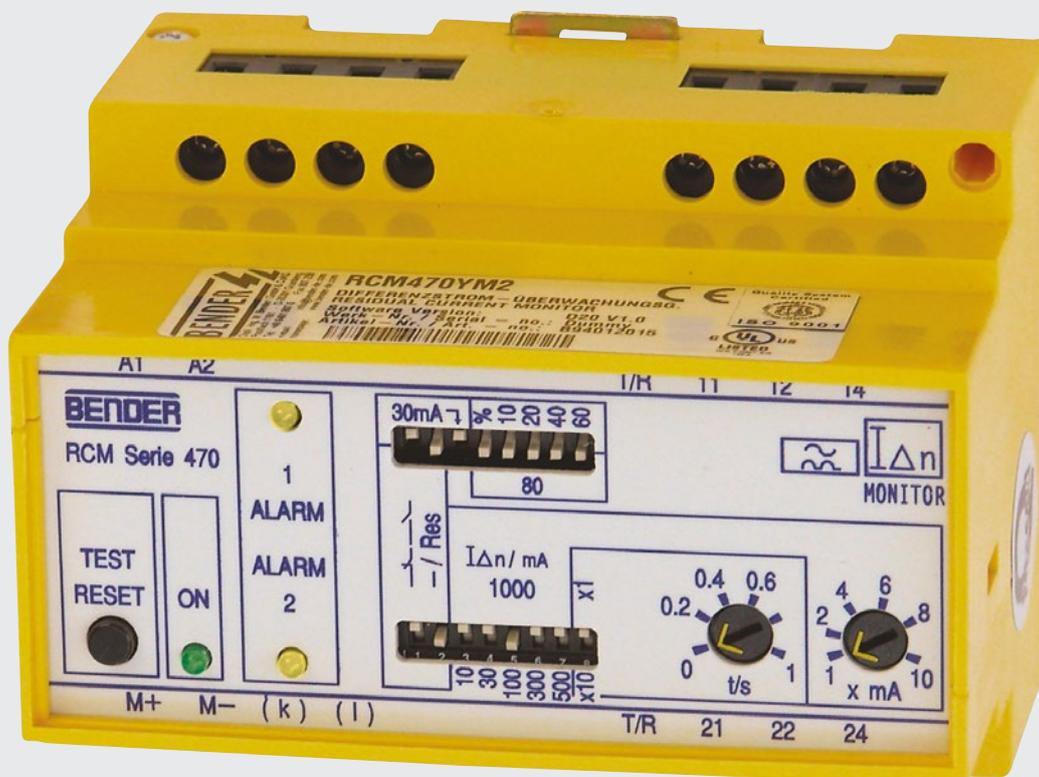


Residual current monitor RCM470YM2

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



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RCM470YM2

Device features

- External measuring current transformer
- Two response values:
 $I_{\Delta n2}$ 10 mA...10 A (50...60 Hz)
 $I_{\Delta n1}$ 30 mA, 10...80 % of $I_{\Delta n2}$ (50...60 Hz)
- Time delay for $I_{\Delta n2}$, adjustable 0...10 s
- Two separate alarm relays with one voltage free changeover contact each
- N/O / N/C operation, selectable
- Fault memory, selectable
- Combined test and reset button
- Connection for external test and reset button
- Connection external measuring instrument
 $I_{\Delta n}$ 0...100%
- CT connection monitoring
- Transparent dust cover for ingress protection
- Separate supply voltage
- Type A according to IEC 60755

Approvals



Product description

The residual current monitor RCM470YM2 is designed for fault current respectively residual current monitoring in earthed systems (TN and TT systems) where an alarm is to be activated in case of a fault, but disconnection must be prevented. Two separately adjustable response values respectively alarm relays allow to distinguish between prewarning and alarm.

The measuring values are detected via measuring current transformers, therefore the devices are nearly independent of the load current and nominal voltage of the system. The device is also suitable for busbar systems.

Application

- Two-stage residual current monitoring in earthed two, three or four conductor systems (TN and TT 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

The residual current is measured using an external measuring current transformer. When the current respectively the residual current exceeds one of the set response values, the respective alarm LED lights and the alarm relay switches after the expiry of the set response delay (applies to $I_{\Delta n2}$ only).

