

## TRP Series Sensors

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## TRP SENSOR

The iWorx® TRP Series are thermistor type 10K Ohms (Type III) sensors. They provide temperature input information to a controller such as the ZXU or BLMC.

The thermistor's higher resistance creates a larger signal with the same measuring current, negating most lead wire resistance problems and eliminating the need for signal conditioners.

### Overview

The TRP Series offers a stainless steel bullet probe which is 1/4" in diameter and 1" long. It is available in two variations of lead length:

Model	Total Length
TRP1	24 inches
TRP2	11 feet

The TRP Series can measure the boiler supply and return water temperature or the outdoor temperature (provided it is mounted in a weatherproof enclosure) or the temperature atop a concrete slab and provide this information to the controllers.

### Features

- Directly connects to selected iWorx® controllers via low-cost, shielded, twisted-pair cable.
- Stainless steel probe.
- Output: 10K Ohm @ 77° F.

### Applicable Documentation

Description	Audience	Purpose
<i>iWorx® TRP Series Sensors Installation Guide</i> , Document No. 502-019 (this document)	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Wholesalers</li> <li>– Contractors</li> </ul>	Provides specific installation information about the sensors, including mounting, wiring, and operating information.
<i>iWorx® Sensor Compatibility</i> , Document No. 509-001	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Wholesalers</li> <li>– Contractors</li> </ul>	Shows operational compatibility among the various iWorx® sensors and controllers.
<i>iWorx® LCI2 Application Guides</i> , Document No. 505-002	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Installers</li> <li>– Service Personnel</li> <li>– Start-up Technicians</li> <li>– End user</li> </ul>	Provides instructions for setting up and using the iWorx® Local Control Interface (LCI).
<a href="http://iWorxWizard.taco-hvac.com">http://iWorxWizard.taco-hvac.com</a>	<ul style="list-style-type: none"> <li>– Application Engineers</li> <li>– Wholesalers</li> <li>– Contractors</li> </ul>	An on-line configuration and submittal package generator based on user input. Automatically generates bill of materials, sequence of operations, flow diagrams, wiring diagrams, points and specifications.

# INSTALLATION INSTRUCTIONS

## PRECAUTIONS

### General



This symbol is intended to alert the user to the presence of important installation and maintenance (servicing) instructions in the literature accompanying the equipment.



**WARNING:** Electrical shock hazard. Disconnect **ALL** power sources when installing or servicing this equipment to prevent electrical shock or equipment damage.

Make all wiring connections in accordance with these instructions and in accordance with pertinent national and local electrical codes.

### Static Electricity

Static charges produce voltages that can damage the equipment to which this sensor is being connected. Follow these static electricity precautions when handling this equipment.

- Work in a static free area.
- Touch a known, securely grounded object to discharge any charge you may have accumulated.
- Use a wrist strap when handling printed circuit boards. The strap must be secured to earth ground.

### Location

Avoid locations where corrosive fumes, excessive moisture, vibration or explosive vapors are present.

Avoid electrical noise interference. Do not install near large contactors, electrical machinery, or welding equipment.

Mount out of direct sunlight and away from sources of heat and cold other than the space you wish to measure.

## BEFORE INSTALLING

### About this Document

The instructions in this manual are for the TRP series sensors, which provide temperature-sensing capabilities to an iWorx® system.

### Inspecting the Equipment

Inspect the shipping carton for damage. If damaged, notify the carrier immediately. Inspect the equipment for damage. Return damaged equipment to the supplier.

### What is Not Included with this Equipment

- Job wiring diagrams
- Tools:
  - Drill and bits for mounting screws
  - Level
  - Static protection wrist strap
- Mounting screws
- Accessories

## INSTALLATION



**Warning:** Electrical shock hazard. To prevent electrical shock or equipment damage, disconnect **ALL** power sources to controllers and loads before installing or servicing this equipment or modifying any wiring.



Thermistors are resistive elements, and therefore, are NOT polarity sensitive. It is recommended that wiring for these units not be run in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators, and coils.

## Mounting the Device

When mounting on a pipe, the unit should be mounted on the bottom side of the pipe to ensure proper heat transfer and an accurate temperature reading. Heat transfer compound and proper insulation will help the overall accuracy of the sensor.

## WIRING INFORMATION

The following electrical connection can be made to the iWorx® TRP series sensors:

- Wiring to the temperature inputs of iWorX controllers



**CAUTION:** Do not connect any power wiring to the sensor. Failure to observe this precaution will damage the sensor.

## Wiring

Wiring includes a connection between an iWorx® controller and an iWorx® TRP Series sensor.

Wiring requires at least 18 gauge (0.205 mm<sup>2</sup>), shielded twisted-pair wire.

