

Overview and Identification

BAPI Temperature Transmitters are 4 to 20mA output (loop powered) or 0 to 5VDC or 0 to 10VDC output transmitters that can be ordered with a separately purchased 10K-2 thermistor. The T100 and T1K transmitters come with flying leads but terminals are available (-TS). Terminals are not available on the T10K units.

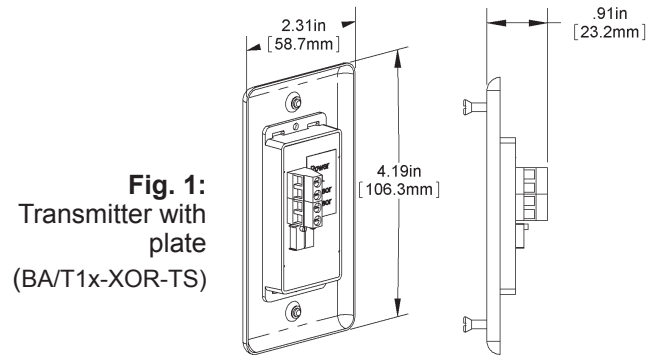


Fig. 1:
Transmitter with
plate
(BA/T1x-XOR-TS)

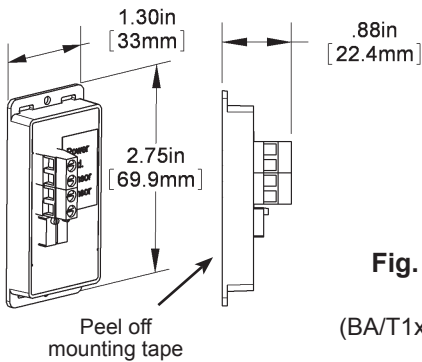


Fig. 2: Transmitter
only
(BA/T1x-XOR-STM-TS)

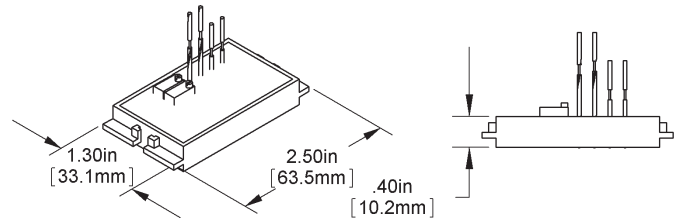


Fig. 3: Transmitter only - fits inside Weather Tight Enclosure (BA/T1x-XOR-EUM)

Fig. 4: Transmitter with Snaptrack (BA/T1x-XOR-TRK)

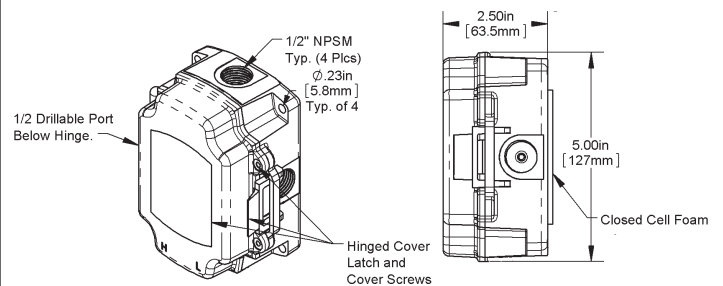
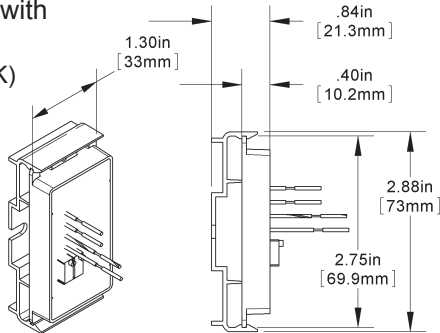


Fig. 5: Transmitter in BAPI-Box (BA/T1x-XOR-BB)

Fig. 6: Transmitter in BAPI-Box 2 (BA/T1x-XOR-BB2)

