

Residual current monitor RCM470LY

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



Device features

- External measuring current transformer
- Response values, adjustable
10 mA...10 A / 100 A 40...400 Hz
- Response delay, adjustable 0...10 s
- Alarm relay with two potential-free
changeover contacts
- N/O or N/C operation
- Fault memory, selectable
- Combined TEST and RESET button
- Connection external TEST and RESET
button
- LED bar graph indicator $I_{\Delta n}$ 0...100 %
- Connection external measuring instru-
ment $I_{\Delta n}$ 0...100 %
- CT connection monitoring
- Sealable transparent cover
- Separate supply voltage
- Type A according to IEC 60755

Approvals



Product description

The residual current monitor RCM470LY 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. In addition, the device can be used to monitor single conductors, such as PE conductors, N-PE connections and PE-PAS connections.

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. The device can also be used for busbar systems.

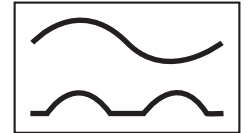
Application

- Residual current monitoring in earthed two, three or four conductor systems.
- Current monitoring of single conductors de-energized 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 kitchen
- Monitoring of earthed power supplies for stray currents, loads of N conductors.

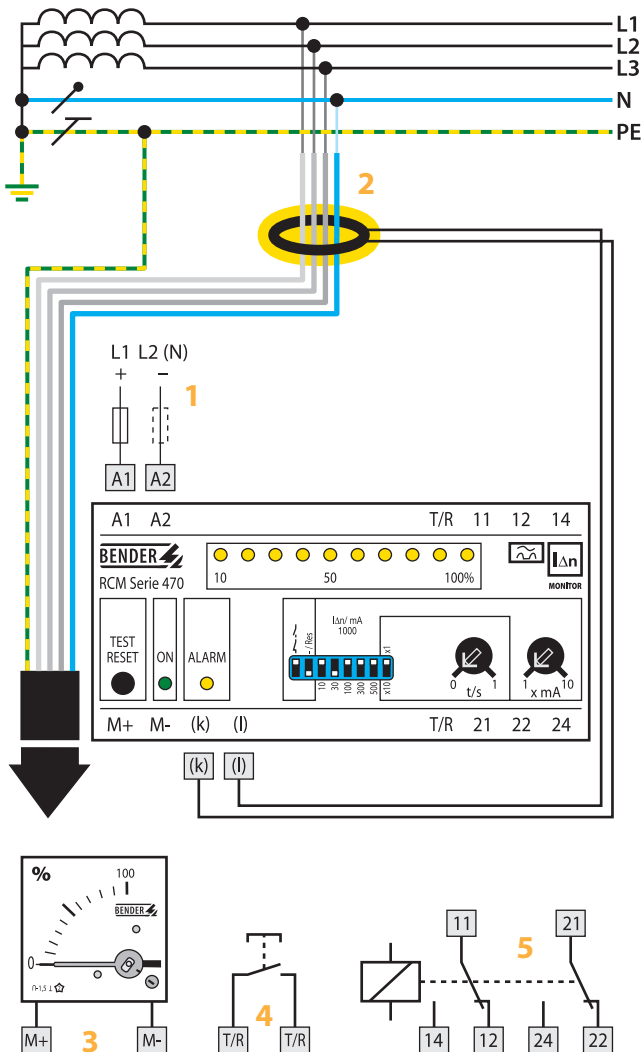
Function

Residual current monitoring takes place via an external measuring current transformer. When the residual current respectively the current exceeds the set response value, the alarm LED lights 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.

The currently measured value in per cent related to the set response value is indicated on the LED bar graph indicator. The CT circuit is continuously monitored. In case of wire breakage, the alarm relay switches and the alarm LED flashes.



