

# UT 6-TMC M...

## Thermomagnetic circuit breakers

### CLIPLINE

Data sheet  
103943\_en\_04

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## 1 Description

The UT 6-TMC M circuit breaker is a single-position overload circuit breaker with thermomagnetic tripping. It is a space-saving circuit breaker with trip-free mechanism in the event of overload and short circuits within the maximum interrupting rating. The UT 6-TMC M is mounted on an NS 35 DIN rail.

UT 6-TMC M thermomagnetic circuit breakers feature a compact design, large labeling areas, and a double plug-in bridge shaft.

The circuit breakers provide a high level of system availability thanks to their reclosure function and clear status display.

Eleven nominal current versions can be selected from 0.5 A to 16 A. The large center labeling area enables clear assignment of the relevant circuit breaker.



**NOTE:** The magnetic tripping ranges differ for alternating currents (AC) and direct currents (DC) (see page 3). The magnetic operating currents for direct currents (DC) are approximately 1.6 times higher.



**NOTE:** When mounted in rows with simultaneous load, a mutual thermal effect occurs (see page 4). Calibration is required for an ambient temperature of +23°C. A correction factor must be used to determine the nominal current for a lower or higher ambient temperature (see page 5).



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This data sheet is valid for all products listed on the following page:

## 2 Ordering data

### Circuit breakers

| Description                            | Nominal current | Type            | Order No. | Pcs./Pkt. |
|--|-----------------|-----------------|-----------|-----------|
| Thermomagnetic circuit breaker, 1-pos. | 0.5 A           | UT 6-TMC M 0,5A | 0916603   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 1 A             | UT 6-TMC M 1A   | 0916604   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 2 A             | UT 6-TMC M 2A   | 0916605   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 4 A             | UT 6-TMC M 4A   | 0916606   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 5 A             | UT 6-TMC M 5A   | 0916607   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 6 A             | UT 6-TMC M 6A   | 0916608   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 8 A             | UT 6-TMC M 8A   | 0916609   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 10 A            | UT 6-TMC M 10A  | 0916610   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 12 A            | UT 6-TMC M 12A  | 0916611   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 15 A            | UT 6-TMC M 15A  | 0916612   | 6         |
| Thermomagnetic circuit breaker, 1-pos. | 16 A            | UT 6-TMC M 16A  | 0916613   | 6         |

### Accessories

| Description  | Type        | Order No.              | Pcs./Pkt. |
|--|-------------|------------------------|-----------|
| Plug-in bridge, for cross connection in the bridge shaft, red, 2-pos.  | FBS 2-6     | 3030336                | 50        |
| Plug-in bridge, for cross connection in the bridge shaft, red, 3-pos.  | FBS 3-6     | 3030242                | 50        |
| Plug-in bridge, for cross connection in the bridge shaft, red, 4-pos.  | FBS 4-6     | 3030255                | 50        |
| Plug-in bridge, for cross connection in the bridge shaft, red, 5-pos.  | FBS 5-6     | 3030349                | 50        |
| Plug-in bridge, for cross connection in the bridge shaft, red, 10-pos. | FBS 10-6    | 3030271                | 10        |
| Plug-in bridge, for cross connection in the bridge shaft, red, 20-pos. | FBS 20-6    | 3030365                | 10        |
| Warning label, for UT series, yellow                                   | WS UT 6     | 3047345                | 10        |
| Screwdriver  | SZS 1,0X4,0 | 1205066                | 10        |
| UniCard sheet, for labeling  | UC-TM 12    | (See CLIPLINE catalog) |           |
| Zack marker strip, for labeling  | ZB 12       | (See CLIPLINE catalog) |           |

