

# TE-6100 Series Temperature Sensors and Completed Sensor/Hardware Assemblies

## Product Bulletin

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TE-6100 Series Completed Assemblies are used in a wide variety of temperature sensing applications. In addition to these completed units, there are various other sensing elements and hardware configurations that may be field assembled, depending on the application.

Refer to the *TE-6000 Temperature Sensing Elements Product Bulletin (LIT-216288)* for available temperature sensing elements and the *TE-6001 Hardware Assemblies for TE-6000 Temperature Elements Product/Technical Bulletin (LIT-216300)* for available hardware configurations.

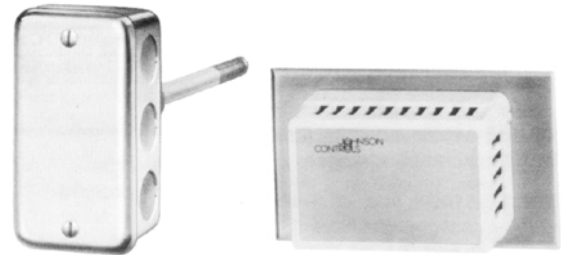


Figure 1: TE-6100-3 (Left) and TE-6100-8, -960, and -961 (with T-4000 Cover; Right)

Table 1: Features and Benefits

Features	Benefits
Nickel and Silicon Sensor Elements	Provide multiple resistance ranges for a variety of applications.
Modular Jack Connectors on Room Temperature Sensors TE-6100-11 and -12	Allow connection to controllers and test panels over standard or plenum-rated telephone cable.
Optional Mounting Assemblies	Provide easy mounting through the use of a mounting bracket or wallplate.

## Models

**IMPORTANT:** The TE-6100 Series Completed Assemblies are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the TE-6100 devices 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 TE-6100 devices.

The TE-6100-1 through -8 Temperature Sensing Assemblies are designed for use with Metasys® analog inputs. The sensing portion of these assemblies is a nickel or silicon element, which varies its resistance with temperature changes.

### **TE-6100-1 and -2**

The TE-6100-1 and -2 Averaging Element Assemblies have 17 and 8 ft (5.2 and 2.4 m) elements respectively, and are suitable for duct mounting as well as other applications.

### **TE-6100-3**

The TE-6100-3 Duct Insertion Assembly is designed for temperature control and/or indication. This assembly has a dual wound nickel wire element that consists of an element winding on each of two concentric tubes. The outer tube thermally insulates the inner tube and its winding, to produce a time lag in sensing temperature changes. When used in a control system, this element provides an effect similar to rate action, that prevents cycling caused by sudden large temperature changes.

### **TE-6100-8**

The TE-6100-8 Room Element Assembly consists of a nickel wire sensor, setpoint adjustment, wallplate adaptor, and mounting bracket. A T-4000 Cover is required and must be ordered separately. (See Table 4 for available covers.)

### **TE-6100-11 and -12**

The TE-6100-11 and -12 Room Sensor Assemblies consist of a 1,000-ohm nickel sensor, an 8-pin phone jack for field wiring to Metasys VAV and UNT controllers, a 6-pin phone jack to connect to a test panel, and a setpoint potentiometer (-12 model). A T-4000 Cover and TE-1800-9600 Wall Box Mounting Adaptor Kit must be ordered separately. Connections are also provided for a TE-6001-961 Override Switch (ordered separately).

### **TE-6100-960 and -961**

The TE-6100-960 and -961 Assemblies are used in room sensing applications. These assemblies consist of a Positive Temperature Coefficient (PTC) silicon sensor, setpoint adjustment (-960 model), wallplate adaptor, and mounting bracket. The TE-6100-960 has five wires and the TE-6100-961 has three wires. A T-4000 Cover is required and must be ordered separately.

