

## MODEL CTR - TRUE RMS AC CURRENT TRANSDUCER

- TRUE RMS OUTPUT
- JUMPER SELECTABLE RANGES
- OUTPUT IS MAGNETICALLY ISOLATED FROM THE INPUT
- SPLIT-CORE CASE



### GENERAL DESCRIPTION

CTR Series transducers combine a current transformer and a signal conditioner into a single package. This provides higher accuracy, lower wiring costs, easier installation and saves valuable panel space.


The CTR Series transducers are available in 4-20 mA output only. The CTR Series provides a "True RMS" output on distorted waveforms found on VFD or SCR outputs, and on linear loads in "noisy" power environments. Select the CTR Series for variable speed or SCR controlled loads.

The current waveform of a typical linear load is a pure sine wave. In VFD and SCR applications, however, output waveforms are rough approximations of a sine wave. There are numerous spikes and dips in each cycle. CTR transducers use a mathematical algorithm called "True RMS", that integrates the actual waveform over time. The output is the amperage component of the true power (heating value) of the AC current waveform. True RMS is the only way to accurately measure distorted AC waveforms.


### SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so, can be potentially harmful to persons or equipment in the event of a fault to the unit.



**CAUTION: Read complete instructions prior to installation and operation of the unit.**



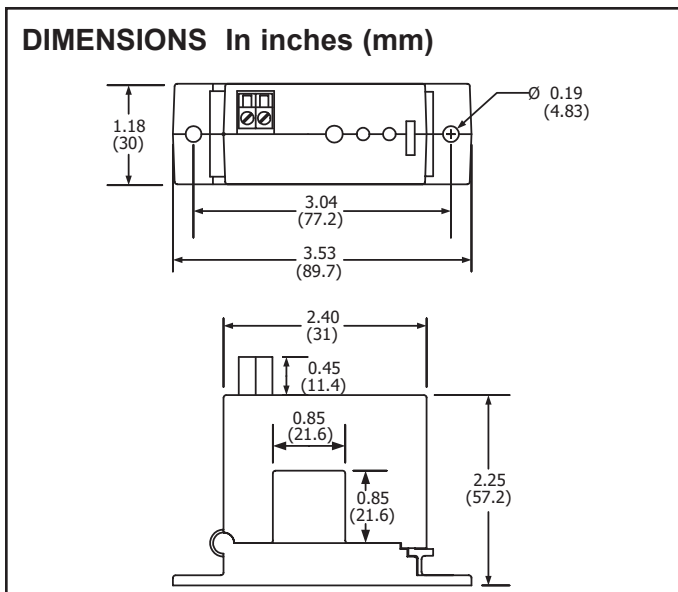
**CAUTION: Risk of electric shock.**

### SPECIFICATIONS

1. **OUTPUT SIGNAL:** 4 to 20 mA DC, loop-powered, True RMS
2. **OUTPUT LIMIT:** 23 mA
3. **FREQUENCY RANGE:** 10-400 Hz (All Waveforms)
4. **RESPONSE TIME:** to 90% of step change 600 msec
5. **ACCURACY:** 0.8% FS
6. **POWER SUPPLY:** 24 VDC Nominal, 40 VDC Max.
7. **INPUT RANGES:** (Jumper Selectable)

MODEL	RANGE	MAXIMUM		
		Continuous	6 sec	1 sec
CTR05	10 A	80 A	125 A	250 A
	20 A	110 A	150 A	300 A
	50 A	175 A	215 A	400 A
CTR2	100 A	200 A	300 A	600 A
	150 A	300 A	450 A	800 A
	200 A	400 A	500 A	1000 A

8. **ISOLATION VOLTAGE:** 3 kV
9. **CASE:** UL 94V-0 Flammability rated thermoplastic
10. **ENVIRONMENTAL:** -4 to 122 °F (-20 to 50 °C)  
0-95% RH, non-condensing
11. **TORQUE RATINGS:** 9 in-lbs
12. **LISTING:** UL 508 Industrial Control Equipment, CSA C22.2 No. 14-M95, and CE Certified.