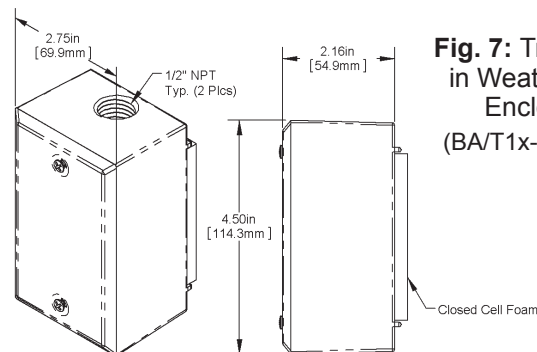
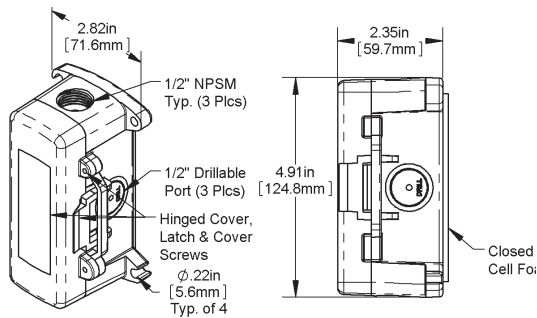


Fig. 7: Transmitter
in Weatherproof
Enclosure
(BA/T1x-XOR-WP)

Specifications subject to change without notice.

Mounting

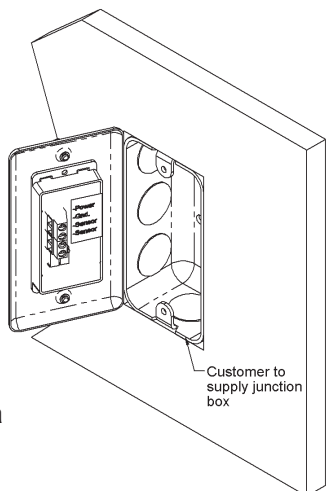


Fig. 8: Transmitter w/ plate mounted in a Handy Box

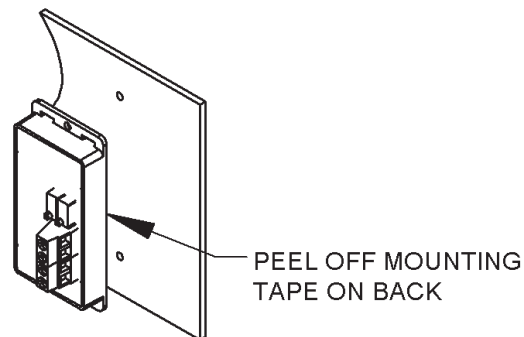
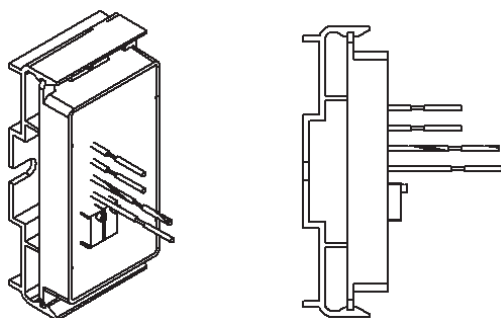


Fig. 9: Transmitter with double stick mounting tape



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. 10: Transmitter in Snaptrack

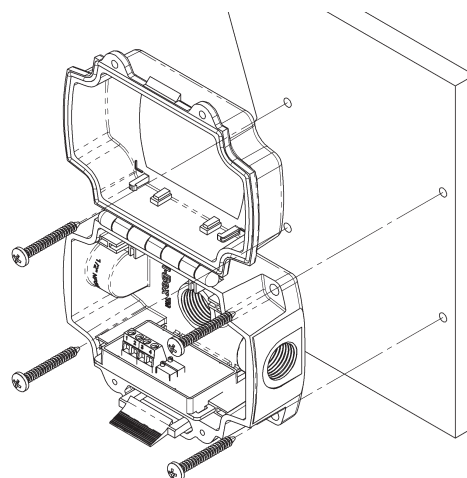
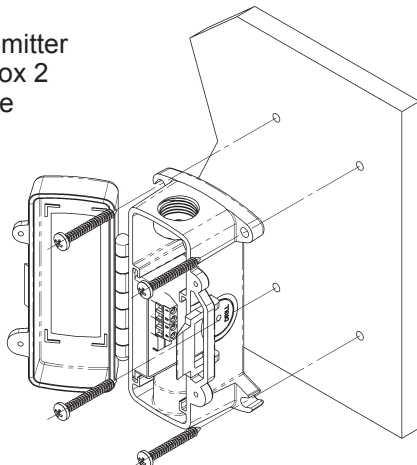


