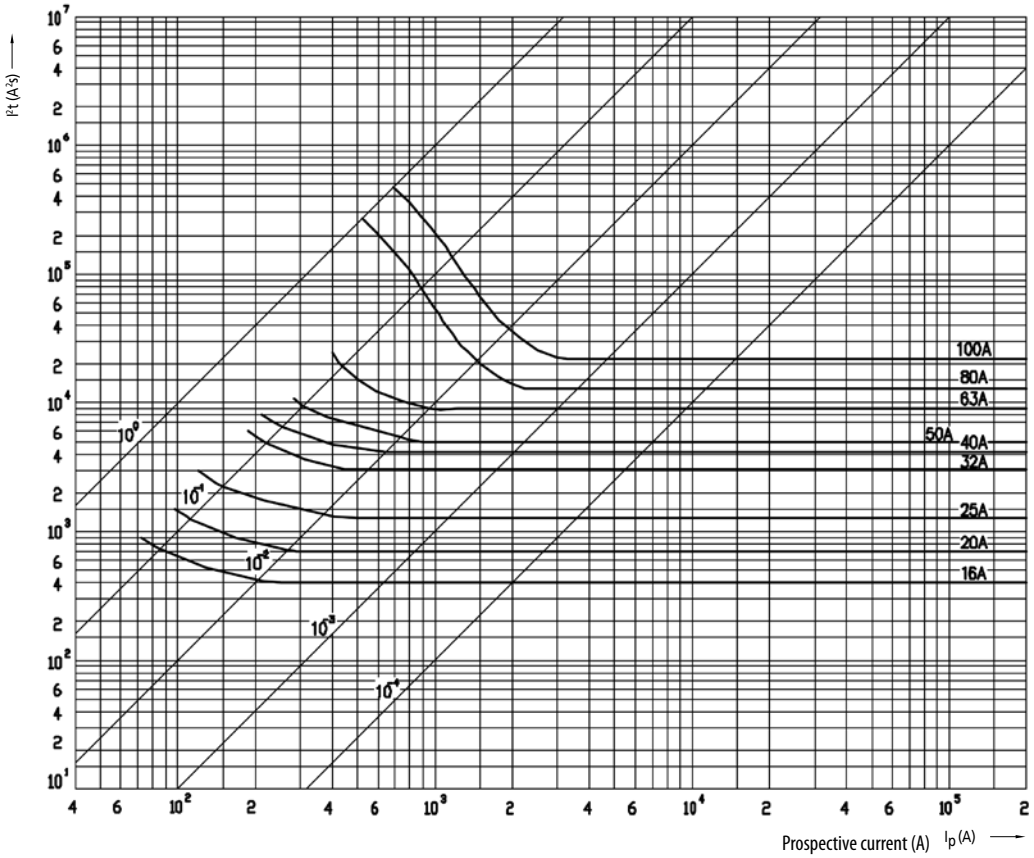


Cut-off current
characteristics
CH22

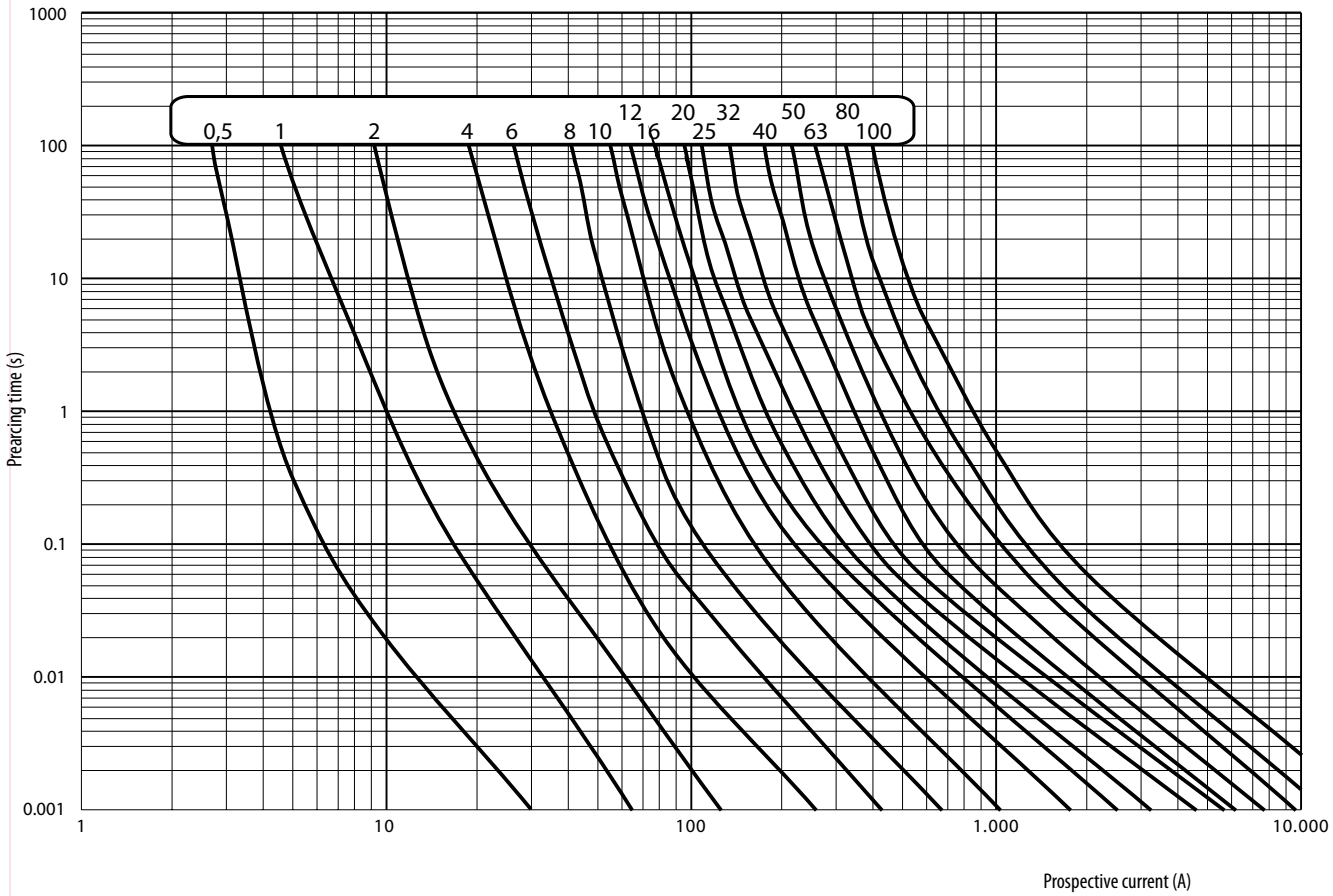


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Melting energy characteristics I^2t CH22



Time current characteristics I/t, aM CH10, 14, 22



Fuse-switch disconnectors for cylindrical fuse-links EFD

Technical data EFD

	EFD 8	EFD 10		EFD CC	EFD 14		EFD 22		EFD J30
Fuse type	CH 8x32	CH 10x38		Class CC	CH 14x51		CH 22x58		Class J, size J30
	IEC	IEC	UL	UL	IEC	UL	IEC	UL	UL
Versions	Without indicator/LED indicator	Without indicator / LED indicator							
Number of poles	1p, 1p+N, 2p, 3p, 3p+N	1p, 2p, 3p			1p, 1p+N, 2p, 3p, 3p+N	1p, 2p, 3p	1p, 1p+N, 2p, 3p, 3p+N	1p, 2p, 3p	
Rated operational voltage Ue	400V a.c.	690V a.c.	600V a.c./d.c.	600V a.c./d.c.	690V a.c.	600V a.c./d.c.	690V a.c.	600V a.c./d.c.	600V a.c./d.c.
Rated operational current Ie	20A	32A	30A	30A	50A	50A	100A	100A	30A
Maximum rated current of fuselinks 690V		10A gG			25A gG 25A aM		50A gG 50A aM		
500V		25A gG 16A aM			50A gG		100A gG		
400V	20A gG 10A aM	32A gG			50A aM		100A aM		
Rated frequency	50Hz	50Hz	60Hz	60Hz	50Hz	60Hz	50Hz	60Hz	60Hz
Rated short-time withstand current Icw	240A	300A/1s			600A/1s		1200A/1s		
Conventional free air thermal current Ith					50A		100A		
Rated conditional short-circuit current	50kA	100kA/400V	100kA	200kA	gG: 120kA/500V (50A gG) aM: 50kA/400V (50A aM)	100kA	gG: 120kA/500V (100A gG) aM: 50kA/400V (100A aM)	100kA	200kA
Rated insulation voltage Ui	400V	690V			690V		690V		
Rated imp. withstand voltage Uimp	8kV	8kV			8kV		8kV		
Overvoltage category (according to Table H.1 in IEC 60947-1 and according to IEC 60099-1)	III	III			III		III		
Max power dissipation of the fuse-link (W)	gG: 2,5W aM: 0,9W	gG: 3W aM: 1,2W		3W	gG: 5W aM: 3W		gG: 9,5W aM: 7W		6W
LED indicator operating range	50V-690V a.c.		50V - 600V a.c. 80V - 600V d.c.		50V-690V a.c.	50V - 600V a.c. 80V - 600V d.c.	50V-690V a.c.	50V - 600V a.c. 80V - 600V d.c.	
NEON indicator operating range	100V-750V a.c.	100V-750V a.c.							
Utilization category	AC-22B	AC-22B	Do not operate under load		AC-22B at 690V/50A	Do not operate under load	AC-21B at 690V/100A	Do not operate under load	
Operational performance (cycles with current)	300	300			300		300		
Operational performance (cycles without current)	1700	1700			1700		1700		
Humidity									
Operating ambient temperature	-5°C ... +40°C				-5°C ... +40°C		-5°C ... +40°C		
Store ambient temperature	-25°C ... +55°C				-25°C ... +55°C		-25°C ... +55°C		
Degree of protection (IEC 60529)	IP 20	IP 20			IP 20		IP 20		
Terminal capacity	1-25mm^2	1-25mm^2	AWG 18-8 solid&stranded Cu only		1,5-35mm^2 rigid or flexible	AWG 16-6 solid&stranded Cu only	4-50mm^2 rigid or flexible	AWG 12-2 solid&stranded Cu only	
Screw	PZ M5	PZ M5	PZ M5	PZ M5	PZ M5	PZ M5	PZ M6	PZ M6	PZ M6
Torque	2Nm	2Nm	2Nm; 17,7 lb-in		2,5-3Nm	2Nm; 17,7 lb-in	3Nm	3Nm; 26,6 lb-in	
Mounting on EN 60715 rail	35mm rail								
Sealing posibility	ON and OFF								
Standards - fuse links	IEC/EN 60269-2	IEC/EN 60269-2	IEC/EN 60269-2	UL 248-4 IEC/EN 60269-2	IEC/EN 60269-2	IEC/EN 60269-2	IEC/EN 60269-2	IEC/EN 60269-2	UL 248-8 IEC/EN 60269-2
Standards - Fuse-switch disconnectors/fuse holders	IEC 60947-1 IEC 60947-3		UL 4248-1 UL 4248-4 UL 486E		IEC 60947-1 IEC 60947-3	UL 4248-1 UL 486E	IEC 60947-1 IEC 60947-3	UL 4248-1 UL 486E	UL 4248-1 UL 4248-8 UL 486E
Test reports	CCA/CB	CCA/CB	UL	UL	CCA/CB	UL	CCA/CB	UL	UL
Certificates			$_{c}UR_{us}$	$_{c}UL_{us}$		$_{c}UR_{us}$		$_{c}UR_{us}$	$_{c}UL_{us}$

Technical data EFD

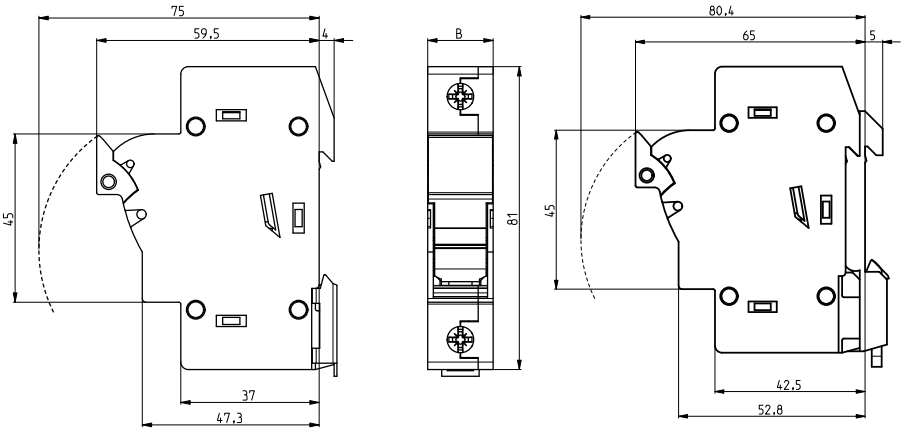
		EFD 8	EFD 10		EFD CC	EFD 14		EFD 22		EFD J30
Fuse type		CH 8x32	CH 10x38		Class CC	CH 14x51		CH 22x58		Class J, size J30
		IEC	IEC	UL	UL	IEC	UL	IEC	UL	UL
Derating factor of current I_n for different ambient temperatures	20^0	1								
	30^0	0,95								
	40^0	0,9								
	50^0	0,8								
	60^0	0,7								
	70^0	0,5								
Derating factor of current I_n for side by side mounting fuse holders (nr. of poles)	1-4	1								
	5-6	0,8								
	7-9	0,7								
	≥10	0,6								

Fuse-switch disconnector EFD 8, EFD 10

type	dimension B
EFD 8, 10 1p	17,5
EFD 8, 10 1p+N	35
EFD 8, 10 2p	35
EFD 8, 10 3p	52,5
EFD 8, 10 3p+N	70

Fuse-switch disconnector EFD CC

type	dimension B
EFD CC 1p	17,5
EFD CC 2p	35
EFD CC 3p	52,5



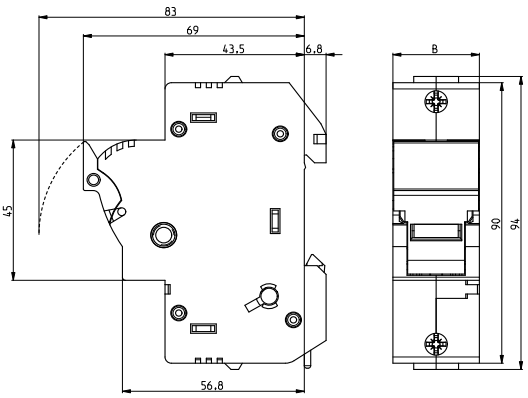
Version with adapter

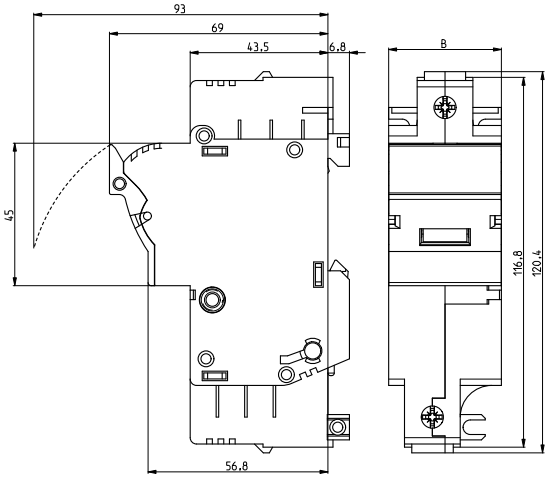
Fuse-switch disconnector EFD 14

type	dimension B
EFD 14 1p	27
EFD 14 1p+N	54
EFD 14 2p	54
EFD 14 3p	81
EFD 14 3p+N	108

Fuse-switch disconnector EFD 22 & EFD J30

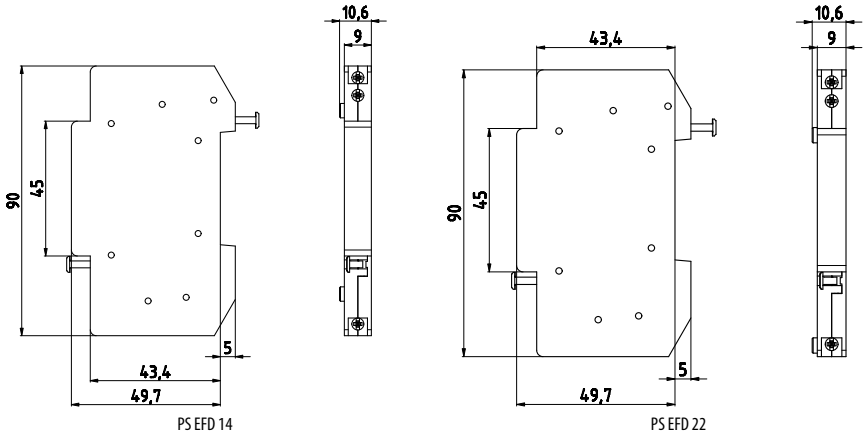
type	dimension B
EFD 22, J30 1p	35,6
EFD 22 1p+N	71,2
EFD 22, J30 2p	71,2
EFD 22, J30 3p	106,8
EFD 22 3p+N	142,4





C

Auxiliary switch EFD

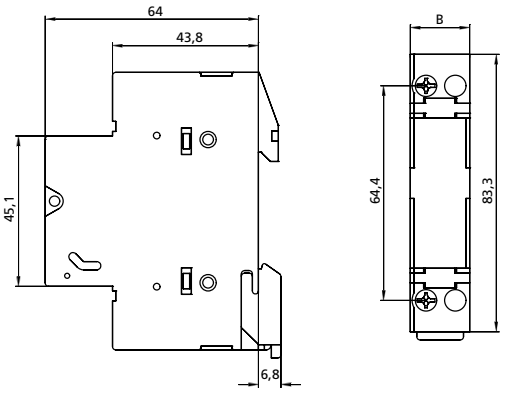


Fuse-switch disconnectors for cylindrical fuse-links PCF

Technical data PCF

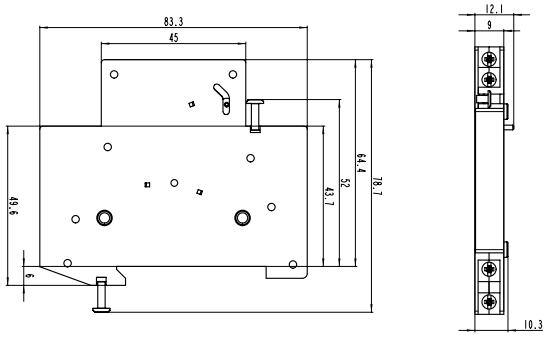
		PCF 8	PCF 10	
Fuse type		CH 8x32	CH 10x38	
		IEC	IEC	UL
Versions		Without indicator / LED indicator		
Number of poles		1p, 1p+N, 2p, 3p, 3p+N		1p, 2p, 3p
Rated operational voltage Ue		400V a.c.	690V a.c.	600V a.c./d.c.
Rated operational current Ie		20A	32A	30A
Maximum rated current of fuselinks	690V		10A gG	
	500V		25A gG, 16A aM	
	400V	20A gG, 10A aM	32A gG	
Rated frequency		50Hz	50Hz	60Hz
Rated short-time withstand current Icw		240A	300A	
Rated conditional short-circuit current		50kA	100kA	200kA
Rated insulation voltage Ui		400V	690V	
Rated imp. withstand voltage Uimp		4kV	4kV	
Overvoltage category		III	III	
Max power dissipation of the fuse-link (W)		gG: 2,5W / aM: 0,9W	gG: 3W / aM: 1,2W	
LED indicator operating range		50V-690V a.c.		50V-600V a.c., 80V-600V d.c.
Utilization category		AC-22B	AC-22B	Do not operate under load
Operational performance (cycles with current)		300	300	
Operational performance (cycles without current)		1700	1700	
Humidity		90% at 20°C		
Operating ambient temperature		-5°C ... +40°C		
Store ambient temperature		-25°C ... +55°C		
Degree of protection (IEC 60529)		IP 20	IP 20	
Terminal capacity		0,5-10mm^2, Double connection		20-10 stranded, Cu only
Screw		PZ M4	PZ M4	PZ M4
Torque		1,2Nm	1,2Nm	1,2Nm
Mounting on EN 60715 rail		35mm rail		
Sealing posibility		ON and OFF		
Standards - fuse links		IEC/EN 60269-2		
Standards - Fuse-switch disconnectors/fuse holders		IEC 60947-1, IEC 60947-3		UL 4248-1
Test reports		Int.	CCA/CB	UL
Certificates				$_{c}UR_{us}$

Technical data PCF				
		PCF 8	PCF 10	
Fuse type		CH 8x32	CH 10x38	
		IEC	IEC	UL
Derating factor of current I_n for different ambient temperatures	20^0	1		
	30^0	0,95		
	40^0	0,9		
	50^0	0,8		
	60^0	0,7		
	70^0	0,5		
Derating factor of current I_n for side by side mounting fuse holders (nr. of poles)	1-4	1		
	5-6	0,8		
	7-9	0,7		
	≥10	0,6		



Fuse-switch disconnector PCF 8, PCF 10	
type	dimension B
PCF 8, 10 1p	17,8
PCF 8, 10 1p+N	17,8
PCF 8, 10 2p	35,6
PCF 8, 10 3p	53,4
PCF 8, 10 3p+N	53,4

Auxiliary switch PS PCF



NV/NH

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*DC and PV NH fuses are in Special Purpose Fuses and Green Protect catalogues

HR

Low voltage NH knife-blade fuses



ETI POWER NEEDS CONTROL

Low voltage NH knife-blade fuse-links

NV/NH KOMBI advantages
ETI is introducing a new generation of low-voltage fuse-links from size NV00C up to NV3 with new, dual indication of fuse-link operation, called KOMBI. The indicator is easily visible on the top and centre of the fuse-link, whether it is situated in a standard fuse base or vertical fuse rail or in fuse-switch disconnector.
The most important advantages of NV/NH KOMBI fuse-links:

- High breaking capacity, 120 kA (400 V gG - except NV00C and NV00CI, and 500 V gG) and 100 kA (400 V gG NV00C and NV00CI, 690 V gG, 400 V gTR, 400 V gF and 690 V aM)
- Rated voltages: 400 V a.c., 500 V a.c., 690 V a.c.
- Two versions of covers: aluminium, when the removal tag is under voltage and plastic, when insulated metal removal tag is incorporated into the plastic cover
- VDE certificates and CCA/CB test reports

General about NV/NH fuse-links
Their dimensions correspond with DIN 43620, other technical characteristics correspond with the requirements of the following standards:

- Rated voltage 400V/500V/690V/gG: IEC 60269-1:2005 / EN 60269-1:1998+A1:2005 IEC 60269-2:1986+Corr.1:1996+A11995+A2:2001 / EN 60269-2:1995+A1:1998+A2:2002 IEC 60269-2-1:2004 / HD 60269-2-1:2005
- Rated voltage 690V/aM: VDE 0636-2011
- Rated voltage 400V/gF: PN-IEC 60269-2
- Rated voltage 400V/gTr: VDE 0636-2011

Short description of constituent parts for NV/NH fuse-links
The body of the fuse-link is made of quality steatite which is highly resistant against temperature overloads.
In the inner part of the steatite body there is a copper melting element which is welded on a specially shaped inner part of the contact knife by spot welding. By careful shaping of this part we achieved that during assembly the melting element is placed exactly into the middle of the inner place. The remaining inside place of the ceramic body is filled up with precisely determined granulation and chemical structure quartz sand. All contact knives are additionally protected with a layer of silver or on special order of nickel. On the base of cyclic tests we have proved that the fusing characteristics are very stable and the tolerance on the current axis can be up to ± 10%.

Fuse-link NV/NH gG

Rated current	Breaking capacity	Rated voltage
2-1600 A	**120 kA / 100 kA**	**400, 500, 690 V**



NV/NH 00C KOMBI gG

Rated current [A]	Code No. ~ 400V 100 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Korrosionsfest ~ 400V 100 kA	Weight [g]	Packaging [pcs]
2	004181101	004181201	004181301	004181118	125	3/120
4	004181102	004181202	004181302	004181119	125	3/120
6	004181103	004181203	004181303	004181120	125	3/120
10	004181104	004181204	004181304	004181121	125	3/120
16	004181105	004181205	004181305	004181122	125	3/120
20	004181106	004181206	004181306	004181123	125	3/120
25	004181107	004181207	004181307	004181138	125	3/120
32	004181108	004181208	004181308	004181139	125	3/120
35	004181109	004181209	004181309	004181140	125	3/120
40	004181110	004181210	004181310	004181141	125	3/120
50	004181111	004181211	004181311	004181142	125	3/120
63	004181112	004181212		004181143	125	3/120
80	004181113	004181213		004181130	125	3/120
100	004181114	004181214		004181131	125	3/120
125		004181215			125	3/120
160	004181216				125	3/120

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NV/NH 00 CI KOMBI gG*

Rated current [A]	Code No. ~ 400V 100 kA	~ 500V 120 kA	~ 690V 100 kA	Weight [g]	Packaging [pcs]
2	004191101	004191201	004191301	125	3/120
4	004191102	004191202	004191302	125	3/120
6	004191103	004191203	004191303	125	3/120
10	004191104	004191204	004191304	125	3/120
16	004191105	004191205	004191305	125	3/120
20	004191106	004191206	004191306	125	3/120
25	004191107	004191207	004191307	125	3/120
32	004191108	004191208	004191308	125	3/120
35	004191109	004191209	004191309	125	3/120
40	004191110	004191210	004191310	125	3/120
50	004191111	004191211	004191311	125	3/120
63	004191112	004191212		125	3/120
80	004191113	004191213		125	3/120
100	004191114	004191214		125	3/120
125				125	3/120
160				125	3/120

* INSULATED

NV/NH 00 C gG with striker pin

Rated current [A]	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
2	004111172	135	3
4	004111173	135	3
6	004111174	135	3
10	004111175	135	3
16	004111176	135	3
20	004111177	135	3
25	004111178	135	3
32	004111179	135	3
35	004111180	135	3
40	004111181	135	3



NV/NH 00 KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
63			004182312		173	3/90
80			004182313		173	3/90
100			004182314		173	3/90
125	004182115	004182215	004182315	004182118	173	3/90
160	004182116	004182216		004182119	173	3/90

NV/NH 00 I KOMBI gG*

Rated current [A]	Code No. ~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	Weight [g]	Packaging [pcs]
63			004192312	173	3/90
80			004192313	173	3/90
100			004192314	173	3/90
125	004192115	004192215	004192315	173	3/90
160	004192116	004192216		173	3/90

* INSULATED



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NV/NH 00 gG with striker pin

Rated current [A]	Code No. ~ 500 V 120 kA	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
50		004111182	205	3
63		004111183	205	3
80		004111184	205	3
100		004111185	205	3
125		004111186	205	3
160	004111187			



NV/NH 0 KOMBI gG

Rated current [A]	Code No. ~ 500 V 120 kA	Code No. ~690 V 100 kA	Weight [g]	Packaging [pcs]
6	004183203	004183303	226	3/45
10	004183204	004183304	226	3/45
16	004183205	004183305	226	3/45
20	004183206	004183306	226	3/45
25	004183207	004183307	226	3/45
32	004183208	004183308	226	3/45
35	004183209	004183309	226	3/45
40	004183210	004183310	226	3/45
50	004183211	004183311	226	3/45
63	004183212	004183312	226	3/45
80	004183213	004183313	226	3/45
100	004183214	004183314	226	3/45
125	004183215	004183315	226	3/45
160	004183216		226	3/45

NV/NH 1 C KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
25	004184107	004184207	004184307	004184131	233	3/45
32	004184108	004184208	004184308	004184130	233	3/45
35	004184109	004184209	004184309	004184129	233	3/45
40	004184110	004184210	004184310	004184128	233	3/45
50	004184111	004184211	004184311	004184127	233	3/45
63	004184112	004184212	004184312	004184138	233	3/45
80	004184113	004184213	004184313	004184139	233	3/45
100	004184114	004184214	004184314	004184132	233	3/45
125	004184115	004184215	004184315	004184133	233	3/45
160	004184116	004184216		004184134	233	3/45

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NV/NH 1C I KOMBI gG*

Rated current [A]	Code No. ~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	Weight [g]	Packaging [pcs]
25	004194107	004194207	004194307	233	3/45
32	004194108	004194208	004194308	233	3/45
35	004194109	004194209	004194309	233	3/45
40	004194110	004194210	004194310	233	3/45
50	004194111	004194211	004194311	233	3/45
63	004194112	004194212	004194312	233	3/45
80	004194113	004194213	004194313	233	3/45
100	004194114	004194214	004194314	233	3/45
125	004194115	004194215	004194315	233	3/45
160	004194116	004194216		233	3/45

* INSULATED



NV/NH 1 KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
63	004184120	004184220	004184320		430	3/24
80	004184121	004184221	004184321		430	3/24
100	004184122	004184222	004184322		430	3/24
125	004184123	004184223	004184323		430	3/24
160	004184124	004184224	004184324		430	3/24
200	004184117	004184217	004184317	004184135	430	3/24
224	004184118	004184218	004184318	004184136	430	3/24
250	004184119	004184219	004184319	004184137	430	3/24



NV/NH 1 I KOMBI gG*

Rated current [A]	Code No. ~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	Weight [g]	Packaging [pcs]
63	004194120	004194220	004194320	430	3/24
80	004194121	004194221	004194321	430	3/24
100	004194122	004194222	004194322	430	3/24
125	004194123	004194223	004194323	430	3/24
160	004194124	004194224	004194324	430	3/24
200	004194117	004194217	004194317	430	3/24
224	004194118	004194218	004194318	430	3/24
250	004194119	004194219	004194319	430	3/24

* INSULATED

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NV/NH 1 gG with striker pin			
Rated current [A]	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
63	004113340	452	3
80	004113341	452	3
100	004113342	452	3
125	004113343	452	3
160	004113344	452	3
200	004113345	452	3
224	004113346	452	3
250	004113347	452	3

NV/NH 2 C KOMBI gG						
Rated current [A]	Code No.			Korrosionsfest	Weight	Packaging
	~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	~ 400V 120 kA	[g]	[pcs]
63	004185112	004185212	004185312	004185144	430	3/15
80	004185113	004185213	004185313	004185145	430	3/15
100	004185114	004185214	004185314	004185146	430	3/15
125	004185115	004185215	004185315	004185147	430	3/15
160	004185116	004185216	004185316	004185133	430	3/15
200	004185117	004185217	004185317	004185134	430	3/15
224	004185118	004185218	004185318	004185135	430	3/15
250	004185119	004185219	004185319	004185136	430	3/15



NV/NH 2 CI KOMBI gG*					
Rated current [A]	Code No.			Weight	Packaging
	~ 400V 120 kA	~ 500V 120 kA	~ 690V 100 kA	[g]	[pcs]
63	004195112	004195212	004195312	430	3/15
80	004195113	004195213	004195313	430	3/15
100	004195114	004195214	004195314	430	3/15
125	004195115	004195215	004195315	430	3/15
160	004195116	004195216	004195316	430	3/15
200	004195117	004195217	004195317	430	3/15
224	004195118	004195218	004195318	430	3/15
250	004195119	004195219	004195319	430	3/15

* INSULATED

Technical data on page 723

NV/NH 2 KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
280	004185120	004185220	004185320	004185137	500	3/15
300	004185121	004185221	004185321	004185138	500	3/15
315	004185122	004185222	004185322	004185139	500	3/15
355	004185123	004185223		004185140	500	3/15
400	004185124	004185224		004185141	500	3/15



NV/NH 2 I KOMBI gG*

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Weight [g]	Packaging [pcs]
280	004195120	004195220	004195320	500	3/15
300	004195121	004195221	004195321	500	3/15
315	004195122	004195222	004195322	500	3/15
355	004195123	004195223		500	3/15
400	004195124	004195224		500	3/15

* INSULATED

NV/NH 2 gG with striker pin

Rated current [A]	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
160	004114345	593	3
200	004114346	593	3
224	004114347	593	3
250	004114348	593	3
300	004114349	593	3
315	004114350	593	3



NV/NH 3 C KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
250	004186119	004186219	004186319	004186150	510	3/12
280	004186120	004186220	004186320		510	3/12
300	004186121	004186221	004186321	004186140	510	3/12
315	004186122	004186222	004186322	004186141	510	3/12
355	004186123	004186223		004186142	510	3/12
400	004186124	004186224		004186143	510	3/12



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NV/NH 3 KOMBI gG

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Korrosionsfest ~ 400V 120 kA	Weight [g]	Packaging [pcs]
355			004186328		923	3/12
400			004186329		923	3/12
425	004186130	004186230	004186330	004186144	923	3/12
500	004186131	004186231	004186331	004186145	923	3/12
560	004186132	004186232			923	3/12
630	004186133	004186233		004186147	923	3/12

NV/NH 3 I KOMBI gG*

Rated current [A]	Code No. ~ 400V 120 kA	Code No. ~ 500V 120 kA	Code No. ~ 690V 100 kA	Weight [g]	Packaging [pcs]
200	004196123	004196223	004196323	923	3/12
224	004196124	004196224	004196324	923	3/12
250	004196125	004196225	004196325	923	3/12
300	004196126	004196226	004196326	923	3/12
315	004196127	004196227	004196327	923	3/12
355	004196128	004196228	004196328	923	3/12
400	004196129	004196229	004196329	923	3/12
425	004196130	004196230	004196330	923	3/12
500	004196131	004196231	004196331	923	3/12
560	004196132	004196232		923	3/12
630	004196133	004196233		923	3/12

* INSULATED



NV/NH 3 gG with striker pin

Rated current [A]	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
250	004115120	895	3
300	004115121	895	3
315	004115122	895	3
400	004115123	895	3
425	004115124	895	3
500	004115125	895	3



NV/NH 4 gG

Rated current [A]	Code No. ~ 500 V 120 kA	Weight [g]	Packaging [pcs]
630	004116101	2130	1/12
710	004116102	2130	1/12
800	004116103	2130	1/12
900	004116105	2130	1/12
1000	004116104	2130	1/12
1250	004116106	2130	1/12

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NV/NH 4a gG

Rated current [A]	Code No. ~ 500 V, 120 kA		~ 690 V 100 kA	Weight [g]	Packaging [pcs]
		SI			
630	004116108	004176026	004176105	2170	1/12
710	004116109	004176027	004176106	2170	1/12
800	004116110	004176028	004176107	2170	1/12
900	004116111	004176029	004176108	2170	1/12
1000	004116112	004176030	004176109	2170	1/12
1250	004116113	004176031	004176110	2170	1/12
1500	004116119	004176032		2170	1/12
1600	004116120	004176033		2170	1/12



NV/NH 4a gG with striker pin

Rated current [A]	Code No. ~ 690 V 100 kA	Weight [g]	Packaging [pcs]
500	004116186	2835	1
630	004116187	2835	1
800	004116188	2835	1
1000	004116189	2835	1
1250	004116190	2835	1



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Fuse-link NV/NH aM

Rated current	Breaking capacity	Rated voltage
2-1250 A	**100 kA / 120 kA**	**500V, 690 V**

Fuse-links with aM characteristics are intended for protection of switchgears and controlgears as well as motors in motor drives where gG characteristics do not comply with all requirements of succesful protection of these devices. They are made in all standard NV sizes from 00 to 4a for all standard rated currents and for voltages to 690 V. Their main duty is to enable a full usage of switchgears and controlgears in the region of starting currents and to prevent sparking or destruction of protective contacts in case of short-circuit currents. It should be noted that these fuse-links are intended only for protection in the limited region (in the region of short-circuit currents).





NV/NH fuse-link aM

Rated current [A]	Code No. ~ 690 V, 100 kA							
	NV 00 C kombi	NV 00 kombi	NV 0	NV 1 kombi	NV 2 C kombi	NV 2 kombi	NV3 kombi	NV4a
2	004181401							
4	004181402							
6	004181403							
10	004181404			004184425				
16	004181405		004112125**	004184426				
20	004181406		004112126**	004184427				
25	004181407		004112127**	004184428				
32	004181408		004112128**					
35	004181409		004112129**	004184429	004185429			
40	004181410		004112130**	004184430	004185430			
50	004181411	004182411	004112131**	004184431	004185431			
63	004181412	004182412	004112132**	004184420	004185412			
80	004181413*	004182413	004112133**	004184421	004185413			
100	004181414*	004182414	004112134**	004184422	004185414			
125		004111735**	004112135**	004184423	004185415			
160		004111736**	004112136**	004184424	004185416	004185425		
200				004184417	004185417	004185426		
224				004184418	004185418	004185427		
250				004184419	004185419	004185428		
280						004185420		
300						004185421		
315						004185422		
355						004185423	004186428	
400						004185424	004186429	
425							004186430	
500							004186431	
630							004186432**	004187432**
710								004187433**
800								004187434**
900								004187435**
1000								004187436**
1250								004187437**

Weight and Packaging the same as for gG fuse-links.
*500V, 120 kA
** NOT in KOMBI version

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Fuse-link NV/NH gF

Rated current	Breaking capacity	Rated voltage
20-250 A	**100 kA**	**400 V**

Fuse-links with gF current characteristics are intended for protection of low voltage installations and energy lines, where expected short circuit currents are low. We offer all standard rated currents in sizes NV00C, NV00, NV1C and NV1 for voltages of up to 400V.

NV/NH fuse-link gF

Rated current	Code No. ~ 400 V				Weight	Packaging
[A]	NV/NH 00 C	NV/NH 00	NV/NH 1 C	NV/NH 1	[g]	[pcs]
20	004119200		004139200		the same as for gG fuse-links	the same as for gG fuse-links
25	004119201		004139201			
32	004119202		004139202			
40	004119203		004139203			
50	004119204		004139204			
63		004119100	004139205			
80		004119101	004139206			
100		004119102	004139207			
125		004119103	004139208			
160		004119104	004139209			
200				004139100		
250				004139101		





Fuse-link NV/NH gTr

Rated transformer power	Breaking capacity	Rated voltage
50-1000 kVA	**100 kA**	**400 V**

NV/NH fuse-link gTr

Rated transformer power	Code No.						Weight	Packaging
[kVA]	NV/NH 2	NV/NH 2 INSULATED	NV/NH 3c	NV/NH 3	NV/NH 3 INSULATED	NV/NH 4a	[g]	[pcs]
50	004114400*	004114407*	004115400*		004115430*	004116400	the same as for gG fuse-links	the same as for gG fuse-links
75	004114401*	004114413*	004115401*		004115431*	004116401		
100	004114402*	004114412*	004115402*		004115432*	004116402		
125	004114403*	004114408*	004115403*		004115433*	004116403		
160	004114404*	004114409*	004115404*		004115434*	004116404		
200	004114405*	004114410*	004115405*		004115435*	004116405		
250	004114406*	004114411*	004115406*		004115436*	004116406		
315				004115407*	004115437*	004116407		
400				004115408*	004115438*	004116408		
500				004115409		004116409		
630				004115410		004116410		
800						004116411		
1000						004116412		

* KOMBI version



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Fuse bases

Advantages

PK fuse bases with ceramic insulation for NH fuses are suitable for surface mounting on mounting plates and can be used in combination with NH fuse-links according to DIN VDE 0636-2/IEC 60269-2 as well as solid links.

They offer a compact and simple solution for application of fuses as protective elements in low voltage distribution boards and are characterized by silver plated contacts, in-house developed technical ceramic materials with high thermal resistance and a broad range of connections.

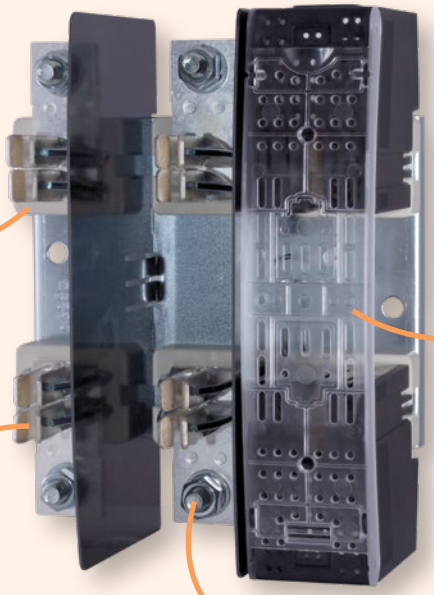
PK fuse bases are available in sizes 00 to 3, in 1-pole and 3-pole version. The range comes with accessories including protection barriers, IP20 finger safe protection kits and neutral links, which, along with the possibility of attaching additional poles, provides an optimal solution for every application.

Rated for fuse-links with breaking capacity up to 200 kA.

Ratings:
Rated voltage: 690 V a.c.
Rated currents: 160 A - 630 A

Standards:
IEC 60269-2
DIN VDE 0636-2
DIN 43620

As one of the leading producers of technical ceramics for fuse applications we have developed a range of extremely reliable thermosetting materials with high thermal resistance, dimensional stability and superior resistance to tracking.

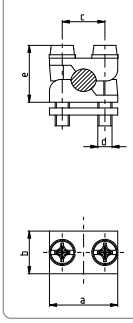


Sturdy and compact IP 20 protection kits.

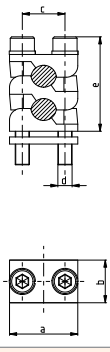
Galvanically silver plated contacts, providing ideal contact characteristics.

We offer one- and two-cable terminals with a broad range of available connections:
- flat terminals
- clip terminals
- prism clamps
- V shaped clamps

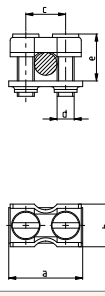
P00, P1, P2, P3



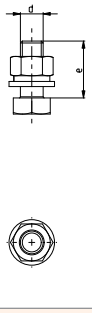
2P00, 2P1, 2P2, 2P3



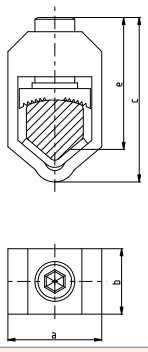
2xM6, S12



M8, M10, M12



V shaped clamp



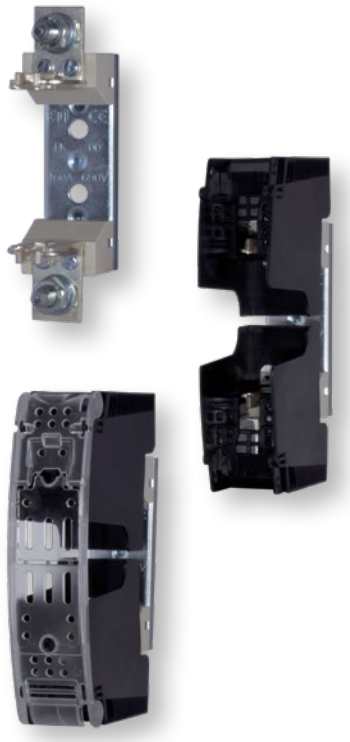
PK Fuse Bases with Ceramic Insulation sizes 00 to 3

Rated voltage
690 V

1-pole fuse base size 00

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PK 00 M8-M8 1p S	160	004123000	173	3
PK 00 2M6-2M6 1p S	160	004123001	173	3
PK 00 M8-2M6 1p S	160	004123002	173	3
PK 00 M8-P00 1p S	160	004123003	190	3
PK 00 M8-2P00 1p S	160	004123004	205	3
PK 00 P00-P00 1p S	160	004123005	205	3
PK 00 P00-2P00 1p S	160	004123006	219	3
PK 00 2P00-2P00 1p S	160	004123007	233	3
PKI 00 M8-M8 1p S	160	004123011	213	3
PKI 00 2M6-2M6 1p S	160	004123012	213	3
PKI 00 M8-2M6 1p S	160	004123013	213	3
PKI 00 M8-P00 1p S	160	004123014	230	3
PKI 00 M8-2P00 1p S	160	004123015	245	3
PKI 00 P00-P00 1p S	160	004123016	245	3
PKI 00 P00-2P00 1p S	160	004123017	259	3
PKI 00 2P00-2P00 1p S	160	004123018	273	3
PKIP 00 M8-M8 1p S	160	004123021	223	3
PKIP 00 2M6-2M6 1p S	160	004123022	223	3
PKIP 00 M8-2M6 1p S	160	004123023	223	3
PKIP 00 M8-P00 1p S	160	004123024	240	3
PKIP 00 M8-2P00 1p S	160	004123025	255	3
PKIP 00 P00-P00 1p S	160	004123026	255	3
PKIP 00 P00-2P00 1p S	160	004123027	269	3
PKIP 00 2P00-2P00 1p S	160	004123028	283	3

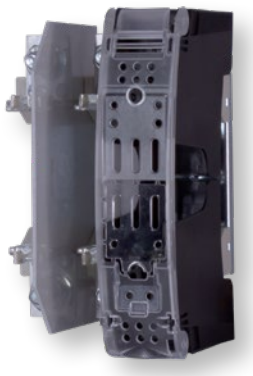
PK basic version
PKI fuse base with terminal covers
PKIP fuse base with terminal covers and fuse cover



3-pole fuse base size 00

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PK 00 M8-M8 3p S	160	004132100	558	1
PK 00 2M6-2M6 3p S	160	004132101	563	1
PK 00 M8-2M6 3p S	160	004132102	560	1
PK 00 M8-P00 3p S	160	004132103	608	1
PK 00 M8-2P00 3p S	160	004132104	651	1
PK 00 P00-P00 3p S	160	004132105	658	1
PK 00 P00-2P00 3p S	160	004132106	700	1
PK 00 2P00-2P00 3p S	160	004132107	743	1
PKI 00 M8-M8 3p S	160	004132111	675	1
PKI 00 2M6-2M6 3p S	160	004132112	680	1
PKI 00 M8-2M6 3p S	160	004132113	677	1
PKI 00 M8-P00 3p S	160	004132114	725	1
PKI 00 M8-2P00 3p S	160	004132115	768	1
PKI 00 P00-P00 3p S	160	004132116	775	1
PKI 00 P00-2P00 3p S	160	004132117	817	1
PKI 00 2P00-2P00 3p S	160	004132118	860	1
PKIP 00 M8-M8 3p S	160	004132121	704	1
PKIP 00 2M6-2M6 3p S	160	004132122	709	1
PKIP 00 M8-2M6 3p S	160	004132123	706	1
PKIP 00 M8-P00 3p S	160	004132124	754	1
PKIP 00 M8-2P00 3p S	160	004132125	797	1
PKIP 00 P00-P00 3p S	160	004132126	804	1
PKIP 00 P00-2P00 3p S	160	004132127	846	1
PKIP 00 2P00-2P00 3p S	160	004132128	889	1

PK basic version with protective barriers
PKI fuse base with terminal covers
PKIP fuse base with terminal covers and fuse covers



Technical data on page 750



*Terminal covers and fuse covers sold separately

1-pole fuse base PK 1, 2, 3

Tipus	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PK 1 M10-M10 1p S	250	004123100	603	3
PK 1 M10-S12 1p S	250	004123101	595	3
PK 1 S12-S12 1p S	250	004123102	587	3
PK 1 M10-P1 1p S	250	004123103	665	3
PK 1 M10-2P1 1p S	250	004123104	715	3
PK 1 P1-P1 1p S	250	004123105	727	3
PK 1 P1-2P1 1p S	250	004123106	777	3
PK 1 2P1-2P1 1p S	250	004123107	827	3
PK 2 M10-M10 1p S	400	004123200	840	3
PK 2 M10-S12 1p S	400	004123201	833	3
PK 2 S12-S12 1p S	400	004123202	825	3
PK 2 M10-P2 1p S	400	004123203	963	3
PK 2 M10-2P2 1p S	400	004123204	1029	3
PK 2 P2-P2 1p S	400	004123205	1085	3
PK 2 P2-2P2 1p S	400	004123206	1151	3
PK 2 2P2-2P2 1p S	400	004123207	1217	3
PK 3 M12-M12 1p S	630	004123300	1106	3
PK 3 M12-P3 1p S	630	004123301	1265	3
PK 3 M12-2P3 1p S	630	004123302	1360	3
PK 3 P3-P3 1p S	630	004123303	1424	3
PK 3 P3-2P3 1p S	630	004123304	1519	3
PK 3 2P3-2P3 1p S	630	004123305	1614	3





*Terminal covers and fuse covers sold separately

3-pole fuse base PK 1, 2, 3

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PK 1 M10-M10 3p S	250	004132200	1809	1
PK 1 M10-S12 3p S	250	004132201	1785	1
PK 1 S12-S12 3p S	250	004132202	1761	1
PK 1 M10-P1 3p S	250	004132203	1995	1
PK 1 M10-2P1 3p S	250	004132204	2145	1
PK 1 P1-P1 3p S	250	004132205	2181	1
PK 1 P1-2P1 3p S	250	004132206	2331	1
PK 1 2P1-2P1 3p S	250	004132207	2481	1
PK 2 M10-M10 3p S	400	004132300	2520	1
PK 2 M10-S12 3p S	400	004132301	2499	1
PK 2 S12-S12 3p S	400	004132302	2475	1
PK 2 M10-P2 3p S	400	004132303	2889	1
PK 2 M10-2P2 3p S	400	004132304	3087	1
PK 2 P2-P2 3p S	400	004132305	3255	1
PK 2 P2-2P2 3p S	400	004132306	3453	1
PK 2 2P2-2P2 3p S	400	004132307	3651	1
PK 3 M12-M12 3p S	630	004132400	3318	1
PK 3 M12-P3 3p S	630	004132401	3795	1
PK 3 M12-2P3 3p S	630	004132402	4080	1
PK 3 P3-P3 3p S	630	004132403	4272	1
PK 3 P3-2P3 3p S	630	004132404	4557	1
PK 3 2P3-2P3 3p S	630	004132405	4824	1

PK basic version with protective barriers

Technical data on page 750

Accessories			
Type	Code No.	Weight [g/pc]	Packaging [pcs]
Terminal covers			
ZP PT 00-1	004129010	20	6
ZP PT 1-1	004129012	47,5	6
ZP PT 2-1	004129013	62	6
ZP PT 3-1	004129014	73,5	6
Fuse covers			
PZP PT 00-1	004129020	9,5	6
PZP PT 1-1	004129022	25	6
PZP PT 2-1	004129023	36,5	6
PZP PT 3-1	004129024	45	6
Protective barriers			
PR PK00 S	004941320	17	20
PR PK1 S	004941321	47	20
PR PK2 S	004941322	56	20
PR PK3 S	004941323	62	20









Neutral terminal base / Earth clamp				
Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PK 00/0 M8-2M5 S	160	004941410	187	3
PK 1/0 M10-M10 S	250	004941411	635	3
PK 2/0 M10-M10 S	400	004941412	1016	3
PK 3/0 M12-M12 S	630	004941413	1066	3



1-pole fuse base PK 0, 4				
Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
PK 0 M8 - 2 x M6	160	004122009	258	3/90
PK 0 M8 - M8	160	004122002	258	3/90
PK 02 x M6 - 2 x M6	160	004122008	258	3/90
PK 4	1250	004122006	3030	1/7



3-pole fuse base PK 0				
Type	I_n [A]	Code No.	Weight [g]	Packaging [pcs]
PK 0/3 M8 - 2 x M6	160	004132007	650	1/18
PK 0/3 M8 - M8	160	004132002	650	1/18
PK 0/3 2xM6 - 2xM6	160	004132016	650	1/18



Technical data on page 750

Plastic fuse bases type PT size 00 to 3

Rated voltage
690 V

Advantages

Plastic fuse bases PT for NH fuses are suitable for screw mounting / surface mounting on mounting plates or mounting on DIN-rails, and can be used in combination with NH fuse-links according to DIN VDE 0636-2/IEC 60269-2 as well as solid links.

They offer a compact and simple solution for application of fuses as protective elements in low voltage distribution boards and are characterized by silver plated contacts and a broad range of connections.

PT fuse bases are available in sizes 00 to 3, in 1-pole and 3-pole version. The range comes with accessories including protection barriers, IP20 finger safe protection kits and neutral links, which, along with the possibility of attaching additional poles, provides an optimal solution for every application.

Rated for fuse-links with breaking capacity up to 120 kA.

Ratings:
Rated voltage: 690 V a.c.
Rated current: 160 A - 630 A

Standards:
IEC 60269-2
DIN VDE 0636-21 & 201
DIN 43620



Possibility of linking more than 3 poles together using dividing partitions.

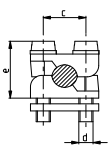
Possibility of screw mounting or mounting on DIN-rail.

Sturdy and compact IP 20 protection kits.

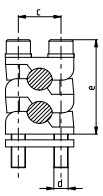
Galvanically silver plated contacts, providing ideal contact characteristics .

We offer one- and two-cable terminals with a broad range of available connections:
- flat terminals
- clip terminals
- prism clamps
- V shaped clamps

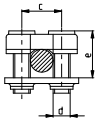
P00, P1, P2, P3



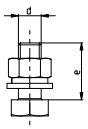
2P00, 2P1, 2P2, 2P3



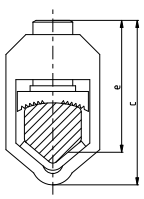
2xM6, S12



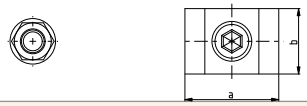
M8, M10, M12



V shaped clamp





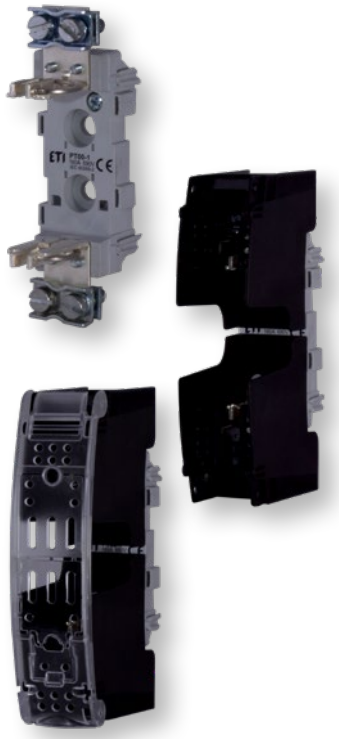


NV/NH

1-pole fuse base size 00

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PT 00 M8-M8 1p	160	004121300	110	3
PT 00 2M6-2M6 1p	160	004121301	114	3
PT 00 M8-2M6 1p	160	004121302	112	3
PT 00 M8-P00 1p	160	004121303	126	3
PT 00 M8-2P00 1p	160	004121304	140	3
PT 00 P00-P00 1p	160	004121305	143	3
PT 00 P00-2P00 1p	160	004121306	157	3
PT 00 2P00-2P00 1p	160	004121307	172	3
PTI 00 M8-M8 1p	160	004121311	150	3
PTI 00 2M6-2M6 1p	160	004121312	154	3
PTI 00 M8-2M6 1p	160	004121313	152	3
PTI 00 M8-P00 1p	160	004121314	166	3
PTI 00 M8-2P00 1p	160	004121315	180	3
PTI 00 P00-P00 1p	160	004121316	183	3
PTI 00 P00-2P00 1p	160	004121317	197	3
PTI 00 2P00-2P00 1p	160	004121318	212	3
PTIP 00 M8-M8 1p	160	004121321	160	3
PTIP 00 2M6-2M6 1p	160	004121322	164	3
PTIP 00 M8-2M6 1p	160	004121323	162	3
PTIP 00 M8-P00 1p	160	004121324	176	3
PTIP 00 M8-2P00 1p	160	004121325	190	3
PTIP 00 P00-P00 1p	160	004121326	193	3
PTIP 00 P00-2P00 1p	160	004121327	207	3
PTIP 00 2P00-2P00 1p	160	004121328	222	3

PT basic version
PTI fuse base with terminal covers
PTIP fuse base with terminal covers and fuse cover



3-pole fuse base size 00

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PT 00 M8-M8 3p	160	004131200	360	1
PT 00 2M6-2M6 3p	160	004131201	374	1
PT 00 M8-2M6 3p	160	004131202	367	1
PT 00 M8-P00 3p	160	004131203	410	1
PT 00 M8-2P00 3p	160	004131204	453	1
PT 00 P00-P00 3p	160	004131205	460	1
PT 00 P00-2P00 3p	160	004131206	502	1
PT 00 2P00-2P00 3p	160	004131207	545	1
PTI 00 M8-M8 3p	160	004131211	425	1
PTI 00 2M6-2M6 3p	160	004131212	438	1
PTI 00 M8-2M6 3p	160	004131213	431	1
PTI 00 M8-P00 3p	160	004131214	475	1
PTI 00 M8-2P00 3p	160	004131215	518	1
PTI 00 P00-P00 3p	160	004131216	525	1
PTI 00 P00-2P00 3p	160	004131217	567	1
PTI 00 2P00-2P00 3p	160	004131218	610	1
PTIP 00 M8-M8 3p	160	004131221	450	1
PTIP 00 2M6-2M6 3p	160	004131222	463	1
PTIP 00 M8-2M6 3p	160	004131223	456	1
PTIP 00 M8-P00 3p	160	004131224	500	1
PTIP 00 M8-2P00 3p	160	004131225	543	1
PTIP 00 P00-P00 3p	160	004131226	550	1
PTIP 00 P00-2P00 3p	160	004131227	592	1
PTIP 00 2P00-2P00 3p	160	004131228	635	1

PT basic version
PTI fuse base with terminal covers
PTIP fuse base with terminal covers and fuse cover



Technical data on page 754



*Terminal covers and
fuse covers
sold separately

1-pole fuse base PT 1, 2, 3

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PT 1 M10-M10 1p	250	004121400	364	3
PT 1 M10-S12 1p	250	004121401	357	3
PT 1 S12-S12 1p	250	004121402	349	3
PT 1 M10-P1 1p	250	004121403	427	3
PT 1 M10-2P1 1p	250	004121404	477	3
PT 1 P1-P1 1p	250	004121405	489	3
PT 1 P1-2P1 1p	250	004121406	539	3
PT 1 2P1-2P1 1p	250	004121407	589	3
PT 2 M10-M10 1p	400	004121500	394	3
PT 2 M10-S12 1p	400	004121501	387	3
PT 2 S12-S12 1p	400	004121502	379	3
PT 2 M10-P2 1p	400	004121503	517	3
PT 2 M10-2P2 1p	400	004121504	583	3
PT 2 P2-P2 1p	400	004121505	639	3
PT 2 P2-2P2 1p	400	004121506	705	3
PT 2 2P2-2P2 1p	400	004121507	771	3
PT 3 M12-M12 1p	630	004121600	649	3
PT 3 M12-P3 1p	630	004121601	810	3
PT 3 M12-2P3 1p	630	004121602	905	3
PT 3 P3-P3 1p	630	004121603	966	3
PT 3 P3-2P3 1p	630	004121604	1061	3
PT 3 2P3-2P3 1p	630	004121605	1156	3



*Terminal covers and
fuse covers
sold separately

3-pole fuse base PT 1, 2, 3

Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PT 1 M10-M10 3p	250	004131300	1204	1
PT 1 M10-S12 3p	250	004131301	1183	1
PT 1 S12-S12 3p	250	004131302	1159	1
PT 1 M10-P1 3p	250	004131303	1393	1
PT 1 M10-2P1 3p	250	004131304	1543	1
PT 1 P1-P1 3p	250	004131305	1579	1
PT 1 P1-2P1 3p	250	004131306	1729	1
PT 1 2P1-2P1 3p	250	004131307	1879	1
PT 2 M10-M10 3p	400	004131400	1312	1
PT 2 M10-S12 3p	400	004131401	1291	1
PT 2 S12-S12 3p	400	004131402	1267	1
PT 2 M10-P2 3p	400	004131403	1681	1
PT 2 M10-2P2 3p	400	004131404	1879	1
PT 2 P2-P2 3p	400	004131405	2047	1
PT 2 P2-2P2 3p	400	004131406	2245	1
PT 2 2P2-2P2 3p	400	004131407	2443	1
PT 3 M12-M12 3p	630	004131500	2105	1
PT 3 M12-P3 3p	630	004131501	2588	1
PT 3 M12-2P3 3p	630	004131502	2873	1
PT 3 P3-P3 3p	630	004131503	3056	1
PT 3 P3-2P3 3p	630	004131504	3341	1
PT 3 2P3-2P3 3p	630	004131505	3626	1

PT basic version with protective barriers

Technical data on page 754

Accessories			
Type	Code No.	Weight [g/pc]	Packaging [pcs]
Terminal covers			
ZP PT 00-1	004129010	20	6
ZP PT 00-3	004129011	56,7	1
ZP PT 1-1	004129012	47,5	6
ZP PT 2-1	004129013	62	6
ZP PT 3-1	004129014	73,5	6
Fuse covers			
PZP PT 00-1	004129020	9,5	6
PZP PT 00-3	004129021	14,7	6
PZP PT 1-1	004129022	25	6
PZP PT 2-1	004129023	36,5	6
PZP PT 3-1	004129024	45	6
Protective barriers			
PR PT00-1	004941330	18,1	20
PR PT00-3	004941331	17,5	20
PR PT1	004941332	38	20
PR PT2	004941333	45,7	20
PR PT3	004941334	52,4	20



Neutral terminal base / Earth clamp				
Type	I_n [A]	Code No.	Weight [g/pc]	Packaging [pcs]
PT 00/0 M8-2M5	160	004941502	124	3
PT 1/0 M10-M10	250	004941503	396	3
PT 2/0 M10-M10	400	004941504	570	3
PT 3/0 M12-M12	630	004941505	609	3



Plastic fuse bases type PLNVV 000 and 00 (fuses with screw connection - S)

Rated voltage
690 V

1-pole PLNVV 000 and 00 (fuses with screw connection - S)				
Type	I_n [A]	Code No.	Weight [kg/pc]	Package [pcs]
PLNVV – 000/1 A	160	001701010	0,51	3
PLNVV – 00/1 A	160	001701020	0,58	3

* fuse bases PLNVV have no special accessories but only protective barriers Type ZP
** all bases are ready for mounting on mounting plate
*** with use of TS NP-00 is possible to mount fuse bases size 00 on the 35mm mounting rail



Technical data on page 754, 758

Neutral terminal base PLNS

Rated voltage
690 V



PLNS - 00



2PLNS – 1,2,3



C-PLNS-00 + 2x PLNS-00N A

Neutral terminal bases PLNS 00, 1, 2

Type	I_n [A]	Code No.	Weight [kg/pc]	Packaging [pcs]
PLNS - 00N A	160	001701150	0,61	5
PLNS - 00N B	160	001701151	0,56	5
PLNS - 00N C	160	001701152	0,62	5
PLNS - 00N D	160	001701153	0,63	5
PLNS - 00N E	160	001701154	0,64	5
PLNS - 00N F	160	001701155	0,64	5
PLNS - 00N G	160	001701156	0,65	5
PLNS - 00N H	160	001701157	0,66	5
2PLNS - 1N A	250	001701158	0,60	5
2PLNS - 1N B	250	001701159	0,59	5
2PLNS - 1N C	250	001701160	0,60	5
2PLNS - 1N D	250	001701161	0,61	5
2PLNS - 1N E	250	001701162	0,62	5
2PLNS - 1N F	250	001701163	0,63	5
2PLNS - 1N G	250	001701164	0,64	5
2PLNS - 1N H	250	001701165	0,64	5
2PLNS - 1N K	250	001701180	0,66	5
2PLNS - 2N A	400	001701166	0,81	5
2PLNS - 2N B	400	001701167	0,76	5
2PLNS - 2N C	400	001701168	0,84	5
2PLNS - 2N D	400	001701169	0,86	5
2PLNS - 2N E	400	001701170	0,88	5
2PLNS - 2N F	400	001701171	0,89	5
2PLNS - 2N G	400	001701172	0,89	5
2PLNS - 2N H	400	001701173	0,90	5
2PLNS - 2N K	400	001701181	0,91	5

* basic Type is 1-pole and can be composed to multipole
** for connector description A, B, … K see table of connections PLNV
*** C-PLNS-00 is used to equalize potential between N and PE terminal through M8 screw Type connection (see table of accessories)



Neutral terminal base with separation function PLNSR 00

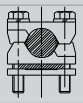
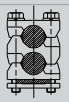
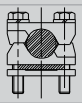
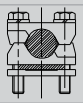
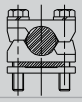
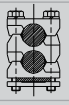
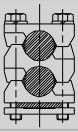
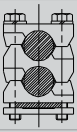
Type	Code No.	Weight [kg/pc]	Package [pcs]
PLNSR-00 A	001701182	0,13	5
PLNSR-00 B	001701175	0,12	5
PLNSR-00 C	001701183	0,13	5
PLNSR-00 D	001701184	0,14	5
PLNSR-00 E	001701185	0,14	5
PLNSR-00 F	001701186	0,15	5
PLNSR-00 G	001701187	0,15	5
PLNSR-00 H	001701188	0,16	5

* supplied standard variant is 1-pole, 3-pole shall be made by instalments
** for connector description A, B, … K see table of connections PLNV

Technical data on page 759

Type of connections PLNVV and PLNS

Type of connection for fuse bases PLNV and PLNS

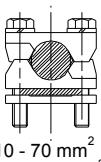
Connection	Size	One side of fuse base			Other side of fuse base		
		Description	Type	Drawing	Description	Type	Drawing
A	00 1 2 3	screw	M8 M10 M10 M12		screw	M8 M10 M10 M12	
B	00 1 2	clip terminal	OS00 OS12 OS12		clip terminal	OS00 OS12 OS12	
C	00 1 2	clip terminal	OS00 OS12 OS12		screw	M8 M10 M10	
D	00 1 2 3	screw	M8 M10 M10 M12		prism clamp	P00 P1 P2 P3	
E	00 1 2 3	screw	M8 M10 M10 M12		prism clamp	P002* P12 P22 P32	
F	00 1 2 3	prism clamp	P00 P1 P2 P3		prismclamp	P00 P1 P2 P3	
G	00 1 2 3	prism clamp	P00 P1 P2 P3		prism clamp	P002* P12 P22 P32	
H	00 1 2 3	prism clamp	P002* P12 P22 P32		prism clamp	P002* P12 P22 P32	
K	1 2	»V« shaped clamp			»V« shaped clamp		

* IK00 protective cover is only as high as the terminals 2x (10-25mm2 = height of approx. 25mm)
** interchangeability of the terminals is only possible between type OS... and P... within the same base size. Replacing the terminal with screw M... with the terminal OS... or with terminal P... is not possible.
*** »V« shaped clamp is not interchangeable.

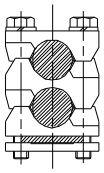
Connections:



OS00 .... 6 - 50 mm^2 - Cu
OS12 .. 25 - 150 mm^2 - Cu



P00 ... 10 - 70 mm^2 - Cu / Al
P1 ..... 70 - 150 mm^2 - Cu / Al
P2 ... 120 - 240 mm^2 - Cu / Al
P3 ... 120 - 300 mm^2 - Cu / Al

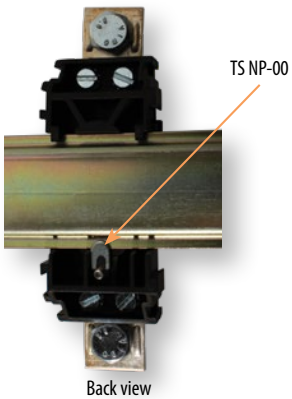


P002 ... 2 x (10 - 50 mm^2) - Cu / Al
P12 ..... 2 x (70 - 95 mm^2) - Cu / Al
P22 ... 2 x (120 - 150 mm^2) - Cu / Al
P32 ... 2 x (120 - 240 mm^2) - Cu / Al

Accessories for PLNVV, PLNS

Type	Description	Code No.	Used in combination with	Weight [kg/pc]	Packaging [pcs]
TS NP-00	Mounting set (mounting on 35mm mounting rail)	001701221	PLNV 00, PLNVV - 000, 00	0,01	3
C-PLNS-00	Linking element to equalize potential between N and PE terminal	001701222	PLNS-00N	0,02	5

* for mounting 1-pole PLNVV, PLNS on 35mm mounting rail one set of TS NP-00 is needed.
** C-PLNS-00 is used to equalize potential between N and PE terminal through M8 screw Type connection on PLNS-00N base.



Back view



TS NP-00



C-PLNS-00

Accessories



NV/NH separator uninsulated					
Type	I_N [A]	Code No. (Ni)	Code No. (Ag)	Weight [g]	Packaging [pcs]
NVL 00	160	004941230	004941235	75,5	20
NVL 0	160	004941231	004941236	120	20
NVL 1	250	004941232	004941237	145,5	20
NVL 2	400	004941233	004941238	210	20
NVL 3	630	004941234	004941239	275	6/48
NVL 4	1250	004941208		692	5
NVL 4a	1600	004941209		553	5

*size NVL 00, 0,1,2,3….drawing A in technical data
size NVL 4, 4a…..drawing B in technical data



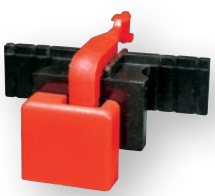
NV/NH separator insulated				
Type	I_N [A]	Code No.	Weight [g]	Packaging [pcs]
NVLI 00 Ag*	160	004941220	70	5/60
NVLI 0 Ag*	160	004941221	120	5/40
NVLI 1 Ag*	250	004941222	145	5/40
NVLI 2 Ag*	400	004941223	215	5/40
NVLI 3 Ag*	630	004941224	315	5/40

*silver plated



Handle				
Type	I_N [A]	Code No.	Weight [g]	Packaging [pcs]
R 00-3	2-630	004941111	276	10
VRRN 00-3*	2-630	001691061	320	1
VRRL 85	25-160	001691064	550	1

*handle with sleeve



Signal Switch NVS 5			
Type	Code No.	Weight [g]	Packaging [pcs]
NVS 5	004117001	11,5	10/340

NVS 5 is used for signalling of interruption of fuse-links of the Type NV/NH of the size NV/NH 00 C to NV/NH 3 (except NV/NH 1 ultra with knives for fastening with screws). NVS is activated through the indicator spring. We also offer Electronic Fuse Monitors - see page 140.

Technical data on page 760

Protection link			
Type	Code No.	Weight [g]	Packaging [pcs]
NVL00	004941206	30	10
NVL 1-3	004941207	78	10

Base separating elements			
Type	Code No.	Weight [g]	Packaging [pcs]
PP 00, PK 00	004941301	50	20/100
PK 0	004941302	50	20/100
PK 1	004941303	50	20/100
PK 2	004941304	50	20/100
PK 3	004941305	50	20/100



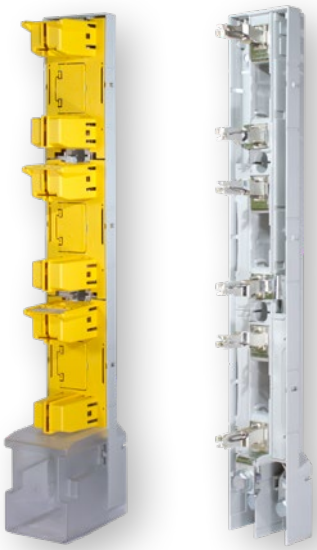


Low voltage fuse-rails

NV/NH fuse-rail sizes 00, 1, 2, 3

Characteristics of LV NV fuse-rails
The LV NV/NH fuse-rails are 3-pole bases of LV fuse-links, intended for busbar mounting. The LV NV/NH fuse-rails comprises three single-pole connections in one unit. Each contact at an individual phase is connected to the phase on the busbar system. The other contacts are fitted with cable connecting terminals or intended for attachment of the following busbar system.
Use
The LV NV/NH fuse-rails are mainly used for cable distribution and power supply systems.
Principle of operation
The LV NV/NH fuse-rails are intended for insertion of LV fuse-links that are inserted and removed from the LV NV/NH fuse-rails by means of a special handle (refer to Catalogue ETI - LV fuse-links, Code No. number 4941111 and 4941100).
Design of LV NV/NH fuse-rails
The insulated supporting body is made of one piece, the material is polyester reinforced with glass fibres. A silver-plated contact system, fitted with tinned extinction chambers, ensures a low power dissipation, optimum thermal characteristics, and a high breaking capacity. The contact derived parts are intended for cable connections or for attachment of the next busbar system. All the live parts are protected against accidental contacts - in conformity with BVG A2. A special form of the contact part cover provides for safe insertion and removal of the LV fuse-links.
Short description
The LV NV/NH fuse-rails are manufactured in compliance with the DIN 43623 standard, and are mostly used for installation into cable distribution cabinets and power supply systems.
They are available in sizes of 00/160 A to 3/630 A. Covers provide insulation protection for all live parts.
All the LV NV/NH fuse-rails are fitted with new, modern Delta contact systems allowing optimum pressure contact between the fuse cartridge and the LV NV/NH fuse-rails, resulting in extremely low level of power dissipation and heating-up.
All standard insulated LV NV/NH fuse-rails shown in the Catalogue are intended for general usage.
Upon request appropriate individual configurations can be designed - in such cases please contact our sales engineers, or call us to the factory.
Advantages
- upper or lower cable connection - as required
- optimum pull contact
- simple installation
- modular design

Technical data on page 760



General LV NV/NH fuse-rail table

Size	Code No.	Busbar system	Product designation	Connection description	Protection cover	Weight [kg]	Packaging [pcs]
00	001691015	100	VL00/100 M8-2	flat connection – screw M8	/	0,8	1/1
00	001691016	100	VL00/100 SP.95-2	prism 35 - 95 mm^2	/	0,8	1/1
00	001691020	185	VL00 M8	flat connection – screw M8	/	1,5	1/1
00	001691021	185	VL00 SP.95	V-clip 10-95 mm^2	/	1,5	1/1
1	001691024	185	VL1 M10	screw M10	terminal compartment cover	3,5	1/1
1	001695280	185	VL1H M10*	screw M10	terminal compartment cover	3,5	1/1
1	001691025	185	VL1 SP.300	V-clip 25-300 mm^2	terminal compartment cover	3,5	1/1
2	001691022	185	VL2 M12	screw M12	terminal compartment cover	3,8	1/1
2	001695290	185	VL2H M12*	screw M12	terminal compartment cover	3,8	1/1
2	001691029	185	VL2 M12x35	screw M12x35	terminal compartment cover	3,8	1/1
2	001691030	185	VL2 SP.240 P	V-clip 25-240 mm^2	terminal cover	3,8	1/1
2	001691031	185	VL2 SP.300	V-clip 25-300 mm^2	terminal compartment cover	3,8	1/1
3	001691027	185	VL3 M12	screw M12	terminal compartment cover	4,3	1/1
3	001691028	185	VL3 SP.300	V-clip 25-300 mm^2	terminal compartment cover	4,3	1/1

* H - "Omega" contact (make short - circuit current 80 kA)



busbar support

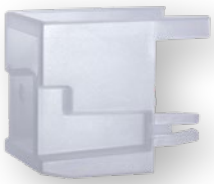


busbar connection





busbar covering



protection covering of contact connections

Table of accessories for LV NV/NH fuse-rails

Type	Code No.	Description	Packaging [pcs]
busbar connection KS 00/5-10	001691040	busbar thickness 5-10mm	1/3
busbar connection KS 123/10	001692460	busbar thickness 10mm	1/1
protection covering of contact connections ZPL 123/10HA	001691045	for sizes 1,2,3	1/1
busbar covering PZ 00/185	001691046	mounting thread M8	1/1
busbar covering PZ 00/100	001691047	mounting thread M8	1/1
busbar covering PZ 123/185	001691048	mounting thread M12	1/1
busbar support POP 100/185	001691055	for busbar system 100 mm and 185 mm	1/1
protection covering of POP busbar support ZP POP 100	001691056	Lateral cover for busbar support 100 mm	1/1
protection covering of POP busbar support ZP POP 185	001691057	Lateral cover for busbar support 185 mm	1/1

Busbar connection
Busbar connections are used for drill-free direct contacting of the strip-fuseways on the busbars.

Protection cover
The terminal compartment and terminal covers provide probe-safe frontal protective covering of the terminal compartment.

Busbar cover, screw-Type
The screw-Type covers of 100 mm width are fixed at busbars with M12 thread or stud. The covers of 50 mm width are fixed on busbars or adapters with M8 thread.

Busbar support
The 3-pole busbar support is used for the fixing of flat bars at 100 mm and 185 mm distances.

Technical data on page 761

NV/NH fuse-rail type VL00 EK

Description
Fuse-rail type VL00/100 EK is a three-pole fuse-base in vertical design for mounting on busbar system. Intended for use with fuse-links size 000 (00C), 00 fuse-rail protects equipment in electrical circuits from overload and short circuit. Special designed contact cover enables safe manipulation with fuse-links (insertion / pull out) with special handle.
Application
- transformer substation
- distribution boards, distribution panels
- public lightening cabinets
- cable distribution cabinets
- industry
Mounting
Rails can be mounted on 100mm busbar system directly, with additional adapters can be mounted also to 185mm busbar system. Mounting in vertical and horizontal position.
Standards
VL00/100 EK are in accordance with the following standards:
- IEC 60947-1
- IEC 60947-3
- IEC 60269-1
- IEC 60269-2.

Fuse-rail type VL00/100 EK

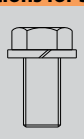
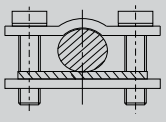
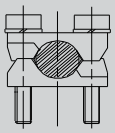
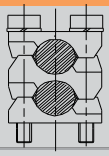
Type	Code No.	Weight [g]	Packaging [pcs]
VL00/100 EK M8	001701600	0,95	1
VL00/100 EK BT00 10-70	001701601	0,95	1
VL00/100 EK OS00 6-50	001701602	0,94	1
VL00/100 EK P00 10-70	001701603	0,94	1
VL00/100 EK P002 50	001701605	0,96	1

*VL00/100 EK fuse-rails are used only for 100mm busbar system
** VL00/100 EK is possible to mount on 185mm busbar using special adapters
*** for Type of terminals see table of terminal for SL00/100 EK and VL00/100 EK
**** busbar connection for drill-free direct contacting of the fuse-rail is not at disposal



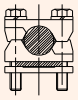
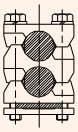
VL00/100 EK M8

Table of connections for SL00/100 EK and VL00/100 EK

Cable terminal drawing					
Cable terminal type	M8	BT00 10-70*	OS00 6-50	P00 10-70	P002 50
Clamping cross-section	70 mm^2	10-70 mm^2 Al/Cu	(6-50) mm^2 Cu	(10-70) mm^2 Al/Cu	2x50 mm^2 Al/Cu
Screw type	M8x12	M6	2x(M5x14)	2x(M5x25)	2x(M5x40)
Tightening torque	12-15 Nm	4,5 Nm	2,6 Nm	4,5 Nm	4,5 Nm
Package	3	3	3	3	3

* connection type BT00 10-70 have to be ordered with the product, latter excahange is not possible

Technical data on page 764

Additional connections for VL00/100 EK				
Type	Code No.	Connector drawing	Suitability	Packaging [pcs]
OS00 6-50	001701480	 Cu*	SL00/100 EK VL00/100 EK	set = 3
P00 10-70	001701481	 Al/Cu*	SL00/100 EK VL00/100 EK	set = 3
P002 50	001701467	 Al/Cu*	SL00/100 EK VL00/100 EK	set = 3

* cable type for direct connection is indicated on the connector drawing
** exchange between connection Type is possible



RA-1 100/185



PRS-SL/VL EK

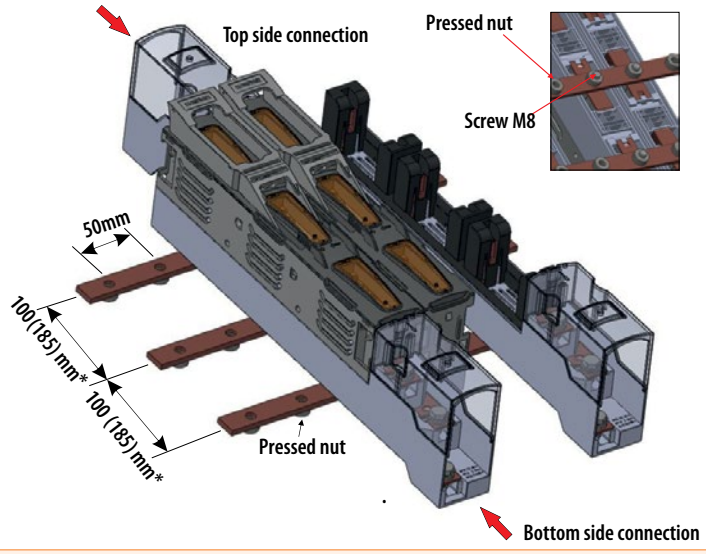
Accesories for VL00/100 EK				
Type	Code No.	Description	Weight [kg/pc]	Package [pcs]
PRS-SL/VL EK	001701470	Protection cover for connection terminals	0,05	1
RA-1 100/185	001701471	Mounting adapter for 185mm busbar, single	0,25	1
RA-2 100/185	001701472	Mounting adapter for 185mm busbar, double	0,60	1

* PRS-SL/VL EK is needed for additional protection covering when using mountin adapter RA-…
** RA-1 100/185 is adapter that is needed if one SL00/100 EK or VL00/100 EK have to be mounted on 185mm busbar. With adapter RA-2 100/185 two SL00/100 EK or VL00/100 EK can be mounted on 185mm busbar same time.



RA-2 100/185

Example:



Technical data on page 764

Strip type fuse-switch-disconnectors

NV/NH Strip type fuse-switch-disconnector sizes 00, 1, 2, 3

Characteristics of the NV/NH Strip type fuse-switch-disconnectors
The NV/NH Strip type fuse-switch-disconnectors are 3-pole bases of NV/NH fuse cartridges, intended for busbar mounting. An NV/NH Strip type fuse-switch-disconnectors comprises three single-pole connections in one unit. Each contact at an individual phase is connected to the phase on the busbar system. The other contacts are fitted with cable connecting terminals or intended for attachment of the following busbar system.
Use
The NV/NH Strip type fuse-switch-disconnectors are mainly used for cable distribution and power supply systems, transformer systems, where they are connected when electric energy transmission is required. The following rated currents are available: 160 A, 250 A, 400 A, 630 A.
Principle of operation
The NV/NH Strip type fuse-switch-disconnectors are used in combination with NV/NH fuse cartridges protecting the circuit against shorts. The upper part of the NV/NH Strip type fuse-switch-disconnectors with insulation class IP3X is provided with a separate test opening through which the live state can be tested according to DIN VDE 0680, part 5.
Design of the NV/NH Strip type fuse-switch-disconnectors
The insulated supporting body is made of one piece, the material is polyester reinforced with glass fibres. A silver-plated contact system, fitted with tinned extinction chambers, ensures a low power dissipation, optimum thermal characteristics and a high breaking capacity. The contact derived parts are intended for cable connections or for attachment of the next busbar system. All the live parts are protected against accidental contacts - in conformity with BVG A2. A special form of the contact part cover ensures a safe insertion and removal of the NV/NH fuse cartridges.

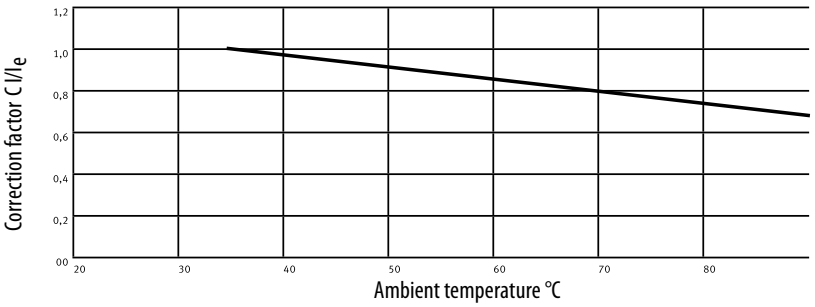
Short description
The NV/NH Strip type fuse-switch-disconnectors are mostly used for installation into cable distribution cabinets and power supply systems - in accordance with IEC/EN 61439-1. The NV/NH Strip type fuse-switch-disconnectors have been tested in accordance with IEC/EN 60947-3. They are available for the sizes of fuse cartridges from 00 to 3, with both single-pole and 3-pole switching-on.

Advantages
- upper or lower cable connection - as required
- optimum pull contact
- direct connection
- double strip connection up to 1250 A
- universal cover
- high breaking capacity
- low power disipation
- use of standard earthing connections
- modular conctruction

Main types of the NV/NH Strip type fuse-switch-disconnectors - characteristics
Basically, as shown, there are several types of the NV/NH Strip type fuse-switch-disconnectors:
- for a 3-pole switching-in
- for a single-pole switching-in
- for attachment directly to a busbar system
- with side contacts for a busbar system

All the NV/NH Strip type fuse-switch-disconnectors are fitted with new, modern Delta contact systems allowing optimum pressure contact between the fuse cartridge and the NV/NH Strip type fuse-switch-disconnectors, resulting in extremely low level of power dissipation and heating-up. All the standard NV/NH Strip type fuse-switch-disconnectors shown in the catalogue are intended for general usage. Upon request appropriate individual configurations can be designed - in such cases please contact our sales engineers, or call us to the factory.

Influence of ambient temperature on rated current of NH strip-type fuse-switch-disconnectors



Rated diversity factor acc to IEC EN 61439-2:2012-06 table 101

No. of main circuits	Rated diversity factor
2 & 3	0,9
4 & 5	0,8
6 ... 9	0,7
10 ≤	0,6



General table of NV/NH strip type-fuse-switch-disconnector-single-pole switching-in

Size	Code No.	Busbar system	Product designation	Product designation	Switch lever	Weight [kg]	Packaging [pcs]
00	001692010	185	SL00 1P M8	flat connection - screw M8	standard	2,4	1/1
00	001692012	185	SL00 1P SP.95	V-clip 10-95 mm²	standard	2,4	1/1
1	001692110	185	SL1 1P M10	screw M10	standard	4,9	1/1
1	001695200	185	SL1H 1P M10*	screw M10	standard	4,9	1/1
1	001692111	185	SL1 1P SP.300	V-clip 25-300 mm²	standard	4,9	1/1
1	001695201	185	SL1H 1P SP.300*	V-clip 25-300 mm²	standard	4,9	1/1
1	001692112	185	SL1 1P SP.240	V-clip 25-240 mm²	standard	4,9	1/1
1	001695202	185	SL1H 1P SP.240*	V-clip 25-240 mm²	standard	4,9	1/1
2	001692210	185	SL2 1P M12	screw M12	standard	4,9	1/1
2	001695220	185	SL2H 1P M12*	screw M12	standard	4,9	1/1
2	001692211	185	SL2 1P SP.300	V-clip 25-300 mm²	standard	4,9	1/1
2	001695221	185	SL2H 1P SP.300*	V-clip 25-300 mm²	standard	4,9	1/1
2	001692212	185	SL2 1P SP.240	V-clip 25-240 mm²	standard	4,9	1/1
2	001695222	185	SL2H 1P SP.240*	v-clip 25-240 mm²	standard	4,9	1/1
3	001692310	185	SL3 1P M12	screw M12	standard	5,6	1/1
3	001692311	185	SL3 1P SP.300	V-clip 25-300 mm²	standard	5,6	1/1
3	001692312	185	SL3 1P SP.240	V-clip 25-240 mm²	standard	5,6	1/1

* H - "Omega" contact (make short - circuit current 80 kA)



General tabel of NV/NH Strip type fuse-switch-disconnector-three-pole switching-in

Size	Code No.	Busbar system	Product designation	Connection description	Weight [kg]	Packaging [pcs]
00	001692034	100	SL00/100 3P M8-2	flat connection – screw M8	1	1/1
00	001692035	100	SL00/100 3P SP.70-2	V-clip 10-70 mm²	1	1/1
00	001692032	185	SL00 3P M8	flat connection – screw M8	2,4	1/1
00	001692033	185	SL00 3P SP.95	V-clip 10-95 mm²	2,4	1/1
1	001692130	185	SL1 3P M10	screw M10	4,9	1/1
1	001695210	185	SL1H 3P M10 *	screw M10	4,9	1/1
1	001692131	185	SL1 3P SP.300	V-clip 25-300 mm²	4,9	1/1
1	001695211	185	SL1H 3P SP.300*	V-clip 25-300 mm²	4,9	1/1
1	001692132	185	SL1 3P SP.240	V-clip 25-240 mm²	4,9	1/1
1	001695212	185	SL1H 3P SP.240*	V-clip 25-240 mm²	4,9	1/
2	001692000	185	SL2 3P SP.300	V-clip 25-300 mm²	4,9	1/1
2	001695231	185	SL2H 3P SP.300*	V-clip 25-300 mm²	4,9	1/1
2	001692230	185	SL2 3P M12	screw M12	4,9	1/1
2	001695230	185	SL2H 3P M12*	screw M12	4,9	1/1
2	001692231	185	SL2 3P SP.240	V-clip 25-240 mm²	4,9	1/1
2	001695232	185	SL2H 3P SP.240*	V-clip 25-240 mm²	4,9	1/1
3	001692330	185	SL3 3P M12	screw M12	5,6	1/1
3	001692331	185	SL3 3P SP.300	V-clip 25-300 mm²	5,6	1/1
3	001692332	185	SL3 3P SP.240	V-clip 25-240 mm²	5,6	1/1

* H - "Omega" contact (make short - circuit current 80 kA)

Technical data on page 765

NV/NH Strip type fuse-switch-disconnector with current transformer

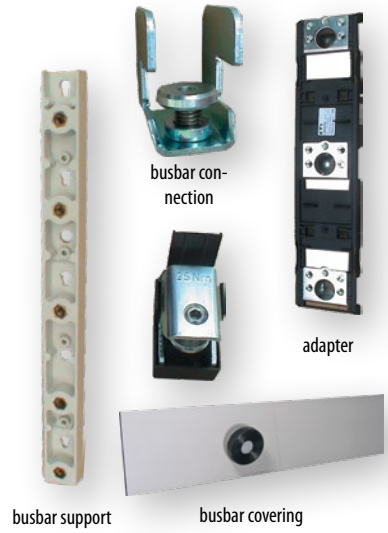
Size	Code No.	Busbar system	Product designation	Connection description	Current transformer	Weight [kg]	Packaging [pcs]
00	001693000	100	SL00/100 3P M8 150/5 Kl.1	flat connection, M8	150/5 class 1	1,7	1/1
1	001693010	185	SL1 3P M10 250/5 Kl.1	screw M10	250/5 class 1	3,1	1/1
2	001693020	185	SL2 3P M12 400/5 Kl.1	screw M12	400/5 class 1	4,6	1/1
3	001693030	185	SL3 3P M12 600/5 Kl.1	screw M12	600/5 class 1	4,6	1/1
00	001693040	100	SL00/100 3P SP.70 150/5 Kl.1	V-clip 10-70mm^2	150/5 class 1	1,7	1/1
1	001693050	185	SL1 3P SP.300 250/5 Kl.1	V-clip 25-300mm^2	250/5 class 1	3,1	1/1
2	001693060	185	SL2 3P SP.300 400/5 Kl.1	V-clip 25-300mm^2	400/5 class 1	4,6	1/1
3	001693070	185	SL3 3P SP.300 600/5 Kl.1	V-clip 25-300mm^2	600/5 class 1	4,6	1/1



Table of accessories for NV Strip type fuse-switch-disconnector

Type	Code No.	Description	Packaging [pcs]
busbar connection KS 00/5-10	001691040	busbar thickness 5-10mm	3
busbar connection KS 123/10	001692460	for size 1,2,3	1/1
adapter DA 185/185 42	001692411	for system 185 mm height 42 mm	1/1
adapter DA 185/100 52	001692412	for system 185/100mm, height 52 mm, for 2 x SL00	1/1
protection covering of contact connections ZP 00 HA BOTTOM	001692420	for size 00; used when cable connects from the bottom	1/1
protection covering of contact connections ZP 00 HA TOP	001692424	for size 00; used when cable connects from the top	1/1
protection covering of contact connections ZP 123/10HA	001692421	for size 1,2,3; universal - for top / bottom cable connections	1/1
busbar covering PZ 00/185	001691046	mounting thread M8	1/1
busbar covering PZ 00/100	001691047	mounting thread M8	1/1
busbar covering PZ 123/185	001691048	mounting thread M12	1/1
nameplate NP 123	001692431	for size 1,2,3	1/1
busbar support POP 100/185	001691055	for systems 100 mm and 185 mm	1/1
Deriv. connection OP L	001692440	for size 1,2,3	1/1
double connection DP 3x2 (6)*	001692450	for size 1,2,3	1/1
double protection cover ZP 3x2/10HA*	001692422	for size 1,2,3	1/1
double terminal connections SPD 2x3 3x300	001692423	for size 1,2,3	1/1
micro switch MST SL00/100 3p**	001691050	open/close position of SL	1/1
micro switch MST SL00 3p**	001691051	open/close position of SL	1/1
micro switch MST SL123 3p**	001691052	open/close position of SL	1/1
protection covering of POP busbar support ZP POP 100	001691056	Lateral cover for busbar support 100 mm	1/1
protection covering of POP busbar support ZP POP 185	001691057	Lateral cover for busbar support 185 mm	1/1
SP SL123 M/2x95-150	001692452	Retrofit kit for 2 conductors	1/1
SP SL123 M/2x240	001692453	Retrofit kit for 2 conductors	1/1
SP SL123 V/2x95-150	001692454	Retrofit kit for 2 conductors	1/1
SP SL123 V/2x150-240	001692455	Retrofit kit for 2 conductors	1/1

* accessories for assembling: SL 1250 (2 parallel connected fuse-switch-disconnectors)
** one MST can be installed inside SL





protection covering of contact connections sizes 1,2,3



BUSBAR CONNECTION
Busbar connections are used for drill-free direct contacting of the strip-fuseways on the busbars.

PROTECTION COVER
The terminal compartment and terminal covers provide probe-safe frontal protecive covering of the terminal compartment.

BUSBARCOVER, SCREW-TYPE
The screw-type covers of 100 mm width are fixed at busbars with M12 thread or stud. The covers of 50 mm width are fixed on busbars or adapters with M8 thread.

BUSBAR SUPPORT
The 3-pole busbar support is used for the fixing of flat bars at 100 mm and 185 mm distances.

DOUBLE CONNECTOR
The connector kits are used for parallel switching of 2 strips.

DOUBLE TERMINAL CONNECTION
The kit for 1250 A allows 2 strips to be connected at the terminal and 3 or 4 cables per phase to be connected.

NAMEPLATE
The designation plate mount is plugged on the strips at the end face. It allows fitting of an additional designation plate. When fitted in switch boards, it can also be used as support for a system cover.

BUSBAR ADAPTERS
The adapters are required for combining different strip sizes, e.g. size 00 with sizes 1 to3.

DERIVED CONNECTION
The derived connection enables fuse-protected temporary connections (worksite electrical supply) to size 1 to 3 LV NV strip-fuseways.

Technical data on page 765

Strip type fuse-switch disconnectors type SL00 EK

Characteristics of the NV/NH Strip type fuse-switch-disconnectors
Strip type fuse-switch disconnector SL00/100 EK is a three-pole low-voltage switching device which enables safely manual connecting and disconnecting electrical circuits under load, depending on voltage and utilization category. It`s purpose is protection of low voltage electrical equipment against specified overload currents and short circuit currents using fuse-links size 000 (00C), 00. SL00/100 EK are three-pole switching.

Application
Strip type fuse-switch disconnectors are intended for:
- transformer substation
- distribution boards, distribution panels
- public lightening cabinets
- cable distribution cabinets
- industry

Mounting
Strip type fuse-switch disconnectors can be mounted on 100mm busbar system directly and with additional adapters can be mounted also to 185mm busbar system. Mounting in vertical and horizontal position.

Standards
SL00/100 EK are in accordance with the following standards:
- IEC 60947-1
- IEC 60947-3
- IEC 60269-1
- IEC 60269-2



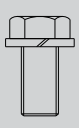
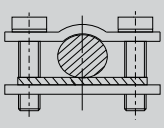
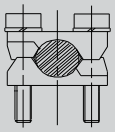
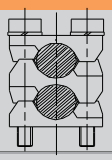
SL00/100 EK

Fuse-switch disconnector strip type SL00/100 EK, three pole switching

Type	Code No.	Weight [g]	Packaging [pcs]
SL00/100 EK 3p M8	001701500	1,20	1
SL00/100 EK 3p BT00 10-70	001701501	1,20	1
SL00/100 EK 3p OS00 6-50	001701502	1,10	1
SL00/100 EK 3p P00 10-70	001701503	1,10	1
SL00/100 EK 3p P002 50	001701505	1,30	1

* SL00/100 EK strip type fuse-switch disconnectors are used only for 100mm busbar system
** SL00/100 EK is possible to mount on 185mm busbar using special adapters
*** for Type of terminals see table of terminal for SL00/100 EK and VL00/100 EK
**** busbar connection for drill-free direct contacting of the strip type fuse-switch disconnector is not at disposal

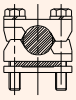
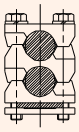
Table of connections for SL00/100 EK and VL00/100 EK

Cable terminal drawing					
Cable terminal type	M8	BT00 10-70*	OS00 6-50	P00 10-70	P002 50
Clamping cross-section	70 mm^2	10-70 mm^2 Al/Cu	(6-50) mm^2 Cu	(10-70) mm^2 Al/Cu	2x50 mm^2 Al/Cu
Screw type	M8x12	M6	2x(M5x14)	2x(M5x25)	2x(M5x40)
Tightening torque	12-15 Nm	4,5 Nm	2,6 Nm	4,5 Nm	4,5 Nm
Package	3	3	3	3	3

* connection type BT00 10-70 have to be ordered with the product, latter excahange is not possible

Technical data on page 769

Additional connections for SL00/100 EK

Type	Code No.	Connector drawing	Suitability	Packaging [pcs]
OS00 6-50	001701211	 Cu*	SL00/100 EK VL00/100 EK	set = 3
P00 10-70	001701213	 Al/Cu*	SL00/100 EK VL00/100 EK	set = 3
P002 50	001701467	 Al/Cu*	SL00/100 EK VL00/100 EK	set = 3

* cable Type for direct connection is indicated on the connection drawing
** exchange between connection Type is possible



RA-1 100/185



PRS-SL/VL EK



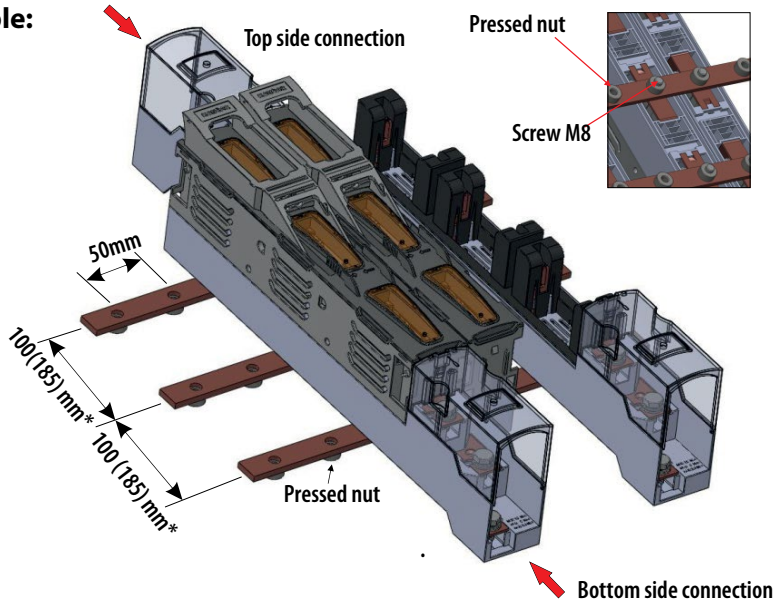
RA-2 100/185

Accesories for SL00/100 EK

Type	Code No.	Description	Weight [kg/pc]	Package [pcs]
PRS-SL/VL EK	001701470	Protection cover for connection terminals	0,05	1
RA-1 100/185	001701471	Mounting adapter for 185mm busbar, single	0,25	1
RA-2 100/185	001701472	Mounting adapter for 185mm busbar, double	0,60	1

* PRS-SL/VL EK is needed for additional protection covering when using mountin adapter RA-...
** RA-1 100/185 is adapter that is needed if one SL00/100 EK or VL00/100 EK have to be mounted on 185mm busbar. With adapter RA-2 100/185 two SL00/100 EK or VL00/100 EK can be mounted on 185mm busbar same time.

Example:



Technical data on page 769

NV/NH disconnectors with fuses

NV/NH horizontal fuse-switch disconnectors KVL

Uniform cover cutout

KVL - horizontal fuse-switch disconnectors with different sizes can be combined together and form uniform cover cutout. The new assortment contains four cover support levels at 32, 60, 70 and 90 mm above the uper of busbar. KVL fuse-switch disconnectors can be mounted on baseplates and DIN rails (for busbars see chapter ETIBUSBAR).

- Available with 1-, 2-, 3-, 4- pole versions
- Four sizes: size 00, size 1, size 2, size 3
- Use with NV/NH Fuse-links 000, 00, 1, 2, 3

Baseplate and DIN-rail mounting

KVL disconnectors have multiple mounting holes for variability of installations.
KVL-00 and KVL-1 can also be mounted on two parallel DIN-rails.



KVL size 00
Ie = 160A
Overall width: 106mm
System size: 195mm

KVL size 1
Ie = 250A
Overall width: 184mm
System size: 300mm

KVL size 2
Ie = 400A
Overall width: 210mm
System size: 300mm

KVL size 3
Ie = 630A
Overall width: 250mm
System size: 300mm

Practical advantages



Easy voltage measurements
- Easy access with standard voltage Testers.
Window in the handle is movable.
- Protection degree IP2XC in normal operating condition



Safety lock
- Prevents unauthorized operation
- Can be used for all sizes

Simple and practical parking position
- Safe parking position of the handle
- Accidental reclosing not possible

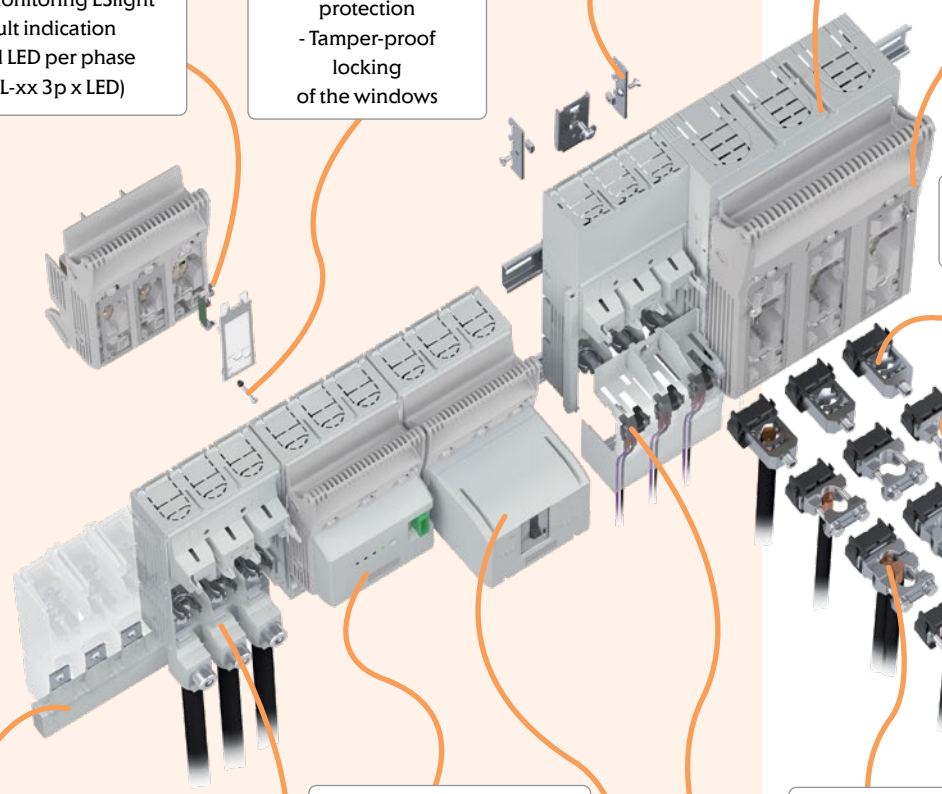


Montage on DIN rails
- Time saving installation
- KVL-00 and KVL-1 can fit on the same TH rails



New generation!

Advantages



Terminal cover
- extendable
-cable entry adjustable
(PRS KVL-x 3p)

DIN-rail fixing kit
for mounting on DIN-rails
- Used for KVL-00 and KVL-1
(DIN KVL-x 100-150)

For sealing disconnector
- For all sizes
- It is integrated in disconnector

Fuse-monitoring ESlight
Fault indication
- Red LED per phase
(KVL-xx 3p x LED)

Power theft protection
- Tamper-proof locking of the windows

Frame clamp
(SP KVL-x V)

Prism clamp (SP KVLx P1)

Clip terminal
(SP KVLx)

Prism clamp for 2-conductors connection
(SP KVLx P2)

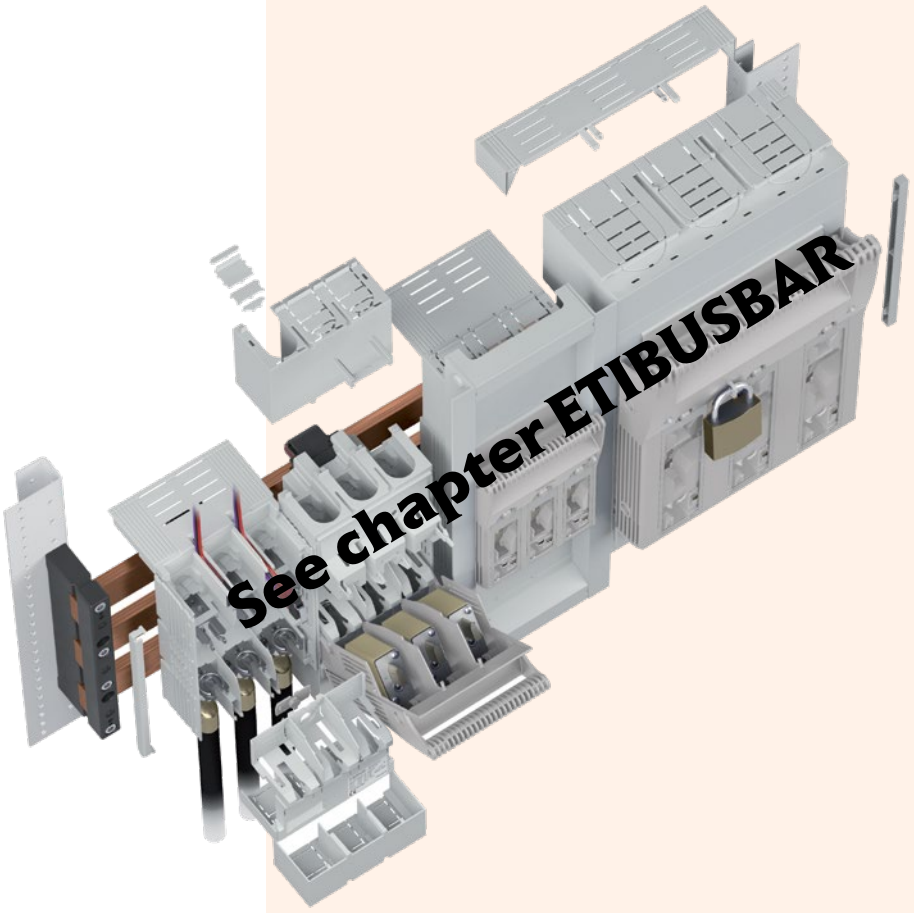
3-phase busbar
Feeding system is touch-protected
- Can feed up to to five KVL-00
(IZx KVL-00 3p)

Electronic fuse-monitoring unit (ES10)
The universal-solution for AC400-500V
- with stand-by indicator
- fault simulation
- selective fault indicator for fuse failure
(EFMU KVL-x 3p)

Mechanical fuse-monitoring unit
For use with NV/NH-fuse-links with striker (MFM KVL-x 1p/2p/3p)

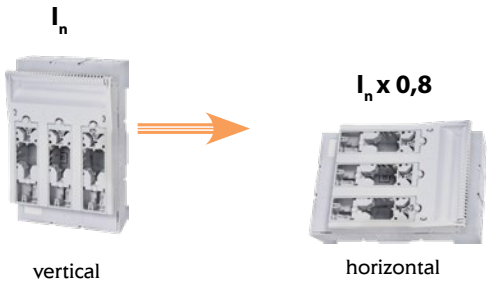
Feeding clamp
(25-95mm^2), touch-protected
- Used with KVL-00, terminal M8
(SP KVL-00 FC95)

Electromechanical fuse-monitoring unit AM
Monitoring with motor-protection switch
- For special applications AC690V/DC150V (MPFMU KVL-x 3p)

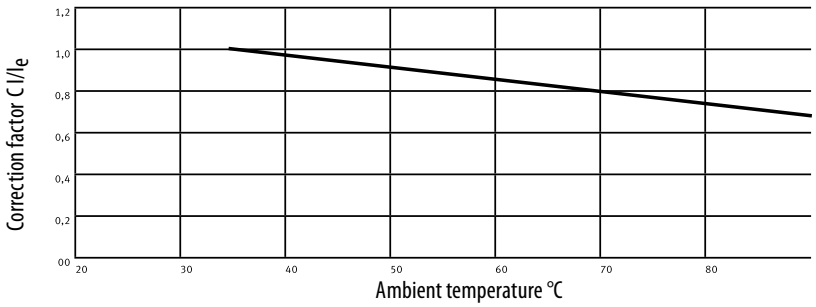


Derating factor: to operate the fuse switch disconnector in horizontal mounted position

The fuse switch disconnectors are designed to operate in both horizontal as well as vertical mounted positions. However the main field of application is for vertical mounting because the heat dissipation on this type of mounting is considerably low. To operate them on horizontal mounted position a derating factor has to be taken in to consideration.



Influence of ambient temperature on rated current of NH strip-type fuse-switch-disconnectors



Rated diversity factor acc to IEC EN 61439-2:2012-06 table 101

No. of main circuits	Rated diversity factor
2 & 3	0,9
4 & 5	0,8
6 ... 9	0,7
10 ≤	0,6

3-pole, Baseplate mounting

Size	Code No.	Type	Weight [kg]	Packaging [pcs]
00	001690870	KVL-00 3p M8-M8	0,63	1
	001690871	KVL-00 3p BC95-BC95	0,67	1
1	001690872	KVL-1 3p M10-M10	2,03	1
2	001690873	KVL-2 3p M10-M10	3,42	1
3	001690874	KVL-3 3p M10-M10	3,95	1
4a	001692620	HVL4a 3P M16 1250	15,7	1
4a	001692630	HVL4a 3P 2xM12 1600	15,7	1



BC95-BC95



3-pole, Baseplate mounting, LED indication

Size	Code No.	Type	Weight [kg]	Packaging [pcs]
00	001690880	KVL-00 3p M8-M8 LED	0,66	1
	001690881	KVL-00 3p BC95-BC95 LED	0,7	1
1	001690882	KVL-1 3p M10-M10 LED	2,06	1
2	001690883	KVL-2 3p M10-M10 LED	3,45	1
3	001690884	KVL-3 3p M10-M10 LED	3,92	1

! Only used for 400 V AC
! Not used for DC



1-pole, Baseplate mounting

Size	Code No.	Type	Weight [kg]	Packaging [pcs]
00	001690890	KVL-00 1p M8-M8	0,31	2
1	001690891	KVL-1 1p M10-M10	0,93	1
2-3	001690892	KVL-3 1p M10-M10	1,57	1
4a	001692498	HVL4a 1P M16 1250A	5,3	1
4a	001692499	HVL4a 1P 2xM12 1600A	5,3	1



2-pole, Baseplate mounting

Size	Code No.	Type	Weight [kg]	Packaging [pcs]
00	001690895	KVL-00 2p M8-M8	0,72	1
1	001690896	KVL-1 2p M10-M10	1,88	1
2-3	001690897	KVL-3 2p M10-M10	3,19	1



4-pole, Baseplate mounting

Size	Code No.	Type	Weight [kg]	Packaging [pcs]
00	001690900	KVL-00 4p M8-M8	1,19	1
1	001690901	KVL-1 4p M10-M10	2,91	1
2-3	001690902	KVL-3 4p M10-M10	5,76	1



Technical data on page 771


PRS KVL-00 1p


PRS KVL-00 1p S


SP KVL


SP KVL...P1


DIN KVL-00 100-150

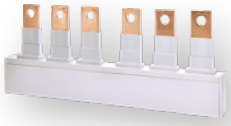

SP KVL-1 V

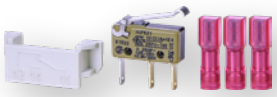

SP KVL-23 V


SP KVL-00 FC95


MTB KVL00
2x25/1x16/M8


MTB KVL00
4x10/M8


IZ2 KVL-00 3p


MST KVL- ...


MFM KVL-123 1p 2p 3p


PRS KVL-... 3p


CK KVL-00 2p/4p

Accessories for KVL

Type	Code No.	Description	Packaging min order [pcs]
SP KVL00	001692701	Clip terminal, 1,5 – 50 mm² Cu	3
SP KVL1	001692702	Clip terminal, 25– 150 mm² Cu	3
SP KVL2	001692703	Clip terminal, 25– 240 mm² Cu	3
SP KVL3	001692704	Clip terminal, 11x21 mm² Cu	3
SP KVL00 P1	001692760	Prism clamp, 10 – 70 mm² Al/Cu	3
SP KVL1 P1	001692761	Prism clamp, 70 – 150 mm² Al/Cu	3
SP KVL2 P1	001692762	Prism clamp, 120 – 240 mm² Al/Cu	3
SP KVL3 P1	001692763	Prism clamp, 120 – 300 mm² Al/Cu	3
SP KVL1 P2	001692764	Prism clamp for 2-conductors connection, 2x70 – 95 mm² Al/Cu	3
SP KVL2 P2	001692765	Prism clamp for 2-conductors connection, 2x120 – 150 mm² Al/Cu	3
SP KVL3 P2	001692766	Prism clamp for 2-conductors connection, 2x120 – 240 mm² Al/Cu	3
SP HVL 4a D2	001692767	Direct terminal clamp for 2-conductors connection, 2x120– 300mm² Al/Cu	1
SP HVL 4a D3	001692768	Direct terminal clamp for 3-conductors connection, 3x95 – 150 mm² Al/Cu	1
SP HVL 4a D4	001692769	Direct terminal clamp for 4-conductors connection, 4x95 – 150 mm² Al/Cu	1
SP KVL-1 V	001690940	Frame clamp, 35-150mm² Al/Cu	3
SP KVL-23 V	001690941	Frame clamp, 95-300mm² Al/Cu	3
SP KVL-00 FC95	001690942	Feeding clamp, 25-95mm² Cu/Al, isolated, terminal M8,*	3
MTB KVL00 2x25/1x16/M8	001690978	Terminal block with multiple wire connections	3
MTB KVL00 4x10/M8	001690979	Terminal block with multiple wire connections	3
IZ2 KVL-00 3p	001690943	Phase busbars, 2 x 3pole KVL-00 50mm²	5
IZ3 KVL-00 3p	001690944	Phase busbars, 3 x 3pole KVL-00 50mm²	5
IZ4 KVL-00 3p	001690945	Phase busbars, 4 x 3pole KVL-00 50mm²	3
IZ5 KVL-00 3p	001690946	Phase busbars, 5 x 3pole KVL-00 50mm²	3
MST KVL-00 1p	001690947	Switch position indicator, 1-pole, size 00, **	1
MST KVL-00 3p	001690948	Switch position indicator, 3-pole, size 00, **	1
MST KVL-123 1p/2p/3p	001690949	Switch position indicator, 1/2/3 -pole, size 1, 2, 3, **	1
MST 4a 1p+3p	001692714	Switch position indicator + mechanical fuse monitor, size 4a, 1p/3p	1
MFM KVL-00 1p/2p/3p	001690950	Mechanical fuse monitor, size 00, **	3
MFM KVL-123 1p/2p/3p	001690951	Mechanical fuse monitor, size 1, 2, 3, **, ***	3
PRS KVL-00 3p L	001690952	Terminal cover, 3-pole, variable to open, Length 66mm, size 00	2
PRS KVL-00 3p S	001690953	Terminal cover, 3-pole, variable to open, Length 36mm, size 00	2
PRS KVL-1 3p	001690954	Terminal cover, 3-pole, variable to open, Length 42mm, size 1	2
PRS KVL-2 3p	001690955	Terminal cover, 3-pole, variable to open, Length 42mm, size 2	2
PRS KVL-3 3p	001690956	Terminal cover, 3-pole, variable to open, Length 42mm, size 3	2
PRS KVL-00 1p L	001690957	Terminal cover, 1-pole, variable to open, Length 66mm, size 00	2
PRS KVL-00 1p S	001690958	Terminal cover, 1-pole, variable to open, Length 36mm, size 00	2
PRS KVL-1 1p	001690959	Terminal cover, 1-pole, variable to open, Length 42mm, size 1	2
PRS KVL-3 1p	001690960	Terminal cover, 1-pole, variable to open, Length 42mm, size 3	2
DIN KVL-00 100-150	001690964	DIN rail fixing parts, For mounting on DIN rails, size 00	3
DIN KVL-1 100-150	001690965	DIN rail fixing parts, For mounting on DIN rails, size 1	3
EFMU KVL-00 3p	001690966	Electronic fuse monitoring unit, 3-pole, size 00, ****	1
EFMU KVL-1 3p	001690967	Electronic fuse monitoring unit, 3-pole, size 1, ****	1
EFMU KVL-2 3p	001690968	Electronic fuse monitoring unit, 3-pole, size 2, ****	1
EFMU KVL-3 3p	001690969	Electronic fuse monitoring unit, 3-pole, size 3, ****	1
MPFMU KVL-00 3p	001690974	Elektromechanical fuse monitoring unit (AM), 3-pole, size 00, ****	1
MPFMU KVL-1 3p	001690975	Elektromechanical fuse monitoring unit (AM), 3-pole, size 1, ****	1
MPFMU KVL-2 3p	001690976	Elektromechanical fuse monitoring unit (AM), 3-pole, size 2, ****	1
MPFMU KVL-3 3p	001690977	Elektromechanical fuse monitoring unit (AM), 3-pole, size 3, ****	1
CK KVL-00 2p/4p	001690970	Connecting kit 2- and 4-pole, For making of 2- and 4-pole disconnectors, size 00	1
CK KVL-123 2p/4p	001690971	Connecting kit 2- and 4-pole, For making of 2- and 4-pole disconnectors, size 1, 2, 3	1
LP KVL-00123	001690972	Interlock device, locking with padlock, diameter 6mm max., size 00, 1, 2, 3	10
IC KVL-00123	001690973	Contact cover interlock, only be operated by tool, size 00-3	10

* Feeding clamp, AC690V/DC1000V-250A
** 1 Changeover, AC250V, 10/3A (ohmic/ind.)
*** Only in combination with ETI fuse-links with striker-pin; not in combination with frame-clamp or 2-wire-prism clamp.
**** For monitoring of fuse-links with live gripping lugs

! For other pictures of Accessories, see chapter ETIBUSBAR

Technical data on page 778

Horizontal fuse-switch disconnector type HVL EK size 000 and 00

Description
Horizontal fuse-switch disconnector type HVL EK is a low voltage device that provides switching of the circuits, depending on the voltage and use categories. The main purpose of HVL EK is installation of the NH fuses size 000 and 00, and protection of equipment from the harmful effects of short circuit and overload. If instead of NH fuses NH separators are installed, HVL EK provides disconnection function and meets all regulatory requirements in the open position.

Fields of use and features
Horizontal fuse-switch disconnectors are designed for use in a number of applications that require disconnection function. They are suitable for challenging the scope of the external electrical junction boxes, and public lighting, security cable branches in industrial applications and for the separation of distribution metering cabinets.
The program of horizontal fuse-switch disconnectors type HVL EK includes sizes 000 and 00 and is intended for mounting on a mounting plate, DIN rails and 60 mm busbar system. The standard offer includes 1-pole, 3-pole and 4-pole versions. Available is a wide range of different connections allowing great flexibility in use. Horizontal fuse-switch disconnectors HVL EK meet the requirements of the following standards:
IEC 60947-1,
IEC 60947-3,
IEC 60269-1,
IEC 60269-2-1

In horizontal fuse-switch disconnector type HVL EK 000 only NH knife-blade fuse links size 000 (00C) could be used while in horizontal fuse-switch disconnector type HVL EK 00 sizes 00 and 000 (00C) could be used. About additional warnings on products see technical part of the catalogue.

3-pole horizontal fuse-switch disconnector HVL EK 000

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 000 3p M8	001701000	0,58	1
HVL EK 000 3p OS00 6-16	001701001	0,52	1
HVL EK 000 3p OS00 25-50	001701002	0,58	1
HVL EK 000 3p P00 10-35	001701003	0,62	1
HVL EK 000 3p P00 50-70	001701004	0,63	1
HVL EK 000 3p P002 10-16	001701005	0,66	1
HVL EK 000 3p P002 25-35	001701006	0,67	1

* HVL EK 000 are ready for mounting on mounting plate or mounting on 35mm mounting rail without accessories
** connections are described in table of connections for HVL EK 000
*** given Type connector for the HVL EK means same connectors on both sides of HVL EK
**** different combinations of connections on both sides of the separator can be made with terminals that are available as accessories
***** highest clamp that can be placed on top side is P002 25-35, and on bottom side P002 50



1-pole horizontal fuse-switch disconnector HVL EK 000

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 000 1p M8	001701400	0,23	3
HVL EK 000 1p OS00 6-16	001701401	0,22	3
HVL EK 000 1p OS00 25-50	001701402	0,22	3
HVL EK 000 1p P00 10-35	001701403	0,24	3
HVL EK 000 1p P00 50-70	001701404	0,24	3
HVL EK 000 1p P002 10-16	001701405	0,25	3
HVL EK 000 1p P002 25-35	001701406	0,25	3

* HVL EK 000 are ready for mounting on mounting plate or mounting on 35mm mounting rail without accessories
** connections are described in table of connections for HVL EK 000
*** two-pole design can be done using two single-pole
**** highest clamp that can be placed on top side is P002 25-35, and on bottom side P002 50





4-pole horizontal fuse-switch disconnector HVL EK 000

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 000 4p M8	001701420	0,82	1

* HVL EK 000 are ready for mounting on mounting plate or mounting on 35mm mounting rail without accessories
** connections are described in table of connections for HVL EK 000
*** switching off neutral pole (N) same time as switching phase polarity
**** highest clamp that can be placed on top side is P002 25-35, and on bottom side P002 50



3-pole horizontal fuse-switch disconnector HVL-B EK 000 (5-10mm Busbar)

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL-B EK 000 3p M8	001701011	0,85	1
HVL-B EK 000 3p BT00 10-70	001701012	0,88	1

* HVL-B EK 000 are ready for mounting on 60mm busbar system, 5-10 mm thick
** connections are described in table of connections for HVL EK 000
*** connector BT00 10-70 in combination with HVL-B EK have clamping cross-section up to 50mm2.
**** connecting from top/bottom (read installation manual carefully to avoid wrong connection!)
***** for additional remarks on product see technical part of the catalogue.
****** highest clamp that can be placed on top side is P002 25-35, and on bottom side P002 50



3-pole horizontal fuse-switch disconnector HVL-P EK 000 (flat bar connection)

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL-P EK 000 3p M8	001701013	0,59	1
HVL-P EK 000 3p OS00 6-50	001701014	0,53	1
HVL-P EK 000 3p P00 10-70	001701015	0,59	1

* HVL-P EK 000 are ready for mounting on mounting plate or mounting on 35mm mounting rail without accessories
** HVL-P EK 00 are supplied with extra protective covering of connectors on the bottom side (PRS EK 000/3)
*** connections are described in table of connections for HVL EK 000
**** highest clamp that can be placed on top side is P002 25-35, and on bottom side P002 50

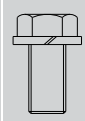
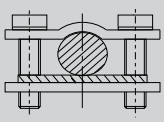
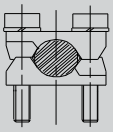
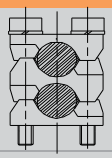


Accessories for HVL EK 000

Type	Code No.	Description	Weight [kg/pc]	Packaging [pcs]	Min order [pcs]
PRS EK 000/1	001701450	Protecting cover, 1p	0,02	set = 2	1 set
PRS EK 000/3	001701451	Protecting cover, 3p	0,03	set = 2	1 set
PRS-B EK 000/3	001701452	Protecting cover, 3p	0,03	set = 2	1 set

* PRS EK 000... to be used for HVL EK 000, supplied in pairs covering the TOP and BOTTOM side
** PRS-B EK 000 to be used for HVL-B EK 000, supplied in pairs covering the TOP and BOTTOM side

Table of connections for HVL EK 000

Cable terminal drawing									
Cable terminal type	M8	BT00 10-70	OS00 6-16	OS00 25-50	P00 10-35	P00 50-70	P002 10-16	P002 25-35	P002 50
Clamping cross-section	70 mm^2	10-50 mm^2 Al/Cu	(6-16) mm^2 Cu	(25-50) mm^2 Cu	(10-35) mm^2 Al/Cu	(50-70) mm^2 Al/Cu	2x(10-16) mm^2 Al/Cu	2x(25-35) mm^2 Al/Cu	2x50 mm^2 Al/Cu
Screw type	M8x12	M6	2x(M5x12)	2x(M5x14)	2x(M5x20)	2x(M5x25)	2x(M5x25)	2x(M5x30)	2x(M5x35)
Tightening torque	12-15 Nm	4,5 Nm	2,6 Nm	2,6 Nm	4,5 Nm	4,5 Nm	4,5 Nm	4,5 Nm	4,5 Nm
Package	3	3	3	3	3	3	3	3	3

* basic type of HVL EK 000 is screw connection M8
** connector BT00 10-70 at disposal only in combination with HVL-B EK for busbar (HVL-B EK 000 3p BT00 10-70)
*** HVL EK 00 allows an easy change of mutual connections (except BT00 10-70)

Technical data on page 783, 785, 786

3-pole horizontal fuse-switch disconnector HVL EK 00

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 00 3p M8	001701250	0,65	1
HVL EK 00 3p OS00 6-50	001701251	0,63	1
HVL EK 00 3p P00 10-70	001701252	0,69	1
HVL EK 00 3p P00 35-95	001701255	0,72	1
HVL EK 00 3p BT00 10-70	001701256	0,66	1

* HVL EK 00 are ready for mounting on mounting plate
** basic Type of HVL EK 000 is screw connection M8
*** connections are described in table of connection s for HVL EK 00
**** clamps that can be placed on top side are OS00 and P00 , while on bottom side there is no limitation (see table range of connections for HVL EK 000/00)
***** For clamp limitation, see table of accessories



1-pole horizontal fuse-switch disconnector HVL EK 00

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 00 1p M8	001701410	0,28	3
HVL EK 00 1p OS00 6-50	001701411	0,26	3
HVL EK 00 1p P00 10-70	001701412	0,28	3
HVL EK 00 1p P00 35-95	001701415	0,30	3
HVL EK 00 1p BT00 10-70	001701416	0,28	3

* HVL EK 00 are ready for mounting on mounting plate
** basic Type of HVL EK 000 is screw connection M8
*** connections are described in table of connections for HVL EK 00
**** two-pole design can be made using two single-pole
***** For clamp limitation, see table of accessories



4-pole horizontal fuse-switch disconnector HVL EK 00

Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL EK 00 4p M8	001701430	0,92	1
HVL EK 00 4p BT00 10-70	001701431	0,92	1

* HVL EK 00 are ready for mounting on mounting plate
** basic Type of HVL EK 000 is screw connection M8
*** connections are described in table of connection s for HVL EK 00
*** switching off neutral pole (N) same time as switching phase polarity
***** For clamp limitation, see table of accessories

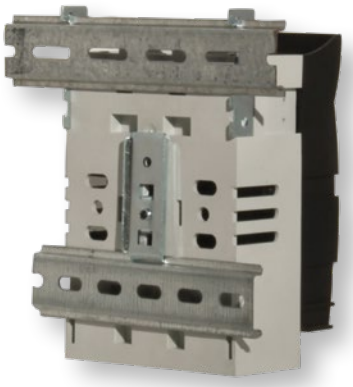


3-pole horizontal fuse-switch disconnector HVL-P EK 00 (additional flat bar connection)

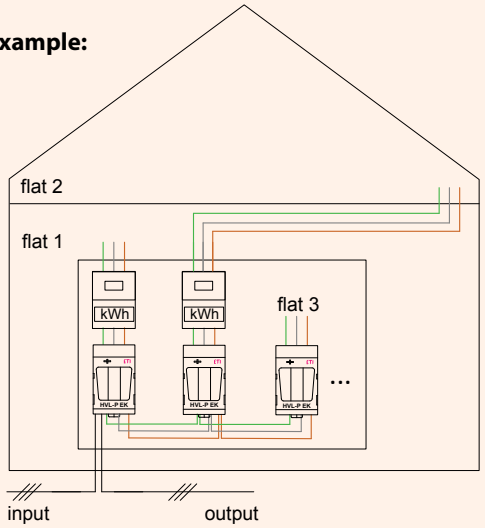
Type	Code No.	Weight [kg/pc]	Packaging [pcs]
HVL-P EK 00 3p M8	001701260	0,67	1
HVL-P EK 00 3p OS00 6-50	001701261	0,65	1
HVL-P EK 00 3p P00 10-70	001701262	0,71	1

* HVL-P EK 00 are ready for mounting on mounting plate
** HVL-P EK 00 are supplied without any extra protective covering of connectors
*** connections are described in table of connection s for HVL EK 00
***** For clamp limitation, see table of accessories





Example:

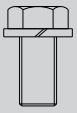
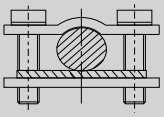
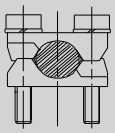
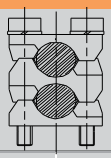


Accesories for HVL EK 00

Type	Code No.	Description	Packaging [pcs]
DIN EK 00 125-150	001701453	Mounting brackets for mounting on two rails 35mm	1 set

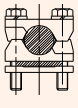
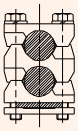
* DIN EK 00 125-150 set allows to mount HVL EK 00 on two mounting rails in distance of 125mm or 150mm.

