

<b>Description of Miniature Circuit Breakers</b>	<b>Page 10</b>
<b>Technical Data</b>	<b>Page 14</b>
<b>"S" Product Range B and C Characteristic</b>	
- 1-pole, 1-pole with switched neutral, 2-pole	<b>Page 21</b>
- 3-pole, 3-pole with switched neutral	<b>Page 22</b>
<b>"SL" Product Range B and C Characteristic</b>	
- 1-pole, 3-pole	<b>Page 23</b>
<b>"T" Product Range B, C, D, K and Z Characteristic</b>	
- 1-pole, 1-pole with switched neutral	<b>Page 24</b>
- 2-pole, 3-pole	<b>Page 25</b>
- 3-pole with switched neutral, 4-pole	<b>Page 26</b>
<b>Accessories</b>	
- Shunt trip	<b>Page 27</b>
- Undervoltage trip	<b>Page 27</b>
- Auxiliary contacts	<b>Page 28</b>
- Busbars	<b>Page 29</b>



## 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.

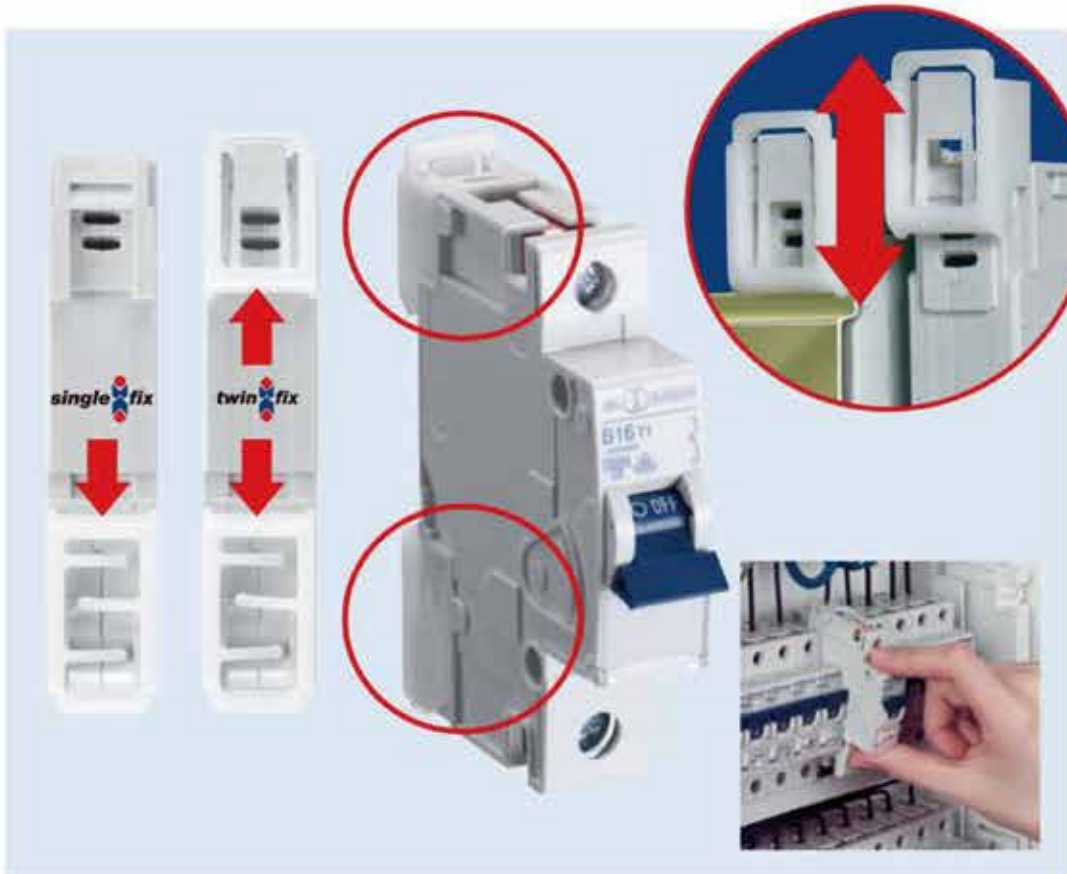
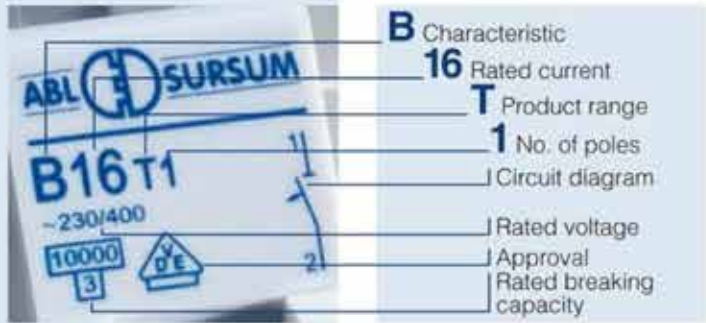
### A future-oriented concept:

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.

