



Technical catalogue

Line Protection Devices

Miniature circuit-breakers (MCB)


- SH200

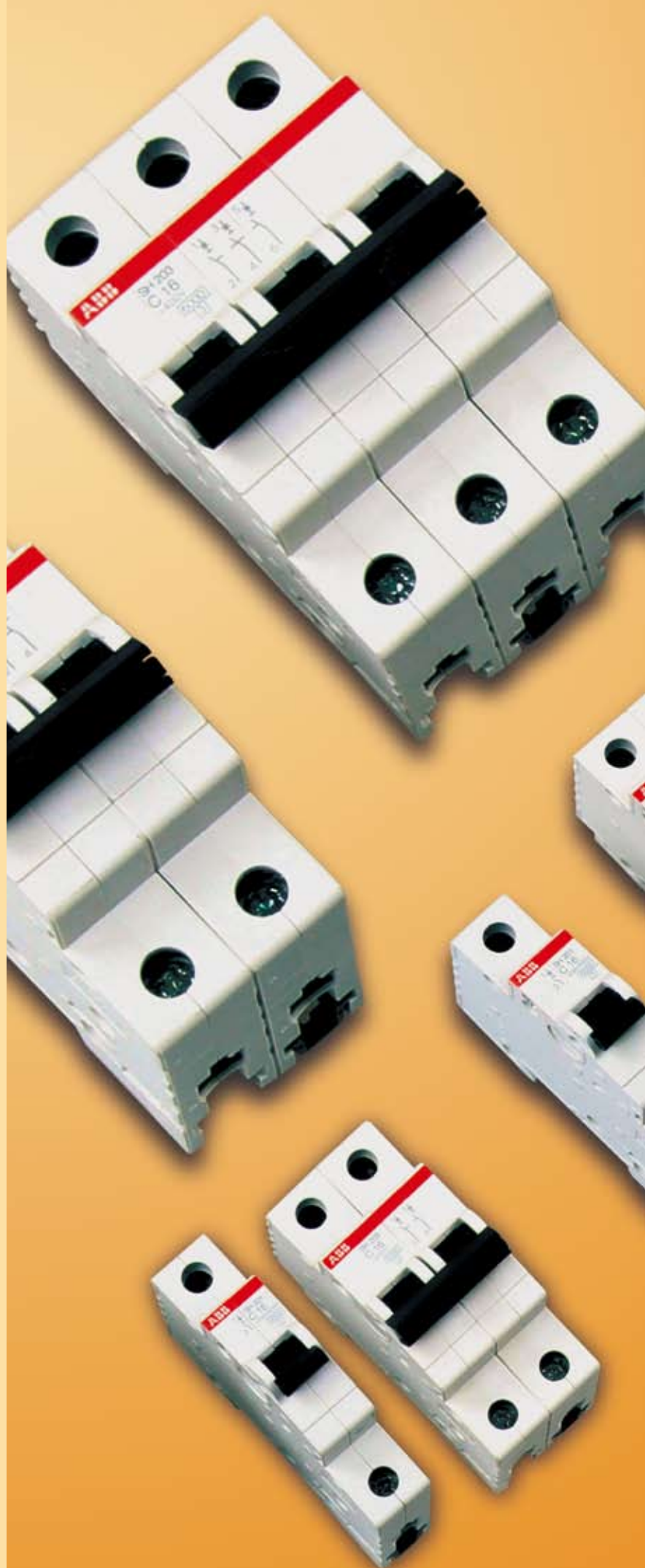


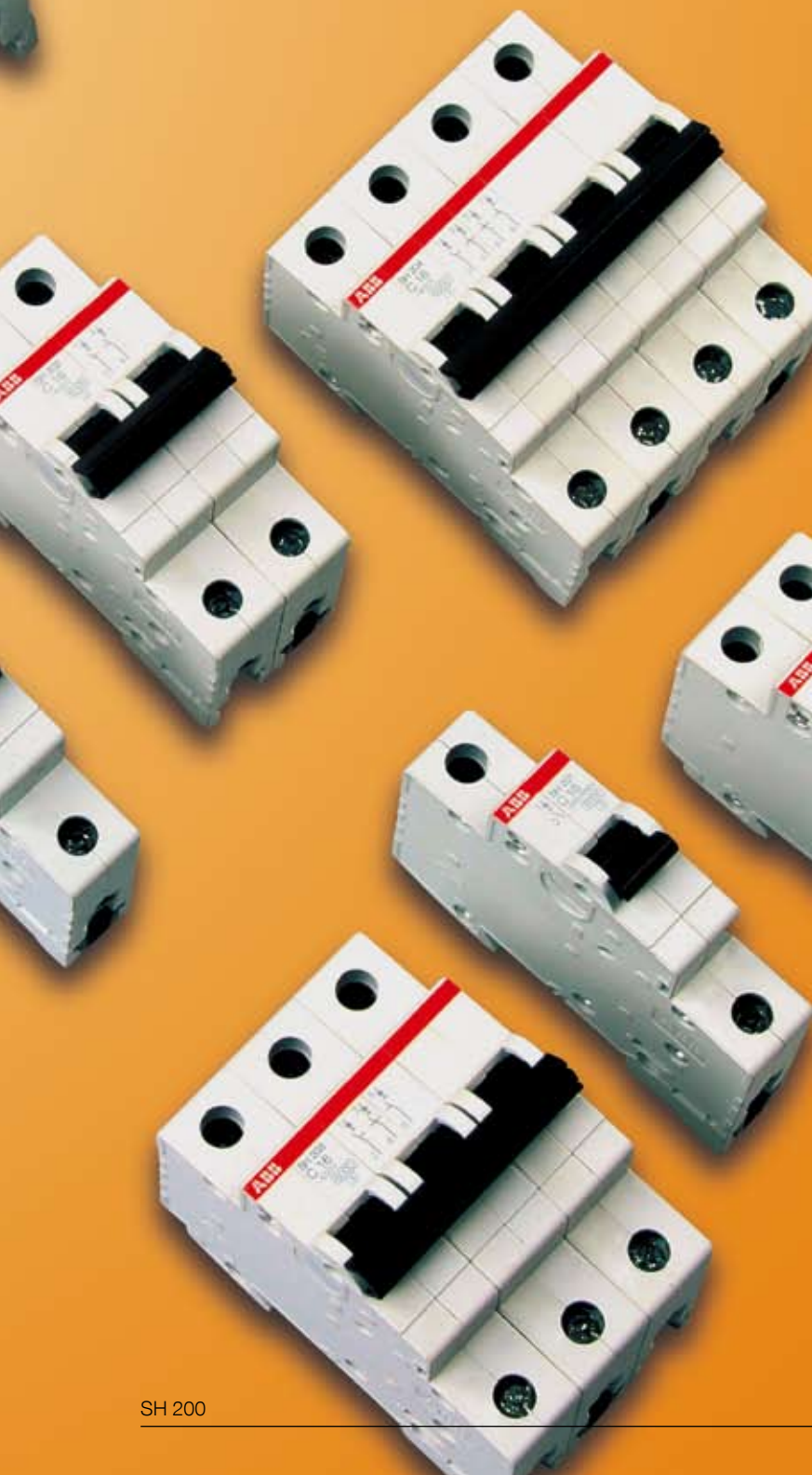
The ABB Line Protection Devices quality system is conforming with the ISO 9001 International Standard (model for quality assurance as regards design, development, construction, installation and service) and to the equivalent EN ISO 9001 European Standard.

ABB commitment to protecting the environment is also shown in concrete way by the Life Cycle Assessments of the products, which is being realized directly by ABB Research and Development.

All the products of Compact Home range are conforming to the European standards 2002/95/CE regarding the restrictions on the use of certain dangerous substances in the electrical and electronical equipments. It is necessary to respect the local regulations concerning the elimination of the packaging materials and of the circuit-breakers and, if possible, to recycle them.

The symbol  marked on the product means that the circuit breaker must not be eliminated together with the general litter.





All Compact Home devices comply to European and international product standards :

- IEC/EN 60898 (MCBs)

They are also conforming to the following EC directives :

- Electromagnetic Compatibility Directive IEC61543

CE marking of Compact Home devices warrants free circulation and sale in European Union. It is realized on supplier's responsibility, in addition to this marks and approvals, guarantee functioning, compatibility and safety conforming to national and International Standards.