Table of connections for HVL EK 00

Cable terminal drawing							
Cable terminal type	M8	BT00 10-70*	OS00 6-50	P00 10-70	P00 35-95*	P002 10-35	P002 50
Clamping cross-section	70 mm^2	10-70 mm^2 Al/Cu	(6-50) mm^2 Cu	(10-70) mm^2 Al/Cu	(35-95) mm^2 Al/Cu	2x(10-35) mm^2 Al/Cu	2x50 mm^2 Al/Cu
Screw type	M8x12	M6	2x(M5x14)	2x(M5x25)	2x(M5x30)	2x(M5x30)	2x(M5x40)
Tightening torque	12-15 Nm	4,5 Nm	2,6 Nm	4,5 Nm	4,5 Nm	4,5 Nm	4,5 Nm
Package	3	3	3	3	3	3	3

* connections P00 35-95 and BT00 10-70 should be orderd with fuse-switch disconnector while latter exchange is not possible
** basic type of HVL EK 00 is screw connection M8
*** HVL EK 00 allows an easy change of mutual connections (except BT00 10-70 and P00 35-95)

Accessories for HVL EK 000/00 (connectors)

Type	Code No.	Connector drawing	Suitability	Packaging [pcs]
OS00 6-16	001701460	 Cu**	HVL EK 000	set = 3
OS00 25-50	001701461		HVL EK 000	set = 3
OS00 6-50	001701480		HVL EK 00	set = 3
P00 10-35	001701462	 Cu/Al**	HVL EK 000	set = 3
P00 50-70	001701463		HVL EK 000	set = 3
P00 10-70	001701481		HVL EK 00	set = 3
P00 35-95*	001701464		HVL EK 00	set = 3
P002 10-16	001701465	 Cu/Al**	HVL EK 000	set = 3
P002 25-35	001701466		HVL EK 000	set = 3
P002 10-35	001701482		HVL EK 00***	set = 3
P002 50	001701467		HVL EK 000, 00 ***	set = 3
P002 35-70*	001701468		HVL EK 00***	set = 3

* because of wider screw distance change is only possible between these two Types of connections (however always possible to change connections OS with P00 and P002 and vice versa only the exceptions are marked with '*')
** Type of cable for direct connection is given on connector drawing
*** Double prism clamp (P002) can be used only on bottom side of HVL EK 00, while on top side clamps (OS00 and P00) remain

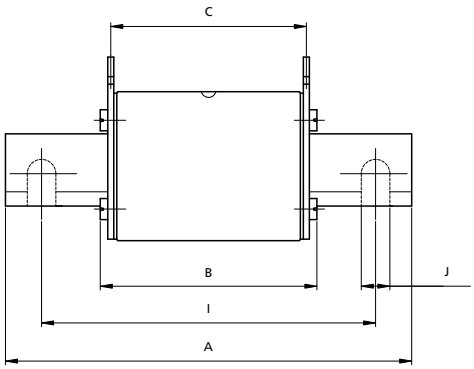
Technical data on page 786

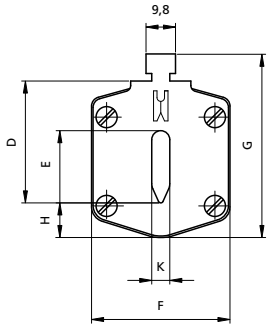
Fuse Links NV/NH

Electrical characteristics	
Rated voltage U_n	400 V AC, 500 V AC, 690 V AC
Rated current I_n	2 - 1600 A
Breaking capacity U_n	120 kA, 100 kA, 50 kA
Melting characteristic	gG, aM, gF, gTr
Certified	DIN VDE0636-201 (1998-06)
In accordance with	IEC 60269-1:2005 / EN 60269-1:1998+A1:2005 IEC 60269-2:1986+Corr.1:1996+A11995+A2:2001 / EN 60269-2:1995+A1:1998+A2:2002 IEC 60269-2-1:2004 / HD 60269-2-1:2005
Dimensions according to	DIN43620 Part: 1 - 4
Two versions of covers	aluminium and plastic

Fuse Links NV/NH gG Dimensions

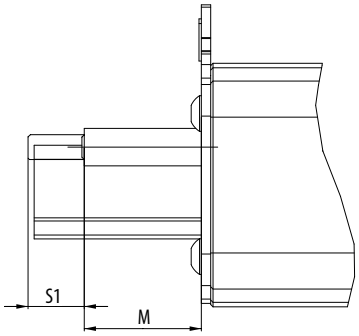
Type	Dimensions											
	A	B	C	D	E	F	G	H	I	J	K	
NV00C	79	53	47	35	15	21	52	7,5			6	KOMBI
NV00C I	79	53	47	35	15	21	52	7,5			6	KOMBI
NV00	79	53	47	35	15	28	56	12			6	KOMBI
NV00 I	79	53	47	35	15	28	56	12			6	KOMBI
NV0	125	68	65	35	15	28	56	12			6	KOMBI
NV1C	135	68	65	40	15	28	61	12			6	KOMBI
NV1C I	135	68	65	40	15	28	61	12			6	KOMBI
NV1	135	72	65	40	20	46	65	14			6	KOMBI
NV1 I	135	72	65	40	20	46	65	14			6	KOMBI
NV2C	150	72	65	48	20	46	73	14			6	KOMBI
NV2C I	150	72	65	48	20	46	73	14			6	KOMBI
NV2	150	72	65	48	26	54	73	14			6	KOMBI
NV2 I	150	72	65	48	26	54	73	14			6	KOMBI
NV3C	150	72	65	60	26	54	84	14			6	KOMBI
NV3	150	72	65	60	33	65	84	14			6	KOMBI
NV4	200	75	66	87	50	100	121	24	150	16	8	
NV4a	200	99	87	85	50	95	121	27			6	
NV4a SI*	200	99	87	85	50	95	121	27			6	

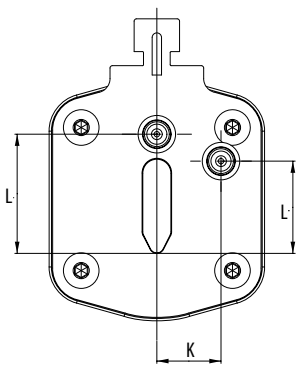




Fuse Links NV/NH gG with Striker Pin Dimensions

Type	Dimensions			
	K	L	M	S1
00C	0	20.7	16.7	7.5
00	0	20.7	16.7	7.5
1	13.7	19.7	25	12
2	16.2	27.4	25	12
3	17	35.6	25	12
4a	24	49	25	12

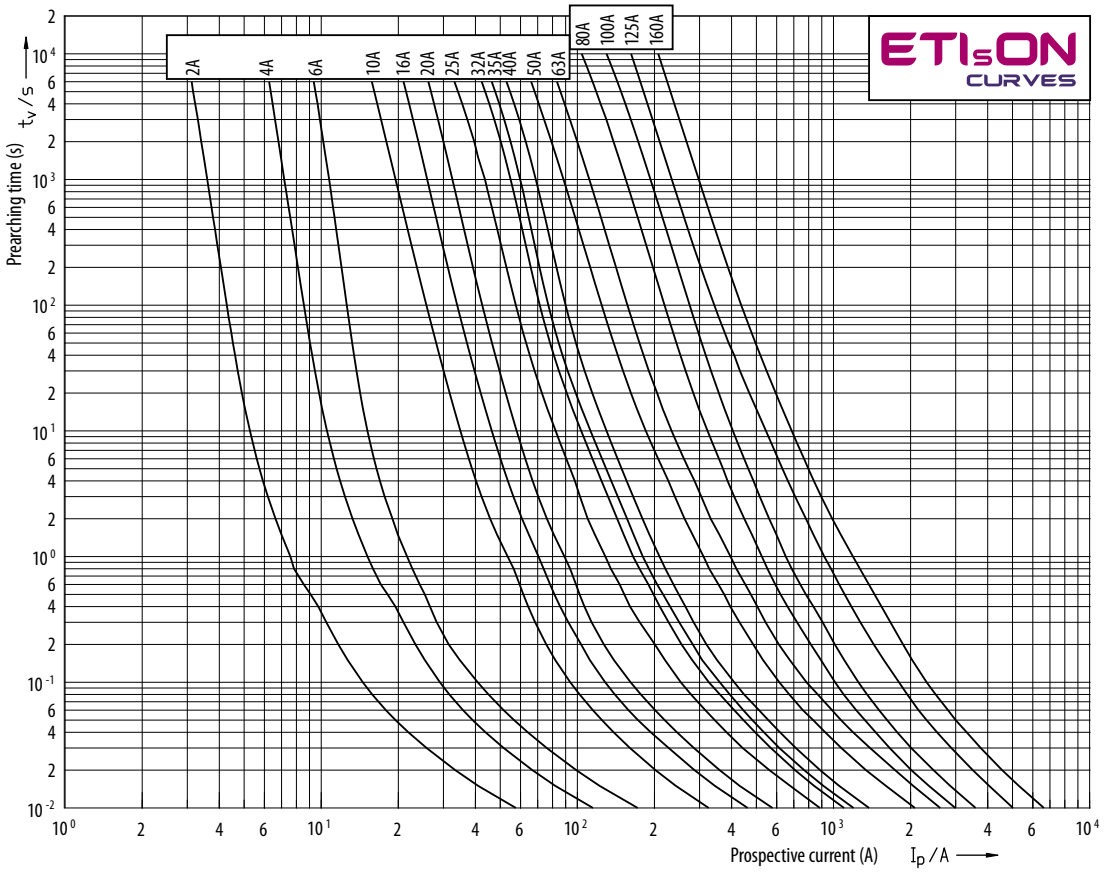




Fuse-link NV/NH gG characteristics

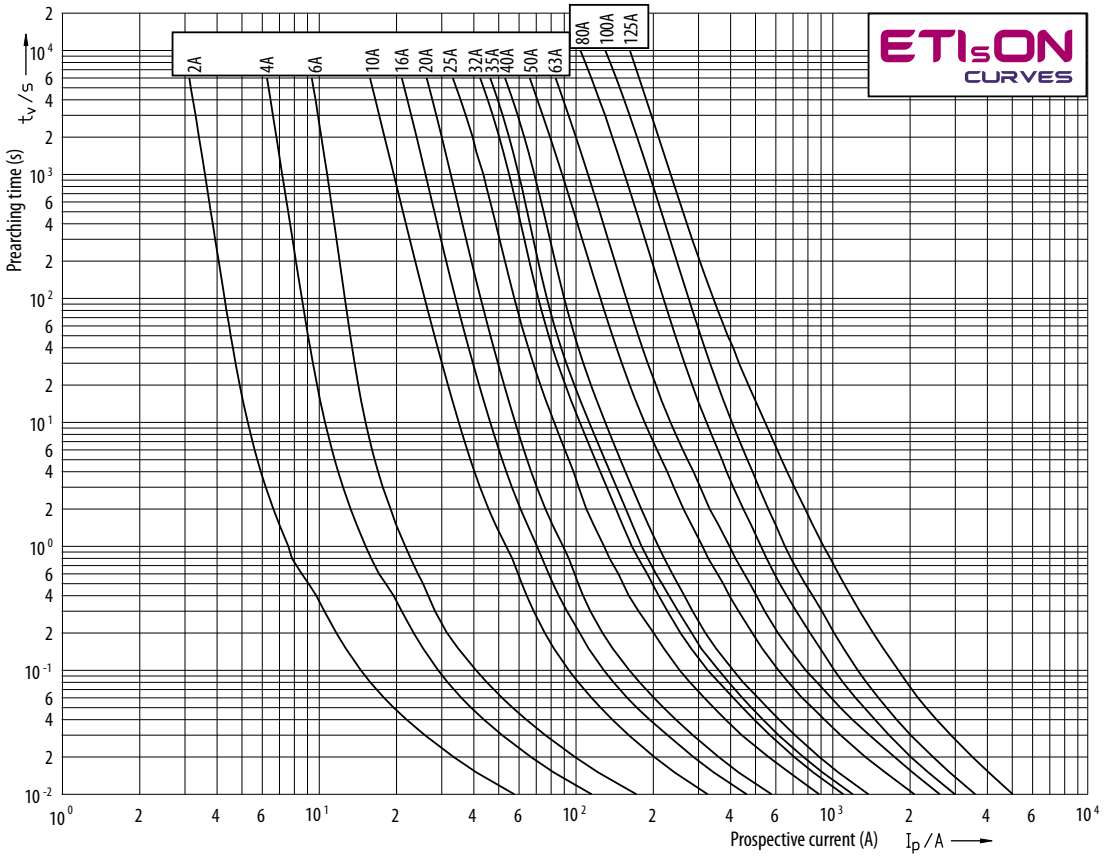
NH000 400V

Time current characteristics I/t, gG



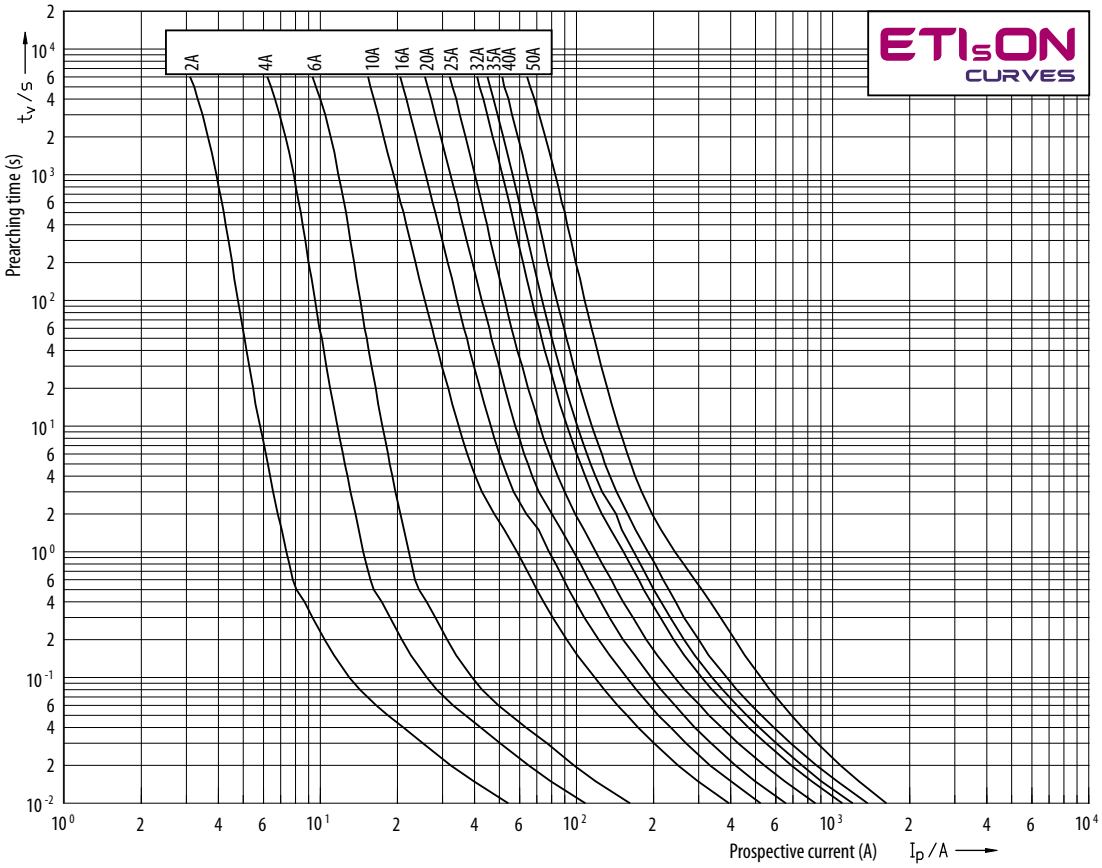
NH000 500V

Time current characteristics I/t, gG



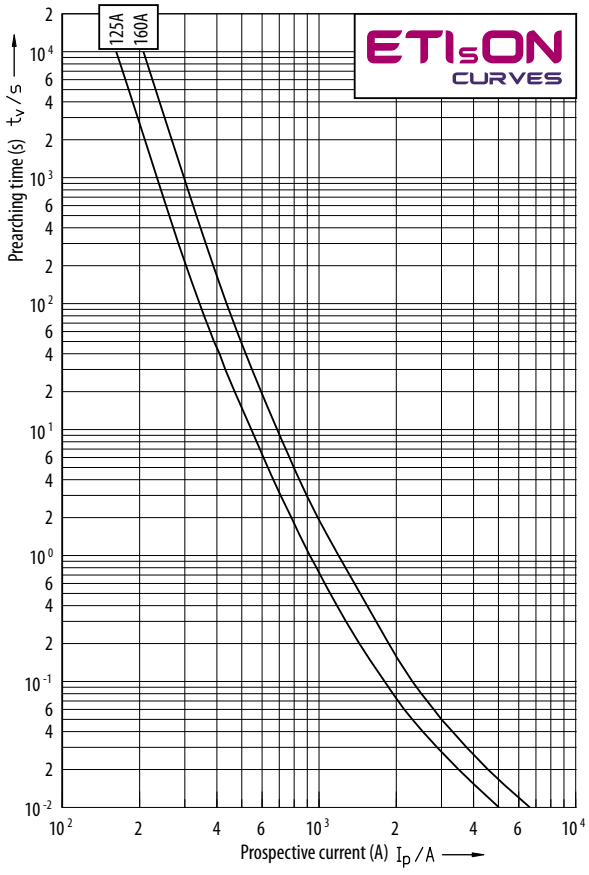
NH000 690V

Time current characteristics I/t, gG



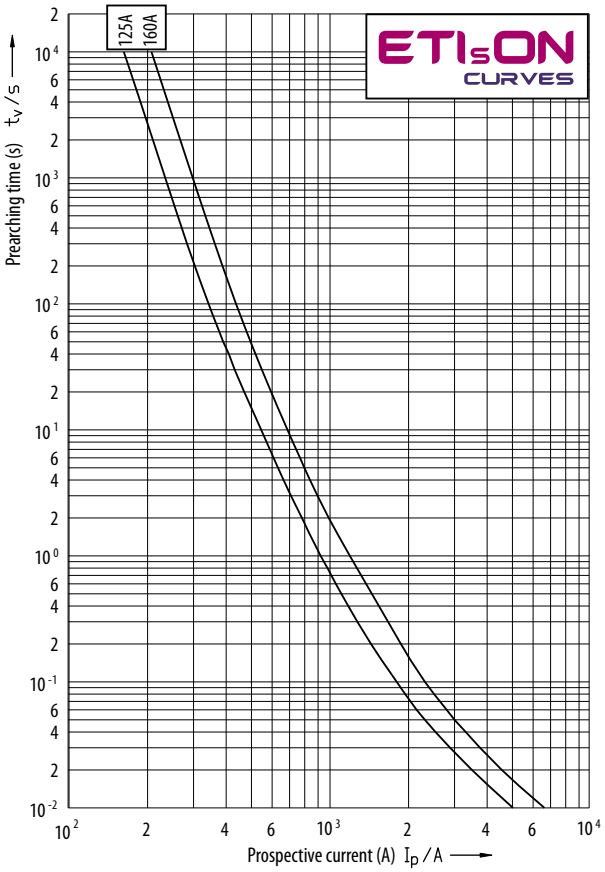
NH00 400V

Time current characteristics I/t, gG



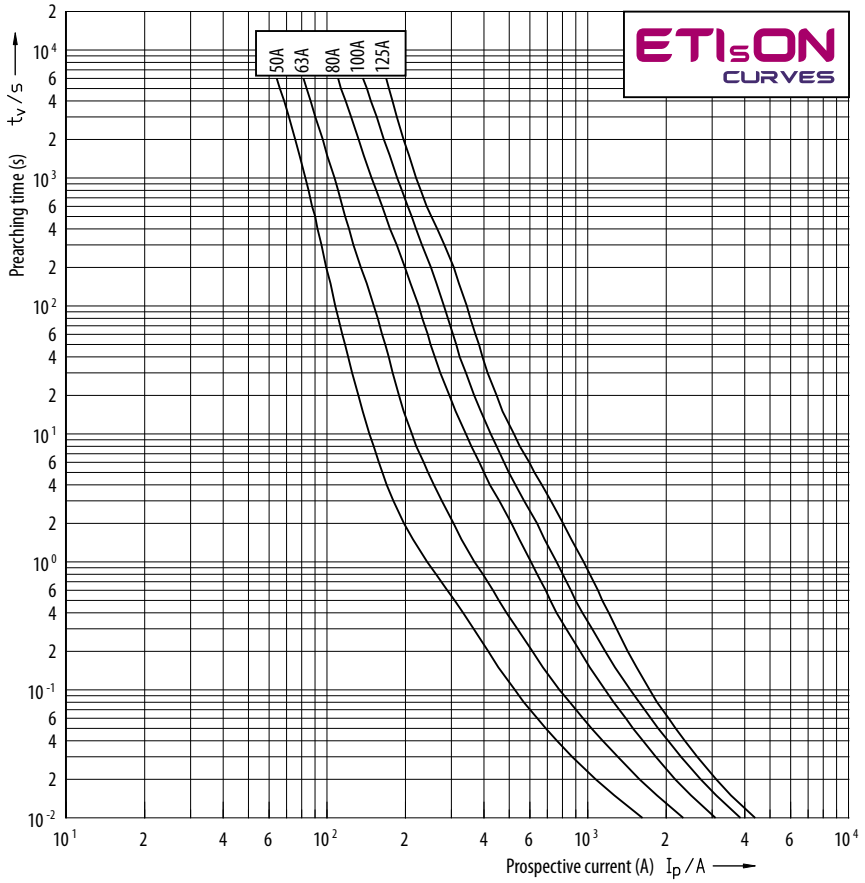
NH00 500V

Time current
characteristics
I/t, gG



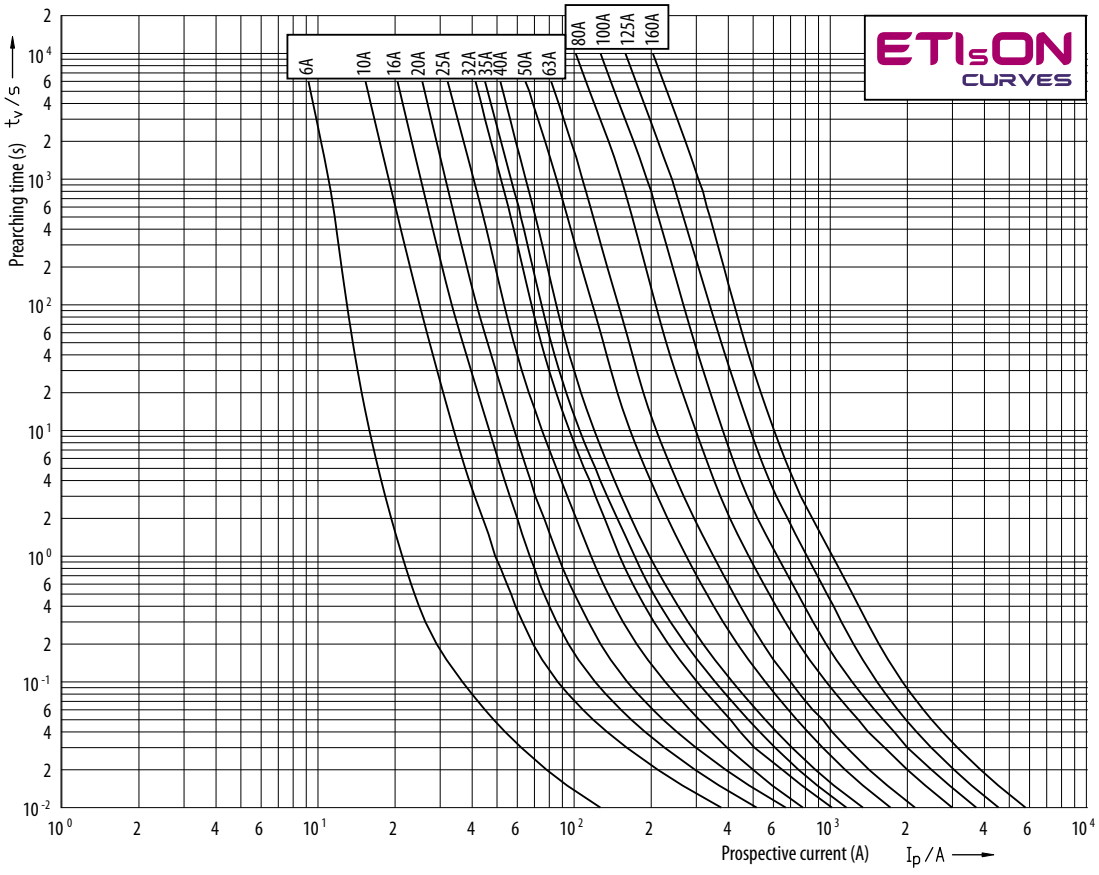
NH00 690V

Time current characteristics I/t, gG



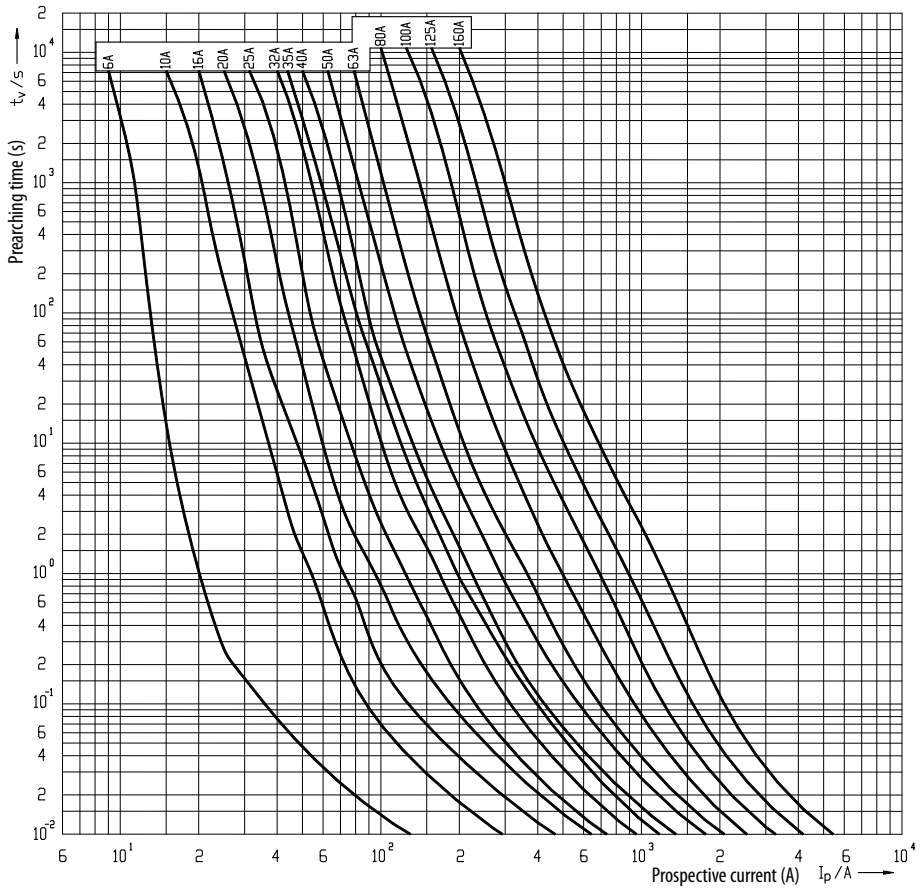
NH0, NH1C 400V

Time current characteristics I/t, gG

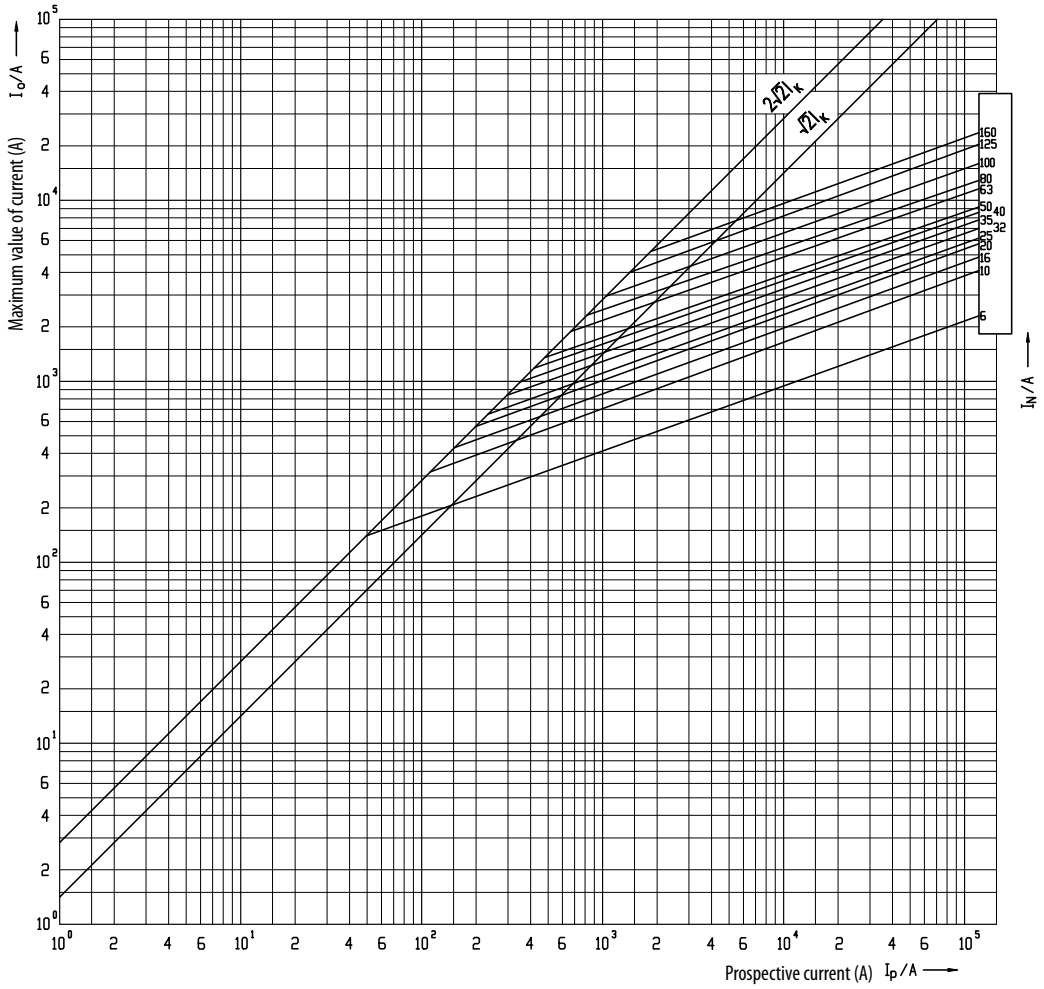


NH0, NH1C 500V

Time current characteristics I/t, gG

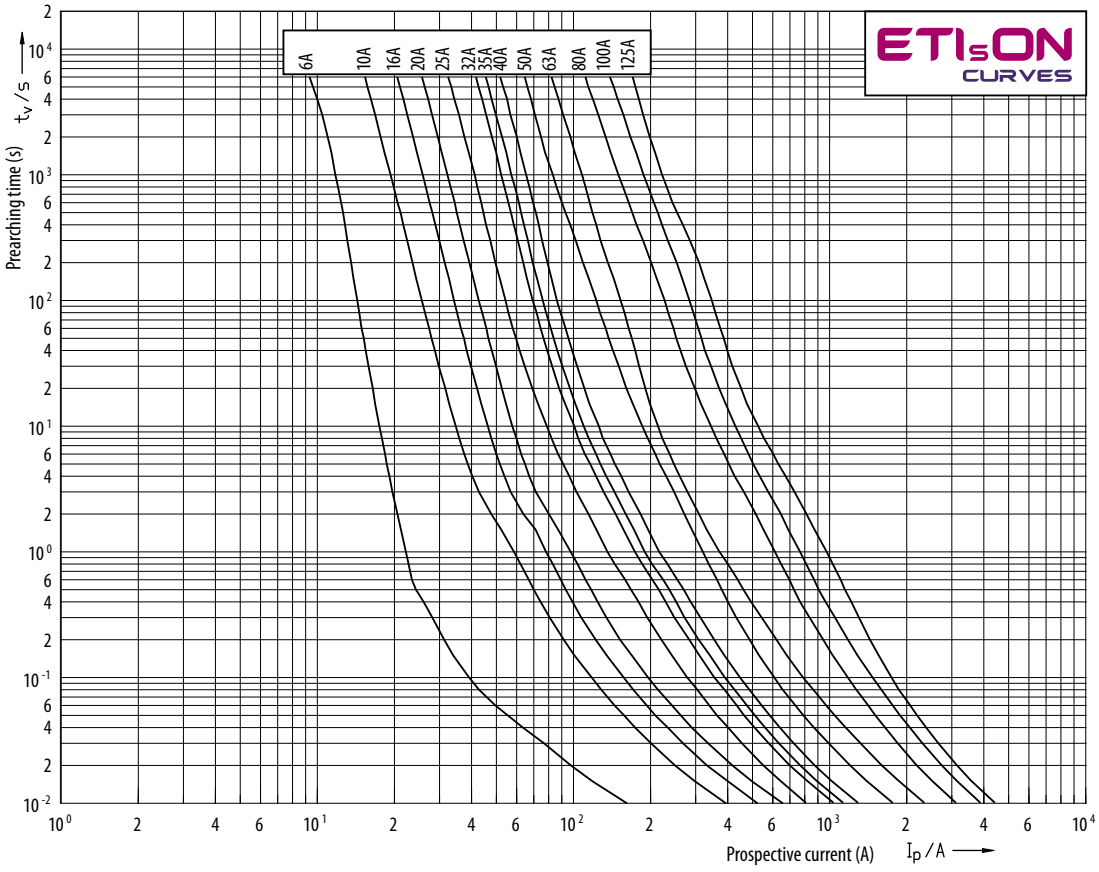


Cut-off current characteristics



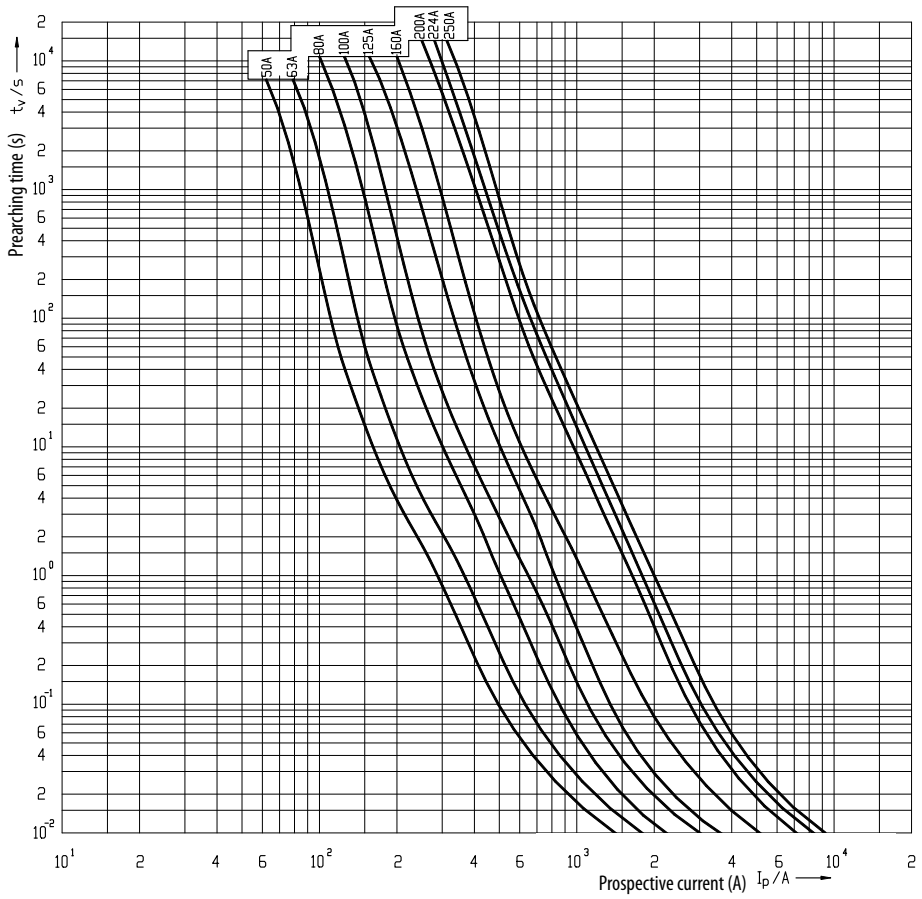
NH0, NH1C 690V

Time current characteristics I/t, gG

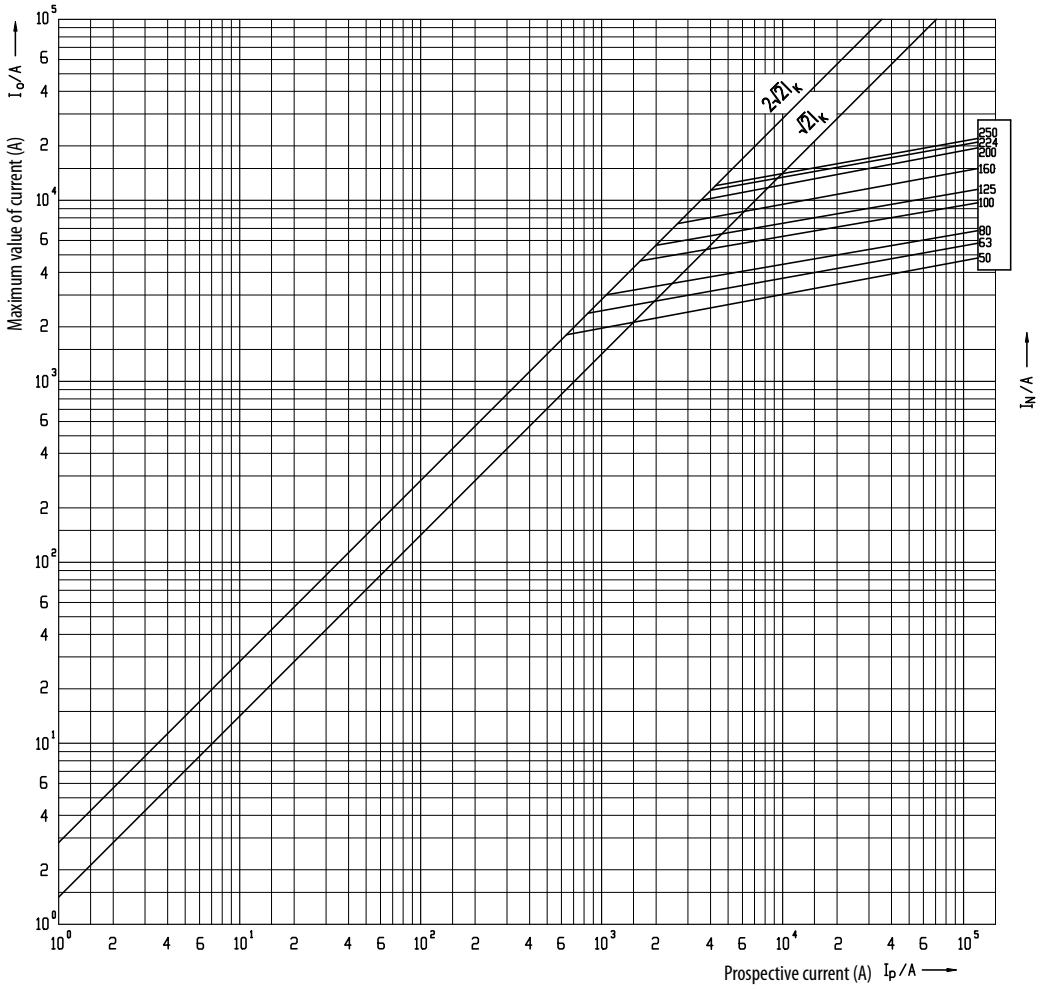


NH1 400V

Time current characteristics I/t, gG

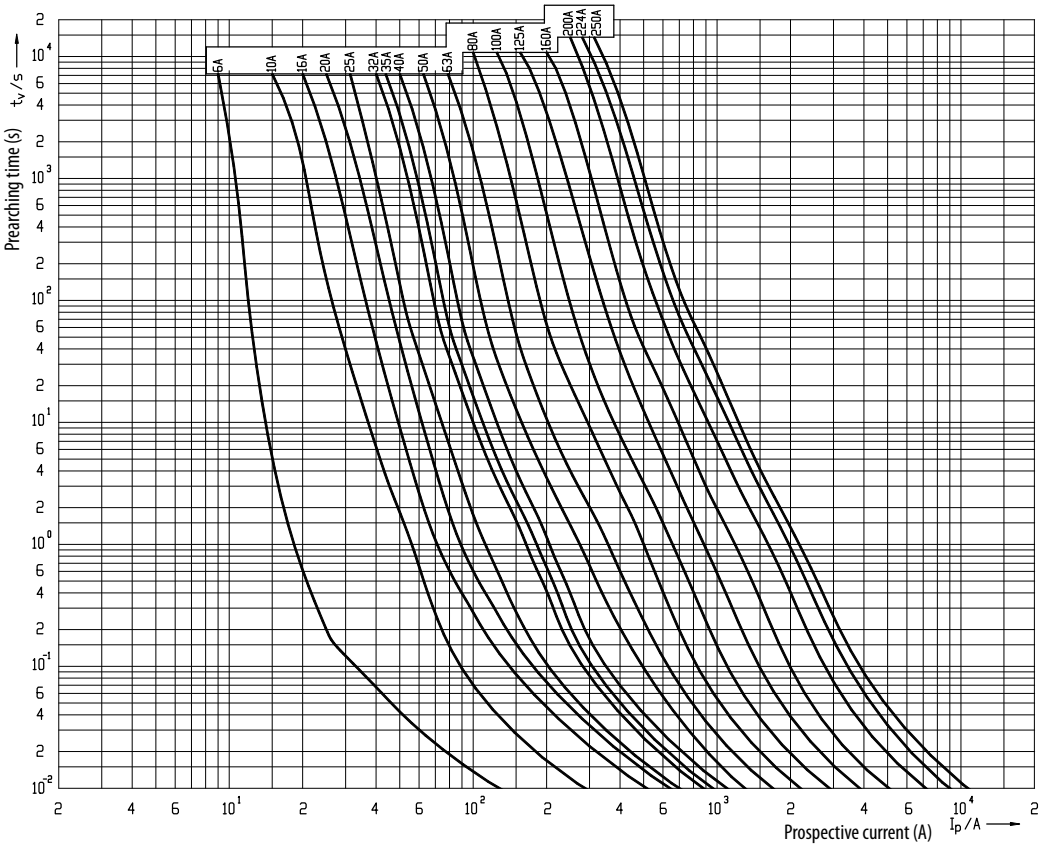


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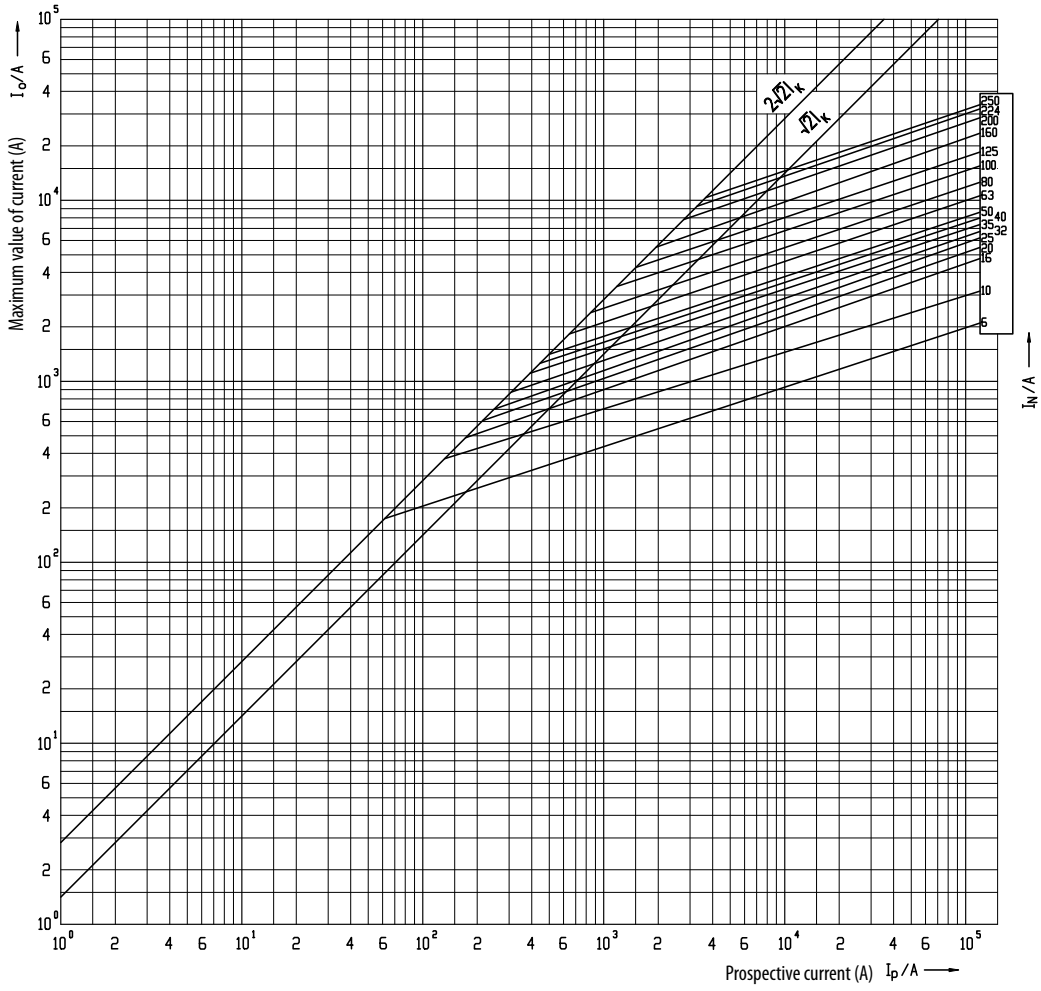


NH1 500V

Time current characteristics I/t, gG

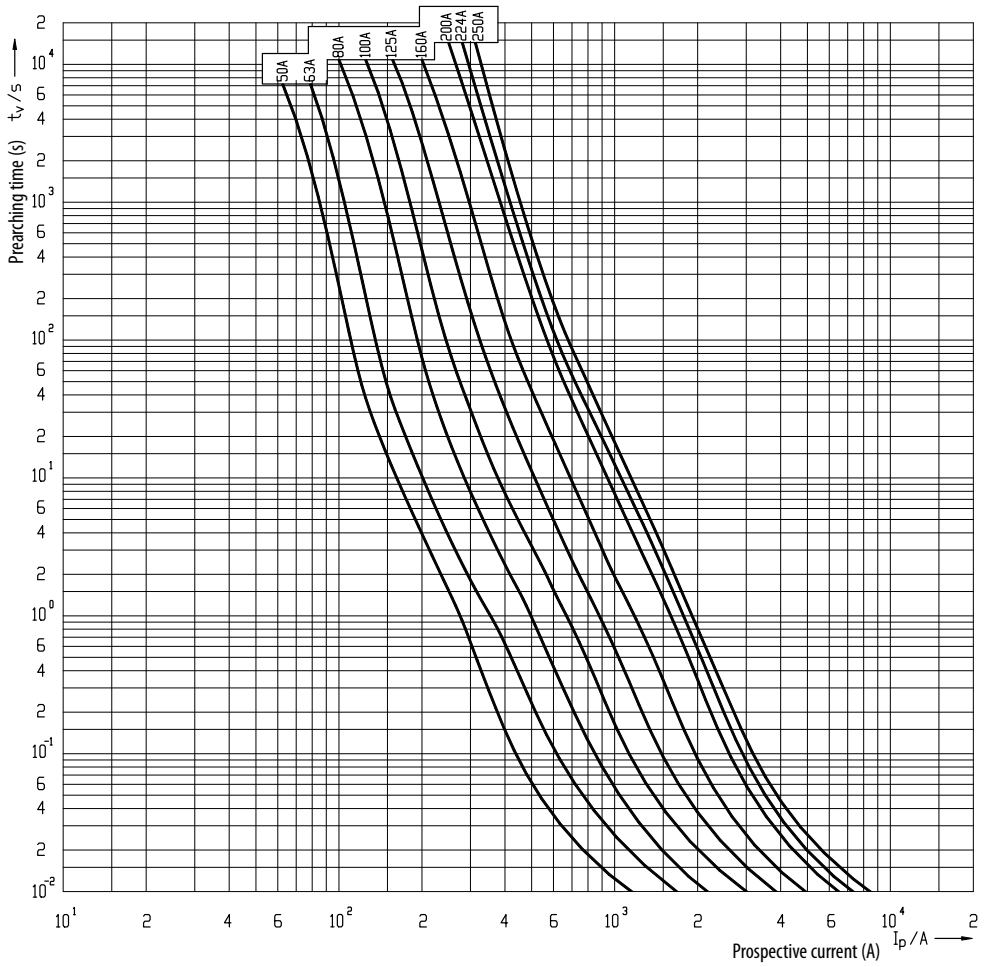


Cut-off current characteristics

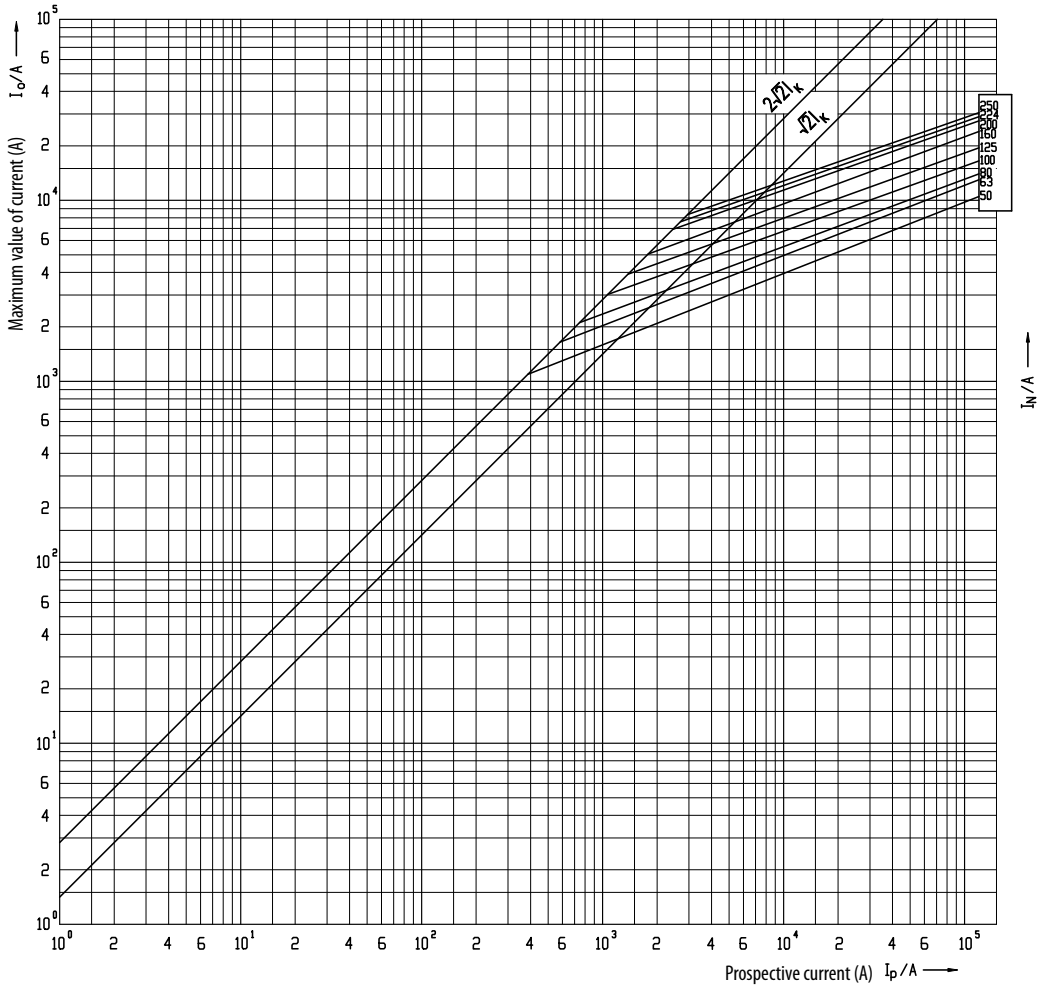


NH1 690V

Time current characteristics I/t, gG

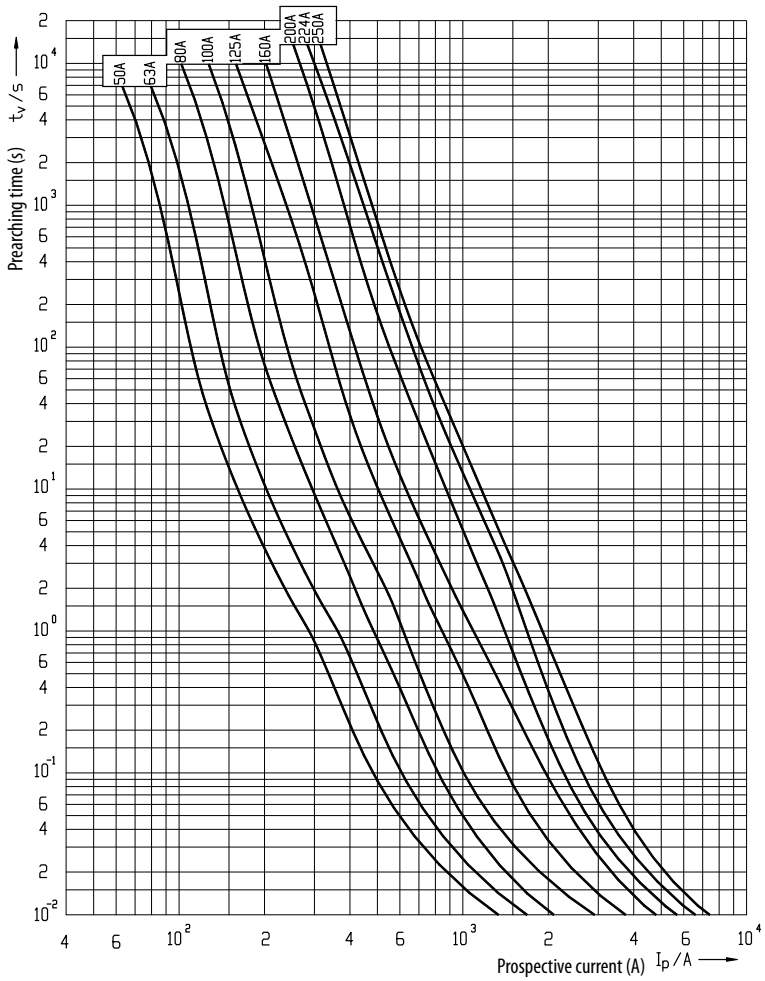


Cut-off current characteristics

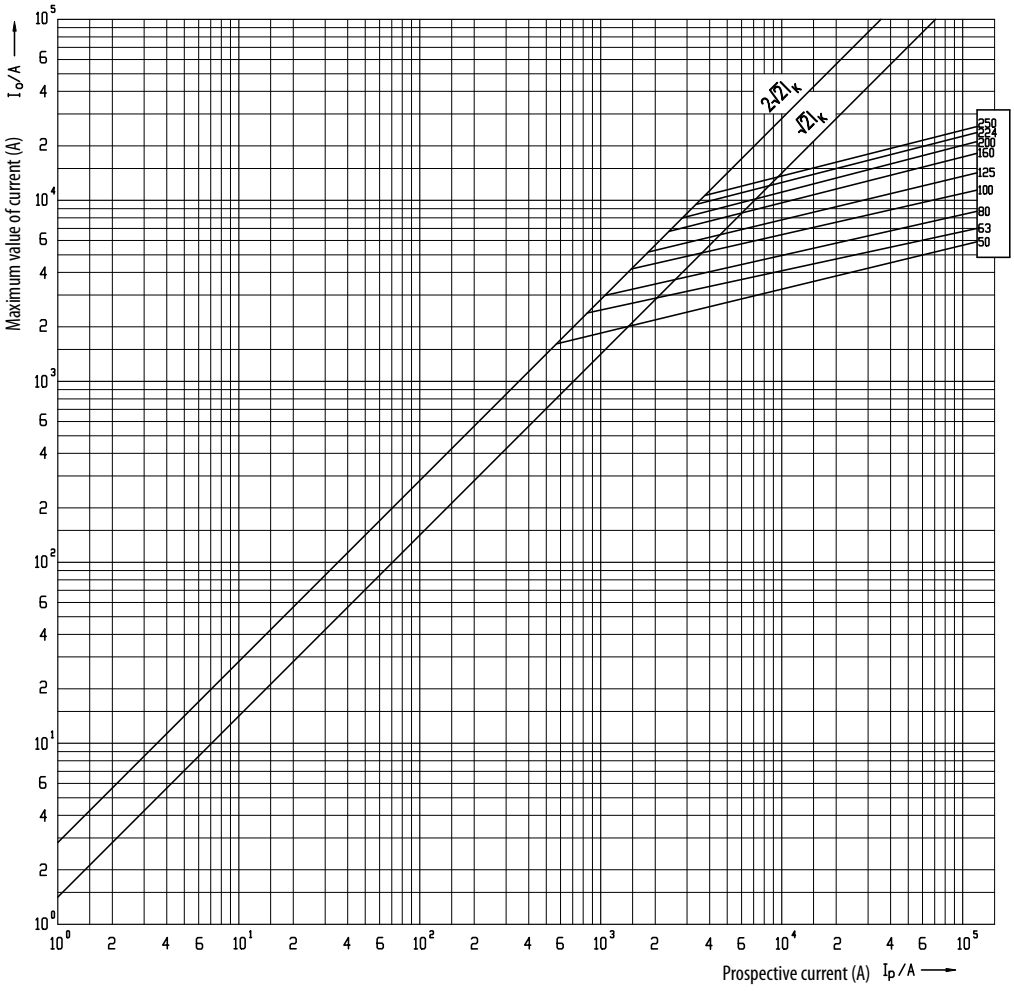


NH2C 400V

Time current characteristics
I/t, gG

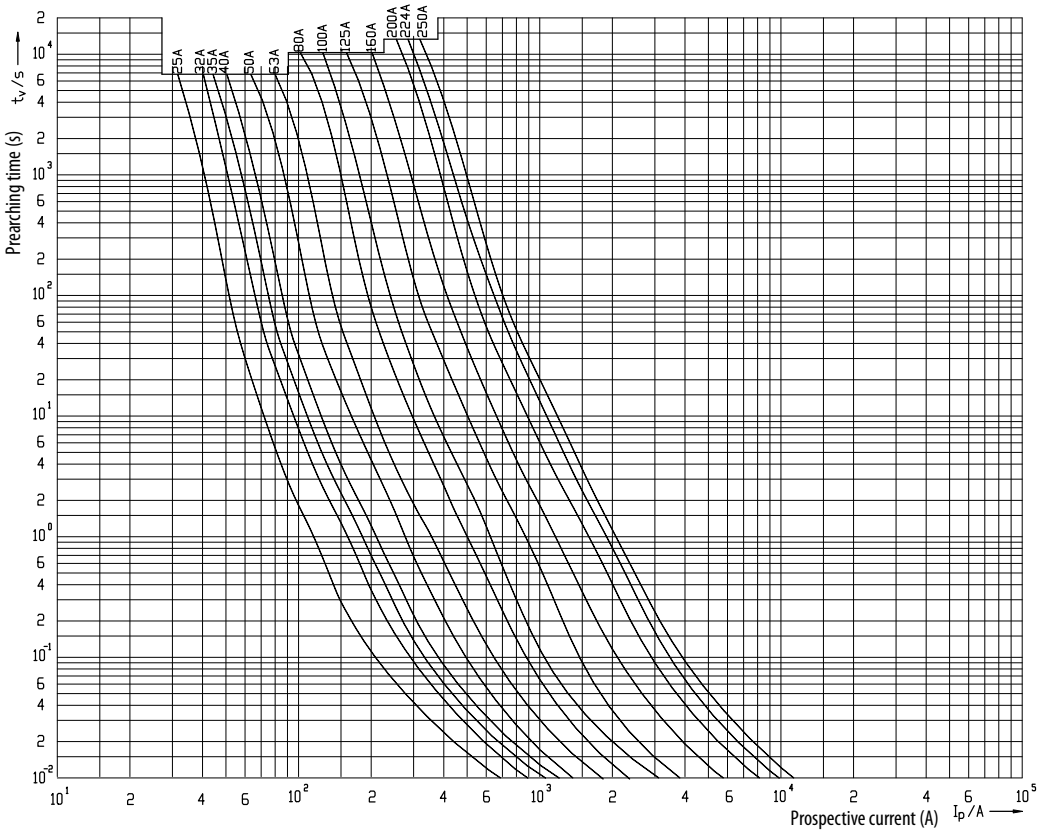


Cut-off current characteristics

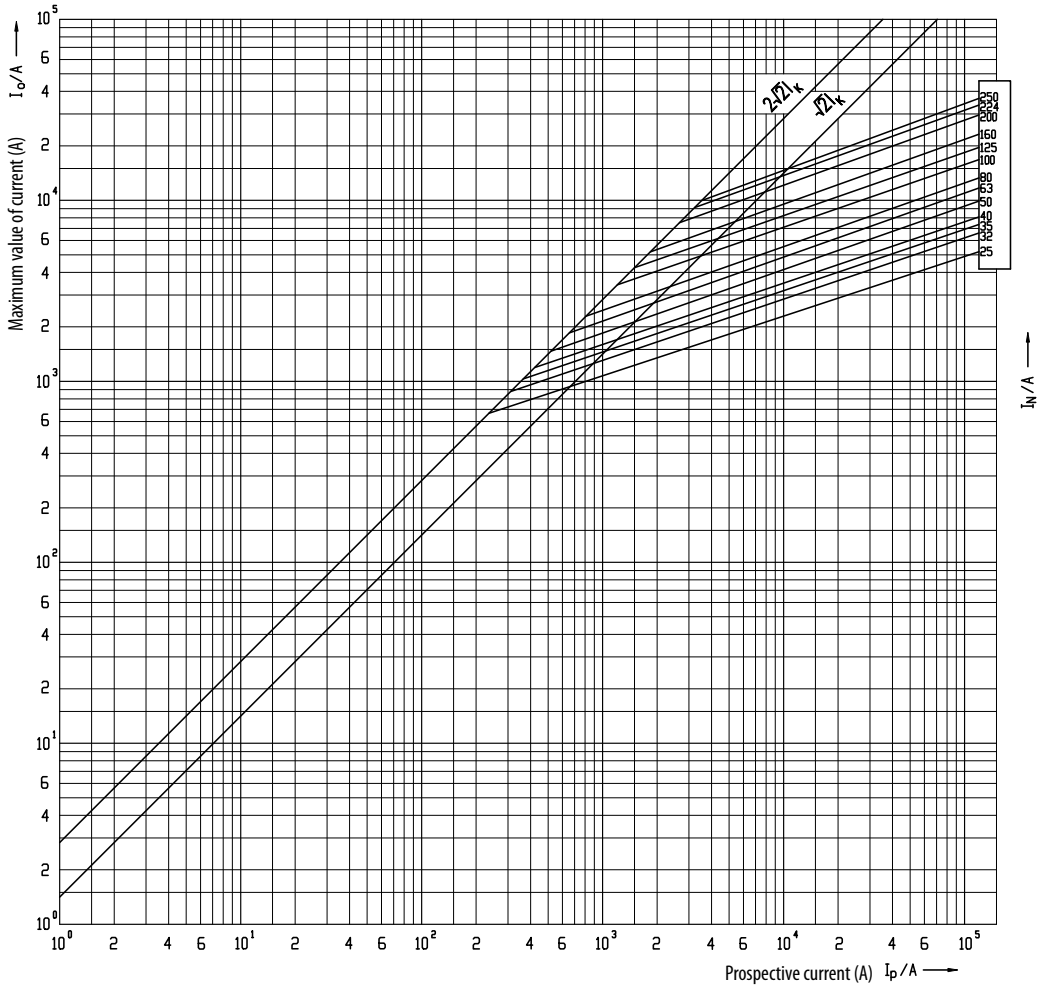


NH2C 500V

Time current characteristics I/t, gG

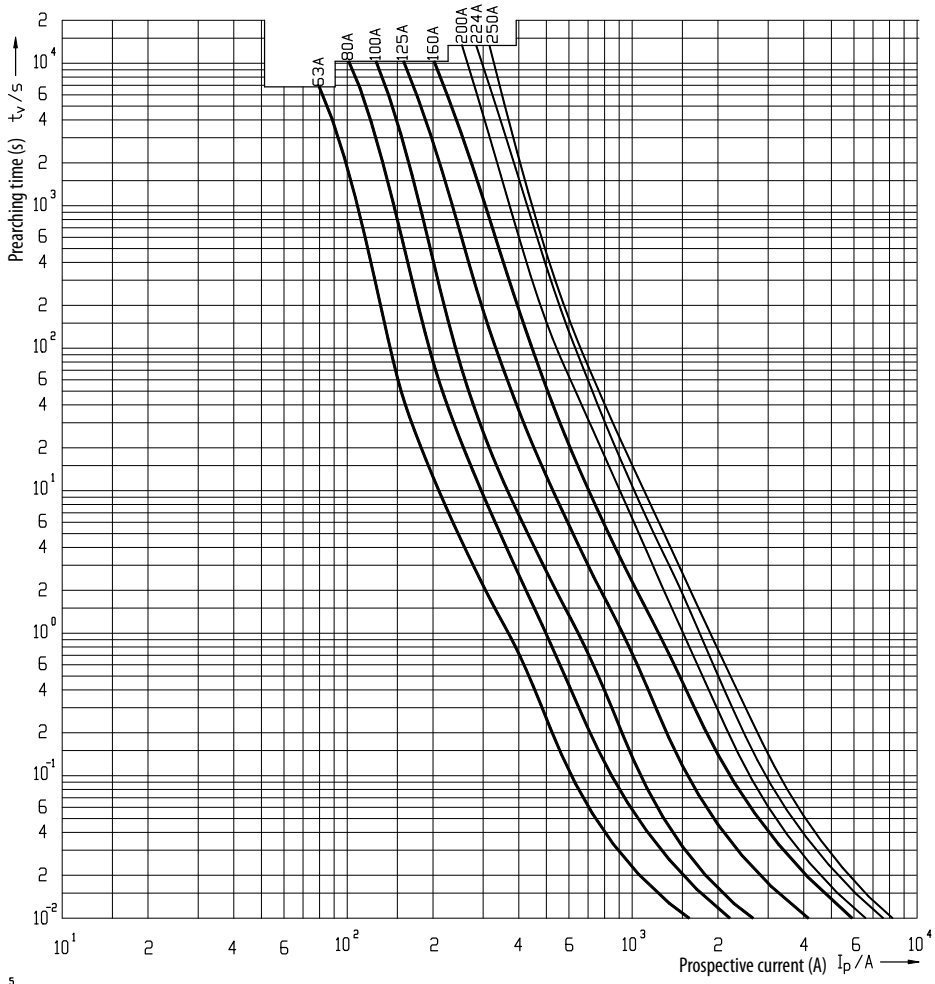


Cut-off current characteristics

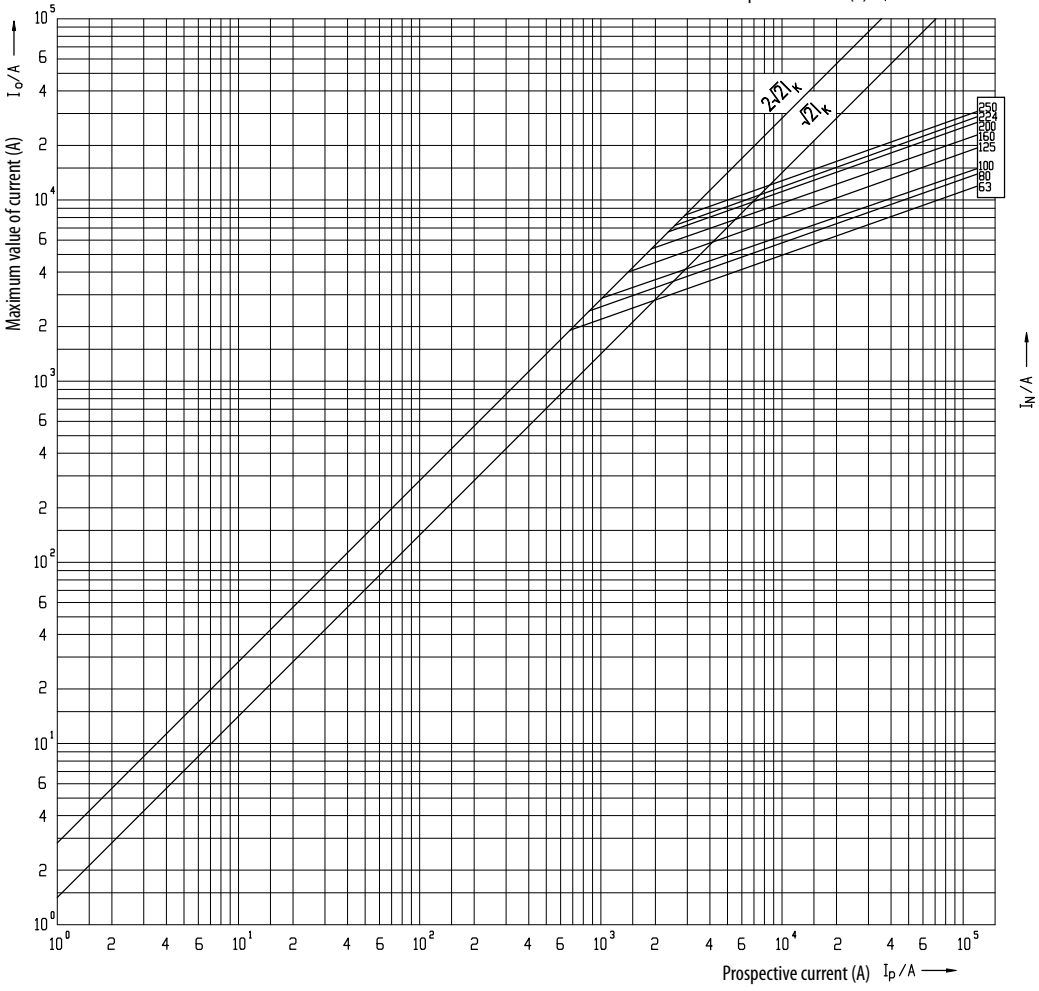


NH2C 690V

Time current characteristics
I/t, gG

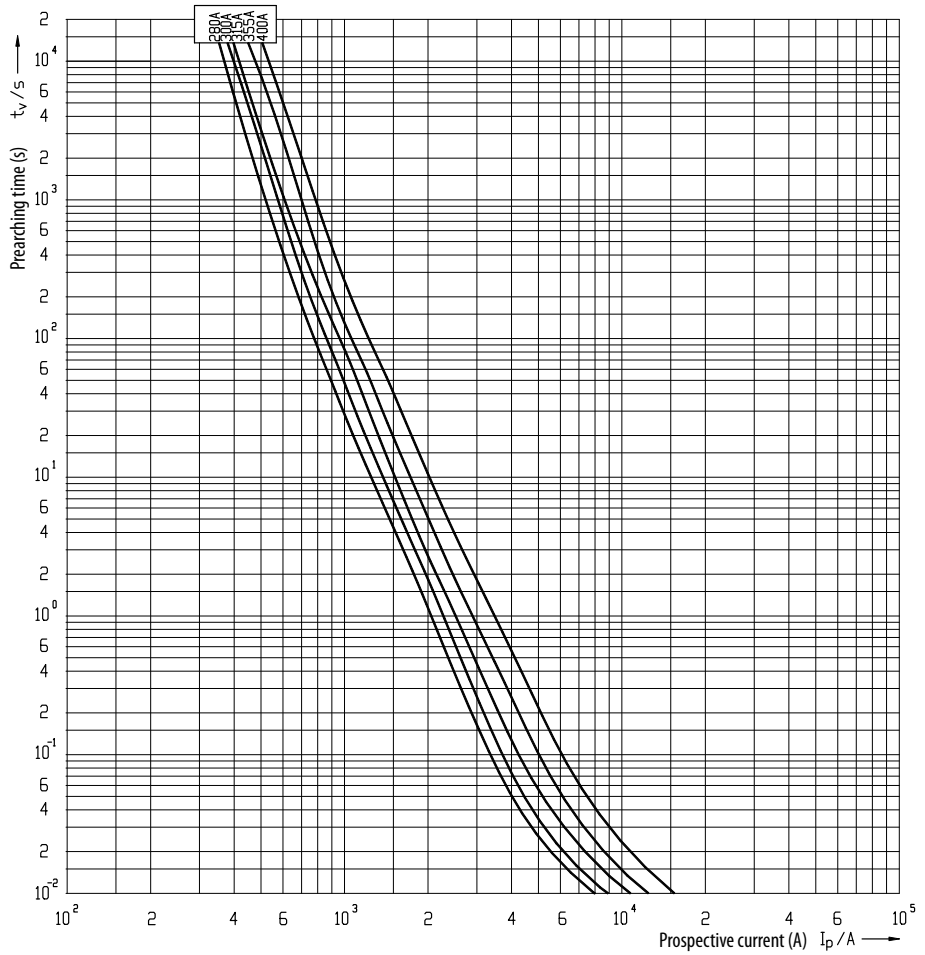


Cut-off current characteristics

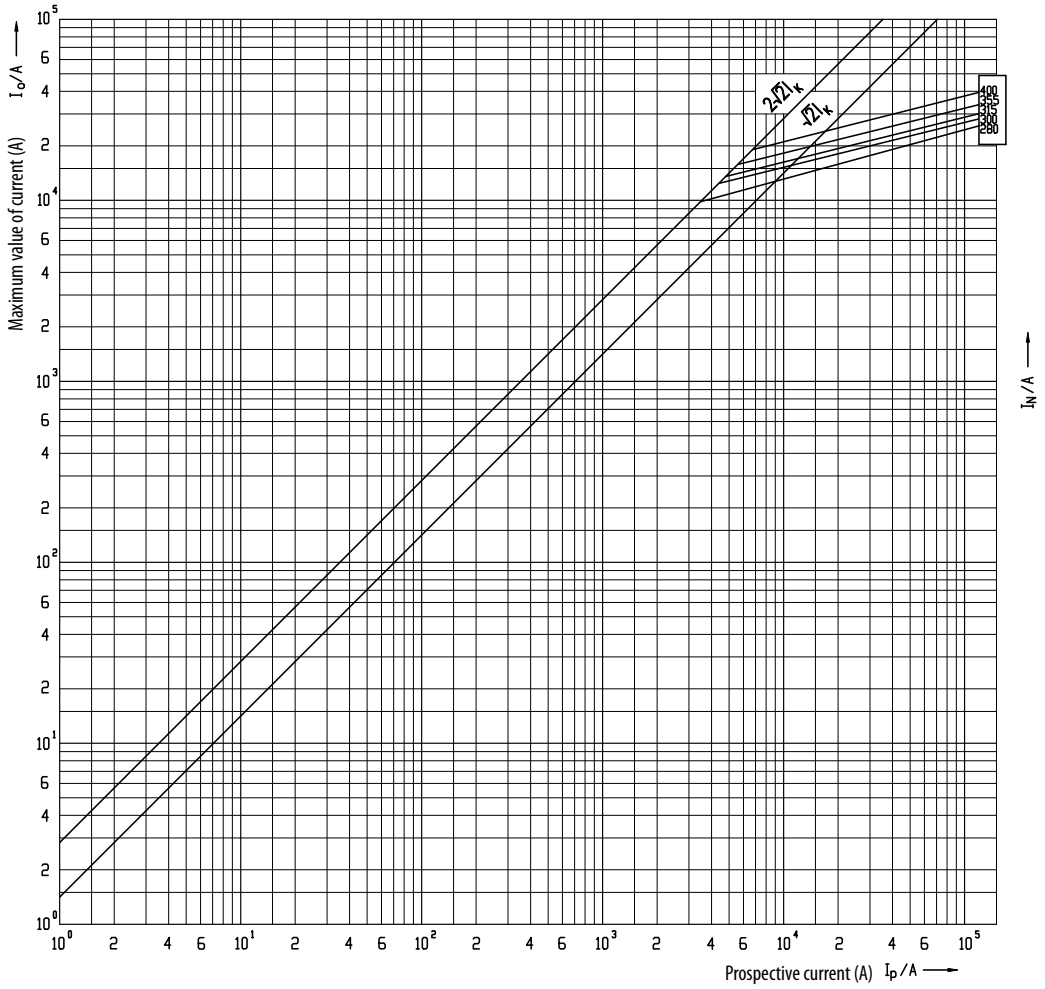


NH2 400V

Time current characteristics I/t, gG

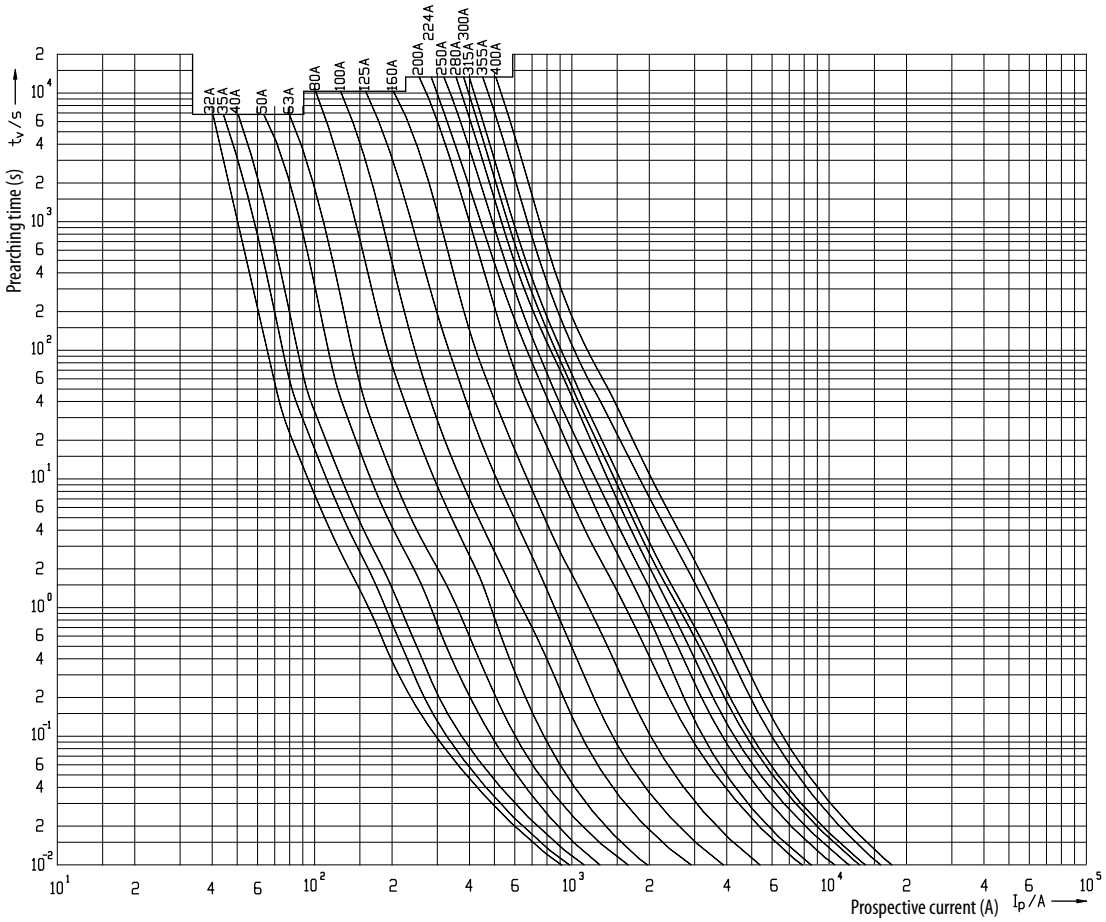


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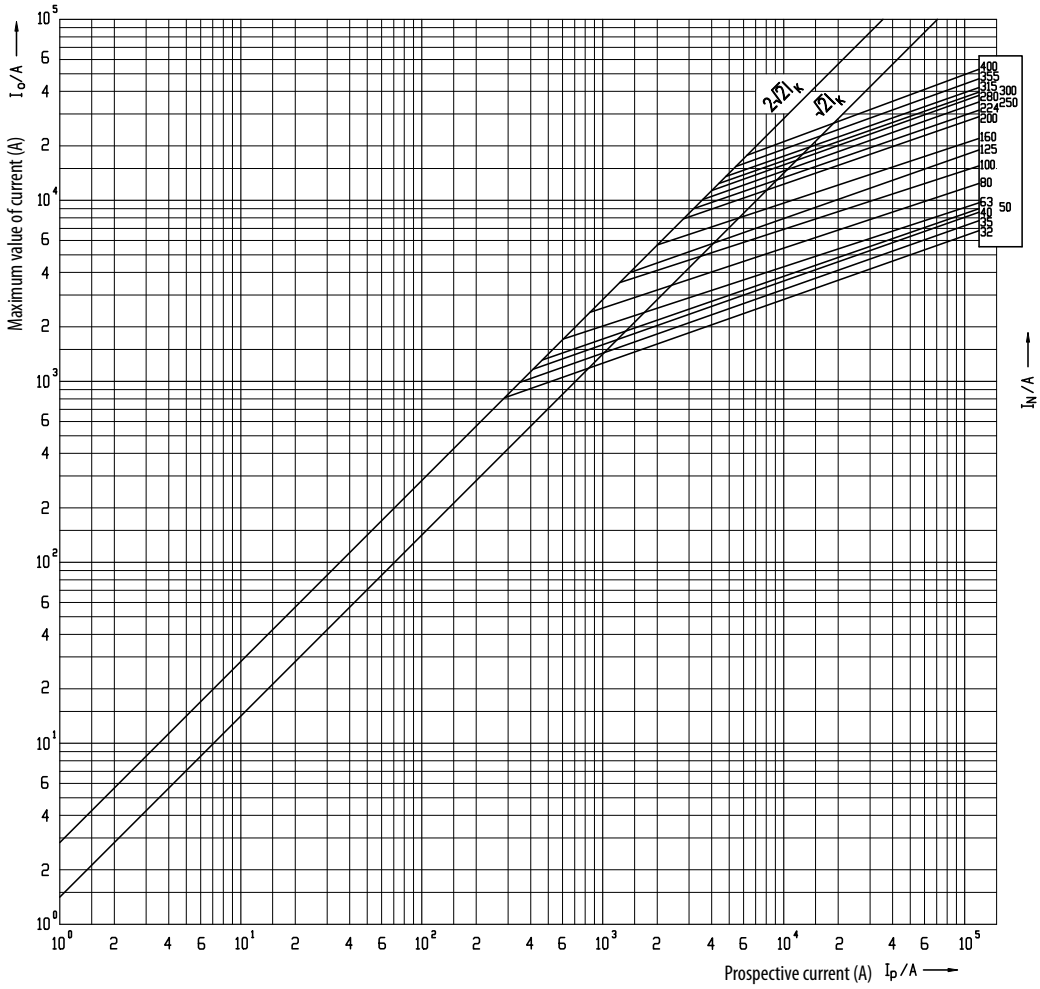


NH2 500V

Time current characteristics I/t, gG

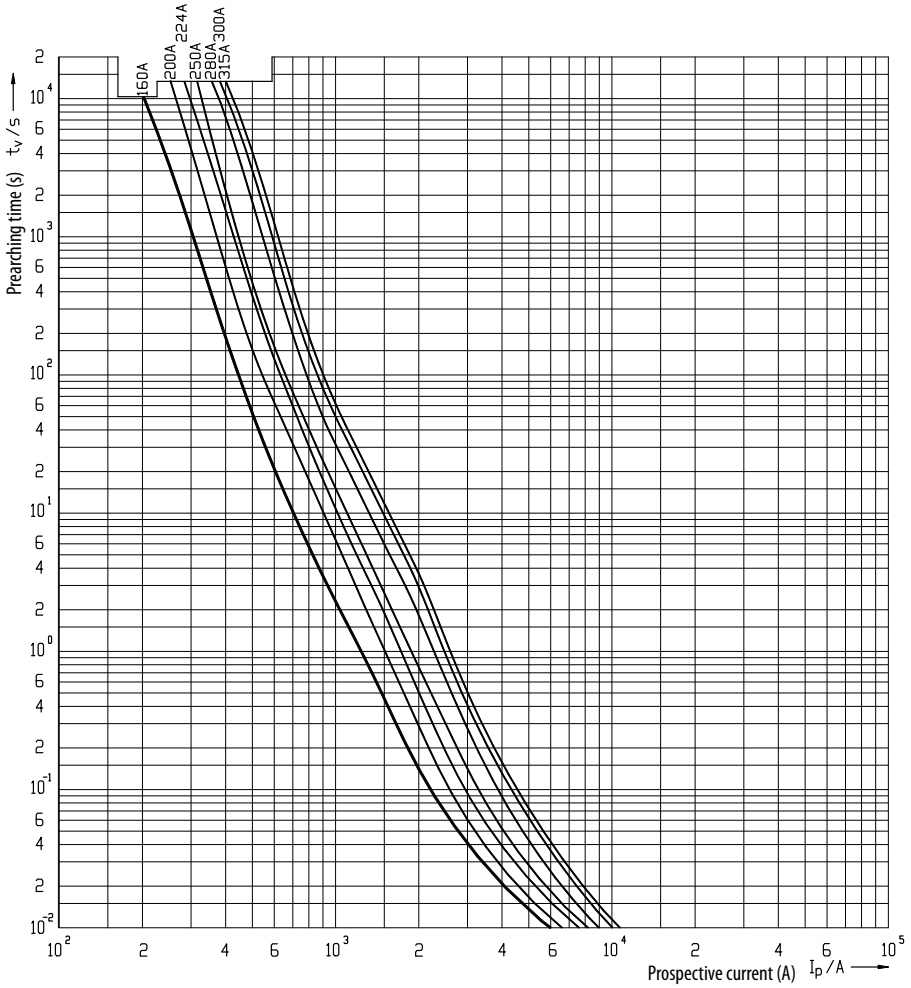


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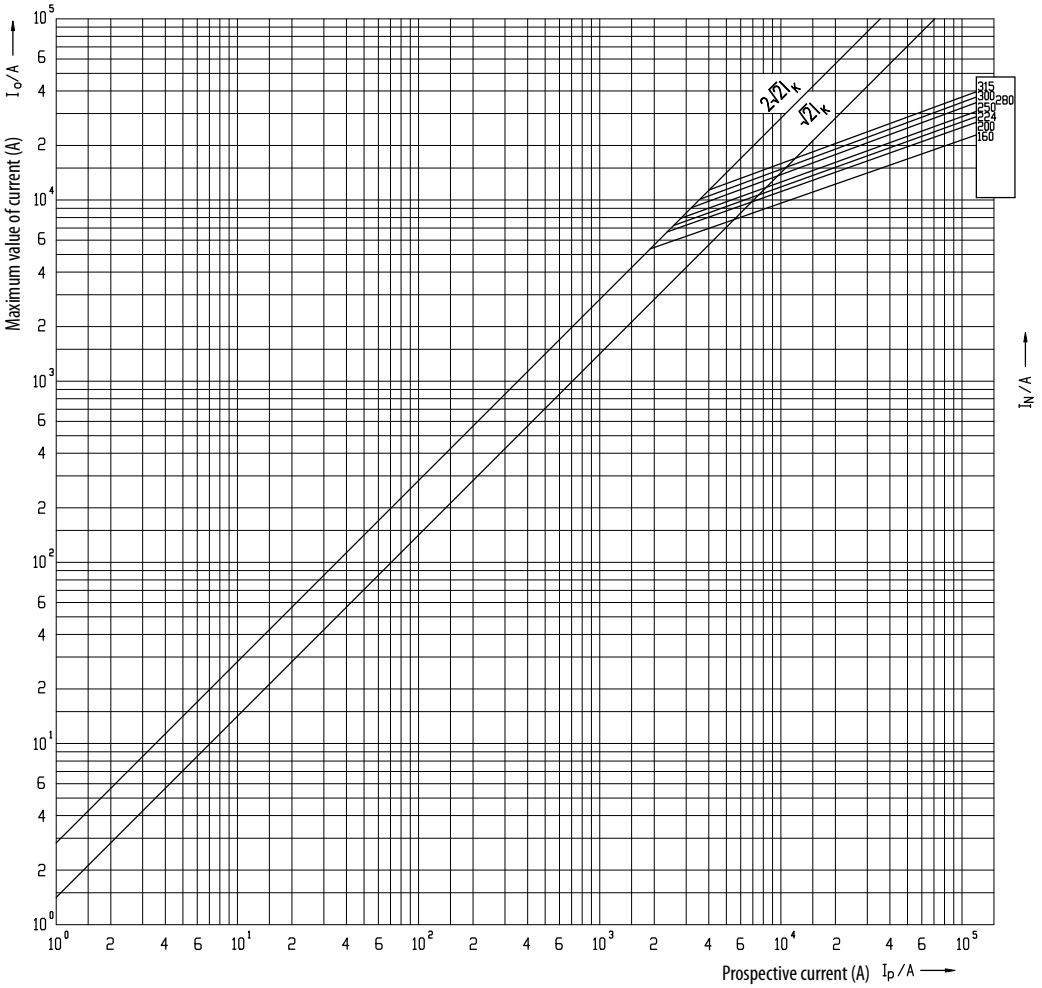


NH2 690V

Time current characteristics I/t, gG

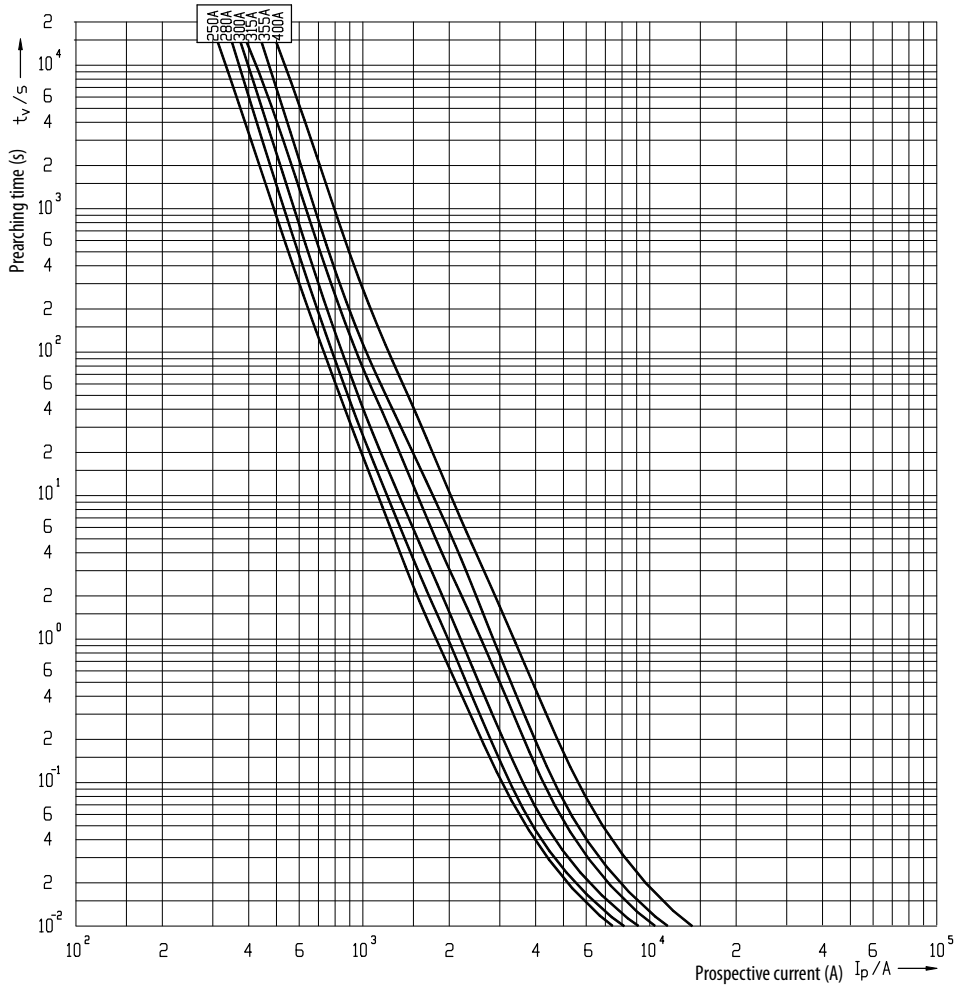


Cut-off current characteristics

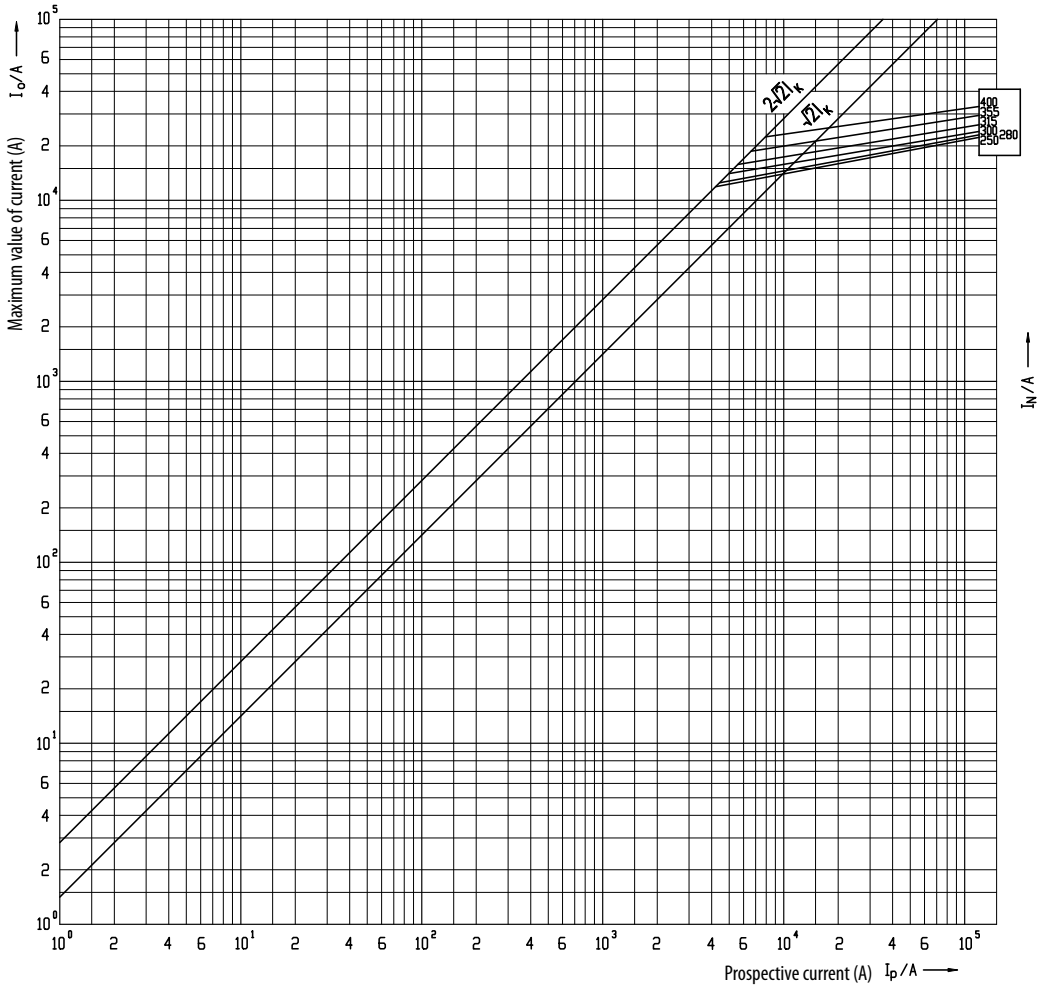


NH3C 400V

Time current characteristics I/t, gG

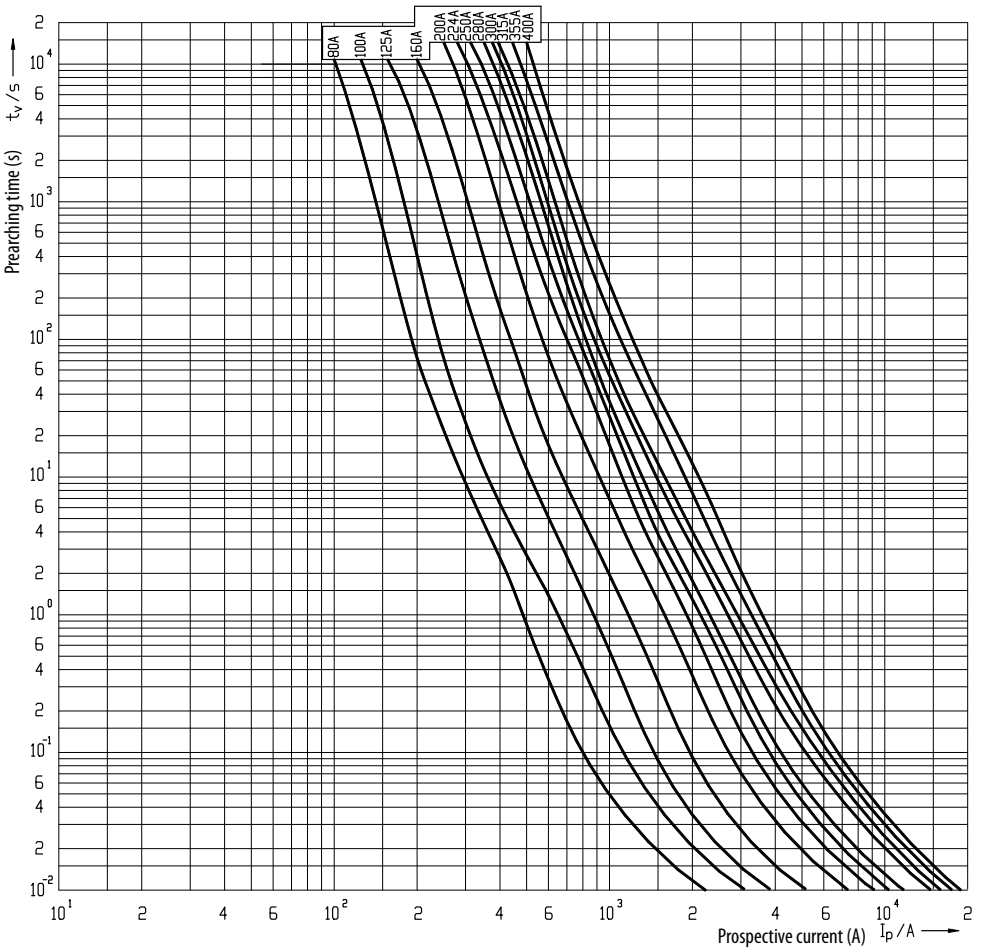


Cut-off current characteristics

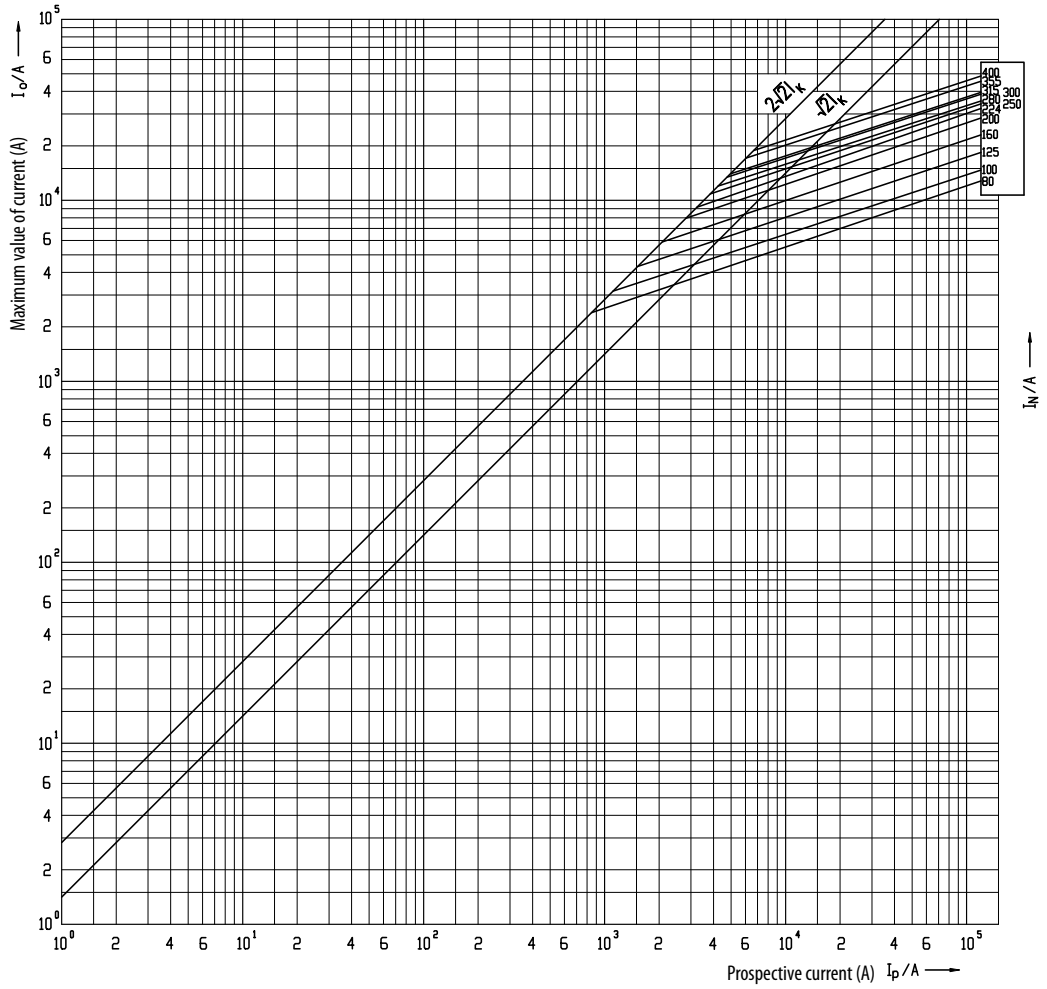


NH3C 500V

Time current characteristics I/t, gG

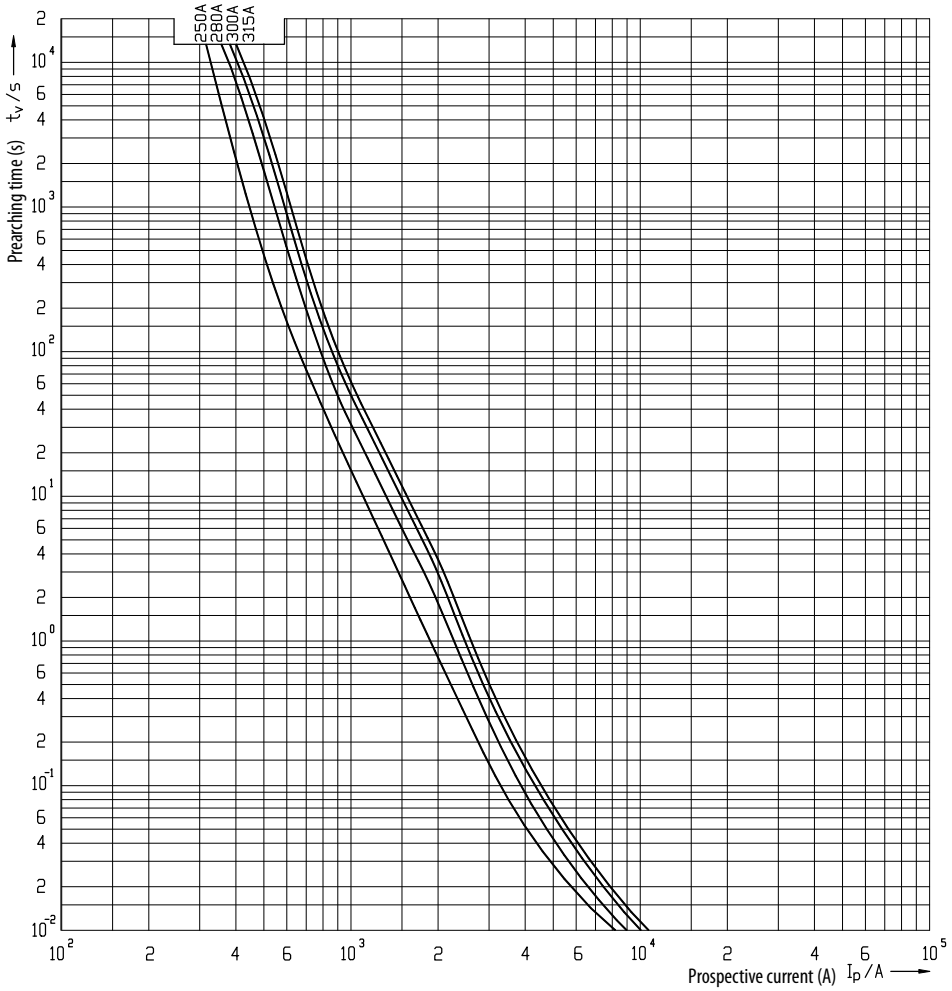


Cut-off current characteristics

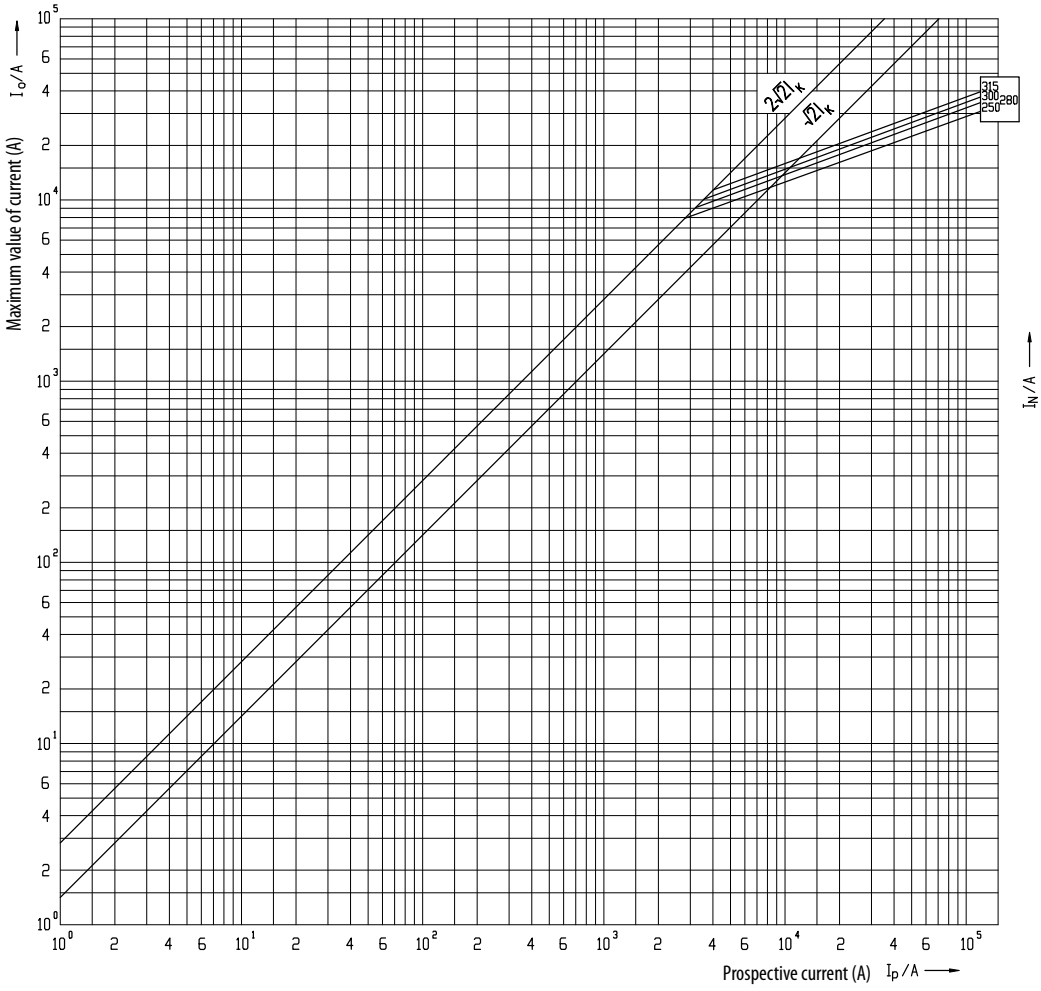


NH3C 690V

Time current characteristics I/t, gG

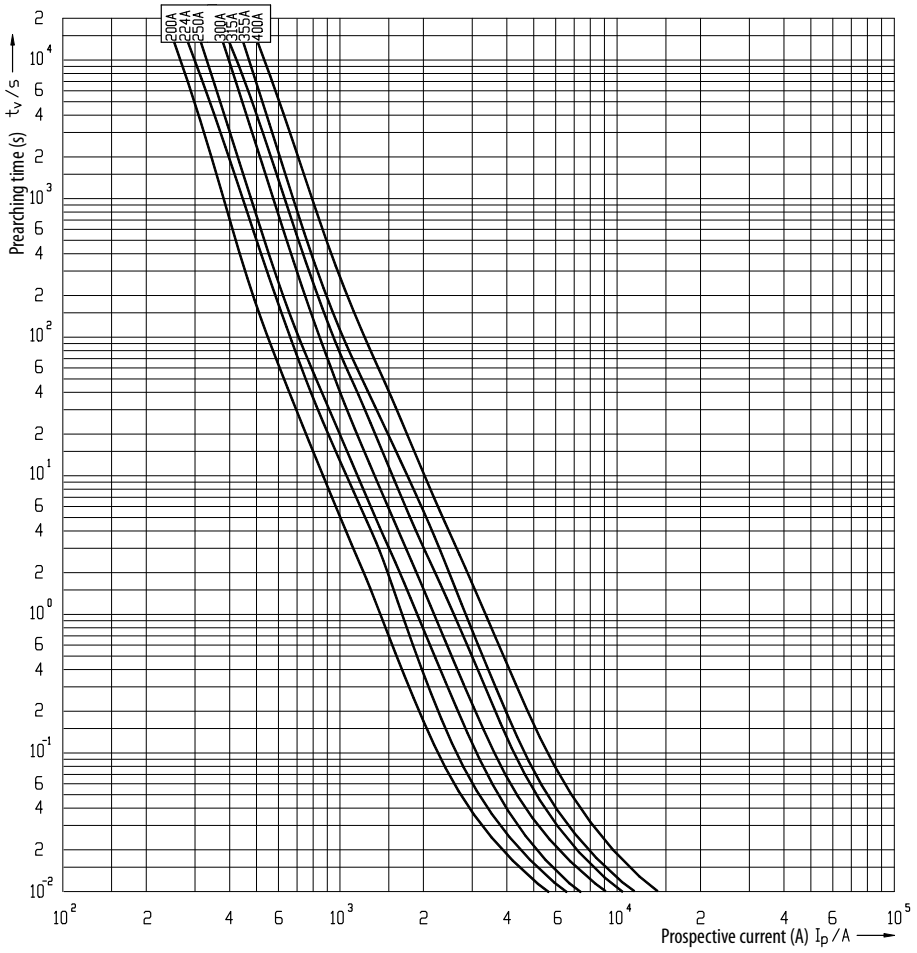


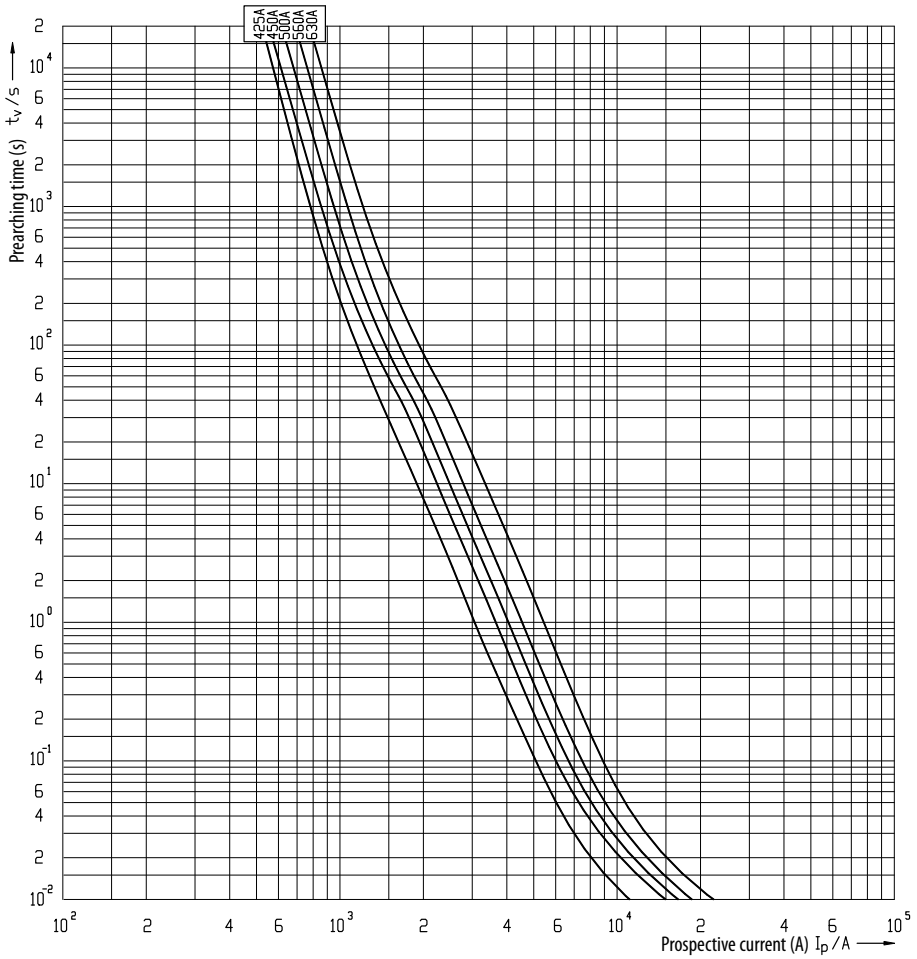
Cut-off current characteristics



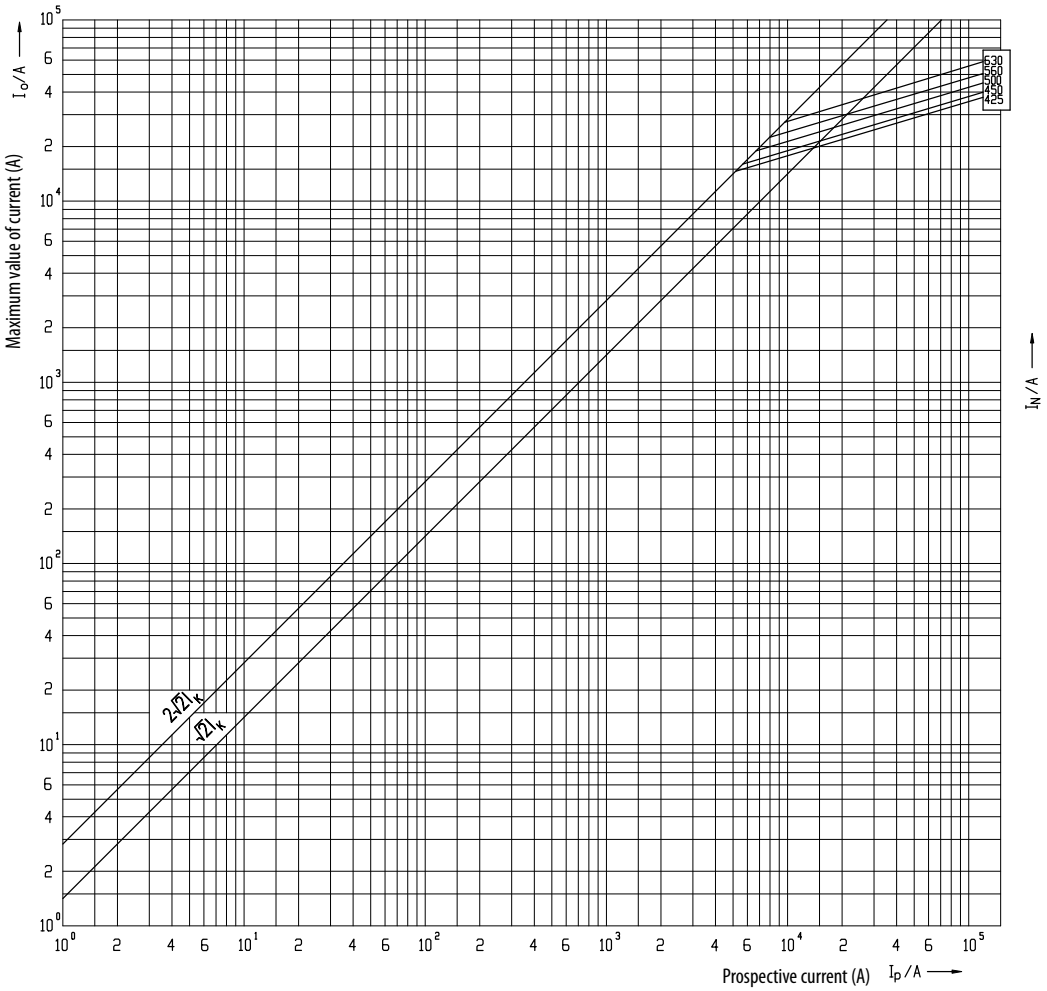
NH3 400V

Time current characteristics I/t, gG



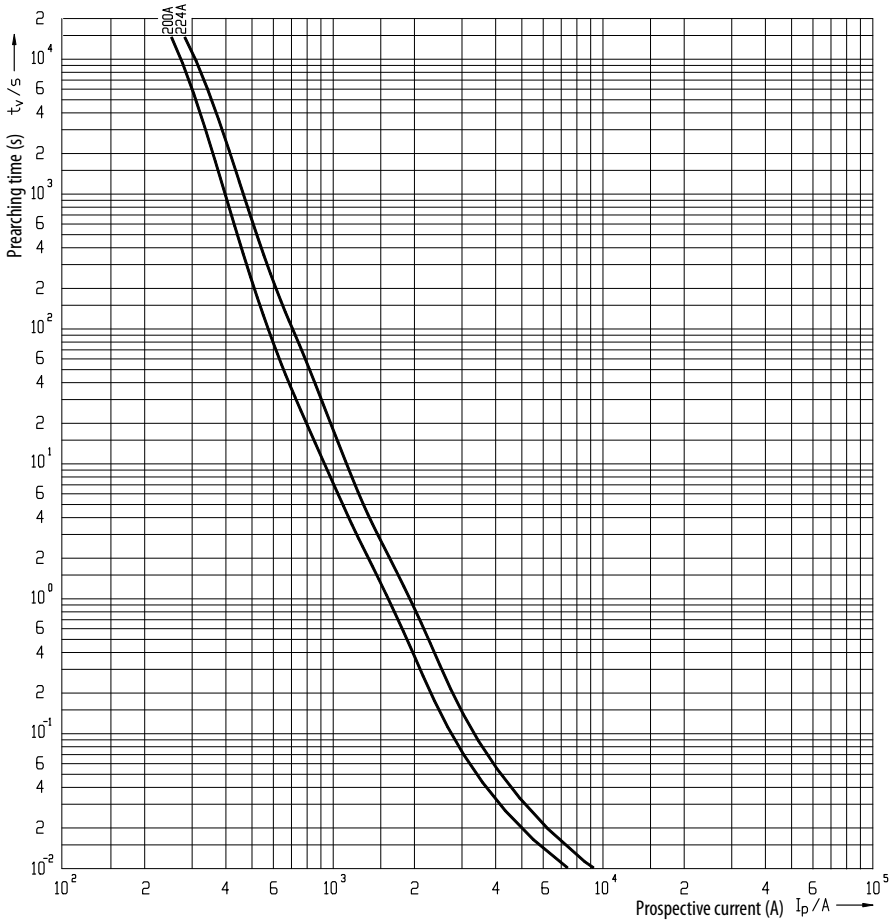


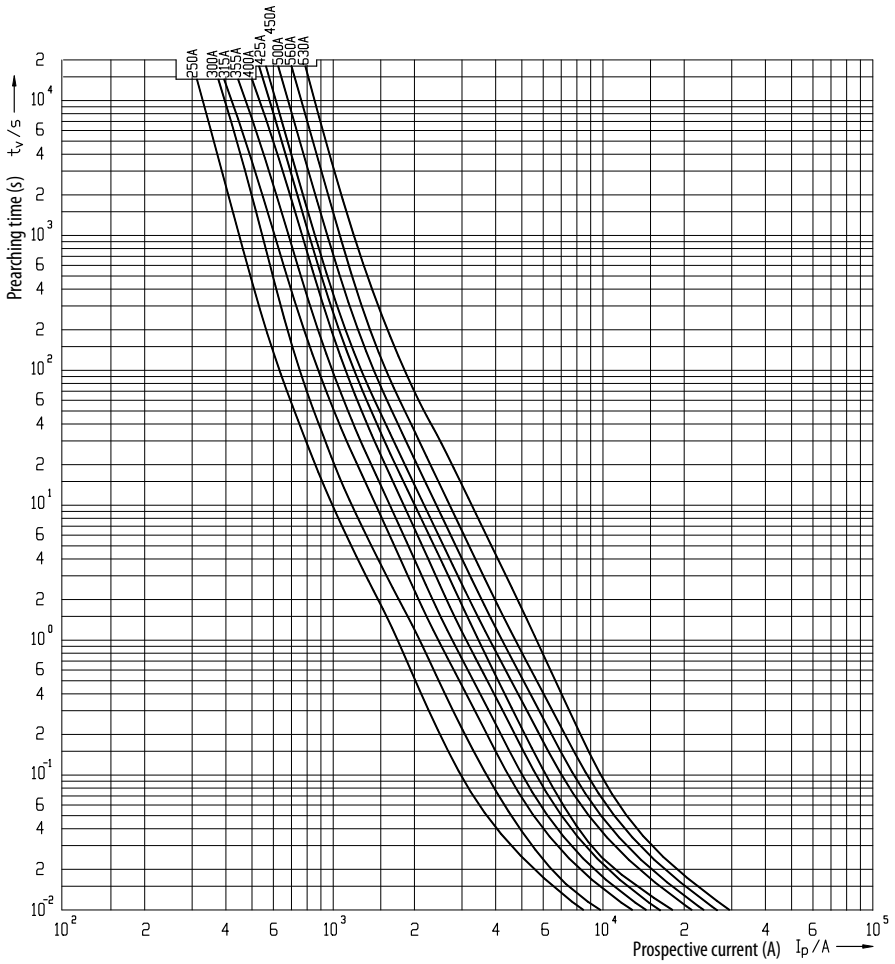
Cut-off current characteristics



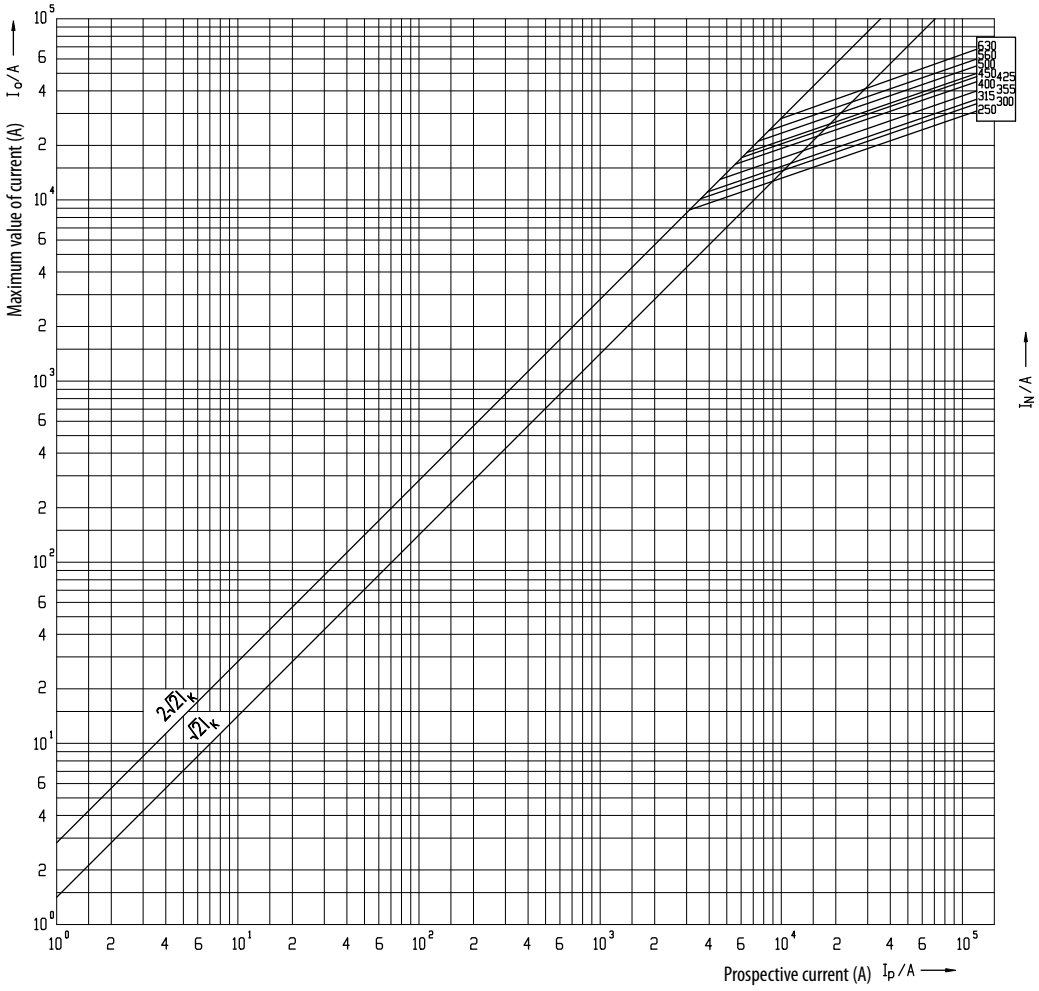
NH3 500V

Time current characteristics I/t, gG



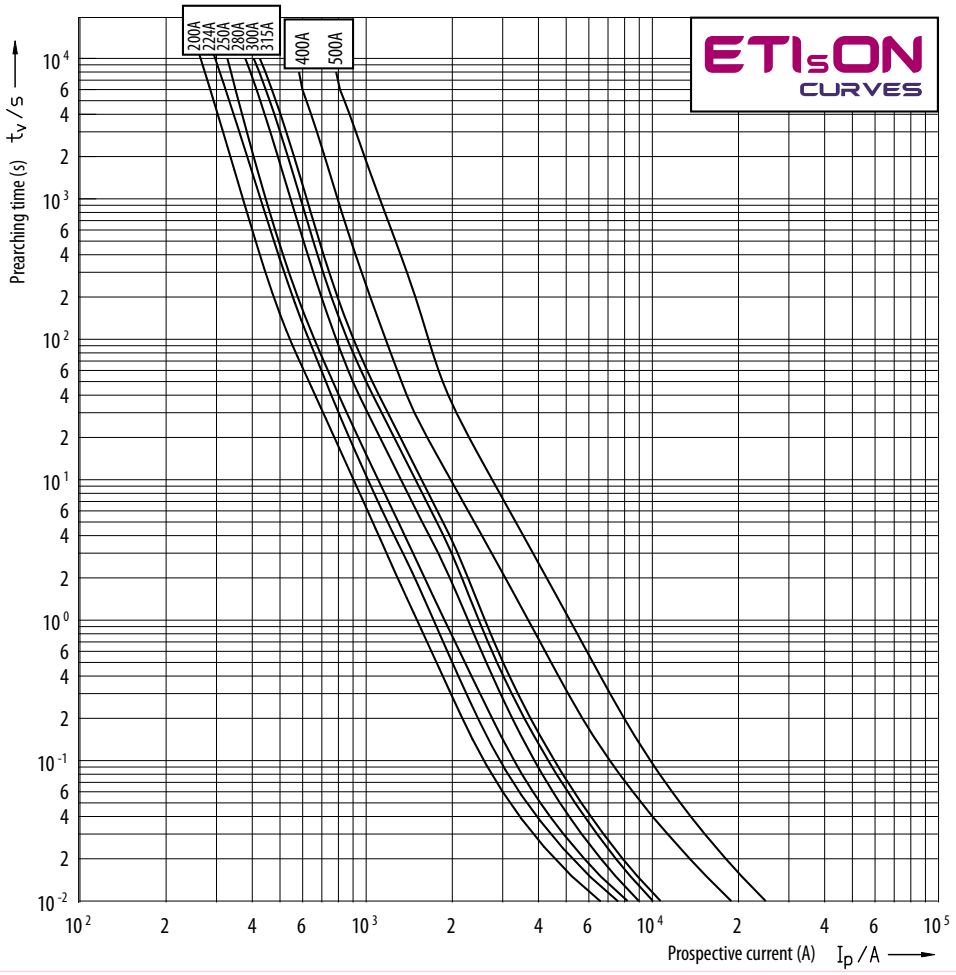


Cut-off current characteristics



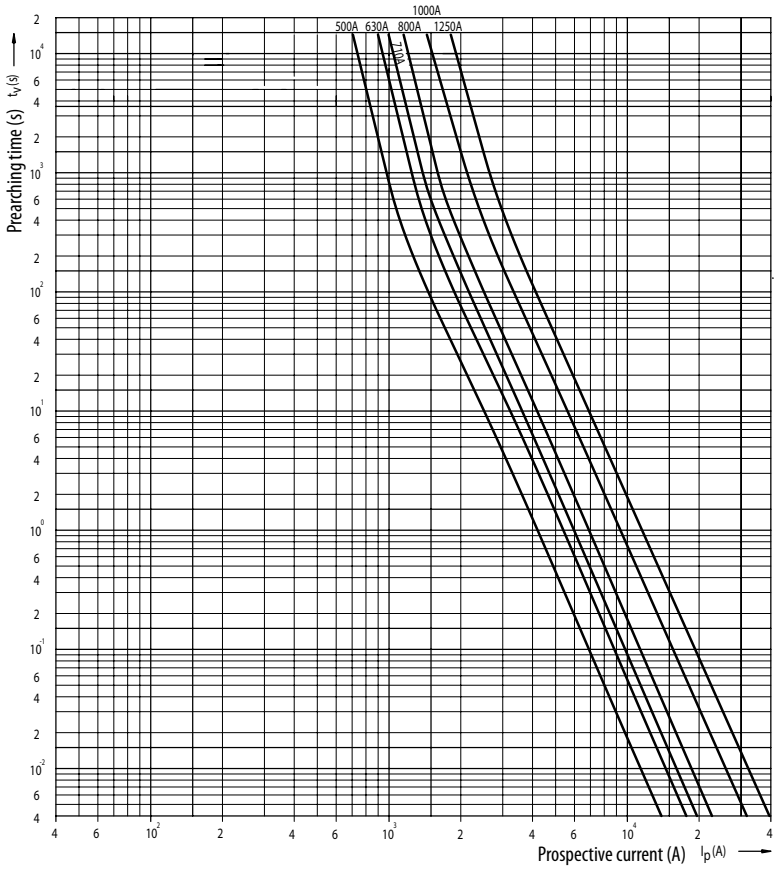
NH3 690V

Time current characteristics I/t, gG



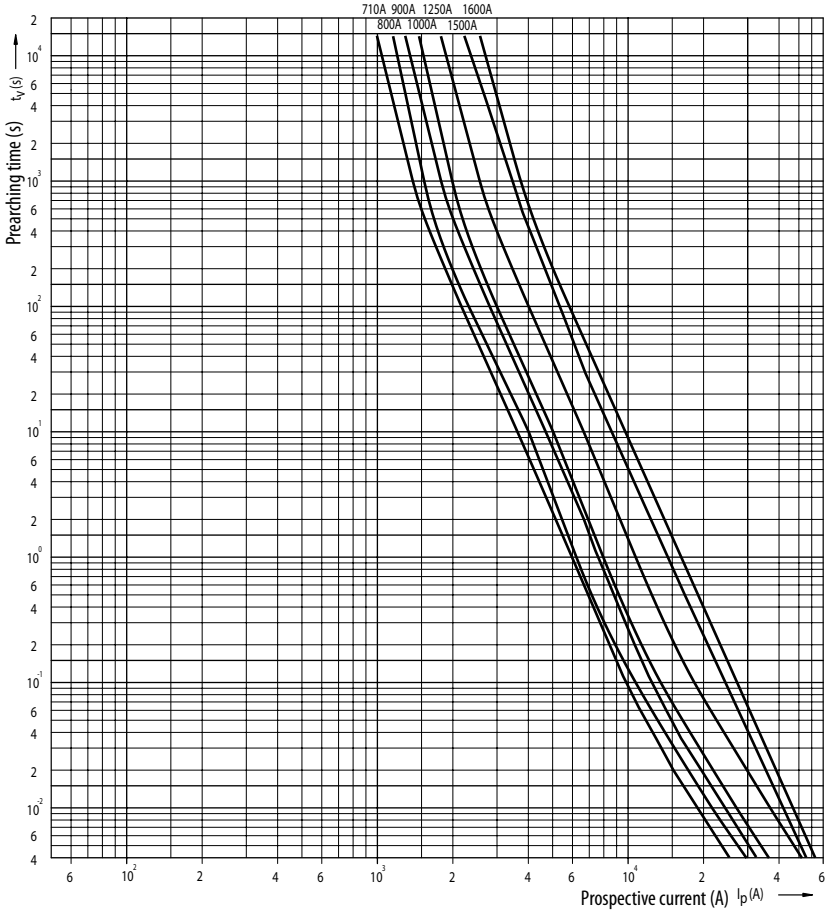
NH4

Time current characteristics I/t, gG



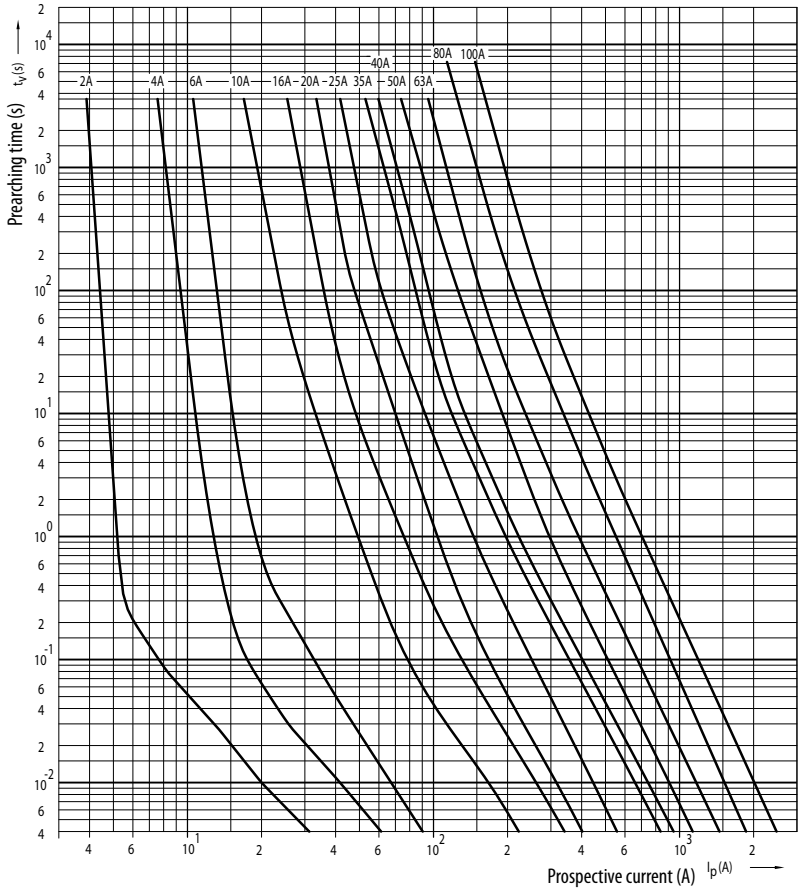
NH4a

Time current characteristics I/t, gG (nonstandard rated currents)



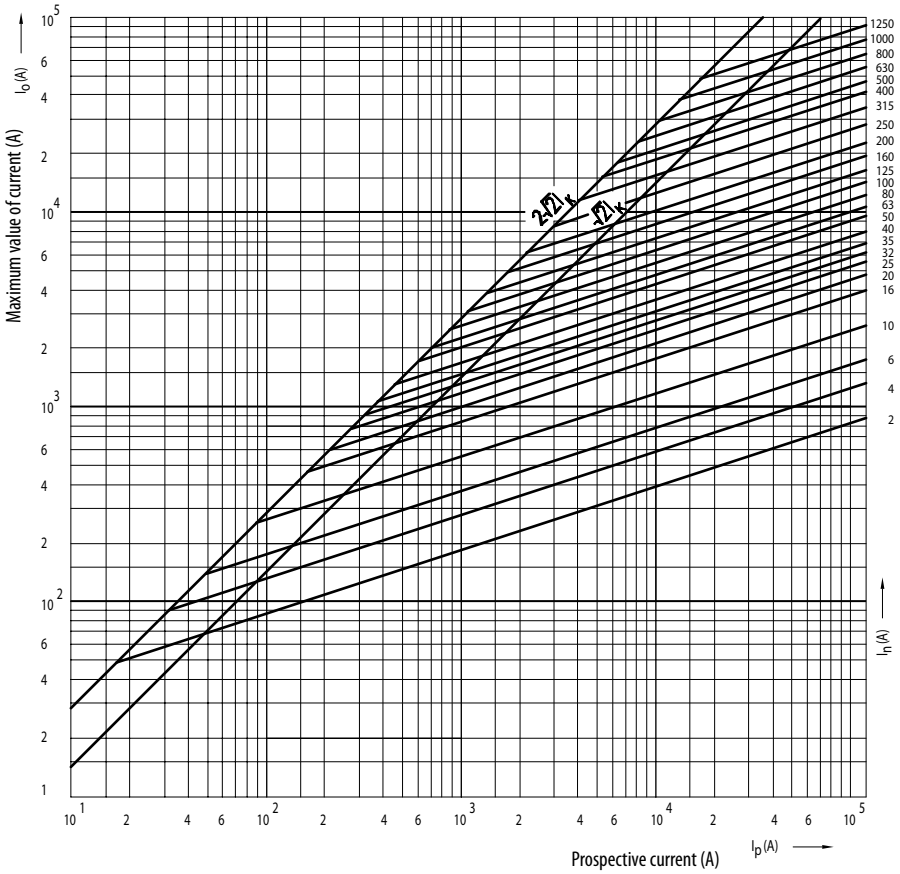
NH1 1000V

Time current characteristics I/t, gG



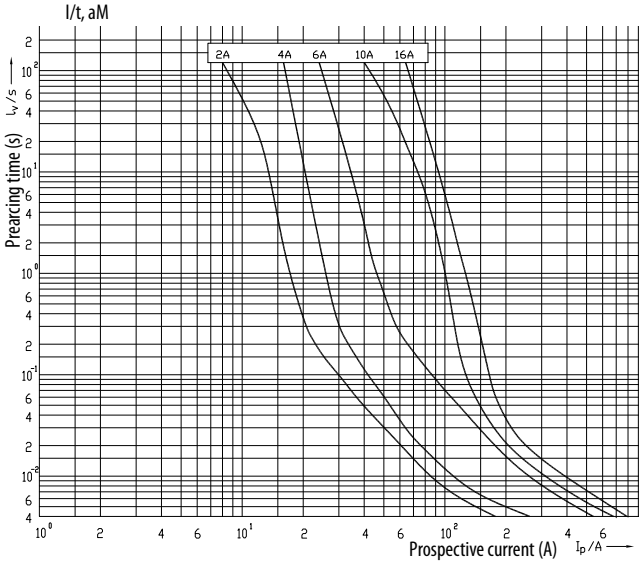
NH4
NH4a
NH1 1000V

Cut-off current characteristics



NV fuse-link aM

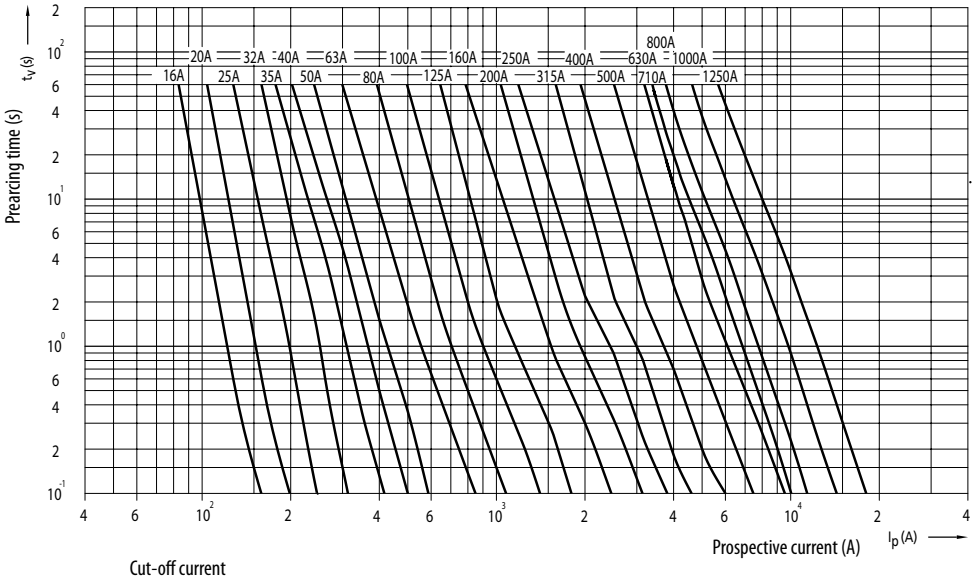
Time current characteristics I/t, aM



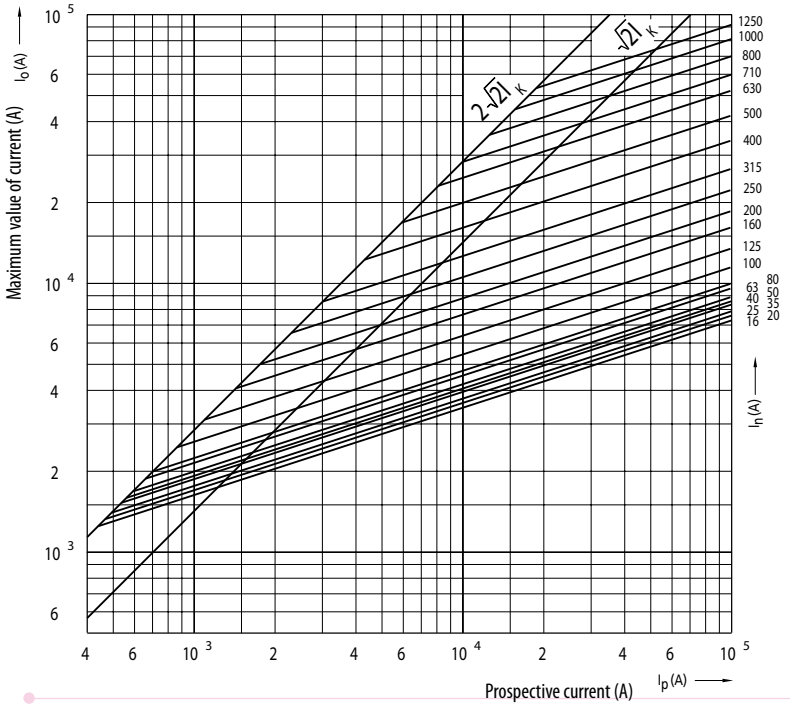
Technical data:	
Rated voltage U_n	690 V AC
Rated current I_n	2-1250 A
Dimensions	DIN 43620, IEC 60269, EN 60269
Fusing characteristics	aM -> VDE 0636-2011, DIN VDE 0636
Breaking capacity at 1,1 U_n	100 kA

Power dissipation of fuse-links NV aM 690 V a.c.

