

## Ground fault monitor RCM475LY

Ground Fault Monitor / Relay  
for Grounded AC Systems



### Product description

The RCM475LY monitors for ground faults in grounded and high-resistance grounded AC systems, both single- and three-phase. The RCM475LY is specially designed to provide advanced warning of developing ground faults without the problems associated with high sensitivity nuisance tripping.

A wide, steplessly adjustable setpoint range allows for flexibility in a variety of systems. A DPDT contact allows for both information transmission (such as to a PLC) and power interruption (such as through a contactor or shunt trip breaker).

Since the values are measured using a special current transformer, the RCM475LY is nearly independent of the load current and the system voltage.

### Application

- Ground fault detection in single- or three-phase AC systems
- Motors and motor control systems
- Generators, portable and fixed
- Alarm systems, safety devices
- Current monitoring of normally offline single conductors
- Cooling equipment with valuable frozen goods
- Industrial controls
- Heat tracing systems
- Systems with space requirements such that the CT and the monitor must be together

### Function

Measurements of the system's ground fault current are taken via an internal current transformer built through the middle of the RCM475LY. All phases (including the neutral if one exists) are placed through the current transformer. The currently measured value (measured as a percentage of the setpoint) is indicated on the LED bar graph.

If the measured value exceeds the response value, the contacts switch over and the alarm LEDs activate after the time delay has expired. If the device is set to non-latching mode and the ground fault clears, the alarms will then clear. If the device is set to latching mode, the alarms will not clear until the device is manually reset or the supply voltage is lost.

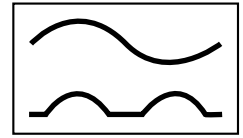
The TEST function allows for an internal operation testing of the device. Settings are modified via the device's DIP switches and potentiometers.

### Device features

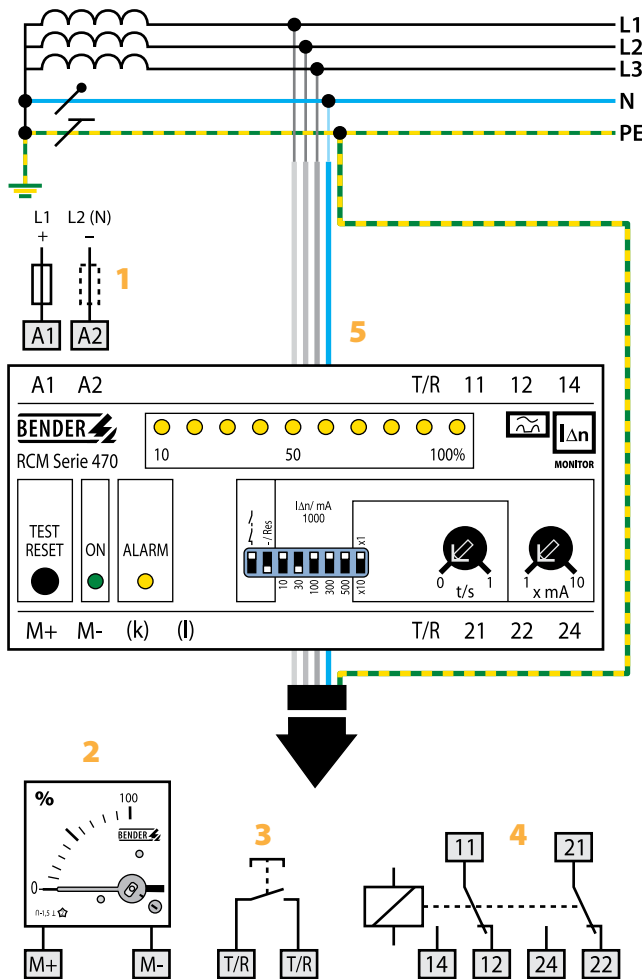
- Internal measuring current transformer  $\varnothing$  18 mm
- Wide response value ranges:  
10 mA...10 A, 6 mA... 600 mA  
(50...60 Hz)
- Response delay, adjustable 0...10 s
- Alarm relay with voltage-free DPDT contact
- Selectable between normally energized and normally de-energized operation
- Latching or non-latching operation
- TEST / RESET button, internal / external
- LED bar graph indicator  $I_{\Delta n}$  0...100 %
- Optional external meter terminal
- Sealable transparent cover
- Separate auxiliary supply voltage
- Type A according to IEC 60755

### Approvals





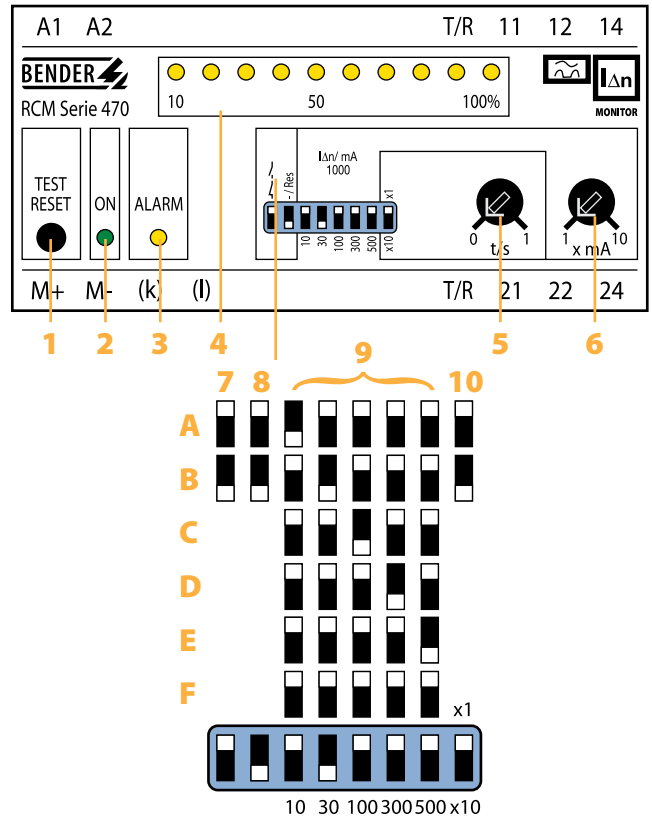
Wiring diagram – System connection, external connections



