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LINETRAXX® RCMS460-D/-L – RCMS490-D/-L

Multi-channel AC, pulsed DC and AC/DC sensitive residual current monitors for earthed AC, DC and AC/DC systems (TN and TT systems)

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Multi-channel AC, pulsed DC and AC/DC sensitive residual current monitors for earthed AC, DC and AC/DC systems (TN and TT systems)

LINETRAXX® RCMS460-D und RCMS490-L

Device features

- Optional AC, pulsed DC or AC/DC sensitive measurement by selecting the respective measuring current transformer for each channel
- True r.m.s. value measurement
- 12 measuring channels per device for residual current measurement or digital input
- Up to 90 RCMS… monitors, up to1080 measuring channels in the system
- Fast parallel scanning for all channels
- Response ranges:
  10 mA…10 A (0…2000 Hz),
  6 mA…20 A (42…2000 Hz),
  100 mA…125 A (42…2000 Hz) RCMS…-D4
- Preset function
- Adjustable time delays
- The frequency response characteristics can be set for the protection of persons, fire and plant protection
- History memory with date and time stamp for 300 data records
- Data logger for 300 data records/channel
- Analysis of the harmonics, DC, THF
- Two alarm relays with one changeover contact each
- Device version RCMS490 with one alarm contact per channel
- N/O or N/C operation and fault memory selectable
- Connection external test/reset button
- Backlit graphical display (7-segment display) and alarm LEDs
- Data exchange via BMS bus
- Password protection for device setting
- Continuous CT connection monitoring
- RoHS compliant

Approvals

Product description RCMS460-D…/-L… and RCMS490-D…/-L…

The RCMS system consists of one or more RCMS460-D/-L or RCMS490-D/-L residual current monitors, which are able to detect and evaluate fault, residual and operating currents in earthed power supplies via the related measuring current transformers. The maximum voltage of the system to be monitored depends on the nominal insulation voltage of the measuring current transformer used in the case of busbar systems, resp. depend on the cables or conductors that are routed through.

Closed CTUB100 series measuring current transformers are required to measure AC/DC sensitive residual currents (according to IEC/TR 60755: Type B). For the CTUB100 series measuring current transformers require one 24 V DC power supply unit (e.g. STEP-PS series). CTAC… (closed), WR (rectangular), WS (split-core) and WF… (flexible) series measuring current transformers are used for alternating and pulsating currents (according to IEC/TR 60755: Type A).

Any combination of the various measuring current transformer series can be connected to the monitor measuring channels. Each RCMS460-D/-L and RCMS490-D/-L has 12 measuring channels. Up to 90 residual current monitors can be connected via a BMS bus (RS-485 interface with BMS protocol), thereby up to 1080 measuring channels (sub-circuits) can be monitored.

If this product is to be used for personnel, fire or plant protection, the frequency response can be set accordingly. The measured currents can be analysed for harmonics.

Typical applications

Measuring and evaluating residual, fault and rated currents of loads and installations in the frequency range of 0…2000 Hz (CTUB100 series measuring current transformers), 42…2000 Hz (CTAC…, WR…, WS…, WF… series measuring current transformers).

- Monitoring of currents regarded as fire hazards in flammable atmospheres
- EMC monitoring of TN-S systems for “stray currents” and additional N-PE connections.
- Monitoring of N conductors for overload caused by harmonics
- Monitoring of PE and equipotential bonding conductors to ensure they are free of current
- Residual current monitoring of stationary electrical equipment and systems to determine test intervals which meet practical requirements in compliance with the accident prevention regulations DGUV V3 (Germany).
- Personnel and fire protection due to rapid disconnection
- Monitoring of digital inputs

Function

The currents are detected and evaluated as true r.m.s. values in the frequency range of 0 (42)…2000 Hz. All channels are scanned simultaneously so that the maximum scanning time for all channels is 180 ms if 1x the response value is exceeded and 30 ms if 5x the response value is exceeded.

The current values of all channels are indicated on the LC display in bar graph format. If one of both values falls below or exceeds the set response value, the response delay t_{on} begins. Once the response delay has expired, the common alarm relays “K1/K2” switch and the alarm LEDs 1/2 light up.

Two response values/common alarm relays, which can be set separately, allow a distinction to be made between prewarning and alarm. The faulty channel(s) and the associated measured value are indicated on the LC display. If the current exceeds or falls below the release value (response value plus hysteresis), the delay on release toff begins. Once the delay has expired, the common alarm relays return to their initial position.

If the fault memory is enabled, the common alarm relays remain in the alarm state until the reset button is pressed or a reset command is sent via the BMS bus. The device function can be tested using the test button. Parameters are assigned to the device via the LCD and the control buttons on the front of one of the connected RCMS…-D devices or via connected panels and protocol converters (e.g. COM465IP). The preset function allows the response values to be set for all channels considering the currently measured value for each channel.

Digital input

Each individual channel can be used for one of the following monitoring functions:
as digital input using a potential-free contact 1/0 or for current or residual current monitoring in combination with measuring current transformers.

History memory in RCMS460-D, RCMS490-D

The device utilises a history memory for failsafe storing of up to 300 data records (date, time, channel, event code, measured value), so that all data about an outgoing circuit or an area can be traced back at any time (what happened when).

Analysis of harmonics

The analysis of the harmonics of the measured currents can be selected via a menu item in RCMS460-D, RCMS490-D. There, the DC component, the THF and the current value of the harmonics (1…40 at 50/60 Hz, 1…5 at 400 Hz) is displayed numerically and graphically.

Device variants

RCMS residual current monitoring systems differ in the type of residual current evaluator used. RCMS460… or RCMS490… are available as an option.

RCMS460-D

Device version RCMS460-D utilises a backlit graphical display. This version is applied when detailed information about all devices in the switchboard cabinet, connected to the bus, are to be displayed locally. This device is capable of assigning parameters to all RCMS devices connected to the BMS bus and displaying all measurement details. Several RCMS-D devices can be used in one system.

RCMS460-L

Device version RCMS460-L utilises a two-digit 7-segment display where the address of this device is displayed within the BMS bus. The alarm LEDs indicate in which measuring channel the response value has been exceeded. Parameter assignment can be carried out via an RCMS-D… or the protocol converter COM465IP.

RCMS490-D/RCMS490-L

The function of the device versions RCMS490-D/RCMS490-L corresponds to the function described above. In addition, a galvanically isolated alarm contact (N/O contact) is provided, for example, to trigger a circuit breaker in this sub-circuit when a response value has been exceeded or the value has fallen below the set response value.

