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Miniature Circuit Breakers (MCBs)

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The next generation in installation technology – innovative and modular miniature circuit breakers from ABL SURSUM.

Building a future means successfully advancing tradition. Circuit breakers are an 80-year-old tradition at ABL SURSUM. The first screw-in circuit breaker came onto the market in 1925. Even then there was thermal and electromagnetic tripping. The first high-performance circuit breaker followed less than 10 years later. A socket circuit breaker, which even achieved the American UL certification. These circuit breakers ushered in the long success story of ABL SURSUM circuit-protection devices.

We are continuing this success story with the new miniature circuit breakers. They combine our experience with the requirements of modern installation technology. With a broad-ranging, product-specific knowledge and in cooperation with our customers, we have developed three innovative product ranges of miniature circuit breakers.

Application-orientation, functionality and the highest quality were just as important as reliable operation, maximum safety and effective time-saving installation.

The result is application-oriented products with a perfect combination of all requirements on the highest quality level and in a modern design. They continue to stand for quality and reliability.



The S Range

The installation-friendly 6-kA miniature circuit breakers for house installations.

The SL Range

The innovative 6 kA miniature circuit breakers with screwless top terminal for fast mounting.

The T Range

The flexible 10 kA miniature circuit breakers for industry applications on the highest level.

Designed for all electrical engineering applications.

The requirements of modern installation technology were systematically implemented with three product ranges of innovative miniature circuit breakers. Thus the right products can be made available for each project.

The system components which are designed with different functions and performance allow an optimal covering of different applications:

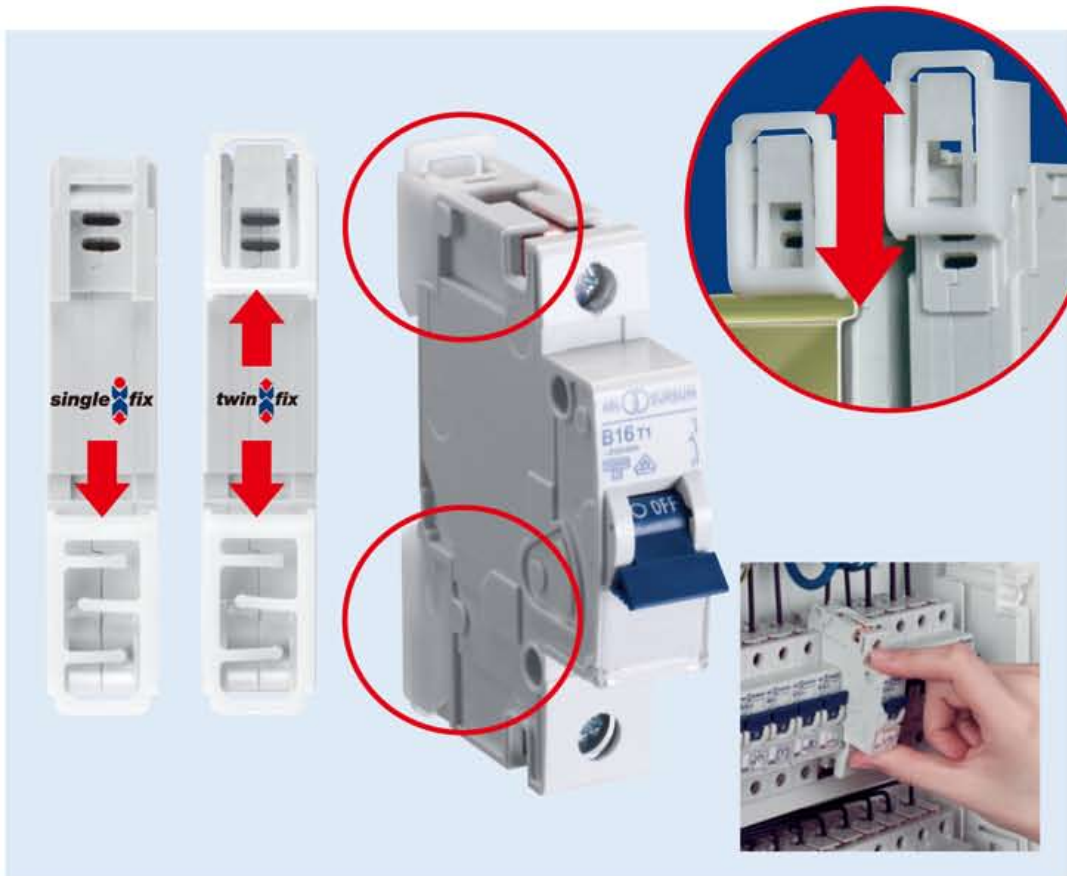
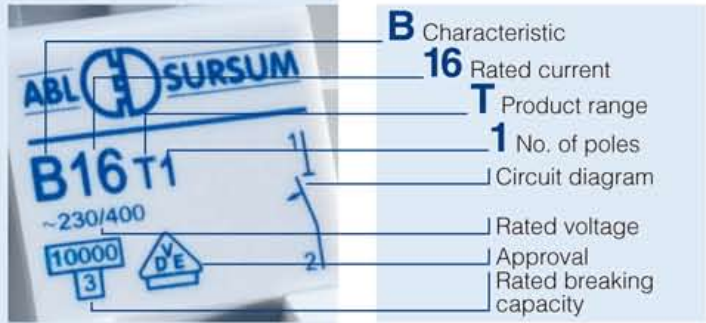
- Conventional house installation.
- Industrial installation.
- Industry applications, machine and system installation.

A future-oriented concept:
application-oriented innovations, time-saving easier installation and reliable quality.



Form and function combined perfectly.

- Compact dimensions (only 83 mm vertical height) for more convenient mounting.
- Modern design, optimum comfort and user-friendliness.
- Easy-to-understand product designations.



Convenient and time-saving mounting.

- Innovative DIN-rail clip for easy removal from a busbar combination
- No laborious moving of the other components
- T product range with "twin-fix" for removal from the busbar – no matter whether top or bottom-mounted.



- S and SL product ranges with "single-fix" for removal from a bottom-mounted busbar.

plug²power

Fast and safe.

The innovative, screwless "plug2power" connection technology results in safety and more time:

- Fast mounting.
- Highest wiring safety.
- Extreme tensile load capacity.
- Easy to release.
- Integrated test opening for voltage measurement.

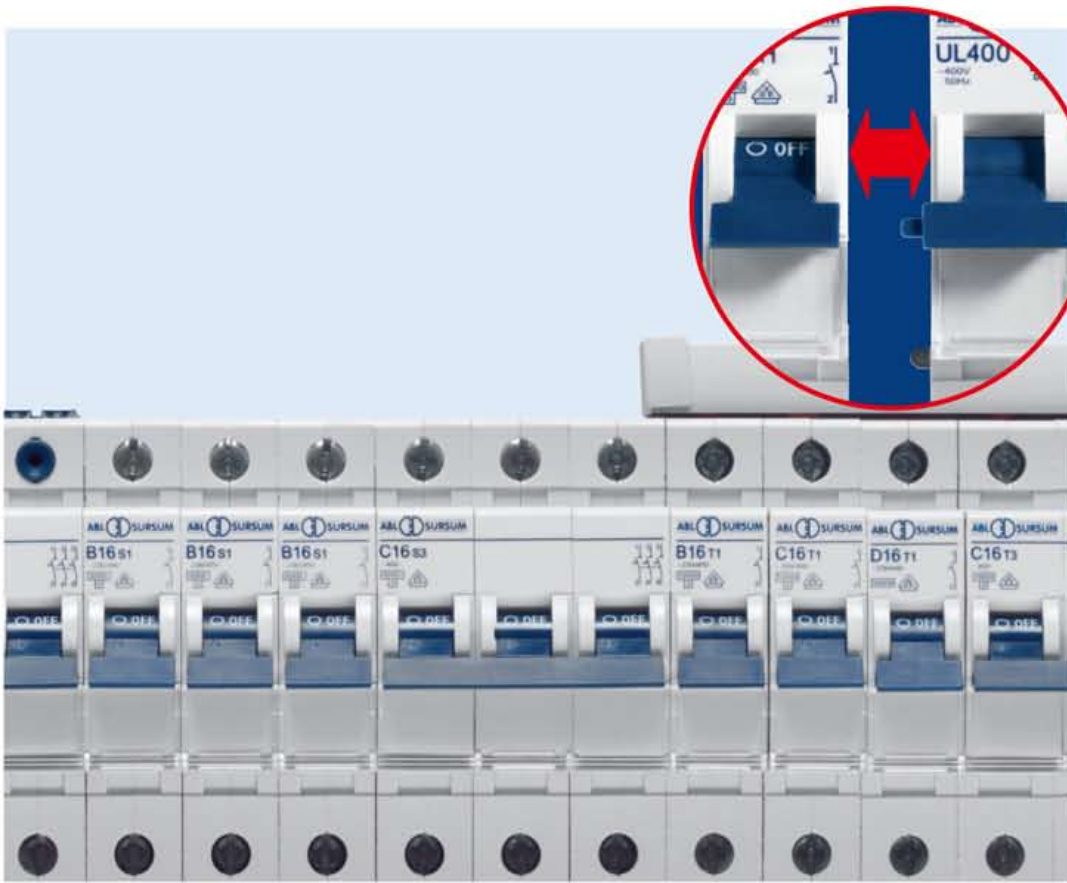


pictoplan

Perfect and compact.

