TT881
Explosion-Proof Temperature Assembly
Installation and Operating Instructions

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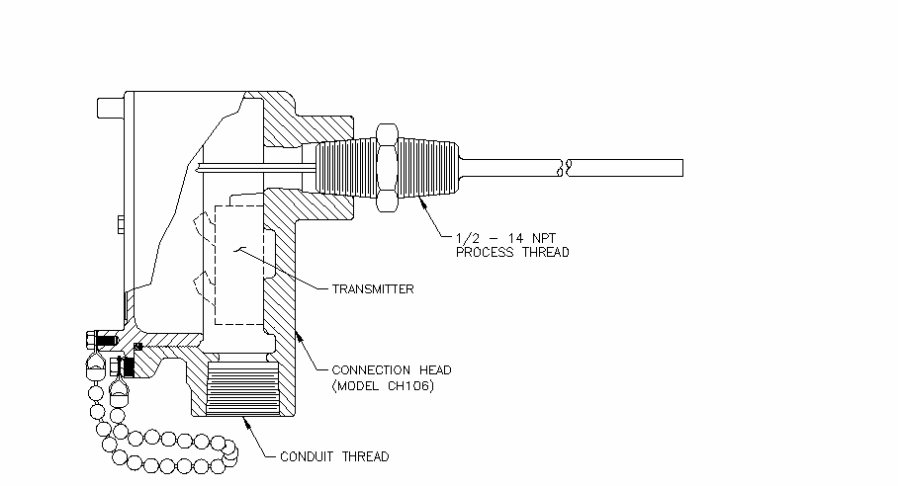
Installation

Thermowell, Head, and Sensor

1. Unscrew the connection head from the fitting. This is hand-tight and should not require tools.



2. The sensor fitting is factory welded in the correct position and cannot be removed from or repositioned on the probe.

3. Slide the probe, tip first, into position and thread the fitting into the process connections. Tighten using a 7/8" open-end adjustable wrench.

Transmitter

Connect the Temptran as shown below, observing the +/- polarity of the current loop. Maximum DC supply voltage = 35 VDC. The RTD connections for the Temptran in Figure 1 below must be connected as shown or the transmitter will not function properly.

Wiring Diagram

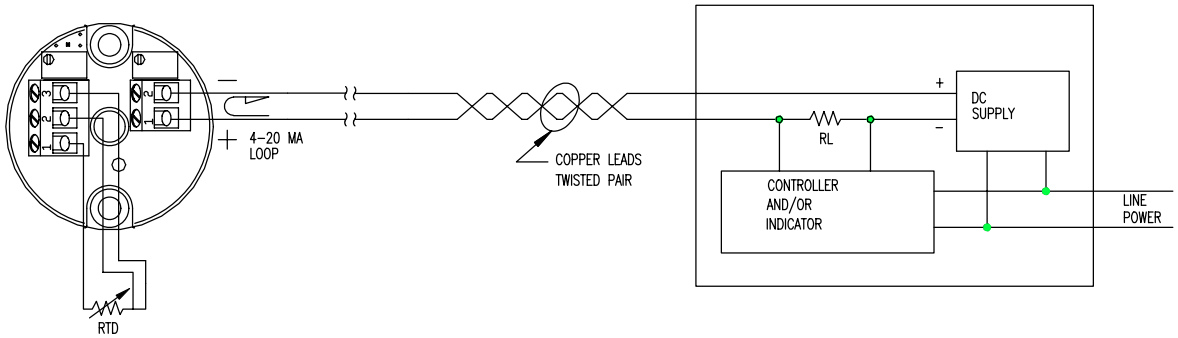


Figure 1

Transmitter Calibration Procedure

1. Connect a power supply of 24 VDC, and a digital milliammeter (5-1/2 digit preferred) as shown in Figure 2, or use a loop calibrator instead of the DC supply and milliammeter.

2. Connect a resistance decade box with a resolution of at least .01 ohms to the input of the transmitter. If unsure or concerned about the decade box's accuracy, measure the zero and span resistance settings using a known-accurate ohmmeter and record decade box settings before connecting decade box to the transmitter.

Leads 1-3 and A are used for coarse adjustment of the temperature range. See Transmitter ranging on page 4.

