

E-T-A® Thermal Overcurrent Circuit Breakers 104/105/106-...

Description

Miniaturised single pole thermal circuit breaker with push-to-reset tease free, trip-free, snap action mechanism (R-type TO CBE to EN 60934). Available in versions for PCB or panel mounting, snap-in or threadneck, or as an integral type. Approved to CBE standard EN 60934 (IEC 934). For higher current ratings see type 1140.

Typical applications

Motors, transformers, solenoids, printed circuit boards, hand-held machines and appliances.

Ordering information

Type No.	
104	PCB mounting type (-PR), or integral type (-P30/P10)
105	snap-in panel mounting
106	threadneck panel mounting with hex and knurled nut *
106-M1	threadneck mounting for standard fuseholder cutout *
Terminal design	
P10	blade terminals A6.3-0.8
P30	blade terminals A2.8-0.8
PR	solder terminal pins for PCB mounting (type 104 only)
Shunt terminal (optional)	
A3	same as main terminals (up to I_N 6 A/3 A max. load)
Auxiliary contacts (optional)	
Si51	type 104 only
Current ratings	
0.05...10 A	

106 - P30 - [] - [] - 5 A = ordering example

The exact part 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 hardware bulk shipped

Please enquire for packaging quantities

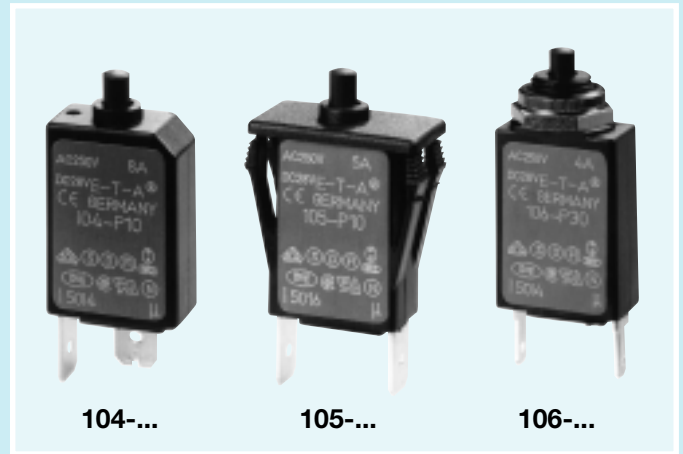
Standard current ratings and typical internal resistance values

Current rating (A)	Internal resistance (Ω)	Current rating (A)	Internal resistance (Ω)
0.05	285	1.8	0.28
0.08	134	2	0.25
0.1	81	2.5	0.18
0.2	22	3	0.11
0.3	8.7	3.5	0.076
0.4	5.5	4	0.067
0.5	3.3	4.5	0.051
0.6	2.45	5	≤ 0.05
0.7	1.6	6	≤ 0.05
0.8	1.45	7	≤ 0.05
1	0.9	8	≤ 0.05
1.2	0.6	10	≤ 0.05
1.5	0.4		

Approvals

Authority	Voltage ratings	Current ratings
VDE (EN 60934), SEV	AC 240 V	0.05...8 A
	DC 48 V	0.05...10 A
Demko	AC 250 V, DC 28 V	0.05...10 A
CSA, UL	AC 250 V, DC 48 V	0.05...10 A
Semko	AC 250 V, DC 48 V	0.1...10 A
Kema (EN 60934)	AC 240 V	0.05...8 A
	DC 48 V	0.05...10 A

