

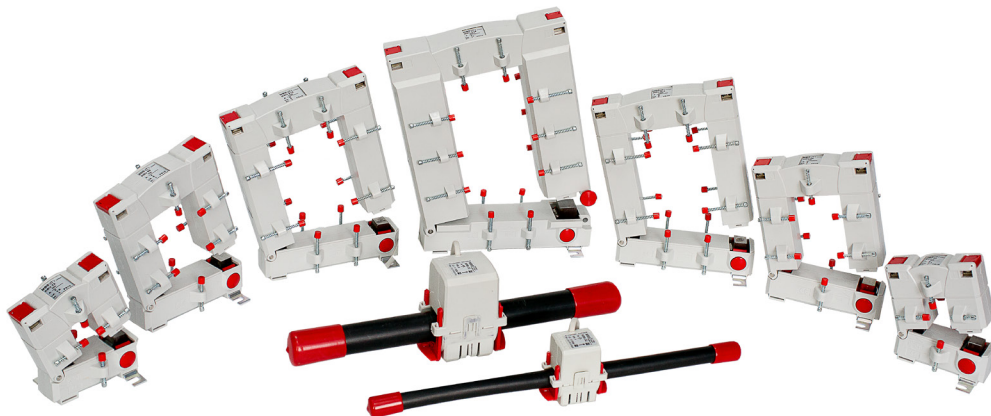


Split-core current transformers

We make energy measurable and take care of your future



www.mbs-ag.com



IPH BERLIN
Independent, accredited testing station - Member laboratory of STL and LOVAG

TYPE TEST REPORT

NO. 1469.2130168.0085

MBS AG
Sulzbach Messwandler
Eisbachstraße 51
74429 Sulzbach-Laufen
GERMANY

CLIENT

MBS AG
Sulzbach Messwandler

MANUFACTURER

Low-voltage current transformer (split-core current transformer)

TEST OBJECT

KBR 32

TYPE

13A 96545979, 13A 96545980 and 13A 96545981

SERIAL NO.

Rated primary current	(I _N)	600 A	RATED CHARACTERISTICS GIVEN BY THE CLIENT
Rated continuous thermal current	(I _{th})	1.2 x I _N	
Rated secondary current	(I _{sc})	1 or 5 A	
Rated output	(S)	5 VA	
Accuracy class	(I _{sc})	1F50	
Rated dynamic current	(I _{dyn})	90 kA	
Rated short-time thermal current	(I _{th})	36 kA 1 s	
Highest voltage for equipment	(U _m)	0.72 kV	
Rated power-frequency withstand voltage	(U ₁)	3 kV	
Rated lightning impulse withstand voltage	(U _{imp})	- kV	
Rated frequency	(f)	50 Hz	
Insulating material class			

IEC 61869-2: 2012-09

- Short-time current tests
- Temperature-rise test
- Test for accuracy
- Routine tests (dielectric tests)

01 to 25 February 2013

The rated characteristics related to the range of tests performed have been verified.
The type tests have been PASSED.

Ronald Borchert
Senior engineer
Berlin, 07 August 2013

Dagmar Hauschild
Test engineer in charge

IPH BERLIN
Independent test laboratory accredited by the German Accreditation Body DAkkS, Deutsche Akkreditierungsstelle GmbH, in the fields of high-voltage switchgear and their components, cables and conductors as well as industrial low-voltage apparatus.
IPH Institut „Prüfwerk für elektrische Hochleistungstechnik“ GmbH (IPH Berlin) is a subsidiary of CES SpA, Milan.

DAkkS
Deutsche Akkreditierungsstelle
D-PL 12307-03-01

IPH BERLIN
Independent, accredited testing station - Member laboratory of STL and LOVAG

TYPE TEST REPORT

NO. 1469.2130062.0009

MBS AG
Sulzbach Messwandler
Eisbachstraße 51
74429 Sulzbach-Laufen
GERMANY

CLIENT

MBS AG
Sulzbach Messwandler

MANUFACTURER

Low-voltage current transformer (split-core current transformer)

TEST OBJECT

KBU 812

TYPE

12/353549 and 12/353547

SERIAL NO.

