

LINETRAXX® CTUB100 series

AC/DC sensitive measuring current transformer (Type B)




CTUB100 series

Device features

- Combined test and reset button
- Multicolour LED for operation, fault and status messages
- Exchangeable electronic module without mechanical separation of the primary conductors
- Extension/retrofitting or modification of functionalities in case of changed monitoring requirements
- Insensitive to load currents due to full magnetic shield (CTUB10x-CTBC20P...210P only)
- Monitoring of the connection to the measuring current transformer
- Supply voltage DC ± 12 V/DC 24 V
- CTUB101-CTBC20...60 for AC/DC sensitive residual current monitors of the RCMA420 series
- CTUB10x-CTBC20...210 for residual current monitoring systems of the RCMS460/490 series as well as for RCMA423 residual current monitor
- CTUB10x-CTBC20P...210P for residual current monitoring systems of the RCMS460/490 series as well as for RCMA420/423 residual current monitors. Can be used for short-term system-related load currents.

Certifications



Product description

The CTUB100 series measuring current transformers are combinations of CTBC... measuring current transformer cores and CTUB10... electronic modules, which convert AC and DC currents into an evaluable measurement signal. The measurement signals can be evaluated using devices of the RCMA420/423 or RCMS460/490 series. The measuring current transformers are connected to the respective devices via a 2- or 6-core cable. They can be used in DC, AC, and 3(N)AC systems.

The CTUB101-CTBCxx measuring current transformers are intended for connection to devices of the RCMA420/423 series and are supplied directly from the evaluator with the supply voltage DC ± 12 V via the 6-core cable.

The CTUB102-CTBCxx measuring current transformers are intended for connection to RCMS460/490. If the CTUB102-CTBCxx measuring current transformers are connected to an RCMS460/490 system, a DC 24 V power supply unit is required for the measuring current transformers, which is available as an accessory.

The measuring current transformer cores of the CTBC20P...210P series feature an integrated magnetic shield and are suitable for applications with high load currents or inrush currents.

Standards

CTUB100 series measuring current transformers comply with the following device standard:

- IEC 62020:2003-11 in combination with an evaluator (RCMS460/490 or RCMA420/423)

Variants

A measuring current transformer always consists of a measuring current transformer core and an electronic module, which is required for signal conversion and can be connected to an evaluator. Each electronic module can be combined with all measuring current transformer cores.

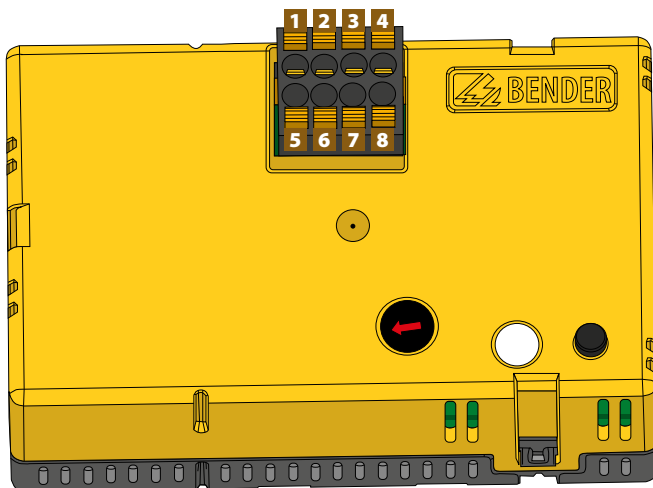
Electronic modules

- **CTUB101**
Electronic module for conversion of the residual current signal from the measuring current transformer core for the connection to evaluators via terminals K and L, supply voltage DC ±12 V
- **CTUB102**
Electronic module for conversion of the residual current signal from the measuring current transformer core for the connection to evaluators via terminals K and L, supply voltage DC 24 V

