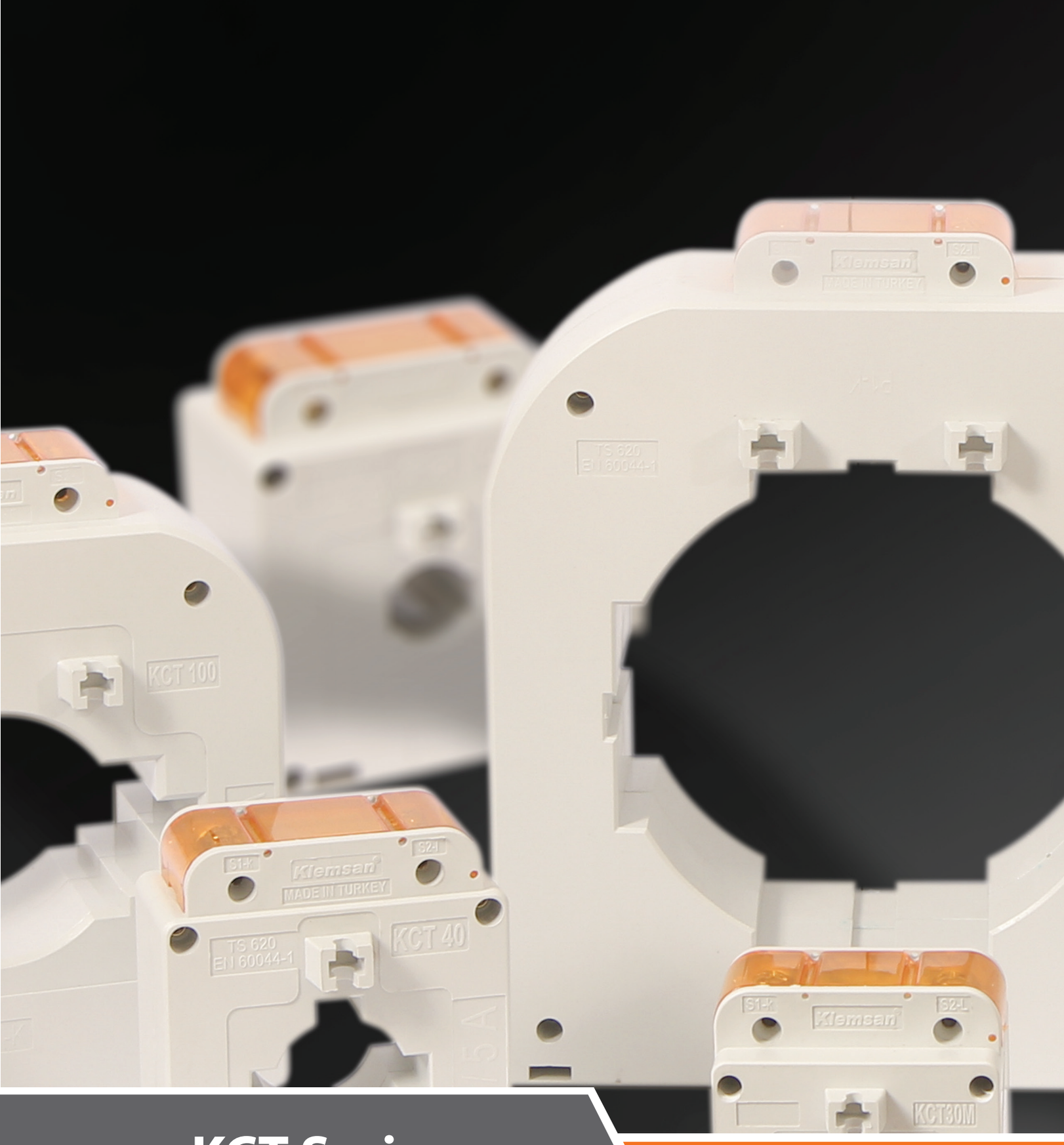



# KCT Series
## Current Transformers

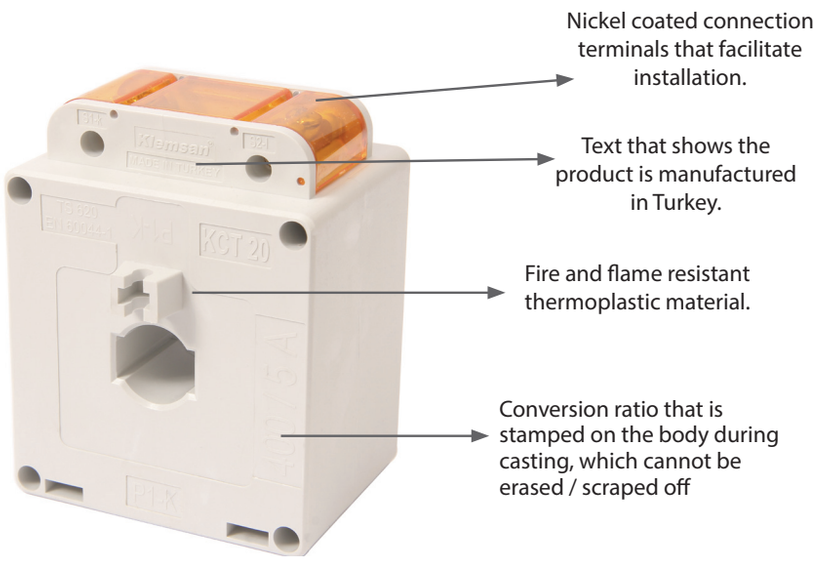
Klemsan®

Leader at Home, Ambitions Worldwide

KLEMSAN low voltage current transformers transform primary currents from 20A to 5000A in desired power and accuracy ratings into 1A or 5A secondary current.

KLEMSAN low voltage current transformers are manufactured in accordance with TS 620 EN 60044-1 with 11 different sizes for varying bus bar measurements. When desired, they can be manufactured with seals from Ministry of Industry and Commerce.

- Quality control for all magnetic kernels are performed and categorized before manufacturing.
- The primary-secondary intermediary insulation strength, which is required as 3 kV in TS 620 EN 60044-1 is 7 kV in Klemsan current transformers.
- Every manufactured Current Transformer is checked for accuracy class using Omicron brand test device.




| Current Transformers | Technical Specifications |
|---|---|
| Highest Mains Voltage | 0.72 kV |
| Location of Use | Indoors |
| Continuous Operation Current | 1.2 x In |
| Primary-Secondary Intermediary Insulation Breakdown Voltage | 7 kV (3 kV in the standard) |
| Accuracy class | 0.2 - 0.5 - 1 - 3 (for protection 5P10 - 10P10 - 5P20 - 10P20) |
| Safety Coefficient Ipn<= 2.000A (Scale Class) | < 5 |
| Safety Coefficient Ipn<= 2.000A (Scale Class) | < 10 |
| Powers | 1.5 - 1.5 - 3.75 - 5 - 7.5 - 10 - 15 - 20 - 25 - 30 VA |
| Nominal Primary Current | 5 A to 5.000 A |
| Nominal Secondary Current | 1 A and 5 A |
| Operating Frequency | 50 - 60 - 150 Hz. |
| Operating Temperature | -5°C / + 45°C |
| Thermal Rated Current | Ith = 60xIn |
| Dynamic Rated Current | Idyn=2.5xIth |

# The importance of current transformer secondary end not being left open

Since the inner resistances of the components connected to the secondary of the current transformer is very low, the current transformers run in short circuit state. If the secondary ends of a current transformer that has its primary connected to the circuit is left open, the magnetic flux of the secondary coil that is in opposite direction to the primary flux is removed. Depending on the current passing through the primaries, the magnetic flux in the transformer kernel increases significantly. When the magnetic flux increases, the transformer kernel is saturated with magnetization current and a few thousand volts of voltage is formed at the secondary ends. Also, since the magnetic flux is high, the iron losses in the kernel increase and heat up the kernel significantly, and the transformer gets damaged. To prevent these hazards, the secondary end of the current transformer is short circuited even if it is not used.

