

# 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

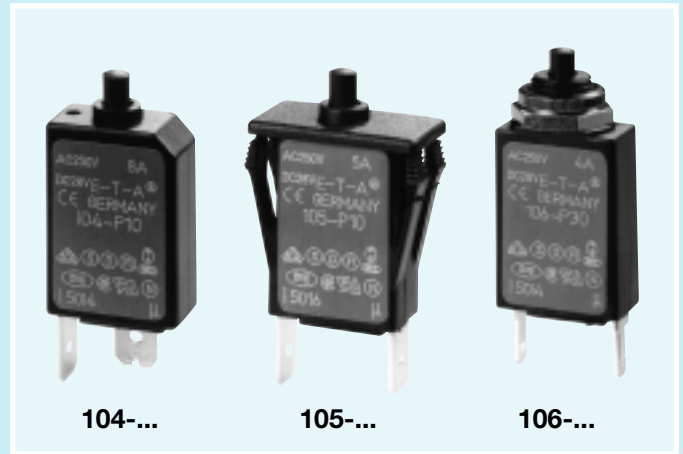
## Standard current ratings and typical internal resistance values

| Current rating (A) | Internal resistance ( $\Omega$ ) | Current rating (A) | Internal resistance ( $\Omega$ ) |
|--------------------|----------------------------------|--------------------|----------------------------------|
| 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                  | $\leq 0.05$                      |
| 0.7                | 1.6                              | 6                  | $\leq 0.05$                      |
| 0.8                | 1.45                             | 7                  | $\leq 0.05$                      |
| 1                  | 0.9                              | 8                  | $\leq 0.05$                      |
| 1.2                | 0.6                              | 10                 | $\leq 0.05$                      |
| 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

