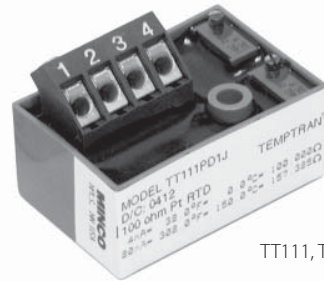


# Miniature Temptran™ RTD Transmitters



TT111, TT211

## Overview

- Two models:
  - TT111: UL-recognized component for Canada and United States.
  - TT211: Wider ambient rating; Factory Mutual (FM) approved intrinsically safe and nonincendive.
- Optional high-accuracy calibration to Minco RTDs for improved accuracy; see next page and page 4-22 for more information.

## Specifications

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

**Calibration accuracy:** ±0.1% of span.

**Linearity:** Referenced to actual sensor temperature.

Platinum RTD input: ±0.1% of span.

Nickel and nickel-iron RTD input:

±0.25% of span for spans less than 100°C.

±0.25% of span per 100°C of span for spans greater than 100°C.

**Adjustments:** Zero and span, ±5% of span. Factory set.

**Ambient temperature:**

TT111: 0 to 50°C (32 to 122°F).

TT211: -25 to 85°C (-13 to 185°F).

Storage: -55 to 100°C (-67 to 212°F).

**Ambient temperature effects:**

±0.013% of span per °C.

±0.025% of span per °C for spans less than 55°C.

**Warmup drift:** ±0.1% of span max., with

$V_{supply} = 24$  VDC and  $R_{loop} = 250 \Omega$ .

Stable within 30 minutes.

**Supply voltage:** 8.5 to 35 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:

$$R_{loop\ max} = \frac{V_{supply} - 8.5}{0.020\ \text{amps}}$$

Example: With supply voltage 24 VDC, maximum loop resistance is 775  $\Omega$ .

**Minimum span:** 27.8°C (50°F).

**Hazardous atmospheres:** All models may be used with Minco flameproof/explosionproof connection heads. Models TT211 is Factory Mutual 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;  $C_i = 0$   $\mu$ F and  $L_i = 0$  mH.

**Connections:**

Terminal block for wires AWG 22 to AWG 14.

**Physical:** Polycarbonate case, epoxy potted for moisture resistance.

**Weight:** 1.1 oz. (30 g).

### Hazardous area requirements

For more information on how to classify a hazardous area, methods of protection, and the various standards and agencies (including FM, CSA, CENELEC, IECEx and ATEX), visit [www.minco.com](http://www.minco.com).

▼ = STANDARD OPTIONS  
Specifications subject to change

# Miniature RTD Transmitters

## RTD input types

2-wire resistance thermometer:

| Element                   |                       | Code   |
|---------------------------|-----------------------|--------|
| Platinum (0.00392 TCR)    | 100 $\Omega$ at 0°C   | PA     |
| Platinum (0.00391 TCR)    | 100 $\Omega$ at 0°C   | PB     |
| Platinum (0.00385 TCR)    | 100 $\Omega$ at 0°C   | PD, PE |
| Platinum (0.00385 TCR)    | 1000 $\Omega$ at 0°C  | PF     |
| Platinum (0.00375 TCR)    | 1000 $\Omega$ at 0°C  | PW     |
| Nickel-iron (0.00518 TCR) | 604 $\Omega$ at 0°C   | FA     |
| Nickel-iron (0.00527 TCR) | 1000 $\Omega$ at 70°F | FB     |
| Nickel-iron (0.00527 TCR) | 2000 $\Omega$ at 70°F | FC     |
| Nickel (0.00672 TCR)      | 120 $\Omega$ at 0°C   | NA     |

## Special high-accuracy calibration

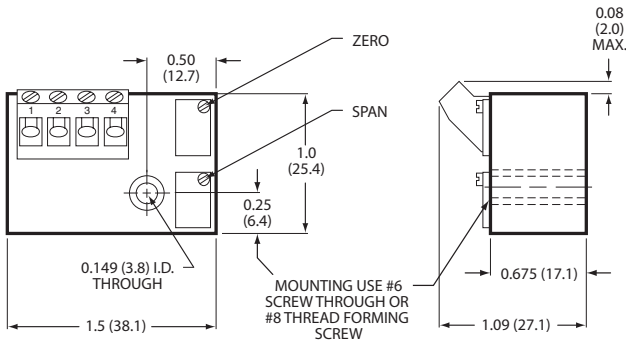
For high system accuracy, specify transmitters with matched calibration. Temptrans match calibrated to a sensor are always ordered as assemblies. Common examples are shown in Section 1.