# The importance of grounding of the Current Transformer body and secondary end and the connection type

One end of the secondary coils of the current transformers must be grounded. The reason for this is that; in case of a short circuit between the current transformer's primary coil and secondary coil, the primary circuit voltage creates a closed circuit from the neutral point of the power transformer with the help of the grounded secondary end. If the secondary coil end of the current transformer is not grounded; the primary circuit voltage in the said malfunction is applied on the measurement and protection circuits connected to the secondary. Thus, the insulation of the measurement and protection components on this circuit are punctured. Also, it creates a death hazard for working personnel.

# Determining the power of Current Transformers

The following formula can be used to determine the power of the current transformer. The most important aspect here is that the determined power should not be higher than the full load of the transformer power to be requested and not lower than quarter its load. Otherwise, it may cause incorrect measurement or protection signals to be produced.

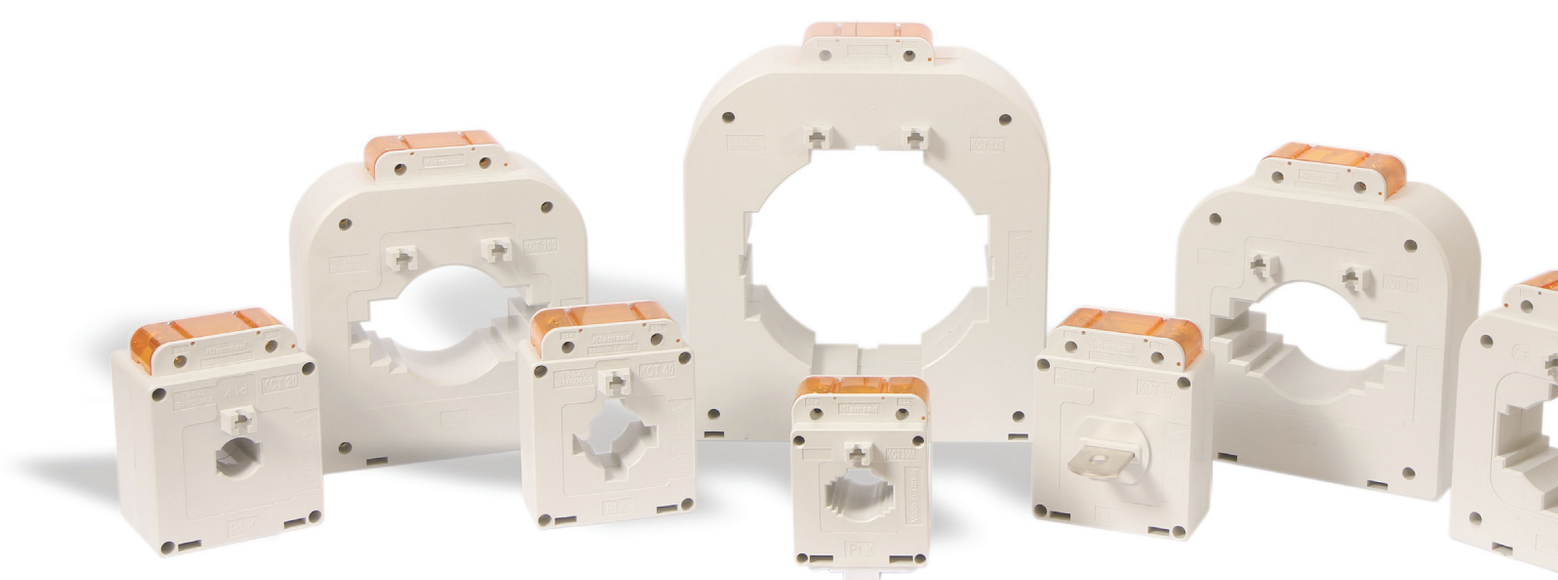
| Distance Between Current Transformer Load | Loss Of The Cable Connected To Secondary (Pk) (VA ) | | | |
|---|---|---|---|---|
| | 2.5 mm² | 4 mm² | 6 mm² | 10 mm² |
| 1m | 0.36 | 0.22 | 0.15 | 0.09 |
| 2m | 0.71 | 0.45 | 0.3 | 0.18 |
| 3m | 1.07 | 0.67 | 0.45 | 0.27 |
| 4m | 1.43 | 0.89 | 0.6 | 0.36 |
| 5m | 1.78 | 1.12 | 0.74 | 0.44 |
| 6m | 2.14 | 1.34 | 0.89 | 0.54 |
| 7m | 2.5 | 1.56 | 1.04 | 0.63 |
| 8m | 2.86 | 1.79 | 1.19 | 0.71 |
| 9m | 3.21 | 2.01 | 1.34 | 0.8 |
| 10m | 3.57 | 2.24 | 1.49 | 0.89 |

*($P_S$) Secondary power*
*($P_A$) Receiver power*
*($P_K$) Connection cable losses*
*($P_T$) Contact losses (can be taken as 0.5 VA)*

*Connection cable losses*
*($P_{EK}$) P= ($Isn^2$x2l) / Sx56*

*Isn = Secondary rated current*
*2l = Length of the conductor between receiver and secondary*
*S = Cross-section of the copper conductor (mm2*
*56 = Specific conductivity of the copper wire*

** The formula above can be used for the power that shall be lost in conductor lengths other than those in the table above.*



# Some important terms used in selection of Current Transformers

## Primary Rated Current

Current transformers must be able to stand against 1.2 times the primary rated current under continuous operation, and thus 1.2 times the secondary rated current as well. Primary rated current is the current value that is taken as basis during transformer manufacture and specifies nominal operating conditions. Klemsan current transformers are manufactured with primary coils up to 150/5 A cl:0.5 10 VA values.

## Saturation Coefficient

The saturation coefficients in current transformers is the minimum current that takes current transformer kernel to saturation. This current is specified as a certain multiple of the secondary current. It is shown as n10 in application. As is known, current transformers allow a current to pass through its their secondary proportional to the current passing through their primary until they are saturated. When the kernel is saturated, the current passing through the secondary remains the same, no matter what current passes through the primary. It is desired that the saturation coefficient for the current transformers to be used in measurement circuits be $n < 5$. Because it is desired that the measurement device not to be damaged under very high short circuit currents that will be produced. Thus the saturation coefficient must be $n < 5$. This is specified as $n \leq 5$ or $Fs \leq 5$ (Safety coefficient) on the current transformer label.