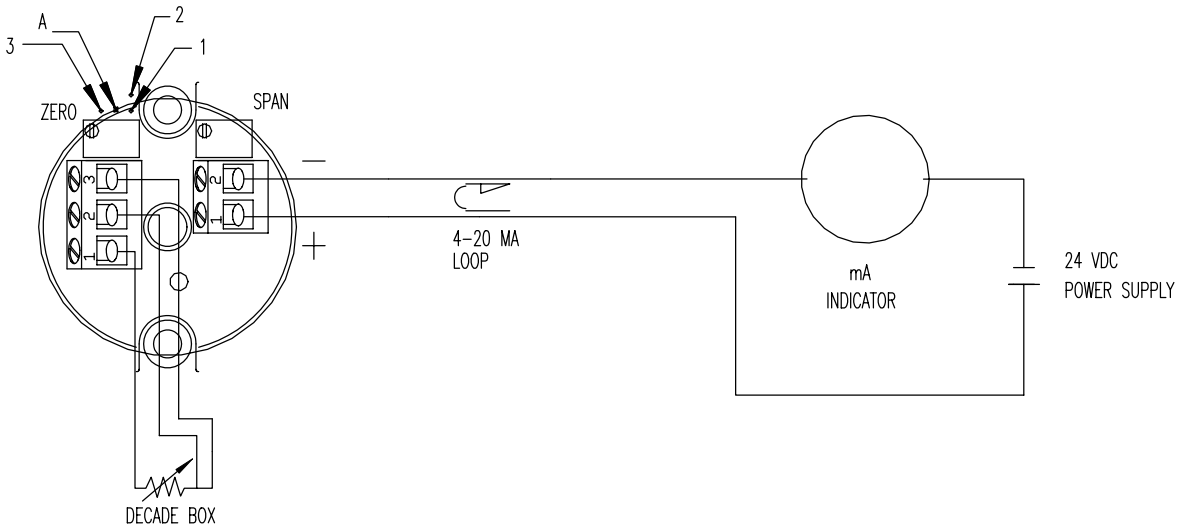


Figure 2

3. Determine the temperature range by reading the label information on the side of the transmitter. For example, if the label reads “4mA = -20°F” and “20mA = 140°F”, then your temperature range is –20 to 140°F.

4. Set decade box resistance to simulate the 4 mA temperature. For the given example, the decade box resistance should be set to simulate -20 °F.

5. Adjust ZERO potentiometer on the transmitter until the meter reads 4 mA.

6. Set decade box resistance to simulate the 20 mA temperature. For the given example, the decade box resistance should be set to simulate 140 °F.

7. Adjust SPAN potentiometer on the transmitter until the meter reads 20 mA.

8. Repeat steps 4 - 8 until no further adjustment is necessary.

Transmitter Ranging

The transmitter is initially calibrated to a specific temperature range as shown on the label attached to the transmitter. Unless a different range is desired, ranging is not necessary. If calibration is necessary, recalibrate the transmitter as described in section *Calibration Procedure*.

Re-ranging the transmitter requires a coarse adjustment of the temperature range. This is done by soldering a lead designated 1, 2, or 3 to lead A. Figure 2 on page 3 shows the location of the leads. Fine adjustment is then done per the calibration procedure on page 3. To perform the coarse adjustment, follow these steps:

1. The adjustability limits of the transmitter is dependent on the initial temperature range ordered from the factory. To determine the limits of adjustability, you must first determine the temperature span and then use Table 1. The temperature range information can be found on the label of the transmitter. For example, if the model is TT881PD1H1, then "H" = 40 to 90°F temperature range (4mA = 40°F, 20mA = 90°F), so the total temperature span is 90 – (40) = 50°F. Using Table 1, the adjustability limits for this example is; Zero: -15 to 75°F, Span: 45 to 180°F, and the adjustability limit code is "RA". The new temperature range you wish to calibrate to must fall within these limits.

Selection Table for TT881 Transmitter Range Code			
Temperature Span	Adjustability		
	Zero (4mA)	Span (20mA-4mA)	Adjustibility limit Code
Span <= 150°F	-15 to 75 °F	45 to 180 °F	RA
150°F < Span <= 300°F	-60 to 125 °F	90 to 360 °F	RB
Span > 300°F	-150 to 390 °F	270 to 1080 °F	RC

Table 1

2. Once you've determined your new temperature range, use Table 2 to determine the solder connection required for calibrating to that range. Again you need to determine the temperature span of the new range. For example, if you want your new range to be -10 to 70°F, the total temperature span is 70 – (-10) = 80. Using table 2 and the RA limit code as determined above, you will need to solder lead #2 to lead "A" (lead locations shown in Figure 2 on page 3).