### **TE-6100-962**

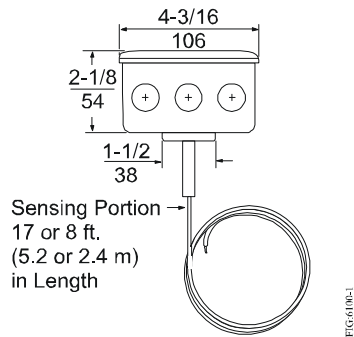
The TE-6100-962 Averaging Element Assembly is used in duct-insertion applications. This assembly consists of a PTC silicon element mounted in an 18 in. (457 mm) metal tube. The tube may be shortened to 8 in. (203 mm) by removing the end cap, cutting the tube, and reinstalling the end cap.

## Operation

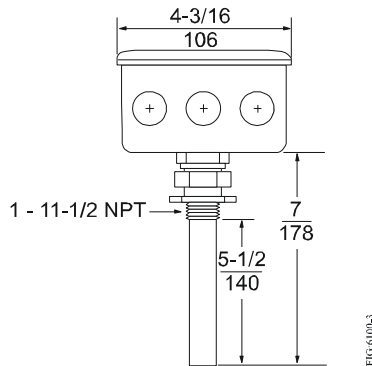
The TE-6100 Nickel or Silicon Resistance Sensor provides a varying resistance to a controller. When the temperature at the sensor changes, the resistance of the sensor changes. The sensor exhibits a positive resistance change with temperature.

The silicon sensor changes resistance 0.42% per F° (0.75% per C°), with a reference resistance of 1,035 ohms at 77°F (25°C). The nickel sensor changes 3 ohms per F° (5.4 ohms per C°) with a reference resistance of 1,000 ohms at 70°F (21°C).

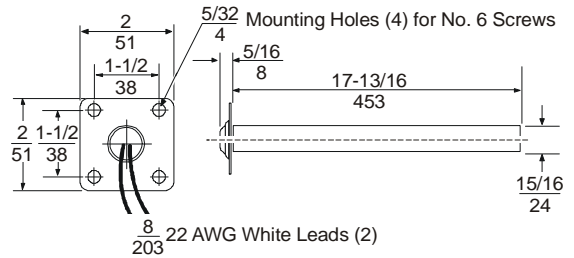
## Dimensions



**Figure 2: TE-6100-1, -2 Averaging Element Dimensions, in./mm**



**Figure 3: TE-6100-3 Dual Wound Duct Insertion Element Dimensions, in./mm**



**Figure 4: TE-6100-962 Dimensions, in./mm**

## Repair Information

If the TE-6100 Temperature Sensors and completed sensor/hardware assemblies fail to operate within their specifications, replace the units. For replacement devices, contact the nearest Johnson Controls® representative.

## Ordering Information

Specify the code number from the following selection chart.

**Table 2: Selection Chart**

Product Code Number	Type	Description
TE-6100-1	Nickel	17 ft (5.18 m) Averaging, Temperature Sensing Element (1,000 ohms, $\pm 1\%$ ) with Conduit Box
TE-6100-2		Similar to TE-6100-1 Except 8 ft (2.4 m) Averaging Element
TE-6100-3		Temperature Sensing Element (1,000 ohms, $\pm 1\%$ ), Dual-Wound with Conduit Box
TE-6100-8 <sup>1</sup>		Room Temperature Sensing Element (1,000 ohms, $\pm 1\%$ ) with Setpoint 55 to 85°F (13 to 29°C), without Cover
TE-6100-11 <sup>1,2</sup>		Nickel Sensor Room Sensing Element with Modular Jack, without Cover
TE-6100-12 <sup>1,2</sup>		Similar to TE-6100-11 Except with Setpoint, without Cover
TE-6100-960 <sup>1</sup>	Silicon	Base Room Thermostat with Setpoint, without Cover
TE-6100-961 <sup>1</sup>		Space Temperature Assembly with Wallplate Adaptor and Mounting Bracket
TE-6100-962		18 in. (457 mm) Duct-Temperature Sensor Assembly, Averaging Type (may be shortened to 8 in. [203 mm])