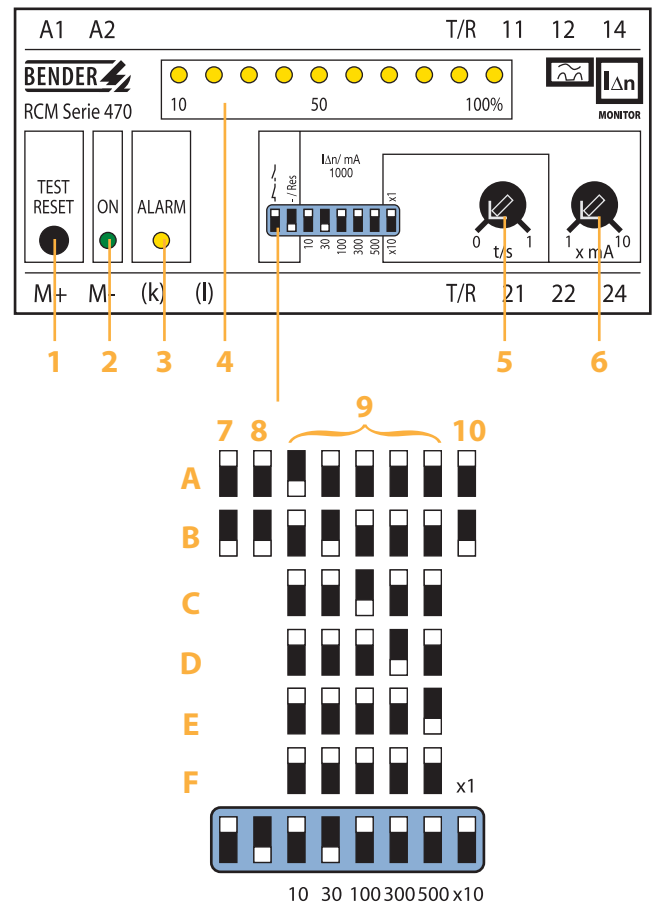
Wiring diagram – system connection, external connections



- 1 - Supply voltage U_S (see ordering information), a 6 A fuse recommended for line protection.
- 2 - External measuring current transformer (refer to table "External measuring current transformers")
- 3 - External measuring instrument
- 4 - External TEST and RESET button
- 5 - Alarm relay: switches when the fault current exceeds the response value and in case of interruption of the CT connection.

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

Wiring diagram – front plate



- 1 - Combined TEST and RESET button: short-time pressing (< 1s) = RESET; long-time pressing (> 2s) = TEST
- 2 - Power On LED
- 3 - Alarm LED: lights when the fault current exceeds the response value and flashes in case of interruption of the CT connection.
- 4 - LED bar graph indicator: shows the measuring value in per cent related to the preset response value.
- 5 - Potentiometer for setting the response delay (0...1 s).
- 6 - Potentiometer for setting the response value (x 1...10 mA)

Setting of the DIP switches (white = switch position)

- 7 - Operating principle of the alarm relay

A - N/O operation	B - N/C operation
-------------------	-------------------
- 8 - Fault memory behaviour relay + LED

A - Fault memory ON	B - Fault memory OFF
---------------------	----------------------
- 9 - Setting of the response range

RCM470LY	RCM470LY-72
A - 10 mA	A - 100 mA
B - 30 mA	B - 300 mA
C - 100 mA	C - 1 A
D - 300 mA	D - 3 A
E - 500 mA	E - 5 A
F - 1000 mA	F - 10 A
- 10 - Setting of the response delay

A - x 1	B - x 10
---------	----------

Technical data residual current monitor RCM470LY

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 details
Operating range of U_S	0.85...1.1 x U_S
Frequency range of U_S	DC / 50...400 Hz
Power consumption	≤ 3 VA

