



Current Control Unit

Manual PSSR 1PH Control Unit

Foreword

Revision history

| Version | Date | Change |
|---------|---------|--|
| 0.0 | 03/2013 | First edition |
| 1.0 | 04/2014 | Page 10 and 11: "short-circuit" replaced with "output breakdown" |

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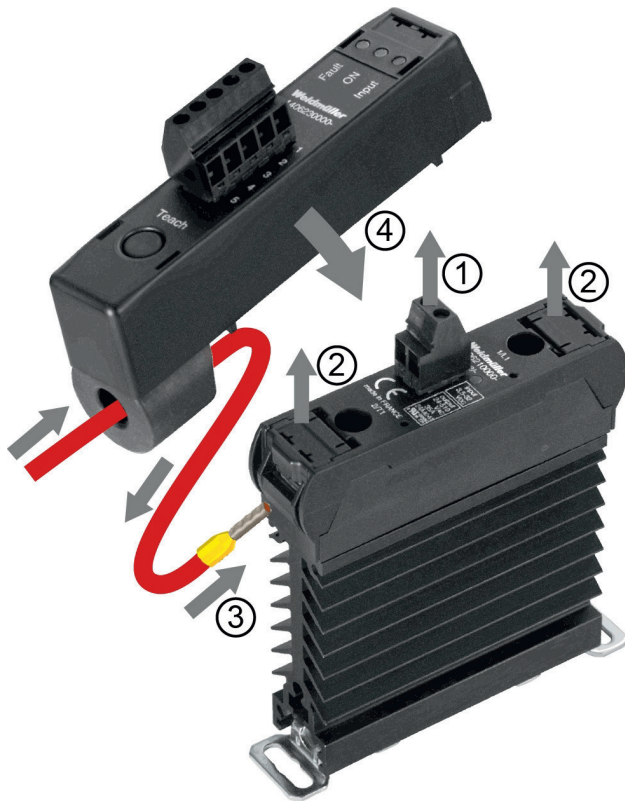
1 Product description

1.1 Product description

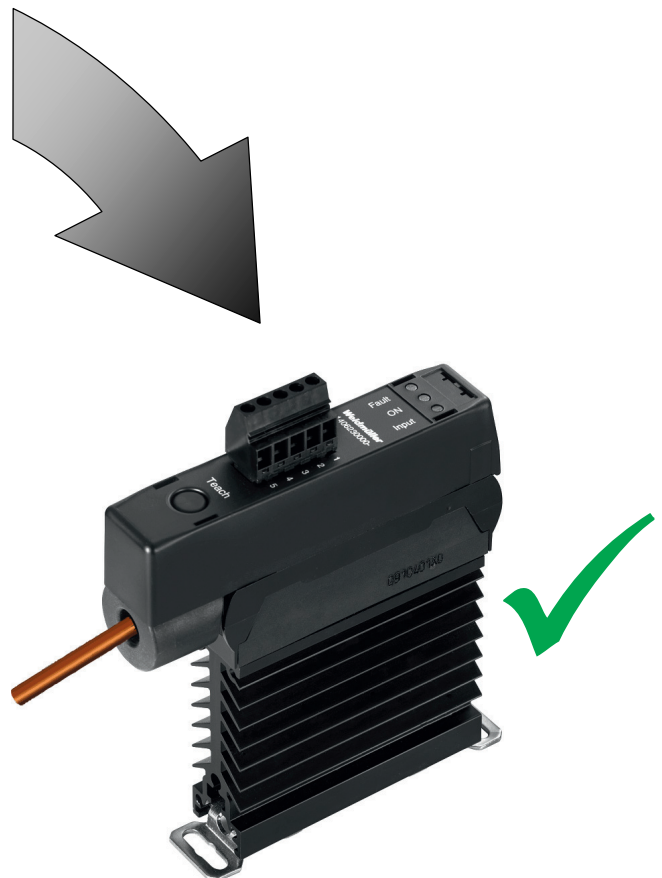
- Permanent current monitoring for up to 5 heating elements for assembly on the standard solid-state relays from the PSSR 1PH series with heatsink
- Fixing of rated current is done via a pushbutton or an external signal
- Alarm threshold $0.84 \times I_{\text{teach}}$ (corresponds to $I_{\text{teach}} - 16\%$)
- Detection on open load circuit
- Detection of open mains
- Detection of partial load break
- Detection of relay function
- Detection of leakage current
- Simple assembly of the unit on the relay
- Protection category IP20
- Developed and assembled according to EN 60947-4-3 (IEC 947-4-3) and EN 60950 / VDE 0805 (reinforced insulation).
- PSSR 1PH Control Unit 1406230000
is suitable for the solid-state relays
- PSSR 24VDC/1PH AC 25A 1406200000
- PSSR 24VDC/1PH AC 35A 1406210000

