

Circuit Breaker for Equipment thermal-magnetically with Metal Actuator



See below:

[Approvals and Compliances](#)

### Description

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

### Applications

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

### References

Component 1: circuit breakers  
 Component 2: metal switch  
 Component 3: Coupler

### Weblinks

[pdf datasheet](#), [html-datasheet](#), [General Product Information](#), [Distributor-Stock-Check](#), [Detailed request for product](#), [Product News](#)

### Technical Data

Rated Voltage AC	240 V; 50/60	Overload	IEC: min. 40 trips @ 6 x I <sub>r</sub> , cos φ 0.6
Rated Voltage DC	28 V		UL / CSA: min. 50 trips @ 1.5 x I <sub>r</sub> , cos φ 0.75
Rated current range AC	0.05 - 15 A	Ambient temperature	-5 °C to 60 °C
Conditional short circuit capacity	IEC: Inc, PC1, AC 240 V: 1 kA	Vibration Resistance	± 0.75 mm @ 5 - 60 Hz acc. to IEC 60068-2-6, test Fc 7 G @ 60 - 500 Hz acc. to IEC 60068-2-6, test Fc
Dielectric Strength	50Hz: > 1.5 kV Impulse 1.2/50 μs: > 2.5 kV	Shock Resistance	60 G / 18 ms acc. to IEC 60068-2-27, test Ea
Insulation Resistance	500VDC > 100 MΩ	Tripping Type	Thermal-Magnetic
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 Point Illumination
	Manual ON/OFF type	Weight	ca. 55 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		

### Approvals and Compliances

Detailed information on product approvals, code requirements, usage instructions and detailed test conditions can be looked up in [Details about Approvals](#)

### Product standards

Product standards that are referenced

Organization	Design	Standard	Description
	Designed according to	IEC 60934	Circuit-breakers for equipment (CBE)
	Designed according to	UL 1077	Standard for Supplementary Protectors for Use in Electrical Equipment
	Designed according to	GB 17701	Circuit-breaker for equipment





## Application standards

Application standards where the product can be used

Organization	Design	Standard	Description
	Designed for applications acc.	IEC/UL 60950	IEC 60950-1 includes the basic requirements for the safety of information technology equipment.

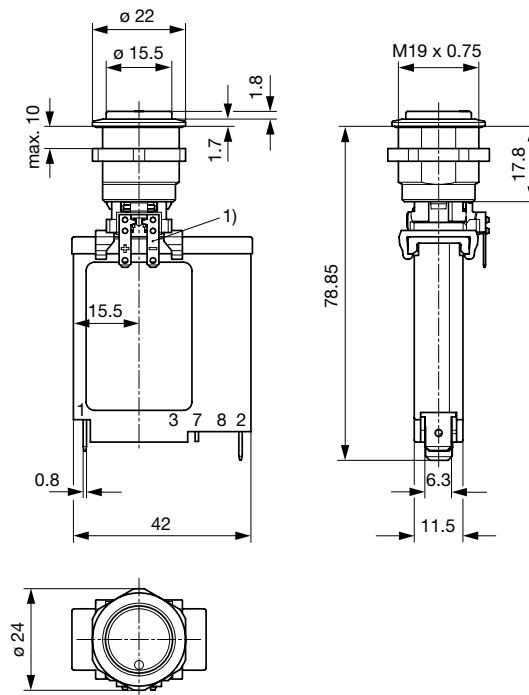
## Compliances

The product complies with following Guide Lines

Identification	Details	Initiator	Description
	<a href="#">CE declaration of conformity</a>	SCHURTER AG	The CE marking declares that the product complies with the applicable requirements laid down in the harmonisation of Community legislation on its affixing in accordance with EU Regulation 765/2008.
	RoHS	SCHURTER AG	EU Directive RoHS 2011/65/EU
	China RoHS	SCHURTER AG	The law SJ / T 11363-2006 (China RoHS) has been in force since 1 March 2007. It is similar to the EU directive RoHS.
	REACH	SCHURTER AG	On 1 June 2007, Regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals 1 (abbreviated as "REACH") entered into force.

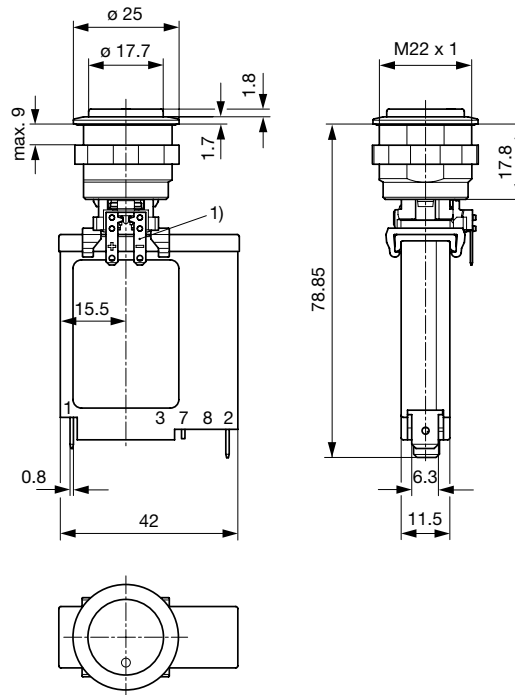
## Dimension [mm]