**plug<sup>2</sup>power**

**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**

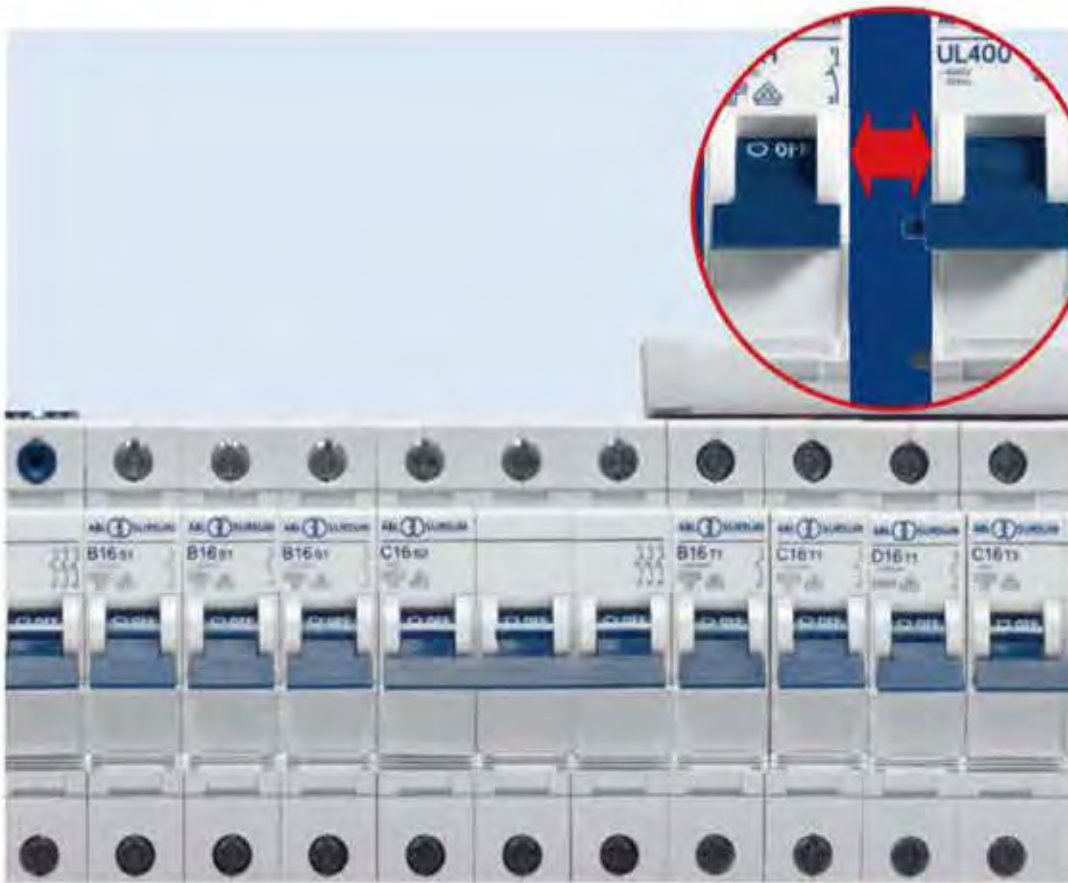
**Perfect and compact.**

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



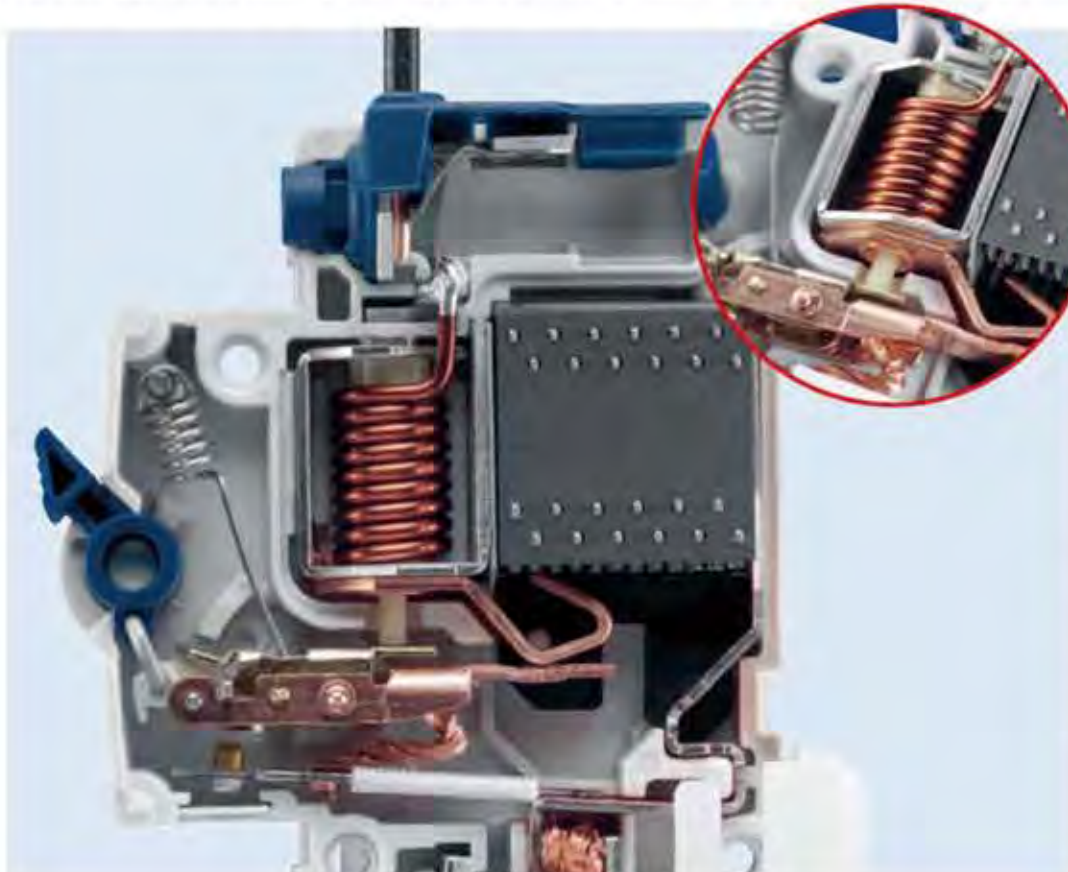
## Miniature Circuit Breakers

S, SL, T Product Ranges



### 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.

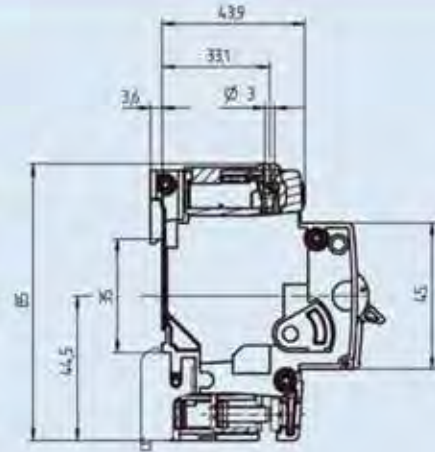
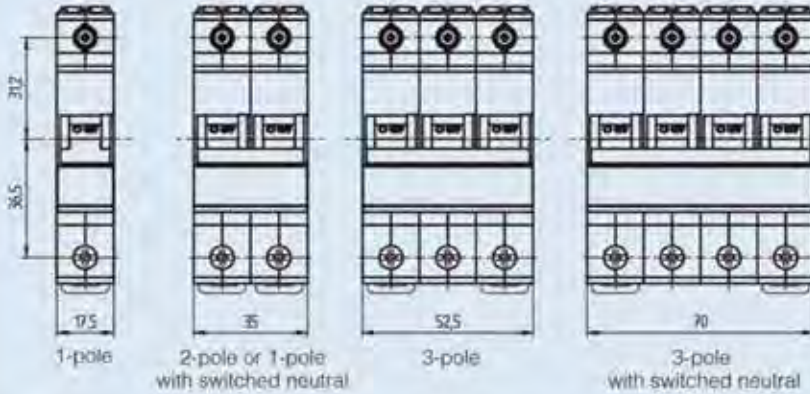


Characteristic	B	C	D	K	Z	
Application	Wiring protection	Wiring protection Device protection	Wiring protection Power circuits Transformers Motors	Wiring protection Power circuits Transformers Motors	Wiring protection Semiconductor protection High impedance	
Number of poles						
Product range „S“	1-3; 1+N; 3+N					
Product range „SL“	1 and 3					
Product range „T“	1 - 4; 1 + N; 3 + N					