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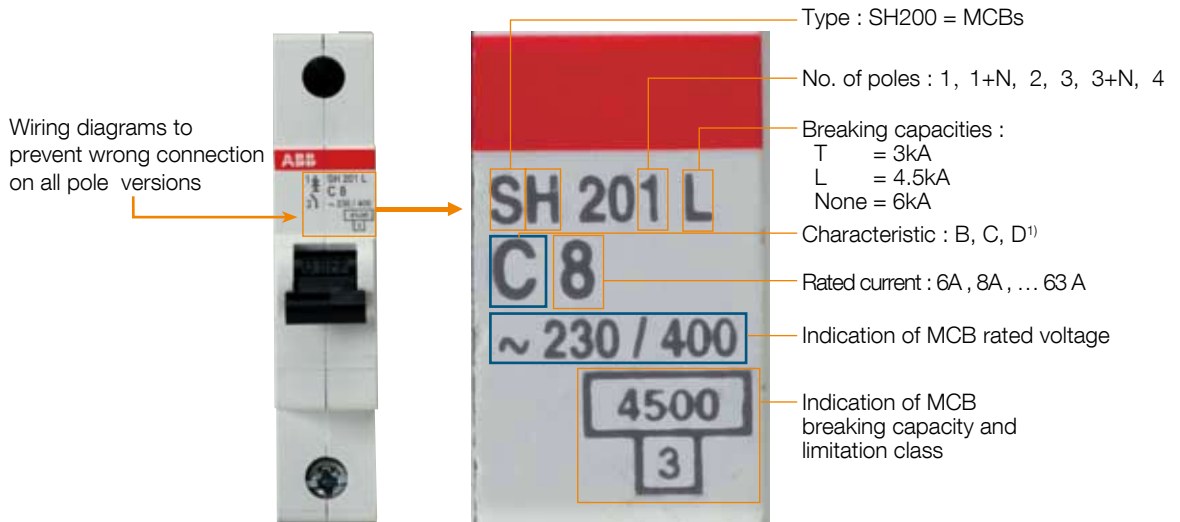
Introduction

- The MCB's Compact Home are equipped with 25 mm² cage terminals, a well proven and reliable technology.
- The terminals accept not only single wires, but as well several conductors of the same size e.g. 6 x 1.5 mm² or even conductors with different cross sections e.g. 1 x 6 mm² and 1 x 2.5mm².
- The cross wiring can easily be done by inserting the Compact Home busbars and then the incoming wires into one of the MCB's terminals.
- The terminals accept Compact Home busbars and conductors up to 16 mm² together.
- Compatibility with pro M compact is given in all kind of variations like.
- Insertion of 1 pro M compact MCB into an Installation with Compact Home components and Compact Home busbars.
- Also the combination of 1 Compact Home MCB with pro M compact components and pro M compact busbars is not a problem.