The current monitoring module PSSR 1PH Control Unit, in connection with a solid-state relay from the PSSR 1PH series with heatsink, enables permanent monitoring of heating circuits with 1 to a maximum of 5 heating elements connected in parallel. Partial load breaks, interruptions in the circuit as well as a defect in the relay are diagnosed; in the event of a fault, the diagnostic output is set ($+V_{\text{DD}}$) and the red LED is activated.

2 Assembly and installation



- ① Remove the connecting plug from PSSR 1PH
- ② Disassemble finger protection of PSSR 1PH from both connection sides
- ③ Feed the measurement line through the current sensor of the current monitoring module and connect it to the PSSR 1PH
- ④ Clip the current monitoring module onto the PSSR 1PH



3 Operation

3.1 Functional description

The rated current, for example during first operation, is measured by the “Teach” pushbutton or by an external signal (on terminal 5) and saved in the current monitoring module. If there is a deviation of -16% ($0.84 \times I_{\text{teach}}$) during operation, the diagnostic output is set.

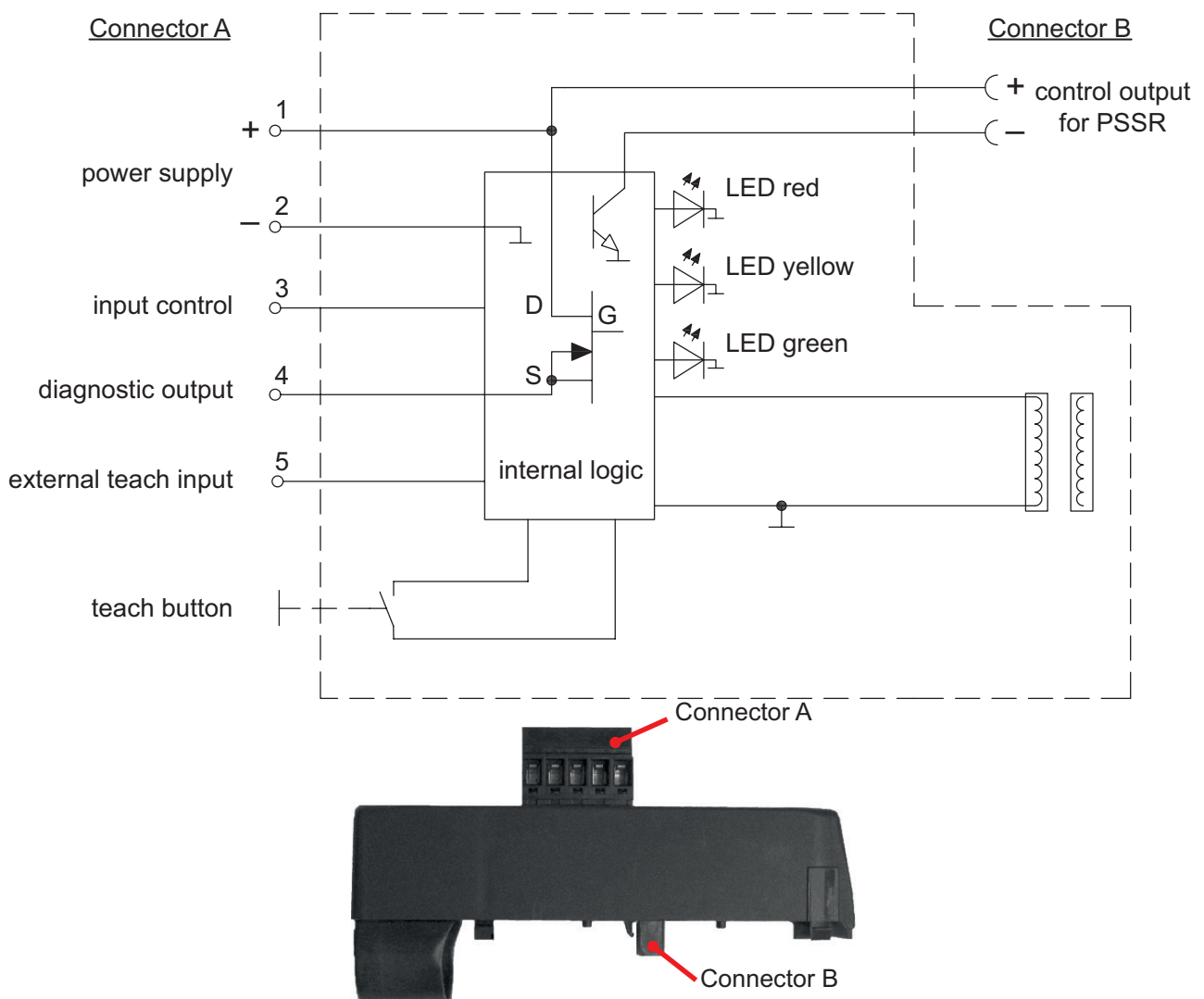
The green LED visualises the control signal, the yellow LED displays the switching status of the relay. If the relay is active, the green and yellow LEDs light up.