RCMS…-D4/RCMS…-L4

The function of device version RCMS…-D4/RCMS…-L4 corresponds to the function described before. The functions of measuring channels k9… k12 vary from those described before. They are exclusively designed for current measurements with Type A measuring current transformers (measuring range 100 mA…125 A). For that reason, the measuring channels k9…k12 cannot be used in combination with CTUB100 series measuring current transformers or as digital inputs.

Standards

The LINETRAXX® RCMS460/490 series complies with the requirements of the device standards:

- DIN EN 62020 (VDE 0663)
- IEC 62020

Overview of device types

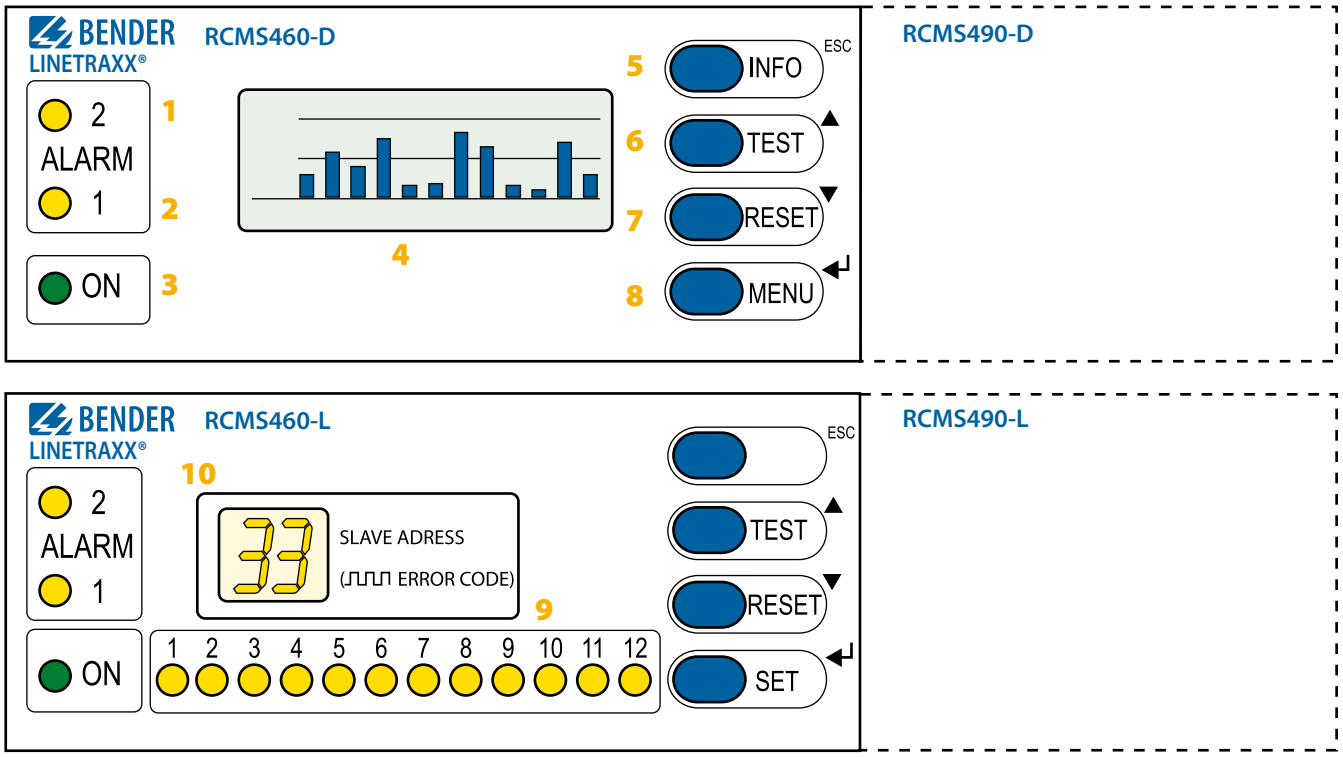
Distinctive device features			RCMS460-D…	RCMS460-L	RCMS490 -D…	RCMS490-L…
	Parameter setting function		■	–	■	–
	Master/Slave		■	■	■	■
	Address range		1…90	1…90	1…90	1…90
Measuring circuit	Measuring channels per device		12	12	12	12
	CTAC…, CTUB100, WR…S(P), WS…, W…F series measuring current transformers		■	■	■	■
	CT monitoring		■	■	■	■
	Rated residual operating current $I_{\Delta n2}$ (Alarm)	AC/DC sensitive 0…2000 Hz (Type B)	10 mA…10 A	10 mA…10 A	10 mA…10 A	10 mA…10 A
		pulsed DC sensitive 42…2000 Hz (Type A)	6 mA…20 A	6 mA…20 A	6 mA…20 A	6 mA…20 A
		pulsed DC sensitive 42…2000 Hz (Type A) for the channels 9…12 (RCMS4x0-D4/-L4)	100 mA…125 A	100 mA…125 A	100 mA…125 A	100 mA…125 A
	Rated residual operating current $I_{\Delta n1}$ (prewarning)		10…100 %, min. 5 mA	10…100 %, min. 5 mA	10…100 %, min. 5 mA	10…100 %, min. 5 mA
	Function selectable per channel off, <, >, I/O		■	■	■	■
	Cut-off frequency adjustable for personnel, plant and fire protection		■	*	■	*
	Preset function for $I_{\Delta n2}$ and I/O		■	■	■	■
	Hysteresis		2…40 %	2…40 %	2…40 %	2…40 %
	Factor for additional CT		■	■	■	■
Switching elements	Common alarm relay for all channels		2 x 1 changeover contact	2 x 1 changeover contact	2 x 1 changeover contact	2 x 1 changeover contact
	Alarm relay per channel		–	–	12 x 1 N/O contact	12 x 1 N/O contact
Time response	Start-up delay 0…99 s		■	■	■	■
	Response delay tv, adjustable 0…999 s		■	■	■	■
	Operating time at	$I_{\Delta n} = 1 \times I_{\Delta n2}$: ≤ 180 ms	■	■	■	■
		$I_{\Delta n} = 5 \times I_{\Delta n2}$: ≤ 30ms	■	■	■	■
Displays, memory	Analysis of the harmonics (IΔ, DC, THF)		■	*	■	*
	History memory 300 data records		■	–	■	––
	Data logger for 300 data records/ channel		■	–	■	–
	Internal clock		■	–	■	–
	Password		■	–	■	–
	Language English, German, French, Swedish		■	–	■	–
	Backlit graphics LC display		■	–	■	–
	7-segment display and LED line		–	■	–	■