MCB - SH200

Introduction

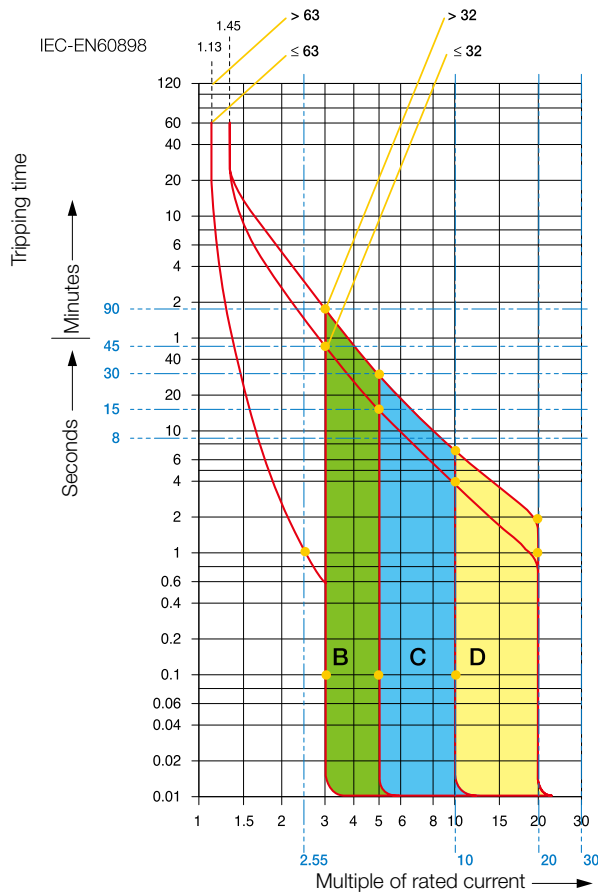


1) Characteristic D is only for SH200



for more information about this products, see the technical catalogue

Tripping diagrams



Tripping characteristic B, C, D
acc. to DIN VDE 0641 part 11
SH200 : $I_n = 6 \dots 63$ A
SH200 T / SH200 L : $I_n = 6 \dots 40$ A

MCB - SH200

Technical Data

				SH200 T	SH200 L	SH200
Electrical features						
Standards				IEC/EN 60898, GB10963.1		
Rated current I_n		A	6 - 40		6 - 63	
Poles				1, 2, 3, 4, 1+NA, 3+NA		
Rated Voltage U_e		IEC 1P, 1P+N	V	230		
		IEC 2P, 3P, 3P+N, 4P	V	230/400		
Insulation voltage U_i			V	250		
Max. operating voltage U_b max.		IEC AC	V	254/440		
Min. operating voltage U_b min.			V	12 V AC - 12 V DC		
Rated frequency			Hz	50...60		
Rated breaking capacity ultimate I_{cn}		IEC/EN 60898	A	3000	4500	6000
Rated impulse withstand voltage (1.2 / 50) U_{imp}			kV	4 (test voltage 6.2 at sea level, 5 at 2000 m)		
Dielectric strength at power freq. for 1 min.			kV	2.5		
Overvoltage category				III		
Pollution degree				2		
Thermomagnetic release characteristic		B: $3 I_n \leq I_m \leq 5 I_n$ C: $5 I_n \leq I_m \leq 10 I_n$ D: $10 I_n \leq I_m \leq 20 I_n$		• •	• • •	
Mechanical features						
Toggle				black sealable in ON-OFF position		
Electrical life				10000		
Mechanical life / operations				20000		
Protections degree / operations		housing		IP4X		
		terminals		IP2X		
Mechanical shock resistance				30 g - 2 shocks - duration 11 ms		
Resistance to vibrations acc. to IEC/EN 60060-2--6				5g - 20 cycles at frequency 5...150...5 Hz with 0.8 x I_n		
Tropicalization (acc. to IEC/EN 60068-2) humid heat			°C/RH	28 cycles with 55/95...100		
constant climatic conditions			°C/RH	23/28 - 40/93 - 55/20		
variable climatic conditions			°C/RH	25/95 - 40/95		
Reference temperature for setting of thermal element			°C	30		
Ambient temperature (with daily averages $\leq +35^\circ\text{C}$)		IEC	°C	-25...+55		
Storage temperature			°C	-40...+70		
Installation						
Terminal type				cage terminal		
Terminal size top / bottom for cable		IEC	mm ²	25/25		
Tightening torque		IEC	N*m	2.5		
Tool				Nr. 2 Pozidriv		
Mounting				on DIN rail EN 60715 (35 mm) by means of fast clip device		
Mounting position				optional		
Connection				from top and bottom		
Dimensions and weight						
Pole dimensions (H x D x W)			mm	85 x 68 x 17.5		
Pole weight			g	125		

MCB - SH200

Application

Internal resistances and power losses of the Miniature Circuit-Breakers

Rated current A	SH 200 T (B, C)		SH 200 L (B, C)		SH 200 (B, C, D)	
	Internal resistances (mΩ)	Power losses (W)	Internal resistances (mΩ)	Power losses (W)	Internal resistances (mΩ)	Power losses (W)
6	64	2.3	64	2.3	55	2.0
8	-	-	-	-	15	1.0
10	19	1.9	19	1.9	13.3	1.3
13	-	-	-	-	13.3	2.3
16	14	3.6	14	3.6	7.0	1.8
20	12	4.8	12	4.8	6.25	2.5
25	7.1	4.4	7.1	4.4	5.0	3.2
32	6.5	6.7	6.5	6.7	3.6	3.7
40	4.7	7.5	4.7	7.5	3.0	4.8
50	-	-	-	-	1.3	3.25
63	-	-	-	-	1.2	4.8