Measuring current transformer cores

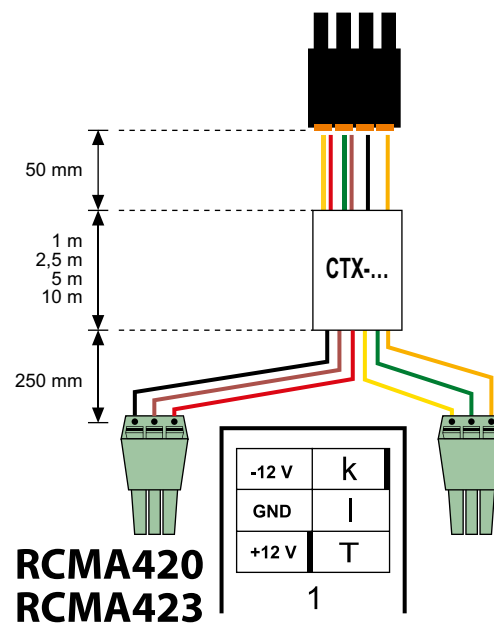
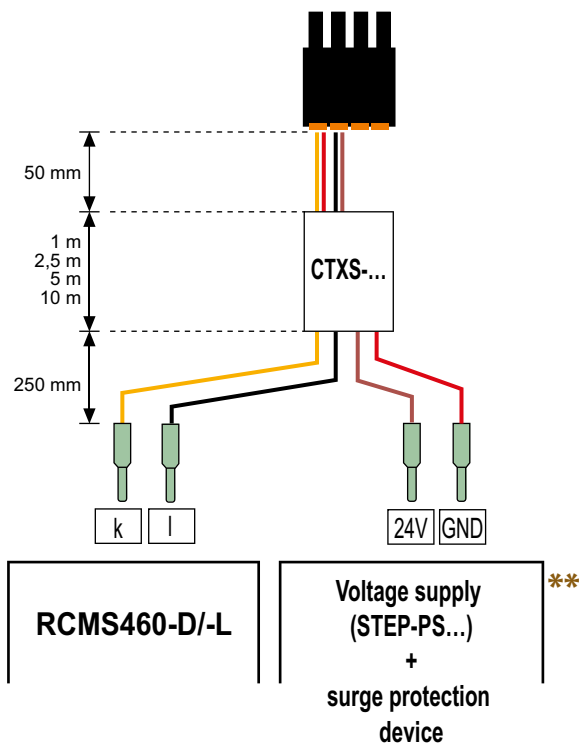
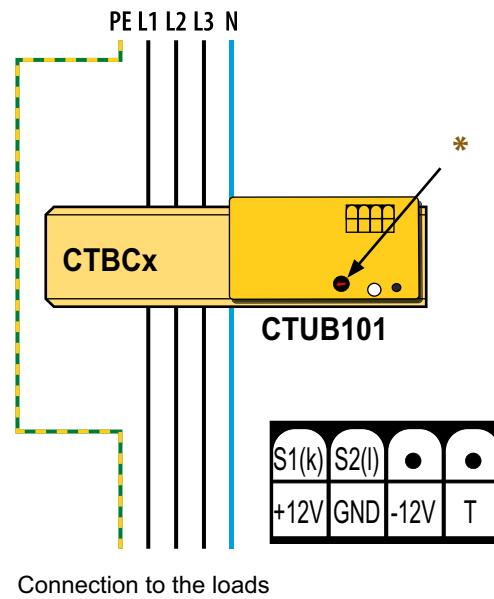
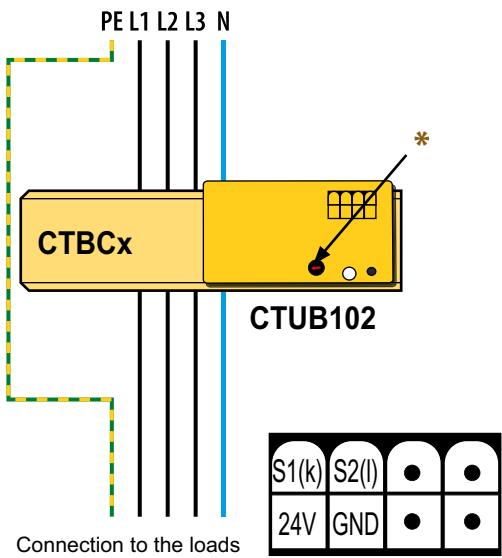
- **CTBC20**
Measuring current transformer core, internal diameter 20 mm
- **CTBC20P**
Measuring current transformer core shielded, internal diameter 20 mm
- **CTBC35**
Measuring current transformer core, internal diameter 35 mm
- **CTBC35P**
Measuring current transformer core shielded, internal diameter 35 mm
- **CTBC60**
Measuring current transformer core, internal diameter 60 mm
- **CTBC60P**
Measuring current transformer core shielded, internal diameter 60 mm
- **CTBC120**
Measuring current transformer core, internal diameter 120 mm
- **CTBC120P**
Measuring current transformer core shielded, internal diameter 120 mm
- **CTBC210**
Measuring current transformer core, internal diameter 210 mm
- **CTBC210P**
Measuring current transformer core shielded, internal diameter 210 mm