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					
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 $\frac{2}{3}$ 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					

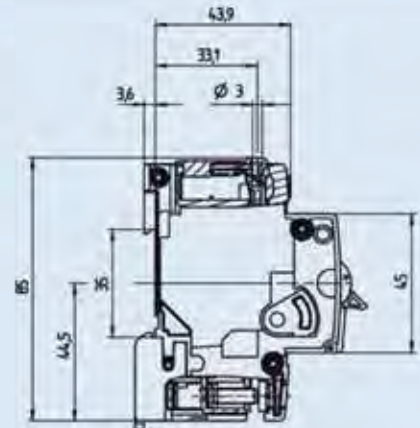
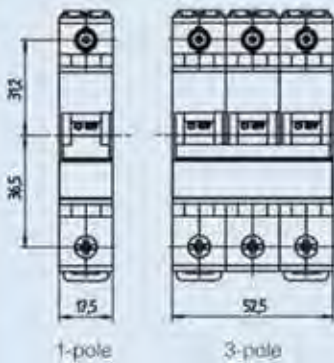
Conductor cross sections product ranges S and T				
Type of conductor	Box terminal bottom		Box terminal top	
	max.	min.	max.	min.
Single wire	35 mm <sup>2</sup>	0,5 mm <sup>2</sup>	25 mm <sup>2</sup>	0,5 mm <sup>2</sup>
Multiple wire	35 mm <sup>2</sup>	1,5 mm <sup>2</sup>	25 mm <sup>2</sup>	1,5 mm <sup>2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

<sup>\*)</sup> Stripped length 12 - 14 mm

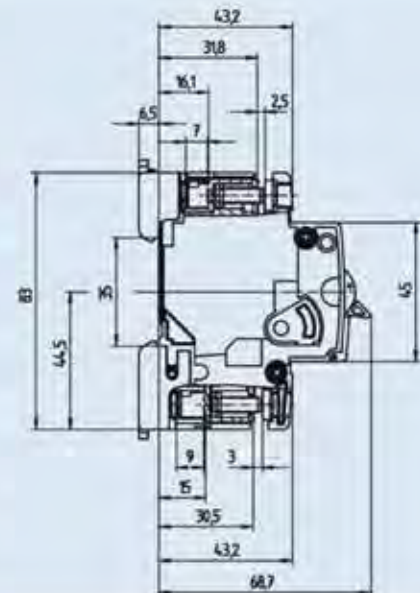
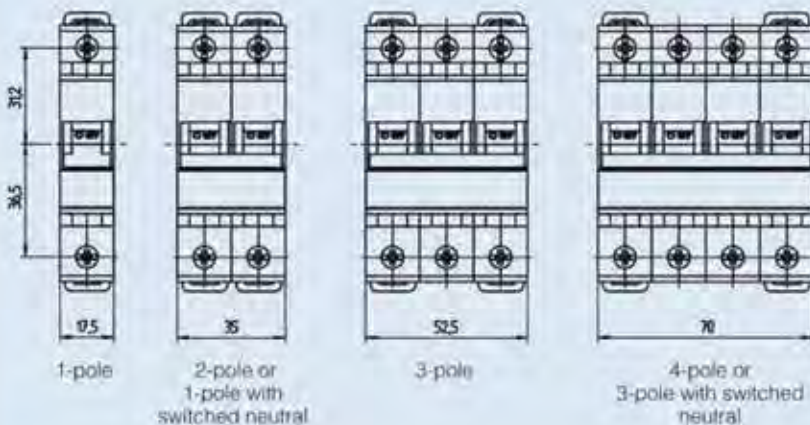
Miniature circuit breakers, **S product range**  
with screw terminals  
can be removed from a **BOTTOM-MOUNTED** busbar  
combination