Circuit breakers with -Si51 not approved

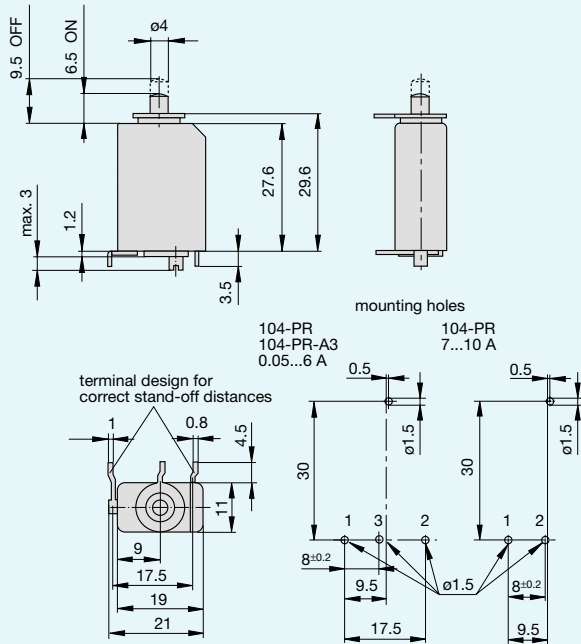


Technical data

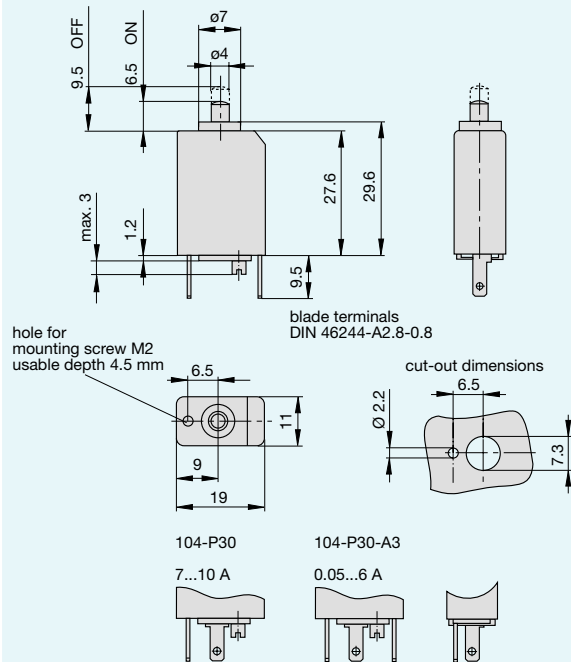
Voltage rating	AC 240 V; DC 48 V		
Current ratings	0.05...10 A		
Auxiliary circuit	0.5 A, AC 240 V, DC 28 V		
Typical life	0.05...5 A:	3,000 operations at $2 \times I_N$	
	6...8 A:	500 operations at $2 \times I_N$	
	10 A:	50 operations at $2 \times I_N$	
Ambient temperature	-20...+60 °C (T 60)		
Insulation co-ordination (IEC 664 and 664 A)	Rated impulse withstand voltage	Pollution degree	
	2.5 kV	2	
	reinforced insulation in operating area		
Dielectric strength (IEC 664 and 664A) operating area	Test voltage		
	AC 3,000 V		
Insulation resistance	>100 M Ω (DC 500 V)		
Interrupting capacity I_{cn}	0.05 ... 2 A	6 x I_N	
	2.5 ...10 A	5 x I_N	
Interrupting capacity (UL 1077)	I_N	U_N	
	0.05...4.5 A	AC 250 V	200 A
	5 A	AC 250 V	1000 A
	6...10 A	AC 250 V	2000 A
	0.05...10 A	DC 48 V	200 A
Degree of protection (IEC 529/DIN 40050)	operating area	IP 40	
	terminal area	IP 00	
Vibration	10 g (57-500 Hz), ± 0.76 mm (10-57 Hz), to IEC 68-2-6, test Fc, 10 frequency cycles/axis		
Shock	25 g (11 ms) to IEC 68-2-27, test Ea		
Corrosion	96 hours at 5 % salt mist, to IEC 68-2-11, test Ka		
Humidity	240 hours at 95 % RH, to IEC 68-2-3, test Ca		
Mass	approx. 10 g		

