



LINETRAXX® CTUB103

AC/DC sensitive measuring current transformer



Intended use

The AC/DC sensitive measuring current transformers of the CTUB103 series convert system leakage and fault currents into an evaluable measurement signal. The devices are suitable for detecting fault currents with smooth DC components. They consist of a CTBC... measuring current transformer core and a CTUB103 electronic module, which can be combined to suit the application. The measuring current transformers can be used in DC, AC and 3(N)AC systems as well as in high-resistance grounded systems for monitoring the star point. The evaluation in resistance grounded systems is carried out with devices of the NGRM... series, to which the measuring current transformers are connected.

Device features

- Multicolour LED for operation, fault and status messages
- Electronic module can be exchanged without mechanical separation of the primary conductors
- Monitoring of the connection to the measuring current transformer
- Evaluator: NGRM500, NGRM700

General safety instructions

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

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



DANGER! Indicates a high risk of danger that will result in death or serious injury if not avoided.

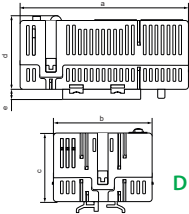
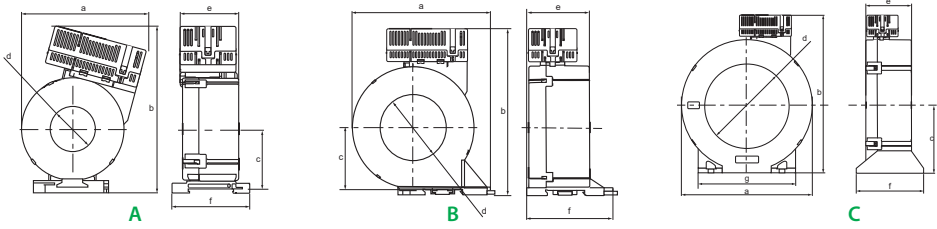


CAUTION! Indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoided.



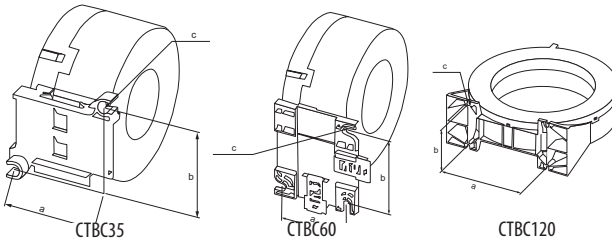
i Information can help to optimise the use of the product.

Dimension diagrams


 Dimensions [mm (in)], Tolerance: $\pm 0,5$ mm

	Typ	a	b	c	d	e	f	g
A	CTUB103-CTBC35	97 (3.82)	130 (5.12)	47 (1.85)	$\emptyset 35$ ($\emptyset 1.38$)	46 (1.81)	61 (2.40)	-
B	CTUB103-CTBC60	126 (4.96)	151 (5.94)	57 (2.24)	$\emptyset 60$ ($\emptyset 2.36$)	56 (2.20)	78 (3.07)	-
C	CTUB103-CTBC120	188 (7.40)	225 (8.86)	96 (3.78)	$\emptyset 120$ ($\emptyset 4.72$)	65 (2.56)	96 (3.78)	139 (5.47)
D	CTUB103	74 (2.91)	44 (1.73)	30 (1.18)	32 (1.26)	4,6 (0.18)		

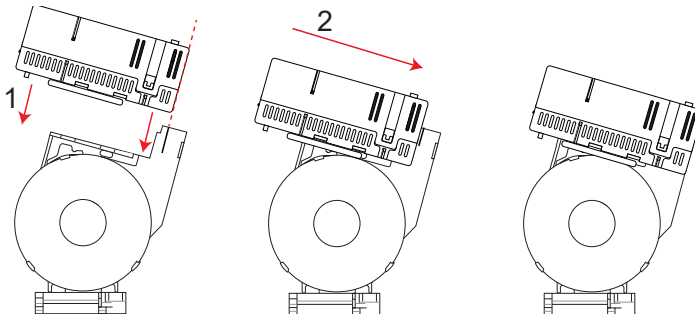
Mountings



Dimensions [mm (in)], Tolerance: $\pm 0,5$ mm			
Typ	a	b	c
CTBC35	49 (1.93)	49,80 (1.96)	2 x $\emptyset 5,5$ (2 x $\emptyset 0.22$)
CTBC60	56 (2.20)	66 (2.60)	3 x $\emptyset 6,5$ (3 x $\emptyset 0.26$)
CTBC120	103 (4.05)	81 (3.19)	4 x $\emptyset 6,5$ (4 x $\emptyset 0.26$)