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



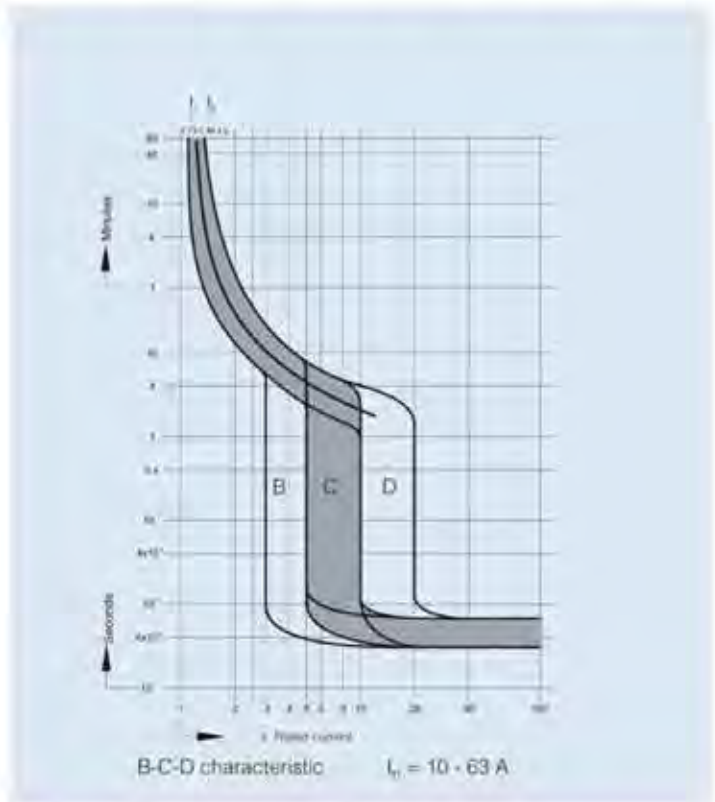
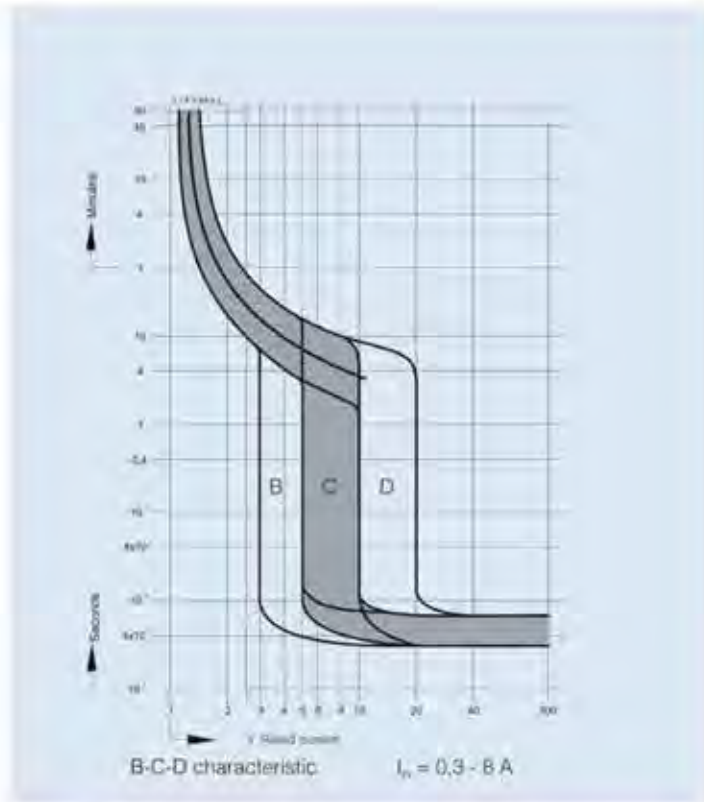
Miniature circuit breakers, **T product range**  
with screw terminals  
can be removed from a **TOP and BOTTOM-MOUNTED**  
busbar combination