Temperature Span (20mA – 4mA)			
Sensor:	100 and 1000 Ω Platinum		
Connect:	RA Limit Code	RB Limit Code	RC Limit Code
1 - A	45 to 65 °F	90 to 125 °F	270 to 360 °F
2 - A	65 to 90 °F	125 to 180 °F	360 to 540 °F
3 - A	90 to 180 °F	180 to 360 °F	540 to 1080 °F
Zero (4 mA):	-15 to 75 °F	-60 to 125 °F	-150 to 390 °F

Table 2

3. Calibrate TT881 transmitter as described in *Calibration Procedure*.

Specifications

Input:	2- or 3-wire 100 ohm, 1000 ohm platinum RTD's.
Output:	4 to 20 mA DC over specified range.
Calibrated Accuracy:	+/- 0.1% of span when factory calibrated.
Linearity:	+/- 0.2% of span.
Adjustments:	See temperature range chart page 4.
Ambient Temperature:	Operating: -40 to 85 °C (-40 to 185 °F). Storage: -55 to 100 °C (-67 to 212 °F).
Ambient Temperature Effects:	+/- 0.018% of span/°C. (+/- 0.01% of span/°F).
Warmup Drift:	+/- 0.1% of span max., assuming Vsupply = 24 VDC and Rloop = 250 ohms. Stable within 15 minutes.
Supply Voltage:	10 to 35 volts DC with no load. Reverse polarity protected.
Voltage effect:	+/- 0.001% of span per volt.
Lead Wire Compensation (3-wire RTD):	+/- 0.05% of span per ohm, up to 25 ohms in each leg.
Maximum Load Resistance:	The maximum allowable resistance of the signal-carrying loop is given by this formula: Rloop max = (Vsupply-10)/.02 amps. Example: With supply voltage 24 VDC, maximum loop resistance is 700 ohms.
Minimum Output current:	2.2 mA.
Maximum Output current:	28 mA.
Connections:	Terminal blocks accept wires from AWG 22 to AWG 14.
Physical:	Epoxy potted for moisture resistance.
Weight:	2.5 lbs. (1145 g).

Transmitter Dimensions:

All dimensions are in inches (millimeters).

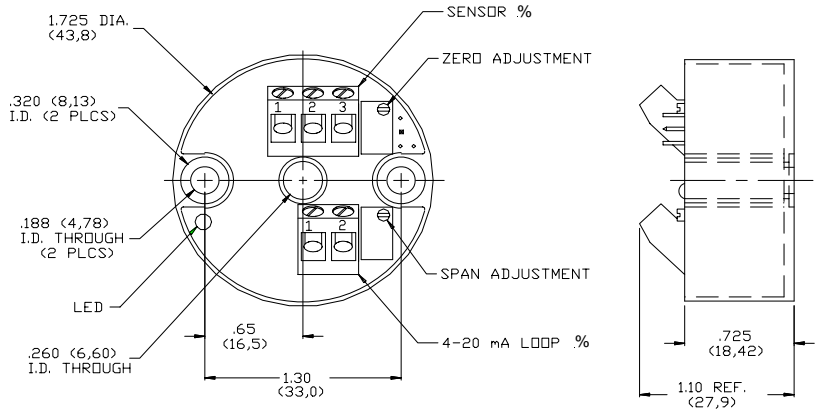
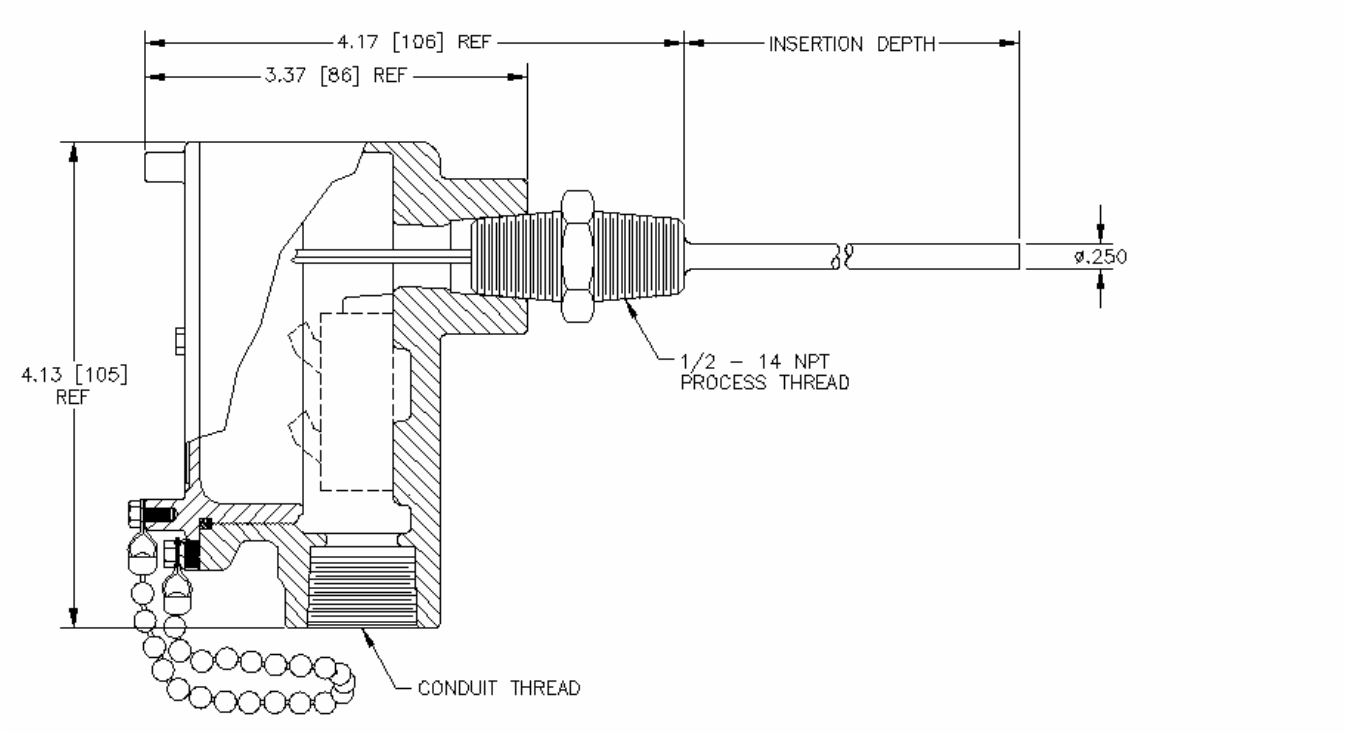