## 3 Electrical data

### Nominal current, nominal voltage, and additional electrical data

|                                      |  |
|--------------------------------------|--|
| Rated insulation voltage             | 440 V AC   |
| Rated frequency                      | 50/60 Hz (at 240 V AC)   |
| Nominal voltage                      | 240 V AC, 28 V DC  |
| Nominal current AC/DC                | Depending on module: 0.5 A, 1 A, 2 A, 4 A, 5 A, 6 A, 8 A, 10 A, 12 A, 15 A, 16 A |
| Operating voltage range              | 50 V AC ... 264 V AC, 5 V DC ... 30.8 V DC                                       |
| Operating frequency range            | 48 Hz ... 62 Hz  |
| Insulation resistance (main circuit) | > 100 MΩ   |
| Insulation resistance                | 50 Hz: 2000 V<br>Pulse: 2800 V   |
| Surge voltage category               | II   |
| Pollution degree                     | 2  |

|   | AC                                | DC                                |
|---|-----------------------------------|-----------------------------------|
| Switching cycles  |                                   |                                   |
| Service life under load   | 6000 cycles at 1 x I <sub>n</sub> | 6000 cycles at 1 x I <sub>n</sub> |
| Overload according to IEC 60943                                 | 40 cycles at 6 x I <sub>n</sub>   | 40 cycles at 6 x I <sub>n</sub>   |
| Overload according to UL 1077                                   | 50 cycles at 1.5 x I <sub>n</sub> | 50 cycles at 1.5 x I <sub>n</sub> |
| Short-circuit switching capacity (Inc)                          | 200 A                             | 400 A                             |
| Conditional short-circuit switching capacity (Inc)[Backup fuse] | 2000 A                            | 2000 A                            |

| Backup fuse | Nominal current<br>UT 6-TMC M | Maximum backup fuse |
|-------------|-------------------------------|---------------------|
|-------------|-------------------------------|---------------------|



**NOTE:** If in the application the maximum short-circuit switching capacity ( $I_{cn}$ ) could be exceeded in the event of an error, a backup fuse must be used in combination with the circuit breaker.

The following maximum backup fuse values are recommended according to characteristic gG (VDE 0636, IEC 269)

|       |      |
|-------|------|
| 0.5 A | 16 A |
| 1 A   | 16 A |
| 2 A   | 16 A |
| 4 A   | 16 A |
| 5 A   | 20 A |
| 6 A   | 20 A |
| 8 A   | 25 A |
| 10 A  | 25 A |
| 12 A  | 25 A |
| 15 A  | 25 A |
| 16 A  | 25 A |

### Tripping characteristics

|   |                        |
|---|------------------------|
| Type of actuation   | Manual ON/OFF (S type) |
| Tripping method   | Thermomagnetic (TM)    |
| Tripping type   | Trip-free mechanism    |
| Specified non-tripping current (no tripping within an hour) | $1.05 \times I_n$      |
| Specified tripping current (tripping within an hour)        | $1.32 \times I_n$      |
| Instantaneous non-tripping current                          | $6 \times I_n$ (AC)    |
| Instantaneous tripping current                              | $12 \times I_n$ (AC)   |



**NOTE:** The magnetic tripping ranges differ for alternating currents (AC) and direct currents (DC). Please observe the tripping characteristics shown in Figure 1.

The magnetic operating currents for direct currents (DC) are approximately 1.6 times higher.

