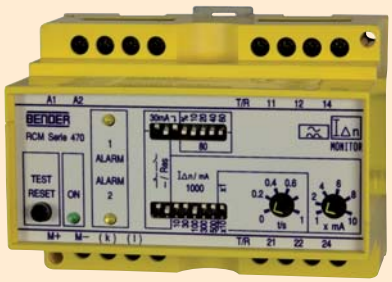
Residual current monitor RCM475YM2

Residual current monitor for TN and TT systems (AC and pulsating DC currents)



RCM475YM2

Device features

- Internal measuring current transformer ø 18 mm
- Two separately adjustable response values $I_{\Delta n2}$ 10 mA…10 A (50…60 Hz) $I_{\Delta n1}$ 30 mA, 10…80 % von $I_{\Delta n2}$ (50…60 Hz)
- Response delay for $I_{\Delta n2}$ adjustable 0…10 s
- Two separate alarm relays with one potential-free changeover contact each
- N / O or N / C operation, selectable
- Fault memory behaviour, selectable
- Combined test / reset button
- Connection external test and reset button
- Connection external measuring instrument $I_{\Delta n}$ 0…100 %
- Sealable transparent cover
- External supply voltage
- Type A acc. to IEC 60755

Approvals and certifications

GL c UL us LISTED PCT AE25

Product description

The residual current monitor RCM475YM2 is designed for fault and residual current monitoring in earthed power supply systems (TN and TT systems) where an alarm is to be activated in the event of a fault, but disconnection must be prevented. Two separately adjustable response values and alarm relays allow to distinguish between prewarning and alarm.

Since the values are measured with measuring current transformers, the device is nearly independent of the load current and the nominal voltage of the system.

Application

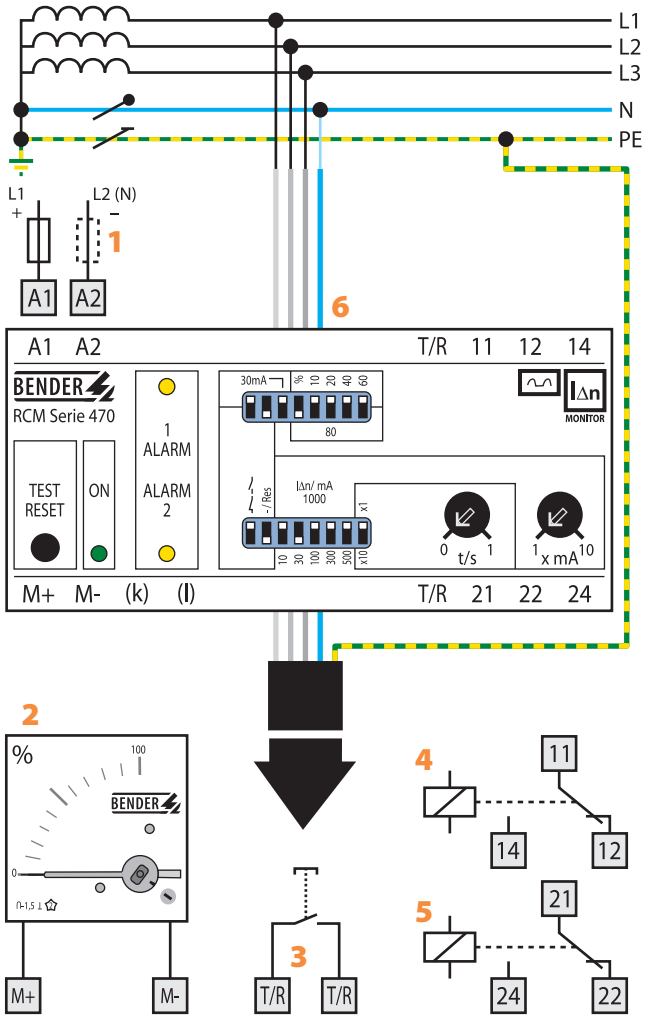
- Two-stage residual current monitoring in earthed two, three or four conductor systems (TN and TT systems)
- Current monitoring of single conductors de-energised under normal conditions
- Socket-outlet circuits for devices which are operated unattended for a long time and which may not fail
- Alarm systems, safety devices
- Air conditioning systems, EDP systems
- Cooling equipment with valuable frozen goods
- Canteen kitchens
- Monitoring of earthed power supplies for stray currents, load on N conductors

Function

Residual current monitoring takes place via an internal measuring current transformer. When the current respectively the residual current exceeds one or both preset response values, the respective alarm LED lights (applies to $I_{\Delta n2}$ only) and the alarm relay switches after the expiry of the set response delay.

