

**Description**

Single, double and three pole high performance thermal-magnetic circuit breakers with tease-free, trip-free, snap action mechanism and toggle actuation (S-type TM CBE to EN 60 934; also to EN 60 947). Designed for rail, panel or surface mounting. Available with a choice of characteristic curves and optional auxiliary contacts.

**Typical applications**

Motors, generators, transformers, thyristors and silicon rectifiers.

**Interrupting capacity to IEC 60947/EN 60947**

AC voltage					
Number of poles	Voltage rating	Interrupting capacity $I_N$	Power factor	Interrupting capacity $I_N$	Power factor
		$I_N$ 12...125 A		$I_N$ 7 + 10 A	
1	AC 240 V	5,000 A	$\cos\varphi = 0.7$	3,500 A	$\cos\varphi = 0.8$
2	AC 240 V	8,000 A	$\cos\varphi = 0.7$	6,000 A	$\cos\varphi = 0.7$
3	3 AC 415 V	5,000 A	$\cos\varphi = 0.7$	3,000 A	$\cos\varphi = 0.85$
DC voltage					
Number of poles	Voltage rating	Interrupting capacity $I_N$	Time constant	Interrupting capacity $I_N$	Time constant
		$I_N$ 12...125 A	$I_N$ 7 + 10 A		
1	DC 110 V	3,000 A	13 ms	3,000 A	L/R = 5 ms
1	DC 110 V	5,000 A	5 ms		
2	DC 110 V	5,000 A	13 ms	3,000 A	L/R = 5 ms
2	DC 110 V	10,000 A	≈ 0 ms		

**Standard current ratings and typical internal resistance values**

Curves 01, 02, 04, 05:		Curves B3, C3:	
Current rating (A)	Internal resistance ( $\Omega$ ) per pole	Current rating (A)	Internal resistance ( $\Omega$ ) per pole
10	0.033	7	0.033
16	0.015	10	0.015
20	0.010	12	0.015
25	0.0062	16	0.010
32	0.0039	20	0.0062
40	0.0031	25	0.0039
50	0.0022	32	0.0031
63	≤ 0.002	40	0.0022
80	≤ 0.002	50	≤ 0.002
90	≤ 0.002	63	≤ 0.002
100	≤ 0.002	80	≤ 0.002
125	≤ 0.002	100	≤ 0.002

**Approvals**

Authority	Standard	Rated voltage	Current ratings
UL	UL 1077 C22.2 No 235	AC 277 V	7...125 A (type 520)



**Technical data**

Voltage rating	AC 240 V; 3 AC 415 V; 3 AC 500 V DC 110 V
Current rating range	curves 01, 02, 04, 05: 10...125 A (EN 60947) curves B3, C3, 01: 7...100 A (EN 60898)
Auxiliary circuit	6 A, AC 240 V or DC 28 V 1 A, DC 110 V
Typical life	10,000 operations at 1 x $I_N$ 20,000 operations mechanical
Ambient temperature	-40...+60 °C (-40...+140 °F)
Insulation co-ordination (IEC 60664 and 60664A)	rated impulse withstand voltage 6 kV pollution degree 3
Dielectric strength (IEC 60664 and 60664A)	test voltage AC 3,300 V operating area pole/pole AC 3,300 V main circuit/aux.circuit AC 2,200 V aux. circuit 11-12/13-14 AC 1,000 V
Insulation resistance	> 100 M $\Omega$ (DC 500 V)
Degree of protection (IEC 60529/DIN 40050)	operating area IP40 terminal area IP00
Vibration	curves 02, 04, 05, B3, C3: 4 g (60-500 Hz), ± 0.30 mm (10-60 Hz) curve 01: 3 g (60-500 Hz), ± 0.23 mm (10-60 Hz) to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock	curves 02, 04, 05, B3, C3: 50 g (11 ms) directions 1, 2, 3, 4, 5 30 g in direction 6 curve 01: 30 g (11 ms) in directions 1, 2, 3, 4, 5 20 g in direction 6 to IEC 60068-2-7, test Ea
Corrosion	96 hours at 5 % salt mist, to IEC 60068-2-11, test Ka
Humidity	240 hours at 95 % RH to IEC 60068-2-3, test Ca
Mass	410 (1-pole): approx. 290 g 520 (2-pole): approx. 580 g 530 (3-pole): approx. 870 g

