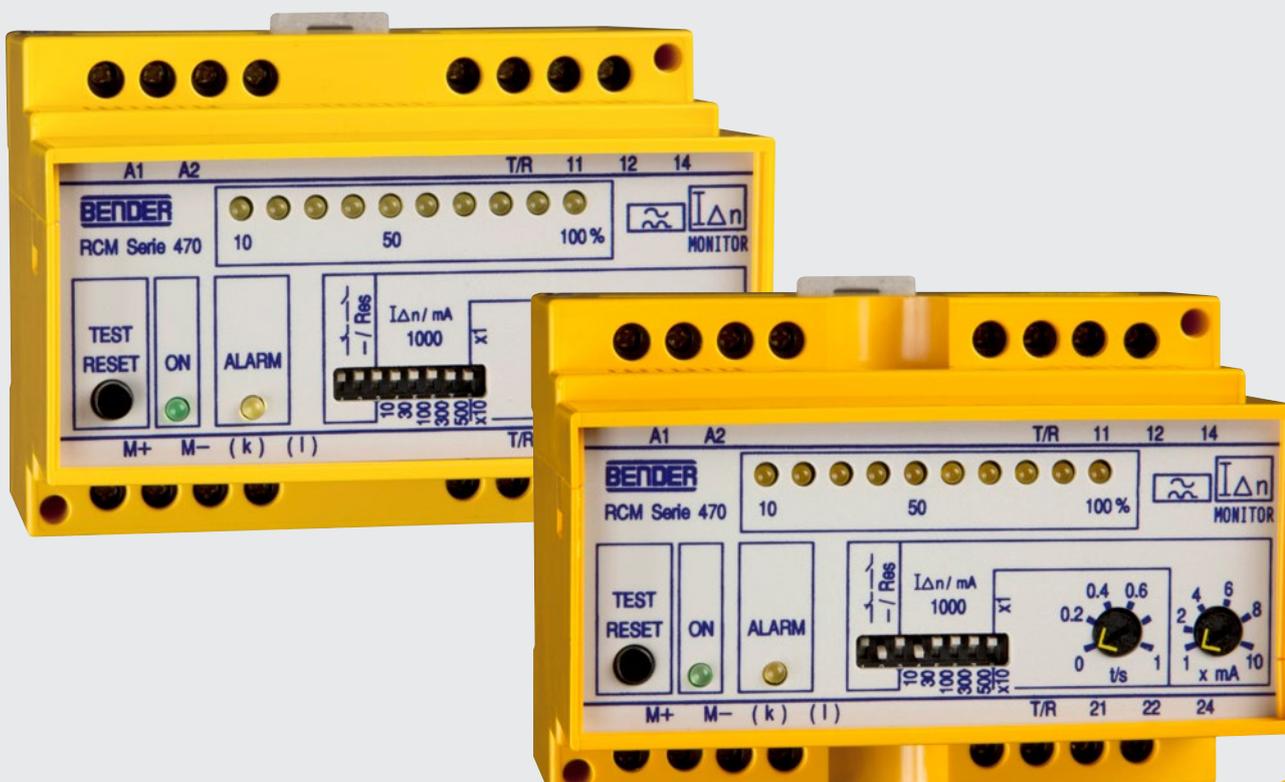


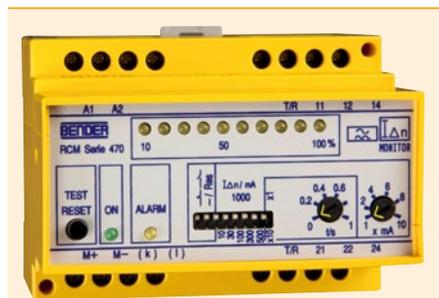
Residual current monitor RCM470LY/RCM475LY

for TN and TT systems (AC and pulsating DC currents)



Residual current monitor RCM470LY

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



RCM470LY

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, selectable
- Fault memory behaviour, selectable
- Combined test/reset button
- Connection external test and reset button
- LED bar graph indicator $I_{\Delta n}$ 0...100 %
- Connection external measuring instrument $I_{\Delta n}$ 0...100 %
- CT connection monitoring
- Sealable transparent cover
- External supply voltage
- Type A acc. to IEC/TR 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 (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, impact on 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.