Wiring diagram of the electronic module



Connection CTUB10x								
Type	1	2	3	4	5	6	7	8
CTUB101	S1 (k)	S2 (l)	•	•	+12V	GND	-12V	T
CTUB102	S1 (k)	S2 (l)	•	•	24V	GND	•	•

Wiring diagram



* The measuring range must be selected according to the response value $I_{\Delta n}$ set on the RCMS460 or RCMA420/423 evaluator. If, however, a larger measuring range is selected, the resolution deteriorates.

Measuring range setting				
#	Potentiometer setting	Response value RCMA/RCMS	Measuring range rms	Measuring range peak
1		$I_{\Delta n} \leq 0.1 \text{ A}$	0...450 mA	0...900 mA
2		$0.1 \text{ A} < I_{\Delta n} \leq 0.5 \text{ A}$	0...0.75 A	0...3.5 A
3		$I_{\Delta n} > 0.5 \text{ A}$	0...10 A	0...20 A

** – The use of a type 2 surge protection device (SPD) is mandatory due to possible impulse voltages and in order to comply with normative requirements.

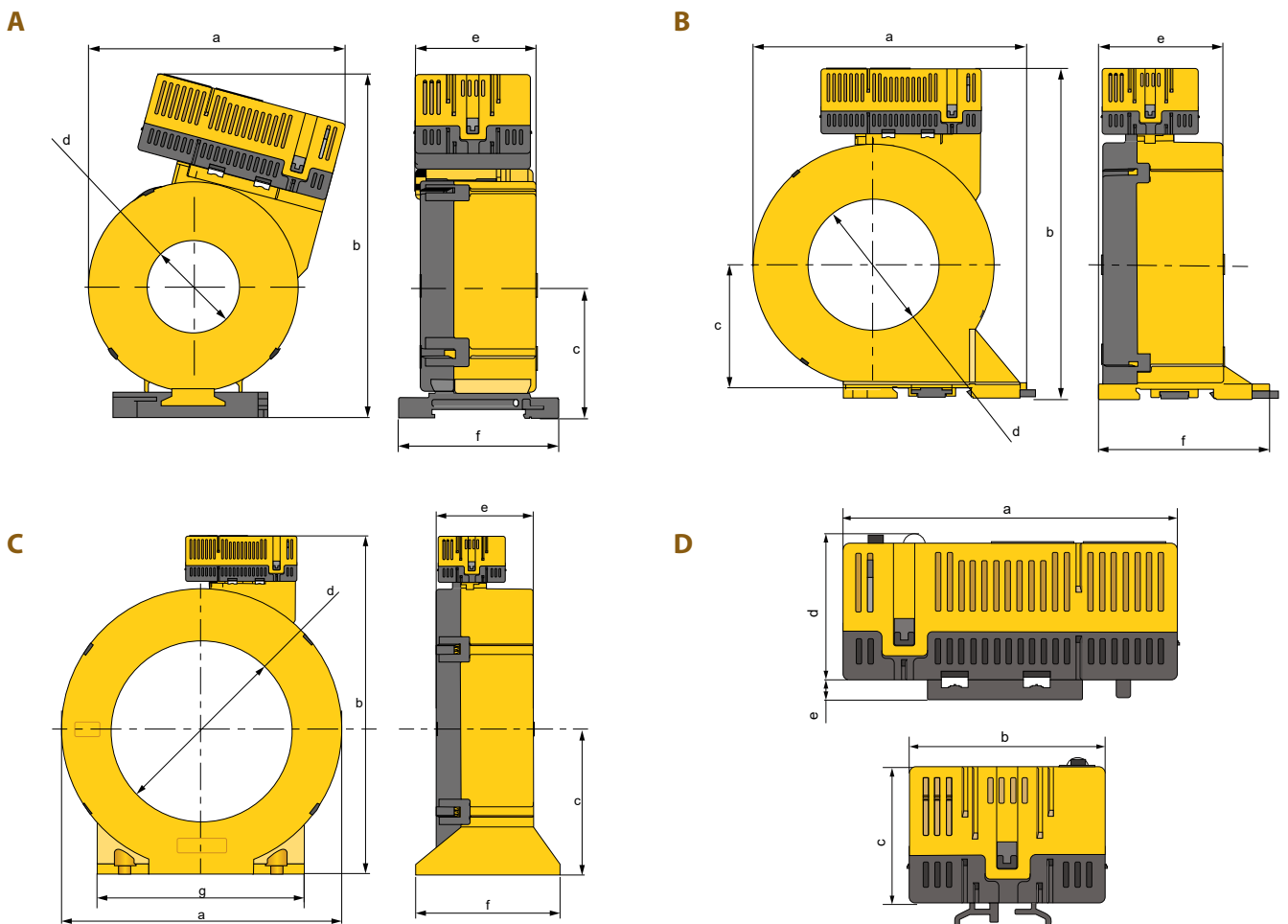
- The surge protection device must be connected upstream of the power supply unit on the supply side.
- The surge protection device 7P.22.8.275.1020 from Finder or an equivalent alternative can be used.

