Current Transformer
Voltage Transformer

Content

Current transformers

Current transformers are special transformers for the proportional transformation of high currents info direct measurable values. Their construction and physical operating principle enables a galvanic separation of the primary circuit from the measured circuit, thereby providing in the event of a fault a protection against sequence connected instruments.

Actual transformation ratio
The ratio of the primary nominal current to the secondary nominal current. It is ratio specified as an unabridged brake on the rating plate.

Rated current
The specified value of the primary and secondary currents on the rating plate. Standardized primary nominal currents have the following values: 5; 10; 15; 20; 25; 30; 40; 50; 60; 75; 100 A with a decadic multiple of the previously mentioned values to a maximum of 7500 A. Standardized secondary nominal currents have the values 5 A and 1 A.

Maximum voltage for electrical equipment U_m
This denotes the highest constant permitted value for delta voltage for which the current transformer insulation is rated.

Burden
The impedance of the secondary circuit in ohms an power-factor. The burden is usually expressed as the apparent power in volt amperes absorbed at a specified power-factor and at the rated secondary current.

Rated burden
The value of the burden on which the accuracy requirements of this specification are based.

Rated output
The value of the apparent power (in VA at a specified power-factor) which the transformer is intended to supply to the secondary circuit at the rated secondary current and with rated burden connected to it.

Volt-ampere rating
The product of the (rated output) burden and the square of the secondary nominal current in Volt-amperes. According to DIN VDE 0414, p. 7, point 7, the following nominal ratings are standardised for current transformers 2.5; 5; 7.5; 10; 15 and 30 VA.

Error limit for the primary current
The full load current where 1. the pre-determined total error permissible as a safeguard in the current transformer operated with the burden has not yet been exceeded and 2. in the case of current transformers for measuring applications, the total error is equal to or greater than 10 %. It is the reference quantity for the determination of the nominal overload current limiting factor.

Rated Accuracy Factor
The factor by which the primary current must be multiplied in order to obtain the [FS] primary nominal error limit current.

Accuracy
of a current is the percentage ratio of the square root error of the secondary current's momentary value, averaged over the duration of one cycle and the primary current's effective value.

The current error F_i
is the percentage deviation of the nominal transmission multiplied by the secondary current, from that of the primary current. The current error is calculated positively, should the actual value of the second current exceed the nominal value.

Phase displacement error
signifies the phase shift of the secondary current against the primary current. The output directions are arranged in such a way that when the transformer is without error, there is a 0° displacement. The phase displacement error is specified in phase displacement minutes or hundredths of a radius (1 degree = 34.4 min) and is positively calculated, if the secondary size succeeds the primary one.

Precision
The accuracy of current transformers is classed, according to its precision. Specified error limits are allocated to each class.

Important
All the current transformers in our product range are designed to comply with EN 60044/1, for a nominal thermal continuous current of $I_d = 1{,}0 \times I_n$.

Application
Two main requirements are cited by the user for the principle demand of current transformers. These must be:

- a high degree of precision in the range of nominal current
- and protective functions at overload

In order to fulfil these demands it is necessary that the assumed nominal power of a current transformer fully achieves the actual power requirements of the prescribed measurement.

In ascertaining the actual power requirements, consideration is to be given not only to the loss of power of the appliances to be connected, but also to the losses incurred by the conductors.

Fixings
Foot-angle and bus-bar mounting screws with insulating cap (protection proof) are supplied free of charge. All transformers are suitable for use on massive primary lines as well as on flexible, insulating copper bands.

Elucidation of types
Our production exclusively comprises low voltage transformers of the 0.5 series with a maximum operating voltage of up to 0.72 KV according to DIN VDE 0414. part 1, DIN 42600 and DIN EN 60044/1 edition 11/2001 as well as regulation VBG4.

Special features
- unbreakable plastic casing
- black Polycarbonate
- are difficult to alight
- are self-extinguishing
- transformer casing has been ultrasonically welded
- nickel-plated secondary terminals
- integrated secondary caps.

Denomination of the connecting terminals
Terminals of all the primary windings are marked with "K-P1" and "l-P2". The terminals of all the secondary windings are marked with the corresponding smallest letters "k-s1" and "l-s2". Tapping with current transformers is to be done on the "L" -side. The winding end then receives the letter and by tapping the diminishing number of windings, they are numbered with the continuous numbers "2", "3", etc.

With summation current transformers, where there are several independent primary windings, the terminals of the individual windings marked with either the capital letter "K" and "L " are further differentiated with the capital letters "A ", "B", "C", etc. For example "AK"- "AL " for the highest primary circuit, and "BK"- "BL" for the second circuit and so on. Alternatively the transmission - respectively the transmission ratio -of each individual primary winding to one another; is to be specified on each terminal pair:

Please supply the following information when ordering summation current transformers:

a.) Ratio of main transformer
b.) Number of main transformers that will be connected
c.) Rated output of the main transformers in VA
d.) Accuracy class of main transformers
e.) Resistance of cable line if long distance

Special Models
Special current transformers like tariff measurement transformer are available on request. Please send us a request if you don't find a needed transformer in our catalogue.