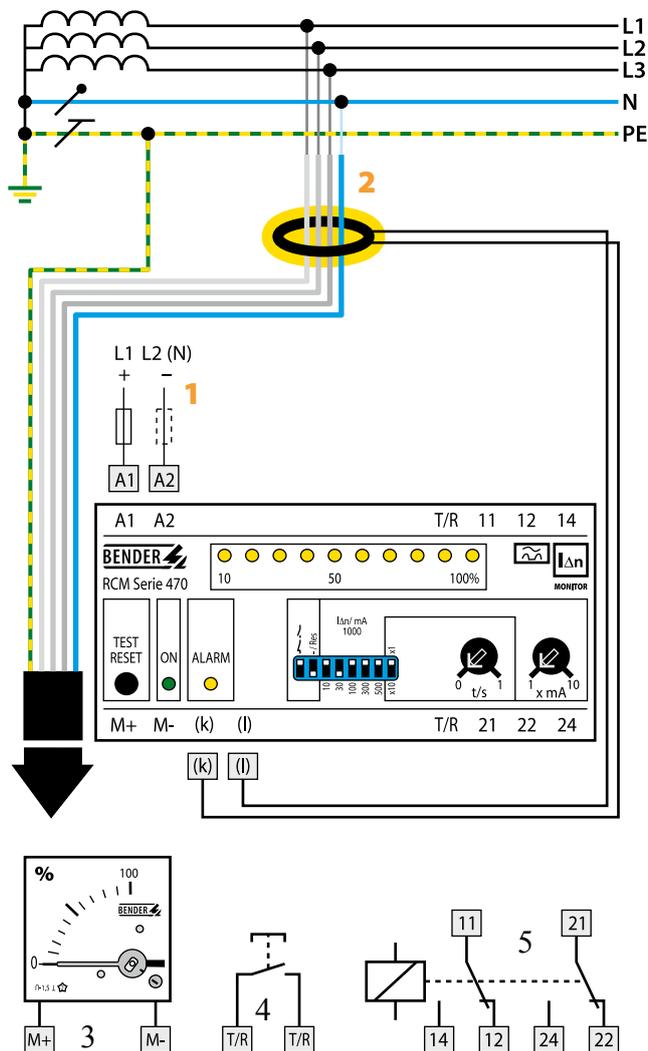
The currently measured value in per cent related to the set response value is indicated on the LED bar graph indicator. The CT circuit is continuously monitored. In case of wire breakage, the alarm relay switches and the alarm LED flashes.

Standards

The RCM470LY series complies with the requirements of the device standards: DIN EN 62020 (VDE 0663) und IEC 62020.



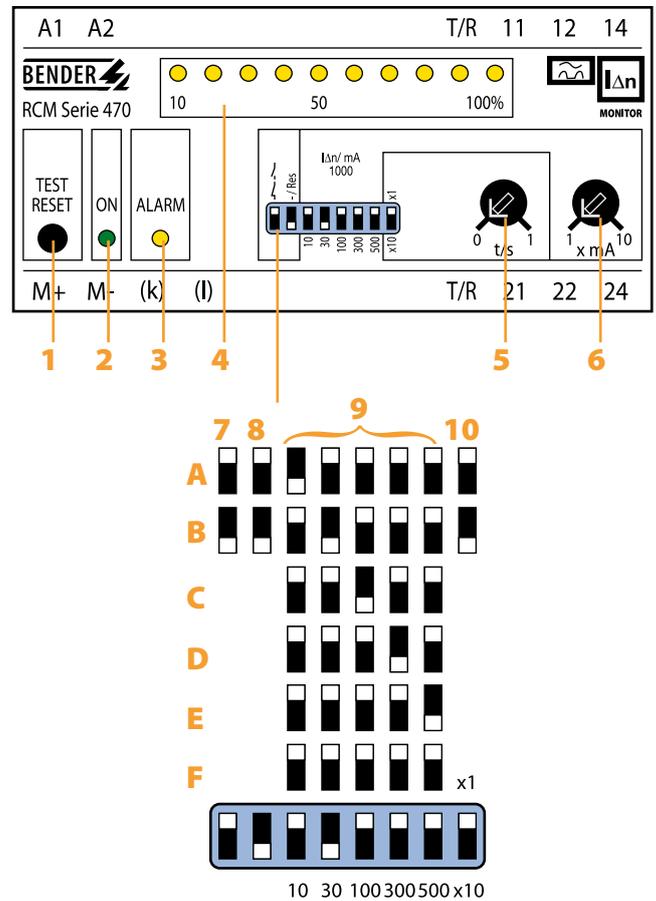
Wiring diagram- system connection, external connections