Fig. 11: Transmitter in a BAPI-Box Enclosure

Fig 12: Transmitter in a BAPI-Box 2 Enclosure



1/2" NPSM Typ.
(3 Plcs)

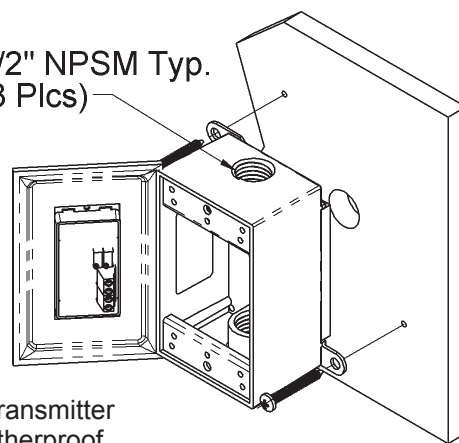


Fig. 13: Transmitter in a Weatherproof Enclosure

Specifications subject to change without notice.

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.

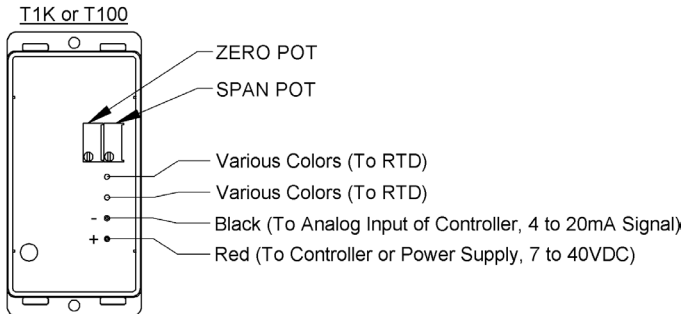


Fig. 14: Typical RTD 4 to 20mA Transmitter with Flying Leads

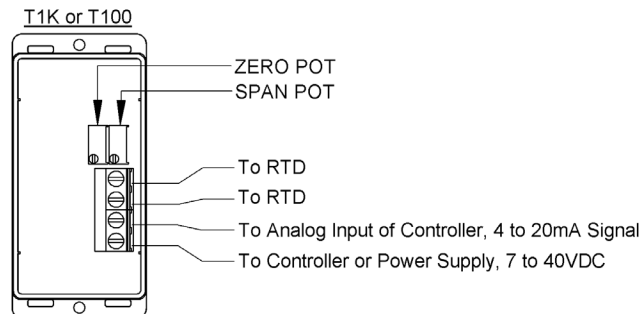


Fig. 15: Typical RTD 4 to 20mA Transmitter with Terminals

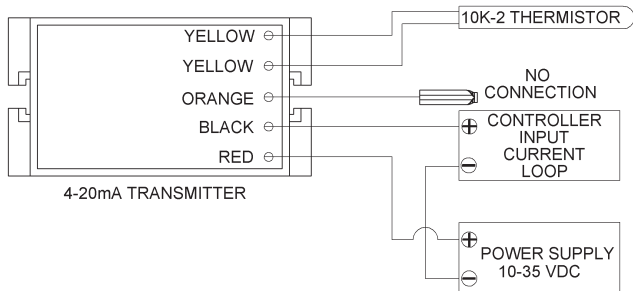


Fig. 16: Typical Thermistor 4 to 20mA Transmitter

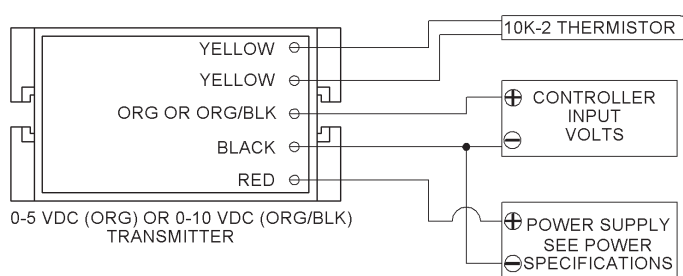


Fig. 17: Typical Thermistor Voltage Transmitter

Diagnostics

Possible Problems:

- Unit will not operate.
- The reading is incorrect in the controller.