**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

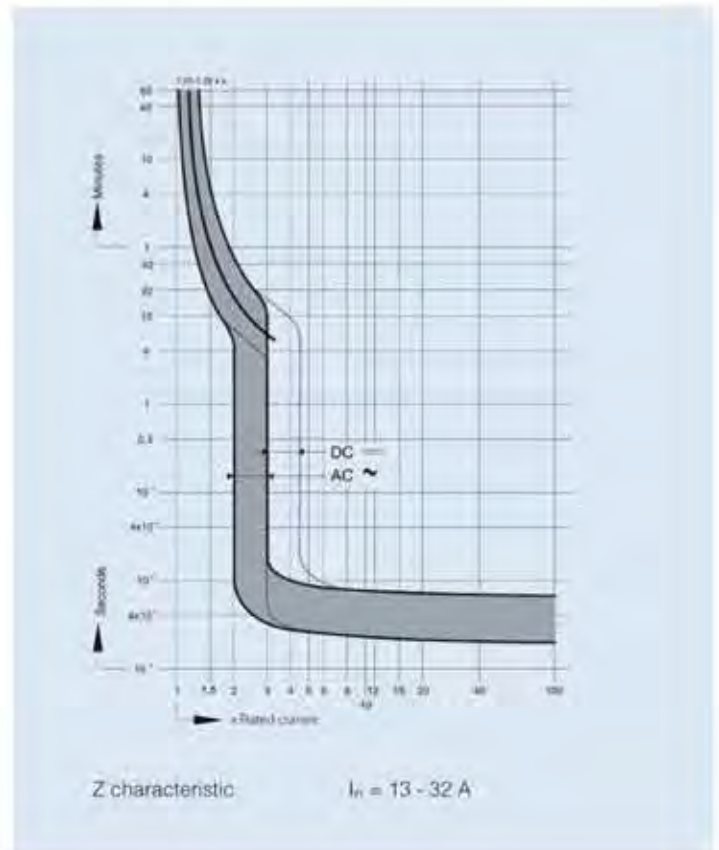
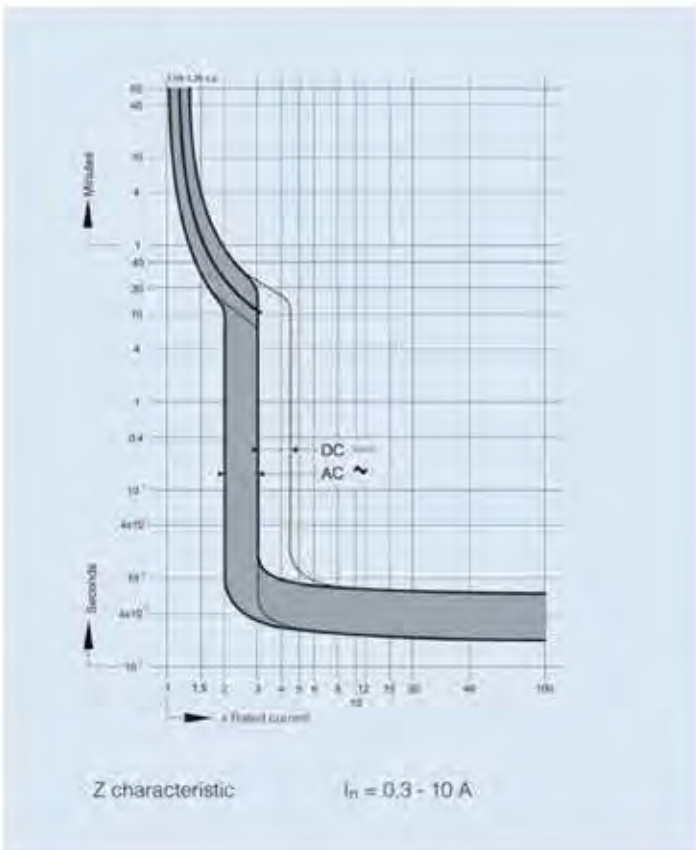
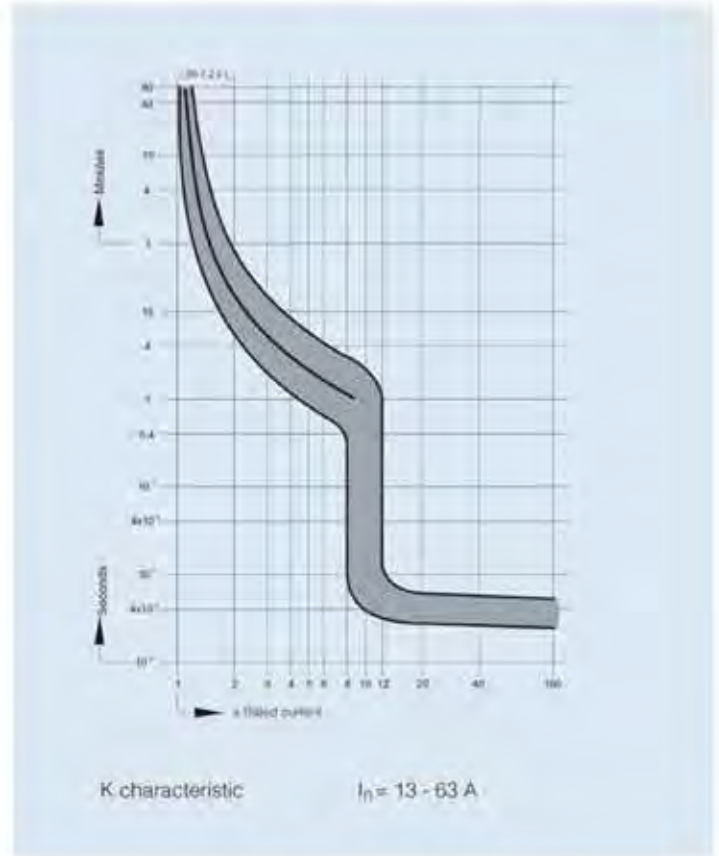
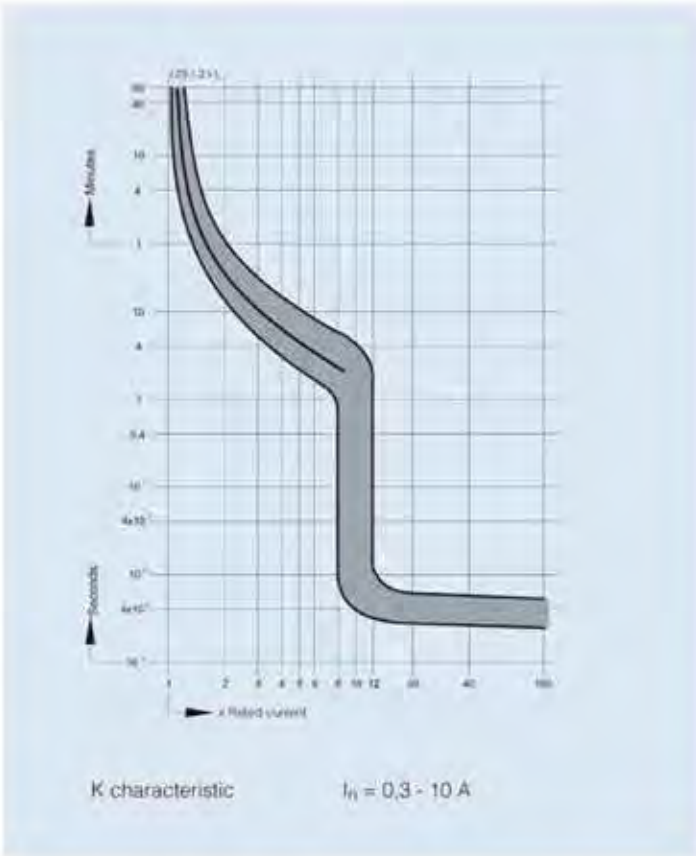
**Undelayed electromagnetic short circuit tripping**

- $I_4$  = 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	-	-		

### 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	10	13	16	20	25	32	40	50	63	63	63				
LV HRC fuse Characteristic gL/gG according to DIN VDE 0636	$I_n$ (A)	25	0,85 0,7 0,7	0,8 0,7 0,6	0,8 0,7 0,6	0,75 0,65 0,6	0,7 0,6 0,55	0,6 0,55 0,5								1.)	
	35	1,6 1,3 1,2	1,6 1,3 1,15	1,5 1,25 1,1	1,5 1,2 1,1	1,4 1,2 1,0	1,2 1,1 0,9	1,1 1,0 0,8	0,8 0,7 0,5								
	50	2,4 2,1 1,9	2,35 2,1 1,8	2,3 2,0 1,7	2,3 2,0 1,7	2,2 1,9 1,6	1,6 1,5 1,3	1,5 1,4 1,2	1,3 1,2 1,1	1,2 1,1 1,0							
	63	3,5 2,9 2,5	3,3 2,8 2,4	3,2 2,7 2,4	3,2 2,7 2,3	3,0 2,6 2,3	2,5 2,1 1,8	2,4 2,0 1,8	1,8 1,6 1,4	1,7 1,5 1,3	1,6 1,4 1,2						
	80	5,0 4,1 3,5	4,8 4,0 3,4	4,7 3,9 3,3	4,6 3,9 3,2	4,3 3,6 3,1	3,4 2,8 2,5	3,3 2,8 2,4	2,5 2,1 1,9	2,4 2,0 1,8	2,3 1,9 1,7						
	100	7,6 6,3 5,2	7,3 6,1 4,9	7,1 5,9 4,8	7,0 5,7 4,7	6,5 5,0 4,4	5,1 4,0 3,5	5,0 3,9 3,4	3,5 2,9 2,5	3,3 2,8 2,4	3,1 2,6 2,3						
	125	10 10 8,8	10 10 8,0	10 10 7,7	10 10 7,6	10 8,7 7,1	8,8 6,9 5,7	8,5 6,8 5,6	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	10	13	16	20	25	32	40	50	63	63	63			
LV HRC fuse Characteristic gL/gG according to DIN VDE 0636	$I_n$ (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	1,6 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	2,3 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.

