

Circuit Breaker for Equipment thermal with Metal Actuator

new



### Description

- Thermal circuit breaker
- Metal switch non-illuminated and illuminated
- 1-pole
- Quick connect terminals 6.3 x 0.8 mm or screw terminals

### Approvals

- Approval Reference Type: T12
- IEC Standard: IEC 60934
- UL Standard: UL 1077
- GB Standard: GB 17701

### Applications

- Power supplies
- Uninterruptible power supply
- Power tools
- Household appliances

### References

Component 1: circuit breakers [T12-221](#); [T12-222](#)  
Component 2: metal switch [MSM LA 19](#); [MSM LA 22](#)  
Component 3: Coupler

### Weblinks

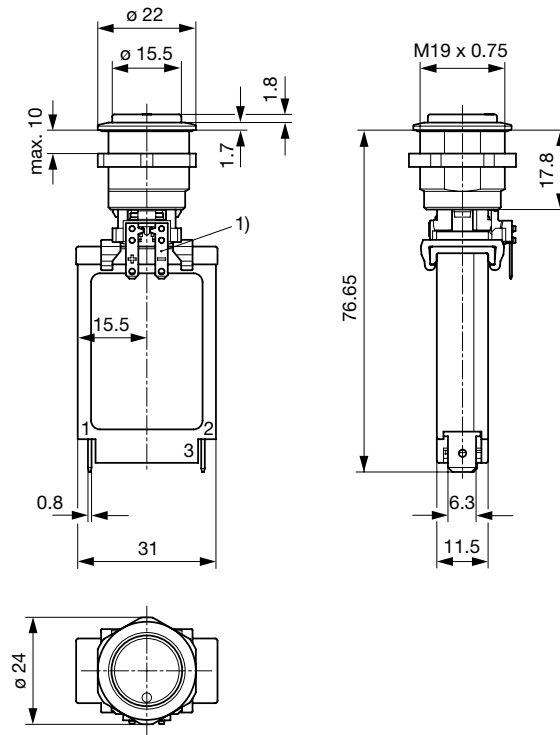
[pdf-datasheet](#), [html-datasheet](#), [General Product Information](#), [Approvals](#), [CE declaration of conformity](#), [RoHS](#), [CHINA-RoHS](#), [REACH](#), [e-Shop](#), [SCHURTER-Stock-Check](#), [Distributor-Stock-Check](#), [Detailed request for product](#), [Product News](#)

### Technical Data

|                                    |   |  |  |
|------------------------------------|---|--|--|
| Rated Voltage AC                   | 240 V; 50/60 Hz                               | Overload                               | IEC: min. 40 trips<br>@ 6 x I <sub>r</sub> , cos φ 0.6   |
| Rated Voltage DC                   | 28 V  |  | UL / CSA: min. 50 trips<br>@ 1.5 x I <sub>r</sub> , cos φ 0.75   |
| Rated current range AC             | 0.05 - 15/16 A                                | Ambient temperature                    | -5 °C to 60 °C   |
| Conditional short circuit capacity | IEC: Inc, PC1, AC 240V: 1 kA                  | Vibration Resistance                   | ± 0.75 mm @ 5 - 60 Hz<br>acc. to IEC 60068-2-6, test Fc<br>7 G @ 60 - 500 Hz<br>acc. to IEC 60068-2-6, test Fc |
| Dielectric Strength                | 50Hz: > 1.5 kV<br>Impulse 1.2/50 μs: > 2.5 kV | Shock Resistance                       | 60 G / 18ms<br>acc. to IEC 60068-2-27, test Ea   |
| Insulation resistance              | 500 VDC > 100 MΩ                              | Tripping Type                          | Thermal  |
| Endurance typical                  | 2 x I <sub>r</sub> : 5000 switching cycles    | Actuation type                         | Manual ON/OFF  |
|                                    | Reset type                                    | Shock Protection                       | IK 07  |
|                                    | AC : 2 x I <sub>r</sub> , cos φ 0.6 :         | Tightening Torque Stainless Steel Nut  | 12 Nm for thread M19, 16 Nm for M22  |
|                                    | DC : 2 x I <sub>r</sub> , L/R = 2 - 3 ms :    | Salt Spray Test (acc. to DIN 50021-SS) | 24 h / 48 h / 96 h Residence Time  |
|                                    | 50 switching cycles                           | Supply Voltage                         | 24 VDC Ring Illumination without series resistor<br>Point Illumination   |
|                                    | Manual ON/OFF type                            | Weight                                 | ca. 45 g   |
|                                    | AC : 2 x I <sub>r</sub> , cos φ 0.6 :         |  |  |
|                                    | DC : 2 x I <sub>r</sub> , L/R = 2 - 3 ms :    |  |  |
|                                    | 5000 switching cycles                         |  |  |

