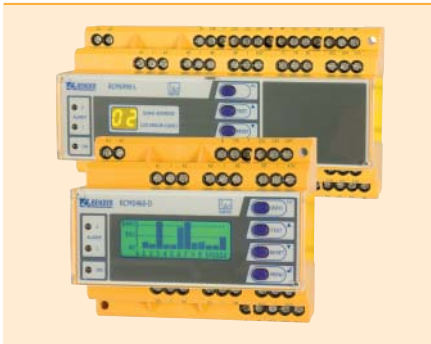


## Residual current monitors

### 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)**



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..., monitoring of 1080 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, THD
- 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 behaviour 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 W...AB series measuring current transformers are required to measure AC/DC sensitive residual currents (according to IEC/TR 60755: Type B). Six W...AB series measuring current transformers require one AN420 or AN110 power supply unit. W (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 (W...AB series measuring current transformers), 42...2000 Hz (W, 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 BGV A3 (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  $t_{off}$  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. FTC470XET). 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 THD factor 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 FTC470XET.

**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 W...AB series measuring current transformers or as digital inputs.

**Standards**

The RCMS... corresponds to the requirements of IEC 62020: 2003-11 and DIN EN 62020 (VDE 0663): 2005-11.

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
<b>Measuring circuit</b>				
Measuring channels per device	12	12	12	12
W..., WR..., WS..., W...AB, WF... 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 current sensitive 42...2000 Hz (Type A)	6 mA...20 A	6 mA...20 A	6 mA...20 A	6 mA...20 A
Pulsed current 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	×	×	×	×
<b>Switching elements</b>				
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
<b>Specified time</b>				
Start-up delay 0...99 s	×	×	×	×
Response delay $t_v$ , adjustable 0...999 s	×	×	×	×
Operating time at $I_{\Delta n} = 1 \times I_{\Delta n2} \leq 180$ ms	×	×	×	×
$I_{\Delta n} = 5 \times I_{\Delta n2} \leq 30$ ms	×	×	×	×
<b>Displays, memory</b>				
Analysis of the harmonics ( $I_h$ , DC, THD)	×	*	×	*
History memory 300 data records	×	--	×	--
Data logger for 300 data records/ channel	×	--	×	--
Internal clock	×	--	×	--
Password	×	--	×	--
Language GB, D, F	×	--	×	--
Backlit graphics LC display	×	--	×	--
7-segment display and LED line	--	×	--	×

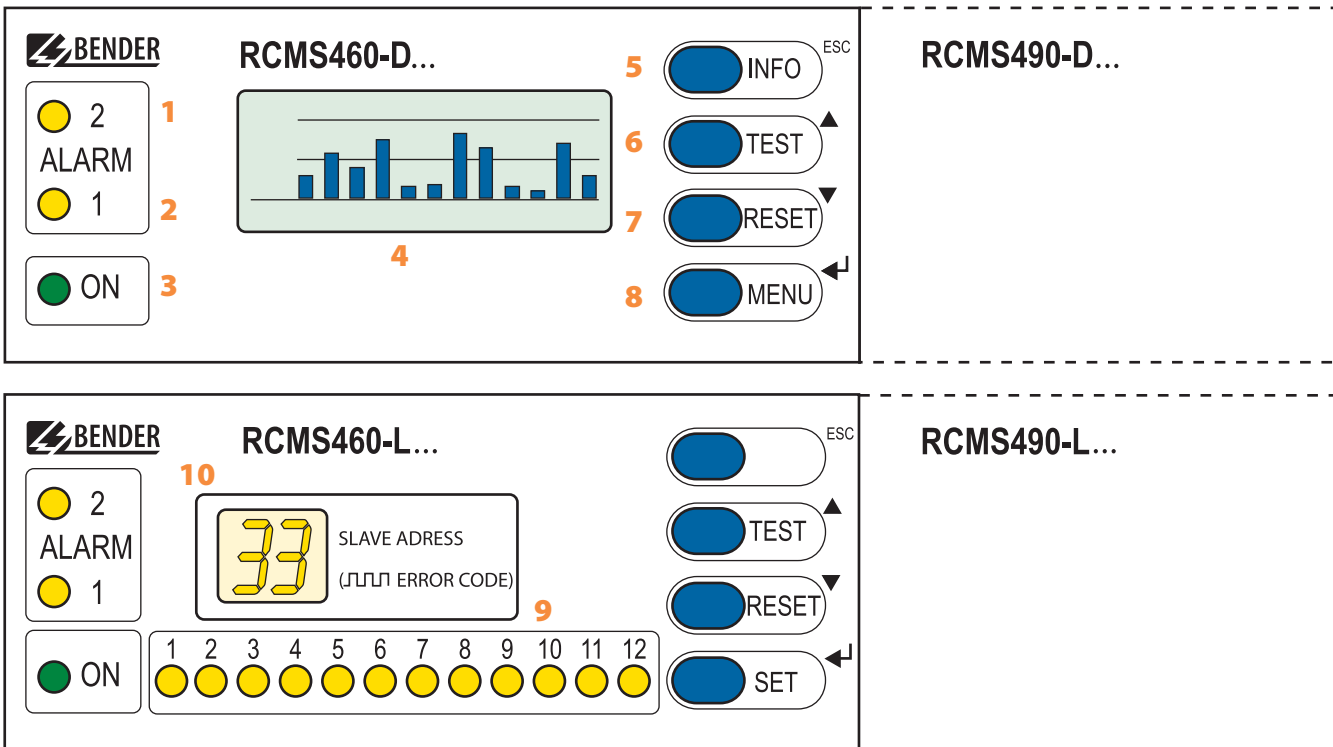
\* only in conjunction with RCMS4xx-D, MK2430 or FTC470XET

