TT220 Isolated RTD Transmitter

FM APPROVED

TT220 Isolated RTD Transmitter

Overview

Model TT220 is a rugged industrial transmitter designed for process control and other applications. It provides electrical isolation to 600 VRMS between the input and output.

The TT220 has a built-in LED indicator to help troubleshoot signal loops. A very bright LED indicates an open sensor; a dark LED signals a shorted sensor or loss of current loop power.

- 4 to 20 mA current signal
- 2 or 3-wire RTD input
- Input/output isolated to 600 VRMS
- Factory Mutual (FM) approved intrinsically safe, nonincendive for hazardous locations
- Ambient rated to 85°C (185°F)
- Optional high-accuracy calibration to Minco RTDs for improved accuracy; see next page and page 5-22 for more information

Specifications

Output: 4 to 20 mA over specified range, linear with temperature.

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 to185°F).
Storage: -55 to 100°C (-67 to 212°F).

Ambient temperature effects: ±0.018% of span per °C.

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

Input/output isolation: 600 VRMS.

Supply voltage: 13 to 45 VDC. Voltage effect ±0.001% of span per volt. Reverse polarity protected.

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

$$R_{loop\ max} = \frac{V_{supply} - 13}{0.020\ \text{amps}}$$

Example: With supply voltage 24 VDC, maximum loop resistance is 550 Ω.

Minimum span: 10°C (18°F).

Minimum output current: 2.5 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:
Model TT220 may be used with Minco explosionproof connection heads. This model is 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: 3.0 oz. (85 g).

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/.

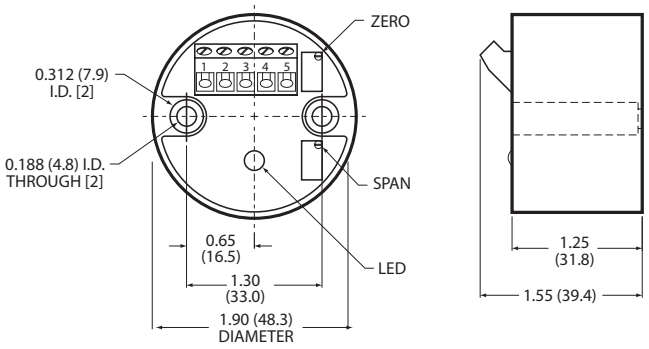
Specifications subject to change

RTD input types

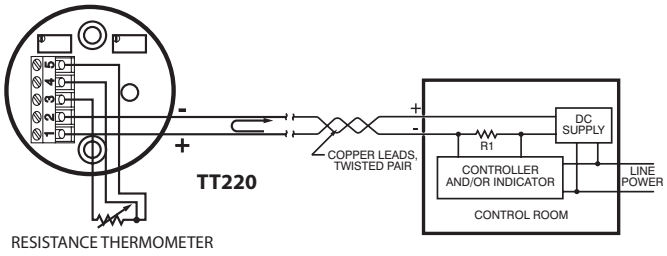
2 or 3-wire resistance thermometer:

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

Dimensions in inches (mm)



Wiring Diagram



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 shown in Section 2.

Specification and order options

TT220	Model number
PA	RTD element code from table
1	Output: 4 to 20 mA DC
GH	Temperature range code starting on page 5-20 [Ex: GH = -40 to 100°C (-40 to 212°F)]
TT220PA1GH = Sample part number	

Specify and order products at:

www.minco.com/sensors_config

TT221 Isolated Thermocouple Transmitter

TT221 Isolated RTD Transmitter

Overview

Model TT221 is a rugged thermocouple transmitter designed for process control and other applications. It provides electrical isolation to 600 VRMS between the input and output. You can use thermocouples with either grounded or ungrounded junctions.

The TT221 has a built-in LED indicator to help troubleshoot signal loops. A dark LED signals loss of loop power or an open thermocouple.

- 4 to 20 mA current signal
- Thermocouple input
- Input/output isolated to 600 VRMS
- Factory Mutual (FM) approved intrinsically safe, nonincendive for hazardous locations
- Ambient rated to 85°C (185°F)

Specifications

Output: 4 to 20 mA over specified range.

Accuracy: ±0.2% of span.

Linearity: Voltage linear.
The output signal of the TT190 and TT205 is voltage linear (not temperature linear) and is intended for use with instruments which compensate for the nonlinear signal output of the thermocouples sensor.