The fault messages can be stored. The fault memory can be reset by pressing the RESET button. The device function can be tested using the test button.

Wiring diagram – system connection, external connections



1 - Supply voltage U_S, see ordering information (6 A fuse recommended)

2 - External measuring instrument

3 - External test and reset button "T / R"

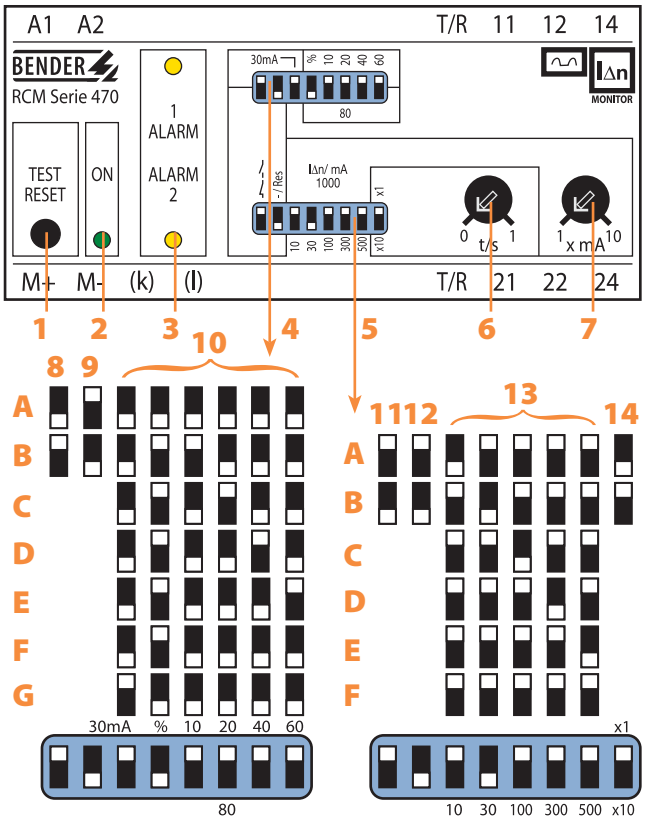
4 - Alarm relay: switches when the fault current exceeds the response value Alarm 1

5 - Alarm relay: switches when the fault current exceeds the response value Alarm 2

6 - Internal measuring current transformer

Note! Do not route the PE conductor through the measuring current transformer!

Wiring diagram – front plate



1 - Combined test / reset button "TEST / RESET"; short-time pressing (< 1 s) = RESET, long-time pressing (> 2 s) = TEST

2 - Power On LED "On"

3 - Alarm LEDs: Alarm1 = prewarning, Alarm 2 = alarm

4 - Response range Alarm 1 (prewarning)

5 - Response range Alarm 2 (alarm)

6 - Potentiometer for setting the response delay (0…1 s)

7 - Potentiometer for setting the response value ($I_{\Delta n}$ / mA x 1…10)

Setting of the DIP switches (white = switch position)

Operating principle and settings of the alarm relay Alarm 1

8 - Setting of the operating principle
- A - N / C operation
- B - N / O operation

9 - Fault memory behaviour relay + LED
- A - Fault memory ON
- B - Fault memory OFF

10 - Setting of the prewarning range
- A - prewarning OFF
- B - 10 % of $I_{\Delta n2}$
- C - 20 % of $I_{\Delta n2}$
- D - 40 % of $I_{\Delta n2}$
- E - 60 % of $I_{\Delta n2}$
- F - 80 % of $I_{\Delta n2}$
- G - respone value 30 mA

Operating principle and settings of the alarm relay Alarm 2

11 - Setting of the operating principle
- A - N / O operation
- B - N / C operation

12 - Fault memory behaviour relay + LED
- A - Fault memory ON
- B - Fault memory OFF

13 - Setting of the alarm level
- A - 10…100 mA
- B - 30…300 mA
- C - 100…1000 mA
- D - 300…3000 mA
- E - 500…9000 mA
- F - 1…10 A