Tripping characteristics

Tripping characteristic	Thermal trips ①			Electromagnetic trips ②		
	Test currents		Tripping-time	Test currents		Tripping - time
	Low test current I_1	High test current I_2		hold current surges	trip at least	
B	$1.13 \cdot I_n$ -	- $1.45 \cdot I_n$	> 1 h < 1 h ③	$3 \cdot I_n$ -	- $5 \cdot I_n$	0.1 s ... 45 s ≤ 32 A / 0.1 s ... 90 s ≥ 32 A < 0.1 s
C	$1.13 \cdot I_n$ -	- $1.45 \cdot I_n$	> 1 h < 1 h ③	$5 \cdot I_n$ -	- $10 \cdot I_n$	0.1 s ... 45 s ≤ 32 A / 0.1 s ... 30 s ≥ 32 A < 0.1 s
D	$1.13 \cdot I_n$ -	- $1.45 \cdot I_n$	> 1 h < 1 h	$10 \cdot I_n$ -	- $20 \cdot I_n$	0.1 s ... 45 s ≤ 32 A / 0.1 s ... 30 s ≥ 32 A < 0.1 s

① Influence of ambient temperature see below.

② The tripping for the electromagnetic trip are valid for AC 50... 60 Hz.
For other frequencies see table below.

③ From warm operating condition (After $I_1 > 1$ h resp. 2 h)

Influence of frequency on electromagnetic trips

The stated tripping values of the electromagnetic trips are valid for a frequency of 50 ... 60 Hz. In case of frequencies deviating from 50 ... 60 Hz as well as direct current the tripping values are changed by the factor mentioned below.

	AC			DC
	100 Hz	200 Hz	400 Hz	
Factor approx.	1.1	1.2	1.5	1.5

The tripping values of the thermal trips are independent of the frequency

Influence of ambient temperature

The thermal trips are calibrated for an ambient temperature 30 °C for B-, C- and D-characteristic.

In the case of temperatures deviating from these values the tripping values

- are reduced in case of higher temperatures
- are increased in case of lower temperatures

The electronic tripping is not dependent on temperature

MCB - SH200

Application

Current-carrying capacity of the MCB's as a function of the ambient temperature

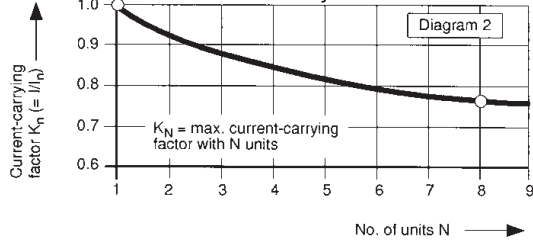
Max. operating current depending on the ambient temperature of a circuit-breaker in load circuit of characteristics type B, C and D

B, C and D	Ambient temperature T (°C)											
	-40	-30	-20	-10	0	10	20	30	40	50	60	70
In (A)												
6	8.0	7.7	7.5	7.2	6.9	6.6	6.3	6.0	5.7	5.3	4.9	4.5
8	10.7	10.3	10.0	9.6	9.2	8.8	8.4	8.0	7.5	7.1	6.5	6.0
10	13.3	12.9	12.5	12.0	11.5	11.1	10.5	10.0	9.4	8.8	8.2	7.5
13	17.3	16.8	16.2	15.6	15.0	14.4	13.7	13.0	12.3	11.5	10.6	9.7
16	21.3	20.7	20.0	19.2	18.5	17.7	16.9	16.0	15.1	14.1	13.1	11.9
20	26.7	25.8	24.9	24.0	23.1	22.1	21.1	20.0	18.9	17.6	16.3	14.9
25	33.3	32.3	31.2	30.0	28.9	27.6	26.4	25.0	23.6	22.0	20.4	18.6
32	42.7	41.3	39.9	38.5	37.0	35.4	33.7	32.0	30.2	28.2	26.1	23.9
40	53.3	51.6	49.9	48.1	46.2	44.2	42.2	40.0	37.7	35.3	32.7	29.8
50	66.7	64.5	62.4	60.1	57.7	55.3	52.7	50.0	47.1	44.1	40.8	37.3
63	84.0	81.3	78.6	75.7	72.7	69.6	66.4	63.0	59.4	55.6	51.4	47.0

