Installation Guide

502-015

TS100 Series Sensor

SUPERSEDES: November 17, 2010

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TS100 SERIES WALL SENSORS

iWorx® TS100 Series Sensors are a family of wall-mounted thermistor type 10K Ohms temperature sensors. Each model measures room temperature and provides the measurement as input information to a controller such as the iWorx® ZXU1 and BZU2.

Overview

Available in three models, these iWorx® TS100 Series Sensors measure the room temperature and provide that information to the controllers. The TS101 and TS103 offer a thermistor without temperature display.

The TS102 offers a thermistor with a liquid crystal display (LCD) which features an easy-to-read 3.5 digit display and wide operating range. The LCD requires a 24 VAC power supply and is easy to incorporate with the controller power supply. This unit is available in either degrees C (Celsius) or degrees F (Fahrenheit).

The TS103 has a thermistor and sliding local setpoint adjustment without temperature display. It allows for local setpoint adjustment using a sliding linear 3K potentiometer in series with the thermistor to allow an offset from the controller setpoint. The local setpoint adjustment provides a local setting of Cool | Warm with an average of ± 5º from controller setpoint.

Features

- Contemporary, low-profile styling.
- Three models.
- 2” x 4” J-box or drywall mount.
- Local slide setpoint adjustment (TS103).
- Output: 10K Ohm @ 77º F.
- 24 VAC LCD digital display (TS102) - specify C or F.
- Decorative white color.

Applicable Documentation

Description	Audience	Purpose
iWorx® TS100 Series Sensors Installation Guide, Document No. 502-015 (this document)	– Application Engineers – Wholesalers – Contractors	Provides specific application information about the sensors, including sequence of operation and configuration 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.

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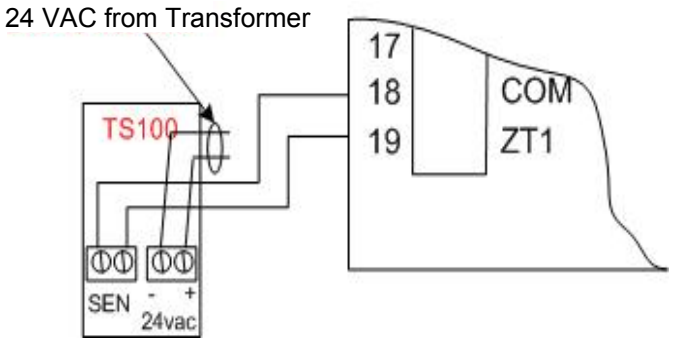
Typical Use

Figure 1: Typical use diagram for an iWorx® TS102 Series Sensor



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The iWorx® Sensor shall only be used for the applications identified in the product specifications and for no other purposes. For example, the iWorx® Sensor is 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 used for such purposes.

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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 indoor use only. Operate where ambient temperatures do not exceed 122 °F (50 °C) or fall below 32 °F (0 °C) and relative humidity does not fall below 5% or exceed 90%, non-condensing.

Make certain sensor is located out of direct sunlight.

BEFORE INSTALLING

About this Document

The instructions in this manual are for the TS100 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.

The TS100 Series sensor is packaged disassembled in one box and consists of the following major parts:

- A pre-wirable base plate for wiring to the controller
- A removable cover

What is Not Included with this Equipment

- Job wiring diagrams
- Tools:
  - Drill and bits for mounting screws
  - Level
  - Static protection wrist strap
- Two mounting screws (dry-wall anchors for direct-wall mount)
- Accessories

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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.

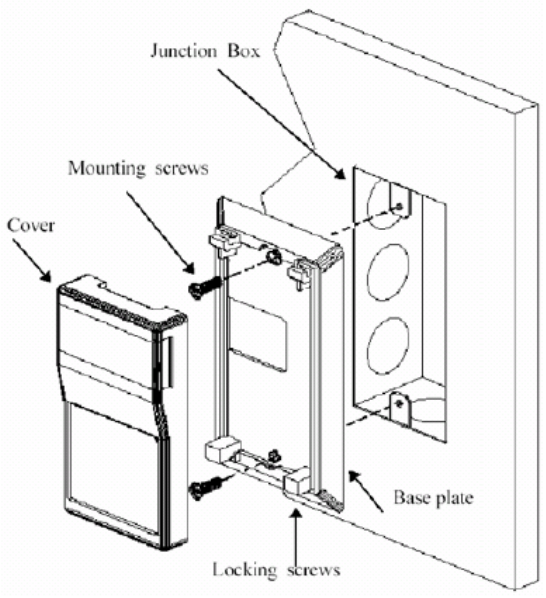
Thermistors are resistive elements, and therefore, are NOT polarity sensitive. It is recommended that wiring for these units not be run in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators, and coils.

Mounting the Device

1. Select mounting location.
2. Pull the wires through the wire-way hole in the base.
3. For junction box installation, secure the base to the junction box using the 6-32 x 1” mounting screws provided.
4. For drywall installation, pre-drill two 3/16” holes 3 1/4” apart on center. Insert the drywall anchors and secure the base using the 6-32 x 1” metal screws provided.
5. Attach the cover by latching the cover to the top of the base. Rotate the cover down and secure it in place by backing out the locking screws (located at the bottom of the base plate) using a 1/16” hex wrench until they are flush with the bottom of the cover.