## Specification and order options:

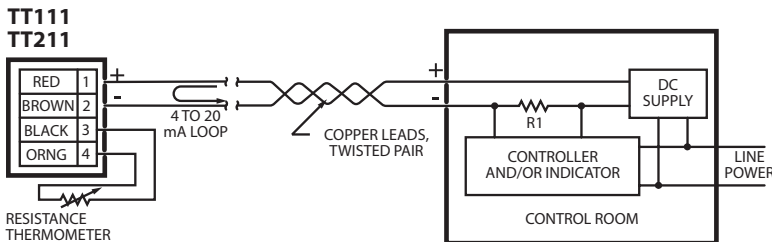
|                                |  |
|--------------------------------|--|
| TT111                          | Model number: TT111 or TT211   |
| PD                             | RTD element code from table  |
| 1                              | Output: 4 to 20 mA DC  |
| C                              | Temperature range code starting on page 4-20<br>[Ex: C = 0 to 100°C (32 to 212°F)] |
| TT111PD1C = Sample part number |  |

INSTRUMENTS

## Dimensions in inches (mm)



## Wiring Diagram



▼ = **STANDARD OPTIONS**  
Specifications subject to change



# TT246 RTD Transmitters



TT246 RTD Transmitter,  
voltage output

## Overview

Specify this rugged, accurate transmitter for process control and other industrial applications.

Model 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.

- 2 or 3-wire RTD input
- 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 4-22 for more information.

## Specifications

**Output:** Linear with temperature over specified range.  
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:

TT246: 7.5 to 35 VDC

Voltage effect ±0.001% of span per volt.

Reverse polarity protected.

**Supply current:** 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:** May be used with Minco explosion-proof connection heads.

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

**Physical:** Polycarbonate case, epoxy potted for moisture resistance.

**Weight:** 2.0 oz. (57 g).

▼ = **STANDARD OPTIONS**

Specifications subject to change

## RTD input types

2 or 3-wire resistance thermometer:

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

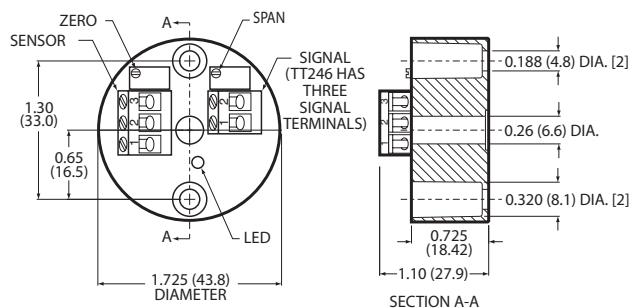
## Special high-accuracy calibration

For high system accuracy, specify transmitters with matched calibration. Temptrans match calibrated to a sensor are always ordered as assemblies.

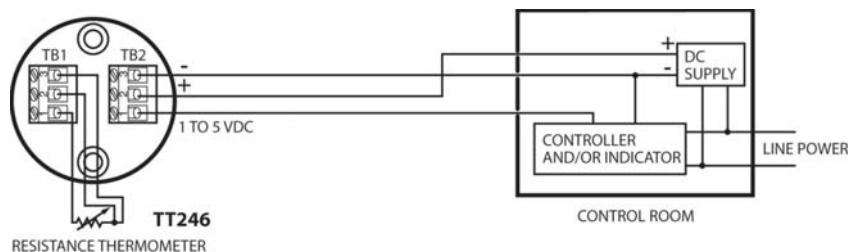
## Specification and order options:

|                                |  |
|--------------------------------|--|
| TT246                          | Model Number:  |
| PB                             | RTD element code from table  |
| 1                              |  |
| K                              | Temperature range code starting on page 4-20<br>[Ex: K = 0 to 200°C (32 to 392°F)] |
| TT246PB1K = Sample part number |  |

## Dimensions in inches (mm)



## Wiring Diagram



▼ = **STANDARD OPTIONS**  
Specifications subject to change