Dimensions

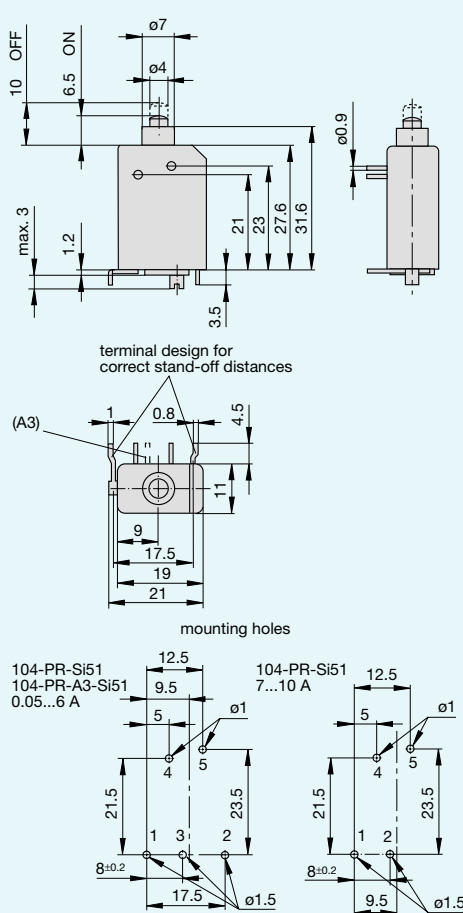
104-PR



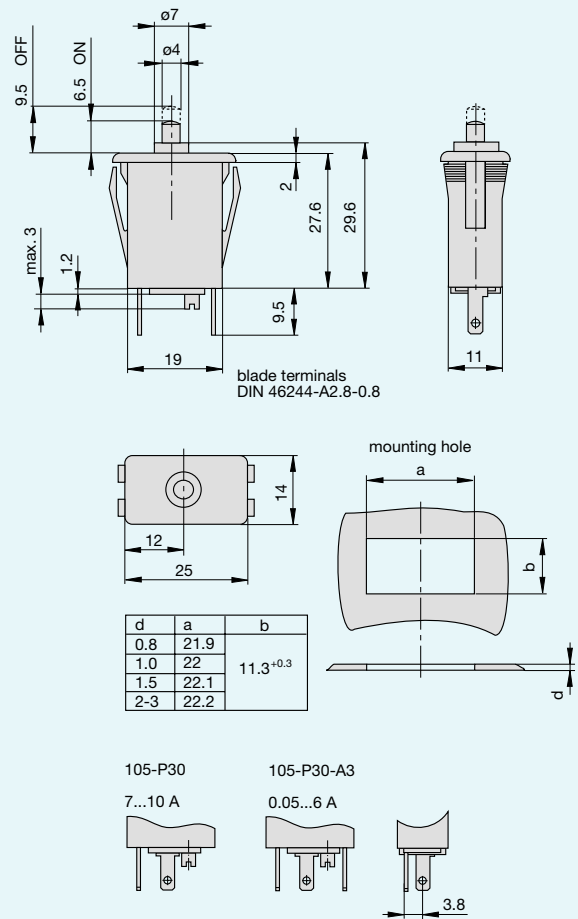
104-P30



104-PR-(A3)-Si51

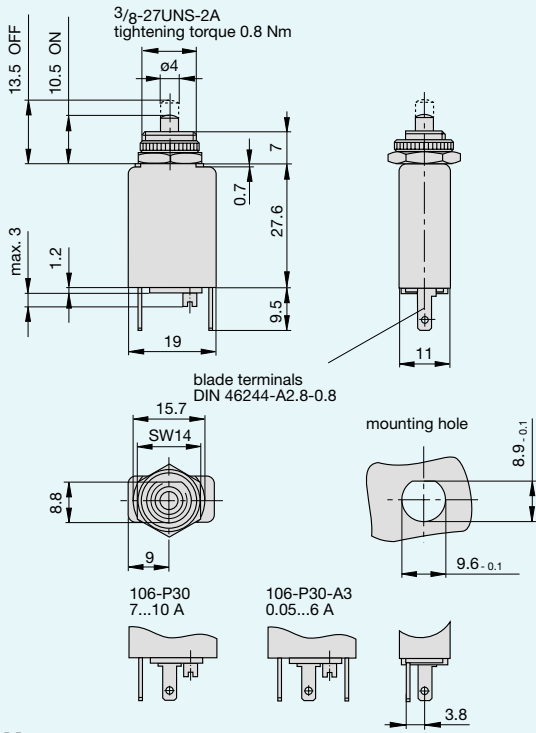


105-P30

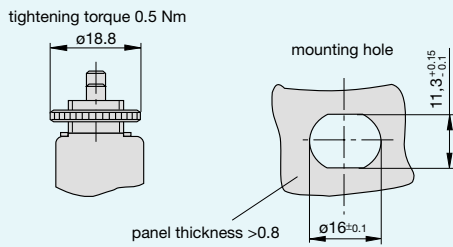


