

TT176, TT246 RTD Transmitters



TT176 RTD Transmitter,
current output



TT246 RTD Transmitter,
voltage output

Overview

Specify these rugged, accurate transmitters for process control and other industrial applications.

Model TT176 provides a linearized 4 to 20 mA current signal for long-distance transmission. It has a built-in LED indicator to monitor operation.

TT246 outputs 1 to 5 VDC proportional to temperature.

It draws only 3 mA of quiescent current, making it ideal for solar or battery powered systems.

- TT176: 4 to 20 mA current signal
TT246: 1 to 5 VDC voltage signal
- 2 or 3-wire RTD input
- TT176: Factory Mutual (FM) approved intrinsically safe, nonincendive for hazardous locations
- Ambient rated to 85°C (185°F)
- Fits DIN "B" style connection heads
- Optional high-accuracy calibration to Minco RTDs for improved accuracy; see next page and page 5-22 for more information.

Specifications

Output: Linear with temperature over specified range.

TT176: 4 to 20 mA

TT246: 1 to 5 VDC

Calibration Accuracy: ±0.1% of span (0.2% of span for spans less than 10 Ω)

Linearity: 0.1% of span, referenced to actual sensor temperature

Adjustments Zero and span, ±5% of span, non-interacting. Factory set.

Ambient temperature:

Operating: -40 to 85°C (-40 to 185°F)

Storage: -55 to 100°C (-67 to 212°F)

Ambient temperature effects:

±0.009% of span per °C

±0.014% of span per °C for spans less than 10 Ω

Warmup drift:

±0.1% of span max., with $V_{supply} = 24$ VDC and $R_{loop} = 250$ Ω. Stable within 15 minutes.

Supply voltage:

TT176: 10 to 35 VDC

TT246: 7.5 to 35 VDC

Voltage effect ±0.001% of span per volt.

Reverse polarity protected.

Supply current (TT246) : 3mA max. with no load.

Maximum load resistance: The maximum allowable resistance of the signal carrying loop is:

$$R_{loop\ max} = \frac{V_{supply} - 10}{0.020\ \text{amps}}$$

Example: With supply voltage 24 VDC, maximum loop resistance is 700 Ω.

Minimum span: 10°C (18°F).

Minimum output current: 2.2 mA.

Maximum output current: 28 mA.

Leadwire compensation: (3-wire RTD) ±0.05% of span per Ω up to 25 Ω in each leg.

Hazardous atmospheres: Both models may be used with Minco explosionproof connection heads. Model TT176 is also Factory Mutual (FM) approved nonincendive for use in Class I, Division 2 areas and intrinsically safe for Class I, Division 1 areas (requires approved barrier). Transmitter entity parameters: $V_{max} = 35$ volts; $I_{max} = 150$ mA; $C_i = 0$ μF and $L_i = 0$ mH.

Connections: Terminal block for wires AWG 22 to AWG 14.

Physical: Polycarbonate case, epoxy potted for moisture resistance.

Weight: 2.0 oz. (57 g).

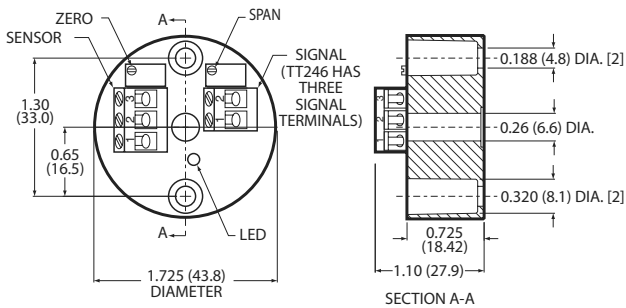
Specifications subject to change

RTD input types

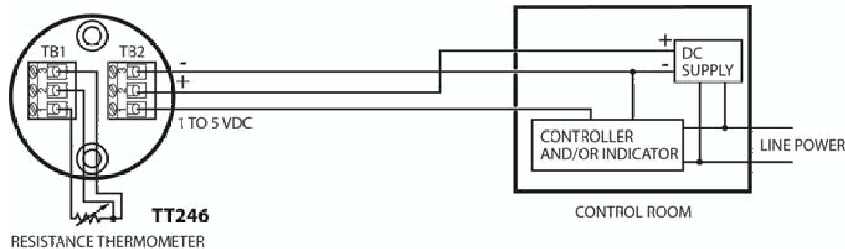
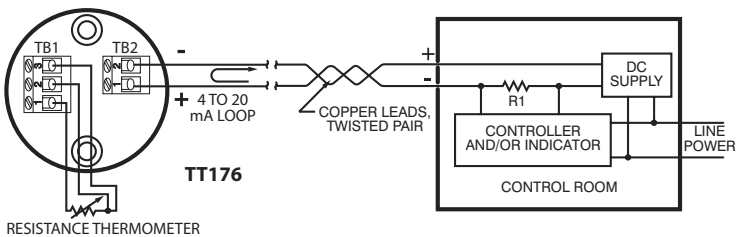
2 or 3-wire resistance thermometer:

Element		Code
Platinum (0.00392 TCR)	100 Ω at 0°C	PA
Platinum (0.00391 TCR)	100 Ω at 0°C	PB
Platinum (0.00385 TCR)	100 Ω at 0°C	PD, PE
Platinum (0.00385 TCR)	1000 Ω at 0°C	PF
Platinum (0.00375 TCR)	1000 Ω at 0°C	PW
Copper (0.00427 TCR)	10 Ω at 25°C	CA
Nickel-iron (0.00518 TCR)	604 Ω at 0°C	FA
Nickel-iron (0.00527 TCR)	1000 Ω at 70°F	FB
Nickel-iron (0.00527 TCR)	2000 Ω at 70°F	FC
Nickel (0.00672 TCR)	120 Ω at 0°C	NA

Dimensions in inches (mm)



Wiring Diagrams



Special high-accuracy calibration

For high system accuracy, specify transmitters with matched calibration. Temptrans match calibrated to a sensor are always ordered as assemblies. Common examples are show in Section 2.

Specification and order options:

TT176	Model Number: TT176: 4 to 20 mA TT246: 1 to 5 VDC
PB	RTD element code from table
1	
K	Temperature range code starting on page 5-20 [Ex: K = 0 to 200°C (32 to 392°F)]
TT176PB1K = Sample part number	

Specify and order products at:

www.minco.com/sensors_config

Hazardous area requirements

Refer to Minco's Application Aid #19 entitled "Specifying Temperature Sensors for Hazardous Areas" for more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, CENELEC and ATEX). Application Aid #19 is available at www.minco.com/sensoraid/.

Specifications subject to change