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

#### Overview of measuring functions

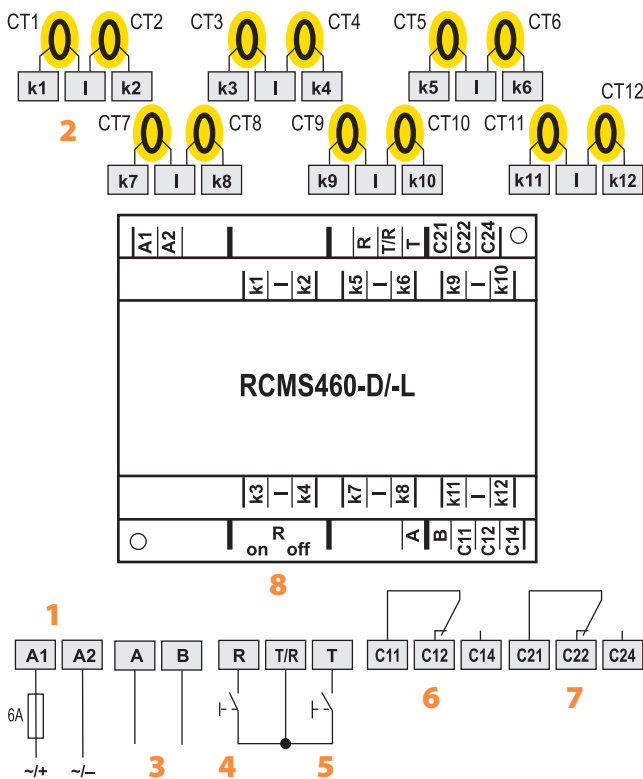
Type	RCMS460-D / -L, RCMS490-D / -L	RCMS460-D4 / -L4, RCMS490-D4 / -L4		
Measuring functions, selectable	Channel 1...12	Channel 1...8	Channel 9...12	
I / I <sub>Δn</sub> 6 mA...20 A (42 ...2000 Hz)	</> / OFF	</> / OFF	--	
I / I <sub>Δn</sub> 100 mA...125 A (42 ...2000 Hz)	--	--	</> / OFF	
I / I <sub>Δn</sub> 10 mA...10 A (0 ...2000 Hz)	</> / OFF	</> / OFF	--	
I / 0	I / 0 / OFF	I / 0 / OFF	--	

