iWorX® Installation Guide

502-018

TOA1 Series Sensor

SUPERSEDES: October 22, 2010 EFFECTIVE: November 17, 2010

Plant ID: 001-3966

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TOA1 SENSOR

The iWorX® TOA1 Sensor is an outdoor enclosure with a 10K Ohms digital thermistor temperature sensor. The sensor measures the outdoor temperature and provides the measurement as input information to a controller such as the ASM2 and 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.

Features

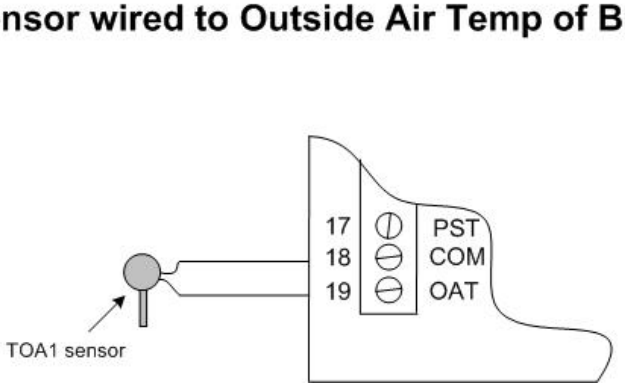
- Low-profile packaging.
- Directly connects to selected iWorX® controllers via low-cost shielded twisted-pair cable.
- Output: 10K Ohm @ 77º F.

Applicable Documentation

Description	Audience	Purpose
iWorX® TOA1 Series Sensor Installation Guide, Document No. 502-018 (this document)	– Application Engineers – Wholesalers – Contractors	Provides specific installation information about the sensor, including mounting, wiring, and operating information.
iWorX® Sensor Compatibility, Document No. 509-001	– Application Engineers – Wholesalers – Contractors	Shows operational compatibility among the various iWorX® sensors and controllers.
iWorX® LCI2 Application Guides, Document No. 505-002	– Application Engineers – Installers – Service Personnel – Start-up Technicians – End user	Provides instructions for setting up and using the iWorX® Local Control Interface (LCI).
http://iWorxWizard.taco-hvac.com	– Application Engineers – Wholesalers – Contractors	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.

Typical Use

Figure 1: Typical use diagram for an iWorX® TOA1 Series Sensor.



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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 this equipment. Follow these static electricity precautions when handing 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.

This equipment is suitable for outdoor use. Operate where ambient temperatures do not exceed 158 °F (70 °C) or fall below -40 °F (-40 °C).

Make certain sensor is located out of direct sunlight.

BEFORE INSTALLING

About this Document

The instructions in this manual are for the TOA1 series sensor, which provides temperature-sensing capabilities to an iWorX® controller.

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.

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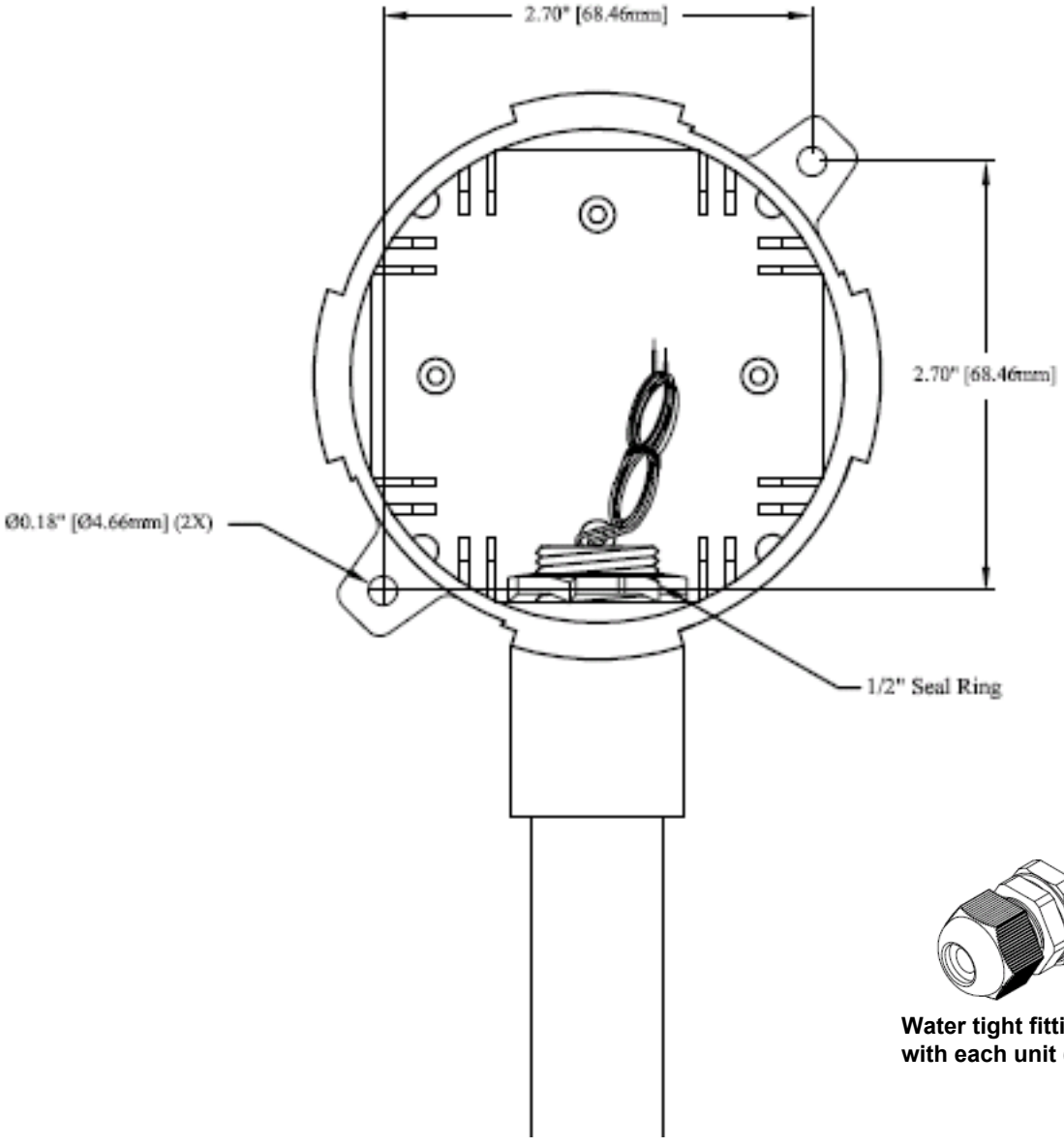
Mounting the Device