Application

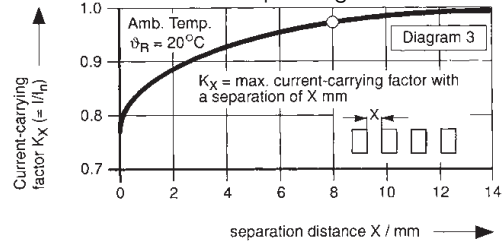
Mutual thermal influence in the case of simultaneous load

MCB's mounted in a row side by side



SK 0080 Z 93

MCB's mounted with a separating distance X



SK 0078 Z 93

Load data	from diagram	Calculation	Example
Rated current and characteristics of M.C.B.		$I_n / B, C, D$	16 A – B
Continuous load		ϑ_R	40 °C
Number of M.C.B.'s / Mounting distance		N / X	8 pieces / 0 and 8 mm
Load ≤ 1 h	1 a resp. 1 b	$I = I_n \cdot K_\vartheta$	$16 \cdot 1.07 = 17.1 \text{ A}$
Continuous load > 1 h		$I = 0.9 \cdot I_n \cdot K_\vartheta$	$0.9 \cdot 16 \cdot 1.07 = 15.4 \text{ A}$
Continuous load, N M.C.B.'s, Distance 0	2	$I = 0.9 \cdot K_\vartheta \cdot K_N$	$0.9 \cdot 16 \cdot 1.07 \cdot 0.77 = 11.9 \text{ A}$
Continuous load, N M.C.B.'s, Distance X	3	$I = 0.9 \cdot K_\vartheta \cdot K_X$	$0.9 \cdot 16 \cdot 1.07 \cdot 0.98 = 15.1 \text{ A}$

MCB - SH200 L

Selection Tables

Applications: buildings, both residential and commercial

B characteristic: protection and control of the circuits against overloads and short-circuits; protection for people and big-length cables in TN and IT systems.

Type No.	Rated Current I_n (A)	Breaking capacity I_{cn} (kA)	Order Code	Weight (kg/pc)	Packing (pc)
1P (U_{Bmax} : 440 V~ 60 V...)					
SH201 L-B6	6	4.5	2CDS 241 001 R0065	0.125	12
SH201 L-B10	10		2CDS 241 001 R0105		
SH201 L-B13	13		2CDS 241 001 R0135		
SH201 L-B16	16		2CDS 241 001 R0165		
SH201 L-B20	20		2CDS 241 001 R0205		
SH201 L-B25	25		2CDS 241 001 R0255		
SH201 L-B32	32		2CDS 241 001 R0325		
SH201 L-B40	40		2CDS 241 001 R0405		
1P + NA (U_{Bmax} : 440 V~ 60 V...)					
SH201 L-B6NA	6	4.5	2CDS 241 103 R0065	0.25	6
SH201 L-B10NA	10		2CDS 241 103 R0105		
SH201 L-B13NA	13		2CDS 241 103 R0135		
SH201 L-B16NA	16		2CDS 241 103 R0165		
SH201 L-B20NA	20		2CDS 241 103 R0205		
SH201 L-B25NA	25		2CDS 241 103 R0255		
SH201 L-B32NA	32		2CDS 241 103 R0325		
SH201 L-B40NA	40		2CDS 241 103 R0405		
2P (U_{Bmax} : 440 V~ 125 V... with 2 poles connected in series)					
SH202 L-B6	6	4.5	2CDS 242 001 R0065	0.25	6
SH202 L-B10	10		2CDS 242 001 R0105		
SH202 L-B13	13		2CDS 242 001 R0135		
SH202 L-B16	16		2CDS 242 001 R0165		
SH202 L-B20	20		2CDS 242 001 R0205		
SH202 L-B25	25		2CDS 242 001 R0255		
SH202 L-B32	32		2CDS 242 001 R0325		
SH202 L-B40	40		2CDS 242 001 R0405		
3P (U_{Bmax} : 440 V~)					
SH203 L-B6	6	4.5	2CDS 243 001 R0065	0.375	4
SH203 L-B10	10		2CDS 243 001 R0105		
SH203 L-B13	13		2CDS 243 001 R0135		
SH203 L-B16	16		2CDS 243 001 R0165		
SH203 L-B20	20		2CDS 243 001 R0205		
SH203 L-B25	25		2CDS 243 001 R0255		
SH203 L-B32	32		2CDS 243 001 R0325		
SH203 L-B40	40		2CDS 243 001 R0405		
3P + NA (U_{Bmax} : 440 V~)					
SH203 L-B6NA	6	4.5	2CDS 243 103 R0065	0.5	4
SH203 L-B10NA	10		2CDS 243 103 R0105		
SH203 L-B13NA	13		2CDS 243 103 R0135		
SH203 L-B16NA	16		2CDS 243 103 R0165		
SH203 L-B20NA	20		2CDS 243 103 R0205		
SH203 L-B25NA	25		2CDS 243 103 R0255		
SH203 L-B32NA	32		2CDS 243 103 R0325		
SH203 L-B40NA	40		2CDS 243 103 R0405		
4P (U_{Bmax} : 440 V~ 125 V... with 2 poles connected in series)					
SH204 L-B6	6	4.5	2CDS 244 001 R0065	0.5	3
SH204 L-B10	10		2CDS 244 001 R0105		
SH204 L-B13	13		2CDS 244 001 R0135		
SH204 L-B16	16		2CDS 244 001 R0165		
SH204 L-B20	20		2CDS 244 001 R0205		
SH204 L-B25	25		2CDS 244 001 R0255		
SH204 L-B32	32		2CDS 244 001 R0325		
SH204 L-B40	40		2CDS 244 001 R0405		