	Tube current transformer																			
Primary nominal current	ASR 20.3 (*)		ASR 201.3 (*)		ASR 21.3 (*)		ASR 22.3 (*)		ASK 205.3 (*)	ASK 21.3 (*)	ASK 231.5	ASK 31.3 (*)	ASK 318.3 (*)	ASK 31.4 (*)	ASK 31.5 (*)	ASK 31.6	ASK 41.3 (*)	ASK 421.4	ASK 41.4 (*)	ASK 412.4 (*)
	Secondary 5 A and 1 A Accuracy classes																			
A	0,5	1	0,5	1	0,5	1	0,5	1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1	0,5 1
1																				
2,5																				
5																				
10																				
15																				
20																				
25																				
30																1,5		1		
40							1			1					1	2,5		1,5		
50		1		1			1,5			1,5	1,25	1		1,5	2,5	2,5	2,5	1,5	2,5	1,5	1,5
60		1,25		1,25			1,5		1	1,5	1 1,25	1	1	1,5	2,5	2,5	5	1,5	3,75	1,5	1,5
75		1,5		1,5			2,5		1	2,5	1 1,25	1,5	1,5	2,5	2,5	5	5	2,5	5	2,5	2,5
80		1,5		1,5			2,5		1,25	2,5	2,5 5	2,5	2,5	2,5	2,5	5	10	2,5	5	2,5	2,5
100	2,5	2,5	2,5	2,5	1	2,5	5		1,5	2,5 5	2,5 5	2,5 2,5	2,5 2,5	2,5 5	5 5	10	15	1,5	5 10	2,5 3,75	1,5 3,75
125	2,5	3,75	2,5	3,75							2,5 5								5 10		
150	2,5	3,75	2,5	3,75	1,5	5	5		2,5	5 5	5 5	2,5 2,5	2,5 2,5	2,5 7,5	5 7,5	15	15	2,5	5 10	5 5	2,5 5
200	5	5	5	5	2,5	5	10		2,5	5 10	5 10	5 5	5 5	5 10	10 15	15	15	2,5	5 15	5 10	2,5 10
250	5	7,5	5	7,5	5	5	15		5	5 15	5 10	5 10	5 10	5 15	15 15	15	15	5	10 15	5 10	5 10
300	5	7,5	5	7,5	5	5	15		5	5 15	5 10	5 10	5 10	10 15	15 15	15	15	5	10 15	10 15	5 15
400					10	10	15		10	10 15	10 15	5 10	10 10	10 15	15 30	15	15	5	15 30	10 15	10 15
500					10	10	15			10 15	10 15	5 10	10 10	10 15	15 30	15	15	10	15 30	15 15	10 15
600					10	10	15			10 15	10 15	5 15	15 15	15 15	15 30	15	15	10		15 15	10 15
750												5 10	15 15	15 15	15 30	15	15	15		15 15	15 30
800																		15		15 30	15 30
1000																				15 30	
1200																		Sec. 1A for this type only up to 300A			
1250																					
1500																					
1600																					
1800																					
2000																					
2500																					
3000																					
4000																					
5000																					
6000																					
7500																					
Primary conductor in mm									20 x 5	20 x 10	30x10	30x10 2x 20x10	31x18	30x10 2x 20x10	30x10 2x 20x10	30x10 20x13	40x12 32x18	20x10	40x10 2x 30x5	40x12 30x15
Round conductor in mm	21		21		22,5		22,5		17,5	19,2	28,0	26	26	28	28	23	26	20	32	30,5
width in mm	44		44		48,5		60		48,5	60	50	60	60	60	60	95	60	70	70	70

For the marked transformers are **DIN Rail mountings** (DIN 50022 – 35 mm) available.
Accessories: Foot-angle and bus-bar mounting screws with insulating cap (protection proof) are supplied free of charge. Seal plates, Cu - tubes, and Cu - bars can be supplied on request. The transformers are supplied with integrated secondary caps (exception: ASK 31.6, ASK 41.6, ASK 51.6, ASK 61.6, WSK 31.5. WSK 70.6, ASR 201.3).

Plug-in current transformers

ASK 41.6		ASK 541.4		ASK 51.4		ASK 51.6		ASK 561.4		ASK 61.4		ASK 61.6		ASK 63.4		ASK 63.6		ASK 81.4		ASK 101.4		ASK 103.3		ASK 105.6		ASK 123.3		ASK 127.6		ASK 129.10	
Secondary 5 A and 1 A Accuracy classes																													
0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1
			1																										
			2,5																										
1,5	2,5		2,5																										
1,5	2,5	1,5	2,5																										
5	5	2,5	2,5																										
5	5	2,5	5																										
10	10	5	10		1,5	5	5					1,5	2,5																
		5	10																										
15	15	5	10	2,5	2,5	10	10					2,5	2,5																
15	15	15	15	5	5	10	10		2,5	2,5	2,5	5	10				2,5												
15	15	15	15	5	10	15	15		5	2,5	5	10	15			2,5	2,5												
15	15	15	15	5	10	15	30	5	5	5	5	15	15	2,5	2,5	5	10												
15	15	15	15	10	15	15	30	5	10	10	10	15	30	5	5	5	10	5	5										
15	15	15	30	10	15	15	30	5	15	15	15	15	30	5	10	5	15	10	10	5	10								
30	30	30	30	15	15	15	30	10	15	15	15	15	30	10	15	10	15	10	10	5	10			5	10				
30	30	30	30	10	15	15	30	10	15	15	15	15	30	15	15	10	15	15	15	5	10	2,5	10	5	10				
30	30	30	30	15	30	15	45	15	30	15	15	15	30	15	15	15	15	15	15	10	15	5	15	10	10				
30	45	15	15	15	30	30	45	15	30	30	30	30	45	15	15	15	30	15	30	10	30	10	15	5	10	5	10	5	10	5	15
				15	30	30	45	15	30	30	30	30	45	15	15	30	30	15	30	10	30	10	30	10	15	10	15	10	15	10	15
				15	30	30	45	15	30	30	30	30	45	15	15	15	30	15	30	10	30	15	30	15	15	15	15	30	30	10	15
										30	30	30	45	15	15	15	30	15	45	15	30	15	45	15	30	15	30	30	30	30	30
										30	30	30	45	15	15	15	30	15	45	15	45	15	45							30	30
														15	15					15	45			15	30	15	30	30	30	30	30
														15	15	15	30	15	45	15	45	30	45	30	45	30	45	30	45	30	30
																				15	45	30	45	30	45	30	45	30	45	45	45
																						30	45	30	45	30	45	45	45		
																								30	45	30	45	45	45		
																										30	45	45	45		
																										30	45	45	45		
																												45	45		
40x12 30x15		40x10 2x 30x5		50x12 2x 40x10		50x12 40x30		60x10 2x 50x10		63x10 2x 50x10		60x10 50x30		60x30 50x40		60x30		80x10 2x 60x10		100x10 2x 80x10		2x100 x10 3x 80x10		100x55		123x30 3x 100x10		120x72		120x90	
32		32		44		40		44		44		40		44		30		55		70		85		55		100		72		90	
95		85		85		95		85		95		95		95		88		120		130		172		129		172		205		250	

For the marked transformers are **DIN Rail mountings** (DIN 50022 – 35 mm) available.
Accessories: Foot-angle and bus-bar mounting screws with insulating cap (protection proof) are supplied free of charge. Seal plates, Cu - tubes, and Cu - bars can be supplied on request. The transformers are supplied with integrated secondary caps (exception: ASK 31.6, ASK 41.6, ASK 51.6, ASK 61.6, WSK 31.5. WSK 70.6, ASR 201.3).

