Product overview

Residual current monitoring

Design the future of energy

BENDER

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Detect faults – avoid downtime

Many electrical installations today must be available 24/7. Downtime is costly. To prevent failures, shutdowns or electrical fires, critical operating conditions must be detected as early as possible.

The solution: Bender residual current monitor systems. Continuous monitoring with residual current monitoring systems is a preventive measure that increases the safety and availability of electrical installations.

The systems monitor electrical installations for residual or fault currents, display the current measured values and alert when adjustable response values are exceeded.

This provides you with early information about impending critical operating conditions, enabling you to prevent unplanned downtime as well as personal injury, fire and property damage.

In this way, residual current monitoring supports you in preventive maintenance. At the same time, continuous monitoring significantly reduces the effort required for periodic verification in accordance with DGUV Regulation 3.

Residual current monitoring explained briefly

Residual current monitoring (RCM) is a technology capable of detecting fault currents in earthed power grids or electrical installations.

Residual current monitors display the current measured value of the fault current and alert when specified response values are exceeded. The devices are designed for signalling and/or switching. Bender residual current monitors comply with DIN EN IEC 62020-1 VDE 0633-1 'Electrical installation equipment – Residual current monitors (RCMs)".

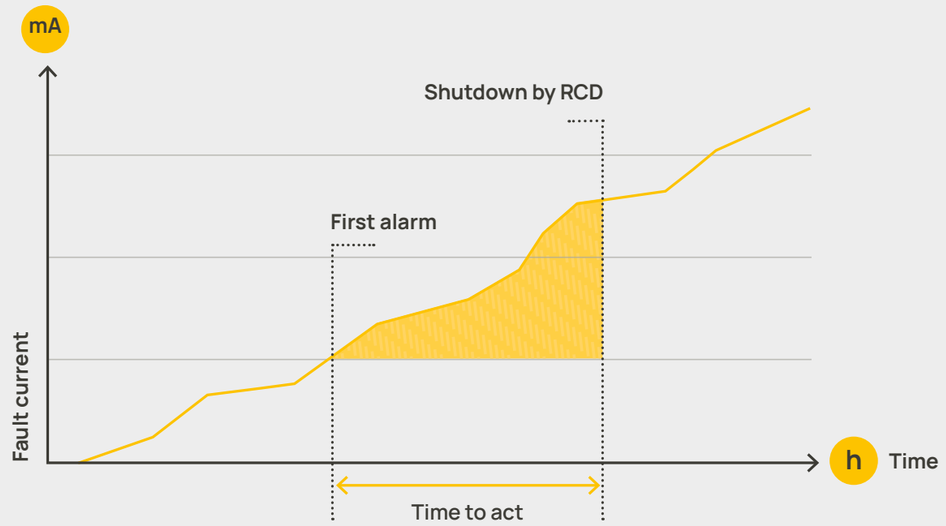
Electrical safety for all industries

The range of applications for residual current monitors extends from data centres, banks and insurance companies to production facilities, office buildings and hospitals, as well as energy supply and distribution facilities, broadcasting stations, communications technology facilities and transport technology. Residual current monitoring systems can therefore be used in almost any electrical systems.

The advantages of continuous residual current monitoring

- Preventing failures and downtime
- Improved protection for people and equipment
- Increased fire safety/protection against electrical fires
- Reduction of operational and cost risks
- Time and cost-optimised maintenance
- Reducing EMC interferences
- Significantly less effort required for periodic inspections in accordance with DGUV Regulation 3

The continuous monitoring of electrical installations for residual or fault currents offers maximum electrical safety.



Information advantage thanks to RCM

Residual current monitoring for all applications

Residual current monitors in accordance with DIN EN IEC 62020-1 differ in terms of type, frequency and waveform of the currents they can detect. Depending on the application, the appropriate monitors must be used.

Bender offers suitable residual current monitors for every application.

RCMA, RCMB series

AC/DC sensitive residual current monitors for monitoring alternating currents, pulsating and smooth direct fault currents with type B/B+ tripping characteristics in accordance with IEC 60755.

For example, for monitoring motors and other loads that generate direct current components.

RCM series

Residual current monitors for monitoring sinusoidal alternating currents and pulsating direct fault currents with type A/F tripping characteristics in accordance with IEC 60755.

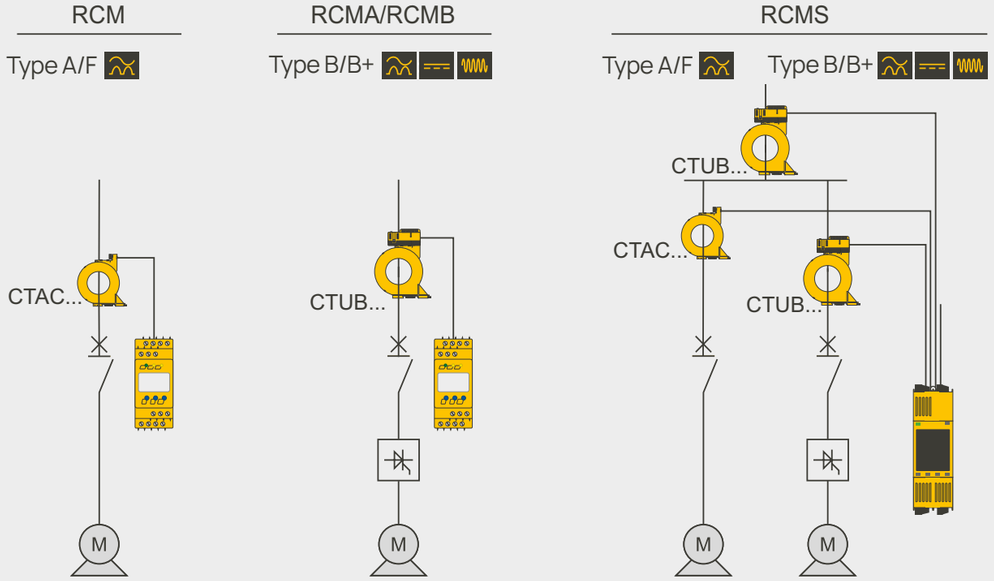
For example, for monitoring motors in star or delta operation without frequency converters.