Dimensions

106-P30

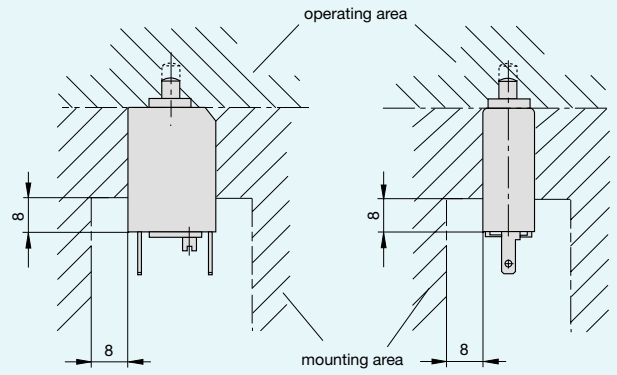


106-M1

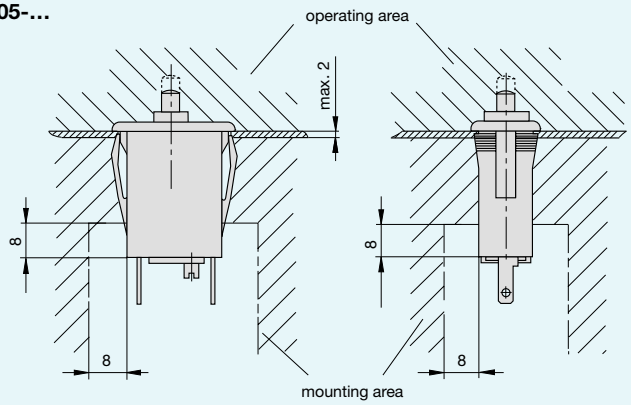


Installation drawings

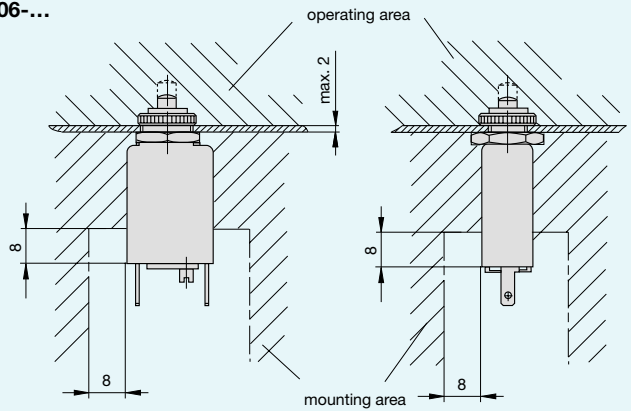
104-...



