

Overview and Identification

BAPI's Temperature Transmitter can be ordered with a 1K Ω (385) RTD that has a field adjustable 1 to 5, 0 to 5, 2 to 10, 0 to 10VDC or 4 to 20 mA output over a selected temperature range. These adjustable outputs can be set at the factory to order or default set to 4 to 20mA.

These transmitters are available with a wired connection via flying leads or a pluggable terminal block (-TS).

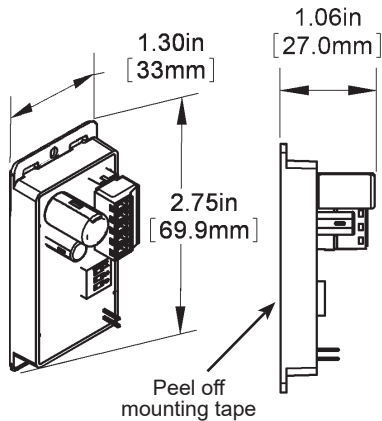


Fig. 1: Transmitter only (BA/T1K-XOR-STM-TS)

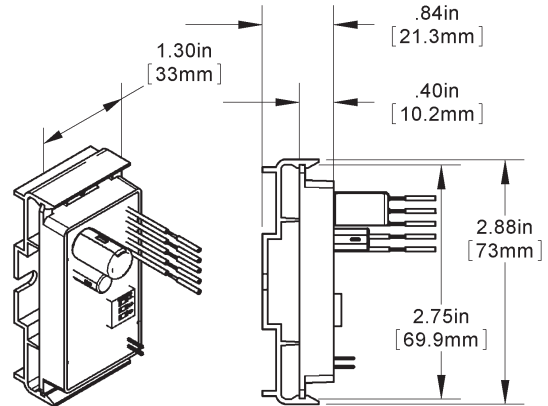


Fig. 2: Transmitter with Snaptrack (BA/T1K-XOR-TRK)

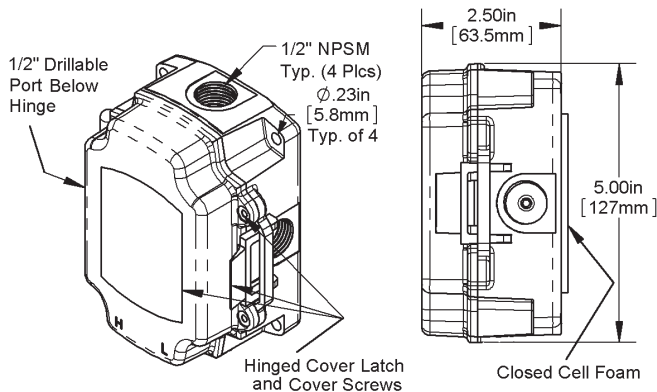


Fig. 3: Transmitter in BAPI-Box (BA/T1K-XOR-BB)

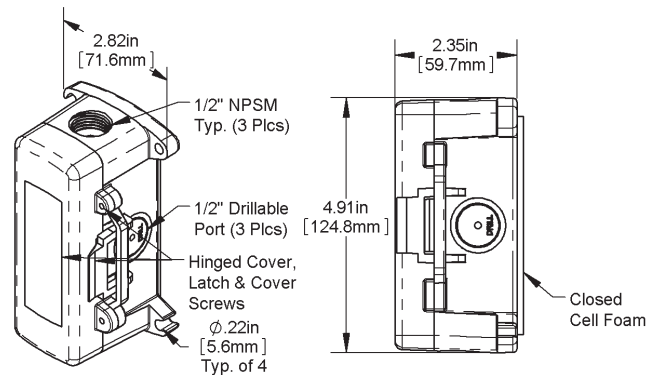


Fig. 4: Transmitter in BAPI-Box 2 (BA/T1K-XOR-BB2)

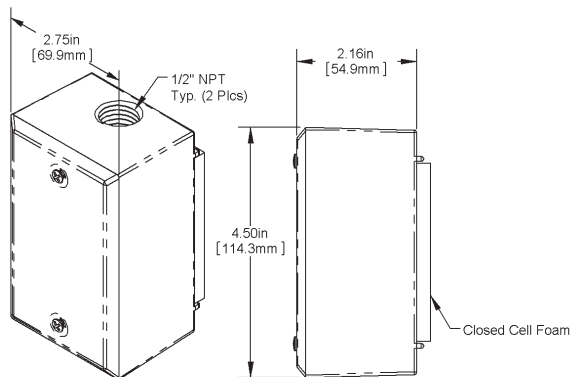


Fig. 5: Transmitter in Weatherproof Enclosure (BA/T1K-XOR-WP)