Since the relays used in protection circuits run in case of a malfunction, they wish to sense passing currents that are up to 10 times the rated current to provide selectivity. Thus, it is desired that the secondary of the current transformer that feeds the relay measures the currents up to 10 times the rated current proportional to the current passing through the primary; in other words, not be saturated. Thus $n > 10$. For protection kernels in IEC standards the saturation coefficient is specified as 5P10, 10P10 and 10P20.

## Thermal Rated Current

Current transformer must also be able to withstand against the thermal effects of the short circuit currents that will be created in the system, since it is connected to the system in series. The current value that the current transformer can withstand thermally is shown as thermal rated current (I th) on the label. When the secondary of a current transformer is in short circuit state, the effective value of the primary current that it can withstand without reaching the temperature that will disrupt its insulation for 1sec determines that current transformer's thermal rated current. In Klemsan current transformers the thermal rated current is 60 times the primary rated current.

## Dynamic Rated Current

Dynamic rated current is the maximum (peak) value of the primary current that the current transformer can withstand in relation to the mechanical forces that the pulse current that shall pass in the first period during the short circuit on the primary network shall cause. Dynamic rated current is shown as 2.5 times the thermal rated current.

### Current error and phase shift limits according to TS 620 EN 60044-1 0.1 - 0.2 - 0.5 - 1 classes

| Accuracy Class | The ± percent current (Rate) error for the rated current percentages given below | | | | The ± phase shift for the rated current percentages given below | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Minute | | | | Centiradians | | | |
| | %5 | %20 | %100 | %120 | %5 | %20 | %100 | %120 | %5 | %20 | %100 | %120 |
| 0.1 | 0.4 | 0.2 | 0.1 | 0.1 | 15 | 5 | 5 | 5 | 0.45 | 0.24 | 0.15 | 0.15 |
| 0.2 | 0.75 | 0.35 | 0.2 | 0.2 | 30 | 10 | 10 | 10 | 0.9 | 0.45 | 0.3 | 0.3 |
| 0.5 | 1.5 | 0.75 | 0.5 | 0.5 | 90 | 30 | 30 | 30 | 2.7 | 1.35 | 0.9 | 0.9 |
| 1.0 | 3.0 | 1.5 | 1.0 | 1.0 | 180 | 90 | 60 | 60 | 5.4 | 2.7 | 1.8 | 1.8 |

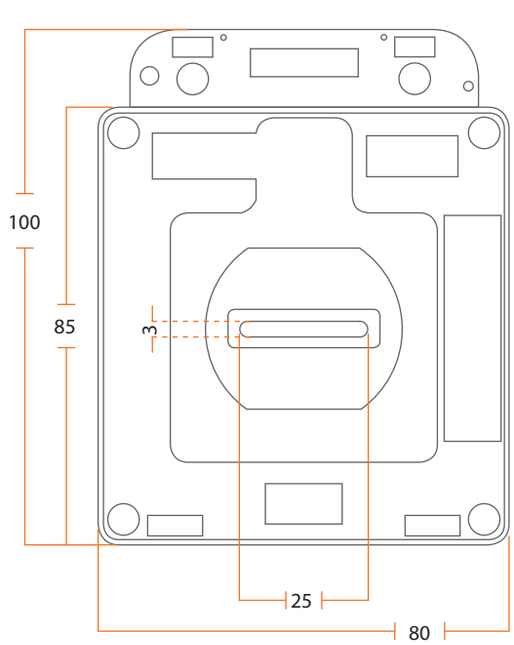
*The values in the table must not be exceeded when the current error and phase shift, secondary load in rated frequency varies between 1/1 and 1/4 of the rated load.*

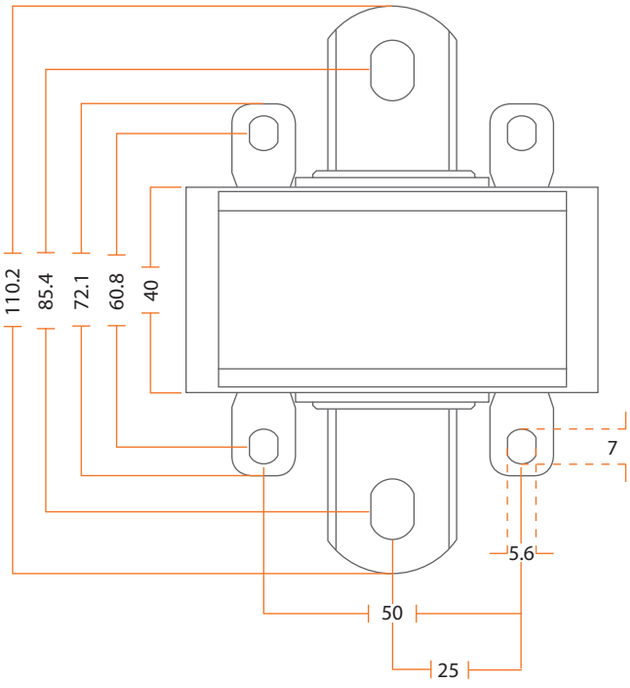
### Current error and phase shift limits for 5P and 10P classes

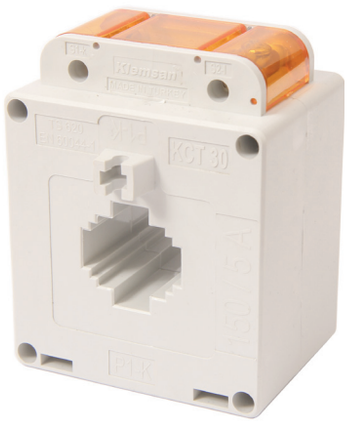
| Accuracy Class | Current error % in primary rated current | Phase shift in primary rated | | Combined error % in rated accuracy limit primary current |
|---|---|---|---|---|
| | | Minute | Centiradians | |
| 5P | ±1 | ±60 | ±18 | 5 |
| 10P | ±3 | - | - | 10 |


## KCT25B Series Bus Bar Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01010 | KCT25B-20 | 20 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01020 | KCT25B-25 | 25 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01030 | KCT25B-30 | 30 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01040 | KCT25B-40 | 40 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01050 | KCT25B-50 | 50 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01060 | KCT25B-60 | 60 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01070 | KCT25B-75 | 75 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01080 | KCT25BN-80 | 80 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01090 | KCT25B-100 | 100 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01100 | KCT25B-125 | 125 | 5 | Self Bus Bar | Standard | 10 | 0,5 |
| 0.0.0.7.01110 | KCT25B-150 | 150 | 5 | Self Bus Bar | Standard | 10 | 0,5 |

