Residual current monitor RCM470DY

Directionally discriminating residual current monitor for IT AC systems (AC and pulsating DC currents)

RCM470DY

Features

- External measuring current transformer
- Response value, adjustable 10 mA…10 A / 100 mA…100 A
- 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
- TEST and RESET button internal / external
- Power on LED, alarm LEDs
- Connection monitoring for external CTs
- Sealable transparent cover
- Enclosure for DIN rail mounting and screw mounting
- Separate supply voltage
- Type A according to IEC 60755

Approvals

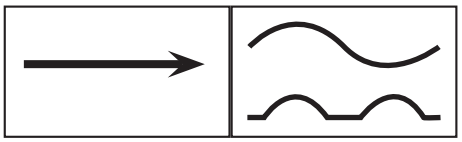
GL c UL us LISTED PCT AE25

Product description

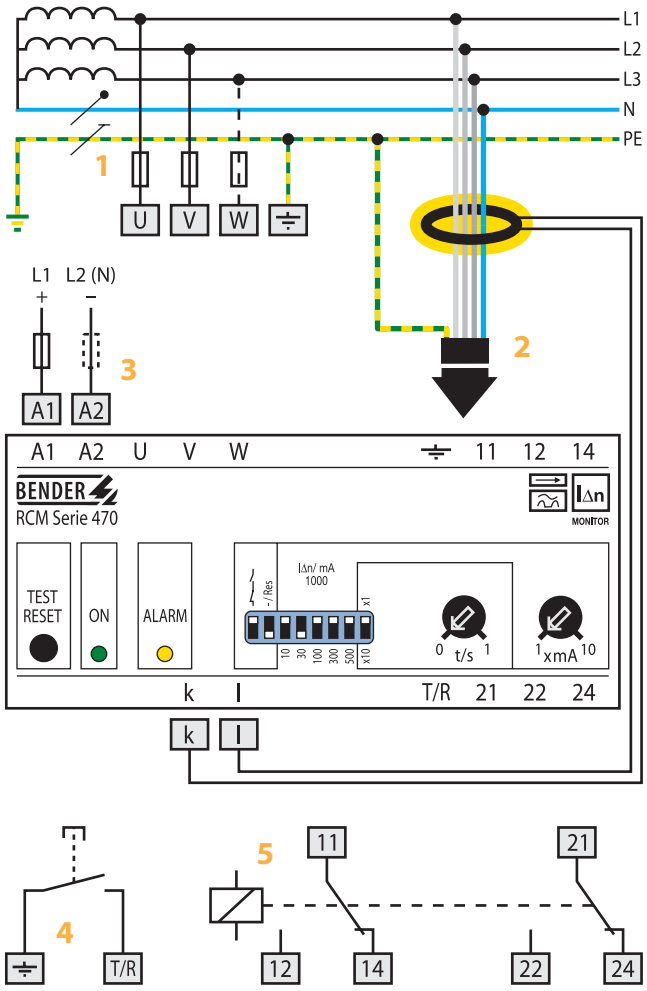
The residual current monitor RCM470DY monitors the residual current (AC, DC pulsating) in unearthed AC or 3NAC systems (IT systems). The residual current is evaluated directionally, i.e. insulation faults detected on the load side are signalled. That allows selective fault location in extended systems.

A precondition for the use of the device are sufficient high leakage capacitances upstream the CT so that a residual current higher than the response value can flow. However, a high leakage current is not desirable in many sectors so that principally the value of the maximum permissible leakage current of the IT system and the application field has to be taken into consideration when using directionally discriminating residual current monitors. Also the nominal voltage has to be considered when selecting the appropriate device since the measuring principle requires the neutral point displacement voltage of the IT system to be monitored.

For the RCM470DY series, external measuring current transformers of the type W… or WR… can be used. The nominal voltage range can be extended up to AC resp. 3NAC 1000 V with the coupling device AKS470.



Wiring diagram – system connection, external connections



1 - A 6 A fuse is recommended. The terminal W is not applied in single phase systems.*

2 - External measuring current transformer (refer to table “External measuring current transformers”).

3 - Supply voltage U_S see ordering information, a 6 A fuse is recommended.