Rated primary current	(I _N)	1500 A	RATED CHARACTERISTICS GIVEN BY THE CLIENT
Rated continuous thermal current	(I _{th})	1.0 x I _N	
Rated secondary current	(I _{sc})	1 or 5 A	
Rated output	(S)	15 VA	
Accuracy class	(I _{sc})	1F50	
Rated dynamic current	(I _{dyn})	150 kA	
Rated short-time thermal current	(I _{th})	60 kA 1 s	
Highest voltage for equipment	(U _m)	0.72 kV	
Rated power-frequency withstand voltage	(U ₁)	3 kV	
Rated lightning impulse withstand voltage	(U _{imp})	- kV	
Rated frequency	(f)	50 Hz	
Insulating material class			

IEC 61869-2: 2012-09

- Short-time current tests
- Temperature-rise test
- Test for accuracy
- Routine tests (dielectric tests)

04 January 2013

The rated characteristics related to the range of tests performed have been verified.
The type tests have been PASSED.

Ronald Borchert
Senior engineer
07 March 2013

Dagmar Hauschild
Test engineer in charge

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D-PL 12307-03-01

GL

Type Approval Certificate

This is to certify that the undemoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No. 59 718 - 13 HH

Company MBS AG
Eisbachstraße 51
74429 Sulzbach-Laufen, GERMANY

Product Description Measuring current transformer

Type KBU23, KBU58, KBR18, KBR32, KBR44, KBU812, KBU816

Environmental Category C

Technical Data / Range of Application
Highest voltage of equipment U_m: 0.72 kV
Rated frequency: 50 Hz
Rated power-frequency withstand voltage: 3 kV
Class of insulation: E

Type: KBU23 KBU58
Rated Primary current: 100 up to 400A 250A up to 1000A
Rated Secondary current: 1 or 5A 1 or 5A
Accuracy class: 1F50 0.5FS10 or 0.5FS15 ≥400A
Rated continuous thermal current: 1.0 x I_N 1.0 x I_N
Rated short-time thermal current: 6 up to 24kA, 1sec 15 up to 40kA, 1sec
Rated dynamic current: 15 up to 60kA 37.5 up to 100kA

Test Standard Guidelines for the Performance of Type Approvals Chapter 2, Edition 2012 IEC 60044-1 (2003) IEC 61869-2 (2012)

Documents Test Report: IPH 1469.2111233.0031, IPH 1469.2111215.0856
IPH 1469.2121180.0591, IPH 1469.2121178.0552, IPH 1469.2130062.0009
IPH 1469.2130168.0084, IPH 1469.2130168.0085, IPH 1469.2111429.0057
MBS-Typprüfprotokoll Baureihe KBR 18, KBR 44, KBU 816
RMS Nr. 02-04/2013, RMS Nr.01-11/2012

Remarks None

Valid until 2018-01-04
Page 1 of 2
File No. L4.05
Hamburg, 2013-07-31

Type Approval Symbol GL

Germanischer Lloyd
This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1, Procedure".

Arne Schaumann
Harald Seibinger

IPH BERLIN
Independent, accredited testing station - Member laboratory of STL and LOVAG

TYPE TEST REPORT

NO. 1469.2111215.0856

MBS AG
Sulzbach Messwandler
Eisbachstraße 51
74429 Sulzbach-Laufen
GERMANY

CLIENT

MBS AG
Sulzbach Messwandler

MANUFACTURER

Low-voltage current transformer (split-core current transformer)

TEST OBJECT

KBU 58

TYPE

11/12995 and 11/13002

SERIAL NO.

Rated primary current	(I _N)	100 A	RATED CHARACTERISTICS GIVEN BY THE CLIENT
Rated secondary current	(I _{sc})	1 resp. 5 A	
Rated continuous thermal current	(I _{th})	1.0 x I _N	
Rated output	(S)	1.25 VA	
Accuracy class	(I _{sc})	3F510	
Highest voltage for equipment	(U _m)	0.72 kV	
Rated power-frequency withstand voltage	(U ₁)	3 kV	
Rated lightning impulse withstand voltage	(U _{imp})	- kV	
Rated short-time thermal current	(I _{th})	15 kA 1 s	
Rated dynamic current	(I _{dyn})	37.5 kA	
Rated frequency	(f)	50 Hz	
Insulating material class		E	

IEC 60044-1: 2003-02

- Short-time current tests
- Temperature-rise test
- Determination of errors
- Routine tests (dielectric tests)

09 to 13 January 2012

The rated characteristics related to the range of tests performed have been verified.
The type tests have been PASSED.