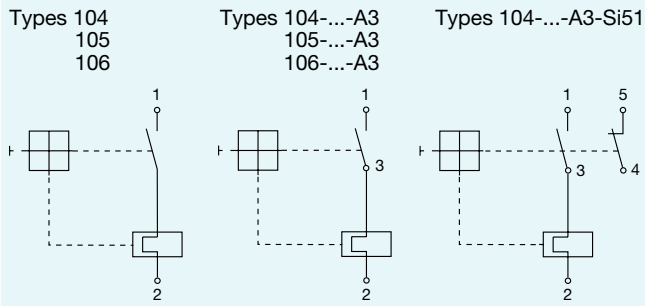
105-...



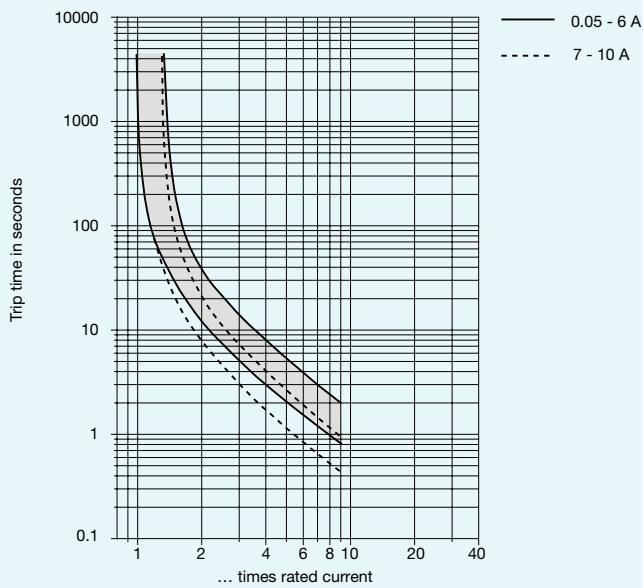
106-...



Internal connection diagrams



Typical time/current characteristics at +23 °C



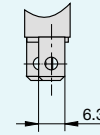
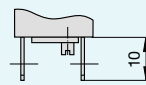
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 – Technical information.

Ambient temperature °C	-20	-10	0	+23	+40	+50	+60
Multiplication factor	0.76	0.84	0.92	1	1.08	1.16	1.24

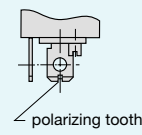
Terminal design

104/105/106-P10

0.05...6 A

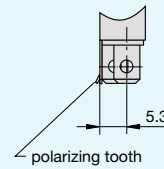


7...10 A



104/105/106-P10-A3

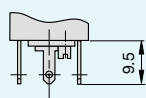
0.05...6 A



blade terminals
DIN 46244-A6.3-0.8

104/105/106-P30-A3

0.05...6 A

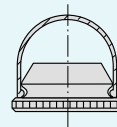


Accessories

Water splash cover (transparent)/knurled nut assembly (type 106-... only)

X 201 285 01

Degree of protection IP 64



E-T-A® Thermal Overcurrent Circuit Breaker 1658-...

Description

Very cost effective design to meet international requirements. No exposed metal parts which are, or could become, current-carrying except for terminals. R-type TO CBE to EN 60934.

- Manual reset, trip free mechanism
- Extremely small and lightweight
- UL, CSA, VDE and EN 60934 (IEC 934) approved

Typical applications

Battery chargers, consumer products, power supplies, motors.

Ordering information

Type No.	
1658	single pole thermal circuit breaker
Threadneck design	
G21	manual reset type, 3/8"-27 threadneck
G41	manual reset type, 7/16"-28 threadneck
A21	auto reset type, 3/8"-27 threadneck
A41	auto reset type, 7/16"-28 threadneck
A00	auto reset type, without threadneck
Hardware	
00	no hardware
01	one mounting nut, bulk
02	one mounting nut, one knurled nut, bulk
06	one knurled nut, bulk
07	one hex nut, bulk
08	two hex nuts, bulk
Terminals	
P10	blade terminals A6.3-0.8
P13	blade terminals A6.3-0.8, 90°
S80	straight screw terminals*
S83	90° bent screw terminals*
Current ratings	
5 ... 25 A	

