

## Ground fault monitor RCM460Y

Ground Fault Monitor / Ground Fault Relay  
for Grounded AC Systems



RCM460Y

### Product description

The RCM460Y monitors for ground faults in grounded and high-resistance grounded AC systems, both single- and three-phase. The RCM460Y is specially designed to provide advanced warning of developing ground faults without the problems associated with high sensitivity nuisance tripping.

A steplessly adjustable setpoint range allows for flexibility in a variety of systems. A voltage-free SPDT contact allows for either information transmission (such as to a PLC) or power interruption (such as through a contactor or shunt trip breaker). Its compact size allows for easy placement in control panels.

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. These special UL listed current transformers have been designed to prevent nuisance tripping.

### Device features

- External measuring current transformer
- Response values, adjustable  
30 mA...300 mA (40...400 Hz)
- Response delay, adjustable 0...1 s
- Voltage-free SPDT contact
- Normally de-energized operation
- TEST button
- Compact size
- Sealable transparent cover
- Separate supply voltage
- Type A according to IEC 60755

### Application

- Ground fault detection in single- or three-phase AC systems
- Motors and motor control systems
- Generators, portable and fixed
- Industrial controls
- Individual loads

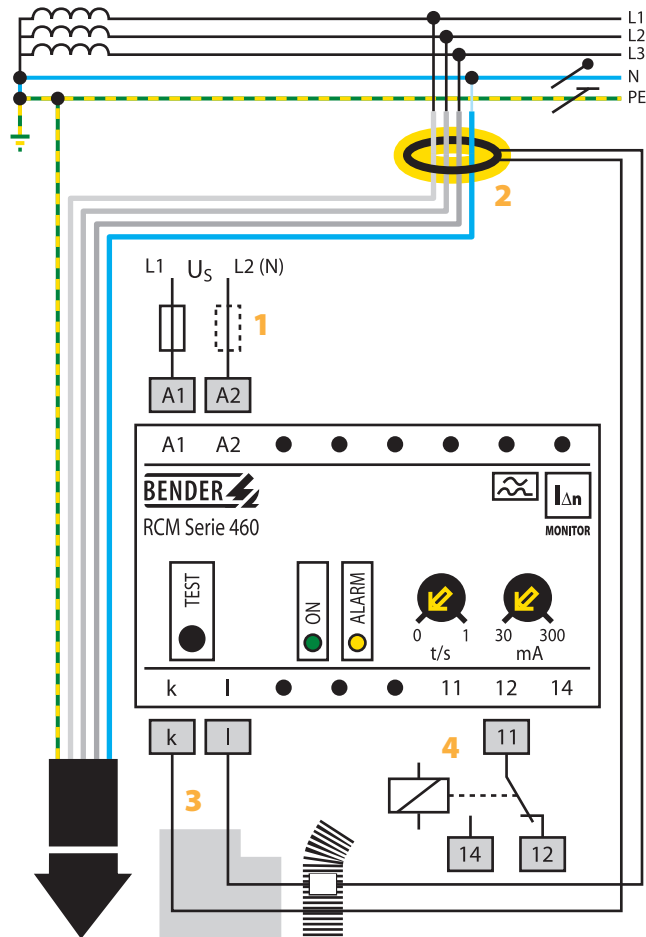
### Function

Measurements of the system's ground fault current are taken via an external current transformer. All phases (including the neutral if one exists) are placed through the current transformer. If the measured value exceeds the response value, the contact switches over and the alarm LED activates after the time delay. After the ground fault clears, the contacts will switch back over and the LED will dim.

### Approvals



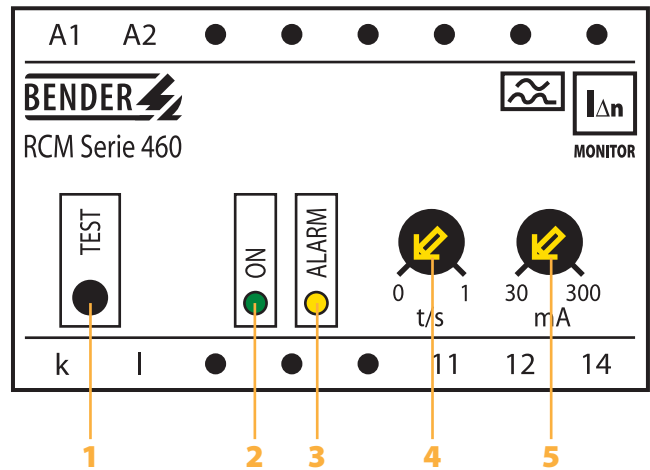
Wiring diagram – system connection, external connections



- 1 - Supply voltage  $U_s$  (see ordering information), a 6 A fuse recommended for internal short circuit protection.
- 2 - Connection to external current transformer. All phases, including the neutral if one exists, are placed through the CT.
- 3 - The CT connecting leads k and l must be led through the EMI absorber. The EMI absorber has to be fixed directly at the RCM in front of the terminals k and l using the accompanying cable ties.
- 4 - Alarm relay: switches when the preset response value is reached or when the CT connection alarm is active.

