Temperature Sensor Transmitters

Installation & Operating Instructions

22199_ins_T1K_T100_XMTR rev. 03/16/22

Overview and Identification

BAPI Temperature Transmitters are 4 to 20mA output (loop powered) or 0 to 5VDC or 0 to 10VDC output transmitters. They come with flying leads but terminals are available (-TS).

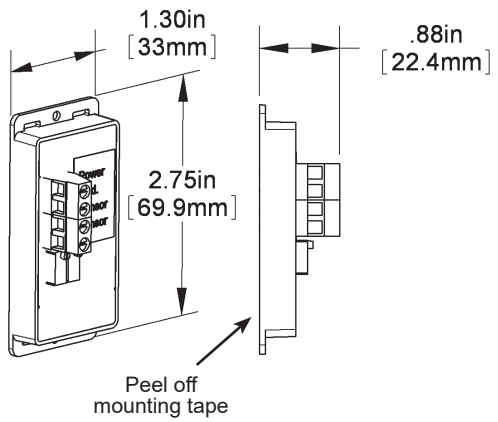

Fig. 1: Transmitter only (BA/T1K-XOR-STM-TS)

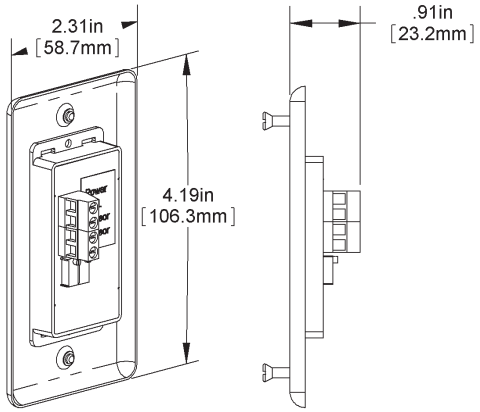

Fig. 2: Transmitter with plate (BA/T1K-XOR-TS)

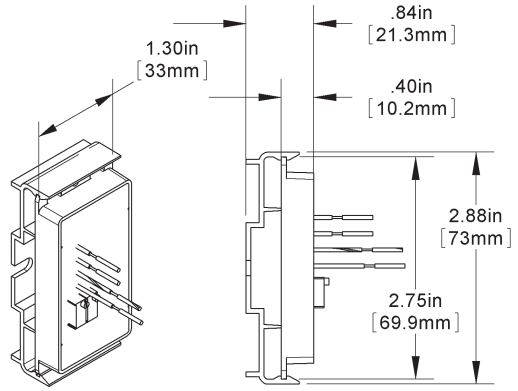

Fig. 3: Transmitter with Snaptrack (BA/T1K-XOR-TRK)

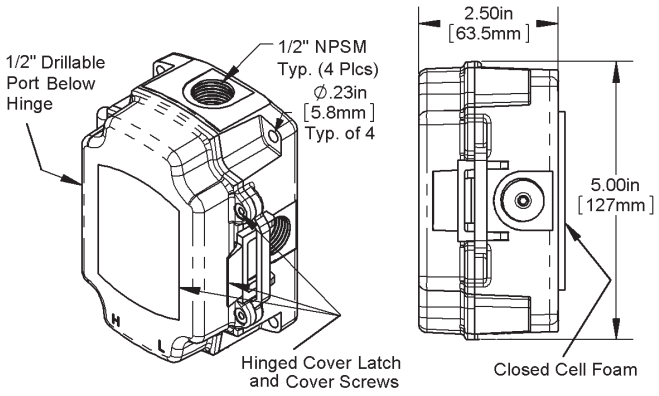

Fig. 4: Transmitter in BAPI-Box (BA/T1K-XOR-BB)

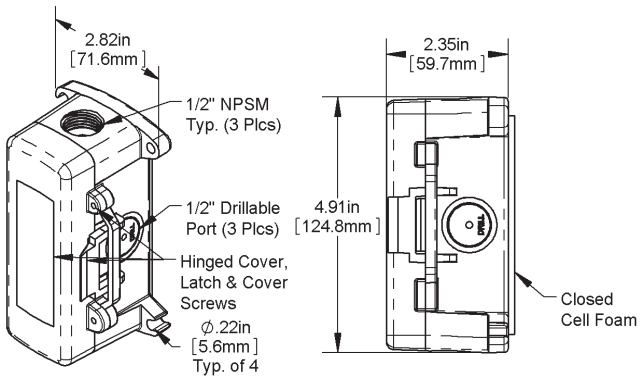

Fig 5: Transmitter in BAPI-Box 2 (BA/T1K-XOR-BB2)