#### Operating and display elements RCMS460-D... / -L ... and RCMS490-D... / -L...



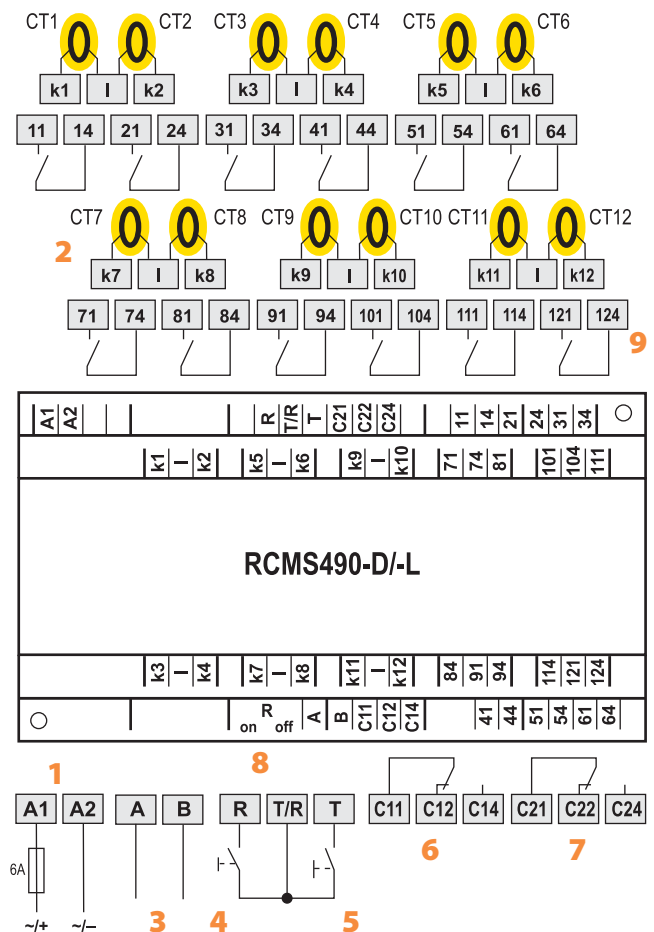
- 1 - The "ALARM 2" LED lights up if the measured value falls below or exceeds the "Alarm" response value in a measuring channel or an error is indicated by the digital input.
- 2 - LED "ALARM 1" lights up if the measured value exceeds or falls below the "Prewarning" response value in a channel or in the event of device error
- 3 - Power LED "ON" lights up when the device is switched on or flashes until the device is ready for operation during switching on
- 4 - Backlit graphics LC display
- 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: to call up the self test  
Arrow up button: parameter change, scroll
- 7 - "RESET" button: to delete alarm and fault messages  
Down button: parameter change, scroll
- 8 - "MENU" button: RCMS460-D/490-D: toggles between the standard display, "MENU" and alarm display  
"SET" button: RCMS460-L/490-L: to set the BMS address  
Enter button: to confirm parameter change
- 9 - Alarm LEDs "1...12" light up if 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...



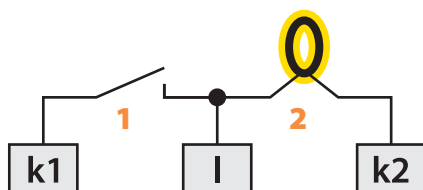
- 1 - Connection of supply voltage  $U_S$  (see ordering information), 6 A fuse recommended
- 2 - Connection measuring current transformers CT1...CT12. Either Type A or Type B measuring current transformers can be selected for each measuring channel. Six W...AB series measuring current transformers require one AN420-2 power supply unit. The channels k9...k12 of the device versions RCMS460-D4 / -L4 require the connection of Type A measuring current transformers.12
- 3 - RS-485 interface (with BMS protocol)
- 4 - External reset button "R" (N/O contact)

Wiring diagram RCMS490-D... / -L...



- 5 - External test button "T" (N/C contact); The external "T/R" buttons of several devices must not be connected to one another.
- 6 - Alarm relay K1: Alarm 1, common alarm for alarm, prewarning, device error, ext. alarm (adjustable)
- 7 - Alarm relay K2: Alarm 2, common alarm for alarm, prewarning, device error, ext. alarm (adjustable)
- 8 -  $R_{on/off}$ : Activate or deactivate the BMS bus terminating resistor (120  $\Omega$ )
- 9 - Alarm relay: N/O contact per channel

Wiring diagram- Digital input

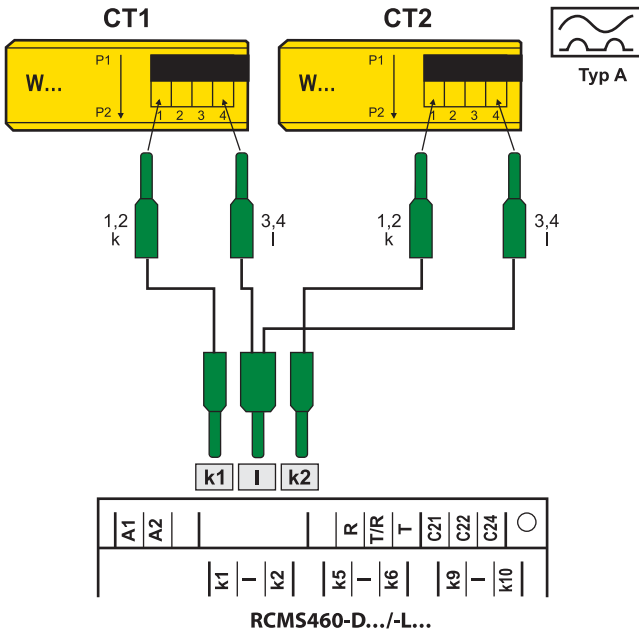


- 1 - Potential-free contact  
 $0 \triangleq$  Resistance between k and I  $> 250 \Omega$   
 $1 \triangleq$  Resistance between k and I  $< 100 \Omega$
- 2 - Measuring current transformers