**Ordering information**

**Type No.**

- 410** single pole (ratings > 125 A: suffix 17015 - parallel connection)
- 520** double pole
- 530** three pole

**Terminal design - main terminals**

**K** screw terminals

- 10-32 A pressure plate B5-DIN 46288 (curves B3/C3, 7-25 A)
- 40-63 A pressure plate B6-DIN 46288 (curves B3/C3, 32-63 A)
- 80-125 A terminal screw DIN 46206, sheet 2, form 1, M6 thread

**Mounting**

- 1** surface mounting
- 2** rail mounting (DIN EN 50022-35x7.5) or panel mounting
- 4** panel mounting with cylinder head screw M3.5

**Magnetic trip curves**

- 01** 2.1-3 x I<sub>N</sub> AC (thyristor and rectifier protection)
- 02** 7-10 x I<sub>N</sub> AC (motor and generator protection to EN 60947)
- 04** 3.5-5 x I<sub>N</sub> AC (cable protection to EN 60947)
- 05** 4-6 x I<sub>N</sub> AC (generator protection to EN 60947)
- B3** 3-5 x I<sub>N</sub> AC (cable protection to EN 60898)
- C3** 5-10 x I<sub>N</sub> AC (cable protection to EN 60898)

**Auxiliary contacts optional (terminals M3.5)**

- Si** one each N/O and N/C contact
- Si1** one N/C (11,12)

**Current ratings**

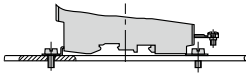
**7...125 A**

**520 - K - 1 - 01 - ... - 10 A** ordering example

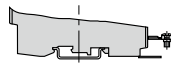
The exact number required can be built up from the table of choices shown above. Ordering references for optional features should be omitted if not required.

**Mounting methods**

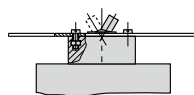
Surface mounting  
-1



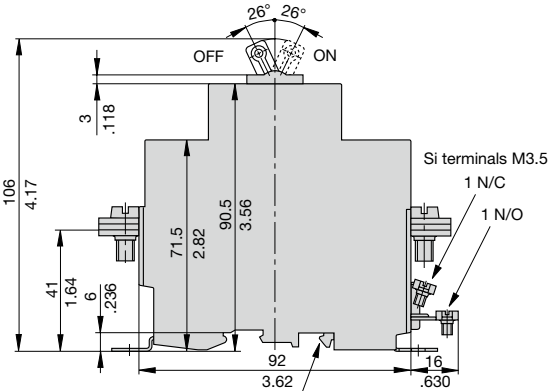
rail mounting  
(DIN EN 50 022-35x7,5)  
-2



panel mounting  
-4

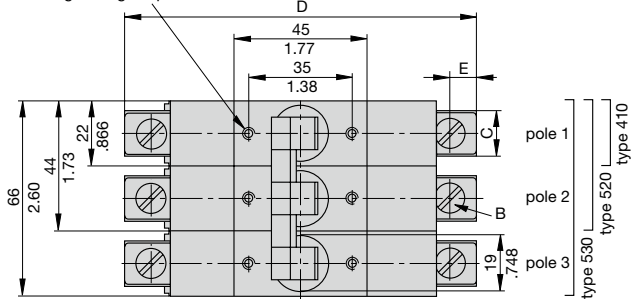


**Dimensions**

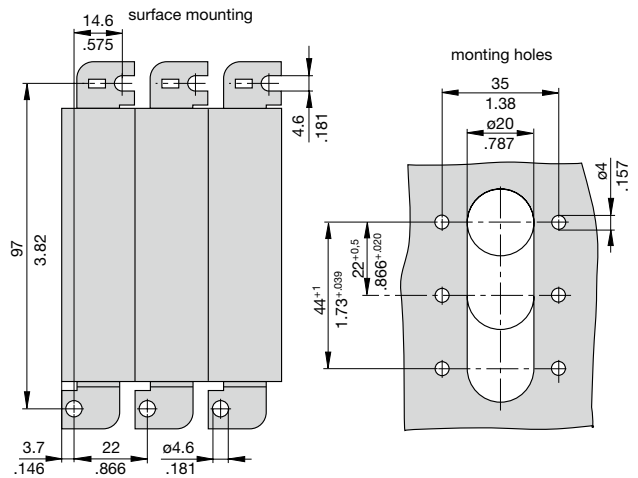


symmetrical rail DIN EN 50022-35x7.5  
G profile rail DIN EN 50035-G32 (not shown)