	Wound current transformer												Summation-current transf.		Split core current transformer				Ct with integr. transducer	
Primary nominal current	WSK 30 (*)		WSK 40 (*)		WSK 60		WSK 70.6		WSK 31.5				KSU 2	SUSK 3-8	KBU 23		KBU 58		KBU 812		SMWU 41.XX	SWMU 41.52 42.52
Secondary 5 A and 1 A Accuracy classes																				
A	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1	0,5	1
1	2,5	5	10	15																		
2,5	2,5	5	10	15																	1	5
5	2,5	5	10	15	10	15					15	30	15	30							5	10
10	2,5	5	10	15	10	15															10	
15	2,5	5	10	15	10	15															15	
20	2,5	5	10	15	10	15															20	
25			10	15	10	15	10	15	15	15											25	
30			5	10	10	15	10	15	15	15											30	
40			5	10	10	15	10	15	15	15											40	
50					10	15	10	15	15	15											50	
60					10	15	10	15	15	15											60	
75					10	15	10	15	15	15											75	
80							10	15	15	15											100	
100							10	15	15	15					1,25						150	
125																					200	
150							10	15	15	15					1,5						250	
200															1,5						300	
250															2		1	2	1	2	400	
300															1,5	4	1,5	3	1,5	3	500	
400															2,5	6	1,5	3	1,5	3	600	
500																	2,5	5	2,5	5	750	
600																	2,5	5	2,5	5	800	
750																	3	6	3	6		
800																	3	7	3	7		
1000																	5	10	5	10		
1200																			6	11		
1250																			7	15		
1500																			8	17		
1600																						
1800																						
2000																						
2500																						
3000																						
4000																						
5000																						
6000																						
7500																						
Primary cond. in mm													2 Main-ct	3-8 Main-ct	20x30		50x80		80x120		40x10	40x10
Round cond. in mm																					27	27
width in mm	60		70		70		70		70				127	156	93		125		155		125	80

Output:

0...20 mA/ 0...10 V
4...20 mA/ 0...10 V
4...20 mA/ 2...10 V

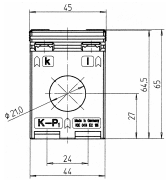
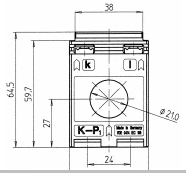
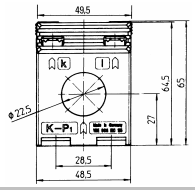
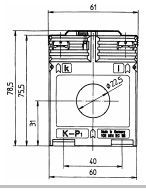
Power supply:

230 VAC

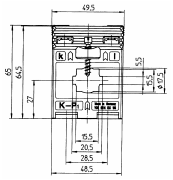
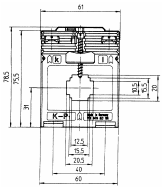
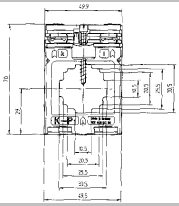
24 V DC

without power supply

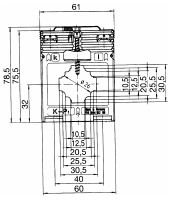
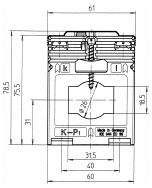
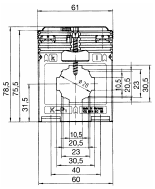
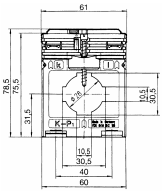
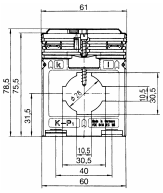
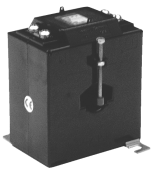
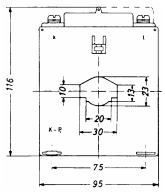
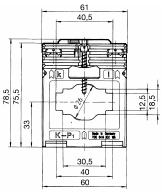
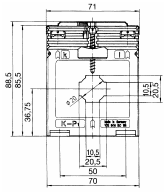
Tube current transformer

	Type	Primary conductor in mm	Width	DIN-Rail mounting	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**ASR 20.3**	21,0 mm Ø	44,0 mm	available			
	**ASR 201.3**	21,0 mm Ø	44,0 mm	available			
	**ASR 21.3**	22,5 mm Ø	48,5 mm	available			
	**ASR 22.3**	22,5 mm Ø	60,0 mm	available			

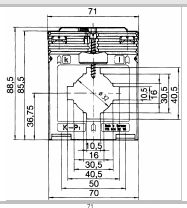
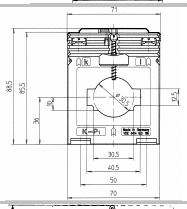
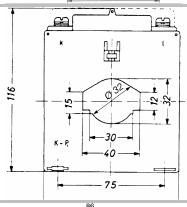
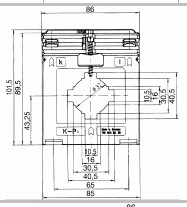
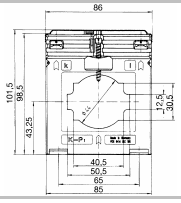
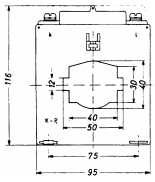
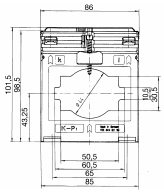
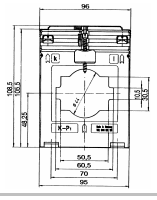
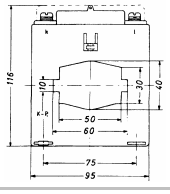
Plug-in current transformer

	Type	Primary conductor in mm	Width	DIN-Rail mounting	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**ASK 205.3**	20x5 mm 17,5 mm Ø	48,5 mm	available			
	**ASK 21.3**	20x10 mm 19,2 mm Ø	60,0 mm	available			
	**ASK 231.5**	30x10 mm 28 mm Ø	49,5 mm	-			

