

Overview and Identification

- The Remote Sensor (BA/#-PP) is a small temperature conductive plastic sensor used for single point temperature measurement with twin plenum rated lead wires. It is ideal for mounting applications inside electronic circuit enclosures or existing thermostats.
- The Remote Probe with Plenum-Rated Cable (BA/#-RPP) is a small Stainless Steel temperature sensor used for single point temperature measurement with PVC plenum rated cable. It is ideal for bracket mounting for Chamber, Duct, Thermowell or L-bracket applications.
- The Remote Probe with FEP-Jacketed Cable (BA/#-RPFEP) is a small Stainless Steel temperature sensor used for single point temperature measurement with FEP plenum cable. It is ideal for bracket mounting in harsh environments for Chamber, Duct, Thermowell or L-bracket applications.
- The Remote Probe with FEP-Jacketed Cable for submersion (BA/#-RPFEP2) is a small Stainless Steel temperature sensor used for single point temperature measurement with submersion FEP plenum cable. It is ideal for bracket mounting in wet or water submersion environments for Chamber, Duct, Immersion or L-bracket applications.

BAPI's Remote Probe 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.

This transmitter can also be ordered in a variety of mounting enclosures as shown at right. Special high accuracy RTD matched transmitters (M) are available which match the sensor to the transmitter for improved accuracy. Enclosure mounting styles come in plastic or metal for both NEMA 3R and NEMA 4 applications and are all UV rated.

