DC Miniature Circuit Breakers Ex9BP

- **DC Miniature Circuit Breakers**
- **Non-polarized, suitable for photovoltaic applications**
- **Tested according to IEC / EN 60947-2**
- **Rated short circuit breaking capacity I_{cu} 10 kA**
- **Rated operating voltage U_e of 150 V DC per pole**
- **Width 1 up to 4 modules**
- **Tripping characteristics C, K**
- **Rated current up to 63A**
- **Wide range of accessories**

DC miniature circuit breakers Ex9BP are designed for direct current applications. Thanks to their polarity independency are suitable for photovoltaic aplications.

It can be combined with wide range of accessories including auxiliary and signal contacts, shunt trip release and undervoltage release. It is possible to create diversed combination of accessories. These combinations are only limited by total number, not by the type of accessories - all components fit together. It can be used up to three units of auxiliary or alarm contacts plus up to two units for release units.

Type Key

Ex9	BP	3P	DC450V	C	16
Product family	Product	Poles	Rated voltage	Tripping curve	Rated current
Ex9	Non-polarized DC MCBs	1, 2, 3, 4	DC150V DC300V DC450V DC600V	C, K	1 — 63 A

Certification marks

CE

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Accessories

Aux. or signal contacts
AX, AL, AXL
Up to 3 units

Voltage or trip releases
SHT, UVT
Up to 2 units

Miniature Circuit Breaker
Ex9BP
1, 2, 3, 4-module width

Auxiliary contacts AX31	see Installation devices catalogue
Alarm contact AL3	see Installation devices catalogue
Auxiliary and alarm contact AXL31	see Installation devices catalogue
Shunt trip releases SHT31	see Installation devices catalogue
Undervoltage releases UVT31	see Installation devices catalogue

All accessories are mounted to the MCBs Ex9BP from the left. The undervoltage release UVT in PV system is intended e.g. for safe remote disconnection of DC part from installation.

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K-Characteristic, 1-pole, 150 V DC

Rated current	Width	Char.	Article No.	Type	Packing
1A	1 MU	K	110015	Ex9BP 1P DC150V K1	1/12/144
2A	1 MU	K	110016	Ex9BP 1P DC150V K2	1/12/144
3A	1 MU	K	110017	Ex9BP 1P DC150V K3	1/12/144
4A	1 MU	K	110018	Ex9BP 1P DC150V K4	1/12/144
6A	1 MU	K	110019	Ex9BP 1P DC150V K6	1/12/144
10 A	1 MU	K	110020	Ex9BP 1P DC150V K10	1/12/144
16 A	1 MU	K	110021	Ex9BP 1P DC150V K16	1/12/144
20 A	1 MU	K	110022	Ex9BP 1P DC150V K20	1/12/144
25 A	1 MU	K	110023	Ex9BP 1P DC150V K25	1/12/144
32 A	1 MU	K	110024	Ex9BP 1P DC150V K32	1/12/144
40 A	1 MU	K	110025	Ex9BP 1P DC150V K40	1/12/144
50 A	1 MU	K	110026	Ex9BP 1P DC150V K50	1/12/144
63 A	1 MU	K	110027	Ex9BP 1P DC150V K63	1/12/144

K-Characteristic, 2-pole, 300 V DC

Rated current	Width	Char.	Article No.	Type	Packing
1A	2 MU	K	110028	Ex9BP 2P DC300V K1	1/6/72
2A	2 MU	K	110029	Ex9BP 2P DC300V K2	1/6/72
3A	2 MU	K	110030	Ex9BP 2P DC300V K3	1/6/72
4A	2 MU	K	110031	Ex9BP 2P DC300V K4	1/6/72
6A	2 MU	K	110032	Ex9BP 2P DC300V K6	1/6/72
10 A	2 MU	K	110033	Ex9BP 2P DC300V K10	1/6/72
16 A	2 MU	K	110034	Ex9BP 2P DC300V K16	1/6/72
20 A	2 MU	K	110035	Ex9BP 2P DC300V K20	1/6/72
25 A	2 MU	K	110036	Ex9BP 2P DC300V K25	1/6/72
32 A	2 MU	K	110037	Ex9BP 2P DC300V K32	1/6/72
40 A	2 MU	K	110038	Ex9BP 2P DC300V K40	1/6/72
50 A	2 MU	K	110039	Ex9BP 2P DC300V K50	1/6/72
63 A	2 MU	K	110040	Ex9BP 2P DC300V K63	1/6/72