NOTICE



The diagnostic output (contact 4, positive switching) must be charged with a current of at least 1 mA. The factory setting of the current monitoring module has an undercurrent switching threshold of 2 A.

3.2 Schematic diagram



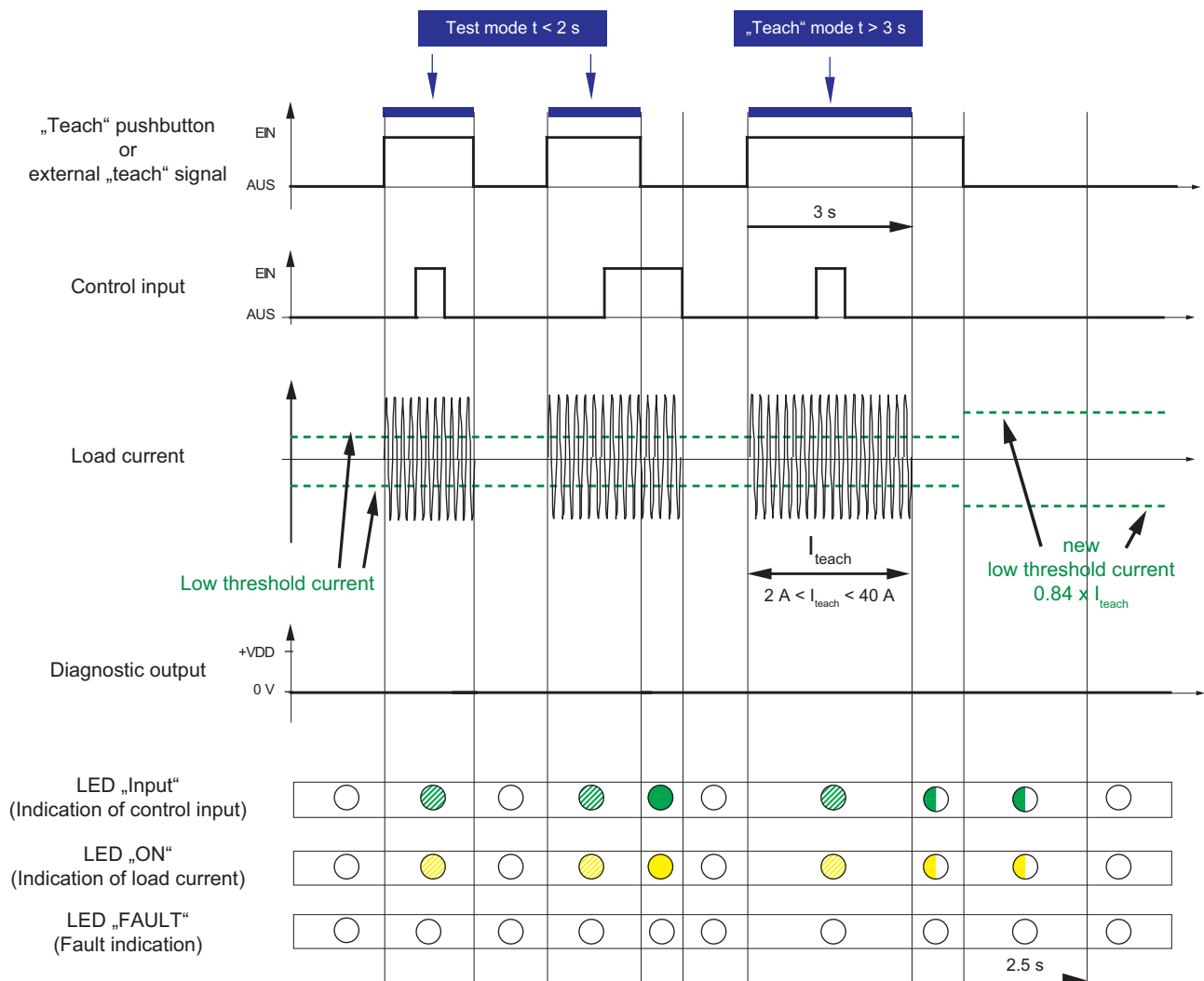
3.3 “Teach” mode

Activating (< 2 s) the “Teach” pushbutton or activating the external “Teach” signal enables a system test. The green and yellow LEDs flash at a rate of 100 ms.