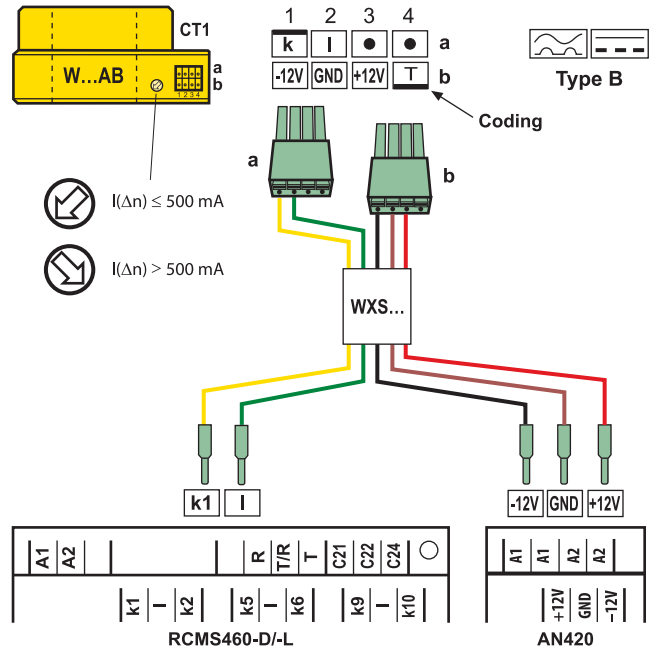
RCMS460-D/-L  
RCMS490-D/-L

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

Example: W...



**Connection W...AB series measuring current transformer (AC / DC current sensitive)**

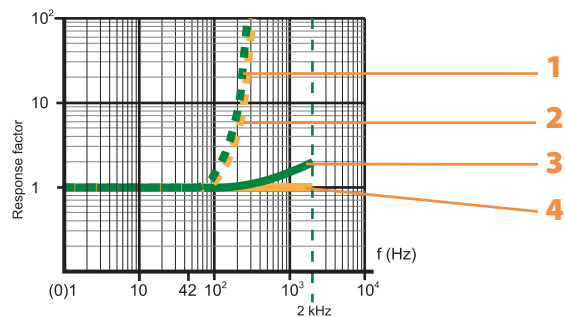


The connections k and I at the residual current monitor must not be interchanged.

**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**



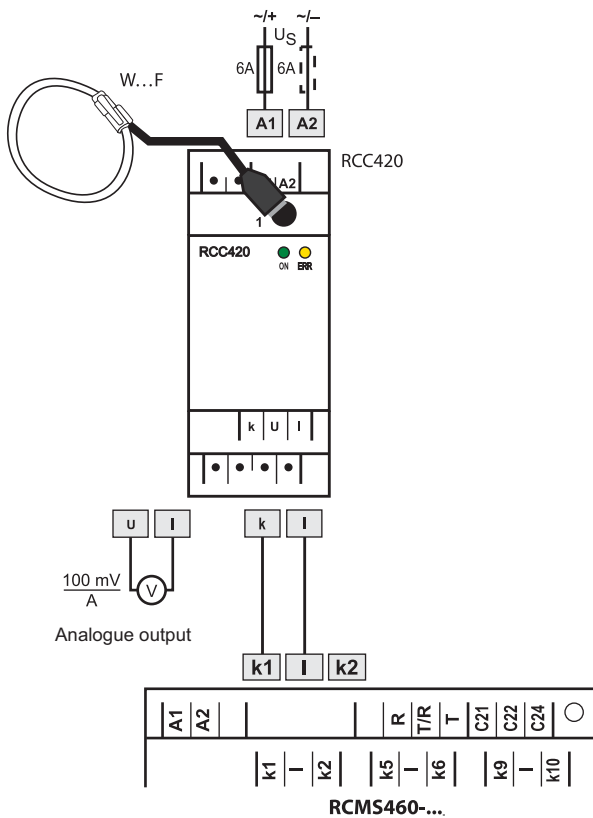
Response factor =  $I_{\Delta} / I_{\Delta n}$

( $I_{\Delta}$ ) Residual operating current: Measured value at which the RCMS responds.