1. Select mounting location, out of direct sunlight with the sensor probe pointing downward.
2. Pull the wires through the wire-way hole in the base.
3. {Pre-drill two 3/16” holes as appropriate. Insert suitable anchors as needed and secure the base using corrosion-resistant screws.
4. Attach the wires to the sensor and secure the cover by firmly screwing it into place.

Figure 2: Mounting Diagram.



Water tight fitting supplied with each unit (not to scale)

WIRING INFORMATION

The following electrical connection can be made to the iWorX® TOA1 series sensors:

- Sensor Wiring

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

Sensor Wiring

The sensor needs at least 18 gauge shielded twisted pair wire.

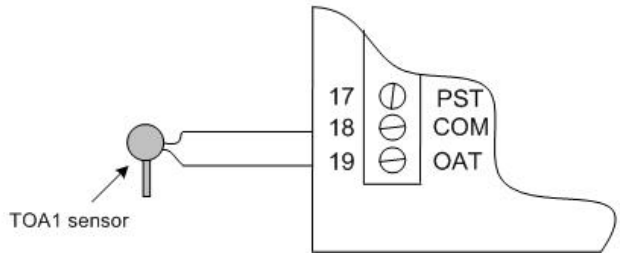
Note:

- Wiring is polarity insensitive.
- Shielded cable is required for wiring.
- Wiring can be in the same conduit with UI, AO, and DI Wiring.
- Wiring must be dedicated. It cannot be part of an active, bundled telephone trunk.
- If the cable is installed in areas of high RIF/EMI, the cable must be in conduit.

Connecting the iWorX® TOA1 Series Sensor

Requires 2-wire connection to the iWorX® controller, which are NOT polarity sensitive. To connect the thermistor outputs, attach one wire to the left terminal block marked (+) and the other wire to the right terminal of (+). The TOA1 series sensor does not require a power supply. See Figure 3.

Figure 3: Wiring Connections.



Wiring Checkout

Verify wiring between TOA1 sensor base plate and the iWorX® Controller is installed according to job wiring diagram, national and local wiring codes.

SPECIFICATIONS

Sensor

Temperature Sensor (TOA1 Series)

- Type: Precision thermistor 10K @ 77°F (25°C), Type III
- Accuracy: ±0.36 °F (0.2 °C)
- Range: -40 to 158°F (-40 to 70 °C)
- Humidity: 0 to 90% RH, non-condensing

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General

Enclosure

- Watertight outdoor compatible
- Dimensions: 8.34 H x 4.00 W x 2.25 D in (212 x 102 x 57 mm) including supply conduit; enclosure cover is 4.0 W x 4.0 H in (102 x 102 mm)
- Conforms to NEMA-1 requirements

Weight

- Sensor Weight: 0.5 pounds (0.226 kilograms)
- Shipping Weight: 0.75 pounds (0.340 kilograms)

Wiring Terminals

- Two terminals. AWG #18 to #24 (0.823 mm^2 maximum) wire

Wire Length

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

TROUBLESHOOTING

This section provides useful tips on troubleshooting the iWorX® TOA1 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® TOA1 Series Sensors can not 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:

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.

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