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.

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

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 subject to change without notice.



Temperature Sensor Transmitters

BA/(T100, T1K, T10K) Temperature Transmitters

Installation & Operating Instructions

22199_ins_T1K_T100_XMTR

rev. 08/31/20

Specifications

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. 30°F (17°C), Max 1000°F, (555°C)
 Zero:Min. -148°F (-100°C), Max 900°F (482°C)
 Zero & Span Adjust: 10% of span
 Accuracy:±0.065% of span
 Linearity:±0.125% of span
 Power Output Shift: ±0.009% of span
 RTD Sensor:2 wire Platinum (Pt), 385 curve
 Transmitter Ambient: -4 to 158°F (-20 to 70°C)
 0 to 95% RH, Non-condensing

Thermistor Transmitter

Supply Voltage:
 10 to 35 VDC0 to 5 VDC or 4 to 20 mA Outputs
 15 to 35 VDC0 to 10 VDC Output
 12 to 24 VAC0 to 5 VDC Outputs
 15 to 24 VAC0 to 10 VDC Output
 Transmitter Output..4 to 20mA, 700Ω@24VDC
 0 to 5VDC, 0 to 10VDC, 10KΩ min
 Output wiring2 & 3 wire (see Wiring detail)
 Transmitter Limits ...-40°F to 185°F, (-40°C to 85°C)
 Accuracy±1.015°C, from (0 to 65°C)
 Linearity±0.065°C, from (0 to 65°C)
 Resolution.....Span/1024
 Thermistor Sensor ..10K-2 Thermistor, 10KΩ @77°F
 Transmitter Ambient..32 to 158°F, (0° to 70°C)
 0 to 95% RH, Noncondensing

Thermistor: 10K-2, Thermal resistor

Accuracy(Std) ±0.36°F, (±0.2°C)
 Accuracy(High) ±0.18°F, (±0.1°C), [XP] option
 Stability< 0.036°F/Year, (<0.02°C/Year)
 Heat Dissipation2.7 mW/°C
 Probe Range-40° to 221°F (-40° to 105°C)
 Wire Colors:
 Standard:Yellow/Yellow (no polarity)
 High Acc. [XP]:Yellow/Yellow (no polarity)

RTD: Resistance Temp Device (Continuous)

Platinum (Pt).....100Ω and 1KΩ @0°C, 385 curve,
 Pt Accuracy.....(Std) 0.12% @Ref, or ±0.55°F, (±0.3°C)
 Pt Accuracy.....(High) 0.06% @Ref, or ±0.277°F,
 (±0.15°C), [A]option
 Pt Stability.....±0.25°F, (±0.14°C)
 Pt Self Heating.....0.4 °C/mW @0°C
 Pt Probe Range.....-40° to 221°F, (-40 to 105°C)
 Wire Colors:.....General color code (other colors possible)
 1KΩ, Class BOrange/Orange (no polarity)
 1KΩ, Class AOrange/White (no polarity)
 100Ω, Class BRed/Red (no polarity)
 100Ω, Class A.....Red/Red-w/black stripe (no polarity)

Sensitivity: Approximate @ 32°F (0°C)

Thermistor Non-linear – Go to bapihvac.com
 click “Resources” and “BAPI
 Sensors Overview”

RTD (Pt) 3.85Ω/°C for 1KΩ RTD
 0.385Ω/°C for 100Ω RTD

Enclosure Types: (Part number designator in bold)

Box Cover Plate: .**XOR**, single gang box cover only.
 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
 Transmitter Only: .**XOR-STM**, No Enclosure
XOR-EUM, No Enclosure

Enclosure Ratings: (Part number designator in bold)

J-Box:**JB**, NEMA 1
 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

Weatherproof ...**WP**, -40°F to 212°F, (-40° to 100°C)
 BAPI-Box**BB**, -40°F to 185°F, (-40° to 85°C)
 BAPI-Box 2**BB2**, -40°F to 185°F, (-40° to 85°C)

Agency

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

Specifications subject to change without notice.