K-Characteristic, 3-module, 450 V DC

Rated current	Width	Char.	Article No.	Type	Packing
1A	3 MU	K	110041	Ex9BP 3P DC450V K1	1/4/48
2A	3 MU	K	110042	Ex9BP 3P DC450V K2	1/4/48
3A	3 MU	K	110043	Ex9BP 3P DC450V K3	1/4/48
4A	3 MU	K	110044	Ex9BP 3P DC450V K4	1/4/48
6A	3 MU	K	110045	Ex9BP 3P DC450V K6	1/4/48
10 A	3 MU	K	110046	Ex9BP 3P DC450V K10	1/4/48
16 A	3 MU	K	110047	Ex9BP 3P DC450V K16	1/4/48
20 A	3 MU	K	110048	Ex9BP 3P DC450V K20	1/4/48
25 A	3 MU	K	110049	Ex9BP 3P DC450V K25	1/4/48
32 A	3 MU	K	110050	Ex9BP 3P DC450V K32	1/4/48
40 A	3 MU	K	110051	Ex9BP 3P DC450V K40	1/4/48
50 A	3 MU	K	110052	Ex9BP 3P DC450V K50	1/4/48
63 A	3 MU	K	110053	Ex9BP 3P DC450V K63	1/4/48

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DC Miniature Circuit Breakers up to 63 A

General parameters

Non-polarized, suitable for general DC as well as Photovoltaic applications		
Accessories		
Auxiliary contacts	AX3111, AX3122	100540, 100542
Alarm contact	AL3111	100541
Auxiliary and alarm contact	AXL31	100543
Shunt trip releases	SHT31, SHT3111	100544-100546, 100547-100549
Undervoltage releases	UVT31, UVT3101, UVT3110	100550-100551, 100552-100553, 100554-100555
Max. number of installed accessories is 3 pcs of one contact units (AX3111, AL3111) or 2 pcs of two contact units (AX3122, AXL31) and 2 pcs of releases (SHT31, UVT31)		

Electrical parameters

Tested according to	IEC / EN 60947-2
Rated operating voltage U_e	150 (1P), 300 (2P), 450 (3P), 600 (4P) V DC
Rated breaking capacity I_{cu}	10 kA
Rated current I_n	1 — 63 A
Tripping characteristics	C, K
Rated impulse withstand voltage U_{imp}	4 kV
Rated insulation voltage U_i	1 000 V DC
Mechanical service life	20 000 operation cycles
Electrical service life	2 500 operation cycles
Line voltage connection	arbitrary above or below

Mechanical parameters

Device width	18 mm (per pole/module)
Device height	83 mm (89 mm including rail clip)
Frame size	45 mm
Mounting	easy fastening onto 35 mm device rail (DIN)
Degree of protection	IP40, IP20 terminals
Terminals	combined lift + open mouthed
Terminal capacity	1 — 35 mm^2
Fastening torque of terminals	3.5 Nm
Busbar thiskness	0.8 — 2 mm
Ambient temperature	-35 — +70 °C
Altitude	≤ 2 000 m
Relative humidity	≤ 95 % at 20ºC, ≤ 50 % at 40ºC
Resistance to humidity and heat	class 2
Pollution degree	3
Installation class	III
Weight	0.12 kg (per pole/module)

