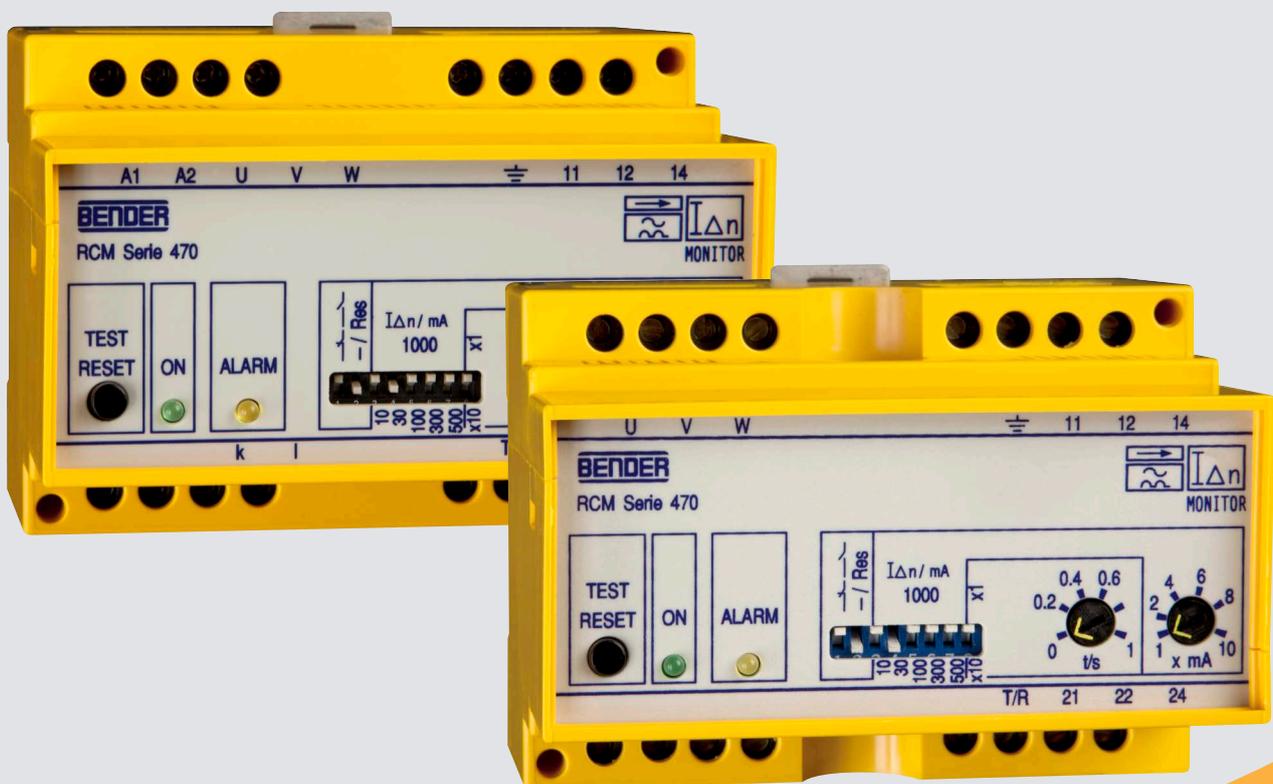


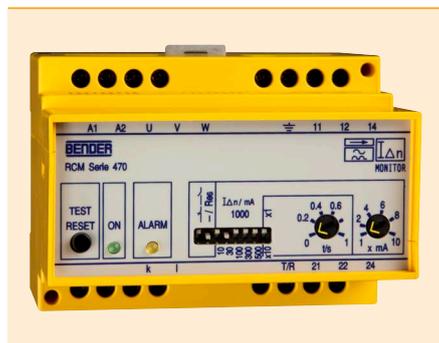
Directionally discriminating residual current monitor RCM470DY/RCM475DY

for IT AC systems (AC and pulsating DC currents)



Residual current monitor RCM470DY

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



RCM470DY

Device 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
- Internal/external test and reset button
- LEDs: Power On, Alarm
- Connection monitoring for external CTs
- Sealable transparent cover
- Enclosure for DIN rail mounting and
screw mounting
- External supply voltage
- Type A acc. to IEC/TR 60755

Approvals



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. only insulation faults detected on the load side are signalled. That allows selective fault location in extended IT 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.