During longer activation (> 3 s), the current at that moment is measured and stored. The green and yellow LEDs flash at a rate of 1 s. After deactivating the “Teach” pushbutton or deactivating the external “Teach” signal, the success of the current value storage by the current monitoring module is acknowledged by the green and yellow LEDs flashing for 2.5 s. The load is switched off for this period.

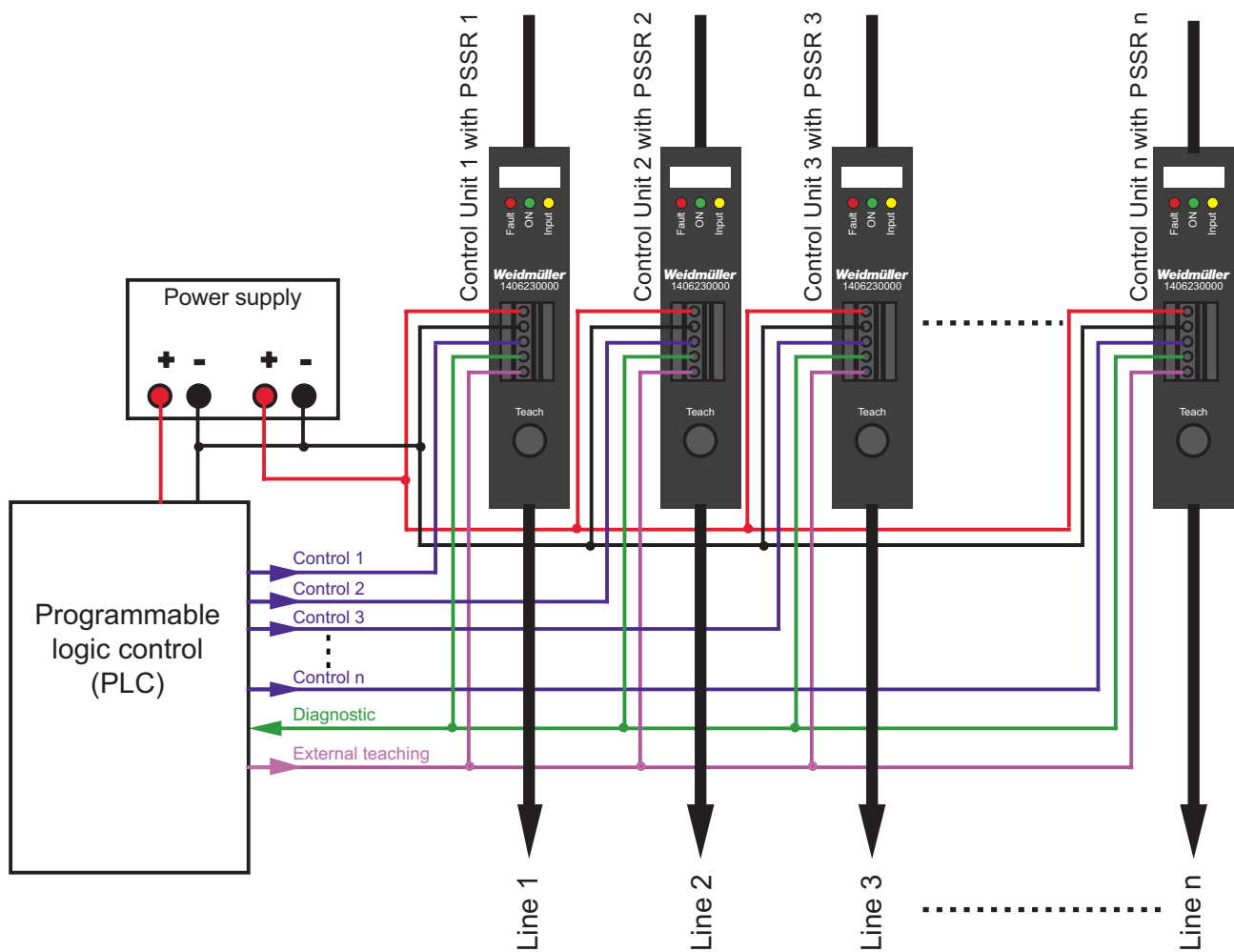
If the current is outside the measured range (< 2 A or > 40 A), this is shown by alternately flashing green and yellow LED.