* only in conjunction with RCMS4xx-D, MK2430 or COM465IP

The following table gives an overview of the measuring functions per channel:

Overview of measuring functions					
Type			RCMS460-D/-L, RCMS490-D/-L	RCMS460-D4/-L4, RCMS490-D4/-L4	
Measuring functions, selectable			Channel 1…12	Channel 1…8	Channel 9…12
$I / I_{\Delta n}$	6 mA…20 A	(42 …2000 Hz)	</>/OFF	</>/OFF	--
$I/I_{\Delta n}$	100 mA…125 A	(42 …2000 Hz)	--	--	</>/OFF
$I/I_{\Delta n}$	10 mA…10 A	(0 …2000 Hz)	</>/OFF	</>/OFF	--
I/O			I/O/OFF	I/O/OFF	--

Operating and display elements RCMS460-D…/-L … and RCMS490-D…/-L…



1 - LED ALARM "2" lights up when the measured value falls below or exceeds the response value in a measuring channel or an error is indicated by the digital input.

2 - LED "ALARM 1" lights up if the measured value exceeds or falls below the "Prewarning" response value in a channel or in the event of device error.

3 - Power On LED "ON" lights up when the device is switched on or flashes until the device is ready for operation during switching on.

4 - Illuminated graphic LCD

5 - "INFO" button: to query standard information (does not apply to RCMS4…-L)

ESC button: to exit the menu function without changing parameters

6 - Test button "TEST": to call up the self test
Arrow up button: Parameter changes, scroll

7 - Reset button "RESET": to delete alarm and fault messages
Arrow down button: Parameter changes, scroll

8 - "MENU" button: RCMS460-D/490-D: to toggle between the standard display, menu and alarm display

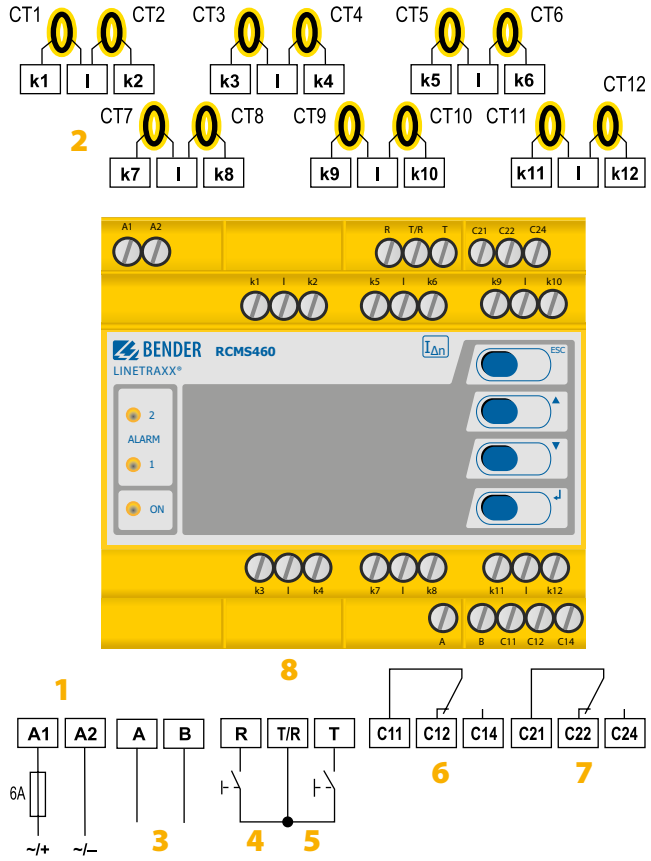
"SET" button: RCMS460-L/490-L: to set the BMS address

Enter button: to confirm parameter changes

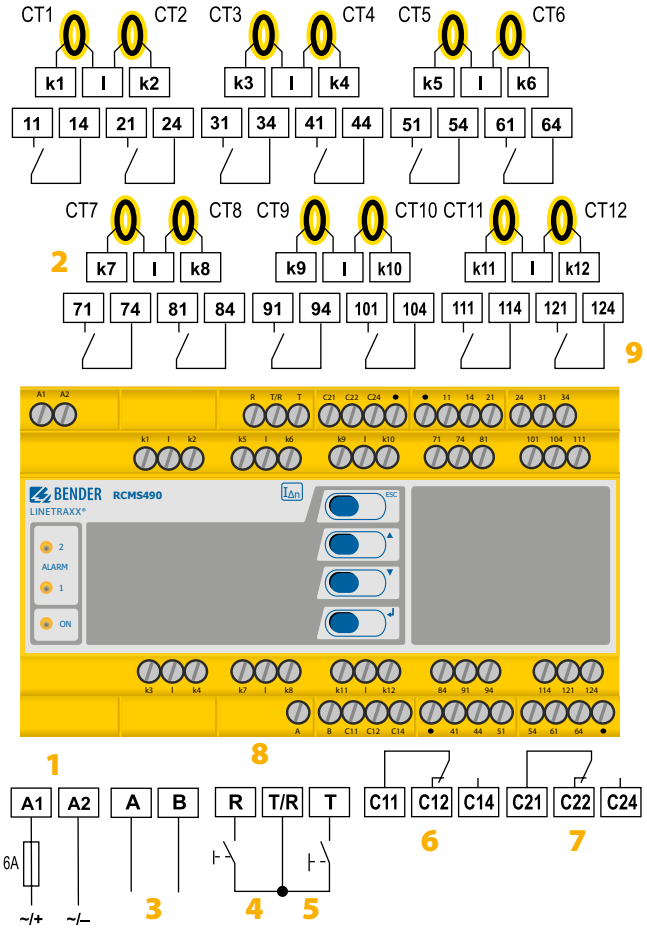
9 - Alarm LEDs "1…12" light up when a fault has been detected in the relevant measuring channel or flash if there is a fault with the measuring current transformer

10 - Digital display for device address and error codes.

Wiring diagram RCMS460-D…/-L…



Wiring diagram RCMS490-D…/-L…



1 - **A1, A2** Connection of supply voltage U_S (see ordering information): we recommend the use of 6 A fuses.

2 - **k1, I… k12, I** Connection of measuring current transformers CT1…CT12. Either Type A or Type B measuring current transformers can be selected for each measuring channel. Six CTUB100 series measuring current transformers require one STEP-PS power supply unit. The channels k9…k12 of the device versions RCMS460-D4/-L4 require the connection of Type A measuring current transformers.

3 - **A, B** BMS bus (RS-485 interface with BMS protocol)

4 - **R, T/R** External reset button (N/O contact). The external reset buttons of several devices must not be connected to one another.