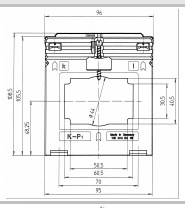
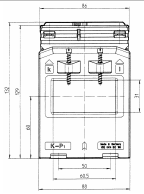
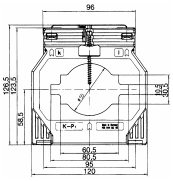
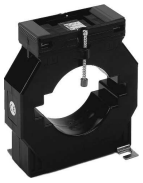
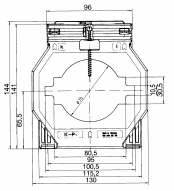
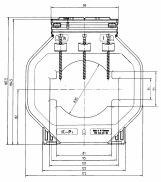
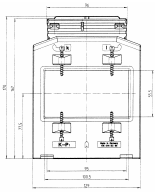
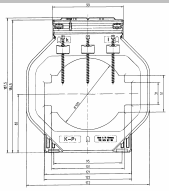
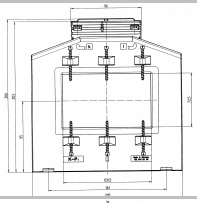
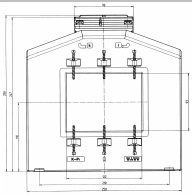
Plug-in current transformer

	Type	Primary conductor in mm	Width	DIN-Rail mounting	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**ASK 31.3**	30x10 mm 2x20x10 mm 26,0 mm Ø	60,0 mm	available			
	**ASK 318.3**	31x18 mm 26,0 mm Ø	60,0 mm	available			
	**ASK 31.4**	30x10 mm 2x20x10 mm 28 mm Ø	60 mm	available			
	**ASK 31.5**	30x10 mm 2x20x10 mm 28 mm Ø	60 mm	available			
	**ASK 31.5**	30x10 mm 2x20x10 mm 28 mm Ø	60 mm	available			
	**ASK 31.6**	30x10 mm 20x13 mm 23 mm Ø	95 mm	-			
	**ASK 41.3**	40x12 mm 32x18 mm 26 mm Ø	60 mm	available			
	**ASK 421.4**	20x10 mm 20 mm Ø	70 mm	available			

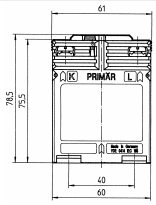
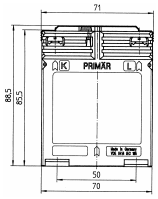
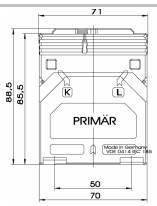
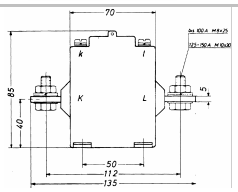
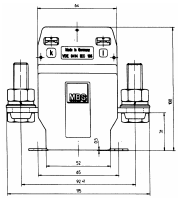
Plug-in current transformer

	Type	Primary conductor in mm	Width	DIN-Rail mounting	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**ASK 41.4**	40x10 mm 2x30x5 mm 32 mm Ø	70 mm	available			
	**ASK 412.4**	40x12 mm 30x15 mm 30,5 mm Ø	70 mm	available			
	**ASK 41.6**	40x12 mm 30x15 mm 32 mm Ø	95 mm	-			
	**ASK 541.4**	40x10 mm 2x30x5 mm 32 mm Ø	85 mm	-			
	**ASK 51.4**	50x12 mm 2x40x10 mm 44 mm Ø	85 mm	-			
	**ASK 51.6**	50x12 mm 40x30 mm 40 mm Ø	95 mm	-			
	**ASK 561.4**	60x10 mm 2x50x10 mm 44 mm Ø	85 mm	-			
	**ASK 61.4**	60x10 mm 2x50x10 mm 44 mm Ø	95 mm	-			
	**ASK 61.6**	60x10 mm 50x30 mm 40 mm Ø	95 mm	-			

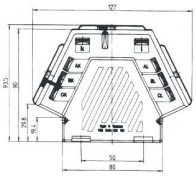
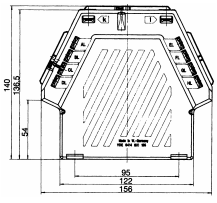
Plug-in current transformer

	Type	Primary conductor in mm	Width	DIN-Rail mounting	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**ASK 63.4**	50x40 mm 60x30 mm 44 mm Ø	95 mm	-			
	**ASK 63.6**	60x30 mm 30 mm Ø	88 mm	-			
	**ASK 81.4**	80x10 mm 60 x 30 mm 2x60x10 mm 55 mm Ø	120 mm	-			
	**ASK 101.4**	100x10 mm 2x80x10 mm 70 mm Ø	130 mm	-			
	**ASK 103.3**	2x100x10 mm 3x80x10 mm 85 mm Ø	172 mm	-			
	**ASK 105.6**	100x55 mm 55 mm Ø	129 mm	-			
	**ASK 123.3**	2x120x10 mm 3x100x10 mm 100 mm Ø	172 mm	-			
	**ASK 127.6**	120x72 mm	205 mm	-			
	**ASK 129.10**	120x90 mm	250 mm	-			

Wound current transformer

	Type	Width	Primary conductor in mm	Drawing	List price € Class 1 Sec. 5 A	List price € Class 1 Sec. 1 A
	**WSK 30**	60 mm	Terminals with screws M5 x 10 (DIN 7985) K and L are primary k und l are secondary			
	**WSK 40**	70 mm	Terminals with screws M5 x 10 (DIN 7985) K and L are primary k und l are secondary			
	**WSK 60**	70 mm	Terminals with screws M5 x 10 (DIN 7985) K and L are primary k und l are secondary			
	**WSK 70.6**	70 mm	Primary K und L Cu – bar 20 x 5 mm with M8 x 25 DIN 933 up to 100 A with M10 x 25 DIN 933 up to 150 A Secondary k und l M 5 x 12 DIN			
	**WSK 31.5**	70 mm	Primary K und L Cu – bar 30 x 5 mm With M 12 x 35 Secondary k und l M 5 x 12 DIN			

Summation current transformer

	Type	Application		Drawing	List price € Class 1 Sec. 5 A	Additional charge €
	**KSU 2**	Primary Secondary Primary Secondary For connection of 2 main current transformers with similar or different nominal transmission ratio	5 A 5 A 1 A 1 A			
	**SUSK 3** **SUSK 4** **SUSK 5** **SUSK 6** **SUSK 7** **SUSK 8**	Primary Secondary Primary Secondary For connection of 3 - 8 main current transformers with similar or different nominal transmission ratio	5 A 5 A 1 A 1 A			

Please supply the following information when ordering summation current transformers:

Ratio of main transformer, number of main transformers that will be connected, rated output of the main transformers in VA, accuracy class of main transformers, resistance of cable line if long distance.