| Legend to symbols | | |
|-------------------|-----------|---|
| | OFF | |
| | ON green | |
| | ON yellow | |
| | flashing | fast symmetrical flashing (Ton = 100 ms / Toff = 100 ms) |
| | flashing | slow symmetrical flashing (Ton = 1 s / Toff = 1 s) |

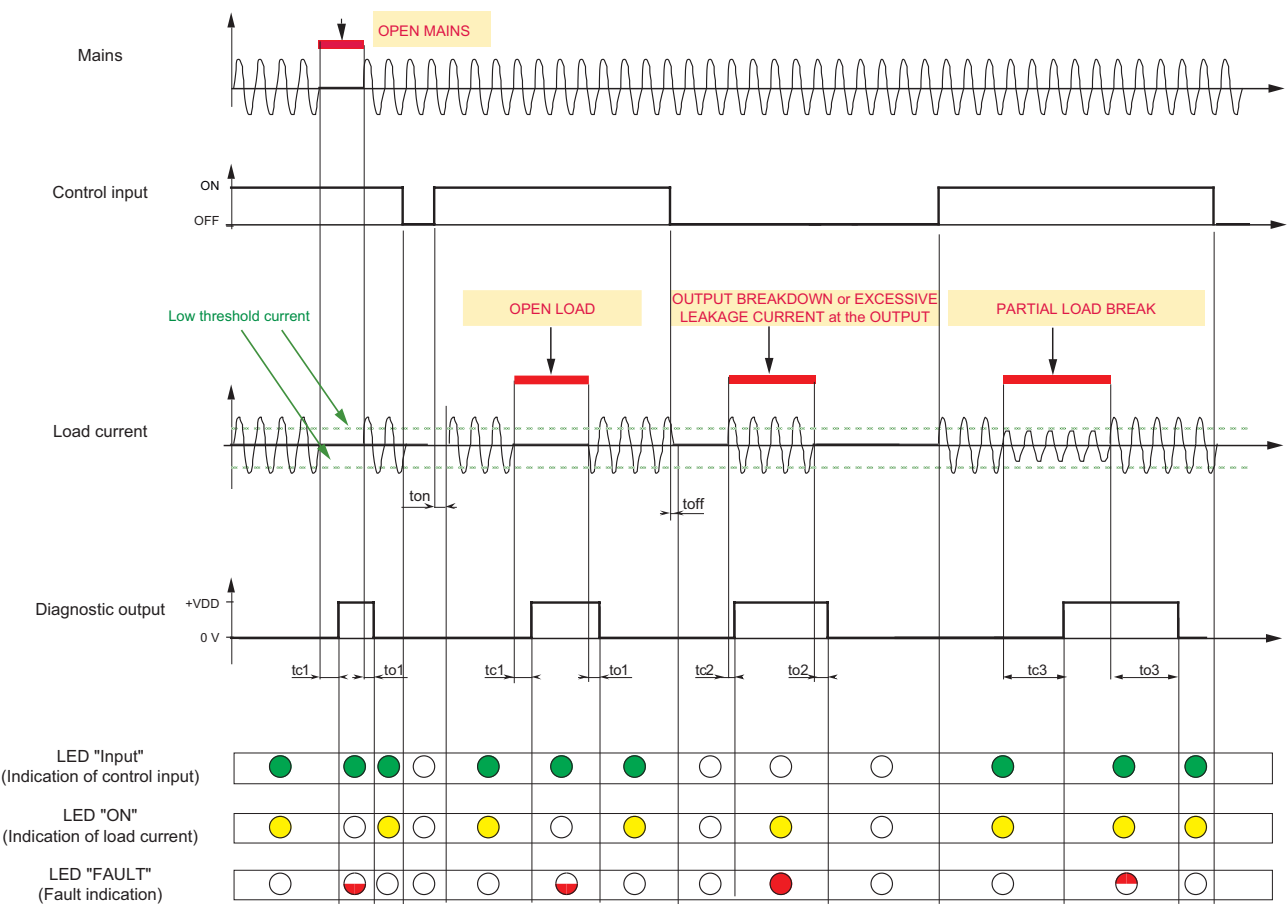


3.4 Parallel connection

The diagnostic outputs from several current monitoring modules can be connected in parallel where, for example, just one input is required for SPS. Faults can be found easily with the integrated LED status display.



3.5 Operation and faults



| Legend to symbols | | |
|-------------------|-----------|---|
| | OFF | |
| | ON green | |
| | ON yellow | |
| | ON red | |
| | flashing | slow symmetrical flashing (Ton = 1 s / Toff = 1 s) |
| | flashing | fast symmetrical flashing (Ton = 100 ms / Toff = 100 ms) |

4 Technical data

| | |
|--|--------------------------------|
| Control side (control input and external "Teach" input) | |
| Rated control voltage | 4...30 V DC |
| Rated control current | ≤ 2.5 mA |
| Dropout voltage | ≤ 2 V DC |
| Input frequency, max. | 10 Hz |
| Current monitoring | |
| Undercurrent switching threshold | $0.84 \times I_{\text{teach}}$ |
| Leakage current in PSSR output, max. | 0.3 A |
| Control output to the PSSR 1PH | |
| Solid-state type | Transistor |
| Nominal switching voltage | 8...30 V DC |
| Switch-on delay | ≤ 15 ms |
| Switch-off delay | ≤ 16 ms |
| Diagnostic output | |
| Solid-state type | MOSFET |
| Nominal switching voltage | 8...30 V DC |