Mounting

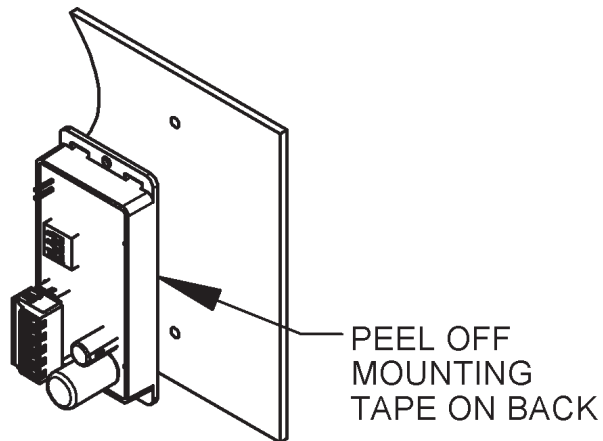
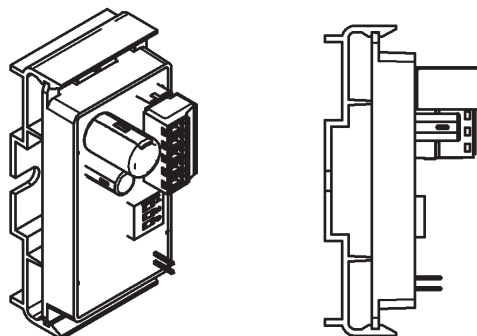


Fig. 6: Transmitter with double stick mounting tape



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. 7: Transmitter in Snaptrack

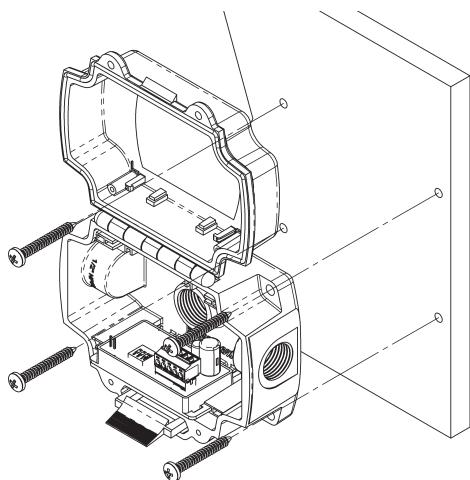


Fig. 8: Transmitter in a BAPI-Box Enclosure

Fig. 9: Transmitter in a BAPI-Box 2 Enclosure

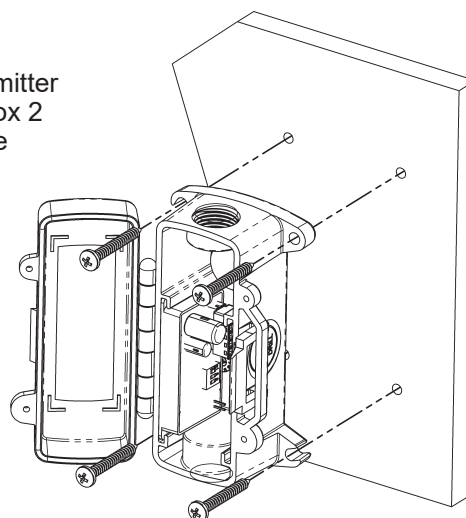
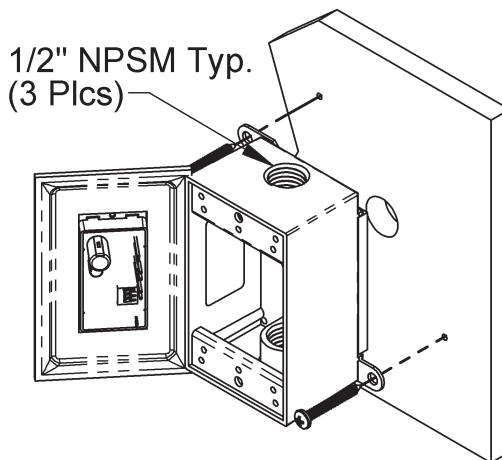


Fig. 10: Transmitter in a Weatherproof Enclosure



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 AC power wiring of NEC class 1 or NEC class 2, NEC class 3 or with wiring used to supply highly inductive loads such as motors, contactors and relays. BAPI's tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. *Note: Keep transmitter at least 5 feet from any radio wave-emitting device (ie: 2 way radio). Transmitters that are less than 5 feet from a radio wave-emitting device can cause unwanted interference.*



BAPI recommends wiring the product with power disconnected. Proper supply voltage, polarity, and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and will void the warranty.