RCMS series

Multi-channel residual current monitors for monitoring alternating currents and pulsating direct fault currents with type A/F tripping characteristics, as well as smooth direct fault currents and alternating currents with high-frequency components with type B/B+ tripping characteristics.

For example, for monitoring motors and other loads that generate direct current components.

RCM/RCMA/RCMB/RCMS application



Multi-channel residual current monitoring system LINETRAXX® SmartDetect RCMS410/425

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type A/F/B/B+
- 4 measuring channels
- Residual current 2 mA…70 A
- DC, 15 Hz…20 kHz

LINETRAXX® RCMS410

LINETRAXX® RCMS425-L

LINETRAXX® RCMS425-D

Trigger characteristic			A/F/B/B+		
Measuring circuit	Number of measuring channels		4		
	CT monitoring		✓		
	Frequency range		DC, 15 Hz…20 kHz		
	Residual operating current $I_{\Delta n}$	Type A / F	6 mA…30 A		
	Residual operating current $I_{\Delta n}$	Type B / B+	10 mA…10 A*		
	Evaluation		AC/DC (RMS), AC, DC		
	Pre-warning prior to main alarm		Adjustable 10…100 %		
	Hysteresis		10…25 %		
	Adjustable frequency response		✓		
Additional inputs and outputs			Digital input, digital input/output, multifunctional digital/analogue output		
Switching elements	Relay/changeover switch		–	2	2
Time response	Start-up delay		0…999 s		
	Response delay		0…10 s		
	Delay on release		0…999 s		
	Operating time at	$1x\ I_{\Delta n}$	≤ 260 ms		
		$5x\ I_{\Delta n}$	40…100 ms		
Communication/ Interfaces	Modbus RTU		✓		
	NFC		✓		
Display	LED bar graph/TFT graphic display		✓ / –	✓ / –	– / ✓
Supply voltage	DC 24 V / AC/DC 100…240 V		✓ / –	✓ / ✓	✓ / ✓
Mounting	DIN rail/screw mounting/mounting clip		✓ / – / –		
Enclosure dimensions	H x W x D in mm		93 x 18 x 63.2	93 x 36 x 63.2	93 x 36 x 72.2

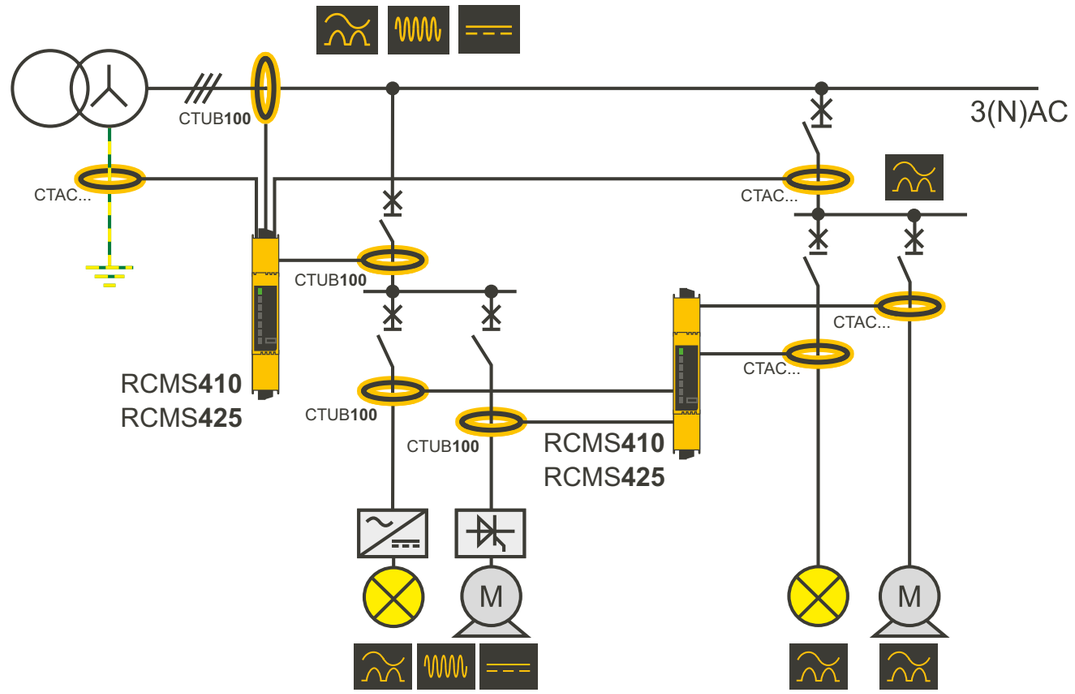
Suitable measuring current transformers, see pp. 20/21
* only with function module B

All RCMS410/425 devices evaluate type A/F residual currents (alternating currents and pulsating direct fault currents). Optional function modules can be activated to expand the range of applications. This can be done either directly when ordering the device or at a later date.