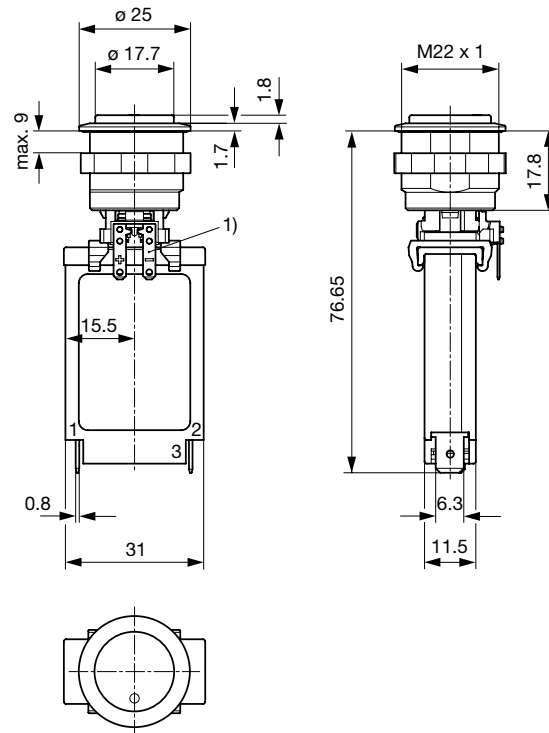
## Dimension

T12 MSM 19



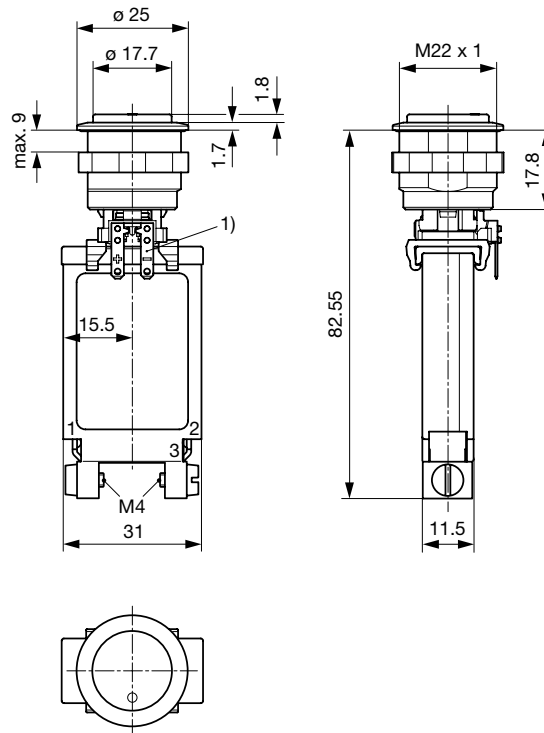
1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm

T12 MSM 22



1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm

T12 MSM 22 screw version



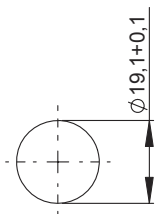
1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm

MSM 19 LA ST / MSM 19 LA RI

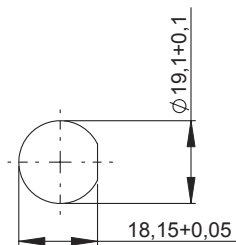
MSM 19 LA LE / MSM 19 LA PI /  
MSM 19 LA RI optional

MSM 22 LA ST / MSM 22 LA RI

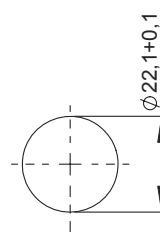
MSM 22 LA LE / MSM 22 LA PI /  
MSM 22 LA RI optional