4 to 20mA Output with Flying Leads

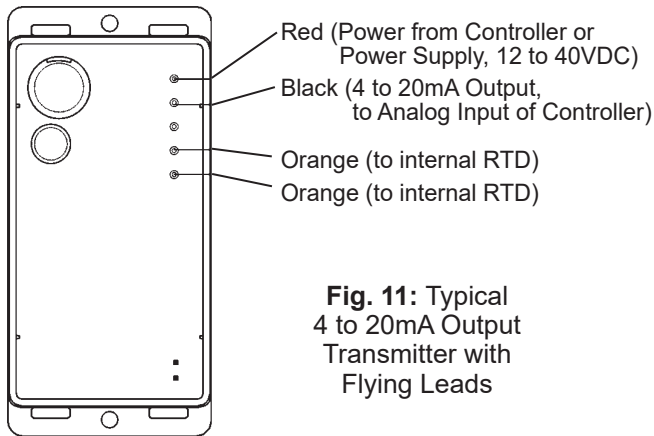


Fig. 11: Typical 4 to 20mA Output Transmitter with Flying Leads

4 to 20mA Output with Terminals

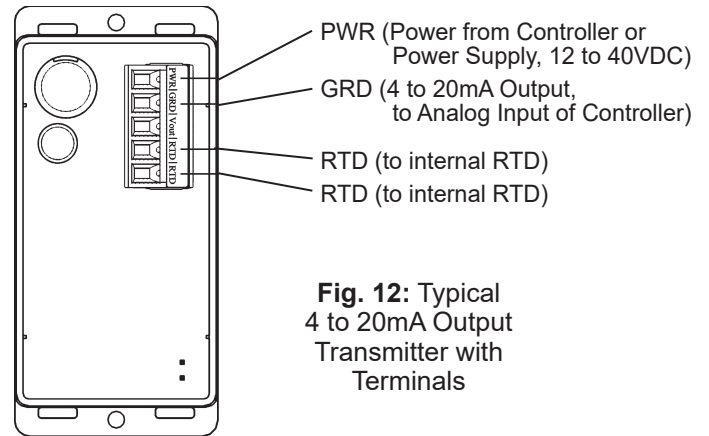


Fig. 12: Typical 4 to 20mA Output Transmitter with Terminals

Voltage Output with Flying Leads

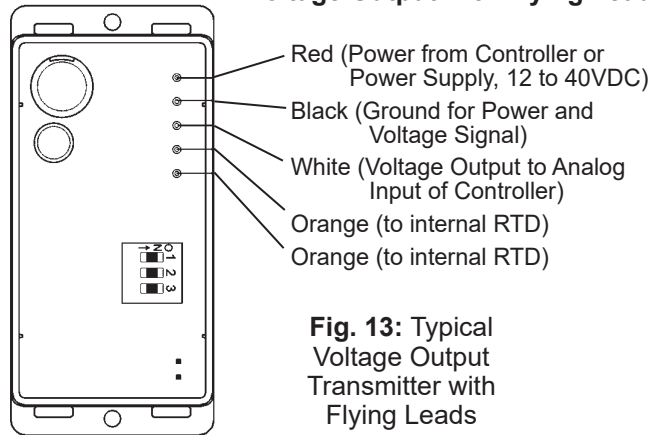


Fig. 13: Typical Voltage Output Transmitter with Flying Leads

Voltage Output with Terminals

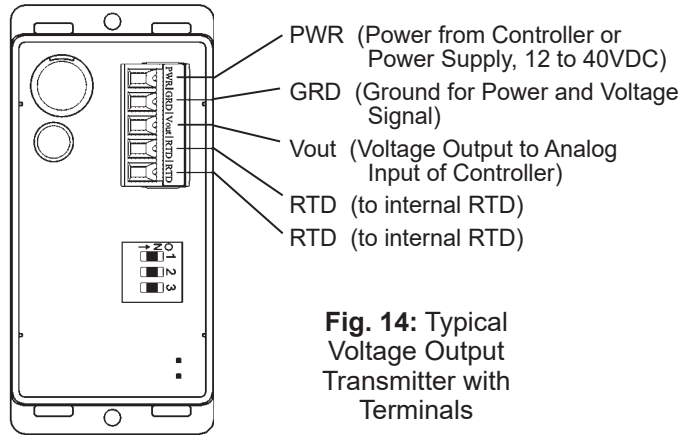
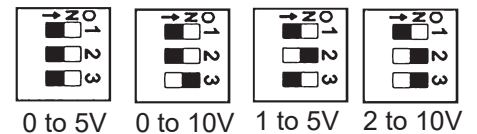