MCB - SH200 L

Selection Tables

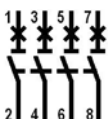
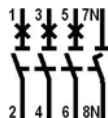
Applications: buildings, both residential and commercial

C characteristic: protection and control of the circuits against overloads and short-circuits; protection for resistive and inductive loads with low inrush current.

Type No.	Rated Current I_n (A)	Breaking capacity I_{cn} (kA)	Order Code	Weight (kg/pc)	Packing (pc)
1P ($U_{Bmax} : 440 V \sim 60 V_{AC}$)					
SH201 L-C6	6	4.5	2CDS 241 001 R0064	0.125	12
SH201 L-C8	8		2CDS 241 001 R0084		
SH201 L-C10	10		2CDS 241 001 R0104		
SH201 L-C13	13		2CDS 241 001 R0134		
SH201 L-C16	16		2CDS 241 001 R0164		
SH201 L-C20	20		2CDS 241 001 R0204		
SH201 L-C25	25		2CDS 241 001 R0254		
SH201 L-C32	32		2CDS 241 001 R0324		
SH201 L-C40	40		2CDS 241 001 R0404		
1P + NA ($U_{Bmax} : 440 V \sim 60 V_{AC}$)					
SH201 L-C6NA	6	4.5	2CDS 241 103 R0064	0.25	6
SH201 L-C8NA	8		2CDS 241 103 R0084		
SH201 L-C10NA	10		2CDS 241 103 R0104		
SH201 L-C13NA	13		2CDS 241 103 R0134		
SH201 L-C16NA	16		2CDS 241 103 R0164		
SH201 L-C20NA	20		2CDS 241 103 R0204		
SH201 L-C25NA	25		2CDS 241 103 R0254		
SH201 L-C32NA	32		2CDS 241 103 R0324		
SH201 L-C40NA	40		2CDS 241 103 R0404		
2P ($U_{Bmax} : 440 V \sim 125 V_{AC}$ with 2 poles connected in series)					
SH202 L-C6	6	4.5	2CDS 242 001 R0064	0.25	6
SH202 L-C8	8		2CDS 242 001 R0084		
SH202 L-C10	10		2CDS 242 001 R0104		
SH202 L-C13	13		2CDS 242 001 R0134		
SH202 L-C16	16		2CDS 242 001 R0164		
SH202 L-C20	20		2CDS 242 001 R0204		
SH202 L-C25	25		2CDS 242 001 R0254		
SH202 L-C32	32		2CDS 242 001 R0324		
SH202 L-C40	40		2CDS 242 001 R0404		
3P ($U_{Bmax} : 440 V \sim$)					
SH203 L-C6	6	4.5	2CDS 243 001 R0064	0.375	4
SH203 L-C8	8		2CDS 243 001 R0084		
SH203 L-C10	10		2CDS 243 001 R0104		
SH203 L-C13	13		2CDS 243 001 R0134		
SH203 L-C16	16		2CDS 243 001 R0164		
SH203 L-C20	20		2CDS 243 001 R0204		
SH203 L-C25	25		2CDS 243 001 R0254		
SH203 L-C32	32		2CDS 243 001 R0324		
SH203 L-C40	40		2CDS 243 001 R0404		