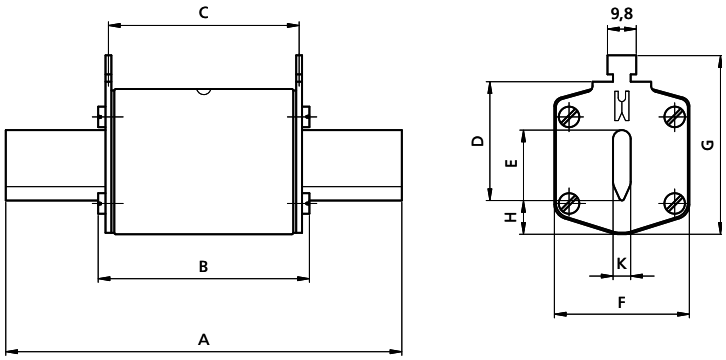
size	the highest rated current at according to VDE 0636-2011 690 V AC (A)	the maximal power dissipation 690 V AC (W)	real power dissipation of fuse-links 690 V AC (W)
NV 00	160	12	9
NV 1	250	32	28
NV 2	400	45	41
NV 3	630	60	58
NV 4a	1250	105	110



Cut-off current characteristics



Fuse-link NV/NH gF

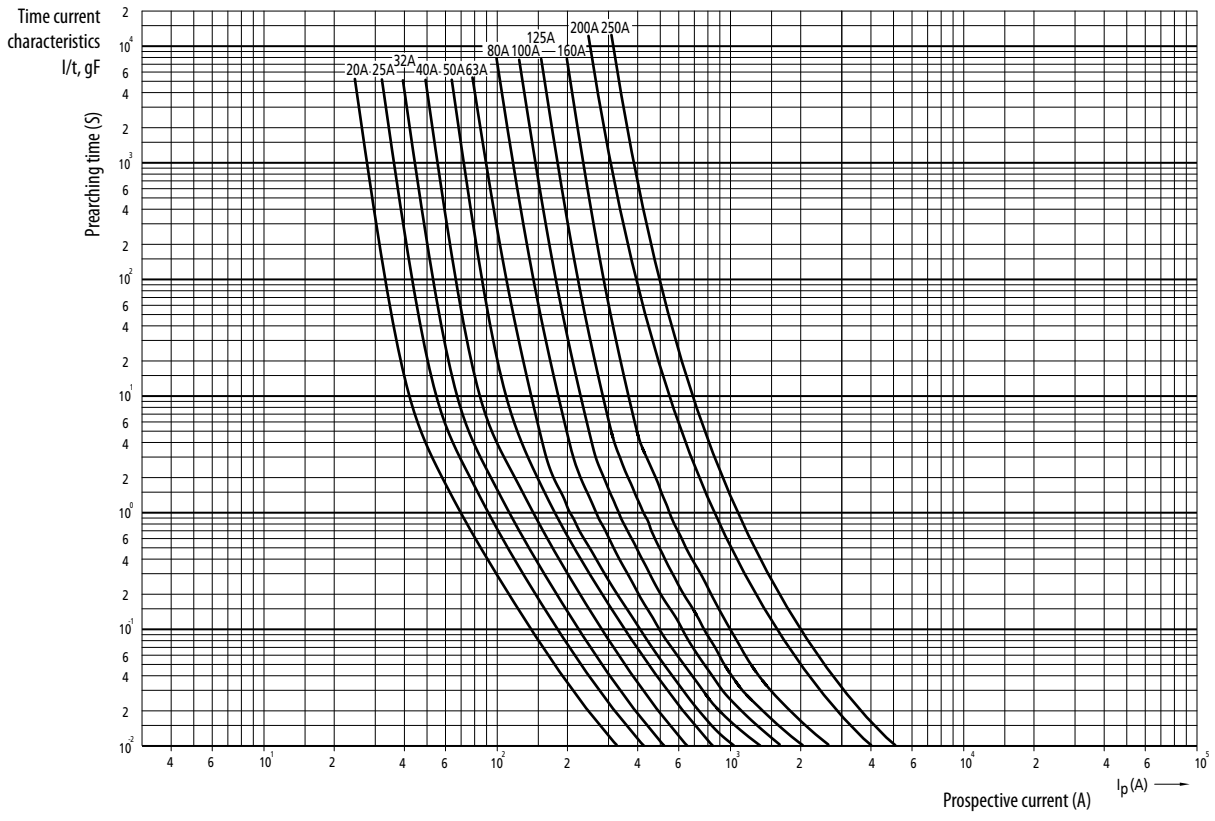


Technical data:	
Rated voltage U_n	400 V AC
Rated current I_n	20 - 250 A
Dimensions	DIN 43620, IEC 60269, EN 60269
Fusing characteristics	gF -> PN 91/E-06160/10 PN 91/E-06160/21
Breaking capacity I_n	100kA

type	dimensions										
	A	B	C	D	E	F	G	H	I	J	K
NV00C	79	53	47	35	15	21	52	7,5			6
NV00	79	53	47	35	15	28	56	12			6
NV1C	135	68	65	40	15	28	61	12			6
NV1	135	72	65	40	20	46	65	14			6

Power dissipation of fuse-links gF 400 V a.c.

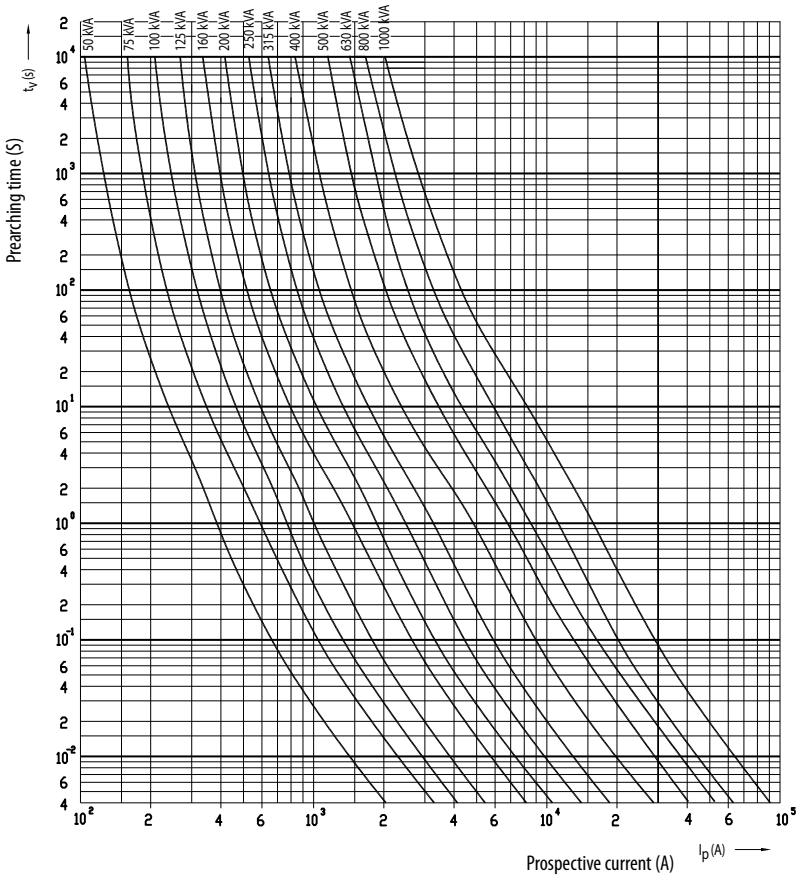
size	the highest rated current at according to PN-IEC 60269-2 (A)	the maximal power dissipation (W)	real power dissipation of fuse-links (W)
NV 00C	100	12	7,2
NV 00	160	16	15,1
NV 1C	160	23	21,9
NV 1	250	32	31,3



Fuse-link NV/NH gTr

Technical data:	
Rated voltage	400 V AC
Rated transformer power	50-1000 kVA
Breaking capacity	100 kA

Time current characteristics I/t, gTr



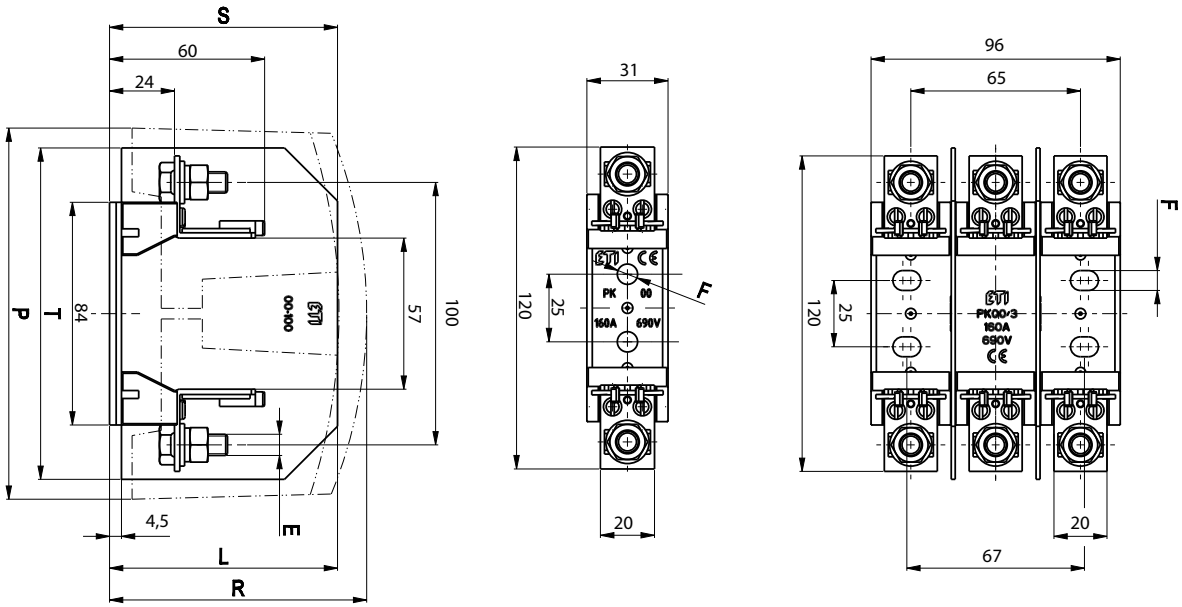
PK Fuse Bases with Ceramic Insulation sizes 00 to 3

Technical data						
Size			**00**	**1**	**2**	**3**
Electrical characteristics						
Rated voltage	U_n	V a.c.	690			
Rated current	I_n	A	160	250	400	630
Conv. free air thermal current with fuse links	I_{th}	A	160	250	400	630
Conv. free air thermal current with solid links	I_{th}	A	200	320	500	800
Rated frequency		Hz	40-60			
Max. permis. power dissipation per fuse link	P_a	W	12	32	45	60
Max. breaking capacity per fuse link	I_{cu}	kA	200			
Derating temperature factors for max. current	≤ 35	°C	1			
	40	°C	0,95			
	50	°C	0,85			
Mechanical characteristics						
Ambient temperature range	T_{amb}	°C	-25...+55			
Rated operating mode			uninterrupted			
Mounting position			vertical, horizontal			
Pollution degree			3			
Overvoltage category			III			
Degree of protection			IP00 without covers; IP20 with covers fitted			
Standards			IEC 60269-2, DIN VDE 0636, DIN 43620			

Dimensions for size 00

1p	3p	E	F	L	P	R	S*	T*
PK 00 M8-M8 1p S	PK 00 M8-M8 3p S	M8-M8	Ø7,5	\	\	\	88	126
PK 00 2M6-2M6 1p S	PK 00 2M6-2M6 3p S	2M6-2M6	Ø7,5	\	\	\	88	126
PK 00 M8-2M6 1p S	PK 00 M8-2M6 3p S	M8-2M6	Ø7,5	\	\	\	88	126
PK 00 M8-P00 1p S	PK 00 M8-P00 3p S	M8-P00	Ø7,5	\	\	\	88	126
PK 00 M8-2P00 1p S	PK 00 M8-2P00 3p S	M8-2P00	Ø7,5	\	\	\	88	126
PK 00 P00-P00 1p S	PK 00 P00-P00 3p S	P00-P00	Ø7,5	\	\	\	88	126
PK 00 P00-2P00 1p S	PK 00 P00-2P00 3p S	P00-2P00	Ø7,5	\	\	\	88	126
PK 00 2P00-2P00 1p S	PK 00 2P00-2P00 3p S	2P00-2P00	Ø7,5	\	\	\	88	126
PKI 00 M8-M8 1p S	PKI 00 M8-M8 3p S	M8-M8	Ø7,5	87	140	\	\	\
PKI 00 2M6-2M6 1p S	PKI 00 2M6-2M6 3p S	2M6-2M6	Ø7,5	87	140	\	\	\
PKI 00 M8-2M6 1p S	PKI 00 M8-2M6 3p S	M8-2M6	Ø7,5	87	140	\	\	\
PKI 00 M8-P00 1p S	PKI 00 M8-P00 3p S	M8-P00	Ø7,5	87	140	\	\	\
PKI 00 M8-2P00 1p S	PKI 00 M8-2P00 3p S	M8-2P00	Ø7,5	87	140	\	\	\
PKI 00 P00-P00 1p S	PKI 00 P00-P00 3p S	P00-P00	Ø7,5	87	140	\	\	\
PKI 00 P00-2P00 1p S	PKI 00 P00-2P00 3p S	P00-2P00	Ø7,5	87	140	\	\	\
PKI 00 2P00-2P00 1p S	PKI 00 2P00-2P00 3p S	2P00-2P00	Ø7,5	87	140	\	\	\
PKIP 00 M8-M8 1p S	PKIP 00 M8-M8 3p S	M8-M8	Ø7,5	87	140	95	\	\
PKIP 00 2M6-2M6 1p S	PKIP 00 2M6-2M6 3p S	2M6-2M6	Ø7,5	87	140	95	\	\
PKIP 00 M8-2M6 1p S	PKIP 00 M8-2M6 3p S	M8-2M6	Ø7,5	87	140	95	\	\
PKIP 00 M8-P00 1p S	PKIP 00 M8-P00 3p S	M8-P00	Ø7,5	87	140	95	\	\
PKIP 00 M8-2P00 1p S	PKIP 00 M8-2P00 3p S	M8-2P00	Ø7,5	87	140	95	\	\
PKIP 00 P00-P00 1p S	PKIP 00 P00-P00 3p S	P00-P00	Ø7,5	87	140	95	\	\
PKIP 00 P00-2P00 1p S	PKIP 00 P00-2P00 3p S	P00-2P00	Ø7,5	87	140	95	\	\
PKIP 00 2P00-2P00 1p S	PKIP 00 2P00-2P00 3p S	2P00-2P00	Ø7,5	87	140	95	\	\

*Protective barriers; included with PK 00 3p fuse bases or sold separately

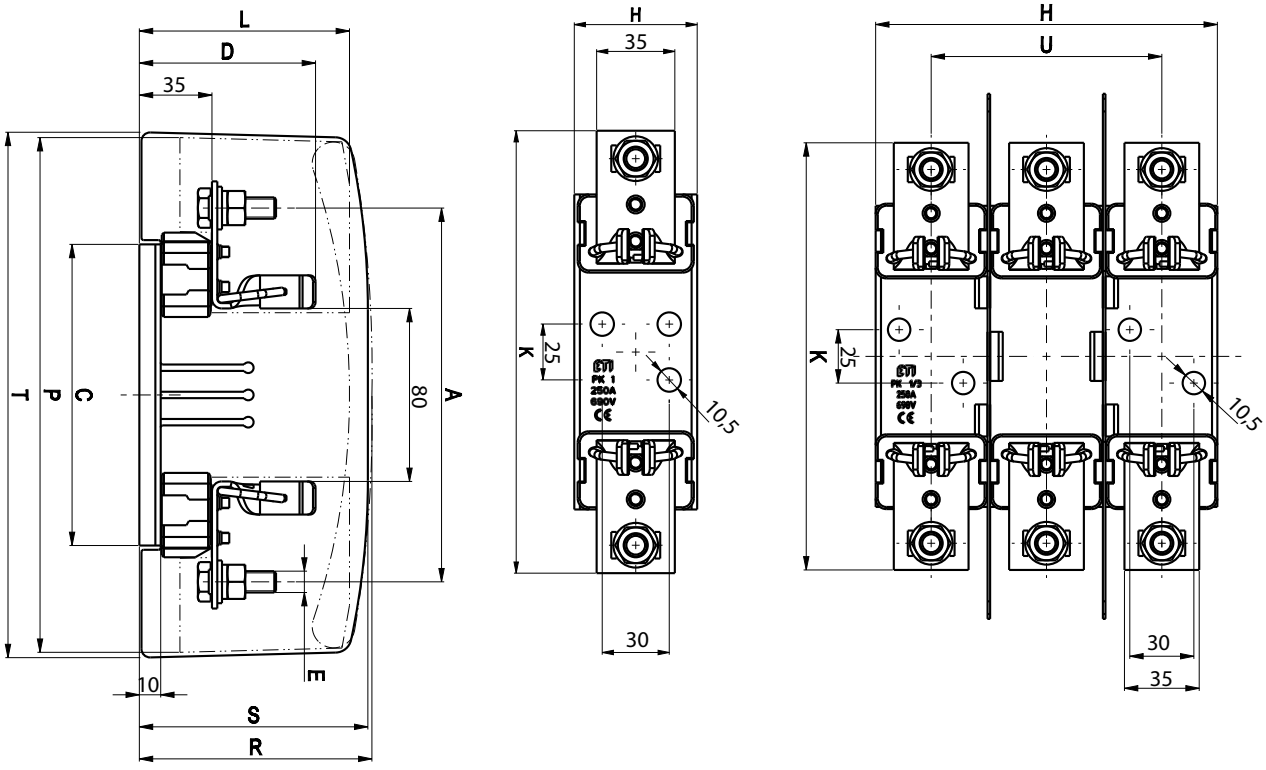


Dimensions for sizes 1, 2, 3

1p	3p	A	C	D	E	H - 1p	H - 3p	K	L**	P**	R**	S*	T*	U
PK 1 M10-M10 1p S	PK 1 M10-M10 3p S	175	141	82	M10-M10	55,5	160	200	108	245	113	108	245	106
PK 1 M10-S12 1p S	PK 1 M10-S12 3p S	175	141	82	M10-S12	55,5	160	200	108	245	113	108	245	106
PK 1 S12-S12 1p S	PK 1 S12-S12 3p S	175	141	82	S12-S12	55,5	160	200	108	245	113	108	245	106
PK 1 M10-P1 1p S	PK 1 M10-P1 3p S	175	141	82	M10-P1	55,5	160	200	108	245	113	108	245	106
PK 1 M10-2P1 1p S	PK 1 M10-2P1 3p S	175	141	82	M10-2P1	55,5	160	200	108	245	113	108	245	106
PK 1 P1-P1 1p S	PK 1 P1-P1 3p S	175	141	82	P1-P1	55,5	160	200	108	245	113	108	245	106
PK 1 P1-2P1 1p S	PK 1 P1-2P1 3p S	175	141	82	P1-2P1	55,5	160	200	108	245	113	108	245	106
PK 1 2P1-2P1 1p S	PK 1 2P1-2P1 3p S	175	141	82	2P1-2P1	55,5	160	200	108	245	113	108	245	106
PK 2 M10-M10 1p S	PK 2 M10-M10 3p S	200	166	87	M10-M10	65	185	225	115	266	125	117	266	125
PK 2 M10-S12 1p S	PK 2 M10-S12 3p S	200	166	87	M10-S12	65	185	225	115	266	125	117	266	125
PK 2 S12-S12 1p S	PK 2 S12-S12 3p S	200	166	87	S12-S12	65	185	225	115	266	125	117	266	125
PK 2 M10-P2 1p S	PK 2 M10-P2 3p S	200	166	87	M10-P2	65	185	225	115	266	125	117	266	125
PK 2 M10-2P2 1p S	PK 2 M10-2P2 3p S	200	166	87	M10-2P2	65	185	225	115	266	125	117	266	125
PK 2 P2-P2 1p S	PK 2 P2-P2 3p S	200	166	87	P2-P2	65	185	225	115	266	125	117	266	125
PK 2 P2-2P2 1p S	PK 2 P2-2P2 3p S	200	166	87	P2-2P2	65	185	225	115	266	125	117	266	125
PK 2 2P2-2P2 1p S	PK 2 2P2-2P2 3p S	200	166	87	2P2-2P2	65	185	225	115	266	125	117	266	125
PK 3 M12-M12 1p S	PK 3 M12-M12 3p S	210	166	99	M12-M12	65	208	240	127	266	135	130	266	148
PK 3 M12-P3 1p S	PK 3 M12-P3 3p S	210	166	99	M12-P3	65	208	240	127	266	135	130	266	148
PK 3 M12-2P3 1p S	PK 3 M12-2P3 3p S	210	166	99	M12-2P3	65	208	240	127	266	135	130	266	148
PK 3 P3-P3 1p S	PK 3 P3-P3 3p S	210	166	99	P3-P3	65	208	240	127	266	135	130	266	148
PK 3 P3-2P3 1p S	PK 3 P3-2P3 3p S	210	166	99	P3-2P3	65	208	240	127	266	135	130	266	148
PK 3 2P3-2P3 1p S	PK 3 2P3-2P3 3p S	210	166	99	2P3-2P3	65	208	240	127	266	135	130	266	148

*Protective barriers; included with 3p fuse bases or sold separately

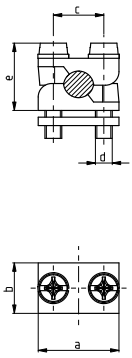
**Terminal covers and fuse covers; sold separately



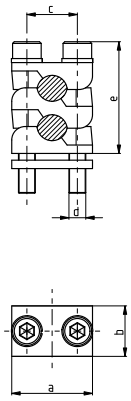
Type of connections

	a	b	c	d	e_{max}	Tightening torque [Nm]	Connections [mm²]
P00	24	15	15	M5	25	2,6	10-70 Cu/Al
2P00	24	15	15	M5	35	2,6	2x(10-50) Cu/Al
P1	37	20	25	M6	30	4,5	70-150 Cu/Al
2P1	37	20	25	M6	42	4,5	2x(70-95) Cu/Al
P2	42	22	28	M8	40	11	120-240 Cu/Al
2P2	42	22	28	M8	55	11	2x(120-150) Cu/Al
P3	50	25	30	M8	44	11	120-300 Cu/Al
2P3	50	25	30	M8	66	11	2x(120-240) Cu/Al
2xM6	26	15	14	M6	16	4	6-70 Cu
S12	36	16	25	M6	25	9,5	25-150Cu
M8				M8	20	10	
MI0				M10	30	32	
M12				M12	30	32	
V shaped clamp	35	23	58		45	22	SM: 50-240 Cu/Al SE: 300 Cu/Al RM: 37-70 Cu/Al RE: 25-50 Cu/Al

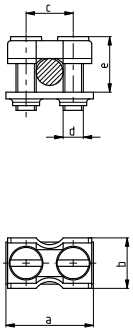
P00, P1, P2, P3



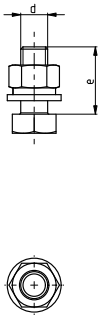
2P00, 2P1, 2P2, 2P3



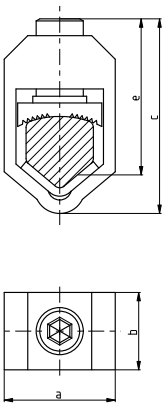
2xM6, S12



M8, M10, M12



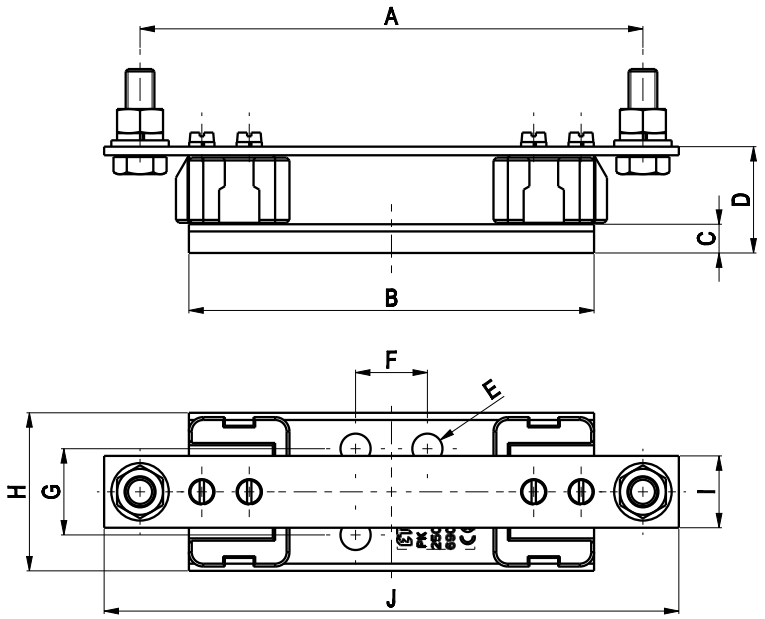
V shaped clamp



Technical data for Neutral Terminal Base / Earth Clamp

Size			00	1	2	3
Electrical characteristics						
Rated voltage	U_n	V a.c.	690			
Rated current	I_n	A	160	250	400	630
Cable terminal						
Connection			M8-2M5	M10-M10		M12-M12
Tightening torque		Nm	10-2,6	32		

Dimensions for Neutral Terminal Base / Earth Clamp										
[mm]	A	B	C	D	E	F	G	H	I	J
PK 00/0 M8-2M5 S	100	84	4,5	26,5	Ø 7,5	25	\	31	20	115
PK 1 M10-M10 S	175	141	10	38	Ø 10,5	25	30	55,5	26	200
PK 2 M10-M10 S	200	166	10	40	Ø 10,5	25	30	65	30	225
PK 3 M12-M12 S	210	166	10	40	Ø 10,5	25	30	65	30	240



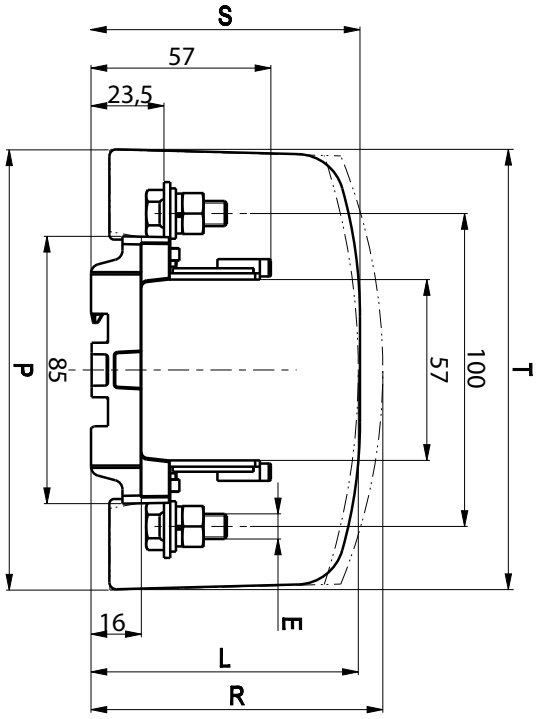
Plastic fuse bases type PT size 00 to 3

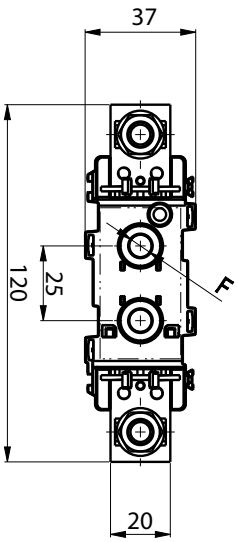
Technical data						
Size			00	1	2	3
Electrical characteristics						
Rated voltage	U_n	V a.c.	690			
Rated current	I_n	A	160	250	400	630
Conv. free air thermal current with fuse links	I_{th}	A	160	250	400	630
Conv. free air thermal current with solid links	I_{th}	A	200	320	500	800
Rated frequency		Hz	40-60			
Max. permis. power dissipation per fuse link	P_a	W	12	32	45	60
Max. breaking capacity per fuse link	I_{cu}	kA	120			
Derating temperature factors for max. current	≤ 35	°C	1			
	40	°C	0,95			
	50	°C	0,85			
Mechanical characteristics						
Ambient temperature range	T_{amb}	°C	-25...+55			
Rated operating mode			uninterrupted			
Mounting position			vertical, horizontal			
Pollution degree			3			
Overvoltage category			III			
Degree of protection			IP00 without covers; IP20 with covers fitted			
Standards			IEC 60269-2, DIN VDE 0636, DIN 43620			

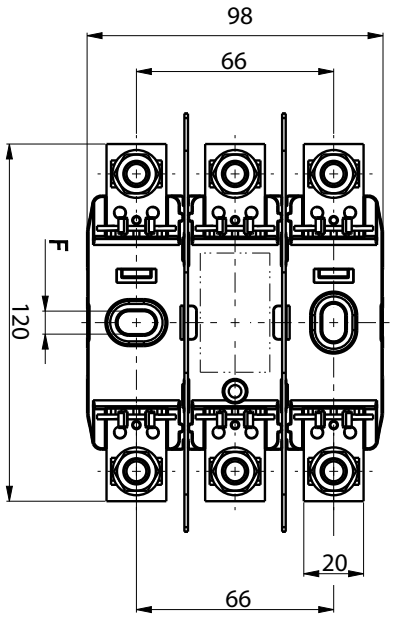
Dimensions for size 00

1p	3p	E	F	L	P	R	S*	T*
PT 00 M8-M8 1p	PT 00 M8-M8 3p	M8-M8	Ø7,5	\	\	\	86	140
PT 00 2M6-2M6 1p	PT 00 2M6-2M6 3p	2M6-2M6	Ø7,5	\	\	\	86	140
PT 00 M8-2M6 1p	PT 00 M8-2M6 3p	M8-2M6	Ø7,5	\	\	\	86	140
PT 00 M8-P00 1p	PT 00 M8-P00 3p	M8-P00	Ø7,5	\	\	\	86	140
PT 00 M8-2P00 1p	PT 00 M8-2P00 3p	M8-2P00	Ø7,5	\	\	\	86	140
PT 00 P00-P00 1p	PT 00 P00-P00 3p	P00-P00	Ø7,5	\	\	\	86	140
PT 00 P00-2P00 1p	PT 00 P00-2P00 3p	P00-2P00	Ø7,5	\	\	\	86	140
PT 00 2P00-2P00 1p	PT 00 2P00-2P00 3p	2P00-2P00	Ø7,5	\	\	\	86	140
PTI 00 M8-M8 1p	PTI 00 M8-M8 3p	M8-M8	Ø7,5	87	140	\	\	\
PTI 00 2M6-2M6 1p	PTI 00 2M6-2M6 3p	2M6-2M6	Ø7,5	87	140	\	\	\
PTI 00 M8-2M6 1p	PTI 00 M8-2M6 3p	M8-2M6	Ø7,5	87	140	\	\	\
PTI 00 M8-P00 1p	PTI 00 M8-P00 3p	M8-P00	Ø7,5	87	140	\	\	\
PTI 00 M8-2P00 1p	PTI 00 M8-2P00 3p	M8-2P00	Ø7,5	87	140	\	\	\
PTI 00 P00-P00 1p	PTI 00 P00-P00 3p	P00-P00	Ø7,5	87	140	\	\	\
PTI 00 P00-2P00 1p	PTI 00 P00-2P00 3p	P00-2P00	Ø7,5	87	140	\	\	\
PTI 00 2P00-2P00 1p	PTI 00 2P00-2P00 3p	2P00-2P00	Ø7,5	87	140	\	\	\
PTIP 00 M8-M8 1p	PTIP 00 M8-M8 3p	M8-M8	Ø7,5	87	140	95	\	\
PTIP 00 2M6-2M6 1p	PTIP 00 2M6-2M6 3p	2M6-2M6	Ø7,5	87	140	95	\	\
PTIP 00 M8-2M6 1p	PTIP 00 M8-2M6 3p	M8-2M6	Ø7,5	87	140	95	\	\
PTIP 00 M8-P00 1p	PTIP 00 M8-P00 3p	M8-P00	Ø7,5	87	140	95	\	\
PTIP 00 M8-2P00 1p	PTIP 00 M8-2P00 3p	M8-2P00	Ø7,5	87	140	95	\	\
PTIP 00 P00-P00 1p	PTIP 00 P00-P00 3p	P00-P00	Ø7,5	87	140	95	\	\
PTIP 00 P00-2P00 1p	PTIP 00 P00-2P00 3p	P00-2P00	Ø7,5	87	140	95	\	\
PTIP 00 2P00-2P00 1p	PTIP 00 2P00-2P00 3p	2P00-2P00	Ø7,5	87	140	95	\	\

*Protective barriers





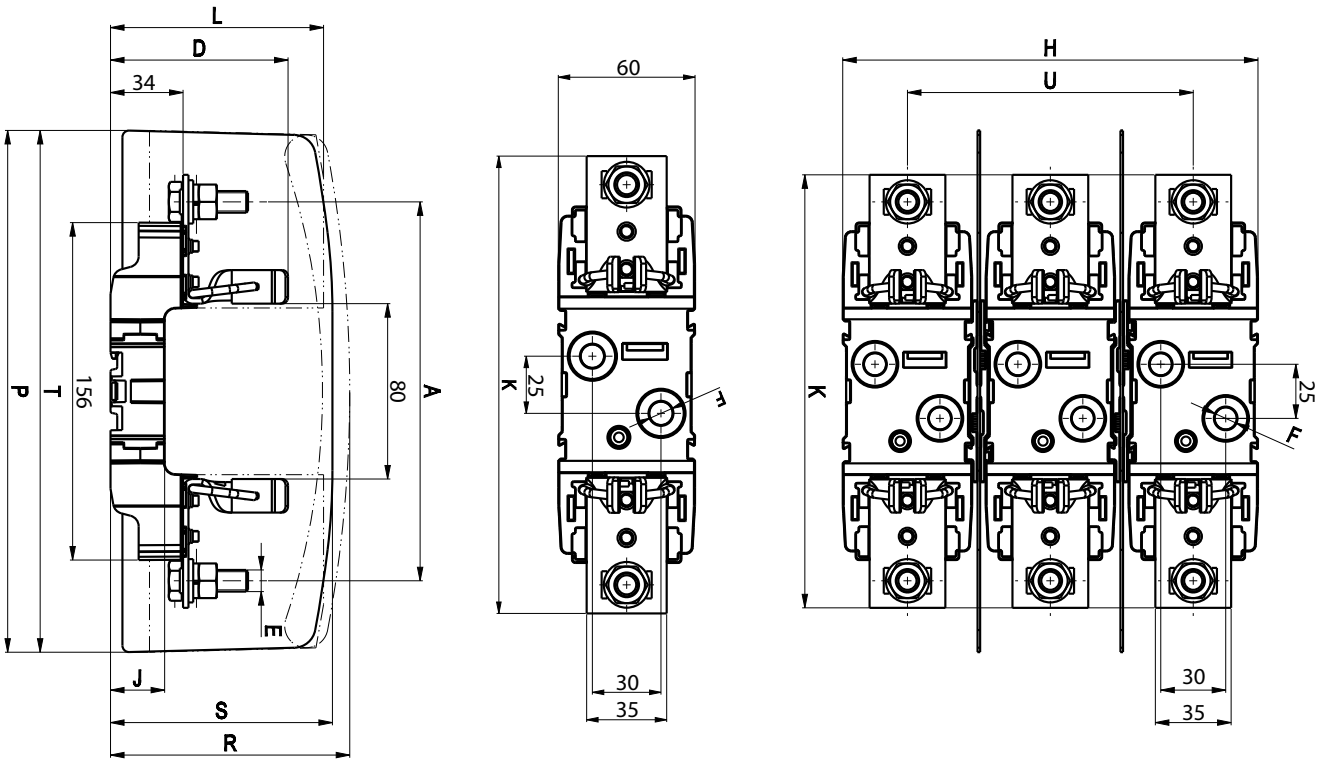


Dimensions for sizes 1, 2, 3

1p	3p	A	D	E	F	H	J	K	L**	P**	R**	S*	T*	U
PT 1 M10-M10 1p	PT 1 M10-M10 3p	175	81	M10-M10	10,5	190	25	200	103	244	110	108	241	130
PT 1 M10-S12 1p	PT 1 M10-S12 3p	175	81	M10-S12	10,5	190	25	200	103	244	110	108	241	130
PT 1 S12-S12 1p	PT 1 S12-S12 3p	175	81	S12-S12	10,5	190	25	200	103	244	110	108	241	130
PT 1 M10-P1 1p	PT 1 M10-P1 3p	175	81	M10-P1	10,5	190	25	200	103	244	110	108	241	130
PT 1 M10-2P1 1p	PT 1 M10-2P1 3p	175	81	M10-2P1	10,5	190	25	200	103	244	110	108	241	130
PT 1 P1-P1 1p	PT 1 P1-P1 3p	175	81	P1-P1	10,5	190	25	200	103	244	110	108	241	130
PT 1 P1-2P1 1p	PT 1 P1-2P1 3p	175	81	P1-2P1	10,5	190	25	200	103	244	110	108	241	130
PT 1 2P1-2P1 1p	PT 1 2P1-2P1 3p	175	81	2P1-2P1	10,5	190	25	200	103	244	110	108	241	130
PT 2 M10-M10 1p	PT 2 M10-M10 3p	200	87	M10-M10	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 M10-S12 1p	PT 2 M10-S12 3p	200	87	M10-S12	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 S12-S12 1p	PT 2 S12-S12 3p	200	87	S12-S12	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 M10-P2 1p	PT 2 M10-P2 3p	200	87	M10-P2	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 M10-2P2 1p	PT 2 M10-2P2 3p	200	87	M10-2P2	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 P2-P2 1p	PT 2 P2-P2 3p	200	87	P2-P2	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 P2-2P2 1p	PT 2 P2-2P2 3p	200	87	P2-2P2	10,5	190	25	225	112	268	120	115,5	266	130
PT 2 2P2-2P2 1p	PT 2 2P2-2P2 3p	200	87	2P2-2P2	10,5	190	25	225	112	268	120	115,5	266	130
PT 3 M12-M12 1p	PT 3 M12-M12 3p	210	98	M12-M12	10,5	222	10	240	126	268	133	130	267	166
PT 3 M12-P3 1p	PT 3 M12-P3 3p	210	98	M12-P3	10,5	222	10	240	126	268	133	130	267	166
PT 3 M12-2P3 1p	PT 3 M12-2P3 3p	210	98	M12-2P3	10,5	222	10	240	126	268	133	130	267	166
PT 3 P3-P3 1p	PT 3 P3-P3 3p	210	98	P3-P3	10,5	222	10	240	126	268	133	130	267	166
PT 3 P3-2P3 1p	PT 3 P3-2P3 3p	210	98	P3-2P3	10,5	222	10	240	126	268	133	130	267	166
PT 3 2P3-2P3 1p	PT 3 2P3-2P3 3p	210	98	2P3-2P3	10,5	222	10	240	126	268	133	130	267	166

*Protective barriers; included with 3p fuse bases or sold separately

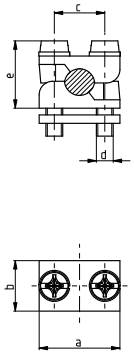
**Terminal covers and fuse covers; sold separately



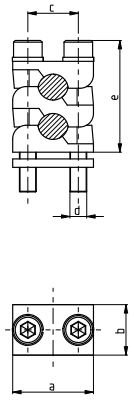
Type of connections

	a	b	c	d	e_{max}	Tightening torque [Nm]	Connections [mm²]
P00	24	15	15	M5	25	2,6	10-70 Cu/Al
2P00	24	15	15	M5	35	2,6	2x(10-50) Cu/Al
P1	37	20	25	M6	30	4,5	70-150 Cu/Al
2P1	37	20	25	M6	42	4,5	2x(70-95) Cu/Al
P2	42	22	28	M8	40	11	120-240 Cu/Al
2P2	42	22	28	M8	55	11	2x(120-150) Cu/Al
P3	50	25	30	M8	44	11	120-300 Cu/Al
2P3	50	25	30	M8	66	11	2x(120-240) Cu/Al
2xM6	26	15	14	M6	16	4	6-70 Cu
S12	36	16	25	M6	25	9,5	25-150Cu
M8				M8	20	10	
MI0				M10	30	32	
M12				M12	30	32	
V shaped clamp	35	23	58		45	22	SM: 50-240 Cu/Al SE: 300 Cu/Al RM: 37-70 Cu/Al RE: 25-50 Cu/Al

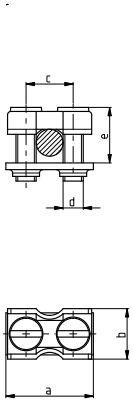
P00, P1, P2, P3



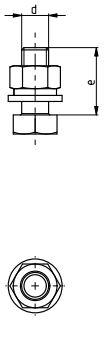
2P00, 2P1, 2P2, 2P3



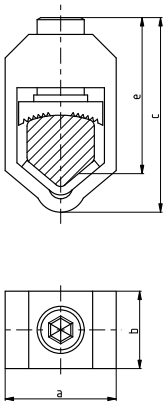
2xM6, S12



M8, M10, M12



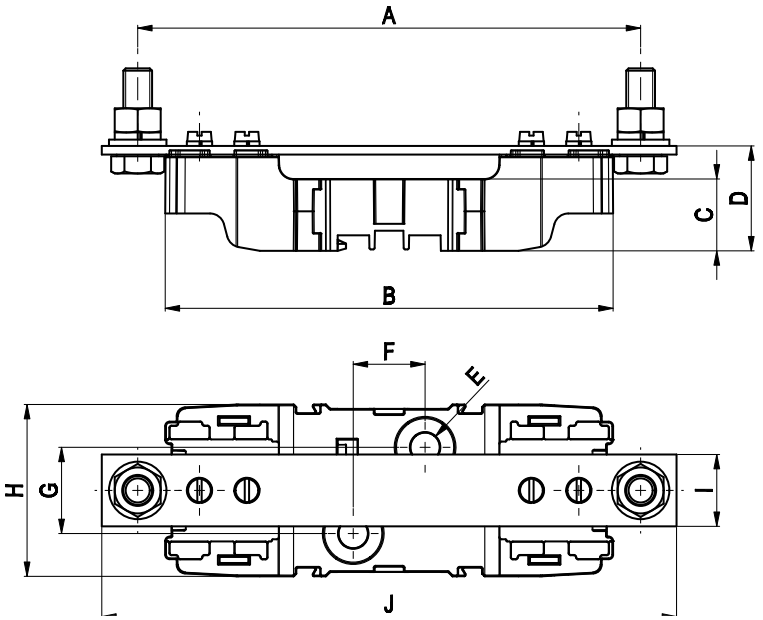
V shaped clamp



Technical data for Neutral Terminal Base / Earth Clamp

Size			00	1	2	3
Electrical characteristics						
Rated voltage	U_n	V a.c./d.c.	690			
Rated current	I_n	A	160	250	400	630
Cable terminal						
Connection			M8-2M5	M10-M10		M12-M12
Tightening torque		Nm	10-2,6	32		

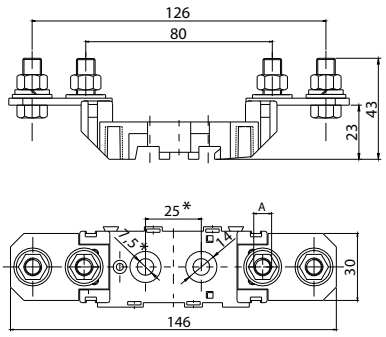
Dimensions for Neutral Terminal Base / Earth Clamp										
[mm]	A	B	C	D	E	F	G	H	I	J
PT 00/0 M8-2M5 S	100	85	4,5	26,5	Ø 7,5	25	\	37	20	115
PT 1 M10-M10 S	175	156	10	38	Ø 10,5	25	30	60	26	200
PT 2 M10-M10 S	200	156	10	40	Ø 10,5	25	30	60	30	225
PT 3 M12-M12 S	210	156	10	40	Ø 10,5	25	30	60	30	240



Plastic fuse bases type PLNVV 000 and 00 (fuses with screw connection - S)

Technical data:	
Rated voltage U_n	690 V AC
Rated current I_n	160 A - sizes 00C, 00, 0 250 A - size 1 400 A - size 2 630 A - size 3
Degree of pollution	3 -> IEC 60947, DIN EN 60947, DIN VDE 0110
Standards	IEC 60269, DIN EN 60269, DIN VDE 0636, HRN EN 60269

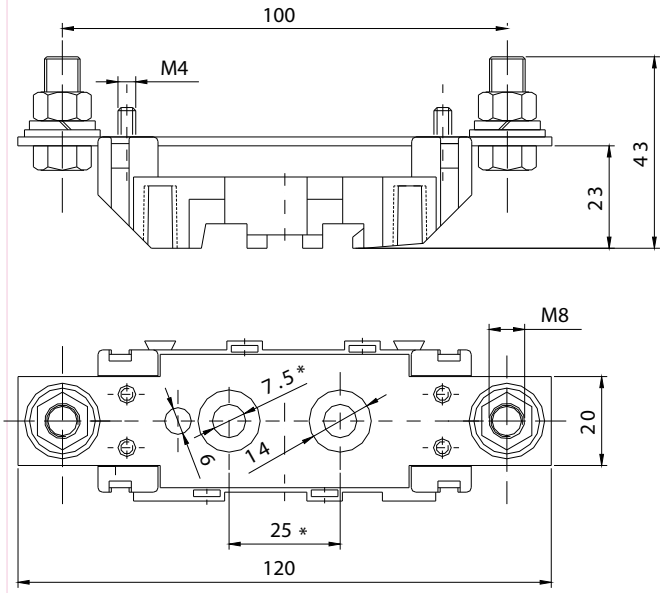
Dimensions



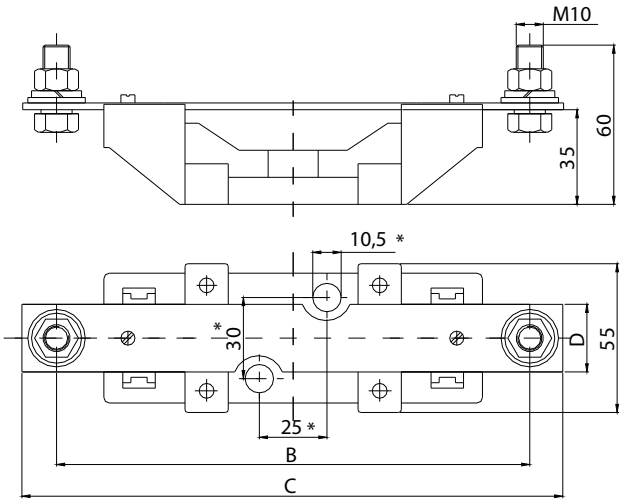
	A
PLNVV -000	M8
PLNVV -00	M10

Neutral terminal base PLNS

PLNS - 00 N

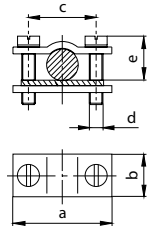


2PLNS - 1,2 N

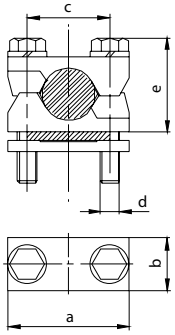


	2PLNS - 1N	2PLNS - 2N
B	175,6	200
C	200	230
D	25	30

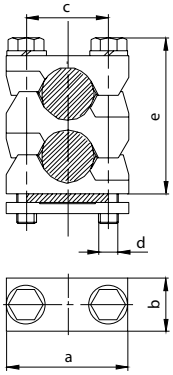
OS 00, OS 12



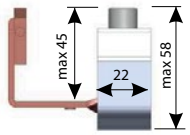
P00, P1, P2, P3



P002, P12, P22, P32



"V" shaped clamp



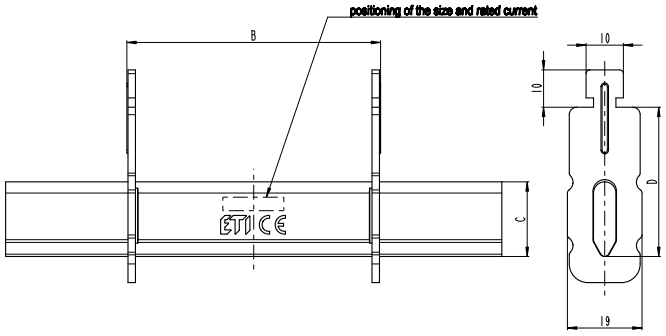
Technical data

Type	a	b	c	d	e_{max}
OS00	24	15	15	M5	15
OS12	36	16	25	M6	25
P00	24	15	15	M5	25
P002	24	15	15	M5	35
P1	37	20	25	M6	30
P12	37	20	25	M6	42
P2	42	22	28	M8	40
P22	42	22	28	M8	55
P3	50	25	30	M8	44
P32	50	25	30	M8	66

Accessories

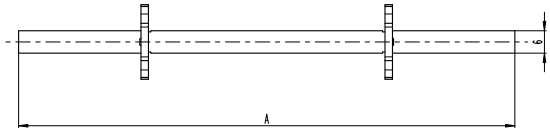
NV separator - Drawing A

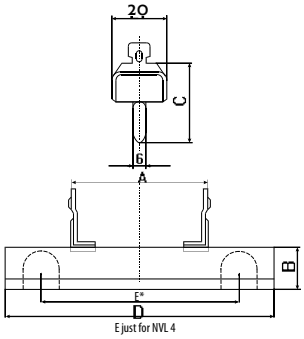
Type	dimension				
	I_N(A)	A	B	C	D
NV L 00	160	77,5	49	15	35
NV L 0	160	125	68	15	35
NV L 1	250	133	68	20	40
NV L 2	400	148	68	26	48
NV L 3	630	148	68	33	60



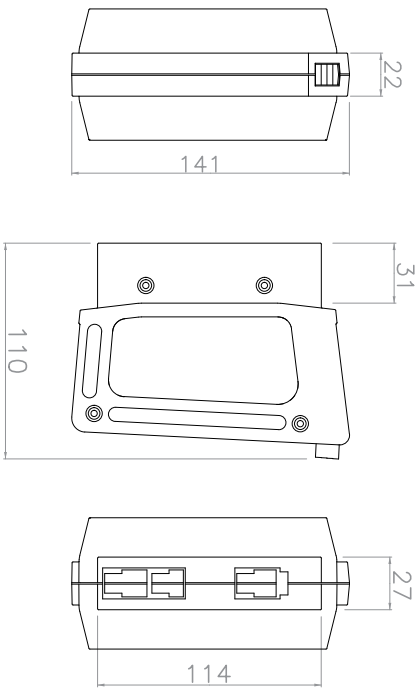
NV separator - Drawing B

type	dimension				
	A	B	C	D	E
NV L 4	68	51	87	200	150
NV L 4a	89	50	86	200	-

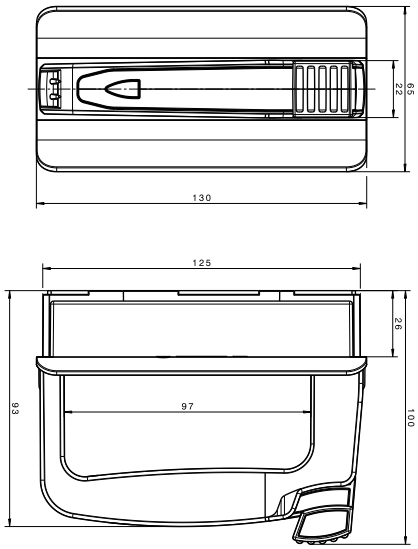




R 00-3 dimension

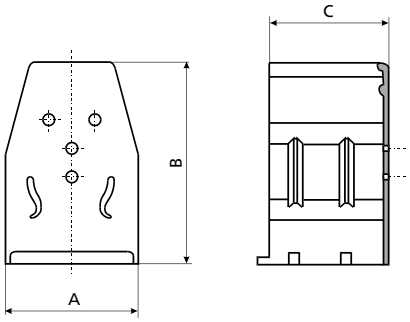


VRRN 00-3 dimension

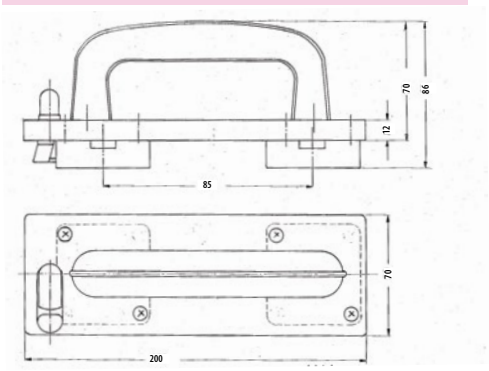


Insulating sleeve of contact spring PK and PP

type	dimension		
	A	B	C
PP 00	32	68	41
PK 1	40	52	33
PK 2	44	63	40
PK 3	44	67	40

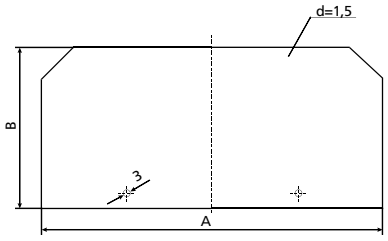


VRRL 85 dimension



Base separating element

type	dimension	
	A	B
PP 00, PK 00	125	83
PK 0	175	82
PK 1	210	100
PK 2	240	110
PK 3	250	110



NV fuse-rail sizes 00, 1, 2, 3

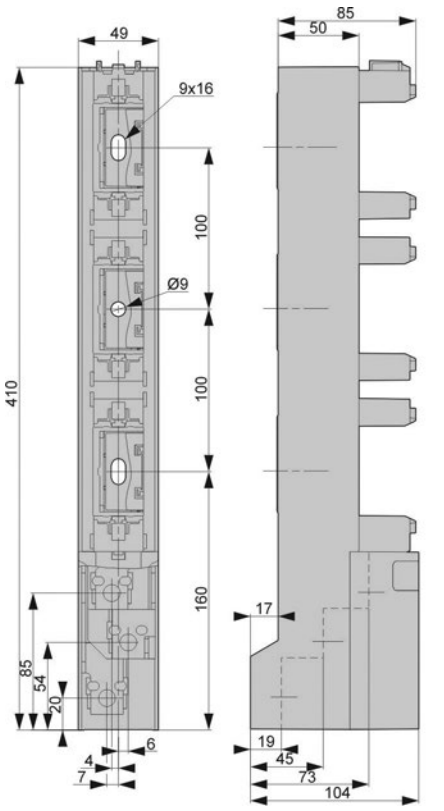
Technical data of insulated fuse-rails (in accordance with VDE 0636, part 201, IEC 60269-2-1)

Technical Specifications			VL00/100	VL00/185	VL1	VL1H
Electrical Characteristics						
Rated operational voltage	U_e	V	690 AC	690 AC	690 AC	690 AC
Rated operational current	I_e	A	160	160	250	250
Rated frequency	-	Hz	40-60	40-60	40-60	40-60
Rated insulation voltage	U_i	V	800 AC		1000 AC	
Total power loss at I_{th} (without fuse)	Pv	W	18	23	23	29
Fuse links						
Size - DIN 43 620, IEC 60269-2	-	-	000/00		1	
Max. rated current (gG)	I_n	A	160	160	250	250
Max. permissible power loss per fuse link	P_v	W	12		32	23
Dimensions						
Mass	-	kg	100 mm = 0,8	185mm=1,5	3,5	
Busbars (distance)	-	mm	100	185	185	
Cable connection						
Screw	-	-	M8		M10	
Torque	Ma	Nm	12-15		30-35	
V-clip	-	mm^2	10-95		25-300	25-240 / 25-300
Torque	Ma	Nm	10		32	
Protection						
Operational state	-	-	IP10			
Operating conditions						
Ambient temperature	T_u	°C	-25 ... +55			
Operating condition	-	-	Continuous operation			
Mounting	-	-	vertical, horizontal			
Altitude	-	m	≤ 2000			
Pollution degree	-	-	3			
Overvoltage category	-	-	III	IV		

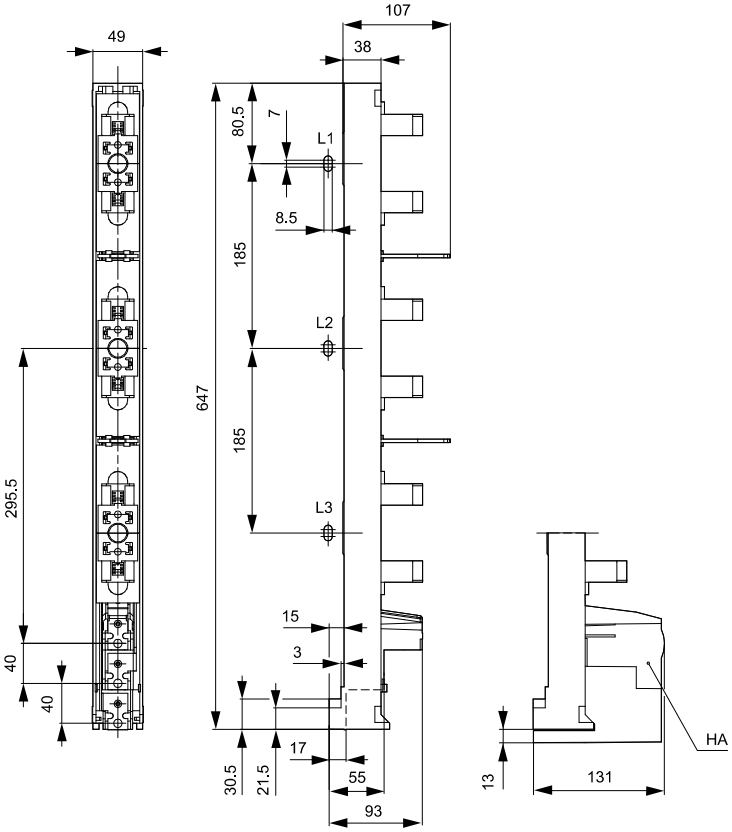
Technical data of insulated fuse-rails (in accordance with VDE 0636, part 201, IEC 60269-2-1)

Technical Specifications			VL2	VL2H	VL3
Electrical Characteristics					
Rated operational voltage	U_e	V	690 AC	690 AC	690 AC
Rated operational current	I_e	A	400	400	630
Rated frequency	-	Hz	40-60	40-60	40-60
Rated insulation voltage	U_i	V		1000 AC	
Total power loss at I_{th} (without fuse)	P_v	W	54	73	115
Fuse links					
Size - DIN 43 620, IEC 60269-2	-	-		2	3
Max. rated current (gG)	I_n	A	400	400	630
Max. permissible power loss per fuse link	P_v	W	45	34	48
Dimensions					
Mass	-	kg		3,8	4,3
Busbars (distance)	-	mm		185	
Cable connection					
Screw	-	-	M12	M12	M12
Torque	Ma	Nm	35-40	35-40	35-40
V-clip	-	mm^2	25-300	25-240 / 25-300	25-300
Torque	Ma	Nm	32	32	32
Protection					
Operational state	-	-		IP10	
Operating conditions					
Ambient temperature	T_u	°C		-25 ... +55	
Operating condition	-	-		Continuous operation	
Mounting	-	-		vertical, horizontal	
Altitude	-	m		≤ 2000	
Pollution degree	-	-		3	
Overvoltage category	-	-		IV	

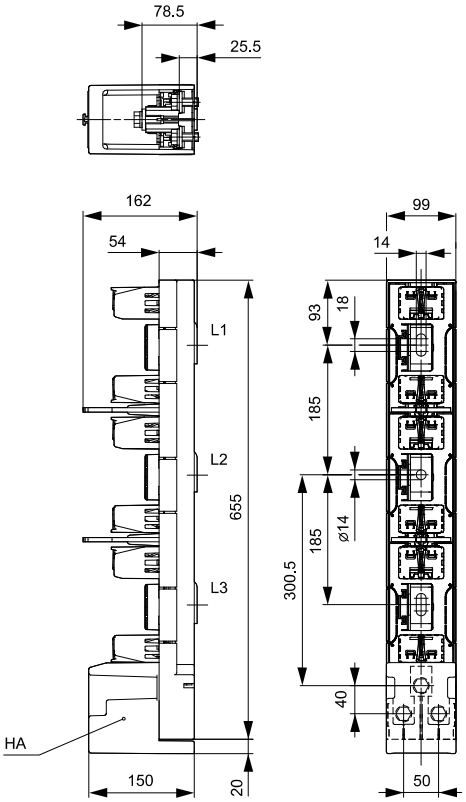
Dimensional overview of VL NV fuse-rails



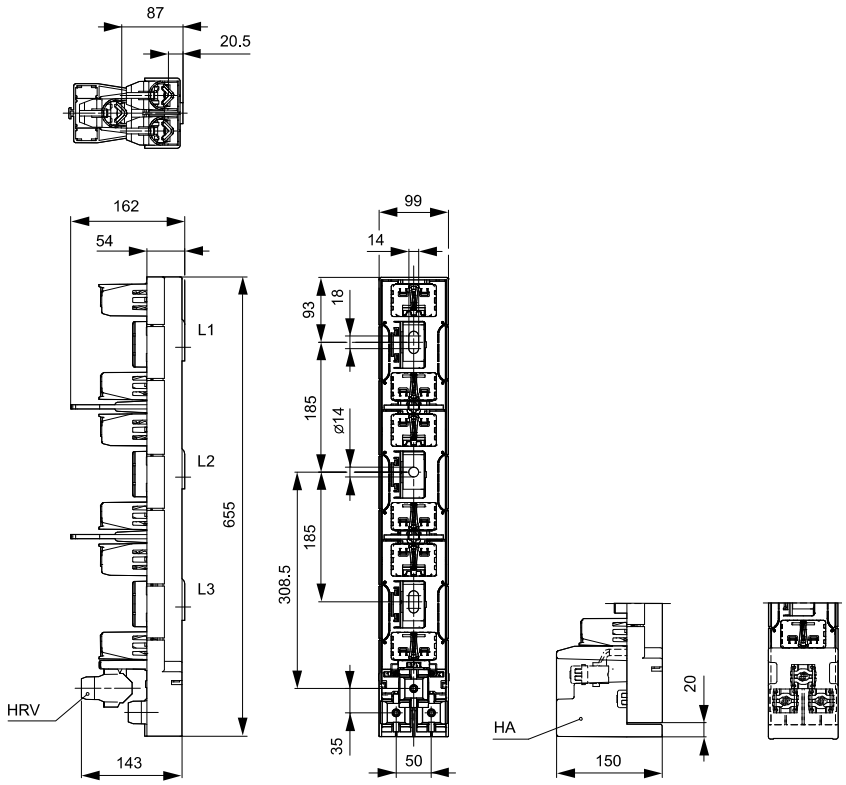
size 00/100



size 00/185

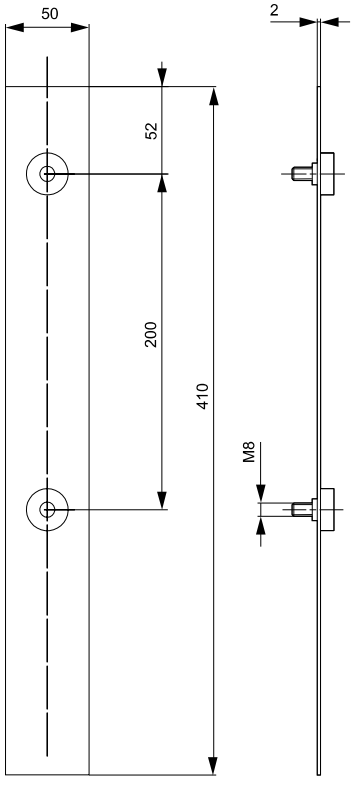


size 1, 2, 3 (M terminal)

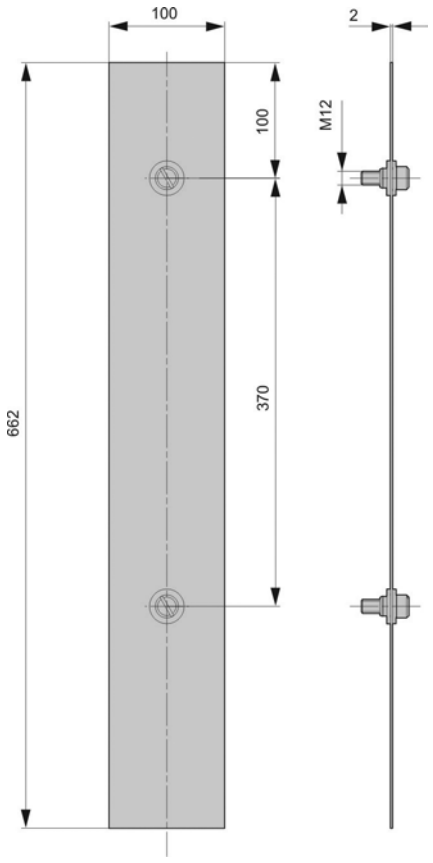


size 1, 2, 3 (SP terminal)

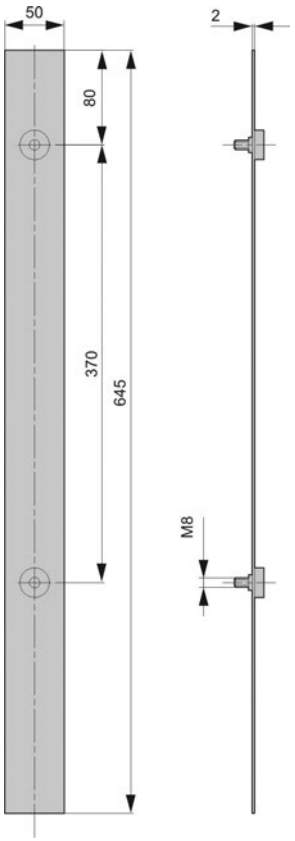
Dimensional overview of accessories for VL NV fuse-rails



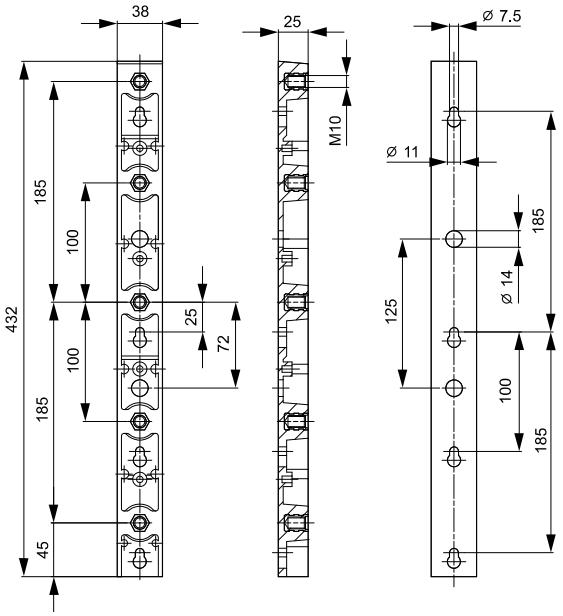
busbar covering PZ 00/100



busbar covering PZ 123/185, busbar covering PZ 00/185



busbar covering PZ 00/185



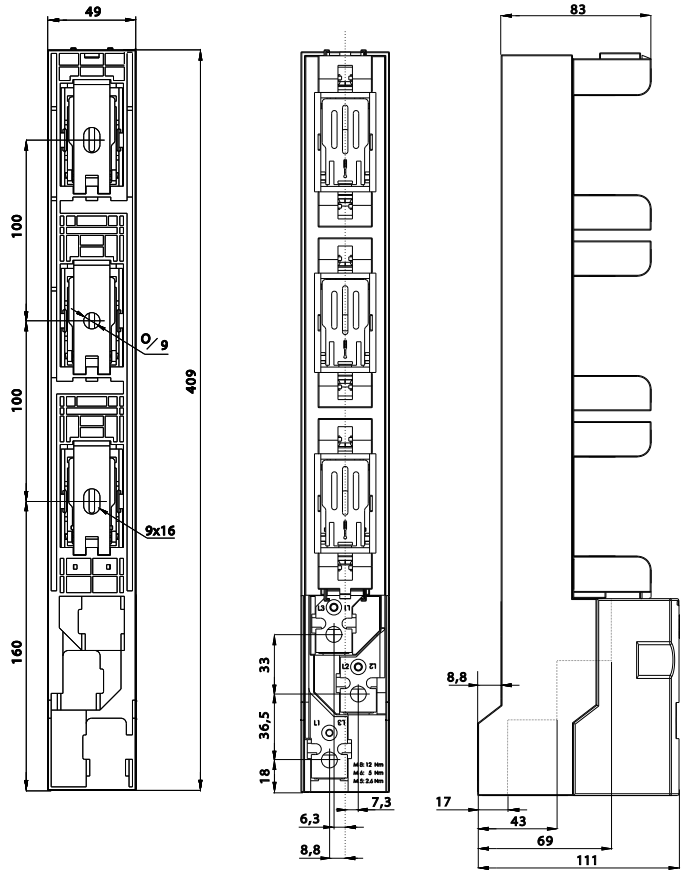
busbar support PP 100/185

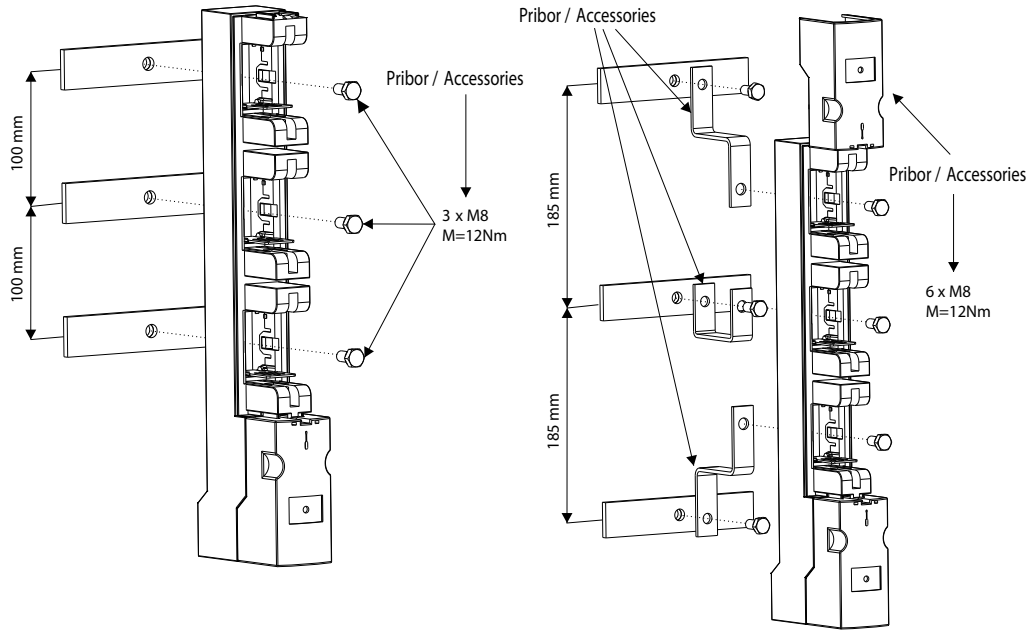
NV fuse-rail type VL00 EK

Technical data

Type		VL00/100 EK
Conventional free air thermal current (Ith)	A	160
Rated insulation voltage	V	AC690
Rated withstand impulse voltage	Kv	6
Rated frequency	Hz	50 (40-60)
Power dissipation (without fuse-links)	W	16,6
Degree of protection (cover closed)		IP20
Degree of protection (cover opened)		IP20
Pollution degree		3
Permissible ambient temperature**	°C	-25°C ... +55°C
Storage temperature	°C	-30°C ... +70°C
Weight (without fuse-links)	kg	0,86
Package	pcs	1

** with ambient temperature between 40-45°C, reduce Ith by 5%;
with ambient temperature above 45°C, reduce Ith by 10%





NV Strip type fuse-switch-disconnector sizes 00, 1, 2, 3

Technical data of NV strip type fuse-switch-disconnectors (in accordance with IEC/EN 60947-3)

Technical Specifications			SL00/100			SL00/185			SL1		
Electrical Characteristics											
Rated operational voltage	U_e	V	500 AC	690 AC	400 AC	500 AC	690 AC	400 AC	500 AC	690 AC	400 AC
Rated operational current	I_e	A	160	100	160	160	160	160	250	250	250
Rated frequency	-	Hz	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60
Rated insulation voltage	U_i	V	AC 800						AC 1000		
Total power loss at I_{th} (without fuse)	Pv	W	18			23					
Utilization category	-	-	AC22B	AC22B	AC22B	AC23B	AC22B	AC23B	AC22B	AC22B	AC23B
Fuse links											
Size - DIN 43 620, IEC 60269-2	-	-	000/00						1		
Max. rated current (gG)	I_n	A	160	100	160	160	160	160	250	250	250
Max. permissible power loss per fuse link	P_v	W	12						32		
Dimensions											
Mass	-	kg	100 mm = 1,40			185mm=2,4			4,9		
Busbars (distance)	-	mm	100			185			185		
Cable connection											
Screw	-	-	M8						M10		
Torque	Ma	Nm	12-15						30-35		
V-clip	-	mm^2	10-95						25-300		
Torque	Ma	Nm	15						32		
Protection											
Operational state	-	-	IP30						IP30		
Cover open	-	-	IP10						IP10		
Operating conditions											
Ambient temperature	T_u	°C	-25 ... +55						-25 ... +55		
Operating condition	-	-	Continuous operation								
Mounting	-	-	vertical, horizontal								
Altitude	-	m	≤ 2000								
Pollution degree	-	-	3								
Overvoltage category	-	-	III			IV					

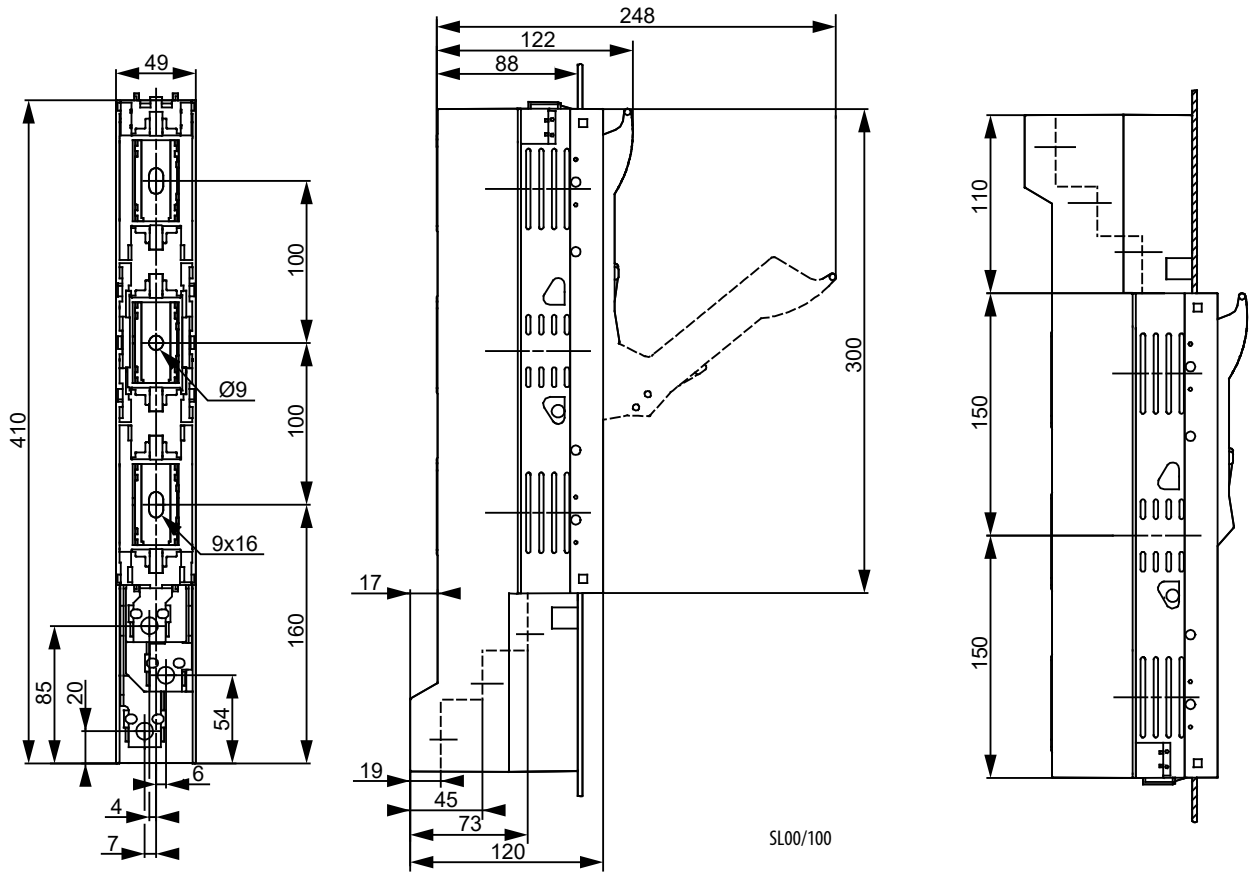
Technical data of NV strip type fuse-switch-disconnectors (in accordance with IEC/EN 60947-3)

Technical Specifications			SL1H			SL2		
Electrical Characteristics								
Rated operational voltage	U_e	V	500 AC	690 AC	400 AC	500 AC	690 AC	400 AC
Rated operational current	I_e	A	250			400	400	400
Rated frequency	-	Hz	40-60			40-60	40-60	40-60
Rated insulation voltage	U_i	V	AC 1000					
Total power loss at I_{th} (without fuse)	Pv	W	29				54	
Utilization category	-	-	AC22B	AC21B	AC23B	AC22B	AC21B	AC23B
Fuse links								
Size - DIN 43 620, IEC 60269-2	-	-	1				2	
Max. rated current (gG)	I_n	A	250			400	400	400
Max. permissible power loss per fuse link	P_v	W	23				45	
Dimensions								
Mass	-	kg	4,9					
Busbars (distance)	-	mm	185					
Cable connection								
Screw	-	-	M10				M12	
Torque	Ma	Nm	30-35				35-40	
V-clip	-	mm^2	25-240 / 25-300				25-300	
Torque	Ma	Nm	32					
Protection								
Operational state	-	-	IP30					
Front cover open	-	-	IP10					
Operating conditions								
Ambient temperature	T_u	^0C	-25 ... +55					
Operating condition	-	-	Continuous operation					
Mounting	-	-	vertical, horizontal					
Altitude	-	m	≤ 2000					
Pollution degree	-	-	3					
Overvoltage category	-	-	IV					

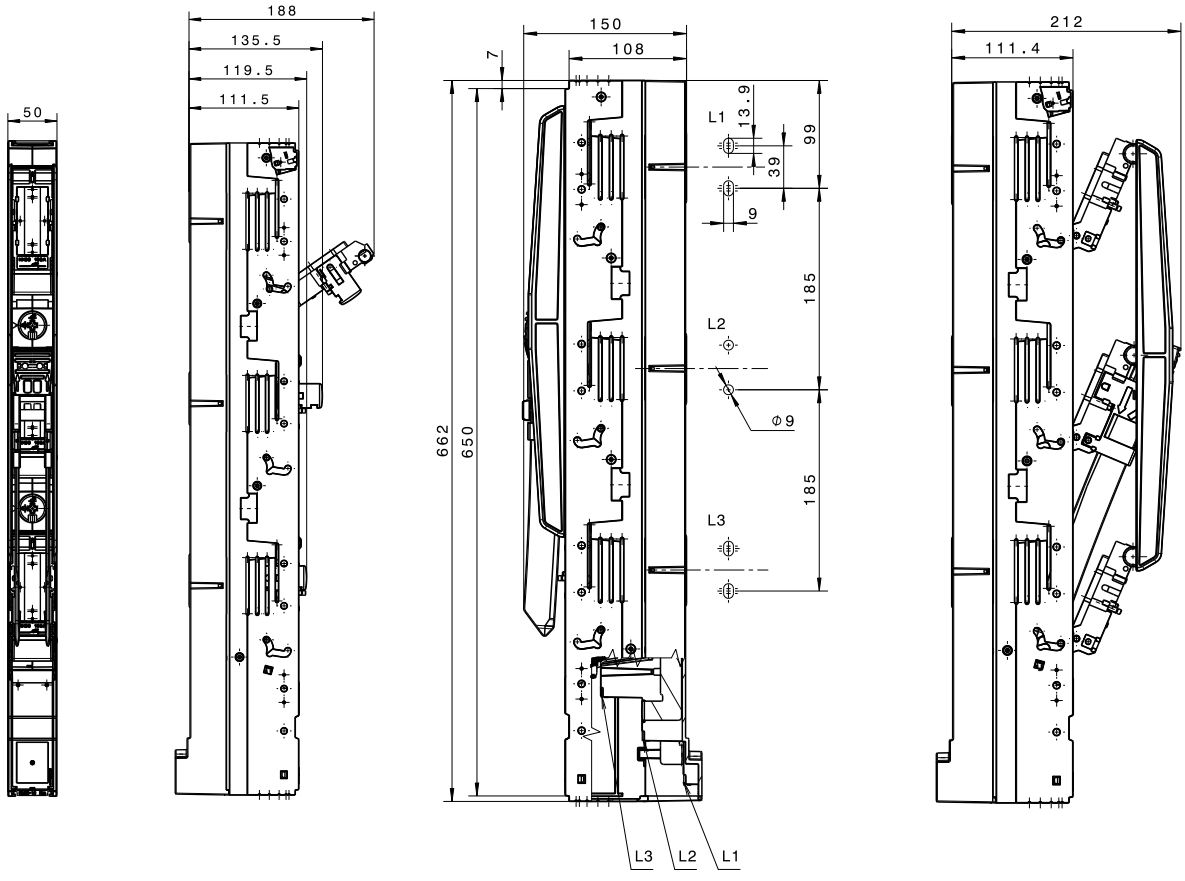
Technical data of NV strip type fuse-switch-disconnectors (in accordance with IEC/EN 60947-3)

Technical Specifications			SL2H			SL3		
Electrical Characteristics								
Rated operational voltage	U_e	V	500 AC	690 AC	400 AC	500 AC	690 AC	400 AC
Rated operational current	I_e	A	400			630	630	630
Rated frequency	-	Hz	40-60			40-60	40-60	40-60
Rated insulation voltage	U_i	V	AC 1000					
Total power loss at I_{th} (without fuse)	Pv	W	73				115	
Utilization category	-	-	AC22B	AC21B	AC23B	AC22B	AC21B	AC23B
Fuse links								
Size - DIN 43 620, IEC 60269-2	-	-	2				3	
Max. rated current (gG)	I_n	A	400			630	630	630
Max. permissible power loss per fuse link	P_v	W	34				48	
Dimensions								
Mass	-	kg	4,9				5,6	
Busbars (distance)	-	mm	185					
Cable connection								
Screw	-	-	M12				M12	
Torque	Ma	Nm	35-40				35-40	
V-clip	-	mm^2	25-240 / 25-300				25-300	
Torque	Ma	Nm	32					
Protection								
Operational state	-	-	IP30					
Front cover open	-	-	IP10					
Operating conditions								
Ambient temperature	T_u	^0C	-25 ... +55					
Operating condition	-	-	Continuous operation					
Mounting	-	-	vertical, horizontal					
Altitude	-	m	≤ 2000					
Pollution degree	-	-	3					
Overvoltage category	-	-	IV					

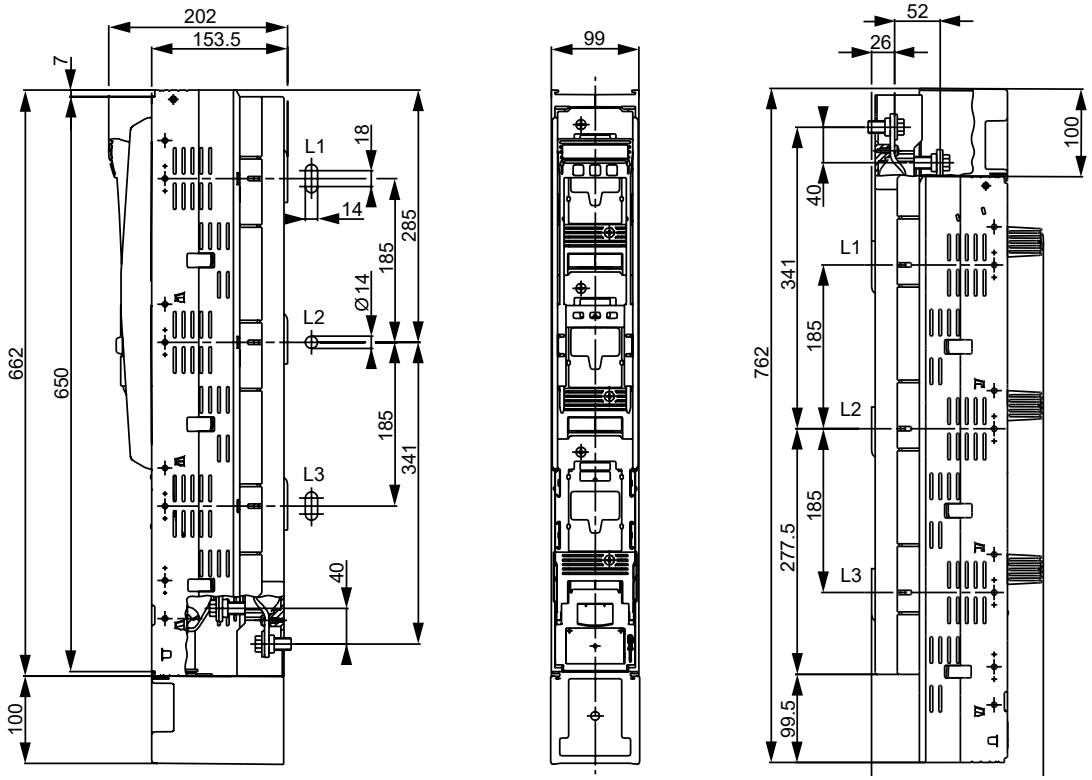
Dimensional overview of NV strip type fuse-switch-disconnectors



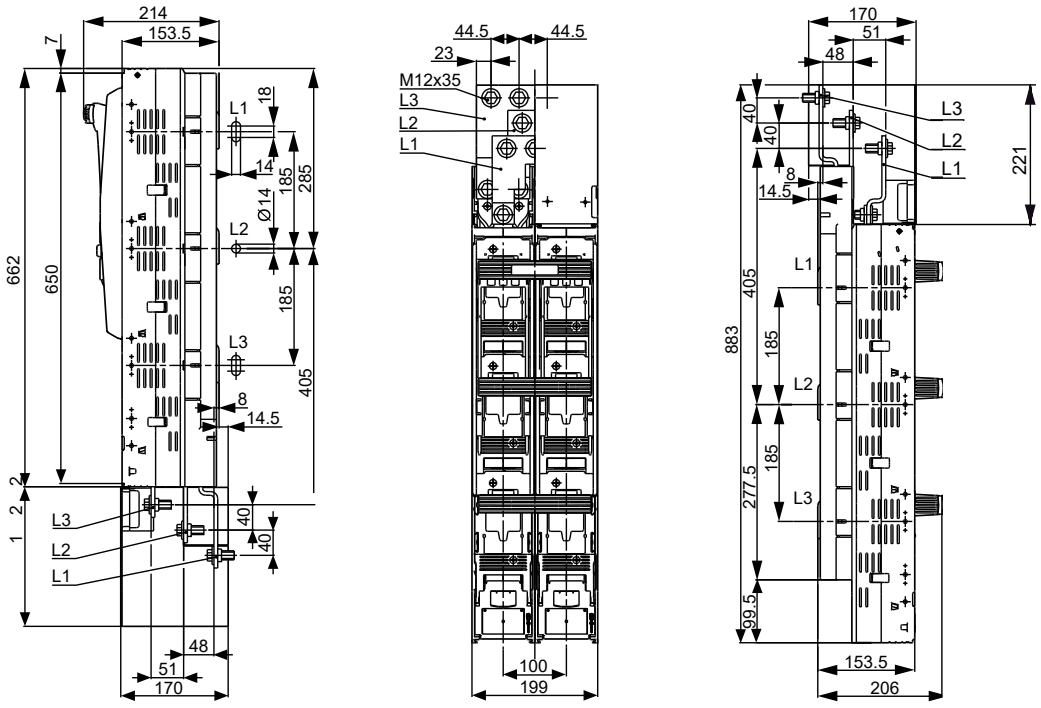
SL00/100



SL00/185

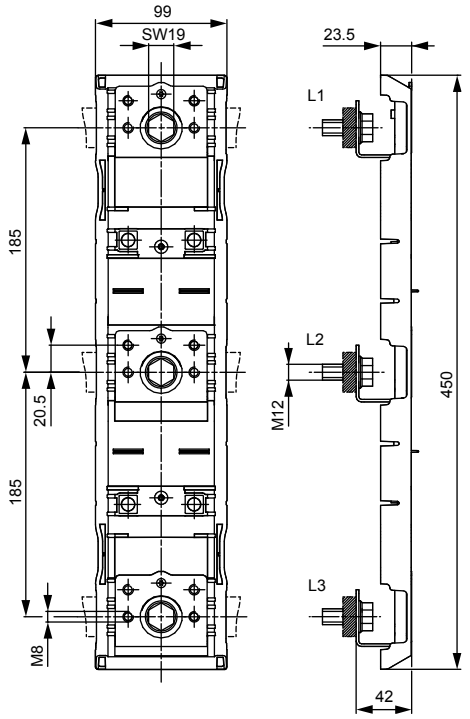


SL1(H), SL2(H), SL3

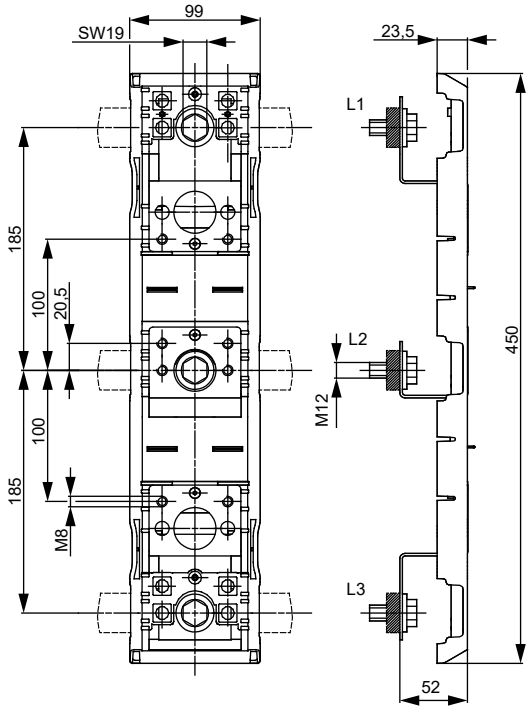


SL3 DOUBLE

Dimensional overview of accessories for NV strip type fuse-switch-disconnectors



adapter DA 185-185/42



adapter DA 185-100/52

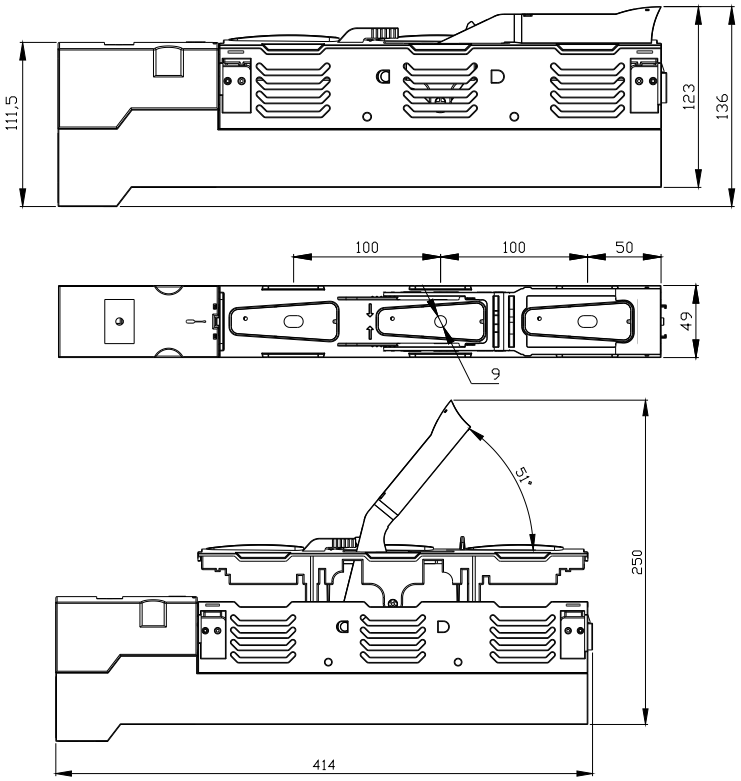
Strip type fuse-switch disconnectors type SL00 EK

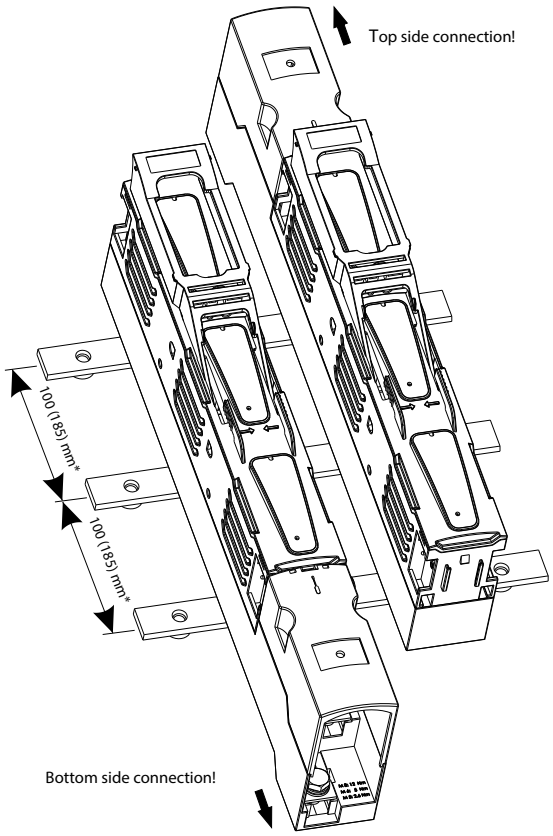
Technical data

Type		SL00/100 EK		
Conventional free air thermal current (Ith)	A	160		
Rated insulation voltage	V	AC690		
Rated withstand impulse voltage	Kv	6		
Rated frequency	Hz	50 (40-60)		
Rated operational (making and breaking) voltage	V	400V	500V	690 V
Utilization category/Rated operational (making and breaking) current	AC21-B	160A	160A	125A
Utilization category/Rated operational (making and breaking) current	AC22-B	160A	160A	100A
Rated conditional short-circuit current	kA_{eff}	63		
Mechanical durability (operating cycles)		1400		
Electrical durability (operating cycles)		200		
Power dissipation (without fuse-links)	W	19,5		
Degree of protection (cover closed)		IP30		
Degree of protection (cover opened)		IP20		
Pollution degree		3		
Permissible ambient temperature**	°C	-25°C ... +55°C		
Storage temperature	°C	-30°C ... +70°C		
Weight (without fuse-links)	kg	1,2		
Package	pcs	1		

** with ambient temperature between 40-45°C, reduce Ith by 5%; with ambient temperature above 45°C, reduce Ith by 10%

Dimensions


111.5
123
136
100
100
50
49
9
51°
250
414


Top side connection!
100 (185) mm*
100 (185) mm*
Bottom side connection!

Horizontal fuse-switch disconnector type KVL size 00, 1, 2, 3 (baseplate mounting)

Technical data (in accordance with IEC/EN 60947-3)

Size			00					1				
Technical Characteristics												
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC	250 DC	440 DC	400 AC	500 AC	690 AC	250 DC	440 DC
Rated operational current*	I_e	A	160	160	160	160	160	250	250	250	250	250
Conv. free air thermal current with fuse-links*	I_{th}	A	160					250				
Conv. free air thermal current with solid-links*	I_{th}	A	210					325				
Rated frequency	f	Hz	40-60	40-60	40-60	/	/	40-60	40-60	40-60	/	/
Rated insulation voltage	U_i	V	1000 AC					1000 AC				
Total power loss (without fuse)	P_v	W	1P - 3W, 3P - 9W					1P - 5W, 3P - 15W				
Power loss at 80% Ith (without fuse-links), **	P_v	W	1P - 1,9 W, 3P - 5,8 W					1P - 3,2 W, 3P - 9,6 W				
Rated impulse withstand voltage	U_{imp}	kV	8					8				
Utilisation category***			AC-23B	AC-22B	AC-21B	DC-22B	DC-21B	AC-23B	AC-22B	AC-21B	DC-22B	DC-21B
Rated conditional short-circuit current, ***, ****		kA	120 (500V), 100 (690V)					120 (500V), 100 (690V)				
Rated short-time withstand current	I_{cw}	kA	5/1s					8,6/1s				
Fuse links												
Size - DIN VDE 0636-2	-	-	000/00					1				
Max. rated current (gG)	I_n	A	160	160	160	160	160	250	250	250	250	250
Max. permissible power loss per fuse link	P_a	W	12					23				
Cable terminal												
Flat terminal-Screw			M8					M10				
Tightening torque	Ma	Nm	12-15					30-35				
Clip terminal, Clamping cross-section		mm^2	Round conductor: 1,5-70 Cu , Laminated copper bar: 6 x 9 x 0,8 Cu					Round conductor: 2,5-150 Cu , Laminated copper bar: 6 x 16 x 0,8 Cu				
Tightening torque	Ma	Nm	2,6					9,5				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL00 P1); 10-70 Al/Cu , 35-95 Al/Cu					(SP KVL1 P1); 10-150 Al/Cu				
Tightening torque	Ma	Nm	(SP KVL00 P1); 2,6					(SP KVL1 P1); 4,5				
Prism Clamp, Clamping cross-section		mm^2						(SP KVL1 P2); 2 x (10-150) Al/Cu				
Tightening torque	Ma	Nm						(SP KVL1 P2); 4,5				
Frame clamp, Clamping cross-section		mm^2	1,5-95 Al/Cu , (Al 95: max. 125A), ******					35-150 Al/Cu				
Torque	Ma	Nm	4,5					12				
Degree of Protection, front side device												
Front cover close	-	-	IP20					IP20				
Front cover open	-	-	IP10					IP10				
With clamp- and lateral cover	-	-	IP2XC					IP2XC				
Operating condition												
Ambient temperature *****	T_{amb}	°C	-25 ... +55					-25 ... +55				
Operating condition	-	-	Continuous operation									
Mounting position	-	-	vertical, horizontal									
Altitude	-	m	≤ 2000									
Pollution degree	-	-	3									
Overvoltage category	-	-	III					III				

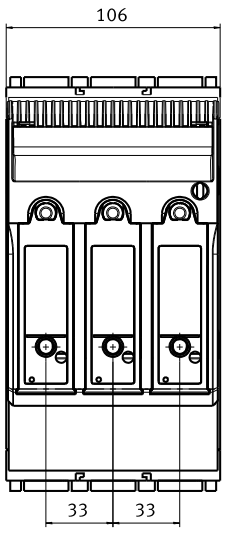
* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current

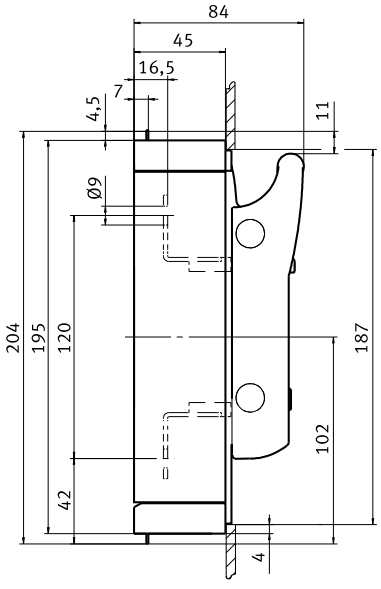
Technical data (in accordance with IEC/EN 60947-3)														
Size			2					3						
Technical Characteristics														
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC	250 DC	440 DC	400 AC	500 AC	690 AC	250 DC	440 DC		
Rated operational current*	I_e	A	400	400	400	400	400	630	630	630	630	630		
Conv. free air thermal current with fuse-links*	I_{th}	A	400					630						
Conv. free air thermal current with solid-links*	I_{th}	A	520					910						
Rated frequency	f	Hz	40-60	40-60	40-60	/	/	40-60	40-60	40-60	/	/		
Rated insulation voltage	U_i	V	1000 AC					1000 AC						
Total power loss (without fuse)	P_v	W	1P - 9W, 3P - 28W					1P - 17W, 3P - 51W						
Power loss at 80% Ith (without fuse-links), **	P_v	W	1P - 6 W, 3P - 17,9 W					1P - 10,9 W, 3P - 32,6 W						
Rated impulse withstand voltage	U_{imp}	kV	8					8						
Utilisation category***			AC-23B	AC-22B	AC-21B	DC-22B	DC-21B	AC-23B	AC-22B	AC-21B	DC-22B	DC-21B		
Rated conditional short-circuit current, ***, ****		kA	120 (500V), 100 (690V)					120 (500V), 100 (690V)						
Rated short-time withstand current	I_{cw}	kA	15/1s					15/1s						
Fuse links														
Size - DIN VDE 0636-2	-	-	2					3						
Max. rated current (gG)	I_n	A	400	400	400	400	400	630	630	630	630	630		
Max. permissible power loss per fuse link	P_a	W	34					48						
Cable terminal														
Flat terminal-Screw			M10					M10 / M12						
Tightening torque	Ma	Nm	30-35					30-35						
Clip terminal, Clamping cross-section		mm^2	Round conductor: 25-150 Cu, Laminated copper bar: 10 x 16 x 0,8 Cu					Laminated copper bar: 11 x 21 x 1 Cu						
Tightening torque	Ma	Nm	23					23						
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P1); 120-240 Al/Cu					(SP KVL3 P1); 120-300 Al/Cu						
Tightening torque	Ma	Nm	(SP KVL2 P1); 11					(SP KVL3 P1); 11						
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P2); 2 x (120-150) Al/Cu					(SP KVL3 P2); 2 x (120-240) Al/Cu						
Tightening torque	Ma	Nm	(SP KVL2 P2); 11					(SP KVL3 P2); 11						
Frame clamp, Clamping cross-section		mm^2	95 -300 Al/Cu					95-300 Al/Cu						
Torque	Ma	Nm	20					20						
Degree of Protection, front side device														
Front cover close	-	-	IP20					IP20						
Front cover open	-	-	IP10					IP10						
With clamp- and lateral cover	-	-	IP2XC					IP2XC						
Operating condition														
Ambient temperature *****	T_{amb}	°C	-25 ... +55					-25 ... +55						
Operating condition	-	-	Continuous operation											
Mounting position	-	-	vertical, horizontal											
Altitude	-	m	≤ 2000											
Pollution degree	-	-	3											
Overvoltage category	-	-	III					III						

* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current

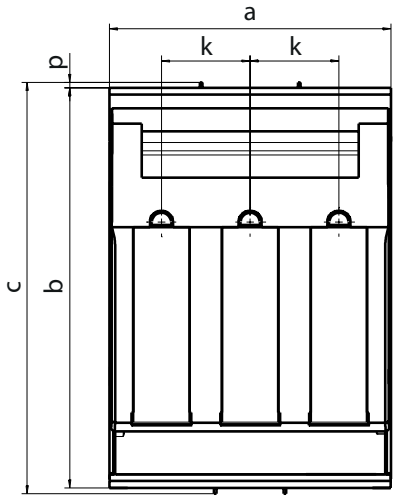
Technical data (in accordance with IEC/EN 60947-3)								
Size			**4a**			**4a**		
Technical Characteristics								
Rated operational voltage	U_e	V	500 AC	690 AC	220 DC	500 AC	690 AC	220 DC
Rated operational current	I_e	A		1250			1600	
Conv. free air thermal current with fuse-links	I_{th}	A		1250			1600	
Conv. free air thermal current with solid-links	I_{th}	A		1250			1600	
Rated frequency	f	Hz	40-60	40-60	/	40-60	40-60	/
Rated insulation voltage	U_i	V		800			800	
Total power loss (without fuse)	P_v	W		32			52	
Rated impulse withstand voltage	U_{imp}	kV		8			8	
Utilisation category			AC-23B	AC-21B	DC-21B	AC-22B	AC-21B	DC-21B
Rated conditional short-circuit current		kA			80 (500V), 50 (690V)			
Rated short-time withstand current	I_{cw}	kA			35			
Fuse links								
Size - DIN VDE 0636-2	-	-			4a			
Max. rated current (gG)	I_n	A		1250			1600	
Max. permissible power loss per fuse link	P_a	W		110			164	
Cable terminal								
Flat terminal-Screw				M16			2x M12	
Tightening torque	Ma	Nm		50-60			35-40	
Cable lug Flat bar		mm^2 mm						
Degree of Protection front side device								
Front cover close	-	-		IP20			IP20	
Front cover open	-	-		IP10			IP10	
Operating condition								
Ambient temperature *	T_{amb}	°C		-25 ... +55			-25 ... +55	
Operating condition	-	-			Continuous operation			
Mounting position	-	-			vertical, horizontal			
Altitude	-	m			≤ 2000			
Pollution degree	-	-			3			
Overvoltage category	-	-		III			III	

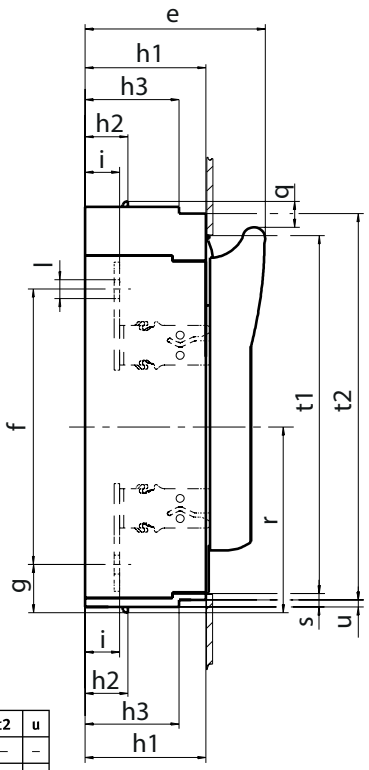
* 35°C Normal temperature, at 55°C with reduced operating current



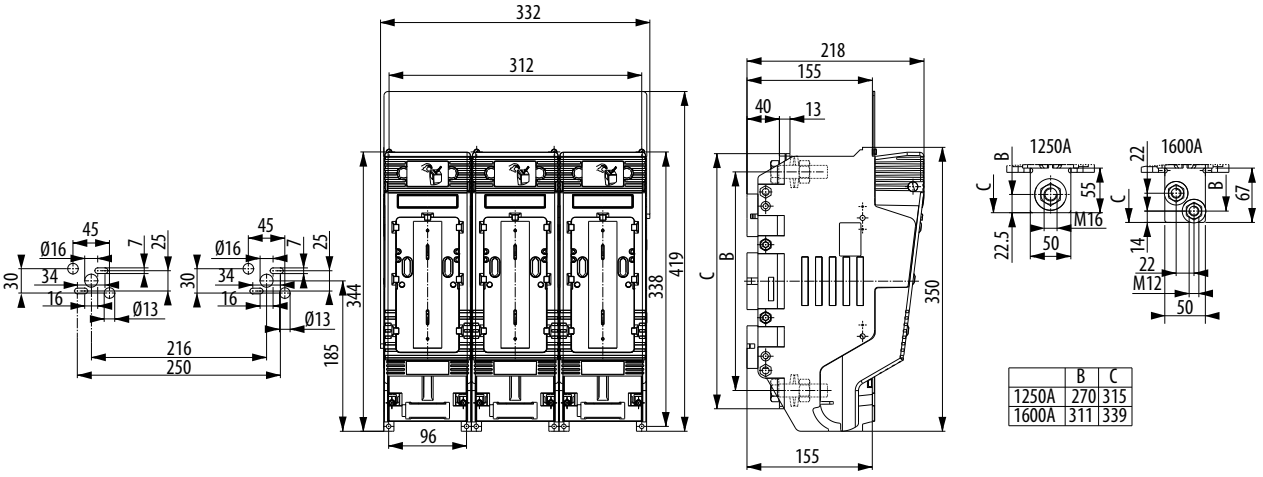


KVL-00 3p M8-M8
KVL-00 3p BC95-BC95
KVL-00 3p M8-M8 LED
KVL-00 3p BC95-BC95 LED





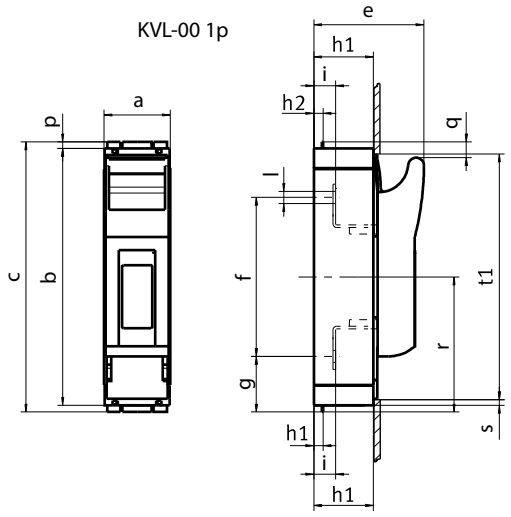
	a	b	c	e	f	g	h1	h2	h3	i	k	l	p	q	r	s	t1	t2	u
KVL-1 3p M10-M10 (LED)	184	298	306	117	185	46	70	32	–	25	58	Ø10,5	4	19	138	5	272	–	–
KVL-2 3p M10-M10 (LED)	210	298	306	134	205	36	90	32	70	26	66	Ø14	4	19	138	10	268	288	5
KVL-3 3p M10-M10 (LED)	250	298	306	143	205	36	90	32	70	26	82	Ø14	4	19	138	10	268	288	5



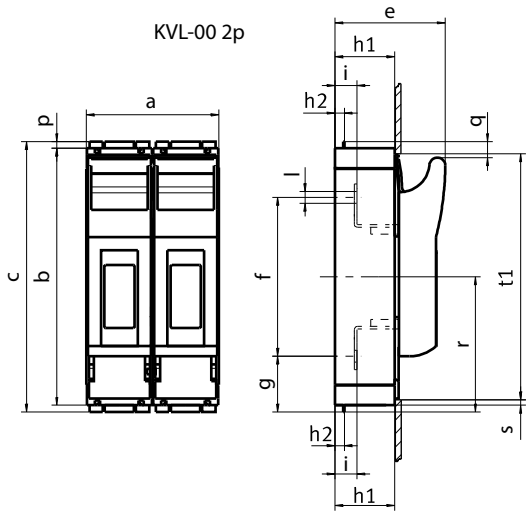
	B	C
1250A	270	315
1600A	311	339

HVL 4a 3p

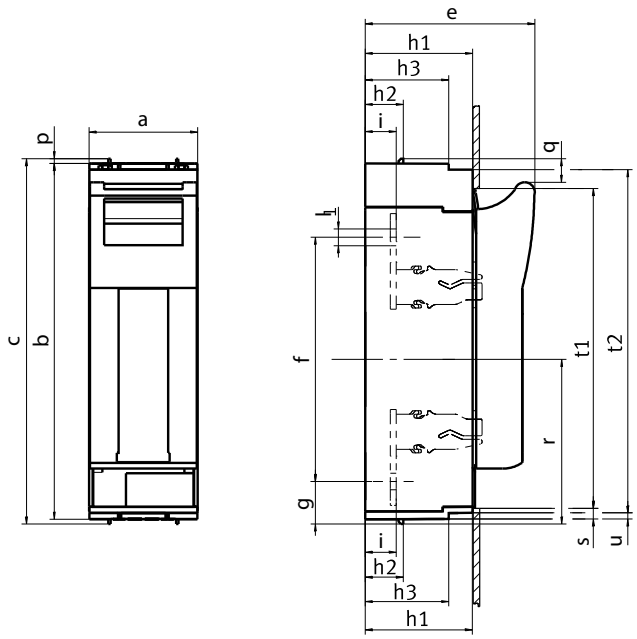
KVL-00 1p



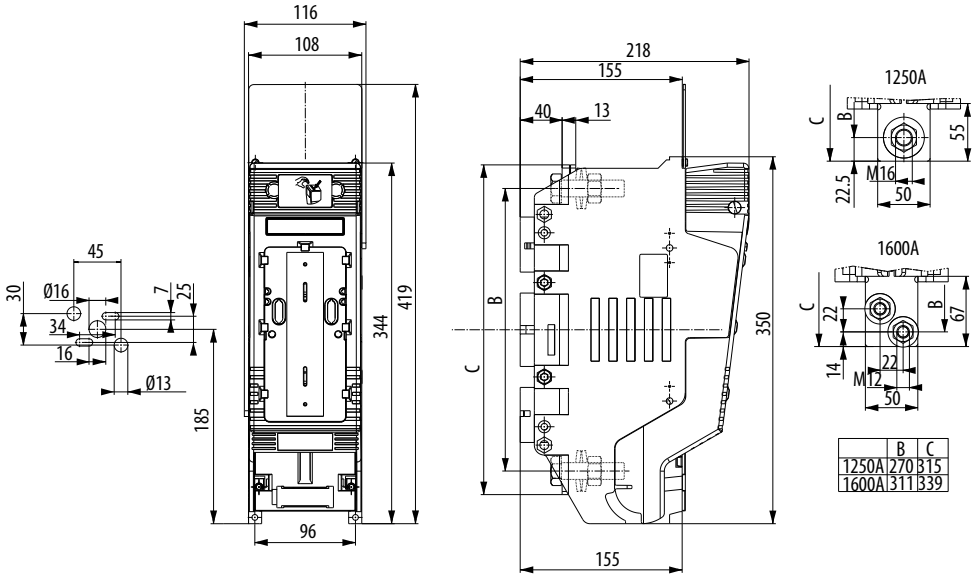
KVL-00 2p



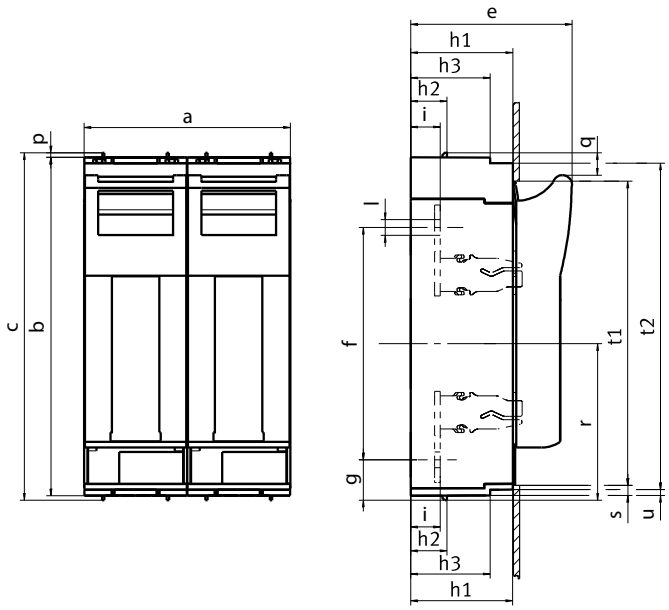
	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1
KVL-00 1p M8-M8	50	195	204	84	120	42	45	7	–	16,5	Ø9	4,5	12	102	5	187
KVL-00 2p M8-M8	100	195	204	84	120	42	45	7	–	16,5	Ø9	4,5	12	102	5	187



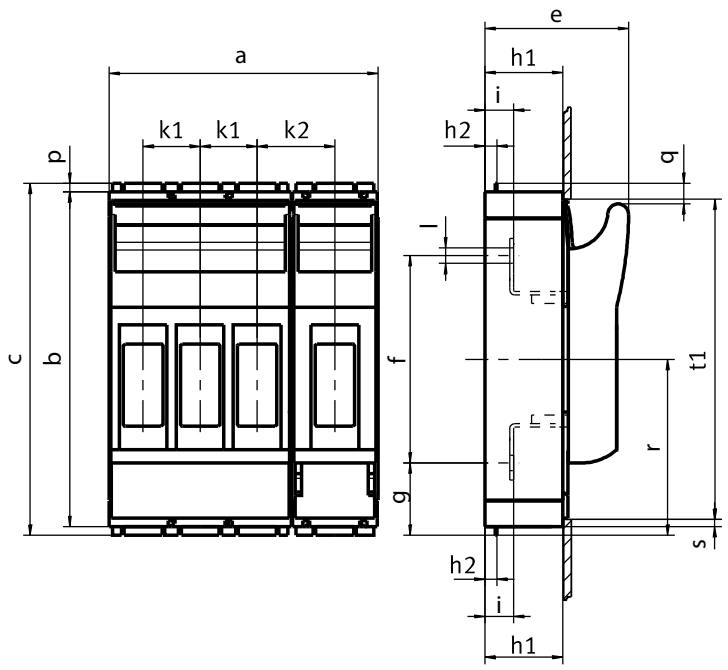
	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1	t2	u
KVL-1 1p M10-M10	69	298	306	117	185	46	70	32	–	25	Ø10,5	4	19	138	5	272	–	–
KVL-3 1p M10-M10	91	298	306	143	205	36	90	32	70	26	Ø14	4	19	138	10	268	288	5



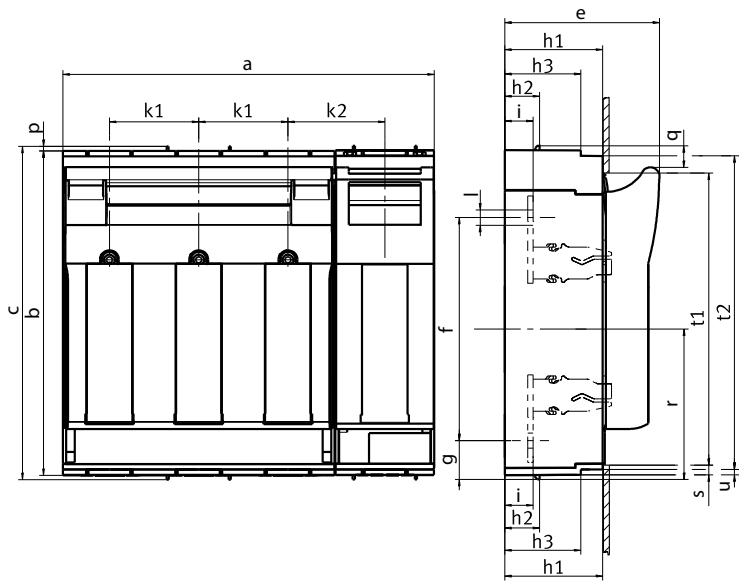
HVL 4a 1p



	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1	t2	u
KVL-1 2p M10-M10	138	298	306	117	185	46	70	32	–	25	Ø10,5	4	19	138	5	272	–	–
KVL-3 2p M10-M10	182	298	306	143	205	36	90	32	70	26	Ø14	4	19	138	10	268	288	5



	a	b	c	e	f	g	h1	h2	h3	k1	k2	i	l	p	q	r	s	t1	t2	u
KVL-00 4p M8-M8	156	195	204	84	120	42	45	7	–	33	45	16,5	Ø9	4,5	12	102	5	187	–	–



	a	b	c	e	f	g	h1	h2	h3	k1	k2	i	l	p	q	r	s	t1	t2	u
KVL-1 4p	254	298	306	117	185	46	70	32	–	58	69	25	Ø10,5	4	19	138	5	272	–	–
KVL-3 4p	341,5	298	306	143	205	36	90	32	70	82	89	26	Ø14	4	19	138	10	268	288	5

Technical data - Feeding clamps

Technical Characteristics			
Max. electrical load			AC690V/DC1000V-250A
Heat deflection temp.			125°C UL94: V0
Comparative tracking index			600
Cross sections			
Conductor - Max. Diameter Ø14 mm			
single wire		mm^2	25 - 95
multi wire		mm^2	25 - 95
fine wire (with end sleeve)		mm^2	25 - 70
Torque	Ma	Nm	13
Degree of protection			IP20
Regulations			EN 60998-1:2004; EN 60998-2:2004; EN 60999-1:2000; EN 60999-2:2003

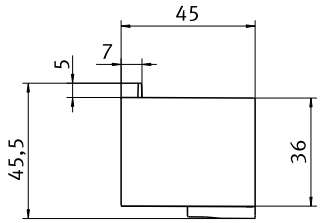


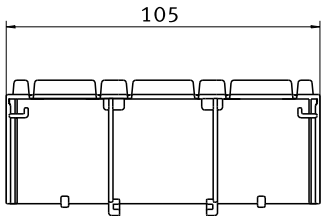
Important
This Terminal is suitable for Al and Cu conductors. Please pay attention to the common handling guidelines when connecting the Aluminium conductors. Clean and brush the contact surfaces and lubricate them with an appropriate grease.

Technical data - Phase busbars

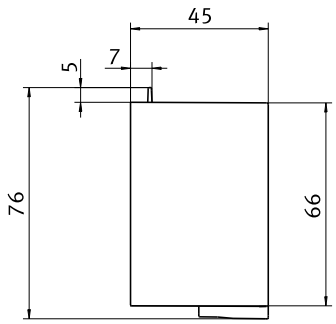
Technical Characteristics			
Rated cross section of the conductor		mm^2	50
Impulse voltage strenght		kV	≥8,5
Min. air distance		mm	>8
Min. creeping distance		mm	>9
Max. operating voltage		V	AC690
Protection class			IP20
Short circuit rating			IPK=25kA/0,1s, Surge energy capacity IPK, ICC 100kA - NH3 355A gL 500V
Dielectric strenght	kV/mm		≥32
Capacity at 35°C ambient temperature depending of feeding point cross section			
Busbar lenght		mm	max. 300
Feeding at beginning/ending			
Max. current Is /Phase		A	250
Connection cross current		mm^2	95
Other feedings			
Max. feeding current Ie /Phase		A	250
Connection cross current		mm^2	95
Overvoltage category / degree of pollution			III / 2
Regulations			IEC 60947-1:2007

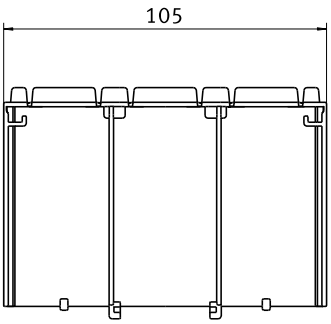
Technical data

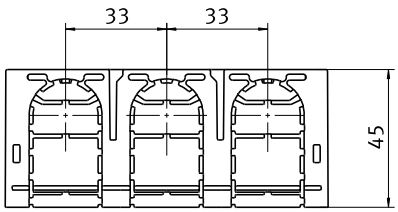


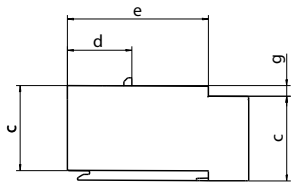


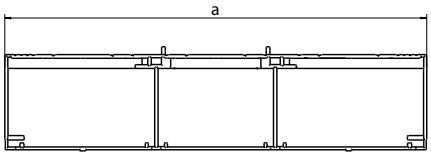
PRS KVL-00 3p S
PRS KVL-00 3p L



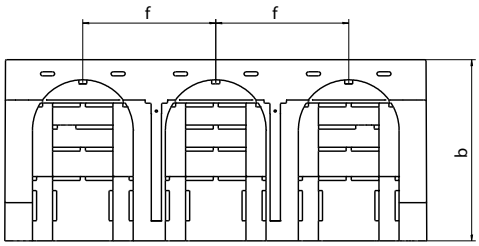




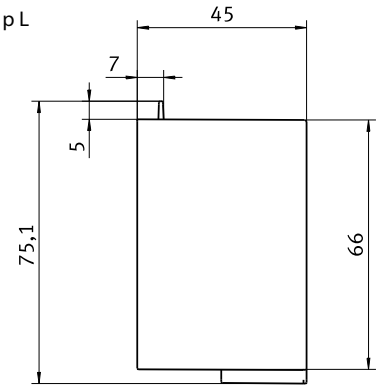


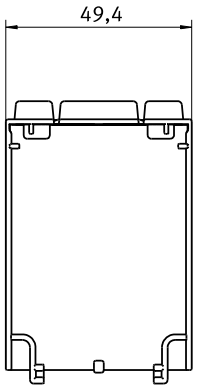


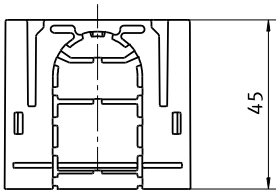
	a	b	c	d	e	f	g
PRS KVL-1 3p	184	70	42	32	–	58	–
PRS KVL-2 3p	210	90	42	32	70	66	5
PRS KVL-3 3p	250	90	42	32	70	82	5



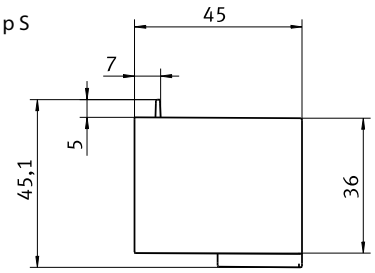
PRS KVL-00 1p L

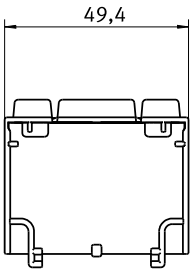


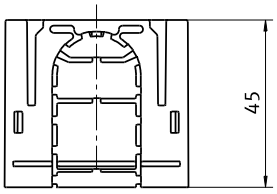




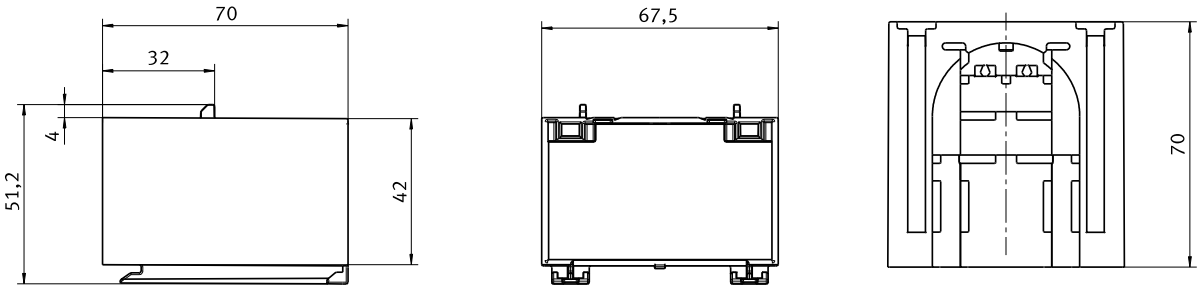
PRS KVL-00 1p S



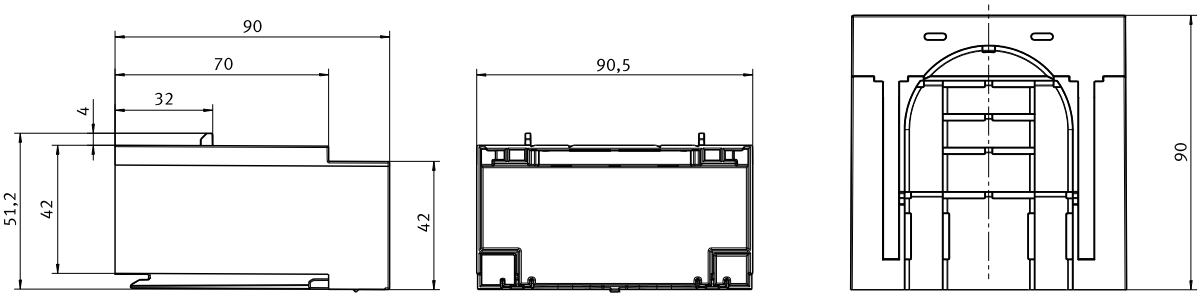




PRS KVL-1 1p

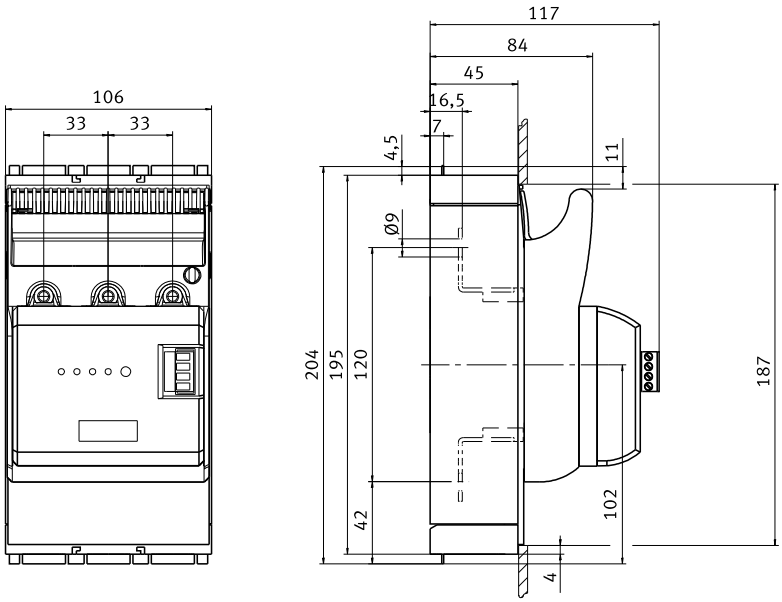


PRS KVL-3 1p

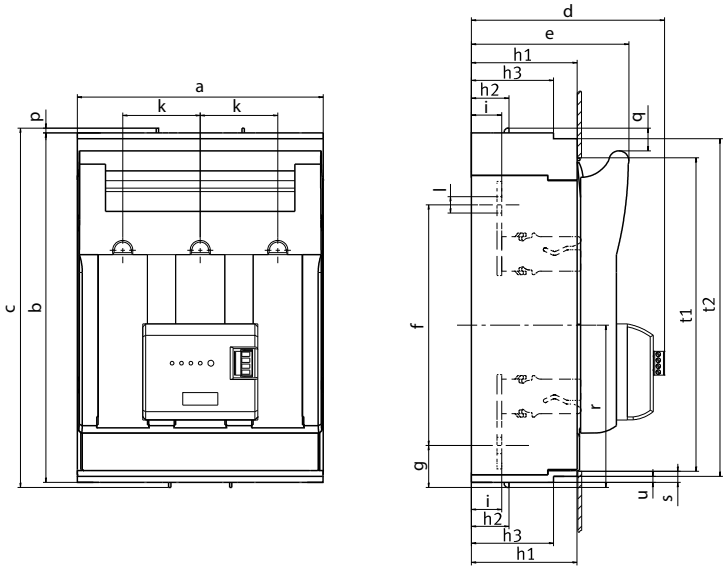


Technical data - Electronic fuse monitoring unit EFMU KVL			
Technical Characteristics			
Rated operational voltage	U_e	V	AC400-500 (+/-10%)
Power supply			Self-powered
Input power		VA	1,5
Overvoltage category			230/400 V : III , (4kV) 500 V : II , (4kV)
Rated frequency	f	Hz	50-60
Input resistance			>1k Ohm/V
Output channels			
Relay output			1NC/1NO
Maximum voltage		V	AC250/DC24
Maximum switching current		A	1
General data			
Operation indicator			1 LED green
Alarm indicator			3 LED (F1, F2, F3) red
Functional test			Test key for relay + LEDs
EMC			IEC 61000-4-5/IEC 61000-4-4
Degree of protection			IP 3X
Operating conditions			
Ambient temperature	T_{amb}	°C	-5 ... +55

No single detection of parallel connected fuses!



KVL-00 3p M8-M8 + EFMU KVL-00 3p
KVL-00 3p BC95-BC95 + EFMU KVL-00 3p



	a	b	c	d	e	f	g	h1	h2	h3	i	k	l	p	q	r	s	t1	t2	u
KVL-1 3p M10-M10 + EFMU KVL-1 3p	184	298	306	148	117	185	46	70	32	–	25	58	Ø10,5	4	19	138	5	272	–	–
KVL-2 3p M10-M10 + EFMU KVL-2 3p	210	298	306	165	134	205	36	90	32	70	26	66	Ø14	4	19	138	10	268	288	5
KVL-3 3p M10-M10 + EFMU KVL-3 3p	250	298	306	173	143	205	36	90	32	70	26	82	Ø14	4	19	138	10	268	288	5

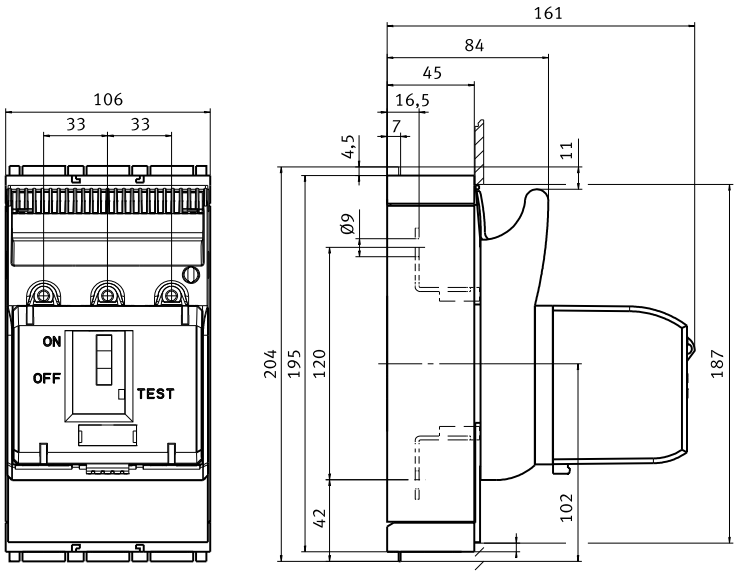
Technical data - Electromechanical fuse monitoring unit MPFMU KVL

Technical Characteristics			
Rated operational voltage	U_e	V	AC24…690 DC24…250
Rated short-circuit breaking capacity	I_{cn}	kA	100
Overvoltage category			230/400V : III (4kV) 500V : II (4kV)
Output channels			
Relay output			1NC/1NO
Maximum voltage		V	AC230/DC24
Maximum switching current			2,5A...AC-12 / 1A...DC-13

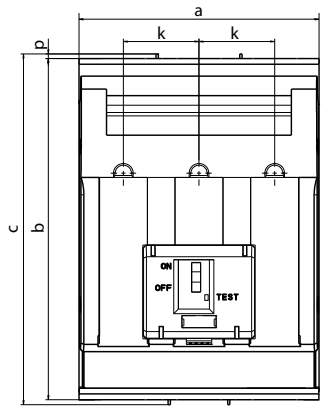
No single detection of parallel connected fuses!

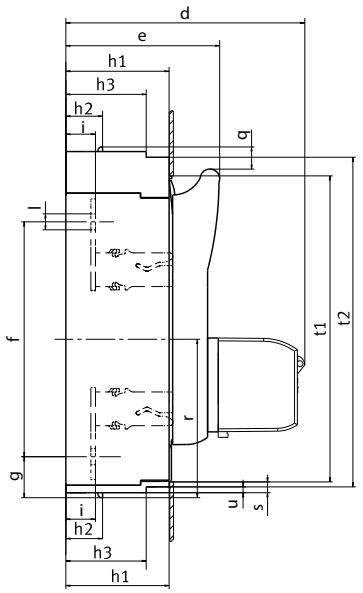
Safety notes

May not be used for safety monitoring in feeders with power control units where, in the event of a fault, it is possible for a DC feedback of >300V (or >600V where 3 current paths are connected in parallel) to occur. If equipment has to be disconnected on the load side of the fuses to be monitored, make sure that no parasitic voltages can arise in the circuit-breaker that is connected in parallel with the fuse-monitoring device.