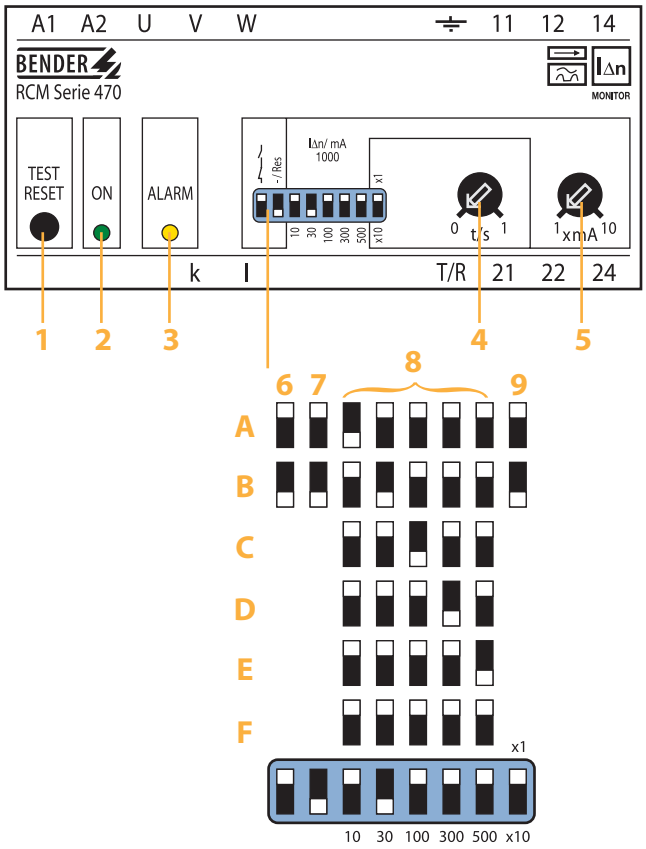
4 - External TEST and RESET button.

5 - Alarm relay: switches when the fault current exceeds or does not reach the response value and in case of interruption of the CT connection.

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

* When insulation or voltage tests are to be carried out, the device must be isolated from the system for the test period.

Wiring diagram – front plate



1 - Combined TEST and RESET button: short-time pressing (< 1 s) = RESET, long-time pressing (> 2 s) = 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 - Potentiometer for setting the response delay (0…1 s).

5 - Potentiometer for setting the response value (x 1…10 mA).

Response range setting, white = switch position. Check that the system is in de-energized state before changing the functions N / O /N / C operation, response delay x 1 / x 10 and fault memory behaviour!

6 - Setting the operating principle of the alarm relay
- A - N / O operation
- B - N / C operation

7 - Setting the fault memory behaviour + LED
- A - Fault memory ON
- B - Fault memory OFF

8 - Response range setting

RCM470DY		RCM470DY-72	
A - 10 mA	x 1…10	A - 100 mA	x 1…10
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	

9 - Response delay setting
- A - x 1
- B - x 10

} 0…1 s

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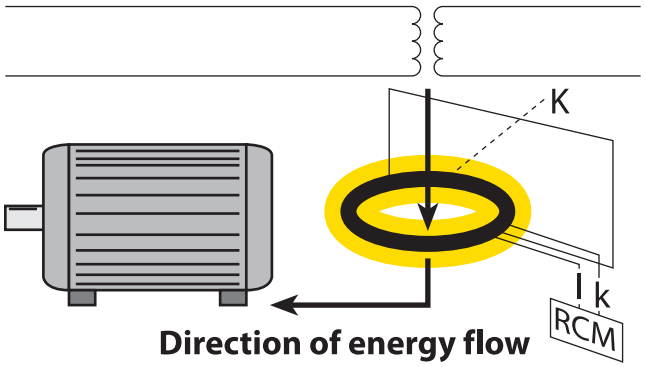
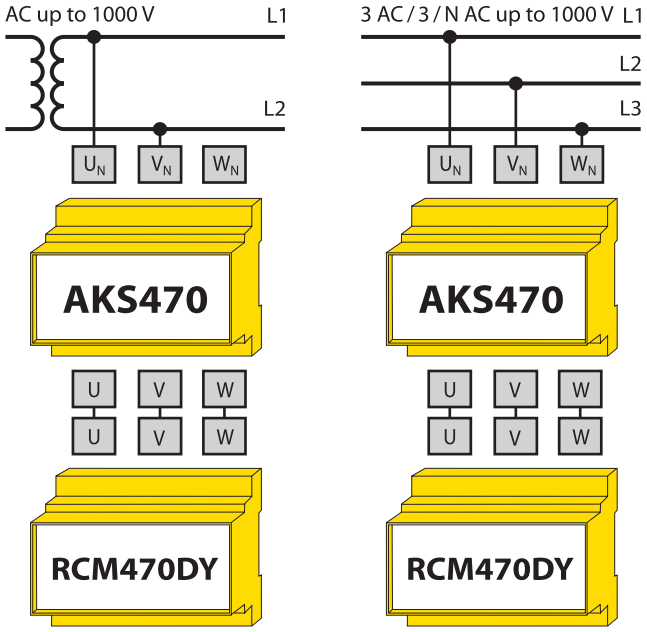
Wiring diagram – CT installation RCM470DY / coupling device AKS470