The listed prices are for transformers with similar nominal transmission ratio.

Measuring transducer for alternating current

Input

Measuring	:	sinusoidal alternating current
Range	:	0 ... I_E
Max. Measuring Voltage	:	0,66 kV
Working range	:	0 ...1,2 I_E (SWMU 41.5x) 0,15 ...1,2 I_E (SWMU 42.52)
Overload	:	1,5 I_E continuous, 8 I_E (max. 40 sec)
Frequency	:	50 ... 60 Hz
Power requirement	:	< 1,0 VA

Output

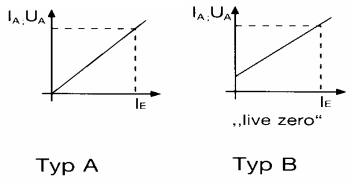
Output current	:	DC current
DC current	:	I_{AN} 0 ... 20 mA, 4 ... 20 mA
External Resistance	:	R_A 0 ... 750 Ohm
Burden voltage	:	0 ... 15 V
Response time	:	< 1 sec. (at $R_{A\,max}$)
Output voltage	:	DC voltage
DC voltage	:	U_A 0 ... 10 V or 2 ... 10 V
External Resistance	:	R_A > 10 KOhm
Voltage limiting	:	>18 V
Output current residual ripple	:	< 1% p.p.
Response time	:	< 0.5 sec.

Environment

Operating temperature	:	- 5 ... + 40°C
Storage temperature	:	-25 ... + 65°C

Power supply

AC power supply	:	230 V +/- 10%, 50 … 60 Hz
DC power supply	:	24 V +/- 15%
Without power supply	:	yes, working range 15 .. 120 % I_N

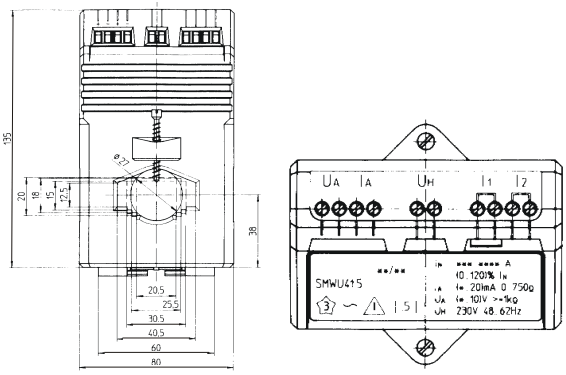


Accuracy

Basic accuracy	:	class 0,5%
Temperature drift	:	< 0,03%K for 1 max. 1 year
Frequency	:	48 - 62 Hz
Wave form	:	sinus, THD < 0,1%
Operating temperature	:	23°C ± 1 K
Warm up	:	> 30 min, acc. DIN IEC 688 Part1

General Data

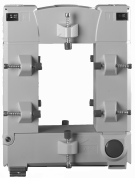
Design	:	Plug-In current transformer With DIN rail mounting 35 mm According to DIN EN50022
Case	:	Polycarbonate (Makrolon), self-extinguishing acc. UL 94 V-O
Terminals	:	Screw terminal (max. 2,5 mm^2)
Working voltage	:	max. 660 V
Test voltage (DIN 57411)	:	4kV, active circuit against casing 4kV, power supply against measuring outputs (230 V version)
Dimension	:	50x80x135 mm (LxWxH)
Weight	:	ca. 0,43 kg
Housing protection	.	IP 40 housing, IP 20 terminals

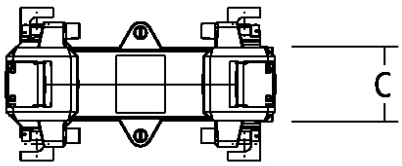


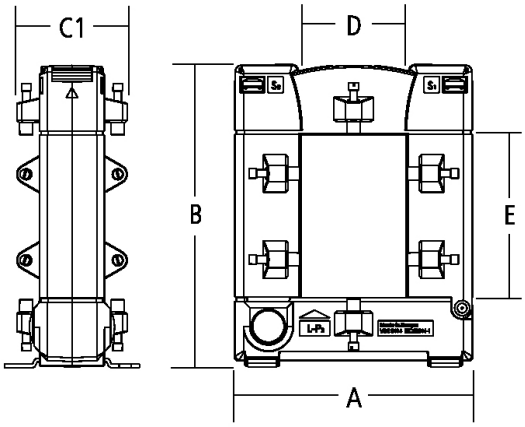
	Type	Power supply	Output *	Primary rated current I_N (A)	List price €
	**SWMU 41.52**	**24 VDC**	0…20 mA - 0…10V 4…20 mA - 0…10V 4…20 mA - 2…10V	1, 5, 10	
		230 VAC	0…20 mA - 0…10V 4…20 mA - 0…10V 4…20 mA - 2…10V	1, 5, 10	
	SWMU 41.51	**24 VDC**	0…20 mA - 0…10V 4…20 mA - 0…10V 4…20 mA - 2…10V	15, 20, 25, 30, 40, 50, 60, 75, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800	
		230 VAC	0…20 mA - 0…10V 4…20 mA - 0…10V 4…20 mA - 2…10V	15, 20, 25, 30, 40, 50, 60, 75, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800	
	SWMU 42.52	**Without ****	0...20 mA - 0…10 V	1, 5	
	SWMU 42.51	**Without ****	0...20 mA - 0…10 V	40, 50, 60, 75, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800	

* The ranges are alternative (not simultaneously)
** The input-working range without power supply is 15 .. 120 % I_N

Split core current transformer

	Type	Primary conductor in mm	Width x Height	List price € class 1 Sec. 5 A	List price € class 1 Sec. 1A
	**KBU 23**	20 x 30 mm	93 x 106 mm	86,40	
	KBU 58	50 x 80 mm	125 x 125 mm	100,70	
	KBU 812	80 x 120 mm	155 x 198 mm	119,20	





Dimensions in mm					Bus bar window	
Type	A (width)	B (height)	C/C1 (depth)	weight	D (width)	E (height)
KBU23	93	106	34/58	0,85 kg	20	30
KBU58	125	152	34/58	1,08 kg	50	80
KBU812	155	198	34/58	1,32 kg	80	120