1658 - G21 - 02 - P10 - 5 A Ordering example

* Screws and lock washers bulk shipped

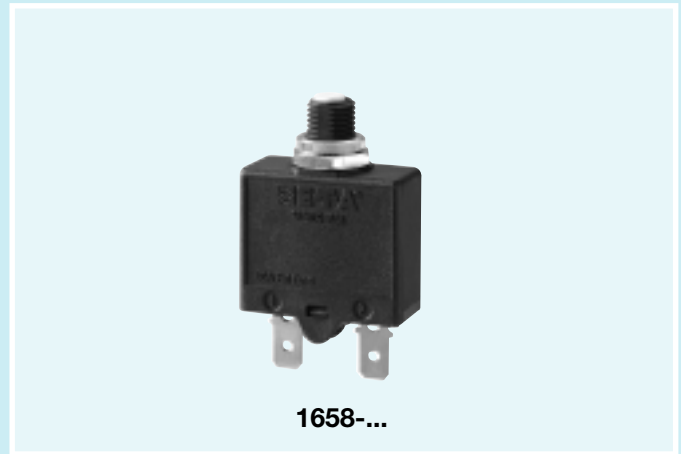
Please enquire for packaging quantities.

Standard current ratings and typical voltage drop values

Current rating (A)	Voltage drop (mV)	Current rating (A)	Voltage drop (mV)
5	≤ 150	10	≤ 140
6	≤ 150	12	≤ 140
7	≤ 150	15	≤ 240
8	≤ 150	20	≤ 240
9	≤ 150	25	≤ 240

Approvals

Authority	Voltage rating	Current ratings	
VDE (EN 60934)	AC 240 V; DC 28 V	5...25 A	
UL, CSA	AC 250 V	5...15 A	1658-G...
	AC 125 V	16...25 A	1658-G...
	AC 125 V	5...25 A	1658-A...