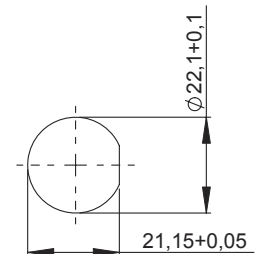
Drilling diagram



Drilling diagram



Drilling diagram



Drilling diagram

Point Illumination

| Operating Data | Forward Current max. | Forward Current at 10 mA | Forward Current at 8 mA | Forward Current max. |
|----------------|----------------------|--------------------------|-------------------------|----------------------|
| LED red        | 30 mA                | 1,9 VDC                  |                         | 3,0 VDC              |
| LED green      | 30 mA                | 2,1 VDC                  |                         | 3,0 VDC              |
| LED blue       | 20 mA                |                          | 3,7 VDC                 | 4,5 VDC              |

Attention: Switches are delivered without series resistor.

## Recommendation of series resistors for point illumination

| LED-Color | I <sub>D</sub><br>[mA] | I <sub>DMax</sub><br>[mA] | U <sub>V</sub> = 5    |                                      |                         |  | U <sub>V</sub> = 12   |                                      |                         |  | U <sub>V</sub> = 24   |                                      |                       |  |
|-----------|------------------------|---------------------------|-----------------------|--------------------------------------|-------------------------|--|-----------------------|--------------------------------------|-------------------------|--|-----------------------|--------------------------------------|-----------------------|--|
|           |                        |                           | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W]** |  | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W]** |  | R <sub>V</sub><br>[Ω] | R <sub>V</sub> <sup>E24</sup><br>[Ω] | P <sub>V</sub><br>[W] |  |
| red       | 10                     | ---                       | 310                   | 330                                  | 0,03                    |  | 1010                  | 1000                                 | 0,10                    |  | 2210                  | 2200                                 | 0,22                  |  |
|           | ---                    | 30                        | 67                    | 68                                   | 0,06                    |  | 300                   | 300                                  | 0,27                    |  | 700                   | 750                                  | 0,63                  |  |
| green     | 10                     | ---                       | 290                   | 300                                  | 0,03                    |  | 990                   | 1000                                 | 0,10                    |  | 2190                  | 2200                                 | 0,22                  |  |
|           | ---                    | 30                        | 67                    | 68                                   | 0,06                    |  | 300                   | 300                                  | 0,27                    |  | 700                   | 750                                  | 0,63                  |  |
| blue      | 8                      | ---                       | 163                   | 160                                  | 0,01                    |  | 1038                  | 1100                                 | 0,07                    |  | 2538                  | 2700                                 | 0,16                  |  |
|           | ---                    | 20                        | 25                    | 27                                   | 0,01                    |  | 375                   | 390                                  | 0,15                    |  | 975                   | 1000                                 | 0,39                  |  |

- I<sub>D</sub> LED-Forward Current [8mA/10mA]
- I<sub>DMax</sub> LED-Forward Current max. [20mA/30mA]
- R<sub>V</sub> Series Resistor (calculated)
- R<sub>V</sub><sup>E24</sup> Series Resistor (regarding E24-Resistor series)
- P<sub>V</sub> Power dissipation concerning R<sub>V</sub> (calculated)

## Typical internal resistance

| Rated Current [A] | Internal Resistance [Ω] |
|-------------------|-------------------------|
| 0.05              | 225.000                 |
| 0.50              | 3.300                   |
| 1.00              | 0.880                   |
| 2.00              | 0.267                   |
| 3.00              | 0.128                   |
| 4.00              | 0.073                   |
| 5.00              | 0.040                   |
| 6.00              | 0.031                   |
| 7.00              | 0.018                   |
| 8.00              | 0.018                   |
| 9.00              | 0.010                   |
| 10.00             | 0.0087                  |
| 11.00             | 0.0087                  |
| 12.00             | 0.0087                  |
| 13.00             | 0.0087                  |
| 14.00             | 0.0070                  |
| 15.00             | 0.0070                  |
| 16.00             | 0.0055                  |