Voltage transformer, single-pole isolated, secondary 100 / 1.73 V

Primary Voltage	MBEV 6		MBEV 10		MBEV 20		MBEV 50		MBEV 100	
Accuracy class	**1**		**0.5 / 1**		**0.5 / 1**		**0.5 / 1**		**0.5 / 1**	
Rated Output VA	**3**		**5 / 10**		**10 / 20**		**25/ 50**		**50 / 100**	
100 / 1,73 V	SEV1001		SEV1010		SEV1019		SEV1028		SEV1037	
110 / 1,73 V	SEV1002		SEV1011		SEV1020		SEV1029		SEV1038	
220 / 1,73 V	SEV1003		SEV1012		SEV1021		SEV1030		SEV1039	
380 / 1,73 V	SEV1004		SEV1013		SEV1022		SEV1031		SEV1040	
400 / 1,73 V	SEV1005		SEV1014		SEV1023		SEV1032		SEV1041	
500 / 1,73 V	SEV1006		SEV1015		SEV1024		SEV1033		SEV1042	
600 / 1,73 V	SEV1007		SEV1016		SEV1025		SEV1034		SEV1043	
800 / 1,73 V	SEV1008		SEV1017		SEV1026		SEV1035		SEV1044	
1000 / 1,73 V	SEV1009		SEV1018		SEV1027		SEV1036		SEV1045	

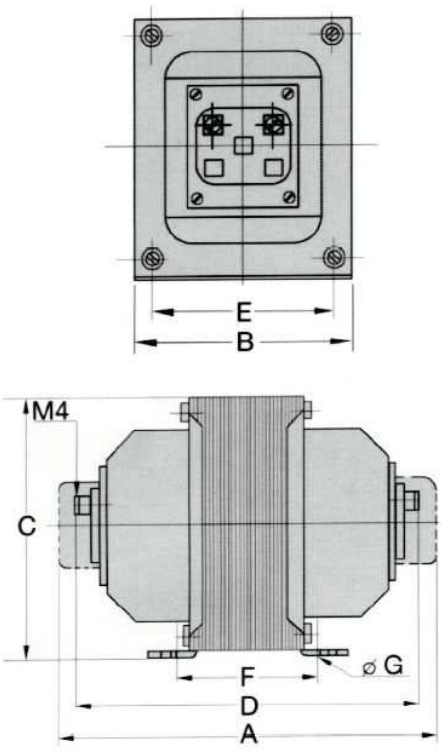
Voltage transformer, double-pole isolated, secondary 100 V

Primary Voltage	MBEV 6		MBEV 10		MBEV 20		MBEV 50		MBEV 100	
Accuracy class	**1**		**0.5 / 1**		**0.5 / 1**		**0.5 / 1**		**0.5 / 1**	
Rated Output VA	**6**		**10 / 20**		**20 / 40**		**50 / 100**		**100 / 200**	
100 V	SZV1001		SZV1010		SZV1019		SZV1028		SZV1037	
110 V	SZV1002		SZV1011		SZV1020		SZV1029		SZV1038	
220 V	SZV1003		SZV1012		SZV1021		SZV1030		SZV1039	
380 V	SZV1004		SZV1013		SZV1022		SZV1031		SZV1040	
400 V	SZV1005		SZV1014		SZV1023		SZV1032		SZV1041	
500 V	SZV1006		SZV1015		SZV1024		SZV1033		SZV1042	
600 V	SZV1007		SZV1016		SZV1025		SZV1034		SZV1043	
800 V	SZV1008		SZV1017		SZV1026		SZV1035		SZV1044	
1000 V	SZV1009		SZV1018		SZV1027		SZV1036		SZV1045	

Technical data		
Standard	IEC 60044-2	
Highest applicable voltage for equipment		0,72 KV … 600 V 1,2 KV … 1000 V
Test voltage		3 KV … 720 V 6 KV … 1000 V
Rating frequency		50 .. 60 Hz
Field of application		Indoors up to 2000 m NN
Climatic Condition	IEC 60721-3-3	3K4
Mechanical Condition	IEC 60721-3-3	3M3
Vibration-proof	IEC 60068-2	2.5 g (25 .. 100 Hz)
Insulation class	IEC 600 85	E(120° C)
Housing degree of protection	IEC 60529	Case IP 50, terminals IP 20
Insulation material	UL E44423 UL E47960 UL E93687 UL E51047	enamelled copper wire winding support insulation layer impregnation varnish

Voltage transformer

Type	Case in mm							Weight	Accessories
	A	B	C	D	E	F	G	Kg	
MBEV 6	140	85	100	125	68	52	4.5	2.3	terminal cover
MBEV 10	165	90	105	145	70	67	4.5	3	
MBEV 20	175	90	105	155	70	82	4.5	4.1	
MBEV 50	195	105	125	175	81	95	5.5	6	
MBEV 100	210	128	155	190	101	97	8	8	
MBZV 6	140	85	100	125	68	52	4.5	2.3	terminal cover
MBZV 10	165	90	105	145	70	67	4.5	3	
MBZV 20	175	90	105	155	70	82	4.5	4.1	
MBZV 50	195	105	125	175	81	95	5.5	6	
MBZV 100	210	128	155	190	101	97	8	8	



Voltage transformer, single-pole isolated, secondary 100 / 1.73 V

Primary Voltage		Secondary Voltage 100 / 1.73 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
100 / 1.73 V 110 / 1.73 V 200 / 1.73 V 220 / 1.73 V 230 / 1.73 V $U_{M=}$ 0,72 KV	MBER60	-	-		-	-		0,5	SE1001		1,5	SE1002	
	MBER70	0,2	SE1003		0,5	SE1004		1	SE1005		3	SE1006	
	MBER100	1	SE1007		2,5	SE1008		5	SE1009		15	SE1010	
	MBER104	5	SE1011		15	SE1012		30	SE1013		30	SE1014	
	MBE100	-	-		10	SE1015		15	SE1016		50	SE1017	
	MBE150	7,5	SE1018		20	SE1019		50	SE1020		120	SE1021	
	MBE150	10	SE1022		30	SE1023		60	SE1024		150	SE1025	
	MBE150	15	SE1026		50	SE1027		100	SE1028		200	SE1029	
	MBE150	25	SE1030		60	SE1031		120	SE1032		250	SE1033	

