



LINETRAXX® CTBC series

AC/DC sensitive measuring current transformer cores



Intended use

The AC/DC sensitive measuring current transformer cores of the CTBC series can **only** be used **in combination** with one of the following devices:

- MRCD8300 series (see manual D00343)
- CTUB100 series (see manual D00362)
- RCMB300 series (see manual D00372)

The measuring current transformer cores convert system leakage and fault currents into a signal to be processed by the devices mentioned above.

When using the CTUB100 series, RCMA4..., RCMS4..., RCMB4... or MRCD84... can be used as final evaluators.

The measuring current transformers can be used in DC, AC, and 3(N)AC systems. The devices are suitable for detecting fault currents with smooth DC components.

CTBC...P are insensitive to load currents due to full magnetic shield, can be used for high short-term system-related load currents.

General safety instructions

Part of the device documentation in addition to this manual is the enclosed „Important safety instructions for Bender products“.

Installation, connection and commissioning are to be carried out by electrically skilled persons only! It is essential to follow the existing safety instructions.



This symbol indicates a high risk of danger that will result in death or serious injury if not avoided.

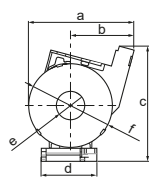


This symbol indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoided.

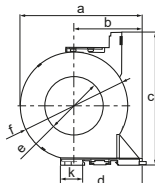


This symbol refers to information that is designed to help you make the best use of the product.

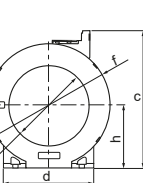
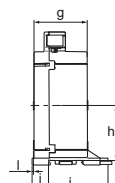
Dimension diagrams



CTBC20(P)/CTBC35(P)



CTBC60(P)

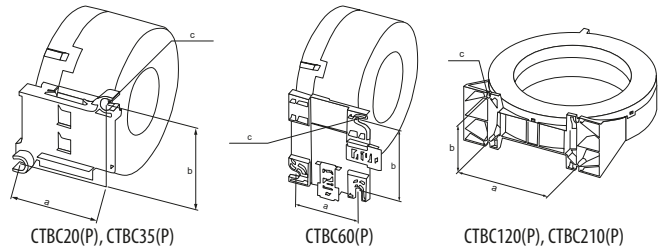


CTBC120/210(P)

Dimensions (mm), tolerance: ± 0.5 mm

CTBC	a	b	c	d	e	f	g	h	i	j	k	l
20(P)	75	45	83	40	$\varnothing 20$	$\varnothing 60$	46	37	6	60.5	—	—
35(P)	94	54	100	58.4	$\varnothing 35$	$\varnothing 79.5$	45	46	5	60.5	—	—
60(P)	126	70	137	84.5	$\varnothing 60$	$\varnothing 111$	55	57	16	78.5	23	1.5
120(P)	—	—	211	139	$\varnothing 120$	$\varnothing 188$	66	96	7.5	96	—	17
210(P)	—	—	324	277	$\varnothing 201$	$\varnothing 302$	68	153	7.5	113	—	26

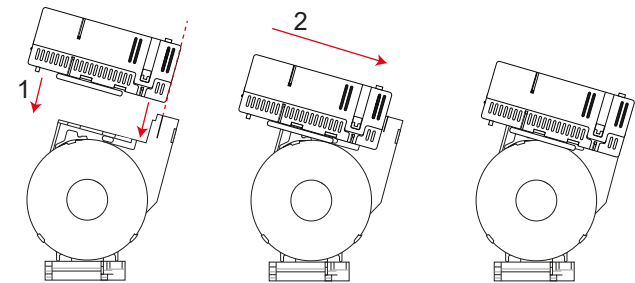
Mountings



Type	a	b	c
CTBC20(P)	31.4	49	2 x ø 5.5
CTBC35(P)	49.8	49	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 6.5

Assembly

Slide the electronic module onto the plug contacts of the measuring current transformer.



i Avoid repeated plugging and unplugging of the electronics (10 plugging cycles).

i In combination with devices of the MRCDB300 series, an offset calibration is mandatory at the final installation site before the initial commissioning.
For measuring current transformer cores with an internal diameter ≥ 120 mm, an offset calibration should always be carried out before the first commissioning. Note that during the offset calibration the system is switched off and no current flows through the measuring current transformer.

	Action	LED
1	Install the measuring current transformer in the system	off
2	Assemble the electronic module and the measuring current transformer core	lights green (CTUB10x, RCMB300 series) lights red (MRCDB300 series)
3	Disconnect the electronic module from the supply voltage	off
4a	Press and hold the "T" button	off
4b	Press and hold "T", supply the electronic module with supply voltage U_s	lights red permanently (not ready for operation)

	Action	LED
4c	Press and hold "T", supply the electronic module with supply voltage U_s	flashes red slowly (ready for calibration)
4d		flashes red quickly (calibration mode)
5	Start calibration: release "T"	
6	Calibration in progress	flashes red quickly
7	Calibration successful, values are accepted	lights green permanently
8	Calibration finished, normal operating status	

Installation instructions of measuring CT



CAUTION! Device damage due to high induction currents! High currents can be induced into the conductor loop due to the AC/DC sensitive measuring technology used. Do not route protective conductors and low-resistance conductor loops through the measuring current transformer!