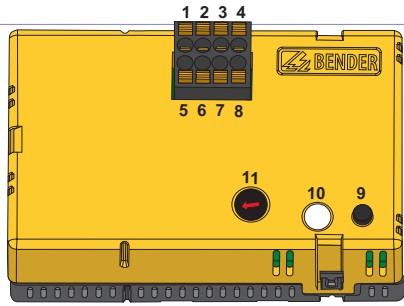
Assembly

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



Device view

No.	CTUB103	Note																		
1 2 3 4 5 6 7 8	Terminal X S1 (k) S2 (l) - - 24 V GND - -	Connection measuring current transformer core/NGRM...																		
			Not in use																	
		Supply voltage U_s																		
			Not in use																	
		9		Button T	Offset calibration (see below)															
		10	Combined LED	lights green normal operation flashes red device error; U_s is connected, no connection to CTBC. Check the connection between CTUB and CTBC, if necessary, snap on the electronic module again. If LED still flashes red: Contact Service please.																
		11	Potentiometer for adjusting the measuring range	<table border="1"> <thead> <tr> <th></th> <th>Measuring range</th> <th colspan="2">Scaling</th> </tr> </thead> <tbody> <tr> <td></td> <td>5 A</td> <td>5 A/50 mA</td> <td>100:1</td> </tr> <tr> <td></td> <td>10 A</td> <td>10 A/50 mA</td> <td>200:1</td> </tr> <tr> <td></td> <td>25 A</td> <td>25 A/50 mA</td> <td>500:1</td> </tr> </tbody> </table>		Measuring range	Scaling			5 A	5 A/50 mA	100:1		10 A	10 A/50 mA	200:1		25 A	25 A/50 mA	500:1
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	5 A			5 A/50 mA	100:1															
	10 A			10 A/50 mA	200:1															
	25 A	25 A/50 mA	500:1																	



Offset-Calibration

i 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. For safety reasons, offset calibration cannot be performed if a current > 15 mA flows through the measuring current transformer during offset calibration.

Index	Action	LED
1	Disconnect X plug (1...8) or interrupt US (24 V).	off
2	Press and hold the "T" button (9).	off
3	Connect X plug (1...8) or switch on US (24 V). Continue to hold the "T" button (9) down.	lights red
4	Continue to hold the "T" button (9) down.	flashes red
5	Continue to hold the "T" button (9) down.	flashes red quickly

Index	Action	LED
6	Release the "T" button (9).	flashes red quickly
7	Calibration successful	lights green
	Calibration not successful: repeat calibration	flashes red

Wiring diagram CTUB103



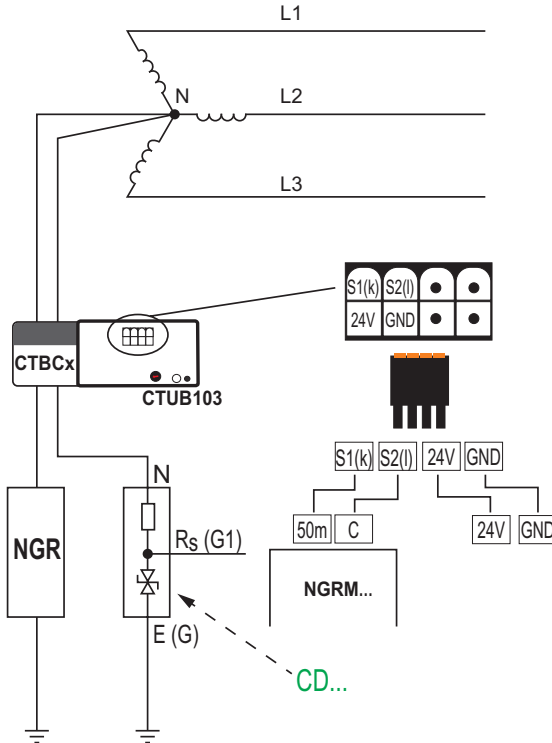
DANGER of electrocution due to electric shock!