*Note:*

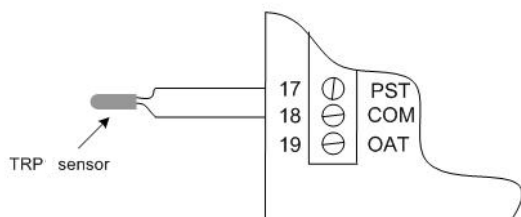
- Wiring is polarity insensitive.
- Shielded cable is required.
- Wiring can be in the same conduit with UI, AO, and DI Wiring.
- If the cable is installed in areas of high RIF/EMI, the cable must be in conduit.

### Connecting the iWorx® TRP Series Sensor

Requires 2-wire connection to the controller. To connect the thermistor outputs, attach the wires from the sensor to suitable terminals of the controller, as shown in Figure 1.

**Figure 1: Wiring Connections.**

### TRP sensor wired to Primary Supply Temp of BLMC



## Wiring Checkout

Verify wiring between TRP sensor and the iWorx® Controller is installed according to job wiring diagram, national and local wiring codes.

## SPECIFICATIONS

### Sensor

#### Temperature Sensor (TRP Series)

- Type: Precision thermistor 10K @ 77°F (25°C), Type III
- Accuracy: ±0.36 °F (0.2 °C)
- Range: -30 to 230°F (-34.4 to 110 °C)
- Humidity: 0 to 90% RH, non-condensing

### General

#### Enclosure

- Stainless steel (304 or 312)
- Dimensions: Probe 1" long x 0.25" dia (25.4 mm x 6.4 mm)

#### Weight and Wires

Sensor	Wire Length (Apx.)	Wire Type	Sensor Weight	Ship Weight
TRP1	22.35-23 in (568-584 mm)	22 AWG 7/30 white, stranded etched teflon rated to 392 °F (200 °C)	0.2 ounces (0.006 kilograms)	0.4 pounds (0.181 kilograms)
TRP2	130.5-131 in (3.31-3.32 m)	CLP2 2 conductor shielded plenum rated temp range -40 to 200°F (-40 to 148.8°C)	0.12 pounds (0.054 kilograms)	0.5 pounds (0.227 kilograms)

#### Wire Length

- 500 feet max. (152.4 meters) between sensor and controller

## TROUBLESHOOTING

This section provides useful tips on troubleshooting the iWorx® TRP Series Sensors.

**Table 1: Troubleshooting Tips**

Problem	Solution
Sensor reads 0 ohms	Sensor or wires are shorted together.
Sensor reads infinity	Sensor or wires are open.
Erratic readings	Bad wire connection or condensation on board.

### Getting Help

Components within iWorx® TRP Series Sensors cannot be field repaired. If there is a problem with a sensor, follow the steps below before contacting your local TES representative or TES technical service.

1. Make sure sensors are connected and communicating to desired devices.
2. Record precise hardware setup indicating the following:
  - Version numbers of applications software.
  - Controller firmware version number.
  - A complete description of difficulties encountered.

**Notes:**



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## LIMITED WARRANTY STATEMENT

Taco Electronic Solutions, Inc. (TES) will repair or replace without charge (at the company's option) any product or part which is proven defective under normal use within one (1) year from the date of start-up or one (1) year and six (6) months from date of shipment (whichever occurs first).

In order to obtain service under this warranty, it is the responsibility of the purchaser to promptly notify the local TES stocking distributor or TES in writing and promptly deliver the subject product or part, delivery prepaid, to the stocking distributor. For assistance on warranty returns, the purchaser may either contact the local TES stocking distributor or TES. If the subject product or part contains no defect as covered in this warranty, the purchaser will be billed for parts and labor charges in effect at time of factory examination and repair.

Any TES product or part not installed or operated in conformity with TES instructions or which has been subject to accident, disaster, neglect, misuse, misapplication, inadequate operating environment, repair, attempted repair, modification or alteration, or other abuse, will not be covered by this warranty.

TES products are not intended for use to support fire suppression systems, life support systems, critical care applications, commercial aviation, nuclear facilities or any other applications where product failure could lead to injury to person, loss of life, or catastrophic property damage and should not be sold for such purposes.

If in doubt as to whether a particular product is suitable for use with a TES product or part, or for any application restrictions, consult the applicable TES instruction sheets or in the U.S. contact TES at 401-942-8000 and in Canada contact Taco (Canada) Limited at 905-564-9422.

TES reserves the right to provide replacement products and parts which are substantially similar in design and functionally equivalent to the defective product or part. TES reserves the right to make changes in details of design, construction, or arrangement of materials of its products without notification.

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## CONTROLS MADE EASY®

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