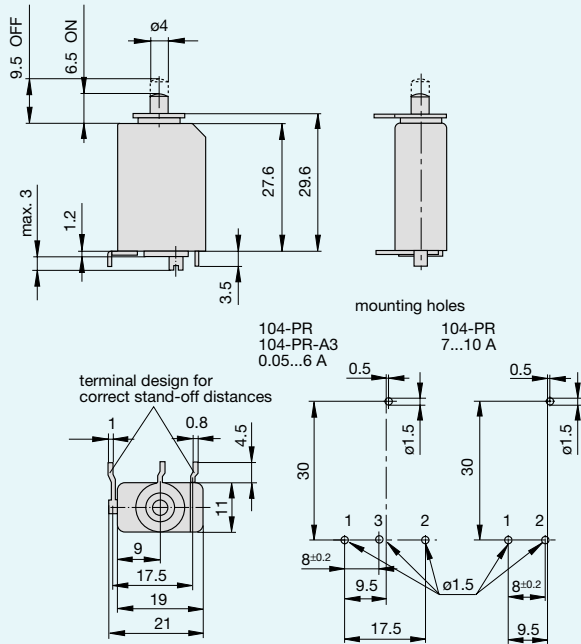


## Technical data

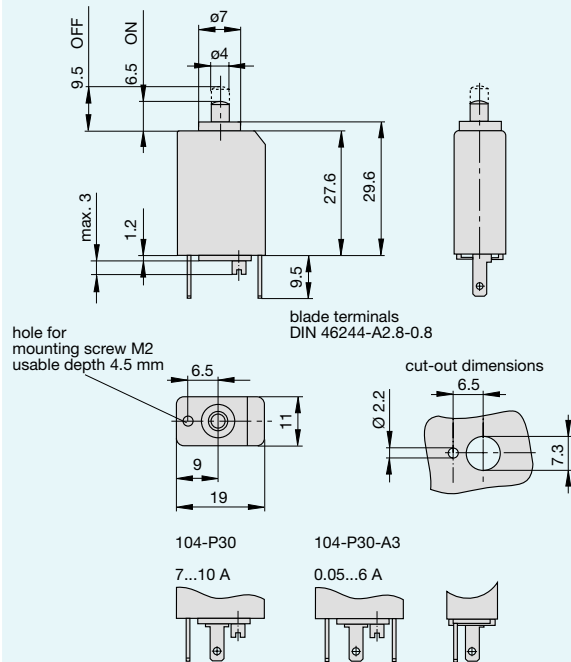
|   |  |   |        |
|---|--|---|--------|
| Voltage rating  | AC 240 V; DC 48 V  |   |        |
| Current ratings                                       | 0.05...10 A  |   |        |
| Auxiliary circuit                                     | 0.5 A, AC 240 V, DC 28 V   |   |        |
| Typical life  | 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                      |        |
|   | 2.5 kV   | reinforced insulation in operating area |        |
|   |  |   |        |
| Dielectric strength (IEC 664 and 664A) operating area | Test voltage   |   |        |
|   | AC 3,000 V   |   |        |
| Insulation resistance                                 | >100 M $\Omega$ (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), $\pm 0.76$ 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