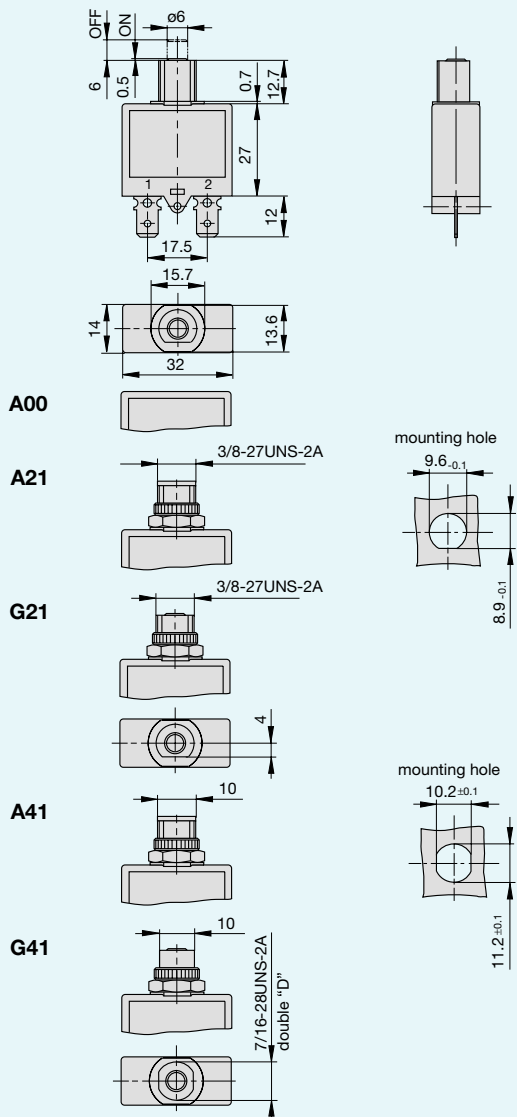


Technical data

Voltage rating	AC 240 V; DC 28 V		
Current ratings	5...25 A		
Typical life	1,000 operations at 2 x I _N		
Ambient temperature	-20...+60 °C		
Insulation co-ordination (IEC 664 and 664 A)	Rated impulse withstand voltage	Pollution degree	
	2.5 kV	2	
reinforced insulation in operating area			
Dielectric strength (IEC 664 and 664A) operating area	Test voltage		
	AC 3,000 V		
Insulation resistance	> 100 MΩ (DC 500 V)		
Interrupting capacity I _{en}	200 A		
Interrupting capacity (UL 1077/EN 60934 PC1)	I _N	U _N	
	5...15 A	AC 250 V	2,000 A
	16...25 A	AC 125 V	2,000 A
Degree of protection (IEC 529/DIN 40050)	operating area IP 40 terminal area IP 00		
Vibration	8 g (57-500 Hz) ±0.61 mm (10-57 Hz), to IEC 68-2-6, Test Fc, 10 frequency cycles/axis		
Shock	30 g (11 ms) to IEC 68-2-27, test Ea		
Corrosion	96 hours at 5 % salt mist, to IEC 68-2-11, test Ka		
Humidity	240 hours at 95 % RH to IEC 68-2-3, test Ca		
Mass	approx. 16 g		

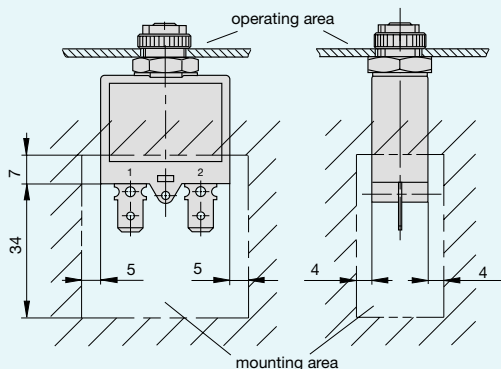
E-T-A® Thermal Overcurrent Circuit Breaker 1658-...

Dimensions

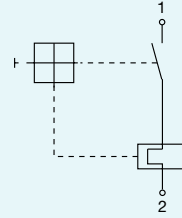


See ordering information for mounting hardware

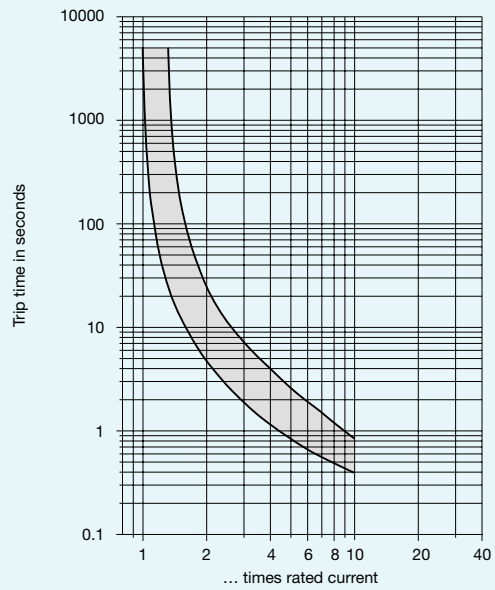
Installation drawing



Internal connection diagram



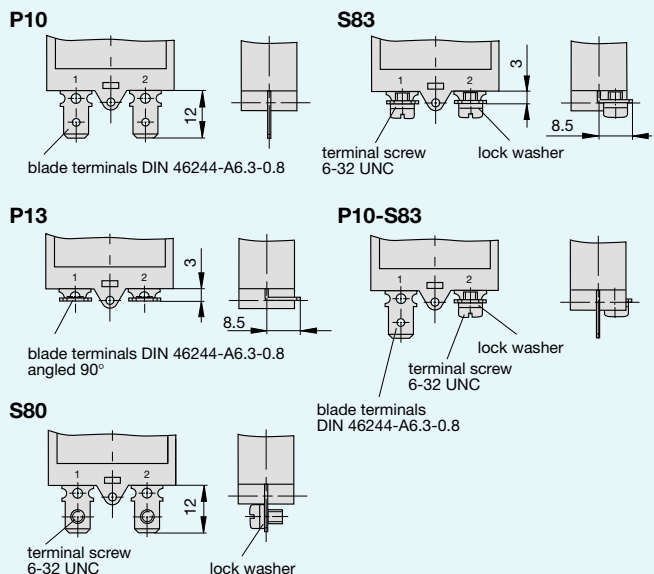
Typical time/current characteristics at +23°C



The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 - Technical information.

