



\Leftarrow WARNING \Rightarrow

- Electric Shock Hazard, Use Caution

- Disconnect and lock out power before installation
- Follow national and local electrical codes
- Read and understand these instructions before installing
- Installation only by qualified electrical personnel
- Do not rely on this device to indicate line power
- Only install this device on insulated conductors
- Only install on 600 Vac maximum conductors
- Do not use this device for life-safety applications
- Do not install in hazardous or classified locations
- Install this product in a suitable electrical enclosure
- Failure to follow these instructions will result in death or serious injury.

Specifications

Measurement Range 10/20/50 Amps (Select model)
Maximum Input Current 100 Amps continuous
Accuracy $\dots \dots \pm 1\%$ FSO
Sensor Power 15 to 30 Vdc (loop powered)
Output Signal
Insulation Class 600 Vac, insulated conductors
Frequency 50/60 Hz
Response Time
Output Load 250 Ω typical
Maximum Load
Operating Temperature15 to 60 °C (5 to 140 °F)
Operating Humidity 5 to 90 %RH, non-condensing
Terminal Block 14 to 22 AWG
Dimensions 1.9 x 1.93 x 0.83 in
(48 x 49 x 21 mm)
Sensor Aperture 0.45 in (11.4 mm)
Enclosure Material ABS/PC, UL94 V-0
Manufacturing ISO 9001 Certified
Agency Approvals cULus Listed

Operation

The CS-652-xx series of current sensors monitor line current for electrical loads such as pumps, conveyors, machine tools or fans and output an analog 4-20 mA signal to represent the load current. They are typically used to monitor motor operation and can be used to determine motor failure, belt loss, machine feed rates or tool wear.

The sensors are loop powered and require an external 15-30 Vdc power supply. The power supply must be 10 Vdc + (Rload x 20 mA) where Rload is the input resistance of the device measuring the signal. So if Rload is 250 Ω the minimum power supply is 15 Vdc. The measured AC line current can be calculated as Iline = (Iloop - 4 mA) x Irange / 16 where Irange is 10, 20 or 50 Amps.

The output signal is limited to < 23 mA, is reverse voltage protected and is factory calibrated to < \pm 1% FSO.



Factory Calibrated Ranges

Installation

- Read all warnings before beginning
- Ensure the selected device has the correct ratings
- Disconnect and lock out power
- Mount the sensor with two screws through the base
- Place the monitored conductor through the sensor hole
- Observe polarity and wire the output to the controller
- Ensure the controller scale matches the sensed range
- Reconnect the power



Dimensions

 $\begin{array}{c} 1.30 \text{ in} \\ 33 \text{ mm} \\ \hline \\ 0.45 \text{ in} \\ 0.45 \text{ in} \\ 0.45 \text{ in} \\ 1.93 \text{ in} \\ 49 \text{ mm} \\ 49 \text{ mm} \\ 1.9 \text{ in} \\ 48 \text{ mm} \end{array}$



Calibration

All models are factory calibrated to operate within $\pm 1\%$ of FSO. If field calibration is required or a custom measurement range is desired, simply peel back the top label to expose the calibration pots. The adjustment pots set the current zero (4 mA) and span (20 mA) of the device and may be adjusted by about $\pm 20\%$ of FSO. Repeat each adjustment until both are acceptable.

Wiring



Applications

For applications with load currents exceeding the sensor current range use an external CT to reduce the current to an acceptable value. For example, to measure a 200 Amp load current, use a 200A:5A CT and wrap the CT secondary through the CS-652-10 twice so the sensor output will be 4-20 mA = 0-200 Amps.

For applications with very small load currents (such as less than 1 Amp), wrap the monitored conductor through the sensor aperture several times to increase the current measured by the sensor. For example, to measure 0-2 Amps with a CS-652-10, wrap the conductor through the sensor aperture 5 times so the sensor output will be 4-20 mA = 0-2 Amps.

For any application using an external CT or with multiple wraps, ensure the controller is scaled accordingly to obtain the correct readings.

For any application with multiple wraps, note that the CS-652 maximum current rating must be divided by the number of wraps. For example, with one wrap the maximum current is 100 Amps, with 5 wraps the maximum current is 100/5 = 20 Amps. Ensure the load current is < 20 Amps or the device may overheat and be damaged.