

Protection current transformers – Technical concepts

Application: Current transformers are for the galvanic separation, proportional transformation of alternating currents of larger currents into smaller, direct measurable values. There are two categories subject to their application:

- measuring transformers
- protection transformers.

All current transformers manufactured by MBS are for low voltage applications with a max. phase to phase voltage of 0.72 kV.

Measuring transformer: Measuring transformers are used to measure current, power, power factor and energy consumption combined with an equivalent measurement unit. Using its magnetic circle, current transformers allow a high transmission accuracy in the nominal current range, whilst simultaneously protecting the connected appliances against over current. The magnetic saturation in the measuring core ensures protection in the event of an over current.

Protection current transformers: Protection current transformers are for the control of protecting relays which have the task to separate switched circuits in the event of over current. For a safe function of these relays a proportional transfer ratio of the transformer up to a multiple of the nominal current is necessary. The dimensioning of this transformer unit secures a proportional current transfer, up to a multiple of the nominal currents, determined by the protection class.

Technical standards: All MBS current transformers are produced in accordance with the technical requirements of DIN EN 60044/1 (edition 12/2003)

Technical characteristics: Application use: Indoors, without condensation

Protection current transformers:

- Ambient temperature: - 5 °C+ 40 °C.
- Housing material: Polycarbonate, self-extinguishing
- Housing form: halve-cup-shaped, ultrasonically welded
- Isolation class: E
- Thermal rated nominal continuous current: $1.2 \times I_N$
- Secondary rated currents: 5 A or 1 A
- Thermal rated short time current: $60 \times I_N$ (max.100 kA)
- Max. excess temperature of the secondary winding: 75 °C
- Isolating test voltage: $3 \text{ kV } U_{\text{EFF}}; 50 \text{ Hz, 1 min}$

Safety instructions: The protection current transformer's physical characteristics has its many advantages and with all these built-in features it is very easy to attend to this transformer with their secondary circuits open. This can be very harmful to the operator or transformers as multiple kilovolt surges can occur. In order to prevent any mishaps an operation as described above is forbidden.

Ordering instructions: For the correct processing of your order, please make available the following specification:

Transformer type
Transmission ratio
Accuracy class
Rated burden

Accuracy classes of current transformers:													
Class	current error (+/- %) by % I_N						phase displacement error (+/- minutes) by % I_N						total error by $n \times I_N$
	1 %	5 %	20 %	50 %	100 %	120 %	1 %	5 %	20 %	50 %	100 %	120 %	
Measuring transformer													
0.2s	0.75	0.35	0.20	-	0.20	0.20	30	15	10	-	10	10	> 10
0.2	-	0.75	0.35	-	0.20	0.20	-	30	15	-	10	10	> 10
0.5s	1.50	0.75	0.50	-	0.50	0.50	90	45	30	-	30	30	> 10
0.5	-	1.50	0.75	-	0.50	0.50	-	90	45	-	30	30	> 10
1	-	3.00	1.50	-	1.00	1.00	-	180	90	-	60	60	> 10
3	-	-	3.00	3.00	3.00	3.00	-	-	-	120	120	120	> 10
Protection current transformer													
5P(n)	-	3.00	1.50	-	1.00	1.00	-	180	90	-	60	60	< 5
10P(n)	-	-	-	3.00	3.00	3.00	-	-	-	120	120	120	< 10
n... over current rated limiting factor													