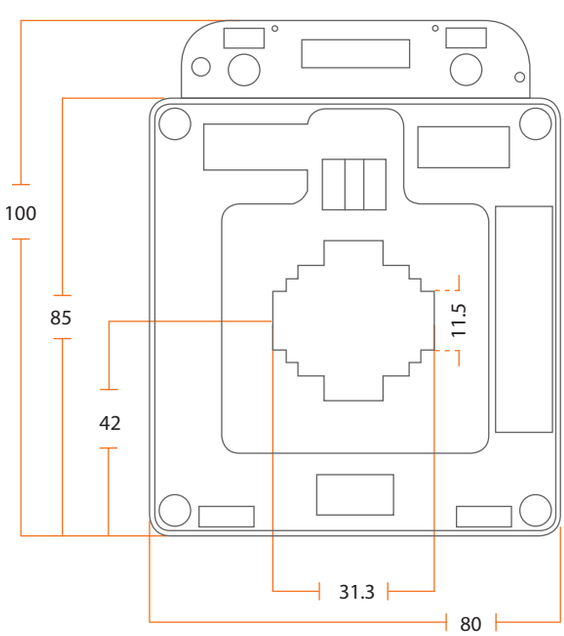


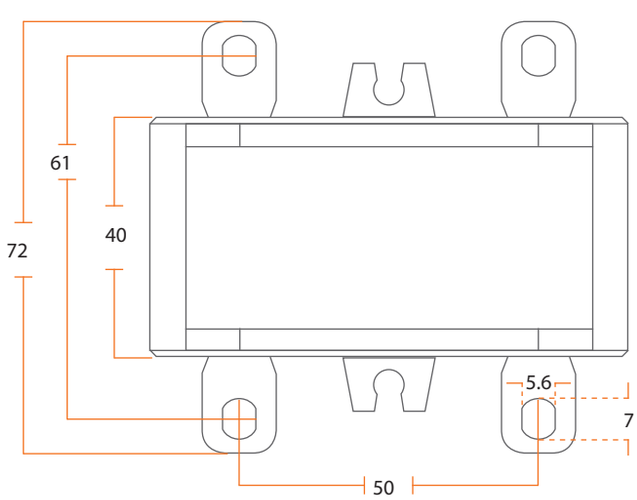





## KCT30 Series Current Transformers

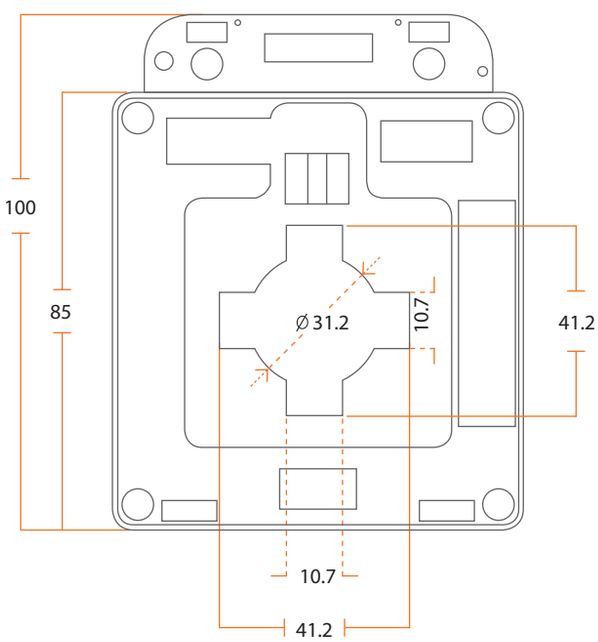
| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01150 | KCT30-150 | 150 | 5 | 30x10 | Standard | 5 | 0,5 |
| 0.0.0.7.01160 | KCT30-200 | 200 | 5 | 30x10 | Standard | 10 | 0,5 |
| 0.0.0.7.01170 | KCT30-250 | 250 | 5 | 30x10 | Standard | 10 | 0,5 |
| 0.0.0.7.01180 | KCT30-300 | 300 | 5 | 30x10 | Standard | 10 | 0,5 |
| 0.0.0.7.01190 | KCT30-400 | 400 | 5 | 30x10 | Standard | 10 | 0,5 |
| 0.0.0.7.01200 | KCT30-500 | 500 | 5 | 30x10 | Standard | 10 | 0,5 |
| 0.0.0.7.01210 | KCT30-600 | 600 | 5 | 30x10 | Standard | 10 | 0,5 |

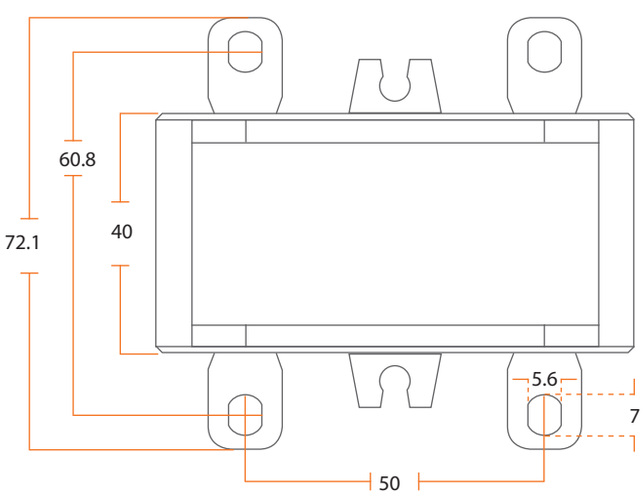


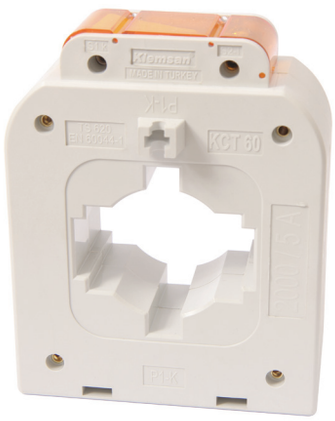



## KCT40 Series Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01220 | KCT40-200 | 200 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01230 | KCT40-300 | 300 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01240 | KCT40-400 | 400 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01250 | KCT40-500 | 500 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01260 | KCT40-600 | 600 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01270 | KCT40-750 | 750 | 5 | 40 x 10 | Standard | 10 | 0,5 |
| 0.0.0.7.01280 | KCT40-800 | 800 | 5 | 40 x 10 | Standard | 10 | 0,5 |

