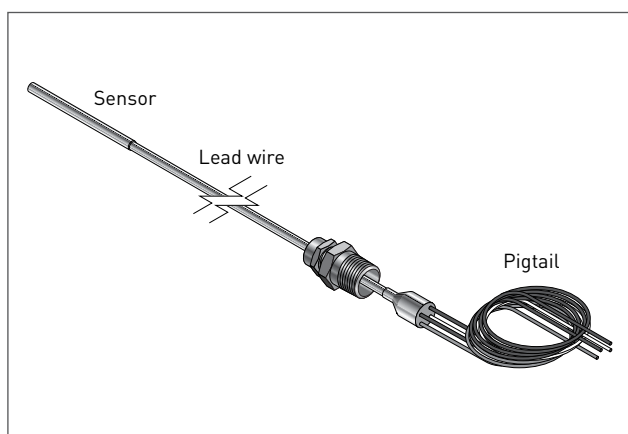


RAYCHEM

RTD-MTO

Resistance Temperature Detector (RTD) for Temperature Measurement up to 1100°F (593°C) Installation Instructions



DESCRIPTION

These three-wire platinum RTD's (resistance temperature detectors) are designed to withstand highly corrosive applications and are typically used with control and monitoring systems when accurate temperature control is required. The alloy 825 sheathed lead wire is rugged, yet flexible, allowing the sensor to get around obstructions or into areas where a rigid conduit is not practical.

TOOLS REQUIRED

- 1/8 in (3.5 mm) flat-blade screwdriver

ADDITIONAL MATERIALS REQUIRED

- Pipe straps

APPROVALS

Hazardous Locations



Class I, Div. 1 & 2, Groups A, B, C, D
 Class II, Div. 1 & 2, Groups E, F, G
 Class III

The RTD10 and RTD20 are approved for Division 1 and 2 only when used with the appropriately rated enclosure suitable for the specific hazardous location.

KIT CONTENTS

Qty Description

- | Qty | Description |
|-----|---------------------------------|
| 1 | Resistance Temperature Detector |

SPECIFICATIONS

Sensor

Housing	304 Stainless steel
Nominal dimensions	3 in (76 mm) length, 1/4 in (6.4 mm) diameter
Accuracy	±1°F at 32°F (±0.5°C at 0°C)
Range	-76°F to 1100°F (-60°C to 593°C)
Resistance	100 ohms at 0°C α =0.00385 ohms/ohm/°C

Lead wire

Outer sheath	Alloy 825 Stainless steel 3/16 in (4.8 mm) in diameter
Length*	RTD10 – 10.2 ft (3.1 M) RTD20 – 20.2 ft (6.1 M) Note: Made-to-order RTDs are available in lengths up to 100 ft (30.5 m).

Maximum exposure temperature	1100°F (593°C)
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Conduit connector	1/2 in NPT, 303 stainless steel
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Pigtail

Length*	24 in (61 cm)
Pigtail wire size (each of 4)	16 AWG, stranded tinned copper

Electrical connection	For connection only to Class 2 circuits
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* Tolerance on length is ±3%.

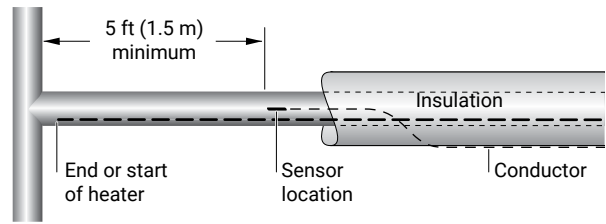
⚠ WARNING:

This component is an electrical device. It must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all the

installation instructions. Component approvals and performance are based on the use of specified parts only. Do not use substitute parts or vinyl electrical tape to make connections.

RTD LOCATION

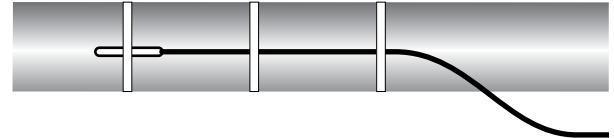
Try to locate the sensor at least 5 ft (1.5 m) from the end of the tracer circuit being controlled. If the pipe is shorter than 10 ft (3 m), position the sensor midway along the circuit being controlled. The RTD should be located on the side of the pipe opposite the heating cable or as specified on the tracer installation drawing.