Function module A
Harmonic analysis (FFT)

Function module B
AC/DC sensitive measurement data acquisition type B/B+

Function module C
External transformer connection type A



RCMS basic system

Ordering information RCMS410 / RCMS425

Type	Supply voltage U_s	Suitable measuring current transformers		Configurable ex works	Activated function modules	Art. No.
		Type A / F	Type B / B+			
RCMS410-24	DC 24 V	✓	(✓) with function module B	Factory settings for function modules	Customised (additional purchases A, B, C possible)	B84604040
		✓	✓	–	B (additional purchases A and C possible)	B84604041
		✓	✓	–	A, B, C	B84604042
RCMS425-L	DC 24 VAC/DC 100...240 V	✓	(✓) with function module B	Factory settings for function modules	Customised (additional purchases A, B, C possible)	B84605040
		✓	✓	–	B (additional purchases A and C possible)	B84605041
		✓	✓	–	A, B, C	B84605042
RCMS425-D	DC 24 VAC/DC 100...240 V	✓	(✓) with function module B	Factory settings for function modules	Customised (additional purchases A, B, C possible)	B84606040
		✓	✓	–	B (additional purchases A and C possible)	B84606041
		✓	✓	–	A, B, C	B84606042

Multi-channel residual current monitoring system LINETRAXX® RCMS150

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type A/F/B/B+
- 6 measuring channels
- Residual current 3…300 mA
- DC…2 kHz
- Monitoring of final circuits
- DGUV Regulation 3

LINETRAXX® RCMS150

Trigger characteristic			A/F/B/B+
Measuring circuit	Number of measuring channels		6
	Internal diameter of measuring channels		10 mm
	Frequency range		DC…2 kHz
	Residual operating current $I_{\Delta n}$		3…300 mA
	Evaluation		RMS, DC
	Pre-warning prior to main alarm		50…100 %
	Hysteresis		10…25 %
Switching elements	Relay/changeover switch		–
Time response	Start-up delay		0.5…600 s
	Response delay		0…600 s
	Delay on release		0…600 s
	Operating time at	1x $I_{\Delta n}$	≤ 260 ms
		5x $I_{\Delta n}$	40…100 ms
Communication/Interfaces	Modbus RTU		✓*
	BMS		✓*
Displays	Operation/Alarm		LED
Power supply	internal/external		– / ✓
Supply voltage			DC 24 V
Mounting	DIN rail/screw mounting/mounting clip		✓ / ✓ / ✓ (optional)
Enclosure dimensions	H x W x D in mm		38 x 245 x 26

* depending on the type used, see ordering information

Ordering information

Type	Supply voltage	Interface	Art. No.
RCMS150	DC 24 V	BMS	B94053025
RCMS150-01	DC 24 V	Modbus RTU	B94053026
RCMS150-W-01**	DC 24 V	Modbus RTU	B94053026W

*** Variant for special vibration resistance

Residual current monitoring module LINETRAXX® RCMB300 with integrated measuring current transformer

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type A/F/B/B+
- 1 measuring channel
- Consisting of
  - Measuring current transformer CTBC (5 sizes)
  - Evaluation unit RCMB301
- Residual current 3 mA…20 A
- DC…100 kHz

LINETRAXX® RCMB300

Trigger characteristic			A/F/B/B+
Measuring circuit	Number of measuring channels		1
	Measuring current transformer type		CTBC20/CTB20P CTBC35/CTBC35P CTBC60/CTBC60P CTBC120CTBC120P CTBC210/CTBC210P
	Frequency range		DC…100 kHz
	Residual operating current $I_{\Delta n}$		30 mA…3 A
	Evaluation		AC, DC, RMS
	Pre-warning prior to main alarm		Adjustable 50…100 %
	Hysteresis		10…25 %
	Adjustable frequency response		✓
Time response	Start-up delay		0 s…60 min
	Response delay		50 ms…60 min
	Delay on release		0 s…60 min
	Operating time at	1x $I_{\Delta n}$	≤ 230 ms
		2x $I_{\Delta n}$	≤ 180 ms
		5x $I_{\Delta n}$	≤ 70 ms
Communication/Interfaces	Modbus RTU		✓
Displays			LED
Power supply	internal/external		– / ✓
Supply voltage			DC 24 V
Mounting	DIN rail/screw mounting/mounting clip		✓ / ✓ / ✓ (optional)

Ordering information

Description	Type	Internal diameter (mm)	Art. No.
Evaluation unit	RCMB301	–	B74043100
Measuring current transformers	CTBC20 / CTBC20P	20	B98120001 / B98120002
	CTBC35 / CTBC35P	35	B98120003 / B98120004
	CTBC60 / CTBC60P	60	B98120005 / B98120006
	CTBC120 / CTBC120P	120	B98120007 / B98120020
	CTBC210 / CTBC210P	210	B98120008 / B98120021

Multi-channel residual current monitoring system LINETRAXX® RCMS460/490

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type A/F/B/B+
- 12 measuring channels
- Residual current 2 mA…70 A
- DC (42 Hz)…2 kHz

			LINETRAXX® RCMS460-D	LINETRAXX® RCMS460-L	LINETRAXX® RCMS490-D	LINETRAXX® RCMS490-L
Trigger characteristic			A/F/B/B+			
Measuring circuit	Number of measuring channels		12			
	CT monitoring		✓			
	Frequency range pulse current sensitive	Type A / F	42 Hz…2 kHz			
	Frequency range AC/DC sensitive	Type B / B+	0 Hz…2 kHz			
	Residual operating current $I_{\Delta n}$	Type A / F	6 mA…20 A			
	Residual operating current $I_{\Delta n}$	Type A / F	100 mA…125 A (only for variants ending in '4')			
	Residual operating current $I_{\Delta n}$	Type B / B+	10 mA…10 A			
	Evaluation		Harmonic analysis I_{Δ}, DC, THD			
	Pre-warning prior to main alarm		10…100 %			
	Hysteresis		2…40 %			
	Adjustable frequency response		–			
Switching elements	Relay/changeover switch		2 x 1 changeover contacts		2 changeover contacts, 12 normally open contacts	
Time response	Start-up delay		0…99 s			
	Response delay		0…999 s			
	Delay on release		0…999 s			
	Operating time at	1x $I_{\Delta n}$	≤ 180 ms			
		5x $I_{\Delta n}$	≤ 30 ms			
Communication/ Interfaces	BMS		✓			
Memory	Data logger		✓	–	✓	–
	History memory		✓	–	✓	–
Displays	Harmonic analysis I_{Δ}, DC, THD		✓	–	✓	–
	Internal clock		✓	–	✓	–
	LED/7-segment/LCD graphic display		✓ / – / ✓	✓ / ✓ / –	✓ / – / ✓	✓ / ✓ / –
Power supply	internal/external		✓* / ✓**			
Supply voltage			see ordering information			
Mounting	DIN rail/screw mounting/mounting clip		✓ / ✓ / ✓ (optional)			
Enclosure dimensions	H x W x D in mm		93 x 108 x 74	93 x 108 x 74	93 x 162 x 74	93 x 162 x 74