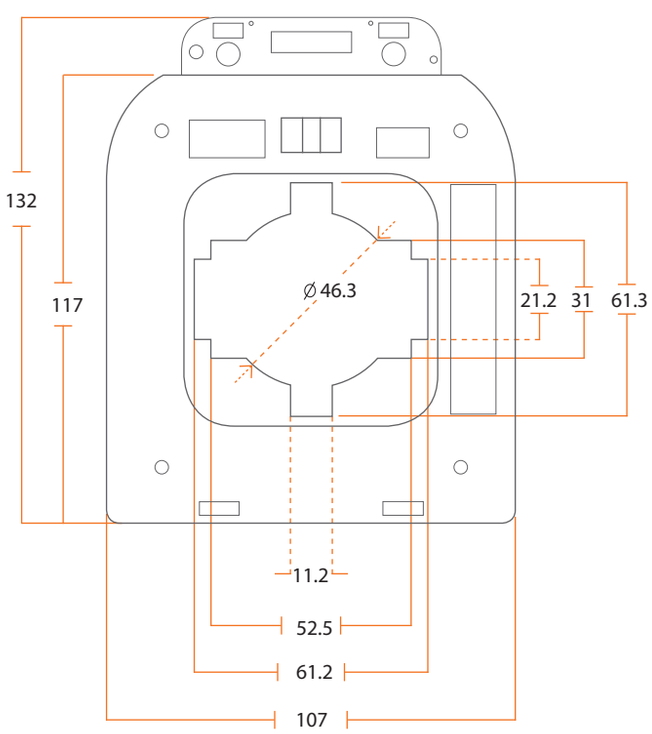


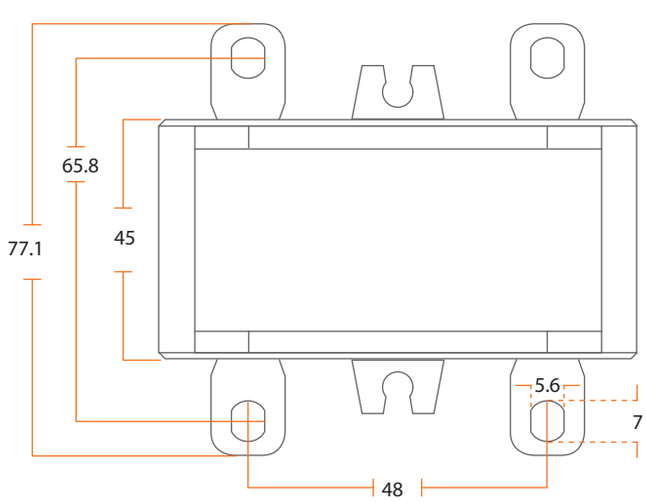






## KCT60 Series Current Transformers

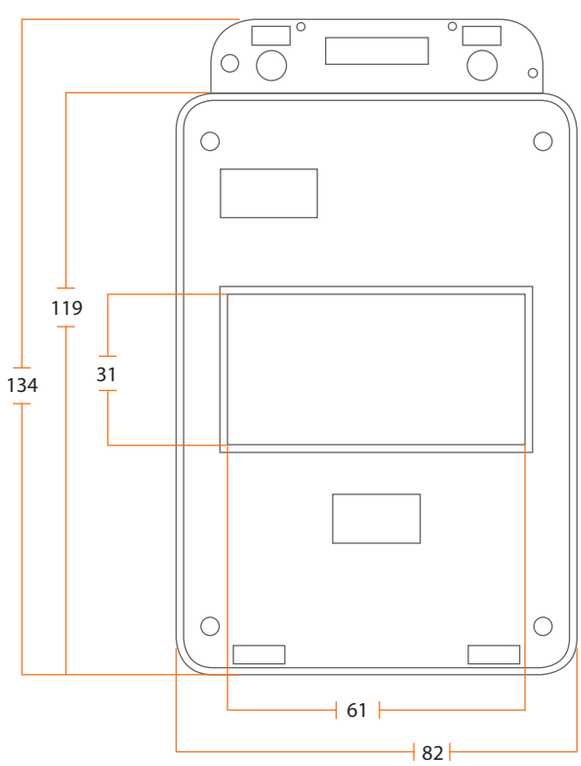
| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01290 | KCT60-400 | 400 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01300 | KCT60-500 | 500 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01310 | KCT60-600 | 600 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01320 | KCT60-750 | 750 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01330 | KCT60-800 | 800 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01340 | KCT60-1000 | 1000 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01350 | KCT60-1200 | 1200 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01360 | KCT60-1250 | 1250 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01370 | KCT60-1500 | 1500 | 5 | 60 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01380 | KCT60-1600 | 1600 | 5 | 60 x 10 | Standard | 15 | 0,5 |

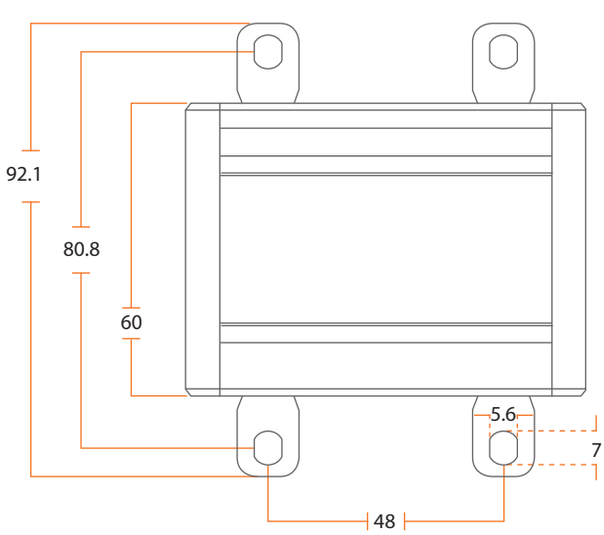


## KCT60D Series Narrow Type Current Transformers

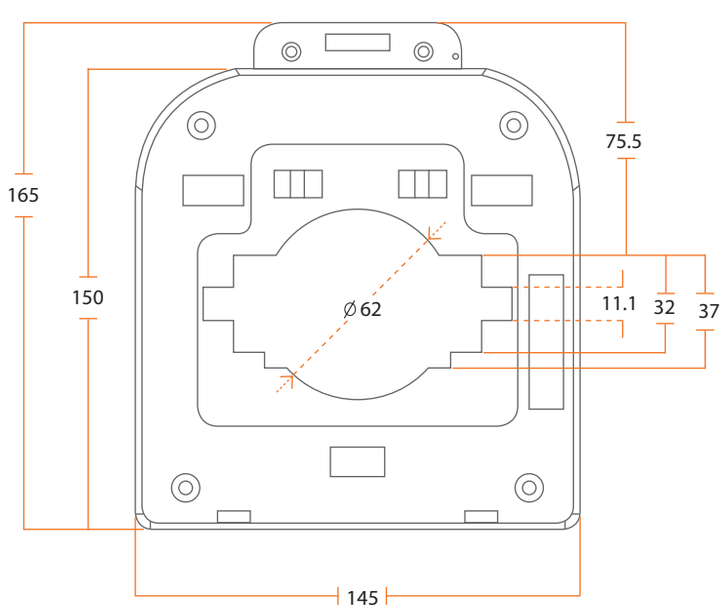
| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01390 | KCT60D-600 | 600 | 5 | 60 x 10 | Narrow | 5 | 0,5 |
| 0.0.0.7.01400 | KCT60D-750 | 750 | 5 | 60 x 10 | Narrow | 7,5 | 0,5 |
| 0.0.0.7.01410 | KCT60D-800 | 800 | 5 | 60 x 10 | Narrow | 7,5 | 0,5 |
| 0.0.0.7.01420 | KCT60D-1000 | 1000 | 5 | 60 x 10 | Narrow | 10 | 0,5 |
| 0.0.0.7.01430 | KCT60D-1200 | 1200 | 5 | 60 x 10 | Narrow | 15 | 0,5 |
| 0.0.0.7.01440 | KCT60D-1250 | 1250 | 5 | 60 x 10 | Narrow | 15 | 0,5 |
| 0.0.0.7.01450 | KCT60D-1500 | 1500 | 5 | 60 x 10 | Narrow | 15 | 0,5 |
| 0.0.0.7.01460 | KCT60D-1600 | 1600 | 5 | 60 x 10 | Narrow | 15 | 0,5 |

