

# Thermocouple, RTD and RTD Transmitter With Thermowell – TC, RTD and RTDT Series

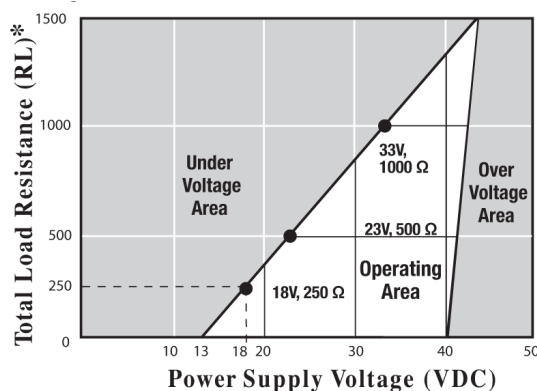
FW Murphy offers a variety of highly reliable thermocouple and RTD (Resistance Temperature Detector) assemblies and 4-20 mA DC output RTD transmitters.

Their innovative features include a 304 stainless steel thermowell that provides protection to the spring-loaded element.

The cast aluminum connecting head meets NEMA 4 requirements and includes an RTD transmitter or a thermocouple/ RTD terminal block mounted on ceramic Steatite and rated NEC Class 2.

The complete assemblies are offered in 2-1/2, 4-1/2 or 7-1/2 in. (63, 114 or 191 mm) thermowell insertion lengths.

## Loop Resistance Graph



\*NOTE: Cable resistance effect included in RL.

Supply voltage for RTDT must be within 13-40 VDC. The graph shows the minimum supply voltage (VDC) required for a given load resistance (RL).

### Thermocouple Assemblies with Thermowell

Available in types J or K, the thermocouple assemblies have ungrounded elements in a 304 stainless steel spring-loaded sheath. For product compatibility see next page (replacement parts and thermocouple extension wire are available).

### RTD Assemblies with Thermowell

Resistance temperature detector (RTD) assemblies are available with a 100 ohm platinum element, 3-wire leads and spring-loaded 316L stainless steel element sheath.

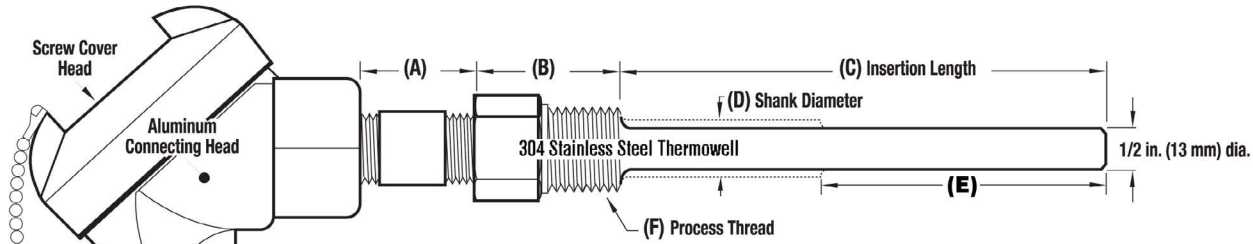
### RTD Transmitter Assemblies with Thermowell

RTDT assemblies transmit process variable temperatures. Available as part of the temperature sensor assemblies or as separate units, the RTDTs accept 2- or 3-wire, 100 ohm RTDs. The RTD transmitters are loop powered. They feature linearized 4-20 mA DC outputs and have reversed polarity protection.



Refer to document 00-02-0849 for specific details on RTDTs at <https://www.fwmurphy.com/products>.

# Dimensions



Model Number	(A)	(B)	(C)	(D)	(E)	(F)
TCJ-225, TCK-225, RTD-225-400-100, RTDT-225-400-100	1 in. (25 mm)	1-3/4 in. (44 mm)	2-1/2 in. (63 mm)	N/A	N/A	1/2 NPT
TCK-325, RTD-325-400-100	1 in. (25 mm)	1-3/4 in. (44 mm)	2-1/2 in. (63 mm)	N/A	N/A	3/4 NPT
TCJ-245, TCK-245, RTD-245-400-100, RTDT-245-400-100	1 in. (25 mm)	1-3/4 in. (44 mm)	4-1/2 in. (114 mm)	5/8 in. (16 mm)	2-1/2 in. (64 mm)	1/2 NPT
TCJ-345, TCK-345, RTD-345-400-100	1 in. (25 mm)	1-3/4 in. (44 mm)	4-1/2 in. (114 mm)	5/8 in. (16 mm)	2-1/2 in. (64 mm)	3/4 NPT
TCJ-275, TCK-275, RTD-275-400-100	1 in. (25 mm)	1-3/4 in. (44 mm)	7-1/2 in. (191 mm)	5/8 in. (16 mm)	2-1/2 in. (64 mm)	1/2 NPT
TCK-375	1 in. (25 mm)	1-3/4 in. (44 mm)	7-1/2 in. (191 mm)	5/8 in. (16 mm)	2-1/2 in. (64 mm)	3/4 NPT

# Specifications

**Thermowell:** 304 SS; 7000 psi (48.2 MPa) [482 bar] max @ 70° F

**Connecting Head:** Cast Aluminum; 400° F (204° C) max operating temp

**Thermocouple:** Ungrounded, magnesium oxide (MgO) insulated 96% purity; element sheath of 304 SS (stainless steel)

**Type J operating temp.:** 900° F (482° C) max

**Type K operating temp.:** 1800° F (982° C) max

**RTD:** 100 ohm @ 0° C platinum element; 3-wire; 400° F maximum; 0.00385 temperature coefficient; 316L stainless steel element sheath