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

Wiring diagram – front plate



- 1 - TEST button
- 2 - Power On LED
- 3 - Alarm LED: Illuminates when the response value has been exceeded. Flashes when the CT connection alarm is active.
- 4 - Potentiometer for setting response delay (0...1 s).
- 5 - Potentiometer for setting response value (30...300 mA).

### Technical data: Ground fault monitor RCM460Y

#### 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 information
Operating range of $U_S$	0.85...1.1 x $U_S$
Frequency range of $U_S$	50...400 Hz
Power consumption	≤ 2.6 VA

#### Measuring circuit

External measuring current transformers	W..., WR..., WS... series
Load	220 Ω
Operating characteristic acc. to IEC 60755	Type A
Rated residual operating current $I_{\Delta n}$	30...300 mA
Response delay $t_v$ , adjustable	0...1 s
Accuracy of response delay	+ / - 20 %
Rated frequency	40...400 Hz
Relative percentage error	0...-25 % 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)	< 300 ms
Response time $t_{an}$ at $I_{\Delta n} = 5 \times I_{\Delta n}$ ( $t_v = 0$ s)	≤ 40 ms
Number of measuring channels	1

#### Displays

LEDs	Power On, Alarm
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#### Inputs / outputs

TEST button	internal
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#### Cable lengths for measuring current transformers

Single wire ≥ AWG 20 (0.75 mm <sup>2</sup> )	0...3.2 ft (0...1 m)
Single wire, twisted ≥ AWG 20 (0.75 mm <sup>2</sup> )	0...32.8 ft (0...10 m)
Shielded cable ≥ AWG 22 (0.5 mm <sup>2</sup> )	0...131 ft (0...40 m)
Recommended cable (shielded, shield on one side connected to ground)	J-Y(ST)Y min. 2 x 0.8

#### Switching elements

Number of switching elements	1 SPDT contact
Operating principle	normally de-energized
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, PF = 0.4 0.2 A, DC 220 V, L / R = 0.04 s

#### 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	AWG 24...12 / 24...14
flexible with ferrules, without / with plastic collar	AWG 24...14
Conductor sizes (AWG)	24...12
Degree of protection, internal components (IEC 60529)	IP30, NEMA 1
Degree of protection, terminals (IEC 60529)	IP20, NEMA 1
Type of enclosure	X460
Enclosure material	polycarbonate
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Flammability class	UL94V-0
Standards	IEC 62020
Instruction leaflet	BP401001
Weight	≤ 180 g

#### Ordering information

Type	Response range $I_{\Delta n}$	Rated frequency	Response delay	Measuring current transformers	Supply voltage $U_S$	Art. No.
RCM460Y	30...300 mA	40...400 Hz	0...1 s	W..., WR..., WS...	AC 230 V	B 9401 2022
RCM460Y-13	30...300 mA	40...400 Hz	0...1 s	W..., WR..., WS...	AC 90...132 V*	B 9401 2031
RCM460Y-71	10...100 mA	40...400 Hz	0...1 s	W..., WR..., WS...	AC 230 V	B 9401 2044
RCM460Y-7113	10...100 mA	40...400 Hz	0...1 s	W..., WR..., WS...	AC 90...132 V*	B 9401 2046

Other supply voltages on request

\* Absolute values of the operating range

**Accessories**

External measuring current transformers		
Type	Inside diameter (mm)	Art. No.
W20	∅ 20	B 9808 0003
W35	∅ 35	B 9808 0010
W60	∅ 60	B 9808 0018
W120	∅ 120	B 9808 0028
W210	∅ 210	B 9808 0034
WR70x175	70 x 175	B 9808 0609
WR115x305	115 x 305	B 9808 0610
WS20x30	20 x 30	B 9808 0601
WS50x80	50 x 80	B 9808 0603
WS80x120	80 x 120	B 9808 0606

Other measuring current transformer types on request.

**Dimension diagram X460**

Dimensions in mm