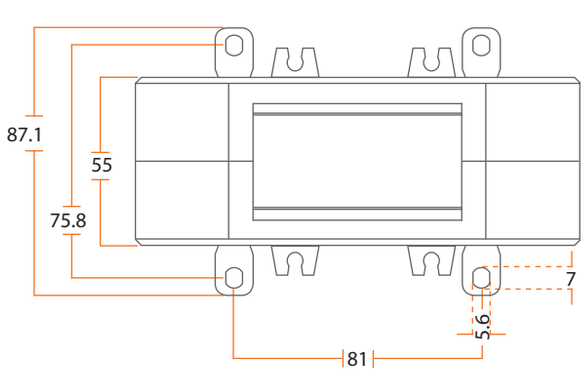


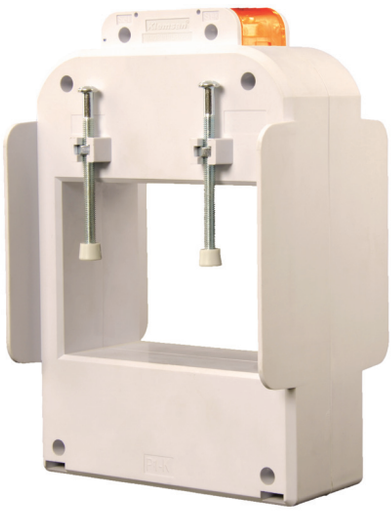



## KCT100 Series Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01470 | KCT100-1000 | 1000 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01480 | KCT100-1200 | 1200 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01490 | KCT100-1250 | 1250 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01500 | KCT100-1500 | 1500 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01510 | KCT100-1600 | 1600 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01520 | KCT100-2000 | 2000 | 5 | 100 x 10 | Standard | 15 | 0,5 |
| 0.0.0.7.01530 | KCT100-2500 | 2500 | 5 | 100 x 10 | Standard | 15 | 0,5 |

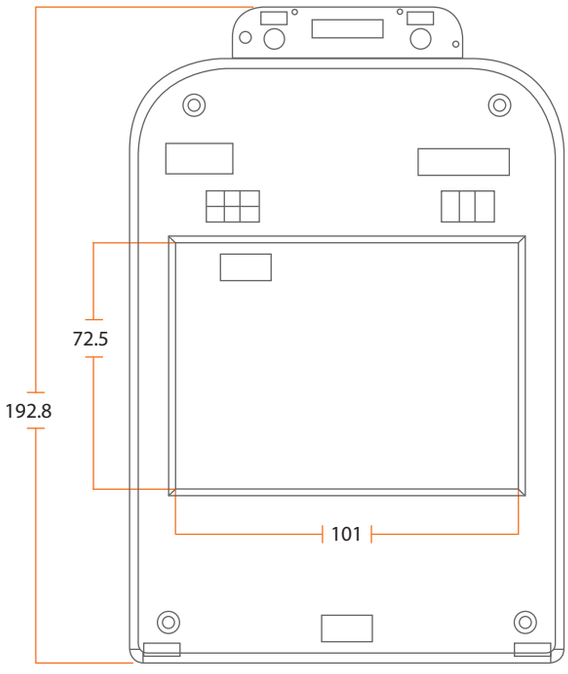


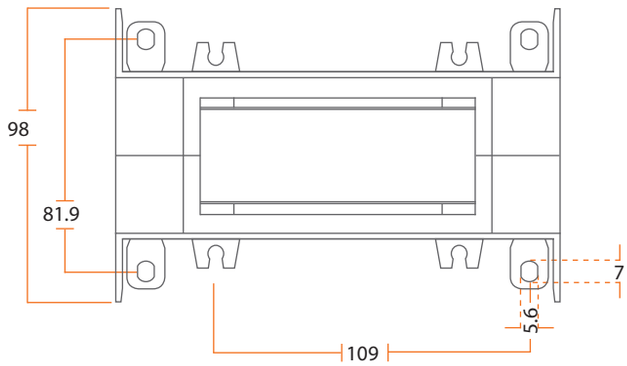



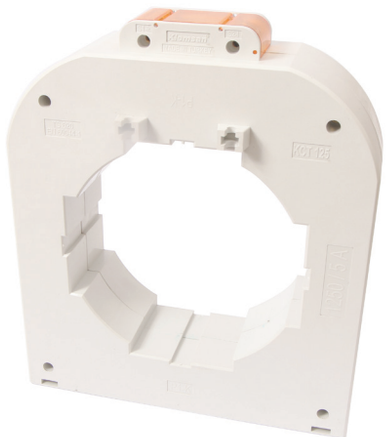


## KCT100D Series Narrow Type Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01540 | KCT100D-1000 | 1000 | 5 | 4 x (100 x 10) | Narrow | 10 | 0,5 |
| 0.0.0.7.01550 | KCT100D-1200 | 1200 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01560 | KCT100D-1250 | 1250 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01570 | KCT100D-1500 | 1500 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01580 | KCT100D-1600 | 1600 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01590 | KCT100D-2000 | 2000 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01600 | KCT100D-2500 | 2500 | 5 | 4 x (100 x 10) | Narrow | 15 | 0,5 |
| 0.0.0.7.01610 | KCT100D-3000 | 3000 | 5 | 4 x (100 x 10) | Narrow | 30 | 0,5 |
| 0.0.0.7.01620 | KCT100D-4000 | 4000 | 5 | 4 x (100 x 10) | Narrow | 30 | 0,5 |