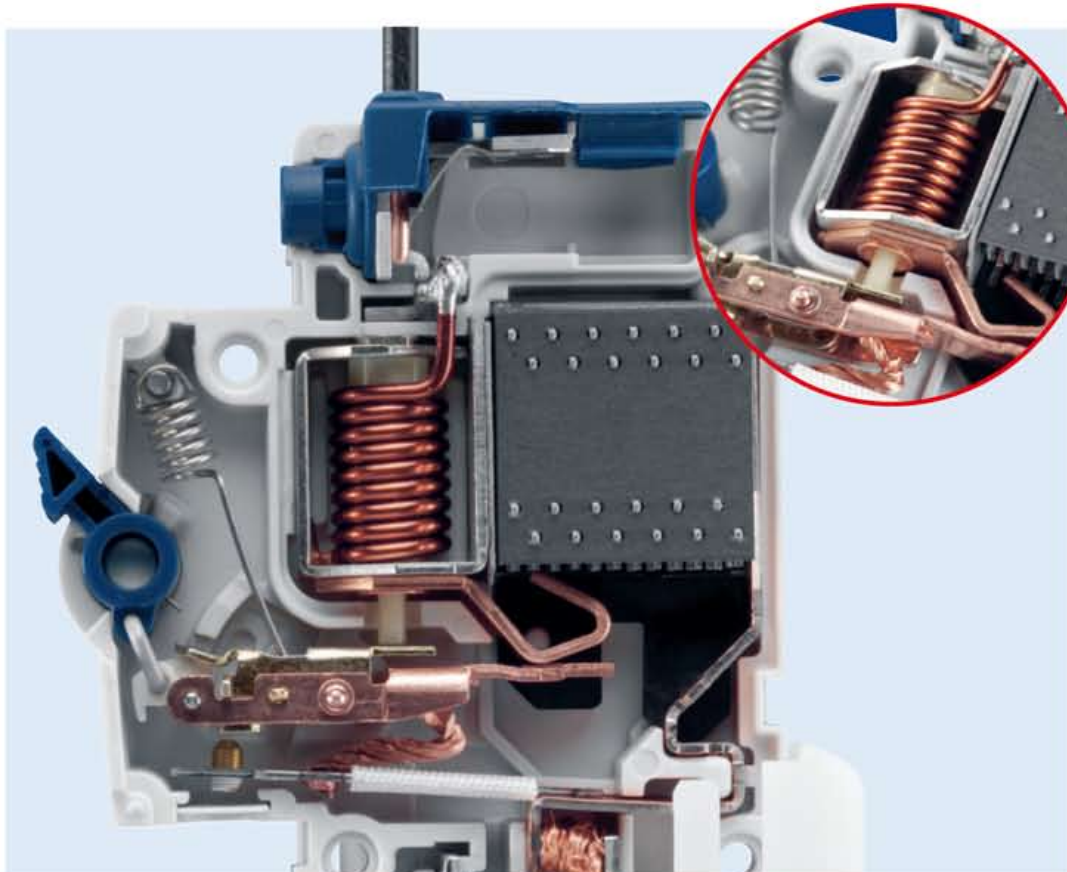
- Optimum labeling possibility.
- User-friendly labeling form.
- Free labeling software.





Compatibility without limitations.

- Multi-system compatibility of the S, SL and T product ranges as well as with RCCDs and DIN-rail panel products.
- Suitable for busbar installation with previous products.
- Use of standard busbars.
- Compatibility to available side-by-side-mounting devices.



Quality and Safety.

- Highest quality without compromises.
- Maximum protection function.
- Tested three times and independently – fulfilling all standards, approvals and degrees of protection.
- Low maintenance, high life expectancy.

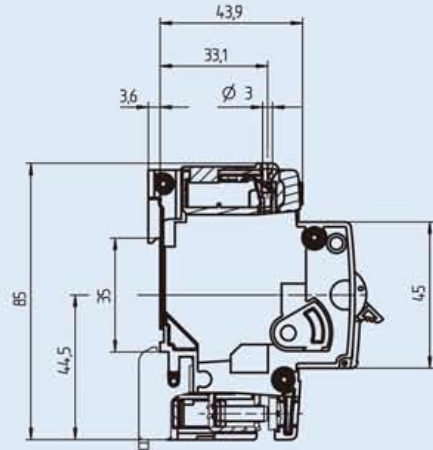
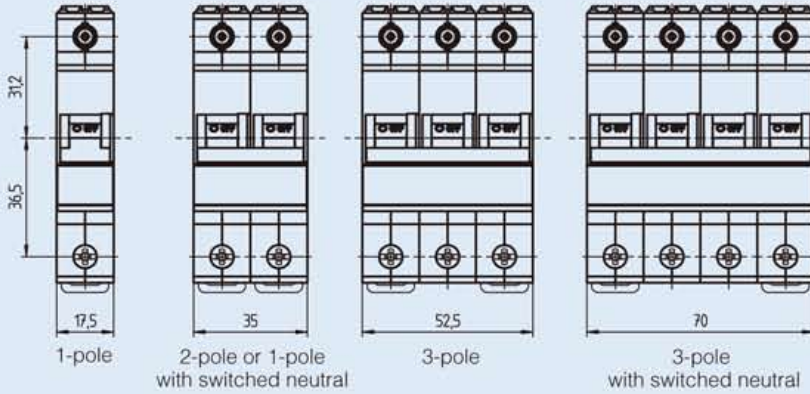


Characteristic	B	C	D	K	Z	
Application	Wiring protection	Wiring protection Device protection	Wiring protection Power circuits Transformers Motors	Wiring protection Power circuits Transformers Motors	Wiring protection Semiconductor protection High impedance	
Number of poles						
Product range „S“	1-3; 1+N; 3+N		-	-	-	
Product range „SL“	1 and 3		-	-	-	
Product range „T“	1 - 4; 1 + N; 3 + N				1 - 3	
Standards short circuit withstand rating	IEC 60898-1, DIN EN 60898-1, VDE 0641-11			IEC 60947-2, DIN EN 60947-2, VDE 0660-101		
Product range „S“	6 kA	6 kA	-	-	-	
Product range „SL“	6 kA	6 kA	-	-	-	
Product range „T“	10 kA	10 kA	10 kA	10 kA	10 kA	
Current limiting class	3	3				
Max. back-up fuse	Fuse according to DIN VDE 0636 125 A operating class gL/gG					
Rated AC voltage	230 / 400 V					
Rated DC voltage L/R = 4 ms	1-pole 60 V, 2-pole 125 V in serial connection of both poles					
Rated current range I_n						
Product range „S“	6 - 63 A	1 - 63 A	-	-	-	
Product range „SL“	6 - 20 A	6 - 20 A	-	-	-	
Product range „T“	1 - 63 A	0,3 - 63 A	0,3 - 63 A	0,3 - 63 A	0,3 - 32 A	
Test currents	Thermal not tripping I_1 (A) > 1 h	$1,13 \times I_n$	$1,13 \times I_n$	$1,13 \times I_n$	$1,05 \times I_n$	$1,05 \times I_n$
	Thermal tripping I_2 (A) < 1 h	$1,45 \times I_n$	$1,45 \times I_n$	$1,45 \times I_n$	$1,2 \times I_n$	$1,35 \times I_n$
	Electromagnetic not tripping I_4 (A) > 0,1 s	$3 \times I_n$	$5 \times I_n$	$10 \times I_n$	$8 \times I_n$	$2 \times I_n$
	Electromagnetic tripping I_5 (A) < 0,1 s	$5 \times I_n$	$10 \times I_n$	$20 \times I_n$	$12 \times I_n$	$3 \times I_n$
Reference calibration tempera- ture of the thermal tripping	30° C + 5° C Influence of the ambient temperature on the thermal tripping: Decrease of the current values with higher ambient temperature and increase with lower temperatures of approximately 5% per 10°C difference in temperature					
Frequency range of the electromagnetic trip	16 ² / ₃ to 60 Hz With higher frequencies, the electromagnetic tripping values increase by approximately a factor of 1,1 at 100 Hz; 1,2 at 200 Hz; 1,3 at 300 Hz; 1,4 at 400 Hz; 1,5 for DC					
Ambient temperature	-25° C to +55° C					
Storage temperature	-40° C to +70° C					
Device depth according to DIN 43880	68 mm					
Mechanical endurance	20.000 switching cycles (20.000 ON/20.000 OFF)					
Protection cover	Finger safe and safe to back of hand according to DIN EN 50274/ VDE0660-514, BGV A2					
Insulation group according to DIN VDE 0110	C at 250 V AC, B at 400 V AC					
Degree of protection according to EN / IEC 60529	IP 20					
Installation position	any					
Mounting	DIN-rail according to DIN EN 60715 35 mm					
Lockability	The handle can be secured against manual switching in the on and off position by a lead seal					
Climatic resistance	Humid heat constant according to DIN IEC 60068-2-78 Humid heat cycle according to DIN EN 60068-2-30					
Vibration resistance	> 15 g according to DIN EN 60068-2-59 during a load with I_1					
Resistance to mechanical shocks	25g 11ms					