Suitable measuring current transformer see page 20/21

* D-2: internal power supply unit available

** D-1: external power supply unit required

Ordering information

Type	Supply voltage	Art. No.
RCMS460-D-1 / RCMS460-D4-1 / RCMS460-L-1	DC 16…94 V/AC 16…72 V, 42…460 Hz	B94053001 / B94053009 / B94053003
RCMS460-D-2 / RCMS460-D4-2 / RCMS460-L-2	DC 70…276 V/AC 70…276 V, 42…460 Hz	B94053002 / B94053010 / B94053004
RCMS490-D-1 / RCMS490-D4-1 / RCMS490-L-1	DC 16…94 V/AC 16…72 V, 42…460 Hz	B94053005 / B94053011 / B94053007
RCMS490-D-2 / RCMS490-D4-2 / RCMS490-L-2	DC 70…276 V/AC 70…276 V, 42…460 Hz	B94053006 / B94053012 / B94053008

Accessories

Mounting frame 144 x 82 mm		B990995

Residual current monitors LINETRAXX® RCMA420/423

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type B
- 1 measuring channel
- Residual current 10…500 mA/30 mA…3 A
- 0 Hz…2 kHz

LINETRAXX® RCMA420

LINETRAXX® RCMA423

Trigger characteristic			B	
Measuring circuit	Number of measuring channels		1	
	CT monitoring		✓	
	Frequency range		0 Hz…2 kHz	
	Residual operating current $I_{\Delta n}$		10…500 mA	30 mA…3 A
	Evaluation		AC, DC	
	Pre-warning prior to main alarm		50…100 %	
	Hysteresis		10…25 %	
	Adjustable frequency response		–	
Switching elements	Relay/changeover switch		2 x 1 changeover contacts	
Time response	Start-up delay		0…10 s	
	Response delay		0…10 s	
	Delay on release		0…99 s	
	Operating time at	1x $I_{\Delta n}$	≤ 180 ms	
		5x $I_{\Delta n}$	≤ 30 ms	
Communication/Interfaces			–	
Memory	Fault memory		✓	
Displays	LC display		✓	
	LED (operation/alarm)		✓	
Power supply	internal/external		✓*/ ✓**	
Supply voltage			see ordering information	
Mounting	DIN rail/screw mounting/mounting clip		✓ / ✓ / ✓ (optional)	
Enclosure dimensions	H x W x D in mm		93 x 36 x 74.5	

Suitable measuring current transformer see page 20/21
* D-2: internal power supply unit available
** D-1: external power supply unit required

Ordering information

Type	Supply voltage	Art. No.	
		Screw-type terminal	Push-wire terminal
RCMA420-D-1	DC 24…78 V/AC 24…60 V, 42…460 Hz	B94043001	B74043001
RCMA420-D-2	DC 100…250 V/AC 100..250 V, 42…460 Hz	B94043002	B74043002
RCMA423-D-1	DC 24…78 V/AC 24…60 V, 42…460 Hz	B94043023	B74043023
RCMA423-D-2	DC 100…250 V/AC 100..250 V, 42…460 Hz	B94043025	B74043025

Accessories

Type	Art. No.
Mounting clip for screw mounting (1 required per device)	B98060008
Mounting frame XM420	B990994

Residual current monitor LINETRAXX® RCM420

Measuring device for monitoring residual currents in earthed power supply systems

- Alternating and pulsed current sensitive type A
- 1 measuring channel
- Residual current 10mA… 10A
- 42 Hz…2 kHz

LINETRAXX® RCM420

Trigger characteristic			A
Measuring circuit	Number of measuring channels		1
	CT monitoring		✓
	Frequency range		42 Hz…2 kHz
	Residual operating current $I_{\Delta n}$		10 mA…10 A
	Pre-warning prior to main alarm		50…100 %
	Hysteresis		10…25 %
	Adjustable frequency response		–
Switching elements	Relay/changeover switch		2 x 1 changeover contacts
Time response	Start-up delay		0…10 s
	Response delay		0…10 s
	Delay on release		0…99 s
	Operating time at	1x $I_{\Delta n}$	≤ 180 ms
		5x $I_{\Delta n}$	≤ 30 ms
Communication/Interfaces			–
Memory	Fault memory		✓
Displays	LC display		✓
	LED (operation/alarm)		✓
Power supply	internal/external		✓*/ ✓**
Supply voltage			see ordering information
Mounting	DIN rail/screw mounting/mounting clip		✓ / ✓ / ✓ (optional)
Enclosure dimensions	H x W x D in mm		93 x 36 x 74.5

Suitable measuring current transformers see page 20/21
* D-2: internal power supply unit available
** D-1: external power supply unit required

Ordering information

Type	Supply voltage	Art. No.	
		Screw-type terminal	Push-wire terminal
RCM420-D-1	DC 24…78 V/AC 24…60 V, 42…460 Hz	B94014001	B74014001
RCM420-D-2	DC 100…250 V/AC 100..250 V, 42…460 Hz	B94014002	B74014002

Accessories

Type	Art. No.
Mounting clip for screw mounting (1 required per device)	B98060008
Mounting frame XM420	B990994

Residual current monitoring module LINETRAXX® RCMB330

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type B
- 1 measuring channel
- Residual current 10…500 mA
- DC…100 kHz
- with integrated split-core measuring current transformer
- DGUV Regulation 3
- Suitable for retrofitting