Primary Voltage		Secondary Voltage 100 / 1.73 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
380 / 1.73 V 400 / 1.73 V 500 / 1.73 V 600 / 1.73 V 660 / 1.73 V $U_{M=}$ 0,72 KV	MBER100	0,5	SE1034		1,5	SE1035		3	SE1036		10	SE1037	
	MBER104	5	SE1038		10	SE1039		25	SE1040		25	SE1041	
	MBE 100	-	-		10	SE1042		15	SE1043		50	SE1044	
	MBE 150	7,5	SE1045		20	SE1046		50	SE1047		120	SE1048	
	MBE 150	10	SE1049		30	SE1050		60	SE1051		150	SE1052	
	MBE 150	15	SE1053		50	SE1054		100	SE1055		200	SE1056	
	MBE 150	25	SE1057		60	SE1058		120	SE1059		250	SE1060	

Primary Voltage		Secondary Voltage 100 / 1.73 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
690 / 1.73 V 750 / 1.73 V 1000 / 1.73 V $U_{M=}$ 1,2 KV	MBER 100/1	-	-		1	SE1061		2	SE1062		5	SE1063	
	MBER 104/1	5	SE1064		10	SE1065		25	SE1066		25	SE1067	
	MBE 100/1	-	-		7,5	SE1068		15	SE1069		30	SE1070	
	MBE 150/1	7,5	SE1071		20	SE1072		45	SE1073		100	SE1074	
	MBE 150/1	10	SE1075		30	SE1076		60	SE1077		120	SE1078	
	MBE 150/1	15	SE1079		45	SE1080		90	SE1081		150	SE1082	
	MBE 150/1	20	SE1083		60	SE1084		100	SE1085		180	SE1086	

Auxiliary winding for production of an open delta winding (VA rating of measuring winding diminished by 30% approx): ../√3/.../√3/100/√3V

Type	Continuous rated current	List price
MBE 150	1 A / 8 h	

intermediate voltage transformers for production of an open delta winding (without measuring winding): 100/√3/100/√3V

MBE 100	1 A / 8 h	
MBE 150	5 A / 8 h	
MBE 150	6 A / 8 h	
MBE 150	8 A / 8 h	

Type	Tropicalized	Castin Resin
MBE (Z) R60		
MBE (Z) R70		
MBE (Z) R 100 (/1)		
MBE (Z) R 104 (/1)		
MBE (Z) 100 (/1)		
MBE (Z) 150 (/1)		

snap-on mountings for:	
MBE (Z) R 60	
MBE (Z) R 70	

common foot mounting for:	
MBE (Z) R 70	

Voltage transformer, double-pole isolated, secondary 100 V

Primary Voltage		Secondary Voltage 100 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
100 V 110 V 200 V 220 V 230 V $U_{M=}$ 0,72 KV	MBZR 60	-	-		0,5	SZ1001		1	SZ1002		3	SZ1003	
	MBZR 70	1	SZ1004		2,5	SZ1005		5	SZ1006		15	SZ1007	
	MBZR 100	2	SZ1008		5	SZ1009		10	SZ1010		25	SZ1011	
	MBZR 104	5	SZ1012		15	SZ1013		30	SZ1014		30	SZ1015	
	MBZ 100	-	-		15	SZ1016		60	SZ1017		60	SZ1018	
	MBZ 150	10	SZ1019		25	SZ1020		90	SZ1021		150	SZ1022	
	MBZ 150	15	SZ1023		45	SZ1024		120	SZ1025		200	SZ1026	
	MBZ 150	20	SZ1027		60	SZ1028		120	SZ1029		250	SZ1030	
	MBZ 150	30	SZ1031		75	SZ1032		150	SZ1033		300	SZ1034	

Primary Voltage		Secondary Voltage 100 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
300 V 400 V 500 V 600 V 660 V $U_{M=}$ 0,72 KV	MBZR 60	-	-		-	-		1	SZ1035		3	SZ1036	
	MBZR 70	0,5	SZ1037		1,2	SZ1038		2,5	SZ1039		7,5	SZ1040	
	MBZR 100	1,5	SZ1041		3	SZ1042		10	SZ1043		20	SZ1044	
	MBZR 104	5	SZ1045		10	SZ1046		25	SZ1047		25	SZ1048	
	MBZ 100	-	-		15	SZ1049		30	SZ1050		60	SZ1051	
	MBZ 150	10	SZ1052		25	SZ1053		60	SZ1054		150	SZ1055	
	MBZ 150	15	SZ1056		45	SZ1057		90	SZ1058		200	SZ1059	
	MBZ 150	20	SZ1060		60	SZ1061		120	SZ1062		250	SZ1063	
	MBZ 150	30	SZ1064		75	SZ1065		150	SZ1066		300	SZ1067	

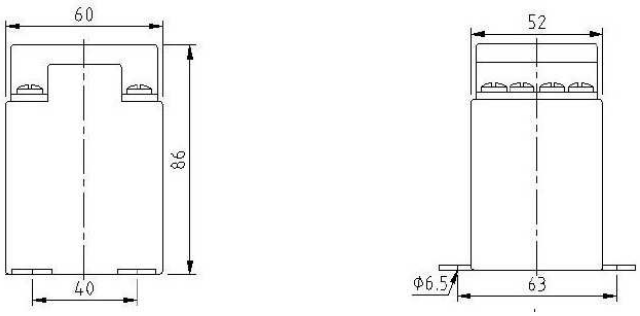
Primary Voltage		Secondary Voltage 100 V											
Class		0,2			0,5			1			3		
Primary	Type	VA	Type	Price	VA	Type	Price	VA	Type	Price	VA	Type	Price
	MBZR 60/1	-	-		*	*		*	*		*	*	
	MBZR 70/1	*	*		*	*		*	*		*	*	
600 V 400 V 1000 V	MBZR 100/1	1	SZ1068		2,5	SZ1069		5	SZ1070		15	SZ1071	
	MBZR 104/1	5	SZ1072		10	SZ1073		25	SZ1074		25	SZ1075	
	MBZ 100/1	-	-		7,5	SZ1076		15	SZ1077		30	SZ1078	
$U_{M=}$ 1,2 KV	MBZ 150/1	7,5	SZ1079		20	SZ1080		50	SZ1081		120	SZ1082	
	MBZ 150/1	10	SZ1083		30	SZ1084		60	SZ1085		150	SZ1086	
	MBZ 150/1	15	SZ1087		45	SZ1088		100	SZ1089		200	SZ1090	
	MBZ 150/1	20	SZ1091		60	SZ1092		120	SZ1093		250	SZ1094	