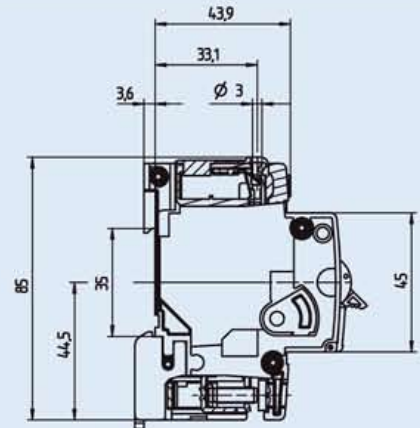
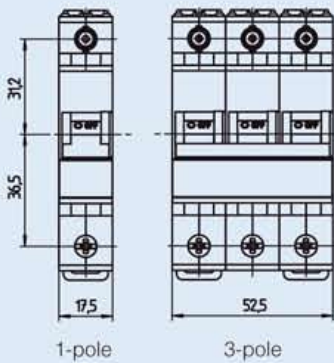
Conductor cross sections product ranges S and T				
	Box terminal bottom		Box terminal top	
Type of conductor	max.	min.	max.	min.
Single wire	35 mm ²	0,5 mm ²	25 mm ²	0,5 mm ²
Multiple wire	35 mm ²	1,5 mm ²	25 mm ²	1,5 mm ²
Stranded wire	25 mm ²	1 mm ²	16 mm ²	1 mm ²
Stranded wire with ferrule	16 mm ²	0,5 mm ²	16 mm ²	0,5 mm ²
Busbar cable lug	Up to 3 mm thickness		Up to 3 mm thickness	
Combined, connector and busbar or cable lug	Up to 35 mm ² and up to 2 mm thickness		Up to 25 mm ² and up to 2 mm thickness	
Torque	max. 2 Nm			
Conductor cross sections SL product range				
	Box terminal bottom		Screwless terminal top ^{*)}	
Type of conductor	max.	min.	max.	min.
Single wire	35 mm ²	0,5 mm ²	4 mm ²	1 mm ²
Multiple wire	35 mm ²	1,5 mm ²	4 mm ²	1,5 mm ²
Stranded wire	25 mm ²	1 mm ²	4 mm ²	1 mm ²
Stranded wire with ferrule	16 mm ²	0,5 mm ²	2,5 mm ²	1 mm ²
Busbar cable lug	Up to 3 mm thickness		-	
Combined, connector and busbar or cable lug	Up to 35 mm ² and up to 2 mm thickness		-	
Torque	max. 2 Nm			

^{*)} Stripped length 12 - 14 mm

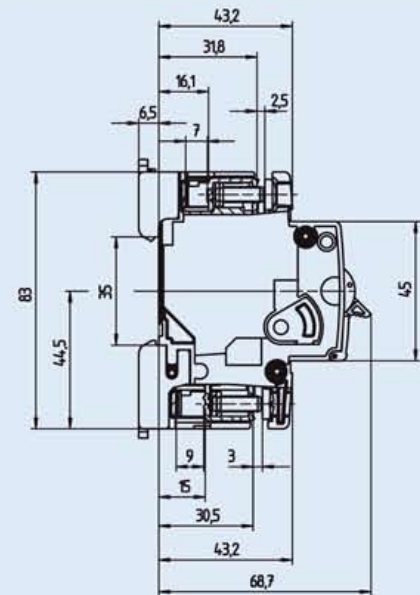
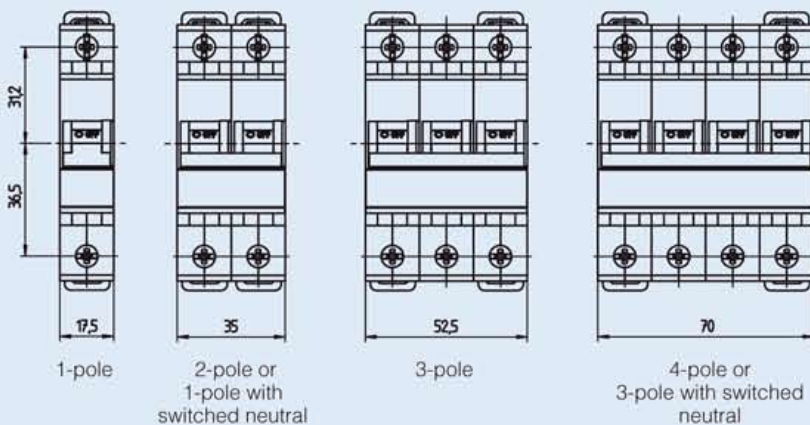
Miniature circuit breakers, **S product range**
with screw terminals
can be removed from a **BOTTOM-MOUNTED** busbar
combination



Miniature circuit breakers, **SL product range**
with screwless terminals
can be removed from a **BOTTOM-MOUNTED** busbar
combination