5 - **T, T/R** External test button (N/O contact). The external test buttons of several devices must not be connected to one another.

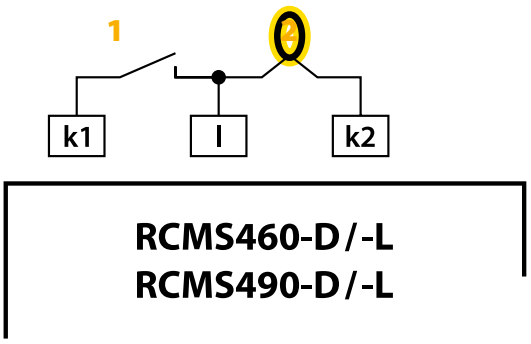
6 - **C11, C12, C14** Common alarm relay K1: Alarm 1, common message for alarm, prewarning, device error.

7 - **C21, C22, C24** Common alarm relay K2: ALARM 2, common message for alarm, prewarning, device error.

8 - **$R_{on/off}$** Activate or deactivate the terminating resistor of the BMS bus (120 Ω).

9 - **CT** Measuring current transformers (CTAC…, CTUB100, WR…, WS…, WF… series)

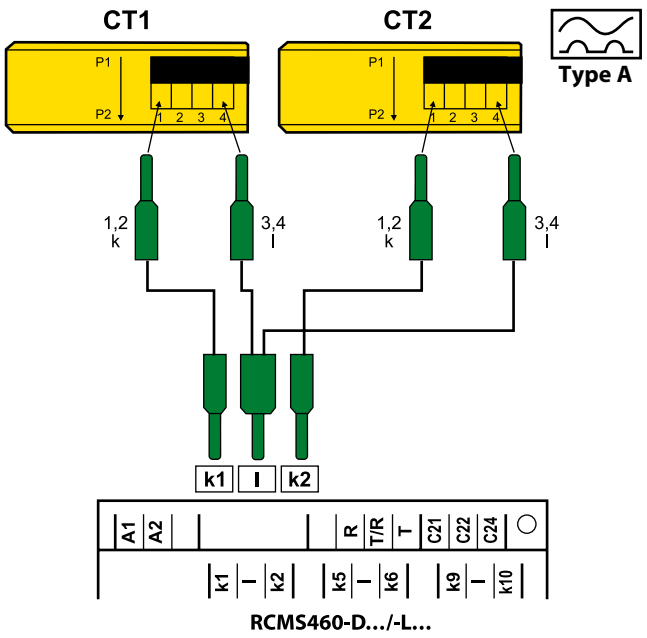
Wiring diagram– Digital input



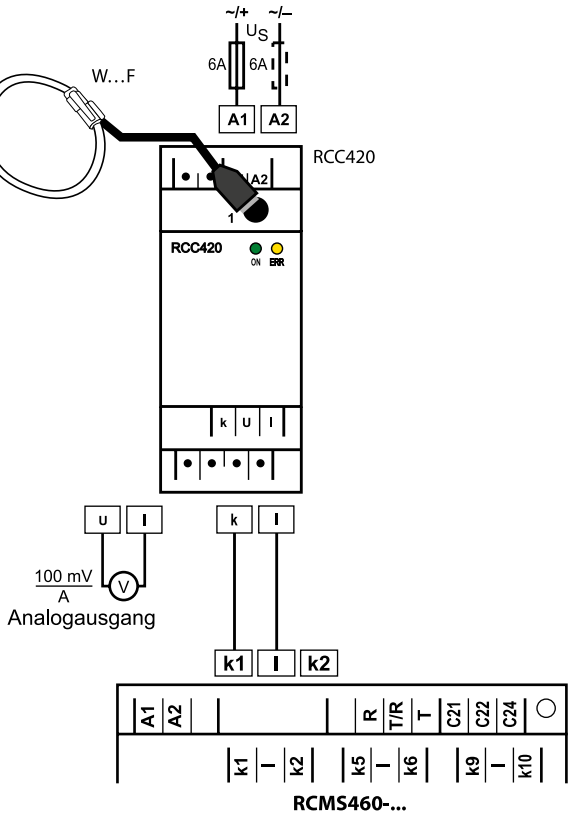
1 - Potential-free contact
0 ≙ Resistance between k and l > 250 Ω
I ≙ Resistance between k and l < 100 Ω

2 - Measuring current transformers

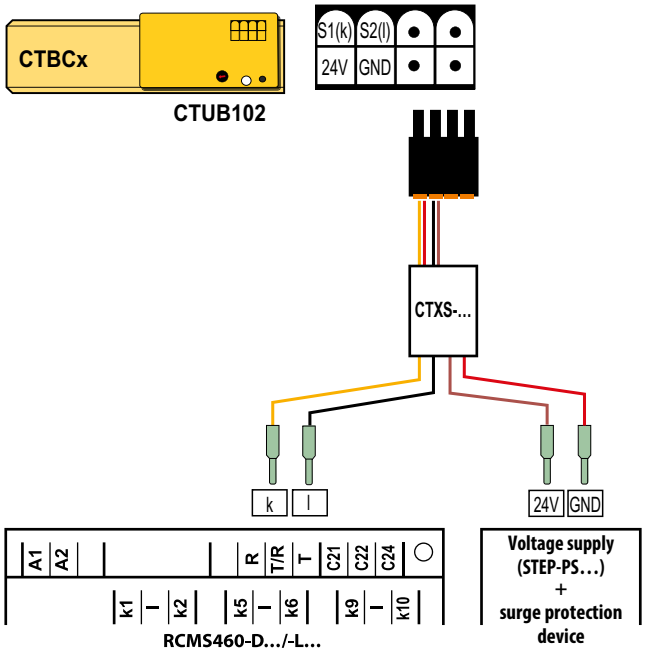
Connection CTAC..., WR..., WS... series measuring current transformers (pulsed current sensitive)



Connection WF... series measuring current transformers



Connection CTUB100 series measuring current transformer (AC/DC current sensitive)

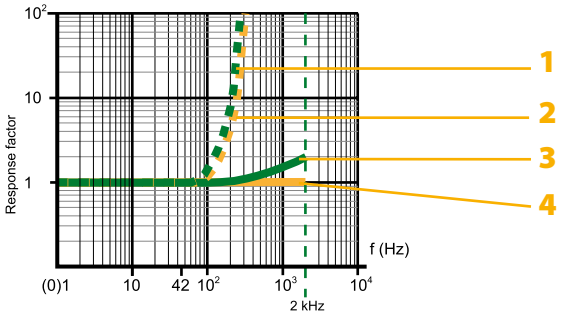


The connections k and l at the residual current monitor must not be interchanged.