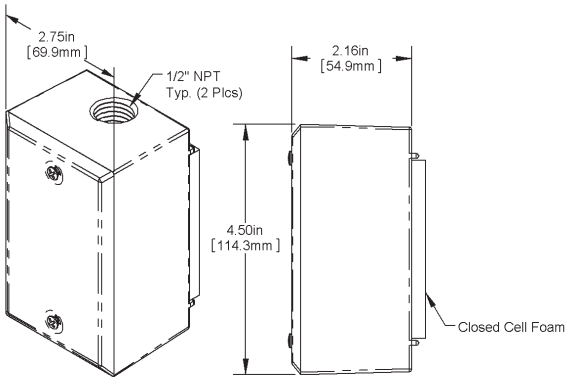

Fig. 6: Transmitter in Weatherproof Enclosure (BA/T1K-XOR-WP)

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Mounting

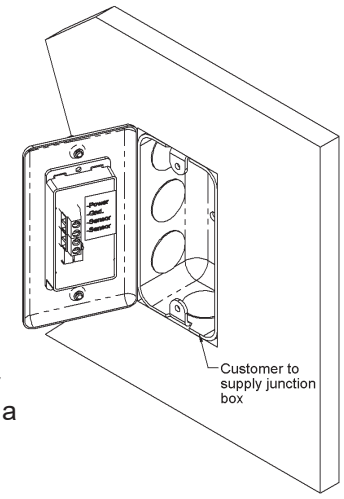


Fig. 7: Transmitter w/ plate mounted in a Handy Box

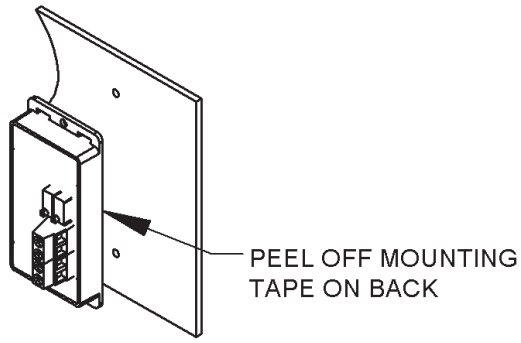
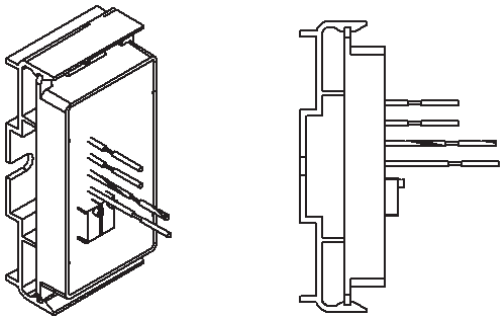


Fig. 8: Transmitter with double stick mounting tape



1. Mount track with screws through the bottom of the plastic track.
2. Insert one edge of the transmitter, then snap the other edge in.

Fig. 9: Transmitter in Snaptrack

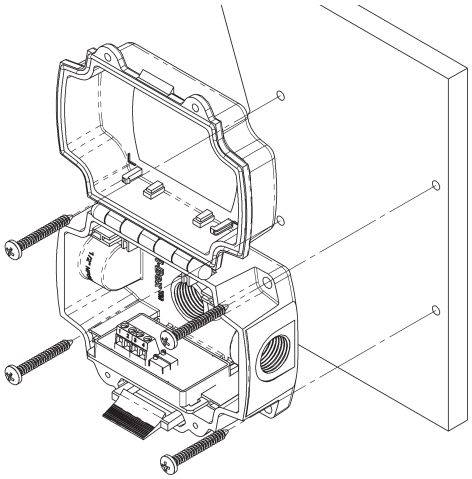
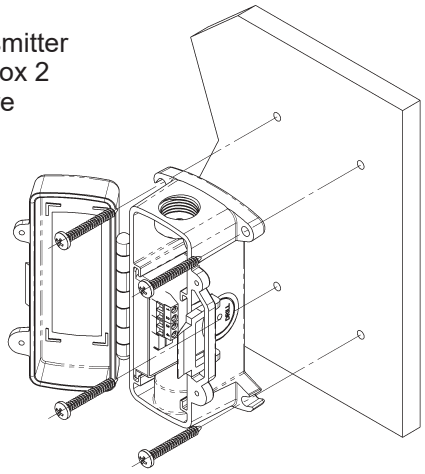


Fig. 10: Transmitter in a BAPI-Box Enclosure

Fig 11: Transmitter in a BAPI-Box 2 Enclosure



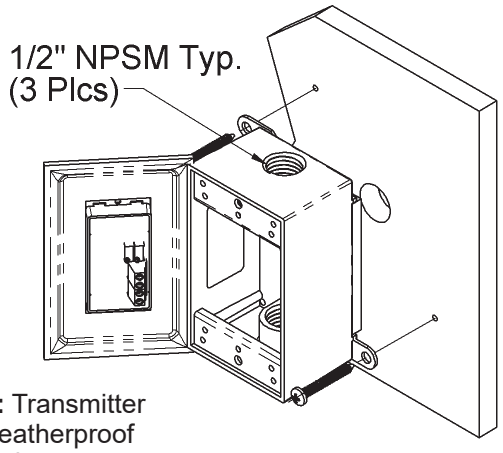


Fig. 12: Transmitter in a Weatherproof Enclosure

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.