- 1 - Supply voltage U_s , see ordering information, 6 A fuse recommended.
- 2 - External measuring current transformer (refer to table "External measuring current transformers")
- 3 - External measuring instrument
- 4 - External test and reset button "T/R"
- 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/reset button "T/R": short-time pressing (< 1s) = RESET; long-time pressing (> 2s) = TEST
- 2 - Power On LED "ON"
- 3 - Alarm LED "ALARM": 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
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- 8 - Fault memory behaviour relay + LED

A - Fault memory ON	B - Fault memory OFF
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- 9 - Setting 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 the response delay

A - x 1	} 0...1 s
B - x 10	

Technical data

Insulation coordination acc. to IEC 60664-1:

Rated insulation voltage	AC 250 V
Rated impulse withstand 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	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 characteristics acc. to IEC 62020 and IEC/TR 60755	Type A
Rated residual operating current $I_{\Delta n}$	10 mA...10 A
Rated residual operating current $I_{\Delta n}$ for -72	100 mA...100 A
Response delay t_v , adjustable	0...10 s
Accuracy of response delay	± 20 %
Rated frequency	40...400 Hz
Relative uncertainty	40...400 Hz: 0...-25 % 400...1000 Hz: 10...-25 %
Hysteresis	approx. 25 % of the response value
Response time t_{an} at $I_{\Delta n} = 1 \times I_{\Delta n}$ ($t_v = 0$ s)	< 250 ms
Response time t_{an} 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 ≥ 0.75 mm ²	0...1 m
Single wire, twisted ≥ 0.75 mm ²	0...10 m
Shielded cable ≥ 0.5 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. 2x0.8

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
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	on/off

Environment/EMC

EMC immunity	EN 61543
EMC immunity	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...+55 °C
Ambient temperature (for storage)	-40...+70 °C
Climatic class acc. to DIN IEC 60721-3-3	3K5

Connection

Connection type	modular terminals
Connection properties	
rigid/flexible	0.2...40.2...2.5 mm ²
flexible with ferrules without/with plastic collar	0.25...2.5 mm ²
Conductor sizes (AWG)	24...12

Other

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP30
Type of enclosure	X470
Enclosure material	polycarbonate
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Flammability class	UL94V-0
Weight	≤ 350 g

Ordering information

Rated frequency	Response delay	Measuring current transformer	Displays	Fault memory behaviour	Response range $I_{\Delta n}$	Supply voltage U_5		Type	Art. No.
						AC	DC		
40...400 Hz	0...10 s	W..., WR..., WS...	internal/external	selectable	10 mA...10 A	230 V	–	RCM470LY	B 9401 2017 ²⁾
						90...132 V*	–	RCM470LY-13	B 9401 2019 ²⁾
						24 V	–	RCM470LY-11	B 9401 2025 ²⁾
						–	9,6...84 V*	RCM470LY-21	B 9401 2021 ¹⁾
					–	77...286 V*	RCM470LY-23	B 9401 2024 ¹⁾	
					100 mA...100 A	230 V	–	RCM470LY-72	B 9401 2027 ²⁾

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

¹⁾ For industrial application only / ²⁾ For industrial and household applications

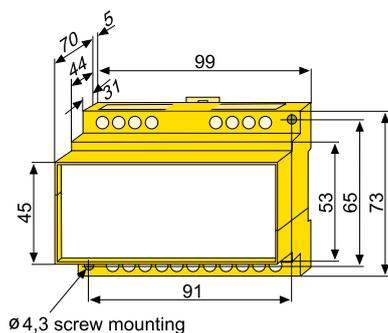
Suitable system components

Type designation	Inside diameter/Size (mm)	Displays	Input	Output	Type	Art. No.
External measuring current transformers	∅ 20	–	–	–	W20	B 9808 0003
	∅ 35	–	–	–	W35	B 9808 0010
	∅ 60	–	–	–	W60	B 9808 0018
	∅ 120	–	–	–	W120	B 9808 0028
	∅ 210	–	–	–	W210	B 9808 0034
	70 x 175	–	–	–	WR70x175	B 9808 0609
	115 x 305	–	–	–	WR115x305	B 9808 0610
	20 x 30	–	–	–	WS20x30	B 9808 0601
	50 x 80	–	–	–	WS50x80	B 9808 0603
80 x 120	–	–	–	WS80x120	B 9808 0606	
External measuring instruments	96 x 96	0...100 %	–	–	9604-4241	B 986 807
Measuring converter	–	–	0...400 µA	0...10 V 0/4...20 mA	RK170	B 9804 1500