Frequency settings

The frequency response of the equipment can be set to a linear frequency response (up to the maximum frequency of Hz) if used for fire protection or to a frequency response in accordance with IEC 60990 for personnel protection. For plant protection, the residual current is measured up to the rated system frequency. The figure below shows the corresponding frequency response.

Frequency curves



Response factor = $I_\Delta/I_{\Delta n}$

(I_Δ) Residual operating current: Measured value at which the RCMS responds.

($I_{\Delta n}$) Rated residual operating current: Set response value

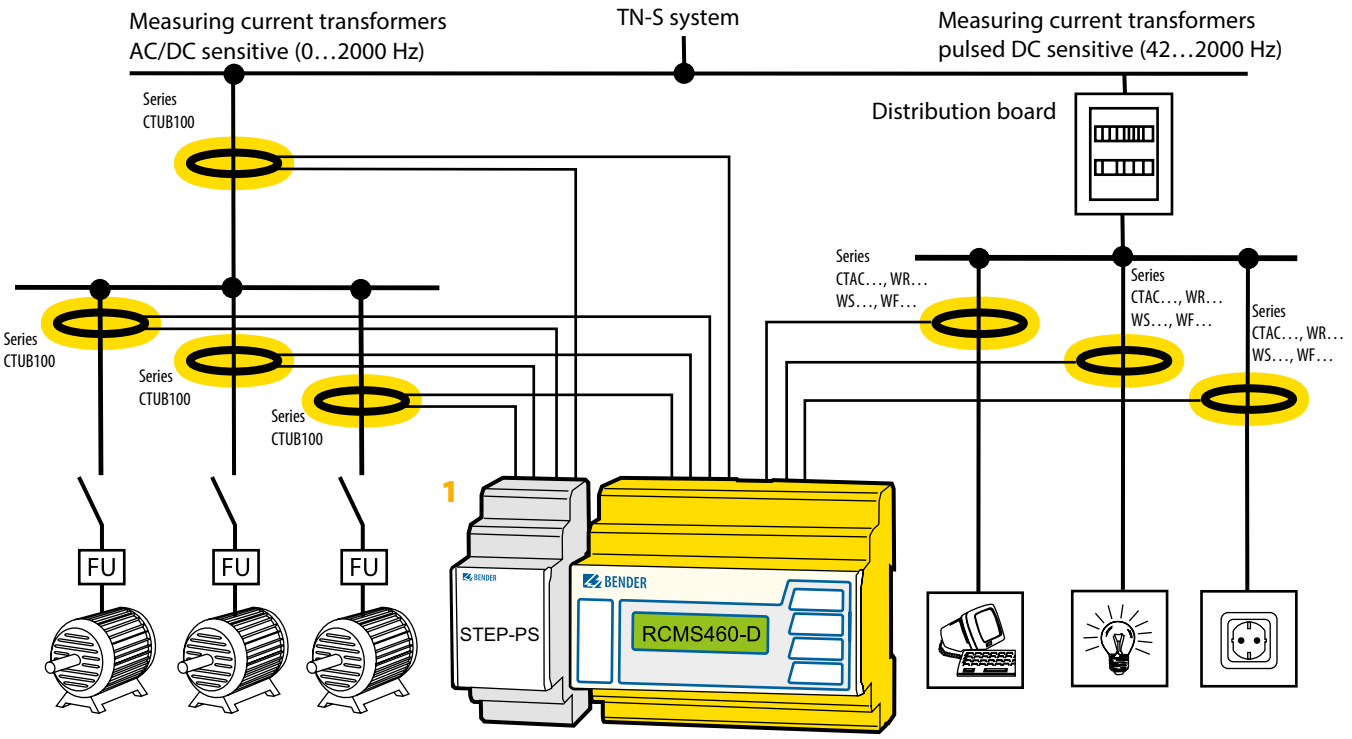
1 - Menu option "50 Hz" – plant protection: Only evaluates the fundamental component of the residual current.

2 - Menu selection "60 Hz"– Plant protection: Only evaluates the fundamental component of the residual current.

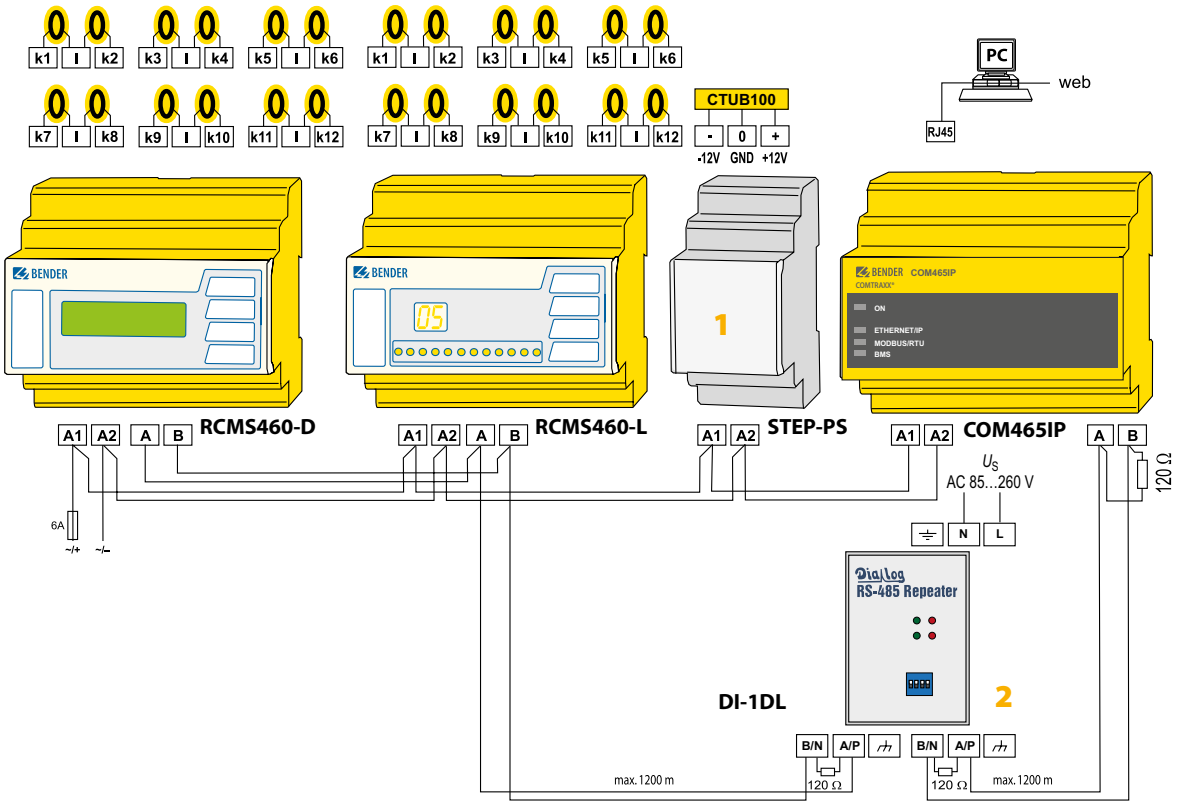
3 - Menu selection "IEC"– Touch current for let go (protection of persons) in accordance with IEC 60990

4 - Menu selection "None"– Fire protection: Response factor remains the same over the entire frequency range.