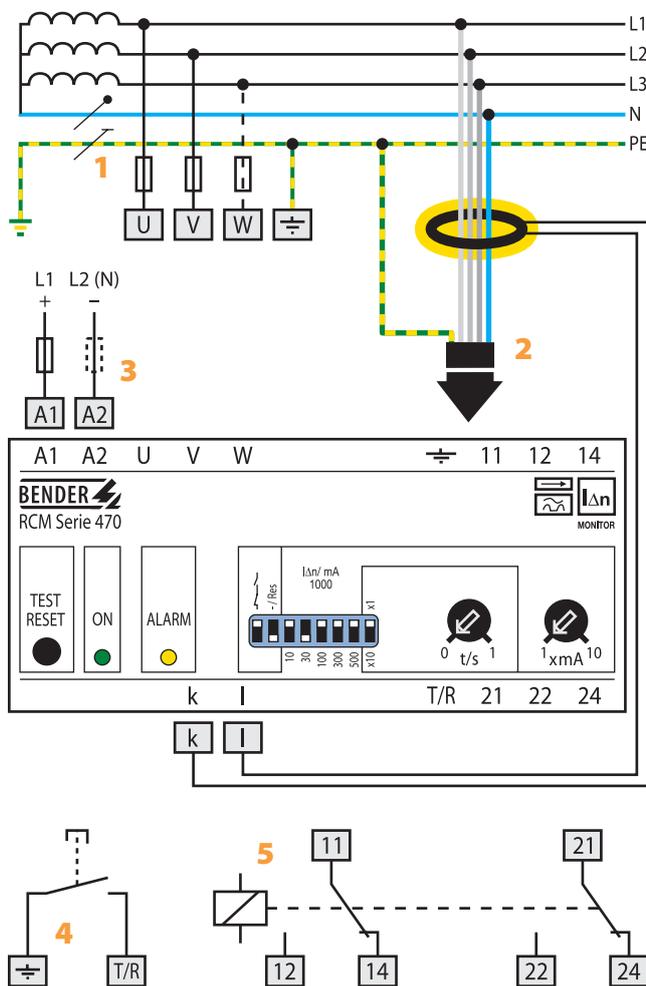
For the RCM470DY series, external measuring current transformers of the type W... or WR... can be used. The nominal voltage range can be extended up to AC resp. 3NAC 1000 V with the coupling device AKS470.

Standards

The RCM470DY series complies with the requirements of the device standards:
DIN EN 62020 (VDE 0663) und IEC 62020.



Wiring diagram- system connection, external connections

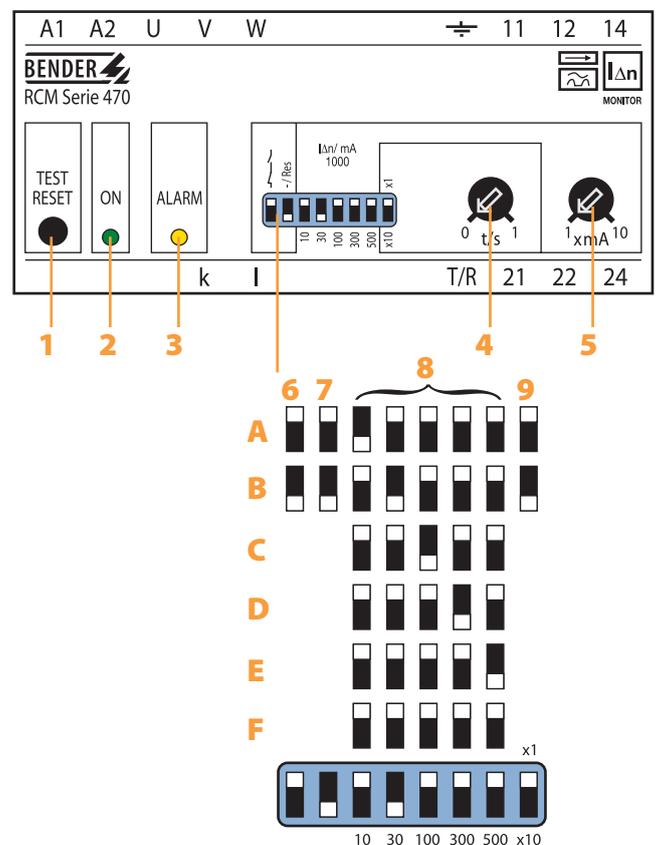


- 1 - A 6 A fuse is recommended. The terminal W is not applied in single phase systems*
- 2 - External measuring current transformer (refer to table "External measuring current transformers")
- 3 - Supply voltage U_s see ordering information, 6 A fuse recommended
- 4 - External test/reset button "T/R"
- 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