**RTD Transmitter:** 100 ohms platinum RTD; 400°F maximum; Ranges:

0° to 400° F and -60° to 140° F. Linearized 4-20 mA DC output. Loop powered typically 24 VDC, when using the Loop Resistance Graph, 13-40 VDC. For use with 100 ohms platinum RTD elements, 0.00385 temp coefficient

**Thermocouple Accuracy (J/K):** 0.5%

**RTD Accuracy:** ±0.12%

**RTD Transmitter Accuracy:** ±0.1%

**Terminal block:** Ceramic Steatite; thermocouples have: 4 terminals; RTDs: 6 terminals. 28 to 14 AWG wire size, (8-32 SS screws)

**Optional Thermocouple Extension Wire:**

Sold separately—see How to Order section

**Individual Conductor Insulation:** Extruded PFA

**Duplex Conductor Insulation:** Twisted; Extruded PFA overall

**Temperature Rating:** Continuous -450° to 500° F (-267° to 260° C)

**Abrasion Resistance:** Good

**Moisture Resistance:** Excellent

**Shielding:** Metallic shield

**Gage:** 20 AWG (0.5 mm<sup>2</sup>),

Ohms per Double Foot Type J: 0.357

Ohms per Double Foot Type K: 0.586

# How to Order

Model Number	Model and Description	Notes
<b>Thermocouple Assemblies (thermowell included)</b>		
TCJ-225	J Type underground thermocouple, 1/2 NPT	2-1/2 in. (63 mm) insertion length
TCK-225	K Type underground thermocouple, 1/2 NPT	
TCK-325	K Type underground thermocouple, 3/4 NPT	4-1/2 in. (114 mm) insertion length
TCJ-245	J Type underground thermocouple, 1/2 NPT	
TCK-245	K Type underground thermocouple, 1/2 NPT	
TCJ-345	J Type underground thermocouple, 3/4 NPT	7-1/2 in. (191 mm) insertion length
TCK-345	K Type underground thermocouple, 3/4 NPT	
TCJ-275	J Type underground thermocouple, 1/2 NPT	7-1/2 in. (191 mm) insertion length
TCK-275	K Type underground thermocouple, 1/2 NPT	
TCK-375	K Type underground thermocouple, 3/4 NPT	
<b>RTD Assemblies (thermowell included)</b>		
RTD-225-400-100	100 ohm Pt RTD 400°F (204°C) max., 1/2 NPT	2-1/2 in. (63 mm) insertion length
RTD-245-400-100	100 ohm Pt RTD 400°F (204°C) max., 1/2 NPT	4-1/2 in. (114 mm) insertion length
RTD-275-400-100	100 ohm Pt RTD 400°F (204°C) max., 1/2 NPT	7-1/2 in. (191 mm) insertion length
<b>RTD Transmitter Assemblies (thermowell included)</b>		
RTDT-225-400-100	100 ohm Pt 4-20 mA RTD Transmitter, 1/2 NPT, 0-400°F (-17.8-204°C)	2-1/2 in. (63 mm) insertion length
RTDT-225-400-100-EX	100 ohm Pt 4-20 mA RTD Transmitter, 1/2 NPT, 0-400°F (-17.8-204°C)	
RTDT-325-400-100	100 ohm Pt 4-20 mA RTD Transmitter, 3/4 NPT, 0-400°F (-17.8-204°C)	4-1/2 in. (114 mm) insertion length
RTDT-245-400-100	100 ohm Pt 4-20 mA RTD Transmitter, 1/2 NPT, 0-400°F (-17.8-204°C)	
RTDT-345-400-100	100 ohm Pt 4-20 mA RTD Transmitter, 3/4 NPT, 0-400°F (-17.8-204°C)	

Model Number	Model and Description	Notes
<b>Replacement Parts (order separately)</b>		
TCKE-25	Type K elements only for 2-1/2 in wells*	all elements are spring loaded
TCKE-45	Type K elements only for 4-1/2 in wells*	
TCKE-75	Type K elements only for 7-1/2 in wells*	
RTDE-25	100 ohm Pt RTD element only for 2-1/2 in. wells	all elements are spring loaded
RTDE-45	100 ohm Pt RTD element only for 4-1/2 in. wells	
RTDE-75	100 ohm Pt RTD element only for 7-1/2 in. wells	
RTDTX-400-100	100 ohm Pt RTD Transmitter only 0-400°F (-17.8-204°C)	
<b>Thermocouple Extension Wire</b>		
00003272	Type K 100 ft. roll	

Product Compatibility		
Model	Power Source	Temp Sensor
MDTM89	CD Ign. 12/24 VDC, 120 VAC	JK ungrounded thermocouples
TDX6	CD Ign. 12/24 VDC, 120 VAC	JK grounded/ungrounded tc.
TDXM	12/24 VDC	JK grounded/ungrounded tc.

Approximate Shipping Weight and Dimensions		
Model	Weight	Dimension
2-1/2 in. (63 mm)	2 lb. (0.907 kg)	12 x 7 x 5-1/2 in. (305 x 178 x 140 mm)
4-1/2 in. (114 mm)	2 lb. 8oz. (1.24 kg)	12 x 7 x 5-1/2 in. (305 x 178 x 140 mm)
7-1/2 in. (191 mm)	3 lb. 6oz. (1.67 kg)	16 x 11 x 5-1/2 in. (406 x 280 x 144 mm)