TE-6000 Series Temperature Sensing Elements

TE-6000 Series elements typically work with TE-6001 hardware assemblies to provide a wide variety of temperature-sensing applications. All models have nickel elements except the TE-6359-1 model.

Users often order elements and hardware separately and then field assemble them to suit the application. Refer to TE-6001 Hardware Assemblies for TE-6000 Temperature Elements Product/Technical Bulletin (LIT-216300) *for available hardware configurations and* TE-6100 Series Temperature Sensors and Completed Sensor/Hardware Assemblies Product/Technical Bulletin (LIT-216310) *for available factory assembled units.*

Figure 1: TE-6000-1, -2, -3, -100, and -101 Nickel Elements

Figure 2: TE-6000-10 Surface Element

Figure 3: TE-6000-11 Bearing Element

Features and Benefits	
❑ **Accurate Sensing Elements**	Provide excellent performance in a wide variety of control applications
❑ **Numerous Element Styles (Surface, Solar, and Bearing)**	Satisfy a variety of temperature-sensing applications
❑ **Bearing Sensing Element (TE-6000-11 only)**	Monitors bearing temperature to optimize equipment use and maintenance

MechTronics Controls
www.hvacusa.com
Phone (877) 632-4876

Operation

IMPORTANT: The TE-6000 Series Temperature Sensing Elements are intended to provide input to equipment under normal operating conditions. Where failure or malfunction of a TE-6000 element could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of the TE-6000 element must be incorporated into and maintained as part of the control system.

The TE-6000 element provides a varying resistance to a controller. When the temperature at the element increases, the resistance of the element rises:

- The nickel element increases 3 ohms/F° (5.4 ohms/C°) with a reference resistance of 1,000 ohms at 70°F (21°C).
- The platinum element increases 2.2 ohms/F° (3.9 ohms/C°) with a reference resistance of 1,000 ohms at 32°F (0°C).

Element Type

Nickel

Johnson Controls designed the TE-6000 nickel temperature to use with temperature controllers and analog inputs. To suit most application needs, resistance tolerance at 70°F (21°C) is 1.0% for models TE-6000-1, -2, and -3 models, and 0.1% for models TE-6000-100 and -101. (See *Technical Specifications* section for more information.)

Platinum

The TE-6359-1 is a 1,000 ohm platinum element in a copper tube. This element is designed to use when DIN 43760 Class A accuracy is required.

Package Type

Discharge

The TE-6000-5 senses duct discharge air in readjustment applications requiring a 20:1 ratio. The unit has a nominal 50 ohm at 70°F (21°C) element with a 2% resistance tolerance. Connect the TE-6000-5 in series with a 1,000 ohm room sensor to the controller.

Solar

Use the TE-6000-6 with Johnson Controls electronic controllers in solar heating applications requiring wire-wound element inputs. The maximum temperature limit for this unit is 350°F (177°C).

Surface

The TE-6000-10 sensing element is encased in an epoxy-filled, adhesive-backed aluminum mounting block. The epoxy fill effectively conducts surface temperature changes from the aluminum block to the nickel temperature element.

Bearing

The TE-6000-11 is encased in a 0.22 in. (5.5 mm) diameter by 1 in. (25 mm) long brass tube. It comes with an insulated 10 ft (3 m) two-wire cable.

Ordering Information

To order a replacement or an accessory, contact the nearest Johnson Controls representative. Specify the desired product code number from Table 1 or Table 2.

Table 1: Temperature Sensing Elements

Product Code Number	Description*
TE-6000-1*	1,000 ohm nickel element
TE-6000-2*	500 ohm nickel element
TE-6000-3*	333 ohm nickel element
TE-6000-5	50 ohm nickel element, ±2.0% accuracy at 70°F (21°C)
TE-6000-6*	1,000 ohm nickel (used in solar heating applications)
TE-6000-10*	1,000 ohm nickel surface element (encased in aluminum mounting block)
TE-6000-11*	1,000 ohm nickel bearing element (encased in a brass tube)
TE-6000-100	1,000 ohm nickel wide range element, ±0.1% accuracy at -50 to 250°F (-46 to 121°C)
TE-6000-101	1,000 ohm nickel narrow range element, ±0.1% accuracy at 55 to 85°F (13 to 29°C)
TE-6359-1	1,000 ohm platinum element, ±0.06% accuracy at 32°F (0°C)

* Accuracy: ±1.0% at 70°F (21°C).