Other measuring current transformer types on request

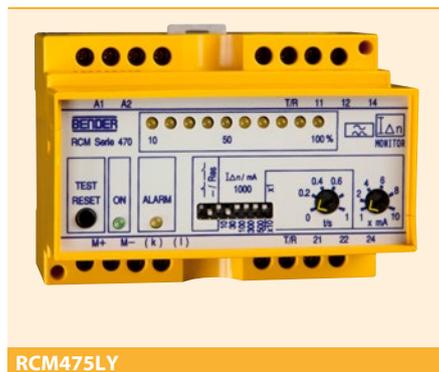
Dimension diagram X470

Dimensions in mm



Residual current monitor RCM475LY

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



RCM475LY

Device features

- Internal measuring current transformer \varnothing 18 mm
- Response values, adjustable 10 mA...10 A 50...60 Hz
- Response delay, adjustable 0...10 s
- Alarm relay with two potential-free changeover contacts
- N/O or N/C operation, selectable
- Fault memory behaviour, selectable
- Combined test/reset button
- Connection external test and reset button
- LED bar graph indicator $I_{\Delta n}$ 0...100 %
- Connection external measuring instrument $I_{\Delta n}$ 0...100 %
- Sealable transparent cover
- External supply voltage
- Type A acc. to IEC/TR 60755

Approvals



Product description

The residual current monitor RCM475LY 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.

Application

- 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, impact on N conductors

Function

Residual current monitoring takes place via an internal 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.

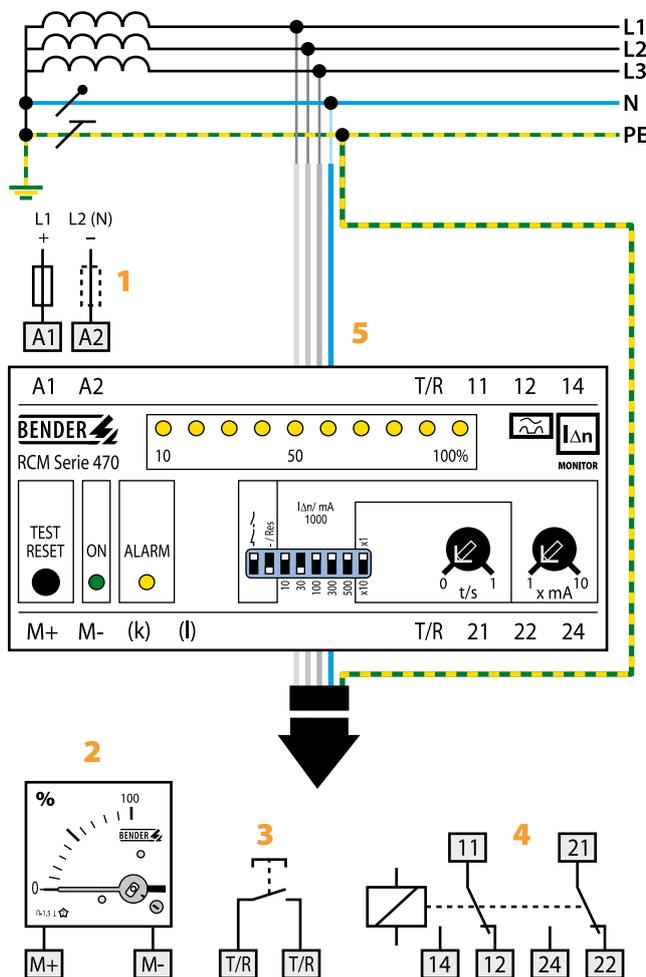
The currently measured value in per cent related to the set response value is indicated on the LED bar graph indicator.

Standards

The RCM475LY series complies with the requirements of the device standards: DIN EN 62020 (VDE 0663) und IEC 62020.