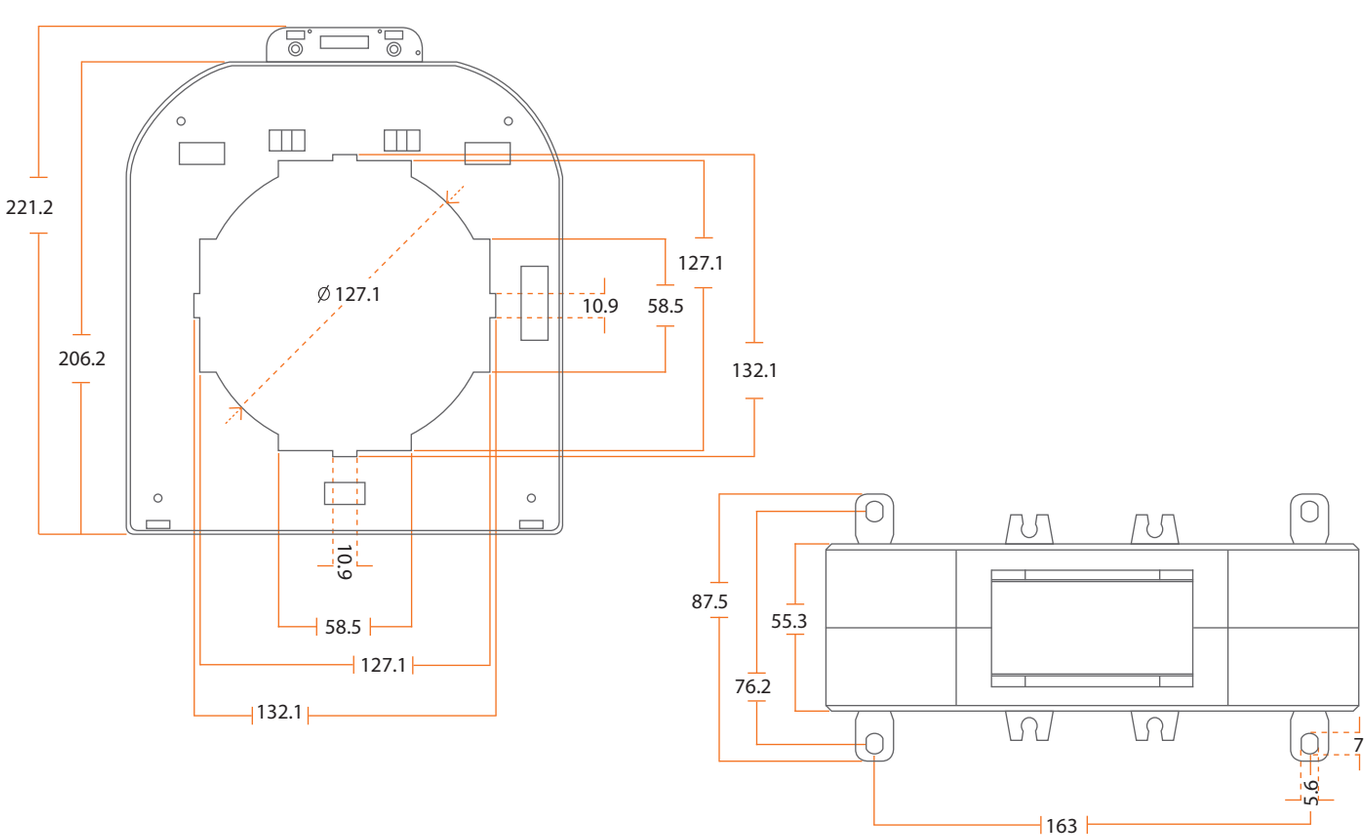




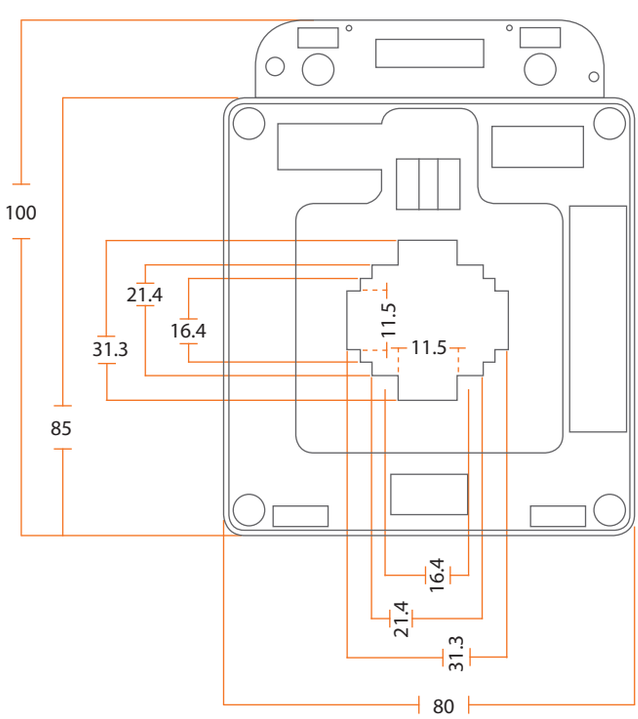
## KCT125 Series Current Transformers

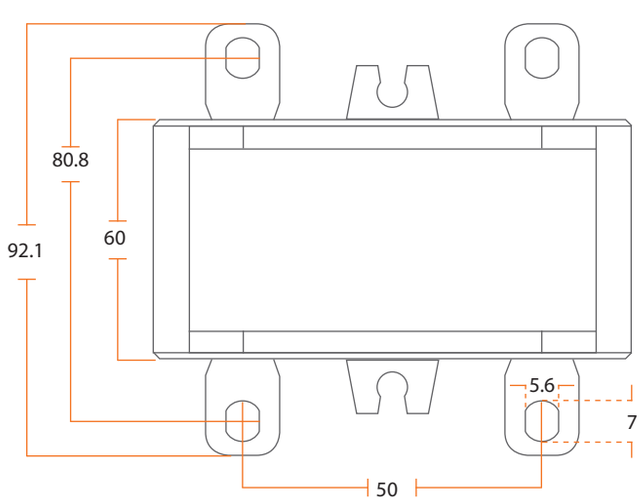
| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01630 | KCT125-1250 | 1250 | 5 | 3 x (125 x 10) | Standard | 15 | 0,5 |
| 0.0.0.7.01640 | KCT125-1500 | 1500 | 5 | 3 x (125 x 10) | Standard | 15 | 0,5 |
| 0.0.0.7.01650 | KCT125-1600 | 1600 | 5 | 3 x (125 x 10) | Standard | 15 | 0,5 |
| 0.0.0.7.01660 | KCT125-2000 | 2000 | 5 | 3 x (125 x 10) | Standard | 15 | 0,5 |
| 0.0.0.7.01670 | KCT125-2500 | 2500 | 5 | 3 x (125 x 10) | Standard | 15 | 0,5 |
| 0.0.0.7.01680 | KCT125-3000 | 300 | 5 | 3 x (125 x 10) | Standard | 30 | 0,5 |
| 0.0.0.7.01690 | KCT125-4000 | 4000 | 5 | 3 x (125 x 10) | Standard | 30 | 0,5 |
| 0.0.0.7.01700 | KCT125-5000 | 5000 | 5 | 3 x (125 x 10) | Standard | 30 | 0,5 |

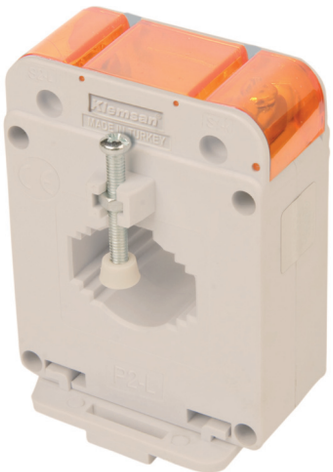



## KCT30L Series Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01120 | KCT30L-100 | 100 | 5 | 30x10 | S30L | 5 vA | 0,5 |
| 0.0.0.7.01130 | KCT30L-125 | 125 | 5 | 30x10 | S30L | 5 vA | 0,5 |
| 0.0.0.7.01140 | KCT30L-150 | 150 | 5 | 30x10 | S30L | 10 vA | 0,5 |