M3.5 - thread max. 9 mm (.354 in.) deep  
tightening torque max. 0.8 N



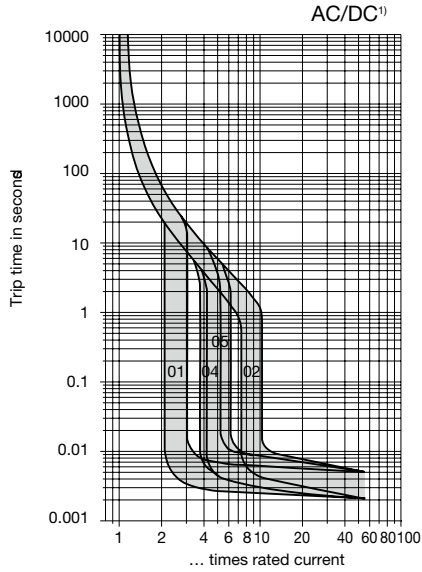
Current rating	Dimensions mm/in.				Terminal	Cross section (see DIN 46288)		Max. tightening torque
	B	C	D	E		with 1 or 2 equal conductors	with 2 different conductors	
≤ 32 A	M5 .512	13 .512	114 4.49	7 .276	pressure plate B5 DIN 46288	2.5 mm <sup>2</sup> to 10 mm <sup>2</sup>	2.5 mm <sup>2</sup> to 10 mm <sup>2</sup>	2.0 Nm
≤ 63 A	M6 .606	15.4 .606	120 4.72	9 .354	pressure plate B6 DIN 46288	4 mm <sup>2</sup> to 16 mm <sup>2</sup>	4 mm <sup>2</sup> and 6 mm <sup>2</sup> or 6 mm <sup>2</sup> to 16 mm <sup>2</sup>	2.5 Nm
≤ 125 A	M6 .606	15.4 .606	120 4.72	9 .354	terminal screw			2.5 Nm



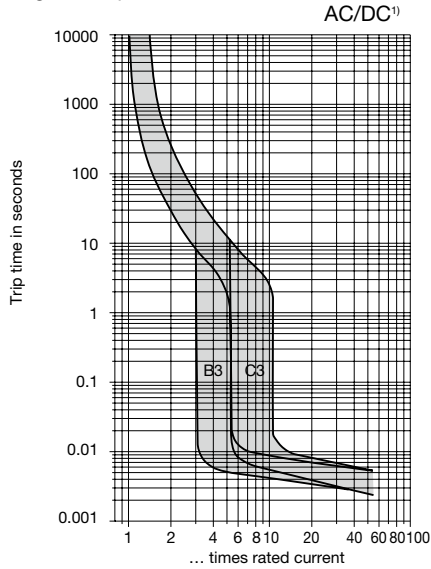
This is a metric design and millimeter dimensions take precedence (mm/inch)

**Typical time/current characteristics at +23 °C/+73.4 °F**

Magnetic trip curves 01,02,04,05



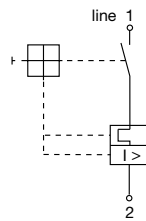
Magnetic trip curves B3,C3



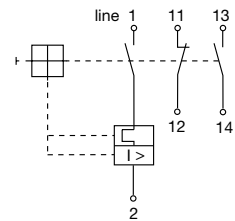
<sup>1)</sup> Magnetic tripping currents are increased by 20% on DC supplies.