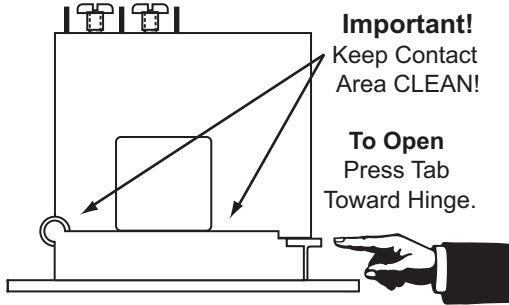


## INSTALLATION

Run wire to be monitored through opening in the sensor. Be sure the monitored current flows in the same direction as the arrow on the sensor. The CTR Series transducers work in the same environment as motors, contactors, heaters, pull-boxes, and other electrical enclosures. They can be mounted in any position or hung directly on wires with a wire tie. Just leave at least one inch (25.4 mm) distance between sensor and other magnetic devices.

### Split-Core Versions

Press the tab in the direction as shown to open the sensor. After placing the wire in the opening, press the hinged portion firmly downward until a definite click is heard and the tab pops out fully.



### KEEP SPLIT-CORE SENSORS CLEAN.

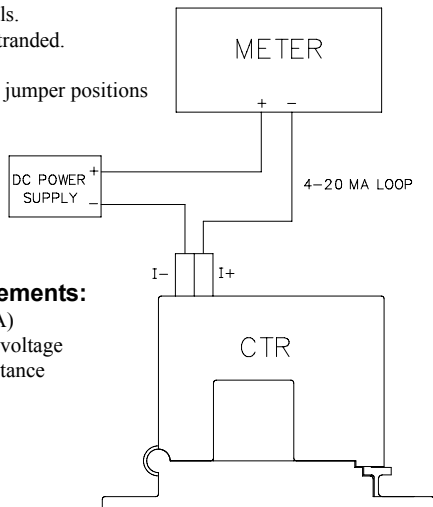
Silicone grease is factory applied on the mating surfaces to prevent rust and improve performance. Be careful not to allow grit or dirt onto the grease in the contact area. Operation can be impaired if the mating surfaces do not have good contact. Check visually before closing.

## OUTPUT WIRING

Connect control or monitoring wires to the sensor. Use up to 14 AWG copper wire and tighten terminals to 9 inch-pounds torque. Be sure the output load or loop power requirements are met (see diagram).

### Connection Notes:

- Captive screw terminals.
- 14-22 AWG solid or stranded.
- Observe Polarity
- See label for ranges & jumper positions



### Loop Voltage Requirements:

$$V_L = 12V + (R_L \times 20 \text{ mA})$$

Where:  $V_L$  = Min. Loop voltage  
 $R_L$  = Loop Resistance

## RANGE SELECT

CTR series transducers feature field selectable ranges. The ranges are factory calibrated, eliminating time consuming and inaccurate field setting of zero or span.

1. Determine the normal operating amperage of your monitored circuit
2. Select the range that is equal to or slightly higher than the normal operating amperage.
3. Place the range jumper in the appropriate position.

## TROUBLE SHOOTING

### 1. Sensor Has No Output

- A. Power supply is not properly sized. Check power supply voltage and current rating.
- B. Polarity is not properly matched. Check and correct wiring polarity.
- C. Split Core models: The core contact area may be dirty. Open the sensor and clean the contact area.

### 2. Output Signal Too Low

- A. The jumper may be set in a range that is too high for current being monitored. Move jumper to the correct range.
- B. Output load too high. Check output load, be sure that  $V_L$  does not exceed 40 VDC.
- C. Monitored current is below minimum required. Loop the monitored wire several times through the aperture until the "sensed" current rises above minimum. Sensed Amps = (Actual Amps) x (Number of Loops). Count loops on the inside of the aperture.

### 3. Output Signal Is Always At 4mA

- A. Monitored load is not AC or is not on. Check that the monitored load is AC and that it is actually on.

### 4. Output Signal Is Always At 20mA

- A. The jumper may be set in a range that is too low for current being monitored. Move jumper to the correct range.

## ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS
CTR	50 A/4-20 mA, Split Case	CTR05000
	200 A/4-20 mA, Split Case	CTR20000

### LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.