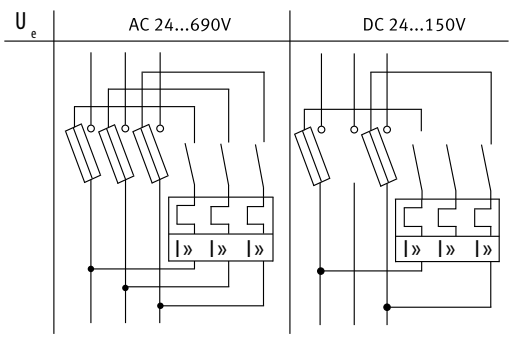


KVL-00 3p M8-M8 + MPFMU KVL-00 3p
KVL-00 3p BC95-BC95 + MPFMU KVL-00 3p





	a	b	c	d	e	f	g	h1	h2	h3	i	k	l	p	q	r	s	t1	t2	u
KVL-1 3p M10-M10 + MPFMU KVL-1 3p	184	298	306	192	117	185	46	70	32	–	25	58	Ø10,5	4	19	138	5	272	–	–
KVL-2 3p M10-M10 + MPFMU KVL-2 3p	210	298	306	209	134	205	36	90	32	70	26	66	Ø14	4	19	138	10	268	288	5
KVL-3 3p M10-M10 + MPFMU KVL-3 3p	250	298	306	217	143	205	36	90	32	70	26	82	Ø14	4	19	138	10	268	288	5



Horizontal fuse-switch disconnector type HVL EK size 000 and 00

Technical data

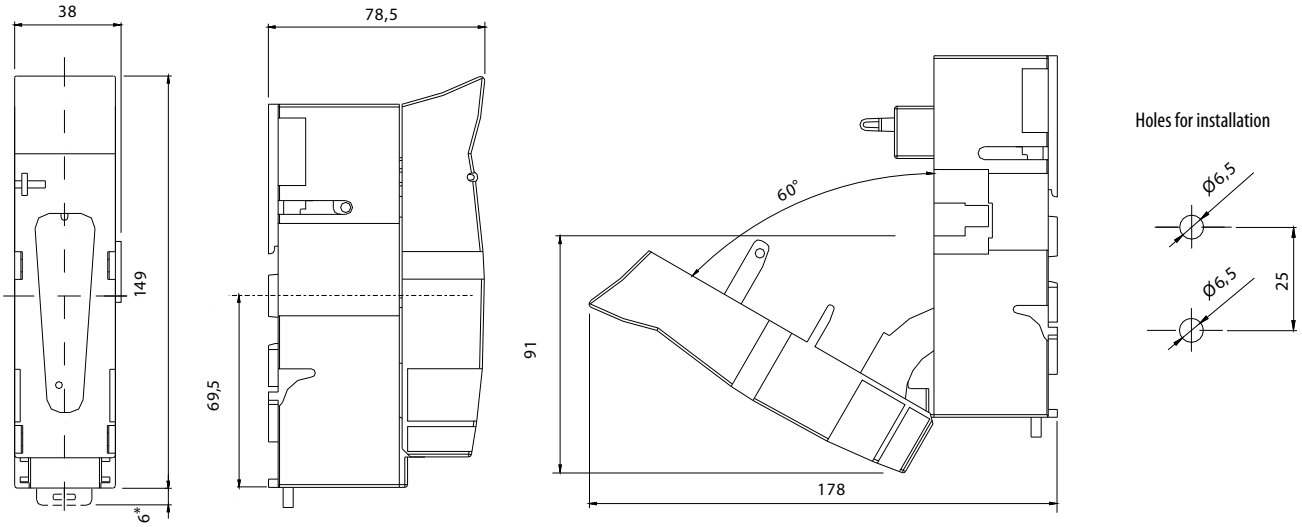
Technical Specifications			HVL EK 000 1p		HVL EK 000 3p			HVL EK 00 1p		HVL EK 00 3p		
Conventional free air thermal current*	I_{th}	A	160									
Rated insulation voltage	U_i	V	AC 690									
Rated withstand voltage	U_{imp}	kV	6									
Rated frequency		Hz	50 (40-60)									
Utilisation category			AC-21B	AC-22B	AC-21B	AC-22B		AC-21B	AC-22B	AC-21B	AC-22B	
Rated operational current	I_e	A	160		125	160	100	160		125	160	125
Rated operational voltage	U_e	V	230 AC		690 AC	400 AC	500 AC	230 AC		690 AC	400 AC	500 AC
Rated conditional short-circuit current		kA_{eff}	63									
Mechanical durability (operating cycles)			1600									
Electrical durability (operating cycles)			200									
Power dissipation (without fuse)		W	3,74		10,2			3,74		10,2		
Degree of protection (cover closed)			IP20									
Degree of protection (cover open)			IP10									
Pollution degree			3									
Permissible ambient temperature**		^0C	-25 ÷ +55									
Storage temperature		^0C	-30 ÷ +70									

* In case of mounting of the fuse-switch disconnector in cabinet, the thermal current should be corrected (I_{th} x derating factor), depending on the number of built apparatuses (see table 1)

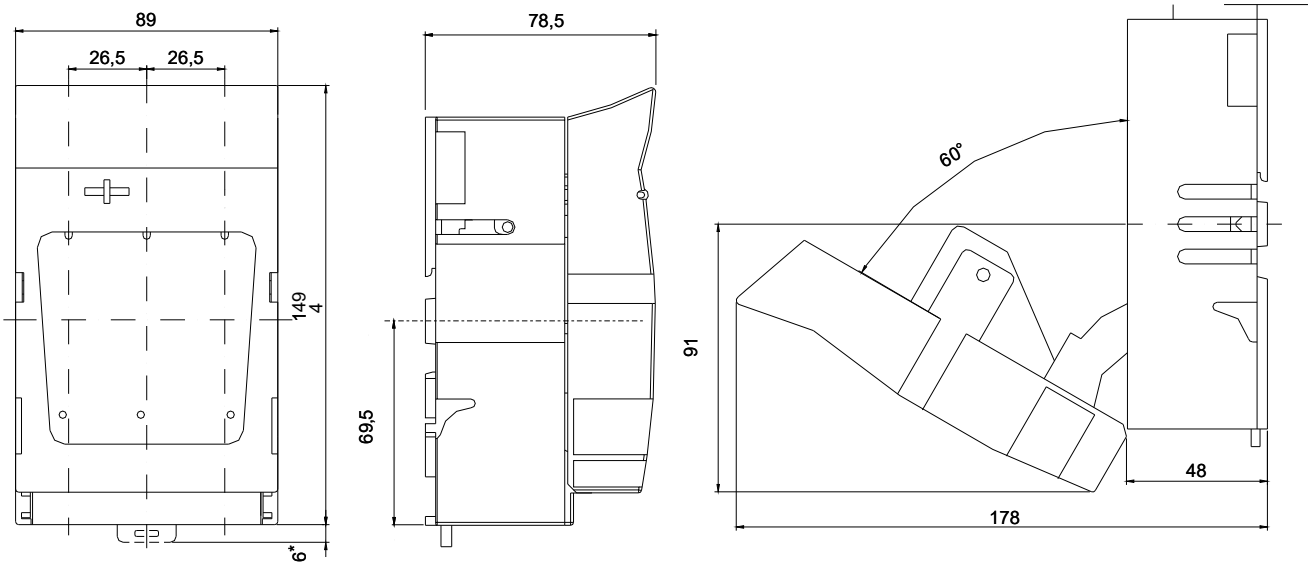
** In case of using the fuse-switch disconnector at temperatures +45^{0}C to +55^{0}C, the thermal current I_{th} should be reduced for 5%-10%

Table 1				
Number of built apparatuses	2 - 3	4 - 5	6 - 9	>9
Derating factor	0,9	0,8	0,7	0,6

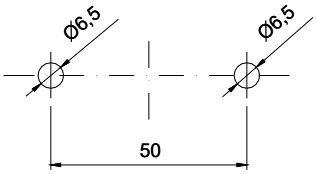
HVL EK 000 1p



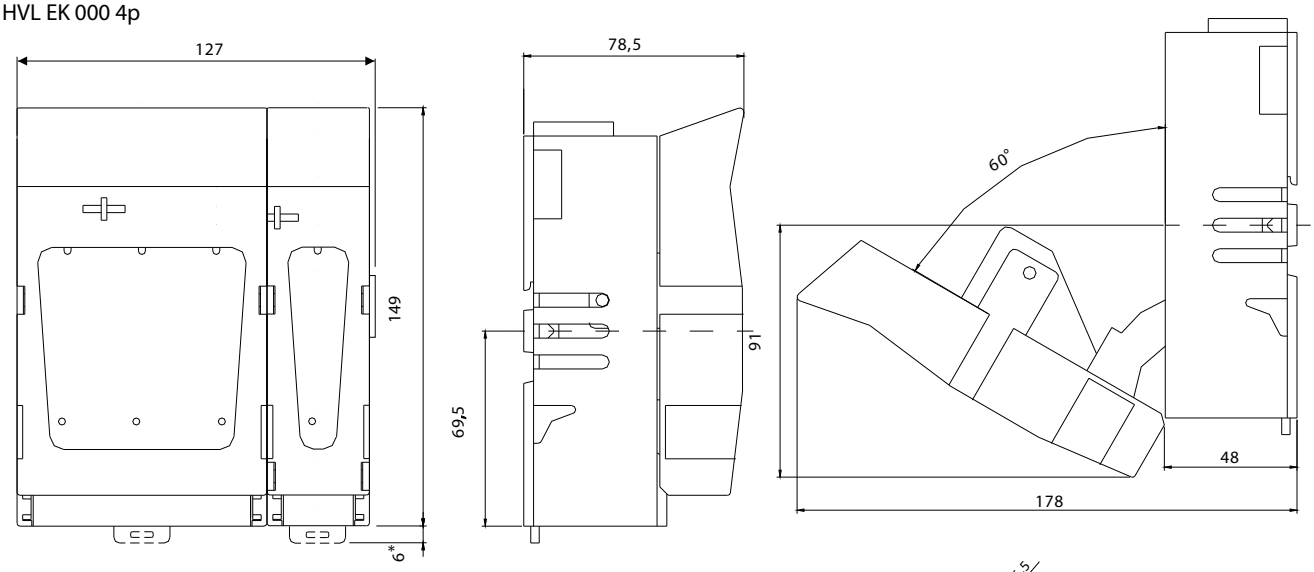
HVL EK 000 3p



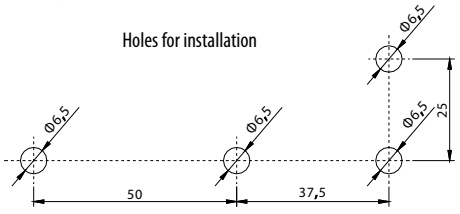
Holes for installation



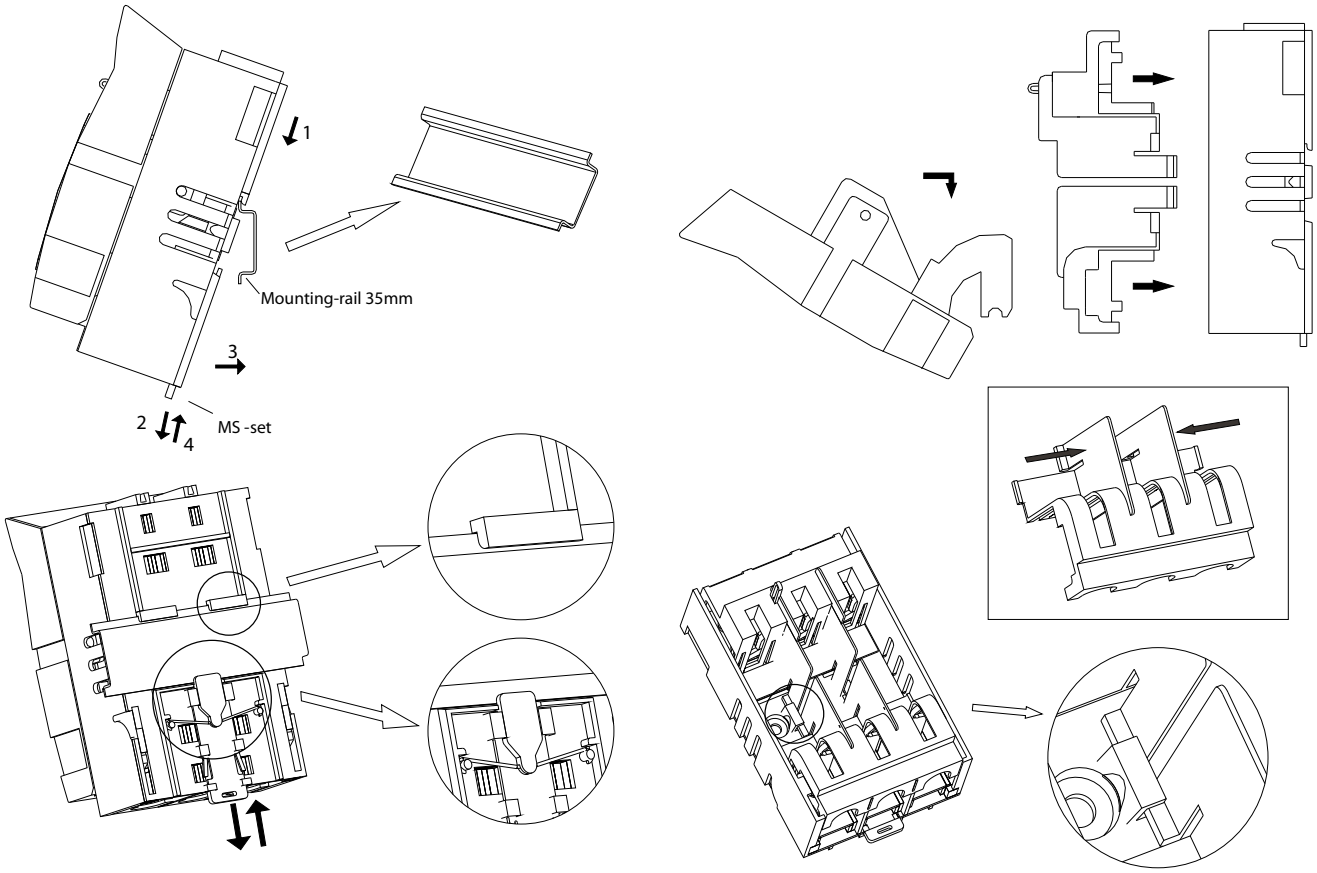
HVL EK 000 4p



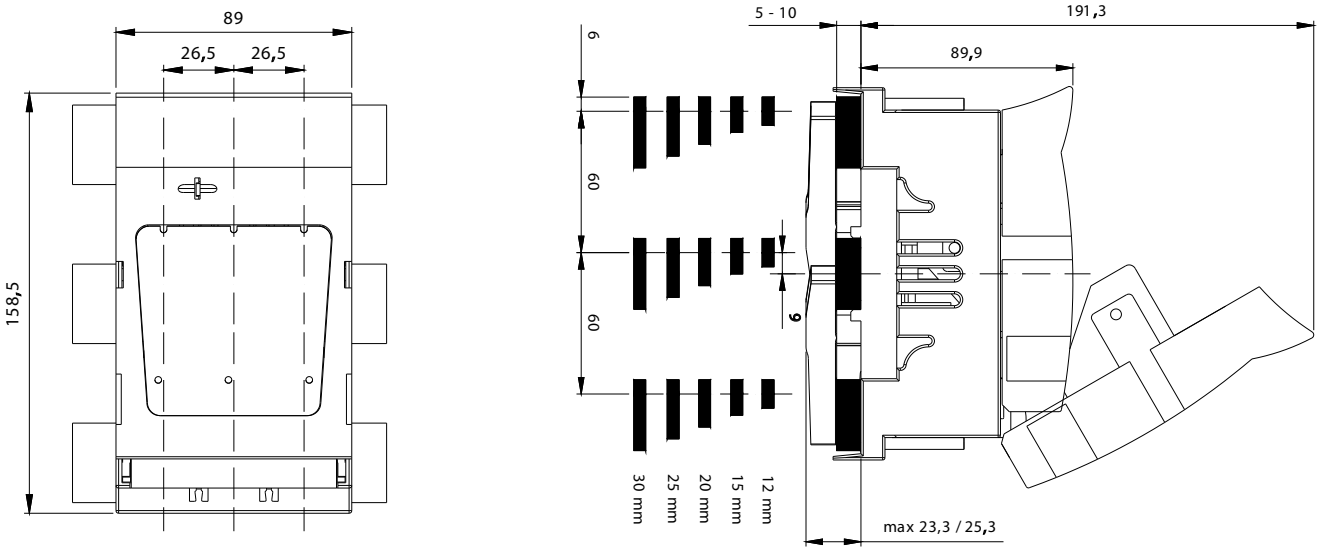
Holes for installation



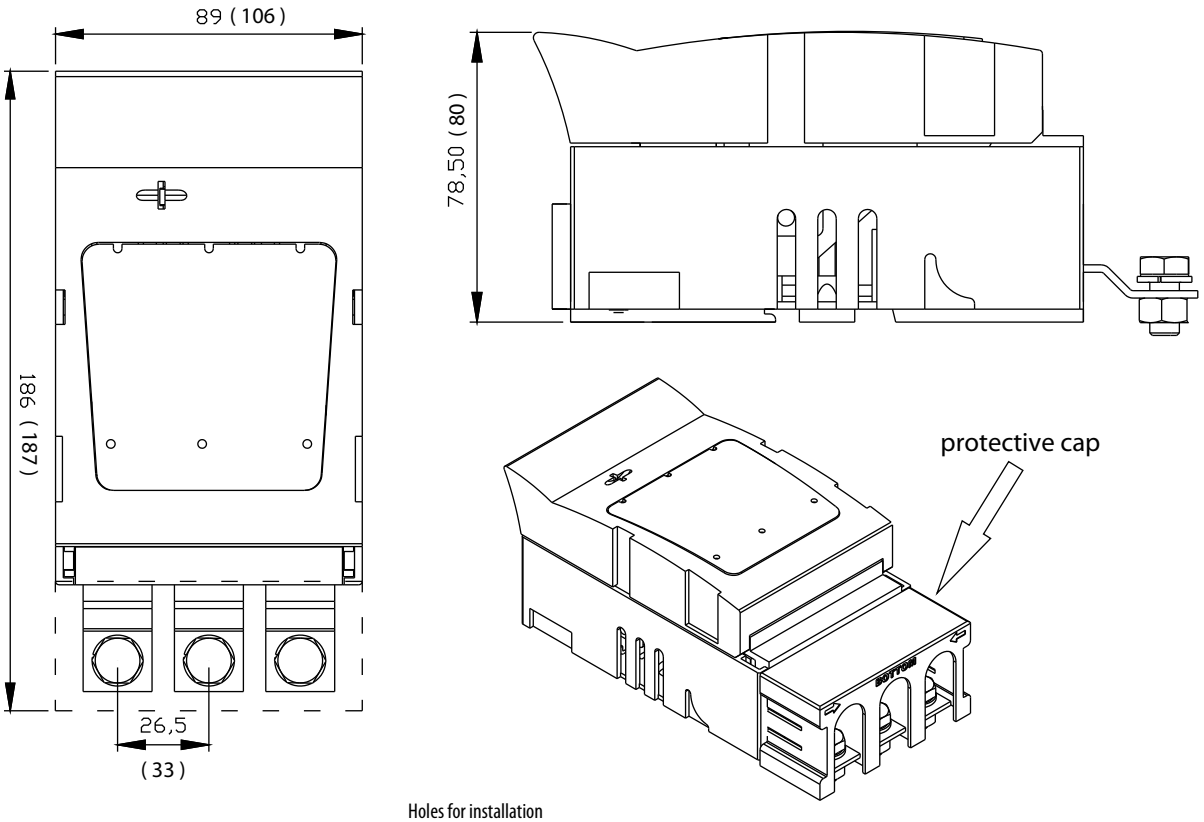
HVL EK 000 – options and Installation guide



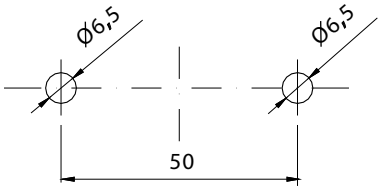
HVL-B EK 000 3p



HVL-P EK 000 3P

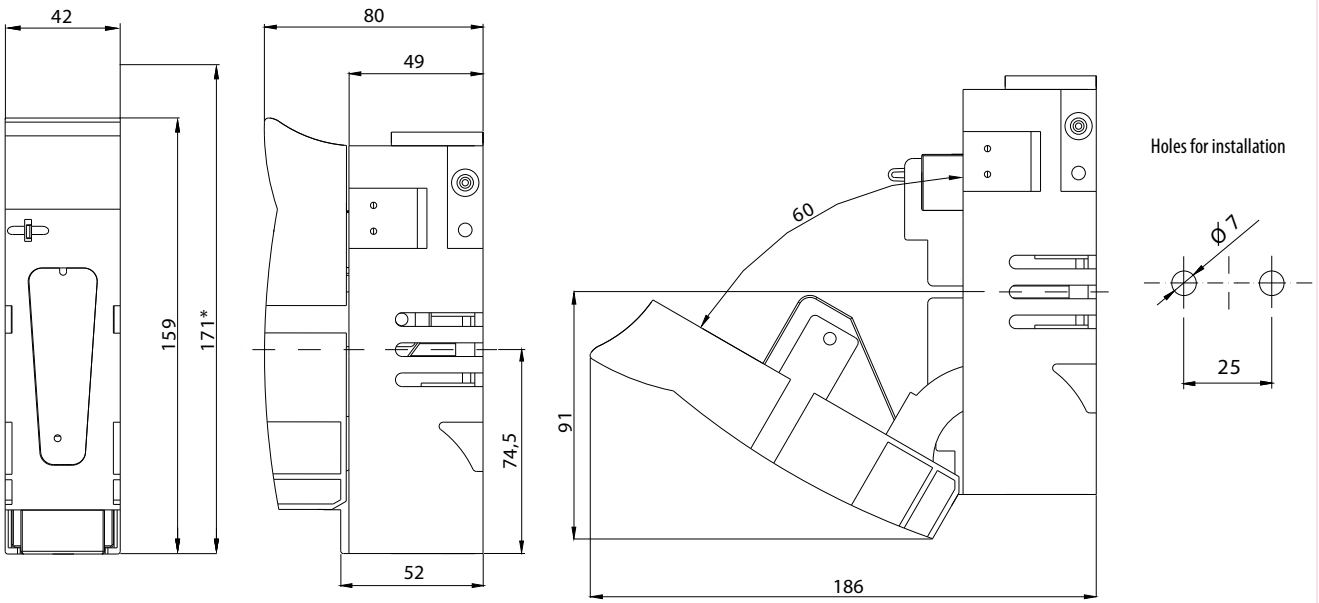


Holes for installation



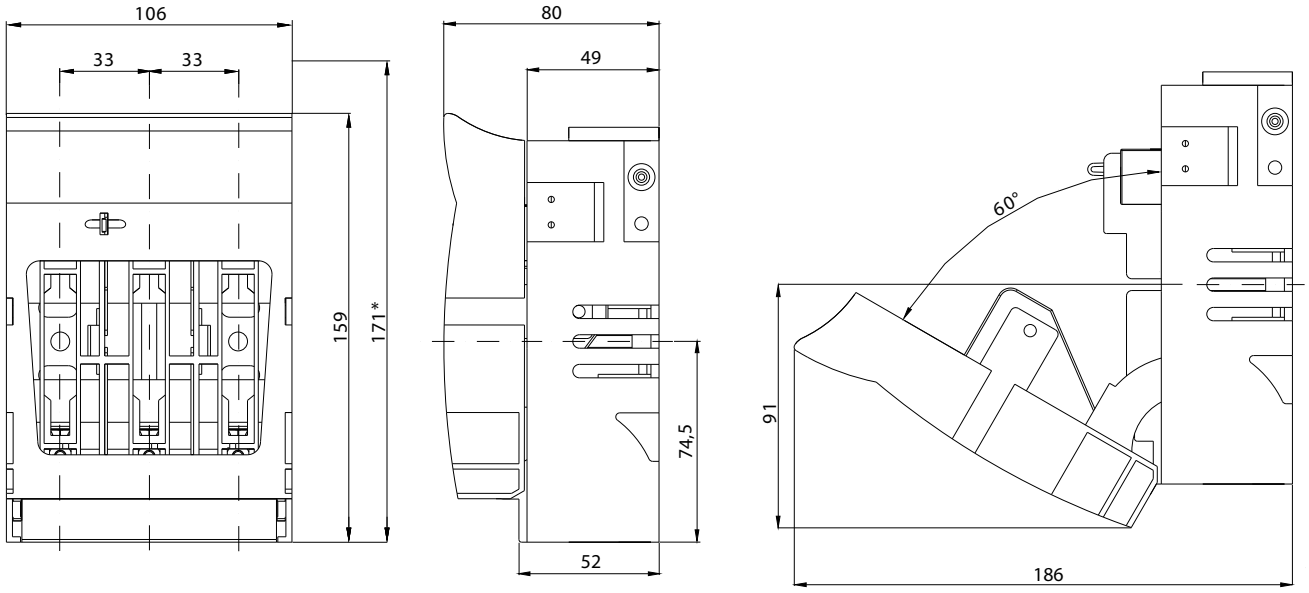
HVL-P EK 000 3p is supplied complete with a bottom covering protection. HVL-P EK 00 3p is supplied without protective coatings.

HVL EK 00 1p

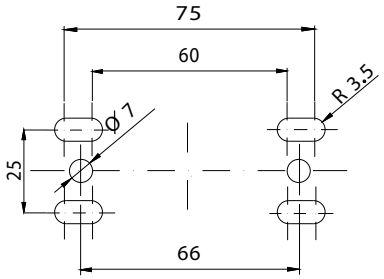


Technical data

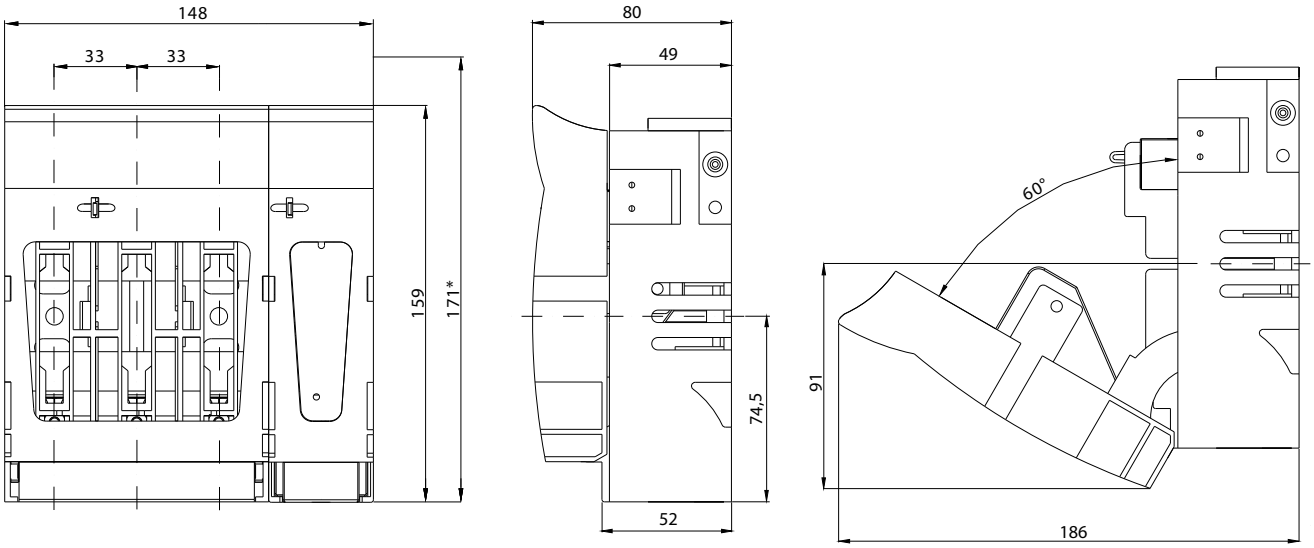
HVL EK 00 3p



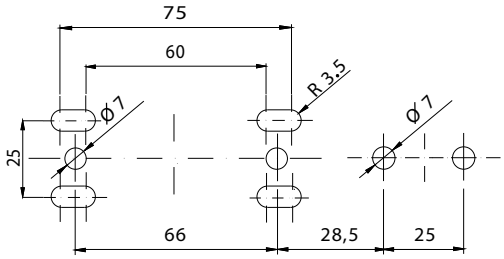
Holes for installation



HVL EK 00 4p



Holes for installation



* with set for mounting on two mounting rails in distance (125mm, 150mm)

ETIBUSBAR

Supports and connections 792

NH fuse-switch disconnectors and fuse bases 793

D fuse-switch disconnectors and fuse bases 797

Device adapters 797

Technical data 799

HR

60 mm busbar system



ETI POWER NEEDS CONTROL

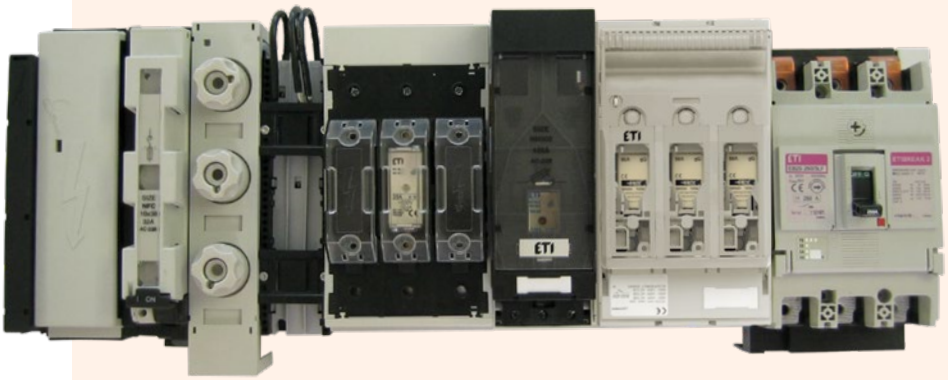
60 mm busbar system

Description

With busbar system (Busbar) can be achieved faster assembly and connecting electrical components and higher density of electrical components per unit area. In this way saves time, which is required for assembly and also saving the space required for installation. The main feature of the busbar system is that all components are installed on the busbars, which provide solidness to the components while installing the components in place already provide junction inlet electrical connections. For complete wiring of electrical components is to be performed only wiring branches to consumers. Busbar system is simple in case of need for subsequent extension because the only condition is to extend the copper busbars. ETI 's busbar system offers a wide range of items for direct mounting on busbar system, the offer also includes special adapters through which they can connect to other components, which shall be affixed to the mounting plate.

Fields of use and features

Busbar systems are used wherever we want to achieve high visibility and compact inside electrical cabinets without undue additional wiring. Busbar system can be used in cases of alteration or extension of existing electrical cabinets because the more compact system saves space, or the only way to ensure enough. As a rule, the busbar systems are used in industrial environments, where the structure of electrical cabinets made by functional block and where it should be ensured high visibility electrical components for ease and speed of servicing in the event of failures and downtime.





ETI 60mm busbar system offers:

- Short installation time
- Less wiring
- Standardized dimensions
- Easy to install
- Flexibility

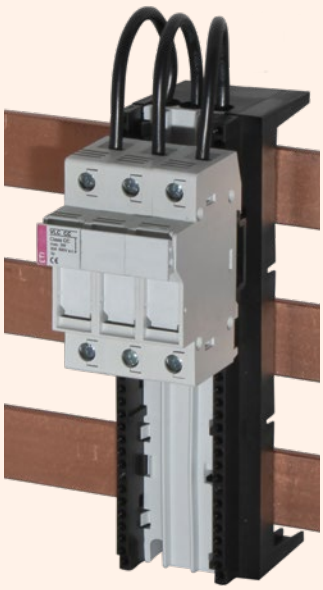
Convincing advantages

- Wide range of application
- Small number of system components
- No customized components demand
- High flexibility
- Innovative and sophisticated solutions
- Easy to fit
- According to standards IEC 60439-1, VDE 0660 part 500

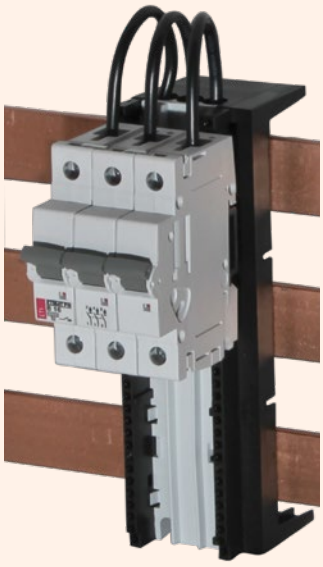
Applications

- Industry and energetics
- Main and Sub-distribution boards
- Cable and Wire protection
- Motor protection

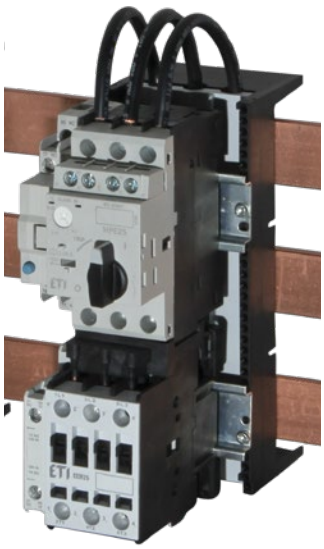
Examples:



1x DA-60/32/54/1
1x VLC 10, 3-pole



1x DA-60/32/54/1
1x ETIMAT P10, 32A

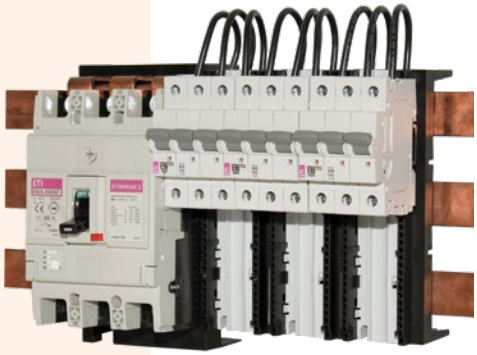


1x DA-60/32/72/2
1x MPE 25 + UVT + ECCMPE25
1x CEM 25 + BXCMLE

Example 1		
Type	Code No.	Number of Components [pcs]
DVL-60/183	001696050	2
CHVL-60/183	001696152	2
DA-60/250/3/FE-5	001696162	1
EB2S 250/3LF 250A 3p	004671813	1



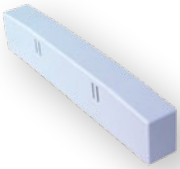
Example 2		
Type	Code No.	Number of Components [pcs]
DA-60/32/54/1	001696081	3
ETIMAT P10, C 32A, 3p	273231109	3
DA-60/250/3/FE-5	001696162	1
EB2S 250/3LF 250A 3p	004671813	1



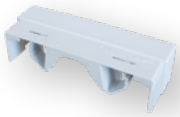

BBS-60/3


BBS-60/3-A25


H5-BBS


L-BBS


S-BBS-60-3


BBC-60/3


BBC-1/30


CM-60/250


CM-60/630


CT-5, 10/…

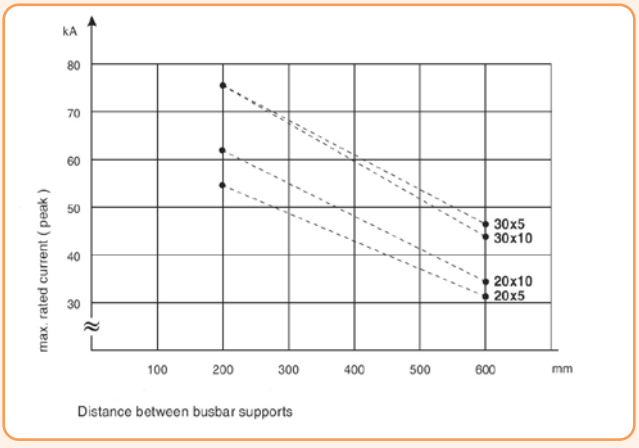

PT-30/34x10


BBCH-60/144


BC-20x5-30x10

Supports and connections (60mm busbar)			
Type	**Code No.**	**Description**	**Packaging [pcs]**
BBS-60/1	001696000	1-pole busbar support for busbars 5-10mm and 20mm or 30mm width	10
BBS-60/3	001696001	3-pole busbar support for busbars 5-10mm and 20mm or 30mm width	10
BBS-60/4	001696002	4-pole busbar support for busbars 5-10mm and 20mm or 30mm width	10
BBS-60/3-A25	001696003	3-pole busbar support for busbars 5-10mm and 20mm or 30mm width with 25mm^2 terminals	5
BBS-60/3-A16	001696004	3-pole busbar support for busbars 5-10mm and 20mm or 30mm width with 16mm^2 terminals	5
H5-BBS	001696005	Insertion for busbar height compensation, 5mm	100
L-BBS-60/3	001696006	Lateral cover for busbar holder, 3p	10
L-BBS-60/4	001696007	Lateral cover for busbar holder, 4p	10
S-BBS-60/3	001696008	Side cover for busbar holder (BBS-60/3-A), 3p	10
BBC-60/3	001696009	Busbar cover (3-pole), covering range 27-50mm/piece	50
BBC-60/4	001696010	Busbar cover (4-pole), covering range 27-50mm/piece	50
BBC-1/20	001696011	Busbar cover (1-pole) for single busbar 5-10mm thick and 20mm wide, length 1m	20
BBC-1/30	001696012	Busbar cover (1-pole) for single busbar 5-10mm thick and 30mm wide, length 1m	20
CM-60/250/3	001696013	Connecting module 250A, 3-pole, terminal 1,5 - 70mm^2 connection	1
CM-60/250/4	001696014	Connecting module 250A, 4-pole, terminal 1,5 - 70mm^2 connection	1
CM-60/250/3/120-5	001696015	Connecting module 250A, 3-pole, terminal 16 - 120mm^2 connection using Cu cable or flat Cu busbar 5mm	1
CM-60/250/3/120-10	001696016	Connecting module 250A, 3-pole, terminal 16 - 120mm^2 connection using Cu cable or flat Cu busbar 10mm	1
CM-60/630/3	001696017	Connecting module 630A, 3-pole, terminal 70 - 300mm^2 connection	1
CM-60/630/F/3	001696018	Connecting module 630A, 3-pole, terminal clamping range 11x21mm using flat Cu busbar	1
CT-5/16	001696019	Conductor terminal with clamping range 1,5-16mm^2 for busbar thickness 5mm	50
CT-5/35	001696020	Conductor terminal with clamping range 1,5-35mm^2 for busbar thickness 5mm	15
CT-5/50	001696021	Conductor terminal with clamping range 1,5-50mm^2 for busbar thickness 5mm	15
CT-5/70	001696022	Conductor terminal with clamping range 16-70mm^2 for busbar thickness 5mm	15
CT-5/120	001696023	Conductor terminal with clamping range 16-120mm^2 for busbar thickness 5mm	15
CT-5/185	001696024	Conductor terminal with clamping range 16-185mm^2 for busbar thickness 5mm	15
CT-10/16	001696025	Conductor terminal with clamping range 1,5-16mm^2 for busbar thickness 10mm	50
CT-10/35	001696026	Conductor terminal with clamping range 1,5-35mm^2 for busbar thickness 10mm	15
CT-10/50	001696027	Conductor terminal with clamping range 1,5-50mm^2 for busbar thickness 10mm	15
CT-10/70	001696028	Conductor terminal with clamping range 16-70mm^2 for busbar thickness 10mm	15
CT-10/120	001696029	Conductor terminal with clamping range 16-120mm^2 for busbar thickness 10mm	15
CT-10/185	001696030	Conductor terminal with clamping range 16-185mm^2 for busbar thickness 10mm	15
PT-30/34x10	001696031	Plate terminal for busbars up to 30mm width, clamping range 34x34x10mm	3
PT-40/34x10	001696150	Plate terminal for busbars up to 40mm width, clamping range 34x34x10mm	3
PT-50/34x10	001696151	Plate terminal for busbars up to 50mm width, clamping range 34x34x10mm	3
BBCH-60/144	001696032	Universal cover of 3-pole busbars 5-10mm, covering width 144mm (ex. cover for conductor terminals type CT- …)	1
BBCH-60/84	001696033	Universal cover of 3-pole busbars 5-10mm, covering width 84mm (ex. cover for conductor terminals type CT- …)	1

BBS-60/… can be adjusted to 20m or 30mm busbar width and 5-10 mm thickness.
CT terminals can accept only Cu conductors.



Technical data on page 799

NV/NH horizontal fuse-switch disconnectors KVL for busbar mounting

Uniform cover cutout

KVL - horizontal fuse-switch disconnectors with different sizes can be combined together and form uniform cover cutout. The new assortment contains four cover support levels at 32, 60, 70 and 90 mm above the uper of busbar. KVL fuse-switch disconnectors can be mounted on busbars (for baseplates and DIN rails see chapter NV/NH).

- Available with 1- and 3-pole versions
- Four sizes: size 00, size 1, size 2, size 3
- Use with NV/NH Fuse-links 000, 00, 1, 2, 3

Busbar mounting

KVL-00 to KVL-3 can be mounted onto 60mm busbar systems - no drilling required



KVL size 00
Ie = 160A
Overall width: 106mm
System size: 195mm

KVL size 1
Ie = 250A
Overall width: 184mm
System size: 300mm

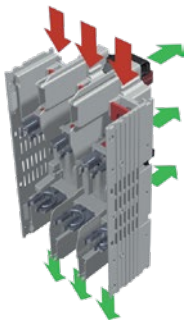
KVL size 2
Ie = 400A
Overall width: 210mm
System size: 300mm

KVL size 3
Ie = 630A
Overall width: 250mm
System size: 300mm

Practical advantages

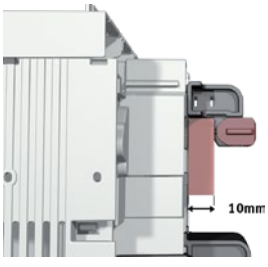


Uniform cover cutout for all sizes disconnectors
- Changeable installation depth by 4 differenet field supporting surfaces (32mm, 60mm, 70mm, 90mm)

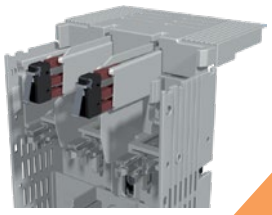


Area-saving
- integrated feeding terminal
- Busbar supply and safe outgoing cable outlet
- Busbar supports up to 20mm width, 19mm height max.

Easy adjustments
- adjustment to 5mm or 10mm thick bars
- simple modification of cable terminal from bottom side to top side



Retrofittable switch position indicator
-Dual monitoring in each unit
- Separate circuits function
- Wide range of applications due to high switching capacity 10/3A (resistive/ind.) AC250V



ETIBUSBAR

New generation!

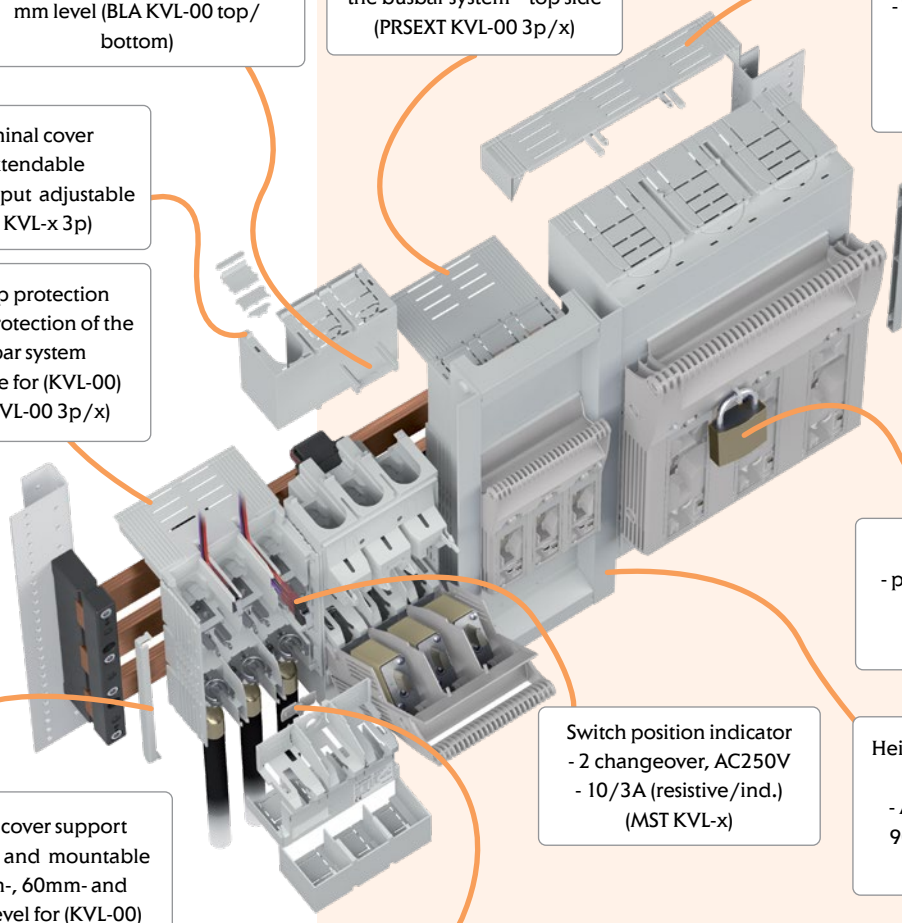
Cover support
- top and bottom side KVL-00
- adjustable on 60 mm and 70 mm level (BLA KVL-00 top/ bottom)

Extension terminal cover
- Touch protection of the busbar system – top side
(PRSEXT KVL-00 3p/x)

Overlap protection
- Touch protection of the busbar system
- Top side for (KVL-1, -2, -3)
(UGS KVL-1,2,3 3p/x)

Terminal cover
- extendable
- cable input adjustable
(PRS KVL-x 3p)

Overlap protection
- Touch protection of the busbar system
- Top side for (KVL-00)
(UGS KVL-00 3p/x)



Lateral cover support
KVL-00
- Variable and mountable
- 32mm-, 60mm-, 70mm- or 90 mm - level (KVL-1, -2, -3)
(BLA KVL-123)

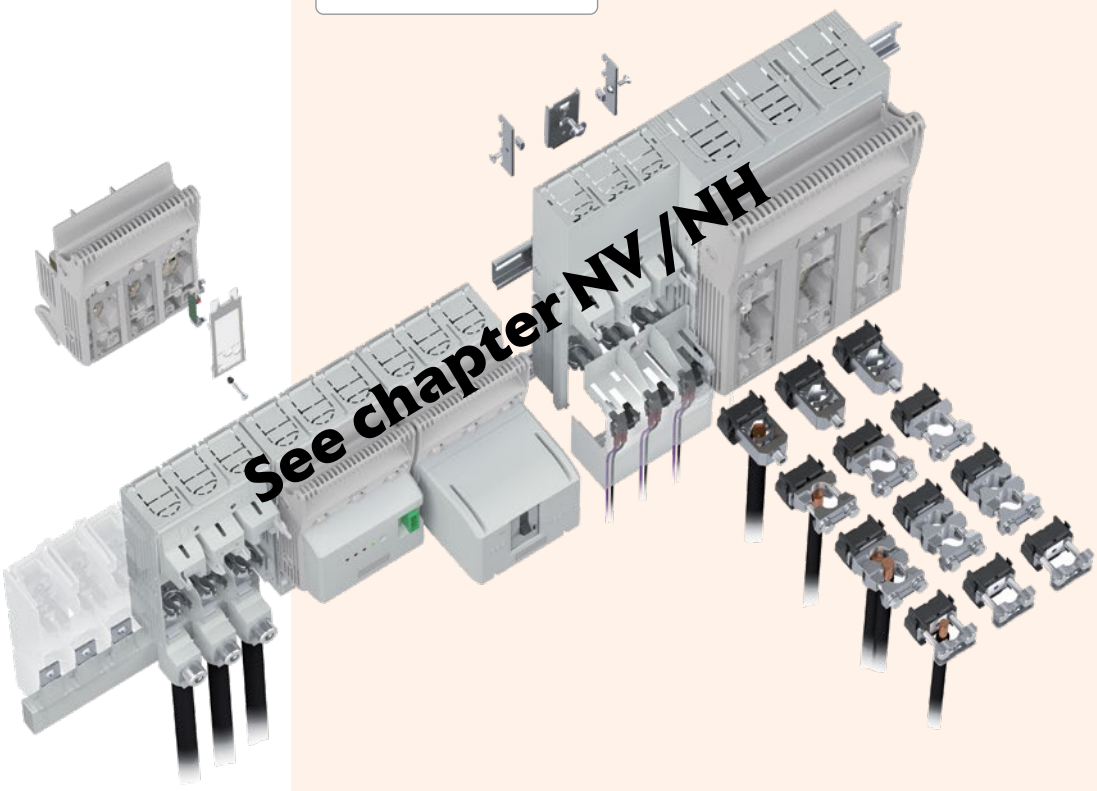
Locking device
- padlock with max. 6mm diameter
(LP KVL-00123)

Switch position indicator
- 2 changeover, AC250V
- 10/3A (resistive/ind.)
(MST KVL-x)

Height adjustment adapter
20mm, 3-pole
- Adaption of KVL-00 at 90mm installation level
(HA KVL-00 3p x)

Lateral cover support
- Variable and mountable
- 32mm-, 60mm- and 70mm-level for (KVL-00)
(BLAL KVL-00 lateral)

Contact cover interlock
Interlock for contact covers
(tool needed)
(LP KVL-00123)



See chapter NV / NH

3-pole, 60mm busbar, thickness 5 mm or 10 mm

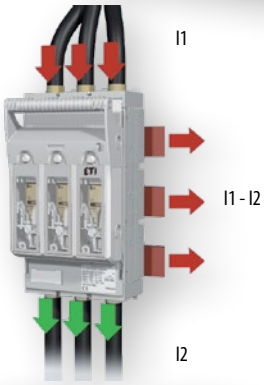
Size	Code No.	Type	Weight [kg]	Packaging [pcs]
000	001690915	KVL-B-000 3p F50 Bottom	0,58	1
	001690916	KVL-B-000 3p F50 Top	0,58	1
00	001690910	KVL-B-00 3p M8-M8	0,9	1
	001690911	KVL-B-00 3p BC95-BC95	0,92	1
1	001690912	KVL-B-1 3p M10-M10	2,14	1
2	001690913	KVL-B-2 3p M10-M10	3,53	1
3	001690914	KVL-B-3 3p M10-M10	4,13	1



KVL-B-000 3p F50 Bottom

3-pole, 60mm busbar, Integrated Feeding Terminal

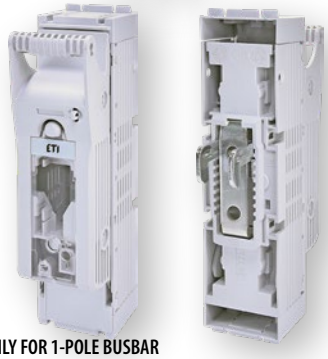
Size	Code No.	Type	Feeding side - Line - I1	Load side I2	I1	I2	Weight [kg]	Packaging [pcs]
00	001690920	KVL-B/FT-00 3p M8-M8	top/bottom	top/bottom	400	160	1,05	1
1	001690922	KVL-B/FT-1 3p M10-M10	top/bottom	top/bottom	500	250	2,39	1
2	001690923	KVL-B/FT-2 3p M10-M10 TOP	bottom	top	800	400	3,9	1
	001690924	KVL-B/FT-2 3p M10-M10 BOTTOM	top	bottom			3,9	1
3	001690926	KVL-B/FT-3 3p M10-M10 TOP	top/bottom	top/bottom	1000	630	4,45	1



1-pole busbar

Size	Code No.	Type	Fixation	Weight [kg]	Packaging [pcs]
00	001690930	KVL-B/SF-00 1p M8-M8	screw fixation	0,35	2
	001690931	KVL-B/CF-00 1p M8-M8	clamp fixation	0,39	2
1	001690932	KVL-B/SF-1 1p M10-M10	screw fixation	0,98	1
2-3	001690933	KVL-B/SF-3 1p M10-M10	screw fixation	1,59	1

DO NOT USE WITH 3-pole 60 mm busbar system !!!

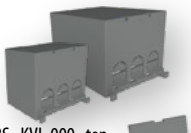


!!! ONLY FOR 1-POLE BUSBAR

Accessories for KVL busbar 60 mm

Type	Code No.	Description	Packaging min order [pcs]
HA KVL-00 3p T/B 340-370	001690980	Height adjusting adapter, 70 to 90mm, 3-pole, System size 340-370mm, top + bottom, size 00	1
HA KVL-00 3p T/B 300	001690981	Height adjusting adapter, 70 to 90mm, 3-pole, System size 300mm, top + bottom, size 00	1
HA KVL-00 3p L/R 340-370	001690982	Height adjusting adapter, 70 to 90mm, 3-pole, System size 340-370mm, right + left, size 00	1
HA KVL-00 3p L/R 300	001690983	Height adjusting adapter, 70 to 90mm, 3-pole, System size 300mm, right + left, size 00	1
PRS KVL-000 3p TOP	001691071	Terminal cover for top side	2
PRS KVL-000 3p BOTTOM	001691072	Terminal cover for bottom side	2
PRSEXT KVL-00 3p/34-39	001690984	Terminal cover extension, 3-pole, h1 = 39 or 34mm, size 00, *	2
PRSEXT KVL-00 3p/32	001690985	Terminal cover extension, 3-pole, h1 = 32mm, size 00, *	2
UGS KVL-000 3p/34-39	001691073	Overlap protector for busbar systems, 39 or 34mm,	10
UGS KVL-00 3p/34-39	001690986	Overlap protector for busbar systems, h1 = 39 or 34mm, for terminal F, S00, P00, R95, size 00	2
UGS KVL-00 3p/32	001690987	Overlap protector for busbar systems, h1 = 32mm, for terminal F, S00, P00, R95, size 00	2
UGS KVL-00 3p/R95T/34-39	001690988	Overlap protector for busbar systems, h1 = 39 or 34mm, for terminal R95T, size 00	2
UGS KVL-00 3p/R95T/32	001690989	Overlap protector for busbar systems, h1 = 32mm, for terminal R95T, size 00	2
UGS KVL-1 3p/34-39	001690990	Overlap protector for busbar systems, h1 = 39 or 34mm, size 1	2
UGS KVL-1 3p/32	001690991	Overlap protector for busbar systems, h1 = 32mm, size 1	2
UGS KVL-2 3p/39-34	001690992	Overlap protector for busbar systems, h1 = 39 or 34mm, size 2	2
UGS KVL-2 3p/32	001690993	Overlap protector for busbar systems, h1 = 32mm, size 2	2
UGS KVL-3 3p/39-34	001690994	Overlap protector for busbar systems, h1 = 39 or 34mm, size 3	2
UGS KVL-3 3p/32	001690995	Overlap protector for busbar systems, h1 = 32mm, size 3	2
BLAL KVL-000 lateral	001691074	Cover support	10
BLA KVL-00 top/bottom	001690961	Cover support, top or bottom side, level 60mm, 70mm, size 00	10
BLAL KVL-00 lateral	001690962	Cover support, lateral, level 32mm, 60mm, 70mm, size 00	10
BLA KVL-123	001690963	Cover support, top or bottom side, lateral, level 32mm, 60mm, 70mm, size 1, 2, 3	10

* h1 = Distance top edge busbar to base plate



PRS_KVL-000_top-bottom



UGS KVL-000 3p/34-39



BLAL KVL-000 lateral



BLA_KVL-00_top-bottom



BLAL_KVL



HA KVL-00 3p T/B 300

Technical data on page 803



PRS KVL-00 1p



PRS KVL-00 1p S



SP KVL... P2



SP KVL-1 V



MST KVL-000 3p



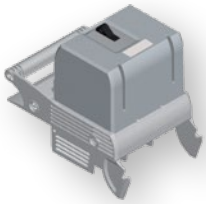
CK KVL-00 2p/4p



IC KVL-00123



LP KVL-00123



MPFMU



EFMU

Accessories for KVL

Type	Code No.	Description	Packaging min order [pcs]
SP KVL00	001692701	Clip terminal, 1,5 – 70 mm² Cu	3
SP KVL1	001692702	Clip terminal, 25– 150 mm² Cu	3
SP KVL2	001692703	Clip terminal, 25– 240 mm² Cu	3
SP KVL3	001692704	Clip terminal, 11x21 mm² Cu	3
SP KVL00 P1	001692760	Prism clamp, 10 – 70 mm² Al/Cu	3
SP KVL1 P1	001692761	Prism clamp, 70 – 150 mm² Al/Cu	3
SP KVL2 P1	001692762	Prism clamp, 120 – 240 mm² Al/Cu	3
SP KVL3 P1	001692763	Prism clamp, 120 – 300 mm² Al/Cu	3
SP KVL1 P2	001692764	Prism clamp for 2-conductors connection, 2x70 – 95 mm² Al/Cu	3
SP KVL2 P2	001692765	Prism clamp for 2-conductors connection, 2x120 – 150 mm² Al/Cu	3
SP KVL3 P2	001692766	Prism clamp for 2-conductors connection, 2x120 – 240 mm² Al/Cu	3
SP HVL 4a D2	001692767	Direct terminal clamp for 2-conductors connection, 2x120– 300mm² Al/Cu	1
SP HVL 4a D3	001692768	Direct terminal clamp for 3-conductors connection, 3x95 – 150 mm² Al/Cu	1
SP HVL 4a D4	001692769	Direct terminal clamp for 4-conductors connection, 4x95 – 150 mm² Al/Cu	1
SP KVL-1 V	001690940	Frame clamp, 35-150mm² Al/Cu	3
SP KVL-23 V	001690941	Frame clamp, 95-300mm² Al/Cu	3
MTB KVL00 2x25/1x16/M8	001690978	Terminal block with multiple wire connections	3
MTB KVL00 4x10/M8	001690979	Terminal block with multiple wire connections	3
MST KVL-000 3p	001691070	Switch position indicator	1
MST KVL-00 1p	001690947	Switch position indicator, 1-pole, size 00, **	1
MST KVL-00 3p	001690948	Switch position indicator, 3-pole, size 00, **	1
MST KVL-123 1p/2p/3p	001690949	Switch position indicator, 1/2/3 -pole, size 1, 2, 3, **	1
MST 4a 1p+3p	001692714	Switch position indicator + mechanical fuse monitor, size 4a, 1p/3p	1
MFM KVL-00 1p/2p/3p	001690950	Mechanical fuse monitor, size 00, **	3
MFM KVL-123 1p/2p/3p	001690951	Mechanical fuse monitor, size 1, 2, 3, **, ***	3
PRS KVL-00 3p L	001690952	Terminal cover, 3-pole, variable to open, Length 66mm, size 00	2
PRS KVL-00 3p S	001690953	Terminal cover, 3-pole, variable to open, Length 36mm, size 00	2
PRS KVL-1 3p	001690954	Terminal cover, 3-pole, variable to open, Length 42mm, size 1	2
PRS KVL-2 3p	001690955	Terminal cover, 3-pole, variable to open, Length 42mm, size 2	2
PRS KVL-3 3p	001690956	Terminal cover, 3-pole, variable to open, Length 42mm, size 3	2
PRS KVL-00 1p L	001690957	Terminal cover, 1-pole, variable to open, Length 66mm, size 00	2
PRS KVL-00 1p S	001690958	Terminal cover, 1-pole, variable to open, Length 36mm, size 00	2
PRS KVL-1 1p	001690959	Terminal cover, 1-pole, variable to open, Length 42mm, size 1	2
PRS KVL-3 1p	001690960	Terminal cover, 1-pole, variable to open, Length 42mm, size 3	2
EFMU KVL-00 3p	001690966	Electronic fuse monitoring unit, 3-pole, size 00, ****	1
EFMU KVL-1 3p	001690967	Electronic fuse monitoring unit, 3-pole, size 1, ****	1
EFMU KVL-2 3p	001690968	Electronic fuse monitoring unit, 3-pole, size 2, ****	1
EFMU KVL-3 3p	001690969	Electronic fuse monitoring unit, 3-pole, size 3, ****	1
MPFMU KVL-00 3p	001690974	Elektromechanical fuse monitoring unit (AM), 3-pole, size 00, ****	1
MPFMU KVL-1 3p	001690975	Elektromechanical fuse monitoring unit (AM), 3-pole, size 1, ****	1
MPFMU KVL-2 3p	001690976	Elektromechanical fuse monitoring unit (AM), 3-pole, size 2, ****	1
MPFMU KVL-3 3p	001690977	Elektromechanical fuse monitoring unit (AM), 3-pole, size 3, ****	1
LP KVL-00123	001690972	Interlock device, locking with padlock, diameter 6mm max., size 00, 1, 2, 3	10
IC KVL-00123	001690973	Contact cover interlock, only be operated by tool, size 00-3	10

** 1 Changeover, AC250V, 10/3A (ohmic/ind.)
*** Only in combination with ETI fuse-links with striker-pin; not in combination with frame-clamp or 2-wire-prism clamp.
**** For monitoring of fuse-links with live gripping lugs



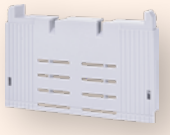
PRS KVL-00 3p L



PRSEXT KVL-00 3p/34-39



UGS KVL-(1 or 2 or 3) 3p/x



UGS KVL-00 3p/34-39

Technical data on page 803

Device adapters for 60 mm busbar			
Type	Code No.	Description	Packaging [pcs]
DA-60/250/3/FE-5	001696162	Adapter for MCCB - ETIBREAK EB2 250 and EB2S 250	1
DA-60/250/4/FE-5	001696163	Adapter for MCCB - ETIBREAK EB2 250 and EB2S 250	1


MCCB adapter

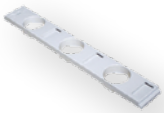
Note:
When ordering D-type fuse-bases and fuse-switch disconnectors, please also order fuse carriers and gauge pieces additionally. See D (see page 621) and D0 (see page 639) chapters of the catalogue.

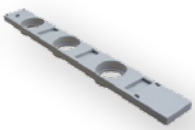
D fuse-switch disconnector and fuse bases for 60mm busbar			
Type	Code No.	Description	Packaging [pcs]
DVL-60/183	001696050	Fuse-switch disconnector for fuses D02	1
CHVL-60/183	001696152	CH-type fuse-switch disconnector	1
PTV-B D02-27/183-5	001696051	D02-type-fuse-bases 3-pole for push-in gauge ring, width 27mm	10
PTV-B DII-45/273-5	001696052	DII-type-fuse-bases 3-pole for push-in gauge ring, width 45mm	1
PTV-B DIII-54/333-5	001696053	DIII-type-fuse-bases 3-pole for push-in gauge ring, width 54mm	10
PTV-B DII-45/273S-5	001696054	DII type-fuse-bases 3-pole for push-in gauge ring, width 45mm	10
PTV-B DIII-54/333S-5	001696055	DIII type-fuse-bases 3-pole for push-in gauge ring, width 54mm	10
C-PTV-B D02-27/183/195	001696056	Protection cover width 27mm, height 195mm	10
C-PTV-B D02-36/183/195	001696057	Protection cover width 36mm, height 195mm	10
C-PTV-B DII-45/273/195	001696058	Protection cover width 45mm, height 195mm	10
C-PTV-B DIII-54/333/195	001696059	Protection cover width 54mm, height 195mm	10
C-PTV-B D02-27/183/230	001696060	Protection cover width 27mm, height 230mm	10
C-PTV-B D02-36/183/230	001696061	Protection cover width 36mm, height 230mm	10
C-PTV-B DII-45/273/230	001696062	Protection cover width 45mm, height 230mm	10
C-PTV-B DIII-54/333/230	001696063	Protection cover width 54mm, height 230mm	10
CL-PTV-B D/195	001696064	Side protection cover width 195 (for C-PTV-B ... /195)	1
CL-PTV-B D/230	001696065	Side protection cover width 230 (za C-PTV-B ... /230)	10
RPH-195	001696066	Protection cover	15
HP-DVL	001696067	Protection cover for DVL and CHVL, TOP/BOTTOM	2
RTP-D02-27/183	001696068	Reach-through protection, face top and bottom , 27mm width	20
RTP-D02-36/183	001696069	Reach-through protection, face top and bottom , 36mm width	20
RTP-DII-45/273	001696070	Reach-through protection, face top and bottom , 45mm width	10
RTP-DIII-54/333	001696071	Reach-through protection, face top and bottom , 54mm width	10
PRS-D02-27/183	001696072	Overreaching protection, face top and bottom, 27mm width	20
PRS-D02-36/183	001696073	Overreaching protection, face top and bottom, 36mm width	20
PRS-DII-45/273	001696074	Overreaching protection, face top and bottom, 45mm width	10
PRS-DIII-54/333	001696075	Overreaching protection, face top and bottom, 54mm width	10
RTP-RL/230	001696076	Reach-through protection lateral right and left	20
PRS-DVL	001696077	D-strips spacer module	10
HA5	001696111	Compensation piece for busbar thickness (to adapt busbar components to fit 10mm or 5mm busbar thickness)	100

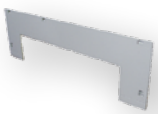
*HA5 is compensation piece which is intent to use for adaptation for example fuse-bases or fuse-switch disconnector from 10mm busbar thickness to 5mm busbar thickness. Each phase pole needs one compensation piece.
** more information available in technical part of the catalogue

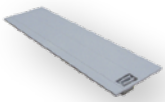

DVL-60/183
CHVL-60/183


PTV-B ...


C-PTV-B ... /195


C-PTV-B ... /230

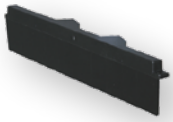

CL-PTV-B D/195


RPH-195


RTP-D ...


PRS-D ...


RTP-RL/230


PSR_DVL


PRS-D ...

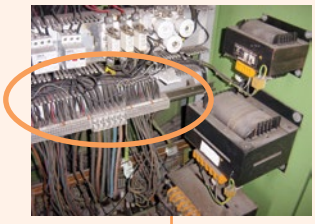

HA5

Benefits using ETI busbar 60mm

Poor visibility of connections without orderliness links.



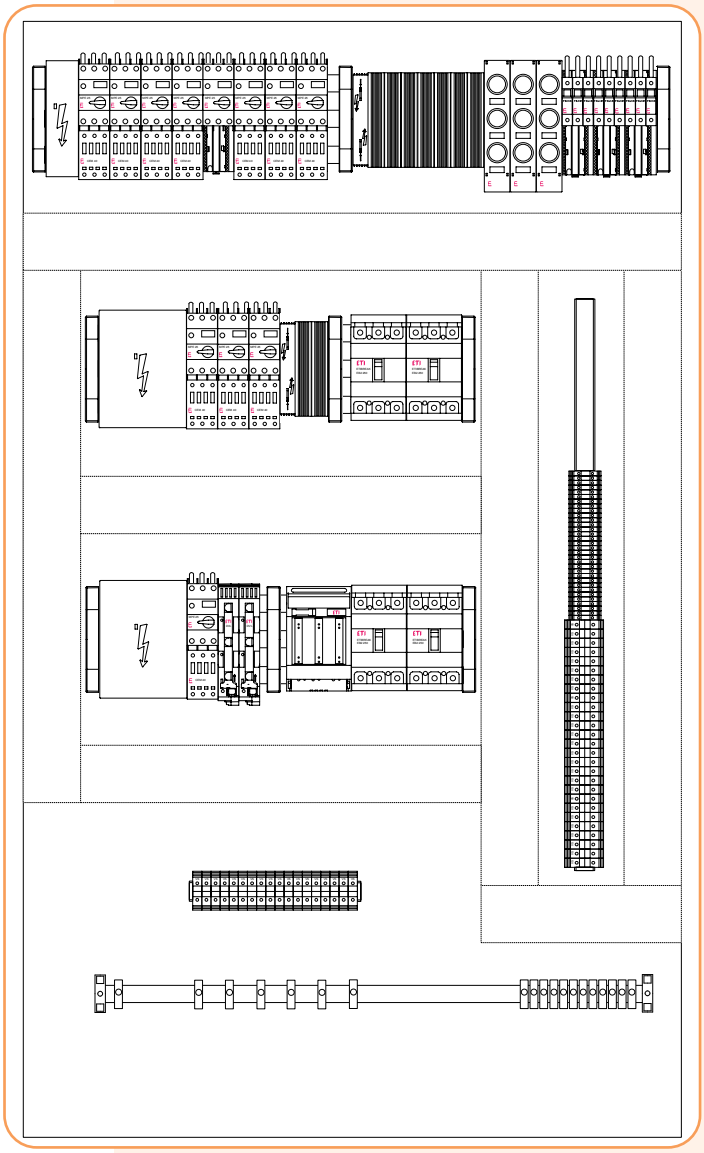
Reduced number of connections (less power supply terminals)



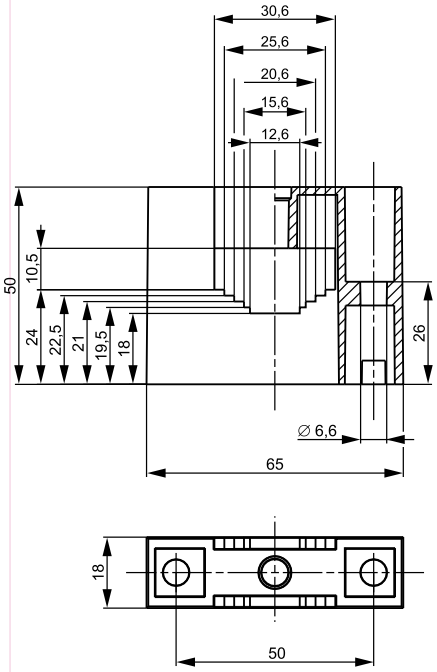
Low integration of elements



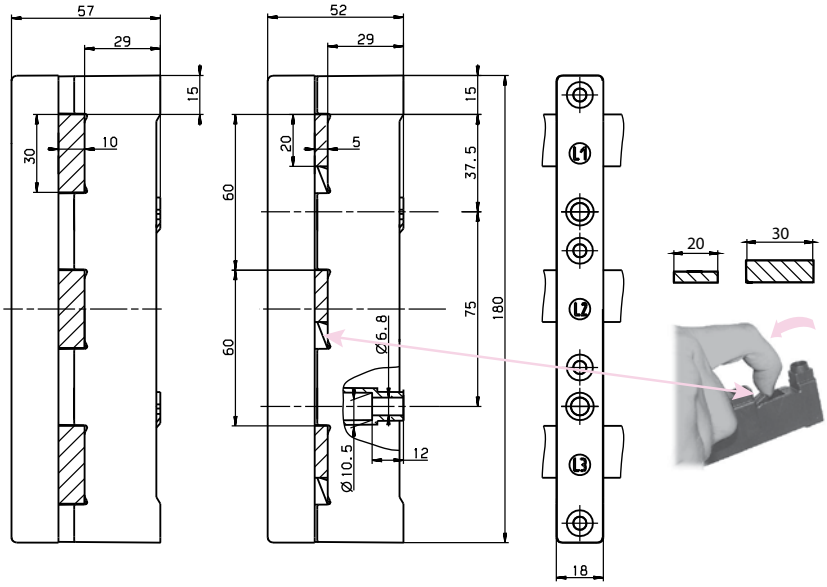
Implementation with the busbar system provides several benefits



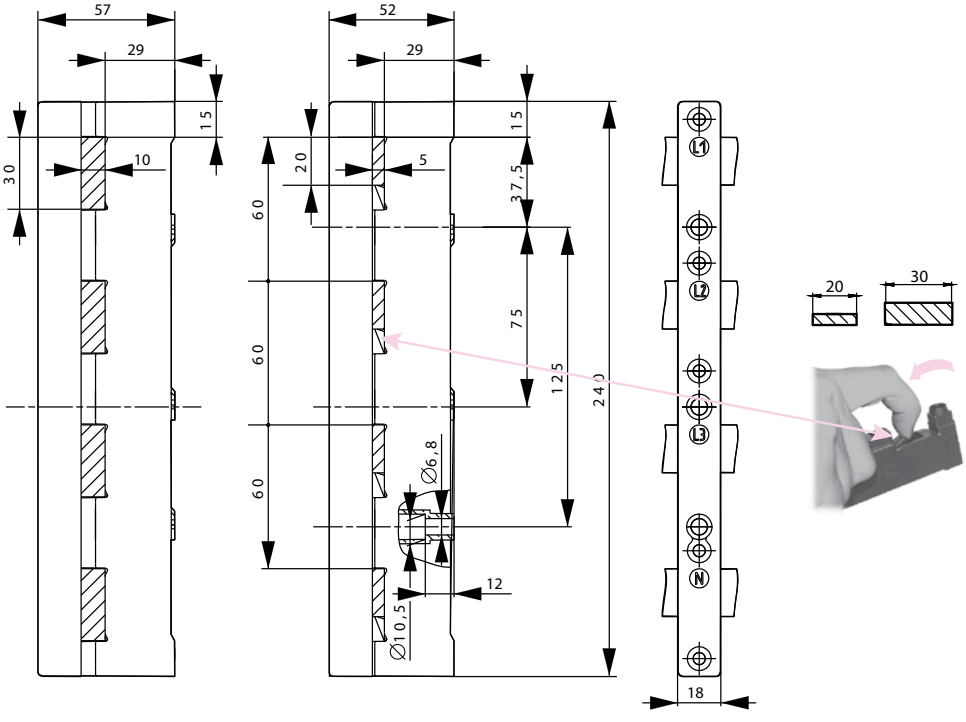
Busbar support



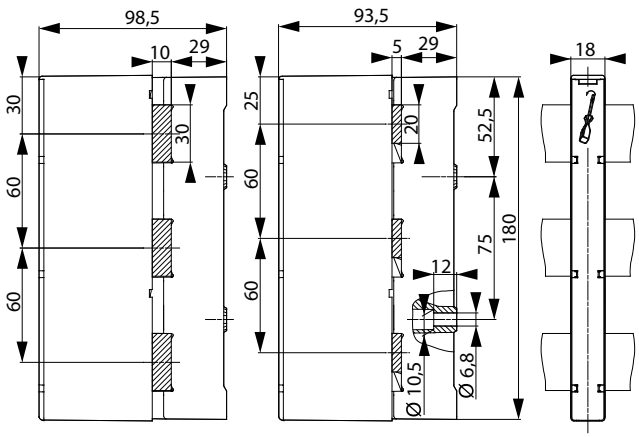
BBS-60/1



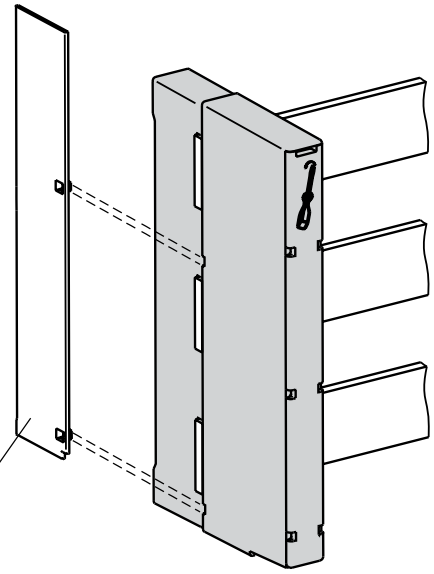
BBS-60/3



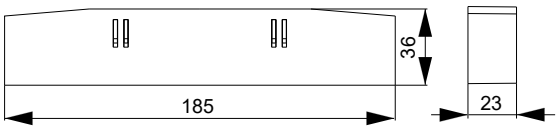
BBS-60/4



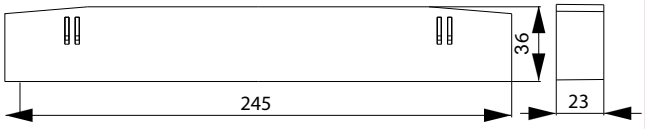
BBS-60/3-A16 (A25)



S-BBS-60/3

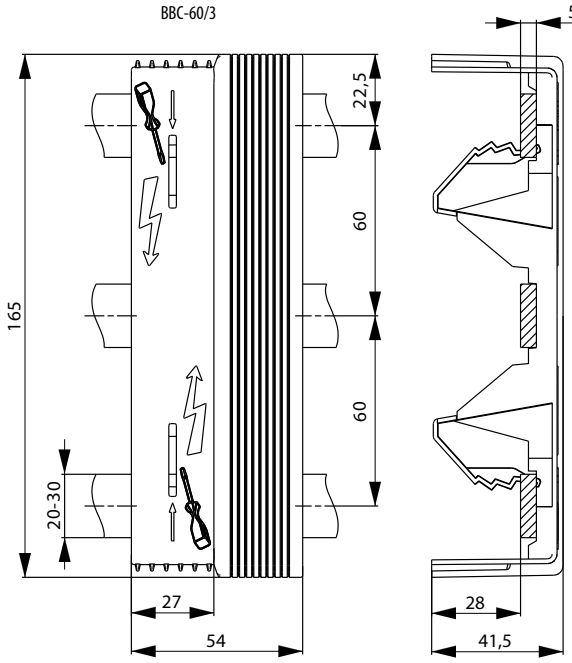


L-BBS-60/3

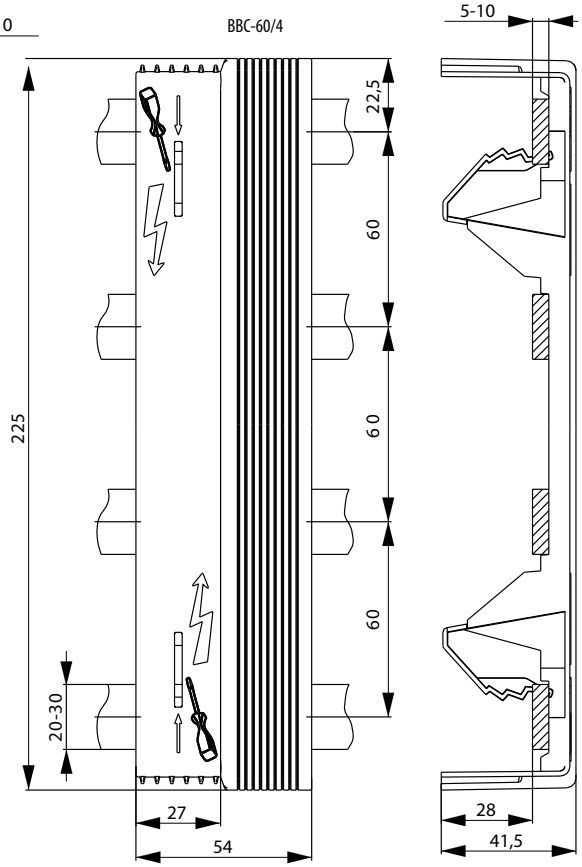


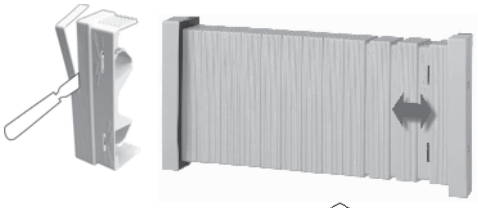
L-BBS-60/4

BBC-60/3

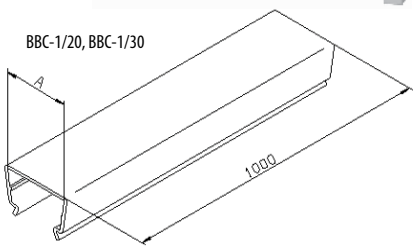


BBC-60/4

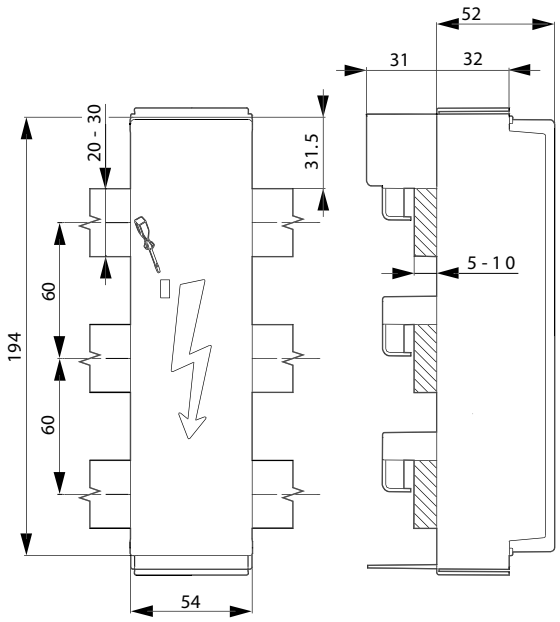




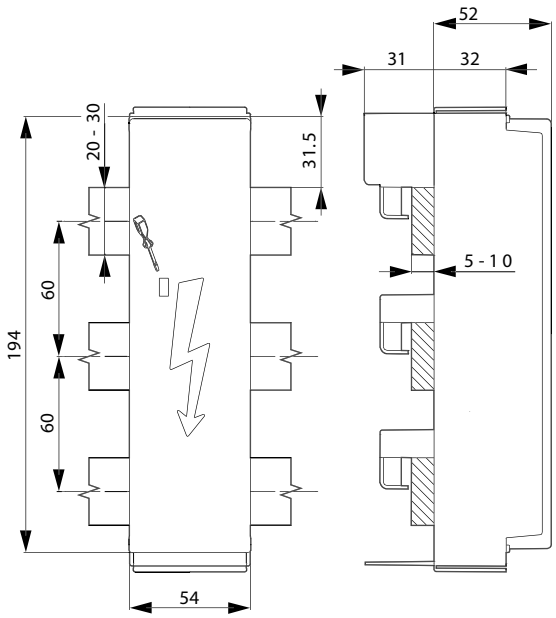
BBC-1/20, BBC-1/30



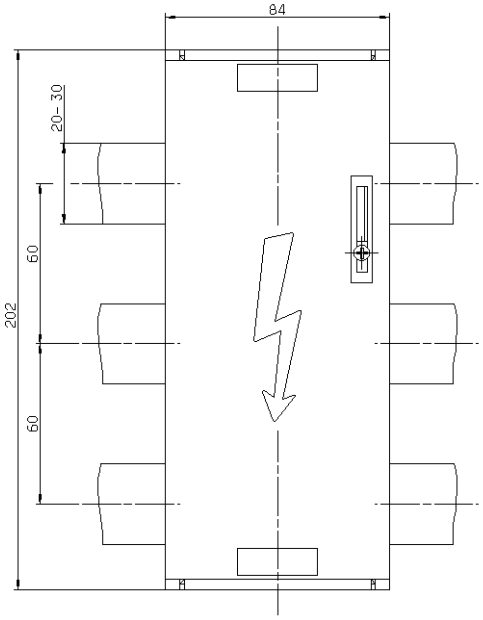
	A	Busbar Type
BBC-1/20	21	20x5 / 20x10
BBC-1/30	31	30x5 / 30x10

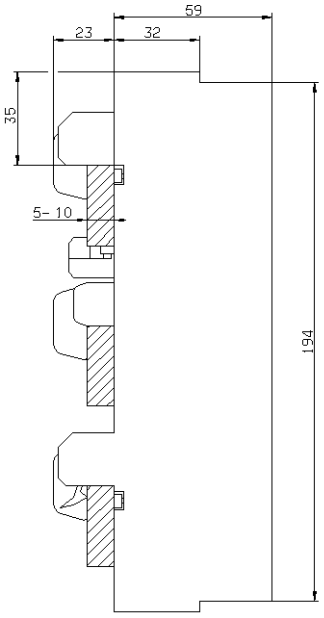


CM-60/250/3

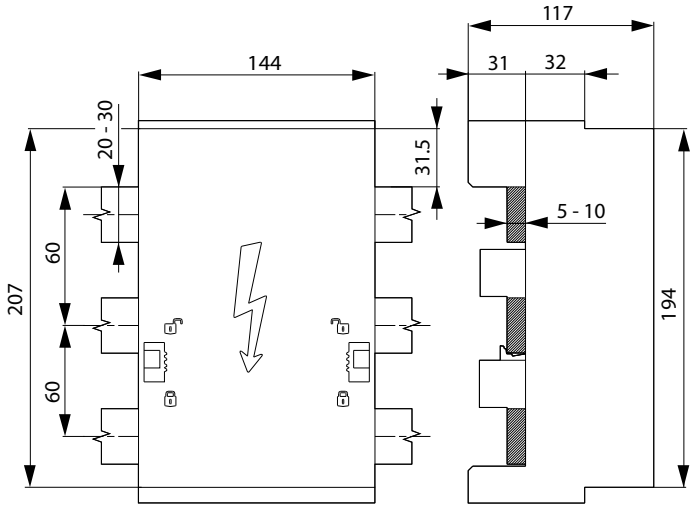


CM-60/250/4

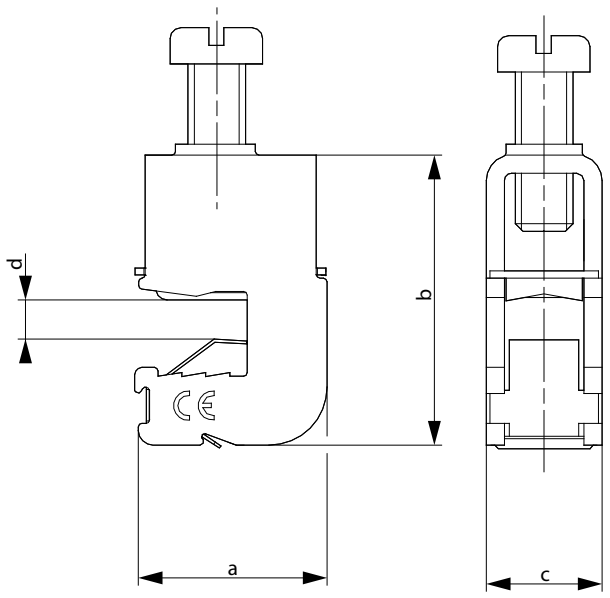




CM-60/250/3/120-5/10

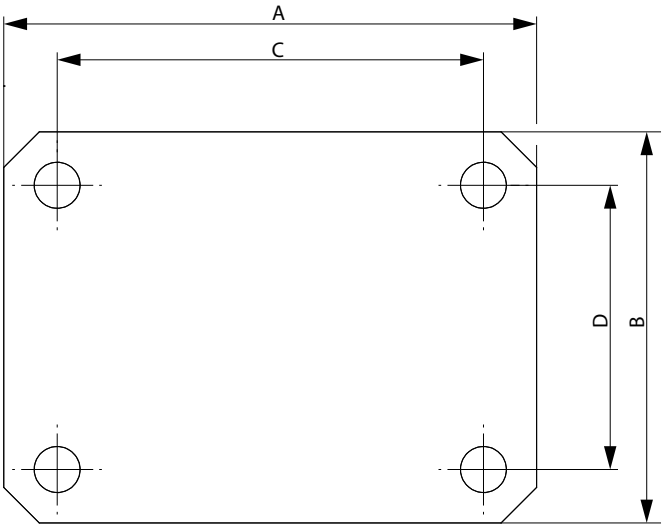


CM-60/630/3



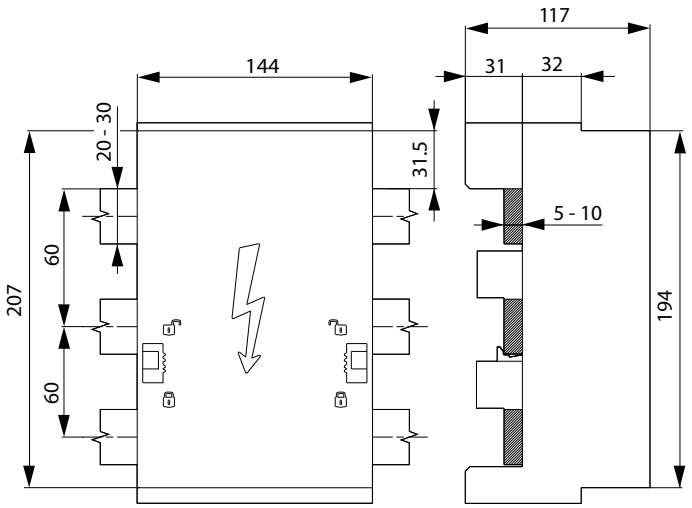
CT- …

	d (Busbar thickness)	a	b	c
CT-5/16	5	25,5	26,5	12
CT-5/35		26,5	31,5	16
CT-5/50		26,5	35	16
CT-5/70		28	39	20,5
CT-5/120		29	46	23
CT-5/185		29	49	28,5
CT-10/16	10	25,5	31,5	12
CT-10/35		26,5	36	16
CT-10/50		26,5	40	16
CT-10/70		28	39	20,5
CT-10/120		29	51	23
CT-10/185		29	53	28,5

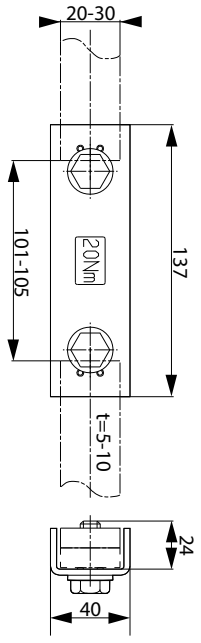


PT-30/34x10

	A	B	C	D
00169031	55	55	40	40
00169150	65	55	50	40
00169151	75	55	60	40



BBCH-60/144



BC-20x5-30x10

Horizontal fuse-switch disconnector type KVL size 000, 00, 1, 2, 3 (60mm busbar)

Technical data (in accordance with IEC/EN 60947-3)											
Size			**000**		**00**						
Technical Characteristics											
Rated operational voltage	U_e	V	500 a.c.	690 a.c.	400 a.c.	500 a.c.	690 a.c.	800 a.c.	1000 a.c.	250 d.c.	1000 d.c.
Rated operational current	I_e	A	125	80	160	160	160	63	160	160	160
Conv. free air thermal current with fuse-links, *	I_{th}	A	125		160						
Conv. free air thermal current with solid-links, *	I_{th}	A	250		210						
Rated frequency	f	Hz	40-60								
Rated insulation voltage	U_i	V	800 a.c.								
Total power loss (without fuse)	P_v	W	12		1P - 3 W, 3P - 9 W						
Power loss at 80% Ith (without fuse-links), **	P_v	W	8		1P - 1,9 W, 3P - 5,8 W						
Rated impulse withstand voltage	U_{imp}	kV	6		8						
Utilisation category***			AC-22B	AC-21B	AC-23B	AC-22B	AC-21B	AC-21B	AC-20B	DC-22B	DC-20B
Rated conditional short-circuit current, ***, ****		kA	80 (500 a.c.)		120 (500 a.c.), 100 (690 a.c.), 10 (800 a.c.), 35 (250 d.c.)						
Rated short-time withstand current	I_{cw}	kA	5/1s								
Fuse links											
Size - DIN VDE 0636-2	-	-	000		000/00						
Max. rated current (gG)	I_n	A	125	80	160	160	160	63	160	160	160
Max. permissible power loss per fuse link	P_a	W	12								
Cable terminal											
Flat terminal-Screw			M8								
Tightening torque	Ma	Nm	12-15								
Clip terminal, Clamping cross-section		mm^2	(SP KVL00) Round conductor: 1,5-70 Cu , Strip conductor: 6 x 9 x 0,8 Cu								
Tightening torque	Ma	Nm	2,6								
Prism Clamp, Clamping cross-section		mm^2	(SP KVL00 P1); 10-70 Al/Cu , 35-95 Al/Cu								
Tightening torque	Ma	Nm	2,6								
Prism Clamp, Clamping cross-section		mm^2									
Tightening torque	Ma	Nm									
Frame clamp, Clamping cross-section		mm^2	1,5-50 Cu		1,5-95 Al/Cu , (Al 95: max. 125A)******						
Torque	Ma	Nm	4,5								
Degree of Protection, front side device											
Front cover close	-	-	IP20								
Front cover open	-	-	IP10								
With clamp- and lateral cover	-	-	IP30		IP2XC						
Operating condition											
Ambient temperature *****	T_{amb}	°C	-25 ... +55								
Operating condition	-	-	Continuous operation								
Mounting	-	-	vertical, horizontal								
Altitude	-	m	≤ 2000								
Pollution degree	-	-	2		3						
Overvoltage category	-	-	III		IV						
Endurance											
Mechanical cycles			1400		1600						
Electrical cycles			200								

* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current

Technical data (in accordance with IEC/EN 60947-3)												
Size			**00**				**1**					
Technical Characteristics												
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC	250 DC	400 AC	500 AC	690 AC	250 DC	440 DC#
Rated operational current	I_e	A	160	160	160	160	250	250	250	250	250
Conv. free air thermal current with fuse-links, *	I_{th}	A	160				250				
Conv. free air thermal current with solid-links, *	I_{th}	A	On request				On request				
Rated frequency	f	Hz	40-60	40-60	40-60	/	40-60	40-60	40-60	/	/
Rated insulation voltage	U_i	V	800 AC				800 AC				
Total power loss (without fuse)	P_v	W	1P - 5 W, 3P - 14 W				1P - 7 W, 3P - 22 W				
Power loss at 80% Ith (without fuse-links), **	P_v	W	1P - 3 W, 3P - 9 W				1P - 4,7 W, 3P - 14,1 W				
Rated impulse withstand voltage	U_{imp}	kV	8				8				
Utilisation category***			AC-23B	AC-22B	AC-21B	DC-22B	AC-23B	AC-22B	AC-21B	DC-22B	DC-21B
Rated conditional short-circuit current, ***, ****		kA	120 (500V), 100 (690V)				120 (500V), 100 (690V)				
Rated short-time withstand current	I_{cw}	kA	5/1s				8,6/1s				
Fuse links												
Size - DIN VDE 0636-2	-	-	000/00				1				
Max. rated current (gG)	I_n	A	160	160	160	160	250	250	250	250	250
Max. permissible power loss per fuse link	P_a	W	12				23				
Cable terminal												
Flat terminal-Screw			M8				M10				
Tightening torque	Ma	Nm	12-15				30-35				
Clip terminal, Clamping cross-section		mm^2	Round conductor: 1,5-70 Cu, Laminated copper bar: 6 x 9 x 0,8 Cu				Round conductor: 2,5-150 Cu, Laminated copper bar: 6 x 16 x 0,8 Cu				
Tightening torque	Ma	Nm	2,6				9,5				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL00 P1); 10-70 Al/Cu , 35-95 Al/Cu				(SP KVL1 P1); 10-150 Al/Cu				
Tightening torque	Ma	Nm	(SP KVL00 P1); 2,6				(SP KVL1 P1); 4,5				
Prism Clamp, Clamping cross-section		mm^2					(SP KVL1 P2); 2 x (10-150) Al/Cu				
Tightening torque	Ma	Nm					(SP KVL1 P2); 4,5				
Frame clamp, Clamping cross-section		mm^2	1,5-95 Al/Cu , (Al 95: max. 125A)				35-150 Al/Cu				
Torque	Ma	Nm	4,5				12				
Degree of Protection, front side device												
Front cover close	-	-	IP20				IP20				
Front cover open	-	-	IP10				IP10				
With clamp- and lateral cover	-	-	IP2XC				IP2XC				
Operating condition												
Ambient temperature *****	T_{amb}	°C	-25 ... +55				-25 ... +55				
Operating condition	-	-	Continuous operation								
Mounting	-	-	vertical, horizontal								
Altitude	-	m	≤ 2000								
Pollution degree	-	-	3								
Overvoltage category	-	-	III				III				

* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current
# 3p version only

Technical data (in accordance with IEC/EN 60947-3)

Size			2					3				
Technical Characteristics												
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC	250 DC	440 DC	400 AC	500 AC	690 AC	250 DC	440 DC#
Rated operational current	I_e	A	400	400	400	400	400	630	630	630	630	630
Conv. free air thermal current with fuse-links, *	I_{th}	A	400					630				
Conv. free air thermal current with solid-links, *	I_{th}	A	On request					On request				
Rated frequency	f	Hz	40-60	40-60	40-60	/	/	40-60	40-60	40-60	/	/
Rated insulation voltage	U_i	V	1000 AC					1000 AC				
Total power loss (without fuse)	P_v	W	1P - 12 W, 3P - 36 W					1P - 29 W, 3P - 86 W				
Power loss at 80% Ith (without fuse-links), **	P_v	W	1P - 7,7 W, 3P - 23 W					1P - 18,3 W, 3P - 55 W				
Rated impulse withstand voltage	U_{imp}	kV	8					8				
Utilisation category***			AC-23B	AC-22B	AC-21B	DC-22B	DC-22B	AC-23B	AC-22B	AC-21B	DC-22B	DC-22B
Rated conditional short-circuit current, ***, ****		kA	120 (500V), 100 (690V)					120 (500V), 100 (690V)				
Rated short-time withstand current	I_{cw}	kA	15/1s					15/1s				
Fuse links												
Size - DIN VDE 0636-2	-	-	2					3				
Max. rated current (gG)	I_n	A	400	400	400	400	400	630	630	630	630	630
Max. permissible power loss per fuse link	P_a	W	34					48				
Cable terminal												
Flat terminal-Screw			M10					M10 / M12				
Tightening torque	Ma	Nm	30-35					30-35				
Clip terminal, Clamping cross-section		mm^2	Round conductor: 25-150 Cu, Laminated copper bar: 10 x 16 x 0,8 Cu					Laminated copper bar: 11 x 21 x 1 Cu				
Tightening torque	Ma	Nm	23					23				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P1); 120-240 Al/Cu					(SP KVL3 P1); 120-300 Al/Cu				
Tightening torque	Ma	Nm	(SP KVL2 P1); 11					(SP KVL3 P1); 11				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P2); 2 x (120-150) Al/Cu					(SP KVL3 P2); 2 x (120-240) Al/Cu				
Tightening torque	Ma	Nm	(SP KVL2 P2); 11					(SP KVL3 P2); 11				
Frame clamp, Clamping cross-section		mm^2	95 -300 Al/Cu					95-300 Al/Cu				
Torque	Ma	Nm	20					20				
Degree of Protection, front side device												
Front cover close	-	-	IP20					IP20				
Front cover open	-	-	IP10					IP10				
With clamp- and lateral cover	-	-	IP2XC					IP2XC				
Operating condition												
Ambient temperature *****	T_{amb}	°C	-25 ... +55					-25 ... +55				
Operating condition	-	-	Continuous operation									
Mounting	-	-	vertical, horizontal									
Altitude	-	m	≤ 2000									
Pollution degree	-	-	3									
Overvoltage category	-	-	III					III				

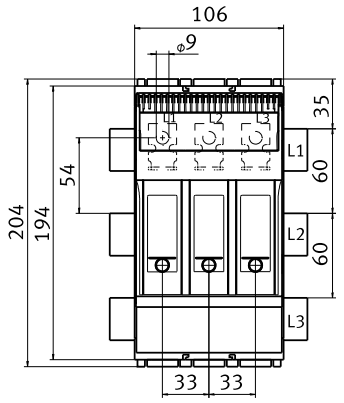
* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current
# 3p version only

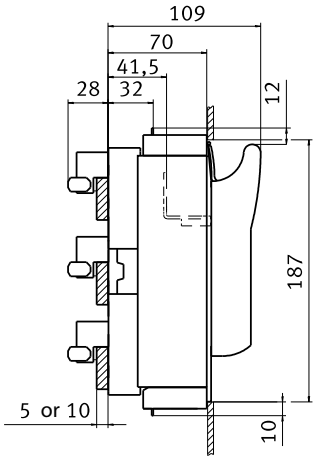
Technical data (in accordance with IEC/EN 60947-3)

Size			2					3				
Technical Characteristics												
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC	250 DC	440 DC	400 AC	500 AC	690 AC	250 DC	440 DC#
Rated operational current	I_e	A	400	400	400	400	400	630	630	630	630	630
Conv. free air thermal current with fuse-links, *	I_{th}	A	400					630				
Conv. free air thermal current with solid-links, *	I_{th}	A	On request					On request				
Rated frequency	f	Hz	40-60	40-60	40-60	/	/	40-60	40-60	40-60	/	/
Rated insulation voltage	U_i	V	1000 AC					1000 AC				
Total power loss (without fuse)	P_v	W	1P - 12 W, 3P - 36 W					1P - 29 W, 3P - 86 W				
Power loss at 80% Ith (without fuse-links), **	P_v	W	1P - 7,7 W, 3P - 23 W					1P - 18,3 W, 3P - 55 W				
Rated impulse withstand voltage	U_{imp}	kV	8					8				
Utilisation category***			AC-23B	AC-22B	AC-21B	DC-22B	DC-22B	AC-23B	AC-22B	AC-21B	DC-22B	DC-22B
Rated conditional short-circuit current, ***, ****		kA	120 (500V), 100 (690V)					120 (500V), 100 (690V)				
Rated short-time withstand current	I_{cw}	kA	15/1s					15/1s				
Fuse links												
Size - DIN VDE 0636-2	-	-	2					3				
Max. rated current (gG)	I_n	A	400	400	400	400	400	630	630	630	630	630
Max. permissible power loss per fuse link	P_a	W	34					48				
Cable terminal												
Flat terminal-Screw			M10					M10 / M12				
Tightening torque	Ma	Nm	30-35					30-35				
Clip terminal, Clamping cross-section		mm^2	Round conductor: 25-150 Cu, Laminated copper bar: 10 x 16 x 0,8 Cu					Laminated copper bar: 11 x 21 x 1 Cu				
Tightening torque	Ma	Nm	23					23				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P1); 120-240 Al/Cu					(SP KVL3 P1); 120-300 Al/Cu				
Tightening torque	Ma	Nm	(SP KVL2 P1); 11					(SP KVL3 P1); 11				
Prism Clamp, Clamping cross-section		mm^2	(SP KVL2 P2); 2 x (120-150) Al/Cu					(SP KVL3 P2); 2 x (120-240) Al/Cu				
Tightening torque	Ma	Nm	(SP KVL2 P2); 11					(SP KVL3 P2); 11				
Frame clamp, Clamping cross-section		mm^2	95 -300 Al/Cu					95-300 Al/Cu				
Torque	Ma	Nm	20					20				
Degree of Protection, front side device												
Front cover close	-	-	IP20					IP20				
Front cover open	-	-	IP10					IP10				
With clamp- and lateral cover	-	-	IP2XC					IP2XC				
Operating condition												
Ambient temperature *****	T_{amb}	°C	-25 ... +55					-25 ... +55				
Operating condition	-	-	Continuous operation									
Mounting	-	-	vertical, horizontal									
Altitude	-	m	≤ 2000									
Pollution degree	-	-	3									
Overvoltage category	-	-	III					III				

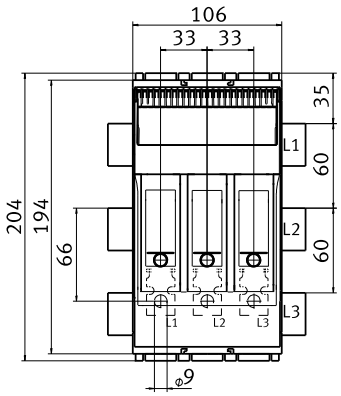
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** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current
# 3p version only

Load cable terminal at topside



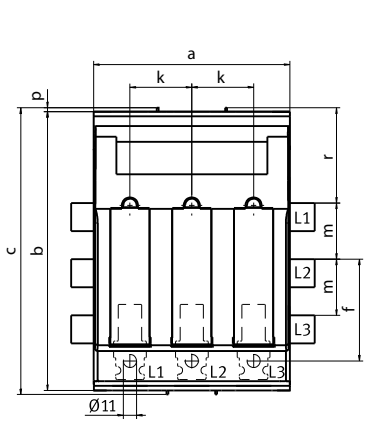


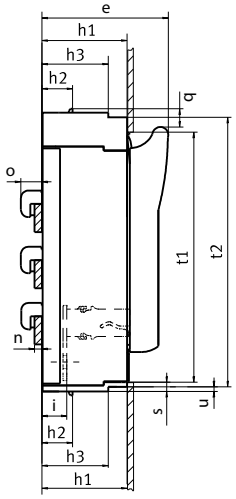
Load cable terminal at bottom side



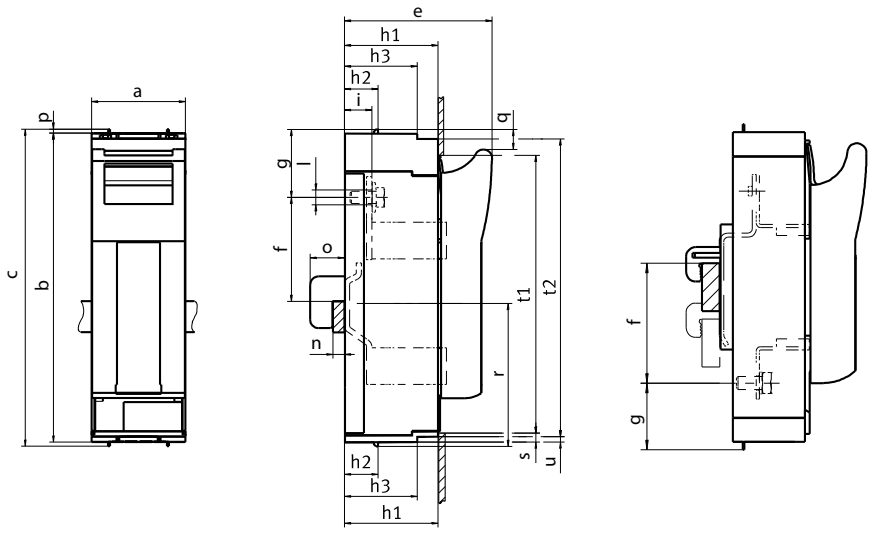
KVL-B-00 3p M8-M8
KVL-B-00 3p BC95-BC95
KVL-B/FT-00 3p M8-M8

Load cable terminal at bottom side





	a	b	c	e	f	h1	h2	h3	i	k	l	m	n	o	p	q	r	s	t1	t2	u
KVL-B-1 3p M10-M10 KVL-B/FT-1 3p M10-M10 TOP KVL-B/FT-1 3p M10-M10 BOTTOM	184	298	306	117	98	70	32	–	25,5	58	Ø10,5	60	4-10	25	4	19	102	5	272	–	–
KVL-B-2 3p M10-M10 KVL-B/FT-2 3p M10-M10 TOP KVL-B/FT-2 3p M10-M10 BOTTOM	210	298	306	135	109	90	32	70	26,5	66	Ø14	60	4-10	25	4	19	102	10	268	289	5
KVL-B-3 3p M10-M10	250	298	306	143	109	90	32	70	26,5	82	Ø14	60	4-10	25	4	19	102	10	268	289	5



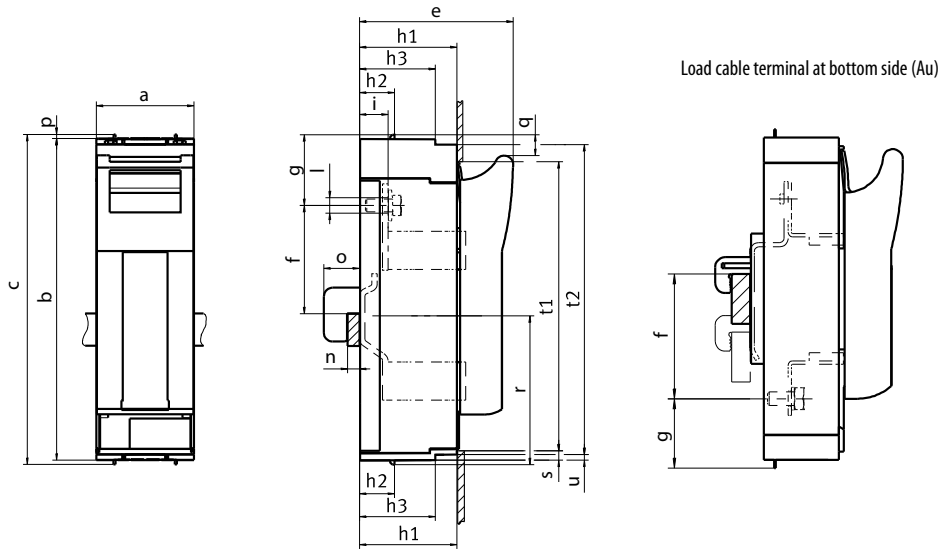
Load cable terminal at topside (Ao)

Load cable terminal at bottom side (Au)

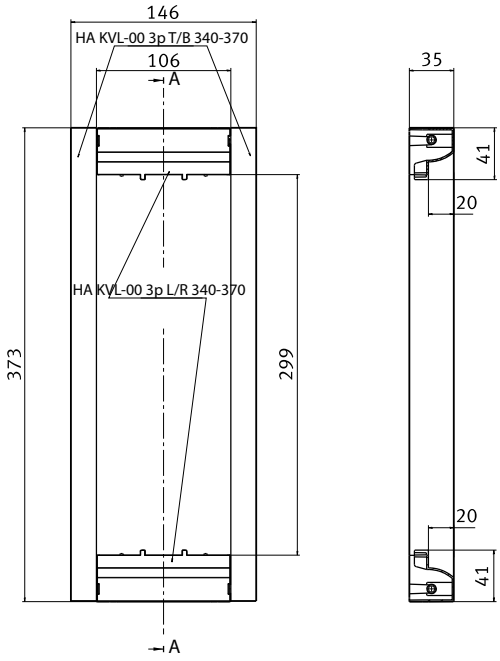
	a	b	c	e	f-Ao	f-Au	g-Ao	g-Au	h1	h2	i	l	n	o	p	q	r	s	t1
KVL-B/SF-00 1p M8-M8 KVL-B/CF-00 1p M8-M8	50	195	204	92	45,50,55 ... 75	75,70,65 ... 45	42	42	53	15	24,5	Ø9	4-10	22	4,5	12	102	5	187

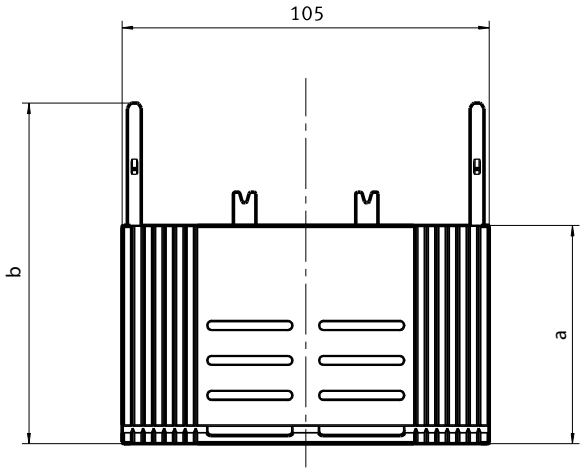
Load cable terminal at topside (Ao)

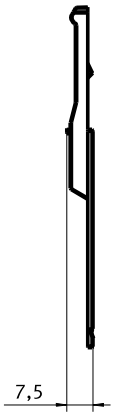
Load cable terminal at bottom side (Au)



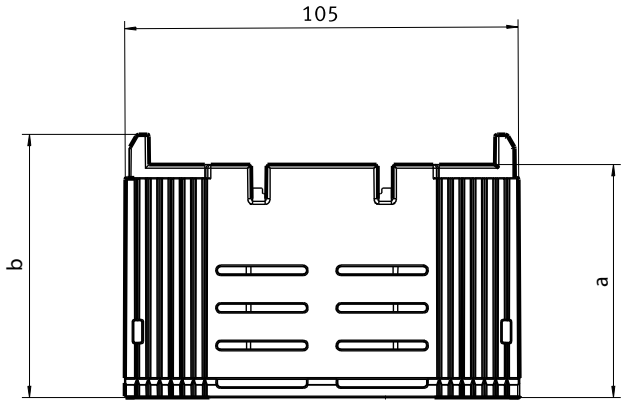
	a	b	c	e	f-Ao	f-Au	g-Ao	g-Au	h1	h2	h3	i	l	n	o	p	q	r	s	t1	t2	u
KVL-B/SF-1 1p M10-M10	69	298	306	117	93	93	76	44	70	32	–	25,5	Ø10,5	5-10	33	4	19	138	5	272	–	–
KVL-B/SF-3 1p M10-M10	91	298	306	143	100	104	66	36	90	32	70	26,5	Ø14	5-10	33	4	19	138	10	268	289	5

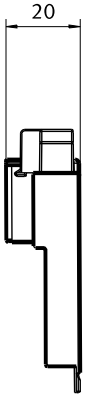




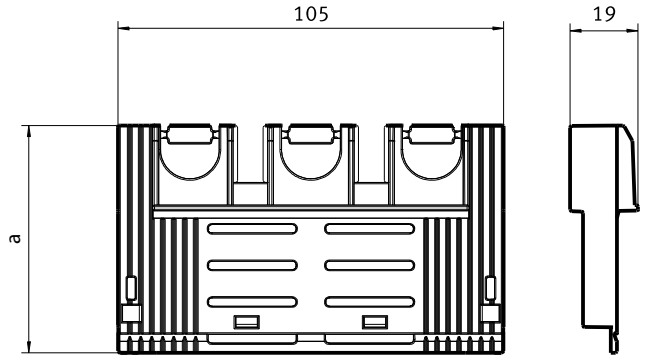


	a	b
PRSEXT KVL-00 3p/34-39	62,5	97,5
PRSEXT KVL-00 3p/32	55,5	90,5

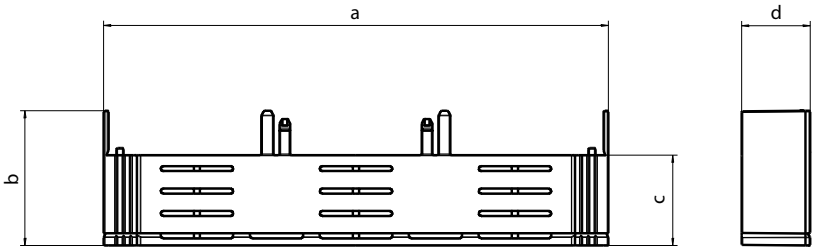




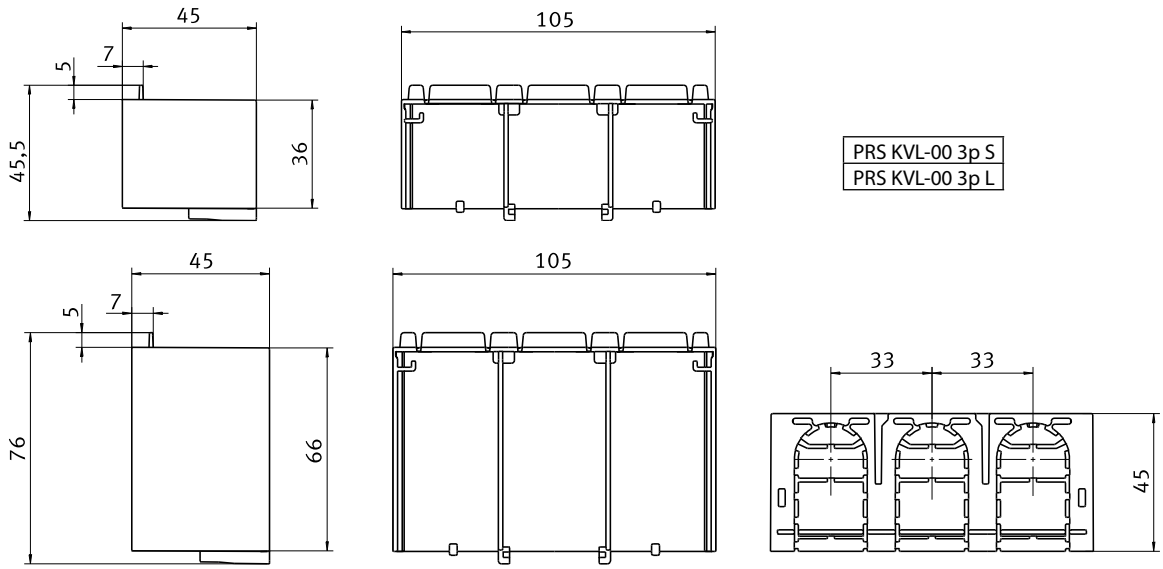
	a	b
UGS KVL-00 3p/34-39	62	70
UGS KVL-00 3p/32	55	63



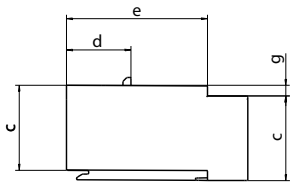
	a
UGS KVL-00 3p/R95T/34-39	62
UGS KVL-00 3p/R95T/32	55

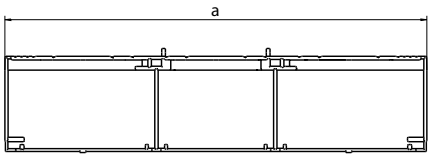


	a	b	c	d
UGS KVL-1 3p/32	184	51,5	30,5	16
UGS KVL-1 3p/34-39	184	58,5	37,5	16
UGS KVL-2 3p/32	210	49	30,5	28,5
UGS KVL-2 3p/39-34	210	56	37,5	28,5
UGS KVL-3 3p/32	250	49	30,5	28,5
UGS KVL-3 3p/39-34	250	56	37,5	28,5

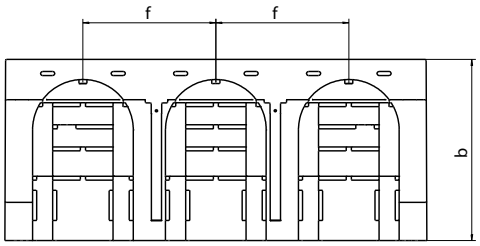


PRS KVL-00 3p S
PRS KVL-00 3p L

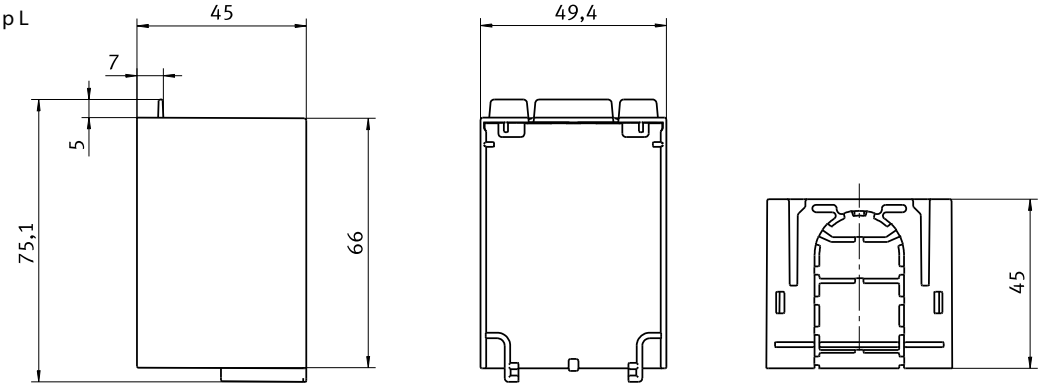




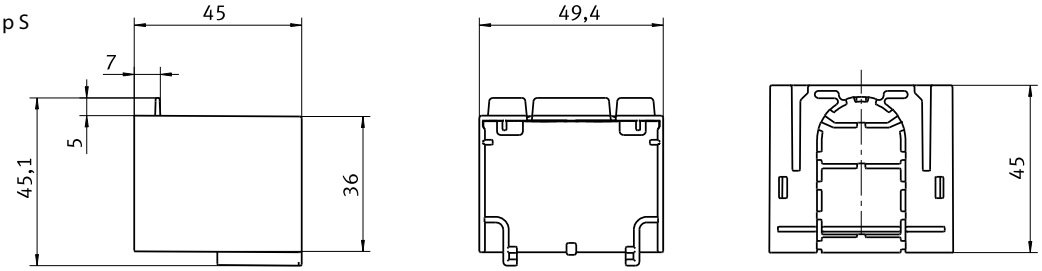
	a	b	c	d	e	f	g
PRS KVL-1 3p	184	70	42	32	–	58	–
PRS KVL-2 3p	210	90	42	32	70	66	5
PRS KVL-3 3p	250	90	42	32	70	82	5



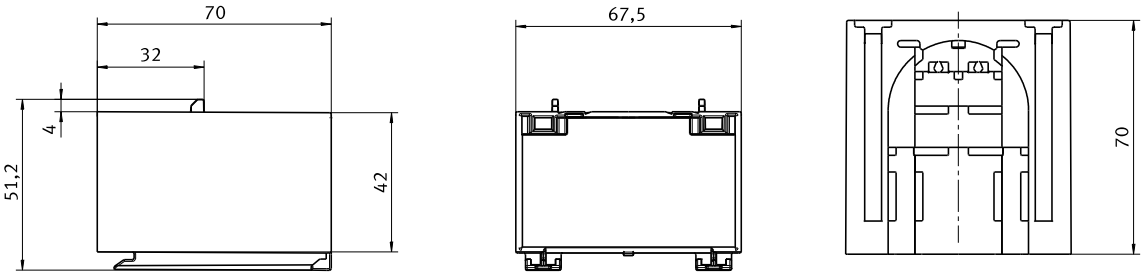
PRS KVL-00 1p L



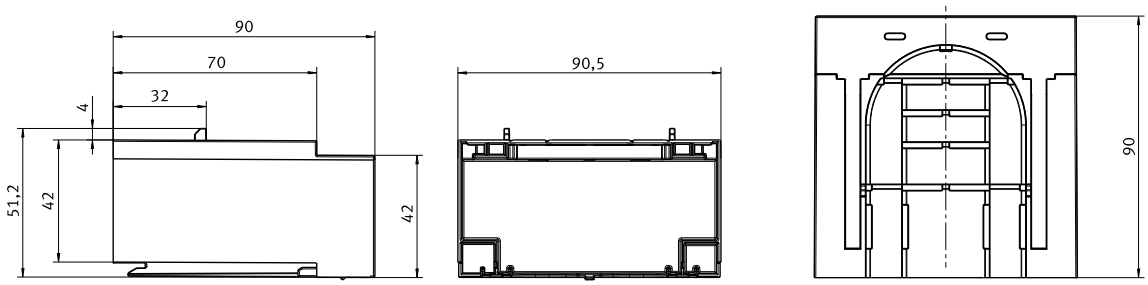
PRS KVL-00 1p S

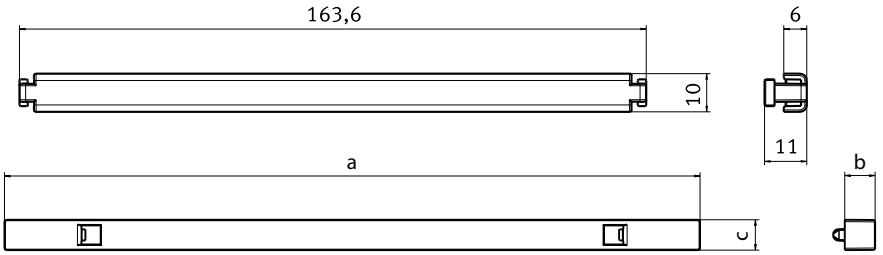


PRS KVL-1 1p

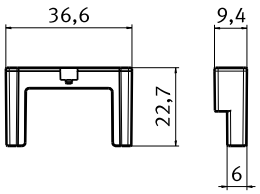


PRS KVL-3 1p



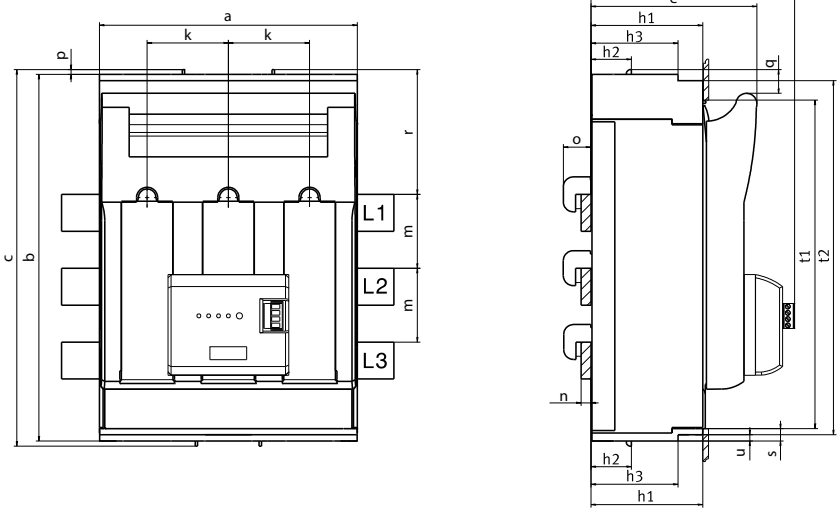


	a	b	c	d	d	d	d	e
BLA KVL-00 top/bottom	183	8	8	32	60	70	–	60
BLAL KVL-00 lateral	183	8	8	32	60	70	90	60
BLA KVL-123	183	8	8	32	60	70	90	60



Technical data - Electronic fuse monitoring unit EFMU KVL			
Technical Characteristics			
Rated operational voltage	U_e	V	AC400-500 (+/-10%)
Power supply			Self-powered
Input power		VA	1,5
Overvoltage category			230/400 V : III , (4kV) 500 V : II , (4kV)
Rated frequency	f	Hz	50-60
Input resistance			>1k Ohm/V
Output channels			
Relay output			1NC/1NO
Maximum voltage		V	AC250/DC24
Maximum switching current		A	1
General data			
Operation indicator			1 LED green
Alarm indicator			3 LED (F1, F2, F3) red
Functional test			Test key for relay + LEDs
EMC			IEC 61000-4-5/IEC 61000-4-4
Degree of protection			IP 3X
Operating conditions			
Ambient temperature	T_{amb}	°C	-5 ... +55

No single detection of parallel connected fuses!



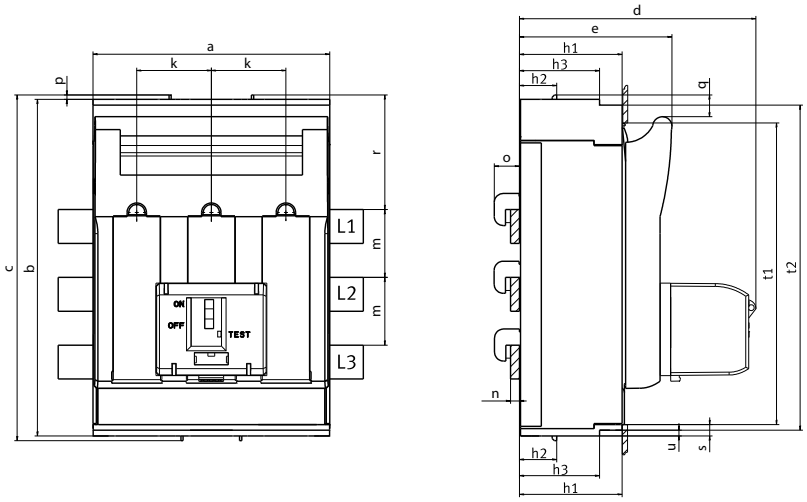
	a	b	c	d	e	h1	h2	h3	k	m	n	o	p	q	r	s	t1	t2	u
KVL-B-1 3p M10-M10 + EFMU KVL-1 3p KVL-B/FT-1 3p M10-M10 TOP + EFMU KVL-1 3p KVL-B/FT-1 3p M10-M10 BOTTOM + EFMU KVL-1 3p	184	298	306	148	117	70	32	–	58	60	4-10	25	4	19	102	5	272	–	–
KVL-B-2 3p M10-M10 + EFMU KVL-2 3p KVL-B/FT-2 3p M10-M10 TOP + EFMU KVL-2 3p KVL-B/FT-2 3p M10-M10 BOTTOM + EFMU KVL-2 3p	210	298	306	165	135	90	32	70	66	60	4-10	25	4	19	102	10	268	289	5
KVL-B-3 3p M10-M10 + EFMU KVL-3 3p	250	298	306	173	143	90	32	70	82	60	4-10	25	4	19	102	10	268	289	5

Technical data - Electromechanical fuse monitoring unit MPFMU KVL			
Technical Characteristics			
Rated operational voltage	U_e	V	AC24…690 DC24…250
Rated short-circuit breaking capacity	I_{cn}	kA	100
Overvoltage category			230/400V : III (4kV) 500V : II (4kV)
Output channels			
Relay output			1NC/1NO
Maximium voltage		V	AC230/DC24
Maximum switching current		A	2,5A...AC-12 / 1A...DC-13

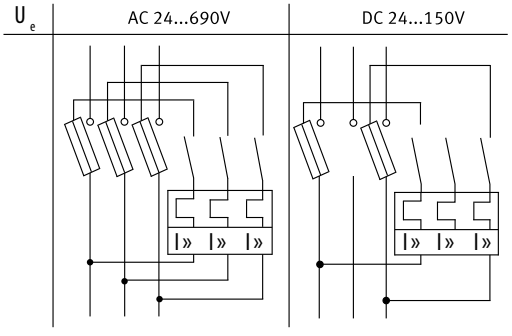
No single detection of parallel connected fuses!

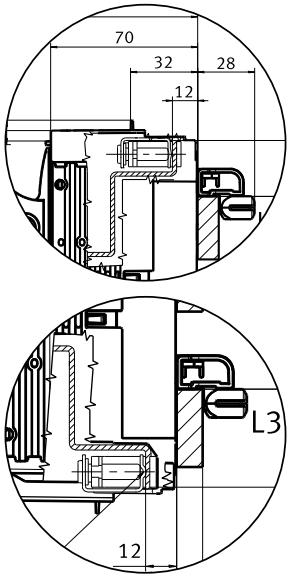
Safety notes

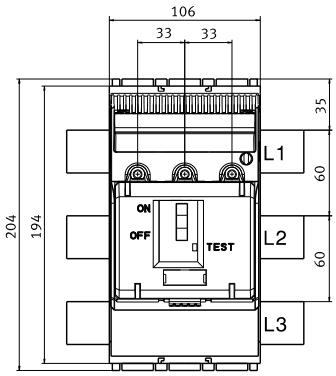
May not be used for safety monitoring in feeders with power control units where, in the event of a fault, it is possible for a DC feedback of >300V (or >600V where 3 current paths are connected in parallel) to occur. If equipment has to be disconnected on the load side of the fuses to be monitored, make sure that no parasitic voltages can arise in the circuit-breaker that is connected in parallel with the fuse-monitoring device.