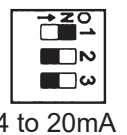
Fig. 14: Typical Voltage Output Transmitter with Terminals

DIP Switch Settings for Field-Selectable Voltage Output Units

The circuit board for voltage output units has a 3-position DIP switch that controls the output value. This switch is set at the factory at the time of the order but may be changed in the field.



Note: Units ordered with Voltage Output can be switched to 4 to 20mA output with the DIP switch setting shown at right. The middle flying lead or middle terminal would not be used in that case and the unit would be wired similar to Figs 11 and 12 above.





Temperature Sensor Transmitters

Installation & Operating Instructions

22199_ins_T1K_T100_XMTR

rev. 03/11/24

Diagnosics

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.
- 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.
- For a voltage transmitter, measure the signal with a volt meter (Orange or Orange/Black to Black). The signal should read according to the "Voltage 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

Voltage Temperature Equation

$$T = T_{Low} + \frac{(V \times T_{Span})}{V_{Span}}$$

- T = Temperature at sensor
- T_{Low} = Low temperature of span
- T_{High} = High temperature of span
- T_{Span} = T_{High} - T_{Low}
- V_{Low} = Low transmitter voltage usually=(0, 1 or 2v)
- V_{High} = High transmitter voltage usually=(5 or 10v)
- V_{Span} = V_{High} - V_{Low}
- V = Signal reading in volts

Specifications

Transmitter Circuit

- Power Required:.....12 to 40VDC
- Transmitter Output:.....4 to 20mA, 0 to 5, 1 to 5, 0 to 10 or 2 to 10VDC, 850Ω@24VDC
- Output Wiring:.....2 wire loop
- Output Limits:<1mA (short), <22.35mA (open)
- Span:Min. 30°F (17°C), Max 1000°F, (555°C)
- Zero:Min. -148°F (-100°C), Max 900°F (482°C)
- System Accuracy:±0.065% of span
- Linearity:±(0.125 * T-20°C)/100
- RTD Sensor:.....2 wire Platinum (Pt), 385 curve
- Transmitter Ambient:-4 to 158°F(-20 to 70°C)
0 to 95% RH, Non-condensing

RTD Sensor: Resistance Temp Device (Bare Sensor)

- Platinum RTD:1KΩ @ 0°C, 385 curve
- Sensitivity:3.85Ω/°C, Approximate @ 32°F (0°C)
- Accuracy (Standard):....0.12% @Ref, or ±0.55°F, (±0.3°C)
- Accuracy (High):.....0.06% @Ref, or ±0.277°F, (±0.15°C),
[A]option

- Stability:±0.25°F, (±0.14°C)
- Self Heating:0.4 °C/mW @0°C
- Probe Range:-40 to 221°F, (-40 to 105°C)

Enclosure Types: (Part number designator in bold)

- Weatherproof: ... **-WP**, w/ two ½" FNPT entries, (Bell box)
- BAPI-Box: **-BB**, w/ four ½" NPSM & one ½" drill-out
- BAPI-Box 2: **-BB2**, w/ three ½" NPSM & three ½" drill-outs

Enclosure Ratings: (Part number designator in bold)

- Weatherproof..... **-WP**, NEMA 3R, IP14
- BAPI-Boxes **-BB, BB2**, NEMA 4, IP66, UV Rated

Enclosure Material: (Part number designator in bold)

- Weatherproof..... **-WP**, Cast Aluminum, UV rated
- BAPI-Boxes **-BB, BB2** Polycarb., UL94V-0, UV rated

Ambient (Encl.) ... 0 to 100% RH, Non-condensing

- BAPI-Boxes **-BB, BB2**, -40°F to 185°F, (-40° to 85°C)
- BAPI-Box 2 **-BB2**, -40°F to 185°F, (-40° to 85°C)

Agency

- CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment) / RoHS / PT=DIN43760, IEC Pub 751-1983 / JIS C1604-1989

Specifications subject to change without notice.