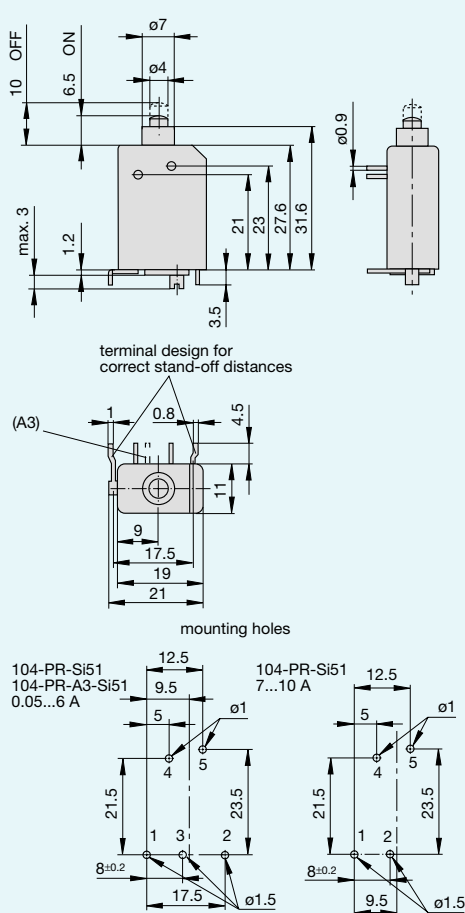
### 104-PR



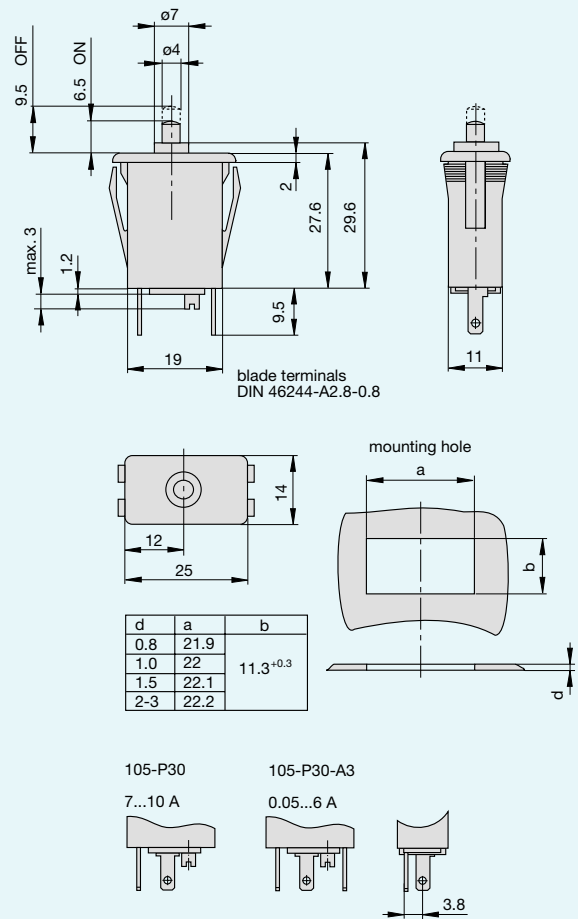
### 104-P30



### 104-PR-(A3)-Si51

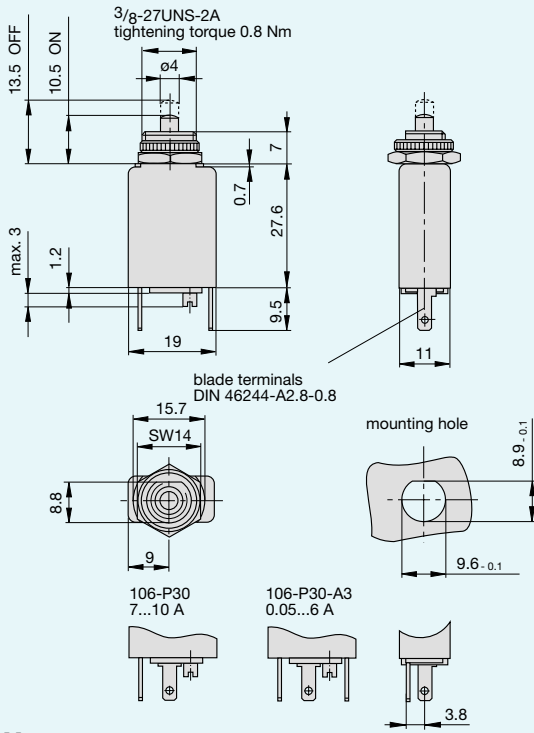


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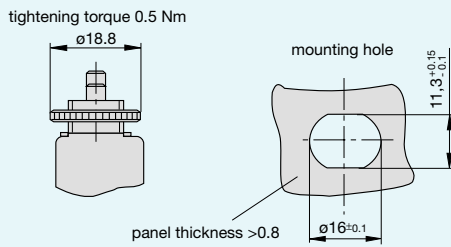