CAUTION! Device damage due to interference pulses! The connecting cable (supply, analogue interface...) must not be routed directly past the current transformer core.



CAUTION! Risk of injury due to accessible live conductors! The measuring current transformer must be connected to the corresponding evaluator before the first use and before commissioning of the monitored system.

i

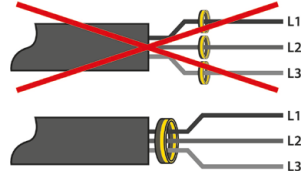
Application in railway vehicles

/ DIN EN 45545-2:2016: If the horizontal or vertical distance to adjacent components which do not meet the requirements in table 2 of DIN EN 45545-2 is less than 20 mm or less than 200 mm respectively, they are to be regarded as grouped. Refer to DIN EN 45545-2 chapter 4.3 Grouping rules.

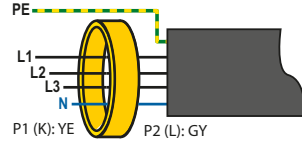
i

Do not route any shielded cables through the measuring current transformer.

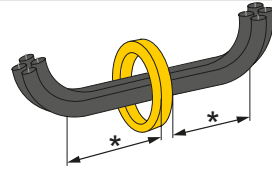
The measuring current transformer must be connected to the corresponding evaluator before the first use and before commissioning of the monitored system.



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

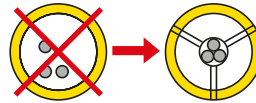


Never route an existing protective conductor through the measuring current transformer.



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.

* Distance to 90° angle = 2 x outer diameter.



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

Technical data

Measuring circuit

Internal diameter measuring current transformer.....

..... see dimension diagrams

Rated current I_n RCM application / MRCD application

CTBC20 at $I_n \geq 30$ mA..... 63 A / 40 A

CTBC20 at $I_n \geq 300$ mA..... 80 A / 63 A

CTBC20P 80 A / 80 A

CTBC35 at $I_n \geq 30$ mA..... 125 A / 80 A

CTBC35 at $I_n \geq 300$ mA..... 160 A / 125 A

CTBC35P 160 A / 160 A

CTBC60 at $I_n \geq 30$ mA..... 200 A / 160 A

CTBC60 at $I_n \geq 300$ mA..... 400 A / 250 A

CTBC60P 400 A / 320 A

CTBC120 at $I_n \geq 100$ mA..... 400 A / 330 A

CTBC120P at $I_n \geq 100$ mA..... 630 A / 630 A

CTBC210 at $I_n \geq 300$ mA..... 630 A / 630 A

CTBC210P at $I_n \geq 100$ mA..... 630 A / 630 A

CTBC210P at $I_n \geq 300$ mA..... 1000 A / 1000 A

Measurement accuracy ±1 % of full scale value
Test winding yes
Rated continuous thermal current ¹⁾ I_{cth} 125 A
at UL applications 30 A
Rated short-time thermal current ¹⁾ I_{th} 2.4 kA/1 s
Rated dynamic current ¹⁾ I_{dyn} 6 kA/40 ms
¹⁾ refers to the residual current

Environment/EMC

EMC IEC 60200-1
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) 3K24
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) 3M11
Transport (IEC 60721-3-2) 2M4
Long-term storage (IEC 60721-3-1) 1M12

Connection

The device may only be connected directly to electronic modules of the CTUB10x, RCMB300 and MRCDB300 series.

Mounting CTBC...

Screw type

CTBC20...60(P) DIN EN ISO 7045 - M5x
CTBC120...210(P) DIN EN ISO 7045 - M6

Washer type

CTBC20...60(P) DIN EN ISO 7089/7090 - 5
CTBC120...210(P) DIN EN ISO 7089/7090 - 6

Tightening torque

CTBC20...35(P) 0.6 Nm
CTBC60...210(P) 1 Nm

Other

Operating mode continuous operation
Mounting any position
Degree of protection, built-in components (DIN EN 60529)...IP40
Degree of protection, terminals (DIN EN 60529).....IP20
Flammability class UL94 V-0
Software D591

Weight

CTBC20 ≤ 160 g
CTBC20P ≤ 220 g
CTBC35 ≤ 240 g
CTBC35P ≤ 320 g
CTBC60 ≤ 460 g
CTBC60P ≤ 620 g
CTBC120 ≤ 1390 g
CTBC120P ≤ 1750 g
CTBC210 ≤ 4220 g
CTBC210P ≤ 4870 g

Spare parts

Measuring current transformer cores

ø CT´s	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

Standards

The variants B98120001, B98120002, B98120003, B98120004, B98120005 and B98120006 of the CTBC series comply with the requirements of the standard DIN EN 45545-2.



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