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

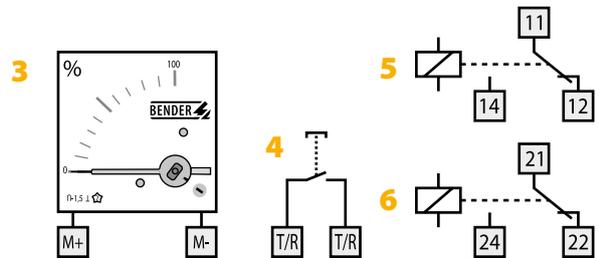
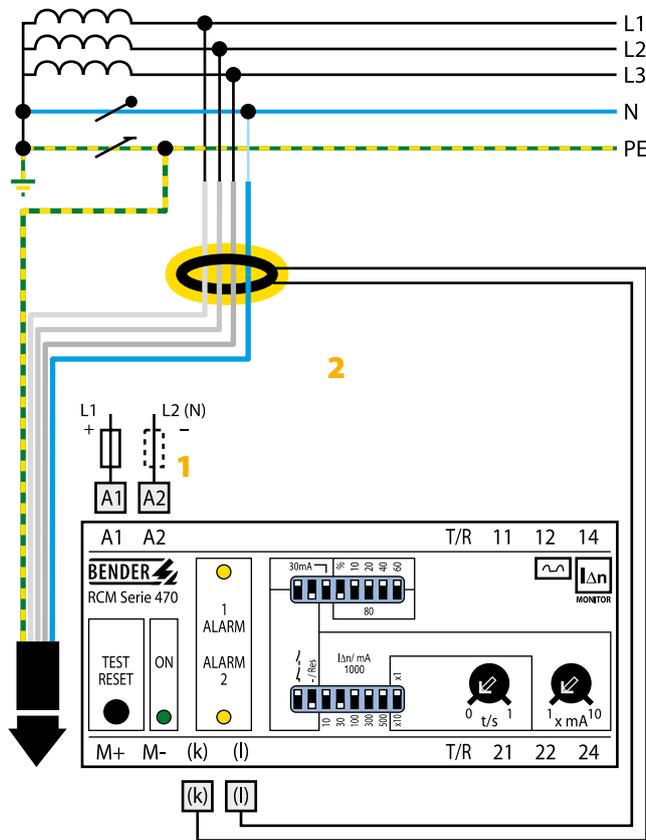
The CT circuit is continuously monitored. In case of wire breakage, the alarm relays switch and the alarm LEDs flash.

Standards and regulations

The residual current monitor RCM470YM2 complies with the requirements of DIN EN 62020 (VDE 0663), IEC 62020.



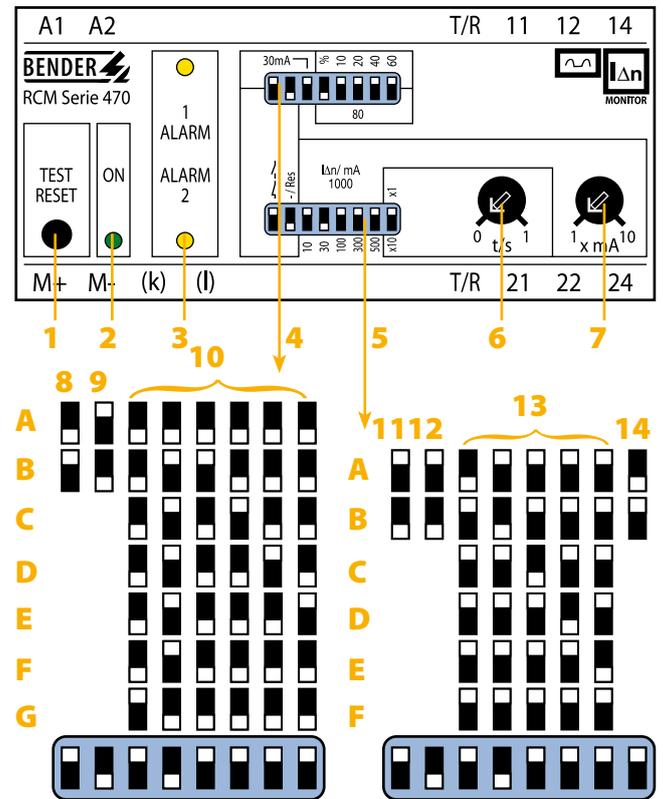
Wiring diagram – system connection, external connections



- 1 - Supply voltage U_S see ordering details, a 6 A fuse is recommended
- 2 - External measuring current transformer, see 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 Alarm 1 and in case of interruption of the CT connection
- 6 - Alarm relay: switches when the fault current exceeds the response value Alarm 2 and in case of interruption of the CT connection

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

Wiring diagram – frontplate



- 1 - Combined test and reset button: short-time pressing (< 1 s) = RESET; long-time pressing (> 2 s) = TEST
 - 2 - Power ON LED
 - 3 - Alarm LEDs: Alarm 1 = 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 ($\Delta I_n / \text{mA} \times 1 \dots 10$)
- Setting of the DIP switches (white = switch position)

- 8 - Operating principle and settings of the alarm relay Alarm 1
 - A - N/C operation
 - B - N/O operation
- 9 - Setting of the fault memory
 - A - fault memory ON
 - B - fault memory OFF
- 10 - Setting of the prewarning range
 - A - prewarning OFF
 - B - 10 % of Alarm 2
 - C - 20 % of Alarm 2
 - D - 40 % of Alarm 2
 - E - 60 % of Alarm 2
 - F - 80 % of Alarm 2
 - G - Response value 30 mA