* available on request

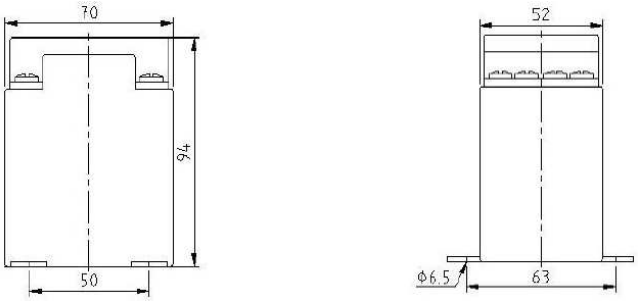
Voltage transformer

Type	Case in mm					Weight	Accessories
	Size	Width	Height	Depth	h	kg	
MBZR60 (/1)	2	60	86	52		0,5	foot mounting terminal cover
MBZR 70 (/1)		70	94	52		0,6	
MBZR 100 (/1)		100	126	73		1,1	
MBZR 104 (/1)		104	135	75		2,0	
MBZ100 (/1)		103	106	141		3,1	
MBZ 150 (/1)	1	150	123	172	40	7,0	
	2	150	123	182	50	8,0	
	3	150	123	192	60	9,0	
	4	150	123	212	80	11,5	

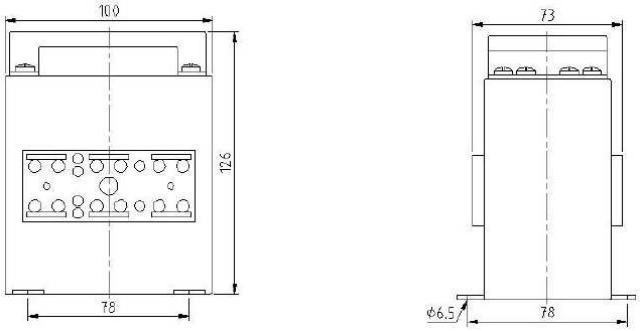
MBZR 60 (/1)
(MBER 60)



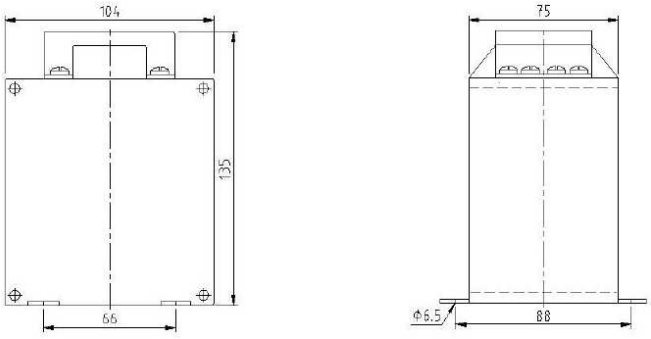
MBZR 70 (/1)
(MBER 70)



MBZR 100 (/1)
[MBER 100 (/1)]



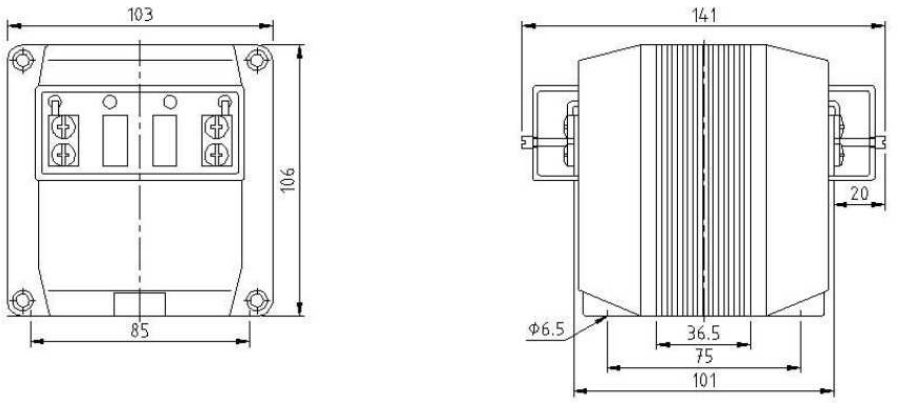
MBZR 104 (/1)
[MBER 104 (/1)]



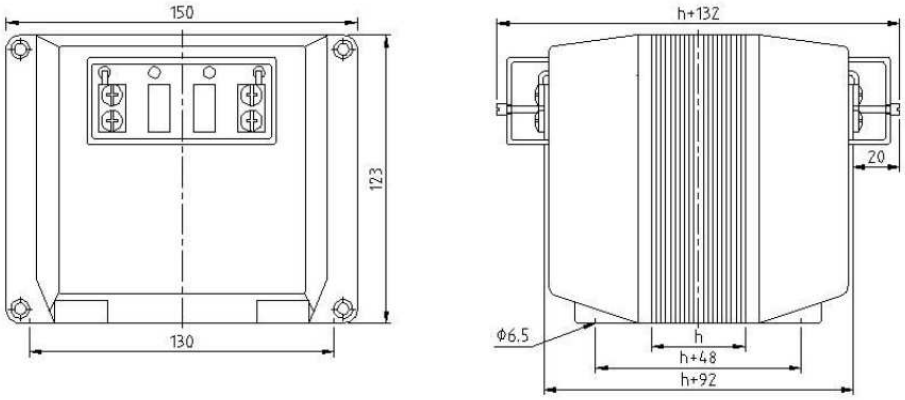
Voltage transformer

Type	Case in mm					Weight	Accessories
	Size	Width	Height	Depth	h	kg	
MBER 60	2	60	86	52		0,5	foot mounting terminal cover
MBER 70		70	94	52		0,6	
MBER 100 (/1)		100	126	73		1,1	
MBER 104 (/1)		104	135	75		2,0	
MBE 100 (/1)		103	106	141		3,1	
MBE 150 (/1)	1	150	123	172	40	7,0	
	2	150	123	182	50	8,0	
	3	150	123	192	60	9,0	
	4	150	123	212	80	11,5	

MBE 100 (/1)
[MBZ 100 (/1)]



MBE 150 (/1)
[MBZ 150 (/1)]



Order example:

Type	**MBZR 60**
Ratio	**230/100 V**
Burden	**0,5 VA**
Class	**0,5**
Type	**SZ1001**