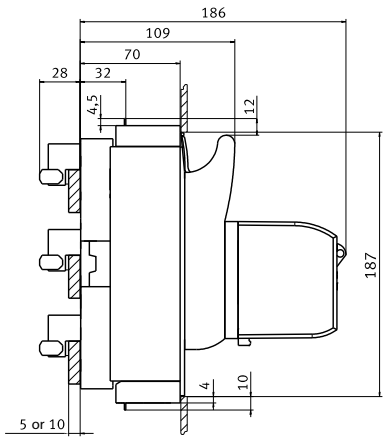


	a	b	c	d	e	h1	h2	h3	k	m	n	o	p	q	r	s
KVL-B-1 3p M10-M10 + MPFMU KVL-1 3p KVL-B/FT-1 3p M10-M10 TOP + MPFMU KVL-1 3p KVL-B/FT-1 3p M10-M10 BOTTOM + MPFMU KVL-1 3p	184	298	306	192	117	70	32	–	58	60	4-10	25	4	19	102	5
KVL-B-2 3p M10-M10 + MPFMU KVL-2 3p KVL-B/FT-2 3p M10-M10 TOP + MPFMU KVL-2 3p KVL-B/FT-2 3p M10-M10 BOTTOM + EFMU KVL-2 3p	210	298	306	209	135	90	32	70	66	60	4-10	25	4	19	102	10
KVL-B-3 3p M10-M10 + MPFMU KVL-3 3p	250	298	306	217	143	90	32	70	82	60	4-10	25	4	19	102	10







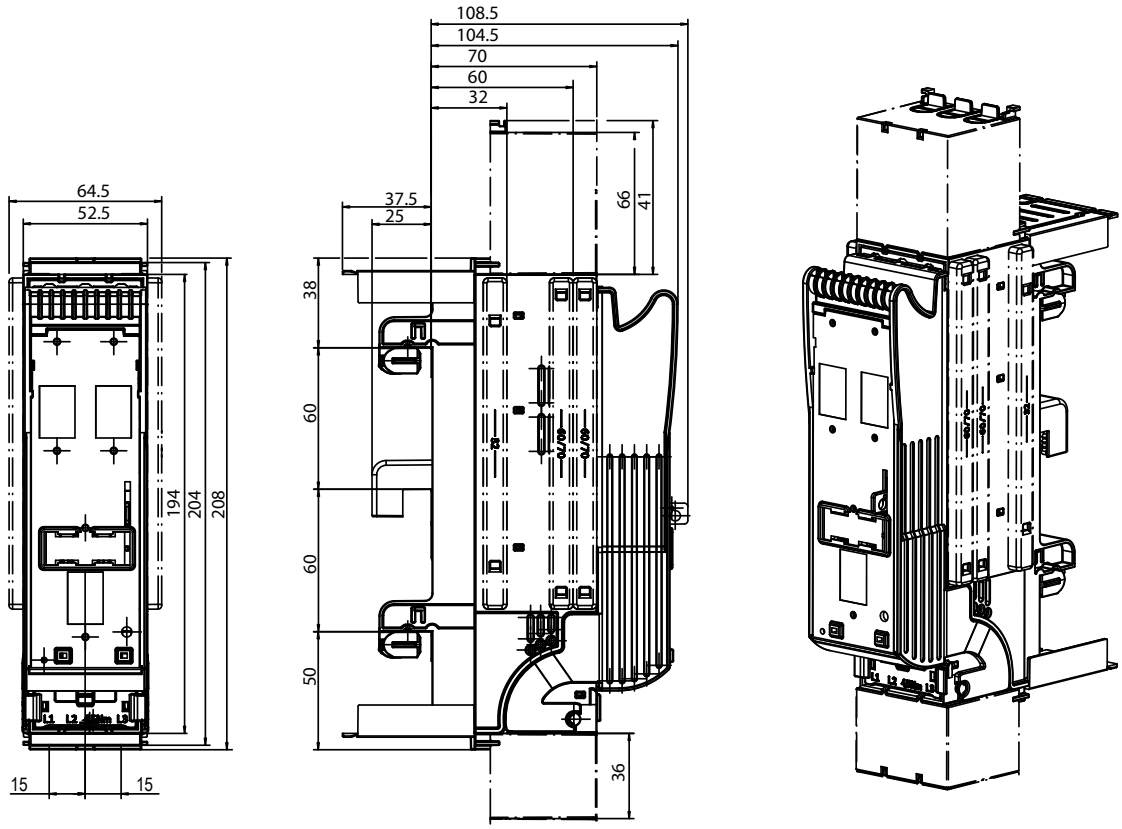


KVL-B-00 3p M8-M8 + MPFMU KVL-00 3p
KVL-B-00 3p BC95-BC95 + MPFMU KVL-00 3p
KVL-B/FT-00 3p M8-M8 + MPFMU KVL-00 3p

Technical data (in accordance with IEC/EN 60947-3)

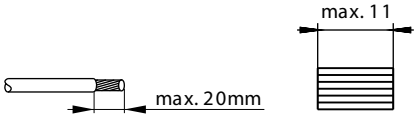
Size			000		
Technical Characteristics					
Rated operational voltage	U_e	V	400 AC	500 AC	690 AC
Rated operational current	I_e	A	125	125	80
Conv. free air thermal current with fuse-links, *	I_{th}	A	125		
Rated frequency	f	Hz	50	50	50
Rated insulation voltage	U_i	V	800 AC		
Total power loss (without fuse)	P_v	W	12 W		
Power loss at 80% Ith (without fuse-links), **	P_v	W	8 W		
Rated impulse withstand voltage	U_{imp}	kV	6		
Utilisation category***			AC-22B	AC-22B	AC-21B
Rated conditional short-circuit current, ***, ****		kA	80 (500V), 80 (690V)		
Rated short-time withstand current	I_{cw}	kA	5/1s		
Fuse links					
Size - DIN VDE 0636-2	-	-	000		
Max. rated current (gG)	I_n	A	125	125	125
Max. permissible power loss per fuse link	P_a	W	9		
Cable terminal					
Clamping cross-section		mm^2	1,5 - 50 Cu		
Tightening torque	Ma	Nm	4,5		
Degree of Protection, front side device					
Front cover close	-	-	IP30		
Front cover open	-	-	IP10		
Operating condition					
Ambient temperature *****	T_{amb}	^0C	-25 ... +55		
Operating condition	-	-	Continuous operation		
Mounting	-	-	vertical, horizontal		
Altitude	-	m	≤ 2000		
Pollution degree	-	-	2		
Overvoltage category	-	-	III		

* Mounting of several units in low voltage switchgear-combinations, please think about rated diversity factors acc. to DIN EN 61439.
** Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.
*** minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm
*** a) Lateral: 50mm/Above: 100mm
**** Type tested with NH fuse-links characteristic gG
***** 35°C Normal temperature, at 55°C with reduced operating current



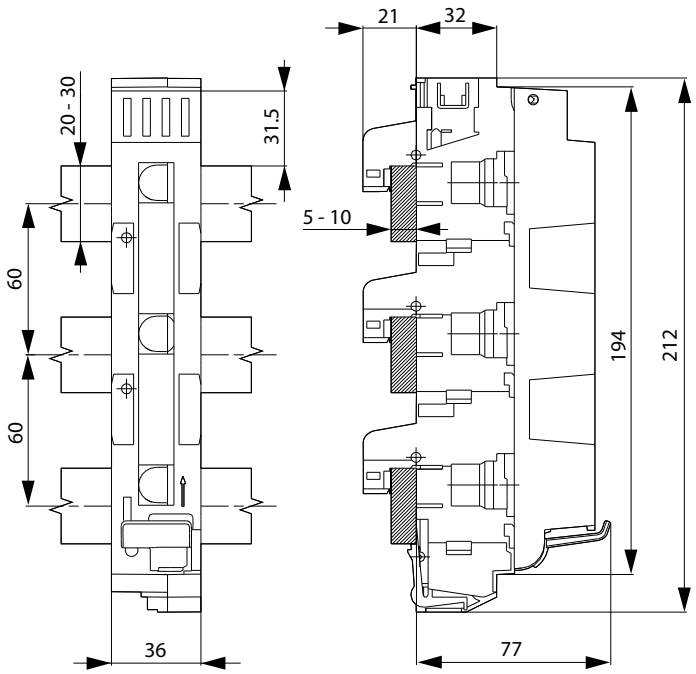
KVL-B-000 3p F50 Bottom / Top

Terminal type	Type	Tightening torque	Clamping range	Size flat strip
Screw terminal M8	F-M8x16	12 - 15 Nm	Cable lugs acc. to DIN 46234 and 46235	
Clip terminal	S00	2,6 Nm	1,5 - 70 mm² Cu	Busbars max. 9x8 flexible flat strip max. 6x9x0,8
Prism clamp	P0070	2,6 Nm	10 - 70 mm² Al/Cu	
Elevator terminal	F57	2,6 Nm	1,5 - 70 mm² Cu	

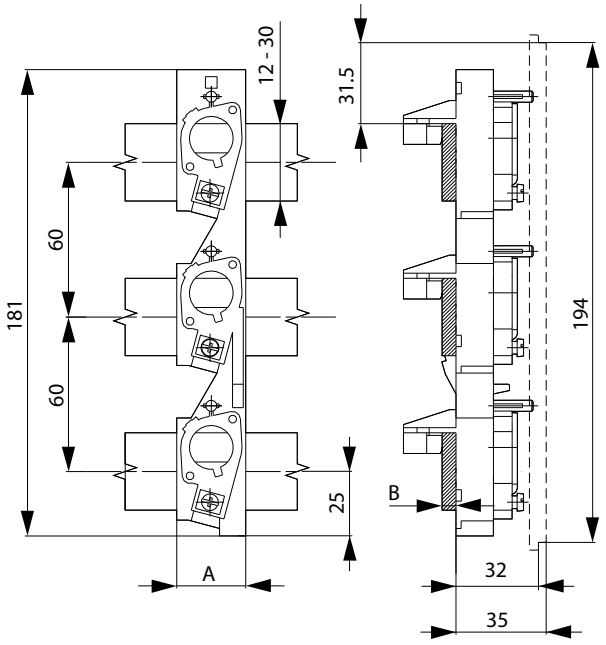


Technical data (in accordance with IEC/EN 60947-3, VDE 0636 part 301)			
Technical Specifications			**DVL-60/183**
Electrical characteristics			
Rated operating voltage	U_e	V	400 AC
Rated operating current	I_e	A	63
Conv. Thermal current with fuse links	I_{th}	A	63
Rated frequency	–	Hz	40-60
Rated insulating voltage	U_i	V	400 AC
Rated conditional short-circuit current	–	kA_{eff}	50
Utilisation category	–	–	AC-23B
Rated making capacity	–	A	630
Rated breaking capacity	–	A	630
Rated impulse voltage	U_{imp}	kV	8
Electrical lifetime (switching cycles)	–	–	300
Total power dissipation (without fuse)	P_v	W	8
Fuselinks			
Size in according to DIN 49522, 49515	–	–	D01, D02
Max. rated current (gl/gG)	I_n	A	63
Max. permissible power dissipation (without fuse)	P_v	W	55
Mehanical parameters			
Mechanical lifetime (switching cycles)	–	–	1700
Busbar spacing (only 3-pole)	–	mm	60
Busbar thickness	–	mm	5 & 10
Busbar width	–	mm	20 & 30
Cable terminal			
Terminal, clamping range"	–	mm^2	0,75-25
Degree of protection			
Frontside, operating state	–	–	IP20
Front cover open	–	–	IP10
Operating conditions			
Ambient temperature [1)]	Tu	°C	-25 ... 55
Bemessungsbetriebsar t	–	–	Uninterrupted duty
Einbaulage	–	–	Vertical, horizontal
Altitude	–	m	< 2000
Pollution degree	–	–	3
Overvoltage categorie	–	–	III

1) 35°C Normal temperature, 55°C with reduced current

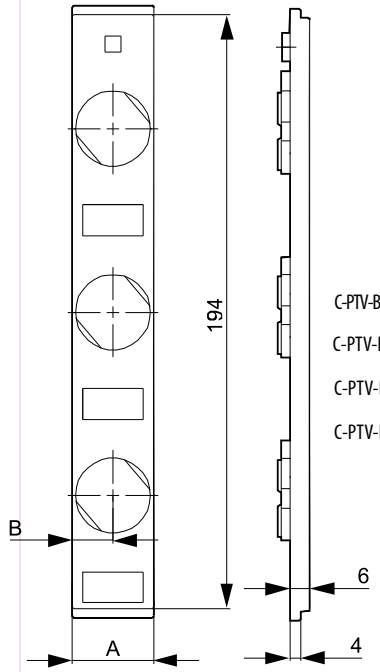


DVL-60/183



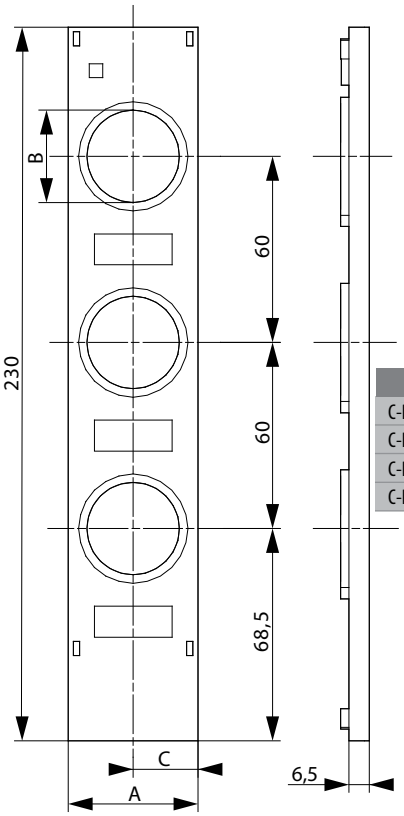
	A	B
PTV-B D02-27/183-5	27	5
PTV-B DII-45/273-5	45	5
PTV-B DIII-54/333-5	54	5

PTV-B D



	A	B
C-PTV-B D02-27/183	27	13.5
C-PTV-B D02-36/183/195	36	22.5
C-PTV-B DII-45/273/195	45	22.5
C-PTV-B DIII-54/333/195	54	27

C-PTV-B D…195



	A	B	C
C-PTV-B D02-27/183/230	27	21	13,5
C-PTV-B D02-36/183/230	36	21	13,5
C-PTV-B DII-45/273/230	45	30	22,5
C-PTV-B DIII-54/333/230	54	36	27

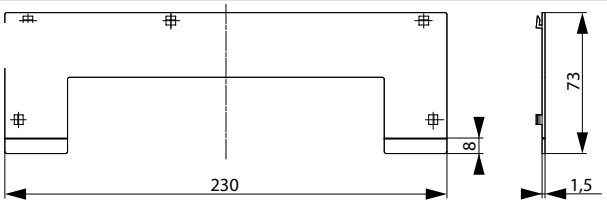
C-PTV-B D…230

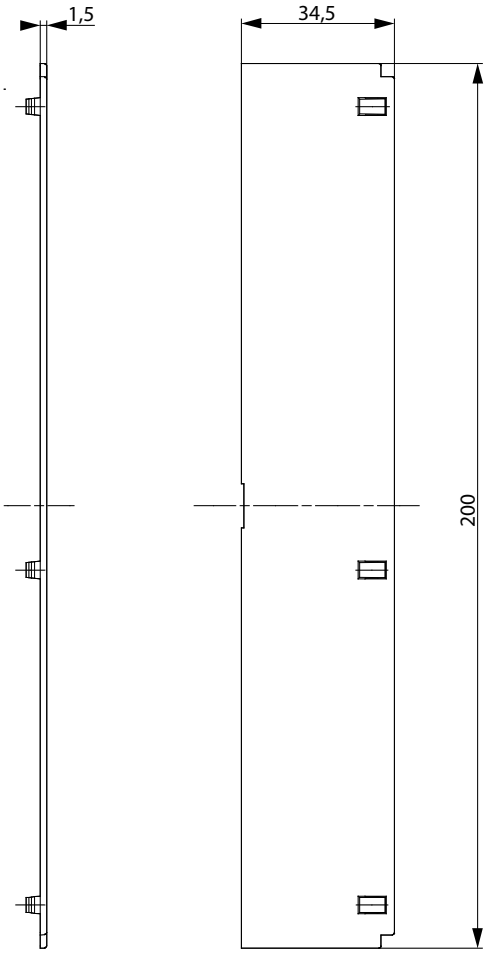
Technical data of strip-type D-fuse bases (in according to IEC/EN 60269-1, VDE 0636 part 301)

Technical Specifications			PTV-B D02	PTV-B DII	PTV-B DIII
Electrical characteristics					
Rated operating voltage	U_e	V	AC400	AC500	AC690
Rated operating current	I_e	A	63	25	63
Thermal current with fuse links	I_{th}	A	63	25	63
Rated frequency	–	Hz	40-60	40-60	40-60
Rated insulating voltage	U_i	V	AC400	AC500	AC690
Rated conditional short-circuit current	–	kAe	50	50	50
Fuselinks					
Size in according to DIN 49522, 49515	–	–	D02	DII	DIII
Max. rated current (gl/gG)	I_n	A	63	25	63
Max. permissible power dissipation (without fuse)	P_v	W	5,5	4	7
Mehanical parameters					
Busbar spacing (only 3-pole)	–	mm	60	60	60
Busbar thickness	–	mm	5 & 10	5 & 10	5 & 10
Busbar width	–	mm	12, 20, 30	12, 20, 30	12, 20, 30
Cable terminal					
Terminal, clamping range"	–	mm^2	0,75-25	0,75-25	0,75-25
Degree of protection					
Frontside, operating state	–	–	IP20	IP20	IP20
Operating conditions					
Umgebungstemperatur 1)/Ambient temperature 1)	Tu	°C	-25 ... +55		
Bemessungsbetriebsar t/Delovno stanje	–	–	Uninterrupted duty		
Einbaulage/Vgradni položaj	–	–	Vertical, horizontal		
Höhenlage/Altitude	–	m	< 2000		
Verschmutzungsgrad/Pollution degree	–	–	3		
Überspannungskategorie/Overvoltage categorie	–	–	III		

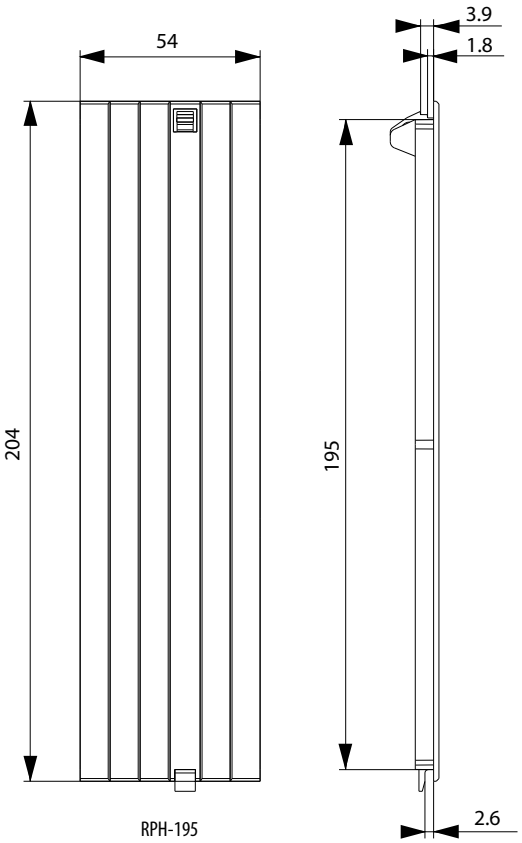
1) 35°C Normal temperature, 55°C with reduced current

CL-PTV-B D/230

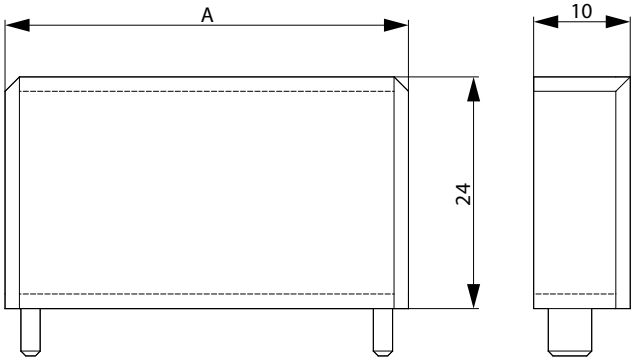




CL-PTV-B D/195

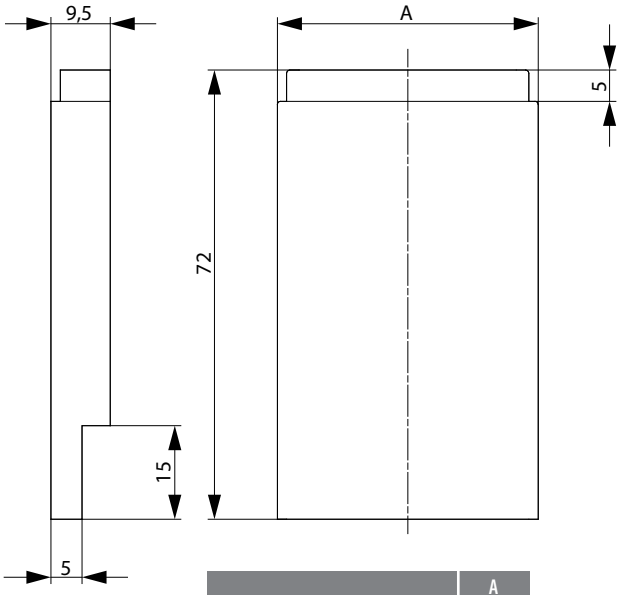


RPH-195



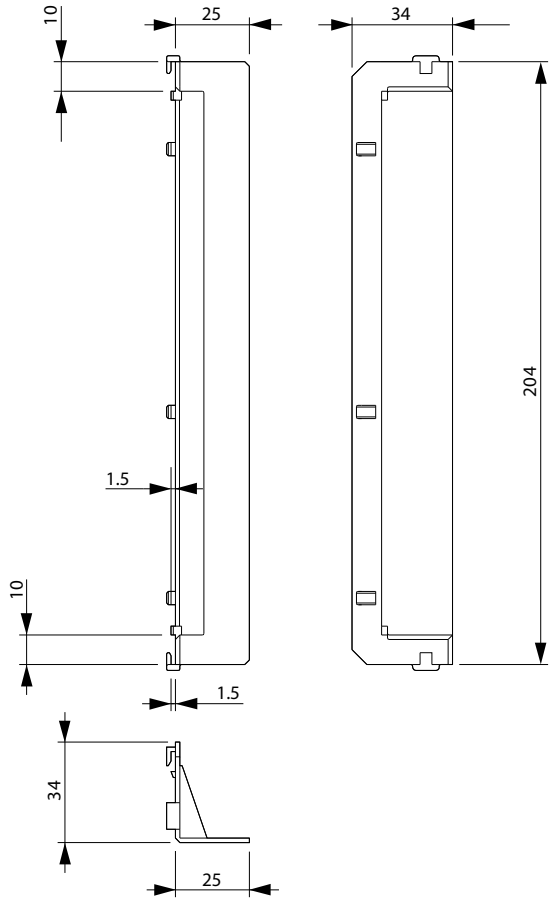
	A
RTP-D02-27/183	27
RTP-D02-36/183	36
RTP-DII-45/273	45
RTP-DIII-54/333	54

RTP-RL/

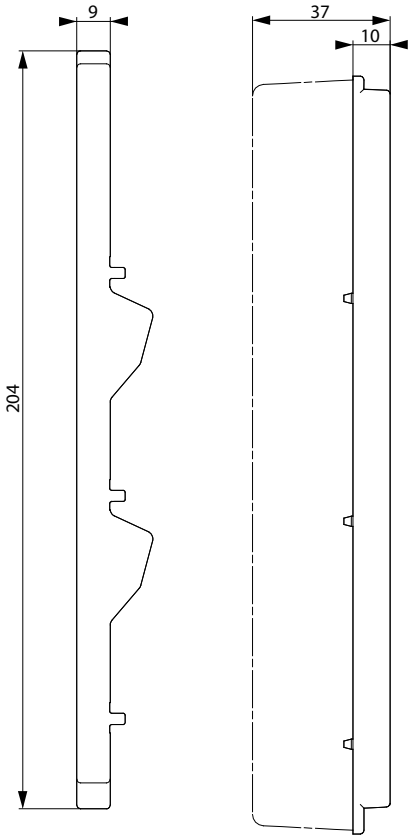


	A
RTP-D02-27/183	27
RTP-D02-36/183	36
RTP-DII-45/273	45
RTP-DIII-54/333	54

PRS-D . . . /183



RTP-RL/230



PRS-DVL

ETIBOX

Distribution boards DIDO 824

SB (S Box) Double insulation enclosures IP66, IK10 836

Polyester enclosures EPC (IP66) 838

Metal enclosures GT Type, IP66 842

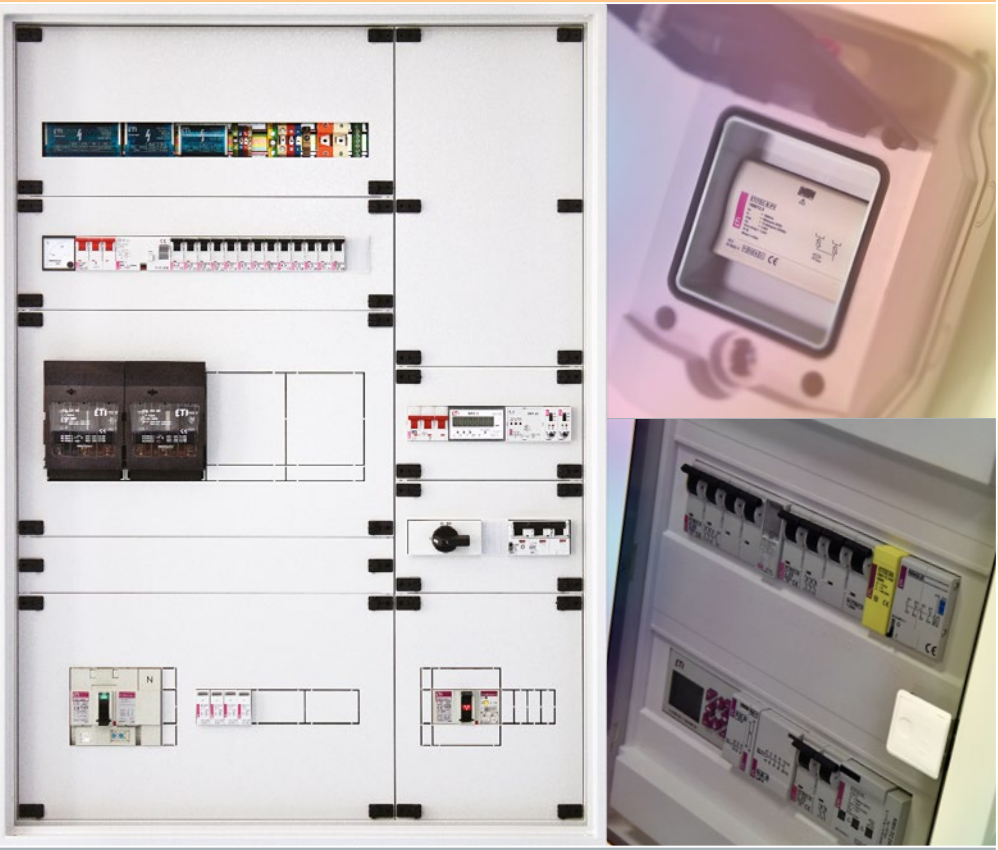
Free-standing cable distribution cabinets KVR 844

Accessories 846

Technical data 861

Metal modular enclosures system SOLID GSX is in a separate catalogue

Free-standing cable distribution cabinets



POWER NEEDS CONTROL

Distribution boards

Home distribution board DIDO-E

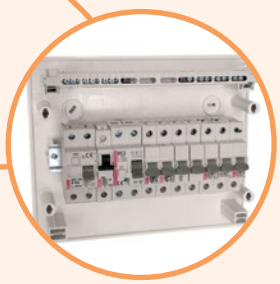
Rated current	Rated voltage	Degree of protection
63 A	**400 V**	**IP 40**

→ N/PE terminals assure fast and simple wiring.





→ Included special marking stickers with symbols most common for home installations



→ Standard set includes:
- metal DIN rail TH35 mounted in enclosure
- PE/N terminals
- mounting set with screws
- marking stickers with symbols
- cover for empty modular spaces





→ Possibility to add key lock to prevent unauthorized access.



→ Easy mounting system

Home distribution boards DIDO-E are available in two types: surface mounted and flush mounted boards, in one, two or three row design. Available with transparent or white doors. With lock set installation the board can be locked. Home distribution boards can easily be built in and already have a DIN rail installed for easier and quicker mounting of module devices. Terminal blocks for PE and N conductors are attached as standard for all distribution boards. Distribution boards correspond to condition of insulation protection and are in accordance with standard IEC60670-24.

Surface mounted distribution board - IP30

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
EC 1+1	001101044	1+1	64	1/10	1
EC 3+1	001101045	3+1	86	1/10	1
EC 3+2	001101046	3+2	170	1/5	1



Surface mounted distribution board - transparent door

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT4PT transparent door	001100140	4	491	1/5	1
ECT8PT transparent door	001101000	4(+4)	598	1/5	1
ECT12PT transparent door	001101001	12	952	1/5	1
ECT18PT transparent door	001101002	18	1207	1/5	1
ECT24PT transparent door	001101003	24	1444	1/5	2
ECT36PT transparent door	001101004	36	1965	1/5	3
ECT48PT transparent door	001101020	48	2200	1/5	4



ECT 8 PT

ECT 12 PT

Surface mounted distribution board - white door

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT4PO white door	001100141	4	491	1/5	1
ECT8PO white door	001101005	4(+4)	598	1/5	1
ECT12PO white door	001101006	12	952	1/5	1
ECT18PO white door	001101007	18	1207	1/5	1
ECT24PO white door	001101008	24	1444	1/5	2
ECT36PO white door	001101009	36	1965	1/5	3
ECT48PO white door	001101021	48	2200	1/5	4



ECT 48 PO

Surface mounted distribution board 2x18 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT 2x18PT transparent door	001101081	2x18	2414	1/5	2
ECT 2x18PO white door	001101082	2x18		1/5	



ECT 2x18 PT

Surface mounted distribution board 3x18 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT 3x18PT transparent door	001101040	3x18	2620	1/5	3
ECT 3x18PO white door	001101041	3x18		1/5	

Surface mounted distribution board 4x18 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT 4x18PT transparent door	001100270	4x18	3200	1/5	4
ECT 4x18PO white door	001100271	4x18		1/5	



ECT 3x18 PT

Surface mounted distribution board 1x24 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECT 1x24PT transparent door	001100280	1x24	950	1/5	1
ECT 1x24PO white door	001100281	1x24		1/5	

Technical data on page 862



ECM 12 PT

Flush mounted distribution board - transparent door

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECM4PT transparent door	001100142	4	491	1/5	1
ECM8PT transparent door	001101010	4(+4)	681	1/5	1
ECM12PT transparent door	001101011	12	922	1/5	1
ECM18PT transparent door	001101018	18	1200	1/5	1
ECM24PT transparent door	001101012	24	1338	1/5	2
ECM36PT transparent door	001101013	36	1785	1/5	3



ECM 36 PO

Flush mounted distribution board - white door

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECM4PO white door	001100143	4	491	1/5	1
ECM8PO white door	001101014	4(+4)	681	1/5	1
ECM12PO white door	001101015	12	922	1/5	1
ECM18PO white door	001101019	18	1200	1/5	1
ECM24PO white door	001101016	24	1338	1/5	2
ECM36PO white door	001101017	36	1785	1/5	3



ECM 3x18 PO

Flush mounted distribution board 2x18 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECM 2x18PT transparent door	001101083	2x18	2414	1/5	2
ECM 2x18PO white door	001101084	2x18		1/5	

Flush mounted distribution board 3x18 modules

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECM 3x18PT transparent door	001101047	3x18	2620	1/5	3
ECM 3x18PO white door	001101048	3x18		1/5	

Surface Mounted IT Distribution Boards DIDO-E MEDIA



ECT24MEDIAPO



ECT48MEDIAPO

Surface mounted, white door, perforated metal plate included

Type	Code No.	Frame size	Weight [g]	Packaging [pcs]
ECT 2x18MEDIAPO	001100210	2x18	2414	1/5
ECT 3x18MEDIAPO	001100211	3x18	2600	1/5
ECT4x18MEDIAPO	001100272	4x18	3200	1/5
ECT24MEDIAPO	001100212	24	1444	1/5
ECT36MEDIAPO	001100213	36	1965	1/5
ECT48MEDIAPO	001100214	48	2200	1/5

Accessories (Schuko socket, holder, RJ45 holder) must be ordered separetely

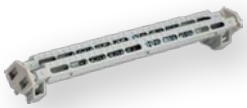
Technical data on page 862

Accessories DIDO-E

Accessories DIDO ECT & ECM

Type	Description	Code No.	Weight [g]	Packaging [pcs]
ECMECT-L2K	Metal lock with 2 keys	001100203	50	1
PST-UNI	2x15 add-on terminal	001101051	100	1/25
MP-E	Modular cover - white (12 modules)	001101052	26	10/500
M20	Rubber gland M20	001101054	10	50/3000
M25	Rubber gland M25	001101055	12	50/2000
M32	Rubber gland M32	001101056	16	25/1000
M40	Rubber gland M40	001101057	20	25/600
ECMEDIA-2xSCH	Double schuko socket with holder	001100201	50	1
ECMEDIA-RHOLD	Device(router or modem) holder	001100202	50	1
ECMEDIA-RJ	RJ45 connector holder, 12 ports	001100206	100	1

* PST-UNI is an extra insulating terminal (2 x 15) that can be mounted into 12, 24, 28, 36, 42, 48 and 56 module distribution boards



PST-UNI



ECMECT-L2K



M20



MP-E



ECMEDIA-RHOLD



ECMEDIA-2xSCH

Replacement door for ECT/ECT MEDIA and ECM/ECM MEDIA

Number of modules	Compatibility	Code No.	Code No. (white door)	Weight [g]	Packaging [pcs]
8	ECT/ECM 8	001101100	001101105	90	1/50
12	ECT/ECM 12	001101101	001101106	100	1/50
18	ECT/ECM 18	001101102	001101107	150	1/50
24	ECT/ECM 24	001101103	001101108	230	1/50
36	ECT/ECM 36	001101104	001101109	350	1/40
36	ECT/ECM 2x18	001101141	001101140	360	1/40
48	ECT/ECM 48	001101120	001101121	460	1/30
54	ECT/ECM 3x18	001101148	001101147	600	1/20

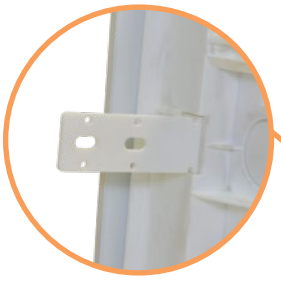


...PT



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Flush mounted enclosures with super thin design (metal or plastic door) DIDO ECG



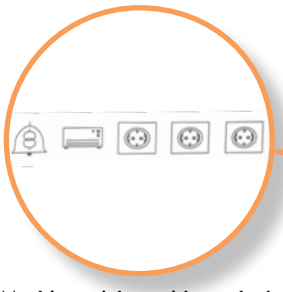
→ Included mounting set for all kind of walls.



→ Front mask sealing possibility



→ Special hinge system provides left or right door opening.



→ Marking sticker with symbols





→ Possible to add key lock



→ N/PE terminals included



→ Standard set includes:
- metal DIN rail TH35
- PE/N terminals
- mounting set with screws for all kinds of walls (concrete, hollow, wooden...)
- marking stickers with symbols
- cover for empty modular spaces



→ Possible to mechanically connect two ECG enclosures side by side with special metal bracket.



Description
DIDO ECG are flush-mounted compact distribution boxes. They are suitable for installation in homes, schools and commercial buildings.
Main characteristics:
- Class II, double insulated
- Cable entrance from top or bottom
- Device cover with opening for 12 modules per row + 2 blended(can be removed). Can be sealed
- Thin design, 88mm depth in wall and 7mm outside the wall.
- Color: White RAL 9003 with allowed difference ΔE = 2,15

Enclosures are completely assembled with all necessary parts, such as:
- DIN rail
- Insulated terminals, neutral and ground
- Covers for free space
- Needed installation accessories for concrete and hollow walls
- Instruction manual

Flush mounted distribution board - metal door, white

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECG14	001101025	12+2	2000	1/1	1
ECG28	001101026	24+4	2500	1/1	2
ECG42	001101027	36+6	3000	1/1	3
ECG56	001101028	48+8	3500	1/1	4
ECG70	001101029	60+10	5000	1/1	5

*Rear side plastics conforms 650°C glow wire test; enclosures conforming 850°C glow wire test according to 60670-24, demand for hollow wall installation are on page 832



Flush mounted distribution board - plastic door - transparent

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECG14PT	001101180	12+2	1900	5	1
ECG28PT	001101181	24+4	2400	5	2
ECG42PT	001101182	36+6	2900	5	3

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)



Flush mounted distribution board - plastic door - white

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECG14PO	001101183	12+2	1900	5	1
ECG28PO	001101184	24+4	2400	5	2
ECG42PO	001101185	36+6	2900	5	3

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)

Technical data on page 861

Enclosures for multimedia and communication device DIDO ECG MEDIA

ENCLOSURE FOR MULTIMEDIA AND COMMUNICATION DEVICES
- Telephone connection
- Modems and routers (for wireless use plastic door!)
- Antenna, cable or satellite TV connection
- Included perforated mounting plate (zinc plated steel),
- Included installation accessories for concrete and hollow walls



Flush mounted multimedia distribution board - perforated metal door, white

Type	Code No.	Number of mounting plates	Weight [g]	Packaging [pcs]
ECG14MEDIA-I	001101156	1	2000	1
ECG28MEDIA-I	001101157	2	2500	1
ECG42MEDIA-I	001101158	3	3000	1
ECG56MEDIA-I	001101159	4	3500	1
ECG70MEDIA-I	001101179	5	5000	1

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)



Flush mounted multimedia distribution board - plastic door - transparent

Type	Code No.	Number of mounting plates	Weight [g]	Packaging [pcs]
ECG14MEDIAPT	001101186	1	2000	5
ECG28MEDIAPT	001101187	2	2500	5
ECG42MEDIAPT	001101188	3	3000	5

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)



Flush mounted multimedia distribution board - plastic door - white

Type	Code No.	Number of mounting plates	Weight [g]	Packaging [pcs]
ECG14MEDIAPO	001101189	1	2000	5
ECG28MEDIAPO	001101190	2	2500	5
ECG42MEDIAPO	001101191	3	3000	5

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)

Technical data on page 861

Flush mounted multimedia distribution board - perforated metal door, white					
Type	Code No.	Description	Number of modules	Weight [g]	Packaging [pcs]
ECG42COMB02/1-I	001100220	2 Media + 1 Modular row	14	3400	1
ECG56COMB03/1-I	001100221	3 Media + 1 Modular row	14	4100	1
ECG56COMB02/2-I	001100222	2 Media + 2 Modular rows	28	4100	1
ECG70COMB04/1-I	001100223	4 Media + 1 Modular row	14	4900	1
ECG70COMB03/2-I	001100224	3 Media + 2 Modular rows	28	4900	1
ECG70COMB02/3-I	001100225	2 Media + 3 Modular rows	42	5000	1

*Rear side plastics conforms 650°C glow wire test (not appropriate for wooden or hollow walls - IEC 60670-24)
** 1x Schuko socket already included

ECG42(H)COMB02/1-I



ECG56(H)COMB02/2-I





ECG70(H)COMB03/2-I

ECG56(H)COMB03/1-I



ECG70(H)COMB04/1-I



ECG70(H)COMB02/3-I



Flush mounted multimedia distribution board - perforated metal door, white					
Type	Code No.	Description	Number of modules	Weight [g]	Packaging [pcs]
ECG42HCOMB02/1-I	001100226	2 Media + 1 Modular row	14	3400	1
ECG56HCOMB03/1-I	001100227	3 Media + 1 Modular row	14	4100	1
ECG56HCOMB02/2-I	001100228	2 Media + 2 Modular rows	28	4100	1
ECG70HCOMB04/1-I	001100229	4 Media + 1 Modular row	14	4900	1
ECG70HCOMB03/2-I	001100230	3 Media + 2 Modular rows	28	4900	1
ECG70HCOMB02/3-I	001100231	2 Media + 3 Modular rows	42	5000	1

* Conforms 850°C glow wire test according to IEC60670-24 for hollow wall installation
** 1x Schuko socket already included

Technical data on page 861

Distribution boards for installation in hollow walls by IEC 60670-24 DIDO-E ECG_H

Description

DIDO ECG are flush-mounted compact distribution boxes. They are suitable for installation in homes, schools and commercial buildings.

Main characteristics:

- Class II, double insulated
- Cable entrance from top or bottom
- Device cover with opening for 12 modules per row + 2 blended(can be removed). Can be sealed
- Thin design, 88mm depth in wall and 7mm outside the wall.
- Color: White RAL 9003 with allowed difference ΔE = 2,15

Enclosures are completely assembled with all necessary parts, such as:

- DIN rail
- Insulated terminals, neutral and ground
- Covers for free space
- Needed installation accessories for concrete and hollow walls
- Instruction manual



Flush mounted distribution board with metal door

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECG14H	001101160	12+2	2000	1/1	1
ECG28H	001101161	24+4	2500	1/1	2
ECG42H	001101162	36+6	3000	1/1	3
ECG56H	001101163	48+8	3500	1/1	4
ECG70H	001101169	60+10	5000	1/1	5

Conforms 850°C glow wire test according to IEC60670-24 for hollow wall installation

Enclosures for multimedia and communication device DIDO ECG_H MEDIA



Flush mounted multimedia distribution board - perforated metal door, white

Type	Code No.	Number of mounting plates	Weight [g]	Packaging [pcs]
ECG14HMEDIA-I	001100130	1	2000	1
ECG28HMEDIA-I	001100131	2	2500	1
ECG42HMEDIA-I	001100132	3	3000	1
ECG56HMEDIA-I	001100133	4	3500	1
ECG70HMEDIA-I	001100134	5	5000	1

Conforms 850°C glow wire test according to IEC60670-24 for hollow wall installation

Technical data on page 862

Accessories DIDO-E ECG

Accessories DIDO ECG

Type	Description	Code No.	Weight [g]	Packaging [pcs]
PST-UNI	2x15 add -on terminal	001101051	100	1/25
MP-E	Modular cover -white (12 modules)	001101052	26	10/500
ECGBRHP	Connecting brackets - horizontal, plastic	001100274	100	1
ECGBRV*	Connecting brackets - vertical	001100200	50	1
ECMEDIA-2xSCH	Double schuko socket with holder	001100201	50	1
ECMEDIA-RHOLD	Device (router or modem) holder	001100202	50	1
ECG-L2K	Metal lock, including 2 keys	001100205	50	1
ECMEDIA-RJ	RJ45 connector holder, 12 ports	001100206	100	1
ECMEDIA-PART**	Partition with 1x integrated socket	001100250	100	1
ECMEDIA-SCH	Extra (2nd) socket 16A, 250V for Partition	001100251	50	1

*1 set includes 1 pair of brackets needed to mechanically connect two distribution boards

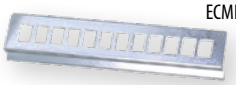
**In one partition can be mounted 2 schuko sockets, one is already included, second can be ordered separetely. Partition with 1x schuko socket is already included in ECG_COMBO distribution board


ECG-L2K


ECGBRV


ECMEDIA-RHOLD


ECMEDIA-2xSCH


ECMEDIA-RJ


ECGBRHP

Flush mounted distribution boards with metal doors (IP40) DIDO ERP

Rated current **63 A** | Rated voltage **400 V** | Degree of protection **IP 40**

- Flush mounted enclosure metal door (white)
- Colour white (RAL9016)
- IP protection IP40
- Equiped with TH rails, PE/N terminals, mounting brackets
- possibility to assemble with lock with key

Enclosures are equipped with:
- DIN rails
- Insulated terminals, neutral and ground
- Modular covering mask
- Instruction manual

Type designation: **ERPxx-A**

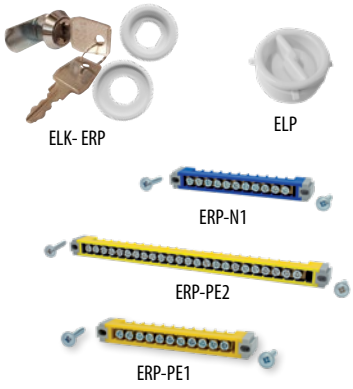
Number of modules in one row ← → Number of rows

Flush mounted distribution board with metal doors

Type	Description	Code No.	Number of rows	Number of modules	Terminals PE/N	Weigh [kg]	Packaging [pcs]
ERP12-1	12 modules p/r	001101200	1	12	11/11	2,1	1
ERP12-2	12 modules p/r	001101202	2	24	1x24/2x11	3,3	1
ERP12-3	12 modules p/r	001101204	3	36	1x24/3x11	4,3	1
ERP12-4	12 modules p/r	001101206	4	48	1x24/4x11	5,2	1
ERP12-5	12 modules p/r	001101298	5	60	1x24/6x11	5,75	1
ERP12-6	12 modules p/r	001101299	6	72	1x24/6x11	6,65	1
ERP18-1	18 modules p/r	001101208	1	18	11/11	4	1
ERP18-2	18 modules p/r	001101210	2	36	1x24/2x11	5,5	1
ERP18-3	18 modules p/r	001101212	3	54	1x24/3x11	6,8	1
ERP18-4	18 modules p/r	001101214	4	72	1x24/4x11	8,2	1
ERP18-5	18 modules p/r	001101216	5	90	2x24/5x11	9,6	1
ERP18-6	18 modules p/r	001101218	6	108	2x24/6x11	11	1
ERP24-2	24 modules p/r	001101293	2	48	1x24/2x11	5,4	1
ERP24-3	24 modules p/r	001101294	3	72	1x24/3x11	7,1	1
ERP24-4	24 modules p/r	001101295	4	96	2x24/4x11	8,8	1
ERP24-5	24 modules p/r	001101296	5	120	3x24/4x11	10,4	1
ERP24-6	24 modules p/r	001101297	6	144	3x24/4x11	12,0	1



Technical data on page 864



Accessories

Type	Description	Code No.	Weight [g]	Packaging [pcs]
EPLMB	Cup for sealing screw	001101278	7	100
ELK-ERP	Lock with key	001101279	56	1/10
ELP	Latch	001101280	12	1/10
ERP-N1	N terminal 11 mod.(blue)	001101281	44	1/10
ERP-N2	N terminal 24 mod.(blue)	001101282	90	1/10
ERP-PE1	PE terminal 11 mod.(yellow)	001101283	44	1/10
ERP-PE2	PE terminal 24 mod.(yellow)	001101284	90	1/10
ERP12-PM	Mounting plate EB2S/ED2S 160 3p for ERP 12	001101285	220	1
ERP18-PM	Mounting plate EB2S/ED2S 160 3p for ERP 18	001101286	250	1
ERP24-PM	Mounting plate EB2S/ED2S 160 3p for ERP 24	001101287	345	1

Distribution boards DIDO ACT

ACT distribution boards can be used in applications with wall mounted electrical installations, like containers, wooden houses. Blended cuttings on top and bottom of enclosure for entrance of various dimensions of installation channel.

Enclosures are completely assembled with all necessary parts, such as:

- DIN rail
- Insulated terminals, neutral and ground
- Covers for free space
- Needed installation accessories
- Instruction manual



Surface mounted distribution board - plastic door - transparent

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ACT12PT	001100240	12+2	1300	5	1
ACT24PT	001100241	24+4	1700	5	2
ACT36PT	001100242	36+6	2100	5	3

Surface mounted distribution board - plastic door - white

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ACT12PO	001100243	12+2	1300	5	1
ACT24PO	001100244	24+4	1700	5	2
ACT36PO	001100245	36+6	2100	5	3

Modular distribution board for use outside DIDO-ECH

Rated current	Rated voltage	Degree of protection
63 A	**400V AC/ 1500V DC**	**IP 65**

Watertight wall-mounted distribution boards apply in domestic and industry architecture for mounting modular equipment for protection (IP65) against wet, dust and another dirtiness. Enclosure is made of high thermal stability material - ASA (Acrylonitrile-Acrylic-Styrene), plastic with good dielectrical and mechanical attributes, UV resistant (colour stability). Easy and quick montage.

Main elements:

Bottom cover with DIN rail, PE and N bars and holes for PG cable inlets properly marked

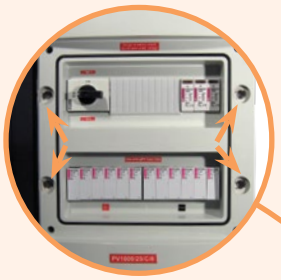
Top cover with seal of the door

Transparent door made of polycarbonate (PC) with plastic lock (in standard) or metal lock with key (in option)

Technical data on page 865



→ Standard set includes:
- metal DIN rail TH35
- PE/N terminals
- mounting set with screws
- marking stickers with symbols
- covers for mounting holes
- cover for empty modular spaces

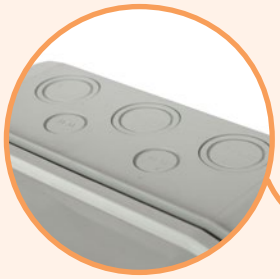


→ Left or right door opening



→ Possible to seal enclosure, to prevent unauthorized access.





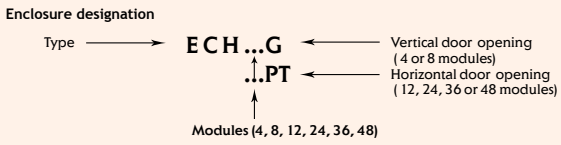
→ Prepaired points for glands (cable entry)



→ Tight closing with rubber between door and housing provide IP65. Also possible to install key lock

Wall mounted distribution board - ECH

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]	Rows
ECH-4G	001101060	4	460	1/5	1
ECH-6G	001101176	6	460	1/5	1
ECH-8G	001101061	8	680	1/5	1
ECH-12PT	001101062	12	1240	1/5	1
ECH-18PT	001100350	18	1700	1/5	1
ECH-24PT	001101063	24	1700	1/5	2
ECH-36PT	001101064	36	2310	1/5	3
ECH-48PT	001100304	48	3220	1/5	4





ECH-8G



ECH-4G



ECH-12PT



ECH-36PT

Accessories

Type	Description	Code No.	Weight [g]	Packaging [pcs]
ECH-L2K	Metal lock with 2 keys	001100204	50	1
PST-UNI	2x15 add-on terminal	001101051	100	1/25
MP-ECH	Modular cover - grey (12modules)	001101053	26	10/500

* PST-UNI is an extra insulating terminal (2 x 15) that can be mounted into 12, 24, 28, 36, 42, 48 and 56 module distribution boards



lock with key ECH-L2k



terminal

Technical data on page 866

SB (S Box) Double insulation enclosures IP66, IK10

Enclosures made of fiberglass-reinforced polyester RAL 7035

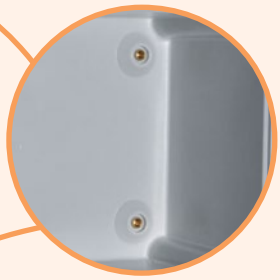




→ Fixing enclusures directly on wall (surface mounted) thru premade holes



→ One enclosure includes polyester mounting plate. If necessary it is possible to order additional plate separetely (as replacement)



→ Removable mounting plate fixed by 4 screws and pressed nuts

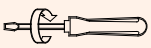




→ Top cover sealed for high IP degree (IP66)



→ Attaching the top cover by four screws using a flat screwdriver



(Max. 2,1 Nm)





→ Door hinges as an option, must be ordered separately (Accessories). Recommended use of the silicone to keep IP protection degree (screw holes)

Description

Enclosures made of fiberglass-reinforced polyester RAL 7035, designed for extreme conditions:

- self extinguishing 960 °C , does not lead flames
- waterproof, IP66
- double insulation
- halogen free
- UV stable polycarbonate cover with gasket
- wide temperature range -30 °C / + 60 °C
- protection against external mechanical impacts: IK10
- easy handling & user friendly
- suitable for PV applications, nominal voltage 1000 V DC
- nominal current 1000A

Enclosures - transparent lid, grey base RAL 7035

Type	Code No.	Number of modules	Weight [g]	Packaging [pcs]
SB-32	001102500	270x180x170	1,25	1
SB-44	001102501	360x360x170	2,90	1
SB-64	001102502	540x360x170	5,05	1

*polyester mounting plate already included and mounted in the box



They are exceptionally durable, corrosian resistant, can withstand exposure to chemicals, water and extreme condition

Accessories, spare parts

Type	Code No.	Description	Weight [g]	Packaging [pcs]
SB-MP32	001102503	Mounting plate for SB-32	0,16	5
SB-MP44	001102504	Mounting plate for SB-44	0,71	5
SB-MP64	001102505	Mounting plate for SB-64	0,88	5
SB-HIN	001102507	Door Hinges	0,01	1



SB-MP..



SB-HIN

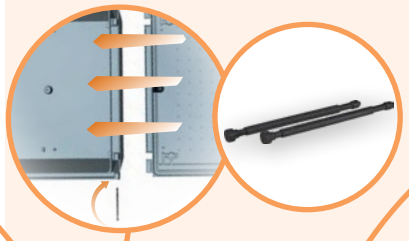
Technical data on page 872

Polyester enclosures EPC (IP66)

→ NON-METALLIC hinge pins that will prevent any kind of corrosion and rust.



→ Anti blow system. With up to 3 or 4 points of pressure.The "wedges" press the rubber gasket at the door against the interior of the enclosure to assure IP66 protection.



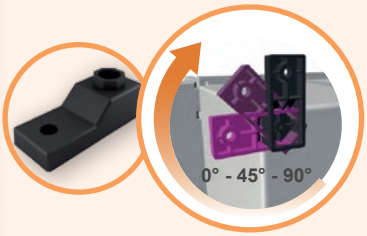


→ Mounting plates are not included in the package. Can be ordered additionaly: polyester or metal.





→ 90° locking mechanism. The standard lock can be replaced by lock with key.



→ Enclosure can be directly mounted on wall or additional wall fixing lugs can be used.



→ Possible to connect 2 or more enclosures together (grouping) by using additional connecting flanges.



→ Manual installation of the hinge pins, without the need for tools. Hinge bolts allow the door to open up to 180°



→ Closets are designed with a Shade or Cover which protects the closet from getting water inside.



→ Included mounting set for installation of enclosures directly on the wall (4 screws with inserts). Due to separated installation hole, IP66 is obtained.



→ Accessory EPC-DH-145 allows limit and lock door opening angle from 180 ° to 145 °



→ 2 types of passive ventilation (natural air convection) systems: EPC-VDS / VDL modules



→ For visual control are available cabinets with window EPC-W series.



→ Metric or PG cable clands can be used for IP66 cable entry.

Fiberglass Reinforced Polyester EPC Cabinets (IP66)

Description
Polyester reinforced with fiber glass enclosures provide double insulation class in IP66 protection. Can be used outside (PV systems, up to 1500VDC) or in industry applications.

→ Double insulated enclosure, protection class II. Rated operational voltage 1000Vac - 1500Vdc

→ Excellent cabinets for outside installation and withstanding extreme climate conditions. Rain, frost, dirt... even chemical agents. They have a much higher lifespan than metallic closets.

→ Manufactured entirely without any metallic parts. WILL NOT RUST

→ All components made with recyclable materials and reduced waste. Abides by the European restrictions of hazardous residue RoHS

→ High mechanical resistance IK-10

→ IP66 grade protection against water and dust; non-hygroscopic materials.

→ UV stable material

→ Thermosetting materials do NOT vary in structure or get deformed with climate changes. However, plastic materials WILL get deformed.

→ Color RAL7035

→ Possible grouping of enclosures by using IP66 connection flanges.

→ Fire resistant at 960 °, self-extinguishing material and hallogen free.



Polyester enclosures IP66 (solid door)

Type	Code No.	Description	Dimensions [mm]			Weight	Packaging
			Height	Width	Depth	[kg]	[pcs]
EPC 30-25-14	001102600	Polyester enclosure IP66	300	250	140	1,93	1
EPC 40-30-20	001102601	Polyester enclosure IP66	400	300	200	3,60	1
EPC 40-40-20	001102602	Polyester enclosure IP66	400	400	200	4,35	1
EPC 50-40-20	001102603	Polyester enclosure IP66	500	400	200	5,25	1
EPC 60-40-23	001102604	Polyester enclosure IP66	600	400	230	7,13	1
EPC 60-50-23	001102605	Polyester enclosure IP66	600	500	230	7,93	1
EPC 80-30-23	001102606	Polyester enclosure IP66	800	300	230	6,40	1
EPC 80-60-30	001102607	Polyester enclosure IP66	800	600	300	12,65	1

Mounting plate not included!

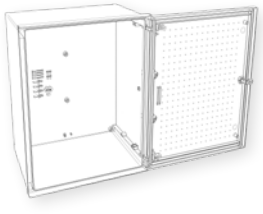


Polyester enclosures IP66 (door with window)

Type	Code No.	Description	Dimensions [mm]			Weight	Packaging
			Height	Width	Depth	[kg]	[pcs]
EPC-W 30-25-14	001102608	Polyester enclosure IP66 (with window)	300	250	140	2,00	1
EPC-W 40-30-20	001102609	Polyester enclosure IP66 (with window)	400	300	200	3,57	1
EPC-W 40-40-20	001102610	Polyester enclosure IP66 (with window)	400	400	200	4,30	1
EPC-W 50-40-20	001102611	Polyester enclosure IP66 (with window)	500	400	200	5,21	1
EPC-W 60-40-23	001102612	Polyester enclosure IP66 (with window)	600	400	230	7,05	1
EPC-W 60-50-23	001102613	Polyester enclosure IP66 (with window)	600	500	230	7,56	1
EPC-W 80-30-23	001102614	Polyester enclosure IP66 (with window)	800	300	230	6,40	1
EPC-W 80-60-30	001102615	Polyester enclosure IP66 (with window)	800	600	300	12,15	1

Mounting plate not included!



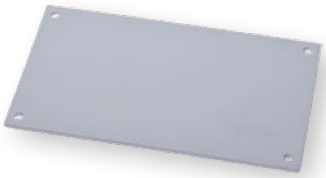


Included:
- enclosure with doors
- hinges
- wall mounting set (4pcs.)
- Standard two-leaf lock with key



Technical data on page 873

Accessories



Mounting plate EPC-PMP (polyester)

Type	Code No.	Description	Overall dimensions [mm]			Weight	Packaging
			Height	Width	Thickness	[g]	[pcs]
EPC-PMP 30-25	001102616	Polyester plate	262	198	3	380	1
EPC-PMP 40-30	001102617	Polyester plate	360	248	3	590	1
EPC-PMP 40-40	001102618	Polyester plate	360	348	3	870	1
EPC-PMP 50-40	001102619	Polyester plate	460	348	3	1090	1
EPC-PMP 60-40	001102620	Polyester plate	558	348	3	1300	1
EPC-PMP 60-50	001102621	Polyester plate	558	448	3	1750	1
EPC-PMP 80-30	001102622	Polyester plate	756	248	3	1460	1
EPC-PMP 80-60	001102623	Polyester plate	756	548	4	2780	1



Mounting plate EPC-MMP (metal)

Type	Code No.	Description	Overall dimensions [mm]			Weight	Packaging
			Height	Width	Thickness	[g]	[pcs]
EPC-MMP 30-25	001102624	Metal plate	262	198	2	790	1
EPC-MMP 40-30	001102625	Metal plate	360	248	2	1300	1
EPC-MMP 40-40	001102626	Metal plate	360	348	2	1900	1
EPC-MMP 50-40	001102627	Metal plate	460	348	2	2200	1
EPC-MMP 60-40	001102628	Metal plate	558	348	2	3000	1
EPC-MMP 60-50	001102629	Metal plate	558	448	2	3600	1
EPC-MMP 80-30	001102630	Metal plate	756	248	2	3260	1
EPC-MMP 80-60	001102631	Metal plate	756	548	2	6400	1

Accessories

Type	Code No.	Description	Overall dimensions [mm]			Weight	Packaging
			Height	Width	Depth	[g]	[pcs]
EPC-DL10	001102632	Lock with universal key	50	20	20	40	1
EPC-LK	001102633	Lock with key	50	40	20	70	1
EPC-VDS	001102634	IP54 ventilation module (mini)	28	25	20	10	1
EPC-VDL	001102635	IP54 ventilation module (large)	68	50	23	30	1
EPC-WM	001102636	Wall mounting fixing lugs	67	28	25	90	1
EPC-DH-145	001102637	Door stop (145°)	6	1	1	10	1



EPC-DL10



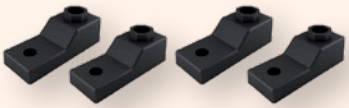
EPC-LK



EPC-VDS



EPC-VDL



EPC-WM



EPC-DH-145

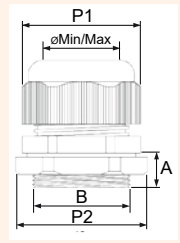
Technical data on page 873

Cable glands PG IP68

IP68 cable glands for cable entry in EPC enclosure, included nut and rubber.

Cable glands PG IP68

Type	Code No.	Thread	Cross-section		Overall dimensions [mm]					Weight	Packaging
			min.	max.		A	B	P1	P2	[g]	[pcs]
PG-7	001102641	M-12	2,5	6,5		9	12,5	16	19	10	1
PG-9	001102642	M-16	4,5	8		9	15,5	19	22	10	1
PG-11	001102643	M-20	5	10		9	18,6	22	24	10	1
PG-13.5	001102644	M-20	6	12		10	20,4	24	26	20	1
PG-16	001102645	M-25	7	14		10	22,5	27	30	20	1
PG-21	001102646	M-32	11	18		12	28,3	33	36	20	1
PG-29	001102647	M-32	17	25		13	37	42	46	30	1
PG-36	001102648	M-40	22	32		16	47	52	56	30	1
PG-42	001102649	M-50	26	39		17	54	60	65	30	1
PG-48	001102650	M-63	30	44		18	59,3	64	70	40	1



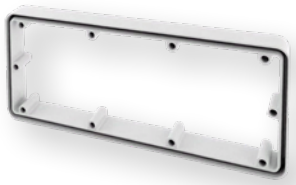


Connection flanges EPC-CF

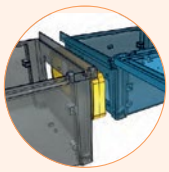
For connecting 2 or more EPC enclosures (grouping).

Connection flanges EPC-CF

Type	Code No.	Description	Overall dimensions [mm]			Weight	Packaging
			Height	Width	Depth	[g]	[pcs]
EPC-CF-A 23x10	001102638	Connection flange	230	100	20	150	1
EPC-CF-B 35x15	001102639	Connection flange	350	150	20	190	1
EPC-CF-C 35x15	001102640	Connection flange	350	150	20	240	1











ETIBOX

Technical data on page 873

Metal enclosures GT Type, IP66

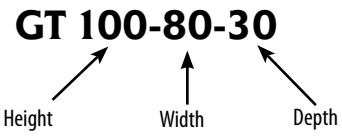
Application :
GT-Type metal enclosures cover a wide range of applications both for industrial and civil buildings. Due to its design they provide high IP protection level, mechanical strength and functionality. They are used in places where electrical equipment is exposed to adverse effect of factors such as water, dust, mechanical impact..
Main advantages:

- Enclosures made of high quality sheet steel thicknesses from 1.2 mm to 2 mm, resistant to external mechanical factors - IK10.
- Specially profiled edges of the housing ensure stiffness and excellent protection against water. Poured polyurethane gasket on the door providing IP66 protection.
- Door opening in the contour of the outer casing, which allows direct linking of several enclosures in series - a special structure hinges. The door mounting on the left or right side.

Not for external use.







Metal enclosures GT Type

Type	Code	Lock quantity	Hinges quantity	Weight [kg]	Packaging [pcs]
GT 25-20-15	001102100	1	2	3,61	1
GT 30-20-15	001102101	1	2	4,14	1
GT 30-30-15	001102102	1	2	5,65	1
GT 30-30-20	001102103	1	2	6,38	1
GT 30-30-25	001102104	1	2	7,13	1
GT 40-30-15	001102105	1	2	7,07	1
GT 40-30-20	001102106	1	2	7,90	1
GT 40-30-25	001102107	1	2	8,74	1
GT 40-40-15	001102108	1	2	8,92	1
GT 40-40-20	001102109	1	2	9,90	1
GT 40-40-25	001102110	1	2	10,89	1
GT 40-60-20	001102111	1	2	14,57	1
GT 40-60-25	001102112	1	2	15,87	1
GT 40-60-30	001102113	1	2	17,17	1
GT 50-40-15	001102114	2	2	10,69	1
GT 50-40-20	001102115	2	2	11,17	1
GT 50-40-25	001102116	2	2	12,86	1
GT 50-55-20	001102117	2	2	15,30	1
GT 50-55-25	001102118	2	2	16,62	1
GT 60-40-15	001102119	2	2	12,47	1
GT 60-40-20	001102120	2	2	13,64	1
GT 60-40-25	001102121	2	2	14,82	1
GT 60-60-20	001102122	2	2	20,02	1
GT 60-60-25	001102123	2	2	21,51	1
GT 60-60-30	001102124	2	2	22,99	1
GT 60-80-30	001102125	2	2	32,65	1
GT 65-55-20	001102126	2	2	19,86	1
GT 65-55-25	001102127	2	2	21,32	1
GT 80-40-20	001102128	2	3	19,45	1
GT 80-40-25	001102129	2	3	21,11	1
GT 80-55-20	001102130	2	3	26,17	1
GT 80-55-25	001102131	2	3	28,11	1
GT 80-60-20	001102132	2	3	28,13	1
GT 80-60-25	001102133	2	3	30,14	1
GT 80-60-30	001102134	2	3	32,17	1
GT 80-60-40	001102135	2	3	36,20	1
GT 80-80-20	001102136	2	3	35,93	1
GT 80-80-25	001102137	2	3	38,31	1
GT 80-80-30	001102138	2	3	40,68	1
GT 80-80-40	001102139	2	3	45,44	1
GT 80-100-30	001102140	2	3	49,20	1
GT 80-100-40	001102141	2	3	54,67	1

Technical data on page 867

Metal enclosures GT Type					
Type	Code	Lock quantity	Hinges quantity	Weight [kg]	Packaging [pcs]
GT 100-60-25	001102142	1*	3	36,35	1
GT 100-60-30	001102143	1*	3	38,60	1
GT 100-60-40	001102144	1*	3	43,10	1
GT 100-80-25	001102145	1*	3	46,11	1
GT 100-80-30	001102146	1*	3	48,72	1
GT 100-80-40	001102147	1*	3	53,94	1
GT 100-100-25	001102148	1*	3	55,87	1
GT 100-100-30	001102149	1*	3	58,83	1
GT 100-100-40	001102150	1*	3	64,78	1
GT 120-60-25	001102151	1*	3	42,55	1
GT 120-80-25	001102152	1*	3	53,90	1
GT 120-80-30	001102153	1*	3	56,76	1
GT 120-80-40	001102154	1*	3	62,45	1
GT 120-100-30	001102155	1*	3	68,47	1
GT 120-100-40	001102156	1*	3	74,88	1

*One lock with 3 point locking system (top, center, bottom)

Accessories				
Type	Code	Description	Weight [kg]	Packaging [pcs]
U400	001102166	Wall holders (set 4 pcs)	370	1
LK-D3-M22	001102167	Lock D3	70	1
LK-D5-M22	001102168	Lock D5	70	1
LK-KW8-M22	001102169	Lock DW	70	1
LK-T9-M22	001102170	Lock T9	70	1
LK-1333-M22	001102171	Patent lock 1333	90	1
LK-B1333-M22	001102172	Patent lock 1333 with knob	120	1
KEY-D5-M	001102173	Key D5 metal	40	1
KEY-T9-M	001102174	Key T9 metal	40	1
KEY-KW8-M	001102175	Key quadrat 8mm	40	1
KEY-UNI-M	001102176	Universal key	70	1
LPE-6	001102177	PE set 6mm^2	20	1
K-A4	001102178	Documentation A4 pocket	160	1


LK-1333-M22


LK-T9-M22


LK-D5-M22


LK-KW8-M22


LK-B1333-M22


KEY-T9-M


KEY-D5-M


KEY-KW8-M


K-A4


KEY-UNI-M


U400

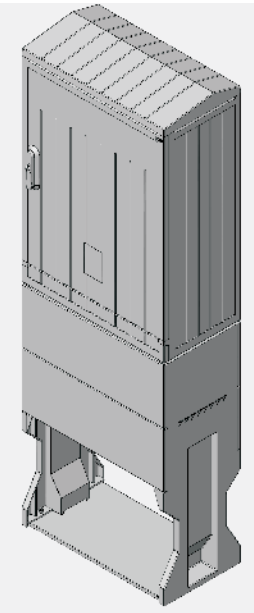

LPE6

ETIBOX

Technical data on page 867

Free-standing cable distribution cabinets

Free-standing cable distribution cabinets KVR



The KVR are DIN size stand-alone thermosetting enclosures with a depth of 320 mm comply with a range of requirements for electrical switchgear. They are made of thermosetting glass fibre reinforced polyester which has insulating, sloaw-burning and self-extingushing properties and its typical features is high resistance to weather conditions (UV). These enclosures due to its multifunctional structure can be used in power electro distribution or telecom facilities as well as general public or industry purposes.
The module design allows to connect the enclosure with the pedestal or cable base. The external surface of these enclosures is ribbed which gives them additional strength and mechanical resilience and also prevents from covering with posters. Doors and segments can be dismounted by hands without any tools. The ventialtion system used in the enclosures minimises accumulation of humidity.

- Enlosures are made of glass fibre reinforced plastic (SMC)
- Available frames sizes 00, 0, 1, 2
- Depth 320 mm
- Modular construction: enclosure, base, pedestal
- Inclinated roof
- Three-point door closing with a revolving handle and the possibility of incorporating a half-cylinder insert
- Three-point busbar holder adjustment
- Standard protection class IP44
- Material resistant to UV radiation, acids, strokes, atmospheric influences
- Colour RAL 7035
- Accessories
- Standards: IEC 62208:2011, IEC 61439-5:2010



Enclosure - regular size (874mm)

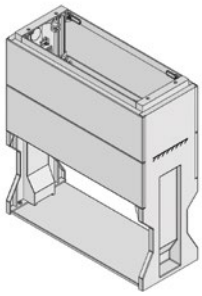
Type	Code No.	Description	Weight [kg]	Packaging [pcs]
KVR 00	001601600	Single doors	14,20	1/1
KVR 0	001601601	Single doors	16,20	1/1
KVR 1	001601602	Two doors (split)	20,60	1/1
KVR 2	001601603	Two doors (split)	26,00	1/1

With possibility to use padlock

Enclosure - 1m size (1144mm)

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
KVR 01	001601604	Single doors	21	1/1
KVR 11	001601605	Two doors (split)	26,5	1/1
KVR 21	001601606	Two doors (split)	33,5	1/1

With possibility to use padlock



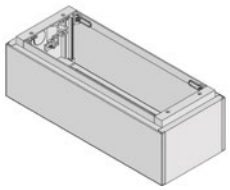
Pedestal

Type	Code No.	For use with	Weight [kg]	Packaging [pcs]
KVR-P 00	001601610	KVR 00	11,60	1
KVR-P 0	001601611	KVR 0, KVR 01	13,20	1
KVR-P 1	001601612	KVR 1, KVR 11	15,20	1
KVR-P 2	001601613	KVR 2, KVR 21	17,80	1

Technical data on page 879

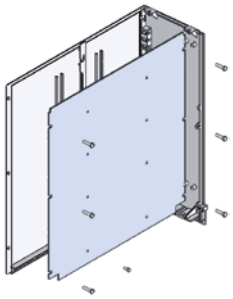
Pedestal extender

Type	Code No.	For use with	Weight [kg]	Packaging [pcs]
KVR-PE 00	001601620	KVR 00	4,60	1
KVR-PE 0	001601621	KVR 0, KVR 01	5,20	1
KVR-PE 1	001601622	KVR 1, KVR 11	6,00	1
KVR-PE 2	001601623	KVR 2, KVR 21	7,40	1



Mounting plate metal Zn for regular size (874mm) enclosure

Type	Code No.	For use with	Weight [kg]	Packaging [pcs]
KVR-MP 00	001601630	KVR 00	5,20	4
KVR-MP 0	001601631	KVR 0	6,80	4
KVR-MP 1	001601632	KVR 1	9,20	4
KVR-MP 2	001601633	KVR 2	13,00	4

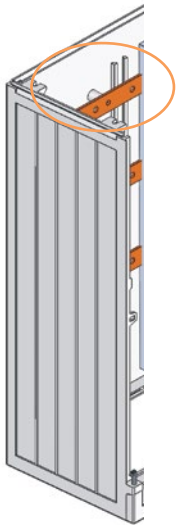


Mounting plate metal Zn for 1m size enclsure

Type	Code No.	For use with	Weight [kg]	Packaging [pcs]
KVR-MP 01	001601634	KVR 01	6,3	4
KVR-MP 11	001601635	KVR 11	8,75	4
KVR-MP 21	001601636	KVR 21	17	4
KVR-MP 2	001601633	KVR 2	13,00	4

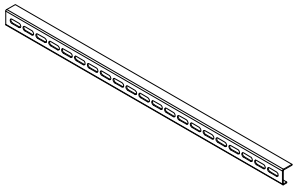
Copper bars without pressed nuts - available upon request

Type	Dimension, for use with	Weight [kg]	Packaging [pcs]
KVR-CB 00 30x5	30x5x444, KVR 00	0,60	4
KVR-CB 00 40x5	40x5x444, KVR 00	0,78	4
KVR-CB 0 30x5	30x5x580, KVR 0, KVR 01	0,78	4
KVR-CB 0 40x5	40x5x580, KVR 0, KVR 01	1,05	4
KVR-CB 1 40x5	40x5x774, KVR 1, KVR 11	1,35	4
KVR-CB 1 40x10	40x10x774, KVR 1, KVR 11	2,70	4
KVR-CB 1 60x10	60x10x774, KVR 1, KVR 11	4,10	4
KVR-CB 2 40x5	40x5x1104, KVR 2, KVR 21	1,90	4
KVR-CB 2 40x10	40x10x1104, KVR 2, KVR 21	3,80	4
KVR-CB 2 60x10	60x10x1104, KVR 2, KVR 21	5,80	4

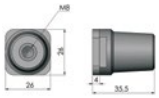


Angle bar for cable fixation

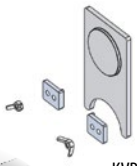
Type	Code No.	Dimension, for use with	Weight [kg]	Packaging [pcs]
KVR-FB 00	001601640	450mm, KVR 00	0,42	4
KVR-FB 0	001601641	585mm, KVR 0, KVR 01	0,58	4
KVR-FB 1	001601642	784mm, KVR 1, KVR 11	0,76	4
KVR-FB 2	001601643	1110mm, KVR 2, KVR 21	1,00	4



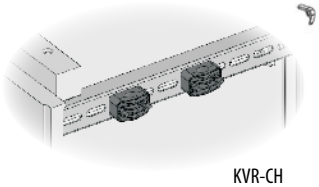
Technical data on page 879



KVR-AI



KVR-OC



KVR-CH

Common accessories

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
KVR-AI	001601650	Support insulator	0,025	20
KVR-OC	001601651	Cable culvert	0,35	10
KVR-CH 120	001601652	Cable holder	0,14	10
KVR-CH 240	001601653	Cable holder	0,20	10

Examples of use for KVR-AI and KVR-OC on page 882

Accessories

Phase busbars





EFB50

Terminal for protective conductor

Type	Code No.	Dimensions [mm]	Weight [g]	Packaging [pcs]
2/6	002911101	6x9x56	23,3	100
2/8	002911102	6x9x86	28,5	100
2/12	002911103	6x9x92	39,3	100
2/18	002911104	6x9x128	53,8	100
EFB50*	002921278	50	29	10

*To connect cable up to 50mm^2 on Cu busbar(phase busbars) fork or pin type



Fork type

Phase busbars 16mm^2 80A(side connection)/130A (middle connection), fork type

Type	Additional description	Code No.	Length [mm]	Weight [g]	Packaging [pcs]	For use with
IZ16/2F/56 18mm	2 pole terminal, 56 module width	002921230	1012	525	10	ETIMAT P10 1P+N, 2P
IZ16/3F/57 18mm	3 pole terminal, 57 module width	002921231	1027	840	10	ETIMAT P10 3P
IZ16/4F/56 18mm	4 pole terminal, 56 module width	002921232	1010	1205	10	ETIMAT P10 3P+N

Phase busbars 16mm^2 80A(side connection)/130A (middle connection),fork type

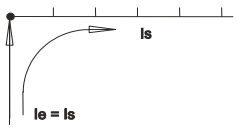
Type	Additional description	Code No.	Length [mm]	Weight [g]	Packaging [pcs]	For use with
IZ16/2F/44 18+9mm	2 pole terminal with extra space	002921233	990	525	10	ETIMAT 2P, DC + aux. contact

Phase busbars 10mm^2 for AFDD

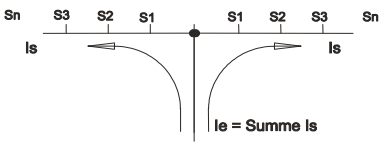
Type	Additional description	Code No.	Cross section [mm^2]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ10/2F/19	10mm^2, 2 p, 19 KZS AFDDs	002921294	10	1,012	0,378	10	KZS AFDD
IZ10/4F/18	10mm^2, 4 p, 18 KZS AFDDs	002921295	10	0,965	0,589	10	KZS AFDD

End covers

Type	Code No.	Weight [g]	Packaging [pcs]	For use with
Z-16/2F/3F 18mm	002921240	3	50	IZ16/2F/56 18mm (002921230), IZ16/3F/57 18mm (002921231), IZ16/2F/44 27mm (002921232), IZ10/2F/19 (002921294)
Z-16/4F 18mm	002921241	2	50	IZ16/4F/56 18mm (002921232), IZ10/L1NL2NL3N (002921279), IZ10/4F/18 (002921295)



Feeding at beginning / ending



Feeding in the middle

In case of center-feeding, please note that the sum of junction currents S1...Sn per rail branch may not be bigger than the above named max. currents Is/Phase.

Technical data on page 883

Phase busbars 10 mm² 63A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ10/1F/54*	10mm², 1-phase, 54 mod.	002921142	10	1,00	260	40	ETIMAT6, ETIMAT P10, ETITEC,SV, VLD01
IZ10/3F/12	10mm², 3-phase, 12 mod.	002921140	10	0,21	115	20/240	
IZ10/3F/54*	10mm², 3-phase, 54 mod.	002921141	10	1,00	560	20	
IZ10/1F/12	10mm², 1-phase, 12 mod.	002921143	10	0,21	50	40/240	
IZ10/ L1NL2NL3N/12	10mm², 4-pole, 12 mod.	002921268	10	0,21	228	10	ETIMAT6 1P+N, ETIMAT P10 1P+N, KZS-2M
IZ10/ L1NL2NL3N/54	10mm², 4-pole, 1m / 53 mod.	002921279	10	0,965	536	10	ETIMAT6 1P+N, ETIMAT P10 1P+N, KZS-2M
IZ10/L1L2L3N-L1NL2NL3N	10mm², 4-pole, 12 mod.	002921275	10	0,21	131	10	EFI4 + ETIMAT 6 1P+N, ETIMAT P10 1P+N
IZ10/L1L2L3NL1/ NL2/NL3/N	10mm², 4-pole, 12 mod.	002921276	10	0,21	255	50	EFI4+ETIMAT1N, KZS1M
IZ10/L1L2L3_ L1L2L3	10mm², 3-pole, 12 mod.	002921277	10	0,21	120	10	EFI4 + ETIMAT 6, ETIMAT P10





IZ10/L1L2L3_L1L2L3

*Not for ETIMAT P10 MULTIPOLE (2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

Phase busbars 12 mm² 80A

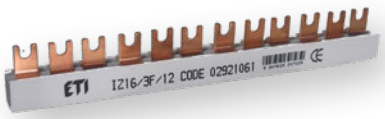
Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ12/1F/12	12mm², 1-phase, 12 modul	002921018	12	0,21	57	40/480	ETIMAT6, ETIMAT P10, ETITEC,SV, VLD01
IZ12/1F/54*	12mm², 1-phase, 54 mod.	002921026	12	1,00	260	40	
IZ12/3F/9	12mm², 3-phase, 9 mod.	002921017	12	0,16	81	20/240	
IZ12/3F/12	12mm², 3-phase, 12 mod.	002921020	12	0,21	115	20/240	
IZ12/3F/18*	12mm², 3-phase, 18 mod.	002921022	12	0,32	180	20/120	
IZ12/3F/54*	12mm², 3-phase, 54 mod.	002921024	12	1,00	560	20	



*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

Phase busbars 16 mm² (normal) 100A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ16/1F/12P	16mm², 1-phase, 12 modul	002921091	16	0,21	70	40/360	ETIMAT6, ETIMAT P10, ETITEC,SV, VLD01
IZ16/1F/54P*	16mm², 1-phase, 54 mod.	002921092	16	1,00	320	40	
IZ16/3F/12	16mm², 3-phase, 12 mod.	002921061	16	0,21	155	20/180	
IZ16/3F/54*	16mm², 3-phase, 54 mod.	002921063	16	1,00	700	20	



*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

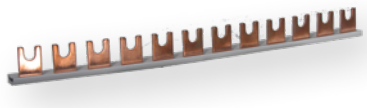
Phase busbars 16mm² (2 pole and 4 pole) 100A

Type	Additional description	Code no.	Cross section (mm²)	Length (m)	Weight (g)	Packaging (pcs)	For use with
IZ16/2F/12	16mm2, 2-pole, 12 mod.	002921066	16	0,21	120	10/120	EFI-2, EFI-4, KZS-2M, KZS-4M ETIMAT6, P10, SV, ETITEC, VLD01
IZ16/2F/54*	16mm2, 2-pole, 54 mod.	002921067	16	1	550	10	
IZ16/4F/12	16mm2, 4-pole, 12 mod.	002921068	16	0,21	230	10/80	
IZ16/4F/56*	16mm2, 4-pole, 56 mod.	002921070	16	1	1020	10	

*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

Phase busbars 16 mm² (L shape) 100A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ16/1F/2/L	16mm², 1-phase, 2 modul	002921081	16	0,03	11	50/600	ETIMAT6, ETIMAT P10, ETITEC,SV, VLD01
IZ16/1F/3/L	16mm², 1-phase, 3 mod.	002921082	16	0,05	16	50/600	
IZ16/1F/4/L	16mm², 1-phase, 4 mod.	002921083	16	0,07	21	50/600	
IZ16/1F/12/L	16mm², 1-phase, 12 mod.	002921060	16	0,21	65	40/360	
IZ16/1F/54/L*	16mm², 1-phase, 54 mod.	002921062	16	1,00	290	40	



*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

Technical data on page 883



Phase busbars 16 mm² (STV) 100A

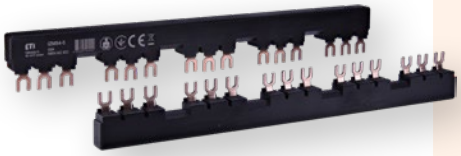
Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZ16/1F/12/STV	16mm², 1-phase, 12 mod.	002921071	16	0,32	95	40/240	STVD02
IZ16/1F/36/STV	16mm², 1-phase, 36 mod.	002921073	16	1,00	280	40	
IZ16/3F/12/STV	16mm², 3-phase, 12 mod.	002921072	16	0,32	230	20/120	
IZ16/3F/36/STV	16mm², 3-phase, 36 mod.	002921074	16	1,00	700	20	



Phase busbars for Motor switches - IZM (16 mm²) 100A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZM16/3F/4	16mm², 3-phase, 12 mod.	002921132	10	0,20	155	20	MPE 25 (no side accessories)
IZM16/3F/20	16mm², 3-phase, 54 mod.	002921133	10	1,00	700	20	

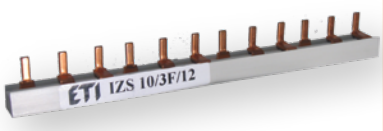




Busbars for motor protective circuit breakers - MPCB: MPE25, MSP0, MS25, 10mm² 63 A/690 VAC

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZM-L3-25	Feed-in terminal, 3 pole, 6-25mm²	002921297	10	44	40	10	MPE25, MSP0, MS25
IZM45-2	3-phase, 45 mm, 14 mm pitch	002921298	10	86,5	35	10	2 x MPCB
IZM45-3	3-phase, 45 mm, 14 mm pitch	002921299	10	131,5	57	10	3 x MPCB
IZM45-4	3-phase, 45 mm, 14 mm pitch	002921300	10	176,5	80	10	4 x MPCB
IZM45-5	3-phase, 45 mm, 14 mm pitch	002921301	10	221,5	100	10	5 x MPCB
IZM54-2	3-phase, 54 mm, 14 mm pitch	002921302	10	95,5	38	10	2 x (MPCB + auxiliary contact)
IZM54-3	3-phase, 54 mm, 14 mm pitch	002921303	10	149,5	61	10	3 x (MPCB + auxiliary contact)
IZM54-4	3-phase, 54 mm, 14 mm pitch	002921304	10	203,5	88	10	4 x (MPCB + auxiliary contact)
IZM54-5	3-phase, 54 mm, 14 mm pitch	002921305	10	257,5	109	10	5 x (MPCB + auxiliary contact)
IZM63-2	3-phase, Fork, 53 mm, 14 mm pitch	002921307	10	104,5	41	10	2 x MPS+ 2x Auxiliary switch or 1x release
IZM63-3	3-phase, Fork, 53 mm, 14 mm pitch	002921308	10	167,5	69	10	3 x MPS+ 2x Auxiliary switch or 1x release
IZM63-4	3-phase, Fork, 53 mm, 14 mm pitch	002921309	10	230,5	97	10	4 x MPS+ 2x Auxiliary switch or 1x release
IZM63-5	3-phase, Fork, 53mm, 14 mm pitch	002921310	10	293,5	125	10	5 x MPS+ 2x Auxiliary switch or 1x release

Pin type



Phase busbars 10 mm² (normal) 63A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS10/1F/12	10mm², 1-phase, 12 mod.	002921100	10	0,21	40	40/480	ETIMAT6, ETIMAT P10, ETITEC,SV,VLD01, PCF8, PCF10, EFD8, EFD10
IZS10/1F/54*	10mm², 1-phase, 54 mod.	002921101	10	1,00	150	40	
IZS10/3F/12	10mm², 3-phase, 12 mod.	002921102	10	0,21	100	20/240	
IZS10/3F/54*	10mm², 3-phase, 54 mod.	002921103	10	1,00	450	20	

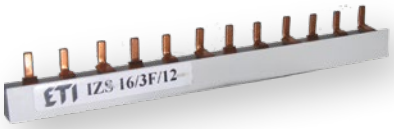
*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.

Technical data on page 883

Phase busbars 16 mm² (normal) 100A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS16/1F/12	16mm², 1-phase, 12 mod.	002921110	16	0,21	50	40/480	ETIMAT6, ETIMAT P10, ETITEC,SV,VLD01, PCF8, PCF10, EFD8, EFD10
IZS16/1F/54*	16mm², 1-phase, 54 mod.	002921111	16	1,00	220	40	
IZS16/3F/12	16mm², 3-phase, 12 mod.	002921112	16	0,21	130	20/180	
IZS16/3F/18*	16mm², 3-phase, 18 mod.	002921113	16	0,32	230	20/120	
IZS16/3F/54*	16mm², 3-phase, 54 mod.	002921114	16	1,00	700	20	

*Not for ETIMAT P10 MULTIPOLE(2P, 3P, 1P+N, 3P+N) with length more than 12 modules.



Phase busbars 16mm² 80A(side connection)/130A (middle connection)

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS16/1F/37	1 p, 37 mod.	002921250	16	0,981	320	10	EFD14, EFH14, PFB D02/D01
IZS16/3F/39	3 p, 39 mod.	002921254	16	1,045	760	10	
IZS16/1F/28	1 p, 28 mod.	002921260	16	0,976	320	10	EFD22
IZS16/3F/30	3 p, 30 mod.	002921264	16	1,05	1050	10	



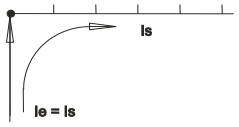
Phase busbars 25mm² 100A(side connection)/200A (middle connection)

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS 25/1F/57	1 p, 57 mod.	002921290	25	1,012	365	10	ETIMAT, SV, ETITEC, EFD8/10, EFH10

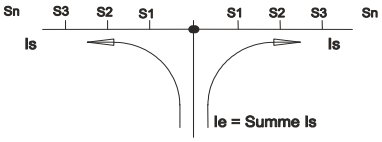


Phase busbars 35mm² 125A(side connection)/200A (middle connection)

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS 35/1F/57	1 p, 57 mod.	002921291	35	1,016	400	25	ETIMAT, SV, ETITEC, EFD8/10, EFH10
IZS 35/1F/46	1 p, 46 mod.	002921292	35	1,016	400	10	EFH 10/14



Feeding at beginning / ending



Feeding in the middle

In case of center-feeding, please note that the sum of junction currents S1...Sn per rail branch may not be bigger than the above named max. currents Is/Phase.

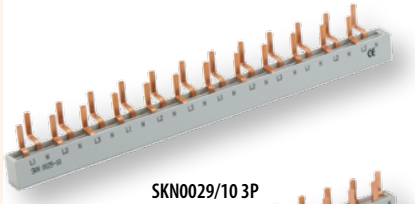
Phase busbars 50mm² 160A(side connection)/250A (middle connection)

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
IZS50/1F/37	1 p, 37 mod.	002921251	50	0,981	750	10	EFD14, EFH14, PFB D02/D01
IZS50/3F/39	3 p, 39 mod.	002921255	50	1,045	2190	10	
IZS50/1F/28	1 p, 28 mod.	002921261	50	0,976	770	10	EFD22
IZS50/3F/30	3 p, 30 mod.	002921265	50	1,05	2320	10	

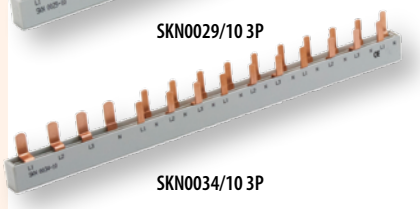
SKN type

Phase busbars 10 mm² (normal) 63A

Type	Additional description	Code No.	Cross section [mm²]	Length [m]	Weight [g]	Packaging [pcs]	For use with
SKN0021/10	10mm², 1p+N, 12 mod.	002921150	10	0,216	203	10	ETIMAT1N, KZS1M
SKN0029/10 3P	10mm², 3p+N, 12 mod.	002921154	10	0,216	292	10	
SKN0032/10	10mm², 1p+N, 12 mod.	002921155	10	0,21	160	10	EFI2+10xETIMAT1N
SKN0034/10 3P	10mm², 3p+N, 14 mod.	002921156	10	0,252	378	10	EFI4+10xETIMAT1N

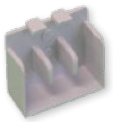


SKN0029/10 3P



SKN0034/10 3P

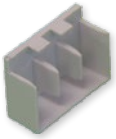
Technical data on page 883

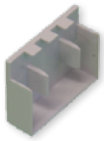

Z-10/3F
Z-16/3F


Z-12/3F


Z-10/1F,
Z-16/1F


Z-10/2F
Z-16/2F


ZS-10/3/F


Z-16/4F

End cover cap

Type	Code No.	Weight [g]	Packaging [pcs]	For use with
Z-10/1F	002921220	0,15	25/250	IZ10/1F (002921143, 002921142), IZ10/3F/D (002921160, 002921161), IZM10/3F/D (002921190, 002921191)
Z-10/3F	002921227	0,8	25/250	IZ10/3F (002921140,002921141), IZM10/3F (002921130, 002921131)
ZS-10/3F	002921226	0,8	25/250	IZS10/3F (002921102, 002921103)
Z-12/1F	002921221	0,15	25/250	IZ12/1F (002921018, 002921026), IZ12/3F/D (002921162, 002921163, 002921164)
Z-12/3F	002921019	0,7	25/250	IZ12/3F (002921017, 002921020, 002921022, 002921024)
Z-16/1F	002921222	0,15	25/250	IZ16/1F (002921091, 002921092), IZ16/3F/D (002921064, 002921065), IZ16/2F/D (002921200, 002921201), IZ16/4F/D (002921210, 002921211), IZM16/3F/D (002921192, 002921193), IZ16/1F/STV (002921071, 002921073)
Z-16/1F	002921252	1,6	50	IZS16/1F/37 (002921250), IZS16/1F/28 (002921260)
Z-16/1F/L	002921205	1,0	25	IZ16/1F/...L (002921081, 002921082, 002921083, 002921060, 002921062)
Z-16/2F	002921224	0,5	25/250	IZ16/2F (002921066, 002921067)
Z-16/2F/3F (18)	002921240	3,0	50	IZ10/2F/19 (002921294), IZ16/2F/56 (002921230), IZ16/3F/57 (002921231), IZ16/2F/44 (002921233), IZS16/3F/30 (002921264), IZS16/3F/39 (002921254)
Z-16/3F	002921228	0,8	25/250	IZ16/3F (002921061, 002921063), IZM16/3F (002921132, 002921133), IZ16/3F/STV (002921072, 002921074)
ZS-16/3F	002921204	0,8	25/250	IZ16/3F (002921061, 002921063), IZM16/3F (002921132, 002921133), IZ16/3F/STV (002921072, 002921074)
Z-16/4F	002921225	1	25/250	IZ16/4F (002921068, 002921070)
Z-16/4F (18)	002921241	2,0	50	IZ10/4F/18 (002921295), IZ16/4F/56 (002921232), IZ10/L1NL2NL3N/54 (002921279)
ZS-16/4F	002921229	1	25/250	IZS16/4F (002921177, 002921178)
Z-25/1F	002921293	1	25	IZS 25/1F/57 (002921290)
Z-50/1F	002921253	3,2	50	IZS50/1F/37 (002921251), IZS35/1F/57 (002921291)
*Z-50/1F/28	002921263	5,6	25	IZS50/1F/28 (002921261), IZS35/1F/46 (002921292)
Z-50/3F	002921267	4,4	50	IZS50/3F/30 (002921265), IZS50/3F/39 (002921255)

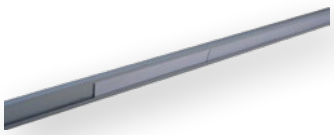
*Under 1 reference code, 1 pair is included (left and right side cover)



DIN rails

Type	Code No.	Length [m]	Weight [g]	Packaging [pcs]	For use with
TH35/L - 1m	002911022	1,00	312	10/50	All modular products
TH35/L - 2m	002911023	2,00	624	10/30	
TH35/A - 1m	002911024	1,00	312	10/50	
TH35/A - 2m	002911025	2,00	624	10/30	

L - Normal quality of galvanic cover – mat
A - Better quality of galvanic cover – shinning



Marking lath

Code No.	Length [m]	width [mm]	Weight [g]	Packaging [pcs]
002911007	1	12	40,7	50



Cover lath

Code No.	Length [m]	opening [mm]	Weight [g]	Packaging [pcs]
002911003	0,217	$46^{+0,5}$	24,4	500

Technical data on page 883

DIN rail distribution blocks EDB

Construction
- Brass screw terminal blocks double-deck
- Housing made of self extinguishing material
- Cover and separating made of polycarbonate

Application
Proper and transparent connecting cables in low voltage distribution boards

Advantages
- TH35 din rail mounted or on a flat surface
- Safe and easy installation
- Transparent cover
- 2 or 4 pole model
- Self extinguishing material
- Possibility of connecting wires with ferrules or without



EDB-407


EDB-411



EDB-215

Distribution blocks EDB

Type	Code No.	Number of terminals	I_n [A]	Dimensions L x W x H [mm]	Weight [kg]	Packaging
2 - poles						
EDB-207	001102300	2 x (5 x Ø 5,3 + 2 x Ø 7,5)	125A	65 x 42 x 50	0,14	1/100
EDB-211	001102301	2 x (7x Ø 5,3 + 2 x Ø 7,5+ 2xØ 9)	125A	100 x 42 x 50	0,18	1/100
EDB-215	001102302	2 x (11x Ø 5,3 + 2 x Ø 7,5+ 2 x Ø 9)	125A	133 x 42 x 50	0,22	1/50
4 - poles						
EDB-407	001102303	4 x (5 x Ø 5,3 + 2 x Ø 7,5)	125A	65 x 88 x 50	0,24	1/100
EDB-411	001102304	4 x (7 x Ø 5,3 + 2 x Ø 7,5+ 2 x Ø 9)	125A	100 x 88 x 50	0,34	1/50
EDB-415	001102305	4 x (11 x Ø 5,3 + 2 x Ø 7,5+ 2 x Ø 9)	125A	133 x 88 x 50	0,46	1/50

Ordering:

EDB - xyy

No. of Poles

Number of terminals per pole

Technical data on page 896

DIN rail distribution blocks EDBM, EDBS

Build
- Brass or aluminum terminals
- Wires screwed by hex key (Allen key)
- Housing made of flame retardant material PA6 GF25

Application
- For connecting the phase and neutral conductors in LV switchboards for proper and lucid distribution of electric energy

Advantages
- Mounted on a TH rail or on a flat surface with screws with low head
- Strong and simple mounting
- Terminal material:
  EDBM – MO-58 brass
  EDBS – 6060 aluminum
- Housing: PA6 GF25 fire retardant

General Specifications:
- Rated impulse voltage withstand 6 kV
- Rated insulation voltage 690 V
- Number of poles 1
- The CTI factor 600 V
- Compliance with IEC 60947-7-1



EDBM-1, EDBM-1/N, EDBM-1/PE - 50 mm²

Cables cross section					
Input	Output	Rigid	Flexible	L	Tightening torque
1	1	4-50 mm²	6-50 mm²	21 mm	14 Nm
	3	2,5-25 mm²	4-25 mm²	17 mm	6 Nm
	4	2,5-16 mm²	2,5-16 mm²	9 mm	3 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-1	001102400	225	1/5/100
EDBM-1/N	001102410	225	1/5/100
EDBM-1/PE	001102411	225	1/5/100

Parameters:
Rated cross section 50 mm², Rated current 160 A, Allen keys 3 mm, 4 mm, 6 mm



EDBM-2, EDBM-2/N, EDBM-2/PE - 50 mm²

Cables cross section					
Input	Output	Rigid	Flexible	L	Tightening torque
1	1	4-50 mm²	6-50 mm²	21 mm	14 Nm
	2	4-35 mm²	6-25 mm²	25 mm	10 Nm
	3	2,5-25 mm²	2,5-16 mm²	12 mm	3 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-2	001102401	225	1/5/100
EDBM-2/N	001102412	225	1/5/100
EDBM-2/PE	001102413	225	1/5/100

Parameters:
Rated cross section 50 mm², Rated current 160 A, Allen keys 3 mm, 5 mm, 6 mm



EDBM-4, EDBM-4/N, EDBM-4/PE - 70 mm²

Cables cross section					
Input	Output	Rigid	Flexible	L	Tightening torque
1	3	4-70 mm²	6-50 mm²	20 mm	14 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-4	001102402	215	1/5/100
EDBM-4/N	001102414	215	1/5/100
EDBM-4/PE	001102415	215	1/5/100

Parameters:
Rated cross section 70 mm², Rated current 192 A, Allen keys 6 mm



EDBM-6, EDBM-6/N, EDBM-6/PE - 70 mm²

Cables cross section					
Input	Output	Rigid	Flexible	L	Tightening torque
1	1	4-70 mm²	6-50 mm²	24 mm	14 Nm
	2	4-50 mm²	6-35 mm²	20 mm	10 Nm
	1	4-25 mm²	6-25 mm²	20 mm	6 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-6	001102403	215	1/5/100
EDBM-6/N	001102416	215	1/5/100
EDBM-6/PE	001102417	215	1/5/100

Parameters:
Rated cross section 70 mm² , Rated current 192 A, Allen keys 4 mm, 5 mm, 6 mm

Technical data on page 897

EDBM-7, EDBM-7/N, EDBM-7/PE - 70 mm²

Input	Output	Cables cross section Rigid	Flexible	L	Tightening torque
1	1	4-70 mm²	6-50 mm²	21 mm	14 Nm
	3	2,5-25 mm²	4-25 mm²	17 mm	6 Nm
	4	2,5-16 mm²	2,5-16 mm²	9 mm	3 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-7	001102422	225	1/5/100
EDBM-7/N	001102423	225	1/5/100
EDBM-7/PE	001102424	225	1/5/100

Parameters:
Rated cross section 70 mm², Rated current 192 A, Allen keys 3 mm, 4 mm, 6 mm



EDBM-8, EDBM-8/N, EDBM-8/PE - 70 mm²

Input	Output	Cables cross section Rigid	Flexible	L	Tightening torque
1	1	4-70 mm²	6-50 mm²	21 mm	14 Nm
	2	4-35 mm²	6-25 mm²	25 mm	10 Nm
	3	2,5-25 mm²	2,5-16 mm²	12 mm	3 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBM-8	001102425	225	1/5/100
EDBM-8/N	001102426	225	1/5/100
EDBM-8/PE	001102427	225	1/5/100

Parameters:
Rated cross section 70 mm², Rated current 192 A, Allen keys 3 mm, 5 mm, 6 mm



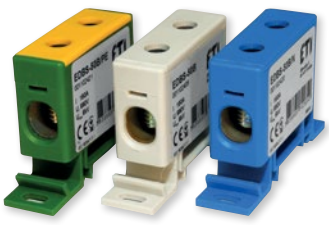
EDBS-50A, EDBS-50A/N, EDBS-50A/PE, EDBS-50B, EDBS-50B/N, EDBS-50B/PE

Input	Output	Cables cross section Rigid	Flexible	L	Tightening torque
1	1	16-70 mm²	25-50 mm²	20 mm	10 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBS-50A	001102404	225	1/5/100
EDBS-50A/N	001102418	225	1/5/100
EDBS-50A/PE	001102419	225	1/5/100

Type	Code No	Weight [g]	Packaging [pcs]
EDBS-50B	001102405	225	1/5/100
EDBS-50B/N	001102420	225	1/5/100
EDBS-50B/PE	001102421	225	1/5/100

Parameters:
Rated cross section 50 mm², Rated current 150 A, Allen key 5 mm
Input - 6060 Aluminum (EDBS-50A version ...), with a protective coat (version EDBS-50B ...)
For Al and Cu cables



Technical data on page 897

Equipotential terminal boards ESC-QBLOK

Equipotential terminal boards
Partition rail assemblies are used as supplementary rail assemblies for phase or neutral expansion inside electrical panels. They are also known as equipotential rail assemblies because they are used as equipotential nodes in distribution control units to collect the earth system.

General features
- Available in 7 and 12 hole versions
- Mounted onto PR/3 profiles conforming to IEC 60715 standards, TH/35 type
- Inherent protection against accidental contact
- IPXXB level according to IEC 60529
- Possible to label with a CNU/8 tag
- Available in green and blue
- Conformance to EN 60998-1:2004 and EN 60998-2-1:2004 regulations
- Insulating body made of 6.6 UL94V-0 polyamide


ESC-QBLOK7001


ESC-QBLOK7002


ESC-QBLOK1201


ESC-QBLOK1202

Equipotential distribution terminal boards

Type	Code No.	Description	Weight [g]	Packaging [pcs]
ESC-QBLOK7001	003903204	for Conductor Flexible/Rigid (10/16)mm², 7 holes, Blue	45	10
ESC-QBLOK7002	003903205	for Conductor Flexible/Rigid (10/16)mm², 7 holes, Green	45	10
ESC-QBLOK1201	003903206	for Conductor Flexible/Rigid (10/16)mm², 12 holes, Blue	28	10
ESC-QBLOK1202	003903207	for Conductor Flexible/Rigid (10/16)mm², 12 holes, Green	28	10

Technical data for ESC-QBLOK Series

		ESC-QBLOK7001	ESC-QBLOK7002	ESC-QBLOK1201	ESC-QBLOK1202
TECHNICAL CHARACTERISTICS					
function / type		Distribution rail assembly			
rated cross-section	(mm²)	10			
connecting capacity:					
flexible(mm²)		1,5 ÷ 10			
rigid(mm²)		1,5 ÷ 16			
max. flexible with ferrule (mm²)-ferrule type		10 - WP100/21			
rated voltage / rated current / gauge conf. to IEC 60947-7-1		500 V / 63 A / B5			
rated impulse withstand voltage / pollution degree		-			
insulation stripping length	(mm)	6			
tightening torque value (test / max)	(Nm)	2 / 2,5			
height / width / thickness	TH/35 7,5 mm	33 - 53 - 16		33 - 85 - 16	
height / width / thickness	TH/35 15 mm	41 - 53 - 16		41 - 85 - 16	
Color		blue	green	blue	green

DIN rail distribution blocks EDBJ

Build
- The blocks consist of an insert / clamp made of brass or aluminum and a housing made of plastic.
- The terminals are equipped with screws with a hex key (Allen key)

Advantages
- mounted on a TH rail
- easy to assemble
- 1 module width !!
- strong connection

Application
- For connecting the phase and neutral conductors in LV switchboards for proper and lucid distribution of electric energy

General Specifications
- Rated impulse withstand voltage 6 kV (EDBJ-4x25-4x25, EDBJ-1x70-4x25), 12kV (EDBJ-1x35-1x35)
- Rated insulation voltage 1000 V
- Number of poles - 1
- Rated voltage 240/415 V
- Terminal material:
  - brass MO-58 (EDBJ-4x25-4x25, EDBJ-1x70-4x25)
  - aluminum 6060 zinc plated (EDBJ-1x35-1x35)
- Housing material:
  - PC / ABS plastic (for EDBJ-4x25-4x25, EDBJ-1x70-4x25)
  - PA6.6 plastic (for EDBJ-1x35-1x35)
- Flammability class V0
- possibility of sealing (for EDBJ-4x25-4x25, EDBJ-1x70-4x25)
- Working temperature -30°C to +80°C
- Compliance with IEC 60947-7-1

EDBJ-4x25-4x25

Cables cross section					
Upper	Bottom	Rigid	Flexible	L	Tightening torque
4	4	25 mm²	16 mm²	16 mm	6 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBJ-4x25-4x25	001102428	125	1/12/240
EDBJ-4x25-4x25N	001102429	125	1/12/240
EDBJ-4x25-4x25PE	001102430	125	1/12/240

Parameters:
Rated cross section 25mm², Rated current 100 A, Allen keys 3 mm


EDBJ-4x25-4x25


EDBJ-4x25-4x25N


EDBJ-4x25-4x25PE

EDBJ-1x70-4x25

Cables cross section					
Upper	Bottom	Rigid	Flexible	L	Tightening torque
1		4-70 mm²	6-50 mm²	25 mm	10 Nm
	4	2,5-25 mm²	2,5-16 mm²	16 mm	6 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBJ-1x70-4x25	001102434	117	1/12/240
EDBJ-1x70-4x25N	001102435	117	1/12/240
EDBJ-1x70-4x25PE	001102436	117	1/12/240

Parameters:
Rated cross section 70 mm², Rated current 192 A, Allen keys 3 mm, 5 mm


EDBJ-1x70-4x25


EDBJ-1x70-4x25N


EDBJ-1x70-4x25PE

EDBJ-1x35-1x35

Cables cross section					
Upper	Bottom	Rigid	Flexible	L	Tightening torque
1	1	2,5-35 mm²	2,5 - 25 mm²	21 mm	6 Nm

Type	Code No	Weight [g]	Packaging [pcs]
EDBJ-1x35-1x35	001102431	27	1/12/300
EDBJ-1x35-1x35N	001102432	27	1/12/300
EDBJ-1x35-1x35PE	001102433	27	1/12/300

Parameters:
Rated cross section 35 mm², Rated current 125 A, Allen keys 3 mm,
The galvanic coating of the insert enables the connection of both Al and Cu conductors


EDBJ-1x35-1x35


EDBJ-1x35-1x35N


EDBJ-1x35-1x35PE

Technical data on page 898

Meter board

Instructions for mounting a meter board
- Fasten the frame of the meter board using four screws and plastic wall inserts. While drilling holes, take care not to damage electrical wires.
- When the board is fixed, attach a meter using bolts with sliding nuts.
- Fasten the wires in the terminals and position the protective cover.



VPO



VP

Meter board			
Type	Code No.	Weight [g]	Packaging [pcs]
MPO	001117001	508	1/25
VPO	001117002	690	1/16
MP	001117004	276	1/25
VP	001117005	453	1/16
ENB2	001101197	350	15

MPO - small meter board
VPO - large meter board
MP - small meter board without frame
VP - large meter board without frame



ENB2

Universal board covering UPO

Standard lenght of profile
1 m

The covering UPO is the improved form for covering the space between rows of built-in elements in distribution boards. The built-in elements are installed on the mounting rails with width of 35 mm which shall be mounted in the distance of 125 mm.
Description - UPO covering consists of terminal plates that should be fixed on mounting rails, and flat and corner profiles, which are click-on mounted on the terminal plates. The space between rows of apparatuses is covered by a flat profile. Upper and lower rows of devices should be covered by corner profile.



Universal board covering UPO			
Type	Code No.	Weight [g]	Packaging [pcs]
Terminal plate	001214011	50	18
Flat profile	001214012	15	322
Corner profile	001214013	10	306

Technical data on page 899

Installation channels

Marking

Cover sealing type
B
A

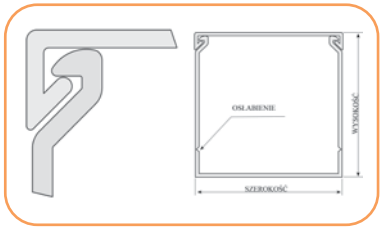
→ **B 40x60 T**

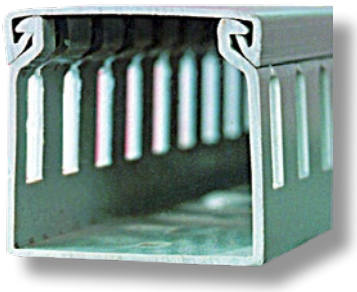
↑ Dimension (width x height)



Type B cover sealing

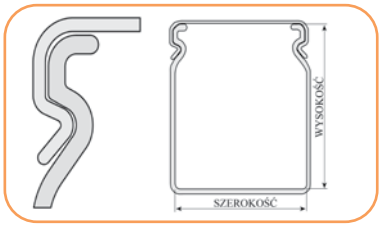
Type	Code No.	Weight [g]	Packaging [pcs]
B 25x40 T	003911034	520	36
B 25x60 T	003911035	620	18
B 25x80 T	003911036	980	18
B 40x40 T	003911037	700	18
B 40x60 T	003911038	840	18
B 40x80 T	003911039	980	18
B 40x100 T	003911040	1225	12
B 48x100 T	003911041	6030	4
B 55x100 T	003911042	3020	4
B 60x40 T	003911043	613	18
B 60x60 T	003911044	1040	12
B 60x80 T	003911045	1480	12
B 60x100 T	003911046	1720	8
B 75x100 T	003911047	1706	8
B 80x40 T	003911048	1160	12
B 80x60 T	003911049	1420	12
B 80x80 T	003911050	1720	12
B 80x100 T	003911051	1790	8
B 100x60 T	003911052	1760	8
B 100x80 T	003911053	1860	8
B 100x100 T	003911054	2120	8
B 150x100 T	003911055	3200	4





Type A cover sealing

Type	Code No.	Weight [g]	Packaging [pcs]
A 25x25 T	003911003	540	48
A 25x30 T	003911004	600	48



Mounting insulators

Rated voltage
250-3600 V

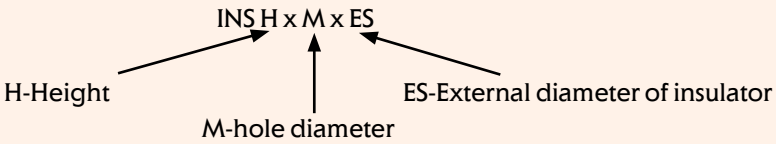
Rated impulse voltage
8-50kV



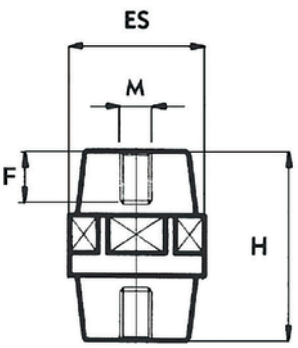
Application
Support insulators are intended for installation in el. enclosures for supporting busbars and/or other current leading parts. They provide electrical insulation. They are made of red fiber-reinforced polyester glass, which guarantees high resistance and mechanical strength. On both sides, the insulator has threaded sleeves made of galvanized steel.



Marking:







F-sleeve thread depth

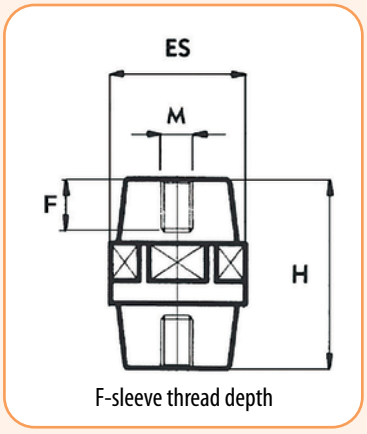
Mounting insulators

Type	Code No.	Dimensions (mm)				Mechanical parameters			Electrical characteristics		Packaging [pcs]	Weight [g]
		H	M	ES	F	Tensile strenght [daN]	Cantilever strenght [daN]	Twisting strenght [Nm]	Operating voltage AC/ DC [V]	Flashover voltage [kV]		
INS 1238	003810201	12	3	8	3,5	100	20	0,6	250	8	200	18
INS 15414	003810203	15	4	14	4,5	300	60	3	250	8	100	22
INS 15514	003810204	15	5	14	4,5	300	60	4	250	8	100	22
INS 16414	003810202	16	4	14	4,5	300	60	3	250	8	100	20
INS 20417	003810205	20	4	17	5	350	80	3	400	15	100	25
INS 20517	003810206	20	5	17	5	350	80	4	400	15	100	26
INS 20617	003810207	20	6	17	5	350	80	8	400	15	100	27
INS 25419	003810208	25	4	19	8	400	220	3	600	25	50	28
INS 25519	003810209	25	5	19	8	400	220	6	600	25	50	30
INS 25619	003810210	25	6	19	8	400	220	10	600	25	50	32
INS 25819	003810211	25	8	19	8	400	220	10	600	25	50	36
INS 30630	003810212	30	6	30	9	900	450	10	750	30	50	40
INS 30830	003810213	30	8	30	9	900	450	25	750	30	50	40
INS 35632	003810214	35	6	32	11	1100	500	10	750	40	50	44
INS 35832	003810216	35	8	32	11	1100	500	25	750	40	50	44
INS 351032	003810218	35	10	32	11	1100	500	50	750	40	50	44
INS 36641	003810215	36	6	41	11	1400	650	10	1000	40	50	48
INS 36841	003810217	36	8	41	11	1400	650	25	1000	40	50	48

Technical data on page 900

Mounting insulators

Type	Code No.	Dimensions (mm)				Mechanical parameters			Electrical characteristics		Packaging [pcs]	Weight [g]
		H	M	ES	F	Tensile strenght [daN]	Cantilever strenght [daN]	Twisting strenght [Nm]	Operating voltage AC/ DC [V]	Flashover voltage [kV]		
INS 361041	003810219	36	10	41	11	1400	650	50	1000	40	50	48
INS 40632	003810220	40	6	32	15	1100	500	10	1000	40	25	52
INS 40832	003810221	40	8	32	15	1100	500	25	1000	40	25	52
INS 401032	003810222	40	10	32	15	1100	500	50	1000	40	25	52
INS 401232	003810223	40	12	32	15	1100	500	87	1000	40	25	55
INS 45641	003810224	45	6	41	15	1400	740	10	1000	40	25	55
INS 45841	003810225	45	8	41	15	1400	740	25	1000	40	25	55
INS 451041	003810226	45	10	41	15	1400	740	50	1000	40	25	55
INS 45846	003810227	45	8	46	15	1500	750	10	1000	40	25	56
INS 451046	003810228	45	10	46	15	1500	750	25	1000	40	25	56
INS 451246	003810229	45	12	46	15	1500	750	50	1000	40	25	56
INS 50636	003810230	50	6	36	15	1300	650	10	1500	50	25	61
INS 50836	003810231	50	8	36	15	1300	650	25	1500	50	25	61
INS 501036	003810233	50	10	36	15	1300	650	50	1500	50	25	61
INS 50850	003810232	50	8	50	15	1500	750	25	1500	50	10	67
INS 501050	003810234	50	10	50	15	1500	750	50	1500	50	10	75
INS 501250	003810235	50	12	50	15	1500	750	87	1500	50	10	75
INS 55855	003810236	55	8	55	15	1600	780	25	1500	50	10	87
INS 551055	003810237	55	10	55	15	1600	780	50	1500	50	10	87
INS 551255	003810238	55	12	55	15	1600	780	87	1500	50	10	87
INS 60855	003810239	60	8	55	15	2000	800	25	1500	50	10	94
INS 601055	003810240	60	10	55	15	2000	800	50	1500	50	10	91
INS 601255	003810241	60	12	55	15	2000	800	87	1500	50	10	91
INS 63841	003810242	63	8	41	15	1600	700	25	1500	50	10	83
INS 631041	003810243	63	10	41	15	1600	700	50	1500	50	10	83
INS 65856	003810244	65	8	56	15	2000	800	25	2000	50	10	85
INS 651056	003810245	65	10	56	15	2000	800	50	2000	50	10	98
INS 651256	003810246	65	12	56	15	2000	800	87	2000	50	10	98
INS 701065	003810249	70	10	65	25	3000	1200	50	2000	50	5	103
INS 701265	003810247	70	12	65	25	3000	1200	87	2000	50	5	112
INS 701665	003810248	70	16	65	25	3000	1200	210	2000	50	5	115
INS 75850	003810253	75	8	50	15	1800	730	25	2000	50	5	114
INS 751050	003810250	75	10	50	25	1800	730	50	2000	50	5	112
INS 751250	003810255	75	12	50	25	1800	730	87	2000	50	5	114
INS 751065	003810254	75	10	65	25	3000	1200	50	2000	50	5	114
INS 751265	003810251	75	12	65	25	3000	1200	87	2000	50	5	112
INS 801065	003810256	80	10	65	25	3500	1300	50	3600	50	5	125
INS 801265	003810257	80	12	65	25	3500	1300	87	3600	50	5	125
INS 801665	003810258	80	16	65	25	3500	1300	210	3600	50	5	154
INS 1001065	003810259	100	10	65	25	4000	1300	50	3600	50	5	154
INS 1001265	003810260	100	12	65	25	4000	1300	87	3600	50	5	154
INS 1001665	003810261	100	16	65	25	4000	1300	210	3600	50	5	154



F-sleeve thread depth

Technical data on page 900

Metric cable glands IP67



M-12G M-16G M-20G M-25G M-32G
M-40G M-50G M-63G

IP 68 with sealing washer

Metric cable glands

Type	Description	Code No.	Weight [g]	Packaging [pcs]
M-12G	Metric cable gland M12	004482200	3	50
M-16G	Metric cable gland M16	004482201	5,6	50
M-20G	Metric cable gland M20	004482202	9,4	250
M-25G	Metric cable gland M25	004482203	19	150
M-32G	Metric cable gland M32	004482204	32	100
M-40G	Metric cable gland M40	004482205	58	50
M-50G	Metric cable gland M50	004482206	84	30
M-63G	Metric cable gland M63	004482207	147	16
M-12N	Metric lock nut M12	004482208	1	200
M-16N	Metric lock nut M16	004482209	1	200
M-20N	Metric lock nut M20	004482210	2	250
M-25N	Metric lock nut M25	004482211	3	800
M-32N	Metric lock nut M32	004482212	5	80
M-40N	Metric lock nut M40	004482213	6	50
M-50N	Metric lock nut M50	004482214	9	30
M-63N	Metric lock nut M63	004482215	15	10
M-12S	TP-M12 Metric sealing rubber washer M12	004482216	1,2	500
M-16S	TP-M16 Metric sealing rubber washer M16	004482217	1,5	500
M-20S	TP-M20 Metric sealing rubber washer M20	004482218	1,8	500
M-25S	TP-M25 Metric sealing rubber washer M25	004482219	2,1	300
M-32S	TP-M32 Metric sealing rubber washer M32	004482220	2,3	250
M-40S	TP-M40 Metric sealing rubber washer M40	004482221	2,6	150
M-50S	TP-M50 Metric sealing rubber washer M50	004482222	2,9	60
M-63S	TP-M63 Metric sealing rubber washer M63	004482223	4,1	50



M-xxN



M-xxS

Technical data on page 901

Home distribution board DIDO-E

Technical data	
Degree of protection	IP 40*
Colour	white
Double insulation	⧈
Standard	IEC 62208, IEC 60670-1, IEC 60670-24
Installation temperature	-25° / +60°C
Glow wire test	650°C

*IP 30 for EC 1+1, 3+1, 3+2, ECGxxMEDIA

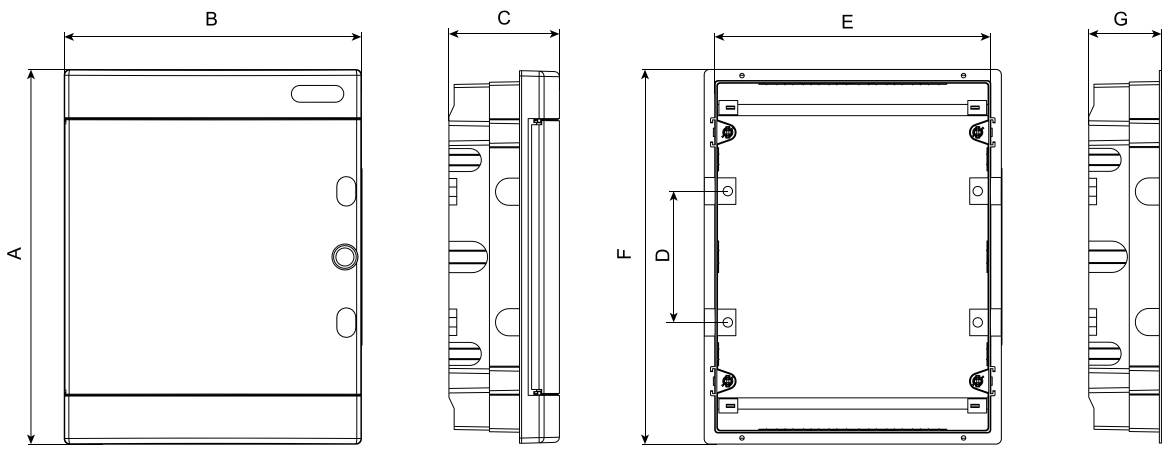
Number of N - PE terminals (1,5…16mm²):

ECT/ECM4PT/PO	2x4	4 PE / 4 N
ECT/M8PT/PO	2x8	8 PE / 8 N
ECT/M12PT/PO	2x10	10 PE / 10 N
ECT/M18PT/PO	2x13	13 PE / 13 N
ECT/M24PT/PO	2x13	13 PE / 13 N
ECT/M36PT/PO	2x15	15 PE / 15 N
ECT48PT/PO	2x20	20 PE / 20 N
ECT/M 2x18PT/PO	2x15	15 PE / 15 N
ECT/M 3x18PT/PO	2x25	25 PE / 25 N
ECT 4x18PT/PO	2x30	30 PE / 30 N
ECT 1x24PT/PO	2x13	13 PE / 13 N
ECG14	2x10	10 PE / 10 N
ECG28	2x13	13 PE / 13 N
ECG42	2x15	15 PE / 15 N
ECG56	2x20	20 PE / 20 N
ECG70	2x30	30 PE / 30 N
EC 1+1	-	
EC 3+1	-	
EC 3+2	2x4	4 PE / 4 N

- ECG14, ECG28, ECG42 have 1 additional free space to build in an extra PST-UNI terminal.
- ECG56 and ECG70 have no extra space for PST-UNI terminals.
- Double insulation not valid for ECG MEDIA

Flush mounted distribution board

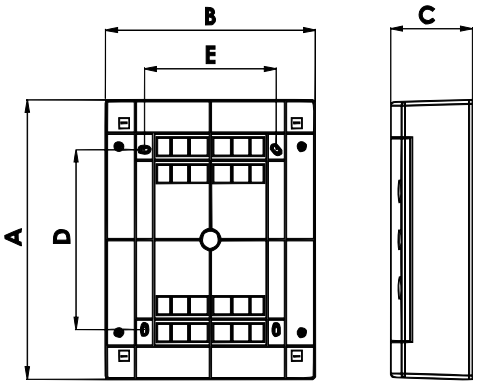
type	Dimensions							Max. allowed power losses when Max. number of devices are installed	Static load
	A	B	C	D	E	F	G	Pde	
ECM4PT/ECM4PO	232 mm	139 mm	99 mm	-	123 mm	216 mm	69 mm	>10 W	520 g
ECM8PT/ECM8PO	232 mm	211 mm	99 mm	-	201 mm	212mm	68 mm	>16 W	1040 g
ECM12PT/ECM12PO	232 mm	283 mm	106 mm	-	273 mm	212 mm	68 mm	>25 W	1560 g
ECM18PT/ECM18PO	232 mm	392 mm	106 mm	-	382 mm	212 mm	68 mm	>25 W	2340 g
ECM24PT/ECM24PO	357 mm	283 mm	106 mm	125 mm	273 mm	336 mm	68 mm	>30 W	1560 g
ECM36PT/ECM36PO	482 mm	283 mm	106 mm	125 mm	273 mm	462 mm	68 mm	>30 W	1560 g
ECM2x18PT/ECM2x18PO	357 mm	392 mm	106 mm	125 mm	382 mm	336 mm	68 mm	>30 W	2340 g
ECM3x18PT/ECM3x18PO	522 mm	392 mm	106 mm	125 mm	382 mm	502 mm	68 mm	>35 W	2340 g



Surface mounted distribution board

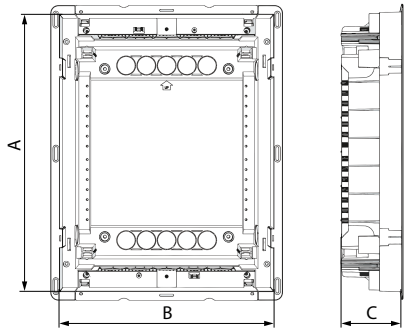
type	Dimensions**					Pde*	Static load
	A	B	C	D	E		
ECT4PT/ECT4PO	235 mm	143 mm	98 mm	127 mm	46 mm	10 W	520 g
ECT8PT/ECT8PO	236 mm	287 mm	102 mm	107 mm	180 mm	16 W	1040 g
ECT12PT/ECT12PO	236 mm	287 mm	112 mm	107 mm	180 mm	25 W	1560 g
ECT18PT/ECT18PT	236 mm	396 mm	112 mm	107 mm	289 mm	25 W	2340 g
ECT24PT/ECT24PO	361 mm	287 mm	112 mm	232 mm	180 mm	30 W	1560 g
ECT36PT/ECT36PO	485 mm	287 mm	112 mm	357 mm	180 mm	30 W	1560 g
ECT48PT/ECT48PO	652 mm	287 mm	112 mm	482 mm	180 mm	35 W	1560 g
ECT2x18PT/ECT2x18PO	361 mm	396 mm	112 mm	232 mm	289 mm	30 W	2340 g
ECT3x18PT/ECT3x18PO	526 mm	396 mm	112 mm	357 mm	289 mm	35 W	2340 g
ECT4x18PT/ECT4x18PO	651 mm	396 mm	112 mm	482 mm	289 mm	40 W	2340 g
ECT1x24PT/ECT1x24PO	236 mm	503 mm	112 mm	107 mm	396 mm	30 W	2340 g

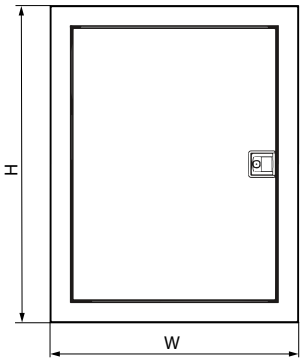
* Max. allowed power losses when Max. number of devices are installed
**Sizes are also valid for IT distribution boards DIDO-E MEDIA: ECT. . .MEDIA



Flush mounted distribution board

type	Dimensions					Max. allowed power losses when Max. number of devices are installed
	A	B	C	H	W	Pde
ECG14	274 mm	306 mm	87 mm	317 mm	346 mm	31 W
ECG28	399 mm	306 mm	87 mm	442 mm	346 mm	40 W
ECG42	549 mm	306 mm	87 mm	592 mm	346 mm	50 W
ECG56	673 mm	306 mm	87 mm	717 mm	346 mm	60 W
ECG70	799 mm	306 mm	87 mm	842 mm	346 mm	70 W





Surface mounted distribution board - IP30

type	Dimensions	Number of modules
EC 1+1	137 x 51 x 57	1 (+1)
EC 3+1	137 x 87 x 57	3 (+1)
EC 3+2	97 x 155 x 57	3 (+2)

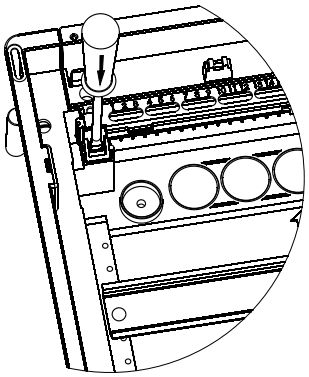
ECG

Material	Acrylonitrile butadiene styrene
Color	RAL9003
Door	Acrylonitrile butadiene styrene
Color	Transparent & white
Glow wire test	650°C
Terminal holder	Self extinguish material (Glow wire test: 960°C)
Temperature	-25°C ... +60°C
Rated voltage	AC400V
Standard	IEC 62208, IEC 60670-1, IEC 60670-24
Halogen free	✓

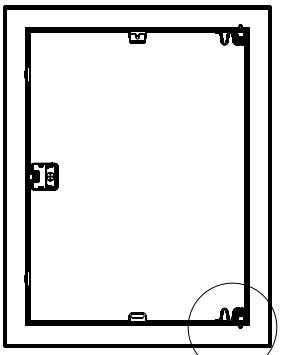
ECG_H

Material	Acrylonitrile butadiene styrene
Color	RAL9003
Door	Metal
Color	white
Glow wire test	850°C
Terminal holder	Self extinguish material (Glow wire test: 960°C)
Temperature	-25°C ... +60°C
Rated voltage	AC400V
Standard	IEC 62208, IEC 60670-1, IEC 60670-24
Halogen free	✓

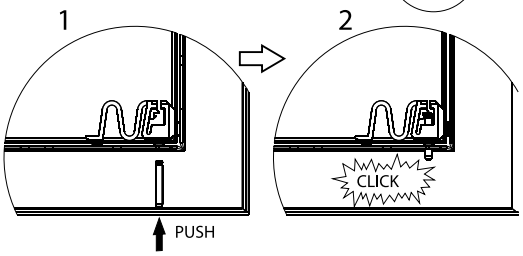
Advantages

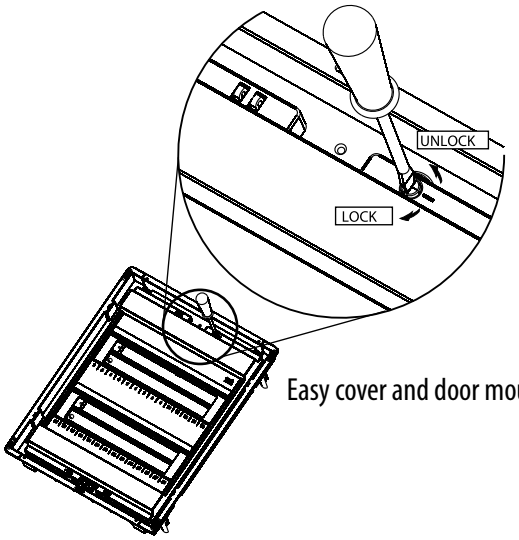


Easy terminal mounting

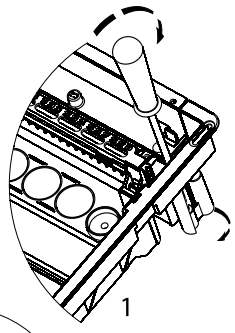


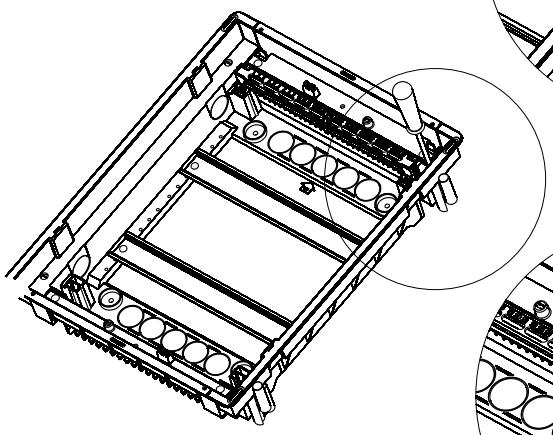
Left or right door mounting

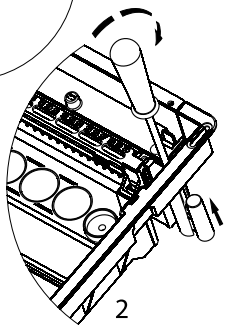




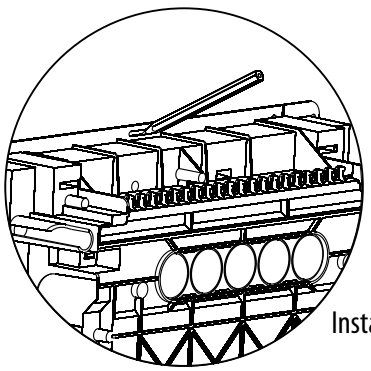
Easy cover and door mounting



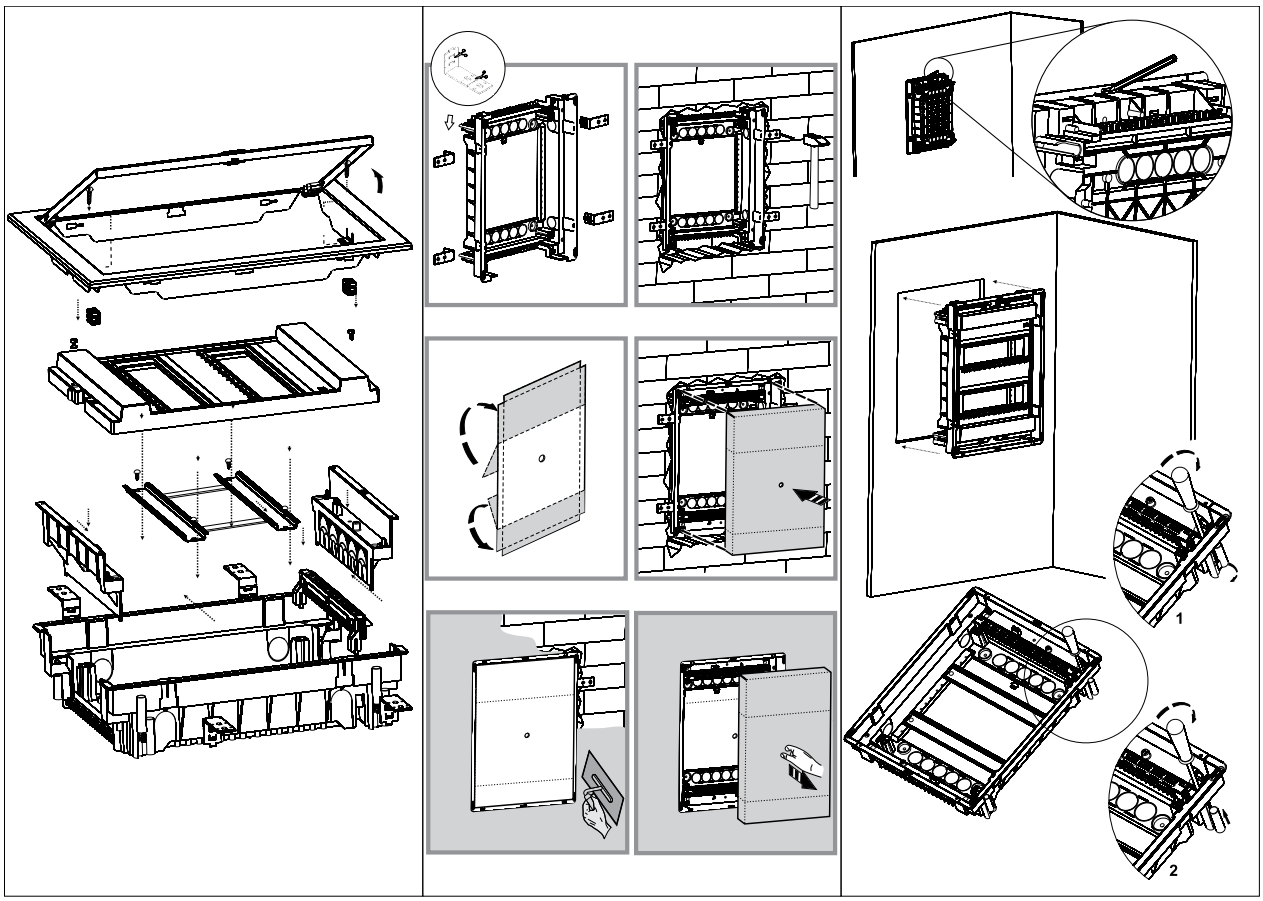




Holders for secure hollow wall installation



Installation marking slots for hollow walls

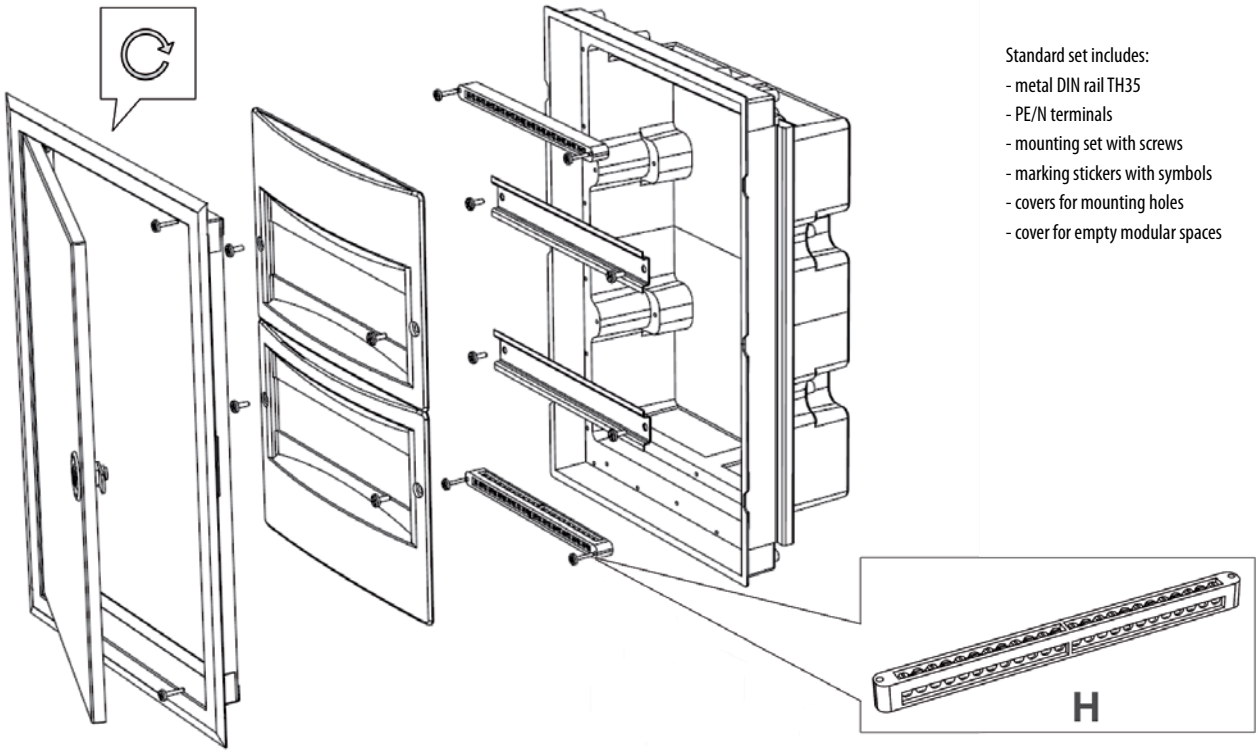


Flush mounted distribution boards with metal doors (IP40) DIDO ERP

Technical data	
Protection against mechanical impacts	IK08
Rated voltage	500V
Protection class	II
Standard	PN-EN 62208:2011

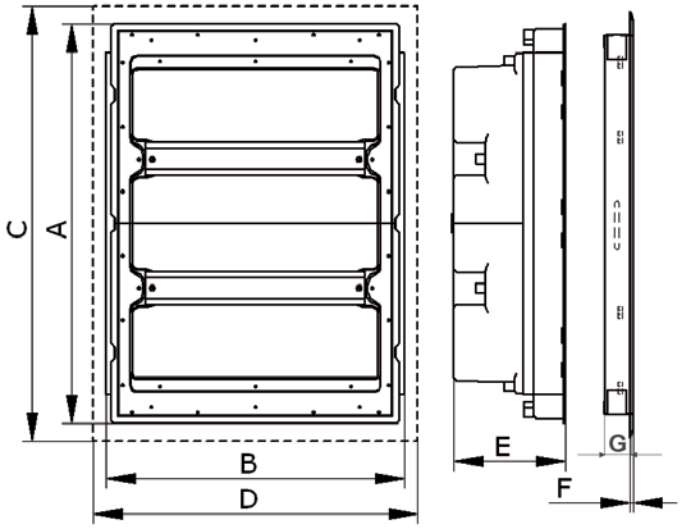
Not for hollow or wooden walls, flush mounted material conforms 650'C glow wire test only!