LINETRAXX® RCMB330

Trigger characteristic		B
Measuring circuit	Number of measuring channels	1
	Internal diameter of measuring channels	25mm
	CT monitoring	–
	Frequency range	DC…100 kHz
	Residual operating current $I_{\Delta n}$	30…500 mA
	Evaluation	AC, DC, RMS
	Pre-warning prior to main alarm	Adjustable 50…100 %
	Hysteresis	N/A
	Adjustable frequency response	–
Switching elements	Relay/changeover switch	–
Time response	Start-up delay	0…60 min
	Response delay	50 ms…60 min
	Delay on release	0…60 min
	Operating time at 1x $I_{\Delta n}$	≤ 500 ms
	Operating time at 5x $I_{\Delta n}$	≤ 100 ms
Communication/Interfaces	Modbus RTU	✓
Memory		–
Displays	LED (operation/condition)	✓
Power supply	internal/external	– / ✓
Supply voltage		DC 24 V
Mounting	DIN rail/screw mounting/mounting clip	✓ / ✓ / –
Enclosure dimensions	H x W x D in mm	100,4 x 25 x 25,5

Ordering information

Type	Supply voltage	Art. No.
RCMB330	DC 24 V	B74043160

Accessories

Power supply unit	Maximum number of connected measuring current transformers	Art. No.
STEP-PS/1 AC/24 DC/0.5	4	B94053110
STEP-PS/1 AC/24 DC/1.75	14	B94053111
STEP-PS/1 AC/24 DC/4.2	34	B94053112

Interface converter	RS-485-USB		B95012045

Residual current monitoring module RCMB130

Measuring device for monitoring residual currents in earthed power supply systems

- AC/DC sensitive type B
- 1 measuring channel
- Residual current 3,5…100 mA
- DC…2 kHz
- for PDUs, outlet boxes and multiple sockets

RCMB131

RCMB132

Trigger characteristic		B	
Measuring circuit	Number of measuring channels	1	
	Internal diameter of measuring channels	15mm	
	CT monitoring	✓	
	Frequency range	DC…2 kHz	
	Residual operating current $I_{\Delta n}$	3,5…100 mA	
	Evaluation	DC, RMS	
	Hysteresis	≤30 %	
	Adjustable frequency response	–	
Switching elements	Relay/changeover switch	–	
Time response	Start-up delay	N/A	
	Response delay	N/A	
	Delay on release	N/A	
	Operating time at 1x $I_{\Delta n}$	≤ 290 ms	
	Operating time at 5x $I_{\Delta n}$	≤ 30 ms	
Communication/Interfaces	Modbus RTU	✓*	
	PWM output	✓**	–
Connector plug		1	2
Memory		–	
Displays	LED (operation/condition)	✓	
Power supply	internal/external	– / ✓	
Supply voltage		DC 12...24 V	
Mounting	DIN rail/screw mounting/mounting clip	✓ / ✓ / –	
	Printed circuit board	✓	–
Enclosure dimensions	H x W x D in mm	53 x 21 x 43	

* only RCMB131-01 and RCMB132-01
** only RCMB131-02

Ordering information

Type	Supply voltage	Art. No.
RCMB131-01	DC 12...24 V	B94042131
RCMB131-02	DC 12...24 V	B94042132
RCMB132-01	DC 12...24 V	B94042136

Accessories for RCMB132-01

Mounting base for DIN rail mounting		B91080111

Residual current monitor for monitoring the central earthing point LINETRAXX® CEP410R

Measuring device for monitoring residual currents at the central earthing point

- Alternating and pulsed current sensitive type A
- Residual current 10 mA…30 A
- 42…70 Hz

LINETRAXX® SmartDetect CEP410R

Trigger characteristic			A
Measuring circuit	Number of measuring channels		1
	CT monitoring		✓
	Frequency range		42…70 Hz
	Residual operating current $I_{\Delta n}$		10 mA…30 A
	Evaluation		–
	Pre-warning prior to main alarm		50…100 %
	Hysteresis		10…25 %
	Adjustable frequency response		–
Switching elements	Relay/changeover switch		1 changeover contact
Time response	Start-up delay		0…900 s
	Response delay		0…10 s
	Delay on release		0…900 s
	Operating time at	1x $I_{\Delta n}$	≤ 260 ms
		5x $I_{\Delta n}$	40…120 ms
Communication/Interfaces	Modbus RTU		✓
	NFC		✓
Displays			LED bar graph
Power supply	internal/external		✓ / ✓
Supply voltage	DC 24 V / AC/DC 100…240 V, 47…63 Hz		✓ / ✓
Mounting	DIN rail/screw mounting/mounting clip		✓ / – / –
Enclosure dimensions	H x W x D in mm		109 x 18 x 64 mm

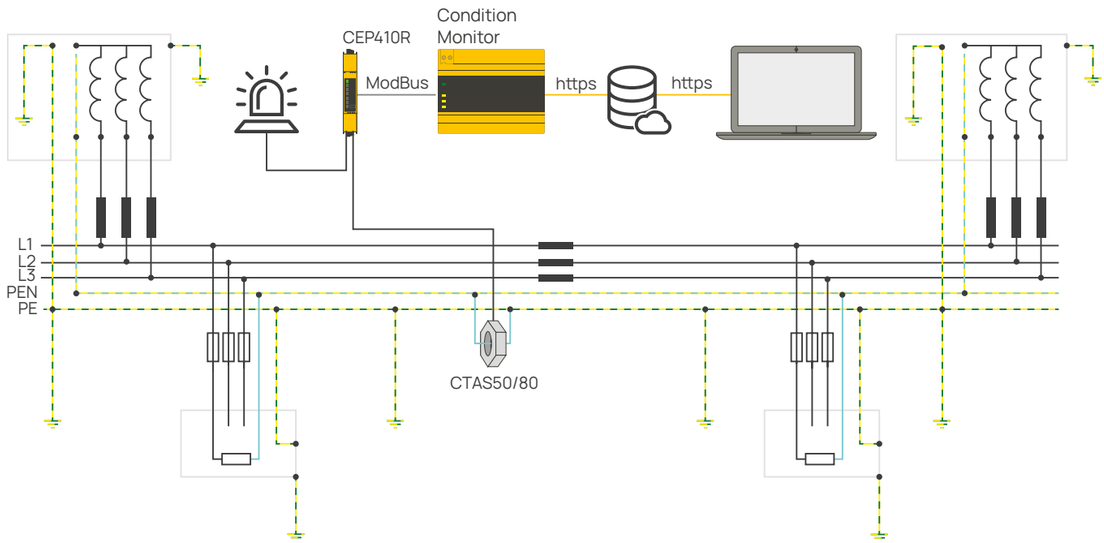
Suitable measuring current transformers see page 20/21