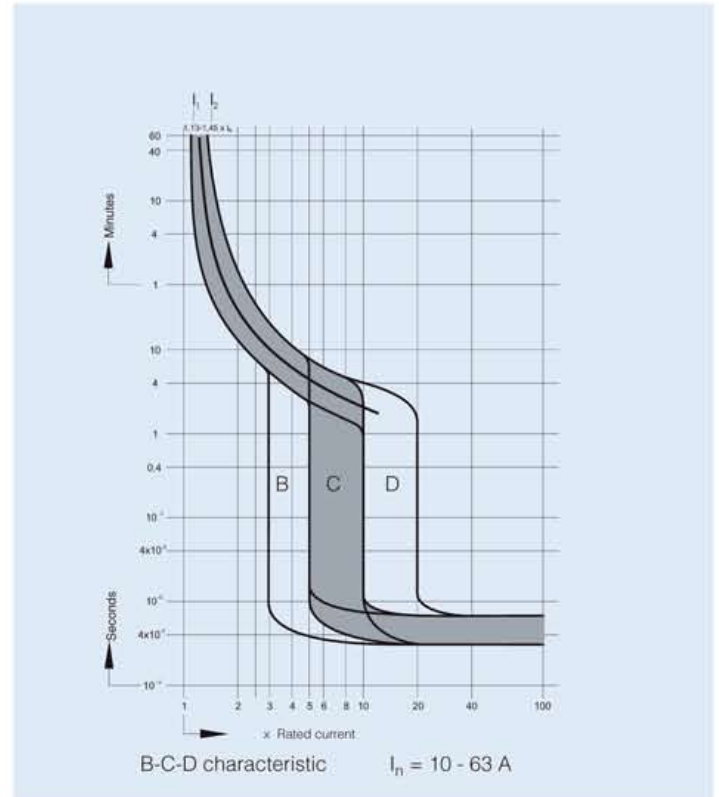
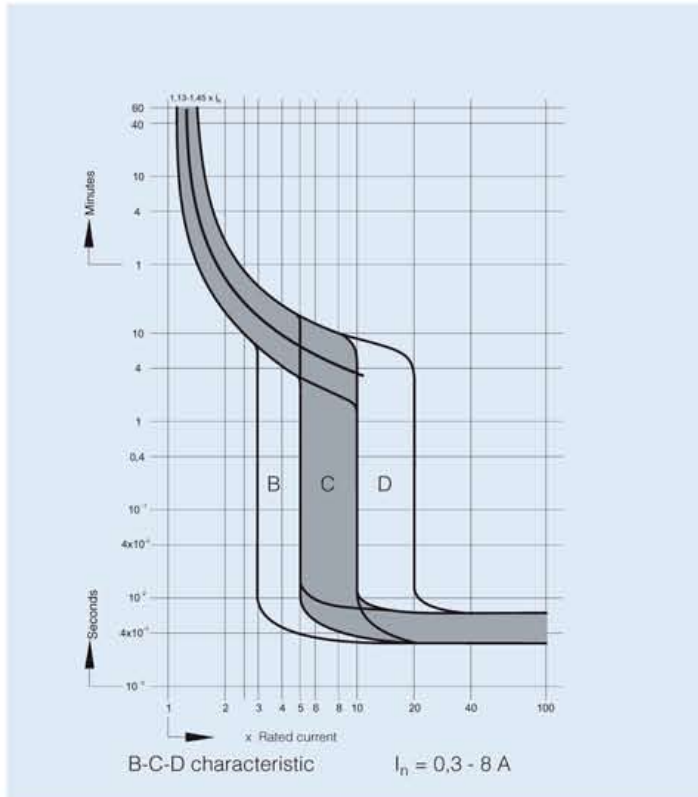


Miniature circuit breakers, **T product range**
with screw terminals
can be removed from a **TOP and BOTTOM-MOUNTED**
busbar combination



Characteristic

According to IEC 60898-1, DIN EN 60898 and VDE 0641-11



Delayed thermal overload tripping

- I_n = **Rated current**
Current which the miniature circuit breaker can sustain in uninterrupted operation
- I_b = **Rated operational current**
Current determined by the load during undisturbed operation
- I_1 = **Thermal not tripping current**
Current which, under defined conditions, does not lead to switching off within 60 min
- I_2 = **Thermal tripping current**
Current which, under defined conditions, leads to switching off within 60 min
- I_1 to I_2 = **Conditions**
Current which, under defined conditions, is run up from I_1 to I_2 with a continuous increase, and leads to switch off within 60 min
- I_3 = **Tolerance limitation at 2,55-times the rated current/ nominal current**
Current which, under defined conditions, does not lead to switch off within 1 sec
Current which, under defined conditions, leads to switch off at rated currents up to 32 A within 60 sec, at rated currents above 32A within 120 sec

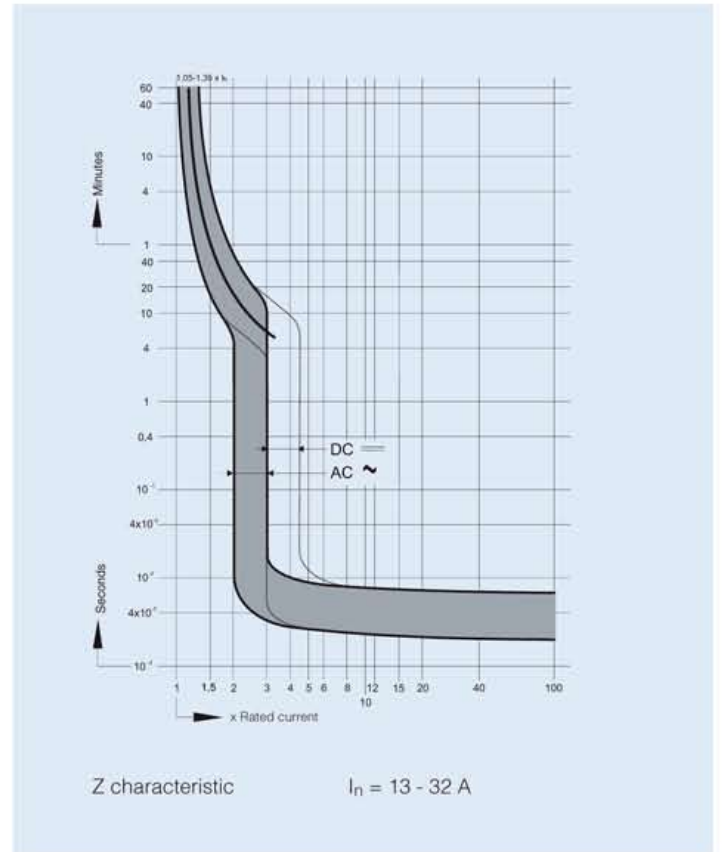
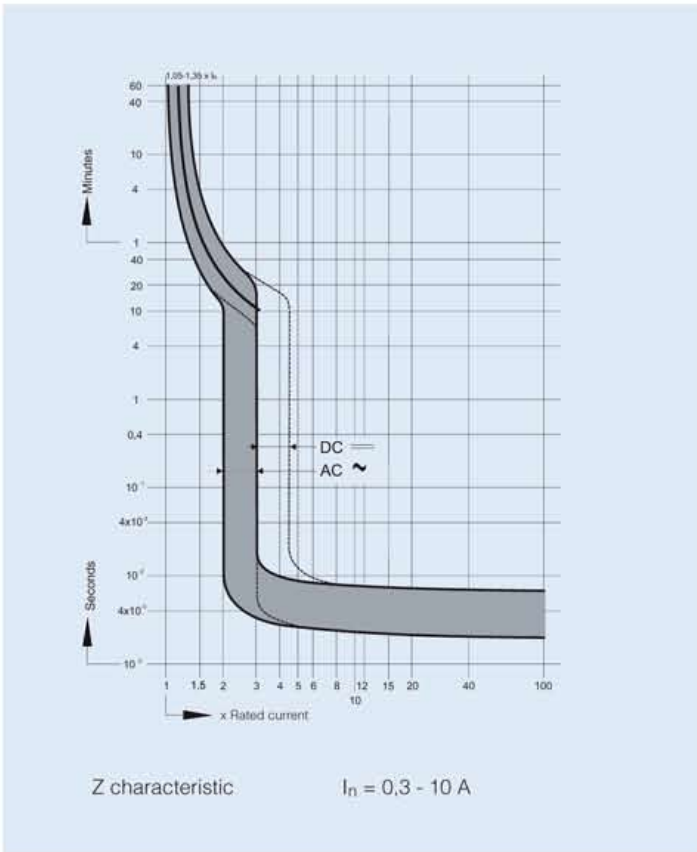
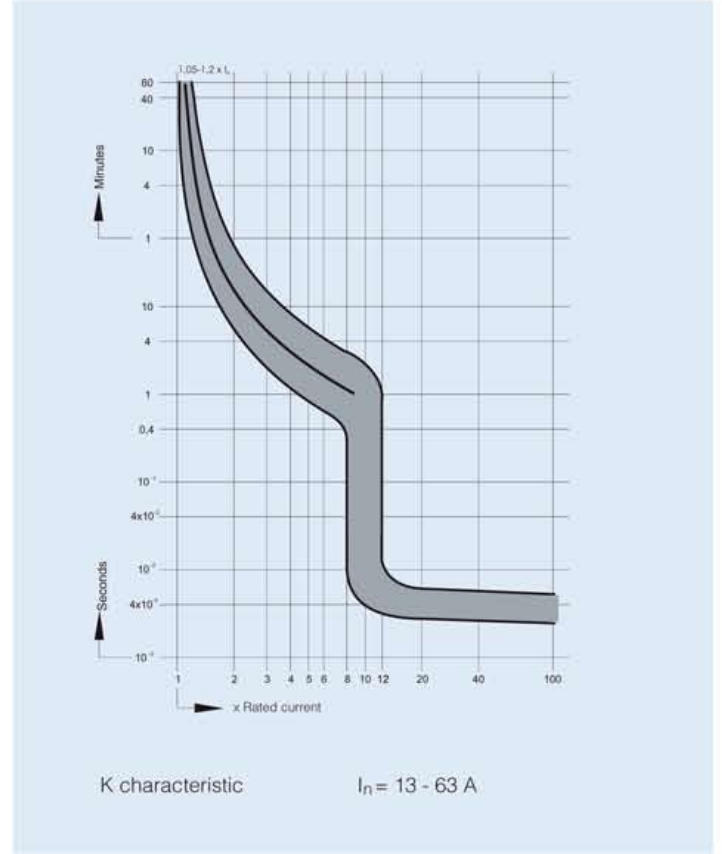
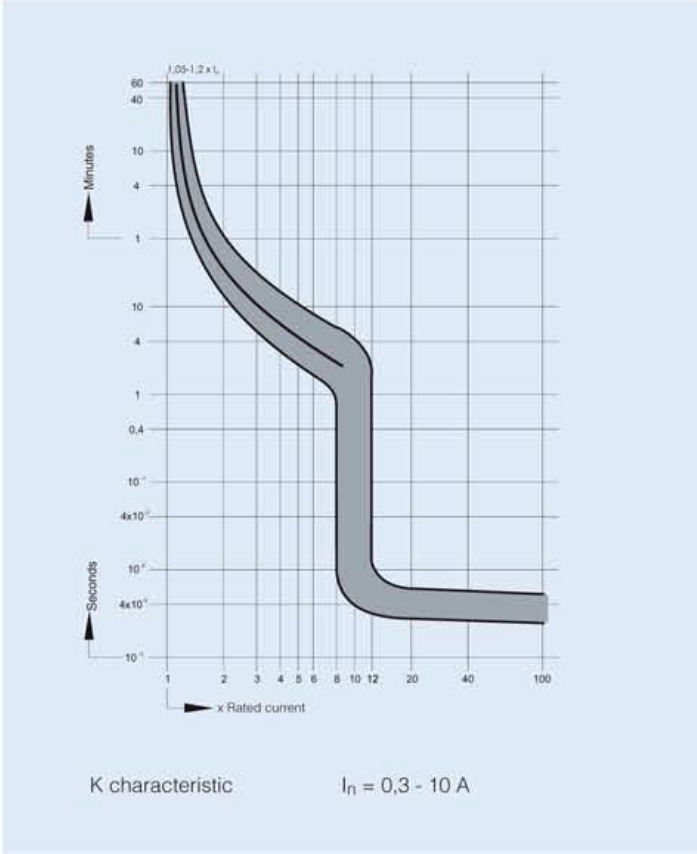
Undelayed electromagnetic short circuit tripping