MCB - SH200 L

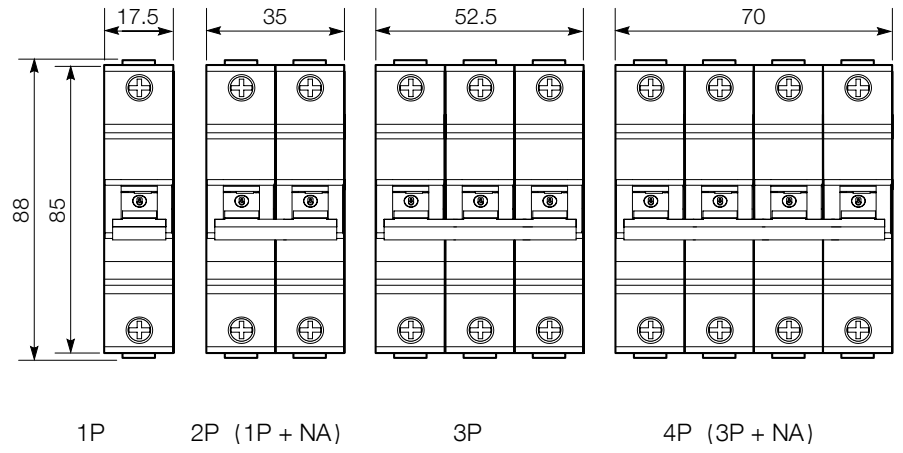
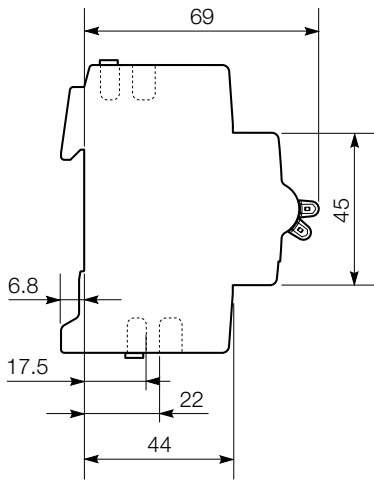
Selection Tables



Type No.	Rated Current I_n (A)	Breaking capacity I_{cn} (kA)	Order Code	Weight (kg/pc)	Packing (pc)
3P + NA (U_{Bmax} : 440 V~)					
SH203 L-C6NA	6	4.5	2CDS 243 103 R0064	0.5	3
SH203 L-C8NA	8		2CDS 243 103 R0084		
SH203 L-C10NA	10		2CDS 243 103 R0104		
SH203 L-C13NA	13		2CDS 243 103 R0134		
SH203 L-C16NA	16		2CDS 243 103 R0164		
SH203 L-C20NA	20		2CDS 243 103 R0204		
SH203 L-C25NA	25		2CDS 243 103 R0254		
SH203 L-C32NA	32		2CDS 243 103 R0324		
SH203 L-C40NA	40		2CDS 243 103 R0404		
4P (U_{Bmax} : 440 V~ 125 V_{DC} with 2 poles connected in series)					
SH204 L-C6	6	4.5	2CDS 244 001 R0064	0.5	3
SH204 L-C8	8		2CDS 244 001 R0084		
SH204 L-C10	10		2CDS 244 001 R0104		
SH204 L-C13	13		2CDS 244 001 R0134		
SH204 L-C16	16		2CDS 244 001 R0164		
SH204 L-C20	20		2CDS 244 001 R0204		
SH204 L-C25	25		2CDS 244 001 R0254		
SH204 L-C32	32		2CDS 244 001 R0324		
SH204 L-C40	40		2CDS 244 001 R0404		

MCB - SH200 T SH200 L SH200

dimensions (mm)



Dimensions