Ordering information

Type	Supply voltage	Art. No.
CEP410R-2	DC 24 V / AC/DC 100…240 V, 47…63 Hz	B74603008

Accessories

Sealable transparent cover		B80609199



Monitoring of the central earthing point

Measuring current transformers for residual current monitors

Family	Description	Type	Size (mm)	Art. No.	RCMS410/425	RCMS460/490	RCM420	CEP410R
CTAC series	CTAC20	round	20	B98110005	✓	✓	✓	✓
	CTAC35		35	B98110007	✓	✓	✓	✓
	CTAC60		60	B98110017	✓	✓	✓	✓
	CTAC120		120	B98110019	✓	✓	✓	✓
	CTAC210		210	B98110020	✓	✓	✓	✓
CTAS series	CTAS50	round, split-core	50	B98110009	✓	✓	✓	✓
	CTAS80		80	B98110010	✓	✓	✓	✓
	CTAS120		120	B98110011	✓	✓	✓	✓
W series	W10/600	round	10	B911761	✓	✓	✓	✓
	W0-S20		20	B911787	✓	✓	✓	✓
	W1-S35		35	B911731	✓	✓	✓	✓
	W2-S70		70	B911732	✓	✓	✓	✓
	W3-S105		105	B911733	✓	✓	✓	✓
	W4-S140		140	B911734	✓	✓	✓	✓
	W5-S210		210	B911735	✓	✓	✓	✓
WS series	WS20x30	rectangular split-core	20 x 30	B98080601	✓	✓	✓	✓
	WS50x80		50 x 80	B98080603	✓	✓	✓	✓
	WS80x120		80 x 120	B98080606	✓	✓	✓	✓
WS...S series	WS50x80S	rectangular split-core	50 x 80	B911741	✓	✓	✓	✓
	WS80x80S		80 x 80	B911742	✓	✓	✓	✓
	WS80x120S		80 x 120	B911743	✓	✓	✓	✓
	WS80x160S		80 x 160	B911755	✓	✓	✓	✓
WR series[1]	WR70x175S	rectangular	70 x 175	B911738	✓	✓	✓	✓
	WR115x305S		115 x 305	B911739	✓	✓	✓	✓
	WR150x350S		150 x 350	B911740	✓	✓	✓	✓
	WR200x500S		200 x 500	B911763	✓	✓	✓	✓
	WR70x175SP		70 x 175	B911790	✓	✓	✓	✓
	WR115x305SP		115 x 305	B911791	✓	✓	✓	✓
	WR150x350SP		150 x 350	B911792	✓	✓	✓	✓
	WR200x500SP		200 x 500	B911793	✓	✓	✓	✓
WF series[2]	WF170-1	flexible	170	B78080201	–	✓	Only -D9	–
	WF170-2		170	B780802022	–	✓	Only -D9	–
	WF250-1		250	B78080203	–	✓	Only -D9	–
	WF250-2		250	B78080204	–	✓	Only -D9	–
	WF500-1		500	B78080205	–	✓	Only -D9	–
	WF500-2		500	B78080206	–	✓	Only -D9	–
	WF800-1		800	B78080207	–	✓	Only -D9	–
	WF800-2		800	B78080208	–	✓	Only -D9	–
	WF1200-1		1200	B78080209	–	✓	Only -D9	–
	WF1200-2		1200	B78080210	–	✓	Only -D9	–
	WF1800-1		1800	B78080221	–	✓	Only -D9	–
	WF1800-2		1800	B78080222	–	✓	Only -D9	–

Family	Description	Type	Size (mm)	Art. No.	RCMS410/425	RCMS460/490	RCMB300	RCMA420/423
CTBC series	CTBC20	round	20	B98120001	–	–	✓	–
	CTBC20P		20	B98120002	–	–	✓	–
	CTBC35		35	B98120003	–	–	✓	–
	CTBC35P		35	B98120004	–	–	✓	–
	CTBC60		60	B98120005	–	–	✓	–
	CTBC60P		60	B98120006	–	–	✓	–
	CTBC120		120	B98120007	–	–	✓	–
	CTBC120P		120	B98120020	–	–	✓	–
	CTBC210		210	B98120008	–	–	✓	–
	CTBC210P		210	B98120021	–	–	✓	–
CTBC + CTUB series[3]	CTUB101-CTBC20	round	20	B78120010	–	–	–	✓
	CTUB101-CTBC20P		20	B78120020	–	–	–	✓
	CTUB101-CTBC35		35	B78120012	–	–	–	✓
	CTUB101-CTBC35P		35	B78120022	–	–	–	✓
	CTUB101-CTBC60		60	B78120014	–	–	–	✓
	CTUB101-CTBC60P		60	B78120024	–	–	–	✓
	CTUB101-CTBC120		120	B78120016	–	–	–	✓
	CTUB101-CTBC120P		120	B78120026	–	–	–	✓
	CTUB101-CTBC210		210	B78120018	–	–	–	✓
	CTUB101-CTBC210P		210	B78120028	–	–	–	✓
	CTUB102-CTBC20		20	B78120011	✓	✓	–	–
	CTUB102-CTBC20P		20	B78120021	✓	✓	–	–
	CTUB102-CTBC35		35	B78120013	✓	✓	–	–
	CTUB102-CTBC35P		35	B78120023	✓	✓	–	–
	CTUB102-CTBC60		60	B78120015	✓	✓	–	–
	CTUB102-CTBC60P		60	B78120025	✓	✓	–	–
	CTUB102-CTBC120		120	B78120017	✓	✓	–	–
	CTUB102-CTBC120P		120	B78120027	✓	✓	–	–
	CTUB102-CTBC210		210	B78120019	✓	✓	–	–
	CTUB102-CTBC210P		210	B78120029	✓	✓	–	–
CTBS series	CTBS25	round, split-cut	25	B98120060	✓	✓	–	–