Ronald Borchert
Senior engineer
Berlin, 11 May 2012

Dagmar Hauschild
Test engineer in charge

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D-PL 12307-03-01

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TYPE TEST REPORT

NO. 1469.2121180.0591

MBS AG
Sulzbach Messwandler
Eisbachstraße 51
74429 Sulzbach-Laufen
GERMANY

CLIENT

MBS AG
Sulzbach Messwandler

MANUFACTURER

Low-voltage current transformer (split-core current transformer)

TEST OBJECT

KBU 58

TYPE

12/353549 and 12/353554

SERIAL NO.

Rated primary current	(I _N)	100 A	RATED CHARACTERISTICS GIVEN BY THE CLIENT
Rated secondary current	(I _{sc})	1 resp. 5 A	
Rated continuous thermal current	(I _{th})	1.0 x I _N	
Rated output	(S)	1.25 VA	
Accuracy class	(I _{sc})	3F510	
Highest voltage for equipment	(U _m)	0.72 kV	
Rated power-frequency withstand voltage	(U ₁)	3 kV	
Rated lightning impulse withstand voltage	(U _{imp})	- kV	
Rated short-time thermal current	(I _{th})	15 kA 1 s	
Rated dynamic current	(I _{dyn})	37.5 kA	
Rated frequency	(f)	50 Hz	
Insulating material class		E	

IEC 61869-2: 2012-09

- Short-time current tests
- Temperature-rise test
- Test for accuracy
- Routine tests (dielectric tests)

20 September to 09 October 2012

The rated characteristics related to the range of tests performed have been verified.
The type tests have been PASSED.

Ronald Borchert
Senior engineer
Berlin, 31 October 2012

Dagmar Hauschild
Test engineer in charge

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D-PL 12307-03-01

Split-core current transformer, type KBU

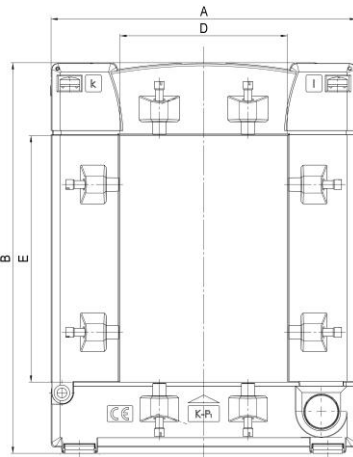


Features / benefits

- Perfect for subsequent assembly into already existing installations
- Easy and safe mounting, due to hearable locking system
- Deliverable with secondary current 5 A / 1 A
- Deliverable also in accuracy class 0.5
- Four different construction types

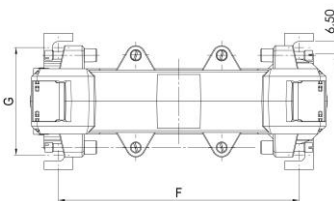
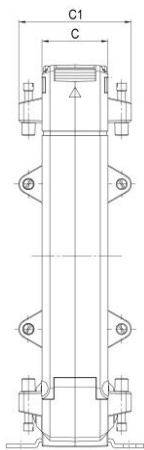
General technical specifications

- Operating temperature: $-5^{\circ}\text{C} < T < +40^{\circ}\text{C}$
- Storage temperature: $-25^{\circ}\text{C} < T < +70^{\circ}\text{C}$
- Therm. nominal continuous rated current I_{cth} : $1.0 \times I_N$
- Therm. nominal short-time current I_{th} : $60 \times I_N$, 1 sec.
- Max. operating voltage U_m : 0.72 kV
- Isolation test voltage: 3 kV, U_{eff} , 50 Hz, 1 min.
- Rated frequency: 50 Hz
- Isolation class: E
- Applicable technical standard: DIN EN 61869, part 1 + 2



Dimensions

Type	A (width) [mm]	B (height) [mm]	C / C1 (depth) [mm]	D [mm]	E [mm]	F [mm]	G [mm]
KBU 23	93	106	34 / 58	23	33	64	56
KBU 58	125	158	34 / 58	55	85	96	56
KBU 812	155	198	34 / 58	85	125	126	56
KBU 816	195	243	64 / 79	85	165	156	62