System states: LED

The LED indicates the system state by means of colours and lighting/flashing.
The priority specifies which system state is displayed if different conditions exist.

System state	LED		Notes
	green (ON)	red (alarm)	
Device switched off	off	off	Device is deenergised
Normal operating state	lights	off	The device is supplied with the specified voltage and the measuring current transformer core is connected to the electronic module.
Device error	off	flashes	The device is supplied with the specified voltage but there is no connection to the measuring current transformer core.

Dimension diagrams

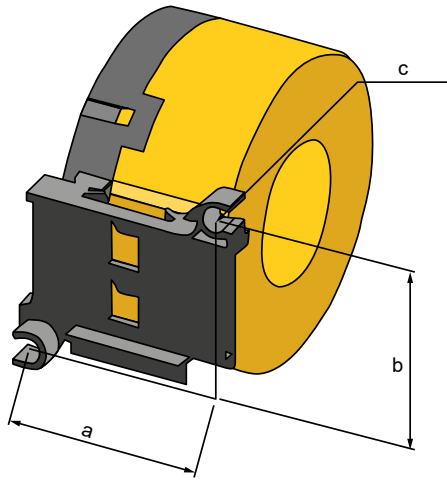


Dimensions (mm)								
	Type	a	b	c	d	e	f	g
A	CTUB10...-CTBC20(P)	75	83	37	∅ 20	46	60.5	
	CTUB10...-CTBC35(P)	97	130	47	∅ 35	46	61	
B	CTUB10...-CTBC60(P)	126	151	57	∅ 60	56	78	
C	CTUB10...-CTBC120(P)	188	225	96	∅ 120	65	96	139
	CTUB10...-CTBC210(P)	302	339	153	∅ 210	67	113	277
D	CTUB10...	74	44	30	32	4.6		

