

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

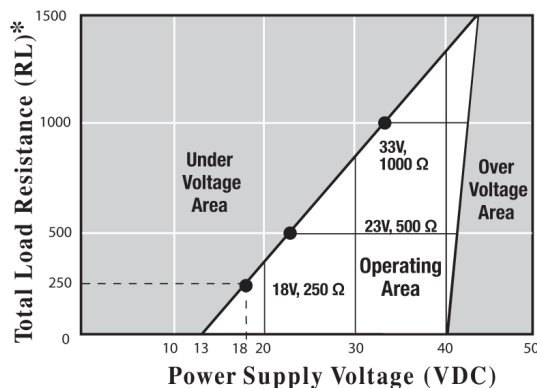
FW Murphy offers a variety of highly reliable thermocouple and RTD (Resistance Temperature Detector) assemblies and 4-20 mA DC output RTD transmitters.

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

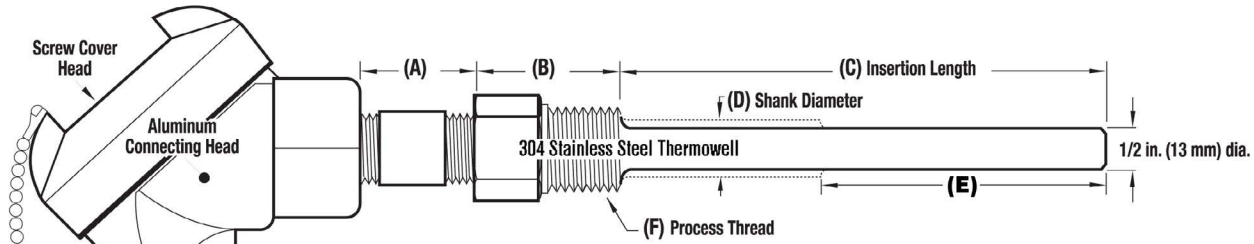
Resistance temperature detector (RTD) assemblies are available with a 100 ohm platinum element, 3-wire leads and spring-loaded 316L stainless steel element sheath.

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.



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 mm²),
 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
Thermocouple Assemblies (thermowell included)		
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	
RTD Assemblies (thermowell included)		
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
RTD Transmitter Assemblies (thermowell included)		
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)	
RTDT-245-400-100	100 ohm Pt 4-20 mA RTD Transmitter, 1/2 NPT, 0-400°F (-17.8-204°C)	

Model Number	Model and Description	Notes
Replacement Parts (order separately)		
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)	
Thermocouple Extension Wire		
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)