E-T-A 104/105/106-... Thermal circuit breakers

Description

Single pole thermal circuit breaker in miniaturised design. A positively trip-free snap action mechanism ensures a reliable switching behaviour. They meet the requirements of the circuit breaker standard EN 60934 (IEC 60934): R-Type, TO. For higher current ratings in a similar design please see our 1140 version. The 106 version combined with a C14 appliance inlet is also available as a ready-for-use power entry module (optionally with or without line filter).

Typical applications

Hand tools, domestic appliances, overcurrent protection of PCB conductor paths, marine vehicles, mobile homes

104-... 105-... 106-...

Approvals

Approval authority	Standard	Rated voltage	Current rating range
VDE	EN 60934	AC 240 V DC 48 V	0.05 A ... 8 A 0.05 A ... 10 A
UL	UL1077	AC 250 V DC 48 V	0.05 A...10 A 0.05 A...10 A
CSA	C22.2 No 235	AC 250 V DC 48 V	0.05 A...10 A 0.05 A...10 A
CQC	GB 17701	AC 240 V DC 48 V	0.05 A...8 A 0.05 A...10 A

Compliance

CE UKCA RoHS REACH

Preferred types

Preferred types	Preferred ratings (A)											
	0.5	0.8	1	1.2	1.5	2	3	4	5	6	8	10
106-P10-	x	x	x	x	x	x	x	x	x	x	x	x
106-P30-	x	x	x	x	x	x	x	x	x	x	x	x

Technical data

For detailed technical information please see www.e-t-a.de/ti_en

Rated voltage		AC 240 V, DC 48 V
Current rating range		0.05 ... 10 A
Typical life	**0.05 ... 5 A**	1,000 cycles at 2 x I_N, inductive DC 28 V: 3,000 cycles at 2 x I_N, inductive
	6 ... 8 A	500 cycles at 2 x I_N, inductive
	10 A	50 cycles at 2 x I_N, inductive
Ambient temperature		-20 ... 60 °C (T 60)
Insulation coordination (IEC 60664)		2.5 kV /2 reinforced insulation at operating area
Dielectric strength		**Actuating area** Test voltage AC 3,000 V
Insulation resistance		> 100 MΩ (DC 500 V)
Interrupting capacity I_{cn}		0.05 ... 8 A: 6 x I_N (AC) 0.05 ... 10 A: 6 x I_N (DC)

Rupture capacity (UL 1077)	I_N	U_N	S.C.
	0.05 ... 10 A	AC 250 V	2000 A, C1
	0.05 ... 10 A	DC 48 V	200 A, C1

Degree of protection (IEC 60529)	Operating area IP40 IP00 terminal area
Vibration	10 g (57-500 Hz), ± 0.76 mm (10-57 Hz), Test to IEC 60068-2-6, test Fc 10 frequency cycles/axis
Shock resistance	25 g (11 ms) Test to IEC 60068-2-27, test Ea
Corrosion	96 hours at 5 % salt mist, Test to IEC 60068-2-11, test Ka
Humidity	240 hrs 95 % RH, test acc. to IEC 60068-2-78, Test Cab
Mass	approx. 10 g

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Ordering number code

Type No.		
104		PCB mounting type (-PR) or mounting type (-P30/-P10)
105		Snap-in panel mounting
106		Threadneck mounting with screw-in hexagonal and plastic knurled nut(1)
106-M2		Threadneck mounting with large lug and screw-in hexagonal and plastic knurled nut
	Terminal design	
	P10	Blade terminal 6.3 x 0.8 mm (IEC 61210)
	P30	Blade terminal 2.8 x 0.8 mm (IEC 61210)
	PR	PR Soldering pins for horizontal PCB mounting (104 version only)
	PR3	PR3 Soldering pins for vertical PCB mounting (104 version only)
		Current rating range
		0.05 ... 10 A
106 -	P30 -	5 A Ordering example

(1) Use this version for configuration with XR38 power entry module

Please observe our minimum ordering quantities.