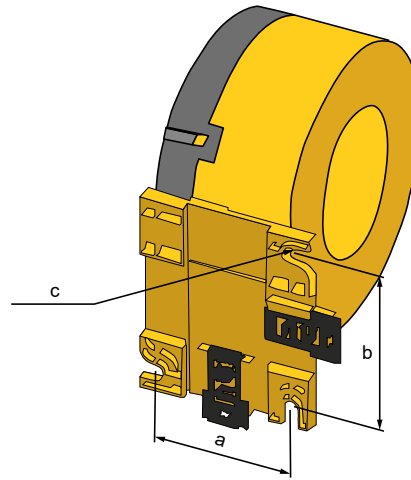
Tolerance: ±0.5 mm

Mountings

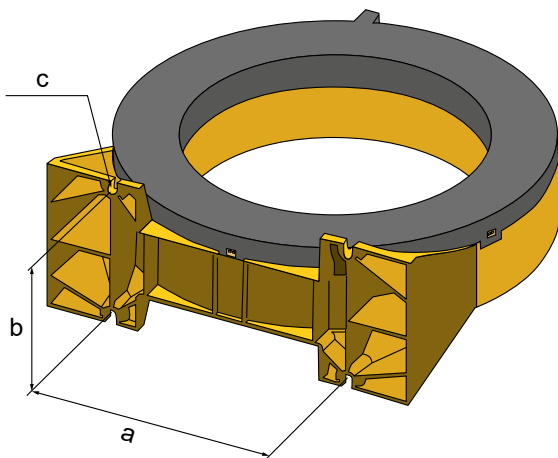
CTBC20(P)/CTBC35(P)



CTBC60(P)



CTBC120(P)/CTBC210(P)



Dimensions (mm)			
Type	a	b	c
CTBC20(P)	49	49.80	2 x Ø 5.5
CTBC35(P)	49	49.80	2 x Ø 5.5
CTBC60(P)	56	66	3 x Ø 6.5
CTBC120(P)	103	81	4 x Ø 6.5
CTBC210(P)	180	98	4 x Ø 5.5

Technical data
Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Definitions:	
Measuring circuit (IC1)	primary conductors routed through the current transformer
Secondary (IC2)	connections terminal block
Rated insulation voltage	800 V
Overvoltage category	III
Area of application	≤ 2000 m AMSL
Rated impulse voltage:	
IC1/IC2	8 kV
Rated insulation voltage (reinforced insulation):	
IC1/IC2	800 V
Pollution degree	2

Supply voltage
CTUB101

Description	+12 V, GND, -12 V
Supply voltage U_s	DC ±12 V
Operating range of U_s	±2 %
Ripple U_s	≤ 1 %
Power consumption	≤ 2.5 W
Inrush current	500 mA (related to the RCMA423)

CTUB102

Description	24 V, GND
Supply voltage U_s	DC 24 V
Operating range of U_s	±20 %
Ripple U_s	≤ 1 %
Power consumption	≤ 2.5 W
Inrush current	1 A
	related to the Phoenix power supply unit (accessory), may vary and depends on various influencing factors

Measuring circuit

Internal diameter measuring current transformer	see dimension diagrams on page 5
Rated current I_n	
CTBC20 at $I_{dn} = 30$ mA	40 A
CTBC20 at $I_{dn} = 300$ mA	63 A
CTBC20P	80 A
CTBC35 at $I_{dn} = 30$ mA	80 A
CTBC35 at $I_{dn} = 300$ mA	125 A
CTBC35P	160 A
CTBC60 at $I_{dn} = 30$ mA	160 A
CTBC60 at $I_{dn} = 300$ mA	250 A
CTBC60P	320 A
CTBC120 at $I_{dn} = 100$ mA	330 A
CTBC120P at $I_{dn} = 100$ mA	630 A
CTBC210 at $I_{dn} = 300$ mA	630 A
CTBC210P at $I_{dn} = 100$ mA	630 A
CTBC210P at $I_{dn} = 300$ mA	1000 A
Measurement accuracy	±1 %
Test winding	yes
Rated continuous thermal current I_{cth}	30 A
Rated short-time thermal current I_{th}	2.4 kA/1 s
Rated dynamic current I_{dyn}	6 kA/40 ms

Possible response values (to be set on the evaluator)

CTBC20, CTBC20P	10 mA...500 mA
CTBC35, CTBC35P, CTUBC60, CTBC60P	30 mA...10 A
CTBC120P, CTBC210P	100 mA...10 A
CTBC120, CTBC210	300 mA...10 A