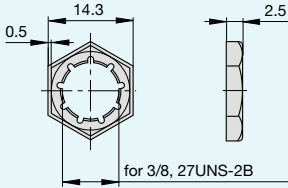
Ambient temperature °C	-20	-10	0	+23	+40	+50	+60
Multiplication factor	0.62	0.7	0.8	1	1.18	1.30	1.50

Terminal design

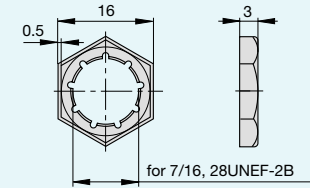


Accessories

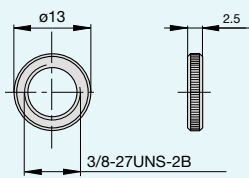
Mounting nut 3/8", 27-thread
Y 306 671 01



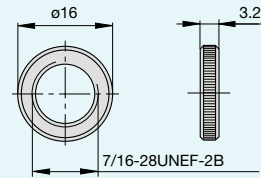
Mounting nut 7/16", 28-thread
Y 303 200 01



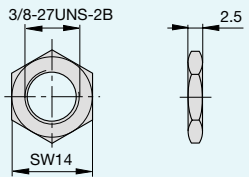
**Knurled nut 3/8", 27-thread
nickel-plated brass**
Y 300 190 03



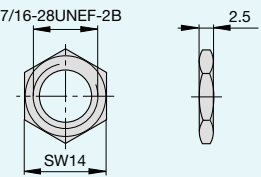
**Knurled nut 7/16", 28-thread
nickel-plated brass**
Y 302 294 03



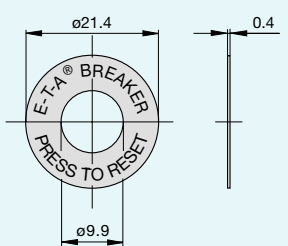
**Hex nut 3/8", 27-thread
nickel-plated brass**
Y 300 192 01



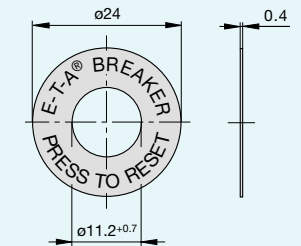
**Hex nut 7/16", 28-thread
nickel-plated brass**
Y 302 295 01



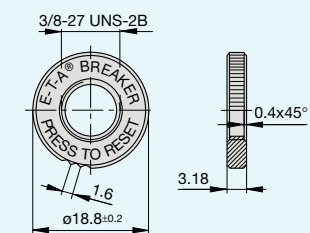
**Press to Reset Plate for 3/8",
27-thread, aluminium**
Y 301 059 02



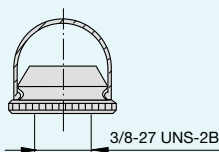
**Press to Reset Plate for 7/16",
28-thread, aluminium**
Y 302 732 01



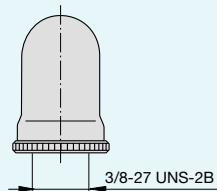
**Press to Reset Plate for 3/8", 27-thread
plastic**
Y 303 051 01



**Reset button seal for 3/8", 27-thread
short**
X 201 285 01



**Reset button seal for 3/8", 27-thread
long**
X 200 799 01



Version with 7/16", 28-thread to special order