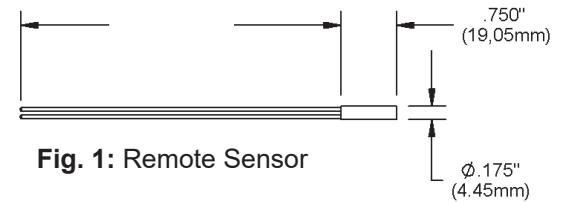


Fig. 1: Remote Sensor

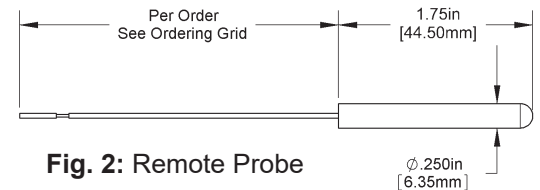


Fig. 2: Remote Probe

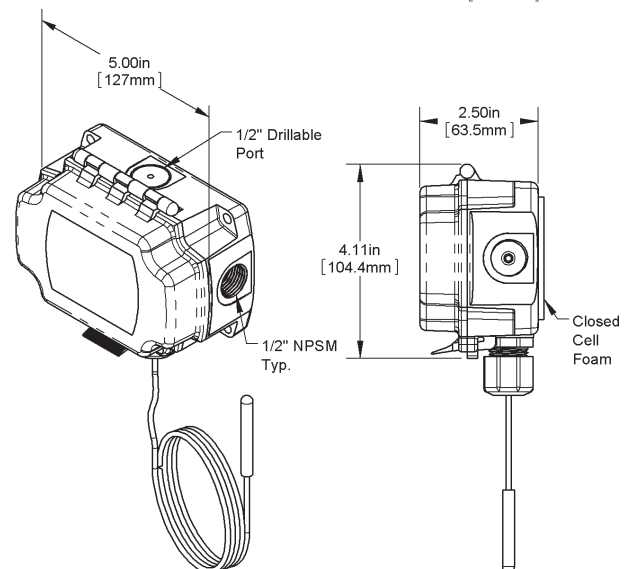


Fig. 3: BAPI-Box (BB) Enclosure

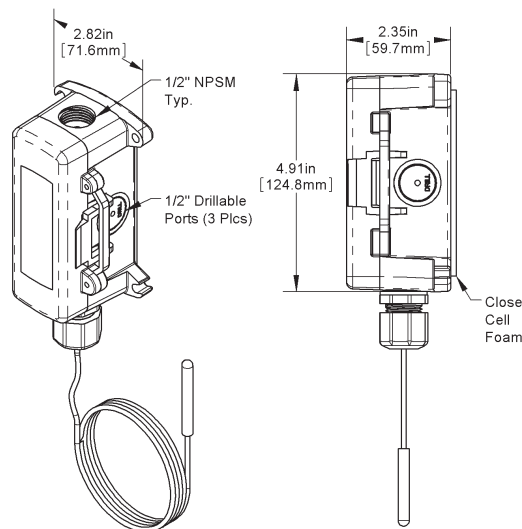


Fig. 4: BAPI-Box 2 (BB2) Enclosure

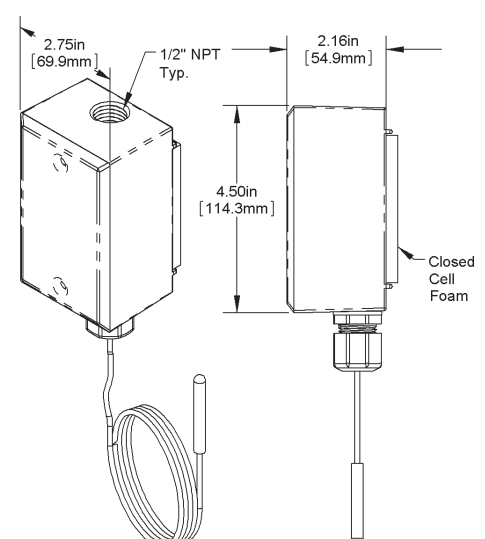


Fig. 5: Weatherproof (WP) Enclosure

Mounting

MOUNTING REMOTE PROBES TO PIPES: Follow the steps below when mounting the remote probe to a pipe.

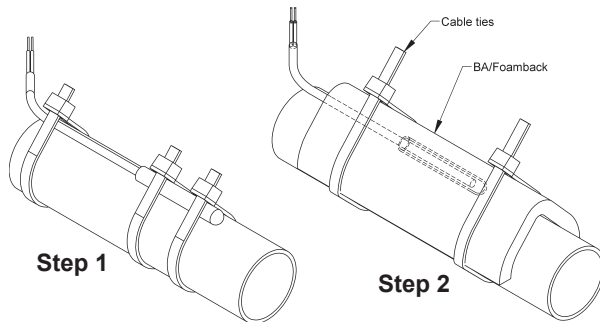


Fig. 6: Remote Probe Strapped to a Pipe

Step 1:

Secure Sensor To Have Good Contact With Bare Pipe

Step 2:

Insulate Over The Sensor (See Notes Below)

Note: Insulation should be installed a minimum of 4 pipe diameters on each side of the sensor.

Example: $\frac{1}{2}$ " pipe x 4 = 2".

Insulation should be 2" on each side of the sensor wrapped all the way around the pipe.

FLEXIBLE PROBE BRACKET: BAPI's Flexible Probe Bracket (BA/FPB) is used to mount averaging sensors. It includes a scored break off for mounting $\frac{1}{4}$ " remote bullet probes.

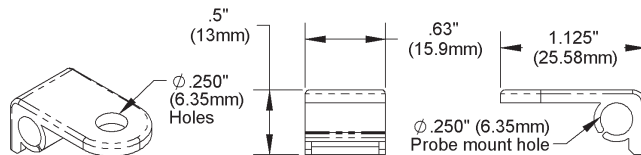
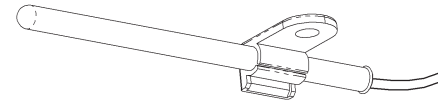


Fig. 7: Flexible Probe Bracket Break-Off Tab Dimensions and Mounting of Remote Probe