- I_4 = **Magnetic not tripping current**
Current which, under defined conditions, does not lead to switching off within 0,1 sec
- I_5 = **Magnetic tripping current**
Current which, under defined conditions, leads to switching off within 0,1 sec

Dependence of the short circuit trip at higher frequencies and for direct current.

at 100 Hz about 1,1 times
at 200 Hz about 1,2 times
at 300 Hz about 1,3 times
at 400 Hz about 1,4 times
at 500 Hz about 1,5 times
for DC about 1,5 times

Characteristic
According to IEC 60947-2, DIN EN 60947-2 and VDE 0660-101



Internal resistances in mOhm and power losses in Watt per pole (at I_n)

Rated current I _n (A)	B-characteristic		C-characteristic		D-characteristic		K-characteristic		Z-characteristic	
	Internal resistance mOhm	Power loss Watt	Internal resistance mOhm	Power loss Watt	Internal resistance mOhm	Power loss Watt	Internal resistance mOhm	Power loss Watt	Internal resistance mOhm	Power loss Watt
0,3	-	-	16600	1,5	16600,0	1,5	16860,0	1,5	31500,0	2,8
0,5	-	-	6850	1,7	6850,0	1,7	6850,0	1,7	10250,0	2,6
0,8	-	-	3050	2,0	3050,0	2,0	3050,0	2,0	5150,0	3,3
1	1950	2,0	1750	1,8	1750,0	1,8	1750,0	1,8	2690,0	2,7
1,6	720	1,8	590	1,5	590,0	1,5	590,0	1,5	940,0	2,4
2	510	2,0	420	1,7	420,0	1,7	420,0	1,7	690,0	2,8
2,5	325	2,0	295	1,8	295,0	1,8	295,0	1,8	430,0	2,7
3	211	1,9	200	1,8	173,0	1,6	200,0	1,8	345,0	3,1
3,5	159	1,9	125	1,5	125,0	1,5	125,0	1,5	225,0	2,8
4	131	2,1	109	1,7	105,0	1,7	109,0	1,7	225,0	3,6
5	85	2,1	61,6	1,5	61,6	1,5	65,4	1,6	105,0	2,6
6	52,9	1,9	49,1	1,8	45,9	1,7	49,1	1,8	82,3	3,0
8	26	1,7	24	1,5	20,7	1,3	44,0	2,8	37,1	2,4
10	13,4	1,3	13,4	1,3	13,4	1,3	31,5	3,1	27,8	2,8
13	11,3	1,9	8,04	1,4	8,1	1,4	8,8	1,5	15,1	2,6
16	8,04	2,1	8,04	2,1	8,1	2,1	7,5	1,9	11,3	2,9
20	7,1	2,8	7,45	3,0	6,4	2,5	6,3	2,5	7,4	3,0
25	5	3,1	5	3,1	4,1	2,5	4,7	2,9	5,8	3,7
32	3,6	3,7	3,6	3,7	2,7	2,8	2,8	2,9	3,6	3,7
40	2,2	3,5	2,2	3,5	2,2	3,5	2,2	3,5	-	-
50	1,95	4,9	1,9	4,8	1,8	4,6	2,0	4,9	-	-
63	1,77	7,0	1,77	7,0	1,7	6,8	1,8	7,0	-	-

Overload and short circuit currents

I _n (A)	Overload						Short circuit										
	B,C,D		K		Z		B		C		D		K		Z		
	I ₁	I ₂	I ₁	I ₂	I ₁	I ₂	I ₄	I ₅	I ₄	I ₅	I ₄	I ₅	I ₄	I ₅	I ₄	I ₅	
0,3	0,339	0,435	0,315	0,360	0,315	0,405	0,9	1,5	1,5	3	3	6	2,4	3,6	0,6	0,9	
0,5	0,565	0,725	0,525	0,600	0,525	0,675	1,5	2,5	2,5	5	5	10	4	6	1	1,5	
0,75	0,848	1,088	0,788	0,900	0,788	1,013	2,25	3,75	3,75	7,5	7,5	15	6	9	1,5	2,25	
1	1,13	1,45	1,05	1,20	1,05	1,35	3	5	5	10	10	20	8	12	2	3	
1,6	1,81	2,32	1,68	1,92	1,68	2,16	4,8	8	8	16	16	32	12,8	19,2	3,2	4,8	
2	2,26	2,90	2,10	2,40	2,10	2,70	6	10	10	20	20	40	16	24	4	6	
2,5	2,83	3,63	2,63	3,00	2,63	3,38	7,5	12,5	12,5	25	25	50	20	30	5	7,5	
3	3,39	4,35	3,15	3,60	3,15	4,05	9	15	15	30	30	60	24	36	6	9	
3,5	3,96	5,08	3,68	4,20	3,68	4,73	10,5	17,5	17,5	35	35	70	28	42	7	10,5	
4	4,52	5,80	4,20	4,80	4,20	5,40	12	20	20	40	40	80	32	48	8	12	
5	5,65	7,25	5,25	6,00	5,25	6,75	15	25	25	50	50	100	40	60	10	15	
6	6,78	8,70	6,30	7,20	6,30	8,10	18	30	30	60	60	120	48	72	12	18	
8	9,04	11,60	8,40	9,60	8,40	10,80	24	40	40	80	80	160	64	96	16	24	
10	11,3	14,5	10,5	12,0	10,5	13,5	30	50	50	100	100	200	80	120	20	30	
13	14,7	18,9	13,7	15,6	13,7	17,6	39	65	65	130	130	260	104	156	26	39	
16	18,1	23,2	16,8	19,2	16,8	21,6	48	80	80	160	160	320	128	192	32	48	
20	22,6	29,0	21,0	24,0	21,0	27,0	60	100	100	200	200	400	160	240	40	60	
25	28,3	36,3	26,3	30,0	26,3	33,8	75	125	125	250	250	500	200	300	50	75	
32	36,2	46,4	33,6	38,4	33,6	43,2	96	160	160	320	320	640	256	384	64	96	
40	45,2	58,0	42,0	48,0	-	-	120	200	200	400	400	800	320	480	-	-	
50	56,5	72,5	52,5	60,0	-	-	150	250	250	500	500	1000	400	600	-	-	
63	71,2	91,4	66,2	75,6	-	-	189	315	315	630	630	1260	504	756	-	-	