Example for a design of a – minimum system consisting of an RCMS460-D and 12 measuring points



Example for a system design of – standard system consisting of an RCMS460-D and RCMS460-L and a protocol converter COM465IP



Note:

1 - When AC/DC sensitive measuring current transformers of the CTUB100 series are used, an 24 V DC power supply unit (e.g. STEP-PS series). is required that supplies up to six measuring current transformers of this type.

2 - The DI-1DL repeater only is required when the length of the cable exceeds 1200 m or when more than 32 devices are connected to the bus.

Technical data

Insulation coordination acc. to IEC 60664-1/IEC 60664-3 for the versions:

a) RCMS4x0-D1

Supply voltage U_S	DC 24…75 V/AC 24…60 V (AC/DC ±20 %)
Supply voltage frequency	DC, 50/60 Hz
Rated insulation voltage	100 V
Rated impulse voltage/pollution degree	2.5 kV/3
Overvoltage category	III
Protective separation (reinforced insulation) between	(A1, A2) - (k1, l…k12, R, T/R, T, A, B)
Voltage test acc. to IEC 61010-1	1.344 kV
Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	4 kV/3
Overvoltage category	III
Basic insulation between	(A1, A2), (k1, l…k12, R, T/R, T, A, B) - (C11, C12, C14), (C21, C22, C24), (11,14), (21,24), (31,34), (41,44), (51,54), (61,64), (71,74), (81,84), (91,94),(101,104), (111,114), (121,124)
Basic insulation between:	(11, 14) - (21, 24) - (31, 34) - (41, 44) - (51, 54) - (61, 64)
Voltage test acc. to IEC 61010-1	2.21 kV
Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	6 kV/3
Overvoltage category	III
Protective separation (reinforced insulation) between	(C11, C12, C14) - (C21, C22, C24) - (11, 14, 21, 24, 31, 34) - (41, 44, 51, 54, 61, 64) - (71,74) - (81,84) - (91,94) - (101,104) - (111,114) - (121,124)
Voltage test acc. to IEC 61010-1	3.536 kV

b) RCMS4x0-D2

Supply voltage U_S	AC/DC 100…240 V (-20…+15 %)
Supply voltage frequency	DC, 50/60 Hz
Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	6 kV/3
Overvoltage category	III
Protective separation (reinforced insulation) between	(A1, A2) - (k1, l…k12, R, T/R, T, A, B), (C11, C12, C14), (C21, C22, C24), (11,14), (21,24), (31,34), (41,44), (51,54), (61,64), (71,74), (81,84), (91,94),(101,104), (111,114), (121,124)
Protective separation (reinforced insulation) between	(C11, C12, C14) - (C21, C22, C24) - (11, 14, 21, 24, 31, 34) - (41, 44, 51, 54, 61, 64) - (71,74) - (81,84) - (91,94) - (101,104) - (111,114) - (121,124)
Voltage test acc. to IEC 61010-1	3.536 kV
Rated insulation voltage	250 V
Rated impulse voltage/pollution degree	4 kV/3
Overvoltage category	III
Basic insulation between:	k1, l…k12, R, T/R, T, A, B) - (C11, C12, C14), (C21, C22, C24)
Basic insulation between:	(11, 14) - (21, 24) - (31, 34) - (41, 44) - (51, 54) - (61, 64)
Voltage test acc. to IEC 61010-1	2.21 kV

Measuring circuit

External measuring current transformers	CTAC…, WR…, WS…, WF… series (Type A), CTUB100 series (Type B)
CT monitoring	on/off (on)*
Rated burden RCMS…-D/-L	68 Ω
Rated burden RCMS…-D4/-L4 (channels 9…12 only)	1 Ω
Rated insulation voltage (measuring current transformer)	800 V
Operating characteristics acc. to IEC/TR 60755	type A and type B depending on measuring current transformer series (type A)*
Rated frequency	0…2000 Hz (Type B) / 42…2000 Hz (type A)
Cut-off frequency	none, IEC, 50 Hz, 60 Hz (none)*
Measuring range RCMS…-D/-L	0…30 A (measuring current transformer type A) 0…20 A (measuring current transformer type B) Crest factor up to 10 A = 4, up to 20 A = 2
Measuring range RCMS…-D4/-L4 (channels 9…12 only)	100 mA…125 A
Rated residual operating current IΔn2 (alarm)	10 mA…10 A (type B) 6 mA…20 A (type A) (100 mA overcurrent)*
Rated residual operating current $I_{\Delta n2}$ (alarm) for RCMS…-D4/-L4 (channels 9…12 only)	100 mA…125 A (16 A overcurrent)*
Rated residual operating current $I_{\Delta n1}$ (prewarning)	10…100 % x $I_{\Delta n2}$ min. 5 mA (50 %)*
Digital input	1: < 100 Ω 0: > 250 Ω
Preset for alarm	I_Δ x factor 1…99 (3)* Offset 0…20 A (30 mA)*
Preset for digital input	0/1 (1)*
Relative uncertainty RCMS…-D/-L	0…-20 %**
Relative uncertainty RCMS…-D4/-L4 (channels 9…12 only)	+10…-20 %**
Hysteresis	2…40% (20 %)*
Factor for additional CT	/1…10; x 1…250 (x 1)*
Number of measuring channels (per device/system)	12/1080

Time response

Start-up delay t (start-up) per device	0…99 s (0 ms)*
Response delay t_{on} per channel	0…999 s (200 ms)*
Delay on release t_{off} per channel	0…999 s (200 ms)*
Operating time t_{ae} at $I_{\Delta n} = 1$ x $I_{\Delta n1/2}$	≤ 180 ms
Operating time t_{ae} at $I_{\Delta n} = 5$ x $I_{\Delta n1/2}$	≤ 30 ms
Response time t_{an} for residual current measurement	$t_{an} = t_{ae} + t_{on1/2}$
Operating time t_{ae} digital inputs	≤ 3.5 s
Scanning time for all measuring channels (residual current measurement)	≤ 180 ms
Recovery time t_b	500…600 ms