Measuring ranges

Measuring range 1 ($I_{dn} \leq 0.1$ A)	0...900 mA (peak)
Measuring range 2 (0.1 A < $I_{dn} \leq 0.5$ A)	0...3.5 A (peak)
Measuring range 3 ($I_{dn} > 0.5$ A)	0...20 A (peak)

Indication

Multicolour LED	table on page 5
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Output

Name	S1 (k), S2 (l)
Scaling	400 mV/1 A
Max. voltage	±10 V
Max. connector length	10 m
Output resistance	172 Ω

Input

Name	T (only on CTUB101)
Current-carrying capacity	< 300 mA

Environment/EMC

EMC	IEC 62020: 2005-11
Operating temperature	-25...70 °C

Classification of climatic conditions acc. to IEC 60721

(except condensation and formation of ice)

Stationary use (IEC 60721-3-3)	3K5
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K22

Classification of mechanical conditions acc. to IEC 60721

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Connection
Connecting cables are optionally available
Terminal block

Manufacturer	Phoenix Contact
Type	DFMC 1.5/4-ST-3.5 BK
The connection conditions of the manufacturer apply.	
Connection properties	
rigid	0.2...1.5 mm ² (AWG 24...16)
flexible	0.2...1.5 mm ²
with ferrule	0.25...0.75 mm ²

Mounting CTBC...

Screw type	
CTBC20...60(P)	DIN EN ISO 7045 - M5
CTCB120...210(P)	DIN EN ISO 7045 - M6
Washer type	
CTBC20...60(P)	DIN EN ISO 7089/7090 - 5
CTCB120...210(P)	DIN EN ISO 7089/7090 - 6
Tightening torque	
CTBC20...35 (P)	0.6 Nm
CTCB60...210(P)	1 Nm

Other

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (DIN EN 60529)	IP40
Degree of protection, terminals (DIN EN 60529)	IP20
Flammability class	UL94 V-0
Software	D591
Weight	
CTUB10x- CTBC20	≤ 230 g
CTUB10x- CTBC20P	≤ 290 g
CTUB10x- CTBC35	≤ 310 g
CTUB10x- CTBC35P	≤ 390 g
CTUB10x- CTBC60	≤ 530 g
CTUB10x- CTBC60P	≤ 690 g
CTUB10x- CTBC120	≤ 1460 g
CTUB10x- CTBC120P	≤ 1820 g
CTUB10x- CTBC210	≤ 4290 g
CTUB10x- CTBC210P	≤ 4940 g

The use of the power supply units listed at "Accessories" is recommended.
The use of a surge protection device is mandatory.

Ordering details

Supply voltage	Current transformer diameter	Shielding	Type	Art. No.
DC ±12 V	ø 20		CTUB101-CTBC20	B78120010
	ø 20	■	CTUB101-CTBC20P	B78120020
	ø 35		CTUB101-CTBC35	B78120012
	ø 35	■	CTUB101-CTBC35P	B78120022
	ø 60		CTUB101-CTBC60	B78120014
	ø 60	■	CTUB101-CTBC60P	B78120024
	ø 120		CTUB101-CTBC120	B78120016
	ø 120	■	CTUB101-CTBC120P	B78120026
DC 24 V	ø 210		CTUB101-CTBC210	B78120018
	ø 210	■	CTUB101-CTBC210P	B78120028
	ø 20		CTUB102-CTBC20	B78120011
	ø 20	■	CTUB102-CTBC20P	B78120021
	ø 35		CTUB102-CTBC35	B78120013
	ø 35	■	CTUB102-CTBC35P	B78120023
	ø 60		CTUB102-CTBC60	B78120015
	ø 60	■	CTUB102-CTBC60P	B78120025
DC 24 V	ø 120		CTUB102-CTBC120	B78120017
	ø 120	■	CTUB102-CTBC120P	B78120027
	ø 210		CTUB102-CTBC210	B78120019
	ø 210	■	CTUB102-CTBC210P	B78120029

Ordering details for accessories and spare parts

Electronic modules

Supply voltage U_s	Type	Art. No.
DC		
±12 V	CTUB101	B78120050
24 V	CTUB102	B78120051

Required terminals or connecting cables are optionally available.