# Miniature Circuit Breakers S Product Range

6 kA B and C characteristic according to IEC 60898-1, DIN EN 60898-1, VDE 0641-11



**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



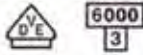
**single fix**

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



**single fix**

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



**single fix**

**3-pole  
with switched neutral**

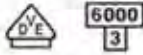
1		C1S9	480	3
2		C2S9	480	3
3		C3S9	480	3
4		C4S9	480	3
5		C5S9	480	3
6	B6S9	C6S9	480	3
10	B10S9	C10S9	480	3
13	B13S9	C13S9	480	3
16	B16S9	C16S9	480	3
20	B20S9	C20S9	480	3
25	B25S9	C25S9	480	3
32	B32S9	C32S9	480	3
40	B40S9	C40S9	500	3
50	B50S9	C50S9	540	3
63	B63S9	C63S9	540	3

## 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

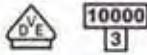
**single**  **fix**

# 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.		
<b>1-pole</b>							
0,3		C0.3T1	D0.3T1	K0.3T1	Z0.3T1	120	12
0,5		<b>C0.5T1</b>	<b>D0.5T1</b>	<b>K0.5T1</b>	<b>Z0.5T1</b>	120	12
0,8		C0.8T1	D0.8T1	K0.8T1	Z0.8T1	120	12
1	B1T1	<b>C1T1</b>	<b>D1T1</b>	<b>K1T1</b>	<b>Z1T1</b>	120	12
1,6		C1.6T1	D1.6T1	K1.6T1	Z1.6T1	120	12
2	B2T1	<b>C2T1</b>	<b>D2T1</b>	<b>K2T1</b>	<b>Z2T1</b>	120	12
2,5		C2.5T1	D2.5T1	K2.5T1	Z2.5T1	120	12
3	B3T1	<b>C3T1</b>	<b>D3T1</b>	<b>K3T1</b>	<b>Z3T1</b>	120	12
3,5		C3.5T1	D3.5T1	K3.5T1	Z3.5T1	120	12
4	B4T1	<b>C4T1</b>	<b>D4T1</b>	<b>K4T1</b>	<b>Z4T1</b>	120	12
5	B5T1	C5T1	D5T1	K5T1	Z5T1	120	12
6	B6T1	<b>C6T1</b>	<b>D6T1</b>	<b>K6T1</b>	<b>Z6T1</b>	120	12
8		C8T1	D8T1	K8T1	Z8T1	120	12
10	<b>B10T1</b>	<b>C10T1</b>	<b>D10T1</b>	<b>K10T1</b>	<b>Z10T1</b>	120	12
13	<b>B13T1</b>	<b>C13T1</b>	<b>D13T1</b>	<b>K13T1</b>	<b>Z13T1</b>	120	12
16	<b>B16T1</b>	<b>C16T1</b>	<b>D16T1</b>	<b>K16T1</b>	<b>Z16T1</b>	120	12
20	<b>B20T1</b>	<b>C20T1</b>	<b>D20T1</b>	<b>K20T1</b>	<b>Z20T1</b>	120	12
25	<b>B25T1</b>	<b>C25T1</b>	<b>D25T1</b>	<b>K25T1</b>	<b>Z25T1</b>	120	12
32	<b>B32T1</b>	<b>C32T1</b>	<b>D32T1</b>	<b>K32T1</b>	<b>Z32T1</b>	120	12
40	<b>B40T1</b>	<b>C40T1</b>	<b>D40T1</b>	<b>K40T1</b>		125	12
50	<b>B50T1</b>	<b>C50T1</b>	<b>D50T1</b>	<b>K50T1</b>		135	12
63	<b>B63T1</b>	<b>C63T1</b>	<b>D63T1</b>	<b>K63T1</b>		135	12



<b>1-pole with switched neutral</b>							
0,3		C0.3T8	D0.3T8	K0.3T8		240	6
0,5		<b>C0.5T8</b>	<b>D0.5T8</b>	K0.5T8		240	6
0,8		C0.8T8	D0.8T8	K0.8T8		240	6
1	B1T8	<b>C1T8</b>	<b>D1T8</b>	K1T8		240	6
1,6		C1.6T8	D1.6T8	K1.6T8		240	6
2	B2T8	<b>C2T8</b>	<b>D2T8</b>	K2T8		240	6
2,5		C2.5T8	D2.5T8	K2.5T8		240	6
3	B3T8	<b>C3T8</b>	<b>D3T8</b>	K3T8		240	6
3,5		C3.5T8	D3.5T8	K3.5T8		240	6
4	B4T8	<b>C4T8</b>	<b>D4T8</b>	K4T8		240	6
5	B5T8	C5T8	D5T8	K5T8		240	6
6	B6T8	<b>C6T8</b>	<b>D6T8</b>	K6T8		240	6
8		C8T8	D8T8	K8T8		240	6
10	<b>B10T8</b>	<b>C10T8</b>	<b>D10T8</b>	K10T8		240	6
13	<b>B13T8</b>	<b>C13T8</b>	<b>D13T8</b>	K13T8		240	6
16	<b>B16T8</b>	<b>C16T8</b>	<b>D16T8</b>	K16T8		240	6
20	<b>B20T8</b>	<b>C20T8</b>	<b>D20T8</b>	K20T8		240	6
25	<b>B25T8</b>	<b>C25T8</b>	<b>D25T8</b>	K25T8		240	6
32	<b>B32T8</b>	<b>C32T8</b>	<b>D32T8</b>	K32T8		240	6
40	<b>B40T8</b>	<b>C40T8</b>	<b>D40T8</b>	K40T8		250	6
50	<b>B50T8</b>	<b>C50T8</b>	<b>D50T8</b>	K50T8		270	6
63	<b>B63T8</b>	<b>C63T8</b>	<b>D63T8</b>	K63T8		370	6