Short circuit selectivity

10 kA miniature circuit breakers, T product range Short circuit selectivity to fuses in kA

		Rated current I _n (A)																						
Characteristic	B	6		10		13		16		20		25		32		40		50		63				
	C	6/8	6/8	10	10	13	13	16	16	20	20	25	25	32	32	40	40	50	50	63	63			
D		6/8		10		13		16		20		25		32		40		50		63				
I _n (A)	25	0,85	0,7	0,8	0,7	0,8	0,7	0,75	0,65	0,7	0,6	0,6	0,55								1.)			
	35	1,6	1,3	1,6	1,3	1,5	1,25	1,5	1,2	1,4	1,2	1,2	1,1	1,1	1,0	0,8	0,7							
	50	2,4	2,1	2,35	2,1	2,3	2,0	2,3	2,0	2,2	1,9	1,6	1,5	1,5	1,4	1,3	1,2	1,2	1,1	1,0				
	63	3,5	2,9	3,3	2,8	3,2	2,7	3,2	2,7	3,0	2,6	2,5	2,1	2,4	2,0	1,8	1,6	1,4	1,7	1,5	1,3	1,6	1,4	1,2
	80	5,0	4,1	4,8	4,0	4,7	3,9	4,6	3,9	4,3	3,6	3,4	2,8	3,3	2,8	2,5	2,1	1,9	2,4	2,0	1,8	2,3	1,9	1,7
	100	7,6	6,3	7,3	6,1	7,1	5,9	7,0	5,7	6,5	5,0	5,1	4,0	5,0	3,9	3,5	2,9	2,5	3,3	2,8	2,4	3,1	2,6	2,3
	125	10	10	10	10	10	10	10	10	10	8,7	8,8	6,9	8,5	6,8	5,4	4,5	3,8	5,1	4,3	3,6	4,9	4,1	3,5

1.) There is no more overload selectivity above the step line.

6 kA miniature circuit breakers, S and SL product ranges Short circuit selectivity to fuses in kA

		Rated current I _n (A)																				
Characteristic	B	6		10		13		16		20		25		32		40		50		63		
	C	6	6	10	10	13	13	16	16	20	20	25	25	32	32	40	40	50	50	63	63	
I _n (A)	25	0,85	0,7	0,8	0,7	0,8	0,7	0,75	0,65	0,7	0,6	0,6	0,55								1.)	
	35	1,6	1,3	1,6	1,3	1,5	1,25	1,5	1,2	1,4	1,2	1,2	1,1	1,1	1,0	0,8	0,7					
	50	2,4	2,1	2,35	2,1	2,3	2,0	2,3	2,0	2,2	1,9	1,6	1,5	1,5	1,4	1,3	1,2	1,2	1,1			
	63	3,5	2,9	3,3	2,8	3,2	2,7	3,2	2,7	3,0	2,6	2,5	2,1	2,4	2,0	1,8	1,6	1,7	1,5	1,5	1,6	1,4
	80	5,0	4,1	4,8	4,0	4,7	3,9	4,6	3,9	4,3	3,6	3,4	2,8	3,3	2,8	2,5	2,1	2,4	2,0	2,0	2,3	1,9
	100									6,0	5,0	5,1	4,0	5,0	3,9	3,5	2,9	3,3	2,8	3,1	2,6	

1.) There is no more overload selectivity above the step line.



single  **fix**

Rated current I_n A	Characteristic		Weight g/each	Packing unit
	B Article no.	C Article no.		

1-pole

1		C1S1	120	12
2		C2S1	120	12
3		C3S1	120	12
4		C4S1	120	12
5		C5S1	120	12
6	B6S1	C6S1	120	12
10	B10S1	C10S1	120	12
13	B13S1	C13S1	120	12
16	B16S1	C16S1	120	12
20	B20S1	C20S1	120	12
25	B25S1	C25S1	120	12
32	B32S1	C32S1	120	12
40	B40S1	C40S1	125	12
50	B50S1	C50S1	135	12
63	B63S1	C63S1	135	12



single  **fix**

1-pole with switched neutral

1		C1S8	240	6
2		C2S8	240	6
3		C3S8	240	6
4		C4S8	240	6
5		C5S8	240	6
6	B6S8	C6S8	240	6
10	B10S8	C10S8	240	6
13	B13S8	C13S8	240	6
16	B16S8	C16S8	240	6
20	B20S8	C20S8	240	6
25	B25S8	C25S8	240	6
32	B32S8	C32S8	240	6
40	B40S8	C40S8	250	6
50	B50S8	C50S8	270	6
63	B63S8	C63S8	270	6



single  **fix**

2-pole

1		C1S2	240	6
2		C2S2	240	6
3		C3S2	240	6
4		C4S2	240	6
5		C5S2	240	6
6	B6S2	C6S2	240	6
10	B10S2	C10S2	240	6
13	B13S2	C13S2	240	6
16	B16S2	C16S2	240	6
20	B20S2	C20S2	240	6
25	B25S2	C25S2	240	6
32	B32S2	C32S2	240	6
40	B40S2	C40S2	250	6
50	B50S2	C50S2	270	6
63	B63S2	C63S2	270	6



Rated current I_n A	Characteristic		Weight g/each	Packing unit
	B Article no.	C Article no.		

3-pole

1		C1S3	360	4
2		C2S3	360	4
3		C3S3	360	4
4		C4S3	360	4
5		C5S3	360	4
6	B6S3	C6S3	360	4
10	B10S3	C10S3	360	4
13	B13S3	C13S3	360	4
16	B16S3	C16S3	360	4
20	B20S3	C20S3	360	4
25	B25S3	C25S3	360	4
32	B32S3	C32S3	360	4
40	B40S3	C40S3	375	4
50	B50S3	C50S3	405	4
63	B63S3	C63S3	405	4



3-pole

with switched neutral

1		C1S9	480	3
2		C2S9	480	3
3		C3S9	480	3
4		C4S9	480	3
5		C5S9	480	3
6	B6S9	C6S9	480	3
10	B10S9	C10S9	480	3
13	B13S9	C13S9	480	3
16	B16S9	C16S9	480	3
20	B20S9	C20S9	480	3
25	B25S9	C25S9	480	3
32	B32S9	C32S9	480	3
40	B40S9	C40S9	500	3
50	B50S9	C50S9	540	3
63	B63S9	C63S9	540	3

Miniature Circuit Breakers SL Product Range

With screwless top terminal (plug2power)
6 kA B and C characteristic according to IEC 60898-1, DIN EN 60898-1, VDE 0641-11

plug2power

“plug2power”
The innovative screwless terminal technology
for fast and safe connections



Rated current I_n A	Characteristic		Weight g/each	Packing unit
	B Article no.	C Article no		

1-pole

6	B6SL1	C6SL1	120	12
10	B10SL1	C10SL1	120	12
13	B13SL1	C13SL1	120	12
16	B16SL1	C16SL1	120	12
20	B20SL1	C20SL1	120	12

single  **fix**



3-pole

6	B6SL3	C6SL3	360	4
10	B10SL3	C10SL3	360	4
13	B13SL3	C13SL3	360	4
16	B16SL3	C16SL3	360	4
20	B20SL3	C20SL3	360	4

single  **fix**

Miniature Circuit Breakers T Product Range

10kA B, C and D characteristic according to IEC 60898-1, DIN EN 60898-1, VDE 0641-11
10kA K and Z characteristic according to IEC 60947-2, DIN EN 60947-2, VDE 0660-101

This product range differentiates between:

- standard products for normal market applications (**shown in the table in bold**)
- exclusive products for branch-specific applications (shown in the table in normal print)