Operating principle and settings of alarm relay Alarm 2

- 11 - Setting of the operating principle
 - A - N/O operation
 - B - N/C operation
- 12 - Setting of the fault memory
 - A - Fault memory ON
 - B - Fault memory OFF
- 13 - Setting of the alarm stage
 - 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
 - A - x 10
 - B - x 1

Technical data

Insulation coordination according to IEC 60664-1:

Rated 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 U_S	50...400 Hz
Max. power consumption	3 VA

Measuring circuit/response values

Type of external CT	series W...WR...WS...
Load	180 Ω
Operating characteristics 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
Rated frequency	50...60 Hz
Relative percentage error	0...-25 %
Hysteresis	approx. 25 % of the response value
Response time t_{an} at $I_{\Delta n1}$	\leq 200 ms
Response time t_{an} at $I_{\Delta n2} = 1 \times I_{\Delta n2}$ ($t_v = 0$ s)	$<$ 250 ms
Response time t_{an} at $I_{\Delta n2} = 5 \times I_{\Delta n2}$ ($t_v = 0$ s)	\leq 20 ms
Response delay t_v , adjustable ($I_{\Delta n2}$)	0...10 s
Accuracy of response delay	\pm 20%
Number of measuring channels	1

Displays and LEDs

LEDs	Power On, alarm
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Inputs/outputs

Test/reset button voltage free	internal/external
Max. cable length external test/reset button	\leq 10 m
Current source for external measuring instrument/max.load	DC 0...400 μ A/12.5 k Ω

Cable lengths for measuring current transformers

Single wire \geq 0.75 mm ²	0...1 m
Single wire, twisted \geq 0.75 mm ²	0...10 m
Shielded cable \geq 0.5 mm ²	0...40 m
Recommended cable (shielded, shield on one side connected to PE)	J-Y(St)Y min. 2x0.6

Switching elements

Switching elements	1 x 2 changeover contacts
Operating principle, adjustable	N/C or 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, selectable	ON/OFF

Environment/EMC

EMC immunity acc. to	EN 61543
EMC emission acc. to	EN 61000-6-4
Shock resistance IEC 60068-2-27 (device in operation)	15 g/11 ms
Bumping IEC 60068-2-29 (during transport)	40 g/6 ms
Vibration resistance IEC 60068-2-6 (device in operation)	1 g/10...150 Hz
Vibration resistance IEC 60068-2-6 (device out of operation)	2 g/10...150 Hz
Ambient temperature (during operation)	-10 $^{\circ}$ C...+55 $^{\circ}$ C
Storage temperature range	-40 $^{\circ}$ C...+70 $^{\circ}$ C
Climatic class according to DIN IEC 60721-3-3	3K5

Connection

Connection	screw terminals
Cross sectional area of connecting cable	
Rigid/flexible	0.2...4 mm ² /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
Position	any position
Degree of protection, internal components (DIN EN 60529)	IP30
Degree of protection, terminals (DIN EN 60529)	IP20
Enclosure	X470
Enclosure, material	polycarbonate
Screw fixing	2 x M4
DIN rail mounting according to	DIN EN 60715/IEC 60715
Installation into standard distribution panels acc. to	DIN 43871
Flammability class	UL94V-0
Instruction leaflet No.	401005
Weight approx.	350 g

Ordering details

Response range $I_{\Delta n2}/I_{\Delta n1}$	Rated frequency	Time delay	Measuring current transformer	Indication	Fault memory	Supply voltage U_s		Type	Art. No.
						AC			
10 mA...10 A 30 mA, 10...80% $I_{\Delta n2}$	50...60 Hz	0...10 s	W..., WR..., WS...	external	selectable	230 V		RCM470YM2	B 9401 2015
						90...132 V*		RCM470YM2-13	B 9401 2034

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

Accessories

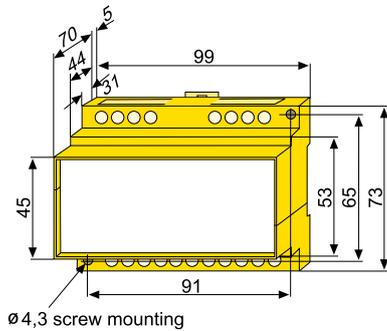
External measuring current transformers		
Internal diameter (mm)	Type	Art. No.
ø 20	W20	B 9808 0003
ø 35	W35	B 9808 0010
ø 60	W60	B 9808 0018
ø 120	W120	B 9808 0028
ø 210	W210	B 9808 0034
70 x 175	WR70x175	B 9808 0609
115 x 305	WR115x305	B 9808 0609
20 x 30	WS20x30	B 9808 0601
50 x 80	WS50x80	B 9808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

External measuring instrument			
Indication	Size (mm)	Type	Art. No.
0...100%	96 x 96	9604-4241	B 986 807

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

Dimension diagram X470

Dimensions in mm





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