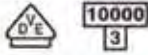


# Miniature Circuit Breakers T Product Range

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
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### 2-pole

0,3		C0.3T2	D0.3T2	K0.3T2	Z0.3T2	240	6
0,5		<b>C0.5T2</b>	<b>D0.5T2</b>	<b>K0.5T2</b>	<b>Z0.5T2</b>	240	6
0,8		C0.8T2	D0.8T2	K0.8T2	Z0.8T2	240	6
1	B1T2	<b>C1T2</b>	<b>D1T2</b>	<b>K1T2</b>	<b>Z1T2</b>	240	6
1,6		C1.6T2	D1.6T2	K1.6T2	Z1.6T2	240	6
2	B2T2	<b>C2T2</b>	<b>D2T2</b>	<b>K2T2</b>	<b>Z2T2</b>	240	6
2,5		C2.5T2	D2.5T2	K2.5T2	Z2.5T2	240	6
3	B3T2	<b>C3T2</b>	<b>D3T2</b>	<b>K3T2</b>	<b>Z3T2</b>	240	6
3,5		C3.5T2	D3.5T2	K3.5T2	Z3.5T2	240	6
4	B4T2	<b>C4T2</b>	<b>D4T2</b>	<b>K4T2</b>	<b>Z4T2</b>	240	6
5	B5T2	C5T2	D5T2	K5T2	Z5T2	240	6
6	B6T2	<b>C6T2</b>	<b>D6T2</b>	<b>K6T2</b>	<b>Z6T2</b>	240	6
8		C8T2	D8T2	K8T2	Z8T2	240	6
10	<b>B10T2</b>	<b>C10T2</b>	<b>D10T2</b>	<b>K10T2</b>	<b>Z10T2</b>	240	6
13	<b>B13T2</b>	<b>C13T2</b>	<b>D13T2</b>	<b>K13T2</b>	<b>Z13T2</b>	240	6
16	<b>B16T2</b>	<b>C16T2</b>	<b>D16T2</b>	<b>K16T2</b>	<b>Z16T2</b>	240	6
20	<b>B20T2</b>	<b>C20T2</b>	<b>D20T2</b>	<b>K20T2</b>	<b>Z20T2</b>	240	6
25	<b>B25T2</b>	<b>C25T2</b>	<b>D25T2</b>	<b>K25T2</b>	<b>Z25T2</b>	240	6
32	<b>B32T2</b>	<b>C32T2</b>	<b>D32T2</b>	<b>K32T2</b>	<b>Z32T2</b>	240	6
40	<b>B40T2</b>	<b>C40T2</b>	<b>D40T2</b>	<b>K40T2</b>		250	6
50	<b>B50T2</b>	<b>C50T2</b>	<b>D50T2</b>	<b>K50T2</b>		270	6
63	<b>B63T2</b>	<b>C63T2</b>	<b>D63T2</b>	<b>K63T2</b>		270	6



### 3-pole

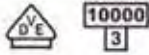
0,3		C0.3T3	D0.3T3	K0.3T3	Z0.3T3	360	4
0,5		<b>C0.5T3</b>	<b>D0.5T3</b>	<b>K0.5T3</b>	<b>Z0.5T3</b>	360	4
0,8		C0.8T3	D0.8T3	K0.8T3	Z0.8T3	360	4
1	B1T3	<b>C1T3</b>	<b>D1T3</b>	<b>K1T3</b>	<b>Z1T3</b>	360	4
1,6		C1.6T3	D1.6T3	K1.6T3	Z1.6T3	360	4
2	B2T3	<b>C2T3</b>	<b>D2T3</b>	<b>K2T3</b>	<b>Z2T3</b>	360	4
2,5		C2.5T3	D2.5T3	K2.5T3	Z2.5T3	360	4
3	B3T3	<b>C3T3</b>	<b>D3T3</b>	<b>K3T3</b>	<b>Z3T3</b>	360	4
3,5		C3.5T3	D3.5T3	K3.5T3	Z3.5T3	360	4
4	B4T3	<b>C4T3</b>	<b>D4T3</b>	<b>K4T3</b>	<b>Z4T3</b>	360	4
5	B5T3	C5T3	D5T3	K5T3	Z5T3	360	4
6	B6T3	<b>C6T3</b>	<b>D6T3</b>	<b>K6T3</b>	<b>Z6T3</b>	360	4
8		C8T3	D8T3	K8T3	Z8T3	360	4
10	<b>B10T3</b>	<b>C10T3</b>	<b>D10T3</b>	<b>K10T3</b>	<b>Z10T3</b>	360	4
13	<b>B13T3</b>	<b>C13T3</b>	<b>D13T3</b>	<b>K13T3</b>	<b>Z13T3</b>	360	4
16	<b>B16T3</b>	<b>C16T3</b>	<b>D16T3</b>	<b>K16T3</b>	<b>Z16T3</b>	360	4
20	<b>B20T3</b>	<b>C20T3</b>	<b>D20T3</b>	<b>K20T3</b>	<b>Z20T3</b>	360	4
25	<b>B25T3</b>	<b>C25T3</b>	<b>D25T3</b>	<b>K25T3</b>	<b>Z25T3</b>	360	4
32	<b>B32T3</b>	<b>C32T3</b>	<b>D32T3</b>	<b>K32T3</b>	<b>Z32T3</b>	360	4
40	<b>B40T3</b>	<b>C40T3</b>	<b>D40T3</b>	<b>K40T3</b>		375	4
50	<b>B50T3</b>	<b>C50T3</b>	<b>D50T3</b>	<b>K50T3</b>		405	4
63	<b>B63T3</b>	<b>C63T3</b>	<b>D63T3</b>	<b>K63T3</b>		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 <sub>n</sub> 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		<b>C0.5T9</b>	<b>D0.5T9</b>	K0.5T9		480	3
0,8		C0.8T9	D0.8T9	K0.8T9		480	3
1	B1T9	<b>C1T9</b>	<b>D1T9</b>	K1T9		480	3
1,6		C1.6T9	D1.6T9	K1.6T9		480	3
2	B2T9	<b>C2T9</b>	<b>D2T9</b>	K2T9		480	3
2,5		C2.5T9	D2.5T9	K2.5T9		480	3
3	B3T9	<b>C3T9</b>	<b>D3T9</b>	K3T9		480	3
3,5		C3.5T9	D3.5T9	K3.5T9		480	3
4	B4T9	<b>C4T9</b>	<b>D4T9</b>	K4T9		480	3
5	B5T9	C5T9	D5T9	K5T9		480	3
6	B6T9	<b>C6T9</b>	<b>D6T9</b>	K6T9		480	3
8		C8T9	D8T9	K8T9		480	3
10	<b>B10T9</b>	<b>C10T9</b>	<b>D10T9</b>	K10T9		480	3
13	<b>B13T9</b>	<b>C13T9</b>	<b>D13T9</b>	K13T9		480	3
16	<b>B16T9</b>	<b>C16T9</b>	<b>D16T9</b>	K16T9		480	3
20	<b>B20T9</b>	<b>C20T9</b>	<b>D20T9</b>	K20T9		480	3
25	<b>B25T9</b>	<b>C25T9</b>	<b>D25T9</b>	K25T9		480	3
32	<b>B32T9</b>	<b>C32T9</b>	<b>D32T9</b>	K32T9		480	3
40	<b>B40T9</b>	<b>C40T9</b>	<b>D40T9</b>	K40T9		500	3
50	<b>B50T9</b>	<b>C50T9</b>	<b>D50T9</b>	K50T9		540	3
63	<b>B63T9</b>	<b>C63T9</b>	<b>D63T9</b>	K63T9		540	3