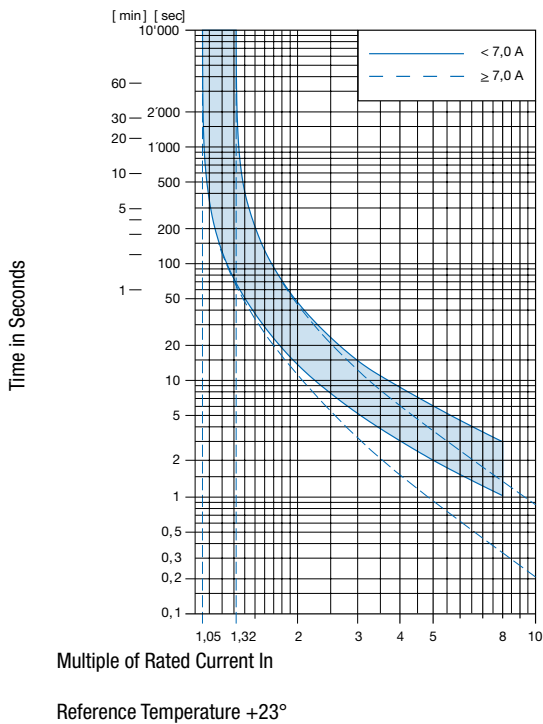
## Effect of ambient temperature

The units are calibrated for an ambient temperature of +23°C. To determine the rated current for a lower or higher ambient temperature, use a correction factor (typical value) from the table below:

| Ambient temperature [°C] | Correction factor |
|--------------------------|-------------------|
| -5                       | 0.87              |
| 0                        | 0.90              |
| 10                       | 0.95              |
| 23                       | 1.00              |
| 30                       | 1.05              |
| 40                       | 1.12              |
| 50                       | 1.20              |
| 60                       | 1.30              |

Example: Rated current = 5 A; Environmental temperature = 50 °C; --> Correction factor = 1.2; Resulting current = 6.0 A

Time-Current-Curves



Lettering

The last three digits in the order number define the lettering:

|         |                      |
|---------|----------------------|
| 000     | No Lettering         |
| 001-074 | Standard Lettering   |
| 101-    | Customized Lettering |

Lettering options see on Datasheet MSM LA 22

All Variants

| Circuit Breakers |            |                                      | Momentary Action Switch |                                 | Order Number |
|------------------|------------|--------------------------------------|-------------------------|---------------------------------|--------------|
| Type             | Rated cur- | connection type                      | Type                    | Illumination                    |              |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | non-illuminated                 | 4410.9001    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | non-illuminated                 | 4410.9002    |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | non-illuminated                 | 4410.9003    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | non-illuminated                 | 4410.9004    |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | Point Illumination, blue        | 4410.9005    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | Point Illumination, blue        | 4410.9006    |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | Point Illumination, blue        | 4410.9007    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | Point Illumination, blue        | 4410.9008    |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | Ring Illumination, blue, 24 VDC | 4410.9009    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 19               | Ring Illumination, blue, 24 VDC | 4410.9010    |
| T12-221-10       | 10A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | Ring Illumination, blue, 24 VDC | 4410.9011    |
| T12-221-16       | 16A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | Ring Illumination, blue, 24 VDC | 4410.9012    |
| T12-222-10       | 10A        | Bolts and nuts                       | MSM LA 22               | non-illuminated                 | 4410.9017    |
| T12-222-16       | 16A        | Bolts and nuts                       | MSM LA 22               | non-illuminated                 | 4410.9018    |
| T12-221-15       | 15A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | non-illuminated                 | 4410.9019    |
| T12-221-15       | 15A        | Quick connect terminals 6.3 x 0.8 mm | MSM LA 22               | Ring Illumination, blue, 24 VDC | 4410.9021    |

| Circuit Breakers    |            |                 | Momentary Action Switch |              | Order Number |
|---------------------|------------|-----------------|-------------------------|--------------|--------------|
| Type                | Rated cur- | connection type | Type                    | Illumination |              |
| Coupler is included |            |                 |                         |              |              |

Availability for all products can be searched real-time: <http://www.schurter.com/en/Stock-Check/Stock-Check-SCHURTER>

**Packaging Unit**      10 Pcs



- Actuating elements in ESD safe packaging
- Screw nuts and sealing rings in a bag (enclosed in the box)
- Circuit breaker in a bag (enclosed in the box)