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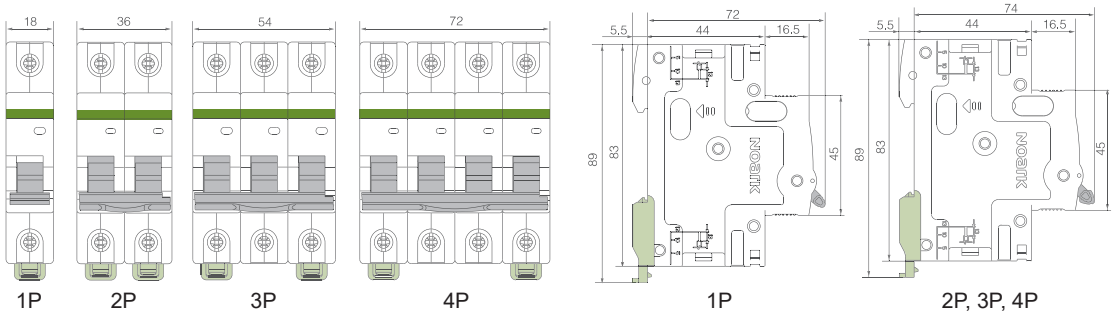
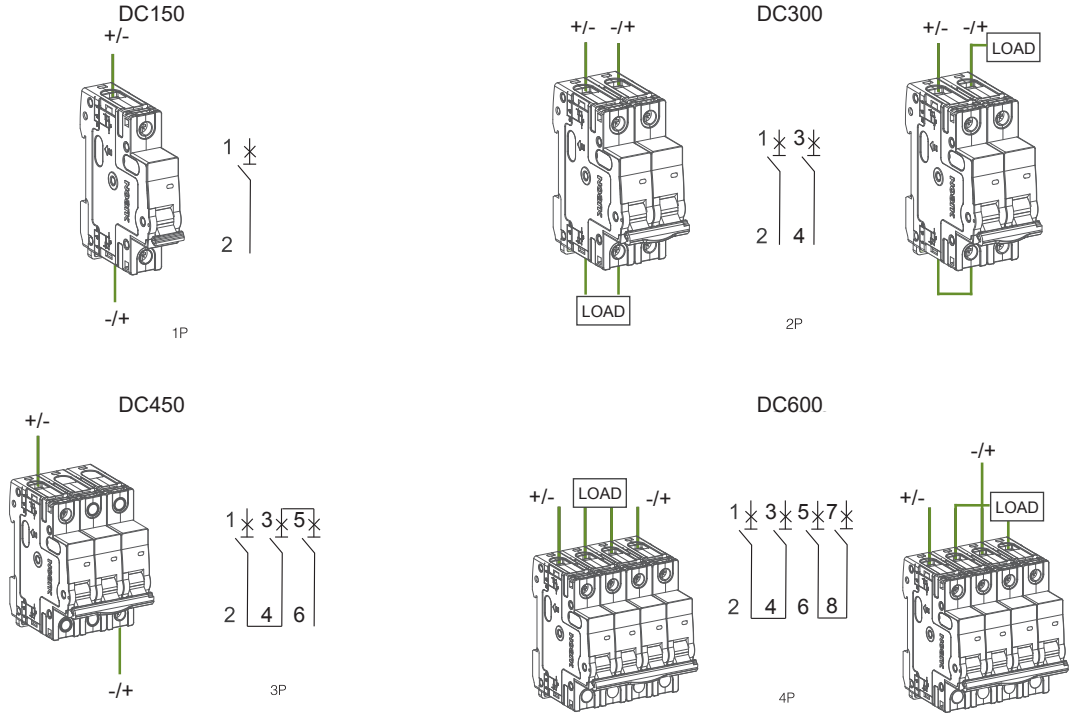
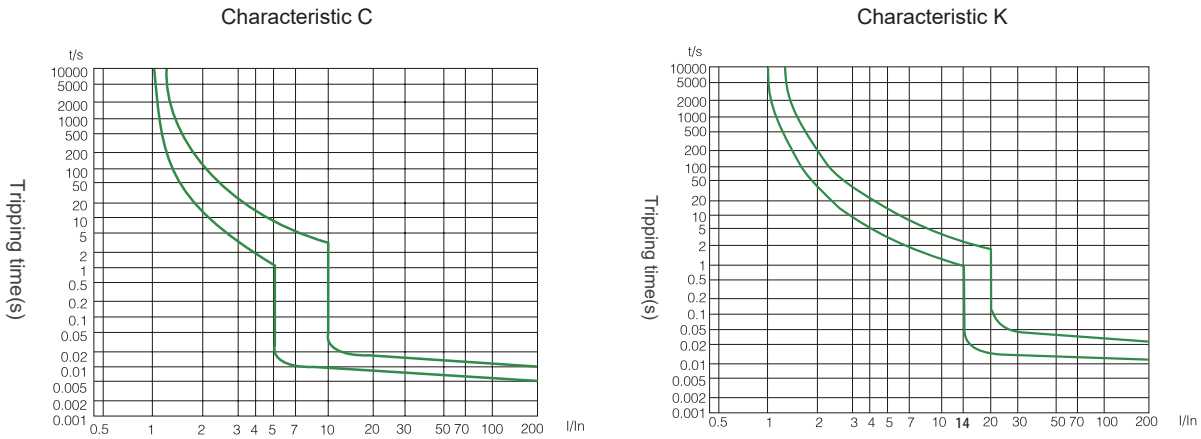
Dimensions