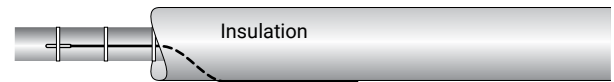
FASTENING THE RTD TO THE PIPE

Attach to the pipe using the appropriate pipe strap from the table below.

Pipe Size (inches)	Pipe Strap
1/4 to 1 in	PS-01
1 to 3 in	PS-03
3 to 10 in	PS-10
10 to 20 in	PS-20

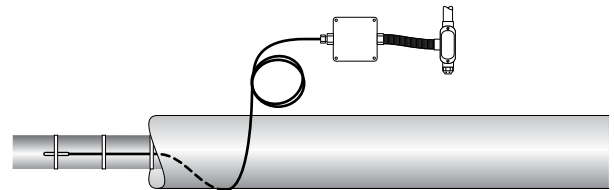


The RTD lead wire should emerge from the insulation cladding at the bottom of the pipe to ensure that water does not enter the insulation.



EXCESS LEAD WIRE

Excess lead wire should be wound neatly in a coil of about 4 in (10 cm) diameter leaving sufficient length to connect into the enclosure.



RTD - RESISTANCE VS. TEMPERATURE TABLES

Note: Where it is desirable to determine the approximate pipe temperature by measuring the resistance, measure the resistance between the red/red leads and subtract from the resistance measured between the red/white leads. Then compare the value to the table below.

DIN 43760 -100 OHM Platinum RTD (Resistance Temperature Detector – Alpha = 0.00385 Ohms/Ohm/°C)

Ohms	°C	°F	Ohms	°C	°F	Ohms	°C	°F
80.31	-50	-58	115.54	40	104	164.76	170	338
84.27	-40	-40	117.47	45	113	168.46	180	356
88.22	-30	-22	119.40	50	122	172.16	190	374
92.16	-20	-4	123.24	60	140	175.84	200	392
96.09	-10	14	127.07	70	158	183.17	220	428
98.04	-5	23	130.89	80	176	190.45	240	464
100.00	0	32	134.70	90	194	194.07	250	482
101.95	5	41	138.50	100	212	197.69	260	500
103.90	10	50	142.29	110	230	204.88	280	536
105.85	15	59	146.06	120	248	212.02	300	572
107.79	20	88	149.82	130	266	220.88	325	617
109.73	25	77	153.58	140	284	229.67	350	662
111.67	30	86	157.31	150	302			
113.61	35	95	161.04	160	320			

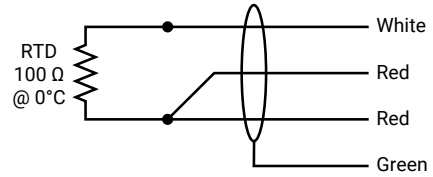
INSULATION RESISTANCE TEST

To test the insulation resistance of the sensor, use a megohmmeter set to 250 Vdc maximum.

Connect the positive lead of the megohmmeter to the green wire. Connect the negative lead to one of the red or white wires. The minimum I.R. should be 100 MΩ.

Note: Do not connect the megohmmeter between the red and white leads as the RTD element may be damaged.

Do not bend the sensor.



RTD TEST RECORD

Controller Tag No. _____

Testing Prior to Installation	Installer: Initial / Date	Owner: Initial / Date
Visually inspect to ensure no apparent damage from shipping/handling		
Multimeter resistance reading <ul style="list-style-type: none"> • Red/Red (0.22 to 21 ohms depending on RTD length) • Red/White (approx. 107.8 ohms at 20°C) Note: Red/White (Ω) - Red/Red (Ω) = Platinum RTD (Ω)		
Megohmmeter reading (250 volts D. C. max.) <ul style="list-style-type: none"> • Minimum acceptable 100 megohms 		
Visually inspect RTD located as per drawing	Installer: Initial / Date	Owner: Initial / Date
Visually confirm RTD is located as per drawing		
RTD properly attached to pipe		
Multimeter resistance reading <ul style="list-style-type: none"> • Red/Red (0.22 to 21 ohms depending on RTD length) • Red/White (approx. 107.8 ohms at 20°C) Note: Red/White (Ω) - Red/Red (Ω) = Platinum RTD (Ω)		
Megohmmeter reading (250 volts D. C. max.) <ul style="list-style-type: none"> • Minimum acceptable 100 megohms 		
Prior to closing the cover on the enclosure check that RTD lead wires have been connected to the correct terminal blocks.		

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