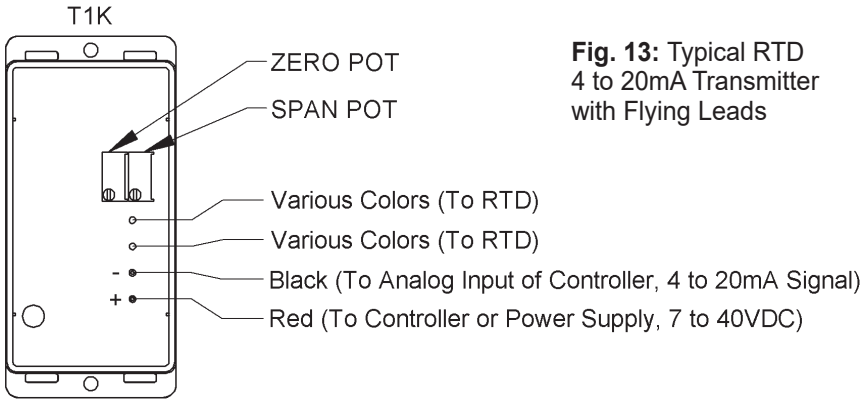


Fig. 13: Typical RTD 4 to 20mA Transmitter with Flying Leads

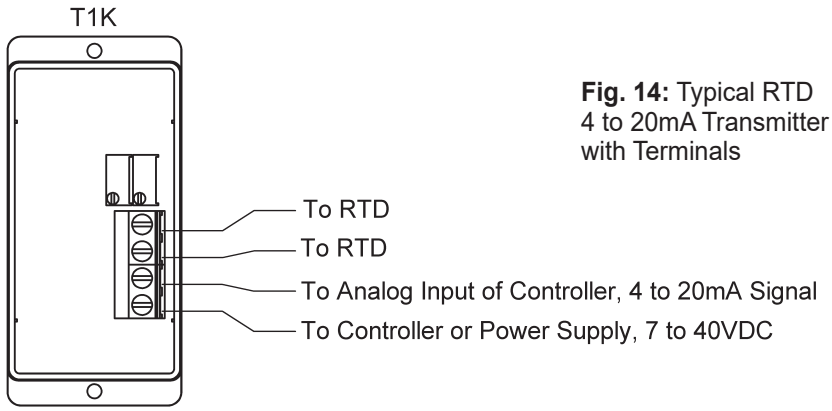


Fig. 14: Typical RTD 4 to 20mA Transmitter with Terminals

Diagnostics

Possible Problems:

• Unit will not operate.

Possible Solutions:

- Measure the power supply voltage by placing a voltmeter across the transmitter's (+) and (-) terminal. Make sure that it matches the drawings above and power requirements in the specifications.
- Check if the RTD wires are physically open or shorted together and are terminated to the transmitter.

• The reading is incorrect in the controller.

- Determine if the input is set up correctly in the controllers and BAS software.
- For a 4 to 20mA current transmitter 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 below.

4 to 20mA Temperature Equation

$$T = T_{Low} + \frac{(A - 4) \times (T_{Span})}{16}$$

T	= Temperature at sensor
T_{Low}	= Low temperature of span
T_{High}	= High temperature of span
T_{Span}	= T_{High} - T_{Low}
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 ±0.277ºF (±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)

Enclosure Ratings: (Part number designator in bold)
Weatherproof: ..... **-WP,** NEMA 3R, IP14
BAPI-Box: ..... **-BB,** NEMA 4, IP66, UV rated
BAPI-Box 2: ..... **-BB2,** NEMA 4, IP66, UV rated

Enclosure Material: (Part number designator in bold)
Weatherproof:..... **-WP,** Cast Aluminum, UV rated
BAPI-Box:..... **-BB,** Polycarbonate, UL94V-0, UV rated
BAPI-Box 2: ..... **-BB2,** Polycarbonate, UL94V-0, UV rated

Ambient (Enclosure): 0 to 100% RH, Non-condensing (Part number designator in bold)
Weatherproof ..... **-WP,** -40 to 212ºF (-40 to 100ºC)
BAPI-Box..... **-BB,** -40 to 185ºF (-40 to 85ºC)
BAPI-Box 2..... **-BB2,** -40 to 185ºF (-40 to 85ºC)

Agency:
RoHS
PT=DIN43760, IEC Pub 751-1983,
JIS C1604-1989

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