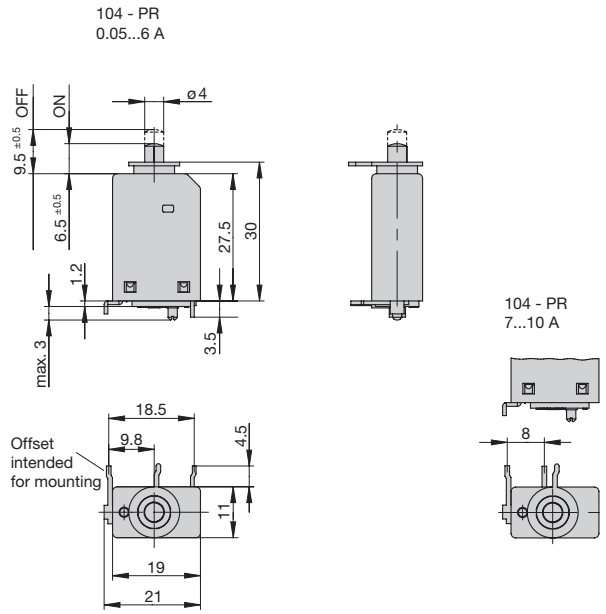
Current ratings and internal resistance values

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		

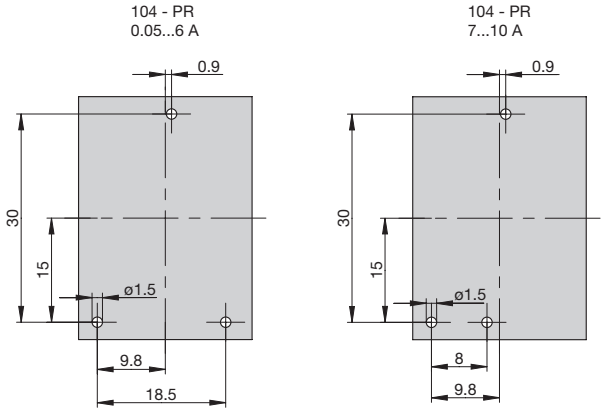
Dimensions

104-PR

Dimensions



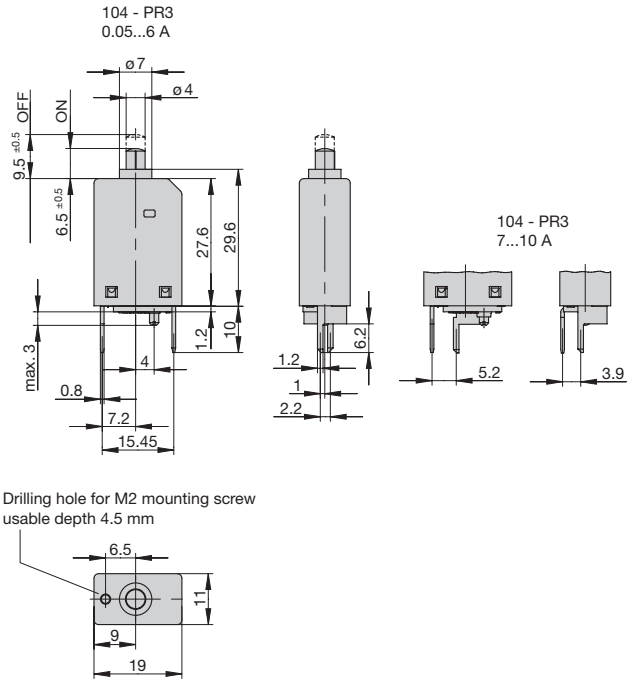
PCB drilling hole diagram



Dimensions

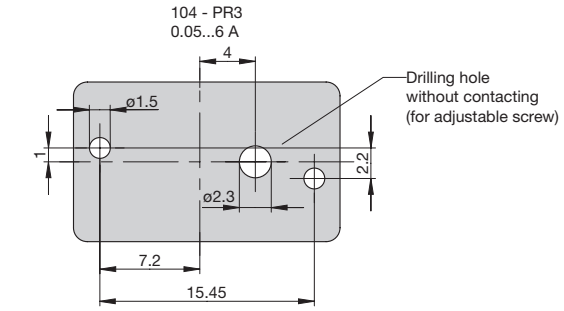
104-PR3

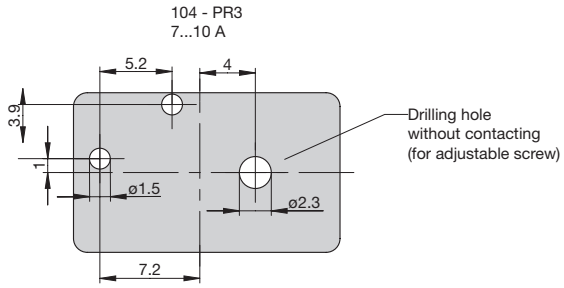
Dimensions



Drilling hole for M2 mounting screw
usable depth 4.5 mm

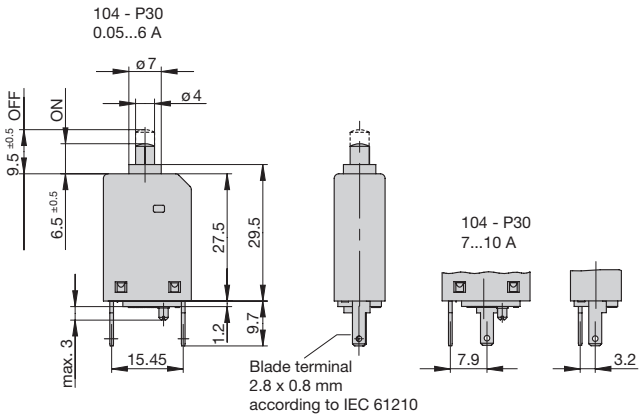
PCB drilling hole diagram



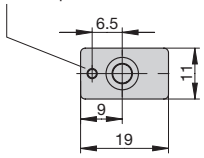


Dimensions

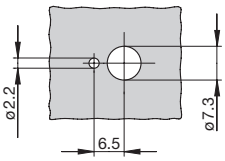
104-P30



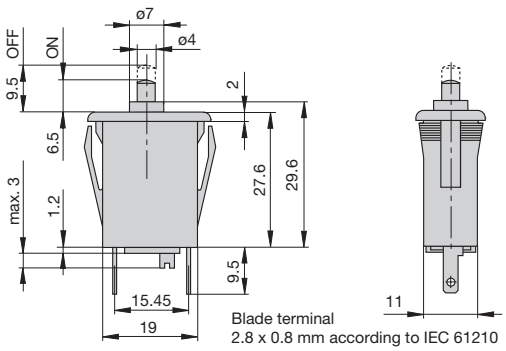
Drilling hole for M2 mounting screw
usable depth 4.5 mm