Rated current I_n A	Characteristic					Weight g/each	Packing unit
	B Article no.	C Article no.	D Article no.	K Article no.	Z Article no.		
1-pole							
0,3		C0.3T1	D0.3T1	K0.3T1	Z0.3T1	120	12
0,5		C0.5T1	D0.5T1	K0.5T1	Z0.5T1	120	12
0,8		C0.8T1	D0.8T1	K0.8T1	Z0.8T1	120	12
1	B1T1	C1T1	D1T1	K1T1	Z1T1	120	12
1,6		C1.6T1	D1.6T1	K1.6T1	Z1.6T1	120	12
2	B2T1	C2T1	D2T1	K2T1	Z2T1	120	12
2,5		C2.5T1	D2.5T1	K2.5T1	Z2.5T1	120	12
3	B3T1	C3T1	D3T1	K3T1	Z3T1	120	12
3,5		C3.5T1	D3.5T1	K3.5T1	Z3.5T1	120	12
4	B4T1	C4T1	D4T1	K4T1	Z4T1	120	12
5	B5T1	C5T1	D5T1	K5T1	Z5T1	120	12
6	B6T1	C6T1	D6T1	K6T1	Z6T1	120	12
8		C8T1	D8T1	K8T1	Z8T1	120	12
10	B10T1	C10T1	D10T1	K10T1	Z10T1	120	12
13	B13T1	C13T1	D13T1	K13T1	Z13T1	120	12
16	B16T1	C16T1	D16T1	K16T1	Z16T1	120	12
20	B20T1	C20T1	D20T1	K20T1	Z20T1	120	12
25	B25T1	C25T1	D25T1	K25T1	Z25T1	120	12
32	B32T1	C32T1	D32T1	K32T1	Z32T1	120	12
40	B40T1	C40T1	D40T1	K40T1		125	12
50	B50T1	C50T1	D50T1	K50T1		135	12
63	B63T1	C63T1	D63T1	K63T1		135	12



1-pole with switched neutral							
0,3		C0.3T8	D0.3T8	K0.3T8		240	6
0,5		C0.5T8	D0.5T8	K0.5T8		240	6
0,8		C0.8T8	D0.8T8	K0.8T8		240	6
1	B1T8	C1T8	D1T8	K1T8		240	6
1,6		C1.6T8	D1.6T8	K1.6T8		240	6
2	B2T8	C2T8	D2T8	K2T8		240	6
2,5		C2.5T8	D2.5T8	K2.5T8		240	6
3	B3T8	C3T8	D3T8	K3T8		240	6
3,5		C3.5T8	D3.5T8	K3.5T8		240	6
4	B4T8	C4T8	D4T8	K4T8		240	6
5	B5T8	C5T8	D5T8	K5T8		240	6
6	B6T8	C6T8	D6T8	K6T8		240	6
8		C8T8	D8T8	K8T8		240	6
10	B10T8	C10T8	D10T8	K10T8		240	6
13	B13T8	C13T8	D13T8	K13T8		240	6
16	B16T8	C16T8	D16T8	K16T8		240	6
20	B20T8	C20T8	D20T8	K20T8		240	6
25	B25T8	C25T8	D25T8	K25T8		240	6
32	B32T8	C32T8	D32T8	K32T8		240	6
40	B40T8	C40T8	D40T8	K40T8		250	6
50	B50T8	C50T8	D50T8	K50T8		270	6
63	B63T8	C63T8	D63T8	K63T8		270	6

Miniature Circuit Breakers T Product Range

10 kA B, C and D characteristic according to IEC 60898-1, DIN EN 60898-1, VDE 0641-11
10 kA K and Z characteristic according to IEC 60947-2, DIN EN 60947-2, VDE 0660-101

This product range differentiates between:

- standard products for normal market applications (**shown in the table in bold**)
- exclusive products for branch-specific applications (shown in the table in normal print)




Rated current I_n A	B Article no.	C Article no.	Characteristic D Article no.	K Article no.	Z Article no.	Weight g/each	Packing unit
2-pole							
0,3		C0.3T2	D0.3T2	K0.3T2	Z0.3T2	240	6
0,5		C0.5T2	D0.5T2	K0.5T2	Z0.5T2	240	6
0,8		C0.8T2	D0.8T2	K0.8T2	Z0.8T2	240	6
1	B1T2	C1T2	D1T2	K1T2	Z1T2	240	6
1,6		C1.6T2	D1.6T2	K1.6T2	Z1.6T2	240	6
2	B2T2	C2T2	D2T2	K2T2	Z2T2	240	6
2,5		C2.5T2	D2.5T2	K2.5T2	Z2.5T2	240	6
3	B3T2	C3T2	D3T2	K3T2	Z3T2	240	6
3,5		C3.5T2	D3.5T2	K3.5T2	Z3.5T2	240	6
4	B4T2	C4T2	D4T2	K4T2	Z4T2	240	6
5	B5T2	C5T2	D5T2	K5T2	Z5T2	240	6
6	B6T2	C6T2	D6T2	K6T2	Z6T2	240	6
8		C8T2	D8T2	K8T2	Z8T2	240	6
10	B10T2	C10T2	D10T2	K10T2	Z10T2	240	6
13	B13T2	C13T2	D13T2	K13T2	Z13T2	240	6
16	B16T2	C16T2	D16T2	K16T2	Z16T2	240	6
20	B20T2	C20T2	D20T2	K20T2	Z20T2	240	6
25	B25T2	C25T2	D25T2	K25T2	Z25T2	240	6
32	B32T2	C32T2	D32T2	K32T2	Z32T2	240	6
40	B40T2	C40T2	D40T2	K40T2		250	6
50	B50T2	C50T2	D50T2	K50T2		270	6
63	B63T2	C63T2	D63T2	K63T2		270	6



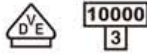

Rated current I_n A	B Article no.	C Article no.	Characteristic D Article no.	K Article no.	Z Article no.	Weight g/each	Packing unit
3-pole							
0,3		C0.3T3	D0.3T3	K0.3T3	Z0.3T3	360	4
0,5		C0.5T3	D0.5T3	K0.5T3	Z0.5T3	360	4
0,8		C0.8T3	D0.8T3	K0.8T3	Z0.8T3	360	4
1	B1T3	C1T3	D1T3	K1T3	Z1T3	360	4
1,6		C1.6T3	D1.6T3	K1.6T3	Z1.6T3	360	4
2	B2T3	C2T3	D2T3	K2T3	Z2T3	360	4
2,5		C2.5T3	D2.5T3	K2.5T3	Z2.5T3	360	4
3	B3T3	C3T3	D3T3	K3T3	Z3T3	360	4
3,5		C3.5T3	D3.5T3	K3.5T3	Z3.5T3	360	4
4	B4T3	C4T3	D4T3	K4T3	Z4T3	360	4
5	B5T3	C5T3	D5T3	K5T3	Z5T3	360	4
6	B6T3	C6T3	D6T3	K6T3	Z6T3	360	4
8		C8T3	D8T3	K8T3	Z8T3	360	4
10	B10T3	C10T3	D10T3	K10T3	Z10T3	360	4
13	B13T3	C13T3	D13T3	K13T3	Z13T3	360	4
16	B16T3	C16T3	D16T3	K16T3	Z16T3	360	4
20	B20T3	C20T3	D20T3	K20T3	Z20T3	360	4
25	B25T3	C25T3	D25T3	K25T3	Z25T3	360	4
32	B32T3	C32T3	D32T3	K32T3	Z32T3	360	4
40	B40T3	C40T3	D40T3	K40T3		375	4
50	B50T3	C50T3	D50T3	K50T3		405	4
63	B63T3	C63T3	D63T3	K63T3		405	4

Miniature Circuit Breakers T Product Range

10kA B, C and D characteristic according to IEC 60898-1, DIN EN 60898-1, VDE 0641-11
10kA K and Z characteristic according to IEC 60947-2, DIN EN 60947-2, VDE 0660-101

This product range differentiates between:

- standard products for normal market applications (**shown in the table in bold**)
- exclusive products for branch-specific applications (shown in the table in normal print)