Displays, memory

Measured value display range RCMS…-D / -L	0…30 A (CT Type A) 0…20 A (CT type B)
Display range, measured value RCMS…-D4/-L4 (channels 9…12)	0…125 A (CT type A)
Error of indication	± 10 %
LEDs	ON/ALARM (RCMS…-D…) ON/ALARM / measuring channel 1…12 (RCMS…-L…)
LC display	backlit graphical display (RCMS…-D…)
7-segment display	2 x 7.62 mm (RCMS4…-L)
History memory	300 data records (RCMS…-D…)
Data logger	300 data records per measuring channel (RCMS…-D…)
Password	off / 0…999 (off)*
Language	D, GB, F (GB)*
Fault memory alarm relay	on/off (off)*

Inputs/outputs

Test/reset button	internal/external
Cable length for external test/reset button	0…10 m

Interface

Interface/protocol	RS-485/BMS
Baud rate	9.6 kbit/s
Cable length	0…1200 m
Cable (shielded, shield connected to PE on one side)	recommended: min. J-Y(St)Y min. 2x0.8
For UL application: : Copper lines	at least 60/70 °C
Terminating resistor	120 Ω (0.25 W) connectable via DIP switch
Device address, BMS bus	1…90 (2)*

Cable lengths for CTAC…, WR…, WS…, WF… series measuring current transformers

Single wire ≥ 0.75 mm²	0…1 m
Single wire, twisted ≥ 0.75 mm²	0…10 m
Shielded cable ≥ 0.5 mm²	0…40 m
Cable (shielded, shield connected to terminal l at one end, must not be earthed)	recommended: J-Y(St)Y min. 2 x 0.8

Cable lengths for CTUB100 series measuring current transformers

Single wire ≥ 0.75 mm²	0…10 m
Connection	plug-in connector, recommended CTXS…

Switching elements

Number	2 x 1 changeover contact (RCMS460) 2 x 1 changeover contact, 12 x 1 N/O contact (RCMS490)				
Operating principle	NC or N/O operation (N/O operation)*				
Electrical endurance under rated operating conditions, number of cycles	10.000				
Contact data acc. to IEC 60947-5-1					
Utilisation category	AC-13	AC-14	DC-1	DC-12	DC-12
Rated operational voltage	230 V	230 V	24 V	110 V	220 V
Rated operational current (common alarm relay)	5 A	3 A	1 A	0.2 A	0.1 A
Rated operational current (alarm relay)	2 A	0.5 A	5 A	0.2 A	0.1 A
Minimum contact rating	1 mA at AC/DC ≥ 10 V				

Environment/EMC

EMC	IEC 62020
Operating temperature	-25…+ 55 °C

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-term storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)

Classification of mechanical conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3

Connection

Connection	screw terminals
Connection properties:	
Rigid/flexible/conductor sizes	0.2…4/0.2…2.5 mm²/AWG 24…12
Multi-conductor connection (2 conductors with the same cross section):	
Rigid/flexible	0.2…1.5/0.2…1.5 mm2
Stripping length	8…9 mm
Tightening torque	0.5…0.6 Nm

Other

Operating mode	continuous operation
Mounting	display-oriented
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Enclosure material	polycarbonate
Flammability class	UL94V-0
Screw mounting	2 x M4
DIN rail mounting acc. to	IEC 60715
Software version measurement technique	D233 V2.42
Software version display	D256 V2.29
Power consumption	≤10 VA (RCMS460) ≤12 VA (RCMS490)
Documentation number	D00067
Weight	≤ 360 g (RCMS460), ≤ 510 g (RCMS490)

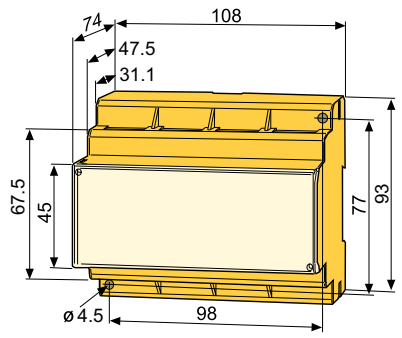
( )* factory setting

** In the frequency range of < 15 Hz, the relative uncertainty is between -35 % and 100 %.

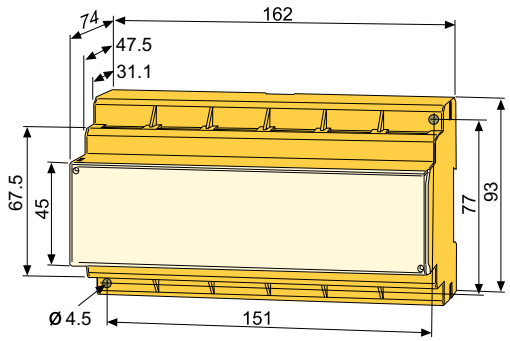
Dimension diagrams

Dimensions in mm

RCMS460-D/-L



RCMS490-D/-L



Ordering information RCMS460/490-D

Differential measurement method		Common alarm relay	Alarm relay per channel	4 channels for load current measurement	Supply voltage [1] U_S		Type	Art. No.
pulsed DC sensitive	AC/DC sensitive				AC	DC		
6 mA…20 A	10 mA…10 A	2 x 1 changeover contact	–	–	16…72 V, 50/60 Hz	16…94 V	RCMS460-D-1	B94053001
					70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS460-D-2	B94053002
				100 mA…125 A	16…72 V, 50/60 Hz	16…94 V	RCMS460-D4-1	B94053009
					70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS460-D4-2	B94053010
			12 x 1 N/O contact	–	16…72 V, 50/60 Hz	16…94 V	RCMS490-D-1	B94053005
					70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS490-D-2	B94053006
				100 mA…125 A	16…72 V, 50/60 Hz	16…94 V	RCMS490-D4-1	B94053011
					70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS490-D4-2	B94053012

[1] Absolute values

[2] For UL application: U_S max = DC 250 V; AC 250 V, 50/60 Hz

Ordering information RCMS460/490-L

Current measurement		Common alarm relay for all channels	Alarm relay per channel	Supply voltage [1] U_S		Type	Art. No.
pulsed DC sensitive	AC/DC sensitive			AC	DC		
6 mA…20 A	10 mA…10 A	2 x 1 changeover contact	–	16…72 V, 50/60 Hz	16…94 V	RCMS460-L-1	B94053003
				70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS460-L-2	B94053004
		2 x 1 changeover contact	12 x 1 N/O contact	16…72 V, 50/60 Hz	16…94 V	RCMS490-L-1	B94053007
				70…276 V, 50/60 Hz[2]	70…276 V[2]	RCMS490-L-2	B94053008