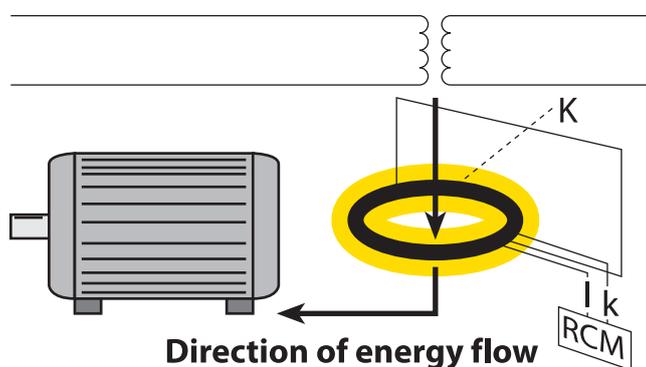


- 1 - Combined test/reset button "TEST/RESET"; short-time pressing (< 1 s) = RESET, long-time pressing (> 2 s) = TEST
 - 2 - Power On LED "ON"
 - 3 - Alarm LED "ALARM": lights when the fault current exceeds the response value and flashes in case of interruption of the CT connection.
 - 4 - Potentiometer 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-energised 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 - Fault memory behaviour relay + LED
 - A - Fault memory ON
 - B - Fault memory OFF
 - 8 - Response range setting

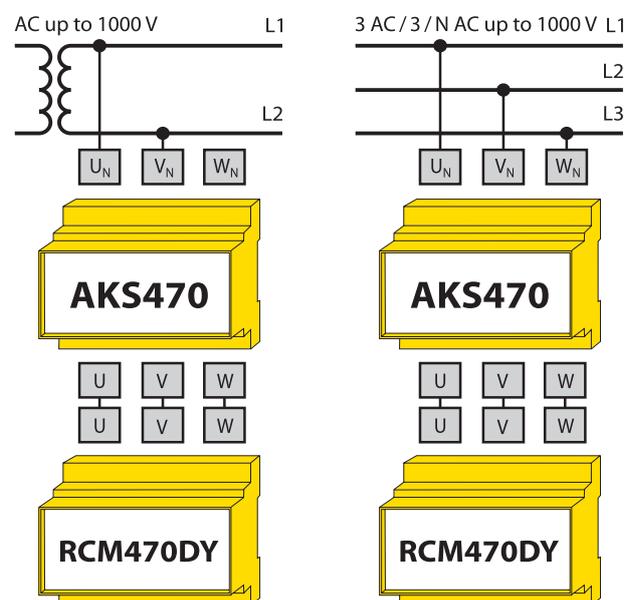
RCM470DY		RCM470DY-72	
A - 10 mA	}	A - 100 mA	}
B - 30 mA		B - 300 mA	
C - 100 mA		C - 1 A	
D - 300 mA		D - 3 A	
E - 500 mA		E - 5 A	
F - 1000 mA		F - 10 A	
	x 1...10		x 1...10
 - 9 - Setting of the response delay
 - A - x 1
 - B - x 10

0...1 s

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.



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

System being monitored U_n	AC 400 V, 50...60 Hz
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 characteristics acc. to IEC/TR 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 uncertainty	0...20 %
Hysteresis	approx. 25 % of the response value
Response time t_n	≤ 500 ms
Number of measuring channels	1

Displays

LEDs	Power On, Alarm
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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 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 L of the RCM, 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
Factory setting	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 (when stored)	-40...+70 °C
Climatic class acc. to 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 /terminal (DIN EN 60529)	IP 30/IP 20
Type of enclosure/enclosure material	X470/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	Fault memory behaviour	Nominal voltage U_n	Supply voltage U_s	Response range I_{Δ}	Type	Art. No.
50...60 Hz	0...10 s	W..., WR...	selectable	AC/3AC 90...440V*	AC 230 V	10 mA...10 A	RCM470DY	B 9402 2025
						100 mA...100 A	RCM470DY-72**	B 9402 2031
					AC 90 ...132 V*	10 mA...10 A	RCM470DY-13	B 9402 2029

* The values listed above are absolute values to which the operating range cannot be applied.