ENCLOSURE MOUNTING

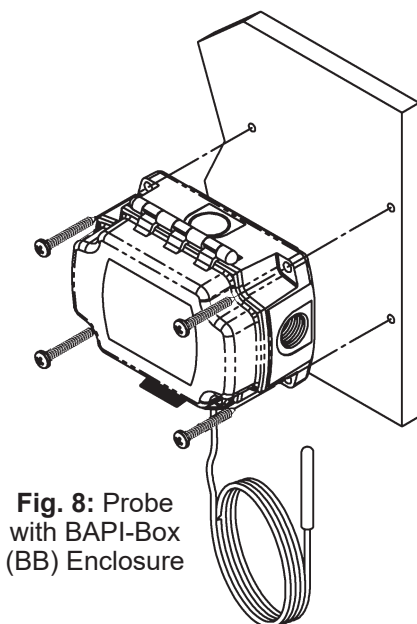


Fig. 8: Probe with BAPI-Box (BB) Enclosure

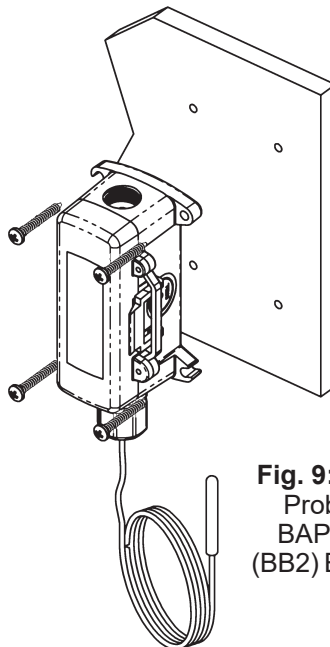


Fig. 9: Remote Probe with BAPI-Box 2 (BB2) Enclosure

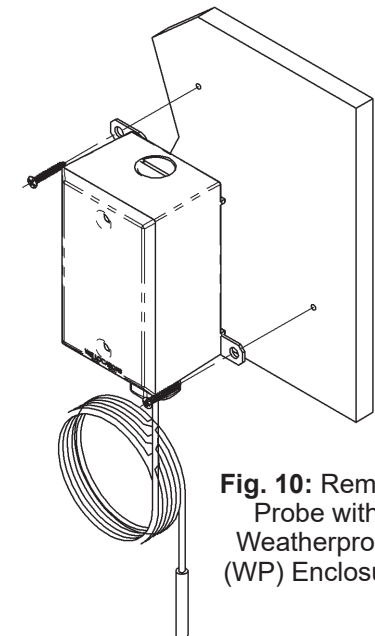


Fig. 10: Remote Probe with Weatherproof (WP) Enclosure



Remote Probe and Remote Sensor Transmitters with a BAPI-Box, BAPI-Box 2 or Weatherproof Enclosure

Installation & Operation

20921_ins_RemoteSen_Active

rev. 05/18/26

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 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.

TERMINATION OF 4 TO 20mA UNITS

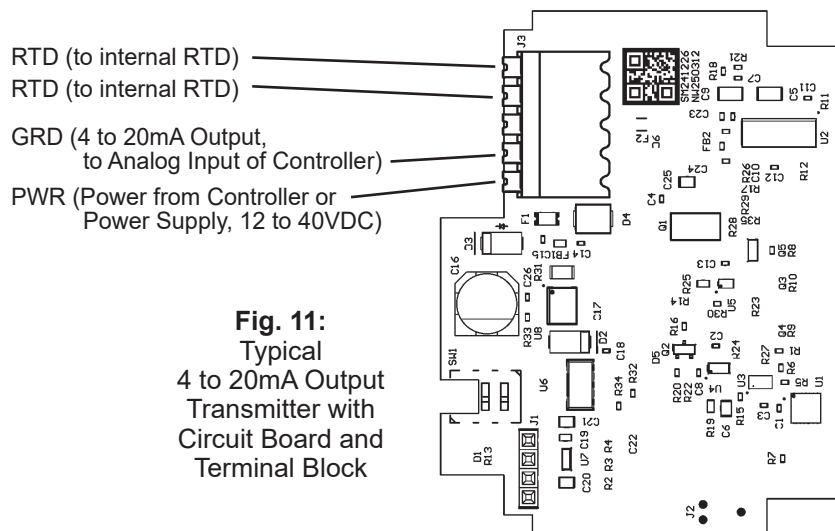


Fig. 11:
Typical
4 to 20mA Output
Transmitter with
Circuit Board and
Terminal Block

4 to 20mA Output with Circuit Board and Push Button Terminal Block

Note on Push Button Terminal Block:

Use a small screwdriver to press the white release button while inserting the wire into the terminal. Release the button once the wire is fully seated to secure the connection. Gently pull on the wire to confirm it is properly secured.

4 to 20mA Output with Potted Shell and Flying Leads

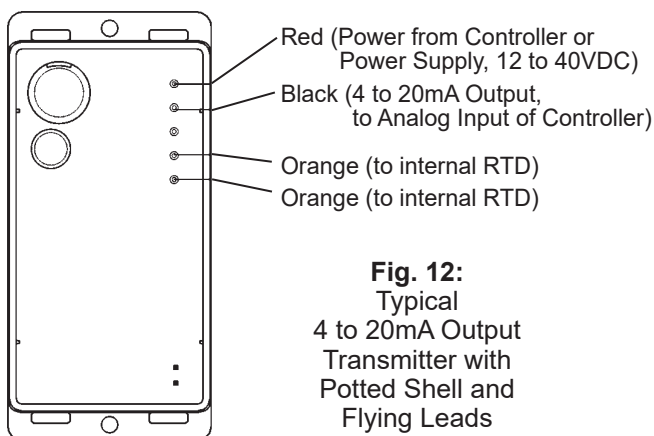


Fig. 12:
Typical
4 to 20mA Output
Transmitter with
Potted Shell and
Flying Leads

4 to 20mA Output with Potted Shell and Screw Terminal Block

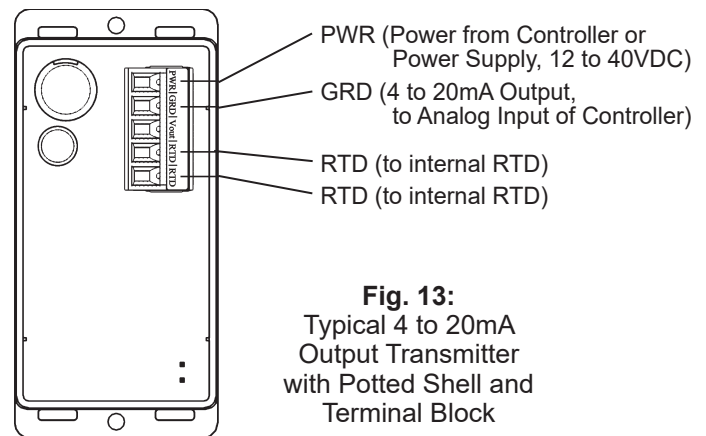


Fig. 13:
Typical 4 to 20mA
Output Transmitter
with Potted Shell and
Terminal Block

Termination continued on next page...

