BAPI Loop-Powered 4 to 20ma Temperature Transmitters Instruction Manual

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Instruction Manual

BAPI

Temperature Transmitters in a BAPI-Box Crossover Enclosure

Installation & Operations

37717_ins_4-20ma_transmitter_bbx rev. 03/16/22

Contents

Overview and Identification

BAPI's loop-powered 4 to 20mA temperature transmitters in the BAPI-Box Crossover enclosure feature a 1K Platinum RTD (385 curve) and are available in a wide selection of temperature ranges or custom ranges. They can be ordered with a special high accuracy RTD matched transmitters which match the sensor to the transmitter for improved accuracy.
The BAPI-Box Crossover enclosure has a hinged cover for easy termination and comes with an IP10 rating (or IP44 rating with a pierceable knockout plug installed in the open port).
This instruction sheet is specific to units with the BAPI-Box Crossover Enclosure. For all other units, please refer

to instruction sheet “22199_ ins_T1K_T100_XMTR.pdf” which is available on the BAPI website or by contacting BAPI.

Fig. 1: Temperature Transmitter in a BAPI-Box Crossover Enclosure

Mounting

Mount the enclosure to the surface using BAPI recommended #8 screws through a minimum of two opposing mounting tabs. A 1/8″ inch pilot screw hole makes mounting easier through the tabs. Use the enclosure tabs to mark the pilot hole locations.
The BAPI-Box Crossover enclosure has a hinged cover for easy termination and comes with an IP10 rating (or IP44 rating with a pierceable knockout plug installed in the open port).
Notes: Use caulk or Teflon tape for your conduit entries to maintain the appropriate IP or NEMA rating for your application. Conduit entry for outdoor or wet applications should be from the bottom of the enclosure.

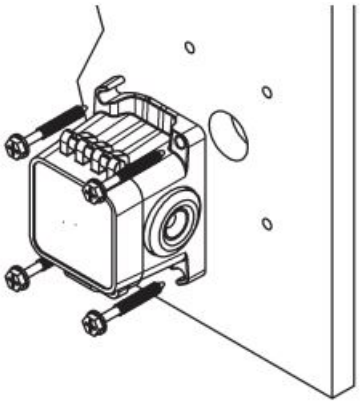

Fig 2: Transmitter Unit Mounting (Shown with knockout plug in open port.)

Wiring & Termination

BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs. All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run this device’s wiring in the same conduit as high or low voltage AC power wiring. BAPI’s tests show that inaccurate signal levels are possible when AC power wiring is present in the same conduit as the sensor wires.

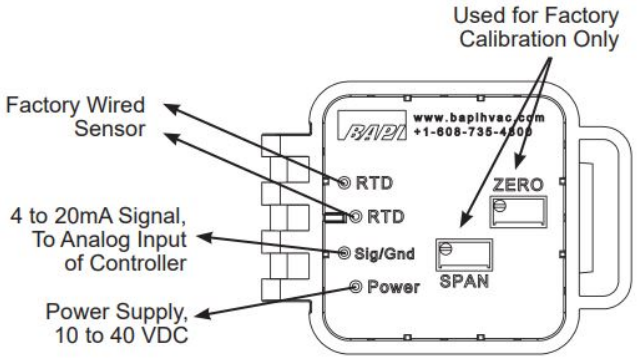

Fig. 3: Transmitter with Flying Leads

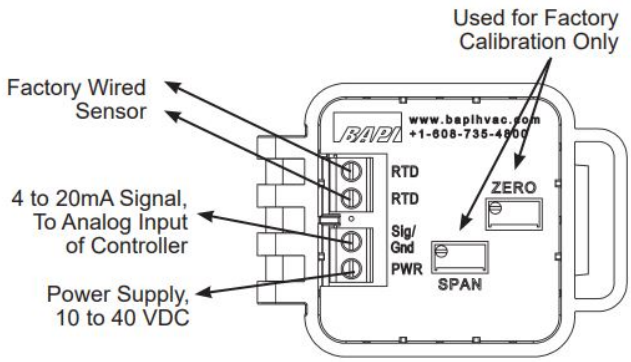

Fig. 4: Transmitter with Terminals

Diagnostics

Possible Problems:	**Possible Solutions:**
Green power LED is not on.	- Measure the power supply voltage by placing a multi-meter across the transmitter's "Power" and "Sig/Gnd" leads or terminals. Make sure that the power is 10 to 40 VDC. - Make sure that the "Power" and "Signal/Gnd" wires are not open or shorted together and are terminated correctly to the controller.
The reading is incorrect in the controller.	- Determine if the input is set up correctly in the BAS and controller's software. - Compare the transmitted current to the actual temperature measurement at the sensor location. Measure the physical temperature at the temperature sensor's location using an accurate temperature standard. Measure the transmitter current by placing an ammeter in series with the controller input. The current should read according to the "4 to 20mA Temperature Equation" shown at right. If the measured resistance is different from the temperature table by more than 5% call BAPI technical support.

4 to 20mA Temperature Equation

$$T = \frac{TLow + (A - 4) \times (TSpan)}{16}$$

T	= Temperature at sensor
TLow	= Low temperature of span
THigh	= High temperature of span
TSpan	= THigh - TLow
A	= Signal reading in mA

Specifications

Platinum 1K RTD Transmitter

Power Required:	7 to 40VDC
Transmitter Output:	.4 to 20mA, 850Ω @ 24VDC
Output Wiring:	2 wire loop
Output Limits:	<1mA (short), <22.35mA (open)
Span:	Min. 30ºF (17ºC), Max 1,000ºF (555ºC)
Zero:	Min. -148°F (-100°C), Max 900ºF (482ºC)
Zero & Span Adjust:	10% of span
Accuracy:	±0.065% of span
Linearity:	±0.125% of span
Power Output Shift:	±0.009% of span
Transmitter Ambient:	-4 to 158ºF (-20 to 70ºC) 0 to 95% RH, Non-condensing
Resistance	1KΩ @ 0ºC, 385 curve (3.85Ω/ºC)
Standard Accuracy	0.12% @ Ref, or ±0.55ºF (±0.3ºC)
High Accuracy	0.06% @ Ref, or ±0.28ºF (±0.15ºC), **[A]**option
Stability	±0.25ºF (±0.14ºC)
Self Heating	0.4ºC/mW @ 0ºC
Probe Range	-40 to 221ºF (-40 to 105ºC)
Wire Colors:	General color code (other colors possible)
1KΩ, Class B	Orange/Orange (no polarity)
1KΩ, Class A	Orange/White (no polarity)

Environmental Operating Range: -4 to 158°F (-20 to 70°C) 0 to 95% RH, Non-condensing
Lead Wire: 22AWG stranded
Mounting: Extension tabs (ears), 3/16″ holes
BAPI-Box Crossover Enclosure Ratings: IP10, NEMA 1 IP44 with knockout plug installed in open port
BAPI-Box Crossover Enclosure Material: UV-resistant polycarbonate & Nylon, UL94V-0
Agency: RoHS PT= DIN43760, IEC Pub 751-1983, JIS C1604-1989

Specifications subject to change without notice.
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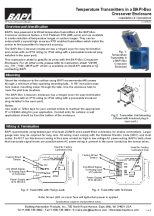
Documents / Resources

	BAPI Loop-Powered 4 to 20ma Temperature Transmitters [pdf] Instruction Manual Loop-Powered 4 to 20ma Temperature Transmitters, 20ma Temperature Transmitters, Temperature Transmitters, Transmitters