Touching live parts of the system carries the risk of:

- An electric shock
- Damage to the electrical installation
- Destruction of the device

Before installing and connecting the device, make sure that the installation has been de-energised. Observe the rules for working on electrical installations. Observe the information on nominal voltage and supply voltage specified in the technical data!

Connect the device according to the wiring diagram. Please observe the technical data.



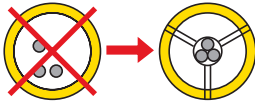
Installation instructions measuring current transformer



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

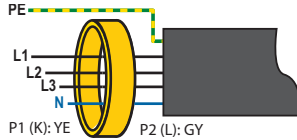
i Do not route any shielded cables through the measuring current transformer.

The measuring current transformer must be connected to the corresponding evaluator before the first use and before commissioning of the monitored installation. Pay attention to the following:

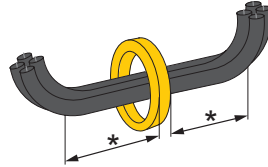


The cables must be aligned with the centre of the measuring current transformer.

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.



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 * outer diameter

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 X plug

Rated voltage..... 800 V

Oversvoltage 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 CTUB103

Description 24 V, GND

Supply voltage U_s DC 24 V

Operating range of U_s ±20 %

Ripple U_s ≤ 1 %

Power consumption ≤ 5.3 W

Inrush current 1 A for 1 ms

Measuring circuit

Internal diameter measuring current transformer see dimension

diagrams on page 3

Measurement accuracy ±2 %

Rated continuous thermal current I_{cth} 42 A

Rated short-time thermal current I_{th} 2.4 kA/1 s

Rated dynamic current I_{dyn} 6 kA/40 ms

Measuring ranges

Measuring range 1 5 A rms

Permanent overload capacity 10.5 A rms

..... 14.5 A peak

Scaling 5 A/50 mA, 100:1

Measuring range 2 10 A rms

Permanent overload capacity 21 A rms

..... 29.5 A peak

Scaling 10 A/50 mA, 200:1

Measuring range 3 25 A rms

Permanent overload capacity 42 A rms

..... 59 A peak

Scaling 25 A/50 mA, 500:1

Displays

Multicolour LED red, green

Output

Name S1 (k), S2 (l)

Max. voltage	±10 V
Max. current	±100 mA
Max. cable length	30 m
Load	68 Ω

Environment/EMC

EMC	IEC 61000-6
Operating temperature	-25...55 °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

Use 60 °C/75 °C copper lines only.

X plug

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 (AWG 24...16)
with ferrule	0.25...0.75 mm ²

Mounting CTBC...

Screw type

CTBC35, CTBC60	DIN EN ISO 7045 - M5
CTBC120	DIN EN ISO 7045 - M6

Washer type

CTBC35, CTBC60	DIN EN ISO 7089/7090 - 5
CTBC120	DIN EN ISO 7089/7090 - 6

Tightening torque

CTBC35	0.6 Nm
CTBC60, CTBC120	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	
CTUB103- CTBC35	≤ 310 g
CTUB103- CTBC60	≤ 530 g
CTUB103- CTBC120	≤ 1460 g

Ordering information

CTUB103-Sets

ø CT	Set	Zulässiger Messbereich	Art.-No.
35 mm	CTUB103-CTBC35	5 A, 10 A	B78120030
60 mm	CTUB103-CTBC60	5 A, 10 A, 25 A	B78120031
120 mm	CTUB103-CTBC120	5 A, 10 A, 25 A	B78120032

Accessories

Power supplies

max. CTs	Type	Art. No.
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

Replacement parts

Measuring current transformer cores

ø Wandler	Typ	Art. No.
35 mm	CTBC35	B98120003
	CTBC35P	B98120004
60 mm	CTBC60	B98120005
	CTBC60P	B98120006
120 mm	CTBC120	B98120007
	CTBC120P	B98120020

Electronic-Modules

U _s	Type	Art. No.
DC 24 V	CTUB103	B78120052

Required terminals are optionally available.

The variant B78120052 of the CTUB10x series meets the requirements of DIN EN 45545-2.



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