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

Ambient temperature:
Operating: -40 to 85°C (-40 to185°F).
Storage: -55 to 100°C (-67 to 212°F).

Ambient temperature effects: ±0.036% of span per °C.

Cold junction compensation drift:
±0.03°C per °C, -25 to 70°C.
±0.06°C per °C, -40 to -25°C and 70 to 85°C.

Warmup drift: ±0.2% of span max., with
V_{supply} = 24 VDC and R_{loop} = 250 Ω.
Stable within 15 minutes.

Input/output isolation: 600 VRMS

Supply voltage: 13 to 45 VDC. Voltage effect ±0.001% of span per volt. Reverse polarity protected.

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

$$R_{loop\ max} = \frac{V_{supply} - 13}{0.020\ \text{amps}}$$

Example: With supply voltage 24 VDC, maximum loop resistance is 550 Ω.

Minimum span: 100°C (180°F).

Minimum output current: 2.5 mA.

Maximum output current: 28 mA.

Burnout: Downscale burnout standard; upscale optional.

Hazardous atmospheres:
Model TT221 may be used with Minco explosionproof connection heads. This model is 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.

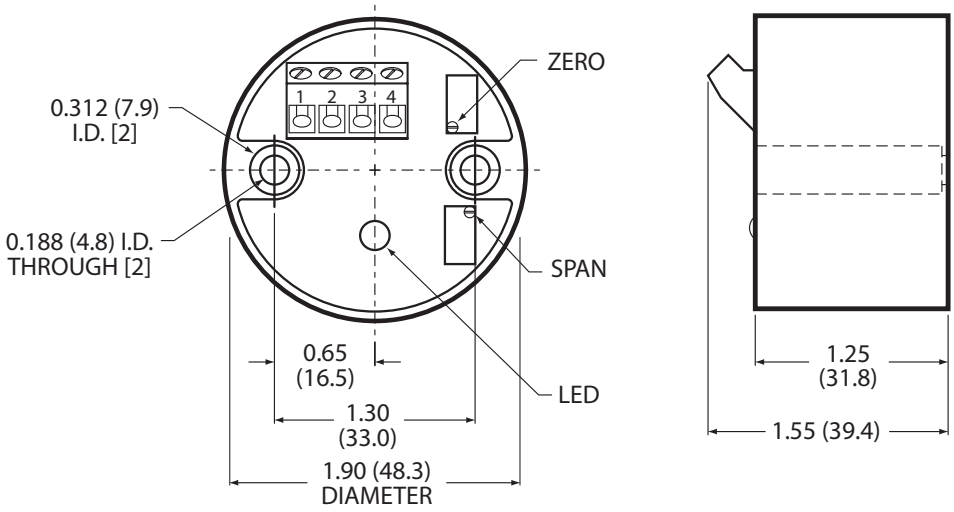
Weight: 3.0 oz. (85 g).

Specification and order options

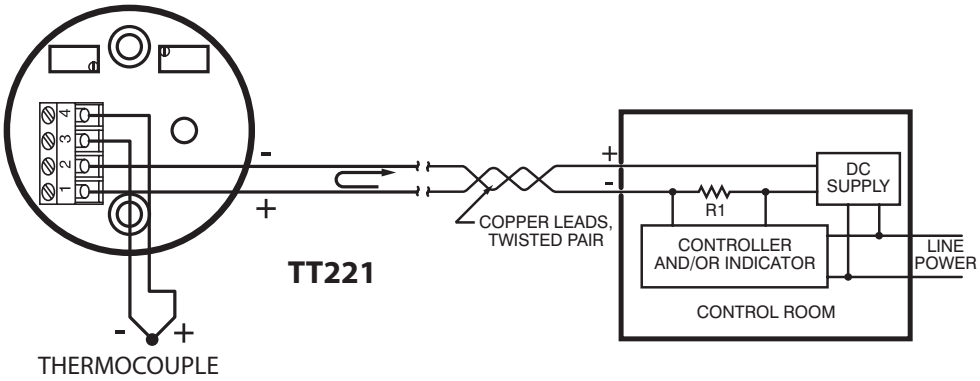
TT221	Model number
J	TC junction type: E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel T = Copper-Constantan
1	Output: 4 to 20 mA DC
BW	Temperature range code starting on page 5-20 [Ex: BW = 0 to 250°C (32 to 482°F)]
TT221J1BW = Sample part number	

Specifications subject to change

Dimensions in inches (mm)



Wiring Diagram



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/.

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Specifications subject to change