### 4-pole

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

Module	Rated operating voltage	max. operating current at $I_n$ ( $t < 10ms$ )	Article no.	Weight g/each	Packing unit
1	12 V UC	1,3 A	<b>FL12</b>	105	5
1	24 V UC	0,6 A	<b>FL24</b>	105	5
1	48 - 72 V UC	0,2 A	<b>FL48</b>	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	<b>FL110</b>	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	<b>UL24</b>	150	5
1	110 V 50 Hz, 120 V 60 Hz	<b>UL110</b>	150	5
1	220-230 V 50 Hz, 240 V 60 Hz	<b>UL230</b>	150	5
1	380-400 V 50 Hz, 440 V 60 Hz	<b>UL400</b>	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	<b>HDS</b>	7	10



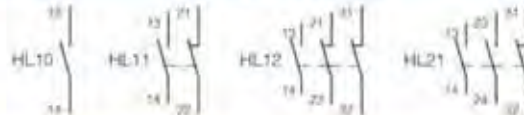
### Lock-off/Lock-on device

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



### Auxiliary contact

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



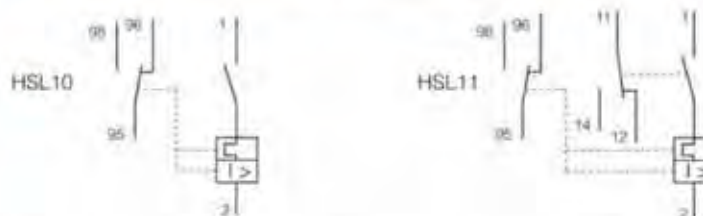
### Auxiliary contact

Module	Type of contact	Contacts	Article no.	Weight g/each	Packing unit
$\frac{1}{2}$	1 auxiliary contact	1 change-over	<b>HWL10</b>	40	20
$\frac{1}{2}$	2 auxiliary contacts	2 change-over	<b>HWL20</b>	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	<b>HSL11</b>	50	20
$\frac{1}{2}$	1 signal contact	1 change-over	<b>HSL10</b>	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		$I_{n e} 16 A$	
Rated operating currents $I_n$	Usage category AC-15	10 A / 230 V	4.8 A / 230 V
	Usage category AC-15	16 A / 110 V	9.6 A / 120 V
	Usage category DC-13	1 A / 250 V	1.6 A / 250 V
	Usage category DC-13	3 A / 125 V	2 A / 125 V
Minimum switching capacity		0.05 VA bei 6 V LIC	

## Busbars

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

Cross section (mm <sup>2</sup> )	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	50	<b>SB16010</b>	250	50	
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#### 1-phase 1-pole circuit breaker + auxiliary contact

24	80/150	37/1	<b>SDO.124</b>	200	50	
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#### 2-phase and 1-phase + N

10	63/100	20/2	<b>SB26010</b>	390	20	SB.A5
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#### 2-phase 2-pole circuit breaker + auxiliary contact

16	80/130	22/2	<b>SB26216</b>	310	20	SB.A2
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#### 3-phase

10	63/100	4/3	<b>SB31210</b>	84	25	SB.A1
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10	63/100	19/3	<b>SB36010</b>	420	20	SB.A1
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16	80/130	19/3	<b>SB36016</b>	675	20	SB.A2
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#### 3-phase 3-pole circuit breaker + auxiliary contact

16	80/130	16/3	<b>SB36316</b>	630	20	SB.A2
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#### 3-phase 1-pole circuit breaker + auxiliary contact

16	80/130	36/1	<b>SDO.316</b>	500	20	SB.A2
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#### 4-phase and 3-phase + N

16	80/130	14/4	<b>SB46016</b>	835	15	SB.A3
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### End caps for busbars

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