Other supply voltages on request

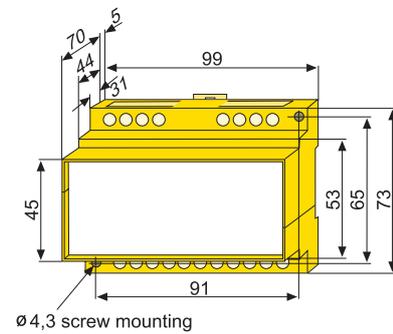
** not GL and UL approved

Suitable system components

Type designation	Internal diameter (mm)	Nominal voltage U_n	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	
Coupling device	–	AC/3AC 1000 V	AKS470	B 9803 9001

Dimension diagram X470

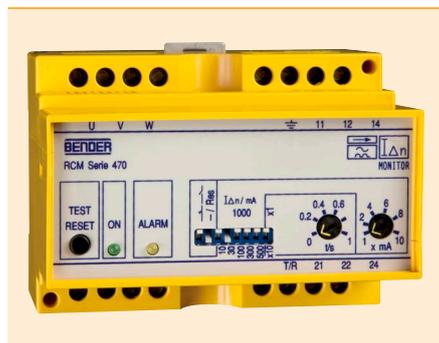
Dimensions in mm



Residual current monitor

RCM475DY

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



RCM475DY

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. only insulation faults detected on the load side are signalled. That allows selective fault location in extended IT 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.

Version RCM475DY utilises an internal measuring current transformer, \varnothing 18 mm.

Device features

- Internal measuring current transformer \varnothing 18 mm
- Response value, adjustable 10 mA...10 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
- Internal/external test and reset button
- LEDs: Power On, Alarm
- Sealable transparent cover
- Enclosure for DIN rail mounting and screw mounting
- Type A acc. to IEC/TR 60755

Standards

The RCM475DY series complies with the requirements of the device standards: DIN EN 62020 (VDE 0663) und IEC 62020.

Approvals



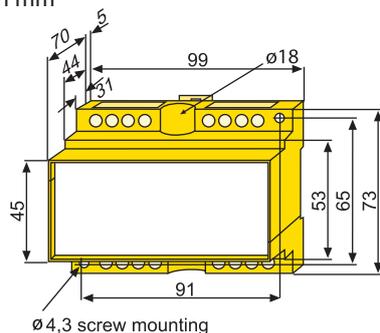
Ordering information

Response range I_{Δ}	Rated frequency	Time delay	Measuring current transformer inside diameter	Fault memory behaviour	Nominal voltage U_n	Type	Art. No.
10 mA...10 A	50...60 Hz	0...10 s	\varnothing 18 mm	selectable	AC/3AC 195...253 V*	RCM475DY	B 9402 2026
					AC 90...132 V*	RCM475DY-13	B 9402 2028