Assembly



Standard set includes:
- metal DIN rail TH35
- PE/N terminals
- mounting set with screws
- marking stickers with symbols
- covers for mounting holes
- cover for empty modular spaces

Dimensions

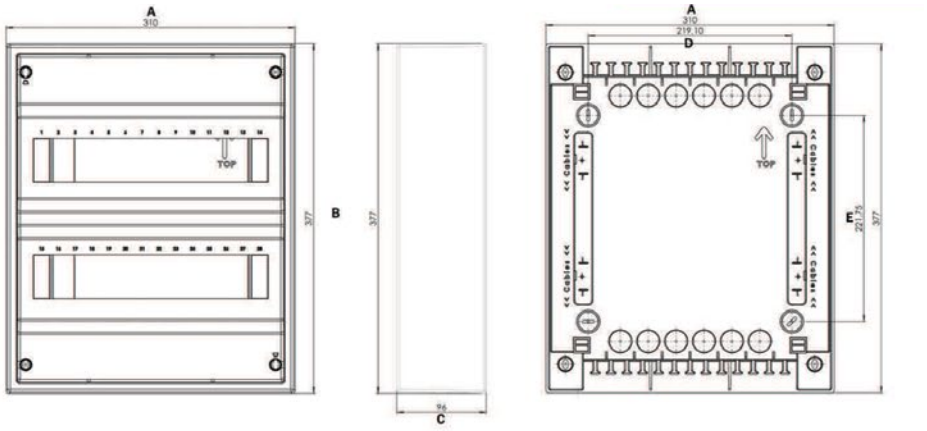


	A	B	C	D	E	F	G	H
ERP12-1	27 0 mm	288 mm	306 mm	326 mm	113 mm	4 mm	25 mm	2 x 5
ERP12-2	412 mm	288 mm	448 mm	326 mm	120 mm	4 mm	25 mm	2x11
ERP12-3	548 mm	288 mm	584 mm	326 mm	120 mm	4 mm	25 mm	4x11
ERP12-4	684 mm	288 mm	720 mm	326 mm	120 mm	4 mm	25 mm	4x11
ERP12-5	809 mm	288 mm	845 mm	326 mm	120 mm	4 mm	25 mm	6x12, 1x24
ERP12-6	943 mm	288 mm	980 mm	326 mm	120 mm	4 mm	25 mm	6x12, 1x24
ERP18-1	275 mm	418 mm	306 mm	451 mm	120 mm	6 mm	25 mm	2x11
ERP18-2	407 mm	418 mm	447 mm	451 mm	120 mm	6 mm	25 mm	3x11
ERP18-3	541 mm	418 mm	581 mm	451 mm	120 mm	6 mm	25 mm	3x11, 1x24
ERP18-4	675 mm	418 mm	715 mm	451 mm	120 mm	6 mm	25 mm	4x11, 1x24
ERP18-5	809 mm	418 mm	849 mm	451 mm	120 mm	6 mm	25 mm	5x11, 2x24
ERP18-6	943 mm	418 mm	983 mm	451 mm	120 mm	6 mm	25 mm	6x11, 2x24
ERP24-2	465 mm	542 mm	507 mm	575 mm	120 mm	6 mm	25 mm	1x24,2x11
ERP24-3	600 mm	542 mm	642 mm	575 mm	120 mm	6 mm	25 mm	1x24,3x11
ERP24-4	735 mm	542 mm	777 mm	575 mm	120 mm	6 mm	25 mm	2x24,4x11
ERP24-5	870 mm	542 mm	912 mm	575 mm	120 mm	6 mm	25 mm	3x24,4x11
ERP24-6	1005 mm	542 mm	1047 mm	575 mm	120 mm	6 mm	25 mm	3x24,4x11

Distribution boards DIDO ACT

DIDO ACT	
Material	ABS
Color	RAL9003
Door	styrene acrylonitrile
Color	Transparent & white
Glow wire test	650°C
Terminal holder	Self extinguish material (Glow wire test: 960°C)
Temperature	-25°C ... +60°C
Rated voltage	AC400V
Standard	IEC 62208, IEC 60670-1, IEC60670-24
Halogen free	✓

Dimensions



	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Max. allowed power losses when Max. number of devices are installed
ACT12	310	251	96	96	219	30W
ACT24	310	377	96	219	222	40W
ACT36	310	502	96	219	347	60W

Modular distribution board for use outside DIDO-ECH

Technical data

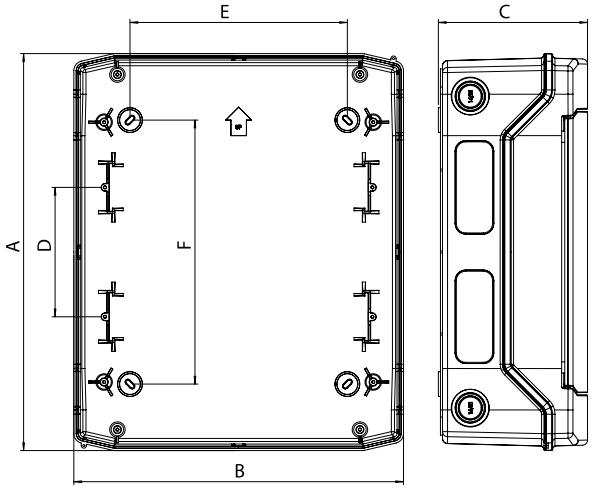
Degree of protection	IP 65
Insulation class	II
Colour	RAL 7035
Double insulation	⧈
Standard	IEC 60670-1, IEC 60670-24
Installation temperature	-20° / +60°C
Glow wire test	650°C

Number of PE - N terminals:

ECH-4G	2x4	4 PE / 4 N
ECH-6G	2x6	6 PE / 6 N
ECH-8G	2x8	8 PE / 8 N
ECH-12PT	2x10	10 PE / 10 N
ECH-18PT	2x13	13 PE / 13 N
ECH-24PT	2x15	15 PE / 15 N
ECH-36PT	2x15	15 PE / 15 N
ECH-48PT	2x20	20 PE / 20 N

Dimensions

type	Dimensions						Max. allowed power losses when Max. number of devices are installed
	A	B	C	D	E	F	Pde
ECH-4G	201 mm	128 mm	120 mm	-	-	140 mm	10 W
ECH-6G	201 mm	165 mm	118 mm	-	63 mm	140 mm	10 W
ECH-8G	201 mm	202 mm	120 mm	-	100 mm	140 mm	13 W
ECH-12PT	259 mm	319 mm	144 mm	-	210 mm	130 mm	16 W
ECH-18PT	259 mm	319 mm	144 mm	-	259 mm	130 mm	20 W
ECH-24PT	384 mm	319 mm	144 mm	125 mm	210 mm	255 mm	24 W
ECH-36PT	508 mm	319 mm	144 mm	125 mm	210 mm	380 mm	26 W
ECH-48PT	664 mm	319 mm	144 mm	125 mm	210 mm	505 mm	28 W



Metal enclosures GT type, IP65

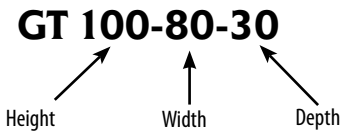
Compliance with standards and directives:

EN 62208 Empty enclosures for low voltage switchgear and controlgear
EN 60529 Degrees of protection provided by enclosures (IP Code)
EN 62262 Degrees of protection against external mechanical impacts provided by enclosures of electrical equipment (IK code)
Meet the requirements of the RoHS Directive
Marked CE

The enclosures are supplied with:

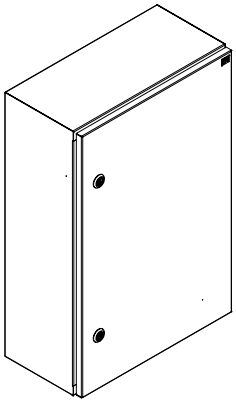
- Cable entry cover with mounting kit
- Mounting plate with mounting kit
- Door lock with, double-bit insert and key
- Cover holes
- Earthing set of grounding (without cable)

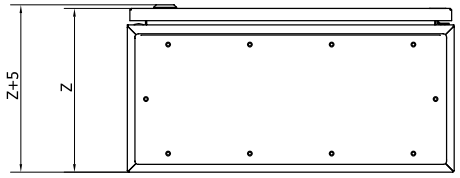
Symbols:

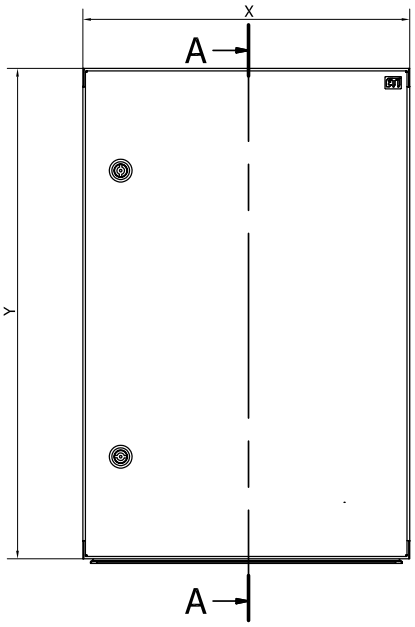


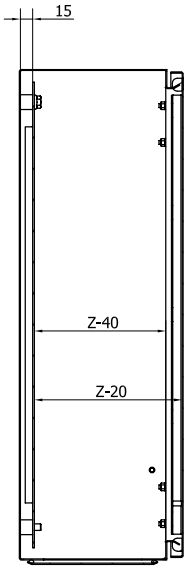
Type	Height Y (mm)	Width X (mm)	Depth Z (mm)	Lock quantity	Hinges quantity	Cable entry depth B1 (mm)	Cable entry width A1 (mm)	Cover cable entry depth B (mm)	Cover cable entry width A (mm)
GT 25-20-15	250	200	150	1	2	70	140	110	180
GT 30-20-15	300	200	150	1	2	70	140	110	180
GT 30-30-15	300	300	150	1	2	70	240	110	280
GT 30-30-20	300	300	200	1	2	120	240	160	280
GT 30-30-25	300	300	250	1	2	170	240	210	280
GT 40-30-15	400	300	150	1	2	70	240	110	280
GT 40-30-20	400	300	200	1	2	120	240	160	280
GT 40-30-25	400	300	250	1	2	170	240	210	280
GT 40-40-15	400	400	150	1	2	70	340	110	380
GT 40-40-20	400	400	200	1	2	120	340	160	380
GT 40-40-25	400	400	250	1	2	170	340	210	380
GT 40-60-20	400	600	200	1	2	120	540	160	580
GT 40-60-25	400	600	250	1	2	170	540	210	580
GT 40-60-30	400	600	300	1	2	170	540	210	580
GT 50-40-15	500	400	150	2	2	70	340	110	380
GT 50-40-20	500	400	200	2	2	120	340	160	380
GT 50-40-25	500	400	250	2	2	170	340	210	380
GT 50-55-20	500	550	200	2	2	120	490	160	530
GT 50-55-25	500	550	250	2	2	170	490	210	530
GT 60-40-15	600	400	150	2	2	70	340	110	380
GT 60-40-20	600	400	200	2	2	120	340	160	380
GT 60-40-25	600	400	250	2	2	170	340	210	380
GT 60-60-20	600	600	200	2	2	120	540	160	580
GT 60-60-25	600	600	250	2	2	170	540	210	580
GT 60-60-30	600	600	300	2	2	170	540	210	580
GT 60-80-30	600	800	300	2	2	170	740	210	780
GT 65-55-20	650	550	200	2	2	120	490	160	530
GT 65-55-25	650	550	250	2	2	170	490	210	530
GT 80-40-20	800	400	200	2	3	120	340	160	380
GT 80-40-25	800	400	250	2	3	170	340	210	380
GT 80-55-20	800	550	200	2	3	120	490	160	530
GT 80-55-25	800	550	250	2	3	170	490	210	530
GT 80-60-20	800	600	200	2	3	120	540	160	580
GT 80-60-25	800	600	250	2	3	170	540	210	580
GT 80-60-30	800	600	300	2	3	170	540	210	580
GT 80-60-40	800	600	400	2	3	170	540	210	580
GT 80-80-20	800	800	200	2	3	120	740	160	780
GT 80-80-25	800	800	250	2	3	170	740	210	780
GT 80-80-30	800	800	300	2	3	170	740	210	780
GT 80-80-40	800	800	400	2	3	170	740	210	780
GT 80-100-30	800	1000	300	2	3	170	940	210	980
GT 80-100-40	800	1000	400	2	3	170	940	210	980
GT 100-60-25	1000	600	250	3p*	3	170	540	210	580
GT 100-60-30	1000	600	300	3p*	3	170	540	210	580
GT 100-60-40	1000	600	400	3p*	3	170	540	210	580
GT 100-80-25	1000	800	250	3p*	3	170	740	210	780
GT 100-80-30	1000	800	300	3p*	3	170	740	210	780
GT 100-80-40	1000	800	400	3p*	3	170	740	210	780
GT 100-100-25	1000	1000	250	3p*	3	170	940	210	980
GT 100-100-30	1000	1000	300	3p*	3	170	940	210	980
GT 100-100-40	1000	1000	400	3p*	3	170	940	210	980
GT 120-60-25	1200	600	250	3p*	3	170	540	210	580
GT 120-80-25	1200	800	250	3p*	3	170	740	210	780
GT 120-80-30	1200	800	300	3p*	3	170	740	210	780
GT 120-80-40	1200	800	400	3p*	3	170	740	210	780
GT 120-100-30	1200	1000	300	3p*	3	170	940	210	980
GT 120-100-40	1200	1000	400	3p*	3	170	940	210	980

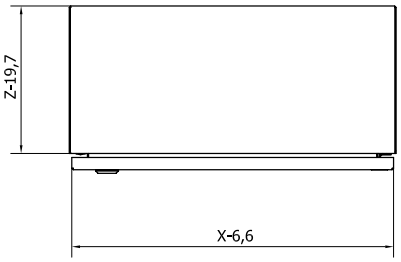
*One lock with 3 point locking system (top, center, bottom)

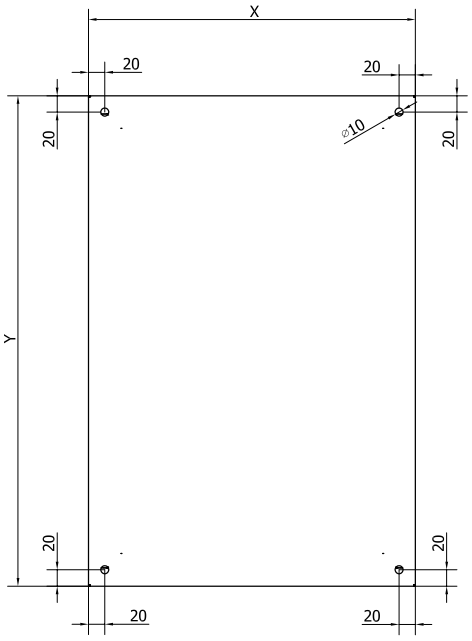


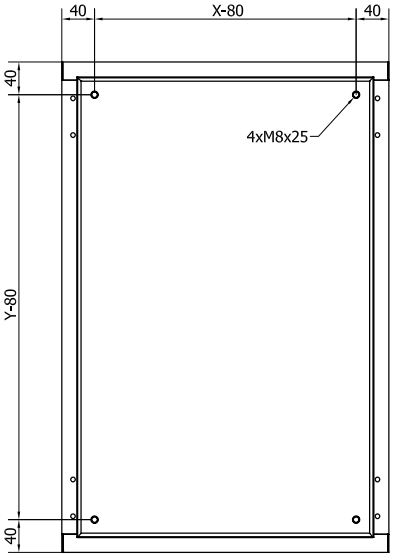

Z+5
Z


X
A
Y
A

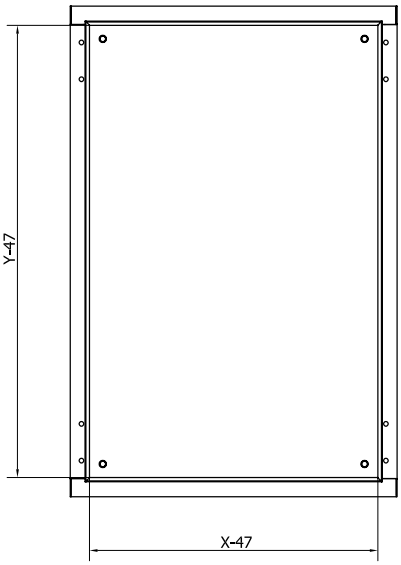

15
Z-40
Z-20

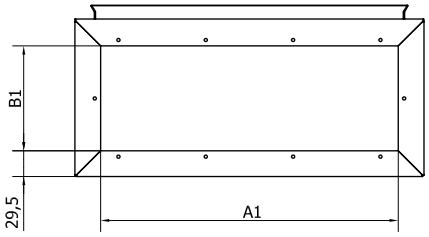

Z-19,7
X-6,6

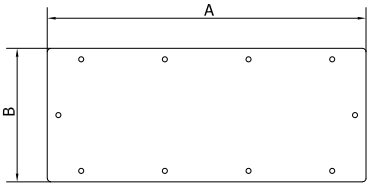




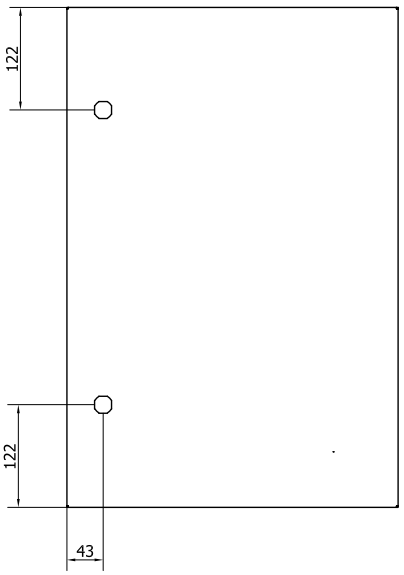
The door

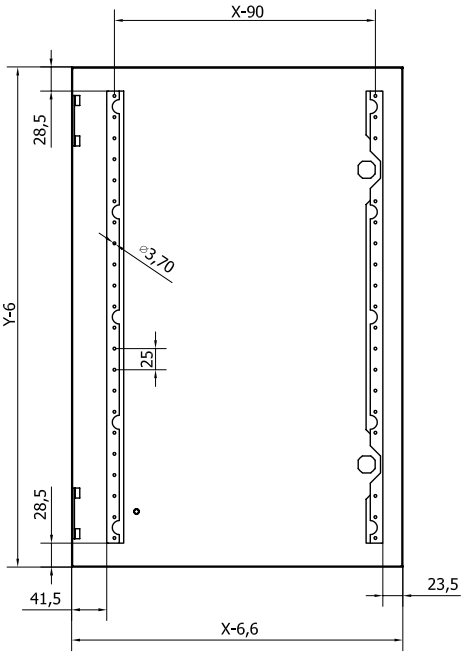




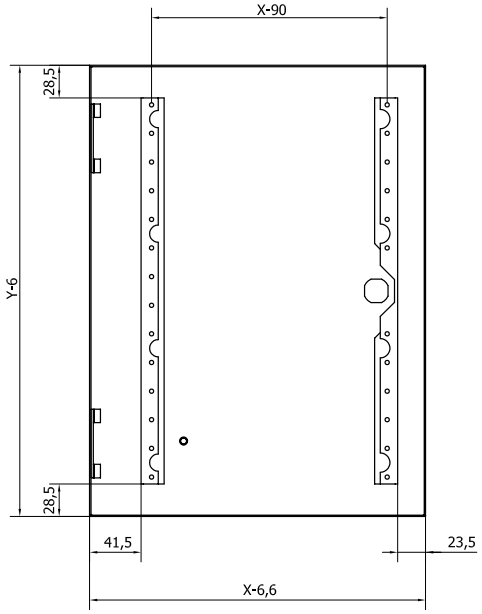


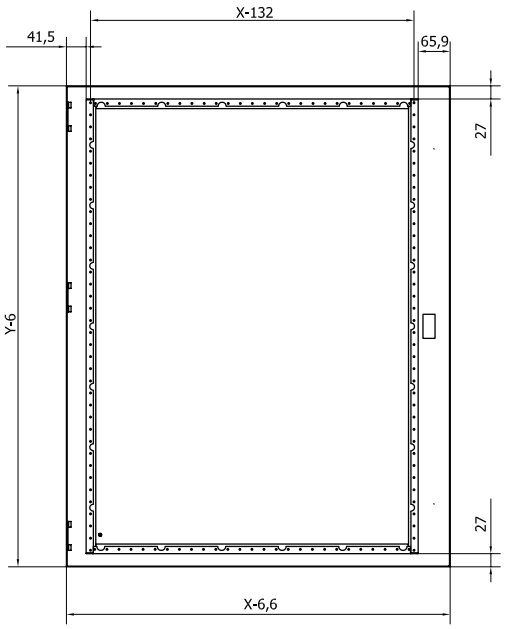
The cover of cable entry



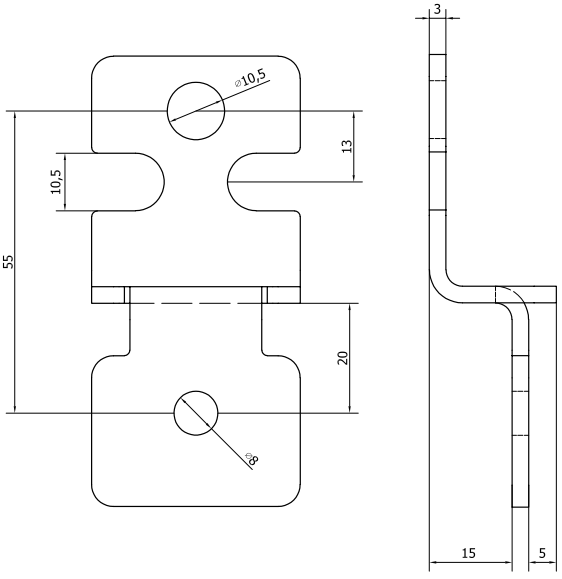


The door

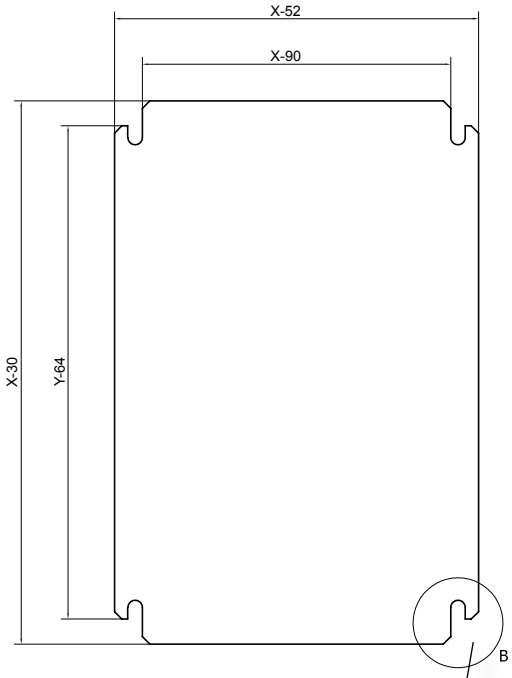




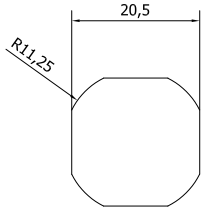
Wall holder

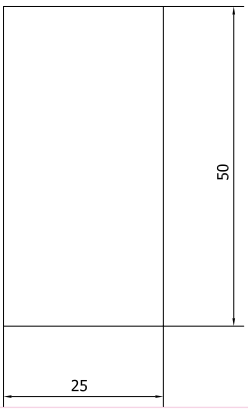


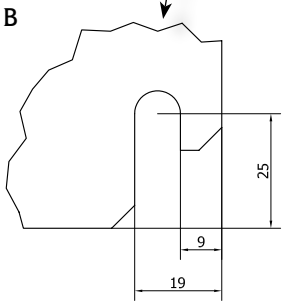
Mounting plate



Door driling



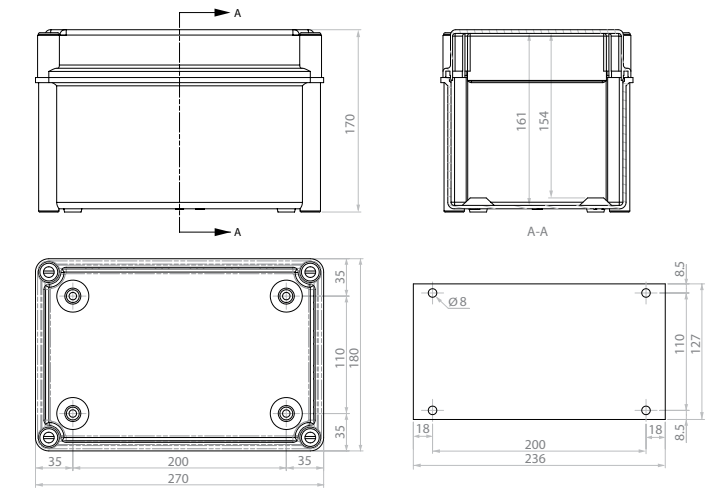




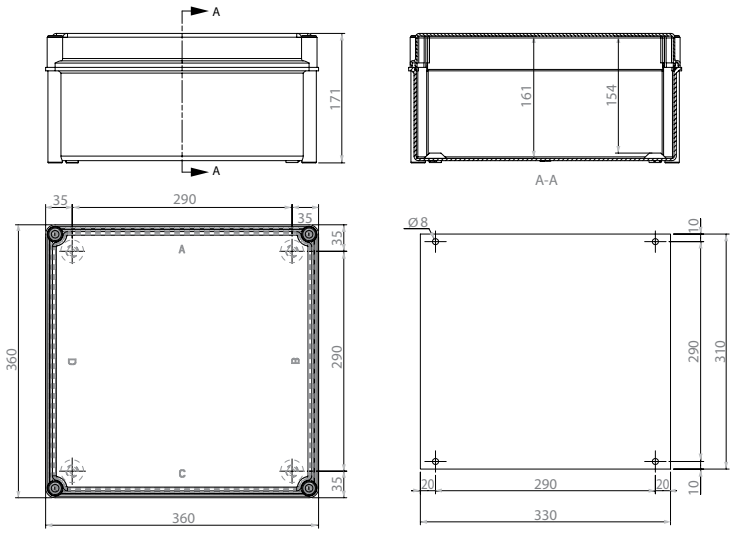
SB (S Box) Double insulation enclosures IP66, IK10

Technical data	
IP protection degree	IP 66
IK protection degree	IK10 (≤ 20 kJ)
Double insulation	⧈
Insulation class	II
Nominal voltage	1500V DC / 1000V AC
Installation temperature	-30°C ... +60°C
Colour	Base - grey (RAL 7035) / Lid - transparent
Flame resistance (UL 94)	Base - V0 / Lid - V2
Thermal resistance	Base - 960°C / Lid - 750°C
Standard	IEC 62208

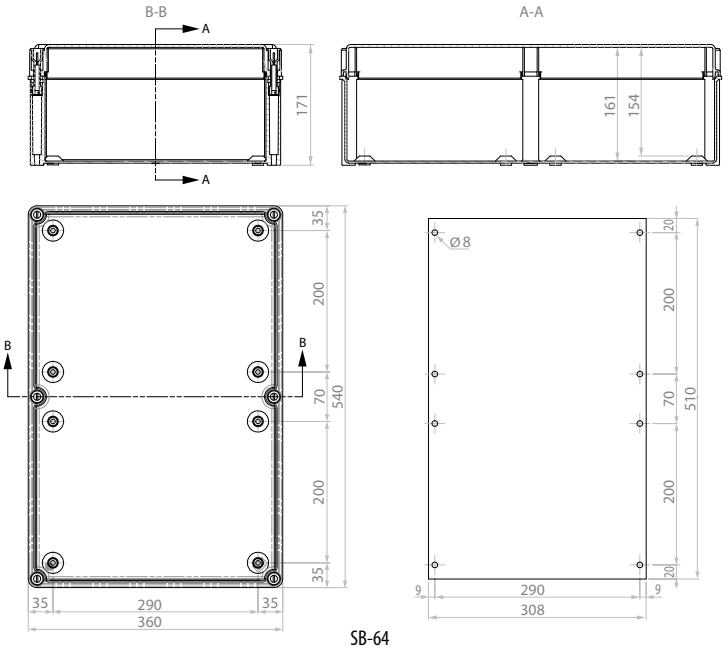
Dimensions



SB-32



SB-44



SB-64

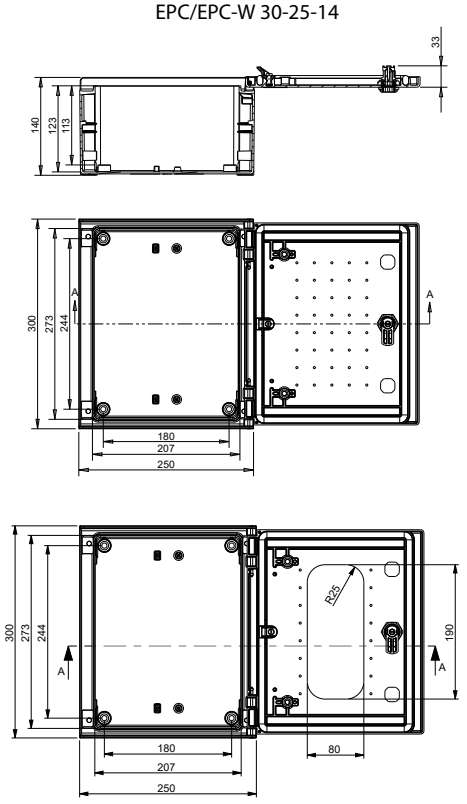
Fiberglass Reinforced Polyester EPC Cabinets (IP66)

Technical data	
Protection degree	IP66
Degree of protection against external mechanical impacts	IK10, IK07 (with window)
Protection class	II
Rated operational voltage	1000 V AC, 1500 V DC
Material body/seal	fiberglass reinforced polyester / polyurethane
UV resistance	✓
Operating temparature	-30 °C ... +120 °C
Color	RAL 7035
Resistance to fire and heat	960 °C
Compliance with standards	IEC 62208

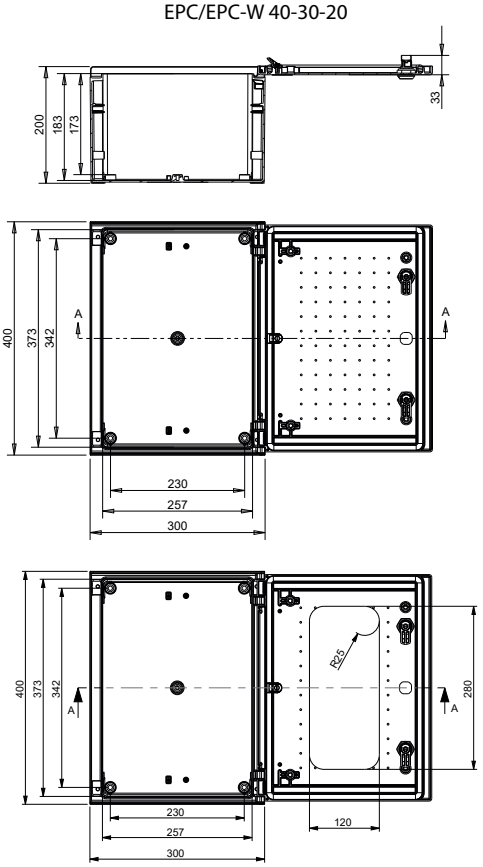
Properties	EPC/-W 30-25-14	EPC/-W 40-30-20	EPC/-W 40-40-20	EPC/-W 50-40-20	EPC/-W 60-40-23	EPC/-W 60-50-23	EPC/-W 80-30-23	EPC/-W 80-60-30
External dimensions								
Height (mm)	300	400	400	500	600	600	800	800
Width (mm)	250	300	400	400	400	500	300	600
Depth (mm)	140	200	200	200	230	230	230	300
Internal dimensions								
Height (mm)	273	373	373	473	573	573	773	773
Width (mm)	207	257	357	357	357	457	257	557
Depth (mm)	123	183	183	183	213	213	213	283
Other characteristics								
Number of locks	1	2	2	2	2	2	2	2
Number of wedges (anti-blow system)	1	1	2	2	2	2	2	2
Number of fixing points - mounting plate	4	5	5	6	6	6	4	7
Power dissipation Pde@T=40 ° C	36,2	58,8	72,6	82,9	99,4	117	103	185
Weight (kg)	1,93	3,6	4,35	5,25	7,13	7,93	6,4	12,65
Mounting plate (polyester)	**EPC-PMP 30-25**	**EPC-PMP 40-30**	**EPC-PMP 40-40**	**EPC-PMP 50-40**	**EPC-PMP 60-40**	**EPC-PMP 60-50**	**EPC-PMP 80-30**	**EPC-PMP 80-60**
Height (mm)	262	360	360	460	558	558	756	756
Width (mm)	198	248	348	348	348	448	248	548
Thickness (mm)	3	3	3	3	3	3	3	4
Weight (kg)	0,38	0,59	0,87	1,09	1,3	1,75	1,46	2,78
Mounting plate (metal)	**EPC-MPP 30-25**	**EPC-MPP 40-30**	**EPC-MPP 40-40**	**EPC-MPP 50-40**	**EPC-MPP 60-40**	**EPC-MPP 60-50**	**EPC-MPP 80-30**	**EPC-MPP 80-60**
Height (mm)	262	360	360	460	558	558	756	756
Width (mm)	198	248	348	348	348	448	248	548
Thickness (mm)	2	2	2	2	2	2	2	2
Weight (kg)	0,79	1,3	1,9	2,2	3	3,6	3,26	6,4

Dimensions

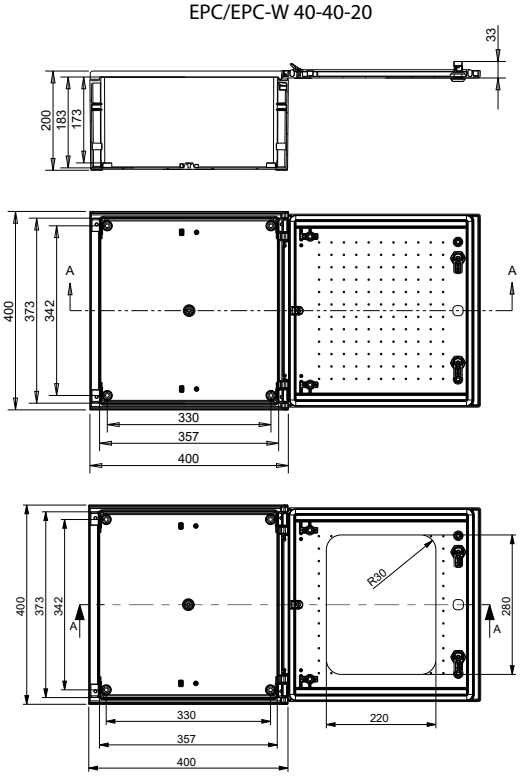
EPC/EPC-W 30-25-14



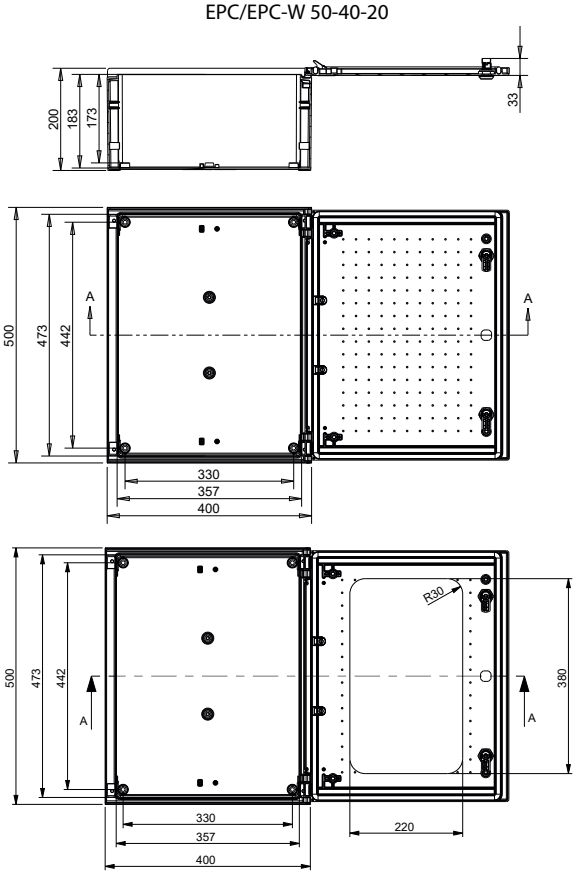
EPC/EPC-W 40-30-20



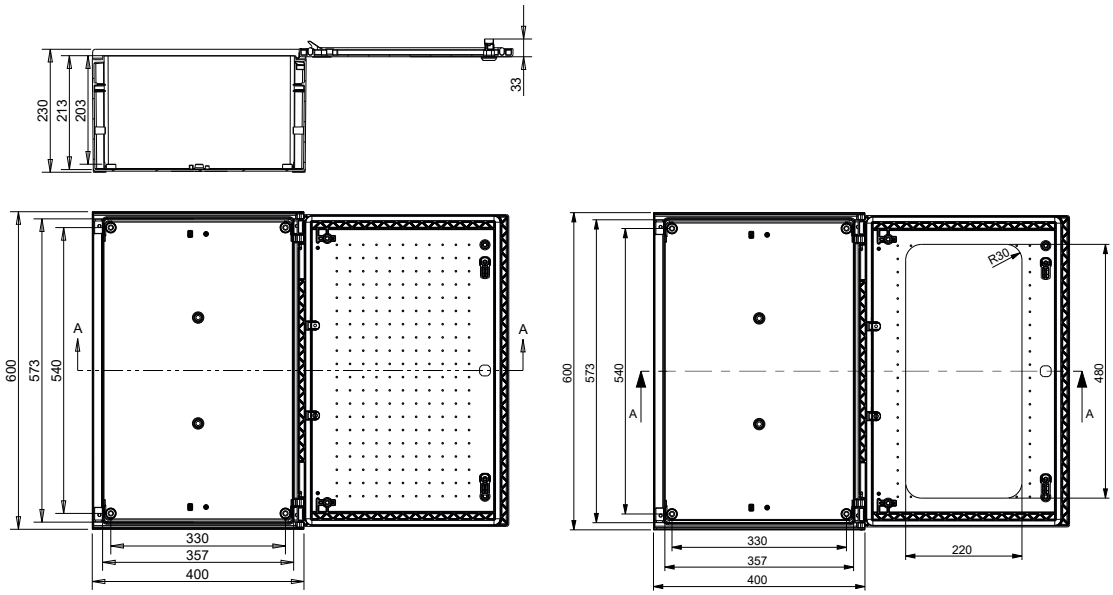
EPC/EPC-W 40-40-20



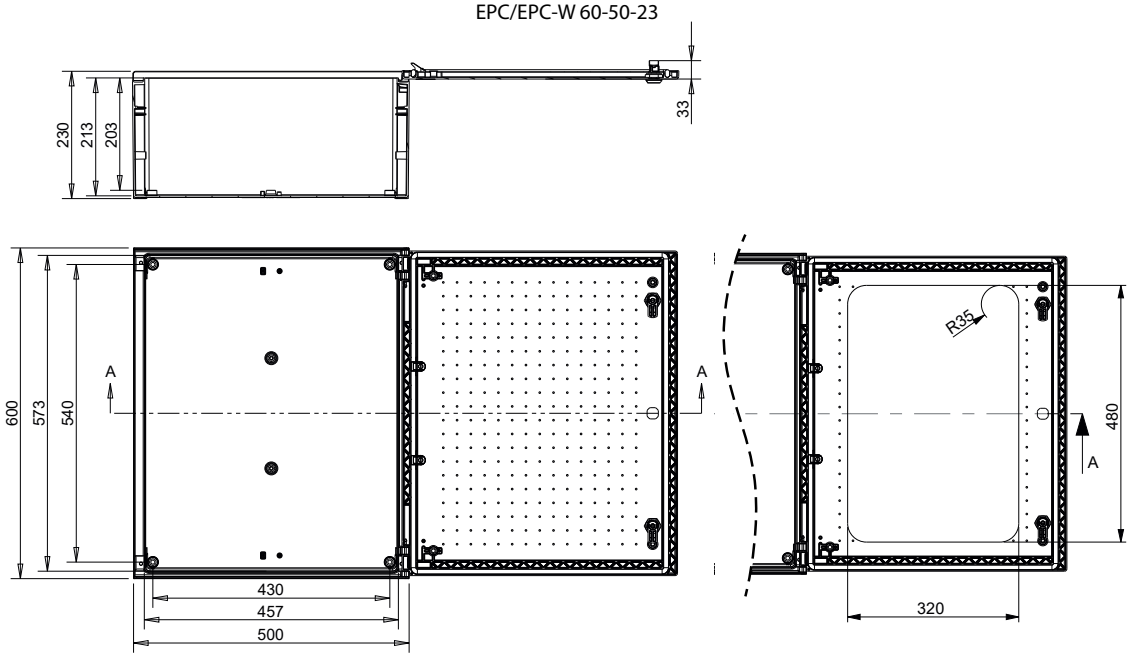
EPC/EPC-W 50-40-20



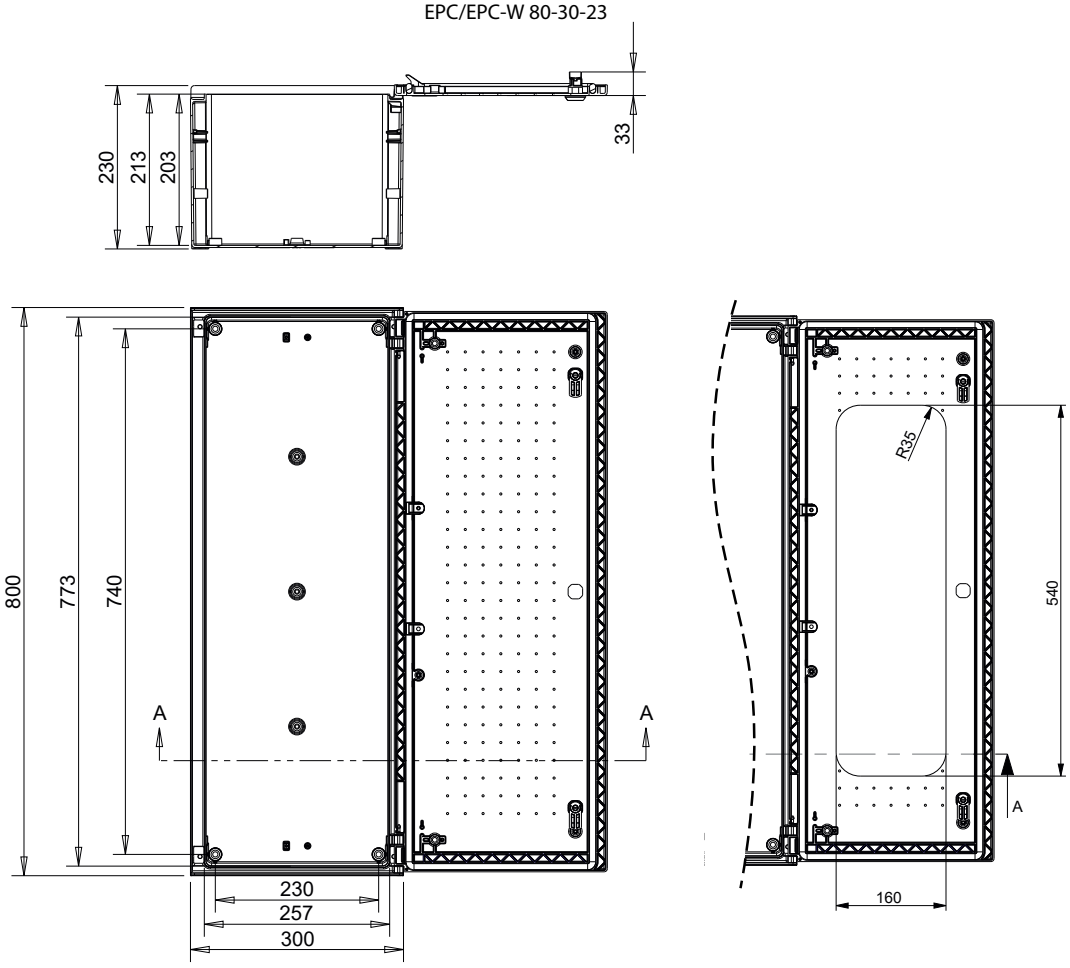
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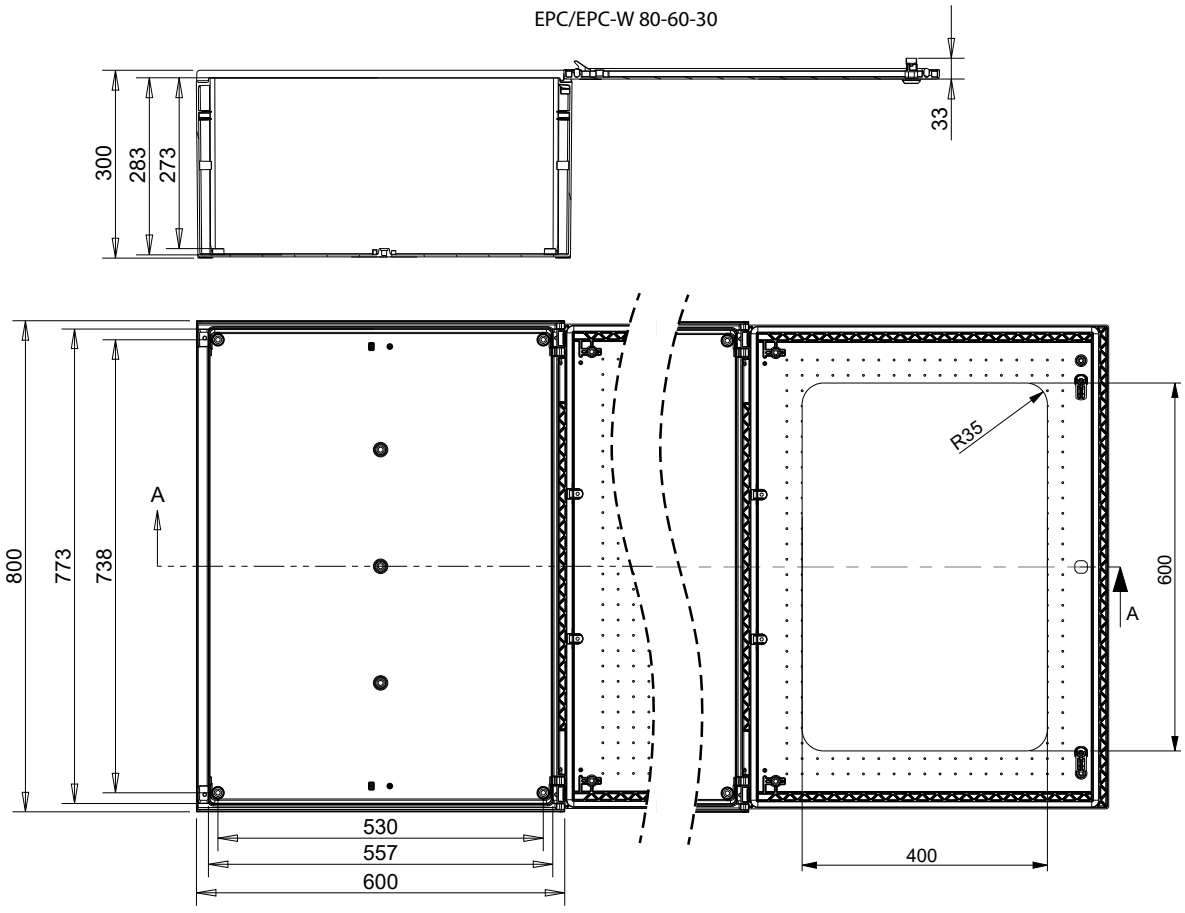
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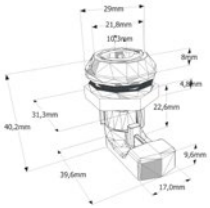
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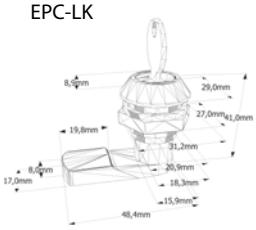
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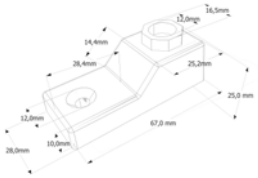
EPC-DL10



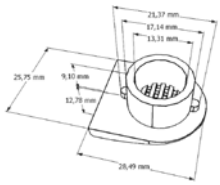
EPC-LK



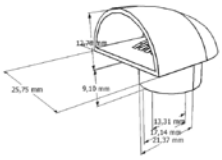
EPC-WM



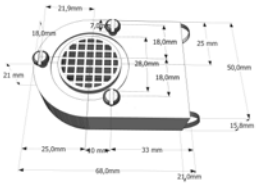
EPC-VDS (1)



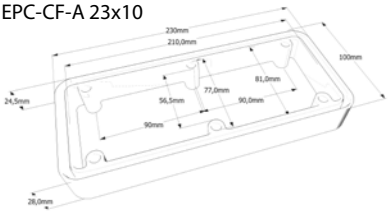
EPC-VDS (2)



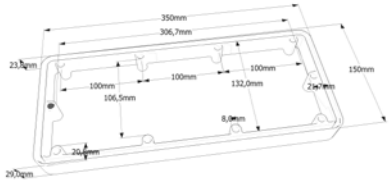
EPC-VDL



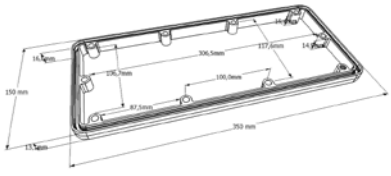
EPC-CF-A 23x10



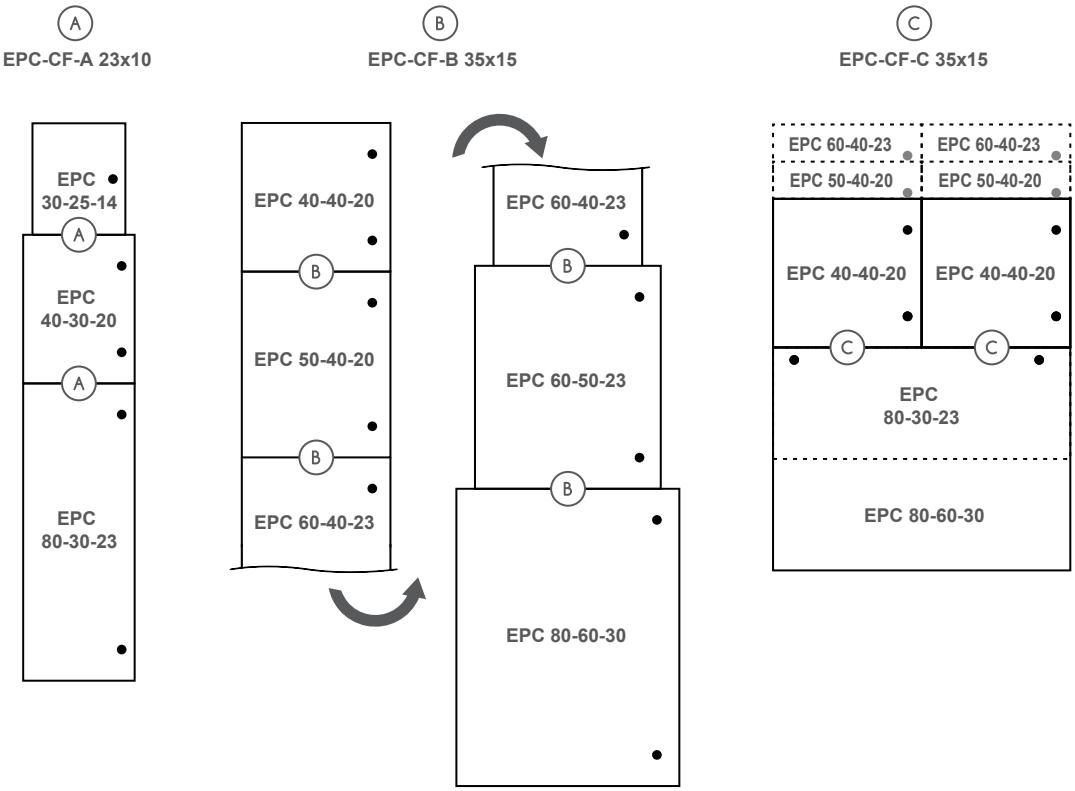
EPC-CF-B 35x15



EPC-CF-C 35x15



Possibilities to connect EPC-CF

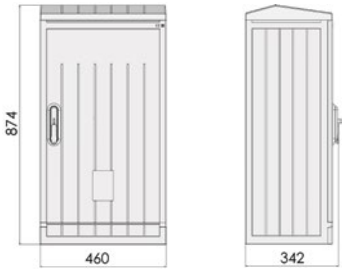


Free-standing cable distribution cabinets

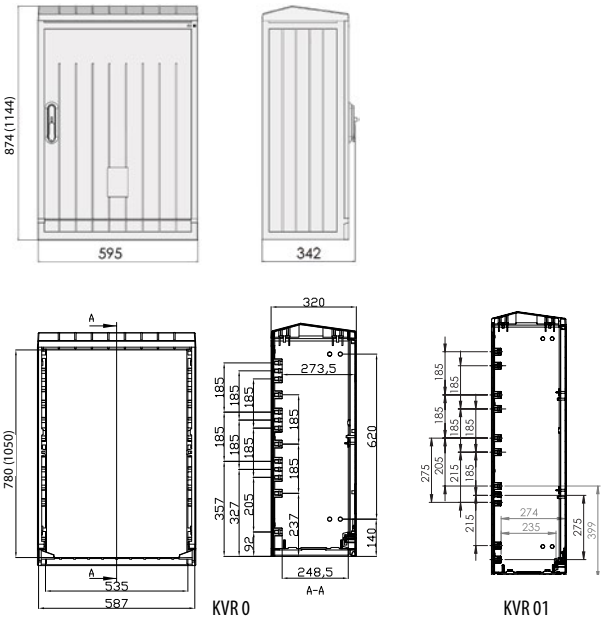
Electrical parameters	
Rated operational voltage Un	400V
Rated insulation voltage Ui	690V
Flamability category	V0
Degree of protection against external mechanical impacts	IK 10
Protection degree	IP44
Protection class	II
Operating temparature	-25°C ... 40°C

Dimensions

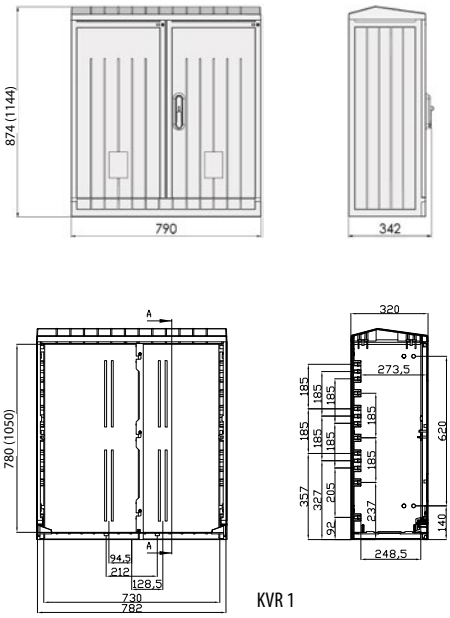
KVR 00



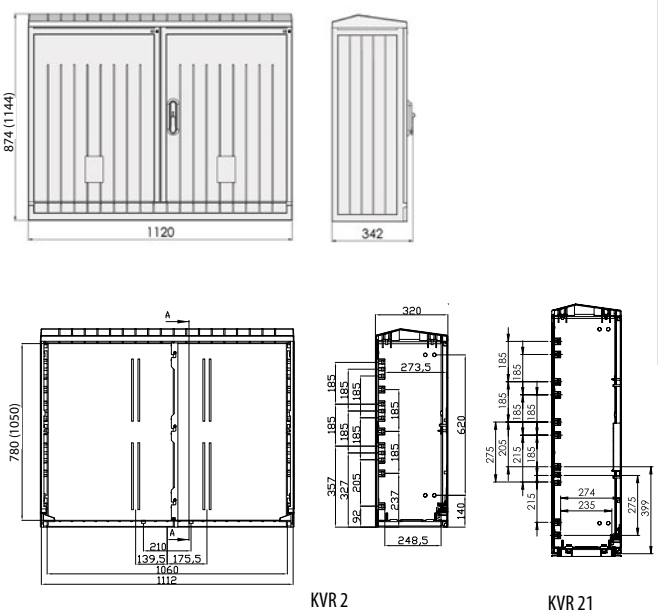
KVR 0 (KVR 01)

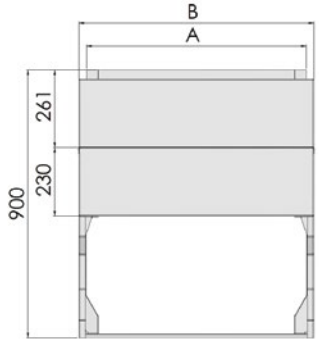


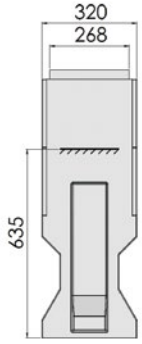
KVR 1 (KVR 11)



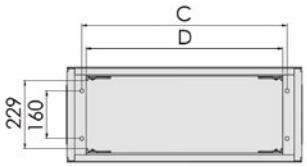
KVR 2 (KVR 21)

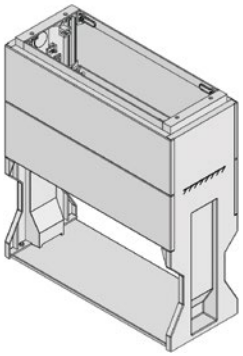


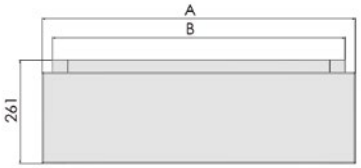


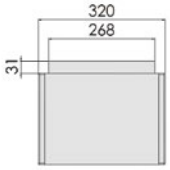


[mm]	A	B	C	D
KVR-P 00	408	460	360	332
KVR-P 0	543	595	495	467
KVR-P 1	738	790	690	662
KVR-P 2	1068	1120	1020	992

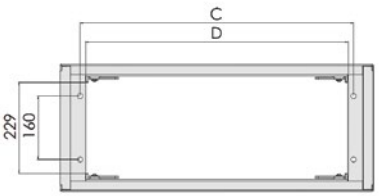


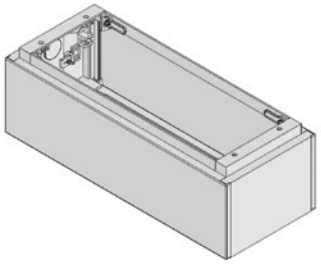


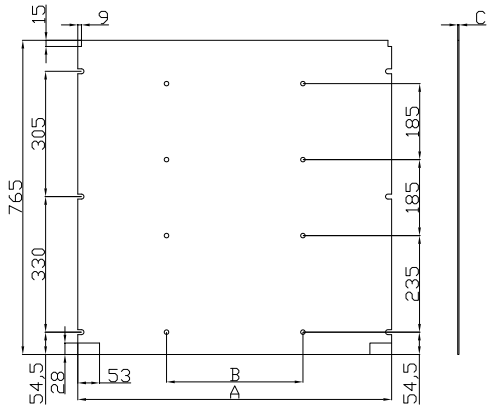


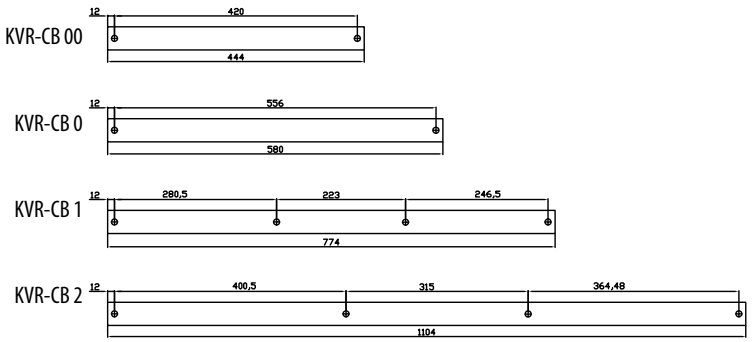


[mm]	A	B	C	D
KVR-PE 00	460	408	360	332
KVR-PE 0	595	543	495	467
KVR-PE 1	790	738	690	662
KVR-PE 2	1120	1068	1020	992

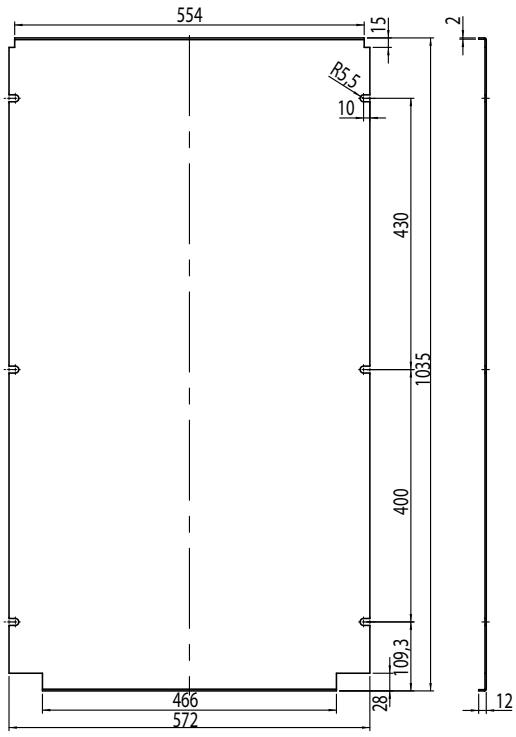




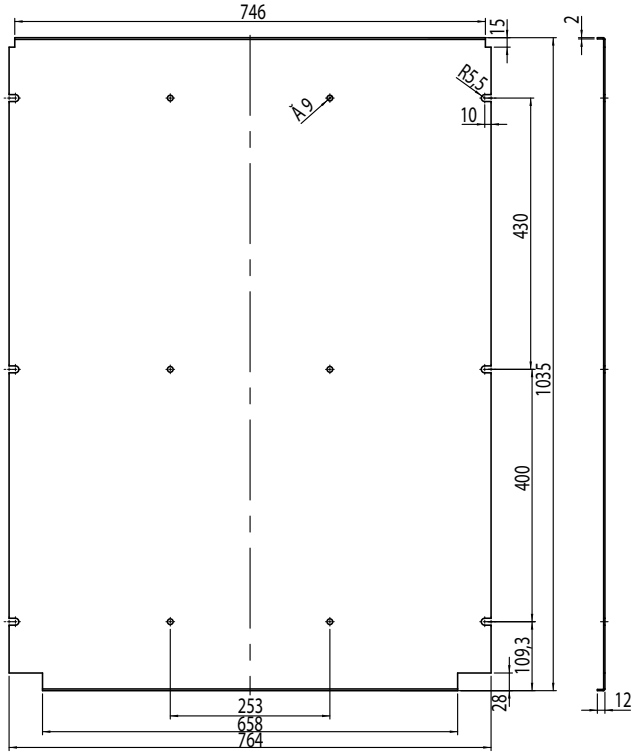




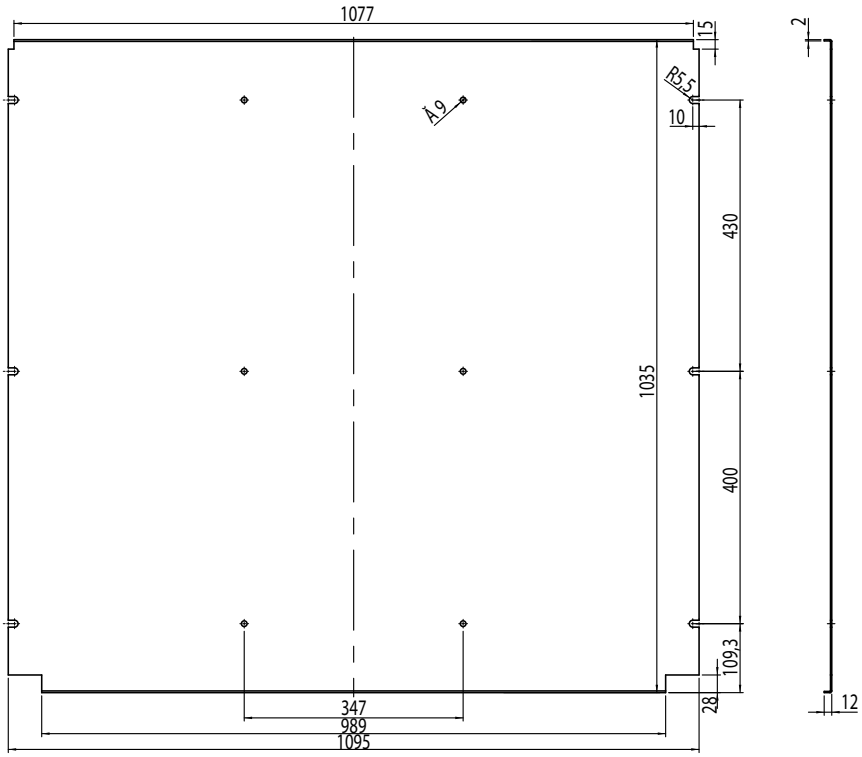
[mm]	A	B	C
KVR-MP 00	435	-	2
KVR-MP 0	572	-	2
KVR-MP 1	764	300	2
KVR-MP 2	1095	400	2



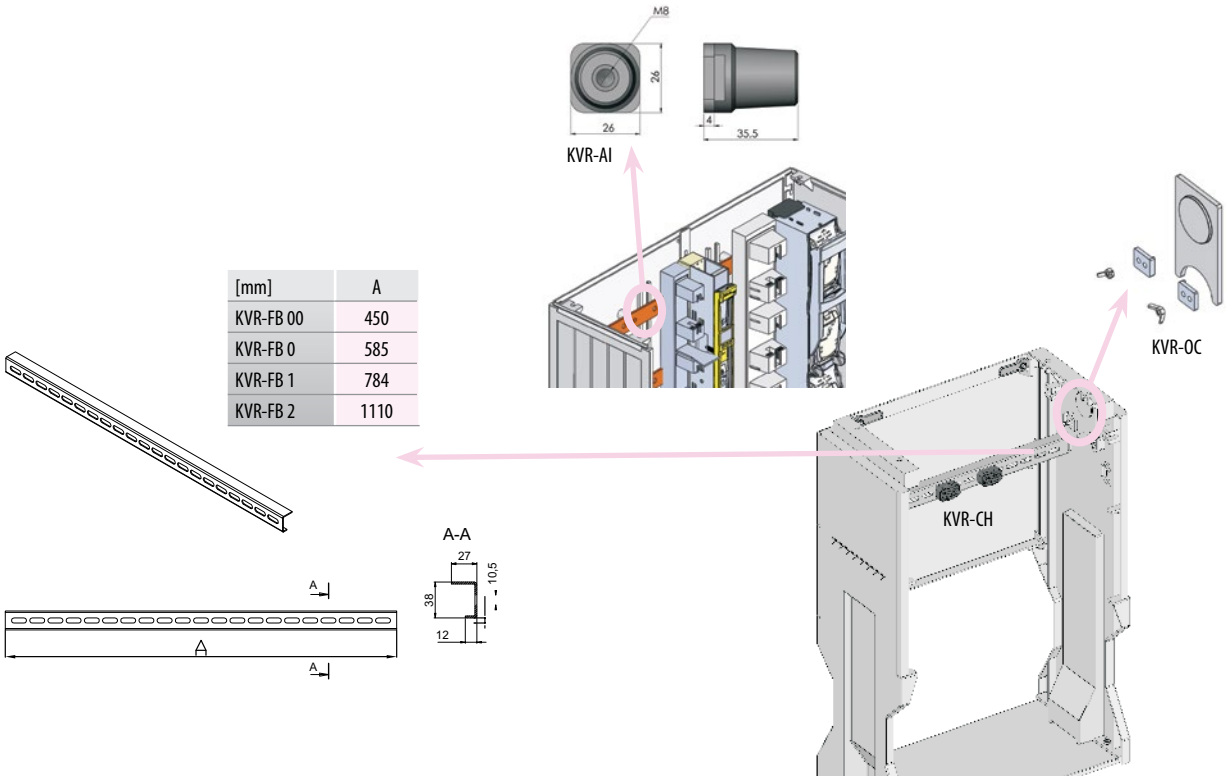
MP01



MP11

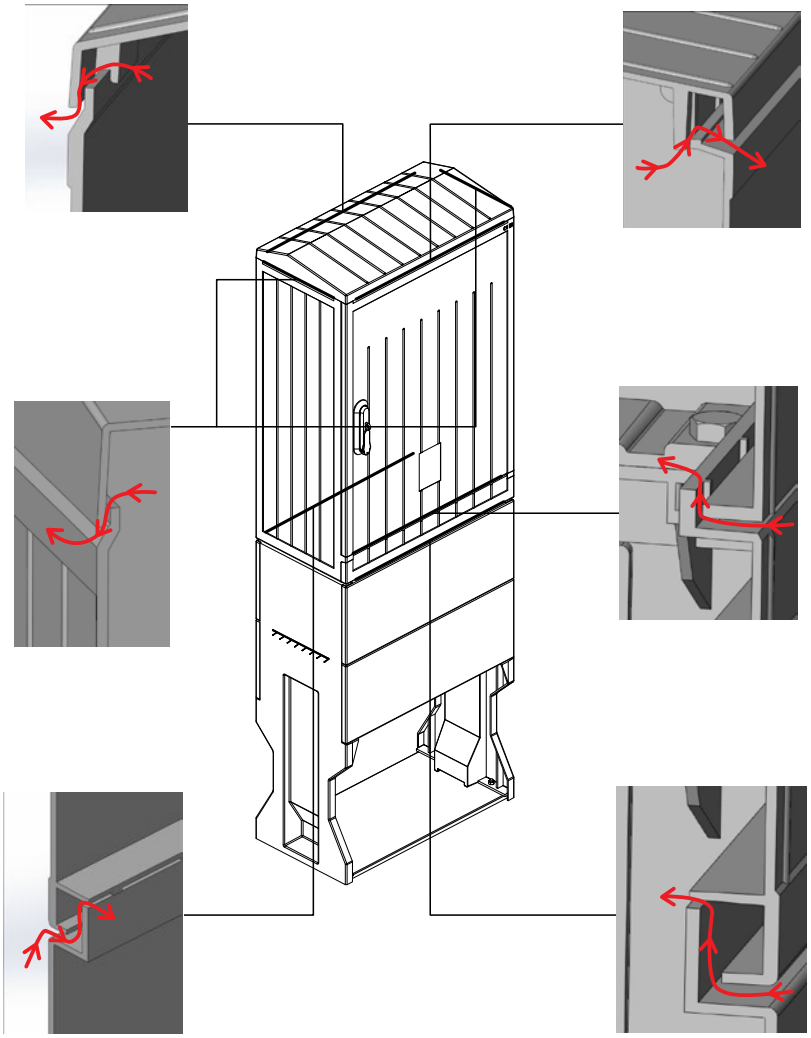


MP21



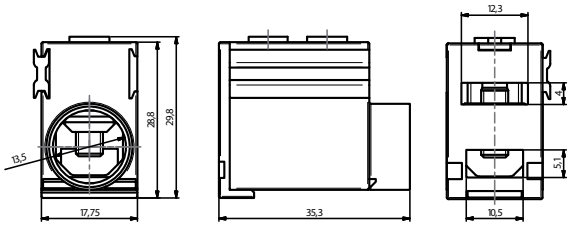
[mm]	A
KVR-FB 00	450
KVR-FB 0	585
KVR-FB 1	784
KVR-FB 2	1110

Enclosure ventilation



Accessories

Terminal for protective conductors			
type	length [m]	supply [mm²]	outlet [mm²]
2/6	0,056	2 x 22	6 x 14
2/8	0,086	2 x 22	8 x 14
2/12	0,092	2 x 22	12 x 14
2/18	0,128	2 x 22	18 x 14



Technical data - Section rails for ETIMAT P10			
Cross section	10 mm²	16 mm²	25 mm²
Feeding at beginning/ending			
Max. current Is/Phase	63	80	100
Cross section of connection, mm²	10	16	25
Feeding in the middle			
Max. current Ie/Phase	100	130	170
Cross section of connection, mm²	25	35	2x25
Heat deflection temperature PVC	80°C flame resistant		
Comparative tracking index PVC	300V		
Standards	EN 60947-1:2007/ IEC 60947-1:2007		
Climate stability	DIN EN 60068		
Insulation coordination	Degree of pollution 2		
Electrical data			
Impulse voltage strength	≥4,5 kV		
Min. air distance	> 5,5 mm		
Min. creeping distance	> 5 mm		
Max. operating voltage	690 V AC/DC		
Protection class	IP20		
Short circuit rating	ICC 15kA NH 250A gL 500V		
Dielectric strenght	≥ 32 kV/mm		
Material			
	Material	Surface	
Busbar	Copper	plain	
Insulation	PVC lead-free	grey RAL 7035	
Endcover	moulded		

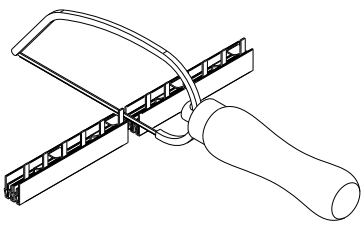
Ampacity at 35 °C ambient temperature depending of feeding point

ATTENTION: To prevent electrical shock, disconnect from power source before installing or servicing.

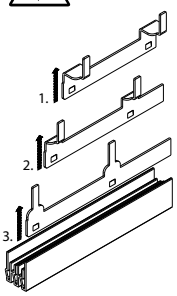
Danger Installation by electricians only

Due to security purposes all shortened busbars need to be covered with suitable endcovers.

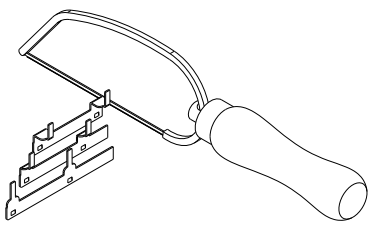
1. Cut



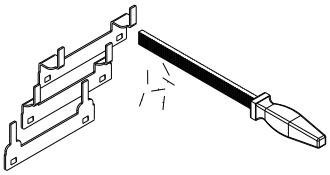
2.



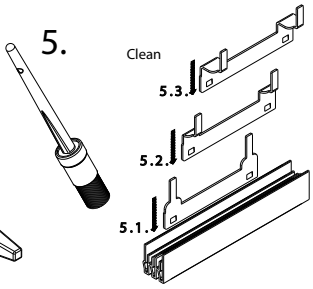
3. Cut back copper



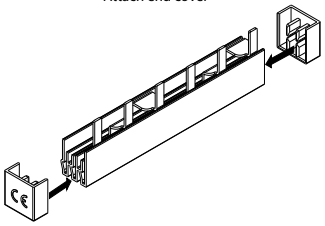
4. Burr



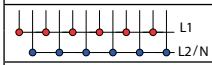
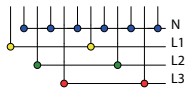
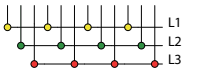
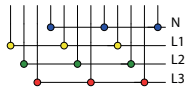
5. Clean

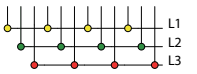


6. Attach end cover

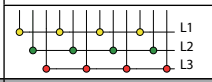


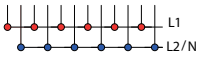
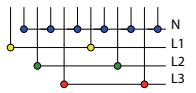
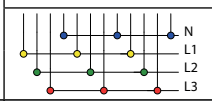
Selection of wiring harness depending on the equipment type

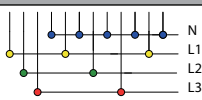
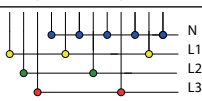
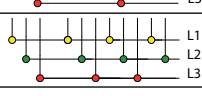
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Fork (FORK type) 10mm² (63A)	12mm² (80A)	16mm² (100A)
MCBs and modular devices (17,8 mm wide): - ST-68 (6-63A), - ETIMAT 6 (0,5-63A), - ETIMAT 10 (0,5-63A), - SV (16-125).		1P	**2** **3** **4**	0,03 0,05 0,07			**002921081** IZ16/1F/2L **002921082** IZ16/1F/3L **002921083** IZ16/1F/4L (angle)
			12	0,21	**002921143** IZ10/1F/12	**002921018** IZ12/1F/12	**002921091** IZ16/1F/12 **002921060** IZ16/1F/12L
			54	1,00	**002921142** IZ10/1F/54	**002921026** IZ12/1F/54	**002921092** IZ16/1F/54 **002921062** IZ16/1F/54L
		1P+N	**12**	0,21			**002921066** IZ16/2F/12
			54	1,00			**002921067** IZ16/2F/54
		3P+N	**12**	0,21	**002921268, 002921212** IZ10/L1NL2NL3N/12 (E)		**002921215** IZ16/L1NL2NL3N/12
			18	0,32	**002921213** IZ10/L1NL2NL3N/18		**002921216** IZ16/L1NL2NL3N/18
			54	1,00	**002921279, 002921214** IZ10/L1NL2NL3N/54 (E)		**002921217** IZ16/L1NL2NL3N/54
		3P	**9**	1,00		**002921017** IZ12/3F/9	
			12	0,21	**002921140** IZ10/3F/12	**002921020** IZ12/3F/12	**002921061** IZ16/3F/12
			18	0,32		**002921022** IZ12/3F/18	
			54	1,00	**002921141** IZ10/3F/54	**002921024** IZ12/3F/54	**002921063** IZ16/3F/54
		3P+N	**12**	0,21			**002921068** IZ16/4F/12
			56	1,00			**002921070** IZ16/4F/54

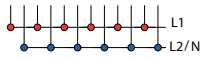
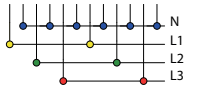
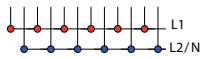
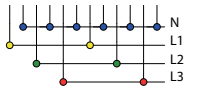
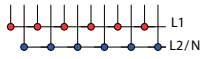
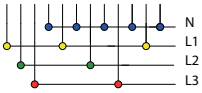
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) 10mm² (63A)	16mm² (100A)
MCBs and modular devices (17,8 mm wide): - ST-68 (6-63A), - ETIMAT 6 (0,5-63A), - ETIMAT 10 (0,5-63A), - SV (16-125).		1P	**12**	0,21	**002921100** IZS10/1F/12	**002921110** IZS16/1F/12
			54	1,00	**002921101** IZS10/1F/54	**002921111** IZS16/1F/54
		3P	**12**	0,21	**002921102** IZS10/3F/12	**002921112** IZS16/3F/12
			18	0,32		**002921113** IZS16/3F/18
			54	1,00	**002921103** IZS10/3F/54	**002921114** IZS16/3F/54

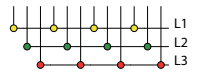
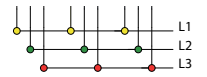
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) 25mm² (100A)	35mm² (125A)
MCBs and modular devices (17,8 mm wide): - ST-68 (6-63A), - ETIMAT 6 (0,5-63A), - ETIMAT 10 (0,5-63A), - ETIMAT 10 DC (0,5-63A), - SV (16-125).		1P	**57**	1,01	**002921290** IZS25/1F/57 (angle 600V AC/1000V DC)	**002921291** IZS35/1F/57 (angle 600V AC/1500V DC)

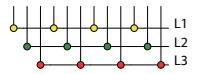
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) 16mm² (80A/130A)	50mm² (160A/250A)
MCBs (27 mm wide): - ETIMAT 10 (80-125A).		1P	**37**	0,98	**002921250** IZ16/1F/37 (angle)	**002921251** IZ50/1F/37 (angle)
		3P	**39**	1,05	**002921254** IZ16/3F/39	**002921255** IZ50/3F/39

Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Fork (FORK type) 10mm² (63A)	16mm² (100A)
RCCBs (17,8 mm wide): - EFI-P2, - EFI-P4. RCBOs (17,8 mm wide): - KZS-2M, - KZS-4M.		1P+N	**12**	0,21		**002921066** IZ16/2F/12
			54	1,00		**002921067** IZ16/2F/54
		1P+N	**12**	0,21	**002921268, 002921212** IZ10/L1NL2NL3N/12 (E)	**002921215** IZ16/L1NL2NL3N/12
			18	0,32	**002921213** IZ10/L1NL2NL3N/18	**002921216** IZ16/L1NL2NL3N/18
			54	1,00	**002921279, 002921214** IZ10/L1NL2NL3N/54 (E)	**002921217** IZ16/L1NL2NL3N/54
		3P+N	**12**	0,21		**002921068** IZ16/4F/12
			56	1,00		**002921070** IZ16/4F/54

Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Fork (FORK type) 10mm² (63A)
Combination EFI-P4 - 1 pc + ETIMAT 6 1P+N-4 pcs (or KZS-2M- 4 pcs).		3P+N	**12**	0,21	**002921275** IZ10/L1L2L3N-L1NL2NL3N
Combination EFI-P4 - 1 pc + KZS-1M - 8 pcs (bottom connection).		3P+N	**12**	0,21	**002921276** IZ10/L1L2L3N-L1/NL2/NL3/N
Combination EFI-P4 - 1 pc + ETIMAT 6, 10 1P - 8 pcs.		3P+N	**12**	0,21	**002921277** IZ10/L1L2L3_L1L2L3

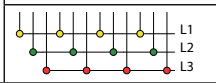
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **10**mm² (**63**A)
RCBOs (17,8 mm wide): - KZS-1M SUP (top connection).		1P+N	**12**	0,22	**002921148** SKN0022/10 (1p+N)
		3P+N	**12**	0,22	**002921149** SKN0030/10 (3p+N)
RCBOs (17,8 mm wide): - KZS-1M (bottom connection).		1P+N	**12**	0,22	**002921150** SKN0021/10 (1p+N)
		3P+N	**12**	0,22	**002921154** SKN0029/10 (3p+N)
Combination EFI-P2 - 1 pc + KZS-1M - 10 pcs (bottom connection).		1P+N	**12**	0,22	**002921155** SKN0032/10 (1p+N)
Combination EFI-P4 - 1 pc + KZS-1M - 10 pcs (bottom connection).		3P+N	**12**	0,25	**002921156** SKN0034/10 (3p+N)

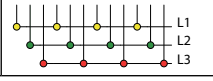
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Fork (FORK type) **10**mm² (**63**A)	**16**mm² (**100**A)
Motor protective circuit breakers: - MS25, - MPE25 (up to 40A).		3P	**6**	0,09	**002921298** IZM 45-2	
			9	0,13	**002921299** IZM 45-3	
			12	0,18	**002921300** IZM 45-4 **002921130** IZM10/3F/4xMPE	**002921132** IZM16/3F/4xMPE
			15	0,22	**002921301** IZM 45-5	
			60	1,00	**002921131** IZM10/3F/20xMPE	**002921133** IZM16/3F/20xMPE
Motor protective circuit breakers: - MS25 + BC, - MPE25 (up to 40A) + BC, - MSP0 (up to 25A, (without accessories).		3P	**6**	0,10	**002921302** IZM 54-2	
			9	0,15	**002921303** IZM 54-3	
			12	0,21	**002921304** IZM 54-4	
			15	0,22	**002921305** IZM 54-5	

Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **10**mm² (**63**A)	**16**mm² (**100**A)
Fuse-switch disconnectors (17,8 mm wide): - EFD8, PCF 8, - EFD10, PCF 10.		1P	**12**	0,21	**002921100** IZS10/1F/12	**002921110** IZS16/1F/12
			54	1,00	**002921101** IZS10/1F/54	**002921111** IZS16/1F/54
		3P	**12**	0,21	**002921102** IZS10/3F/12	**002921112** IZS16/3F/12
			54	1,00	**002921103** IZS10/3F/54	**002921113** IZS16/3F/54

Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **25**mm² (**100**A)	**35**mm² (**125**A)
Fuse-switch disconnectors, fuse holders (17,8 mm wide): - EFD8, PCF 8, - EFD10, EFH 10 1000V DC.		1P	**57**	1,01	**002921290** IZS25/1F/57 (angle 600V AC/1000V DC)	**002921291** IZS35/1F/57 (angle 600V AC/1500V DC)

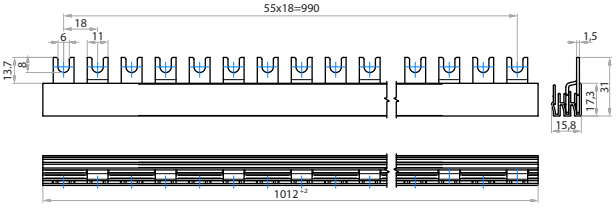
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **35**mm² (**125**A)
Fuse holders: - EFH 10/14 1500V DC.		1P	**46**	1,02	**002921292** IZS 35/1F/16 (angle 600V AC/1500V DC)

Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **16**mm² (**80**A/**130**A)	**50**mm² (**160**A/**250**A)
Fuse-switch disconnectors, fuse holders (27 mm wide): - EFD 14, EFH 14 1000V DC, - PFB D01, PFB D02.		1P	**37**	0,98	**002921250** IZ16/1F/37 (angle) **002921121** IZ16/1F/36V (angle 1000V DC)	**002921251** IZ50/1F/37 (angle)
		3P	**39**	1,05	**002921254** IZ16/3F/39	**002921255** IZ50/3F/39

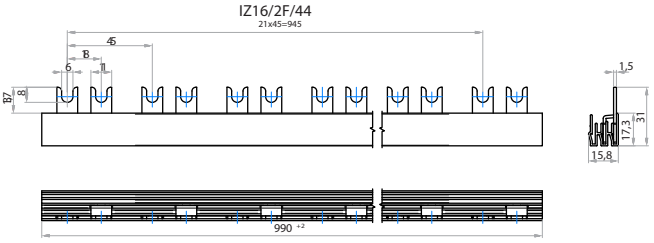
Type of equipment	Wiring diagram	Type	No. of modules	Length [m]	Pin (PIN type) **16**mm² (**80**A/**130**A)	**50**mm² (**160**A/**250**A)
Fuse-switch disconnectors (35,6 mm wide): - EFD 22.		1P	**28**	0,98	**002921260** IZ16/1F/28 (angle)	**002921261** IZ50/1F/28 (angle)
		3P	**30**	1,05	**002921264** IZ16/3F/30	**002921265** IZ50/3F/30

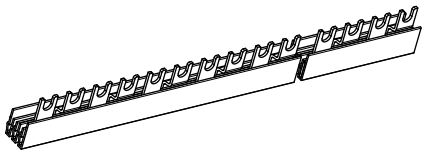
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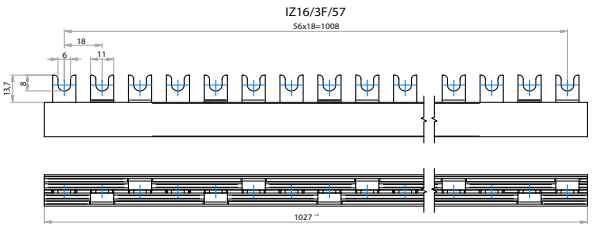


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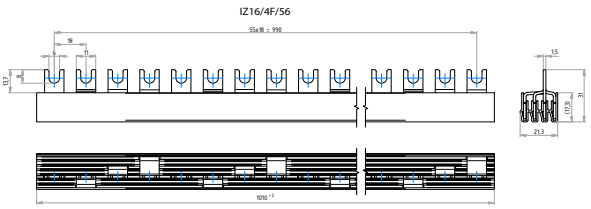


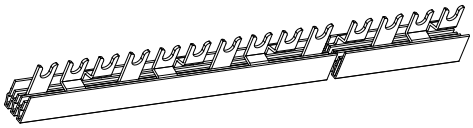


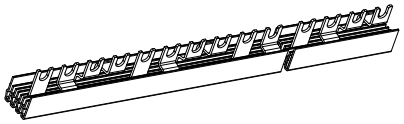
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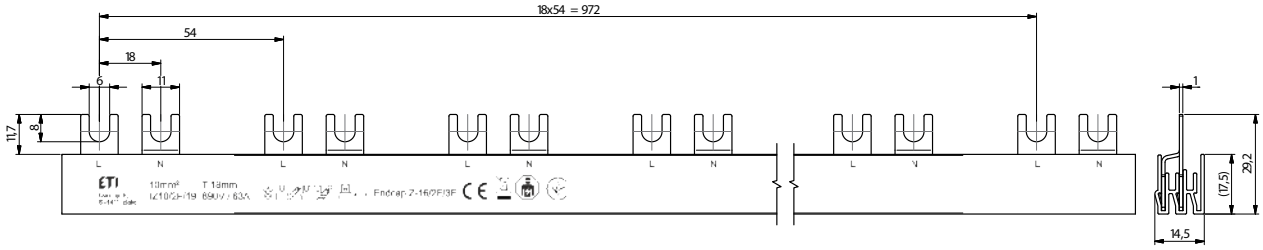


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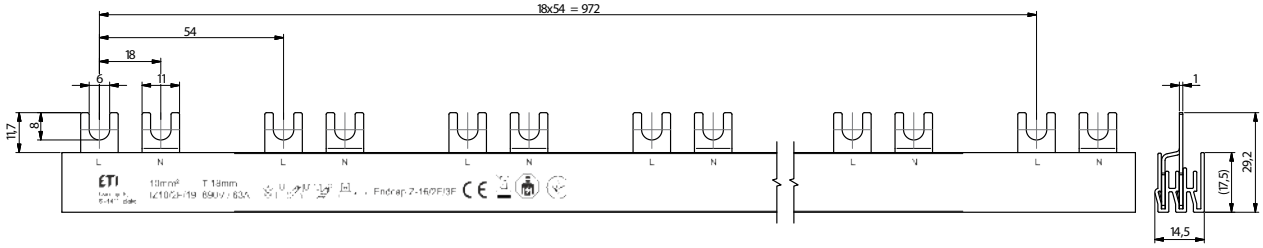




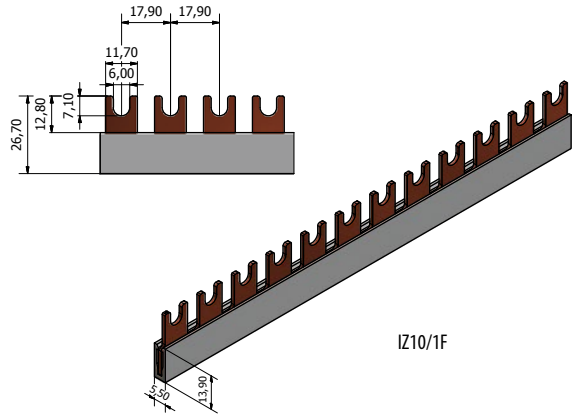




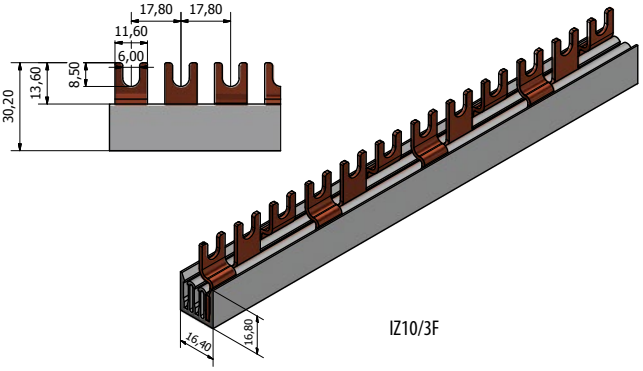
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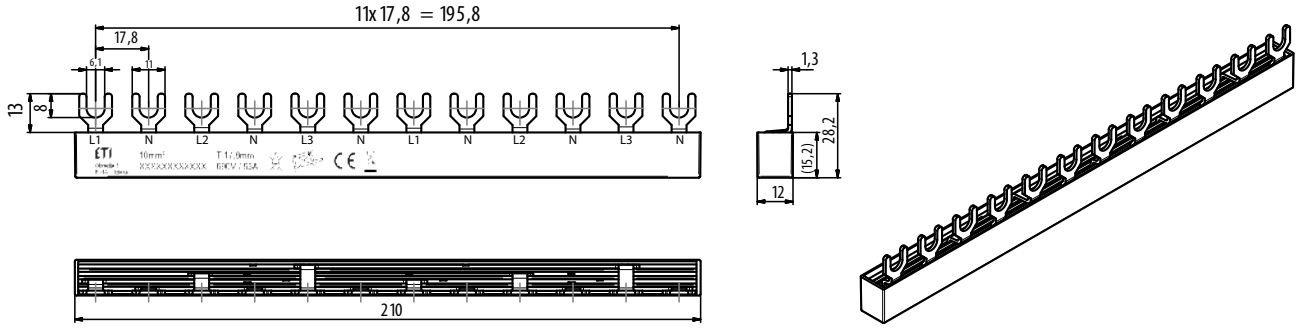
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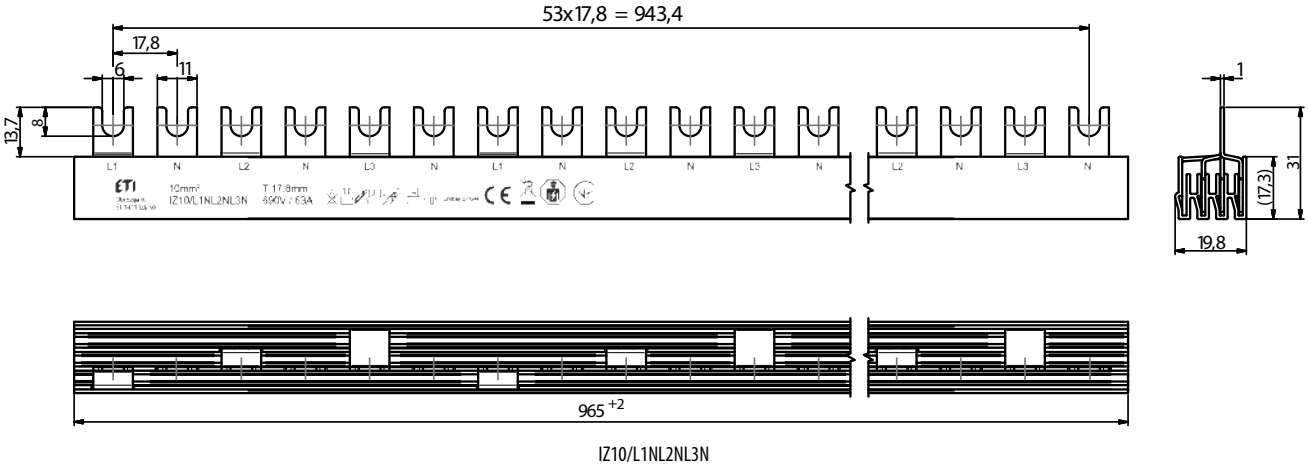
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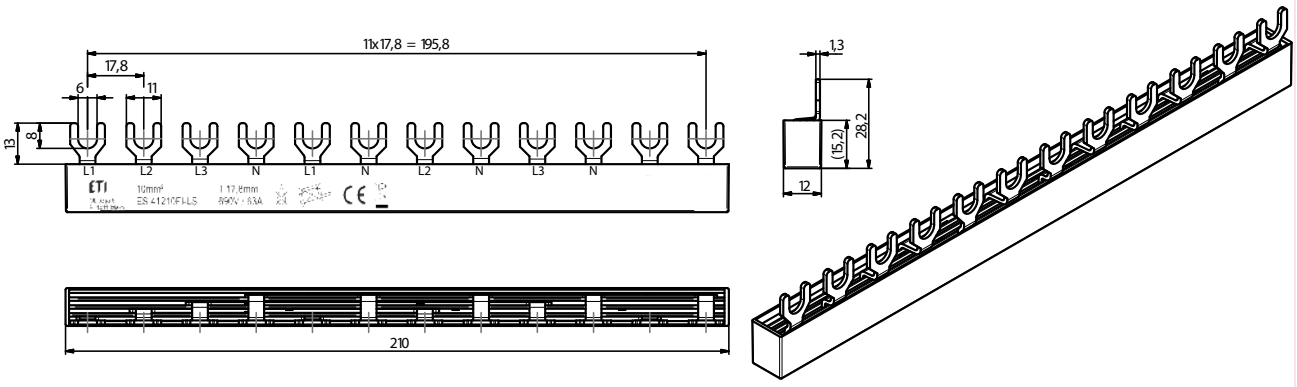
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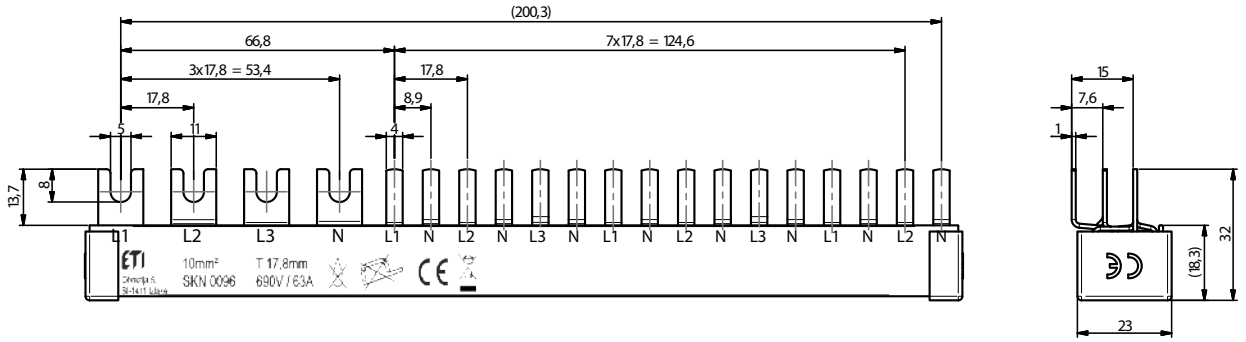
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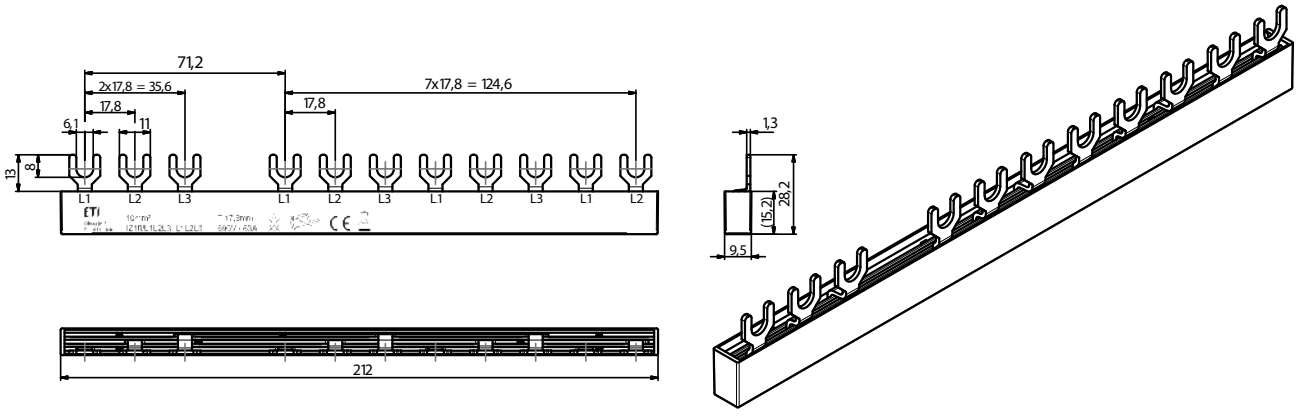
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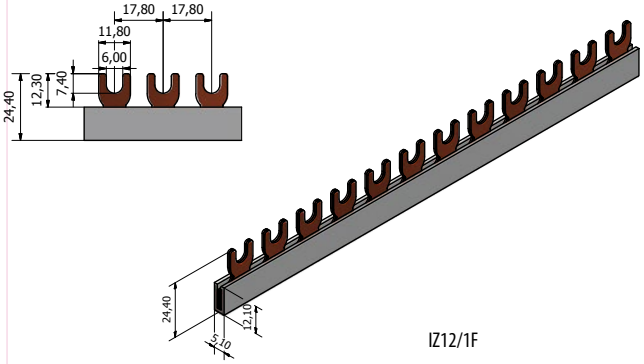
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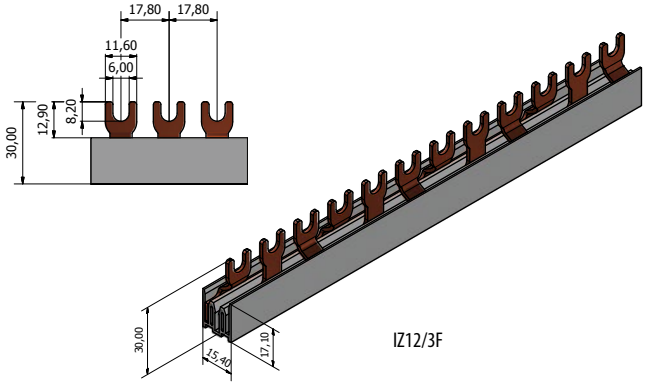
IZ10/L1L2L3NL1/NL2/NL3/N



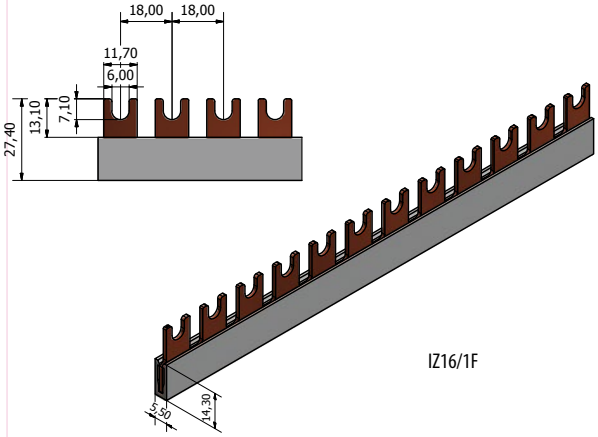
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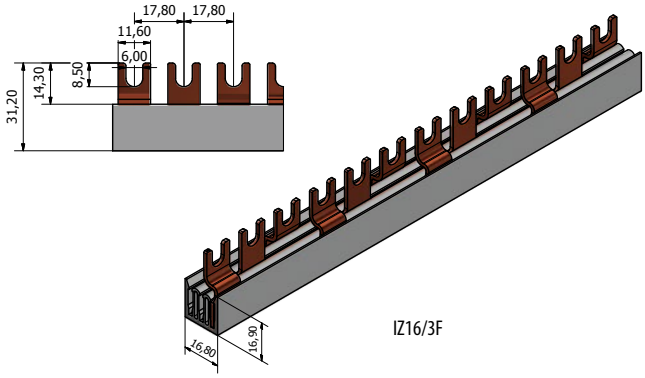
IZ12/1F



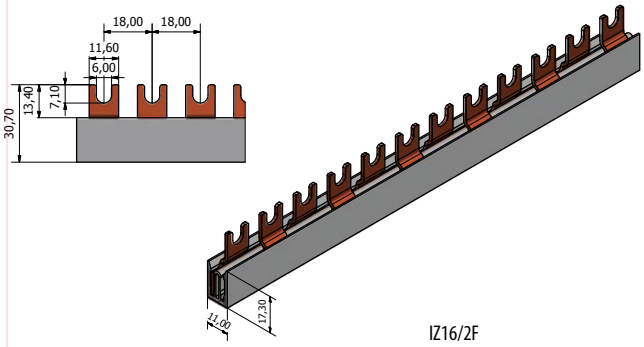
IZ12/3F



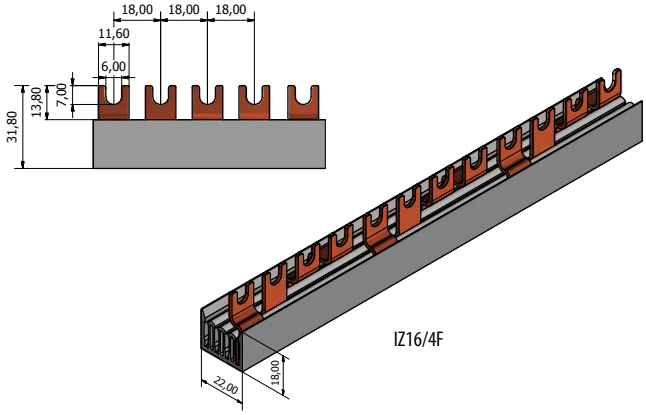
IZ16/1F



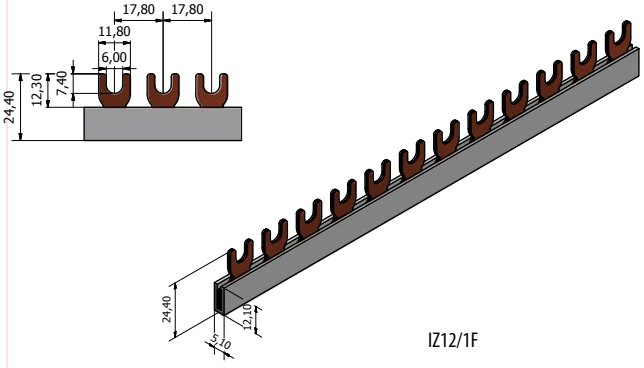
IZ16/3F



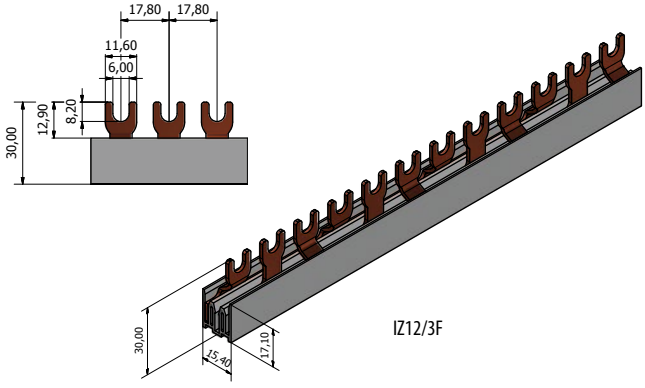
IZ16/2F



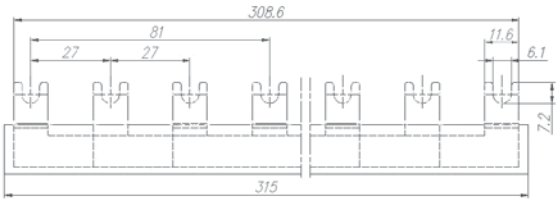
IZ16/4F



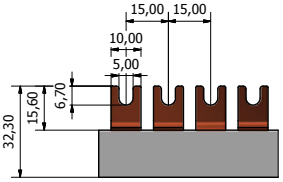
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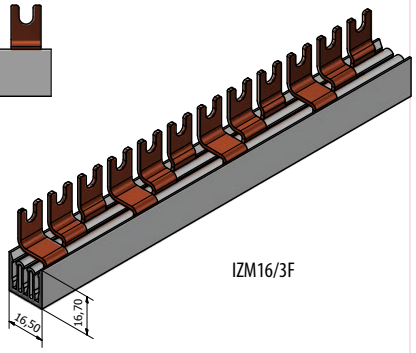


IZ12/3F

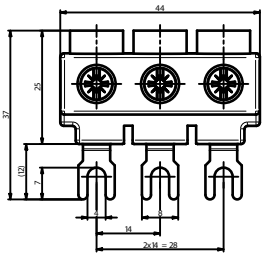


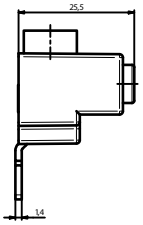
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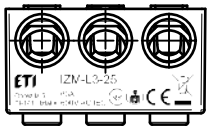




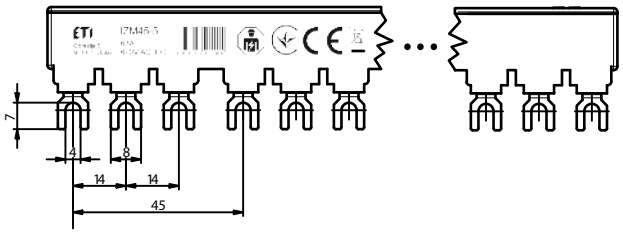
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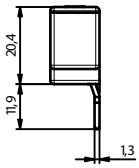


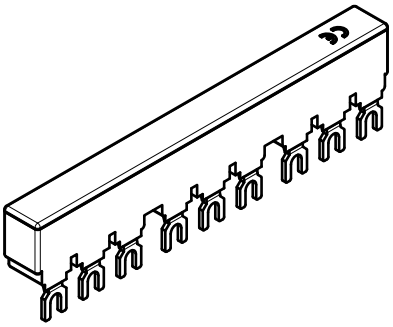




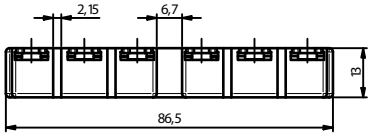
IZM-L3-25



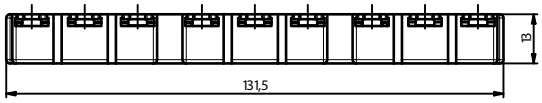




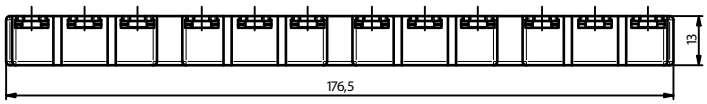
IZM45-2



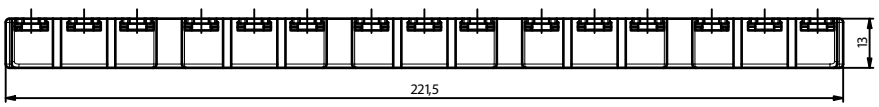
IZM45-3

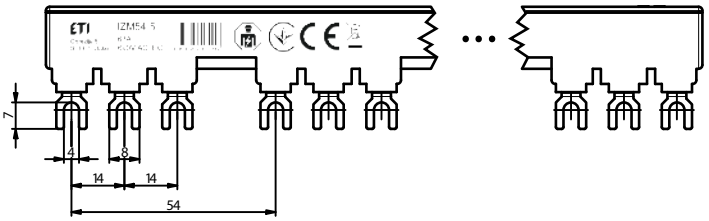


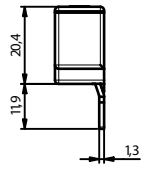
IZM45-4

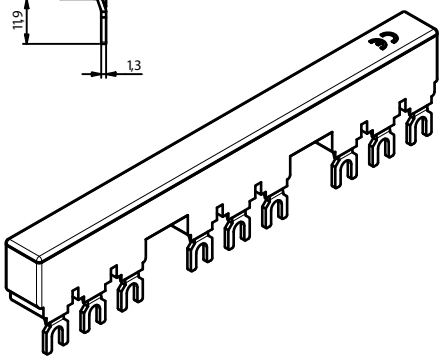


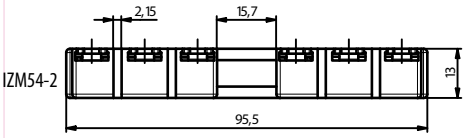
IZM45-5

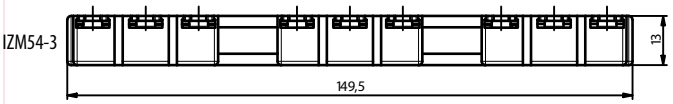


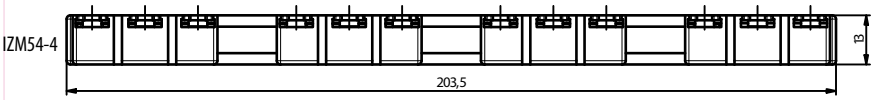

7
4
8
14
14
54

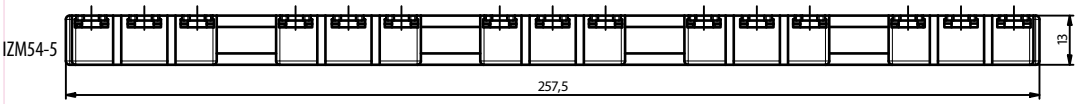

20,4
11,9
1,3

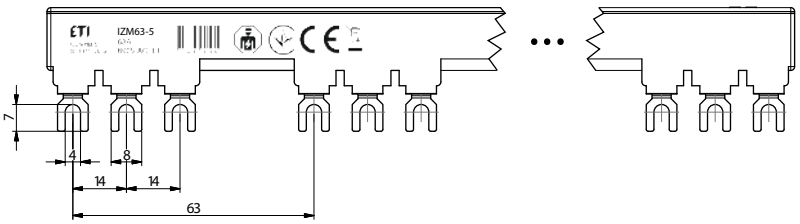


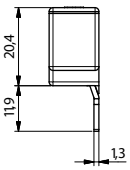

IZM54-2
2,15
15,7
13
95,5

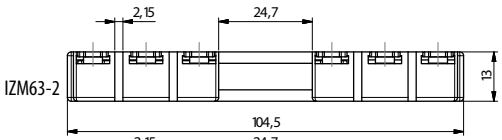

IZM54-3
13
149,5

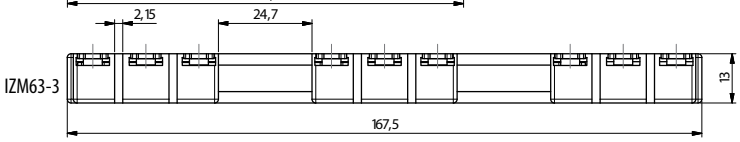

IZM54-4
13
203,5

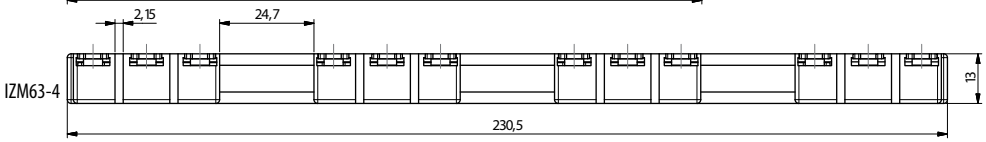

IZM54-5
13
257,5

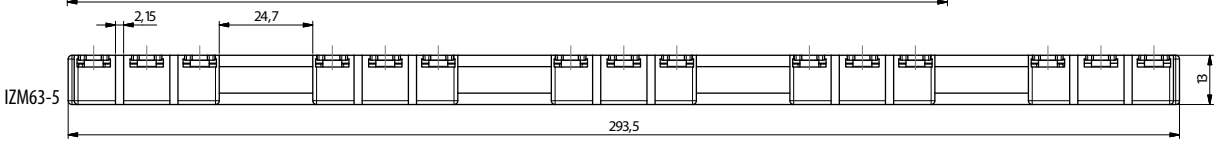

7
4
8
14
14
63


20,4
11,9
1,3


IZM63-2
2,15
24,7
13
104,5

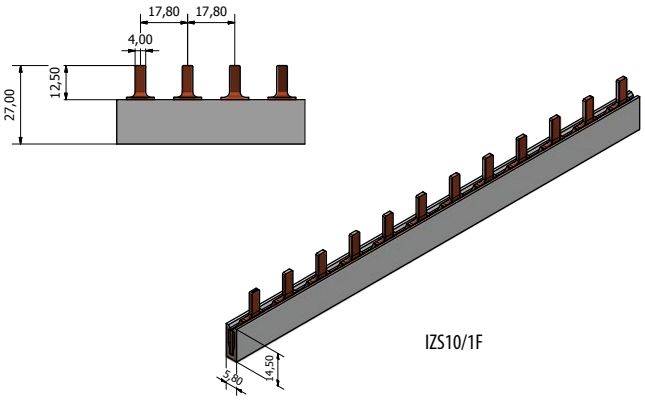

IZM63-3
2,15
24,7
13
167,5


IZM63-4
2,15
24,7
13
230,5

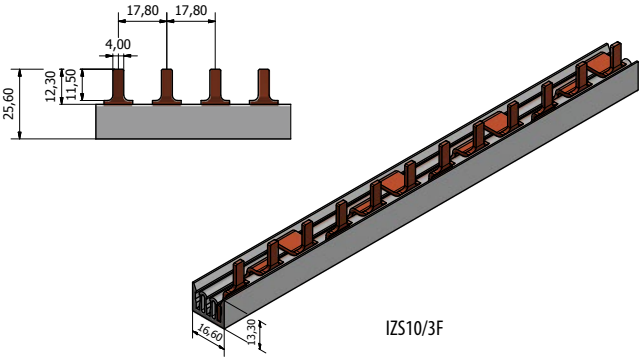

IZM63-5
2,15
24,7
13
293,5

IZ-S rails	
Nominal voltage	max. 500V
Dielectric strength	2,5 kV
Insulating resistance	> 5 MΩ (DIN 53482)
Temperature range	-20°C ... + 50°C
Glow wire test	850°C (IEC 695-2-1)
Self-extinguishing	V-0
Standards	EN 60947-7-1

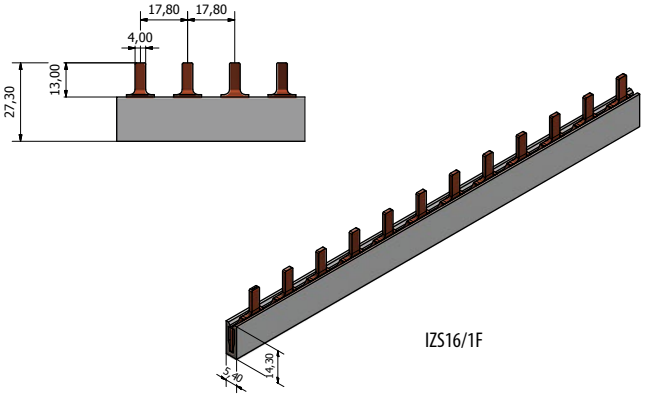
cross section	Rated current (A)
10 mm^2	63
12 mm^2	80
16 mm^2	100



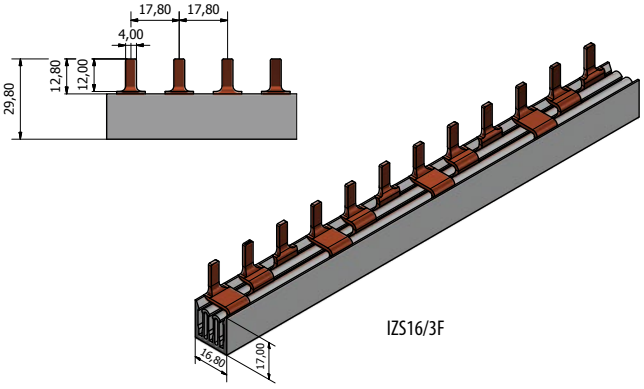
IZS10/1F



IZS10/3F

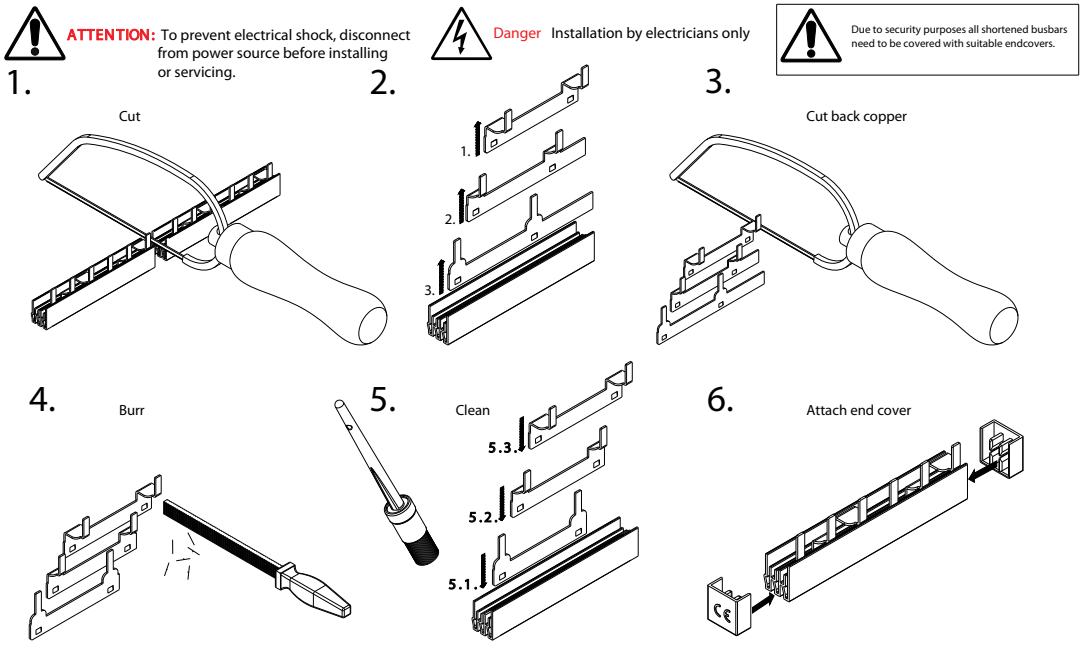


IZS16/1F

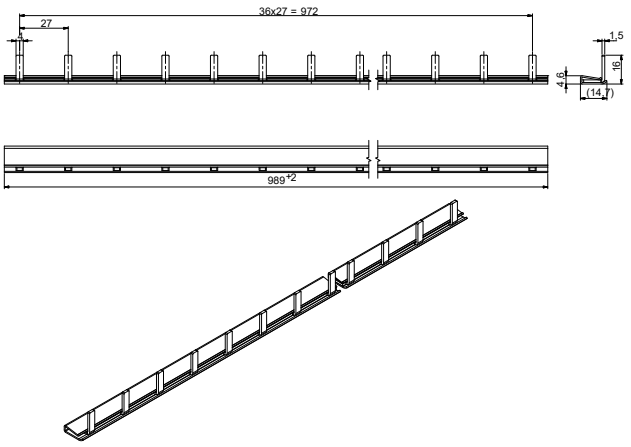


IZS16/3F

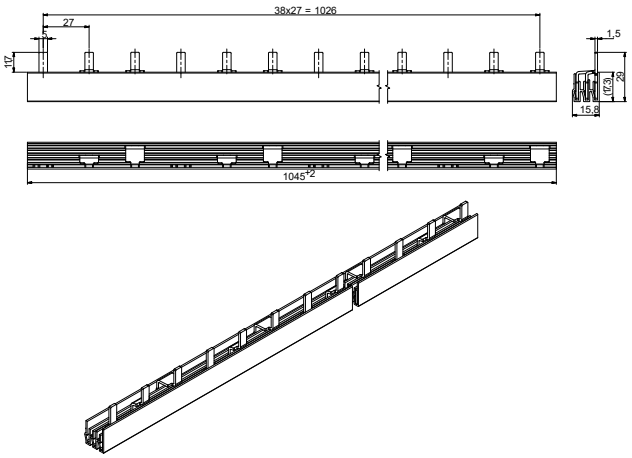
Technical data - Section rails for EFD		
Cross section	**16 mm²**	**50 mm²**
Feeding at beginning/ending		
Max. current Is/Phase	80	160
Cross section of connection, mm²	16	50
Feeding in the middle		
Max. current Ie/Phase	130	250
Cross section of connection, mm²	35	2x50
Heat deflection temperature PVC	80°C flame resistant	
Comparative tracking index PVC	300V	
Standards	EN 60947-1:2007/ IEC 60947-1:2007	
Climate stability	DIN EN 60068	
Insulation coordination	Degree of pollution 2	
Electrical data		
Impulse voltage strength	≥4,5 kV	
Min. air distance	> 5,5 mm	
Min. creeping distance	> 5 mm	
Max. operating voltage	690 V AC/DC	
Protection class	IP20	
Short circuit rating	ICC 15kA NH 250A gL 500V	
Dielectric strenght	≥ 32 kV/mm	
Material		
	Material	Surface
Busbar	Copper	plain
Insulation	PVC lead-free	grey RAL 7035
Endcover	moulded	



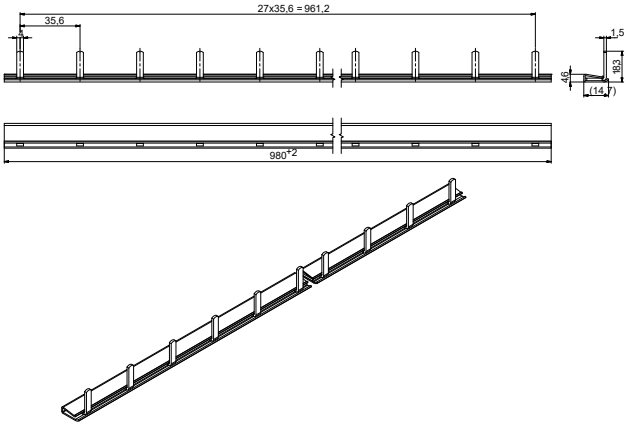
IZ16/1F/37



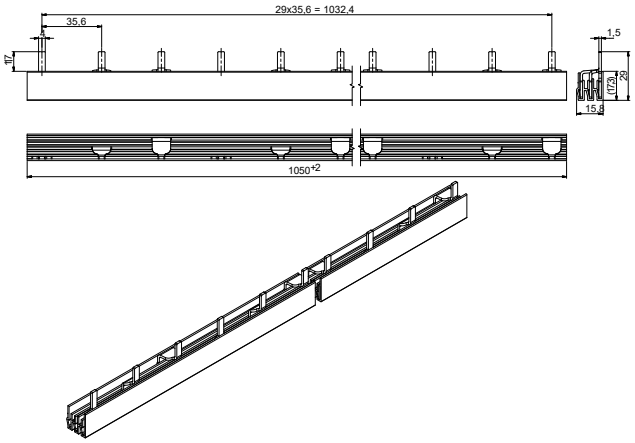
IZ16/3F/37



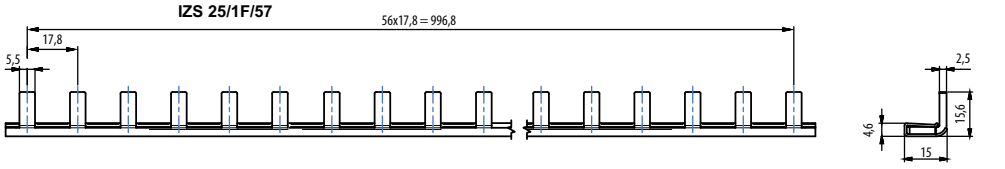
IZ16/1F/28



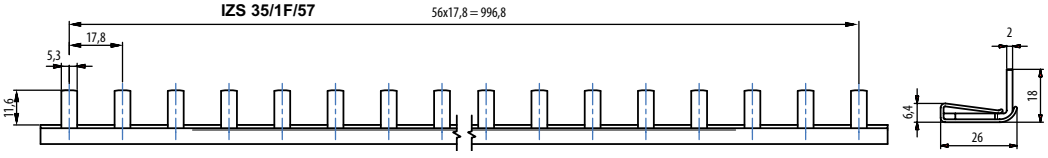
IZ16/3F/28



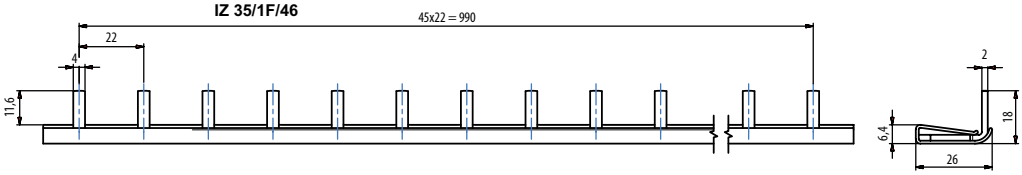
IZS 25/1F/57



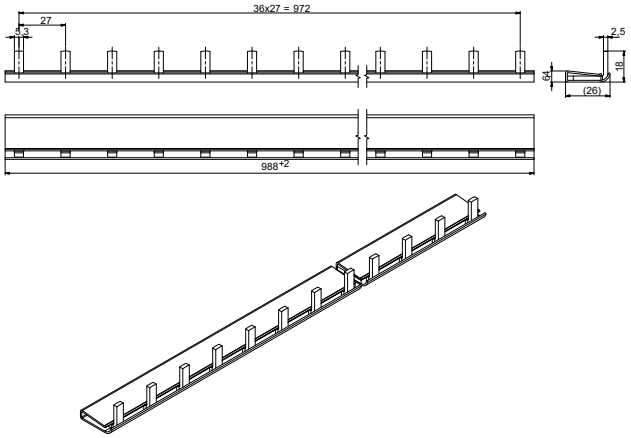
IZS 35/1F/57



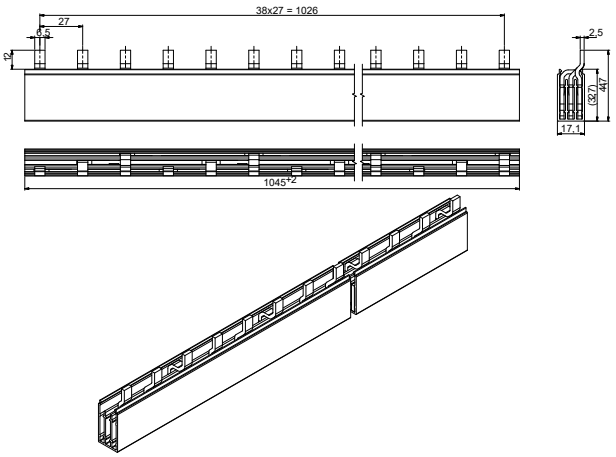
IZ 35/1F/46



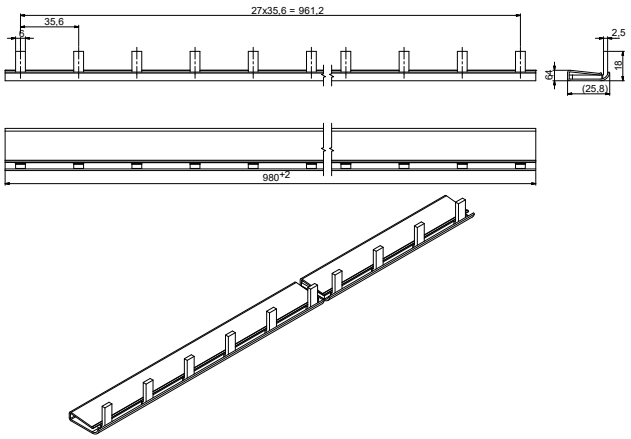
IZ50/1F/37



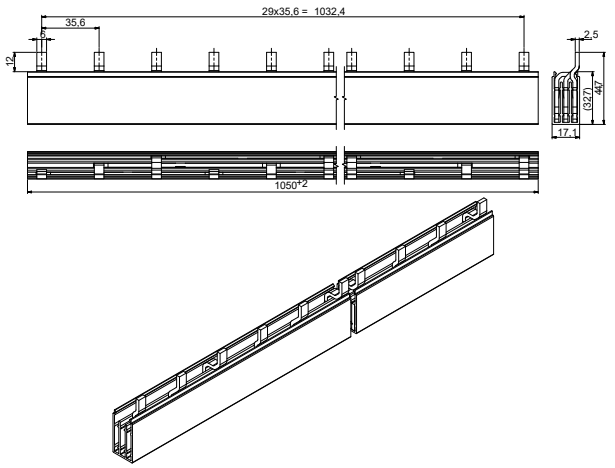
IZ50/3F/37



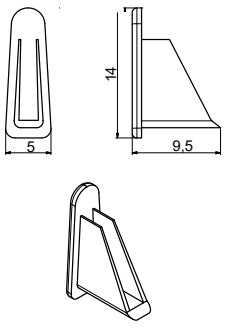
IZ50/1F/28



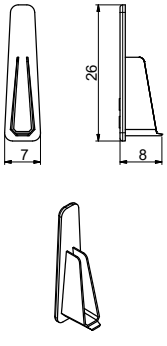
IZ50/3F/28



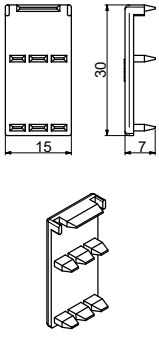
Z-16/1F/37



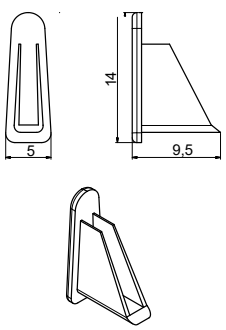
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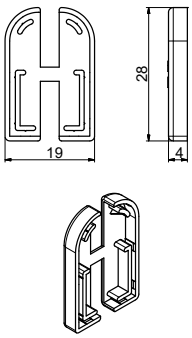
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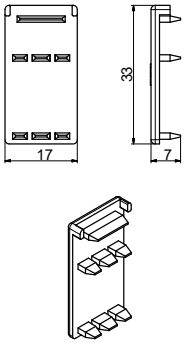
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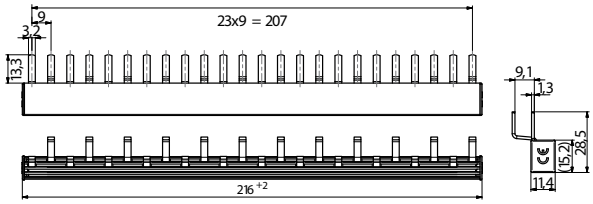


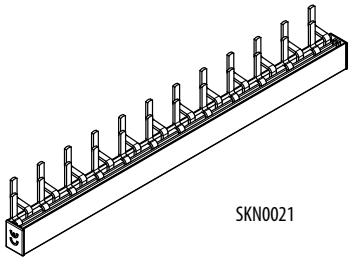
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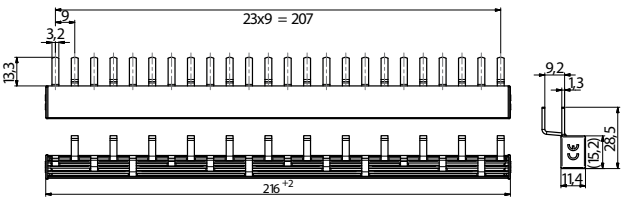
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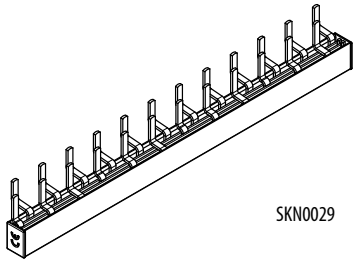




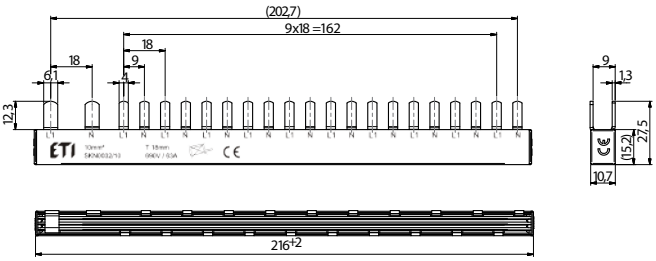


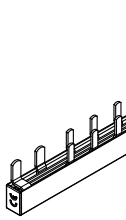
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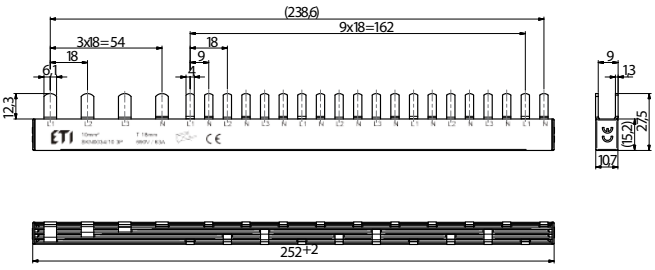


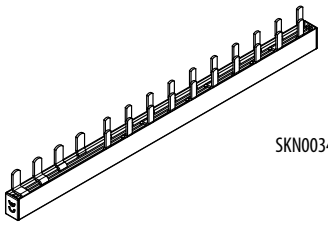
SKN0029





SKN0032



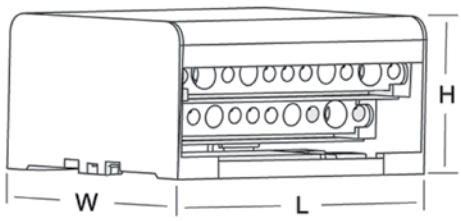


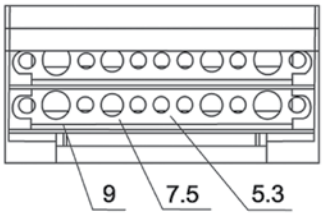
SKN0034 3P

DIN rail distribution blocks EDB

Technical data:	
Degree of protection	IP20 (with closed cover)
Short circuit withstand capability I_{cc}	20kA
Rated current	125A
In accordance with	EN 60947-1, EN 60947-7-1

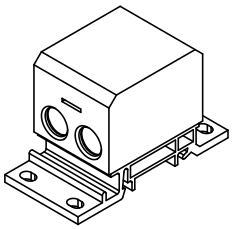
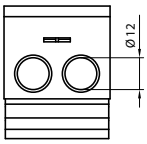
Wire cross section by terminal size		
Wire with ferrule	Wire without ferrule	Terminal size [mm]
1,5 - 6 mm²	2,5 - 6 mm²	Ø 5,3
6 - 16 mm²	10 - 25 mm²	Ø 7,5
10 - 16 mm²	10 - 35 mm²	Ø 9

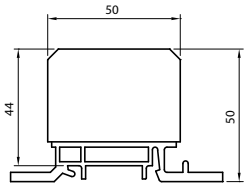


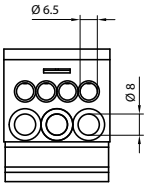


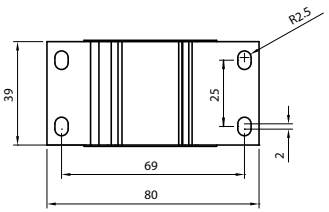
DIN rail distribution blocks EDBM, EDBS

EDBM-1, EDBM-1/N, EDBM-1/PE - 50 mm²

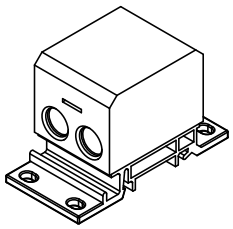
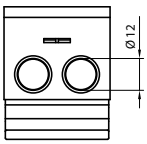



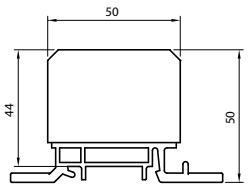


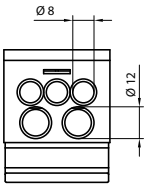


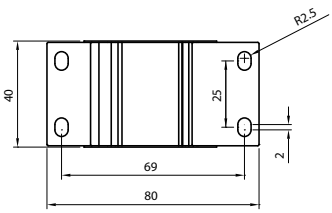


EDBM-2, EDBM-2/N, EDBM-2/PE - 50 mm²

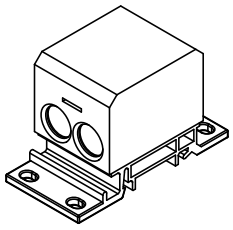
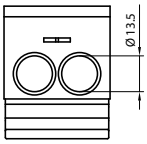



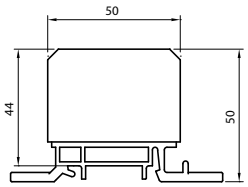


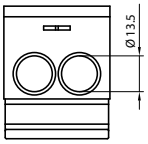


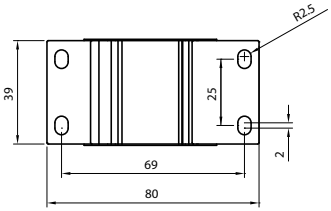


EDBM-4, EDBM-4/N, EDBM-4/PE - 70 mm²

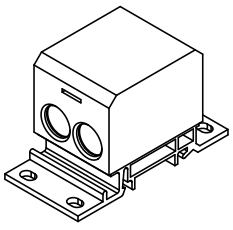
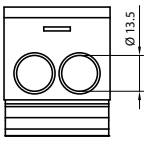



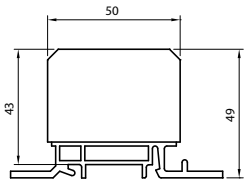


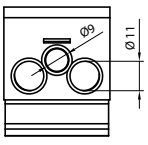


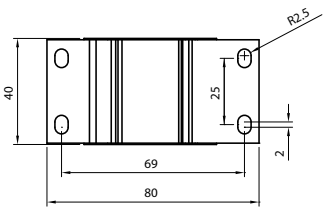


EDBM-6, EDBM-6/N, EDBM-6/PE - 70 mm²

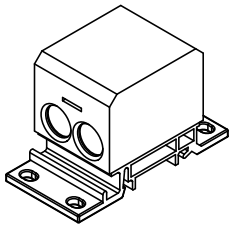
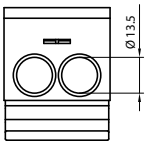



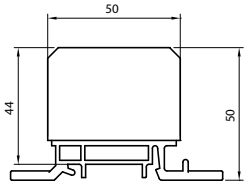


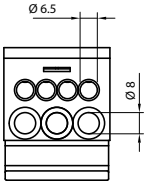


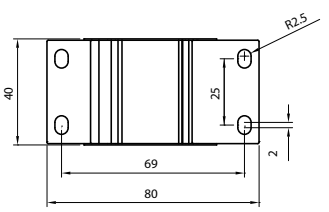


EDBM-7, EDBM-7/N, EDBM-7/PE - 70 mm²

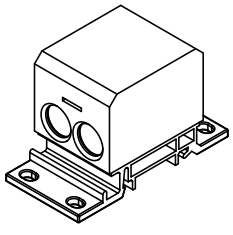
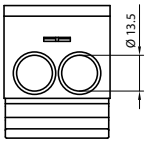



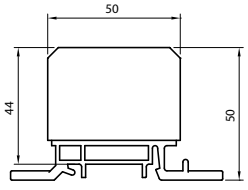


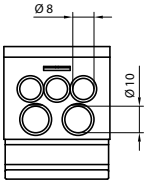


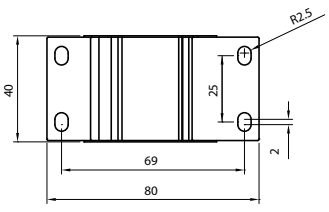


EDBM-8, EDBM-8/N, EDBM-8/PE - 70 mm²

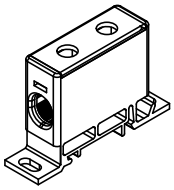
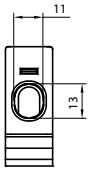



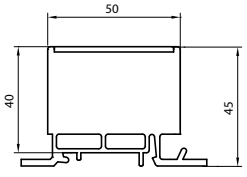


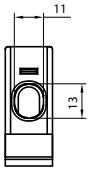


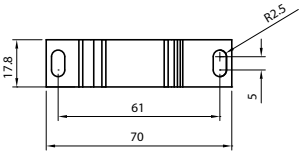


EDBS-50.., EDBS-50../N, EDBS-50../PE

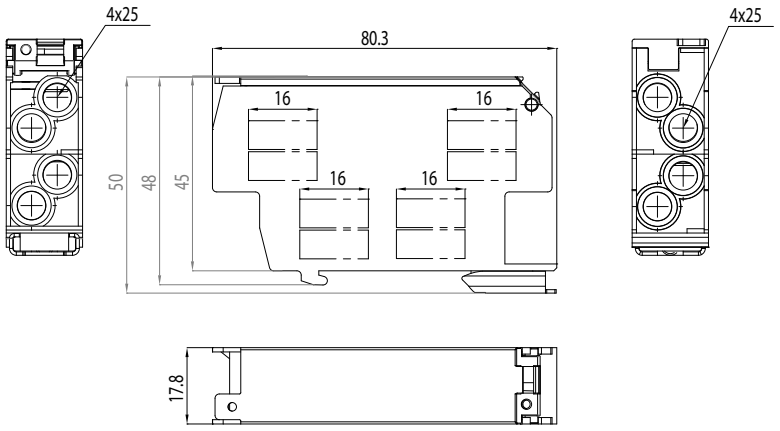





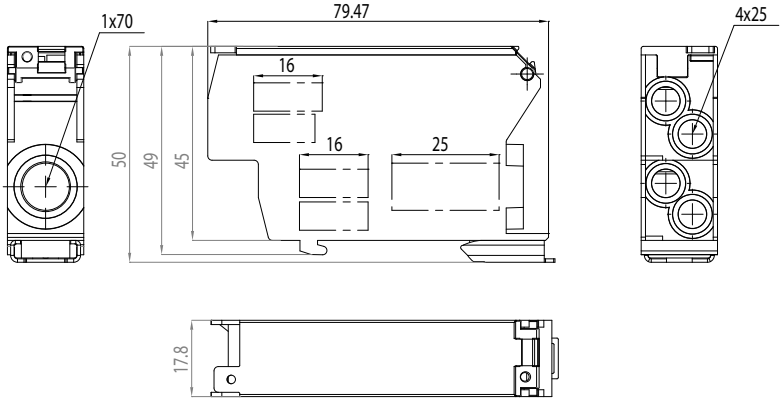




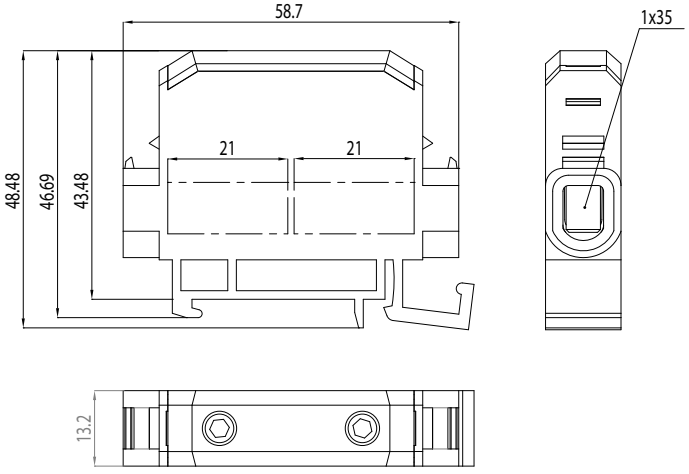
DIN rail distribution blocks EDBJ



EDBJ-4x25-4x25..



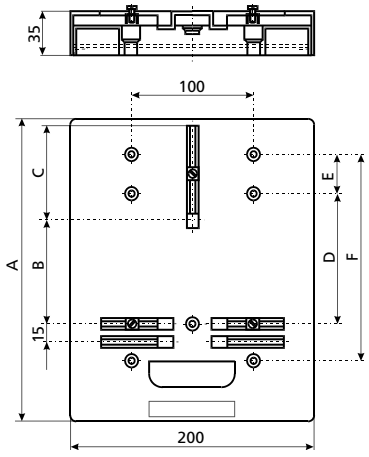
EDBJ-1x70-4x25...