[1] Absolute values

[2] For UL application: U_S max = DC 250 V; AC 250 V, 50/60 Hz

RCMS460-L4 and RCMS490-L4 on request

Accessories

Description	Art. No.
XM460 mounting frame, 144 x 82 mm	B990995

Suitable system components

Description	Version	Type	Art. No.
Power supply unit	for supplying up to 4 CTUB100 series measuring current transformers	STEP-PS/1 AC/24 DC/0.5	B94053110
	for supplying up to 14 CTUB100 series measuring current transformers	STEP-PS/1 AC/24 DC/1.75	B94053111
	for supplying up to 34 CTUB100 series measuring current transformers	STEP-PS/1 AC/24 DC/4.2	B94053112
	RS-485 repeater	DI-1PSM	B95012044
Condition Monitor	Condition Monitor with integrated gateway: Bender system/Ethernet AC/DC 24…240 V, DC, 50…60 Hz	COM465IP	B95061065
	Condition Monitor with integrated gateway: Bender system/Ethernet DC 24 V	COM465IP-24 V	B95061066
	Individual text messages for all devices/channels, device failure monitoring, email in the event of an alarm	COM465IP Function package A	B75061011
	Modbus TCP server for max. 98 * 139 BMS nodes as well as BCOM and universal measuring devices, SNMP server	COM465IP Function package B	B75061012
	Parameter setting of BMS devices as well as BCOM and universal measuring devices	COM465IP Function package C	B75061013
	Visualisation of Bender systems, System visualisation	COM465IP Function package D	B75061014
	Virtual devices	COM465IP Function package E	B75061015
	Integration of third-party devices	COM465IP Function package F	B75061016
	Condition Monitor for the connection of Bender BMS devices and universal measuring devices to TCP/IP networks	CP700	B95061030
	BMS Modbus RTU gateway AC/DC 76…276 V[1]/ AC 42…460 Hz/DC	COM462RTU	B95061022
Alarm indicator and test combination	Alarm indicator and test combination in accordance with IEC 60364-7-710, with BMS bus and USB interface, 16 digital inputs, one relay output, alarm texts programmable via interfaces and personal computer, standard text display. Version: surfacemounting enclosure; menu languages: German English.	MK800A-11	B95100102
	Alarm indicator and test combination in accordance with IEC 60364-7-710, with BMS bus and USB interface, alarm texts programmable via interfaces and personal computer, standard text display. Version: surfacemounting enclosure; Menu languages: German, English.	MK800A-12	B95100103
	Alarm indicator and test combination in accordance with IEC 60364-7-710, with BMS bus and USB interface, 12 digital inputs, one relay output, alarm texts programmable via interfaces and personal computer, standard text display. Version: Flush-mounting enclosure	MK2430-11	B95100001
	Alarm indicator and test combination in accordance with IEC 60364-7-710, with BMS bus and USB interface, alarm texts programmable via interfaces and personal computer, standard text display. Version: Flush-mounting enclosure	MK2430-12	B95100002
	As MK2430-11, but factory-programmed	MK2430P-11	B95100003
	As MK2430-12, but factory-programmed	MK2430P-12	B95100004
	As MK2430-11, but with surfacemounting enclosure	MK2430A-11	B95100005
	As MK2430-12, but with surfacemounting enclosure	MK2430A-12	B95100006
	As MK2430A-11, but factory-programmed, surface-mounting enclosure version	MK2430PA-11	B95100007
	As MK2430A-12, but factory-programmed, surface-mounting enclosure version	MK2430PA-12	B95100008
	As MK2430-11, but front plate with screw fixing	MK2430S-11	B95100011
	As MK2430-12, but front plate with screw fixing	MK2430S-12	B95100012

[1] Absolute values

Accessories suitable system components

Description	Art. No.
Mounting clip for enclosure XM420 (1 piece per device)	B98060008

Measuring current transformers

Pulsating current sensitive measuring current transformers for RCMS460/490

Type of construction	Internal diameter/mm	Type	Art. No.
circular	20	CTAC20	B98110005
	35	CTAC35	B98110007
	60	CTAC60	B98110017
	120	CTAC120	B98110019
	210	CTAC210	B98110020
rectangular	70 x 175	WR70x175S	B911738
		WR70x175SP	B911790
	115 x 305	WR115x305S	B911739
		WR115x305SP	B911791
	150 x 350	WR150x350S	B911740
		WR150x350SP	B911792
	200 x 600	WR200x500S	B911763
		WR200x500SP	B911793
split-core	20 x 30	WS20x30	B98080601
	50 x 80	WS50x80	B98080603
	80 x 120	WS80x120	B98080606

Other measuring current transformer types on request.

Flexible measuring current transformers (pulsed DC sensitive) for RCMS460/490

Internal diameter/mm	Type	Art. No.
170	WF170-1	B78080201
	WF170-2	B78080202
250	WF250-1	B78080203
	WF250-2	B78080204
500	WF500-1	B78080205
	WF500-2	B78080206
800	WF800-1	B78080207
	WF800-2	B78080208
1200	WF1200-1	B78080209
	WF1200-2	B78080210
1800	WF1800-1	B78080221
	WF1800-2	B78080222

WF… series measuring current transformers consist of one flexible WF… series measuring current transformer and one RCC420 signal converter.

AC/DC sensitive measuring current transformers for RCMS460/490

Description	Internal diameter/mm	Type	Art. No.
Measuring current transformer CTUB100 series	ø 20	CTUB102-CTBC20	B78120011
		CTUB102-CTBC20P	B78120021
	ø 35	CTUB102-CTBC35	B78120013
		CTUB102-CTBC35P	B78120023
	ø 60	CTUB102-CTBC60	B78120015
		CTUB102-CTBC60P	B78120025
	ø 120	CTUB102-CTBC120	B78120017
		CTUB102-CTBC120P	B78120027
	ø 210	CTUB102-CTBC210	B78120019
		CTUB102-CTBC210P	B78120029

Description	Length/m	Type	Art. No.
Connection cable measuring current transformer CTUB100 series	1	CTXS-100	B98110090
	2,5	CTXS-250	B98110091
	5	CTXS-500	B98110092
	10	CTXS-1000	B98110093

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