Key

[1] WR...SP: shielded version, for load currents >=500 A

[2] not suitable for product standard DIN VDE 62020-1

[3] Shielded current transformers for load current-insensitive measurements

Overview at all times with Condition Monitoring

Operating data in real time
In modern monitoring systems, thousands of measurements are generated every second. This enormous amount of data must be presented in a structured and comprehensible manner in order to maintain an overview of the system at all times. Bender's Condition Monitors perform this task: They collect and visualise all relevant operating data in real time.

Integrated alarm management
The integrated alarm management system allows sources of error to be identified at an early stage and addressed in a targeted manner. Individually configurable instructions support rapid response, while alerts can also be sent by email – depending on the escalation level. This ensures that critical conditions are not only detected, but also communicated and rectified.

Customised visualisation
Thanks to flexible visualisation options, the information can be displayed both at the system level and at the interface or subsystem level. In addition, measured values can be stored for later analysis. The devices also offer the option of being connected to higher-level systems – for example, for forwarding collective alarms or individual measured values.

What Bender's Condition Monitors offer

- Industrial visualisations
- Integration of external devices
- Links – Controlling actuators
- Alarm management
- Email notifications

The benefits of Condition Monitoring

Full transparency
Continuous data collection provides an overview of the condition of the electrical installation at all times.

Higher system availability
Early detection of the need for action and avoidance of unplanned downtime based on status data.

Effective planning for maintenance
The status and warning messages provide an ideal basis for predictive maintenance.

Quick commissioning of Bender components
No complicated integration of measuring devices necessary.

Bender Condition Monitors are available in two versions: as a compact DIN rail solution or as a display version. Both models feature an integrated web server and all common interfaces and protocols for seamless integration into automation, building and IT systems.

EDGE500IP

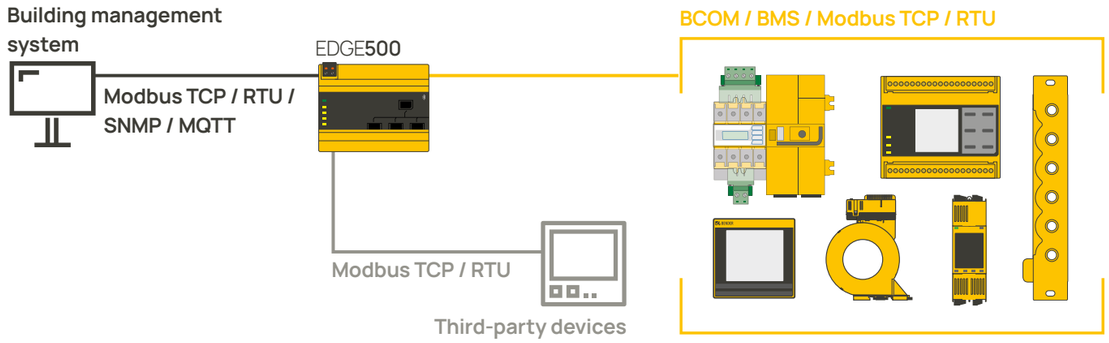
CP907-I

Parameter setting	Web server	✓	
	System-wide device parameter setting	✓	
	Visualisations	✓	
	Individual alerts	✓	
	Email notifications	✓	
	Third-party device integration	✓	
	Complex links	✓	
	System documentation	✓	
	Device/system backup	✓	
	Virtual devices	100 per 16 channels	
	History memory	20,000 data records	
	Data logger	30 per 10,000 data records	
Interfaces	Modbus RTU	✓	
	BMS	✓	
	USB-C	2	12
	Ethernet	2	1
	Protocol entry	BMS (intern), BCOM, Modbus RTU/TCP	
	Protocol output	Modbus RTU/TCP / SNMP / MQTT	Ethernet / Modbus RTU/ TCP / SNMP / Profinet / MQTT
Inputs/outputs	Digital inputs	8	–
	Relay outputs	4	–
Mounting		DIN rail	Control panel, surface-mounted, flush-mounted
Supply voltage		DC 24 V	
Device dimensions		107,5 x 93 x 62,9/48,5 mm	226 x 144 x 78 mm

Ordering information

	Display size	Supply voltage	Art. No.
EDGE500	–	DC 24 V	B95061250*
CP907-I	7" (17,6 cm)	DC 24 V	B95061031**

* Various software modules (function modules) are available for the EDGE500, which extend the functionality of the device.
** Flush-mounted housing, tempered glass display, white



Continuously reliable thanks to long-term monitoring

Recognising gradual changes

Electrical installations are constantly exposed to a variety of influences. These include environmental impact such as moisture, dust and temperature fluctuations, as well as electrical and mechanical stresses. These often have an effect over long periods of time and lead to gradual changes that usually go unnoticed during ongoing operations and, without suitable monitoring measures, jeopardise operational safety and plant availability.

The cloud-based POWERSCOUT® software is a suitable solution for the early detection of such changes.

Assessing installation condition reliably

POWERSCOUT® continuously records and stores measurement data over long periods of time, often spanning several years. Analysis of this historical data reveals changes that develop over weeks, months or years. This allows fault currents, changes in insulation values and critical conditions to be detected at an early stage before costly downtime occurs.

The insights gained also form the basis for predictive maintenance: Operators can take targeted measures at an early stage to extend the service life of their installations, avoid unplanned downtime and ensure long-term operational safety.