## Dimensions

### 106-P30

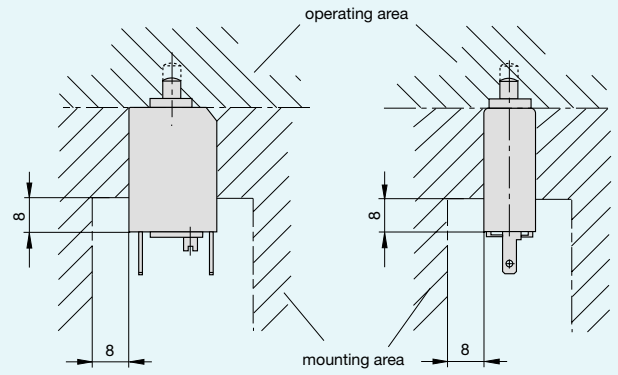


### 106-M1

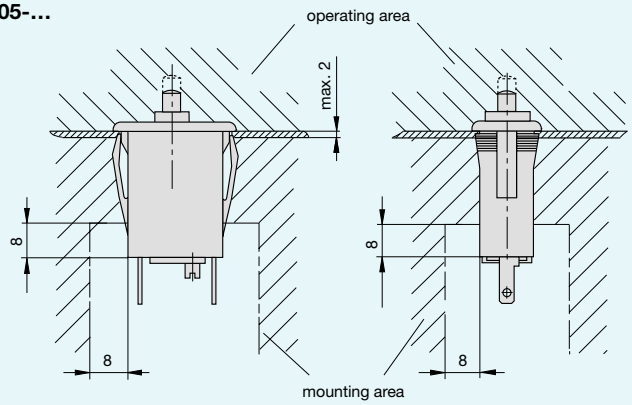


## Installation drawings

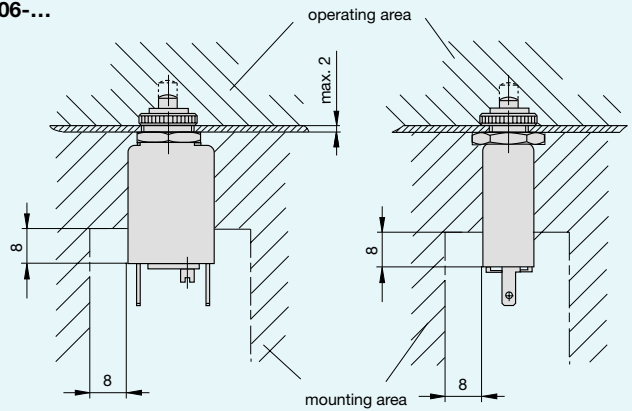
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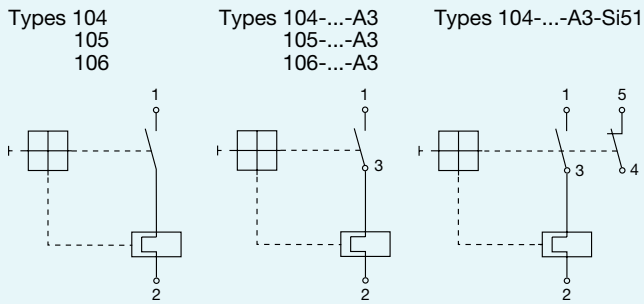
### 105-...



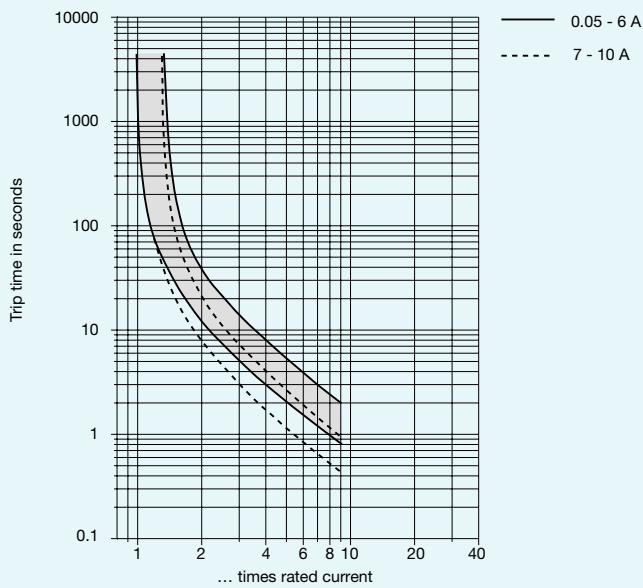
### 106-...



## Internal connection diagrams



## Typical time/current characteristics at +23 °C



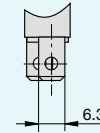
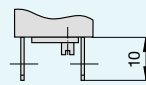
The time/current characteristic curve depends on the ambient temperature prevailing. In order to eliminate nuisance tripping, please multiply the circuit breaker current ratings by the derating factor shown below. See also section 9 – Technical information.

|                        |      |      |      |     |      |      |      |
|------------------------|------|------|------|-----|------|------|------|
| 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 |

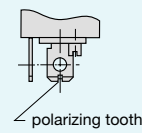
## Terminal design

### 104/105/106-P10

0.05...6 A

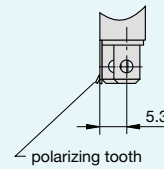


7...10 A



### 104/105/106-P10-A3

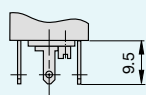
0.05...6 A



blade terminals  
DIN 46244-A6.3-0.8

### 104/105/106-P30-A3

0.05...6 A

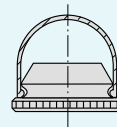


## Accessories

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

X 201 285 01

Degree of protection IP 64



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