### 3.1 Tripping characteristics

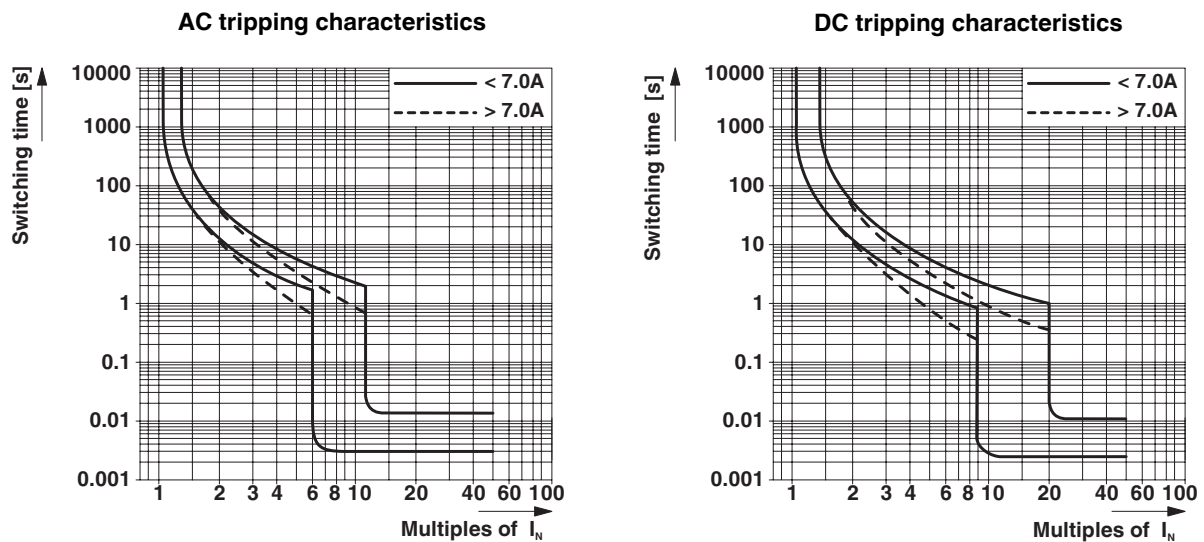


Figure 1 AC and DC tripping characteristics

### 3.2 Effect on thermal tripping of mounting in rows



**NOTE:** When mounted in rows with simultaneous load, a mutual thermal effect occurs.

The mutual thermal effect is tantamount to an increase in the ambient temperature (see page 5). This depends on the following:

- The nominal current
- The ambient temperature
- The number of devices
- The distance between devices

The nominal device current can be either oversized or limited. When the UT 6-TMC M is mounted in rows, the correction factor is usually in the range of 1.25 or at 80% (reciprocal) in relation to the limiting nominal current. These values apply in the event of continuous load and at an ambient temperature of +23°C.

Since the thermal effect varies for each planned installation when mounting in rows, the correction factors must be defined individually and tested.

### Calculation example for oversizing

5 circuit breakers with  $I_n = 10\text{ A}$  are to be mounted in rows. The ambient temperature is +23°C.

Nominal current when not mounted in rows  $I_n = 10\text{ A}$

Typical correction factor  $d_f = 1.25$

Theoretical nominal current when mounting in rows  $I_{n\text{ row}} = 10\text{ A} \times 1.25 = 12.5\text{ A}$

### 3.3 Internal resistance of the UT 6-TMC M

| Nominal current | Resistance |
|-----------------|------------|
| 0.5 A           | 4.37 Ω     |
| 1.0 A           | 0.95 Ω     |
| 2.0 A           | 0.33 Ω     |
| 4.0 A           | 88.0 mΩ    |
| 5.0 A           | 55.8 mΩ    |
| 6.0 A           | 41.7 mΩ    |
| 8.0 A           | 22.2 mΩ    |
| 10.0 A          | 12.3 mΩ    |
| 12.0 A          | 10.9 mΩ    |
| 15.0 A          | 8.3 mΩ     |
| 16.0 A          | 7.7 mΩ     |

Measurement between the LINE and LOAD connections.