   NOTE: The TS102’s LCD module must be unplugged from the 10 pin socket before the base plate can be mounted.

Figure 2: Mounting Diagram



WIRING INFORMATION

The following electrical connection can be made to the iWorx® TS100 series sensors:

- Sensor Wiring

- 24 VAC power wiring (TS102 only)

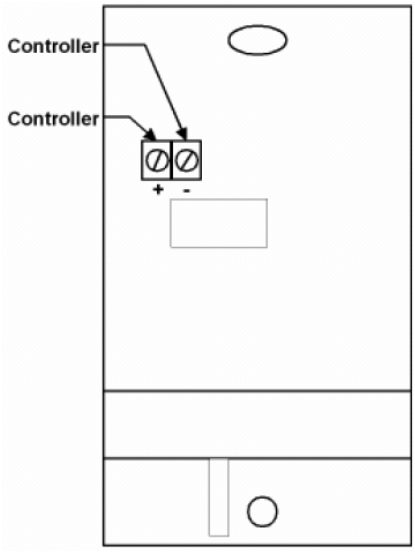
CAUTION: Do not connect any power wiring to the TS101 or TS103 sensors. Failure to observe this precaution will damage the sensor.

Connecting the Sensor

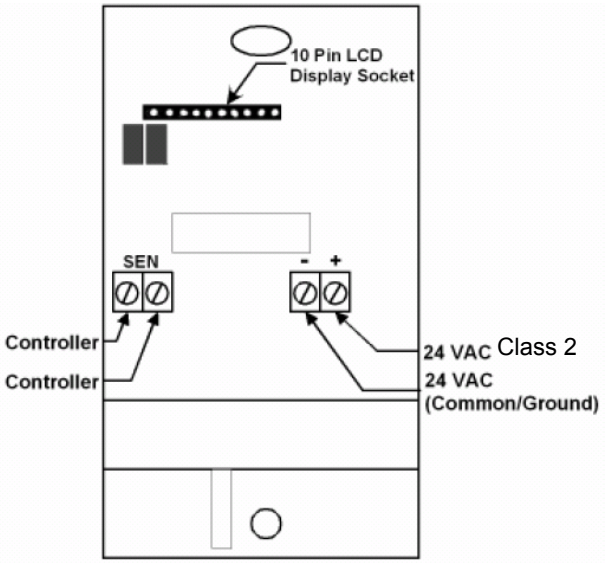
TS101/103

Requires 2-wire connection to the ZXU1 or BZU2 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 TS101/103 sensor does not use a power supply. See Figure 3.

Figure 3: Wiring Connections



TS101 / TS103



TS102

TS102

The TS102 requires a 4-wire connection to the ZXU1 or BZU2. To connect the thermistor outputs which are NOT polarity sensitive, attach one wire from the left side of terminal (SEN) and the other wire to the right side of terminal (SEN). The TS102 requires a 24 VAC Class 2 input power supply for the LCD. The 24 VAC Class 2 power supply to the LCD display must be isolated from the sensor outputs to the controllers. Check that the correct power is being provided before connecting. Connect the 24 VAC to the two position terminal block on the right half of the base. Connect the positive wire to the terminal marked (+) and the common/ground to terminal (-). When wiring is completed, install the LCD module by gently inserting back into the 10 pin LCD Display Socket. See Figure 3.

Wiring Checkout

Verify wiring between TS100 sensor base plate and the iWorx® Controller is installed according to job wiring diagram, national and local wiring codes.

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SPECIFICATIONS

Sensor

Temperature Sensor (TS100 Series)

- Type: Precision thermistor 10K Ohm @ 77°F (25°C)
- Accuracy: ±0.36 °F (0.2 °C)
- Range: 32 to 122 °F (0 to 50 °C - limited by enclosure temperature tolerance)
- TS103 with 3K potentiometer: Available offset: ± 5 @ 65 to 75º F
  (Offset is skewed when used outside this range)
- Humidity: 0 to 90% RH, non-condensing

Inputs

- TS102 with LCD: 24 VAC, 4mA, Class 2 power supply
- 2-wire (TS101/103) or 4-wire (TS102) 18-22 AWG recommended

General

Enclosure

- Dimensions: 4 1/2 H x 2 3/4 W x 1 1/8 D in (114 x 70 x 29 mm)

Weight

- Controller Weight: 3 ounces (0.085 kilograms)
- Shipping Weight: 1.0 pounds (0.46 kilograms)

Wiring Terminals

- Two (2) screw tterminals for TS101 and TS103. Four (4) screw terminals for TS102.
- AWG #18 to #24 (0.823 mm2 maximum) wire

Wire Length

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

Units

- °F or °C, specify F or C model when ordering TS102

TROUBLESHOOTING

This section provides useful tips on troubleshooting the iWorx® TS100 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.
LCD display not working	Check power connections.

Getting Help

Components within iWorx® TS100 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.

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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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