Real-time transparency – anytime, anywhere

The flexibly configurable dashboards from POWERSCOUT® enable clear visualisation of system data, accessible from mobile devices, laptops or desktop computers. It is also possible to compare several buildings or facilities across different locations without any problems, which facilitates centralised monitoring and evaluation.

Automatic documentation

The system documentation in POWERSCOUT® enables automatic reports to be generated on all relevant statuses. This supports compliance with statutory audit requirements, such as those set out in DGUV Regulation 3. A decisive advantage for evidence to insurance companies, testing institutions or internal audits.

Cloud-based software solution POWERSCOUT®

Analysis

- Continuously recording insulation values
- Recognising connections and optimising processes
- Cross-system evaluation possibilities
- Cross-system evaluations
- Support with investment decisions

Reporting

- Automated reports with graphical presentation
- Historical comparisons and alarm statistics
- Documentation to support compliance with statutory inspection deadlines

Predictive maintenance

- Continuous monitoring
- Early detection of gradually developing insulation faults
- Avoid unplanned downtime

POWERSCOUT®: The cloud-based software solution for analysis, predictive maintenance and reporting.

Support during all stages

From planning to modernisation – Our extensive know-how is at your disposal during all project phases.

Furthermore, with our first-class service we guarantee maximum safety for your electrical installations.
We offer services ranging from support over telephone to repairs and on-site service – with modern measuring devices and competent employees.

Secure yourself:

- High availability of your installation thanks to fast reaction to fault messages
- Increased return on your capital expenditure (CAPEX) via optimised maintenance processes
- Targeted reduction of the operating expenditure (OPEX) due to reduced downtimes and shorter service visits
- Support for your predictive installation monitoring and regular tests of your installation/power quality/ monitoring devices
- Automatic checks, analysis, correction, new settings/ updates
- Competent assistance with parameter changes and updates

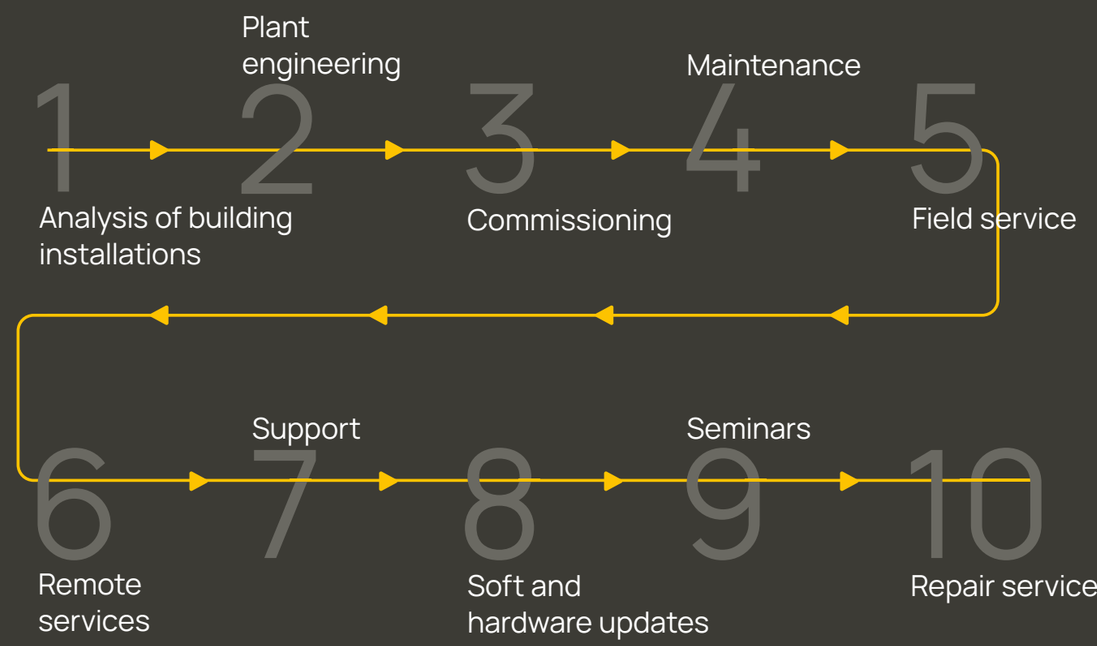
Maximum availability through remote maintenance

Bender Remote Assist offers you support via remote access, high-quality service and advice for your challenging task consisting in ensuring consistent high safety in your systems.

Many service visits, fault clearance but also analyses and controls can be carried out remotely – without the expenses of time and money that an on-site visit of a technician implies.

This fast, efficient help and advice by our expert network allows the highest possible availability of your system.

Competent service for maximum safety and high availability of your installation



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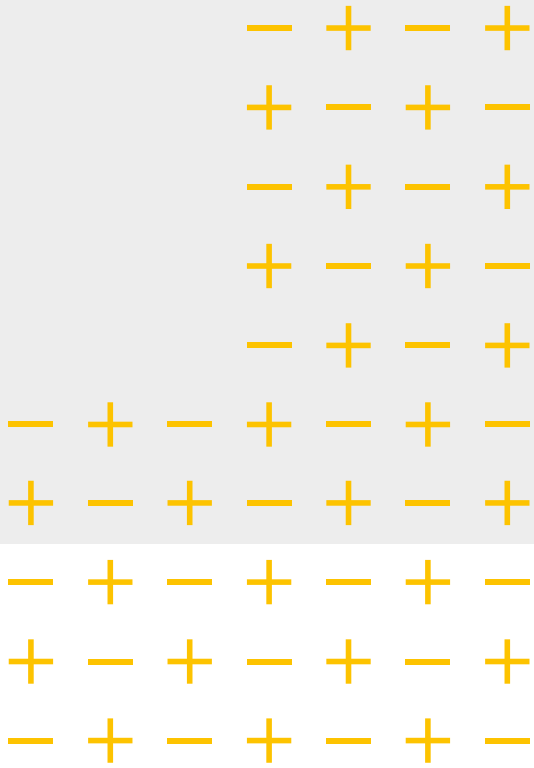

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