Termination continued...

TERMINATION OF FIELD-SELECTABLE VOLTAGE OUTPUT UNITS

Voltage Output with Potted Shell & Flying Leads

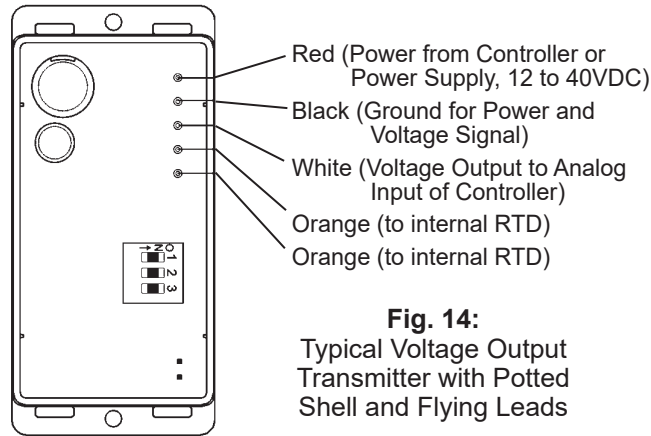


Fig. 14:
Typical Voltage Output Transmitter with Potted Shell and Flying Leads

Voltage Output with Potted Shell & Screw Terminal Block

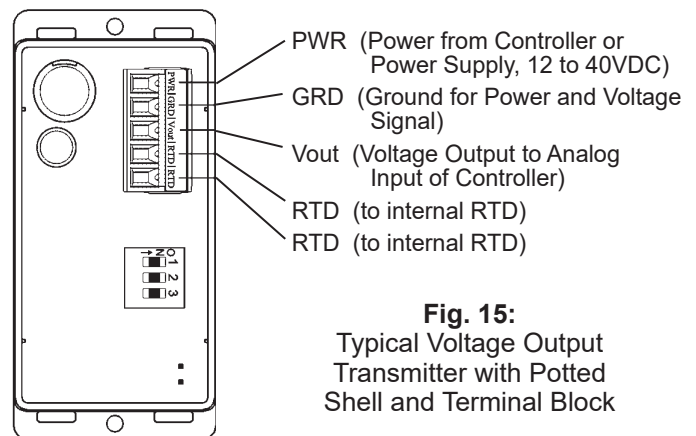
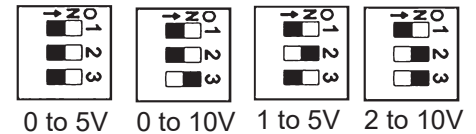


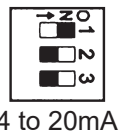
Fig. 15:
Typical Voltage Output Transmitter with Potted Shell and Terminal Block

DIP Switch Settings for Field-Selectable Voltage Output Units (Figs 14 & 15 above)

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 12 and 13 on the previous page.



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.

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.
- 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



Remote Probe and Remote Sensor Transmitters with a BAPI-Box, BAPI-Box 2 or Weatherproof Enclosure

Installation & Operation

20921_ins_RemoteSen_Active

rev. 05/18/26

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, 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)

Remote Sensor

Heat conductive plastic cup, 0.875" (22.2mm) length

Remote Probe

Rigid, 304 Stainless Steel, 0.25" (6.35mm) OD
1.75" (44.5mm) Length

Lead Wire: 22awg stranded

Remote Sensor Wire Insulation

Etched Teflon leads, plenum rated

Remote Probe Wire Insulation

Flame retardant PVC, plenum rated
or FEP-jacketed, plenum rated
or FEP jacketed, plenum and submersion rated

Wall Gasket:

0.25" (6.35mm) Closed cell foam (impervious to mold)

Enclosure Ratings:

Weatherproof (**WP**): NEMA 3R, IP14

BAPI-Boxes (**BB, BB2**): NEMA 4, IP66, UV Rated

Enclosure Material:

Weatherproof (**WP**): Cast Aluminum, UV rated

BAPI-Boxes (**BB, BB2**): Polycarb., UL94V-0, UV rated

Environmental Operating Range

Weatherproof (**WP**): -40 to 212°F (-40 to 100°C)

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

0 to 100%RH, Non-condensing

Agency

CE EN 61326-1:2013 EMC (Industrial Electromagnetic Environment)

PT = DIN43760 | IEC Pub 751-1983 | JIS C1604-1989

RoHS9

Specifications subject to change without notice.