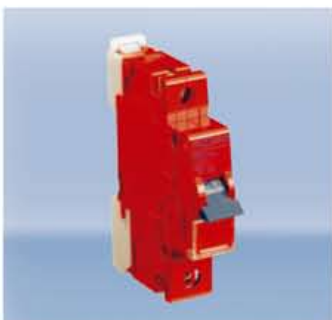


Rated current I_n A	B Article no.	C Article no.	Characteristic D Article no.	K Article no.	Z Article no.	Weight g/each	Packing unit
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3-pole with switched neutral							
0,3		C0.3T9	D0.3T9	K0.3T9		480	3
0,5		C0.5T9	D0.5T9	K0.5T9		480	3
0,8		C0.8T9	D0.8T9	K0.8T9		480	3
1	B1T9	C1T9	D1T9	K1T9		480	3
1,6		C1.6T9	D1.6T9	K1.6T9		480	3
2	B2T9	C2T9	D2T9	K2T9		480	3
2,5		C2.5T9	D2.5T9	K2.5T9		480	3
3	B3T9	C3T9	D3T9	K3T9		480	3
3,5		C3.5T9	D3.5T9	K3.5T9		480	3
4	B4T9	C4T9	D4T9	K4T9		480	3
5	B5T9	C5T9	D5T9	K5T9		480	3
6	B6T9	C6T9	D6T9	K6T9		480	3
8		C8T9	D8T9	K8T9		480	3
10	B10T9	C10T9	D10T9	K10T9		480	3
13	B13T9	C13T9	D13T9	K13T9		480	3
16	B16T9	C16T9	D16T9	K16T9		480	3
20	B20T9	C20T9	D20T9	K20T9		480	3
25	B25T9	C25T9	D25T9	K25T9		480	3
32	B32T9	C32T9	D32T9	K32T9		480	3
40	B40T9	C40T9	D40T9	K40T9		500	3
50	B50T9	C50T9	D50T9	K50T9		540	3
63	B63T9	C63T9	D63T9	K63T9		540	3



4-pole							
0,3		C0.3T4	D0.3T4	K0.3T4		480	3
0,5		C0.5T4	D0.5T4	K0.5T4		480	3
0,8		C0.8T4	D0.8T4	K0.8T4		480	3
1	B1T4	C1T4	D1T4	K1T4		480	3
1,6		C1.6T4	D1.6T4	K1.6T4		480	3
2	B2T4	C2T4	D2T4	K2T4		480	3
2,5		C2.5T4	D2.5T4	K2.5T4		480	3
3	B3T4	C3T4	D3T4	K3T4		480	3
3,5		C3.5T4	D3.5T4	K3.5T4		480	3
4	B4T4	C4T4	D4T4	K4T4		480	3
5	B5T4	C5T4	D5T4	K5T4		480	3
6	B6T4	C6T4	D6T4	K6T4		480	3
8		C8T4	D8T4	K8T4		480	3
10	B10T4	C10T4	D10T4	K10T4		480	3
13	B13T4	C13T4	D13T4	K13T4		480	3
16	B16T4	C16T4	D16T4	K16T4		480	3
20	B20T4	C20T4	D20T4	K20T4		480	3
25	B25T4	C25T4	D25T4	K25T4		480	3
32	B32T4	C32T4	D32T4	K32T4		480	3
40	B40T4	C40T4	D40T4	K40T4		500	3
50	B50T4	C50T4	D50T4	K50T4		540	3
63	B63T4	C63T4	D63T4	K63T4		540	3



B miniature circuit breakers 10 A for the special designation of circuits e.g. EDP, fire warning, cash desk and telephone systems							
10	B10T1R					150	12



Shunt trip

Module	Rated operating voltage	max. operating current at U_n ($t < 10\text{ms}$)	Article no.	Weight g/each	Packing unit
1	12 V UC	1,3 A	FL12	105	5
1	24 V UC	0,6 A	FL24	105	5
1	48 - 72 V UC	0,2 A	FL48	105	5
1	110-230 V UC, 400 V AC	0,25 A at 110 V 0,5 A at 230 V 0,8 A at 400 V	FL110	105	5

Pull-in voltage $0.7 \times U_n$ Switch in duration at U_n 100%



Undervoltage trip (50/60 Hz)

Module	Rated voltage	Article no.	Weight g/each	Packing unit
1	24 V 50/60 Hz	UL24	150	5
1	110 V 50 Hz, 120 V 60 Hz	UL110	150	5
1	220-230 V 50 Hz, 240 V 60 Hz	UL230	150	5
1	380-400 V 50 Hz, 440 V 60 Hz	UL400	150	5

Pull-in voltage $0.85 \times U_n$ Drop-out voltage $0.35 - 0.7 \times U_n$ Switch in duration at U_n 100%



Distance device 9 mm

Module	Article no.	Weight g/each	Packing unit
1/2	HDS	7	10



Lock-off/Lock-on device

Article no.	Weight g/each	Packing unit
EASS	2	10



Auxiliary contact

Module	Type of contact	Contacts	Article no.	Weight g/each	Packing unit
$\frac{1}{2}$	1 auxiliary contact	1NO	HL10	35	20
$\frac{1}{2}$	2 auxiliary contacts	1NO + 1NC	HL11	40	20
$\frac{1}{2}$	3 auxiliary contacts	1NO + 2NC	HL12	45	20
$\frac{1}{2}$	3 auxiliary contacts	2NO + 1NC	HL21	45	20



Auxiliary contact

Module	Type of contact	Contacts	Article no.	Weight g/each	Packing unit
$\frac{1}{2}$	1 auxiliary contact	1 change-over	HWL10	40	20
$\frac{1}{2}$	2 auxiliary contacts	2 change-over	HWL20	50	20



Auxiliary contact with signal contact

Module	Type of contact	Contacts	Article no.	Weight g/each	Packing unit
$\frac{1}{2}$	1 signal contact / 1 auxiliary contact	2 change-over	HSL11	50	20
$\frac{1}{2}$	1 signal contact	1 change-over	HSL10	40	20



The signal contact and the auxiliary contact are each fitted with a floating change-over contact.

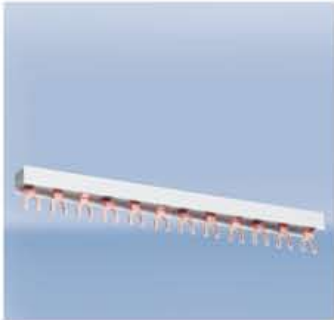
Both contacts have trip-free mechanisms, i.e. manipulating the contact positions from outside is not possible. The signal contact only indicates when the main device is overloaded or short circuited but not when switched off by hand. The auxiliary contact clearly shows the switched condition of the main device i.e. when overloaded or short circuited and when switched off manually.

Technical Data	HL10, HL11, HL12, HL21	HWL10, HWL20, HSL10, HSL11
Standards	IEC 60947-5-1, DIN EN 60947-5-1, VDE 0660-200	
Rated voltage	230 V~	
Conventional thermal current in enclosure	$I_{th} \geq 16$ A	
Rated operating currents I_e	Usage category AC-15	10 A / 230 V
	Usage category AC-15	16 A / 110 V
	Usage category DC-13	1 A / 250 V
	Usage category DC-13	3 A / 125 V
Minimum switching capacity	0,05 VA bei 6 V UC	

Busbars

Busbars for S, SL and T miniature circuit breakers, MA motor circuit breakers and residual current circuit breakers

Cross section (mm ²)	Busbar current Start of busbar/ Middle infeed	Modules/ Phases	Article no.	Weight g/each	Packing unit	Suitable end cap Article no.
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Busbars fork type

1-phase						
12	65/110	56	SB16010	250	50	
1-phase 1-pole circuit breaker + auxiliary contact						
24	90/150	37/1	SDO.124	200	50	
2-phase and 1-phase + N						
10	63/100	28/2	SB26010	390	20	SB.A5
2-phase 2-pole circuit breaker + auxiliary contact						
16	80/130	22/2	SB26216	310	20	SB.A2
3-phase						
10	63/100	4/3	SB31210	84	25	SB.A1
10	63/100	19/3	SB36010	420	20	SB.A1
16	80/130	19/3	SB36016	675	20	SB.A2
3-phase 3-pole circuit breaker + auxiliary contact						
16	80/130	16/3	SB36316	630	20	SB.A2
3-phase 1-pole circuit breaker + auxiliary contact						
16	80/130	36/1	SDO.316	500	20	SB.A2
4-phase and 3-phase + N						
16	80/130	14/4	SB46016	835	15	SB.A3



End caps for busbars

for busbars article no.	Article no.	Weight g/each	Packing unit
SB31210, SB36010	SB.A1	0,8	10
SB36016, SB36316, SDO.316, SB718U, SB26216	SB.A2	1	10
SB46016	SB.A3	1,1	10
SB26010	SB.A5	0,8	10