Order list KBU 23

Secondary current		5 A			1 A		
Primary current [A]	Burden [VA]	Accuracy class			Accuracy class		
		3	1	0.5	3	1	0.5
		Art.-no.	Art.-no.	Art.-no.	Art.-no.	Art.-no.	
100	1.25	80048			80248		
150	1.5	80030			80230		
200	2.5	80031			80231		
250	1.5		80044			80244	
300	3.75		80045			80245	
400	1			80037			80237
	5		80046			80246	

Order list KBU 58

Secondary current		5 A		1 A	
Primary current [A]	Burden [VA]	Accuracy class		Accuracy class	
		1	0.5	1	0.5
		Art.-no.	Art.-no.	Art.-no.	Art.-no.
250	1.5	80061		80261	
300	2.5	80062		80262	
400	1		80038		80238
	2.5	80063		80263	
500	2.5		80054		80254
	5	80064		80264	
600	2.5		80055		80255
	5	80065		80265	
750	2.5		80056		80256
	5	80066		80266	
800	2.5		80057		80257
	7.5	80067		80267	
1000	5		80058		80258
	10	80068		80268	

Order list KBU 812

Secondary current		5A		1A	
Primary current [A]	Burden [VA]	Accuracy class		Accuracy class	
		1	0.5	1	0.5
		Art.-no.	Art.-no.	Art.-no.	Art.-no.
250	1.5	80091		80291	
300	2.5	80092		80292	
400	2.5	80093		80293	
500	2.5		80074		80274
	5	80094		80294	
600	2.5		80075		80275
	5	80095		80295	
750	2.5		80076		80276
	2	80096		80296	
800	2.5		80077		80277
	7.5	80097		80297	
1000	5		80078		80278
	10	80098		80298	
1200	5		80079		80279
	10	80099		80299	
1250	7.5		80080		80280
	15	80100		80300	
1500	7.5		80081		80281
	15	80101		80301	

Order list KBU 816

Secondary current		5A		1A	
Primary current [A]	Burden [VA]	Accuracy class		Accuracy class	
		1	0.5	1	0.5
		Art.-no.	Art.-no.	Art.-no.	Art.-no.
1000	10	80140	80110	80340	80310
	15	80141		80341	
1200	10	80142	80111	80342	80311
	15	80143		80343	
1500	10	80144	80112	80344	80312
	15	80145	80113	80345	80313
1600	10	80146	80114	80346	80314
	15	80147	80115	80347	80315
2000	10	80148	80116	80348	80316
	15	80149	80117	80349	80317
2500	10	80150	80119	80350	80319
	15	80151	80120	80351	80320
3000	15	80152	80122	80352	80322
	30	80153		80353	
4000	15	80154	80123	80354	80323
	30	80155	80124	80355	80324
5000	15	80156	80125	80356	80325
	30	80157	80126	80357	80326

Split-core current transformer, type KBR



Features / benefits

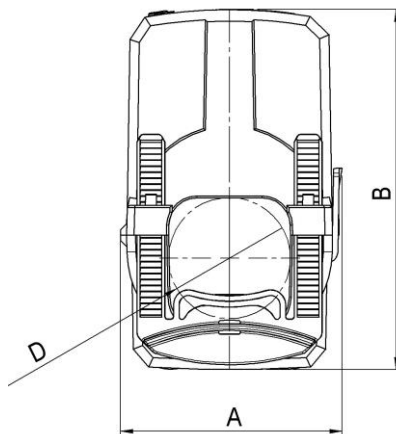
- Perfect for subsequent assembly into already existing installations
- Due to the „click“-system even a one-hand mounting is possible
- Deliverable with secondary 5 A / 1 A or as a current sensor (0...333 mV) or measuring transducer (4...20 mA DC).
- Three different construction types

General technical specifications

- Length of connection cable:

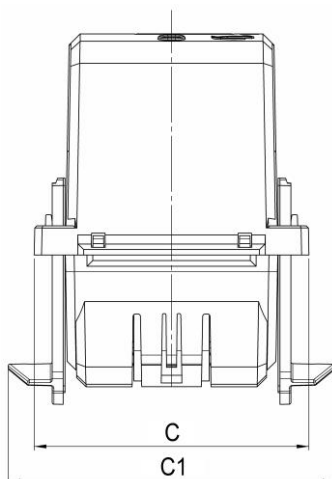
Sec. 1A:	2.5 m, cross section 2x0.75 mm ²
Sec. 5A:	0.5 m, cross section 2x1.5 mm ²
0...333 mV:	2.5 m, cross section 2x0.75 mm ²
4...20 mA:	2.5 m, cross section 2x0.75 mm ²