Figure 3

Assembly Dimensions:

All dimensions are in inches (millimeters).



How to Order TT881

TT881	Model Number: TT881 – RTD Temperature Transmitter in Explosion-proof housing
PW	RTD Element Code: PA = 100 ohm platinum (.00392) PB = 100 ohm platinum (.00391) PD = 100 ohm platinum (.00385) PE = 100 ohm platinum (.00385) PF = 1000 ohm platinum (.00385) PW = 1000 ohm platinum (.00375)
080	Probe Length: LLL in .1" increments 040 = 4.0", 120 = 12.0", 000 for "W" without sensor
E	Mount Type: E = Duct mount P = Immersion W = Wall mount
1	Output: 1 = 4 to 20 mA DC
S	Temperature Transmitter range: EN = -20°F to 140°F S = 0°F to 100°F A = 20°F to 120°F BI = 30°F to 130°F N = 32°F to 122°F H = 40°F to 90°F C = 32°F to 212°F BW = 32°F to 482°F SX = Special range as defined on job order – Must fall within adjustment limits on transmitter. Consult factory for current list of available ranges.
1	Calibration: 1 = No calibration data, sensor or transmitter 2 = Sensor/Transmitter matched at 0°C with NIST cert 3 = Sensor/Transmitter matched at 0, 100, & 260°C with NIST cert
TT881PW080E1S1 ← Sample part number	

Warranty

Items returned within one year from the date of sale, transportation prepaid, which Minco Products, Inc. (The "Seller") reasonably determines to be faulty by reason of defective materials or faulty workmanship will be replaced or repaired at the Seller's discretion, free of charge. This remedy is to be the sole and exclusive remedy available to the buyer in the event of a breach by the Seller. Items that show evidence of mishandling or misapplication, may be returned by the Seller at the customer's expense. Furthermore, the Seller is not to be held responsible for consequential damages caused by its product except as required under Minnesota Statutes, Section 336.1-719 (3). This warranty is expressly in lieu of any other expressed warranty or implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability on the part of the Seller or its employees or agents.

Notes:

Minco (Main Office)
7300 Commerce Lane
Minneapolis, MN
55432
USA
Tel: 1.763.571.3121
Fax: 1.763.571.0927

Customer Service/ Order Desk:
Tel: 1.763.571.3123
Fax: 1.763.571.0942
custserv@minco.com
www.minco.com

Minco S.A.
Usine et Service
Commercial, Z.I.
09310 Aston, France
Tel: (33) 5 61 03 24 01
Fax: (33) 5 61 03 24 09

Minco EC
Hirzenstrasse 2
CH-9244 Niederuzwil
Switzerland
Tel: (41) 71 952 79 89
Fax: (41) 71 952 79 90

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