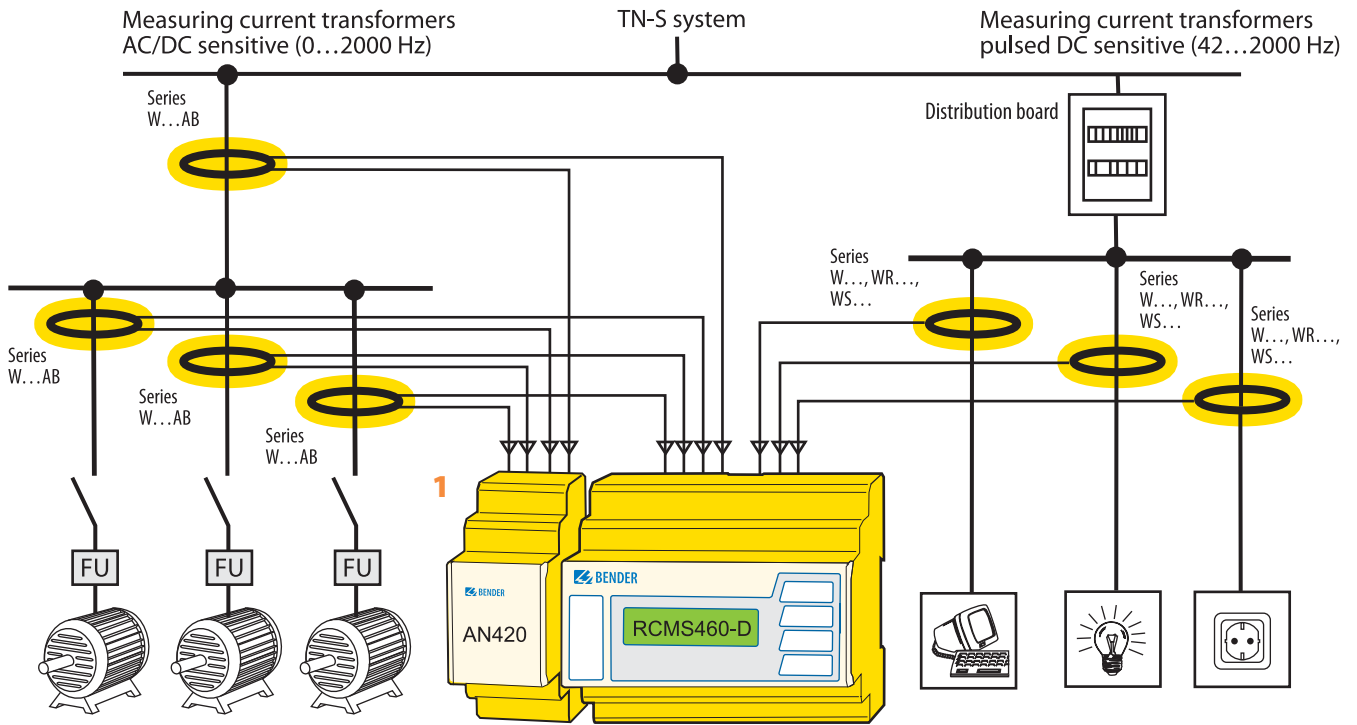
( $I_{\Delta n}$ ) Rated residual operating current: Set response value

- 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.

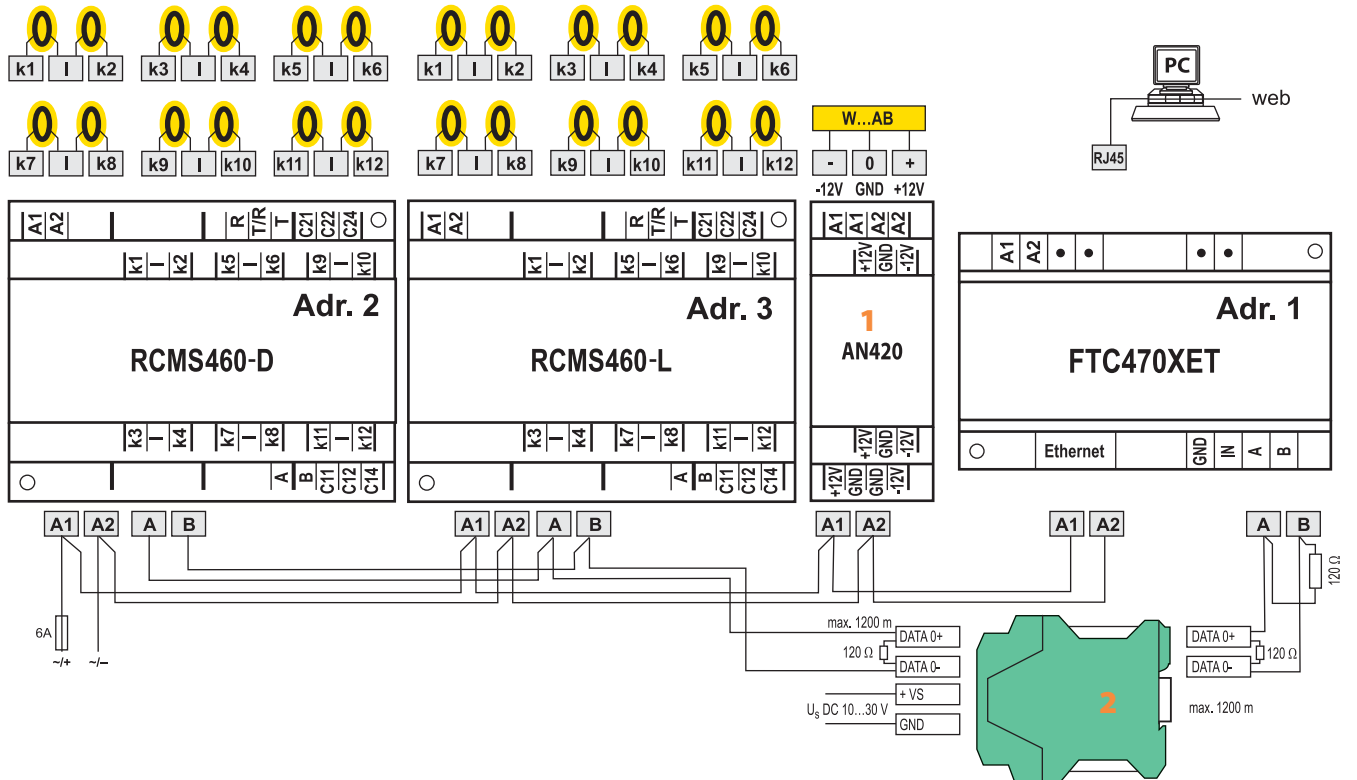
**Connection WF... series measuring current transformers**