Tolerance: ±10%

## 4 Mechanical data

| Fixing  |  |  |          |              |  |  |  |  |   |  |  |   |  |
|---|--|--|----------|--------------|--|--|--|--|---|--|--|---|--|
| Mounting method   | On a DIN rail according to DIN EN 60715, NS 35N/7,5 or NS 35/15<br>The tripping characteristics are not dependent on the mounting position.  |  |          |              |  |  |  |  |   |  |  |   |  |
| Plug-in bridge, for cross connection in the bridge shaft                              | FBS x-6 plug-in bridge (see "Accessories" on page 2)   |  |          |              |  |  |  |  |   |  |  |   |  |
| Connection polarity   | Independent polarity (for DC) for the LINE and LOAD connections  |  |          |              |  |  |  |  |   |  |  |   |  |
| Suitability   | "Factory wiring"   |  |          |              |  |  |  |  |   |  |  |   |  |
| Weight  | 51 g   |  |          |              |  |  |  |  |   |  |  |   |  |
| Housing material  | PA 66  |  |          |              |  |  |  |  |   |  |  |   |  |
| Fuse type   | Medium blow fuse   |  |          |              |  |  |  |  |   |  |  |   |  |
| Inflammability class according to UL 94   | V0   |  |          |              |  |  |  |  |   |  |  |   |  |
| Maximum number of cycles  | 6000 at 1 x $I_n$  |  |          |              |  |  |  |  |   |  |  |   |  |
| Connection terminal block   |  |  |          |              |  |  |  |  |   |  |  |   |  |
| Screw connection  | M4   |  |          |              |  |  |  |  |   |  |  |   |  |
| Connection capacity   | <table border="1"> <thead> <tr> <th>Solid</th> <th>Stranded</th> <th>With ferrule</th> </tr> </thead> <tbody> <tr> <td>0.2 mm<sup>2</sup> ... 10 mm<sup>2</sup></td> <td>0.2 mm<sup>2</sup> ... 10 mm<sup>2</sup></td> <td>0.25 mm<sup>2</sup> ... 6 mm<sup>2</sup></td> </tr> <tr> <td></td> <td>0.2 mm<sup>2</sup> ... 2.5 mm<sup>2</sup></td> <td>0.25 mm<sup>2</sup> ... 1.5 mm<sup>2</sup></td> </tr> <tr> <td></td> <td>0.5 mm<sup>2</sup> ... 4 mm<sup>2</sup></td> <td></td> </tr> </tbody> </table> | Solid  | Stranded | With ferrule | 0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup> | 0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup> | 0.25 mm <sup>2</sup> ... 6 mm <sup>2</sup> |  | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> | 0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |  | 0.5 mm <sup>2</sup> ... 4 mm <sup>2</sup> |  |
| Solid   | Stranded   | With ferrule                                 |          |              |  |  |  |  |   |  |  |   |  |
| 0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup>  | 0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup>   | 0.25 mm <sup>2</sup> ... 6 mm <sup>2</sup>   |          |              |  |  |  |  |   |  |  |   |  |
|   | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>  | 0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |          |              |  |  |  |  |   |  |  |   |  |
|   | 0.5 mm <sup>2</sup> ... 4 mm <sup>2</sup>  |  |          |              |  |  |  |  |   |  |  |   |  |
| 1 conductor   |  |  |          |              |  |  |  |  |   |  |  |   |  |
| 2 conductors (two conductors with same cross-section, ferrule without plastic sleeve) |  |  |          |              |  |  |  |  |   |  |  |   |  |
| 2 stranded conductors with a TWIN ferrule   |  |  |          |              |  |  |  |  |   |  |  |   |  |
| Stripping length  | 12 mm  |  |          |              |  |  |  |  |   |  |  |   |  |
| Tightening torque (EN 60934)  | 1.5 Nm ... 1.8 Nm  |  |          |              |  |  |  |  |   |  |  |   |  |

## 5 Environmental influences

### 5.1 Temperature range, influence on the ambient temperature



**NOTE:** Calibration is required for an ambient temperature of +23°C.

Temperature range -30°C ... +60°C

Reference temperature +23°C

The following typical correction factors must be observed to calculate the nominal current:

#### Correction factors

| I <sub>n</sub> [A] | °C   |      |      |      |      |      |      |      |      |      |
|--------------------|------|------|------|------|------|------|------|------|------|------|
|                    | -30  | -20  | -10  | 0    | 10   | 23   | 30   | 40   | 50   | 60   |
| 0.5                | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| 1                  | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.03 | 1.06 | 1.13 | 1.19 |
| 2                  | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| 4                  | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| 5                  | 0.77 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.25 |
| 6                  | 0.70 | 0.73 | 0.78 | 0.84 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| 8                  | 0.70 | 0.73 | 0.78 | 0.84 | 0.90 | 1.00 | 1.03 | 1.06 | 1.13 | 1.21 |
| 10                 | 0.78 | 0.81 | 0.84 | 0.87 | 0.90 | 1.00 | 1.05 | 1.15 | 1.21 | 1.30 |
| 12                 | 0.77 | 0.80 | 0.85 | 0.90 | 0.95 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| 15                 | 0.73 | 0.73 | 0.78 | 0.84 | 0.90 | 1.00 | 1.03 | 1.08 | 1.11 | 1.21 |
| 16                 | 0.70 | 0.73 | 0.78 | 0.84 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.21 |
| ∅                  | 0.75 | 0.78 | 0.82 | 0.86 | 0.90 | 1.00 | 1.03 | 1.08 | 1.15 | 1.22 |

#### Example calculation:

A circuit breaker with I<sub>n</sub> = 4 A is to be used at an ambient temperature of +60°C.

Nominal current at +23°C I<sub>n</sub> (+23°C) = 4 A

Ambient temperature T<sub>amb</sub> = +60°C

Correction factor df = 1.21

Theoretical nominal current at +60°C

I<sub>n</sub> (+60°C) = 4 A x 1.21 = 4.84 A

At +60°C, a nominal current of 5 A should be selected.

### 5.2 IP protection class

|                     |                 |      |
|---------------------|-----------------|------|
| IP protection class | Actuation area  | IP40 |
|                     | Connection area | IP20 |

### 5.3 Resistance to vibrations and shocks

**Shock resistance according to EN 60068-2-27, Test Ea [3 shocks in each direction (= 18 shocks)]**

| Peak G | Pulse length | Pulse form |
|--------|--------------|------------|
| 50g    | 11 ms        | Half-sine  |

**Vibration resistance according to EN 60068-2-6, Test Fc - frequency range: 5 Hz ... 500 Hz**

| < 60 Hz<br>(constant amplitude) | > 60 Hz<br>(constant acceleration) |
|---------------------------------|------------------------------------|
| 0.15 mm                         | 2g                                 |

### 5.4 Approvals

| Certification body | Standard        | License number | Approved as                   |
|--------------------|-----------------|----------------|-------------------------------|
| VDE                | IEC 60934       | 400028127      | Circuit Breaker for Equipment |
| UL                 | UL 1077         | E140459        | Supplementary Protector       |
| UL                 | CSA 22.2 No.235 | E140459        | Supplementary Protector       |
| CSA                | CSA 22.2 No.235 | 250505         | Supplementary Protector       |

## 6 Dimensions

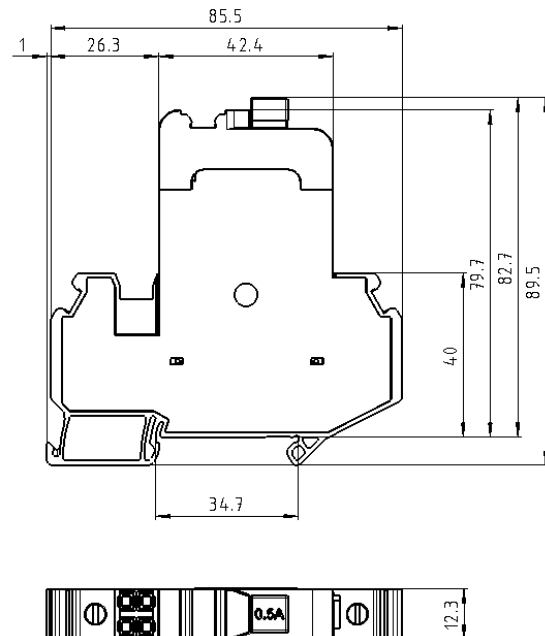


Figure 2 Dimensions (in mm)

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