

# **LINETRAXX® RCMB20-500-01/RCMB35-500-01**

AC/DC sensitive residual current monitoring module  
with frequency converters




**LINETRAXX® RCMB20/RCMB35-500-01**

### Device features

- AC/DC sensitive measured value acquisition
- Frequency range 0...500 Hz
- Measuring current transformer, inside diameter 20 mm/35 mm
- Measuring range 500 mA
- Measuring time ≤ 180 ms
- Supply voltage DC 24 V
- Analogue output current DC 4...20 mA
- Insensitive to load currents ensured by a full magnetic shielding
- Connection monitoring measuring current transformers using cyclical test current
- Multicolour LEDs for operation and fault indication

### Approvals



### Product description

The AC/DC sensitive residual current monitoring modules RCMB20-500-01 and RCMB35-500-01 are used for fault current monitoring in systems with frequency converters where direct and/or alternating fault currents are likely to occur.

Each module has to be installed and connected in the cable connection compartment in front of the mains input of the frequency converter.

Both variants of the modules provide an output signal 4...20 mA proportional to the residual current.

### Function

After switching the supply voltage on, the multi-colour LED shows a green light and the residual current monitoring module carries out a self test.

The residual current monitoring module measures both AC and DC currents. The r.m.s. value is calculated by summing up the DC components included in the residual current and the AC components that are below 500 Hz. A current signal of 4...20 mA in proportion to the r.m.s value is provided at the module output. The analogue value is updated at the latest every 20 ms.

Every two seconds, the residual current monitoring module cyclically tests the connection to the measuring current transformer and the correct functioning of the AC and DC measurement. In addition, the supply voltage is monitored continuously. If a fault occurs, the multi-colour LED flashes red and the analogue DC output current is 20 mA.

### Ordering information

Supply voltage <sup>1)</sup> U <sub>S</sub>	Inside diameter	Type	Art. No.
DC			
20.4...28.8 V	ø 20 mm	RCMB20-500-01	B 9404 2103
	ø 35 mm	RCMB35-500-01	B 9404 2104

<sup>1)</sup> Absolute values

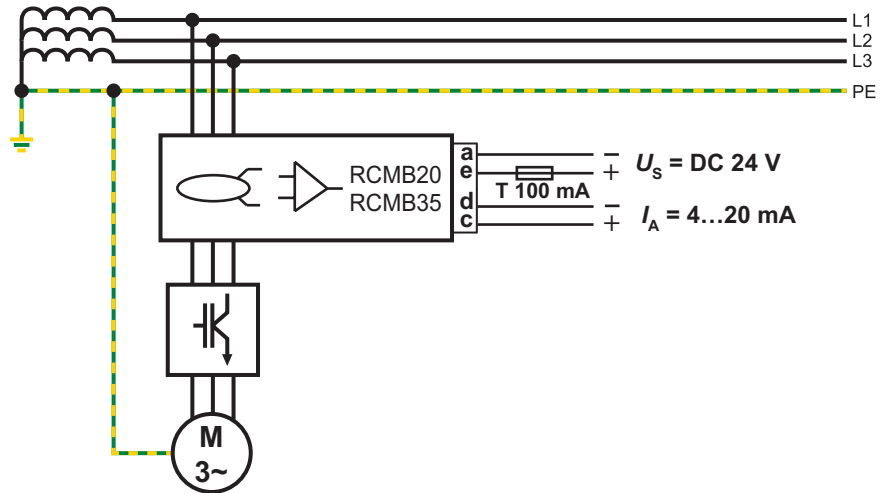
### Scope of delivery

The connection set supplied consists of the following individual parts:

For type	Accessories	Dimensions	Units
RCMB20-500-01	Single conductor with integrally moulded ferrule (black, white, red, blue)	45 cm	4
	PVC insulating tube	45 cm	1
RCMB35-500-01	Single conductor with integrally moulded ferrule (black, white, red, blue)	80 cm	4
	PVC insulating tube	80 cm	1
RCMB20-500-01 RCMB35-500-01	Push-wire plug, four-pole, encoded	—	2
	Mounting brackets for measuring current transformers	—	1
	Ferrule (mm <sup>2</sup> x mm)	0.5 x 6	4
	Cable ties (mm x mm)	100 x 2.5	2
	Lens head screw	M6 x 12	2
	Spring washer	M6	2

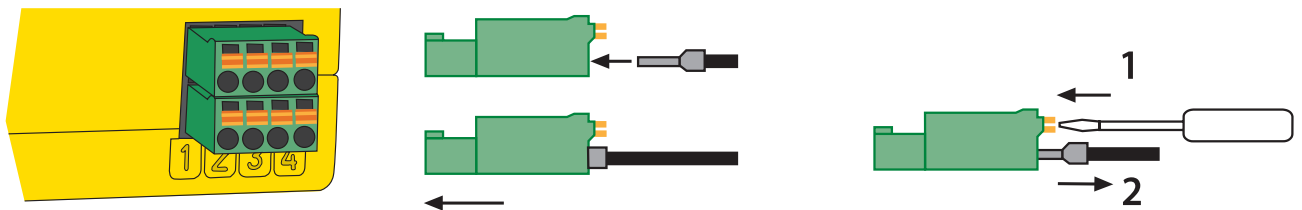
## Wiring diagram

Connect the residual current monitoring module according to the wiring diagram. The output current in proportion to the residual current  $I_A$  must be made available to the frequency converter.



## Connection

Position of the terminals, connecting and disconnecting of the conductors



## Wiring the plug-in terminal XK1

Coding socket	Pluggable push-wire terminal	Terminal	Colour	RCMB20/RCMB35
		A	black	GND ( $U_s$ )
		B	—	—
		C	white	DC 4...20 mA
		D	blue	GND (DC 4...20 mA)
		E	red	+24 V ( $U_s$ )
		F	—	—
		G	—	—
		H	—	—

## Technical data

### Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated insulation voltage	AC 800 V
Rated impulse voltage/pollution degree	12 kV/2
Overvoltage category	CAT III
Protective separation (reinforced insulation) between primary conductor and measurement electronics	
Voltage tests according to IEC 61010-1	6.88 kV

### Supply voltage

Supply voltage $U_S$	DC 24 V
Operating range of $U_S$	20.4...28.8 V
Ripple $U_S$	$\leq 1\%$
Power consumption	$\leq 2.5$ VA

### Measuring circuit

Measuring current transformer RCMB20/RCMB35, inside diameter	20 mm/35 mm
Rated insulation voltage (measuring current transformer)	800 V
Characteristics according to IEC 62020 and IEC/TR 60755	AC/DC sensitive, Type B
Frequency range	0...500 Hz
Measuring range $I_{\Delta n}$	AC/DC 0...500 mA
Nominal current at 3NAC (RCMB20/RCMB35)	32 A/80 A
Operating uncertainty	$\pm 4\%$
Operating uncertainty at 10...30 Hz	$+3\% \dots -15\%$ *
Operating uncertainty at 30...400 Hz	$\pm 3\%$ *
Operating uncertainty at 400...500 Hz	$\pm 10\%$ *
Resolution measuring circuit	2 mA
Test winding	yes

### Time response

Response delay $t_{on}$	0 s
Delay on release $t_{off}$ (if outside the measuring range)	$\leq 1$ s
Operating time $t_{ae}$ at $I_{\Delta}$	$\leq 180$ ms
Response time $t_{an}$	$= t_{ae} + t_{on}$
Recovery time $t_b$	$\leq 1$ s

### Displays

LED	lights constantly green = operation indicator flashes red = fault (output current > 20 mA)
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### Outputs

Current output, proportional to the residual current	DC 4...20 mA
Current output, resolution	$I_{\Delta n} = 31,25 \times (\text{analogue output current} - 4 \text{ mA})$
Load	$\leq 300 \Omega$