Table 2: Accessories

Code Number	Description
TE-6001-1	Duct Temperature Element Holder with Handibox
TE-6001-2	Housing for Outside Air Temperature Sensing Element
TE-6001-3	Handibox, Packing Nut, and Fittings for Use with WZ-1000 Wells
TE-6001-4	Single/Dual Element Holder for TE-6000 Elements in Room Temperature Sensing Applications
TE-6001-5	Dew Point Sensor Kit
TE-6001-6	Ten Adhesive Mounting Pads for Use with T-4100, T-4110
TE-6001-7	Ten Clips for Use with T-4002/4003 and H-4100/5100
TE-6001-11	Duct Temperature Element Holder (Less Handibox)

Technical Specifications

Product	TE-6000-1	1,000 ohm nickel element	
	TE-6000-2	500 ohm nickel element	
	TE-6000-3	333 ohm nickel element	
	TE-6000-5	50 ohm nickel element	
	TE-6000-6	1,000 ohm nickel (used in solar heating applications)	
	TE-6000-10	1,000 ohm nickel surface element (encased in aluminum mounting block)	
	TE-6000-11	1,000 ohm nickel bearing element (encased in a brass tube)	
	TE-6000-100	1,000 ohm nickel wide range element	
	TE-6000-101	1,000 ohm nickel narrow range element	
	TE-6359-1	1,000 ohm platinum element	
Sensing Ranges	TE-6000-6:	-40 to 350°F (-40 to 177°C)	
	TE-6000-10:	0 to 125°F (-18 to 52°C)	
	All Other Models:	-50 to 250°F (-46 to 121°C)	
Elements	TE-6359-1:	Platinum	
	All other models:	Nickel	
Resistance Tolerances	TE-6000-1, -2, -3, -6, -10, -11:	±1.0%	
	TE-6000-5:	±2.0%	
	TE-6000-100:	±0.1%, range of -50 to 250°F (-46 to 121°C)	
	TE-6000-101	±0.1%, range of 55 to 85°F (13 to 29°C)	
	TE-6359-1:	±0.06% (platinum, DIN Class A)	
Temperature Coefficients (All Positive and Approximate)	Nickel:	0.15, 1.0, 1.5 and 3 ohms/F° (0.27,1.8, 2.7, and 5.4 ohms/C°) for 50, 333.3, 500, and 1,000 ohm elements respectively	
	Platinum:	2.2 ohms/F° (3.9 ohms/C°)	
Reference Resistance	At 32°F (0°C)	TE-6359-1:	1,000 ohms (platinum)
	At 70°F (21°C)	TE-6000-1, 6, 10, 11, 100, 101:	1,000 ohms (nickel)
		TE-6000-2:	500 ohms (nickel)
		TE-6000-3:	333 ohms (nickel)
		TE-6000-5:	50 ohms (nickel)
Temperature Ranges	TE-6000-6:	-40 to 350°F (-40 to 177°C)	
	TE-6000-10:	0 to 125°F (-18 to 52°C)	
	TE-6000-101	55 to 85°F (13 to 29°C)	
	All other models:	-50 to 250°F (-46 to 121°C)	
Sensor Construction	TE-6000-6:	Black Anodized Aluminum Probe	
	TE-6000-10:	Aluminum Probe	
	TE-6000-11:	Brass Probe	
	All Other Models:	Copper Probe	
Field Connection	Two wire leads, 18 AWG		
Shipping Weight	0.2 lb (0.09 kg)		

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.

JOHNSON CONTROLS

Controls Group
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

Printed in U.S.A.
www.johnsoncontrols.com