

# TE-6300M Series Well Insertion Temperature Sensors

## Installation Instructions

TE-631xM, TE-635xM,  
TE-634xM, TE-636xM

Part No. 24-4034-182, Rev. E  
Issued January 31, 2013  
Supersedes April 6, 2010

Refer to the [QuickLIT website](http://www.quicklit.com) for the most up-to-date version of this document.

## Applications

**IMPORTANT:** The TE-6300M Series Well Insertion Temperature Sensors are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the sensor could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the sensor.

## Installation

**IMPORTANT:** Do not install the TE-6300M Series Well Insertion Temperature Sensor in ambient temperatures beyond the specified -50 to 220°F (-46 to 104°C) temperature range. Installing the temperature sensor in ambient temperatures beyond this range may damage the unit and void the warranty.

## Dimensions

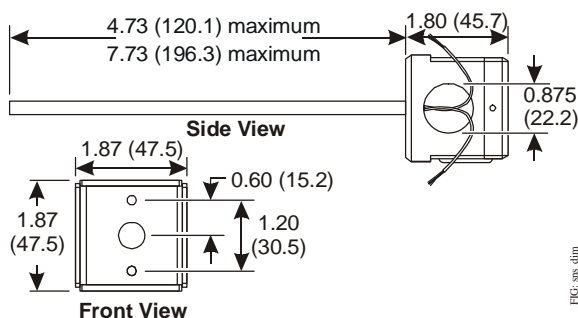


Figure 1: Sensor Dimensions, in. (mm)

## Mounting

### Location Considerations

Consider the following mounting location guidelines:

- Avoid areas subject to the effects of excessive vibration, electrical noise, direct sunlight, or radiant heat.
- Keep electrical wiring as short as possible to minimize temperature error.

## Mounting the Temperature Sensor

See Figure 2 and mount the temperature sensor:

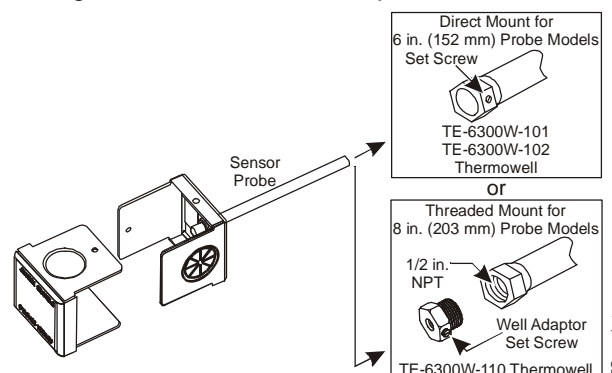


Figure 2: Installing the Well Insertion Sensor

**Note:** The Johnson Controls® TE-6300W-101 thermowell contains thermal compound. The TE-6300W-102 and TE6300W-110 do not contain thermal compound. Add thermal compound (F-1000-182, or equivalent) before inserting the probe if the well does not include thermal compound. For proper sensor function, mount the well so that any condensation that forms drains out of the probe.

1. If the thermowell is:
  - **Direct Mount** (TE-63xAM-2), loosen the set screw
  - **Threaded** (TE-63x2M), screw the well adaptor into the thermowell and loosen the well adaptor set screw
2. Insert the sensor probe into the thermowell until it touches the bottom.
3. Pull back the probe approximately 1/8 in. (3 mm) and then tighten the set screw.
4. Wire the sensor to the controller.
5. Reposition the cover and tighten the cover screws.

## Wiring

For 1k ohm nickel temperature sensors, wire resistance can cause about 1F° (0.56C°) of error for every 250 ft (76 m) run of 18 AWG (1.0 mm diameter) wire, or every 100 ft (31 m) run of 22 AWG (0.6 mm diameter) wire.

For 1k ohm platinum temperature sensors, wire resistance can cause about 1F° (0.56C°) of error for every 150 ft (46 m) run of 18 AWG (1.0 mm diameter) wire, or every 50 ft (15 m) run of 22 AWG (0.6 mm diameter) wire. To minimize error due to field wiring, limit total resistance of all nickel temperature sensor wiring to 3 ohms, and all platinum temperature sensor wiring to 2 ohms. The 2.2k and 10k ohm thermistor applications permit wiring to be relatively long before wire resistance adds significantly to total resistance measured at the controller. As a general rule, a 150 ft (46 m) two-wire 18 AWG (1.0 mm diameter) run contributes 2 ohms of error, or less than 1F° (0.56C°) error over the sensor operating temperature range.

Refer to the appropriate controller documentation for recommended sensor wiring. Secure the wiring bushing or conduit only to the temperature sensor base. See Table 1 for an explanation of the lead wiring color convention

**Table 1: Lead Wiring Color Code**

Sensor Type	Lead Color
1k ohm Nickel	White
1k ohm Platinum	White with Blue Stripe
2.2k ohm Thermistor	Red
10k ohm Thermistor	White with Green Stripe

## Technical Specifications

### TE-6300M Series Well Insertion Temperature Sensors

<b>Models</b>	TE-631xM	Thin-Film Nickel Temperature Sensor
	TE-635xM	Thin-Film Platinum Temperature Sensor
	TE-634xM	2.2k ohm Thermistor Temperature Sensor
	TE-636xM	10k ohm Thermistor Temperature Sensor
<b>Sensor Reference Resistance</b>	Nickel	1k ohms at 70°F (21°C)
	Platinum	1k ohms at 32°F (0°C)
	2.2k ohm Thermistor	2,252 ohms at 77°F (25°C)
	10k ohm Thermistor	10k ohms at 77°F (25°C)
<b>Sensor Accuracy</b>	Nickel	±0.34F° at 70°F (±0.19C° at 21°C)
	Platinum	±0.35° at 70°F (±0.19C° at 21°C), DIN Class A
	2.2k ohm Thermistor	±0.36F° (±0.2C°) in the Range 32 to 158°F (0 to 70°C)
	10k ohm Thermistor	±0.9F° (±0.5C°) in the Range 32 to 158°F (0 to 70°C)
<b>Sensor Temperature Coefficient</b>	Nickel	Approximately 3 ohms/F° (5.4 ohms/C°)
	Platinum	Approximately 2 ohms/F° (3.9 ohms/C°) 3850 ppm/K
	2.2k ohm Thermistor	Nonlinear, Negative Temperature Coefficient (NTC)
	10k ohm Thermistor	Nonlinear, NTC, Johnson Controls Type II
<b>Electrical Connections</b>	22 AWG (0.6 mm Diameter) x 6 in. (150 mm) Long Lead Wires	
<b>Materials</b>	Well Adaptor	0.875 in. (22.2 mm) Hex Brass
	Probe	0.25 in. (6.4 mm) Outside Diameter x 5 in. (127 mm) or 8 in. (203 mm) Long Stainless Steel
	Enclosure	Corrosion-Resistant Steel
<b>Operating Temperature</b>	-50 to 220°F (-46 to 104°C)	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



**Building Efficiency**  
507 E. Michigan Street, Milwaukee, WI 53202

Metasys® and Johnson Controls® are registered trademarks of Johnson Controls, Inc. All other marks herein are the marks of their respective owners. © 2013 Johnson Controls, Inc.



**CAUTION: Risk of Property Damage.**  
Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

**IMPORTANT:** Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the TE-6300M Series Well Insertion Temperature Sensor's electrical ratings.

## Repair Information

If the TE-6300M Series Well Insertion Temperature Sensor fails to operate within its specifications, replace the unit. For a replacement sensor, contact the nearest Johnson Controls representative.