PRTXD Series RTD Temperature Transmitters

M-4115/0507

INSTRUCTION SHEET

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PRTXD Series RTD Transmitters

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†Thermowell required for spring-loaded versions

Accuracy
Display: ±0.1% of span, plus sensor error, ±1 digit
Analog output: ±0.1% of span, plus sensor error
Sensor: ±0.3°C at 0°C, ±1.1°C at 150°C

Sensor
100 Ω RTD element, 0.00385 α coefficient
IEC-751 Class B: ±0.3°C at 0°C, ±1.1°C at 150°C
10 second time constant

Display (update rate, type, size)
3 readings per second nominal display update rate
3 digit LCD, ½" digit height

Controls
Non-interactive zero and span, ±10% range
Test calibration level: 0-100% range

Loop Supply Voltage
Any DC supply/resistance that maintains 8 to 32 VDC at gauge terminals. Minimum 8 V required at gauge terminals at all times for proper operation. Reverse polarity protected

Loop Output Characteristics
4-20 mA output
See chart below right for loop voltage characteristics

Test Function
Front panel TEST button when held, sets loop current and display to test calibration level, independent of temperature input, to allow testing of system performance.

Wiring Connections (see drawing)
3 ft long, 2-conductor 22 AWG cable

Weight
Transmitter: Approx. 12 ounces
Shipping weight: Approx. 1 pound

Material and Color
NEMA 4X ABS/Polycarbonate housing, light gray
Gasketed rear cover

Connection and Probe Material
¼" NPT male hex nipple, 316 stainless steel
316 stainless steel probe sheath

Storage Temperature
–40 to 203°F (–40 to 95°C)

Operating Temperature
–4 to 185°F (–20 to 85°C) at housing

Installation and Precautions
A thermowell is required with flowing material, pressurized applications, and all applications using spring-loaded versions of the PRTXD.
Install or remove using wrench on probe hex fitting only. Do not attempt to tighten by turning housing or any other part of the transmitter. Due to the hardness of 316 stainless steel, it is recommended that a thread sealant be used to ensure leak-free operation.

Electrical Connections
The 2-wire connection allows the PRTXD to be used as a temperature display powered by a low-voltage DC source, or as a loop-powered 4-20 mA transmitter. Connect the loop (+) supply to the RED lead and the loop (–) supply to the BLACK lead. Reversing the connections will not harm the transmitter but it will not operate with incorrect polarity.

Select a loop power supply voltage and total loop resistance so that when the loop current is 20 mA, the transmitter will have at least 8 VDC at its terminals. For correct operation and to avoid erratic or erroneous readings, the terminal voltage must not fall below 8 VDC. Too large a loop resistance will cause the output to "limit" or saturate before reaching its full 20 mA output.

The minimum loop supply voltage may be calculated from the formula:

\[ V_{\text{min}} = 8V + (20mA \times \text{Total loop resistance}) \]

If the terminal voltage falls below about 7.8 VDC erratic operation may occur. This is an indication that the loop supply/resistance may not allow adequate power for reliable operation. This should never occur in normal use. If it does, examine the loop supply and resistance.

Operation
The PRTXD Series is designed for continuous operation. Warm-up time is negligible. The display will show the temperature, and the loop current will be proportional to the indicated temperature.

4 mA = Zero or low end
20 mA = Span, full-scale or high end

Accuracy
Display: ±0.1% of span, plus sensor error, ±1 digit
Analog output: ±0.1% of span, plus sensor error
Sensor: ±0.3°C at 0°C, ±1.1°C at 150°C

Calibration
The PRTXD is factory calibrated and there is generally no need to alter calibration settings. Zero and span calibration should only be attempted if the user has access to temperature calibration equipment that has at least four times the transmitter accuracy.

Remove nylon screw to access the Test calibration potentiometers. These potentiometers calibrate the display. Zero calibration must be done before span calibration. Record readings at three to five points over the transmitter range and adjust span control to minimize error and meet specifications.

Internal zero and span controls adjust the agreement between the displayed value and the 4-20 mA loop current. These are set at the factory and should not normally be adjusted. If adjustment is necessary, accurate current measurement equipment are required to successfully complete this calibration.
Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED.
2. Model and serial number of the product under warranty.
3. Repair instructions and/or specific problems relative to the product.

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