| Continuous current | 0.1 A |
| Turn-on time in the event of power failure or load interruption t_{c1} , typ. * | 40 ms |
| Turn-off time in the event of power failure or load interruption t_{o1} , typ. * | 10 ms |
| Turn-on time in the event of output breakdown recognition t_{c2} , typ. * | 10 ms |
| Turn-off time after output breakdown recognition t_{o2} , typ. * | 40 ms |
| Turn-on time after partial load failure or excess current t_{c3} , typ. * | 100 ms |
| Turn-off time after partial load failure or excess current t_{o3} , typ. * | 100 ms |
| Current transformer | |
| Current measurement range, min./max. | 2 AAC / 40 AAC |
| Diameter of opening in current transformer | 9 mm |
| Supply | |
| Supply voltage | 8...30 V DC |
| Supply current | < 150 mA |
| Reverse polarity protection | Yes |
| Protective circuit | Varistor |
| Environmental conditions | |
| Ambient temperature | -40...+80 °C |
| Storage temperature | -40...+125 °C |
| Relative humidity (interior, no condensation) | 40...85 % |

| General data | |
|--|------------------------|
| Dimensions, depth x width x height | 43 mm x 25 mm x 112 mm |
| Type of protection | IP20 |
| Vibration according to IEC 60068-2-6, 10 / 55 Hz | 2 g |
| Shock according to IEC 60068-2-27, half sine / 11 ms | 15 g |
| Weight | 75 g |
| Enclosure material | PA 6 |
| Flammability class according to UL94 | V-0 |
| Standards | EN 60947-4-3, EN 60950 |
| Approvals | cURus |

* see chapter 3.5 "Operation and faults"

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