 (Other lengths are possible on request)
- Operating temperature: $-5^{\circ}\text{C} < T < +50^{\circ}\text{C}$
- Storage temperature: $-25^{\circ}\text{C} < T < +70^{\circ}\text{C}$
- Therm. nominal continuous rated current I_{cth} : $1.2 \times I_N$
- Therm. nominal short-time current I_{th} : $60 \times I_N$, 1 sec.
- Max. operating voltage U_m : 0.72 kV
- Isolation test voltage: 3 kV, U_{eff} , 50 Hz, 1 min.
- Rated frequency: 50 Hz
- Isolation class: E
- Applicable technical standard: DIN EN 61869, part 1 + 2



Dimensions

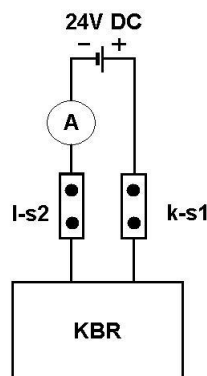
Type	A (width) [mm]	B (height) [mm]	C / C1 (depth) [mm]	D (diameter) [mm]
KBR 18	41.6	64.5	55 / 67.3	18.5
KBR 32	59.2	96.4	75 / 89.2	32.5
KBR 44	72.2	120.6	85 / 98.1	44



Technical characteristics for the KBR with output signal 4...20 mA:

- 2-wire connection, auxiliary power via output circuit
- Auxiliary power: 24 V DC $\pm 15\%$, PV = max. 1 VA
- Load-independent DC current: Live-zero, 4...20 mA
- External resistance: max. 300 Ω
- Current limit under overload: < 30 mA
- Residual ripple of the output current: $\leq 1\%$ p.p.
- Response time: < 300 ms

Wiring diagram of the KBR 44 (4...20 mA):



Order list KBR 18

Secondary current		5 A		1 A		Output	0...333 mV AC	4...20 mA DC
Primary current [A]	Burden [VA]	Accuracy class		Accuracy class		Primary current [A]	Accuracy class	Accuracy class
		3FS5	1FS5	3FS5	1FS5		1	1
		Art.-no.	Art.-no.	Art.-no.	Art.-no.		Art.-no.	Art.-no.
50	1			18-0001		50	18-1001	
75	1			18-0006		75	18-1006	
100	1.25			18-0011		100	18-1011	
125	1.5			18-0016		125	18-1016	
150	2			18-0021		150	18-1021	
200	1				18-0027	200	181026	
	3			18-0026				
250	1.5				18-0032	250	18-1031	
	4			18-0031				

Order list KBR 32

Secondary current		5 A		1 A		Output	0...333 mV AC	4...20 mA DC
Primary current [A]	Burden [VA]	Accuracy class		Accuracy class		Primary current [A]	Accuracy class	Accuracy class
		3FS5	1FS5	3FS5	1FS5		1	1
		Art.-no.	Art.-no.	Art.-no.	Art.-no.		Art.-no.	Art.-no.
100	1.5	32-5011				100	32-1011	32-2011
	2.5			32-0011				
125	2.5	32-5016				125	32-1016	32-2016
	3			32-0016				
150	3	32-5021		32-0021		150	32-1021	32-2021
200	3	32-5026				200	32-1026	32-2026
	5			32-0026				
250	3	32-5031				250	32-1031	32-2031
	5			32-0031				
300	2.5		32-5035			300	32-1034	32-2034
	5				32-0035			
400	5		32-5037		32-0037	400	32-1036	32-2036
500	5		32-5039		32-0039	500	32-1038	32-2038
600	5		32-5041		32-0041	600	32-1040	32-2040