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



Example for the design of a – standard system consisting of an RCMS460-D and RCMS460-L and a protocol converter FTC470XET



Note:

- 1 - When AC / DC sensitive measuring current transformers of the W...AB series are used, an AN420 or AN110\* is required that supplies up to six measuring current transformers of this type.
- 2 - The DI-1 repeater PSM only is required when the length of the cable exceeds 1200 m or when more than 32 devices are connected to the bus.

When the supply voltage of AN110-1 is < 30 V, the output power decreases, so that only 5 measuring current transformers can be connected.

## Technical data

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

Rated insulation voltage	AC 250 V
Rated impulse voltage/pollution degree	6 kV / III
Protective separation (reinforced insulation) between (A1, A2) - (k1, I...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	AC 250 V
Rated impulse voltage/pollution degree	4 kV / III
Basic insulation between: k1, I...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

### Supply voltage

Rated supply voltage $U_s$	see ordering information
Frequency range of $U_s$	see ordering information
Power consumption	≤ 10 VA (RCMS460) ≤ 12 VA (RCMS490)

### Measuring circuit

External measuring current transformer	W..., WR..., WS..., WF... series (Type A) W...AB series (Type B)
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### CT monitoring

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 62020 and IEC/TR 60755	Type A and Type B (Type A)* depending on measuring current transformer series

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  $I_{\Delta n2}$  (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  $1 \hat{=} < 100 \Omega, 0 \hat{=} > 250 \Omega$

Preset for alarm  $I_{\Delta}$  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

### Specified time

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  $I_{\Delta n} = 1 \times I_{\Delta n1/2}$  ≤ 180 ms

Operating time  $t_{ae}$  at  $I_{\Delta n} = 5 \times I_{\Delta n1/2}$  ≤ 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

Display range measured value RCMS...-D/-L 0...30 A (measuring current transformer type A)  
0...20 A (measuring current transformer type B)

Measured value display range RCMS...-D4/-L4 (channels 9...12)  
0...125 A (measuring current transformer type A)

Error of indication ± 10 %

LEDs ON / ALARM (RCMS...-D...)

ON / ALARM / measuring channel 1...12 (RCMS...-D...)

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

Recommended cable (shielded, shield connected to PE on one side) J-Y(St)Y min. 2x0.8

Terminating resistor 120 Ω (0.25 W) connectable via DIP switch

Device address, BMS bus 1...90 (2)\*

Cable lengths for W..., WR..., WS..., WF... series measuring current transformers

Single wire ≥ 0.75 mm<sup>2</sup> 0...1 m

Single wire, twisted ≥ 0.75 mm<sup>2</sup> 0...10 m

Shielded cable ≥ 0.5 mm<sup>2</sup> 0...40 m

Recommended cable (shielded, shield connected to terminal I at one end, not connected to earth) J-Y(St)Y min. 2x0.8

Cable lengths for W...AB series measuring current transformers

Single wire ≥ 0.75 mm<sup>2</sup> 0...10 m

Connection plug-in connector, recommended WXS...