Connecting cables

Length (m)	Connection to	Name	Art. No.
1	RCMA42...	CTX-100	B98110080
2,5		CTX-250	B98110081
5		CTX-500	B98110082
10		CTX-1000	B98110083
1	RCMS46...	CTXS-100	B98110090
2,5		CTXS-250	B98110091
5		CTXS-500	B98110092
10		CTXS-1000	B98110093

Measuring current transformer cores

Internal diameter	Type	Art. No.
20 mm	CTBC20	B98120001
	CTBC20P	B98120002
35 mm	CTBC35	B98120003
	CTBC35P	B98120004
60 mm	CTBC60	B98120005
	CTBC60P	B98120006
120 mm	CTBC120	B98120007
	CTBC120P	B98120020
210 mm	CTBC210	B98120008
	CTBC210P	B98120021

P = full magnetic shield

Accessories

Description	Art. No.
Snap-on mounting for CTBC20 and CTBC20P	B91080111
Snap-on mounting for CTBC35 and CTBC35P	B91080112

Included in scope of delivery

Suitable system components

Description	max. connected current transformers	Type	Art. No.
Voltage supply	4	STEP-PS/1 AC/24 DC/0.5	B94053110
	14	STEP-PS/1 AC/24 DC/1.75	B94053111
	34	STEP-PS/1 AC/24 DC/4.2	B94053112

Composition example of a measuring current transformer from the individual components



Electronic module: CTUB101

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Measuring current transformer core: CTBC35

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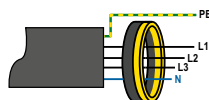


Measuring current transformer: CTUB101-CTBC35*

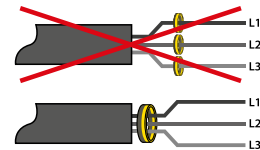
* For connection to an evaluator, a complete measuring current transformer is required. Both components can be ordered separately as spare parts.

Installation instructions

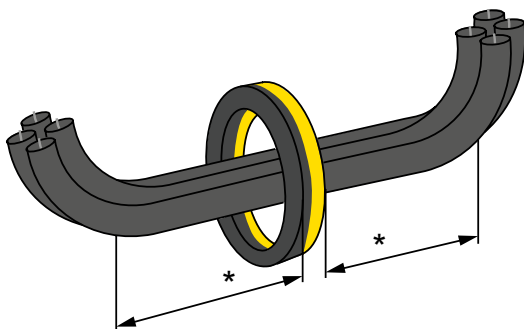
- Do not route any shielded cables through the measuring current transformer.
- Existing protective conductors and low-resistance conductor loops must not be routed through the measuring current transformer! Otherwise, high currents could be induced into the conductor loop due to the AC/DC sensitive measuring technology used.
- The connecting cable (supply, secondary connection etc.) must not be routed directly past the current transformer core, otherwise interference pulses may occur.



Never route an existing protective conductor through the measuring current transformer.

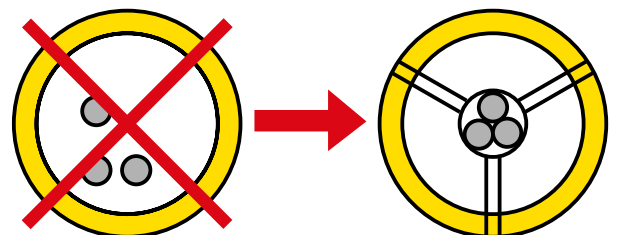


All current-carrying cables must be routed through the measuring current transformer.



* Distance to 90° angle: 2x external diameter of the current transformer

The primary conductors may only be bent from the specified minimum distance. The minimum bending radius specified by the manufacturers for the conductors used must be observed.



The cables must be aligned with the centre of the measuring current transformer.



Distributed in Australia by:

Captech Pty Ltd

Phone: 1300 280 010

Email: sales@captech.com.au



Bender GmbH & Co. KG

P.O. Box 1161 • 35301 Grünberg • Germany

Londorfer Straße 65 • 35305 Grünberg • Germany

Tel.: +49 6401 807-0 • Fax: +49 6401 807-259

E-mail: info@bender.de • www.bender.de



BENDER Group