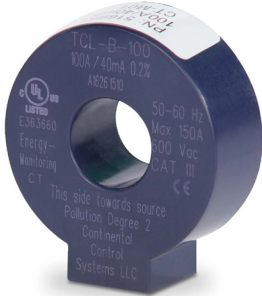



TCL-B Series

Solid-Core Current Transformer Installation Guide





Danger: Hazardous Voltages
Potential shock hazard from dangerous high voltage exists.

The TCL-B series current transformers measure AC line current in circuits up to 600 Vac and nominal currents up to 100 amps. They are solid-core (toroidal) which offers high accuracy (0.3%), security, and low-cost.

They are UL Listed for field installation within distribution and control equipment such as panelboards, switchboards, industrial control equipment, and energy-monitoring/management equipment. They are used to measure current on the service entrance or branch circuit conductors.

The TCL-B series CT are available with either milliamp or millivolt outputs. They are used with electric energy meters, like the WattNode meters, or for other current monitoring purposes.

Precautions

- Only qualified personnel or **licensed electricians** should install the current transformer (CT). The line voltages of 120 Vac to 600 Vac can be lethal!
- Install in accordance with ANSI/NFPA 70, "National Electrical Code" (NEC). Follow all local electrical codes.
- Electrical codes prohibit installation of CTs in equipment where they exceed 75% of the wiring space of any cross-sectional area.
- Do not install CTs where they block ventilation openings.
- Do not install CTs in the area of breaker arc venting.
- The CT lead wires are considered Class 1 wiring (as defined by the NEC) and must be installed accordingly. They are not suitable for Class 2 wiring methods and should not be connected to Class 2 equipment.
- Verify that the line currents will not exceed the "Maximum Amps" (see the Models table below) under normal operation.
- Do not install the CT where it may be exposed to temperatures below -40°C or above 85°C (-40°F to 185°F), excessive moisture, dust, salt spray, or other contamination.
- The current transformer cannot measure direct current (DC), and DC will degrade the AC accuracy.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

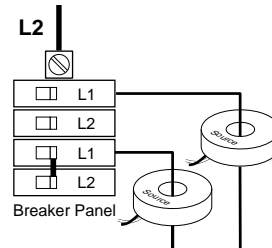
Pre-Installation Checklist

- The CT's rated current should normally be greater than or equal to the maximum current of the measured circuit. Ensure that the fuse or circuit breaker's rating does not exceed the CT's maximum continuous current rating.
- It is preferable to install the CT and meter or monitoring device close to each other. However, you may extend the CT wires by 300 feet (100 m) or more by using shielded twisted-pair cable and by running the CT wires away from high current and line voltage conductors.

Connecting the Current Transformer

- WARNING: To reduce the risk of electric shock, always open or disconnect the circuit from the power-distribution system (or service) of the building before installing or servicing current transformers.**
- Disconnect the conductor to be monitored, so that the CT may be installed on the conductor.
- Install the CT on the conductor with the labeled side of the CT (with "This side towards source") facing toward the current source: the utility meter or the circuit breaker for branch circuits.

Note: If the CT is mounted backwards, the measured power will be negative.



- Reconnect the conductor to be monitored.
- Optional:* Secure the CT to the conductor with a cable tie.
- Route the twisted black and white wires from the CT to the meter or monitoring device. **Be sure to secure the CTs and route the lead wires so that they do not directly contact live terminals or busses.**
- Connect the white and black wires to the terminals on the meter or monitoring device.

Note: If the white and black wires are reversed, the measured power will be negative.

Note: On a WattNode meter, the white wire should be aligned with the white dot on the label, and the black wire should be aligned with the black dot on the label.

Note: Be careful to match the CT to the voltage phases being measured. Use colored labels or tape to identify the wires.

References

For more information about the TCL-B current transformer and CTs in general, see:

- <https://ctlsys.com/product/tcl-b-ct/>
- <https://ctlsys.com/cat/current-transformer/>

For more information about connecting current transformers to WattNode meters, see the appropriate WattNode meter manual.

Specifications

Models

Model	Rated Amps	Output	Accuracy
TCL-B-100	100 A	0.33333 Vac	0.3%
TCL-B-050	50 A	0.33333 Vac	0.3%
TCL-B-100/40mA	100 A	40 mA	0.2%

Electrical

Line Frequency: 50 to 60 Hz

Maximum Continuous Primary Current: 250 amps

Maximum Voltage: 600 Vac

Overvoltage and Measurement Categories: CAT III: 600 Vac

Lead Wire: 2.4 m (8 feet), 18 AWG, 105°C, 600 V, twisted pair

Milliamp Output: Current output

Output Current: 40 mA at 100 A primary current

Output Protection: includes internal clamp Zener at 13 Vac

Millivolt Output: Voltage output, integral burden resistor

Output Voltage at Rated Amps: 0.33333 Vac (one-third volt)

Output Protection: internal burden resistor

Accuracy

Millivolt Output Accuracy (% of reading): TCL-B-xxx

Accuracy: $\pm 0.3\%$ from 1% to 120% of rated current

Phase angle:

± 0.15 degrees (9 minutes) from 20% to 120% of rated current

± 0.33 degrees (20 minutes) from 1% to 20% of rated current

IEEE C57.13 accuracy: class 0.6

IEC 60044-1 accuracy: class 0.5S

Milliamp Output Accuracy (% of reading): TCL-B-100/40mA

Accuracy: $\pm 0.2\%$ from 1% to 120% of rated current

Phase angle:

± 0.15 degrees (9 minutes) from 20% to 120% of rated current

± 0.33 degrees (20 minutes) from 1% to 20% of rated current

IEEE C57.13 accuracy: class 0.6

IEC 60044-1 accuracy: class 0.2

Regulatory

CE

UL: UL listed, X0BA, UL 2808, CAN/CSA-C22.2 No. 61010-1, E363660

RoHS Compliant

Environmental

Operating Temperature: -40°C to $+85^{\circ}\text{C}$ (-40°F to 185°F)

Operating Humidity: Non-condensing, 0 to 100% relative humidity (RH)

Operating Altitude: Up to 3000m

Pollution: POLLUTION DEGREE 2

Indoor Use: Suitable for indoor use

Outdoor Use: Suitable for outdoor use when mounted in a NEMA 3R or 4 (IP 66) rated enclosure, provided the ambient temperature will not exceed 85°C (185°F).

Mechanical

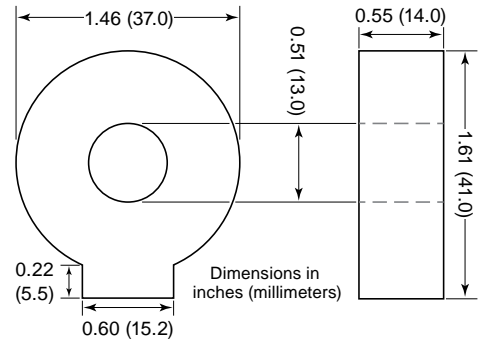
Width: 1.46 inches (37.0 mm \pm 0.3 mm)

Height: 1.61 inches (41.0 mm \pm 0.3 mm)

Thickness: 0.55 inches (14.0 mm \pm 0.2 mm)

Opening: 0.51 inches (13.0 mm \pm 0.2 mm)

Weight: 125 g



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Revision Date: July 2, 2018

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