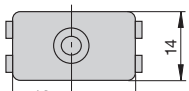


Installation dimensions



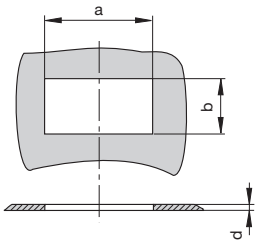
105-P30



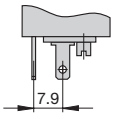


d	a	b
0.8	21.9	$11.3^{+0.3}$
1.0	22	
1.5	22.1	
2-3	22.2	

Cut-out dimensions

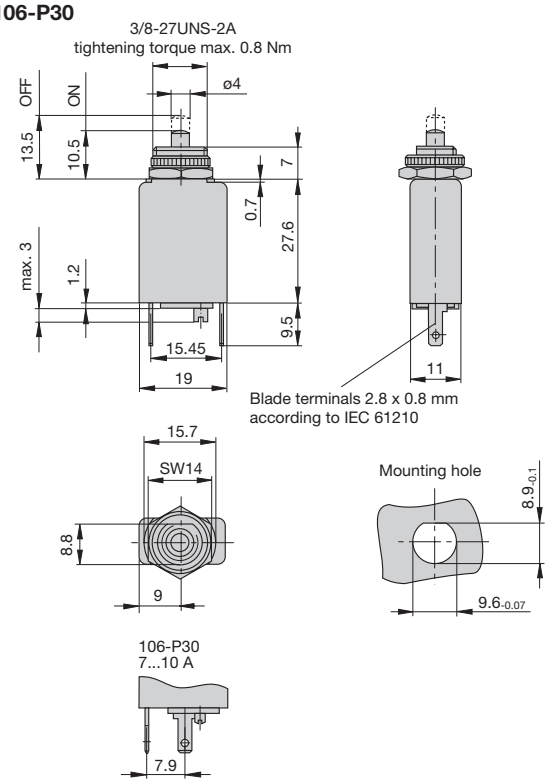


105-P30
7...10 A

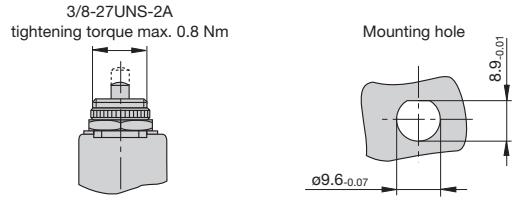


Dimensions

106-P30

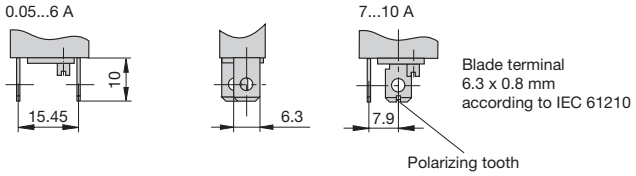


106-M2



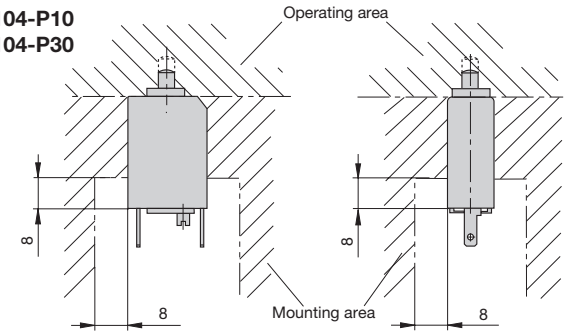
Terminal types

104/105/106-P10

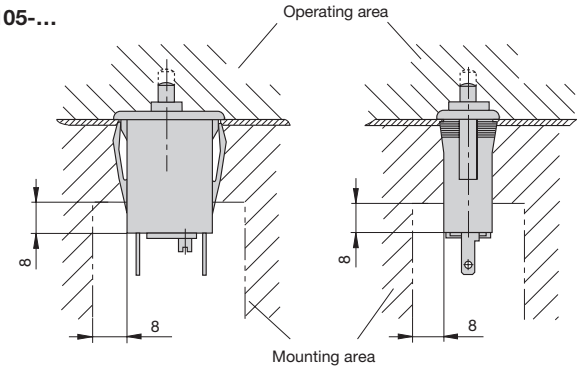


Installation drawing

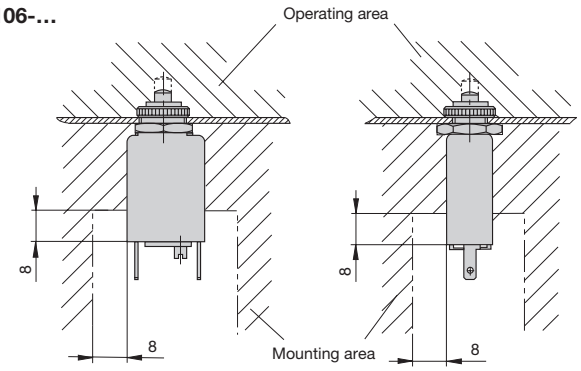
104-P10
104-P30



105-...

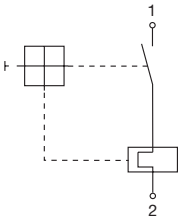


106-...



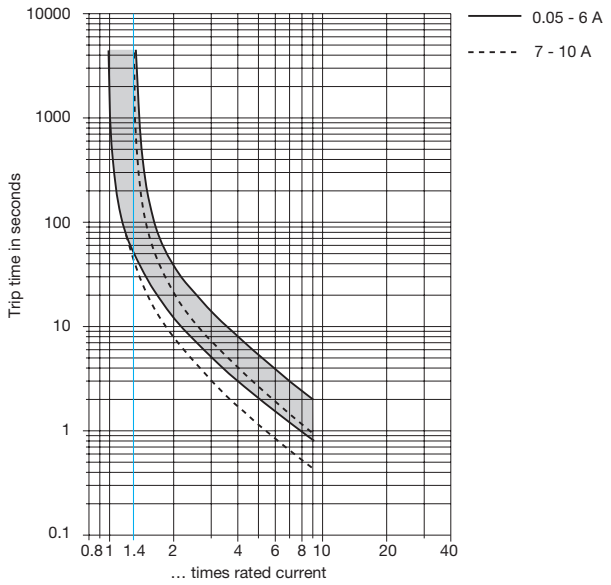
Schematic diagrams

Types 104
105
106



Time/current characteristics

Ambient temperature 23 °C

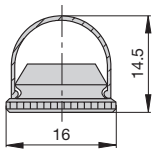


The time/current characteristic depends on the ambient temperature. In order to eliminate nuisance tripping, please multiply the current rating with a temperature factor (see Technical Information chapter)

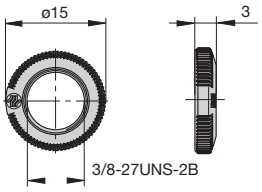
Ambient temperature [°C]	-20	-10	0	+23	+40	+50	+60
Temperature factor	0.76	0.84	0.92	1	1.08	1.16	1.24

Accessories

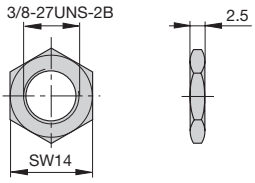
Water splash cover (transparent)/ knurled nut assembly (type 106-... only)
X 201 285 01 (IP64)



Knurled nut 3/8", plastic (standard)
Y 307 117 02



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



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