In order to obtain directional selectivity the instructions concerning the conductors to be monitored through measuring current transformer have to be observed.



4.4

Technical data residual current monitor RCM470DY

Insulation coordination acc. to IEC 60664-1

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

Voltage ranges

System being monitored U_n	AC 50…60 Hz 400 V
Operating range of U_n	0.24…1.1 x U_n
Supply voltage U_S	see ordering information
Frequency range of U_S	50…60 Hz
Operating range of U_S	0.85…1.1 x U_S
Power consumption	≤ 3 VA

Measuring circuit

External measuring current transformer	W…, WR… series
Load	180 Ω
Operating characteristic acc. to IEC 60755	Type A
Rated residual operating current $I_{\Delta n}$	10 mA…10 A / 100 mA…100 A
Response delay t_v, adjustable	0…10 s
Accuracy of response delay	+ / - 20 %
Rated frequency	50…60 Hz
Relative percentage error	0…- 20 %
Hysteresis	approx. 25 % of the response value
Response time t_{an}	≤ 500 ms
Number of measuring channels	1

Displays

LEDs	Power On, Alarm

Inputs / outputs

TEST and RESET button	internal / external
Cable length external TEST and RESET button	≤ 10 m

Cable lengths for measuring current transformers

Single wire ≥ 0.75 mm²	0…1 m
Single wire, twisted ≥ 0.75 mm²	0…10 m
Shielded cable ≥ 0.5 mm²	0…40 m;
Recommended cable (shielded, shield on one side to terminal l of the RCM and 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
Factory setting	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
Limited 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 mm²
flexible with ferrules without / with plastic collar	0.25…2.5 mm²
Conductor sizes (AWG)	24…12
Degree of protection, internal components / terminal (IEC 60529)	IP30 / IP20
Type of enclosure / enclosure material	X470 / polycarbonate
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Flammability class	UL94V-0
Standards	IEC 62020
Instruction leaflet	BP402002
Weight	≤ 350 g

Ordering information

Type	Response range $I_{\Delta n}$	Rated frequency	Time delay	Measuring current transformers	Fault memory	Supply voltage U_S	Nominal voltage U_n	Art. No.
RCM470DY	10 mA…10 A	50…60 Hz	0…10 s	W…, WR…	selectable	AC 230 V	AC / 3AC 90…440 V*	B 9402 2025
RCM470DY-72**	100 mA…100 A	50…60 Hz	0…10 s	W…, WR…	selectable	AC 230 V	AC / 3AC 90…440 V*	B 9402 2031
RCM470DY-13	10 mA…10 A	50…60 Hz	0…10 s	W…, WR…	selectable	AC 90 …132 V*	AC / 3AC 90…440 V*	B 9402 2029

* The values listed above are absolute values to which the operating range cannot be applied.
Other supply voltages on request

** not GL and UL approved

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

Other measuring current transformer types on request.

Coupling device

Type	Nominal voltage U_n	Art.-No.
AKS470	AC / 3AC 1000 V	B 9803 9001[2)]

Dimension diagram X470

Dimensions in mm