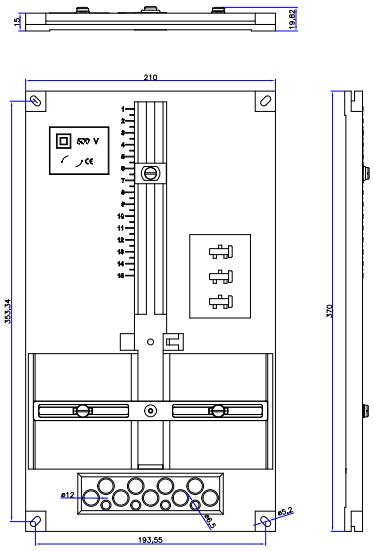


EDBJ-1x35-1x35

METER board

METER board						
type	dimension					
	A	B	C	D	E	F
MPO	250	80	85	47	63	170
VPO	370	75	170	136	50	241
MP	250	80	85	47	63	270
VP	370	75	170	136	50	241

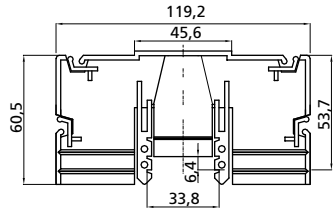




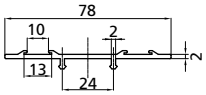
Universal board covering UPO

Technical data:	
Standard length of profile	1 m
Number of carriers per 1 m of profile	4 pcs
Distance between mounting rails	125 mm
Width of distance for built-in elements	46 + 0,5 mm

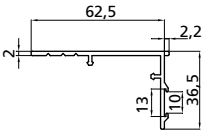
terminal plate



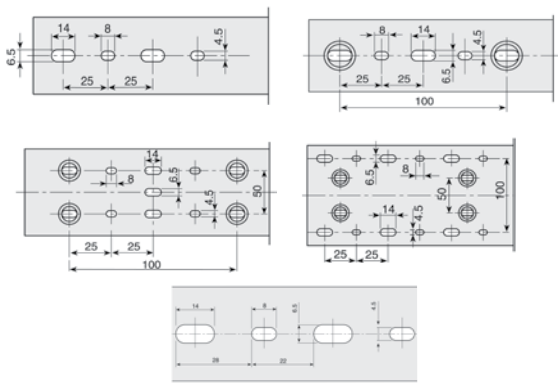
flat profile



corner profile

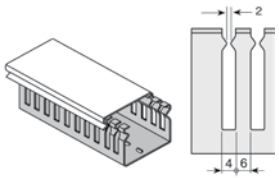


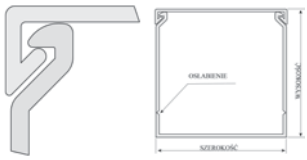
Installation channels



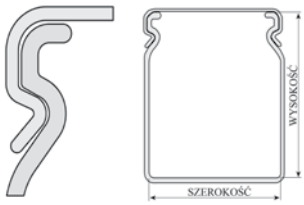
Technical data		
Material		PVC, halogen free
Dimensions	Height	15, 25, 30, 40, 60, 80, 100, 125, 150
	Width	15, 25, 40, 60, 80, 100
Length		2 m
Colour		RAL 7030
Tensile strength		390 kg/cm2
Dielectric strength		36 kV/ mm
Installation temperature		< 70 °C
Electrical resistance		6,1 x 10^{14} Ω/cm
Flammability		UL 94 VO
Halogen free		IEC 60754-2
Directive		RoHS
Marking		CE

Side perforation





Type B cover sealing



Type A cover sealing

Mounting insulators

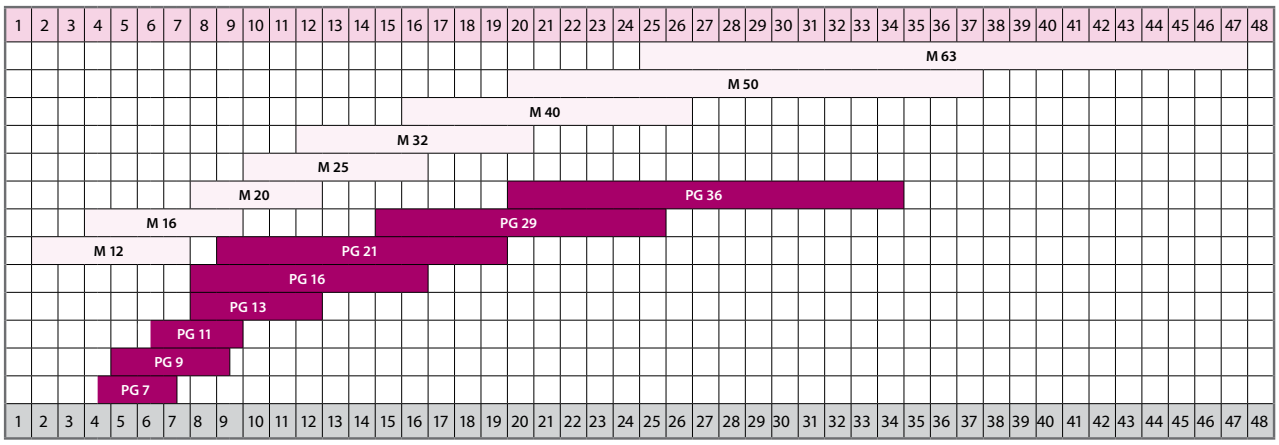
Technical data	
Installation temperature	-20°C ... +120°C
Material	BMC polyester halogen free
Flammability	V0 (UL94)

Metric cable glands IP67

Sealing glands with metric thread

type	sealing range Ømm	assembly spanner	thread	Dimensions					Tightening torque Mk / Nm	Resistance to impact (J)
				L	L_{min}	L_{max}	ØD	assembly opening		
M-12G	2 ÷ 7	16	M12x1,5	8	17	21	16,5	12,5	2,5	40
M-16G	4 ÷ 9	20	M16x1,5	8	21	25	21	16,5	3,75	40
M-20G	8 ÷12	24	M20x1,5	10	25	30	26,5	20,5	5	40
M-25G	10 ÷16	30	M25x1,5	10	30	37,5	33	25,5	7,5	40
M-32G	12 ÷20	36	M32x1,5	12	35	45	40	32,5	10	40
M-40G	16 ÷26	46	M40x1,5	12	40	50	51	40,5	10	40
M-50G	20 ÷37	55	M50x1,5	14	50	60	61	50,5	10	70
M-63G	25 ÷47	70	M63x1,5	14	55	65	78	63,5	10	70

Using glands for cable with a diameter

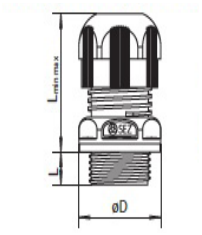


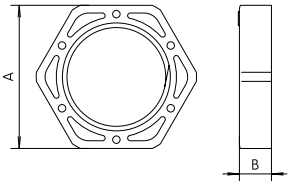
Metric lock nuts

type	thread	dimensions (mm)		Tightening torque
		A	B	
M-12N	M12x1,5	16	4,5	2,5
M-16N	M16x1,5	22		3,75
M-20N	M20x1,5	27	6	5
M-25N	M25x1,5	34		7,5
M-32N	M32x1,5	41	7	10
M-40N	M40x1,5	50		
M-50N	M50x1,5	60	8	10
M-63N	M63x1,5	75		

PA

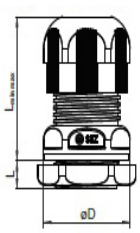
30 sec.

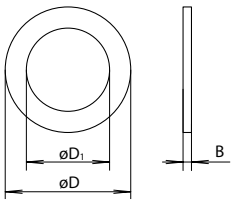




Metric sealing rubber washers

type	dimensions (mm)		
	Ø D	Ø D_1	B
M-12S	16	12	1
M-16S	20,5	16	
M-20S	25	20	1,5
M-25S	31	25	
M-32S	38	32	2
M-40S	48	40	
M-50S	59,4	50,4	
M-63S	76	63	





ETICONNECT

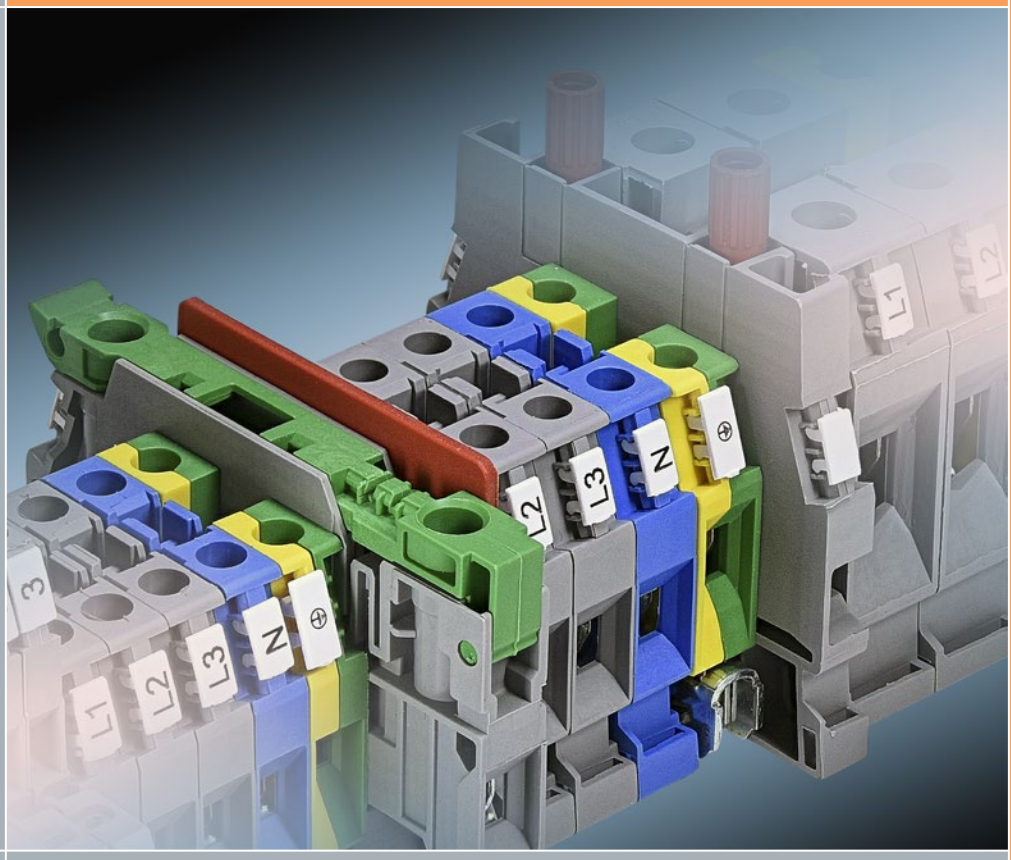
Screw Type terminal blocks 904

»PUSH IN« terminal blocks 925

Spring clamp terminal blocks 932

Common Screw And Spring Type Accessories 945

LINE-UP TERMINALS

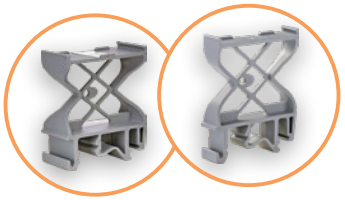


POWER NEEDS CONTROL

Screw Type terminal blocks

Protection against accidental contact: U shapped covers for cross connection ESC-PRP/7 and ESC-PRP/8

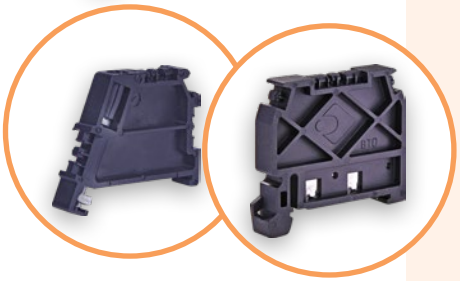
High current terminal blocks ESC-GPA, ESC-GPA / FIX and ESC-GPM / FIX are available in grey (RAL 7042) color. The FIX series is Panel-mount version



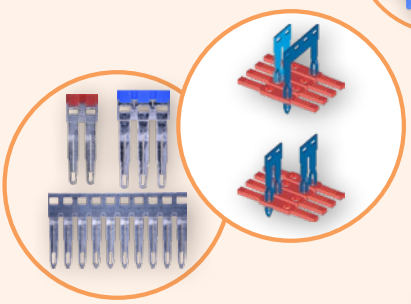
Support for markings
ES-PTM (40 x 16,5) mm
ES-PTMS (40 x 7) mm

The same marking tags for all Types of terminals with rated cross section 2,5mm²...240mm: Possibility to print labels - marking tags using SmartPrint Printer

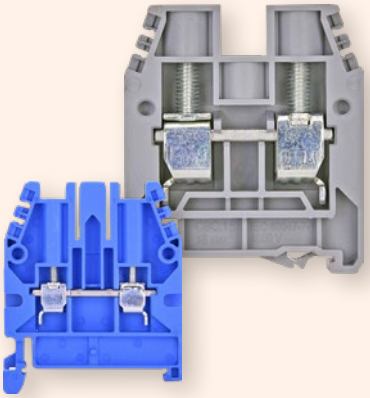
ESC-DFU partitions are used to easy locate or to increase the insulation distances between terminal blocks and parallel multiple commoning bars.



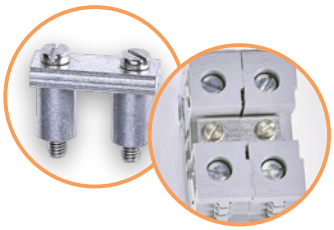
End brackets ES-BTO (spring Type), ES-BT/3 (screw Type) are used to lock terminals on TH35 rails.



"Easy bridge" system: double possibility to insert PTC, PTP multi-pole cross-connections, without the need of insulating protection. Cross connections - bridges 2, 3 and 10 pole versions with insulation red or blue, or without isolation.

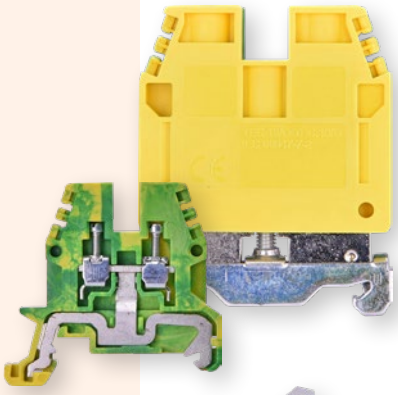


Screw Type terminal blocks ESC-CBC series for conductors with cross sections from 0,2 to 50 mm² in grey and blue color.



ESC-POF permanent cross connections 2 pole and Commoning bar (16 holes) for 16 mm² and 35 mm²

Earth terminal blocks series ESC-TEO and ESC-TEC for conductors with cross sections from 0,2 to 95 mm^2

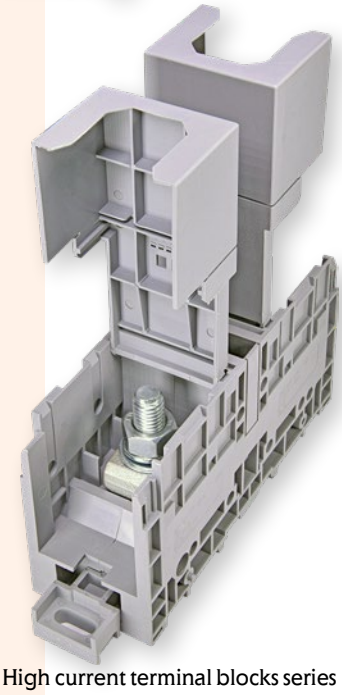




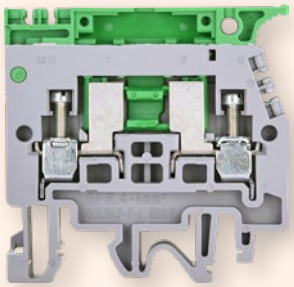


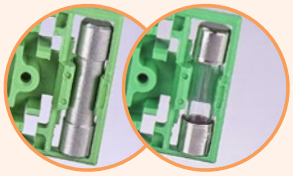
For more reliable fastening and simplified installation of several terminal blocks of the GPA series between them are provided side locks

ESC-GPA series screw terminals for connecting conductors with a cross section of 10 to 300 mm^2 are closed on both sides to prevent accidental touch to current parts. The ESC-GPA / FIX terminals are provided with installation on the mounting panel.



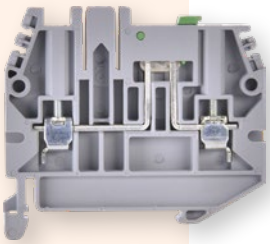
High current terminal blocks series ESC-GPM / FIX are mounted on the mounting panels. Protective covers prevent accidental touch of the conductor.

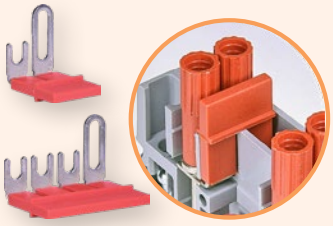




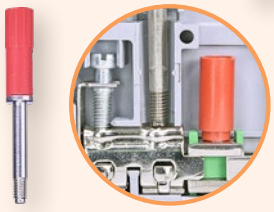
ESC-SFR series terminals for connection conductors with a cross section of 0.2 to 10 mm^2 are used for protection of circuits control using the installed in holder of a fusible insert. ESC-SFR.4 - for protection 5x20, commuting brass cylinder 5x20 or diode 5x20. ESC-SFR.6 - for 6x32 fuses

Disconnect terminal block (1-0) - Screw Type is designed to disconnect the electric circuit.

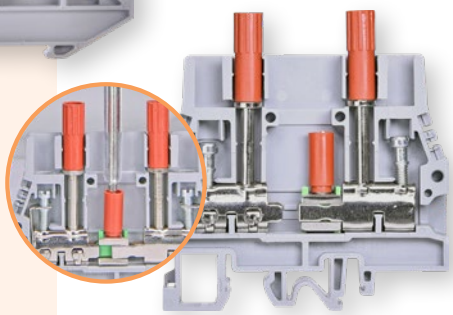




Short circuit plates ESC-SCB.6/PO are used to form special cross-connections with ESC-SCB.6 Disconnect terminal blocks used for test and measurement circuits.



For measurements and checks on circuits which are related to the terminal boards, insulated sockets ESC-PSD screwable onto the conductor body of the terminal blocks can be used.

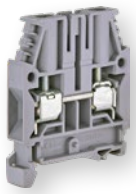
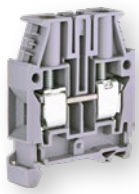
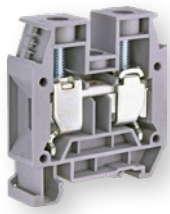


Disconnect terminals blocks for test and measurement circuits ESC-SCB series for connection conductors with a cross section of 0.2 to 10 mm2. It allows you to connect or replace measuring transformers, instruments, counters... without disconnecting the supply voltage.

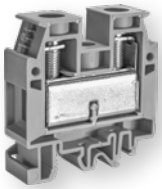
Screw terminal blocks ESC-CBC

				ESC-CBC.2			ESC-CBC.4		
									
1	Height x Width x Thickness * *The size includes the DIN rail			52 x 44 x 5 mm			52 x 44 x 6 mm		
2	Rated cross-section			**2,5 mm²**			**4 mm²**		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 6 mm²		
		stranded		0,2 - 4 mm²			0,2 - 6 mm²		
		with ferrule		2,5 - WP25/14			4 - WP40/16		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			**1000 V**	600 V		**1000 V**	600 V	
5	Max current with rated cross-section			**24 A**	20 A		**32 A**	30 A	
6	Max current with max cross-section			**37 A**	-		**45 A**	-	
7	Insulation stripping length / max tightening torque			9 mm / 0,8 Nm			10 mm / 1,2 Nm		
8	Rated impulse withstand voltage / pollution degree			12 kV / 3			12 kV / 3		
				Type	**Code No.**	**Packaging [pcs]**	**Type**	**Code No.**	**Packaging [pcs]**
9	Feed through terminal block (grey)			ESC-CBC.2	003903000	120	ESC-CBC.4	003903001	120
10	Feed through terminal block (blue)			ESC-CBC.2B	003903044	120	ESC-CBC.4B	003903045	120
	Accessories								
11	End section, thickness 1,5 mm (grey)			ESC-CBC.2-10/PT	003903010	50	ESC-CBC.2-10/PT	003903010	50
12	End section, thickness 1,5 mm (blue)			ESC-CBC.2-10/PTB	003903050	50	ESC-CBC.2-10/PTB	003903050	50
13	Red partition			ESC-DFU/4/R	003903013	50	ESC-DFU/4/R	003903013	50
14	Marking tag			ES-N...	page 946		ES-N...	page 946	
15	U shapped cover for cross connection protection			ESC-PRP/7	003903042	10	ESC-PRP/7	003903042	10
16	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
17	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
18	Red insulation partition to be used in case of cross connections - bridges			ESC-DFM/900	003903016	50	ESC-DFM/900	003903016	50
19	Cross connections - bridges (non-insulated)	2 poles		ESC-PTC/2/02	003903018	25	ESC-PTC/4/02	003903020	25
		10 poles		ESC-PTC/2/10	003903019	10	ESC-PTC/4/10	003903021	10
20	Cross connections - bridges (insulated, red)	2 poles		ESC-PTP2/02/R	003903022	25	ESC-PTP4/02/R	003903028	25
		3 poles		ESC-PTP2/03/R	003903023	25	ESC-PTP4/03/R	003903029	25
		10 poles		ESC-PTP2/10/R	003903024	25	ESC-PTP4/10/R	003903030	25
21	Cross connections - bridges (insulated, blue)	2 poles		ESC-PTP2/02/B	003903025	25	ESC-PTP4/02/B	003903031	25
		3 poles		ESC-PTP2/03/B	003903026	25	ESC-PTP4/03/B	003903032	25
		10 poles		ESC-PTP2/10/B	003903027	25	ESC-PTP4/10/B	003903033	25
22	Cross connections - bridges (non-insulated) * Recommended with (15) U shapped cover for cross connection protection	2 poles							
		multipole							

Screw Type terminal blocks

	ESC-CBC.6			ESC-CBC.10			ESC-CBC.16			ESC-CBC.35		
												
1	52 x 44 x 8 mm			52 x 44 x 10 mm			56 x 47 x 12 mm			63 x 56 x 16 mm		
2	**6 mm²**			**10 mm²**			**16 mm²**			**35 mm²**		
3	0,2 - 10 mm²			1,5 - 16 mm²			1,5 - 25 mm²			2,5 - 50 mm²		
	0,2 - 10 mm²			1,5 - 16 mm²			1,5 - 25 mm²			2,5 - 50 mm²		
	6 - WP60/20			10 - WP100/21			16 - WP160/22			35 - WP350/30		
	IEC	UL		IEC	UL		IEC	UL		IEC	UL	
4	**1000 V**	600 V		**1000 V**	600 V		**1000 V**	600 V		**1000 V**	600 V	
5	**41 A**	50 A		**57 A**	65 A		**76 A**	100 A		**101 A**	125 A	
6	**64 A**	-		**85 A**	-		**114 A**	-		**160 A**	-	
7	10 mm / 1,4 Nm			12 mm / 1,9 Nm			15 mm / 3 Nm			18 mm / 5 Nm		
8	8 kV / 3			8 kV / 3			12 kV / 3			12 kV / 3		
	Type	**Code No.**	**Packaging [pcs]**	**Type**	**Code No.**	**Packaging [pcs]**	**Type**	**Code No.**	**Packaging [pcs]**	**Type**	**Code No.**	**Packaging [pcs]**
9	ESC-CBC.6	003903002	120	ESC-CBC.10	003903003	100	ESC-CBC.16	003903004	50	ESC-CBC.35	003903005	50
10	ESC-CBC.6B	003903046	120	ESC-CBC.10B	003903047	100	ESC-CBC.16 (B)	003903048	25	ESC-CBC.35 (B)	003903049	25
	Accessories											
11	ESC-CBC.2-10/PT	003903010	50	ESC-CBC.2-10/PT	003903010	50	ESC-CBC.16/PT	003903011	25	ESC-CBC.35/PT	003903012	25
12	ESC-CBC.2-10/PTB	003903050	50	ESC-CBC.2-10/PTB	003903050	50	ESC-CBC.16/PTB	003903051	25	ESC-CBC.35/PTB	003903052	25
13	ESC-DFU/4/R	003903013	50	ESC-DFU/4/R	003903013	50	ESC-DFU/4/R	003903013	50	ESC-DFU/5/R	003903014	25
14	ES-N...	page 946		ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
15	ESC-PRP/7	003903042	10	ESC-PRP/7	003903042	10	ESC-PRP/8	003903043	10	ESC-PRP/8	003903043	10
16	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
17	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
18	ESC-DFM/900	003903016	50	ESC-DFM/900	003903016	50	ESC-DFM/700	003903017	50	ESC-DFM/700	003903017	50
19	ESC-PTC/6/02	003903034	25	ESC-PTC/10/02	003903036	25						
	ESC-PTC/6/10	003903035	10	ESC-PTC/10/10	003903037	10						
20												
21												
22							ESC-POF/53	003903038	25	ESC-POF/35	003903039	15
							ESC-CPM/16 + ESC-PMP/05	003903230 003903040	25	ESC-CPM/35 + ESC-PMP/35	003903231 003903041	10

Screw terminal blocks ESC-CBD

				ESC-CBD.50			ESC-CBD.70B**		
									
1	Height x Width x Thickness * *The size includes the DIN rail			62 x 57 x 18 mm			71 x 62 x 20,5 mm		
2	Rated cross-section			**50 mm²**			**70 mm²**		
3	Connecting capacity	solid		1 - 70 mm²			1 - 95 mm²		
		stranded		1,5 - 50 mm²			1,5 - 95 mm²		
		with ferrule		50 - WP500/40			-		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			**1000 V**	600 V		**1000 V**	600 V	
5	Max current with rated cross-section			**150 A**	130 A		**192 A**	220 A	
7	Insulation stripping length / max tightening torque			22 mm / 5 Nm			26 mm / 8 Nm		
8	Rated impulse withstand voltage / pollution degree			12 kV / 3			12 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
9	Feed through terminal block (grey)			ESC-CBD.50	003903241	40	-	-	-
10	Feed through terminal block (blue)			ESC-CBD.50B	003903243	40	ESC-CBD.70B	003903245	40
	Accessories								
11	End section, thickness 1,5 mm (grey)			ESC-CBD.50/PT	003903242	10	-	-	-
12	End section, thickness 1,5 mm (blue)			ESC-CBD.50/PTB	003903244	10	ESC-CBD.70/PTB	003903246	50
13	Marking tag			ES-N...	page 946		ES-N...	page 946	
14	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
15	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
16	Cross connections - bridges (non-insulated) * Recommended with (15) U shapped cover for cross connection protection	2 poles		ESC-POF/07	003903326	15			

** ESC-CBD.70B available only in blue version

MAXIMUM SHORT-TIME WITHSTAND CURRENTS ALLOCATED TO THE RAIL PROFILE

Rail profile	Material	Equivalent E-cu cross-section mm²	Short-time withstand current 1 s kA	Thermal rated current of a PEN busbar A
"Top hat" rail IEC 60715/TH 15 - 5,5	Steel	10	1,2	-
	Copper	25	3	101
	Aluminium	16	1,92	76
G32-Type rail IEC 60715/G32	Steel	35	4,2	-
	Copper	120	14,4	269
	Aluminium	70	8,4	192
"Top hat" rail IEC 60715/TH 35 - 7,5	Steel	16	1,92	-
	Copper	50	6	150
	Aluminium	35	4,2	125
"Top hat" rail IEC 60715/TH 35 - 15	Steel	50	6	-
	Copper	150	18	309
	Aluminium	95	11,4	232

Taken from CEI EN 60947-7-2 standard

High current terminal blocks ESC-GPA

				ESC-GPA.70	ESC-GPA.70/FIX
					
1	Height x Width x Thickness * *The size includes the DIN rail			70 x 91 x 20,5 mm	75 x 102 (88)** x 20,5 mm
2	Rated cross-section			70 mm²	
3	Connecting capacity	solid		10 - 95 mm²	
		stranded		10 - 95 mm²	
	Technical characteristics			IEC	UL
4	Max voltage AC/DC			1000 V	600 V
5	Max current with rated cross-section			192 A	215 A
6	Insulation stripping length / max tightening torque			25 mm / 9 Nm (Allen screw, 4mm wrench)	
7	Rated impulse withstand voltage / pollution degree			12 kV / 3	
				Type	Code No.	Packaging [pcs]
8	Feed through terminal block (grey)			ESC-GPA.70	003903006	25
9	Panel - mount feed through terminal block (grey)			ESC-GPA.70/FIX	003903211	25
	Accessories					
10	Marking tag			ES-N...	page 946	
11	End bracket (spring Type)			ES-BTO	003903075	25
12	End bracket (screw Type)			ES-BT/3	003903229	25
13	Cross connections - bridges (non-insulated) * Recommended with (15) U shapped cover for cross connection protection	2 poles		ESC-POF/70	003903325	25

**Fixing distance between centers

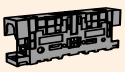
Use of terminals with aluminum conductors
Connection of aluminum conductors:
The aluminum conductor without an insulating sheath starts to oxidize, decreasing the contact quality (Aluminum oxide is not a good conductor) and, consequently, reducing its conductivity.
Steps to follow to ensure a good electrical and mechanical connection of aluminum cables with our terminal blocks:
1) Clean the stripped conductor with a wire brush to remove the oxide layer;
2) Soak the clean conductor in neutral Vaseline and connect it immediately, tightening the clamp to the prescribed torque (do not exceed the suggested tightening torque!). Should you reconnect the same cable this step must be repeated (cleaning and soaking of the conductor in Vaseline);
3) Execute the installation in a free-of-moisture environment and in a non-aggressive atmosphere;
4) Recheck the tightening after a fewdays of settling (this precaution is also suggested for copper cables);
5) If the cable section is greater than 25 mm , the use of ferrules is recommended.
From a technical standpoint the electrical conductivity of the aluminum is lower that copper one:
Electrical resistivity at 20 ° C
- Copper: 0.0178 μΩ m
- Aluminum: 0.0284 μΩ m
As a result of the different resistivity (and, therefore, of the different electrical conductivity) with the same cable section, with the same ambient temperature and allowed ΔT, under the same conditions the current flow rate in an aluminum cable will be lower than the copper cable one. So, from the point of view of the current flow, the aluminum cable cannot stress the connected clamp more than the copper cable: the heating of the clamp is a consequence of the voltage drop which is proportional to the current flow, and, as discussed above, the current flow in an aluminum cable is lower.

High current terminal blocks ESC-GPA

			ESC-GPA.95	ESC-GPA.95/FIX
				
1	Height x Width x Thickness * *The size includes the DIN rail	 	87 x 98 x 26 mm	91 x 111 (97)** x 26 mm
2	Rated cross-section		**95 mm²**	
3	Connecting capacity	solid 	10 - 120 mm²	
		stranded 	10 - 95 mm²	
	Technical characteristics		IEC	UL
4	Max voltage AC/DC		**1000 V**	600 V
5	Max current with rated cross-section		**232 A**	232 A
6	Insulation stripping length / max tightening torque		30 mm / 9 Nm (Allen screw, 4mm wrench)	
7	Rated impulse withstand voltage / pollution degree		12 kV / 3	
			Type	**Code No.**	**Packaging [pcs]**
8	Feed through terminal block (grey)		ESC-GPA.95	003903007	10
9	Panel - mount feed through terminal block (grey)		ESC-GPA.95/FIX	003903212	10
	Accessories				
10	Marking tag		ES-N...	page 946	
11	End bracket (spring Type)		ES-BTO	003903075	25
12	End bracket (screw Type)		ES-BT/3	003903229	25

**Fixing distance between centers

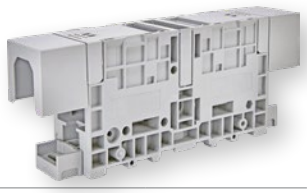
High current terminal blocks ESC-GPM

			ESC-GPM.95/FIX
			
1	Height x Width x Thickness * * The size is given taking into account the installation on the mounting panel		76 x 176 (158)** x 32 mm
2	Rated cross-section		**95**/150 **mm²**
3	Максимальна ширина наконечника, що підключається		22 mm (screw M8)
	Technical characteristics		IEC	UL
4	Max voltage AC/DC		**1000 V**	-
5	Max current with rated cross-section		**232 A**	-
6	Max current with max cross-section		**320 A**	-
7	Rated impulse withstand voltage / pollution degree		12 kV / 3	
			Type	**Code No.**	**Packaging [pcs]**
8	Feed through terminal block (grey)		ESC-GPM.95/FIX	003903215	10
	Accessories				
9	Marking tag		ES-N...	page 946	

**Fixing distance between centers

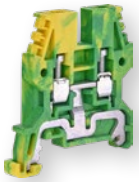
	ESC-GPA.150	ESC-GPA.150/FIX	ESC-GPA.240	ESC-GPA.240/FIX
				
1	99 x 108 x 31 mm	94 x 122 (106)** x 31 mm	120x 119 x 37 mm	115 x 134 (118)** x 37 mm
2	**150 mm²**		**240 mm²**	
3	50 - 185 mm²		50 - 300 mm²	
	50 - 150 mm²		95 - 240 mm²	
	IEC	UL	IEC	UL
4	**1000 V**	600 V	**1000 V**	600 V
5	**309 A**	309 A	**415 A**	415 A
6	35 mm / 15 Nm (Allen screw, 5 mm wrench)		40 mm / 21 Nm (Allen screw, 6 mm wrench)	
7	12 kV / 3		12 kV / 3	
	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	ESC-GPA.150	003903008	8	ESC-GPA.240	003903009	4
9	ESC-GPA.150/FIX	003903213	8	ESC-GPA.240/FIX	003903214	4
	Accessories					
10	ES-N...	page 946		ES-N...	page 946	
11	ES-BTO	003903075	25	ES-BTO	003903075	25
12	ES-BT/3	003903229	25	ES-BT/3	003903229	25

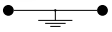
**Fixing distance between centers

	ESC-GPM.150/FIX	ESC-GPM.240/FIX
		
1	76 x 200 (158)** x 42 mm	84 x 250 (172)** x 52 mm
2	**150**/240 **mm²**	**240**/300 **mm²**
3	32 mm (screw M10)	40 mm (screw M12)
	IEC	UL	IEC	UL
4	**1000 V**	-	**1000 V**	-
5	**309 A**	-	**415 A**	-
6	**440 A**	-	**600 A**	-
7	12 kV / 3		12 kV / 3	
	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	ESC-GPM.150/FIX	003903216	6	ESC-GPM.240/FIX	003903217	4
	Accessories					
9	ES-N...	page 946		ES-N...	page 946	

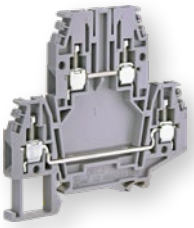
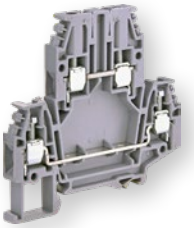
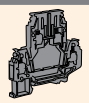
**Fixing distance between centers

Earth terminal blocks ESC-TEO

				ESC-TEO.2			ESC-TEO.4			ESC-TEC.6/0		
												
1	Height x Width x Thickness * *The size includes the DIN rail			47 x 50 x 5,5 mm			52 x 50 x 6,5 mm			52 x 44 x 8 mm		
2	Rated cross-section			**2,5 mm²**			**4 mm²**			**6 mm²**		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 6 mm²			0,5 - 10 mm²		
		stranded		0,2 - 4 mm²			0,2 - 6 mm²			0,5 - 10 mm²		
		with ferrule		2,5 - WP25/14			4 - WP40/16			6 - WP60/20		
	Technical characteristics			IEC	UL		IEC	UL		IEC	UL	
4	Max voltage AC/DC			-	-		-	-		-	-	
5	Max current with rated cross-section			**24 A**	-		**32 A**	-		**41 A**	-	
6	Insulation stripping length / max tightening torque			12 mm / 0,8 Nm			14 mm / 1,2 Nm			10 mm / 1,4 Nm		
7	Rated impulse withstand voltage / pollution degree			8 kV / 3			8 kV / 3			8 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	Earth terminal block (yellow-green)			ESC-TEO.2	003903066	75	ESC-TEO.4	003903067	50	ESC-TEC.6/0	003903070	45
	Accessories											
9	End section (green)			ESC-TEO.2/ PT	003903068	50	ESC-TEO.4/ PT	003903069	25			
10	Marking tag			ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
11	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
12	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25

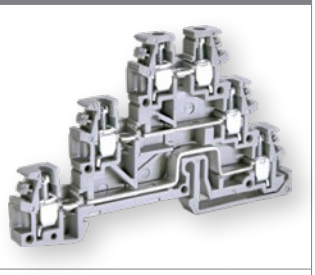
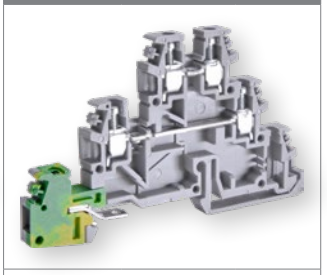
	ESC-TEC.10/0			ESC-TEC.16/0			ESC-TEC.35/0			ESC-TEC.70/0		
												
												
1	52 x 44 x 10 mm			56 x 47 x 12 mm			63 x 56 x 16 mm			81,5 x 70 x 20.5 mm		
2	**10 mm²**			**16 mm²**			**35 mm²**			**70 mm²**		
3	1,5 - 16 mm²			1,5 - 25 mm²			2,5 - 50 mm²			10 - 95 mm²		
	1,5 - 16 mm²			1,5 - 25 mm²			2,5 - 50 mm²			10 - 95 mm²		
	10 - WP100/21			16 - WP160/22			-			-		
	IEC	UL		IEC	UL		IEC	UL		IEC	UL	
4	-	-		-	-		-	-		-	-	
5	**57 A**	-		**76 A**	-		**125 A**	-		**192 A**	-	
6	12 mm / 1,9 Nm			15 mm / 1,2 Nm			18 mm / 5 Nm			25 mm / 9 Nm		
7	8 kV / 3			8 kV / 3			12 kV / 3			8 kV / 3		
	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	ESC-TEC.10/0	003903071	35	ESC-TEC.16/0	003903072	30	ESC-TEC.35/0	003903073	15	ESC-TEC.70/0	003903074	25
	Accessories											
9												
10	ES-N...	page 946		ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
11	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
12	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25

Two-level terminal blocks ESC-DBC

				ESC2-DBC.2			ESC2-DBC.4		
									
									
1	Height x Width x Thickness * *The size includes the DIN rail			66 x 70 x 5 mm			66 x 70 x 6 mm		
2	Rated cross-section			**2,5 mm²**			**4 mm²**		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 6 mm²		
		stranded		0,2 - 4 mm²			0,2 - 6 mm²		
		with ferrule		2,5 - WP25/14			4 - WP40/16		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			**630 V**	600 V		**630 V**	600 V	
5	Max current with rated cross-section			**24 A**	20 A		**32 A**	30 A	
6	Insulation stripping length / max tightening torque			9 mm / 0,8 Nm			9 mm / 1 Nm		
7	Rated impulse withstand voltage / pollution degree			8 kV / 3			8 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	Two-level feed through terminal block (grey)			ESC2-DBC.2	003903053	120	ESC2-DBC.4	003903054	100
	Accessories								
9	End section (grey)			ESC2-DBC.2/PT	003903055	25	ESC2-DBC.4/PT	003903056	25
10	Red partition			ESC-DFU/7/R	003903015	25	ESC-DFU/7/R	003903015	25
11	Marking tag			ES-N...	page 946		ES-N...	page 946	
12	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
13	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
14	Red insulation partition to be used in case of cross connections - bridges	upper level		ESC-DFM/900	003903016	50	ESC-DFM/900	003903016	50
		lower level**		ESP-DFM/500	003903144	50	ESP-DFM/500	003903144	50
15	Cross connections - bridges (non-insulated)	2 poles		ESC-PTC/2/02	003903018	25	ESC-PTC/4/02	003903020	25
		10 poles		ESC-PTC/2/10	003903019	10	ESC-PTC/4/10	003903021	10

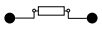
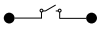
**Additional data under spring Type terminal blocks' accessories

Three-level terminal blocks

				ESC-TLD.2			ESC-TDE.2		
									
									
1	Height x Width x Thickness * *The size includes the DIN rail			52 x 85 x 6,2 mm			52 x 85 x 6,2 mm		
2	Rated cross-section			**2,5 mm²**			**2,5 mm²**		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 4 mm²		
		stranded		0,2 - 4 mm²			0,2 - 4 mm²		
		with ferrule		2,5 - WP25/14			2,5 - WP25/14		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			**250 V**	600 V		**250 V**	600 V	
5	Max current with rated cross-section			**24 A**	15 A		**24 A**	20 A	
6	Insulation stripping length / max tightening torque			8 mm / 0,8 Nm			8 mm / 0,8 Nm		
7	Rated impulse withstand voltage / pollution degree			4 kV / 3			4 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	Three-level feed through terminal block (grey)			ESC-TLD.2	003903247	125			
9	Three-level feed through terminal block (blue)			ESC-TLD.2B	003903249	125			
10	Two feed through levels + earth (grey)						ESC-TDE.2	003903250	25
	Accessories								
11	End section (grey)			ESC-TLD/PT	003903248	25	ESC-TLD/PT	003903248	25
12	Marking tag			ES-N...	page 946		ES-N...	page 946	
13	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
14	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
15	Cross connections - bridges (non-insulated) * Recommended with (15) U shapped cover for cross connection protection	2 poles		ESC-PM/20/2	003903327	25	ESC-PM/20/2	003903327	25
		3 poles		ESC-PM/20/3	003903328	25	ESC-PM/20/3	003903328	25
		10 poles		ESC-PM/20/10	003903329	10	ESC-PM/20/10	003903329	10

Fuse holder terminal blocks ESC-SFR

Disconnect terminal blocks ESC-CBS

				ESC-SFR.4			ESC-SFR.6			ESC-CBS.2		
												
												
1	Height x Width x Thickness * *The size includes the DIN rail			52 x 52 x 8 mm			59 x 79 x 10 mm			52 x 57 x 5 mm		
2	Rated cross-section			**4 mm²**			**6 mm²**			**2 mm²**		
3	Connecting capacity	solid		0,2 - 6 mm²			0,2 - 10 mm²			0,2 - 4 mm²		
		stranded		0,2 - 6 mm²			0,2 - 10 mm²			0,2 - 4 mm²		
		with ferrule		4 - WP40/16			6 - WP60/20			2 - WP25/14		
	Technical characteristics			IEC	UL		IEC	UL		IEC	UL	
4	Max voltage AC/DC			**800 V**	600 V		**630 V**	600 V		**630 V**	600 V	
5	Max current with rated cross-section			**6,3 A (20 A with C0/05)**	6,3 A		**10 A**	10 A		**20 A**	20 A	
6	Insulation stripping length / max tightening torque			11 mm / 1,2 Nm			11 mm / 1,4 Nm			9 mm / 0,6 Nm		
7	Rated impulse withstand voltage / pollution degree			6 kV / 3			6 kV / 3			6 kV / 3		
8	Function / Type			fuse holder for ø 5 x 20 mm fuse			fuse holder for ø 6,3 x 32 mm fuses			disconnect lever		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
9	Disconnect terminal block (grey)			ESC-SFR.4	003903057	70	ESC-SFR.6	003903061	50	ESC-CBS.2	003903064	100
	Accessories											
10	End section (grey)			ESC-SFR.4/PT	003903060	25	ESC-SFR.6/PT	003903062	25	ESC-CB/PT	003903237	25
11	Red partition						ESC-DFU/7/R	003903015	25			
12	Marking tag			ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
13	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
14	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
15	Conducting element	brass cylinder 5x20		ESC-C0/05	003903059	50						
		diode 255/3A 5x20		ESC-SFR/3A	003903058	70						
16	LED indicator	12-48 V AC/DC		ESC-LED.12-48	003903332	10						
		115-230 V AC/DC		ESC-LED.115-230	003903333	10						
17	Red insulation partition to be used in case of cross connections - bridges									ESC-DFM/900	003903016	50
18	Cross connections - bridges (non-insulated)	2 poles								ESC-PTC/2/02	003903018	25
		10 poles								ESC-PTC/2/10	003903019	10
19	Cross connections - bridges (insulated, red)	2 poles								ESC-PTP2/02/R	003903022	25
		3 poles								ESC-PTP2/03/R	003903023	25
		10 poles								ESC-PTP2/10/R	003903024	10
20	Cross connections - bridges (insulated, blue)	2 poles								ESC-PTP2/02/B	003903025	25
		3 poles								ESC-PTP2/03/B	003903026	25
		10 poles								ESC-PTP2/10/B	003903027	10

Features
ESC-SFR Series - Fuse-holders

- with UL94V-0 polyamide insulating body
- available in grey RAL 7042 colour
- universal mounting onto rails - according to IEC 60715 Std., "G32" and "TH/35" Types
- ESC-SFR.4: for ø 5 x 20 mm fuses, with possibility to detect the fuse blow-out status, by means of a LED micro-circuit (CIL...)
- ESC-SFR.6: for ø 6.3 x 32 mm fuses, with solder lug

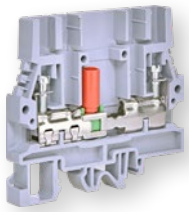
Max. dissipated power – In conf. with IEC 60947-7-3				
Terminal block	Voltage [V] (*)	Current [A]	Protection against overload and short circuit	Only protection against short circuit
			(PV) - [W]	(PV) - [W]
ESC-SFR.4	250	6,3	2,5	2,5
ESC-SFR.6	250	10	2,5	4

Disconnect terminal blocks for test and measurement circuits ESC-SCB

Disconnect terminal blocks for test and measurement circuits ESC-SCB series

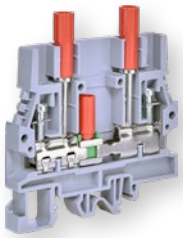
- disconnects by means of conducting element to be inserted in the lever
- slide link disconnect
- possibility to perform parallel connections
- universal mounting for both PR/DIN and PR/3 rails which meet IEC 60715 norms, "G32" and TH/35 Types
- available in grey
- maximum operating temperature 100 °C

ESC-SCB.6



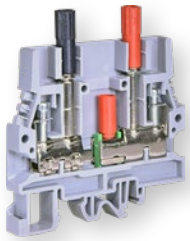
(*) For the simple connection in parallel of two or more adjoining terminal blocks use the parallel skid, with the screws and sleeves, after removing the insulating wall with a simple cutter

ESC-SCB.6/DD



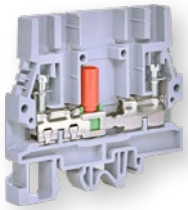
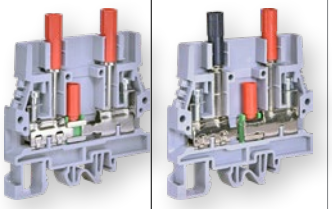
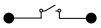
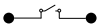
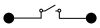
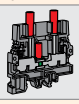
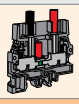
Longitudinal and transversal test switching terminal block. Configuration complete with test plug socket downstream and upstream the slide link, compliant with the ENEL LV 27/3 specifications

ESC-SCB.6/CD



Longitudinal and transversal test switching terminal block. Configuration complete with a test plug socket upstream and a short circuit sleeve ESC-SCB.6/PO-2 or ESC-SCB.6/PO-4 Type, supplied separately, downstream of the slide link, compliant with the ENEL LV 27/2 specifications

Disconnect terminal blocks for test and measurement circuits ESC-SCB

				ESC-SCB.4			ESC-SCB.6			ESC-SCB.6DD ESC-SCB.6CD		
												
												
1	Height x Width x Thickness * *The size includes the DIN rail			44 x 58 x 6,5 mm			65 x 69 x 8 mm			76 x 69 x 8 mm / 77 x 69 x 8 mm		
2	Rated cross-section			**4 mm²**			**6 mm²**			**6 mm²**		
3	Connecting capacity	solid		0,2 - 6 mm²			0,5 - 10 mm²			0,5 - 10 mm²		
		stranded		0,2 - 6 mm²			0,5 - 10 mm²			0,5 - 10 mm²		
		with ferrule		4 - WP40/16			6 - WP60/20			6 - WP60/20		
	Technical characteristics			IEC	UL		IEC	UL		IEC	UL	
4	Max voltage AC/DC			**800 V**	600 V		**800 V**	600 V		**800 V**	-	
5	Max current with rated cross-section			**32 A**	20 A		**41 A**	47 A		**41 A**	-	
6	Insulation stripping length / max tightening torque			9 mm / 1,2 Nm			12 mm / 1,4 Nm			12 mm / 1,4 Nm		
7	Rated impulse withstand voltage / pollution degree			8 kV / 3			8 kV / 3			8 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	disconnect by slide link (grey)			ESC-SCB.4	003903218	75	ESC-SCB.6	003903220	100			
9	disconnect by slide link in special configuration for voltmetric circuits (grey)									ESC-SCB.6/DD	003903221	80
10	disconnect by slide link in special configuration for amperometric circuits (grey)									ESC-SCB.6/CD	003903222	80
	Accessories											
11	End section (grey)			ESC-SCB.4/ PT	003903219	25	ESC-SCB.6/PT	003903223	25	ESC-SCB.6/PT	003903223	25
12	Red partition						ESC-DFU/6/R	003903224	25	ESC-DFU/6/R	003903224	25
13	PSD socket - test connector			ESP-PSD/A	003903226	50	ESC-PSD/P	003903225	50	2 pcs included (for measuring voltage or current)		
14	Short circuit plate	2 poles					ESC-SCB.6/ PO/2	003903227	40	ESC-SCB.6/PO/2	003903227	40
		4 poles					ESC-SCB.6/ PO/4	003903228	20	ESC-SCB.6/PO/4	003903228	20
15	Marking tag			ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
16	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
17	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25

Accessories for screw terminal blocks

ESC-PT end sections

For each Type and cross section of terminal block, there is a specific insulating and closing end section to be placed on the open element of each terminal board. This end section may also be used to separate different phases of adjoining terminal blocks linked by cross connections or to increase insulation distances where specific circumstances may require it. The end sections have the same overall dimension as the related terminal block, thicknesses are given in the table below.

End sections, grey color

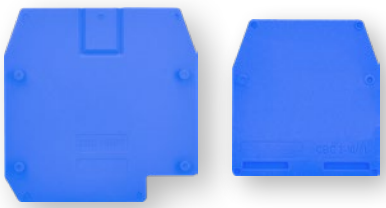
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-CBC.2-10/PT	003903010	ESC-CBC.2...ESC-CBC.10	3	50
ESC-CBC.16/PT	003903011	ESC-CBC.16	3,8	25
ESC-CBC.35/PT	003903012	ESC-CBC.35	5,5	25
ESC-CBD.50/PT	003903242	ESC-CBD.50	6,23	10

Bigger cross sections (ESC-GPA.70...240mm²) are compact, end sections not needed



End sections, blue color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-CBC.2-10/PTB	003903050	ESC-CBC.2B...ESC-CBC.10B	3,1	50
ESC-CBC.16/PTB	003903051	ESC-CBC.16B	3,8	25
ESC-CBC.35/PTB	003903052	ESC-CBC.35B	5,2	25
ESC-CBD.50/PTB	003903244	ESC-CBD.50B	6,23	10
ESC-CBD.70/PTB	003903246	ESC-CBD.70B	6,8	10



End section for two and three level terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC2-DBC.2/PT	003903055	ESC2-DBC.2	5,2	25
ESC2-DBC.4/PT	003903056	ESC2-DBC4	5,2	25
ESC-TLD/PT	003903248	ESC-TLD, ESC-TDE	6	25



End sections for earth terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-TEO.2/PT	003903068	ESC-TEO.2	2,3	50
ESC-TEO.4/PT	003903069	ESC-TEO.4	3,2	25

*Bigger cross sections (6...70mm²) are compact, end sections not needed



End sections for fuse holder terminal block, disconnect terminal block

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-SFR.4/PT	003903060	ESC-SFR.4	3,5	25
ESC-SFR.6/PT	003903062	ESC-SFR.6	5,7	25
ESC-CB/PT	003903237	ESC-CB	3,48	25



End sections for disconnect terminal blocks for test and measurement circuits

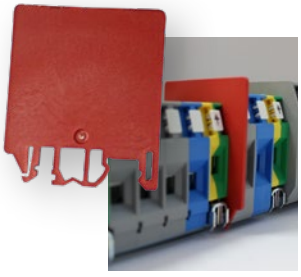
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-SCB.4/PT	003903219	ESC-SCB.4	3,44	25
SCB/6/PT/GR	003903223	ESC-SCB.6, SCB.6/DD/GR, ESC-SCB.6/CD	8,1	25



Terminal block	End section	
	Type	Thickness [mm]
ESC-CBC.2	ESC-CBC.2-10/PT	1,5
ESC-CBC.4	ESC-CBC.2-10/PT	1,5
ESC-CBC.6	ESC-CBC.2-10/PT	1,5
ESC-CBC.10	ESC-CBC.2-10/PT	1,5
ESC-CBC.16	ESC-CBC.16/PT	1,5
ESC-CBC.35	ESC-CBC.35/PT	1,5
ESC-CBD.50	ESC-CBD.50/PT	1
ESC-CBC.2B	ESC-CBC.2-10/PTB	1,5
ESC-CBC.4B	ESC-CBC.2-10/PTB	1,5
ESC-CBC.6B	ESC-CBC.2-10/PTB	1,5
ESC-CBC.10B	ESC-CBC.2-10/PTB	1,5
ESC-CBC.16B	ESC-CBC.16/PTB	1,5
ESC-CBC.35B	ESC-CBC.35/PTB	1,5
ESC-CBD.50B	ESC-CBD.50/PTB	1
ESC-CBD.70B	ESC-CBD.70/PTB	1
ESC2-DBC.2	ESC2-DBC.2/PT	1,5
ESC2-DBC.4	ESC2-DBC.4/PT	1,5
ESC-TLD, ESC-TDE	ESC-TLD/PT	1
ESC-TE0.2	ESC-TE0.2/PT	1,5
ESC-TE0.4	ESC-TE0.4/PT	1,5
ESC-SFR.4	ESC-SFR.4/PT	1,5
ESC-SFR.6	ESC-SFR.6/PT	1,5
ESC-CBS.2	ESC-MPS.4/PT	1,5

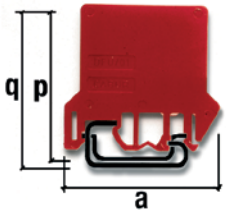
ESC-DFU partitions

In polyamide available in red, colour, 1.5 mm thick, for the separation of elements on the terminal board, in order to make certain circuits easy to locate or to increase the insulation distances between terminal blocks.
The partitions can also be used to increase the insulation distances between adjacent parallel multiple commoning bars. White and green partitions available while stocks last.



Red partitions

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-DFU/4/R	003903013	ESC-CBC.2...ESC-CBC.16	4,9	50
ESC-DFU/5/R	003903014	ESC-CBC.35B	6,2	25
ESC-DFU/6/R	003903224	ESC-SCB.6 / DD / CD	9,04	25
ESC-DFU/7/R	003903015	ESC2-DBC.2 & ESC2-DBC4	7,4	25



NOTE:
q dimension can be obtained by adding 4 mm to dimension p

Terminal block	Partition	Dimensions a x p
ESC-CBC.2	ESC-DFU/4	52 x 62
ESC-CBC.4	ESC-DFU/4	52 x 62
ESC-CBC.6	ESC-DFU/4	52 x 62
ESC-CBC.10	ESC-DFU/4	52 x 62
ESC-CBC.16	ESC-DFU/4	52 x 62
ESC-CBC.35	ESC-DFU/5	62 x 68
ESC2-DBC.2	ESC-DFU/7	80 x 64
ESC2-DBC.4	ESC-DFU/7	80 x 64
ESC-SCB.6 / DD / CD	ESC-DFU/6/R	72 x 74

ESC-PRP protections

The cross connection, consisting of a multiple commoning bar and screws and sleeves, already placed in a recessed position with respect to the terminal board, can be further protected from accidental contact using a nylon U-shaped cover having a standard length of 10 cm. This white-coloured cover, can also be written upon, to serve as a label or reference point on the terminal board.
On the cover suitable slits are arranged to facilitate its removal by using a screwdriver.

for terminal blocks with a cross section of 4-16 mm^2	ESC-PRP/7
for terminal blocks with a cross section of 25-70 mm^2	ESC-PRP/8


ESC-PRP/7



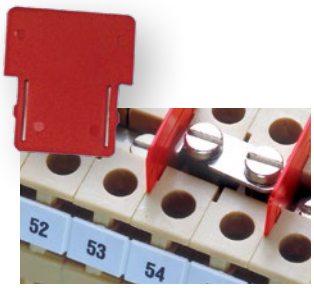


U shaped cover for cross connection protection

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-PRP/7	003903042	ESC-POF & ESC-PMP, length 10 cm (for use with ESC-CBC.4...16)	2	10
ESC-PRP/8	003903043	ESC-POF & ESC-PMP, length 10 cm (for use with ESC-CBC.35...ESC-GPA.70)	2,2	10

ESC-DFM partition insulation of cross connections - bridges

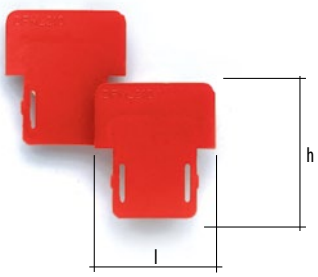
Red coloured in polyamide when it is necessary to guarantee the insulation distance between permanent or switchable cross connections, inserted between adjacent pairs of terminal blocks and, similarly, between multiple commoning bars, inserted between adjacent groups of terminal blocks.



Red insulation partition to be used in case of cross connections - bridges

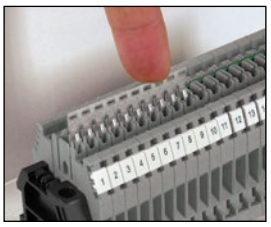
Type	Code No.	Dimension (for use with)	Weight [g]	Packaging [pcs]
ESC-DFM/900	003903016	17 x 18mm (ESC-CBC.2…ESC-CBC.10, ESC2-DBC.2M ESC2-DBC.4)	1	50
ESC-DFM/700	003903017	28 x 32mm (ESC-CBC.16, ESC-CBC.35)	0,9	50

Terminal block	Partition	Dimensions l x h [mm]	Thickness [mm]
ESC-CBC.2	ESC-DFM/900	17 x 18	0,5
ESC-CBC.4	ESC-DFM/900	17 x 18	0,5
ESC-CBC.6	ESC-DFM/900	17 x 18	0,5
ESC-CBC.10	ESC-DFM/900	17 x 18	0,5
ESC-CBC.16	ESC-DFM/700	28 x 32	0,5
ESC-CBC.35	ESC-DFM/700	28 x 32	0,5
ESC2-DBC.2	ESC-DFM/900	17 x 18	0,5
ESC2-DBC.4	ESC-DFM/900	17 x 18	0,5

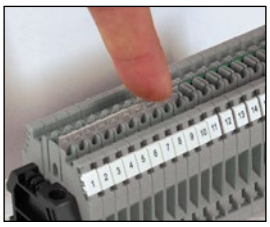


Cross connections
Easy Bridge System

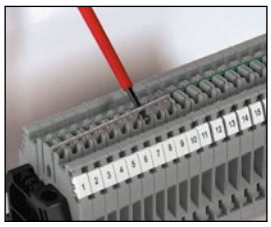
- screwless, snap-in insertion
- transversal and staggered mode connection possibility
- once inserted, intrinsically IPXXB protected resulting installation, without the need for further insulating covers
- patented system



1



2



3

1-2 After having cut the bar according to the number of poles, insert the cross-connection, in the appropriate groove of the terminal block. At this point, by using the blade of a screwdriver, push down the cross-connection until it reaches its blocking point. The cross connection will be fully insulated and intrinsically IPXXB protected.

3 To remove the cross-connection, insert the blade of the screwdriver in the jumper slot, then lift it up and finally extract it.

Terminal block	2-pole jumper	10-pole jumper
ESC-CBC.2	ESC-PTC/2/02	ESC-PTC/2/10
ESC-CBC.4	ESC-PTC/4/02	ESC-PTC/4/10
ESC-CBC.6	ESC-PTC/6/02	ESC-PTC/6/10
ESC-CBC.10	ESC-PTC/10/02	ESC-PTC/10/10
ESC2-DBC.2(*)	ESC-PTC/2/02	ESC-PTC/2/10

Insulated cross connection

Nr. Poles	PTP Series - Blue	PTP Series - Red
2	ESC-PTP/2/02/B	ESC-PTP/2/02/R
3	ESC-PTP/2/03/B	ESC-PTP/2/03/R
10	ESC-PTP/2/10/B	ESC-PTP/2/10/R
2	ESC-PTP/4/02/B	ESC-PTP/4/02/R
3	ESC-PTP/4/03/B	ESC-PTP/4/03/R
10	ESC-PTP/4/10/B	ESC-PTP/4/10/R

ESC-POF permanent cross connections
Allowing the cross connection of two adjacent terminal blocks. Mounted in a suitable position in order to prevent injuries
Each ESC-POF jumper is composed by:

- 2 screws
- 2 sleeves
- 1 plate with 2 holes

All the components are in brass, with nickel plating.

Terminal block	Jumper Type	Screw	Sleeve	Plate
		M x l [mm]	Ø x l [mm]	l x s [mm]
ESC-CBC.16	ESC-POF/53	M4 x 21	8 x 15	7 x 1,5
ESC-CBC.35	ESC-POF/35	M4 x 21	8 x 15	8 x 2
ESC-GPA.70, ESC-GPA.70/FIX	ESC-POF/70	M5 x 35	8 x 23,5	10 x 3
ESC-CBD.50, ESC-CBD.50B	ESC-POF/07	M5 x 20	8 x 12	10 x 2,5
ESC-TLD.2, ESC-TDE.2	ESC-PM/20/2	pre-assembled		
	ESC-PM/30/3			
	ESC-PM/30/10			

Terminal block	Screw/sleeve	Commoning bar	Commoning bar (Length, l x s)	Number of poles
ESC-CBC.16 / B	ESC-CPM/16	ESC-PMP/05	25 cm , 7 x 1,5	21
ESC-CBC.35 / B	ESC-CPM/35	ESC-PMP/35	25 cm , 10 x 4	16

Cross connections - bridges					
Type	Code No.	CROSS CONNECTIONS: nr. of poles, for use with, color	Weight [g]	Packaging [pcs]	Min order [pcs]
ESC-PTC/2/02	003903018	2 POLE for (ESC-CBC.2, ESC2-DBC.2)	1	25	1
ESC-PTC/2/10	003903019	10 POLE for (ESC-CBC.2, ESC2-DBC.2)	5	10	
ESC-PTC/4/02	003903020	2 POLE for (ESC-CBC.4, ESC2-DBC.4)	1	25	
ESC-PTC/4/10	003903021	10 POLE for (ESC-CBC.4, ESC2-DBC.4)	6	10	
ESC-PTP2/02/R	003903022	2 POLE for (ESC-CBC.2) - RED, insulated	0,9	25	
ESC-PTP2/03/R	003903023	3 POLE for (ESC-CBC.2) - RED, insulated	1,4	25	
ESC-PTP2/10/R	003903024	10 POLE for (ESC-CBC.2) - RED, insulated	4,6	10	
ESC-PTP2/02/B	003903025	2 POLE for (ESC-CBC.2) - BLUE, insulated	0,9	25	
ESC-PTP2/03/B	003903026	3 POLE for (ESC-CBC.2) - BLUE, insulated	1,4	25	
ESC-PTP2/10/B	003903027	10 POLE for (ESC-CBC.2) - BLUE, insulated	4,6	10	
ESC-PTP4/02/R	003903028	2 POLE for (ESC-CBC.4) - RED, insulated	1	25	
ESC-PTP4/03/R	003903029	3 POLE for (ESC-CBC.4) - RED, insulated	1,3	25	
ESC-PTP4/10/R	003903030	10 POLE for (ESC-CBC.4) - RED, insulated	5,4	10	
ESC-PTP4/02/B	003903031	2 POLE for (ESC-CBC.4) - BLUE, insulated	1	25	
ESC-PTP4/03/B	003903032	3 POLE for (ESC-CBC.4) - BLUE, insulated	1,3	25	
ESC-PTP4/10/B	003903033	10 POLE for (ESC-CBC.4) - BLUE, insulated	5,4	10	
ESC-PTC/6/02	003903034	2 POLE for (ESC-CBC.6)	2	25	
ESC-PTC/6/10	003903035	10 POLE for (ESC-CBC.6)	12	10	
ESC-PTC/10/02	003903036	2 POLE for (ESC-CBC.10)	3	25	
ESC-PTC/10/10	003903037	10 POLE for (ESC-CBC.10)	18	10	
ESC-POF/53	003903038	cross connection of several terminal blocks for (ESC-CBC.16, length 2 holes)	13	25	25
ESC-POF/35	003903039	cross connection of several terminal blocks for (ESC-CBC.35, length 2 holes)	13	15	15
ESC-CPM/16	003903230	Screw/sleeve, for ESC-CBC.16 / B	5	25	25
ESC-PMP/05	003903040	Commoning bar (21 holes, length 25 cm) for ESC-CBC.16 / B	15	8	8
ESC-CPM/35	003903231	Screw/sleeve for ESC-CBC.35 / B		20	20
ESC-PMP/35	003903041	Commoning bar (16 holes, length 25 cm) for ESC-CBC.35 / B	10	8	8
ESC-POF/70	003903325	2 POLE for (ESC-GPA.70, ESC-GPA.70/FIX)	23	25	25
ESC-POF/07	003903326	2 POLE for (ESC-CBD.50, ESC-CBD.50B)	19	15	15
ESC-PM/20/2	003903327	2 POLE for (ESC-TLD.2, ESC-TDE.2)	2	25	25
ESC-PM/30/3	003903328	3 POLE for (ESC-TLD.2, ESC-TDE.2)	3	25	25
ESC-PM/30/10	003903329	10 POLE for (ESC-TLD.2, ESC-TDE.2)	9	10	10

* Connecting bridges can be cut to the desired length

** In connection with connecting bridges we recommend the use of DFM insulation partitions


ESC-PTC/2/02

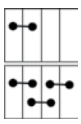

ESC-PTP2/03/B


ESC-PTP2/03/R


ESC-POF/53


ESC-PTC/6/02

PTC jumper configurations

PTC / PTP cross-connection schemes						
	SINGLE OR PARALLEL EXTENDING	POLE SKIPPING	ADJACENT WITH BARRIER	STAGGERED MODE	PARALLEL SKIPPING	
Terminal block	**Isolation voltage [V]**					**I_{max} (A)**
ESC-CBC.2	630 (400)	630 (400)	1000 (400)	500 (320)	500 (320)	24
ESC-CBC.4	630 (320)	500 (320)	800 (320)	500 (320)	500 (320)	32
ESC-CBC.6	630 (320)	630 (320)	800 (320)	630 (250)	630 (250)	41
ESC-CBC.10	800 (250)	630 (320)	800 (250)	800 (250)	630 (250)	57
ESC2-DBC.2	630	500	250* 630**	500	500	24
When connecting groups of terminals of different potential, it is necessary to install jumper separators (ESC-DFM partition insulation of cross connections) to prevent electrical breakthrough and ensure the dielectric distance between plug-in jumpers. When installing the jumpers according to the scheme, the installation of the jumper separator is **mandatory**!						

* between lower adjacent cross connections (with barrier)

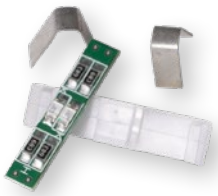
** between upper adjacent cross connections (with barrier)



ESC-C0/5

Accessories for fuse holder terminal block, rated cross section 4mm²

Type	Code No.	Description	Weight [g]	Packaging [pcs]
ESC-SFR/3A	003903058	3A DIODE-HOLDER CARTRIDGE	2	70
ESC-C0/5	003903059	Brass conducting cylinder (act like disconnector)	3	50
ESC-LED.12-48	003903332	Signalling circuit	1,22	10
ESC-LED.115-230	003903333	Signalling circuit	1,22	10



Type	Rated voltage [V d.c. - V a.c.]	Current L R.M.S.
ESC-LED.12-48	12 - 48	3,0 mA
ESC-LED.115-230	115 - 230	2,3 mA

Signalling circuit

- For signalling the status of fuse holder ESC-SFR.4
- Suitable for both a.c. and d.c. circuits

Each packet is supplied with:
- two contact blades
- one non-polarized LED microcircuit
- one transparent protection

The components should be inserted inside the terminal block in the above sequence.

PSD sockets - Test conector

For measurements and checks on circuits which are related to the terminal boards, the following special items can be supplied:
- insulated sockets (PSD) screwable onto the conductor body of the terminal blocks



PSD sockets - Test conector, red color

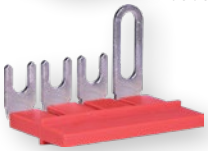
Type	Code No.	Description Internal socket Ø (mm)	For use with	Weight [g]	Packaging [pcs]
ESC-PSD/P	003903225	4,05	ESC-SCB.6, ESC-SCB.6/	4	50
ESC-PSD/A	003903226	2,35	ESC-SCB.4	2	50

Short circuit plates

These allow simultaneous connection to earth of the current reducers, already connected to the ESC-SCB.4, ESC-SCB.6.
They consist of special platelets and sleeves that guarantee the correct sequence of the operation. The platelets, in the open position, block the movements of the cursors,
preventing disconnection of the current circuits.



ESC-SCB.6/P0-2



ESC-SCB.6/P0-4

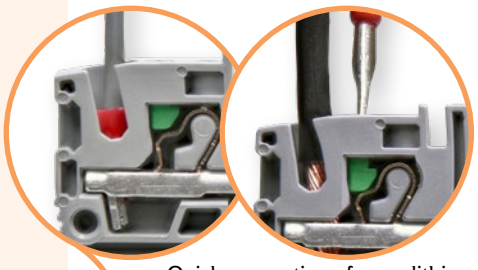
Short circuit plates

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESC-SCB.6/P0-2	003903227	Short circuit plate for two adjacent ESC-SCB.6 terminal blocks	3,15	40
ESC-SCB.6/P0-4	003903228	Short circuit plate for four adjacent ESC-SCB.6 terminal blocks	6	20

»PUSH IN« terminal blocks

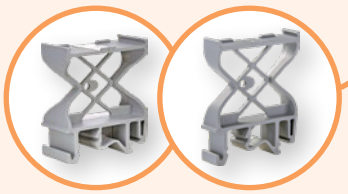
Advantages

- Up to 75% reduction in installation time compared to screw terminals;
- Increased vibration and shock resistance;
- Terminal housing is made of non-combustible polyamide V-0 (according to UL94);
- Connection of up to four conductors of cross-section from 0,5 to 4 mm^2;
- Rated voltage up to 800 V;
- Operating temperature range from -40 to +110°C;
- The "bridge" connection of the terminals is possible thanks to the "EasyBridge" system;
- Installation on TH 35 busbar according to IEC 60715;
- The design of the clamp excludes the possibility of accidental contact with live parts.



Quick connection of monolithic or flexible lug conductor with direct connection without tools

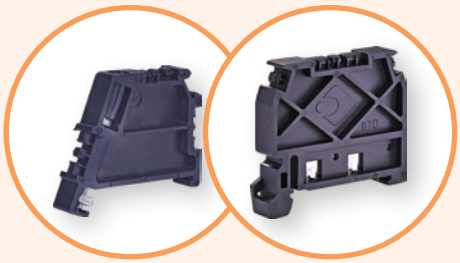
Assembly and disassembly of the flexible conductor is performed with a thin slotted screwdriver



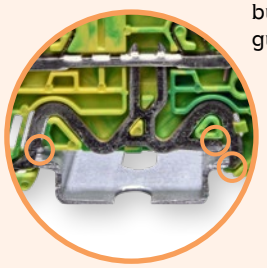
Support for markings ES-PTMS 40x7 mm and ES-PTM 40x16,5 mm

The design of the terminals allows for various marking tags. It is possible to print labels - marking tags using the SmartPrint printer

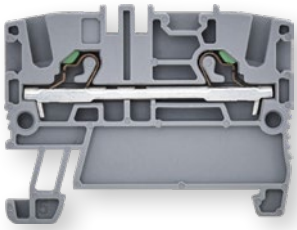
If necessary, the conductor can be easily removed from the terminal by pressing the green button with a screwdriver. This button is isolated from live parts, which is a guarantee of personnel electrical safety



End brackets are used to lock terminals on TH 35 rails



Special triple grounding contact design with DIN-rail ensures reliable mechanical and electrical connection



ESH spring clamps have an increased vibration and shock resistance. Designed for use in rail, road, marine, mining, chemical, agricultural, oil, gas, nuclear, industrial and construction industries



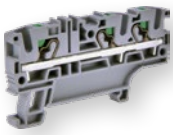
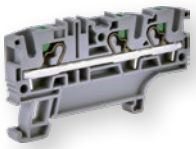
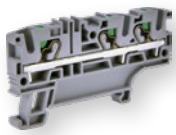
Plug-in insulated 10-pole jumpers in red or blue. Insulated jumpers provide protection against accidental contact

»PUSH IN« terminal blocks
ESH-EFC

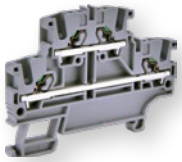
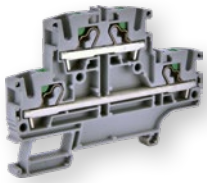
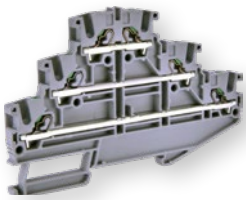
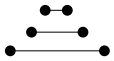
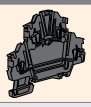
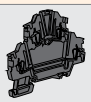
				ESH-EFC.2			ESH-EFC.4		
1	Height x Width x Thickness * *The size includes the DIN rail			39,2 x 49,6 x 5,2 mm			39,2 x 55,2 x 6,2 mm		
2	Rated cross-section			**2,5 mm²**			**4 mm²**		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 6 mm²		
		stranded		0,2 - 4 mm²			0,2 - 6 mm²		
		with ferrule		2,5 - WP25/19			4 - WP40/16		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			**800 V**	600 V		**800 V**	600 V	
5	Max current with rated cross-section			**24 A**	20 A		**32 A**	30 A	
6	Insulation stripping length			9 mm			10 mm		
7	Rated impulse withstand voltage / pollution degree			6 kV / 3			6 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	PUSH-IN spring clamp terminal block (grey)			ESH-EFC.2	003903251	160	ESH-EFC.4	003903255	120
9	PUSH-IN spring clamp terminal block (blue)			ESH-EFC.2B	003903252	160	ESH-EFC.4B	003903256	120
	Accessories								
10	End section (grey)			ESH-EFC.2/PT	003903259	25	ESH-EFC.4/PT	003903263	25
11	End section (blue)			ESH-EFC.2/PTB	003903260	25	ESH-EFC.4/PTB	003903264	25
12	Marking tag			ES-N...	page 946		ES-N...	page 946	
13	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
14	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
15	Cross connections - bridges (insulated, red)	10 poles		ESH-EFB.2/10/R	003903281	5	ESH-EFB.4/10/R	003903283	5
16	Cross connections - bridges (insulated, blue)	10 poles		ESH-EFB.2/10/B	003903282	5	ESH-EFB.4/10/B	003903284	5

The new products with "Push-in" connection technology offers a fast, reliable and efficient wiring of all cable Types.
REDUCTION OF INSTALLATION TIME, INCREASED PERFORMANCE
The Push-in technology allows cables and hoses to be wired with or without wire clips.
Cables are directly inserted in the terminal, with no tooling required to open the clamp spring: just pressing the wire is sufficient to provide a safe and durable electrical connection.
DIRECT PLUG-IN
Connection is so simple, precise and accurate that a switchboard can be wired with a single hand, without impacting performance. This also improves ergonomics.To connect flexible cables without a wire clip, just push the coloured button to open the spring clip and insert the properly stripped cable.
WIRE RELEASE BUTTONS: SPEED, SIMPLICITY AND SAFETY
To remove the wire from the terminal, just press the release button with any tool to open the spring. Release buttons, highlighted by different colours, prevent operators from making mistakes or coming into contact with potentially live parts, even in settings with a high concentration of links.

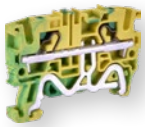
»PUSH IN« terminal blocks
ESH-EFC

			ESH-EFC.2/1+2			ESH-EFC.4/1+2			ESH-EFC.2/2+2		
											
			●——●●			●——●●			●●——●●		
1	Height x Width x Thickness * *The size includes the DIN rail	 	39,2 x 63,1 x 5,2 mm			39,2 x 71,8 x 6,2 mm			39,2 x 76,6 x 5,2 mm		
2	Rated cross-section		**2,5 mm²**			**4 mm²**			**2,5 mm²**		
3	Connecting capacity	solid 	0,2 - 4 mm²			0,2 - 6 mm²			0,2 - 4 mm²		
		stranded 	0,2 - 4 mm²			0,2 - 6 mm²			0,2 - 4 mm²		
		with ferrule 	2,5 - WP25/19			4 - WP40/16			2,5 - WP25/19		
	Technical characteristics		IEC	UL		IEC	UL		IEC	UL	
4	Max voltage AC/DC		**800 V**	600 V		**800 V**	600 V		**800 V**	600 V	
5	Max current with rated cross-section		**24 A**	20 A		**32 A**	30 A		**24 A**	20 A	
6	Insulation stripping length		9 mm			10 mm			9 mm		
7	Rated impulse withstand voltage / pollution degree		6 kV / 3			6 kV / 3			6 kV / 3		
			Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	PUSH-IN spring clamp terminal block (1 input, 2 outputs; grey)		ESH-EFC.2/1+2	003903253	120	ESH-EFC.4/1+2	003903257	110			
9	PUSH-IN spring clamp terminal block (1 input, 2 outputs; blue)		ESH-EFC.2B/1+2	003903254	120	ESH-EFC.4B/1+2	003903258	110			
10	PUSH-IN spring clamp terminal block (2 inputs, 2 outputs; grey)								ESH-EFC.2/2+2	003903285	90
11	PUSH-IN spring clamp terminal block (2 inputs, 2 outputs; blue)								ESH-EFC.2B/2+2	003903286	90
	Accessories										
12	End section (grey)		ESH-EFC.2/1+2/PT	003903261	25	ESH-EFC.4/1+2/PT	003903265	25	ESH-EFC.2/2+2/PT	003903279	25
13	End section (blue)		ESH-EFC.2/1+2/PTB	003903262	25	ESH-EFC.4/1+2/PTB	003903266	25	ESH-EFC.2/2+2/PTB	003903288	25
14	Marking tag		ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
15	End bracket (spring Type)		ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
16	End bracket (screw Type)		ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
16	Cross connections - bridges 10 poles (insulated, red)		ESH-EFB.2/10/R	003903281	5	ESH-EFB.4/10/R	003903283	5	ESH-EFB.4/10/R	003903283	5
18	Cross connections - bridges 10 poles (insulated, blue)		ESH-EFB.2/10/B	003903282	5	ESH-EFB.4/10/B	003903284	5	ESH-EFB.4/10/B	003903284	5

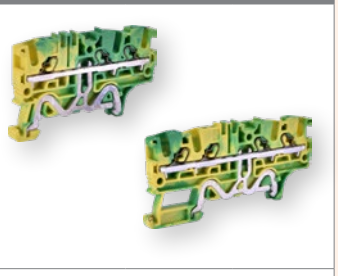
»PUSH IN« terminal blocks
two-level ESH-EFD
three-level ESH-EFT

			ESH-EFD.2	ESH-EFD.4	ESH-EFT.2
					
					
1	Height x Width x Thickness * *The size includes the DIN rail	 	53,8 x 71,6 x 5,2 mm	57,7 x 81,7 x 6,2 mm	68,4 x 106,2 x 5,2 mm mm
2	Rated cross-section		**2,5 mm²**	**4 mm²**	**2,5 mm²**
3	Connecting capacity	solid 	0,2 - 4 mm²	0,2 - 6 mm²	0,2 - 4 mm²
		stranded 	0,2 - 4 mm²	0,2 - 6 mm²	0,2 - 4 mm²
		with ferrule 	2,5 - WP25/19	4 - WP40/16	2,5 - WP25/19
	Technical characteristics		IEC / UL	IEC / UL	IEC / UL
5	Max voltage AC/DC		**800 V** / 600 V	**800 V** / 600 V	**800 V** / 600 V
6	Max current with rated cross-section		**22 A** / 20 A	**29 A** / 30 A	**22 A** / 20 A
7	Insulation stripping length		9 mm	10 mm	10 mm
8	Rated impulse withstand voltage / pollution degree		6 kV / 3	6 kV / 3	6 kV / 3
			Type / Code No. / Packaging [pcs]	Type / Code No. / Packaging [pcs]	Type / Code No. / Packaging [pcs]
9	PUSH-IN two-level spring clamp terminal block (grey)		ESH-EFD.2 / 003903267 / 130	ESH-EFD.4 / 003903268 / 100	
10	PUSH-IN three-level spring clamp terminal block (grey)				ESH-EFT.2 / 003903271 / 100
	Accessories				
11	End section (grey)		ESH-EFD.2/PT / 003903269 / 25	ESH-EFD.4/PT / 003903270 / 25	ESH-EFT.2/PT / 003903272 / 25
12	Marking tag		ES-N... / page 946	ES-N... / page 946	ES-N... / page 946
13	End bracket (spring Type)		ES-BTO / 003903075 / 25	ES-BTO / 003903075 / 25	ES-BTO / 003903075 / 25
14	End bracket (screw Type)		ES-BT/3 / 003903229 / 25	ES-BT/3 / 003903229 / 25	ES-BT/3 / 003903229 / 25
15	Cross connections - bridges (insulated, red) 10 poles		ESH-EFB.2/10/R / 003903281 / 5	ESH-EFB.4/10/R / 003903283 / 5	ESH-EFB.2/10/R / 003903281 / 5
16	Cross connections - bridges (insulated, blue) 10 poles		ESH-EFB.2/10/B / 003903282 / 5	ESH-EFB.4/10/B / 003903284 / 5	ESH-EFB.2/10/B / 003903282 / 5

»PUSH IN« earth terminal blocks ESH-EFCE

				ESH-EFCE.2			ESH-EFCE.4		
									
									
1	Height x Width x Thickness *  *The size includes the DIN rail			39,2 x 51,1 x 5,2 mm			39,2 x 55,2 x 6,2 mm		
2	Rated cross-section			2,5 mm²			4 mm²		
3	Connecting capacity	solid		0,2 - 4 mm²			0,2 - 6 mm²		
		stranded		0,2 - 4 mm²			0,2 - 6 mm²		
		with ferrule		2,5 - WP25/19			4 - WP40/16		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			-	-		-	-	
5	Max current with rated cross-section			20 A	-		26 A	-	
6	Insulation stripping length			9 mm			10 mm		
7	Rated impulse withstand voltage / pollution degree			6 kV / 3			6 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	PUSH-IN spring clamp terminal block (yellow-green)			ESH-EFCE.2	003903273	80	ESH-EFCE.4	003903276	70
	Accessories								
9	End section (grey)			ESH-EFC.2/PT	003903259	25	ESH-EFC.4/PT	003903263	25
10	Marking tag			ES-N...	page 946		ES-N...	page 946	
11	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
12	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
13	Cross connections - bridges (insulated, red)	10 poles		ESH-EFB.2/10/R	003903281	5	ESH-EFB.4/10/R	003903283	5
14	Cross connections - bridges (insulated, blue)	10 poles		ESH-EFB.2/10/B	003903282	5	ESH-EFB.4/10/B	003903284	5

»PUSH IN« earth terminal blocks ESH-EFCE

			ESH-EFCE.2/1+2 ESH-EFCE.2/2+2			ESH-EFCE.4/1+2 ESH-EFCE.4/2+2		
								
1	Height x Width x Thickness * *The size includes the DIN rail		39,2 x 64,6 (78,1*) x 5,2 mm			39,2 x 71,8 (88,4*) x 6,2 mm		
2	Rated cross-section		**2,5 mm²**			**4 mm²**		
3	Connecting capacity	solid	0,2 - 4 mm²			0,2 - 6 mm²		
		stranded	0,2 - 4 mm²			0,2 - 6 mm²		
		with ferrule	2,5 - WP25/19			4 - WP40/16		
	Technical characteristics		IEC	UL		IEC	UL	
4	Max voltage AC/DC		-	-		-	-	
5	Max current with rated cross-section		**20 A**	-		**26 A**	-	
6	Insulation stripping length		9 mm			10 mm		
7	Rated impulse withstand voltage / pollution degree		6 kV / 3			6 kV / 3		
			Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	PUSH-IN spring clamp terminal block (1 input, 2 outputs; yellow-green)		ESH-EFCE.2/1+2	003903274	50	ESH-EFCE.4/1+2	003903277	60
9	PUSH-IN spring clamp terminal block (2 inputs, 2 outputs; yellow-green)		ESH-EFCE.2/2+2	003903275	60	ESH-EFCE.4/2+2	003903278	90
	Accessories							
10	End section (grey) for ESH-EFCE.2/1+2, ESH-EFCE.4/1+2		ESH-EFC.2/1+2/PT	003903261	25	ESH-EFC.4/1+2/PT	003903265	25
11	End section (grey) for ESH-EFCE.2/2+2, ESH-EFCE.4/2+2		ESH-EFC.2/2+2/PT	003903279	25	ESH-EFC.4/2+2/PT	003903280	25
12	Marking tag		ES-N...	page 946		ES-N...	page 946	
13	End bracket (spring Type)		ES-BTO	003903075	25	ES-BTO	003903075	25
14	End bracket (screw Type)		ES-BT/3	003903229	25	ES-BT/3	003903229	25
15	Cross connections - bridges (insulated, red)	10 poles	ESH-EFB.2/10/R	003903281	5	ESH-EFB.4/10/R	003903283	5
16	Cross connections - bridges (insulated, blue)	10 poles	ESH-EFB.2/10/B	003903282	5	ESH-EFB.4/10/B	003903284	5

* Length of ESH-EFCE.2(4)/2+2 terminal blocks

Accessories for »PUSH IN« terminal blocks

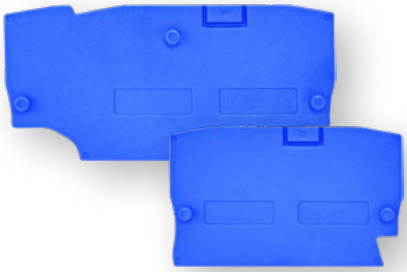
End sections, grey color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESH-EFC.2/PT	003903259	ESH-EFC.2, ESH-EFCE.2	3,11	25
ESH-EFC.2/1+2/PT	003903261	ESH-EFC.2/1+2, ESH-EFCE.2/1+2	3,00	25
ESH-EFC.2/2+2/PT	003903279	ESH-EFC.2/2+2, ESH-EFCE.2/2+2	3,91	25
ESH-EFC.4/PT	003903263	ESH-EFC.4, ESH-EFCE.4	2,99	25
ESH-EFD.4/1+2/PT	003903265	ESH-EFC.4/1+2, ESH-EFCE.4/1+2	3,00	25
ESH-EFC.4/2+2/PT	003903280	ESH-EFCE.4/2+2	4,00	25



End sections, blue color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESH-EFC.2/PTB	003903260	ESH-EFC.2B	2,60	25
ESH-EFC.2/1+2/PTB	003903262	ESH-EFC.2B/1+2	3,00	25
ESH-EFC.2/2+2/PTB	003903288	ESH-EFC.2B/2+2	4,06	25
ESH-EFC.4/PTB	003903264	ESH-EFC.4B	2,99	25
ESH-EFD.4/1+2/PTB	003903266	ESH-EFC.4B/1+2	3,00	25



End section for two and three level terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESH-EFD.2/PT	003903269	ESH.EFD.2	4,51	25
ESH-EFD.4/PT	003903270	ESH-EFT.4	5,35	25
ESH-EFT.2/PT	003903272	ESH-EFT.2	8,10	25



"Easy bridge" system: double possibility to insert ESH-EFB.2/10/R, ESH-EFB.2/10/B and ESH-EFB.4/10/R, ESH-EFB.4/10/B multi-pole cross-connections, without the need of insulating protection. Cross connections - bridges 10 pole versions with insulation red or blue, or without isolation.

Cross connections - bridges

Type	Code No.	CROSS CONNECTIONS: nr. of poles, for use with, color	Weight [g]	Packaging [pcs]
ESH-EFB.2/10/R	003903281	10 POLE for (ESH-EFC.2, ESH-EFCE.2, ESH-EFD.2, ESH-EFT.2) - RED, insulated	5	5
ESH-EFB.2/10/B	003903282	10 POLE for (ESH-EFC.2, ESH-EFCE.2, ESH-EFD.2, ESH-EFT.2) - BLUE, insulated	5	5
ESH-EFB.4/10/R	003903283	10 POLE for (ESH-EFC.4, ESH-EFCE.4, ESH-EFD., ESH-EFT.4) - RED, insulated	5	5
ESH-EFB.4/10/B	003903284	10 POLE for (ESH-EFC.4, ESH-EFCE.4, ESH-EFD., ESH-EFT.4) - BLUE, insulated	5	5

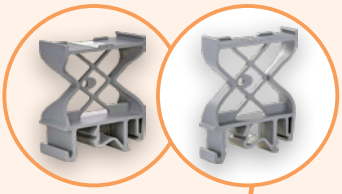
* Connecting bridges can be cut to the desired length

** In connection with connecting bridges we recommend the use of DFM insulation partitions

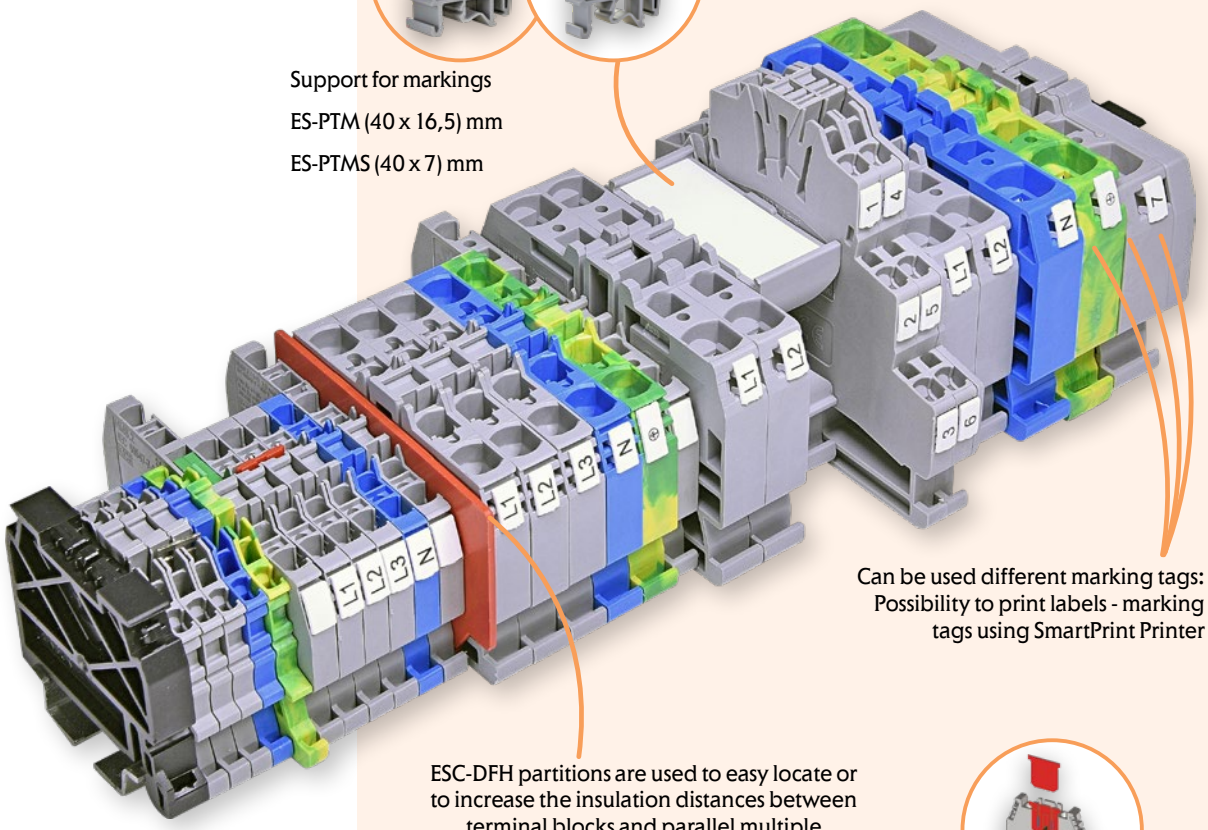




Spring clamp terminal blocks

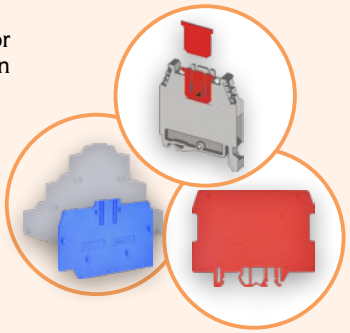


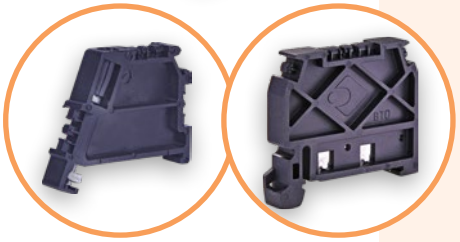
Support for markings
ES-PTM (40 x 16,5) mm
ES-PTMS (40 x 7) mm



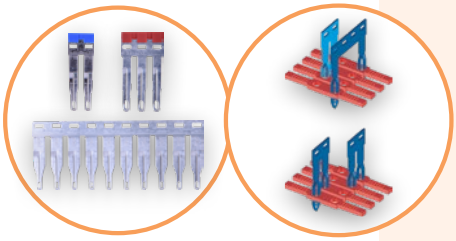
Can be used different marking tags: Possibility to print labels - marking tags using SmartPrint Printer

ESC-DFH partitions are used to easy locate or to increase the insulation distances between terminal blocks and parallel multiple commoning bars.

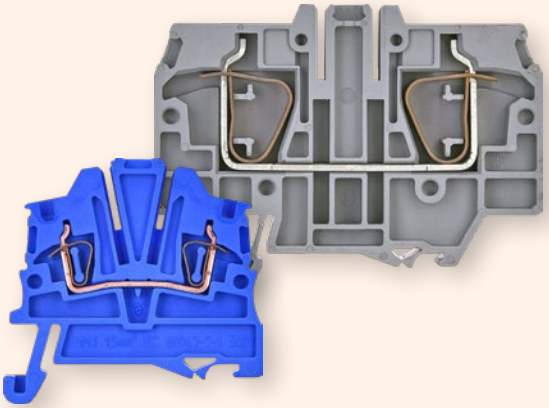




End brackets ES-BTO (spring Type), ES-BT/3 (screw Type) are used to lock terminals on TH35 rails.

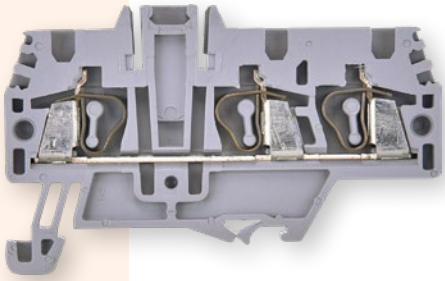


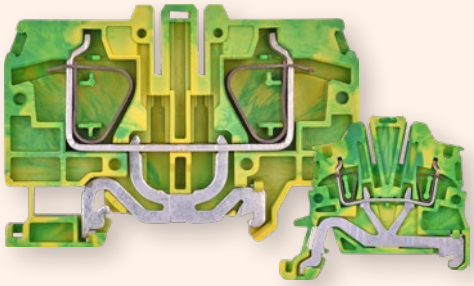
"Easy bridge" system: double possibility to insert PTC, PTP multi-pole cross-connections, without the need of insulating protection. Cross connections - bridges 2, 3 and 10 pole versions with insulation red or blue, or without isolation.



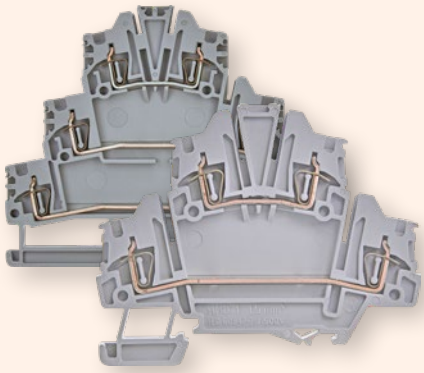
- Spring Type terminal blocks ESP-HMM series for conductors with cross sections from 0,2 to 25 mm^2 in grey and blue color. Provide constant and permanent clamping pressure to electrical conductor, resistant to vibrations.

Feed through terminal blocks ESP-HMM/1+2, 1 input and 2 outputs, grey color. For conductors with cross sections from 0,2 to 4 mm^2.

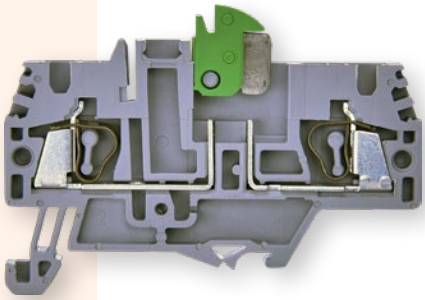




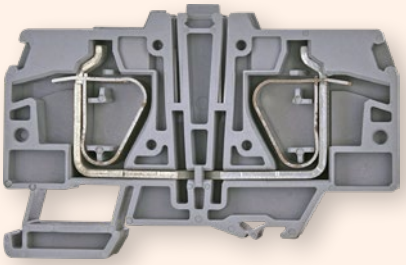
Earth terminal blocks ESP-HTE - Feed through terminal blocks, yellow-green. For conductors with cross sections from 0,2 to 25 mm^2.

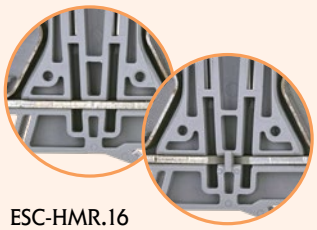


Two and three level terminal blocks ESP2-HMD and ESP3-HLD. For conductors with cross sections from 0,2 to 2,5 mm^2 in grey color.



Disconnect terminal block ESP-HMS.2. For conductors with cross sections from 0,2 to 4 mm^2 in grey color.

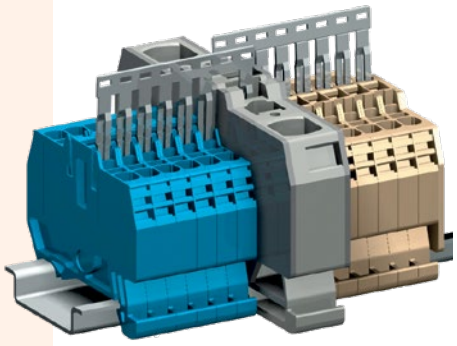




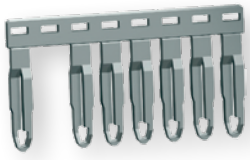
ESC-HMR.16

ESC-HMR.16/D

Potential power distribution, grey color terminal blocks ESP-HMR.16 and ESP-HMR.16/D. For conductors with cross sections from 1,5 to 25 mm^2. We have single and double power supply version.



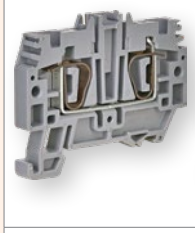
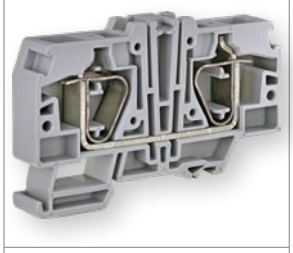
Example: double power supply version



You have to remove second pole from Cross connections - bridges in order to use it with ESC-HMR, ESC-HMR/D.

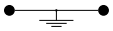
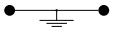
Spring clamp terminal blocks
ESP-HMM

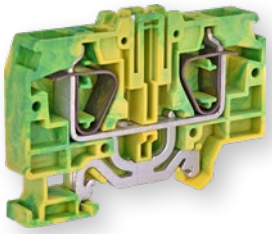
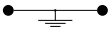
				ESP-HMM.1			ESP-HMM.2		ESP-HMM.2/1+2	
										
1	Height x Width x Thickness * *The size includes the DIN rail			43 x 45 x 4,2 mm			41 x 50 x 5,2 mm		41 x 66 x 5,2 mm	
2	Rated cross-section			**1,5 mm²**			**2,5 mm²**			
3	Connecting capacity	solid		0,2 - 2,5 mm²			0,2 - 4 mm²			
		stranded		0,2 - 2,5 mm²			0,2 - 4 mm²			
		with ferrule		1,5 - WP15/14			2,5 - WP25/14			
	Technical characteristics			IEC	UL		IEC	UL		
4	Max voltage AC/DC			**500 V**	600 V		**800 V**	600 V		
5	Max current with rated cross-section			**17,5 A**	15 A		**24 A**	20 A		
6	Insulation stripping length			10 mm			10 mm			
7	Rated impulse withstand voltage / pollution degree			8 kV / 3			8 kV / 3			
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	
8	Feed through spring clamp terminal block (grey)			ESP-HMM.1	003903130	100	ESP-HMM.2	003903131	80	
9	Feed through spring clamp terminal block (blue)			ESP-HMM.1B	003903166	100	ESP-HMM.2B	003903167	100	
10	Feed through spring clamp terminal block (1 input, 2 outputs; grey)						ESP-HMM.2/1+2	003903233	100	
	Accessories									
11	End section (grey)			ESP-HMT.1/PT	003903136	25	ESP-HMT.2/PT	003903137	25	
12	End section (blue)			ESP-HMT.1/PTB	003903172	25	ESP-HMT.2/PTB	003903173	25	
13	End section (1 input, 2 outputs; grey)						ESP-HMT.2/1+2/PT	003903189	25	
14	Red partition			ESP-DFH/1	003903142	25	ESP-DFH/1 (for ESP-HMM.2)	003903142	25	
15	Marking tag			ESP-SH004S	page 947		ES-N...	page 946		
16	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25	
17	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25	
18	Red insulation partition to be used in case of cross connections - bridges			ESP-DFM/500	003903144	50				
19	Cross connections - bridges (uninsulated)	2 poles		ESP-PTC/1/02	003903145	25				
		3 poles		ESP-PTC/1/03	003903146	25				
		10 poles		ESP-PTC/1/10	003903147	10				
20	Cross connections - bridges (insulated, red)	2 poles					ESP-PTP/3/02/R	003903148	25	
		3 poles					ESP-PTP/3/03/R	003903149	25	
		10 poles					ESP-PTP/3/10/R	003903150	10	
21	Cross connections - bridges (insulated, blue)	2 poles					ESP-PTP/3/02/B	003903151	25	
		3 poles					ESP-PTP/3/03/B	003903152	25	
		10 poles					ESP-PTP/3/10/B	003903153	10	

	ESP-HMM.4	ESP-HMM.4/1+2	ESP-HMM.6	ESP-HMM.10	ESP-HMM.16
					
					
1	45 x 58 x 6,2 mm	45 x 78 x 6,2 mm	44 x 62 x 8,2 mm	53 x 71 x 10 mm	56 x 80 x 12 mm
2	**4 mm²**		**6 mm²**	**10 mm²**	**16 mm²**
3	0,2 - 6 mm²		0,2 - 10 mm²	1,5 - 16 mm²	1,5 - 25 mm²
	0,2 - 6 mm²		0,2 - 10 mm²	1,5 - 16 mm²	1,5 - 25 mm²
	4 - WP40/16		6 - WP60/20	10 - WP100/21	16 - WP160/22
	IEC	UL	IEC	UL	IEC	UL	IEC	UL
4	**800 V**	600 V	**800 V**	600 V	**1000 V**	600 V	**1000 V**	600 V
5	**32 A**	30	**41 A**	41 A	**57 A**	57 A	**76 A**	85 A
6	12 mm		13 mm		18 mm		18 mm	
7	8 kV / 3		8 kV / 3		12 kV / 3		12 kV / 3	

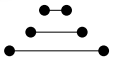
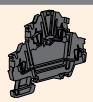
	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	ESP-HMM.4	003903132	60	ESP-HMM.6	003903133	30	ESP-HMM.10	003903134	30	ESP-HMM.16	003903135	30
9	ESP-HMM.4B	003903168	60	ESP-HMM.6B	003903169	30	ESP-HMM.10B	003903170	30	ESP-HMM.16B	003903171	30
10	ESP-HMM.4/1+2	003903234	60									
	Accessories											
11	ESP-HMT.4/PT	003903138	25	ESP-HMT.6/PT	003903139	25	ESP-HMT.10/PT	003903140	25	ESP-HMT.16/PT	003903141	25
12	ESP-HMT.4/PTB	003903174	25	ESP-HMT.6/PTB	003903175	25	ESP-HMT.10/PTB	003903176	25	ESP-HMT.16/PTB	003903177	25
13	ESP-HMT.4/1+2/PT	003903236	25									
14	ESP-DFH/1 (for ESP-HMM.4)	003903142	25	ESP-DFH/1	003903142	25	ESP-DFH/4	003903143	25	ESP-DFH/4	003903143	25
15	ES-N...	page 946		ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
16	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
17	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
18												
19				ESC-PTC/8/02	003903160	25	ESC-PTC/11/02	003903162	25	ESC-PTC/16/02	003903164	25
				ESC-PTC/8/10	003903161	10	ESC-PTC/11/10	003903163	10	ESC-PTC/16/10	003903165	10
20	ESP-PTP/5/02/R	003903154	25									
	ESP-PTP/5/03/R	003903155	25									
	ESP-PTP/5/10/R	003903156	10									
21	ESP-PTP/5/02/B	003903157	25									
	ESP-PTP/5/03/B	003903158	25									
	ESP-PTP/5/10/B	003903159	10									

Earth spring clamp terminal blocks ESP-HTE

				ESP-HTE.1			ESP-HTE.2		
									
									
1	Height x Width x Thickness * *The size includes the DIN rail			43 x 50 x 4,2 mm			41 x 54 x 5,2 mm		
2	Rated cross-section			**1,5 mm²**			**2,5 mm²**		
3	Connecting capacity	solid		0,2 - 2,5 mm²			0,2 - 4 mm²		
		stranded		0,2 - 2,5 mm²			0,2 - 4 mm²		
		with ferrule		1,5 - WP15/14			2,5 - WP25/14		
	Technical characteristics			IEC	UL		IEC	UL	
4	Max voltage AC/DC			-	400 V		-	500 V	
5	Max current with rated cross-section			**17,5 A**	-		**24 A**	-	
6	Insulation stripping length			10 mm			10 mm		
7	Rated impulse withstand voltage / pollution degree			8 kV / 3			8 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	Feed through spring clamp terminal block (yellow-green)			ESP-HTE.1	003903190	100	ESP-HTE.2	003903191	80
	Accessories								
9	End section (grey)			ESP-HMT.1/PT	003903136	25	ESP-HMT.2/PT	003903137	25
10	Red partition			ESP-DFH/1	003903142	25	ESP-DFH/1	003903142	25
11	Marking tag			ESP-SH004S	page 947		ES-N...	page 946	
12	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25
13	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25
14	Cross connections - bridges (uninsulated)	2 poles		ESP-PTC/1/02	003903145	25			
		3 poles		ESP-PTC/1/03	003903146	25			
		10 poles		ESP-PTC/1/10	003903147	10			
15	Cross connections - bridges (insulated, red)	2 poles					ESP-PTP/3/02/R	003903148	25
		3 poles					ESP-PTP/3/03/R	003903149	25
		10 poles					ESP-PTP/3/10/R	003903150	10
16	Cross connections - bridges (insulated, blue)	2 poles					ESP-PTP/3/02/B	003903151	25
		3 poles					ESP-PTP/3/03/B	003903152	25
		10 poles					ESP-PTP/3/10/B	003903153	10

	ESP-HTE.4			ESP-HTE.6			ESP-HTE.10			ESP-HTE.16		
												
												
1	45 x 58 x 6,2 mm			44 x 62 x 8,2 mm			53 x 71 x 10 mm			56 x 80 x 12 mm		
2	**4 mm²**			**6 mm²**			**10 mm²**			**16 mm²**		
3	0,2 - 6 mm²			0,2 - 10 mm²			1,5 - 16 mm²			1,5 - 25 mm²		
	0,2 - 6 mm²			0,2 - 10 mm²			1,5 - 16 mm²			1,5 - 25 mm²		
	4 - WP40/16			6 - WP60/20			10 - WP100/21			16 - WP160/22		
	IEC	UL		IEC	UL		IEC	UL		IEC	UL	
4	-	500 V		-	500 V		-	500 V		-	630 V	
5	**32 A**	-		**41 A**	-		**57 A**	-		**76 A**	-	
6	12 mm			13 mm			18 mm			18 mm		
7	8 kV / 3			8 kV / 3			12 kV / 3			12 kV / 3		
	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
8	ESP-HTE.4	003903192	60	ESP-HTE.6	003903193	30	ESP-HTE.10	003903194	30	ESP-HTE.16	003903195	30
	Accessories											
9	ESP-HMT.4/PT	003903138	25	ESP-HMT.6/PT	003903139	25	ESP-HMT.10/PT	003903140	25	ESP-HMT.16/PT	003903141	25
10	ESP-DFH/1	003903142	25	ESP-DFH/1	003903142	25	ESP-DFH/4	003903143	25	ESP-DFH/4	003903143	25
11	ES-N...	page 946		ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
12	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
13	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
14				ESC-PTC/8/02	003903160	25	ESC-PTC/11/02	003903162	25	ESC-PTC/16/02	003903164	25
				ESC-PTC/8/10	003903161	10	ESC-PTC/11/10	003903163	10	ESC-PTC/16/10	003903165	10
15	ESP-PTP/5/02/R	003903154	25									
	ESP-PTP/5/03/R	003903155	25									
	ESP-PTP/5/10/R	003903156	10									
16	ESP-PTP/5/02/B	003903157	25									
	ESP-PTP/5/03/B	003903158	25									
	ESP-PTP/5/10/B	003903159	10									

Spring clamp terminal blocks two-level ESP2-HMD, three-level ESP3-HLD

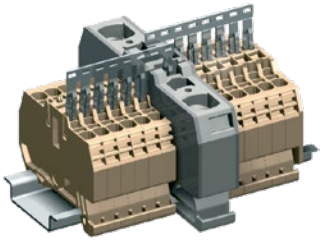
			ESP2-HMD.1			ESP2-HMD.2N			ESP3-HLD.2		
											
											
1	Height x Width x Thickness * *The size includes the DIN rail	 	59 x 73 x 4,2 mm			59 x 73 x 5,2 mm			75 x 95 x 5,2 mm		
2	Rated cross-section		**1,5 mm²**			**2,5 mm²**			**2,5 mm²**		
3	Connecting capacity	solid 	0,2 - 2,5 mm²			0,2 - 2,5 mm²			0,2 - 2,5 mm²		
		stranded 	0,2 - 2,5 mm²			0,2 - 2,5 mm²			0,2 - 2,5 mm²		
		with ferrule 	1,5 - WP15/14			1,5 - WP15/14			1,5 - WP15/14		
	Technical characteristics		IEC	UL		IEC	UL		IEC	UL	
5	Max voltage AC/DC		**500 V**	600 V		**630 V**	600 V		**500 V**	-	
6	Max current with rated cross-section		**17,5 A**	15 A		**24 A**	15 A		**24 A**	-	
7	Insulation stripping length		10 mm			10 mm			10 mm		
8	Rated impulse withstand voltage / pollution degree		6 kV / 3			8 kV / 3			8 kV / 3		
			Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
9	Two level feed through spring clamp terminal block (grey)		ESP2-HMD.1	003903183	50	ESP2-HMD.2N	003903184	40			
	Three level feed through spring clamp terminal block (grey)								ESP3-HLD.2	003903186	50
	Accessories										
10	End section (grey)		ESP2-HMD.1/PT	003903185	25	ESP2-HMD.1/PT	003903185	25	ESP3-HLD.2/PT	003903187	25
11	Red partition		ESC-DFU/7/R	003903015	25	ESC-DFU/7/R	003903015	25			
12	Marking tag		ESP-SH004S	page 947		ES-N...	page 946		ES-N...	page 946	
13	End bracket (spring Type)		ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
14	End bracket (screw Type)		ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
15	Red insulation partition to be used in case of cross connections - bridges		ESP-DFM/500	003903144	50	ESP-DFM/500	003903144	50	ESP-DFM/500	003903144	50
16	Cross connections - bridges (non-insulated)	2 poles 	ESP-PTC/1/02	003903145	25						
		3 poles	ESP-PTC/1/03	003903146	25						
		10 poles	ESP-PTC/1/10	003903147	10						
17	Cross connections - bridges (insulated, red)	2 poles 				ESP-PTP/3/02/R	003903148	25	ESP-PTP/3/02/R	003903148	25
		3 poles				ESP-PTP/3/03/R	003903149	25	ESP-PTP/3/03/R	003903149	25
		10 poles				ESP-PTP/3/10/R	003903150	10	ESP-PTP/3/10/R	003903150	10
18	Cross connections - bridges (insulated, blue)	2 poles 				ESP-PTP/3/02/B	003903151	25	ESP-PTP/3/02/B	003903151	25
		3 poles				ESP-PTP/3/03/B	003903152	25	ESP-PTP/3/03/B	003903152	25
		10 poles				ESP-PTP/3/10/B	003903153	10	ESP-PTP/3/10/B	003903153	10

Potential power distribution spring clamp terminal blocks ESP-HMR
Disconnect spring clamp terminal blocks ESP-HMS

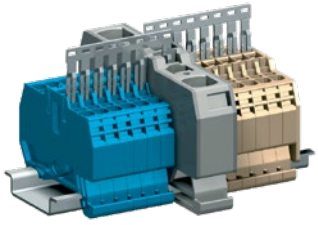
				ESP-HMR.16			ESP-HMR.16/D			ESP-HMS.2		
1	Height x Width x Thickness * *The size includes the DIN rail			50 x 80 x 12,8 mm			50 x 80 x 12,8 mm			37 x 66 x 5,2 mm		
2	Rated cross-section			**16 mm²**			**16 mm²**			**2,5 mm²**		
3	Connecting capacity	solid		1,5 - 25 mm²			1,5 - 25 mm²			0,2 - 4 mm²		
		stranded		1,5 - 25 mm²			1,5 - 25 mm²			0,2 - 4 mm²		
		with ferrule		16 - WP160/22			16 - WP160/22			2,5 - WP25/14		
	Technical characteristics			IEC	UL		IEC	UL		IEC	UL	
5	Max voltage AC/DC			**800 V**	600 V		**800 V**	600 V		**400 V**	600 V	
6	Max current with rated cross-section			**76 A**	30 A		**76 A**	30 A		**16 A**	24A	
7	Insulation stripping length			18 mm			18 mm			10 mm		
8	Rated impulse withstand voltage / pollution degree			12 kV / 3			12 kV / 3			6 kV / 3		
				Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]	Type	Code No.	Packaging [pcs]
9	Potential power distribution spring clamp terminal block (grey) / Disconnect spring clamp terminal block (grey)			ESP-HMR.16 Single power supply version	003903178	15	ESP-HMR.16/D Double supply version	003903179	30	ESP-HMS.2	003903188	80
	Accessories											
10	End section (grey) for ESP-HMM.2, ESP-HMM.2/1+2			ESP-HMR.16-2/ PT	003903180	10	ESP-HMR.16-2/ PT	003903180	10	ESP-HMT.2/1+2/ PT	003903189	25
11	End section (grey) for ESP-HMM.4, ESP-HMM.4/1+2			ESP-HMR.16-4/ PT	003903181	10	ESP-HMR.16-4/ PT	003903181	10			
12	End section (grey) ESP-HMM.6			ESP-HMR.16-6/ PT	003903182	10	ESP-HMR.16-6/ PT	003903182	10			
13	Red partition			ESP-DFH/4	003903143	25	ESP-DFH/4	003903143	25			
14	Marking tag			ES-N...	page 946		ES-N...	page 946		ES-N...	page 946	
15	End bracket (spring Type)			ES-BTO	003903075	25	ES-BTO	003903075	25	ES-BTO	003903075	25
16	End bracket (screw Type)			ES-BT/3	003903229	25	ES-BT/3	003903229	25	ES-BT/3	003903229	25
17	Cross connections - bridges (non-insulated) to connect ESP-HMM.6	10 poles		ESC-PTC/08/10	003903161	25	ESC-PTC/08/10	003903161	25			
18	Cross connections - bridges (red, blue) to connect ESP-HMM.2	2 poles (red)								ESP-PTP/3/02/R	003903148	25
		2 poles (blue)								ESP-PTP/3/02/B	003903151	25
		3 poles (red)		ESP-PTP/3/03/R	003903149	25	ESP-PTP/3/03/R	003903149	25	ESP-PTP/3/03/R	003903149	25
		3 poles (blue)		ESP-PTP/3/03/B	003903152	25	ESP-PTP/3/03/B	003903152	25	ESP-PTP/3/03/B	003903152	25
		10 poles (red)		ESP-PTP/3/10/R	003903150	10	ESP-PTP/3/10/R	003903150	10	ESP-PTP/3/10/R	003903150	10
		10 poles (blue)		ESP-PTP/3/10/B	003903153	10	ESP-PTP/3/10/B	003903153	10	ESP-PTP/3/10/B	003903153	10
19	Cross connections - bridges (red, blue) to connect ESP-HMM.4	3 poles (red)		ESP-PTC/5/03/R	003903155	25	ESP-PTC/5/03/R	003903155	25			
		3 poles (blue)		ESP-PTC/5/03/B	003903158	25	ESP-PTC/5/03/B	003903158	25			
		10 poles (red)		ESP-PTC/5/10/R	003903156	10	ESP-PTC/5/10/R	003903156	10			
		10 poles (blue)		ESP-PTC/5/10/B	003903159	10	ESP-PTC/5/10/B	003903159	10			

Features of potential distribution terminal blocks ESP-HMR

- with UL94V-0 polyamide insulating body
- 16 mm²
- mounting onto rails according to IEC 60715 Std., "TH/35" Type
- available in grey RAL 7042 colour
- can be connected with ESP-HMM.2



Spring clamp potential distribution terminal block, single power supply



Spring clamp potential distribution terminal block, double power supply

NOTES:
The number of poles to be used shall be equal to the number of terminal blocks to be connected, including the distribution terminal block + 1
To allow the connection to the distribution terminal block the second pin of the PTC jumper shall be trimmed off
*Connectable only on the open side of the distribution terminal block

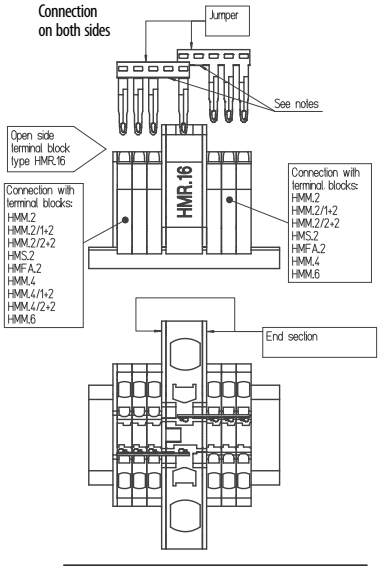


Terminal block connected to supply terminal	End sections	Permanent cross connection (**)	
		Type	Total capacity
ESP-HMM.2	ESP-HMR.16-2/PT	ESP-PTP0303 ESP-PTP0310	24 A
ESP-HMM.4	ESP-HMR.16-4/PT	ESP-PTP0503 ESP-PTP0510	32 A
ESP-HMM.6	ESP-HMR.16-6/PT	ESP-PTC/08/10 poles	41 A

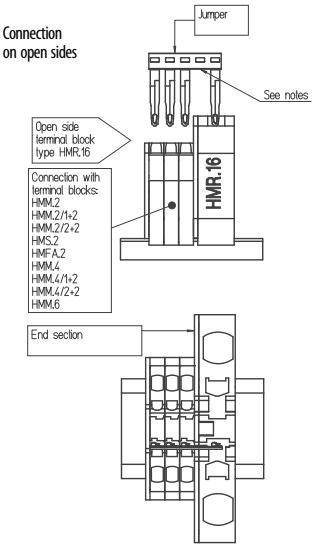
(**) In order to enable the connection to the supply terminal the second pin must be always removed from the strip of the PTC jumper.

Connection

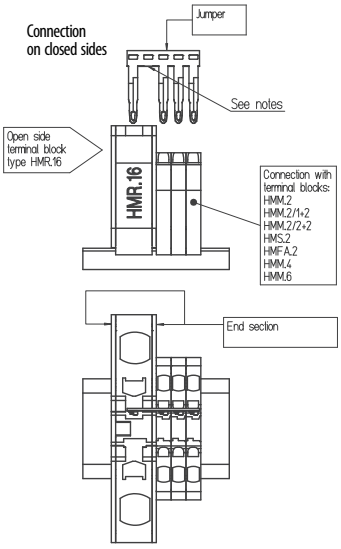
Connection on both sides



Connection on open sides



Connection on closed sides



The number of poles of the PTC jumper must be equal to to the number of terminal blocks to be cross-connected plus 1

Accessories for spring clamp terminal blocks

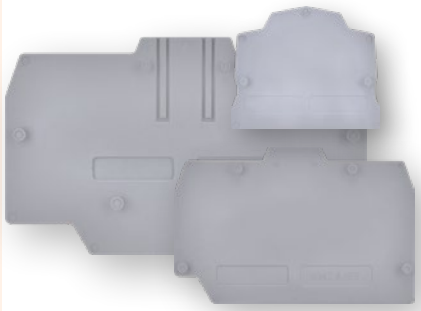
Terminal block	End section	
	Type	Thickness [mm]
ESP3-HLD.2	ESP3-HLD.2/PT	1,5
ESP-HMM.1	ESP-HMT.1/PT	1,5
ESP-HMM.2	ESP-HMT.2/PT	1,5
ESP-HMM.4	ESP-HMT.4/PT	1,5
ESP2-HMD.1	ESP2-HMD.1/PT	1,5
ESP2-HMD.2N	ESP2-HMD.1/PT	1,5
ESP-HMM.6	ESP-HMT.6/PT	1,5
ESP-HTE.1	ESP-HMT.1/PT	1,5
ESP-HTE.2	ESP-HMT.2/PT	1,5
ESP-HTE.4	ESP-HMT.4/PT	1,5
ESP-HTE.6	ESP-HMT.6/PT	1,5
ESP-HTE.10	ESP-HMT.10/PT	1,5
ESP-HTE.16	ESP-HMT.16/PT	1,5
ESP-HMM.1B	ESP-HMT.1/PT B	1,5
ESP-HMM.2B	ESP-HMT.2/PT B	1,5
ESP-HMM.4 B	ESP-HMT.4/PT B	1,5
ESP-HMM.6 B	ESP-HMT.6/PT B	1,5
ESP-HMM.10	ESP-HMT.10/PT	1,5
ESP-HMM.16	ESP-HMT.16/PT	1,5
ESP-HMM.10B	ESP-HMT.10/PTB	1,5
ESP-HMM.16B	ESP-HMT.16/PTB	1,5

ESP-PT end sections

For each Type and cross section of terminal block, there is a specific insulating and closing end section to be placed on the open element of each terminal board. This end section may also be used to separate different phases of adjoining terminal blocks linked by cross connections or to increase insulation distances where specific circumstances may require it. The end sections have the same overall dimension as the related terminal block, thicknesses are given in the table below.

End sections, grey color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP-HMT.1/PT	003903136	ESP-HMM.1, ESP-HTE.1	2,7	25
ESP-HMT.2/PT	003903137	ESP-HMM.2, ESP-HTE.2	2,8	25
ESP-HMT.4/PT	003903138	ESP-HMM.4, ESP-HTE.4	3,8	25
ESP-HMT.6/PT	003903139	ESP-HMM.6, ESP-HTE.6	4,2	25
ESP-HMT.10/PT	003903140	ESP-HMM.10, ESP-HTE.10	5	25
ESP-HMT.16/PT	003903141	ESP-HMM.16, ESP-HTE.16	6	25



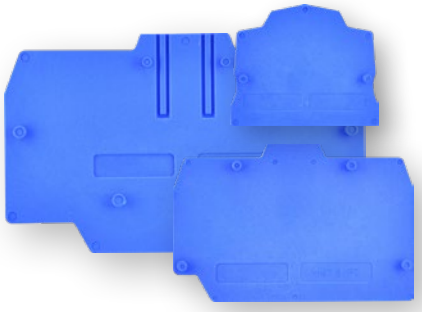
End sections, grey color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP-HMT.2/1+2/PT	003903189	ESP-HMM.2/1+2, ESP-HMS.2	3,4	25
ESP-HMT.4/1+2/PT	003903236	ESP-HMM.4/1+2	4,3	25



End sections, blue color

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP-HMT.1/PTB	003903172	ESP-HMM.1B	2,6	25
ESP-HMT.2/PTB	003903173	ESP-HMM.2B	2,9	25
ESP-HMT.4/PTB	003903174	ESP-HMM.4B	3,4	25
ESP-HMT.6/PTB	003903175	ESP-HMM.6B	4	25
ESP-HMT.10/PTB	003903176	ESP-HMM.10B	10	25
ESP-HMT.16/PTB	003903177	ESP-HMM.16B	6	25





End section for two level terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP2-HMD.1/PT	003903185	ESP2-HMD.1, ESP2-HMD.2N	4,9	25



End section for three level terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP3-HLD.2/PT	003903187	ESP3-HLD.2	6	25

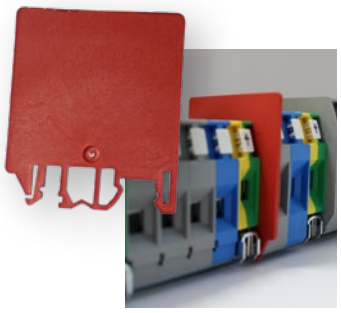


End sections for potential power distribution terminal blocks

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP-HMR.16-2/PT	003903180	Connection to distribution ESP-HMM.2	8	10
ESP-HMR.16-4/PT	003903181	Connection to distribution ESP-HMM.4	8	10
ESP-HMR.16-6/PT	003903182	Connection to distribution ESP-HMM.6	9	10

ESP-DFH partitions

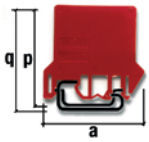
In polyamide available in red, colour, 1.5 mm thick, for the separation of elements on the terminal board, in order to make certain circuits easy to locate or to increase the insulation distances between terminal blocks.
The partitions can also be used to increase the insulation distances between adjacent parallel multiple commoning bars. White and green partitions available while stocks last.



Red partitions

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
ESP-DFH/1	003903142	ESP-HMM.1…ESP-HMM.6	4	25
ESP-DFH/4	003903143	ESP-HMM.10...ESP-HMM.16	6	25

Compatible also with two and three level spring terminal blocks

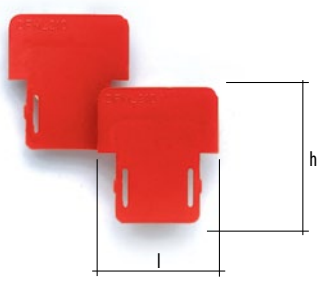


NOTE:
q dimension can be obtained by adding 4 mm to dimension p

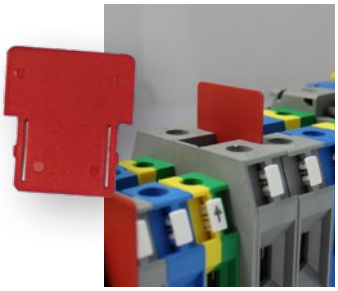
Partition	Dimensions a x p
ESP-DFH/4	97 x 51,5
ESP-DFH/1	64 x 42,5

ESP-DFM partition insulation of cross connections - bridges

Red coloured in polyamide when it is necessary to guarantee the insulation distance between permanent or switchable cross connections, inserted between adjacent pairs of terminal blocks and, similarly, between multiple commoning bars, inserted between adjacent groups of terminal blocks.



Partition	Dimensions l x h [mm]	Thickness [mm]
ESP-DFM/500	4,6 x 13,5	0,5

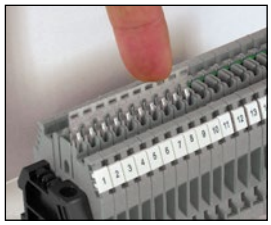


Red insulation partition to be used in case of cross connections - bridges

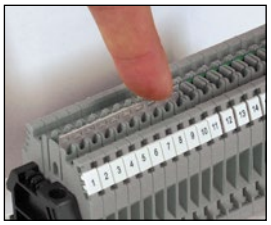
Type	Code No.	Dimension (for use with)	Weight [g]	Packaging [pcs]
ESP-DFM/500	003903144	4,5 x 13 (ESP-HMM.1)	0,1	50

Cross connections
Easy Bridge System

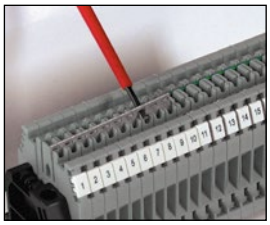
- screwless, snap-in insertion
- transversal and staggered mode connection possibility
- once inserted, intrinsically IPXXB protected resulting installation, without the need for further insulating covers
- patented system



1



2



3

1-2 After having cut the bar according to the number of poles, insert the cross-connection, in the appropriate groove of the terminal block. At this point, by using the blade of a screwdriver, push down the cross-connection until it reaches its blocking point. The cross connection will be fully insulated and intrinsically IPXXB protected.

3 To remove the cross-connection, insert the blade of the screwdriver in the jumper slot, then lift it up and finally extract it.

Terminal block	2-pole jumper	3-pole jumper	10-pole jumper
ESP-HMM.1(**)	ESP-PTC/1/02	ESP-PTC/1/03	ESP-PTC/1/10
ESP2-HMD.1	ESP-PTC/1/02	ESP-PTC/1/03	ESP-PTC/1/10
ESP-HMM.6	ESP-PTC/8/02		ESP-PTC/8/10
ESP-HMM.10	ESP-PTC/11/02		ESP-PTC/11/10
ESP-HMM.16	ESP-PTC/16/02		ESP-PTC/16/10

Insulated cross connection

Nr. Poles	PTP Series - Blue	PTP Series - Red
2	ESP-PTP/3/02/B	ESP-PTP/3/02/R
3	ESP-PTP/3/03/B	ESP-PTP/3/03/R
10	ESP-PTP/3/10/B	ESP-PTP/3/10/R
2	ESP-PTP/5/02/B	ESP-PTP/5/02/R
3	ESP-PTP/5/03/B	ESP-PTP/5/03/R
10	ESP-PTP/5/10/B	ESP-PTP/5/10/R


ESP-PTP3/03/B


ESP-PTC/1/03


ESP-PTP3/03/R

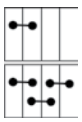

ESP-PTC/08/02

Cross connections - bridges

Type	Code No.	CROSS CONNECTIONS: nr. of poles, for use with, color	Weight [g]	Packaging [pcs]
ESP-PTC/1/02	003903145	2 POLE CROSS CONNECTION (ESP-HMM.1,ESP2-HMD.1)	1	25
ESP-PTC/1/03	003903146	3 POLE CROSS CONNECTION (ESP-HMM.1, ESP2-HMD.1)	1	25
ESP-PTC/1/10	003903147	10 POLE CROSS CONNECTION (ESP-HMM.1, ESP2-HMD.1)	3	10
ESP-PTP/3/02/R	003903148	2 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - RED	0,9	25
ESP-PTP/3/03/R	003903149	3 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - RED	1,4	25
ESP-PTP/3/10/R	003903150	10 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - RED	4,8	10
ESP-PTP/3/02/B	003903151	2 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - BLUE	0,9	25
ESP-PTP/3/03/B	003903152	3 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - BLUE	1,4	25
ESP-PTP/3/10/B	003903153	10 POLE CROSS CONNECTION (ESP-HMM.2, ESP2-HMD.2) - BLUE	4,8	10
ESP-PTP/5/02/R	003903154	2 POLE CROSS CONNECTION (ESP-HMM.4) - RED	1,3	25
ESP-PTP/5/03/R	003903155	3 POLE CROSS CONNECTION (ESP-HMM.4) - RED	1,9	25
ESP-PTP/5/10/R	003903156	10 POLE CROSS CONNECTION (ESP-HMM.4) - RED	6,4	10
ESP-PTP/5/02/B	003903157	2 POLE CROSS CONNECTION (ESP-HMM.4) - BLUE	1,3	25
ESP-PTP/5/03/B	003903158	3 POLE CROSS CONNECTION (ESP-HMM.4) - BLUE	1,9	25
ESP-PTP/5/10/B	003903159	10 POLE CROSS CONNECTION (ESP-HMM.4) - BLUE	6,4	10
ESP-PTC/8/02	003903160	2 POLE CROSS CONNECTION (ESP-HMM.6)	2	25
ESP-PTC/8/10	003903161	10 POLE CROSS CONNECTION (ESP-HMM.6)	12	10
ESP-PTC/11/02	003903162	2 POLE CROSS CONNECTION (ESP-HMM.10)	5	25
ESP-PTC/11/10	003903163	10 POLE CROSS CONNECTION (ESP-HMM.10)	12	10
ESP-PTC/16/02	003903164	2 POLE CROSS CONNECTION (ESP-HMM.16)	6	25
ESP-PTC/16/10	003903165	10 POLE CROSS CONNECTION (ESP-HMM.16)	12	10

Compatible also with two and three level spring terminal blocks

PTC jumper configurations

PTC / PTP cross-connection schemes						
	SINGLE OR PARALLEL EXTENDING	POLE SKIPPING	ADJACENT WITH BARRIER	STAGGERED MODE	PARALLEL SKIPPING	
Terminal block	**Isolation voltage [V]**					**I_{max} (A)**
ESP-HMM.1	630	630	320	630	630	17,5
ESP-HMM.2	630	630	320	630	630	24
ESP-HMM.4	500	500	500	500	500	32
ESP-HMM.6	500	500	500	500	500	41
ESP-HMM.10	1000	1000	800	1000	800	57
ESP-HMM.16	1000	1000	800	1000	800	76
ESP2-HMD.1	500	500	320	500	500	17.5
ESP2-HMD.2N	500	500	320	500	500	24
ESP3-HLD.2	500	500	500	500	500	24
ESP-HMS.2	630	500	-	-	-	24

When connecting groups of terminals of different potential, it is necessary to install jumper separators (ESC-DFM partition insulation of cross connections) to prevent electrical breakthrough and ensure the dielectric distance between plug-in jumpers. When installing the jumpers according to the scheme, the installation of the jumper separator is **mandatory**!



* between lower adjacent cross connections (with barrier)

** between upper adjacent cross connections (with barrier)

Common Screw And Spring Type Accessories

End bracket

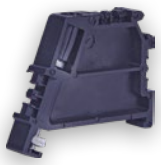
ES-BTO
End bracket suitable for IEC 60715/TH35 rails (our Types PR/3); it is mounted directly in the desired position and does not require screw fixing. Particularly suitable if there are rail fixing screws with high heads:
- in black polyamide
- thickness: 8 mm

ES-BT/3
To be mounted on rails in accordance with the IEC 60715/TH35 standard (our Type PR/3). Requires screw fixing:
- in black polyamide
- thickness: 8 mm

End bracket

Type	Code No.	Description	Weight [g]	Packaging [pcs]
ES-BTO	003903075	End bracket for DIN rail TH35	8	25
ES-BT/3	003903229		6	25

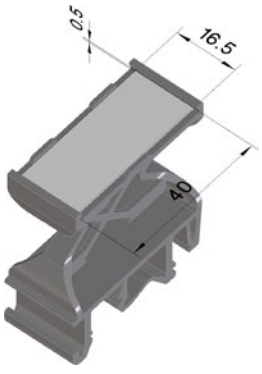

ES-BTO


ES-BT/3

Marking tags
- Marking tags ES-NU0851 suitable for marking all Types of terminal blocks (screw-clamp and spring-clamp) in tables of 100 elements in packs of 500 tags; must be ordered in multiples of 100 pcs
- In white polycarbonate with black printing, to be applied directly into position either before or after preparing the terminal board; tag dimensions: 8 x 5.1 mm
- Marking tags ES-TAP1640AW: must be ordered in multiples of 150 pcs (1 plate).
- Marking tags ES-TAP407AW: must be ordered multiple of 360 pcs (1 plate).