14 - Setting of the response delay

Technical data RCM475YM2

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 250 V
Rated impulse voltage / pollution degree	4 kV / 3

Voltage ranges

Supply voltage U_S	see ordering information
Operating range of U_S	0.85…1.1 x U_S
Frequency range of U_S	50…400 Hz
Power consumption	≤ 3 VA

Measuring circuit / response values

Internal measuring current transformer	ø 18 mm
Load	180 Ω
Operating characteristic acc. to IEC 60755	Type A
Rated residual operating current $I_{\Delta n2}$ (Alarm 2)	10 mA…10 A
Rated residual operating current $I_{\Delta n1}$ (Alarm 1)	30 mA, 10…80 % of $I_{\Delta n2}$ min. 8 mA
Response delay t_v, adjustable	0…10 s
Accuracy of response delay	+ / - 20 %
Rated frequency	50…60 Hz
Relative uncertainty	0…- 25 % of the response value
Hysteresis	approx. 25 % of the response value
Response time t_{an} at $I_{\Delta n1}$	≤ 200 ms
Response time t_{an} at $I_{\Delta n2}$ = 1 x $I_{\Delta n2}$ (t_v = 0 s) / 5 x $I_{\Delta n2}$ (t_v = 0 s)	≤ 250 ms / ≤ 20 ms
Number of measuring channels	1

Displays

LEDs	Power On, Alarm

Inputs / outputs

Test and reset button, potential free	internal / external
Cable length for external test and reset button	≤ 10 m
Current source for external measuring instrument	DC 0…400 µA
Load	≤ 12.5 kΩ

Switching elements

Number of switching elements	2 x 1 changeover contact
Operating principle, adjustable	N / C operation / N / O operation
Electrical endurance, number of cycles	12000
Rated contact voltage	AC 250 V / DC 300 V
Making capacity	AC / DC 5 A
Breaking capacity	2 A, AC 230 V, cos phi = 0.4 – 0.2 A, DC 220 V, L / R = 0.04 s
Fault memory behaviour	ON / OFF

General data

EMC immunity	EN 61543
EMC emission	EN 61000-6-4
Shock resistance IEC 60068-2-27 (during operation)	15 g / 11 ms
Bumping IEC 60068-2-29 (during transport)	40 g / 6 ms
Vibration resistance IEC 60068-2-6 (during operation)	1 g / 10…150 Hz
Vibration resistance IEC 60068-2-6 (during transport)	2 g / 10…150 Hz
Ambient temperature, during operation	- 10 °C…+ 55 °C
Ambient temperature, when stored	- 40 °C…+ 70 °C
Climatic class acc. to DIN IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	any position
Connection	modular terminals
Connection properties rigid / flexible	0.2…4 / 0.2…2.5 mm²
flexible with ferrules without / with plastic sleeve	0.25…2.5 mm²
Conductor sizes (AWG)	24…12
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Type of enclosure	X475
Enclosure material	polycarbonate
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Installation into standard distribution panels acc. to	DIN 43871
Flammability class	UL94V-0
Product standards	DIN EN 62020 (VDE 0663): 2005-11, IEC 62020: 2003-11
Operating manual	TBP401006
Weight	≤ 350 g

Ordering information

Type	Response range $I_{\Delta n2}$ / $I_{\Delta n1}$	Rated frequency	Time delay	Measuring current transformer inside diameter	Displays	Fault memory behaviour	Supply voltage U_S	Art. No.
RCM475LYM2	10 mA…10 A, 30 mA, 10…80 % $I_{\Delta n2}$	50…60 Hz	0…10 s	ø 18 mm	external	selectable	AC 230 V	B 9401 2016
RCM475LYM2-13	10 mA…10 A, 30 mA, 10…80 % $I_{\Delta n2}$	50…60 Hz	0…10 s	ø 18 mm	external	selectable	AC 90…132 V*	B 9401 2036

Other supply voltages on request

* Absolute values of the operating range

Accessories

External measuring instruments

Type	Displays	Size (mm)	Art. No.
9604-4241	0…100 %	96 x 96	B 986 807

Measuring converter

Type	Input	Output	Art. No.
RK170	0…400 µA	0…10 V 0 / 4…20 mA	B 9804 1500

Dimension diagram

Dimensions in mm