TM12 MSM 19

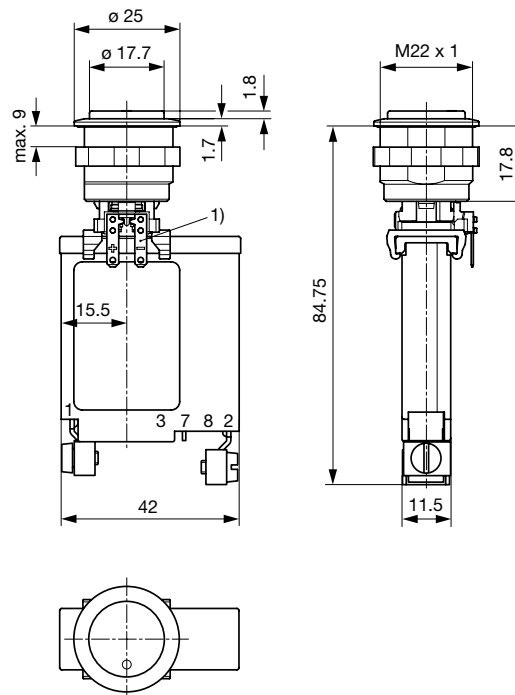


1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm

TM12 MSM 22



1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm  
 TM12 MSM 22 screw version



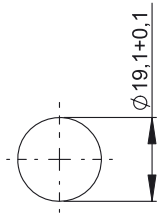
1) only among MSM PI / RI quick connect terminal 2.8x0.5 mm

MSM 19 LA ST / MSM 19 LA RI

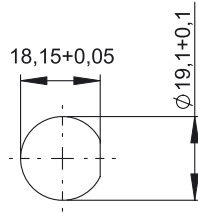
MSM 19 LA LE / MSM 19 LA PI /  
 MSM 19 LA RI optional

MSM 22 LA ST / MSM 22 LA RI

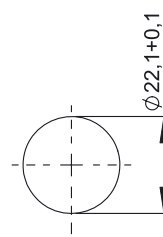
MSM 22 LA LE / MSM 22 LA PI /  
 MSM 22 LA RI optional



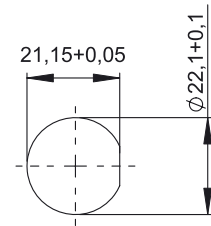
Drilling diagram



Drilling diagram



Drilling diagram



Drilling diagram

## Point Illumination

Operating Data	Forward Current max.	Forward Voltage at 10 mA	Forward Voltage at 8 mA	Forward Voltage 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	$I_D$ [mA]	$I_{DMax}$ [mA]	$U_V = 5$				$U_V = 12$				$U_V = 24$			
			$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [W]**		$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [W]**		$R_V$ [Ω]	$R_V^{E24}$ [Ω]	$P_V$ [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	

$I_D$  LED-Forward Current [8mA/10mA]

$I_{DMax}$  LED-Forward Current max. [20mA/30mA]

$R_V$  Series Resistor (calculated)

$R_V^{E24}$  Series Resistor (regarding E24-Resistor series)

$P_V$  Power dissipation concerning  $R_V$  (calculated)

### Typical internal resistance TMF12

Rated Current [A]	Internal Resistance [ $\Omega$ ]
0.05	335.00
0.50	4.37
1.00	1.23
2.00	0.369
3.00	0.181
4.00	0.097
5.00	0.055
6.00	0.044
7.00	0.0231
8.00	0.0227
9.00	0.0142
10.00	0.0123
11.00	0.012
12.00	0.012
13.00	0.0108
14.00	0.0091
15.00	0.0089
16.00	0.0071

### 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

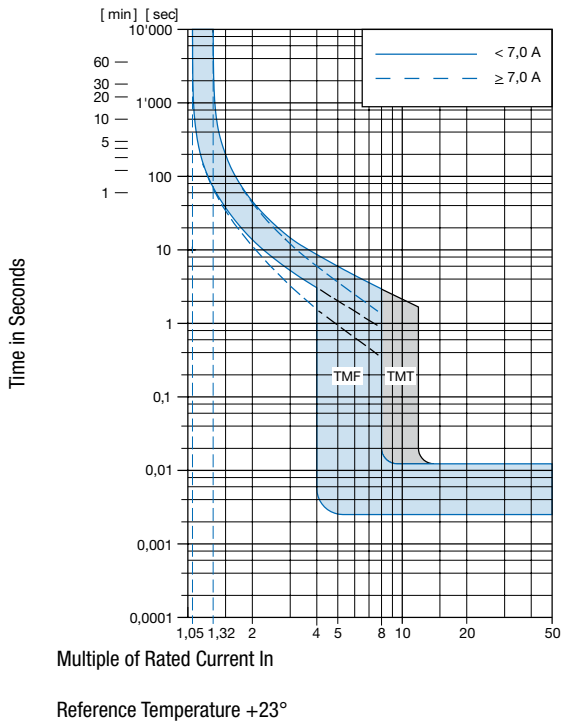
### Lettering

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

**Time-Current-Curves**



**All Variants**

Circuit Breakers			Momentary Action Switch		Order Number
Type	Rated cur-	connection type	Type	Illumination	
TMF12-221-10	10A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 19	non-illuminated	4410.9013
TMF12-221-16	16A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 19	non-illuminated	4410.9014
TMF12-221-10	10A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 22	non-illuminated	4410.9015
TMF12-221-16	16A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 22	non-illuminated	4410.9016
TMF12-221-15	15A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 22	non-illuminated	4410.9020
TMF12-221-15	15A	Quick connect terminals 6.3 x 0.8 mm	MSM LA 22	Ring Illumination, blue, 24 VDC	4410.9022

Coupler is included

Most Popular.

Availability for all products can be searched real-time: <https://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)

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