**Internal connection diagrams**

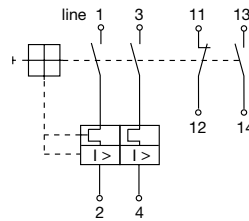
**Type 410-K**



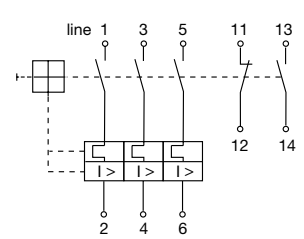
**Type 410-K-Si**



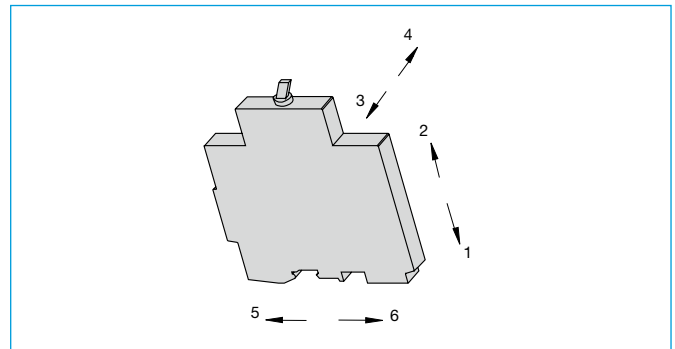
**Type 520-K-Si**



**Type 530-K-Si**



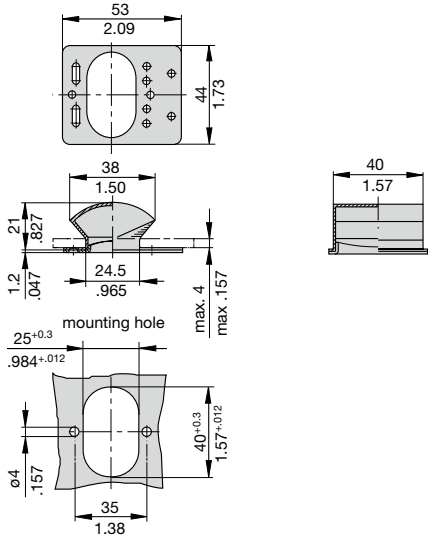
**Shock directions**



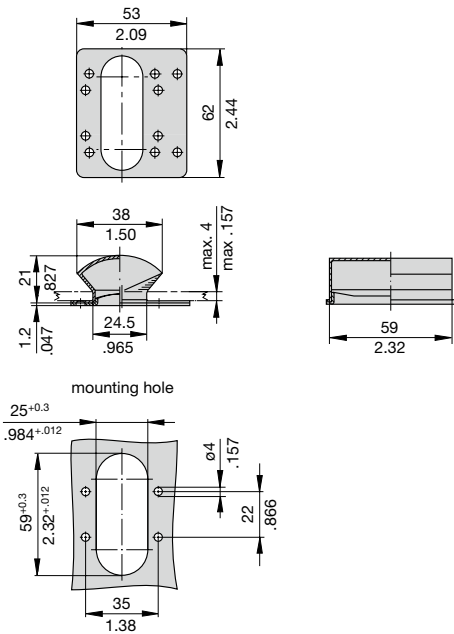
1

**Accessories**

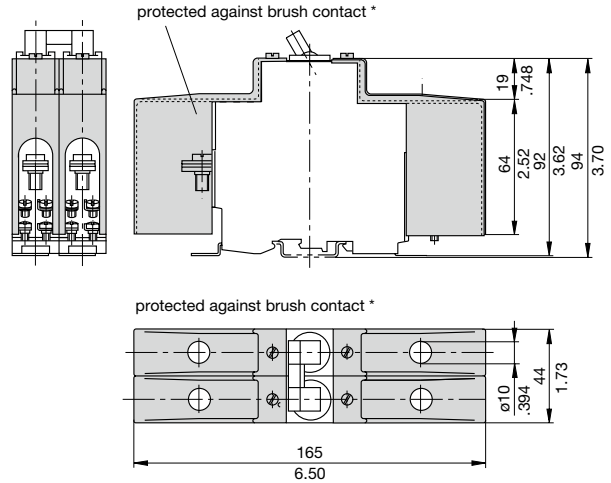
**Splash cover (transparent),  
with fixing plate and screws (IP54)  
for type 410  
X 211 118 01**



**Splash cover (transparent),  
with fixing plate and screws (IP54)  
for type 520  
X 211 119 01**



**Terminal insulation cover for 410/520/530-...  
X 211 705 01  
(1 set = 2 pcs per pole)**



\* to DIN 57106T100/VDE 0106 T100

This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.