### Environment/EMC

EMC	IEC 60947-2 Annex M
Operating temperature	-25...70 °C

### For UL application:

Maximum ambient temperature	70 °C
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Climatic class acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)
Long-time storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)

Classification of mechanical conditions IEC 60721

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M3
Long-time storage (IEC 60721-3-1)	1M3
Chemical stresses acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3C4

### Connection

Primary conductor:	
RCMB20	$\leq 4 \times 6 \text{ mm}^2$ or $3 \times 10 \text{ mm}^2$
RCMB35	$\leq 4 \times 35 \text{ mm}^2$ or $3 \times 50 \text{ mm}^2$
Connector XK1:	
Connection type	pluggable push-wire terminals, 2 x four-pole

### For UL application:

Use at least 60/75 °C copper lines!

Connection properties	
rigid	0.2...2.5 mm <sup>2</sup> (AWG 24...14)
flexible without ferrule	0.2...2.5 mm <sup>2</sup> (AWG 24...14)
flexible with ferrule	0.2...1.5 mm <sup>2</sup> (AWG 24...16)
Stripping length	10 mm
Opening force	50 N

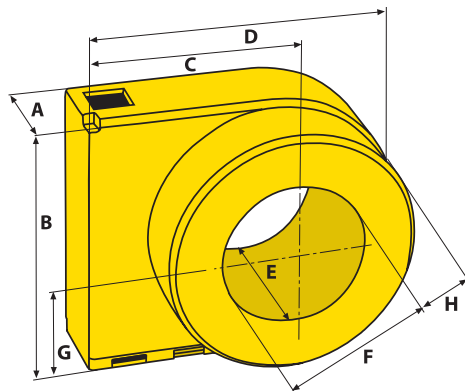
### General data

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (DIN EN 60529)	IP40
Degree of protection, terminals (DIN EN 60529)	IP20
Enclosure material	polycarbonate
Flammability class	UL94 V-0
Screw mounting	M5 with mounting brackets
DIN rail mounting acc. to	IEC 60715
Software version RCMB20-500-01	D378 V1.0
Software version RCMB35-500-01	D379 V1.0
Weight RCMB20	200 g
Weight RCMB35	250 g

\* of full scale value of the measuring range

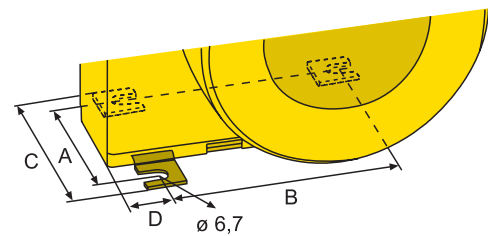
## Dimension diagram

Dimensions in mm



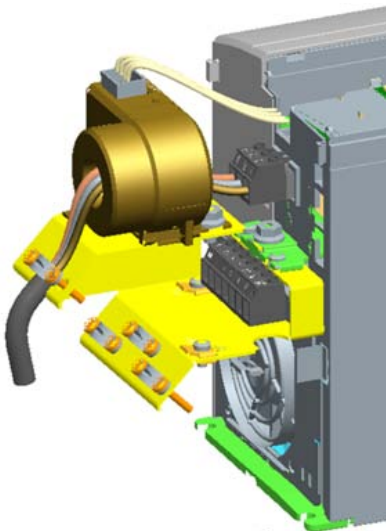
Dimensions (mm)								
Type	A	B	C	D	E	F	G	H
RCMB20	30	56.3	50	76.4	48.5	ø 20	29.8	16.4
RCMB35	30	79.2	62	99.5	55	ø 35	41.7	20

## Screw mounting



Dimensions (mm)				
Type	A	B	C	D
RCMB20 (mounting with 2 angles diagonal)	47	29	63	20.35
RCMB35 (mounting with 2 angles diagonal)	47	48.5	63	12.85

## Installation examples





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