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

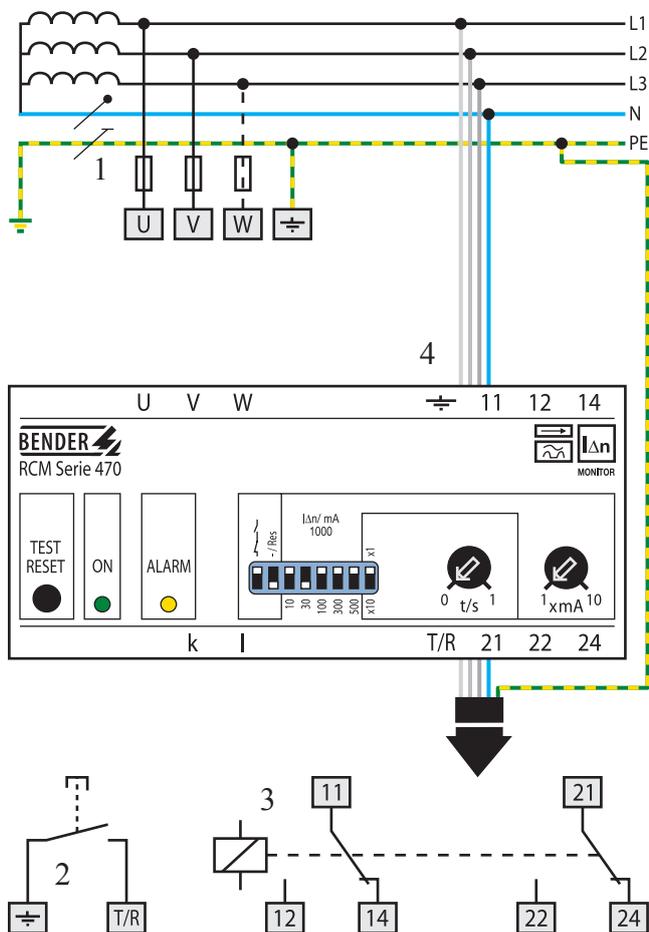
Dimension diagram X475

Dimensions in mm





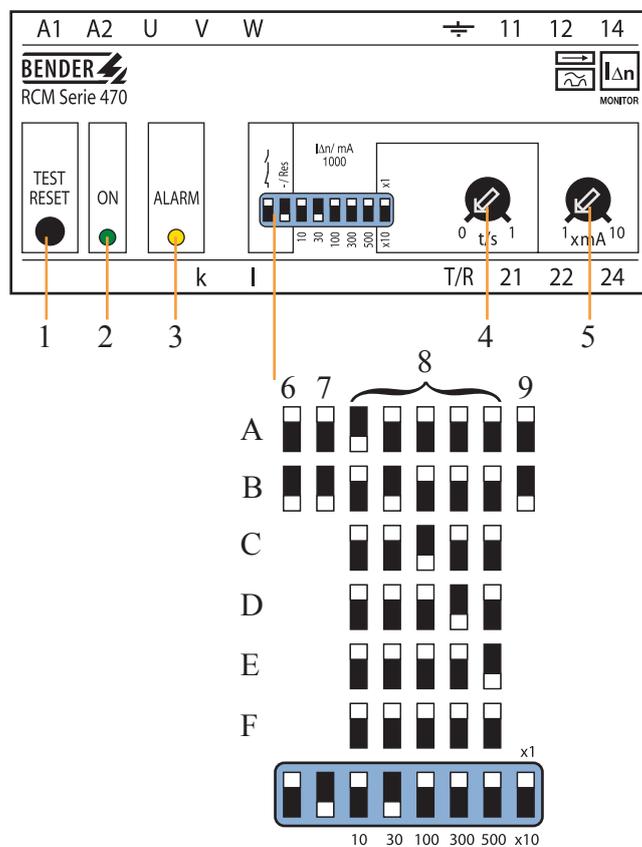
Wiring diagram – RCM475DY system connection



- 1 - A 6 A fuse is recommended
Terminal W is not applied in single-phase systems.
- 2 - External test and reset button "T/R"
- 3 - Alarm relay: switches when the fault current exceeds the response value.
- 4 - 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 LED "ALARM": lights up when the fault current exceeds the set response value
 - 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-energised state before changing the functions N/O/N/C operation, response delay x /x and fault memory behaviour!
- 6 - Setting the operating principle of the alarm relay
 - A - N/O operation
 - B - N/C operation
 - 7 - Fault memory behaviour relay + LED
 - A - Fault memory ON
 - B - Fault memory OFF
 - 8 - Setting of the response range

A - 10 mA	}	x 1...10	D - 300 mA	}	x 1...10
B - 30 mA			E - 500 mA		
C - 100 mA			F - 1000 mA		
 - 9 - Setting of 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

System being monitored U_N	see ordering information
Power consumption	≤ 3 VA

Measuring circuit

Internal measuring current transformer	$\varnothing 18$ 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 %
Hysteresis	approx. 25% of the response value
Response timetan	≤ 500 ms
Number of measuring channels	1

Displays

LEDs	Power On, Alarm
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Inputs/outputs

Test and reset button	internal/external
Cable length external test and reset button	≤ 10 m

Switching elements

Number of switching elements	1 x 2 changeover contacts
Operating principle, adjustable (factory setting)	N/C operation/N/O 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 (when stored)	-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



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