### Switching elements

Number 2 x 1 changeover contacts (RCMS460),  
2 x 1 changeover contacts, 12 x 1 N / O contact (RCMS490)

Operating principle NC / N/O operation (N/O operation)\*

Electrical endurance, number of cycles 10.000

Contact data acc. to IEC 60947-5-1

Utilisation category AC-13 AC-14 DC-12 DC-12 DC-12

Rated operational voltage 230 V 230 V 24 V 110 V 220 V

Rated operational current (common alarm relays) 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

### EMC

EMC IEC 62020:2003-11\*\*

Operating temperature -25 °C...+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-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) 2M2

Long-time storage (IEC 60721-3-1) 1M3

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**Connection screw-type terminals**


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Connection properties:

 rigid / flexible / conductor sizes                      0.2...4 / 0.2...2.5 mm<sup>2</sup> / AWG 24...12

Multi-conductor connection (2 conductors with the same cross section):

 rigid/flexible    0.2...1.5 / 0.2...1.5 mm<sup>2</sup>

Stripping length    8...9 mm

Tightening torque    0.5...0.6 Nm

**Other**


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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

Operating manual    TGH1393

Weight    ≤ 360 g (RCMS460), ≤ 510 g (RCMS490)

( ) \* Factory setting

\*\* In the frequency range of &lt; 15 Hz, the relative uncertainty is between - 35 % and 100 %.



Ordering information		
Type	Supply voltage $U_5^*$	Art. No.
RCMS460-D-1	DC 16...94 V / AC 42...460 Hz 16...72 V	B 9405 3001
RCMS460-D4-1	DC 16...94 V / AC 42...460 Hz 16...72 V	B 9405 3009
RCMS460-D-2	DC 70...276 V / AC 42...460 Hz 70...276 V	B 9405 3002
RCMS460-D4-2	DC 70...276 V / AC 42...460 Hz 70...276 V	B 9405 3010
RCMS460-L-1	DC 16...94 V / AC 42...460 Hz 16...72 V	B 9405 3003
RCMS460-L-2	DC 70...276 V / AC 42...460 Hz 70...276 V	B 9405 3004
RCMS490-D-1	DC 16...94 V / AC 42...460 Hz 16...72 V	B 9405 3005
RCMS490-D4-1	DC 16...94 V / AC 42...460 Hz 16...72 V	B 9405 3011
RCMS490-D-2	DC 70...276 V / AC 42...460 Hz 70...276 V	B 9405 3006
RCMS490-D4-2	DC 70...276 V / AC 42...460 Hz 70...276 V	B 9405 3012
RCMS490-L-1	AC 42...460 Hz 16...72 V / DC 16...94 V	B 9405 3007
RCMS490-L-2	DC 70...276 V AC 42...460 Hz 70...276 V	B 9405 3008

RCMS460-L4 and RCMS490-L4 on request

Type	Supply voltage $U_5^*$	Art. No.
AN420-2 (power supply unit for supplying up to six WAB series measuring current transformers)	DC 70...276 V* AC 42...460 Hz 70...276 V*	B94053100 B74053100
AN110-1 (power supply unit for supplying up to six W...AB series measuring current transformers)	AC 20...60 V DC 18...72 V	B94053101
AN110-2 (power supply unit for supplying up to six W...AB series measuring current transformers)	AC 90...264 V DC 100...353 V	B94053102
DI-1 (RS-485 repeater)	DC 10...30V*	B 9501 2015
DI-1PSM (RS-485 interface repeater)	AC / DC 24 V ± 20 %	B 9501 2044
AN471 (power supply unit for DI-1)	AC 50...60 Hz 230 V / AC, DC 20 V	B 924 189

Repeaters and interface converters		
Type	Supply voltage $U_5^*$	Art. No.
FTC470XDP	DC 85...276 V / AC 50...400 Hz 85...276 V	B 9506 1000
FTC470XMB	DC 85...276 V / AC 50...400 Hz 85...276 V	B 9506 1002
FTC470XET	DC 85...276 V / AC 50...400 Hz 85...276 V	B 9506 1001

\* Absolute values

Connection cable for W...AB series measuring current transformers – RCMS and AN420 resp. AN110		
Type	Length/m	Art. No.
WXS-100	1	B 9808 0506
WXS-250	2,5	B 9808 0507
WXS-500	5	B 9808 0508
WXS-1000	10	B 9808 0509