Wiring diagrams



Tripping characteristics



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DC Miniature Circuit Breakers up to 63 A

Dependence of tripping characteristics on ambient temperature

T [°C]	I_n (T) [A]												
	1A	2A	3A	4A	6A	10 A	16 A	20 A	25 A	32 A	40 A	50 A	63 A
-20	1.2	2.4	3.6	4.8	7.3	13.5	20.0	24.5	29.8	39.5	50.5	60.0	77.5
-15	1.2	2.4	3.5	4.8	7.2	13.3	19.8	24.3	29.7	39.3	50.4	59.8	76.3
-10	1.2	2.3	3.5	4.7	7.1	13.0	19.5	24.0	29.5	39.0	50.2	59.5	75.0
-5	1.2	2.3	3.4	4.7	7	12.7	19.2	23.8	29.3	38.8	50.0	59.2	73.0
0	1.1	2.2	3.4	4.5	6.8	12.5	19.1	23.7	29.2	38.6	48.8	59.0	71.8
5	1.1	2.2	3.3	4.4	6.6	12.3	18.8	23.5	29.0	38.4	48.6	58.8	70.6
10	1.1	2.1	3.3	4.3	6.5	12.1	18.6	23.3	28.8	38.2	48.4	56.5	69.0
15	1.1	2.1	3.2	4.3	6.4	12.0	18.5	23.1	28.6	38.0	48.1	55.0	67.5
20	1	2.1	3.2	4.2	6.3	11.8	18.3	22.8	28.4	37.8	47.8	54.5	66.2
25	1	2	3	4.1	6.2	11.5	18.0	22.6	28.2	37.5	47.0	52.5	64.5
30	1	2	3	4	6	10	16	20	25	32	40	50	63
35	0.99	2	3	3.9	5.9	9.9	15.7	19.7	24.6	31.5	39.2	48.8	61.5
40	0.97	1.9	2.9	3.9	5.8	9.8	15.4	19.3	24.3	31.1	38.8	47.0	58.7
45	0.95	1.9	2.8	3.8	5.7	9.8	15.1	18.8	24.0	30.8	38.3	45.5	55.8
50	0.93	1.9	2.8	3.7	5.6	9.6	14.9	18.5	23.8	30.1	38.0	44.0	53.5
55	0.91	1.8	2.8	3.6	5.5	9.5	14.7	18.2	23.5	29.5	36.5	42.5	51.7
60	0.91	1.8	2.7	3.5	5.4	9.0	14.5	17.8	23.0	28.5	35.0	41.5	49.2
65	0.91	1.8	2.7	3.5	5.3	8.6	14.0	17.5	22.0	27.5	34.0	40.5	47.9
70	0.91	1.8	2.7	3.5	5.3	8.0	13.8	17.3	21.5	27.0	32.5	38.0	46.8

Power loss per pole

I_n [A]	1 A	2 A	3 A	4 A	6 A	10 A	16 A	20 A	25 A	32 A	40 A	50 A	63 A
P [W]	1.5	2.0	1.8	2.0	2.2	1.5	1.8	2.0	2.2	2.6	2.9	3.8	4.4

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