

# Installation Instructions

## VoltageWatch™ Voltage Sensors



### WARNING

#### IN ORDER TO AVOID ELECTRIC SHOCK OR OTHER POSSIBLE INJURY:

- TO AVOID ANY POTENTIAL FOR SHOCK OR SAFETY HAZARD, ENSURE LINE VOLTAGE IS DISCONNECTED AT SOURCE BEFORE WIRING TO UNIT.
- DO NOT USE THIS PRODUCT FOR HUMAN SAFETY APPLICATIONS. IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.
- DO NOT USE THIS PRODUCT IN HAZARDOUS LOCATIONS (E.G. EXPLOSIVE ATMOSPHERES). IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.
- ENSURE THE PRODUCT IS PROPERLY WIRED TO THE CORRECT POWER SUPPLY FOR THE APPLICATION. REFER TO THE SPECIFICATIONS AND WIRING DIAGRAMS IN THIS MANUAL.

### MODELS COVERED IN THIS MANUAL

| Catalog Number | Description  |
|----------------|--|
| EVT1-420-24L   | AC Voltage Sensor, 120V Max Input, 4-20mA Output, Loop Powered |
| EVT3-420-24L   | AC Voltage Sensor, 240V Max Input, 4-20mA Output, Loop Powered |
| EVT4-420-24L   | AC Voltage Sensor, 480V Max Input, 4-20mA Output, Loop Powered |

### INTRODUCTION

Eaton's VoltageWatch™ sensors are designed to monitor AC voltages to allow a monitoring system to detect conditions where supply voltage is above or below normal. Detecting such conditions helps users avoid problems commonly associated with voltage irregularities, such as motor overheating, damage to drives due to regeneration, and loss of phase.



VoltageWatch sensors are available with a 4-20mA "True RMS" output as standard, making them suitable for use in applications where the waveform of the monitored voltage is distorted (such as noisy environments, variable speed applications or SCR controlled loads).

### MOUNTING

VoltageWatch sensors feature a 35mm wide DIN rail compatible enclosure and are typically located in the same environment as motors, contactors, heaters, pull-boxes, and other electrical devices.

**Mounting on DIN Rail:** Orient the sensor so that line voltage terminals L1 and L2 are upright (on top) of the unit and snap securely onto DIN rail. To remove, insert small screwdriver into depression on top of unit and pry orange mounting tab up until unit dislodges from DIN rail.

**Screw Mounting:** Insert small screwdriver into depression on top of unit and pry orange mounting tab up to reveal mounting hole. Continue to pry tab up until it extends and snaps into place, about 0.25 inches. Insert screws and mount to back plane or other suitably flat surface.

### LINE VOLTAGE CONNECTION WARNING

CAUTION: TO AVOID ANY POTENTIAL FOR SHOCK OR SAFETY HAZARD, ENSURE LINE VOLTAGE IS DISCONNECTED AT SOURCE BEFORE WIRING TO UNIT.

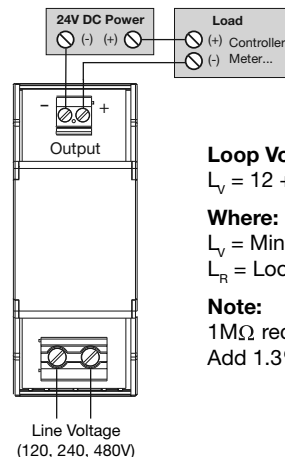
### INSTALLATION

The below steps can be followed to quickly install a VoltageWatch sensor:

1. For your safety, ensure line voltage is disconnected at source before wiring this sensor
2. Ensure correct sensor model was chosen for input voltage of application
3. Mount the sensor to a DIN rail or flat surface using integrated mounting clip on back side of sensor (see "Mounting" section for more information)
4. Connect input voltage L1 and L2 and output wiring (24V + and -) using up to 14 AWG copper wires. Refer to "Output Wiring" section for loop voltage and impedance recommendations.

### OUTPUT WIRING

Connect control or monitoring wires to the sensor using up to 14 AWG copper wires. Tighten terminals to 7 inch-pounds torque. Be sure the output load or loop power requirements are met (see diagram below).



#### Loop Voltage Requirements:

$$L_V = 12 + (L_R \times .02)$$

#### Where:

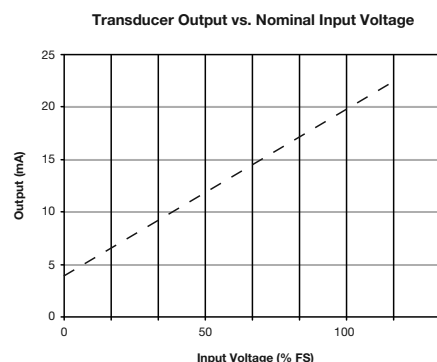
$$L_V = \text{Minimum Loop Voltage}$$

$$L_R = \text{Loop Resistance}$$

#### Note:

1MΩ recommended for output load.  
Add 1.3% error for 100KΩ.

### OUTPUT GRAPH



## TROUBLESHOOTING

| Problem                  | Solution  |
|--------------------------|---|
| Sensor has no output     | Power supply is not properly sized. Check power supply voltage and current rating.  |
|                          | Polarity is not properly matched. Check and correct wiring polarity.  |
| Output signal is too low | Sensor model may be improperly sized for application. Determine the normal operating voltage of your monitored circuit and ensure sensor selected is equal to or slightly higher than the normal operating voltage. |
| Sensor is always at 4mA  | Monitored load is not AC or is not on. Check that the monitored load is AC and that it is actually on.  |

## SPECIFICATIONS

| Specification         |  |
|-----------------------|--|
| Power Supply          | 24V DC Loop-Powered                                  |
| Input                 | 120V, 240V, and 480V                                 |
| Input Over-Range      | +15% of Nominal Range                                |
| Output                | 4-20mA Proportional; Capped at 24mA Max.             |
| Response Time         | 250 ms (to 90% Value)                                |
| Accuracy              | < 1%   |
| Linearity             | < 0.5%   |
| Loading               | < 500 ohm  |
| Isolation Voltage     | 2,500V AC  |
| Frequency Range       | 40Hz - 5kHz  |
| Operating Temperature | -30 to +60° C (-22 to +140° F), 0-95% Non-Condensing |
| Enclosure             | UL94 V0 Rated  |
| EMC/Immunity          | EN50081-1, EN50082-2                                 |
| Output Ripple         | < 1% (Peak to Peak)                                  |
| Approvals             | UL/CUL, CE Pending                                   |

## DIMENSIONS (in/mm)