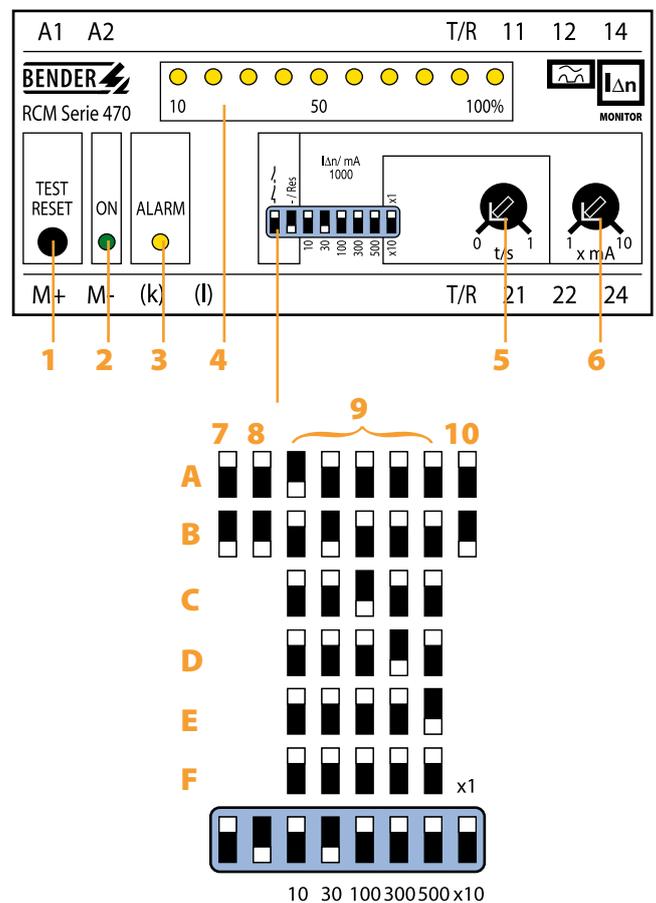
Wiring diagram – system connection, external connections



- 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.
- 5 - 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 "T/R": short-time pressing (< 1 s) = RESET; long-time pressing (> 2 s) = TEST.
 - 2 - Power On LED "ON"
 - 3 - Alarm LED "ALARM": lights when the fault current exceeds the response value.
 - 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
 - A - 10 mA
 - B - 30 mA
 - C - 100 mA
 - D - 300 mA
 - E - 500 mA
 - F - 1000 mA

} x 1...10
 - 10 - Setting of the response delay
 - A - x 1
 - B - x 10

} 0...1 s

Technical data

Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 250 V
Rated impulse withstand 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	DC 50...400 Hz
Power consumption	≤ 3 VA

Measuring circuit/response values

Internal measuring current transformer	∅ 18 mm
Load	180 Ω
Operating characteristics acc. to IEC/TR 60755	Type A
Rated residual operating current $I_{\Delta n}$	10 mA...10 A
Response delay t_v , adjustable	0...10 s
Accuracy of response delay	± 20 %
Rated frequency	50...60 Hz
Relative uncertainty	0...-20 % of the response value
Hysteresis	approx. 25% of the response value
Response time t_{an} at $I_{\Delta n} = 1 \times I_{\Delta n}$ ($t_v = 0$ s)	< 250 ms
Response time t_{an} 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, potential free	internal/external
Maximum cable length for external measuring instrument	≤ 10 m
Current source for external measuring instrument/max. load	DC 0...400 μA/12.5 kΩ

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
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	on/off

Environment/EMC

EMC immunity	EN 61543
EMC immunity	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...+55 °C
Ambient temperature for storage	-40...+70 °C
Climatic class acc. to DIN IEC 60721-3-3	3K5

Connection

Connection type	modular 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

Other

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP30
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
Weight	≤ 350 g

Ordering information

Rated frequency	Time delay	Measuring current transformer inside diameter	Displays	Fault memory behaviour	Response range $I_{\Delta n}$	Supply voltage U_s		Type	Art. No.
						AC	DC		
50...60 Hz	0...10 s	ø 18 mm	internal/external	selectable	10 mA...10 A	230 V	–	RCM475LY	B 9401 2018
						90...132 V*	–	RCM475LY-13	B 9401 2035
						–	77...286 V*	RCM475LY-23**	B 9401 2069

Other supply voltages on request / * Absolute values of the operating range / ** no GL approval

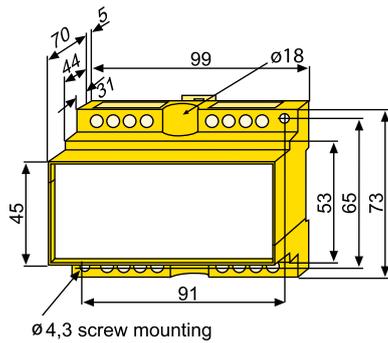
Suitable system components

Type designation	Size (mm)	Displays	Input	Output	Type	Art. No.
External measuring instruments	96 x 96	0...100 %	–	–	9604-4241	B 986 807
Measuring converter	–	–	0...400 µA	0...10 V 0/4...20 mA	RK170	B 9804 1500

Other measuring current transformer types on request

Dimension diagram X470

Dimensions in mm





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