1. Order the T-4000 Cover separately.
2. Order the TE-1800-9600 Mounting Kit separately.

**Table 3: Accessories**

Product Code Number	Description
T-275-100	Mounting Clip for Use with Averaging Sensors
TE-6001-8	Mounting Bracket for Use with Averaging Sensors
TE-6001-961	Push Button Switch for Use with TE-6100-11, -12, -960, -961
TE-6001-962	Toggle Switch for Use with TE-6100-11, -12, -960, -961
TE-1800-9600	Electrical Wallbox Mounting Adaptor Kit; Includes Wallplate Adaptor, Mounting Bracket, and Screws

**Table 4: Cover and Faceplate Options**

Product Code Number <sup>1</sup>	Cover Position	Faceplate/ Cover Color	Description
T-4000-2139	Horizontal	Brushed Aluminum/ Beige	Without Setpoint Window or Thermometer, with Johnson Controls Logo
T-4000-2140			Without Setpoint Window, with °F/°C Thermometer and Johnson Controls Logo
T-4000-2141			Exposed Setpoint, without Thermometer, with Johnson Controls Logo
T-4000-2142			Exposed Setpoint, with °F/°C Thermometer and Johnson Controls Logo
T-4000-2639		Brown and Gold/Beige	Without Setpoint Window or Thermometer, with Johnson Controls Logo
T-4000-2640			Without Setpoint Window, with °F/°C Thermometer and Johnson Controls Logo
T-4000-2642			Exposed Setpoint, with °F/°C Thermometer and Johnson Controls Logo
T-4000-2138	Horizontal or Vertical	Brushed Aluminum/ Beige	Without Setpoint Window, Thermometer, or Johnson Controls Logo
T-4000-2144	Vertical	Brushed Aluminum/ Beige	Without Setpoint Window or Thermometer, with Johnson Controls Logo
T-4000-2145			Exposed Setpoint, without Thermometer, with Johnson Controls Logo
T-4000-2146			Exposed Setpoint, with °F/°C Thermometer and Johnson Controls Logo
T-4000-2644		Brown and Gold/Beige	Without Setpoint Window or Thermometer, with Johnson Controls Logo
T-4000-2645			Exposed Setpoint, without Thermometer, with Johnson Controls Logo

1. The T-4000 covers are for use with the TE-6100-8, -11, 12, -960, and -961 devices.

## Technical Specifications

### TE-6100 Series Temperature Sensors and Completed Sensor/Hardware Assemblies (Part 1 of 2)

Specification	Model	Description
Elements	TE-6100-1 through -12	Nickel resistance type
	TE-6100-960, -961, -962	PTC silicon
Reference Resistances	TE-6100-1 through -12	1,000 ohms at 70°F (21°C)
	TE-6100-960, -961, -962	1,035 ohms at 77°F (25°C)
Temperature Coefficient	TE-6100-1 through -12	Positive, approximately 3 ohms/°F (5.4 ohms/°C)
	TE-6100-960, -961, -962	Positive, approximately 4.3 ohms/°F (7.7 ohms/°C)
Resistance Tolerances	TE-6100-1, -2, -3, -8	±1.0% at 70°F (21°C)
	TE-6100-960, -961, -962	Calibrated for 1,035 ohms ±0.5/-0.15 ohms at 77°F (25°C)

**TE-6100 Series Temperature Sensors and Completed Sensor/Hardware Assemblies (Part 2 of 2)**

<b>Specification</b>	<b>Model</b>	<b>Description</b>
<b>Ambient Operating Environment</b>	TE-6100-1, -2, -3	-50 to 250°F (-46 to 121°C)
	TE-6100-8	0 to 130°F (-18 to 54°C), 10 to 90% RH, noncondensing
	TE-6100-11, -12, 960, -961	32 to 104°F (0 to 40°C), 10 to 90% RH, noncondensing, limited by an 85°F (29°C) maximum dew point
	TE-6100-962	-40 to 212°F (-40 to 100°C), 10 to 90% RH, noncondensing
<b>Set Point Range</b>	TE-6100-8	55 to 85°F (13 to 29°C), °F and °C scales furnished
	TE-6100-12	Warmer/cooler scale
	TE-6100-960	50 to 85°F (10 to 29°C), °F and °C scales furnished

*The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, contact Johnson Controls/PENN Refrigeration Technical Support at 1-800-275-5676. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*



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