Order list KBR 44

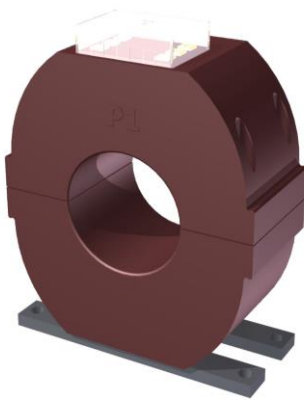
Secondary current		5A	1A	Output	0...333 mV AC	4...20 mA DC
Primary current [A]	Burden [VA]	Accuracy class	Accuracy class	Primary current [A]	Accuracy class	Accuracy class
		1FS5	1FS5		1	1
		Art.-no.	Art.-no.		Art.-no.	Art.-no.
250	1.5	44-5001		250	44-1001	44-2001
	2.5		44-0001			
300	2.5	44-5006	44-0006	300	44-1006	44-2006
400	5	44-5011	44-0011	400	44-1011	44-2011
500	5	44-5016	44-0016	500	44-1016	44-2016
600	5	44-5021	44-0021	600	44-1021	44-2021
750	5	44-5026	44-0026	750	44-1026	44-2026
800	5	44-5031	44-0031	800	44-1031	44-2031
1000	5	44-5036	44-0036	1000	44-1036	44-2036

You haven't found the right split-core current transformer?

You are looking for a split-core current transformer...

- ...with a better accuracy class, f.e. class 0.2 ?
- ...as a protection CT, f.e. in protection class 5P20 ?
- ...with several measuring systems in only one device ?
- ...or a split-core CT with a bigger opening for your primary conductor ?

Then our fully resin-hardened split-core current transformer type CTO is exactly the right decision!



Features / benefits

- Split-core current transformer suitable for measuring or protection purposes, depending on the design of the CT
- The modular design of this series allows a large number of varieties within the different CT sizes (f.e. two cores in one unit); please see next page for details about the different dimensions
- Max. operating voltage: 0.72/3/- kV or 1.2/6/- kV; if the primary conductor is suitably insulated the CT can also be used above 0.72 kV or 1.2 kV
- Primary current range: 50 A ... 5000 A
- Secondary currents: 1 A, 2 A or 5 A
- Rated burden: 2.5 VA ... 30 VA
- Accuracy classes: 0.2S; 0.2; 0.5S; 0.5; 1; 3
- Over-current rated limiting factor for measuring cores: FS5 or FS10
- Protection classes: 5P / 10P / PX
- Over-current rated limiting factor for protection cores: 5, 10, 15, 20, 30

Dimensions

Inner diameter: max. 360 mm
 Transformer width: 150 – 500 mm
 Transformer depth: 60 – 300 mm

Please see next page for details about the different dimensions.

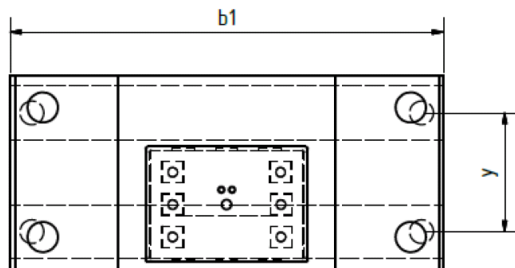
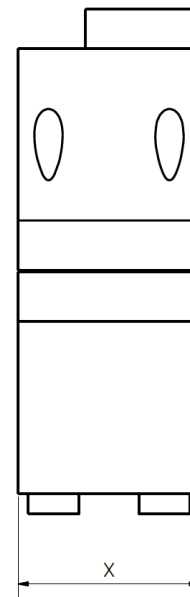
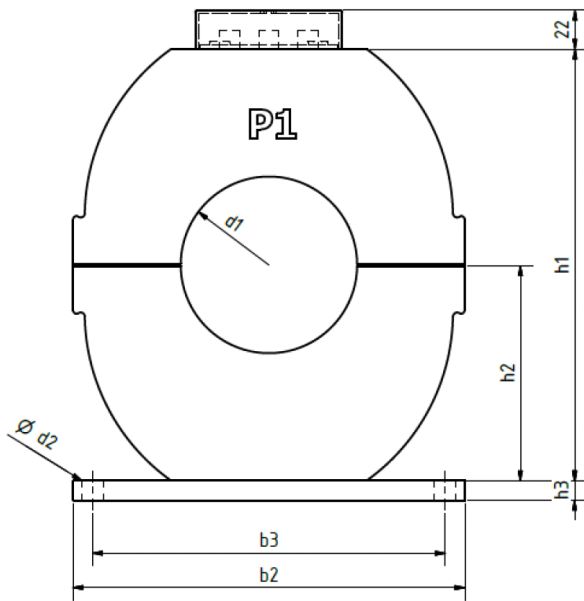
General technical specifications