Measuring circuit

External measuring current transformers	W..., WR..., WS... series
Load	180 Ω
Load RCM470LY-72	18 Ω
Operating characteristic acc. to IEC 60755	Type A
Rated residual operating current $I_{\Delta n}$	10 mA...10 A / 100 A
Response delay t_v , adjustable	0...10 s
Accuracy of response delay	+ / - 20 %
Rated frequency	40...400 Hz
Relative percentage error	40...400 Hz: 0...-25 % 400...1000 Hz: 10...-25 %
Hysteresis	approx. 25 % of the response value
Response time $t_{\Delta n}$ at $I_{\Delta n} = 1 \times I_{\Delta n}$ ($t_v = 0$ s)	≤ 250 ms
Response time $t_{\Delta n}$ at $I_{\Delta n} = 5 \times I_{\Delta n}$ ($t_v = 0$ s)	≤ 20 ms
Number of measuring channels	1

Displays

LED bar graph indicator	0...100 %
LEDs	Power On, Alarm

Inputs / outputs

TEST and RESET button	internal / external
Cable length external TEST and RESET button	≤ 10 m
Current source for external measuring instrument	DC 0...400 μA
Load	12.5 kΩ

Cable lengths for measuring current transformers

Single wire $\geq 0.75 \text{ mm}^2$	0...1 m
Single wire, twisted $\geq 0.75 \text{ mm}^2$	0...10 m
Shielded cable $\geq 0.5 \text{ mm}^2$	0...40 m
Recommended cable (shielded, shield on one side connected to terminal I of the RCM470, not connected to earth)	
	J-Y(ST)Y min. 2 x 0.8

Switching elements

Number of switching elements	1 x 2 changeover contacts
Operating principle, adjustable	N / C operation / N / O operation
Electrical endurance, number of cycles	12000
Rated contact voltage	AC 250 V / DC 300 V
Limited 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	acc. to EN 61543
EMC emission	acc. to 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 category IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	any position
Connection	screw terminals
Connection properties	
rigid / flexible	0.2...4 / 0.2...2.5 mm ²
flexible with ferrules without / with plastic collar	0.25...2.5 mm ²
Conductor sizes (AWG)	24...12
Protection class, internal components (IEC 60529)	IP30
Protection class, terminals (IEC 60529)	IP20
Type of enclosure	X470
Enclosure material	polycarbonate
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Flammability class	UL94V-0
Standards	IEC 62020
Instruction leaflet	BP401003
Weight	≤ 350 g

Ordering information residual current monitor RCM470LY

Type	Response range $I_{\Delta n}$	Rated frequency	Response delay	Measuring current transformers	Display	Fault memory behaviour	Supply voltage U_S	Art. No.
RCM470LY	10 mA...10 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	AC 230 V	B 94012017 ²⁾
RCM470LY-13	10 mA...10 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	AC 90...132 V*	B 94012019 ²⁾
RCM470LY-11	10 mA...10 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	AC 24 V	B 94012025 ²⁾
RCM470LY-21	10 mA...10 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	DC 9.6...84V*	B 94012021 ¹⁾
RCM470LY-23	10 mA...10 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	DC 77...286V*	B 94012024 ¹⁾
RCM470LY-72	100 mA...100 A	40...400 Hz	0...10 s	W..., WR..., WS...	internal / external	selectable	AC 230 V	B 94012027 ²⁾

Other supply voltages on request * Absolute values of the operating range

¹⁾ For industrial application only

²⁾ For industrial and household applications

Accessories

External measuring current transformers

Type	Inside diameter (mm)	Art. No.
W20	ø 20	B 9808 0003
W35	ø 35	B 9808 0010
W60	ø 60	B 9808 0018
W120	ø 120	B 9808 0028
W210	ø 210	B 9808 0034
WR70x175	70 x 175	B 9808 0609
WR115x305	115 x 305	B 9808 0610
WS20x30	20 x 30	B 9808 0601
WS50x80	50 x 80	B 9808 0603
WS80x120	80 x 120	B 9808 0606

Other measuring current transformer types on request.

External measuring instruments

Type	Display range	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 X470

Dimensions in mm