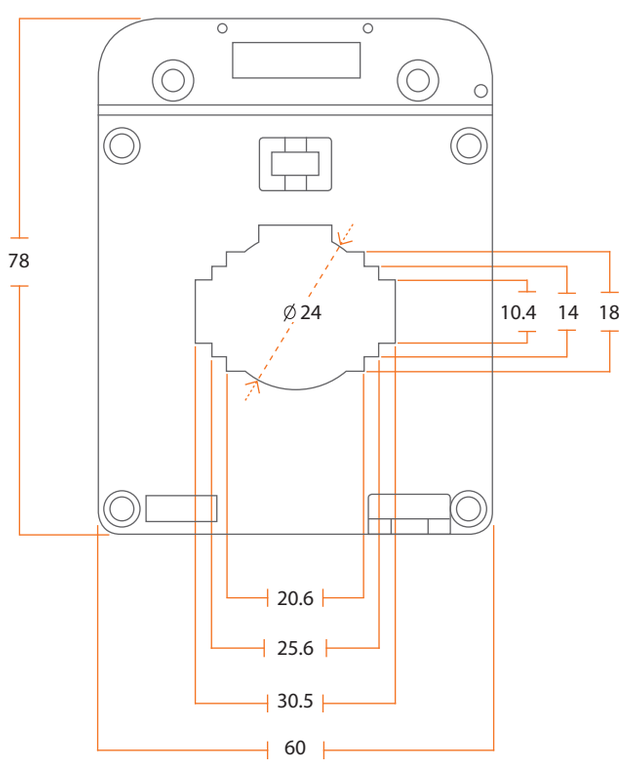


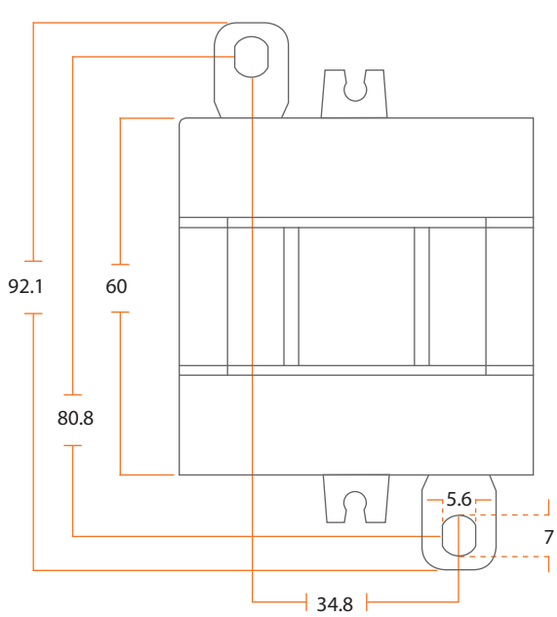





## KCT30SL Series Mini Current

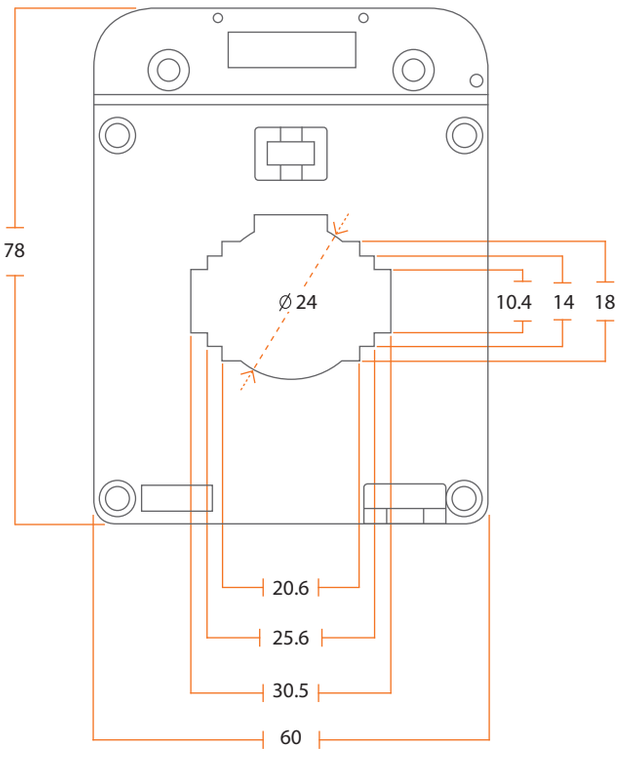
| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01710 | KCT30SL-100 | 100 | 5 | 30x10 | S30ML | 2,5 | 1 |
| 0.0.0.7.01720 | KCT30SL-125 | 125 | 5 | 30x10 | S30ML | 2,5 | 1 |
| 0.0.0.7.01730 | KCT30SL-150 | 150 | 5 | 30x10 | S30ML | 2,5 | 1 |
| 0.0.0.7.01740 | KCT30SL-200 | 200 | 5 | 30x10 | S30ML | 5 | 0,5 |
| 0.0.0.7.01750 | KCT30SL-250 | 250 | 5 | 30x10 | S30ML | 10 | 0,5 |
| 0.0.0.7.01760 | KCT30SL-300 | 300 | 5 | 30x10 | S30ML | 10 | 0,5 |
| 0.0.0.7.01770 | KCT30SL-400 | 400 | 5 | 30x10 | S30ML | 10 | 0,5 |
| 0.0.0.7.01780 | KCT30SL-500 | 500 | 5 | 30x10 | S30ML | 10 | 0,5 |
| 0.0.0.7.01790 | KCT30SL-600 | 600 | 5 | 30x10 | S30ML | 10 | 0,5 |

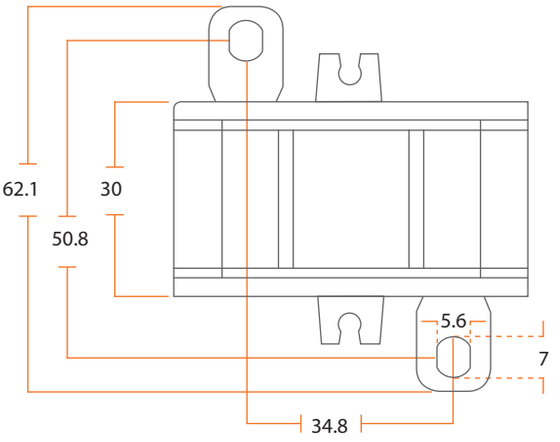


## KCT30S Series Mini Current Transformers

| Stock Code | Stock Name | Primary Current (A) | Secondary Current (A) | Bus Bar Measurement (mm) | Type | Power (VA) | Accuracy Class (%) |
|---|---|---|---|---|---|---|---|
| 0.0.0.7.01800 | KCT30S-200 | 200 | 5 | 30x10 | S30M | 2,5 | 1 |
| 0.0.0.7.01810 | KCT30S-250 | 250 | 5 | 30x10 | S30M | 5 | 0,5 |
| 0.0.0.7.01820 | KCT30S-300 | 300 | 5 | 30x10 | S30M | 5 | 0,5 |
| 0.0.0.7.01830 | KCT30S-400 | 400 | 5 | 30x10 | S30M | 5 | 0,5 |
| 0.0.0.7.01840 | KCT30S-500 | 500 | 5 | 30x10 | S30M | 5 | 0,5 |
| 0.0.0.7.01850 | KCT30S-600 | 600 | 5 | 30x10 | S30M | 10 | 0,5 |



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