- 1 - External supply voltage used to power device, a 6 A fuse recommended for line protection.
- 2 - Optional external measuring instrument
- 3 - External TEST and RESET button terminal
- 4 - Alarm relay: switches when the fault current exceeds the response value.
- 5 - Internal current transformer. All phases, including the neutral if one exists, are placed through the CT.

**Note: Do not route the ground conductor through the measuring current transformer when also routing the power conductors!**

Wiring diagram – front plate



- 1 - Combined TEST and RESET button: short depress (< 1s) = RESET; long depress (> 2s) = TEST.
- 2 - Power On LED
- 3 - Alarm LED: Illuminates when the response value has been exceeded.
- 4 - LED bar graph indicator: Shows the measuring value in percent of 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).  
DIP switch settings (white = switch position)
- 7 - Operating principle of the alarm relay
  - A - Normally de-energized operation
  - B - Normally energized operation
- 8 - Fault memory / latching behavior settings
  - A - Fault memory ON (latching mode)
  - B - Fault memory OFF (non-latching mode)
- 9 - Sample response value settings
  - A - 10 mA
  - B - 30 mA
  - C - 100 mA
  - D - 300 mA
  - E - 500 mA
  - F - 1000 mA
 } x 1...10
- 10 - Time delay settings
  - A - x 1
  - B - x 10
 } 0...1s

4.1

## Technical data residual current monitor RCM475LY

### 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	$\leq 3$ VA

### Measuring circuit / response values

Internal measuring current transformer	$\varnothing 0.71''$ (18 mm)
Load	180 $\Omega$
Operating characteristic acc. to IEC 60755	Type A
Rated residual operating current $I_{\Delta n}$	10 mA...10 A, 6 mA...600 mA
Response delay $t_v$ , adjustable	0...10 s
Accuracy of response delay	$\pm 20$ %
Rated frequency	50...60 Hz
Relative percentage error	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)	$\leq 20$ ms
Number of measuring channels	1

### Displays

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

### Inputs / outputs

TEST and RESET button, voltage-free	internal / external
Cable length of external measuring instrument	$\leq 10$ m
Current source for external measuring instrument / max. load	DC 0...400 $\mu$ A / 12.5 k $\Omega$

### Switching elements

Number of switching elements	1 DPDT contact
Operating principle, adjustable	normally energized or deenergized
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, PF = 0,4 0.2 A, DC 220 V, L / R = 0.04 s
Fault memory behavior	ON / OFF (latching / non-latching)

### 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 $^{\circ}$ C...+55 $^{\circ}$ C
Ambient temperature, when stored	-40 $^{\circ}$ C...+70 $^{\circ}$ C
Climatic category IEC 60721-3-3	3K5
Operating mode	continuous operation
Mounting	any position
Connection	screw terminals
Connection properties	
rigid / flexible	AWG 24...12 / 24...14
flexible with ferrules without / with plastic collar	AWG 24...14
Conductor sizes (AWG)	24...12
Protection class, internal components (IEC 60529)	IP30, NEMA 1
Protection class, terminals (IEC 60529)	IP20, NEMA 1
Type of enclosure	X475
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	$\leq 350$ g

### Ordering information: Ground fault monitor RCM475LY

Type	Response range $I_{\Delta n}$	Rated frequency	Time delay	Measuring current transformer, inside diameter	Display	Fault memory behaviour	Supply voltage $U_S$	Art. No.
RCM475LY	10 mA...10 A	50...60 Hz	0...10 s	$\varnothing 18$ mm	internal / external	selectable	AC 230 V	B 9401 2018
RCM475LY-13	10 mA...10 A	50...60 Hz	0...10 s	$\varnothing 18$ mm	internal / external	selectable	AC 90...132 V*	B 9401 2035
RCM475LY-23**	10 mA...10 A	50...60 Hz	0...10 s	$\varnothing 18$ mm	internal / external	selectable	DC 77...286V*	B 9401 2069
RCM475LY-7113	6 mA...600 mA	50...60 Hz	0...10 s	$\varnothing 18$ mm	internal / external	selectable	AC 90...132 V*	B 9401 2053
RCM475LY-7121	6 mA...600 mA	50...60 Hz	0...10 s	$\varnothing 18$ mm	internal / external	selectable	DC 9.6...84V*	B 9401 2070

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

**Accessories**

<b>External panel mounted meter</b>			
Type	Display range	Size (mm)	Art. No.
9604-4241	0...100 %	96 x 96	B 986 807

<b>Measuring converter</b>			
Type	Input	Output	Art. No.
RK170	0...400 $\mu$ A	0...10 V 0 / 4...20 mA	B 9804 1500

**Dimension diagram X475**

Dimensions in mm