- Operating temperature: $-5^{\circ}\text{C} < T < +40^{\circ}\text{C}$
- Storage temperature: $-25^{\circ}\text{C} < T < +70^{\circ}\text{C}$
- Therm. nominal continuous current I_{ctn} : $1.0 \times I_N$ or $1.2 \times I_N$, other values upon request
- Therm. nominal short-time current I_{th} : Min. $100 \times I_N$, 1 sec., other values upon request
- Isolation test voltage: 3 kV, U_{eff} , 50 Hz, 1 min. or 6 kV, U_{eff} , 50 Hz, 1 min.
- Rated frequency: 50 Hz or 60 Hz, other values upon request
- Isolation class: E
- Applicable technical standard: DIN EN 61869, part 1 + 2

Further information

- Measuring systems fully hardened with Polyurethane resin
- The current transformers type CTO are intended for subsequent installation in existing low-voltage switchgear. In addition, there are customers who use these current transformers in medium-voltage switchgears, if the primary conductor is suitably insulated.
- The two parts of the current transformer are held together by four screws with springs or spring clips on the sides, which ensures a permanent contact pressure.
- The secondary connection terminals are factory-fitted with M5 screws. A clear plastic cover serves as an touch protection.
- Protection type: Housing: IP54, Terminal cover: IP20
- Mounting of CT by means of a baseboard attached to the resin body
- Packaging unit: 1 Stk.
- Customs tariff number: 85043129

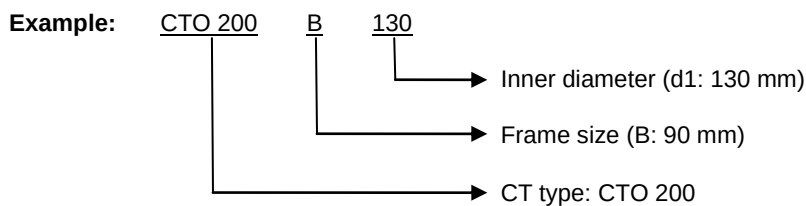
Dimension drawings



Frame size	x*	y*
A	60	25
B	90	55
C	120	85
D	150	115
E	200	165
F	250	215
G	300	265

* Dimension x + y depends on the type and number of measuring systems installed.

Determination of current transformer type



CT type	b1	b2	b3	max. d1	d2	h1	h2	h3	max. frame size	Deliverable
CTO 135	135	150	130	90	9	150	75	10	C	Upon request
CTO 150	150	150	130	110	9	165	82,5	10	D	Upon request
CTO 170	170	170	150	110	11	185	97,5	10	D	Yes
CTO 200	200	200	180	140	11	220	110	10	E	Yes
CTO 250	250	250	230	150	11	270	135	10	E	Yes
CTO 300	300	300	280	210	11	330	165	10	F	Yes
CTO 350	350	350	330	250	11	380	190	10	F	Upon request
CTO 400	400	400	370	300	13	430	215	15	G	Upon request
CTO 500	500	500	440	360	13	530	265	15	G	Upon request

MBS – Wir machen Energie messbar

MBS – We Make Energy Measurable



Auf dem Energieübertragungsweg zwischen Kraftwerk und Verbraucher ist an einer Vielzahl von Messstellen die korrekte Erfassung der Stromstärken notwendig. Dies erfolgt mit Hilfe von Stromwandlern. MBS produziert ein umfangreiches Sortiment an Niederspannungs- und Mittelspannungs-Stromwandlern für Mess- und Schutzzwecke.

When transferring energy from power station to consumer, it is essential to ensure the correct collection of amperages at a multiplicity of measuring points. This is done by means of current transformers. MBS produces an extensive assortment of low- and medium voltage current transformers for measuring and protection purposes.

10 Reasons for MBS

- ✓ Customer oriented solutions
- ✓ Individual consultancy
- ✓ Satisfied customers on all continents
- ✓ A product range in excess of 28,000 units
- ✓ Multiple of international licences and certificates, DIN EN ISO 9001:2000
- ✓ Supreme technical quality
- ✓ Official calibration of current transformers and measuring units
- ✓ Reliability
- ✓ Fast deliveries
- ✓ More than 35 years of success

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Notes

[illegible]



- Current transformers for industry
- Current transformers for tariff
- Accessories for current transformers
- Medium-voltage CTs
- Bus bar insulators / -supports
- Shunts
- Voltage transformers
- All current sensors
- Measuring transducers
- Energy meters with or without MID approval
- Accessories for energy meters
- Panel board heaters, filter fans, roof fans and control units



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