Pulsating current sensitive measuring current transformers for RCMS460/490			
Type	Internal diameter/mm	Type of construction	Art. No.
W20	20	circular	B 9808 0003
W35	35	circular	B 9808 0010
W60	60	circular	B 9808 0018
W120	120	circular	B 9808 0028
W210	210	circular	B 9808 0034
WR70x175	70 x 175	rectangular	B 9808 0609
WR115x305	115 x 305	rectangular	B 9808 0610
WS20x30	20 x 30	split-core	B 9808 0601
WS50x80	50 x 80	split-core	B 9808 0603
WS80x120	80 x 120	split-core	B 9808 0606

Other measuring current transformer types on request

AC/DC sensitive measuring current transformers for RCMS460/490			
Type	Internal diameter/mm	Type of construction	Art. No.
W20AB	20	circular	B 9808 0008
W35AB	35	circular	B 9808 0016
W60AB	60	circular	B 9808 0026
W120AB	120	circular	B 9808 0041
W210AB	210	circular	B 9808 0040

Flexible measuring current transformers (pulsed DC sensitive) for RCMS460/490			
Type	Internal diameter/mm	Supply voltage $U_5$	Art. No.
WF170-1	170	DC 9.6...94 V / AC 42...460 Hz 16...72 V	B 7808 0201
WF170-2	170	DC 70...300 V / AC 42...460 Hz 70...300 V	B 7808 0202
WF250-1	250	DC 9.6...94 V / AC 42...460 Hz 16...72 V	B 7808 0203
WF250-2	250	DC 70...300 V / AC 42...460 Hz 70...300 V	B 7808 0204
WF500-1	500	DC 9.6...94 V / AC 42...460 Hz 16...72 V	B 7808 0205
WF500-2	500	DC 70...300 V / AC 42...460 Hz 70...300 V	B 7808 0206
WF800-1	800	DC 9.6...94 V / AC 42...460 Hz 16...72 V	B 7808 0207
WF800-2	800	DC 70...300 V / AC 42...460 Hz 70...300 V	B 7808 0208
WF1200-1	1200	DC 9.6...94 V / AC 42...460 Hz 16...72 V	B 7808 0209
WF1200-2	1200	DC 70...300 V / AC 42...460 Hz 70...300 V	B 7808 0210

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

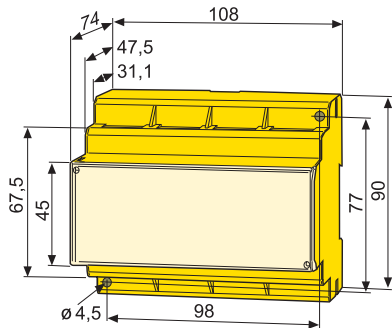
Accessories	
Type	Art. No.
Mounting clip for enclosure XM420 (1 piece per device)	B 9806 0008
Snap-on mounting for W20..., W35...	B 9808 0501
Snap-on mounting for W60...	B 9808 0502
XM460 mounting frame, 144 x 82 mm	B 990995

For further information about measuring current transformers, please refer to the respective data sheets.

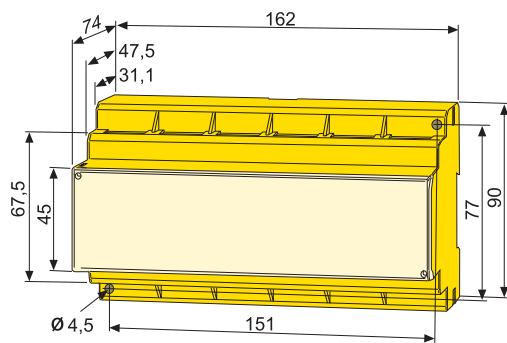
**Dimension diagrams**

Dimensions in mm

**RCMS460-D / -L**

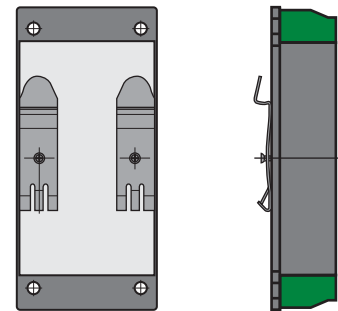
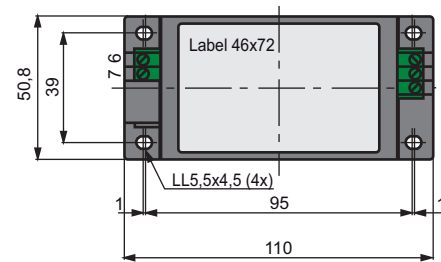


**RCMS490-D / -L**



**Dimension diagram AN110**

Dimensions in mm



**Dimension diagram AN420**

Dimensions in mm

Open the front plate cover in direction of arrow!

**Screw mounting**

Note: The upper mounting clip must be ordered separately (see ordering information).