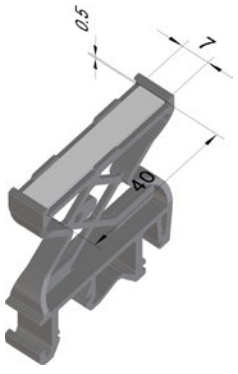
Dimensions

ES-PTM + ES-TA1640AW

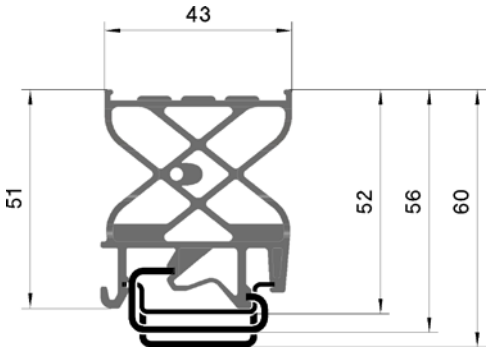


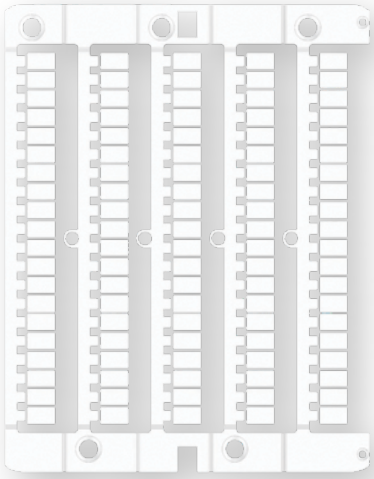


ES-PTMS + ES-TA407AW

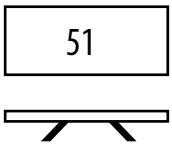






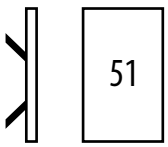


Writing Type

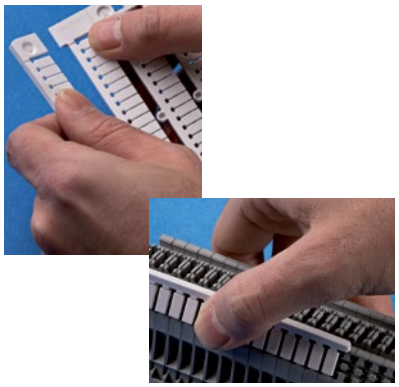


HORIZONTAL

Writing Type



VERTICAL





ES-PTM



ES-PTMS

Marking tags for all Types of terminals with rated cross section 2,5mm²...240mm²

Type	Code No. / 1 pc	Description	Weight [g]	Packaging [pcs]
ES-NU0851	003903076	Blank tags	0,2	1500
ES-NU0851001	003903077	Tags no. 1 to 50	0,2	500
ES-NU0851051	003903078	Tags from 51 to 100	0,2	500
ES-NU0851101	003903079	Tags from 101 to 150	0,2	500
ES-NU0851151	003903080	Tags from 151 to 200	0,2	500
ES-NU0851201	003903081	Tags from 201 to 250	0,2	500
ES-NU0851251	003903082	Tags from 251 to 300	0,2	500
ES-NU0851301	003903083	Tags from 301 to 350	0,2	500
ES-NU0851351	003903084	Tags from 351 to 400	0,2	500
ES-NU0851401	003903085	Tags from 401 to 450	0,2	500
ES-NU0851451	003903086	Tags from 451 to 500	0,2	500
ES-NU0851501	003903087	Tags from 501 to 550	0,2	500
ES-NU0851551	003903088	Tags from 551 to 600	0,2	500
ES-NU0851601	003903089	Tags from 601 to 650	0,2	500
ES-NU0851651	003903090	Tags from 651 to 700	0,2	500
ES-NU0851701	003903091	Tags from 701 to 750	0,2	500
ES-NU0851751	003903092	Tags from 751 to 800	0,2	500
ES-NU0851801	003903093	Tags from 801 to 850	0,2	500
ES-NU0851851	003903094	Tags from 851 to 900	0,2	500
ES-NU0851901	003903095	Tags from 901 to 950	0,2	500
ES-NU0851951	003903096	Tags from 951 to 1000	0,2	500
ES-NU0851510	003903097	Tags from 1 to 10	0,2	500
ES-NU0851520	003903098	Tags from 11 to 20	0,2	500
ES-NU0851530	003903099	Tags from 21 to 30	0,2	500
ES-NU0851540	003903100	Tags from 31 to 40	0,2	500
ES-NU0851550	003903101	Tags from 41 to 50	0,2	500
ES-NU0851560	003903102	Tags from 51 to 60	0,2	500
ES-NU0851570	003903103	Tags from 61 to 70	0,2	500
ES-NU0851580	003903104	Tags from 71 to 80	0,2	500
ES-NU0851590	003903105	Tags from 81 to 90	0,2	500
ES-NU0851600	003903106	Tags from 91 to 100	0,2	500
ES-NU08510L1	003903107	Tags L1	0,2	500
ES-NU08510L2	003903108	Tags L2	0,2	500
ES-NU08510L3	003903109	Tags L3	0,2	500
ES-NU0851N	003903110	Tags N	0,2	500
ES-NU08510PE	003903111	Tags PE	0,2	500
ES-NU085110	003903112	Tags =	0,2	500
ES-NU085111	003903113	Tags +	0,2	500
ES-NU085112	003903114	Tags -	0,2	500
ES-NU085114	003903115	Tags earth	0,2	500
ES-NU0851R	003903116	Tags R	0,2	500
ES-NU0851S	003903117	Tags S	0,2	500
ES-NU0851T	003903118	Tags T	0,2	500
ES-NU0851UV	003903119	Tags U	0,2	500
ES-NU0851V	003903120	Tags V	0,2	500
ES-NU0851W	003903121	Tags W	0,2	500
ES-NU0851X	003903122	Tags X	0,2	500
ES-PTM	003903123	Support for markings (ES-TAP1640AW)	12,5	15
ES-PTMS	003903124	Support for markings (ES-TAP407AW)	6,4	36
ES-TAP1640AW	003903239	Blank marking (40 x 16 x 0,5 mm)	0,89	120
ES-TAP407AW	003903240	Blank marking (40 x 7 x 0,5 mm)	0,89	280
ES-NU1051S	003903232	Blank tags - used with SmartPrint printer	8	1500

Not compatible with HMM.1 (1,5mm² spring terminal blocks), use ESP-SHZ

ES-NU1051S - To be used with SmartPrint
- Tags for terminal blocks CBC-CBD-HMM multiple mounting on CBC.2, single tags on all other sections
- Material: polycarbonate thickness 1.6 mm
- Working temperature: -40 °/+80 °C
- Rub resistance: CEI 16-7.

Numbering strips ESP-SHZ, ESP-SH004S

ESP-SHZ, ESP-SH004S numbering strips can be mounted on the sides of the terminal block or in the appropriate housings provided in the upper part of the terminal block itself.

Marking tags for spring terminals with rated cross section 1,5mm² (ESP-HMM.1, HTE.1)

Type	Code No.	Description	Weight [g]	Packaging [pcs]	Min order [pcs]
ESP-SHZ/1/1_10	003903196	Tags no. 1 to 10	0,2	500	100
ESP-SHZ/1/1_50	003903197	Tags no. 1 to 50	0,2	500	100
ESP-SHZ/1/51_100	003903198	Tags from 51 to 100	0,2	500	100
ESP-SH004S	003903238	Blank tags for Cabur HMM.1 terminal block - used with SmartPrint printer	8	1500	1500

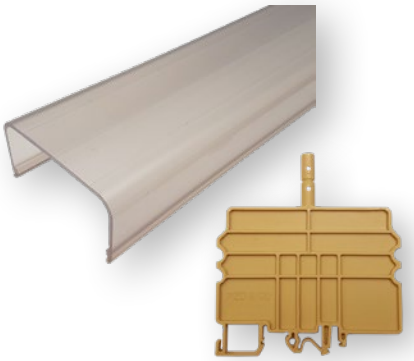


Additional covers for terminals and supports

Terminal blocks having a cross-section up to 70 mm^2 can be protected against accidental contacts or tampering, by means of a PVC transparent cover, supplied in a standard lenght of 2 m, to be mounted on appropriate polyamide supports and to be inserted on PR/DIN, PR/3, "G32" Type and TH/35 mounting rails. They can be fixed by sealing the support ends.

Features

- ES-PZM.4 cover suitable for terminal blocks with overall dimension up to approximately 58 mm (mounting rail included).
- ES-PZM.6 cover suitable for terminal blocks with overall dimension over 58 mm, (mounting rail included).



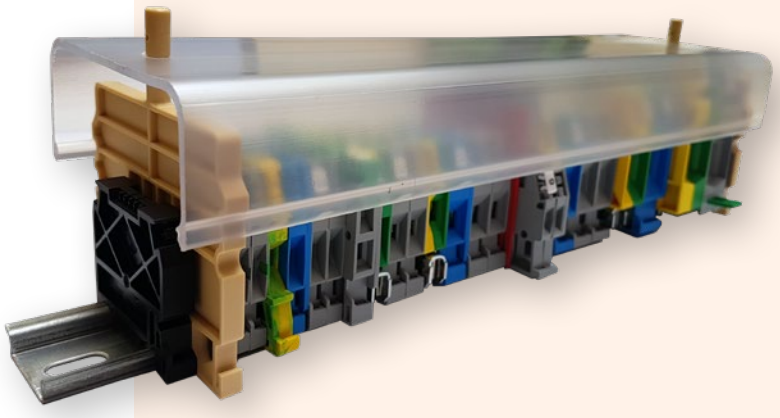
Additional covers for terminals and supports

Type	Code No.	Description, for use with	Weight [g]	Packaging [pcs]
ES-PZM.4	003903200	Protection cover (2m, 66mm x 32 mm), ES-PZD.4/SO	410	2
ES-PZD.4/SO	003903201	Support for ES-PZM.4	14	20
ES-PZM.6	003903202	Protection cover (2m, 87mm x 36 mm), ES-PZD.6/SO	326	2
ES-PZD.6/SO	003903203	Support for ES-PZM.6	8,15	10

Technical data for ES-PZM Series

			ES-PZM.4	ES-PZM.6	ES-PZM.4 + ES-PZD.4/SO	ES-PZM.6 + ES-PZD.6/SO
Technical characteristics			**Technical characteristics**			
Dimensions	Type	(mm)	a = 64+2 / b = 32	a = 85+2 / b = 36		
Mounted with support			ES-PZD.4/SO	ES-PZD.6/SO		
Maximum dimension:		(mm)				
on IEC 60715/G32 mounting rail					70 / 82 (*)	82 / 94 (*)
on IEC 60715/TH35 mounting rail					65 / 77 (*)	78 / 90 (*)

(*) depending on the notches used, upper or lower.



ETICEE

Distribution boxes EDS 950

Industrial plug-in equipment 952

Technical data 959

Industrial plug-in equipment



POWER NEEDS CONTROL

Distribution boxes EDS

Distribution boxes EDS

Degree of protection - IP 44, IP 54
Nominal current 16 A, 32 A / 5P
Nominal voltage 250 V
Mechanical resistance of boxes IK 07, IK 09, IK 10
Products do not contain substances banned under the RoHS directive.

Ordering:
1 - type
2 – number of modules
3 – 2 x schuko version / 2 x 5 poles
4 – Nominal current 16A, 32A

EDS	4	2-2/2-5	16/32
1	2	3	4



EDS 4 mini IP44

Type	Code No.	Sockets applied			Circuit breakers			Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3			
EDS4m 2-2/1-5 16	004483110	1		2	1	1		44	0,4	1
EDS4m 2-2/1-5 32	004483111		1	2	1		1	44	0,4	1



EDS 4 IP44

Type	Code No.	Sockets applied			Circuit breakers			Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3			
EDS4 2-2/2-5 16	004483100	2		2	1	1		44	0,5	1
EDS4 2-2/2-5 32	004483101		2	2	1		1	44	0,5	1
EDS4 2-2/2-5 16/32	004483102	1	1*	2	1	1		44	0,5	1

*Socket 32A/5P - protected with 16A MCB!



EDS 4 H with handle IP44

Type	Code No.	Sockets applied			Circuit breakers			Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3			
EDS4H 2-2/2-5 16	004483120	2		2	1	1		44	0,5	1
EDS4H 2-2/2-5 32	004483121		2	2	1		1	44	0,5	1
EDS4H 2-2/2-5 16/32	004483122	1	1*	2	1	1		44	0,5	1

*Socket 32A/5P - protected with 16A MCB!



EDS 5 IP54

Type	Code No.	Sockets applied			Circuit breakers			Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3			
EDS5 2-2/1-5 16	004483150	1		2	2	1		54	0,7	1
EDS5 2-2/1-5 32	004483151		1	2	2		1	54	0,7	1

Technical data on page 959



EDS 7 IP54

Type	Code No.	Sockets applied			Circuit breakers			Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3			
EDS7 1-2/2-5 16/32	004483200	1	1	1	1	1	1	54	0,9	1

With cam switch - see technical data



EDS 8 IP44

Type	Code No.	Sockets applied			Circuit breakers			RCD 3 phase	Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3				
EDS8 2-2/1-5 16*	004483250	1		2	1	1			44	1	1
EDS8 2-2/1-5 32*	004483251		1	2	1		1		44	1	1
EDS8 6-2/0-5 16*	004483252			6	6				44	1	1
EDS8 RCD 2-2/1-5 16**	004483253	1		2	1	1		1	44	1	1
EDS8 RCD 2-2/1-5 32**	004483254		1	2	1		1	1	44	1	1
EDS8 RCD 3-2/0-0 16**	004483255			6	3			1	44	1	1

*with switch
**with RCD



EDS 8H with handle IP44

Type	Code No.	Sockets applied			Circuit breakers			RCD 3 phase	Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3				
EDS8H 2-2/1-5 16*	004483280	1		2	1	1			44	1,2	1
EDS8H 2-2/1-5 32*	004483281		1	2	1		1		44	1,2	1
EDS8H 6-2/0-5 16*	004483282			6	6				44	1,2	1
EDS8H RCD 2-2/1-5 16**	004483283	1		2	1	1		1	44	1,2	1
EDS8H RCD 2-2/1-5 32**	004483284		1	2	1		1	1	44	1,2	1
EDS8H RCD 6-2/0-5 16**	004483285			6	3			1	44	1,2	1

*with switch
**with RCD



EDS 11 IP54

Type	Code No.	Sockets applied			Circuit breakers			RCD 3 phase	Degree of protection IP	Weight [kg]	Packaging [pcs]
		16A/5P	32A/5P	Schuko 250V	C16/1	C16/3	C32/3				
EDS11 4-2/2-5 16*	004483300	2		4	4	2			54	2	1
EDS11 4-2/2-5 32*	004483301		2	4	4		2		54	2	1
EDS11 4-2/2-5 16/32*	004483302	1	1	4	4	1	1		54	2	1
EDS11 0-2/4-5 16*	004483303	4				3			54	2	1
EDS11 0-2/4-5 32*	004483304		4				3		54	2	1
EDS11 0-2/4-5 16/32*	004483305	2	2			1	2		54	2	1
EDS11 2-2/3-5 16/32	004483306	2	1	2	2	2	1		54	2	1
EDS11 2-2/3-5 32/16	004483307	1	2	2	2	1	2		54	2	1
EDS11 7-2/0-5 16*	004483308			7	7				54	2	1
EDS11 RCD 4-2/2-5 16**	004483309	2		4	4	1		1	54	2	1
EDS11 RCD 4-2/2-5 32**	004483310		2	4	4		1	1	54	2	1
EDS11 RCD 0-2/3-5 16**	004483311	4				2		1	54	2	1
EDS11 RCD 0-2/3-5 32**	004483312		4				2	1	54	2	1
EDS11 RCD 0-2/3-5 16/32**	004483313	2	2			1	1	1	54	2	1
EDS11 RCD 2-2/3-5 16/32 **	004483314	2	1	2	1	1	1	1	54	2	1
EDS11 RCD 2-2/3-5 32/16**	004483315	1	2	2	1	1	1	1	54	2	1
EDS11 RCD 7-2/0-5 16**	004483316			7	7			1	54	2	1

*with switch
**with RCD

Technical data on page 959

Industrial plug-in equipment

Benefits:

→ reliable and safe
→ ambient temperature -25 °C to +40 °C
→ high temperature tolerance up to 125 for "live "parts
→ the right colors with the standards

Application - Our industrial plugs and sockets have been designed to connect electrical devices and consumers to low voltage in a broad spectrum of human activities.They are frequently applied in civil engineering,electric assembly sector, engineering industry,chemical and cosmetic industry, pharmaceutical industry and health service, agriculture, food industryand textile industry, as well as in cinemas, theatres,sports facilities, holiday resorts, etc.

IP44 series



ES 1643



ES 1632



EZ 1643



EZ 3232



EZCZ 1653

Connecting sockets IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
ES 1632	004482000	16A, 230V, 2P+PE	0,17	12
ES 1643	004482001	16A, 400V, 3P+PE	0,18	12
ES 1653	004482002	16A, 400V, 3P+N+PE	0,20	12
ES 3232	004482003	32A, 230V, 2P+PE	0,24	10
ES 3243	004482004	32A, 400V, 3P+PE	0,29	9
ES 3253	004482005	32A, 400V, 3P+N+PE	0,31	9

Wall sockets IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EZ 1632	004482034	16A, 230V, 2P+PE	0,19	9
EZ 1643	004482035	16A, 400V, 3P+PE	0,21	9
EZ 1653	004482036	16A, 400V, 3P+N+PE	0,22	9
EZ 3232	004482037	32A, 230V, 2P+PE	0,26	12
EZ 3243	004482038	32A, 400V, 3P+PE	0,30	6
EZ 3253	004482039	32A, 400V, 3P+N+PE	0,35	6

Combinated sockets IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EZCZ-S 1643	004482050	16A, 400V/230V, 3P+PE plus EE 16S Schuko IP44	0,34	6
EZCZ-S 1653	004482051	16A, 400V/230V, 3P+N+PE plus EE 16S Schuko IP44	0,36	6
EZCZ-S 3243	004482052	32A, 400V/230V, 3P+PE plus EE 16S Schuko IP44	0,42	4
EZCZ-S 3253	004482053	32A, 400V/230V, 3P+N+PE plus EE 16S Schuko IP44	0,45	4

Built-in sockets IP54

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EE 1632	004482076	16A, 230V, 2P+PE	0,12	12
EE 1643	004482077	16A, 400V, 3P+PE	0,12	12
EE 1653	004482078	16A, 400V, 3P+N+PE	0,14	12
EE 3232	004482079	32A, 230V, 2P+PE	0,18	12
EE 3243	004482080	32A, 400V, 3P+PE	0,19	12
EE 3253	004482081	32A, 400V, 3P+N+PE	0,21	12


EE 1643


EE 1632

Built-in sockets IP54, STRAIGHT

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EER 1632	004482128	16A, 230V, 2P+PE	0,13	6
EER 1643	004482092	16A, 400V, 3P+PE	0,15	6
EER 1653	004482093	16A, 400V, 3P+N+PE	0,16	6
EER 3243	004482094	32A, 400V, 3P+PE	0,21	12
EER 3253	004482095	32A, 400V, 3P+N+PE	0,23	12


EER 1643


EER 1632

Flush mounted boxes with socket IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EZB 16S	004482097	16A, 250V, (Schuko)	0,18	8
EZB 1643	004482098	16A, 400V	0,28	8
EZB 1653	004482099	16A, 400V	0,28	8
EZB 3243	004482100	32A, 400V	0,33	8
EZB 3253	004482101	32A, 400V	0,34	8


EZB 16

Surface mounted boxes with socket IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EZBN 16S	004482103	16A, 250V, (Schuko)	0,221	8
EZBN 1643	004482104	16A, 400V	0,317	8
EZBN 1653	004482105	16A, 400V	0,328	8
EZBN 3243	004482106	32A, 400V	0,37	8
EZBN 3253	004482107	32A, 400V	0,39	8


EZBN 16

Technical data on page 964, 965



EV 3253



EV 1632

Plugs IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EV 1632	004482016	16A, 230V, 2P+PE	0,128	14
EV 1643	004482017	16A, 400V, 3P+PE	0,145	14
EV 1653	004482018	16A, 400V, 3P+N+PE	0,159	14
EV 3232	004482019	32A, 230V, 2P+PE	0,193	10
EV 3243	004482020	32A, 400V, 3P+PE	0,235	10
EV 3253	004482021	32A, 400V, 3P+N+PE	0,261	10



EVO 1653

Reversing plugs IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EVO 1653	004482022	16A, 400V, 3P+N+PE	0,156	14
EVO 3253	004482023	32A, 400V, 3P+N+PE	0,259	10



ER 3253



ER 1632

Built-in appliance inlets IP44, ANGLED

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
ER 1632	004482129	16A, 230V, 2P+PE	0,122	12
ER 1643	004482130	16A, 400V, 3P+PE	0,144	12
ER 1653	004482131	16A, 400V, 3P+N+PE	0,153	12
ER 3232	004482109	32A, 230V, 2P+PE	0,122	12
ER 3243	004482132	32A, 400V, 3P+PE	0,196	12
ER 3253	004482133	32A, 400V, 3P+N+PE	0,234	12



ERR 1643



ERR 1632

Built-in appliance inlets IP44, STRAIGHT

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
ERR 1632	004482108	16A, 230V, 2P+PE	0,093	6
ERR 1643	004482110	16A, 400V, 3P+PE	0,113	6
ERR 1653	004482111	16A, 400V, 3P+N+PE	0,127	6
ERR 3243	004482112	32A, 400V, 3P+PE	0,156	6
ERR 3253	004482113	32A, 400V, 3P+N+PE	0,179	6
ERRO 1653	004482114	16A, 400V, 3P+N+PE, phase reverse	0,127	6
ERRO 3253	004482115	32A, 400V, 3P+N+PE, phase reverse	0,183	6

Technical data on page 965, 966

Wall plugs IP44

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EP 1632	004482058	16A, 230V, 2P+PE	0,156	9
EP 1643	004482059	16A, 400V, 3P+PE	0,17	9
EP 1653	004482060	16A, 400V, 3P+N+PE	0,184	9
EP 3232	004482061	32A, 230V, 2P+PE	0,202	12
EP 3243	004482062	32A, 400V, 3P+PE	0,249	6
EP 3253	004482063	32A, 400V, 3P+N+PE	0,273	6
EPO 1653	004482064	16A, 400V, 3P+N+PE, phase reverse	0,2	9
EPO 3253	004482065	32A, 400V, 3P+N+PE, phase reverse	0,291	6



EP 1643



EPO 1653

IP67 series

Connecting sockets IP67

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
ESH 1632	004482006	16A, 230V, 2P+PE	0,178	10
ESH 1643	004482007	16A, 400V, 3P+PE	0,189	10
ESH 1653	004482008	16A, 400V, 3P+N+PE	0,224	10
ESH 3232	004482009	32A, 230V, 2P+PE	0,298	12
ESH 3243	004482010	32A, 400V, 3P+PE	0,285	12
ESH 3253	004482011	32A, 400V, 3P+N+PE	0,324	12
ESH 6343	004482012	63A, 400V, 3P+PE	0,615	10
ESH 6353	004482013	63A, 400V, 3P+N+PE	0,976	2
ESH 12543	004482014	125A, 400V, 3P+PE	1,16	2
ESH 12553	004482015	125A, 400V, 3P+N+PE	1,25	2



ESH 1643



ESH 12543

Wall sockets IP67

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EZH 1632	004482040	16A, 230V, 2P+PE	0,255	9
EZH 1643	004482041	16A, 400V, 3P+PE	0,273	9
EZH 1653	004482042	16A, 400V, 3P+N+PE	0,321	9
EZH 3232	004482043	32A, 230V, 2P+PE	0,418	12
EZH 3243	004482044	32A, 400V, 3P+PE	0,42	12
EZH 3253	004482045	32A, 400V, 3P+N+PE	0,456	12
EZH 6343	004482046	63A, 400V, 3P+PE	0,802	4
EZH 6353	004482047	63A, 400V, 3P+N+PE	1,178	4
EZH 12543	004482048	125A, 400V, 3P+PE	1,9	1
EZH 12553	004482049	125A, 400V, 3P+N+PE	1,95	1



EZH 6353



EZH 1632



EZH 12543

Technical data on page 966, 967



EEH 6353



EEH 1632



EEH 12553

Built-in sockets IP67

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EEH 1632	004482082	16A, 230V, 2P+PE	0,134	12
EEH 1643	004482083	16A, 400V, 3P+PE	0,152	12
EEH 1653	004482084	16A, 400V, 3P+N+PE	0,176	12
EEH 3232	004482085	32A, 230V, 2P+PE	0,226	12
EEH 3243	004482086	32A, 400V, 3P+PE	0,232	12
EEH 3253	004482087	32A, 400V, 3P+N+PE	0,268	12
EEH 6343	004482088	63A, 400V, 3P+PE	0,54	8
EEH 6353	004482089	63A, 400V, 3P+N+PE	0,638	8
EEH 12543	004482090	125A, 400V, 3P+PE	0,89	2
EEH 12553	004482091	125A, 400V, 3P+N+PE	0,99	2



EVH 1643



EVH 1632



EVH 12553

Plugs IP67

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EVH 1632	004482024	16A, 230V, 2P+PE	0,129	12
EVH 1643	004482025	16A, 400V, 3P+PE	0,175	12
EVH 1653	004482026	16A, 400V, 3P+N+PE	0,198	12
EVH 3232	004482027	32A, 230V, 2P+PE	0,238	12
EVH 3243	004482028	32A, 400V, 3P+PE	0,243	12
EVH 3253	004482029	32A, 400V, 3P+N+PE	0,275	12
EVH 6343	004482030	63A, 400V, 3P+PE	0,623	8
EVH 6353	004482031	63A, 400V, 3P+N+PE	0,795	2
EVH 12543	004482032	125A, 400V, 3P+PE	1,05	2
EVH 12553	004482033	125A, 400V, 3P+N+PE	1,16	2

Technical data on page 968, 969

Wall plugs IP67				
Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EPH 1632	004482066	16A, 230V, 2P+PE	0,16	10
EPH 1643	004482067	16A, 400V, 3P+PE	0,198	10
EPH 1653	004482068	16A, 400V, 3P+N+PE	0,226	6
EPH 3232	004482069	32A, 230V, 2P+PE	0,28	12
EPH 3243	004482070	32A, 400V, 3P+PE	0,274	12
EPH 3253	004482071	32A, 400V, 3P+N+PE	0,307	3
EPH 6343	004482072	63A, 400V, 3P+PE	0,848	8
EPH 6353	004482073	63A, 400V, 3P+N+PE	1,016	4
EPH 12543	004482074	125A, 400V, 3P+PE	1,8	1
EPH 12553	004482075	125A, 400V, 3P+N+PE	1,84	1



EPH 1653



EPH 1632



EPH 6353

Accessories



EA 16-32/5

Adapters

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EA-1653/43	004482116	5p/4p	0,284	9
EA-3253/43	004482117	5p/4p	0,457	6
EA-1653/43-0	004482118	5p/4p, phase reverse	0,284	9
EA-3253/43-0	004482119	5p/4p, phase reverse	0,47	6
EA 16-32/4	004482120	4p	0,343	8
EA 16-32/5	004482121	5p	0,386	8
EA 16-32/5-0	004482122	16A/32A 5p, phase reverse	0,386	8



EEH 16S

Built-in sockets schuko

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EE 16S	004482124	IP54	0,043	12
EEH 16S	004482126	250V/16A IP67	0,079	12



EEVG 16

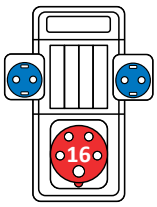
Unischuko plug

Type	Code No.	Description	Weight [kg]	Packaging [pcs]
EEVG 16	004482127	IP67	0,12	14

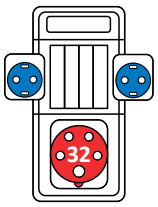
Distribution boxes EDS

Technical data	
Degree of protection	IP 44, IP 54
Nominal current	16 A, 32 A / 5P
Nominal voltage	250 V
Products do not contain substances banned under Rohs directive	

EDS 4 mini

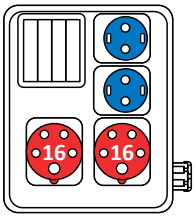


EDS4m 2-2/1-5 16

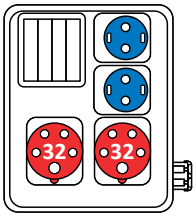


EDS4m 2-2/1-5 32

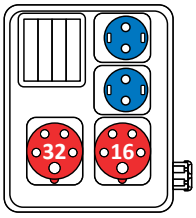
EDS 4



EDS4 2-2/2-5 16

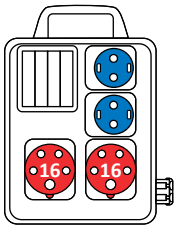


EDS4 2-2/2-5 32

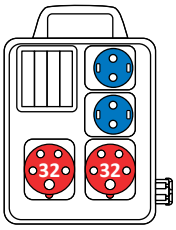


EDS4 2-2/2-5 16/32

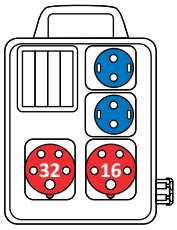
EDS 4H



EDS4H 2-2/2-5 16

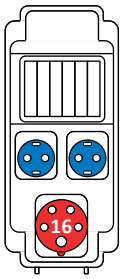


EDS4H 2-2/2-5 32

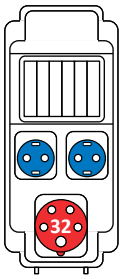


EDS4H 2-2/2-5 16/32

EDS 5

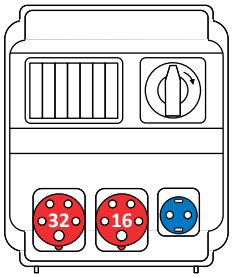


EDS5 2-2/1-5 16



EDS5 2-2/1-5 32

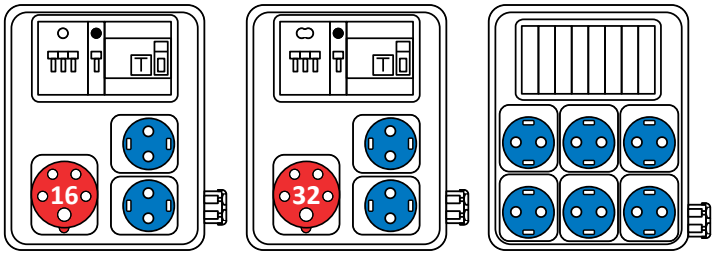
EDS 7



EDS7 1-2/2-5 16/32

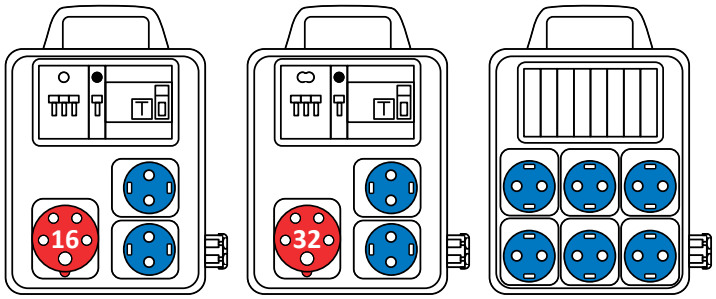
Technical data - cam switches			
Current			40A, 50/60Hz
Rated insulation voltage Ui			690V
Rated operational currents Ie	AC-22A	230V	32A
		400V	
	DC-21A	24V	32A
		110V	16A
		220V	12A
Operational power in AC 23	230V		7,5kW
	400V		13kW
Standards			EN60947-3

EDS 8



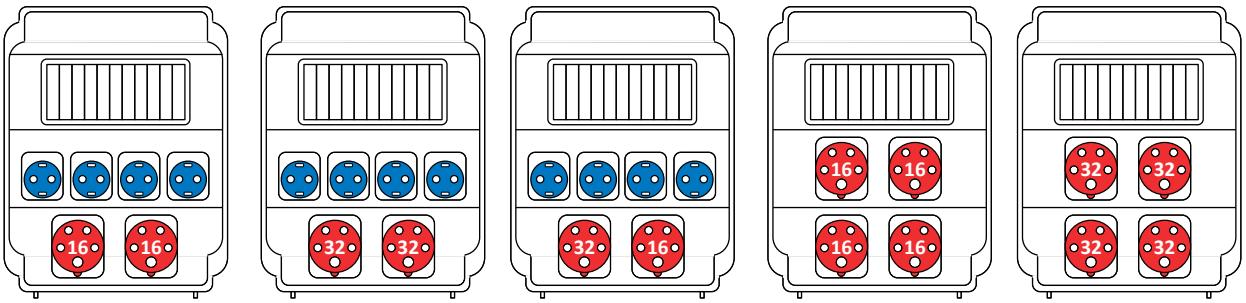
EDS8 RCD 2-2/1-5 16 | EDS8 RCD 2-2/1-5 32 | EDS8 6-2/0-5 16

EDS 8 H

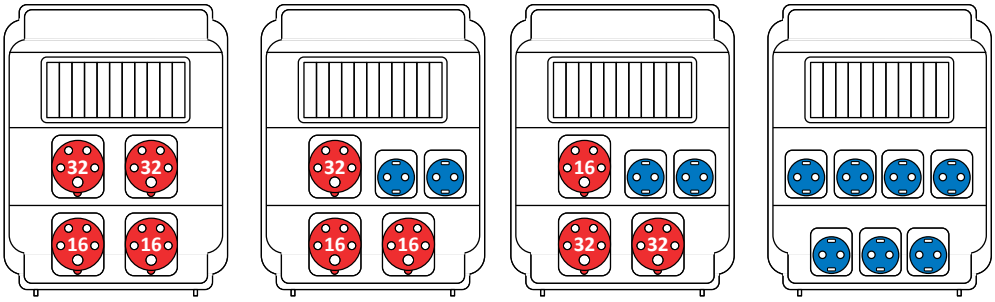


EDS8H RCD 2-2/1-5 16 | EDS8H RCD 2-2/1-5 32 | EDS8H 6-2/0-5 16

EDS 11

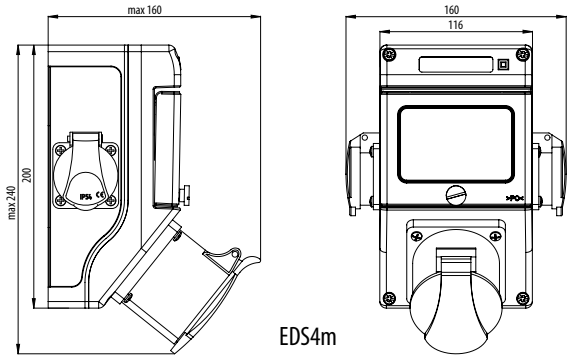


EDS11 4-2/2-5 16 | EDS11 4-2/2-5 32 | EDS11 4-2/2-5 16/32 | EDS11 0-2/4-5 16 | EDS11 0-2/4-5 32

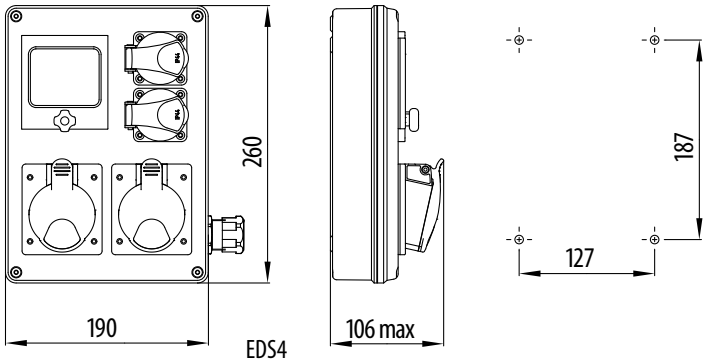


EDS11 0-2/4-5 16/32 | EDS11 2-2/3-5 16/32 | EDS11 2-2/3-5 32/16 | EDS11 7-2/0-5 16

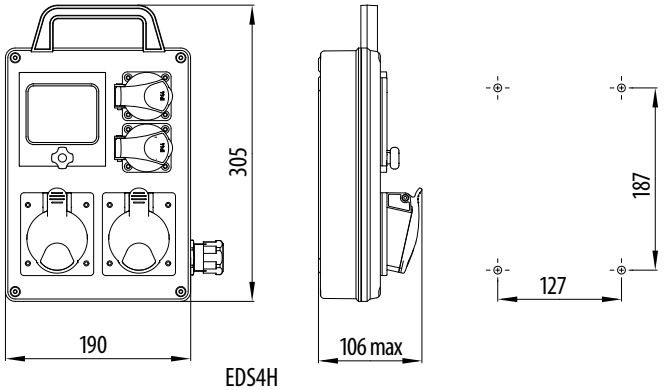
Dimensions



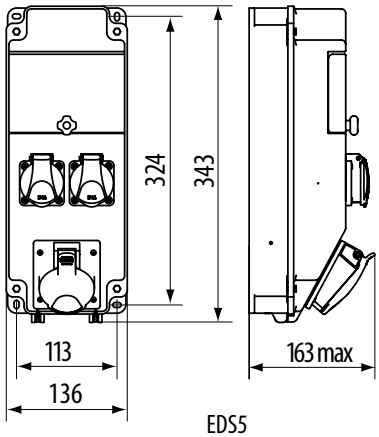
EDS4m



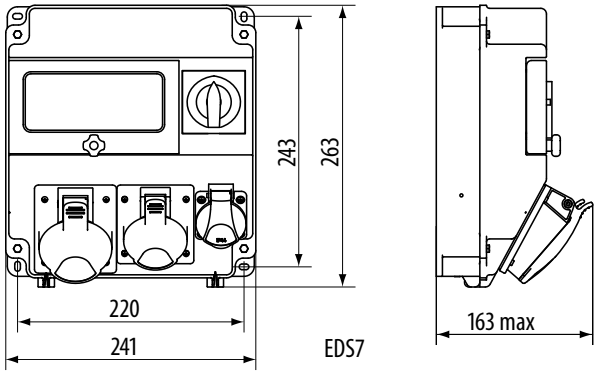
EDS4



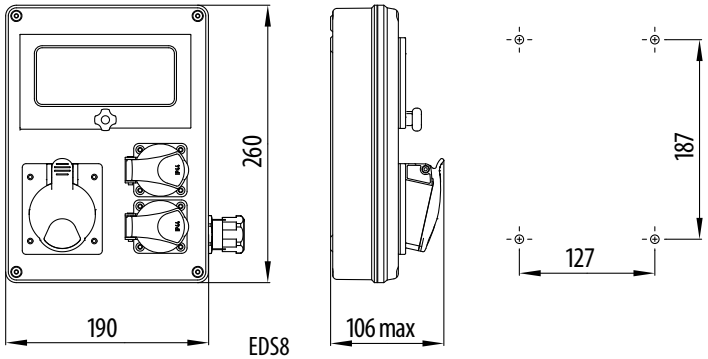
EDS4H



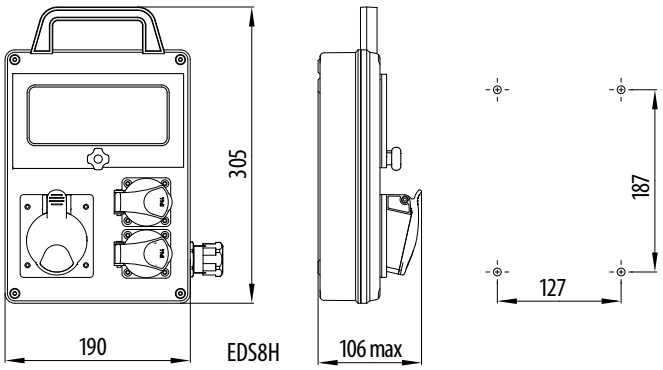
EDS5



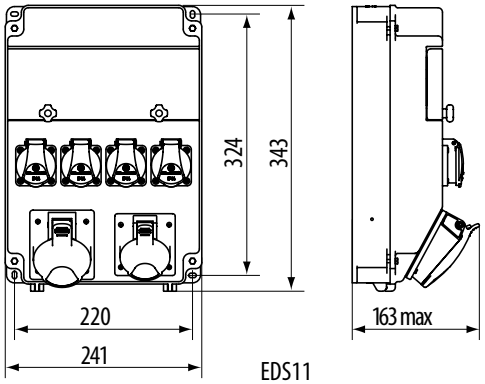
EDS7



EDS8



EDS8H



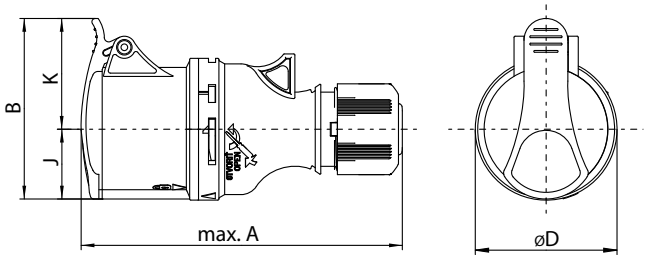
EDS11

Industrial plug-in equipment

Technical data	
Rated voltage U_n	230V, 400V
Rated frequency f_n	50 - 60Hz
Rated current I_n	16, 32, 63, 125 A
Ambient temperature	-25°C ... +40°C
Standards	IEC 60309 – 1, 2

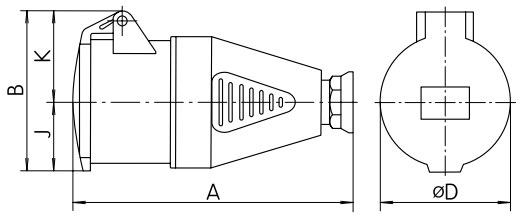
Connecting sockets IP44

Type/(mm)	A	B	øD	J	K
ES1632	145	79	64	29	50
ES 1643	145	81,5	56	31,5	50
ES 1653	145	89	64	35	54
ES 3243	175,5	96	65	38	58
ES 3253	179	103	73	41	62



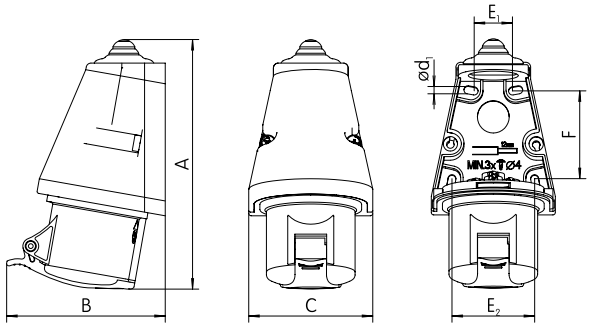
Connecting sockets IP44

Type/(mm)	A	B	øD	J	K	Pg
ES 3232	165	93	72	42	51	21



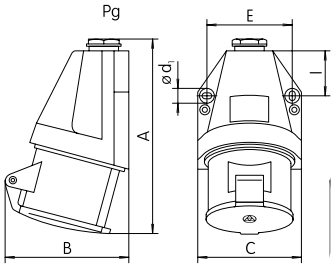
Wall sockets IP44

Type/(mm)	A	B	C	ød1	E1	E2	F
EZ 1632	157	90	78	4	30	53	58
EZ 1643	157	99	78	4	30	53	58
EZ 1653	157	104	78	4	30	53	58
EZ 3243	179	118	88	4	35	61	60
EZ 3253	179	121	88	4	35	61	60



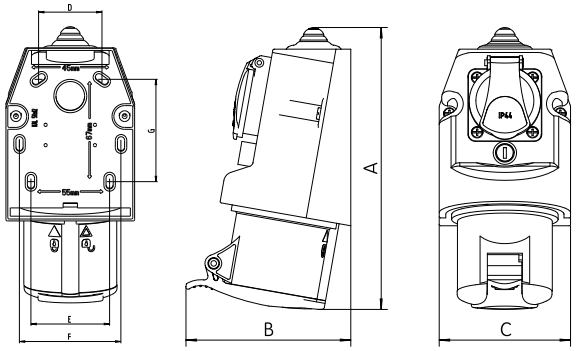
Wall sockets IP44

Type/(mm)	A	B	C	ød1	E	I	Pg	Modification
EZ3232	155	101	82	5,2	67	34	P21	A



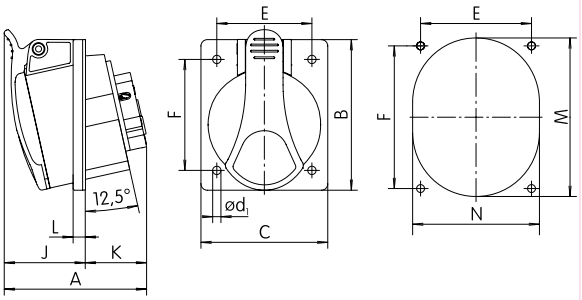
Combinated sockets IP44

Type/ (mm)	A	B	C	D	E	F	G
EZCZ (EZCZ-S) 16xx	182	113	90	45	55	71	67
EZCZ (EZCZ-S) 32xx	193	118	90	45	55	71	67



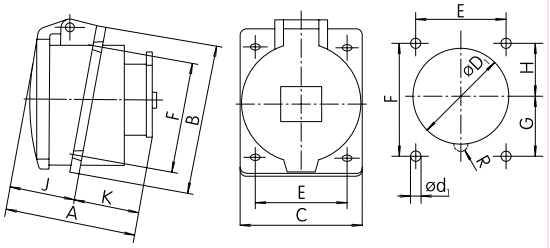
Built-in sockets IP54

Type \ (mm)	A	B	C	ød1	J	E	F	K	L	M	N
EE 1643	73	85	75	5,2	42	60	60	31	7	66	58
EE 1653	75	85	75	5,2	43	60	60	32	7	72	64
EE 3243	90	95	80	5,2	52	60	70	38	8	78	68
EE 3253	92	95	80	5,2	53	60	70	39	8	84	70
EZ 3253	179	121	4	35	4	35	88	4	35	61	60



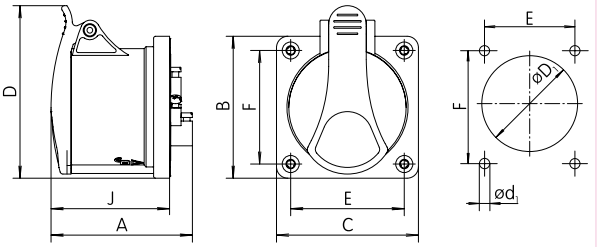
Built-in sockets IP54

Type \ (mm)	A	B	C	øD1	ød1	E	F	G	H	J	K
EE 1632	61	85	75	56	5,5	60	60	30	30	32	29
EE 3232	84	95	80	68	5,5	60	70	38	32	42	42



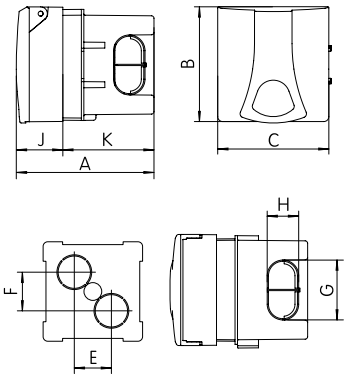
Built-in sockets IP54, STRAIGHT

Type\(mm)	A	B	C	øD1	ød1	D	E	F	J
EER 1632	76	75	75	57	4,2	88	60	60	61
EER 1643	76	75	75	57	4,2	88	60	60	61
EER 1653	77	75	75	57	4,2	91	60	60	63
EER 3243	91	75	75	64	4,2	96	60	60	71
EER 3253	93	75	75	64	4,2	103	60	60	75



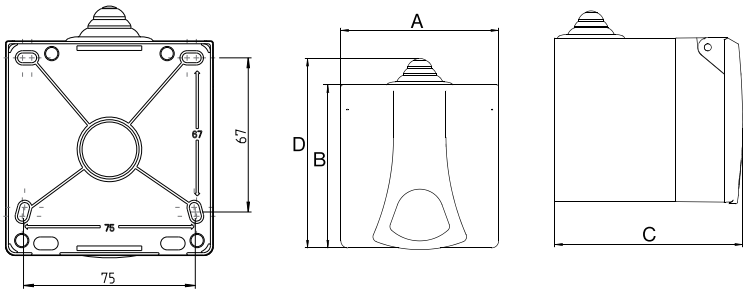
Flush mounted boxes with socket IP44

Type \ (mm)	A	B	C	E	F	G	H	J	K
EZB xxxx	115,5	93	90	30	30	48,5	25,5	37,7	73,8



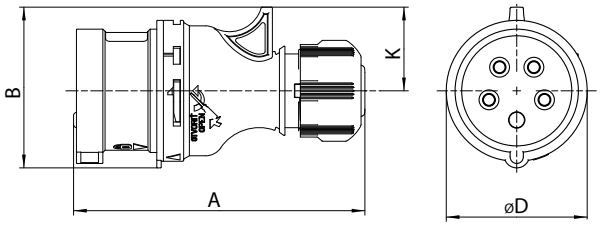
Surface mounted boxes with socket IP44

Type \ (mm)	A	B	C	D
EZBN 16S	90	93	106	108
EZBN 1643	90	93	106	108
EZBN 1653	90	93	106	108
EZBN 3243	90	93	106	108
EZBN 3253	90	93	106	108



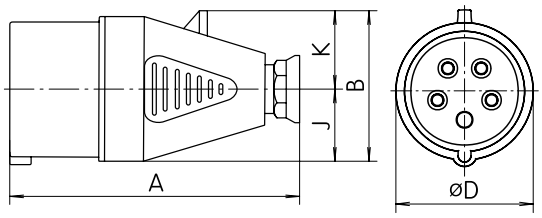
Plugs IP44

Type \ (mm)	A	B	ØD	K
EV 1632	126	64	64	32
EV 1643	132	66	64	34
EV 1653/ EVO 1653	132	73	64	38
EV 3243	162	79	73	41
EV 3253/ EVO 3253	162	86,5	73	45



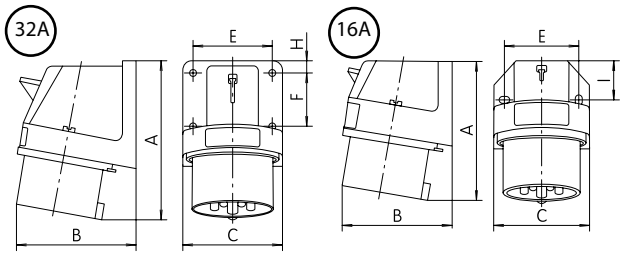
Plugs IP44

Type \ (mm)	A	B	ØD	J	K	Pg
EV 3232	154	77	72	36	41	P21



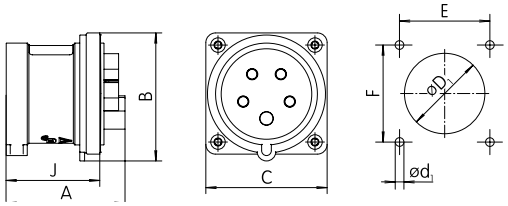
Built-in appliance inlets IP44, ANGLED

Type \ (mm)	A	B	C	E	F	I
ER 1632	91	68	57,2	45	–	20
ER 164x	97	77	65,2	50	–	27,5
ER 1653	98	79	65,2	50	–	27,5
ER 3232	128	88	72,5	58	40	9
ER 324x	128	88	72.3	58	40	9
ER 3253	129	90	72.3	58	40	9



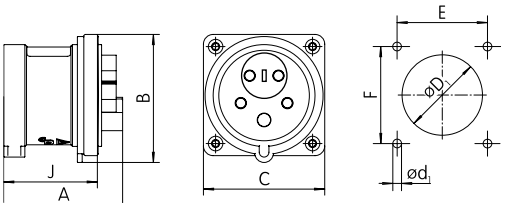
Built-in appliance inlets IP44, STRAIGHT

Type \ (mm)	A	B	C	ød1	øD1	E	F	J
ERR 1632	67	75	75	4,2	57	60	60	48
ERR 1643	66	75	75	4,2	57	60	60	48
ERR 1653	66	75	75	4,2	57	60	60	48
ERR 3243	73	75,3	75	4,2	64	60	60	58
ERR 3253	73	80	75	4,2	64	60	60	58



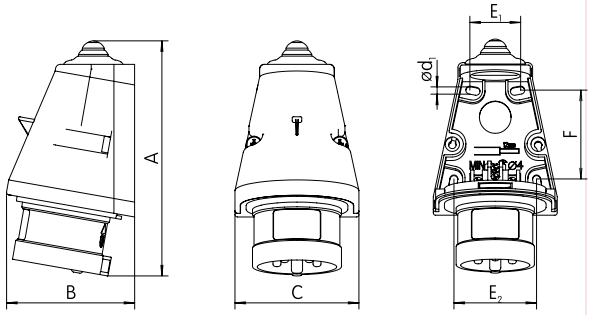
Built-in appliance inlets IP44, STRAIGHT, phase reverse

Type \ (mm)	A	B	C	ød1	øD1	E	F	J
ERRO 1653	66	75	75	4,2	57	60	60	48
ERRO 3253	73	80	75	4,2	64	60	60	58



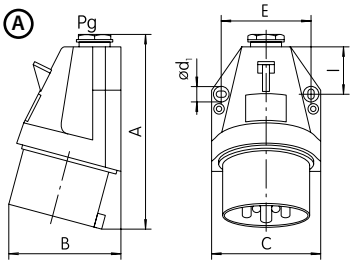
Wall plugs IP44

Type \ (mm)	A	B	C	ød1	E1	E2	F
EP 1632	147	81	78	4	30	53	58
EP 1643	146	81	78	4	30	53	58
EP 1653	146	81	78	4	30	53	58
EP 3243	168	95	88	4	35	61	60
EP 3253	168	95	88	4	35	61	60



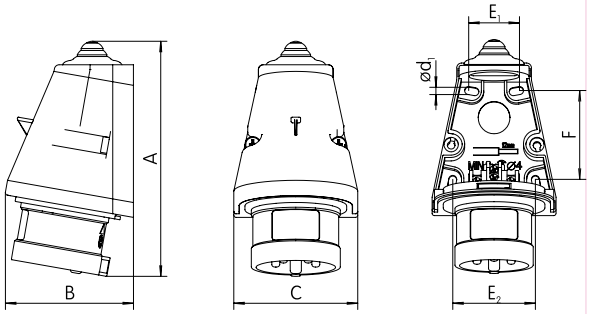
Wall plugs IP44

Type\ (mm)	A	B	C	ød1	E	I	Pg	Modification
EP 3232	147	105	82	5,2	67	34	P21	A



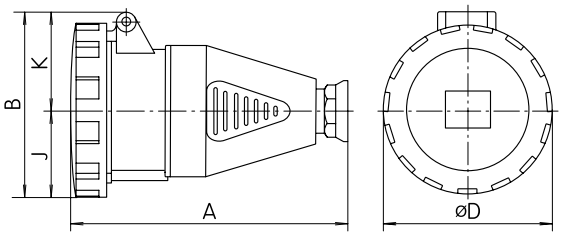
Wall plugs IP44

Type \ (mm)	A	B	C	ød1	E1	E2	F
EPO 1653	146	81	78	4	30	53	58
EPO 3253	168	95	88	4	35	61	60

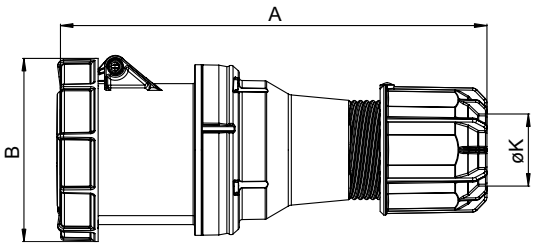


Connecting sockets IP67

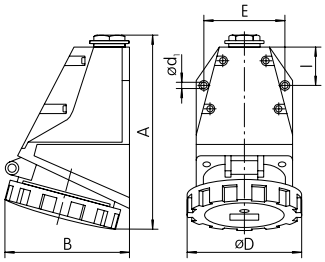
Type \ (mm)	A	B	øD	J	K	Pg
ESH 1632	136	78,5	70	35	43,5	16
ESH 1643	142	85,5	78	39	46,5	16
ESH 1653	145	92,5	87	43,5	49	16
ESH 3232	166	101,5	93	46,5	55	21
ESH 3243	166	101,5	93	46,5	55	21
ESH 3253	168	108	100	50	58	21
ESH 6343	224	-	113	196	-	29



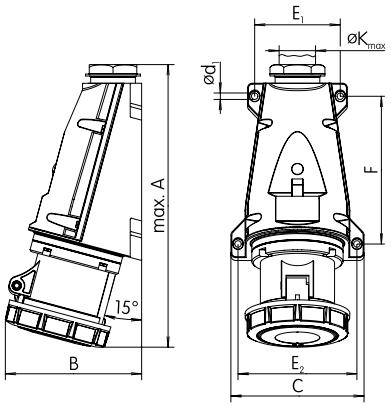
Connecting sockets IP67			
Type\ (mm)	A	B	øK
ESH 12543	269	114	22,5-50
ESH 12553	269	114	22,5-50



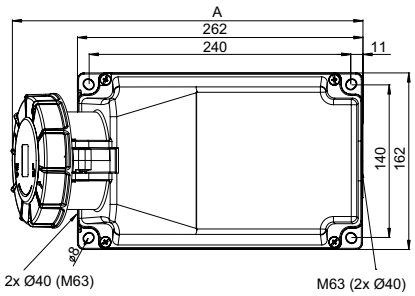
Wall sockets IP67							
Type \ (mm)	A	B	D	ød1	E	I	Pg
EZH 1632	146	90	78,5	4,8	65,6	32	P16
EZH 1643	148	92	78,5	4,8	65,6	32	P16
EZH 1653	148	96	87	4,8	65,6	32	P16
EZH 3232	173	111	92,5	5,2	71	35,5	P21
EZH 3243	173	111	92,5	5,2	71	35,5	P21
EZH 3253	175	114	100	5,2	71	35,5	P21
EZH 6343	225	131	132	7	114	90,3	P36



Wall sockets IP67								
Type \ (mm)	A	B	C	ød1	E1	E2	F	øK
EZH 6353	300	145	140	6,5	90	125	155	35

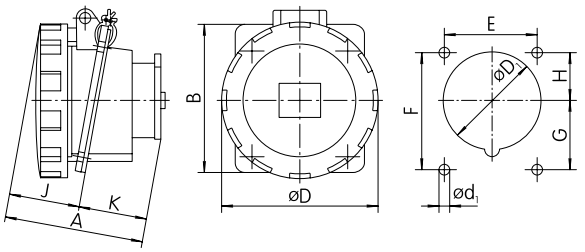


Wall sockets IP67		
Type \ (mm)	A	B=height
EZH 12543	322	205
EZH12553	322	205



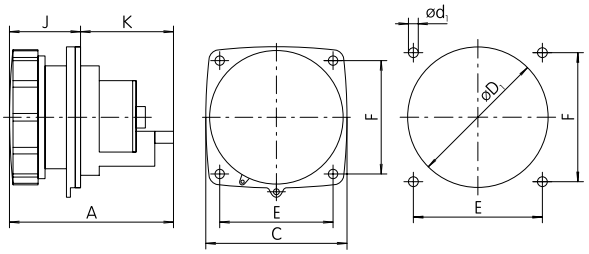
Built-in sockets IP67

Type \ (mm)	A	B	øD	øD1	ød1	E	F	G	H	J	K
EEH 1632	78	85	75	56	5,5	60	60	30	30	39	39
EEH 1643	80	85	78	62	5,5	60	60	31	29	41	39
EEH 1653	81	85	87	65	5,5	60	60	31	29	42	39
EEH 3232	89	95	92,5	68	5,5	60	70	38	32	47	42
EEH 3243	89	95	92,5	68	5,5	60	70	38	32	47	42
EEH 3253	91	95	100	74	5,5	60	70	36	34	49	42



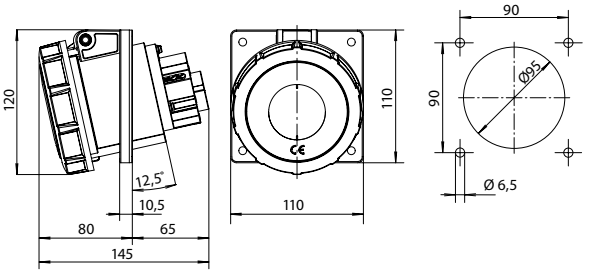
Built-in sockets IP67

Type \ (mm)	A	C	ød1	øD1	E	F	J	K
EEH 634x	131	111	6,8	93	90	90	52	79



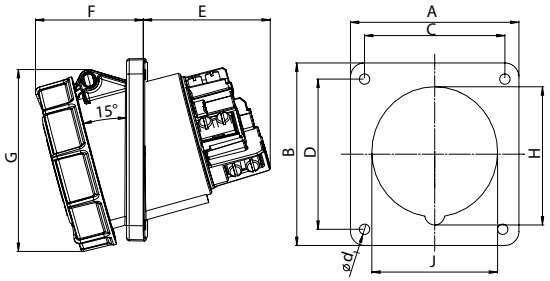
Built-in sockets IP67

EEH 6353



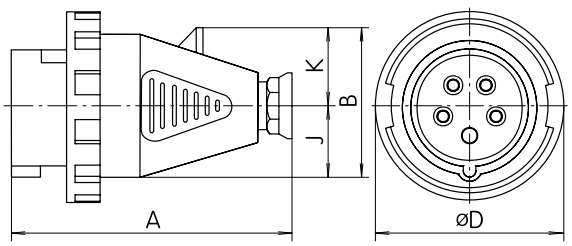
Built-in sockets IP67

Type \ (mm)	A	B	C	D	E	F	G	H	J	ød1
EEH 12543-p	114	114	90	90	92	77	130	102	90	7
EEH 12553-p	114	114	90	90	92	77	130	102	90	7



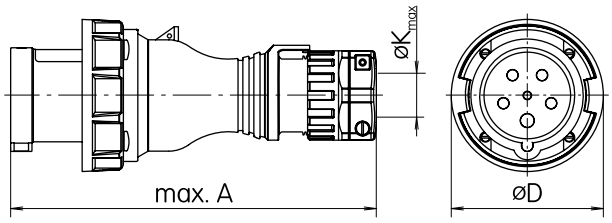
Plugs IP67

Type \ (mm)	A	øD	J	K	Pg
EVH 1632	123	70	28,5	31	P16
EVH 1643	129	78	32,5	35	P16
EVH 1653	129	87	32,5	39	P16
EVH 3232	154	92,5	36	41	P21
EVH 3243	154	92,5	36	41	P21
EVH 3253	154	100	36	46	P21
EVH 6343	224	113	195	-	P29



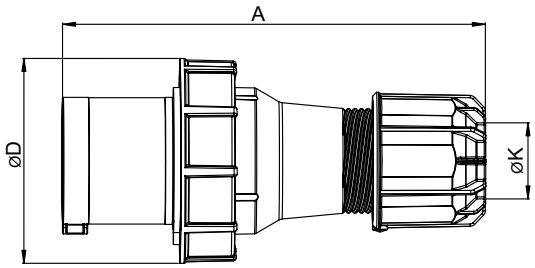
Plugs IP67

Type \ (mm)	A	øD	øK
EVH 6353	265	110	32



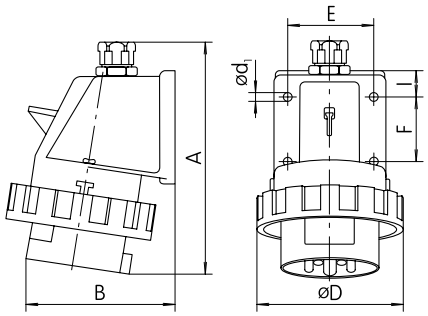
Plugs IP67

Type \ (mm)	A	øD	øK
EVH 12543	270	131	22,5-50
EVH 12553	270	131	22,5-50



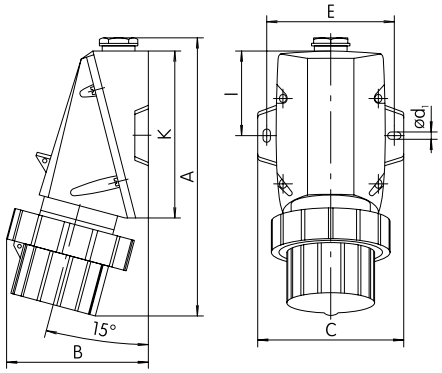
Wall plugs IP67

Type \ (mm)	A	B	ød1	øD	E	F	I	Pg
EPH 1632	140	74	4,8	70	45	30	15	P16
EPH 1643	143	92	5,2	78	50	30	18	P16
EPH 1653	143	98	5,2	87	50	30	18	P16
EPH 3243	165	108	5,2	92,5	58	40	20	P21
EPH 3253	165	113	5,2	100	58	40	20	P21



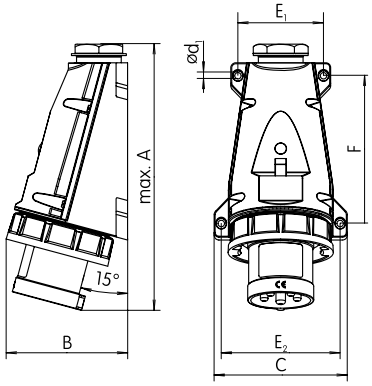
Wall plugs IP67

Type \ (mm)	A	B	C	D1	E	I	K	Pg
EPH 6343	260	122	103	7	91,5	72,2	144,5	P29
EPH 6345	260	122	103	7	91,5	72,2	144,5	P29

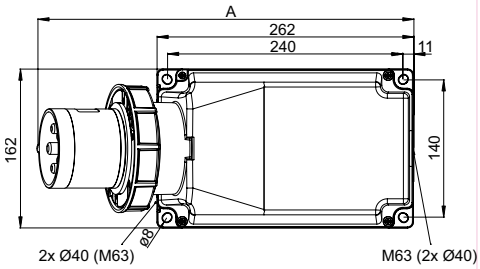


Wall plugs IP67

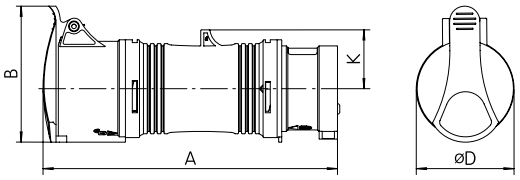
Type\ (mm)	A	B	C	ød1	E1	E2	F	K
EPH 6353	280	130	140	6,5	90	125	155	35



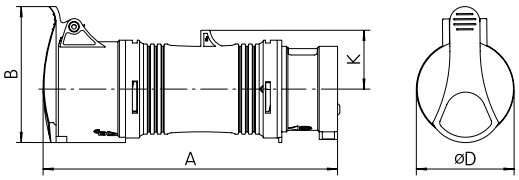
Wall plugs IP67		
Type \ (mm)	A	B=height
EPH 12543	387	209
EPH 12553	387	209



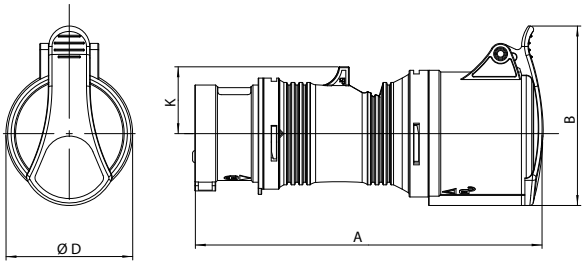
Adapters				
Type \ (mm)	A	B	øD	K
EA 1653/43	180	82	64	39
EA 3253/43	235	96	73	45



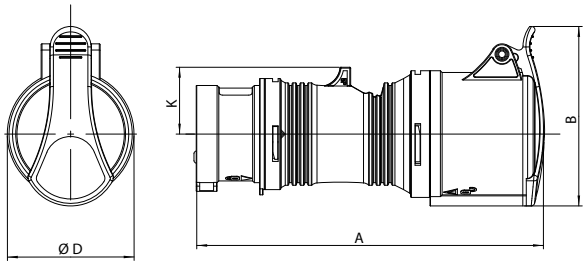
Adapters				
Type \(mm)	A	B	ØD	K
EA 1653/43-0	180	82	64	39
EA 3253/43-0	235	96	73	45



Adapters				
Type \(mm)	A	B	ØD	K
EA 16-32/4	198	96	65	34
EA 16-32/5	200	103	73	37

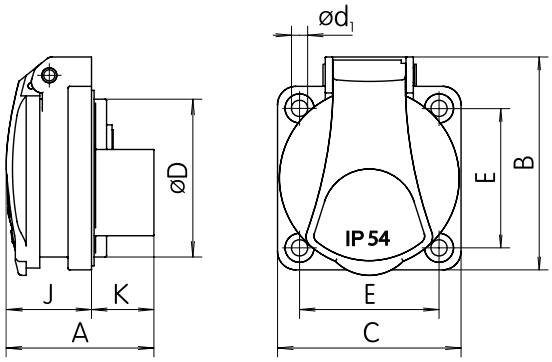


Adapters				
Type \(mm)	A	B	ØD	K
EA 16-32/5	200	103	73	37



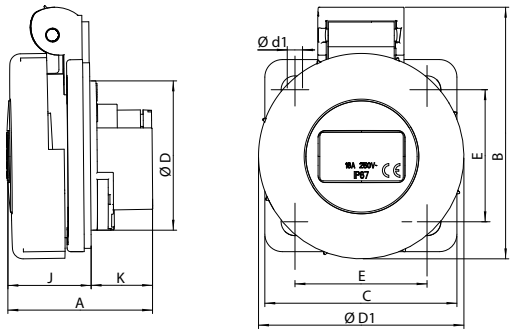
Built-in sockets schuko

Type \(mm)	A	B	C	ØD	Ød1	E	J	K
EE 16 S	43	59,5	50	43	4,5	38	26	17



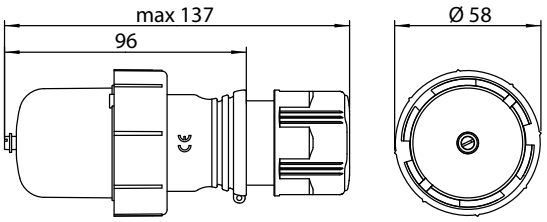
Built-in sockets schuko

Type \(mm)	A	B	C	ØD	Ød1	E	J	K	ØD1
EEH 16 C	42	73	55	43	4,5	38	24	18	60
EEH 16 S	48	73	55	43	4,5	38	24	24	60



Unischuko plug IP67

Type
EEVG 16 - Unischuko plug IP67



VV/HH

High voltage fuse-links 974

Technical data 983

KEMA Labs

High voltage fuses



ETI Power needs control

High voltage fuse-links

High voltage high-breaking capacity VV fuse-links

General information

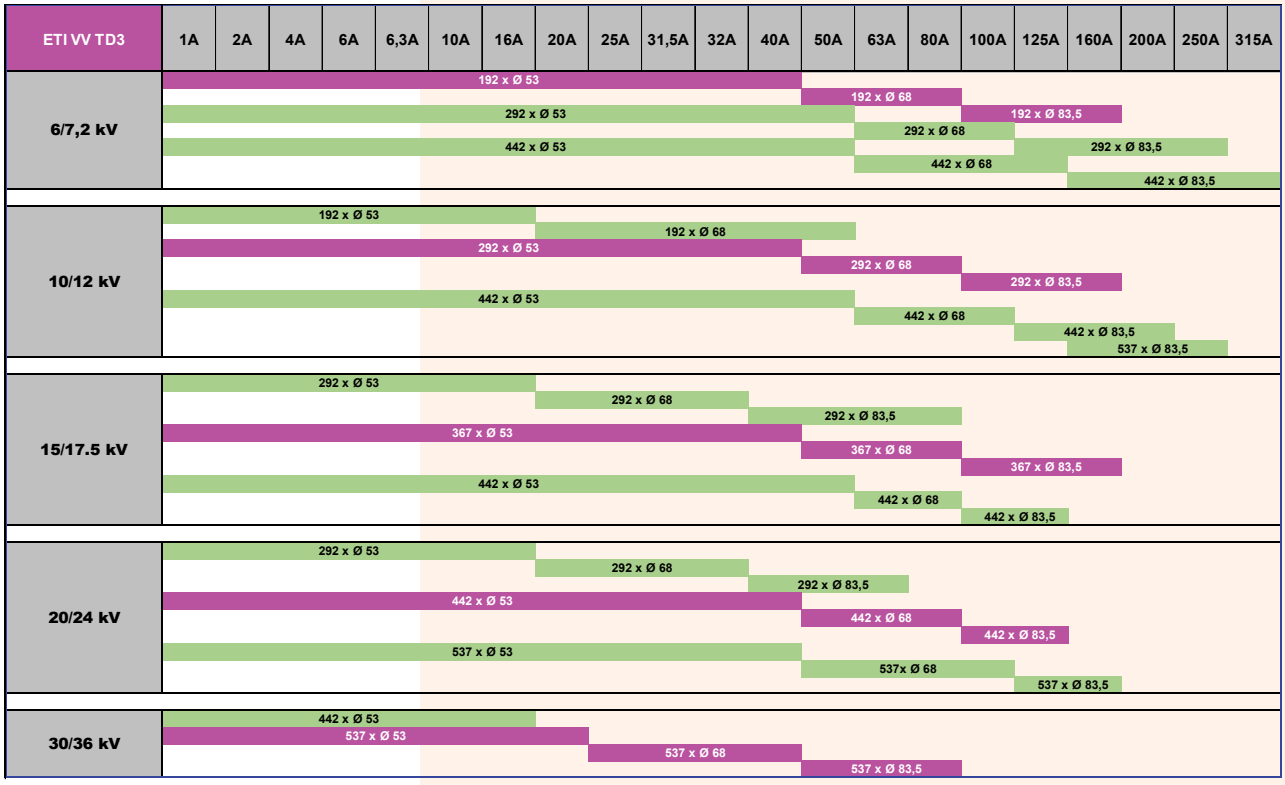
ETI HV (High-voltage Current-limiting fuse-links) named VVT TD3 are designed to protect devices in switch-gears and other equipment (distribution transformers, power capacitors, MV motors) from thermal and dynamic effects of short-circuits and over-currents. Time-current characteristics correspond to standard IEC 60282-1, item 3.3.3. Back-up fuse. They are suitable for installation in:

- indoor and outdoor RMU (Ring-Main Units) switchgear
- SF6 - insulated enclosures
- special service conditions (different from normal conditions, described in item 4.1. of standard IEC 60282-1)

The most significant features of ETI VVT TD3 high-voltage fuses:

- Low temperature rise because of low power dissipation
- Low minimum breaking currents
- High breaking capacity 63 kA (up to 24kV)
- Two types of striker pins: 50N and 80 N (with integrated temperature dependent limiter)
- Reliable sealing system against humidity irruption
- Low switching voltages
- Upon a request, fuse links can be supplied into non-standard dimensions

Overview of standard and non-standard dimensions



* purple: standard dimensions
** green: non-standard dimensions

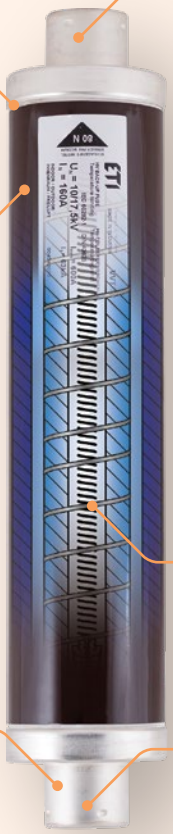
KEMA Labs

→ KEMA type test reports



→ Reliable sealing system against humidity irruption

→ High endurance ceramic tube



→ Striker system: a temperature sensitive element, which does not react to short time overloads, only to inadmissible values of temperatures. Convenient for the protection of the fuse-links, installed in enclosures or SF6 switchgears

→ Rigid striker pin

→ Various striker variants (50N, 80N, without striker, thermo, non-thermo...)

→ Low temperature rise because of low power dissipation

→ Low minimum breaking currents

→ Low switching voltages

→ High breaking capacity 63 kA

→ Silver melting element

→ Galvanically protected contact caps made of electrolytic copper can be nickel (Ni), tin (Sn) or silver (Ag) plated

→ Easier mounting because of improved contact cap

Standards
ETI MV/VV High voltage fuse-links comply with the following standards and specifications:
- IEC 60282-1 "Current-limiting fuses", Edition 8.0 from 2020-04
- DIN 43625 "Hochspannungs-Sicherungen; Nennspannung 3,6 bis 36kV; maβe für Sicherungseinsätze"
- VDE 0670 T402, Wechselstromschaltgeräte für Spannungen über 1kV, "Auswahl von strombegrenzenden Sicherungseinsätzen für Transformatorstromkreise"
- IEC TR 62655 "Tutorial and application guide for high-voltage fuses"
- IEC 60644 "Specification for high-voltage fuse-links for motor circuit applications"
- IEC 60549 "High-voltage fuses for external protection of shunt capacitors"

Certificates, Test reports
- KEMA Type Test Certificates of breaking performance
- Test reports for 25kV, 38.5kV, 40.5kV and 42kV versions

Construction:
ETI High voltage fuse-links are designed to assure stable and reliable technical characteristics. The glazed porcelain tube (made in ETI own ceramic factory) is extremely high mechanical and thermal resistant.
Galvanically protected contact caps made of electrolytic copper are nickel (Ni) or tin (Sn) or upon customer request silver (Ag) plated. Caps are rolled by pressing into the groove of the tube. The tightness of this connection is assured by a special seal resistant to ageing and high temperatures.
The design and method of production of the melting elements ensures precisely tolerances and stable time/current characteristics. Fuse elements are wounded on a ceramic carrier and electrically welded on a special copper strips.
The inside of the tube is filled with quartz sand with an exactly determined granulation and chemical structure. The sand guarantees good and reliable extinguishing of the electric arc.
An important element in the fuse-link construction is also the striker system. Part of that system is temperature sensitive element, which reacts in cases of temperature increasing of the fuse-link due to various reasons. The system reacts in such a way that short time overloads do not cause the fuse to interrupt the circuit unnecessarily. Only when inadmissible values of temperatures are exceeded, the fuse-link open the switch via the striker pin.
Because of these characteristics, ETI "thermal" striker pin is convenient for the protection of the fuse-links, installed in enclosures or SF6 switchgears, which requires additional protection features against inadmissible temperatures.

Striker pin Type description:
- VVA3; without striker
- VVC3; 50N striker force.
- VVT-D3; 80N striker force, with temperature limiter (VVT)







Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVA (without striker pin)	VVC3 Striker type 50N	VVT-D3 Striker type 80N THERMO		Tube diameter "d" (mm)	weight [kg]
					Ni plated contacts	Ag plated contacts*		
3/7.2	192	1 A	004221102				53	1.1
		2 A	004221103	004220003	004222003			
		4 A	004221104	004220004	004222004			
		6 A	004221105	004220005	004222005			
		6,3 A	004221106	004220006	004222006			
		10 A	004221107	004220007	004222007			
		16 A	004221108	004220008	004222008			
		20 A	004221109	004220009	004222009			
		25 A	004221110	004220010	004222010			
		31,5 A	004221111	004220011	004222011			
		32 A	004221112	004220012	004222012			
		40 A	004221113	004220013	004222013			
		50A	004221114	004220014	004222014		68	1.7
		63 A	004221115	004220015	004222015			
		80 A	004221116	004220016	004222016			
		100 A	004221117	004220017	004222017		83,5	2.7
		125 A	004221118	004220018	004222018			
		160 A	004221119	004220019	004222019			
	292	2 A		004220503	004222503	004222033	53	1.6
		4 A		004220504	004222504	004222034		
		6 A		004220505	004222505	004222035		
		6,3 A		004220506	004222506	004222036		
		10 A		004220507	004222507	004222037		
		16 A		004220508	004222508	004222038		
		20 A		004220509	004222509	004222039		
		25 A		004220510	004222510	004222040		
		31,5 A		004220511	004222511	004222041		
		32 A		004220512	004222512	004222042		
		40 A		004220513	004222513	004222043		
		50 A		004220514	004222514	004222044		
		63 A		004220515	004222515	004222045	68	2.8
		80 A		004220516	004222516	004222046		
		100 A		004220517	004222517	004222047		
		125 A		004220518	004222518	004222048	83,5	4.0
		160 A		004220519	004222519	004222049		
		200 A		004220520	004222520			
		250 A		004220521	004222521			
	442	2 A		004220603	004222603		68	3.9
		4 A		004220604	004222604			
		6 A		004220605	004222605			
		6,3 A		004220606	004222606			
		10 A		004220607	004222607			
		16 A		004220608	004222608			
		20 A		004220609	004222609			
		25 A		004220610	004222610			
		31,5 A		004220611	004222611			
		32 A		004220612	004222612			
		40 A		004220613	004222613			
		50 A		004220614	004222614			
		63 A		004220615	004222615			
		80 A		004220616	004222616			
		100 A		004220617	004222617			
		125 A		004220618	004222618			
		160 A		004220619	004222619		83,5	5.8
		200 A		004220620	004222620			
		250 A		004220621	004222621			
		315 A		004220622	004222622			

Note 1: Other ratings and dimensions can be supplied by customer request. For particular applications, please contact ETI technical team.
Note 2: Orange colored types according to IEC 60282-1 dimensions.
* Other dimensions available upon request

Technical data on page 983

Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVA (without striker pin)	VVC3 Striker type 50N	VVT-D3 Striker type 80N THERMO Ni plated contacts	VVT-D3 Striker type 80N THERMO Ag plated contacts*	Tube diameter "d" (mm)	weight [kg]
6/12	192	2 A		004230103	004232103		53	1.1
		4 A		004230104	004232104			
		6 A		004230105	004232105			
		6,3 A		004230106	004232106			
		10 A		004230107	004232107			
		16 A		004230108	004232108			
		20 A		004230109	004232109		68	1.7
		25 A		004230110	004232110			
		31,5 A		004230111	004232111			
		32 A		004230112	004232112			
		40 A		004230113	004232113			
		50 A		004230114	004232114			
	292	1 A	004231102				53	1.6
		2 A	004231103	004230003	004232003	004232033		
		4 A	004231104	004230004	004232004	004232034		
		6 A	004231105	004230005	004232005	004232035		
		6,3 A	004231106	004230006	004232006	004232036		
		10 A	004231107	004230007	004232007	004232037		
		16 A	004231108	004230008	004232008	004232038		
		20 A	004231109	004230009	004232009	004232039		
		25 A	004231110	004230010	004232010	004232040		
		31,5 A	004231111	004230011	004232011	004232041		
		32 A	004231112	004230012	004232012	004232042		
		40 A	004231113	004230013	004232013	004232043		
		50 A	004231114	004230014	004232014	004232044	68	2.8
		63 A	004231115	004230015	004232015	004232045		
		80 A	004231116	004230016	004232016	004232046		
		100 A	004231117	004230017	004232017	004232047	83,5	4.0
		125 A	004231118	004230018	004232018	004232048		
		160 A	004231119	004230019	004232019	004232049		
	442	2 A		004230503	004232503		53	2.3
		4 A		004230504	004232504			
		6 A		004230505	004232505			
		6,3 A		004230506	004232506			
		10 A		004230507	004232507			
		16 A		004230508	004232508			
		20 A		004230509	004232509			
		25 A		004230510	004232510			
		31,5 A		004230511	004232511			
		32 A		004230512	004232512			
		40 A		004230513	004232513			
		50 A		004230514	004232514			
		63 A		004230515	004232515		68	3.9
		80 A		004230516	004232516			
		100 A		004230517	004232517			
		125 A		004230518	004232518		83,5	5.8
		160 A		004230519	004232519			
		200 A		004230520	004232520			
	537	160 A		004230619	004232619		83,5	7.0
		200 A		004230620	004232620			
		250 A		004230621	004232621			







Note 1: Other ratings and dimensions can be supplied by customer request. For particular applications, please contact ETI technical team.
Note 2: Orange colored types according to IEC 60282-1 dimensions.
* Other dimensions available upon request

Technical data on page 984







Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVA (without striker pin)	VVC3 Striker type 50N	VVT-D3 Striker type 80N THERMO		Tube diameter "d" (mm)	weight [kg]
					Ni plated contacts	Ag plated contacts*		
10/17,5	292	2 A		004240103	004242103		53	1.6
		4 A		004240104	004242104			
		6 A		004240105	004242105			
		6,3 A		004240106	004242106			
		10 A		004240107	004242107			
		16 A		004240108	004242108			
		20 A		004240109	004242109		68	2.8
		25 A		004240110	004242110			
		31,5 A		004240111	004242111			
		32 A		004240112	004242112			
		40 A		004240113	004242113		83,5	4.0
		50A		004240114	004242114			
		63 A		004240115	004242115			
		80 A		004240116	004242116			
		100 A		004240117	004242117			
	367	1 A	004241102				53	1.9
		2 A	004241103	004240003	004242003	004242033		
		4 A	004241104	004240004	004242004	004242034		
		6 A	004241105	004240005	004242005	004242035		
		6,3 A	004241106	004240006	004242006	004242036		
		10 A	004241107	004240007	004242007	004242037		
		16 A	004241108	004240008	004242008	004242038		
		20 A	004241109	004240009	004242009	004242039		
		25 A	004241110	004240010	004242010	004242040		
		31,5 A	004241111	004240011	004242011	004242041		
		32 A	004241112	004240012	004242012	004242042		
		40 A	004241113	004240013	004242013	004242043		
		50 A	004241114	004240014	004242014	004242044	68	3.1
		63 A	004241115	004240015	004242015	004242045		
		80A	004241116	004240016	004242016	004242046		
		100 A	004241117	004240017	004242017	004242047	83,5	4.6
		125A	004241118	004240018	004242018	004242048		
		160 A	004241119	004240019	004242019	004242049		
	442	2 A		004240503	004242503		53	2.3
		4 A		004240504	004242504			
		6 A		004240505	004242505			
		6,3 A		004240506	004242506			
		10 A		004240507	004242507			
		16 A		004240508	004242508			
		20 A		004240509	004242509			
		25 A		004240510	004242510			
		31,5 A		004240511	004242511			
		32 A		004240512	004242512			
		40 A		004240513	004242513			
		50 A		004240514	004242514			
		63 A		004240515	004242515		68	3.9
		80A		004240516	004242516			
		100 A		004240517	004242517		83,5	5.8
		125 A		004240518	004242518			

Note 1: Other ratings and dimensions can be supplied by customer request. For particular applications, please contact ETI technical team.
Note 2: Orange colored types according to IEC 60282-1 dimensions.
* Other dimensions available upon request

Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVA (without striker pin)	VVC3 Striker type 50N	VVT-D3 Striker type 80N THERMO		Tube diameter "d" (mm)	weight [kg]
					Ni plated contacts	Ag plated contacts*		
10/24	292	2 A		004250103	004252103		53	1.6
		4 A		004250104	004252104			
		6 A		004250105	004252105			
		6,3 A		004250106	004252106			
		10 A		004250107	004252107			
		16 A		004250108	004252108			
		20 A		004250109	004252109		68	2.8
		25 A		004250110	004252110			
		31,5 A		004250111	004252111			
		32 A		004250112	004252112			
		40 A		004250113	004252113		83,5	4.0
		50A		004250114	004252114			
		63 A		004250115	004252115			
	442	1 A	004251102				53	2.3
		2 A	004251103	004250003	004252003	004252033		
		4 A	004251104	004250004	004252004	004252034		
		6 A	004251105	004250005	004252005	004252035		
		6,3 A	004251106	004250006	004252006	004252036		
		10 A	004251107	004250007	004252007	004252037		
		16 A	004251108	004250008	004252008	004252038		
		20 A	004251109	004250009	004252009	004252039		
		25 A	004251110	004250010	004252010	004252040		
		31,5 A	004251111	004250011	004252011	004252041		
		32 A	004251112	004250012	004252012	004252042		
		40 A	004251113	004250013	004252013	004252043		
		50 A	004251114	004250014	004252014	004252044	68	3.9
		63 A	004251115	004250015	004252015	004252045		
		80A	004251116	004250016	004252016	004252046		
		100 A	004251117	004250017	004252017	004252047	83,5	5.8
		125A	004251118	004250018	004252018	004252048		
	537	2 A		004250503	004252503		53	2.8
		4 A		004250504	004252504			
		6 A		004250505	004252505			
		6,3 A		004250506	004252506			
		10 A		004250507	004252507			
		16 A		004250508	004252508			
		20 A		004250509	004252509			
		25 A		004250510	004252510			
		31,5 A		004250511	004252511			
		32 A		004250512	004252512			
		40 A		004250513	004252513			
		50 A		004250514	004252514		68	4.7
		63 A		004250515	004252515			
		80A		004250516	004252516			
		100 A		004250517	004252517			
		125 A		004250518	004252518		83,5	7.0
		160 A		004250519	004252519			







Note 1: Other ratings and dimensions can be supplied by customer request. For particular applications, please contact ETI technical team.
Note 2: Orange colored types according to IEC 60282-1 dimensions.
* Other dimensions available upon request

Technical data on page 986



Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVA (without striker pin)	VVC3 Striker type 50N	VVT-D3 Striker type 80N THERMO		Tube diameter "d" (mm)	weight [kg]
					Ni plated contacts	Ag plated contacts*		
20/36	442	2 A		004260103	004262103		53	2.3
		4 A		004260104	004262104			
		6 A		004260105	004262105			
		6,3 A		004260106	004262106			
		10 A		004260107	004262107			
		16 A		004260108	004262108			
		20 A		004260109	004262109			
		25 A		004260110	004262110			
	537	1 A	004261102				53	2.8
		2 A	004261103	004260003	004262003	004262033		
		4 A	004261104	004260004	004262004	004262034		
		6 A	004261105	004260005	004262005	004262035		
		6,3 A	004261106	004260006	004262006	004262036		
		10 A	004261107	004260007	004262007	004262037		
		16 A	004261108	004260008	004262008	004262038		
		20 A	004261109	004260009	004262009	004262039		
		25 A	004261110	004260010	004262010	004262040	68	4.7
		31,5 A	004261111	004260011	004262011	004262041		
		32 A	004261112	004260012	004262012	004262042		
		40 A	004261113	004260013	004262013	004262043		
		50 A	004261114	004260014	004262014	004262044	83,5	7.0
		63 A	004261115	004260015	004262015	004262045		
		80 A	004261116	004260016	004262016	004262046		

Note 1: Other ratings and dimensions can be supplied by customer request. For particular applications, please contact ETI technical team.
Note 2: Orange colored types according to IEC 60282-1 dimensions.
* Other dimensions available upon request

High voltage fuse-links for liquid-immersed transformers



Ordering Code Numbers

rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVT-D Striker type 80N	Tube diameter "d" (mm)	weight [kg]
6/12	292	2A	004236903	53	1,6
		4A	004236904		
		6A	004236905		
		10A	004236906		
		16A	004236907		
		20A	004236908		
		25A	004236909		
		32A	004236910		
		40A	004236911		
10/24	292	2A	004256943	53	1,6
		4A	004256944		
		6A	004256945		
		10A	004256946		
		16A	004256947		
	442	2A	004256903	53	2,3
		4A	004256904		
		6A	004256905		
		10A	004256906		
		16A	004256907		
		20A	004256908		
		25A	004256909		
		32A	004256910		
		40A	004256911		

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High voltage fuse-links for protection of voltage transformers

Ordering Code Numbers					
rated voltage U_n [kV]	Dimension "e" according to DIN and IEC (mm)	rated current [A]	VVT-D	Tube diameter "d" (mm)	weight [kg]
10/24	235	2A	004251033	54	1,45
		4A	004251034		



Fuse bases for VV fuse-links

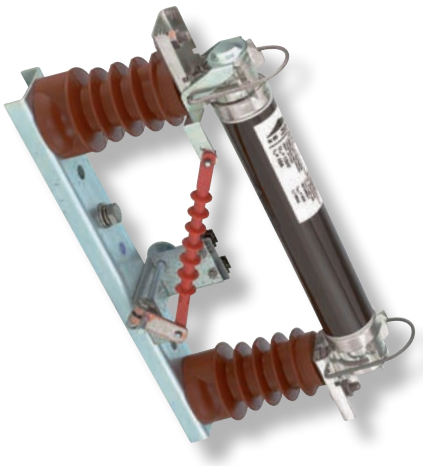
1-pole Indoor mounting				
type	Rated voltage [kV]	code No.	Dimension "e" according to DIN and IEC [mm]	packaging [pcs]
VVP 7,2 1p-N	7,2	004229010	192	1
VVP 12 1p-N	12	004239010	292	1
VVP 17,5 1p-N	17,5	004249010	367	1
VVP 24 1p-N	24	004259010	442	1
VVP 36 1p-N	36	004269010	537	1

* when choosing right fuse base consider size and rated voltage of fuse-link
** due to safety reasons fuse bases cannot be later adjusted on different length by a user
*** indoor edition of fuse base may not be used for outside applications
**** Max thermal current: 100A, used with ETI VVT TD3 fuse-links.



1-pole Indoor mounting with microswitch fuse monitoring				
type	Rated voltage [kV]	code No.	Dimension "e" according to DIN and IEC [mm]	packaging [pcs]
VVP 7,2 1p-N + NK 7,2 BSW	7,2	004349019	192	1
VVP 12 1p-N + NK 12 BSW	12	004349020	292	1
VVP 17,5 1p-N + NK 17,5 BSW	17,5	004349021	367	1
VVP 24 1p-N + NK 24 BSW	24	004349022	442	1
VVP 36 1p-N + NK 7,2 BSW	36	004349023	537	1

* when choosing right fuse base consider size and rated voltage of fuse-link
** due to safety reasons fuse bases cannot be later adjusted on different length by a user
*** Rotation in installation is allowed only with the pin striker pointing upward (as in the photo on the right)
**** Max thermal current: 100A, used with ETI VVT TD3 fuse-links.



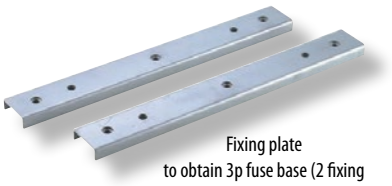
Technical data on page 992, 994



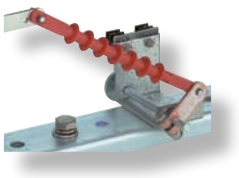
1-pole Outdoor mounting				
type	Rated voltage [kV]	code No.	Dimension "e" according to DIN and IEC [mm]	packaging [pcs]
VVP 7,2 1p-Z	7,2	004229030	192	1
VVP 12 1p-Z	12	004239030	292	1
VVP 17,5 1p-Z	17,5	004249030	367	1
VVP 24 1p-Z	24	004259030	442	1
VVP 36 1p-Z	36	004269030	537	1

* when choosing right fuse base consider size and rated voltage of fuse-link
** due to safety reasons fuse bases cannot be later adjusted on different length by a user
**** Max thermal current: 100A, used with ETI VVT TD3 fuse-links.

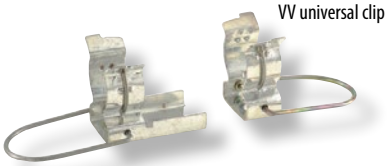
Accessories



Fixing plate
to obtain 3p fuse base (2 fixing plates are needed)



Microswitch



VV universal clip

VV universal clip with tail

Accessories for VVP fuse bases			
type	Rated voltage [kV]	code No.	packaging [pcs]
Fixing plate for VVP 7,2 3p-N, INDOOR	7,2	004229020	1
Fixing plate for VVP 12 3p-N, INDOOR	12	004239020	1
Fixing plate for VVP 17,5 3p-N, INDOOR	17,5	004249020	1
Fixing plate for VVP 24 3p-N, INDOOR	24	004259020	1
Fixing plate for VVP 36 3p-N, INDOOR	36	004269020	1
Fixing plate for VVP 12 3p-Z, OUTDOOR	12	004239040	1
Fixing plate for VVP 24 3p-Z, OUTDOOR	24	004259040	1
Microswitch NK 7,2 BSW, INDOOR	7,2	004349007	1
Microswitch NK 12 BSW, INDOOR	12	004349008	1
Microswitch NK 17,5 BSW, INDOOR	17,5	004349009	1
Microswitch NK 24 BSW, INDOOR	24	004349010	1
Microswitch NK 36 BSW, INDOOR	36	004349011	1
VV universal clip with tail, prepared for M10 screw connection	7,2 - 36	004349015	1
VV universal clip	7,2 - 36	004349016	1

Fixing plate is used for combining 1-pole fuse bases into 3-pole fuse bases.

Technical data on page 994

High-voltage high-breaking capacity VV fuse-links

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value [A^2s]	total I^2t value [A^2s]
3/7.2	192	1	C, D	63	12	1170	3		
		2			12	580	4	6,1	57
		4			20	370	9	17,3	164
		6			25	260	10	36	340
		6,3			25	260	10	36	340
		10			43	75	9	165	1.450
		16			56	44	13,5	320	5.200
		20			70	27	12,5	450	7.000
		25			87	21	16	700	10.000
		31,5			110	18	23,5	1.400	15.000
		32			110	18	25	1.400	15.000
		40			140	13	28,5	3.200	27.000
		50			175	10,5	35,5	5.800	44.000
		63			220	7,5	42,5	12.000	70.000
		80			280	5,9	59	19.000	140.000
		100			360	4,8	73	35.000	202.000
		125			450	3,9	101	55.000	300.000
		160			600	3	144	94.000	580.000
	292	2	C, D	63	12	580	4	6,1	57
		4			20	370	9	17,3	164
		6			25	260	10	36	340
		6,3			25	260	10	36	340
		10			43	75	9	165	1.450
		16			56	44	13,5	320	5.200
		20			70	27	12,5	450	7.000
		25			87	21	16	700	10.000
		31,5			110	18	23,5	1.400	15.000
		32			110	18	25	1.400	15.000
		40			140	13	28,5	3.200	27.000
		50			175	10,5	35,5	5.800	44.000
		63			220	7,5	42,5	12.000	70.000
		80			280	5,9	59	19.000	140.000
		100			360	4,8	73	35.000	202.000
		125			450	3,9	101	55.000	300.000
		160			600	3	144	94.000	580.000
		200			1000	2,1	155	151.780	789.270
		250			1250	1,7	196	228.610	1.188.800
	442	2	C, D	63	12	840	4,7	6,1	57
		4			20	530	11,7	17,3	164
		6			25	270	13,4	36	340
		6,3			25	270	13,4	36	340
		10			43	90	11	165	1.450
		16			56	53	16	320	5.200
		20			70	32	15	450	7.000
		25			87	25	19	700	10.000
		31,5			110	21,5	28	1.400	15.000
		32			110	21,5	30	1.400	15.000
		40			140	15,5	34	3.200	27.000
		50			175	12,6	43	5.800	44.000
		63			220	9	51	12.000	70.000
		80			280	7,1	71	19.000	140.000
		100			360	5,8	88	35.000	202.000
		125			450	4,7	121	55.000	300.000
		160			600	3,6	173	94.000	580.000
		200			1000	2,65	195	151.780	789.270
		250			1250	2,2	253	228.610	1.188.800
		315			1575	1,75	320	368.640	1.916.930

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value $[A^2s]$	total I^2t value $[A^2s]$
6/12	192	2	C, D	50	12	980	6	6,1	57
		4			20	650	15	17,3	164
		6			27	435	21	36	340
		6,3			27	435	21	36	340
		10			42	130	15	165	1.450
		16			64	70	23	320	5.200
		20			80	44	21	450	7.000
		25			100	33	28	700	10.000
		31,5			126	29	38	1.400	15.000
		32			126	29	41	1.400	15.000
		40			160	21	48	3.200	27.000
		50			200	16,5	54	5.800	44.000
	292	1	C, D	63	12	1970	5		
		2			12	980	6	6,1	57
		4			20	650	15	17,3	164
		6			25	435	21	36	340
		6,3			25	435	21	36	340
		10			43	130	15	165	1.450
		16			56	70	23	320	5.200
		20			70	44	21	450	7.000
		25			87	33	28	700	10.000
		31,5			110	29	38	1.400	15.000
		32			110	29	41	1.400	15.000
		40			140	21	48	3.200	27.000
		50			175	16,5	54	5.800	44.000
		63			220	12	62	12.000	70.000
		80			280	9	75	19.000	140.000
		100			360	6,7	114	35.000	202.000
		125			450	5,2	138	55.000	300.000
		160			600	4,1	179	94.000	580.000
	442	2	C, D	63	12	980	6	6,1	57
		4			20	650	15	17,3	164
		6			25	435	21	36	340
		6,3			25	435	21	36	340
		10			43	130	15	165	1.450
		16			56	70	23	320	5.200
		20			70	44	21	450	7.000
		25			87	33	28	700	10.000
		31,5			110	29	38	1.400	15.000
		32			110	29	41	1.400	15.000
		40			140	21	48	3.200	27.000
		50			175	16,5	54	5.800	44.000
		63			220	12	62	12.000	70.000
		80			280	9	75	19.000	140.000
		100			360	6,7	114	35.000	202.000
		125			450	5,2	138	55.000	300.000
		160			600	4,1	179	94.000	580.000
		200			1000	3,3	238	151.780	789.270
	537	160	C, D	63	600	4,1	179	94.000	580.000
		200			1000	3,3	238	151.780	789.270
		250			1250	2,65	305	228.610	1.188.800

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value [A^2s]	total I^2t value [A^2s]
10/17.5	292	2	C, D	50	12	1400	8	6,1	57
		4			20	900	17	17,3	164
		6			27	670	35	36	340
		6,3			27	670	35	36	340
		10			42	160	20	165	1.450
		16			64	95	31	320	5.200
		20			80	58	29	450	7.000
		25			100	45	36	700	10.000
		31,5			126	38	51	1.400	15.000
		32			126	38	53	1.400	15.000
		40			160	28	64	3.200	27.000
		50			200	21,5	75	5.800	44.000
		63			252	16,5	100	12.000	70.000
		80			320	12,5	130	19.000	140.000
		100			400	9	145	35.000	202.000
	367	1	C, D	63	12	2800	6		
		2			12	1400	8	6,1	57
		4			20	900	17	17,3	164
		6			25	670	35	36	340
		6,3			25	670	35	36	340
		10			42	160	20	165	1.450
		16			56	95	31	320	5.200
		20			70	58	29	450	7.000
		25			87	45	36	700	10.000
		31,5			110	38	51	1.400	15.000
		32			110	38	53	1.400	15.000
		40			140	28	64	3.200	27.000
		50			175	21,5	75	5.800	44.000
		63			220	16,5	100	12.000	70.000
		80			280	12,5	130	19.000	140.000
		100			360	9	145	35.000	202.000
		125			450	7,5	210	55.000	300.000
		160			600	5,6	290	94.000	580.000
	442	2	C, D	63	12	1400	8	6,1	57
		4			20	900	17	17,3	164
		6			25	670	35	36	340
		6,3			25	670	35	36	340
		10			42	160	20	165	1.450
		16			56	95	31	320	5.200
		20			70	58	29	450	7.000
		25			87	45	36	700	10.000
		31,5			110	38	51	1.400	15.000
		32			110	38	53	1.400	15.000
		40			140	28	64	3.200	27.000
		50			175	21,5	75	5.800	44.000
		63			220	16,5	100	12.000	70.000
		80			280	12,5	130	19.000	140.000
		100			360	9	145	35.000	202.000
		125			450	7,5	210	55.000	300.000
		160			600	5,6	290	94.000	580.000

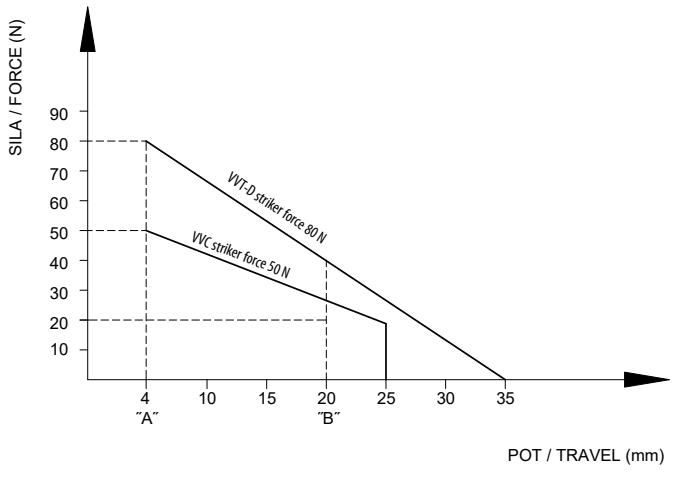
Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value [A^2s]	total I^2t value [A^2s]
10/24	292	2	C, D	31,5	12	2040	12	6,1	57
		4			20	1300	35	17,3	164
		6			27	900	56	36	340
		6,3			27	900	56	36	340
		10			42	230	25,5	165	1.450
		16			64	125	42	320	5.200
		20			80	76	39,5	450	7.000
		25			100	59	49	700	10.000
		31,5			126	52	75	1.400	15.000
		32			126	52	79	1.400	15.000
		40			160	38	94	3.200	27.000
		50			200	29	110	5.800	44.000
		63			252	21,5	137	12.000	70.000
	442	1	C, D	63	12	3900	9		
		2			12	2040	12	6,1	57
		4			20	1300	35	17,3	164
		6			25	900	56	36	340
		6,3			25	900	56	36	340
		10			42	230	25,5	165	1.450
		16			56	125	42	320	5.200
		20			70	76	39,5	450	7.000
		25			87	59	49	700	10.000
		31,5			110	52	75	1.400	15.000
		32			110	52	79	1.400	15.000
		40			140	38	94	3.200	27.000
		50			175	29	110	5.800	44.000
		63			220	21,5	137	12.000	70.000
		80			280	16	174	19.000	140.000
		100			355	12,9	220	35.000	202.000
		125			473	11,9	317	49.000	220.000
	537	2	C, D	63	12	2040	12	6,1	57
		4			20	1300	35	17,3	164
		6			25	900	56	36	340
		6,3			25	900	56	36	340
		10			42	230	25,5	165	1.450
		16			56	125	42	320	5.200
		20			70	76	39,5	450	7.000
		25			87	59	49	700	10.000
		31,5			110	52	75	1.400	15.000
		32			110	52	79	1.400	15.000
		40			140	38	94	3.200	27.000
		50			175	29	110	5.800	44.000
		63			220	21,5	137	12.000	70.000
		80			280	16	174	19.000	140.000
		100			355	12,9	220	35.000	202.000
		125			473	11,9	317	49.000	220.000
		160			600	5,6	290	94.000	580.000

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value $[A^2s]$	total I^2t value $[A^2s]$
20/36	442	2	C, D	20	12	2900	17	6,1	57
		4			20	1870	45	17,3	164
		6			27	1300	73	36	340
		6,3			27	1300	73	36	340
		10			42	323	40	165	1.450
		16			64	177	60	320	5.200
		20			80	110	70	450	7.000
		25			100	83	80	700	10.000
	537	1	C, D	31,5	12	5800	14		
		2			12	2900	17	6,1	57
		4			20	1870	45	17,3	164
		6			25	1300	73	36	340
		6,3			25	1300	73	36	340
		10			42	323	40	165	1.450
		16			56	177	60	320	5.200
		20			70	110	70	450	7.000
		25			87	83	80	700	10.000
		31,5			110	75	115	1.400	15.000
		32			110	75	120	1.400	15.000
		40			140	53	145	3.200	27.000
		50			175	41	150	5.800	44.000
		63			220	30	195	12.000	70.000
		80			280	22,5	230	19.000	140.000

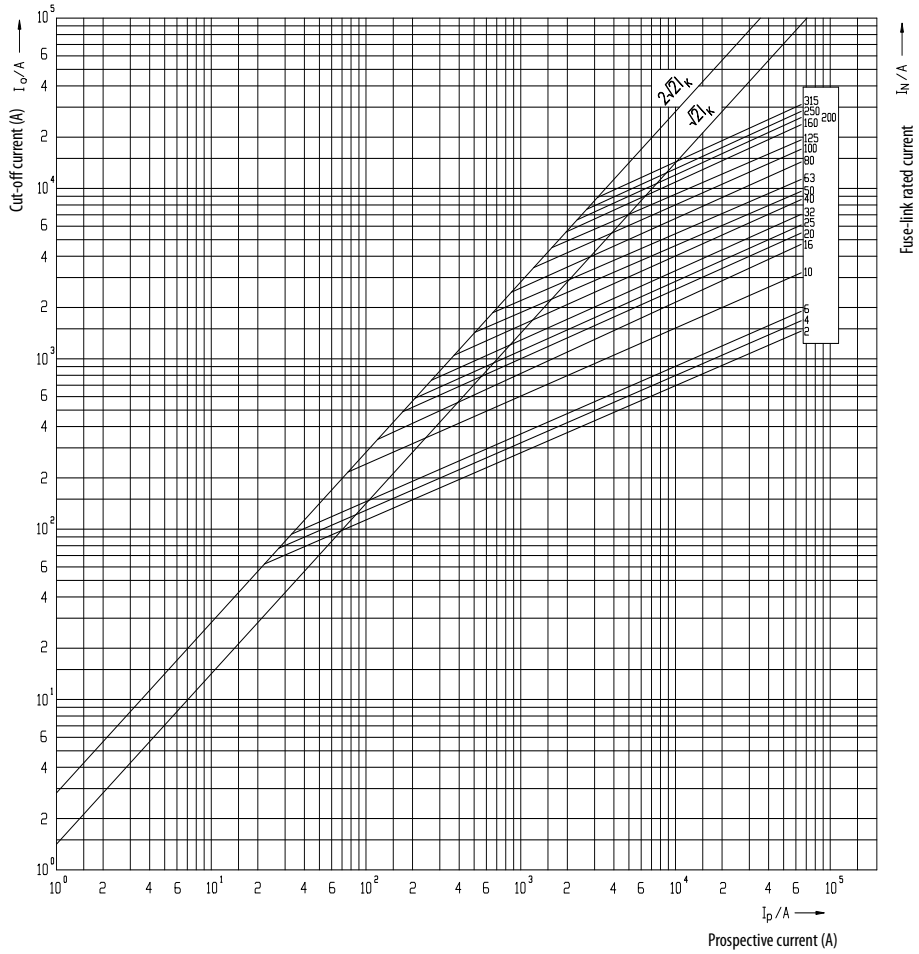
Force / travel striker pin diagram



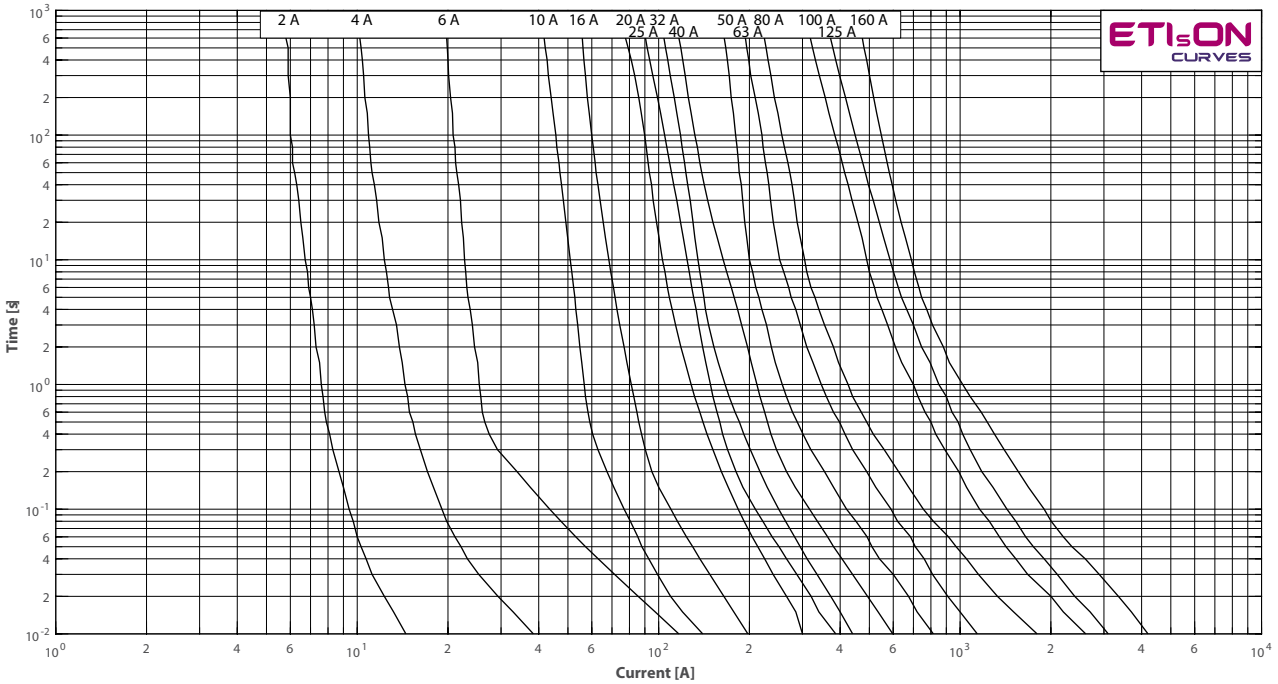
Connection in indoor switchgear, example:



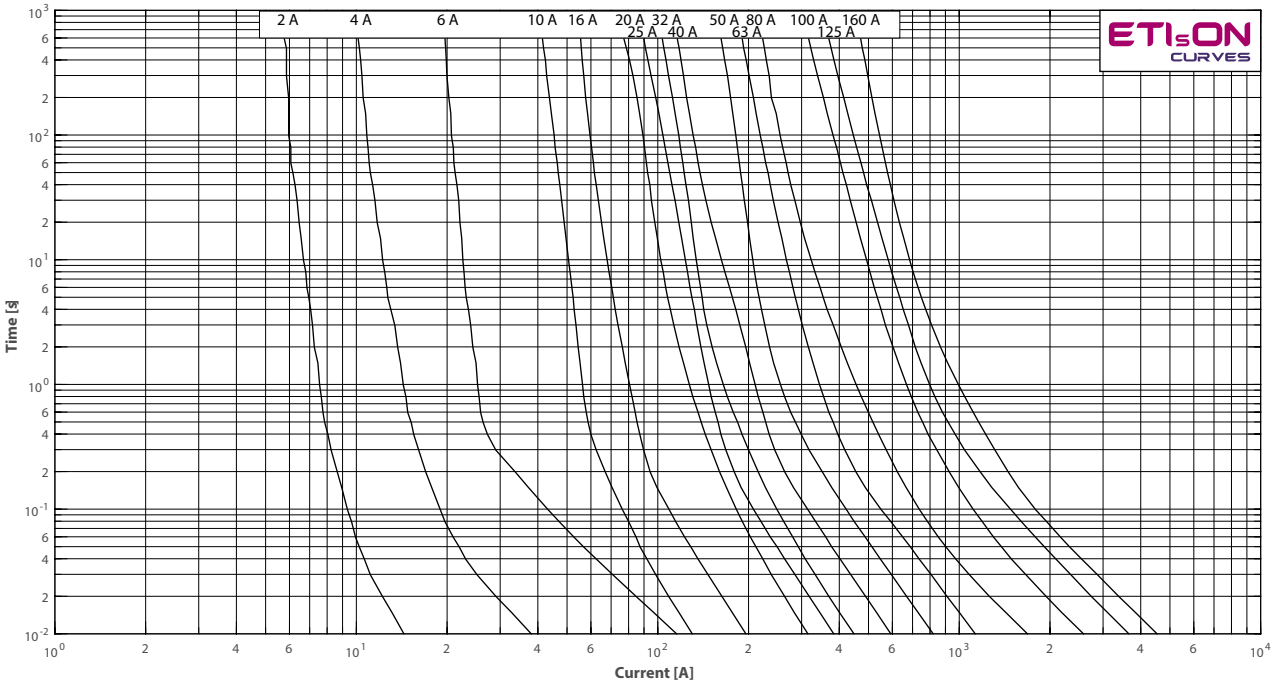
Cut-off current diagram for VV-Thermo fuse links



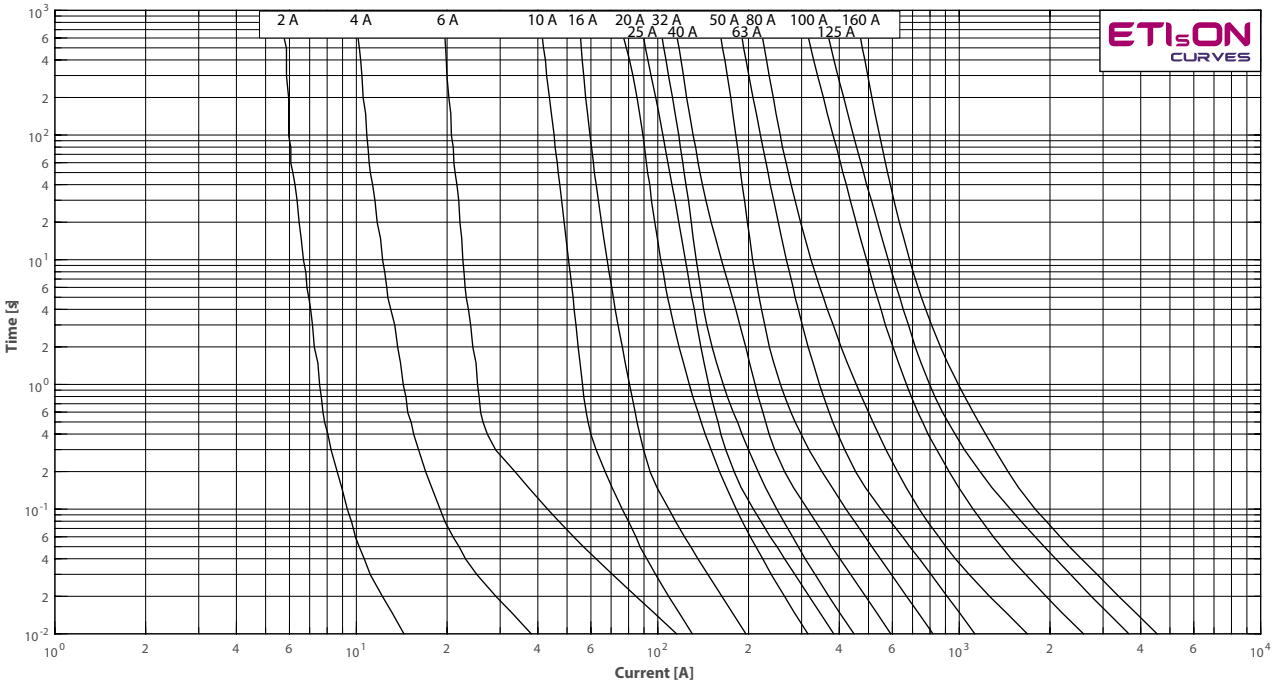
Time-current characteristics for VV-thermo fuse links
7,2 kV



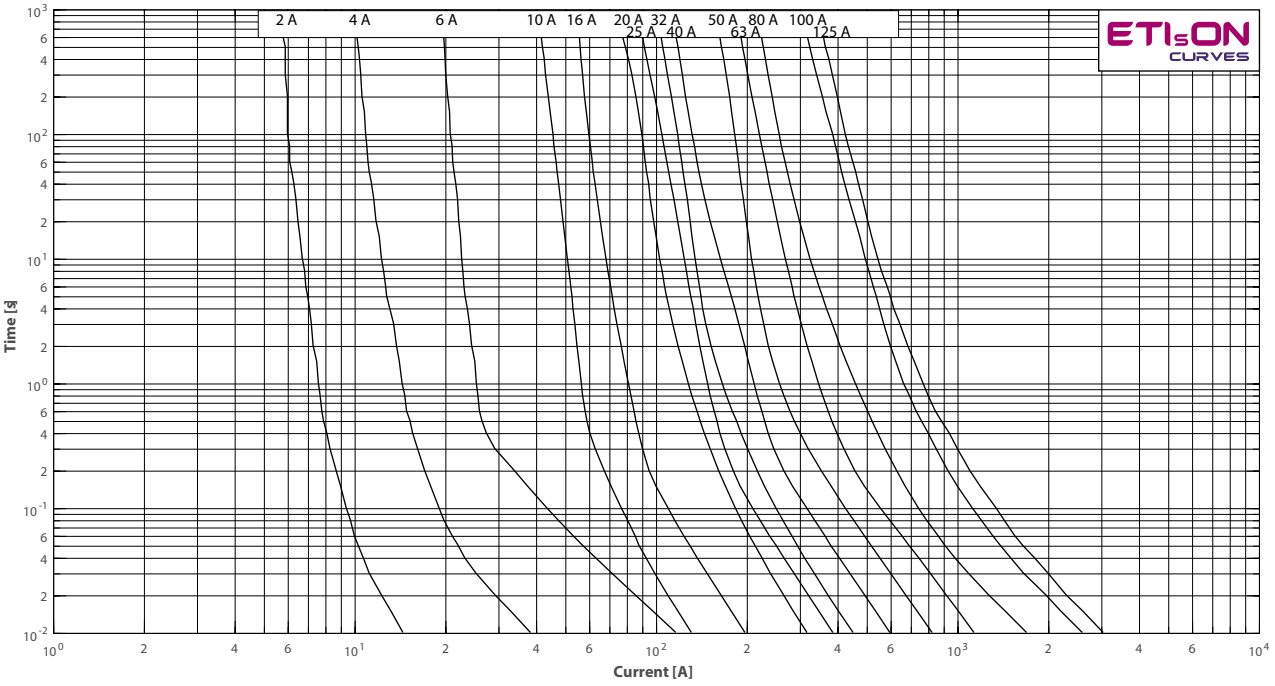
Time-current characteristics for VV-thermo fuse links
12 kV



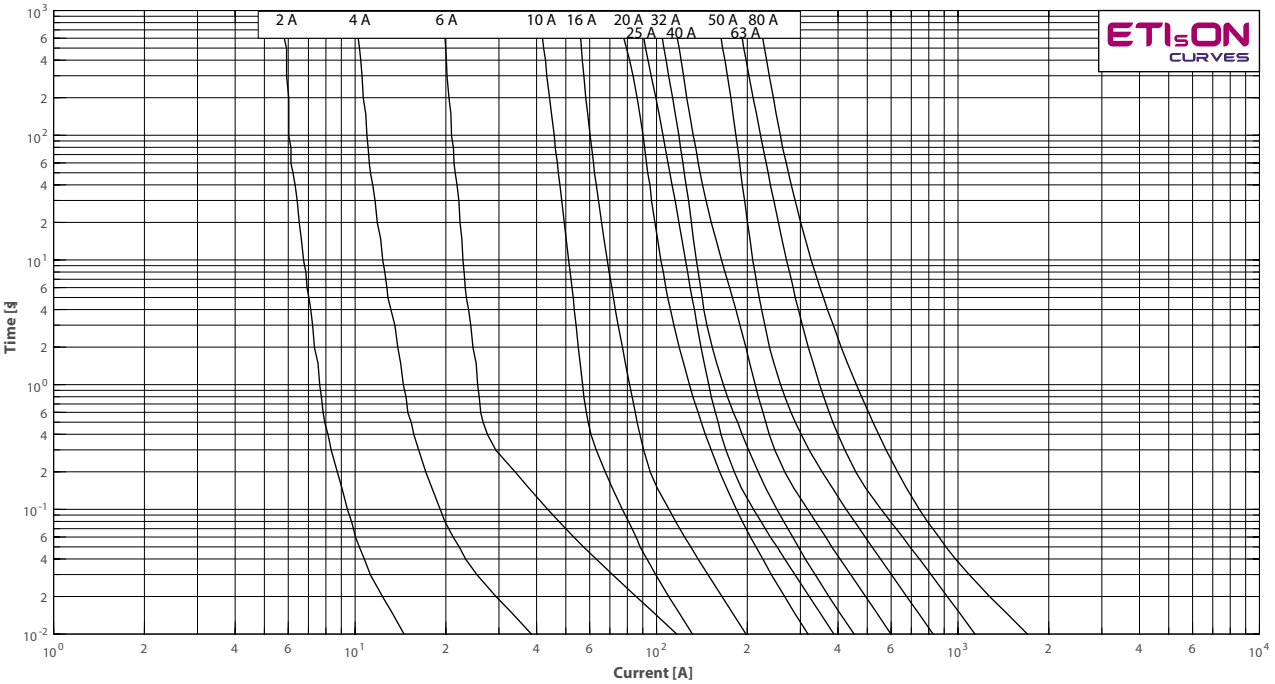
Time-current characteristics for VV-thermo fuse links
17,5 kV

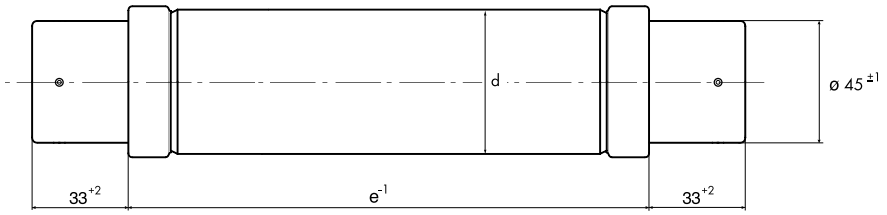


Time-current characteristics for VV-thermo fuse links
24 kV



Time-current characteristics for VV-thermo fuse links
36 kV



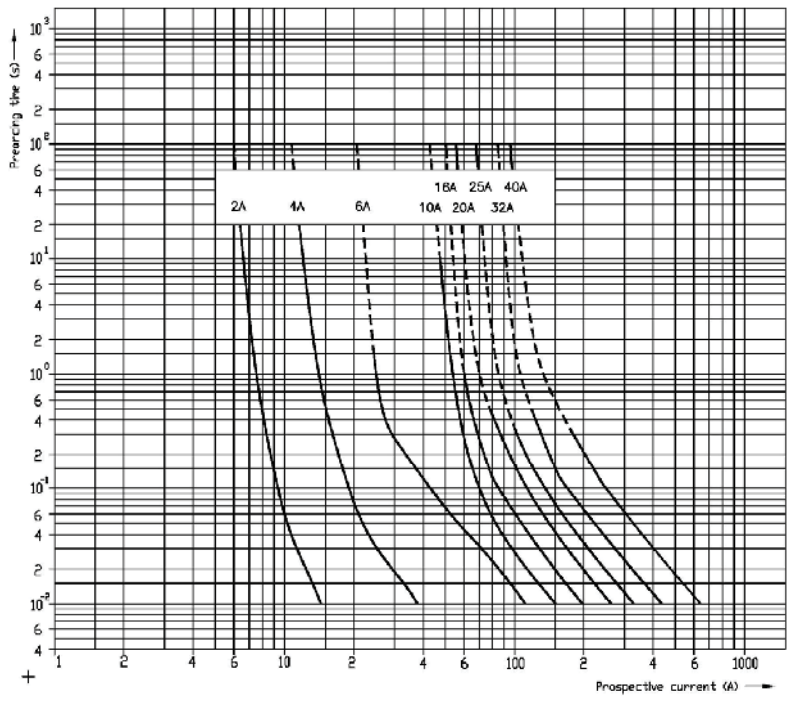


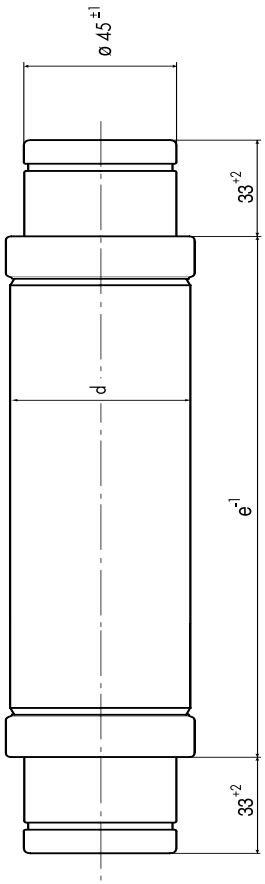
High voltage fuse-links for liquid-immersed transformer protection

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value [A^2s]	total I^2t value [A^2s]
6/12	292	2A	VVT-D	50	12	980	6	6,1	57
		4A			20	650	15	17,3	164
		6A			25	435	21	36	340
		10A			46	87	8	161	1530
		16A			60	60,5	19	250	2270
		20A			80	47	22	430	3750
		25A			105	37	34	650	5500
		32A			130	27	43	1220	10100
		40A			178	21	54	2270	18100
10/24	292	2A	VVT-D	50	12	2040	12	6,1	57
		4A			20	1300	35	17,3	164
		6A			25	900	56	36	340
		10A			46	160	19	161	1530
		16A			60	106	35	250	2270
	442	2A	VVT-D	50	12	2040	12	6,1	57
		4A			20	1300	35	17,3	164
		6A			25	900	56	36	340
		10A			46	160	19	161	1530
		16A			60	106	35	250	2270
		20A			80	85	44	430	3750
		25A			105	67	58	650	5500
		32A			130	48	71	1220	10100
		40A			178	37,5	95	2270	18100

Time-current characteristics

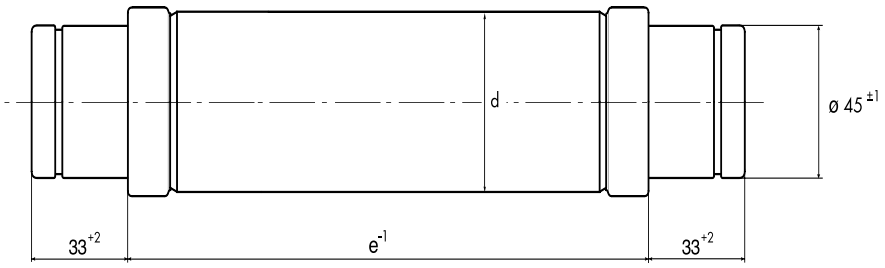




High voltage fuses for protection of voltage transformers

Technical data

rated voltage [kV]	Dimension "e" according to DIN and IEC (mm)	rated current I_n [A]	Striker type	Rated breaking capacity (kA)	Rated minimum breaking current (A)	cold resistance [mΩ]	power dissipation [W]	pre-arcing I^2t value [A^2s]	total I^2t value [A^2s]
10/24	235	2A	/	20	12	2040	14	6,1	57
		4A			20	1300	38	17,3	164



Selection of fuses for transformer protection

For HV fuse-link rated current selection, following transformer technical features has to be known:

- Rated power P_n (kVA)
- Short-circuit voltage U_{cc} (%)
- Rated current I_{nt}
- Inrush current usually between 8-12xI_{nt}
- Short-circuit current I_{cc}
- Overload current usually 1.4 I_{nt}
- Maximum short-circuit duration. Standard 2 sec for transformers up to 630 kVA and 3 sec for higher rated powers

Following HV fuse-link technical features has to be known:

- Rated voltage U_n (kV)
- Rated current I_n (A)
- I/t Characteristics According to the curves
- Melting current (0.1sec) $I_{f\ (0.1sec)}$
- Melting current at 2s ec or 3sec melting time
- Minimum breaking current I_3 (A)
- Breaking capacity I_1 (kA)

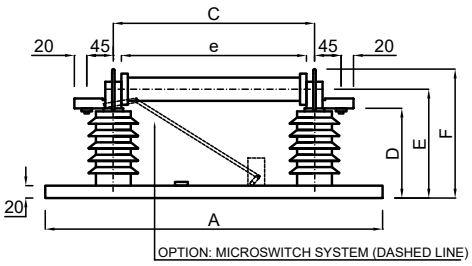
General about transformer protection:

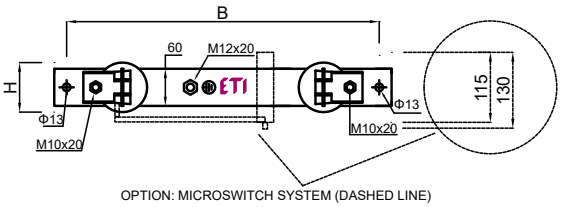
- Fuse-link rated voltage U_n must be higher then network voltage.
- Maximum fuse-link breaking current I_1 must be higher then short circuit-current I_{cc}.
- Inrush current should not melt the fuse-link. Melting current at 100 msec must be higher than 12 times transformer rated current
- Fuse-link has to operate before the expected short-circuit current damage the transformer $I_{cc} > I_f$ (2 sec) or $I_{cc} > I_f$ (3 sec)
- Fuse-link must be able to withstand possible short duration overloads. I_n FUSE > 1.4 I_n TRAFO

Transformer rated capacity	6/7,2 kV				10/12 kV				15/17.5kV				20/24 kV				30/36 kV			
	Transformer rated primary current Ip(A) at	HV Fuse-link rated current	LV Fuse-Link NH gG	LV Fuse-Link NH gTr	Transformer rated primary current Ip(A) at	HV Fuse-link rated current	LV Fuse-Link gG	LV Fuse-Link gTr	Transformer rated primary current Ip(A) at	HV Fuse-link rated current	LV Fuse-Link gG	LV Fuse-Link gTr	Transformer rated primary current Ip(A) at	HV Fuse-link rated current I_F	LV Fuse-Link gG	LV Fuse-Link gTr	Transformer rated primary current Ip(A) at	HV Fuse-link rated current I_F	LV Fuse-Link gG	LV Fuse-Link gTr
Pt (kVA)		I_{HV}				I_{HV}				I_{HVmin}				I_{HVmin}				I_{HVmin}		
	6kV	(A)	(A)	(A)	10kV	(A)	(A)	(A)	15kV	(A)	(A)	(A)	20kV	(A)	(A)	(A)	30kV	(A)	(A)	(A)
50	4,8	**10**	**50**	**72**	2,9	**6**	**50**	**72**	1,9	**6**	**50**	**72**	1,4	**4**	**50**	**72**	1.0	**4**	**50**	**72**
75	7,2	**16**	**80**	**108**	4,3	**10**	**80**	**108**	2,9	**6**	**80**	**108**	2,2	**6**	**80**	**108**	1,4	**4**	**80**	**108**
100	9,6	**20**	**100**	**144**	5,8	**10**	**100**	**144**	3,8	**10**	**100**	**144**	2,9	**6**	**100**	**144**	1,9	**6**	**100**	**144**
125	12,0	**20**	**125**	**180**	7,2	**16**	**125**	**180**	4,8	**10**	**125**	**180**	3,6	**10**	**125**	**180**	2,4	**6**	**125**	**180**
160	15,3	**25**	**160**	**231**	9,2	**20**	**160**	**231**	6,2	**16**	**160**	**231**	4,6	**10**	**160**	**231**	3,1	**6**	**160**	**231**
200	19,2	**32**	**200**	**289**	11,5	**20**	**200**	**289**	7,7	**16**	**200**	**289**	5,8	**10**	**200**	**289**	3,8	**10**	**200**	**289**
250	24,0	**40**	**250**	**361**	14,4	**25**	**250**	**361**	9,6	**20**	**250**	**361**	7,2	**16**	**250**	**361**	4,8	**10**	**250**	**361**
315	30,3	**50**	**315**	**455**	18,2	**32**	**315**	**455**	12,1	**20**	**315**	**455**	9,1	**16**	**315**	**455**	6,0	**16**	**315**	**455**
400	38,5	**63**	**400**	**577**	23,1	**40**	**400**	**577**	15,4	**25**	**400**	**577**	11,5	**20**	**400**	**577**	7,7	**16**	**400**	**577**
500	48,1	**80**	**500**	**722**	28,8	**50**	**500**	**722**	19,2	**32**	**500**	**722**	14,4	**20**	**500**	**722**	9,6	**20**	**500**	**722**
630	60,6	**100**	**630**	**909**	36,4	**63**	**630**	**909**	24,2	**40**	**630**	**909**	18,2	**25**	**630**	**909**	12,1	**20**	**630**	**909**
800	77,0	**100**	**800**	**1.155**	46,2	**80**	**800**	**1.155**	30,8	**50**	**800**	**1.155**	23,1	**40**	**800**	**1.155**	15,4	**25**	**800**	**1.155**
1000	96,2	**125**	**1.000**	**1.443**	57,7	**80**	**1.000**	**1.443**	38,5	**63**	**1.000**	**1.443**	28,9	**50**	**1.000**	**1.443**	19,2	**32**	**1.000**	**1.443**
1250	120,0	**160**	**1250**	**	72,2	**100**	**1250**	**	48,1	**80**	**1250**	**	36,1	**63**	**1250**	**	24,0	**40**	**1250**	**
1600	154,0	**200***	**1600**	**	92,4	**125**	**1600**	**	61,6	**100**	**1600**	**	46,2	**63**	**1600**	**	30,8	**50**	**1600**	**
2000	192,5	**250***	**	**	115,5	**160**	**	**	77,0	**100**	**	**	57,7	**80**	**	**	38,5	**63**	**	**

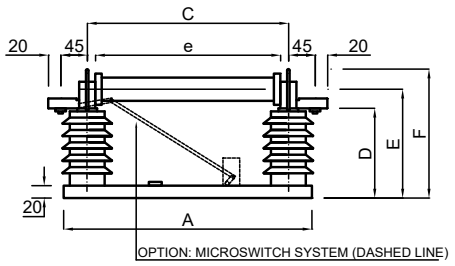
1-pole fuse-base	microswitch	Un [kV]	A [mm]	B [mm]	C [mm]	K[mm]	D [mm]	E [mm]	F [mm]	H [mm]	"e" Fuse length	Version
INDOOR MOUNTING	×	7,2	445	405	225		150	202	259	83	192	1
	✓	7,2	445	405	225		147	190	220	80	192	1
	×	12	456	424	322		150	202	259	83	292	2
	✓	12	456	424	322		147	190	220	60	292	2
	×	17,5	480	280	397	528	245	297	354	80	367	2
	✓	17,5	480	280	397	528	197	240	270	80	367	2
	×	24	555	355	475	606	245	297	354	80	442	2
	✓	24	555	355	475	606	227	270	300	60	442	2
	×	36	670	350	570	701	330	382	439	80	537	2
	✓	36	670	350	570	701	327	370	400	80	537	2
OUTDOOR MOUNTING	×	7,2	445	405	225		306	358	415	127	192	1
	×	12	456	424	322		306	358	415	127	292	2
	×	17,5	480	280	397	528	306	358	415	127	367	2
	×	24	555	355	475	606	306	358	415	127	442	2
	×	36	670	350	570	701	509	561	618	120	537	2

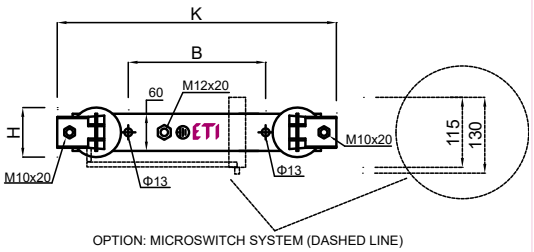
VARIANT 1





VARIANT 2





Definitions and terms

Back-up fuse-links
According to standard IEC 60282-1 Fifth edition (2002-01), item 3.3.3, Back-up fuse is current-limiting fuse capable of breaking, under specified conditions of use and behaviour, all currents from the rated maximum breaking current (I_1) down to the rated minimum breaking current (I_3).
Back-up fuse links should not operate below theirs minimum breaking current. If the short-circuit current of the transformer is lower than the minimum breaking current, additional protection must be provided.

Rated voltage range voltages
ETI VV Thermo fuse-links must be operated at the rated voltage. At lower operating voltages without limitation provided, please contact ETI team.

Breaking capacity I_1
This value (sometimes named "rated maximum breaking current" of current indicates, that this is the maximum current which can be interrupted by the fuse-link. I_1 should be greater than the maximum expected short circuit current at the fuse-link site.

Minimum breaking current I_3
This value (sometimes named "rated minimum breaking current" is specified for Back-up fuse-links. Up from this current, fuse-link is capable to breaking fault current.

Power dissipation of a fuse-link P_n
The power dissipation of a VV Thermo fuse-link is specified at the rated current of the fuse-link. For calculations of protection with VV Thermo fuse-link, it should be noted, that operating current is normally below half of the rated current.

Time-current characteristics
I/t characteristics represents the correlation between current and time up to the melting of a silver fuse element. For coordination with other protection devices, melting integral must be referred for melting times below 100ms.

Current limitation
This is most significant advantage of fuse-links compared to mechanical switches. Contacts of that switches need much longer time as fuse-link to interrupt fault currents. VV fuse-link interrupt fault current within few milliseconds and sinusoidal current does not reach its peak value.

Switching voltages
Between current-limiting process, short circuit current must be limited and reduced as soon as possible. This require a switching voltage that exceed the normal system voltage and force the current to zero.
Permissible value of switching voltage is 2.2 times peak value of the maximum rated voltage.

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