

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.

All of the above sensors are available in multiple types of thermistors or RTDs as shown in the specifications. The probe is available bare without enclosure or using a termination enclosure in plastic or metal for NEMA1, NEMA 3R and NEMA 4 applications and are all plenum rated.

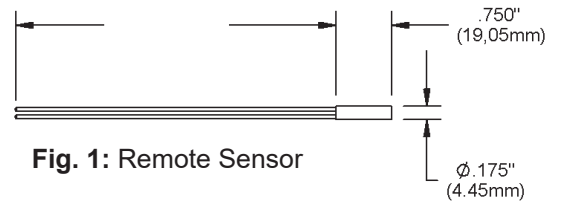


Fig. 1: Remote Sensor

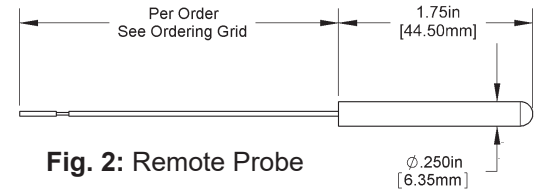


Fig. 2: Remote Probe

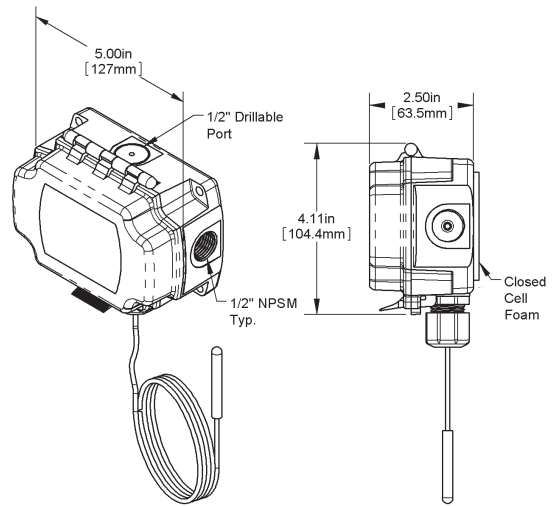


Fig. 3: Remote Probe in a BAPI-Box (BB) Enclosure

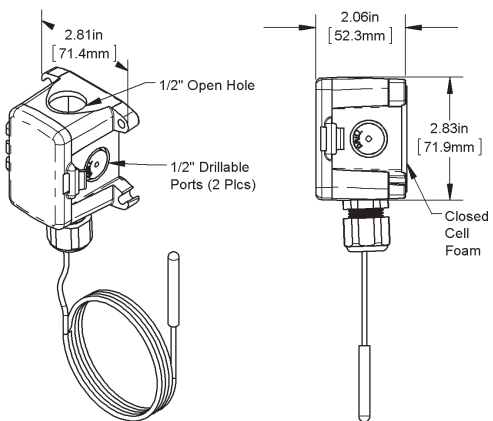


Fig. 4: Remote Probe in a BAPI-Box 4 (BB4) Enclosure

A Pierceable Knockout Plug is available from BAPI for the open port in the BB4. (Part #: BA/PAK-100)

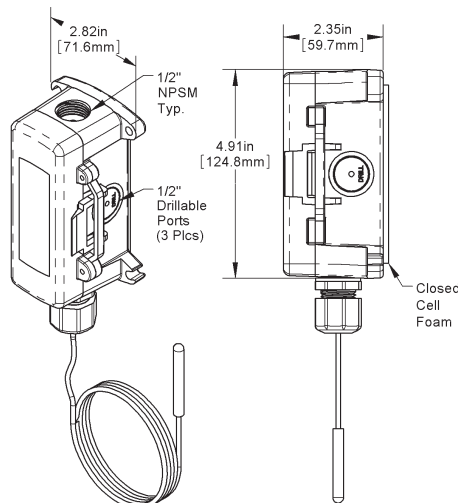


Fig. 5: Remote Probe in a BAPI-Box 2 (BB2) Enclosure

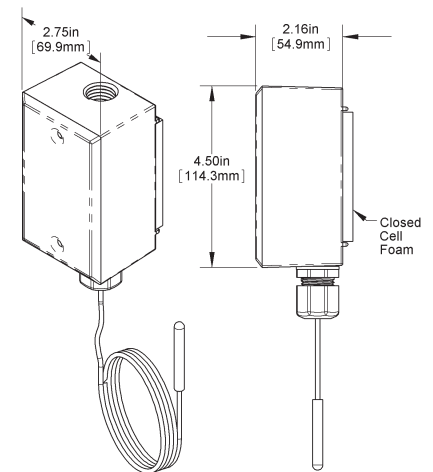
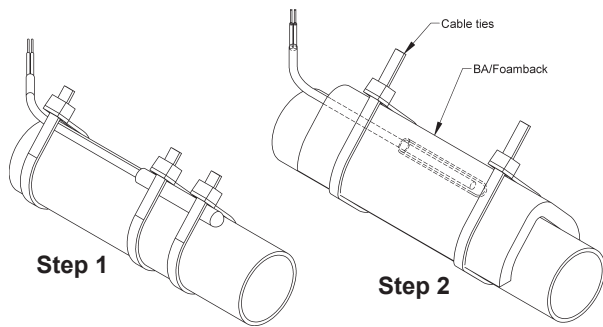


Fig. 6: Remote Probe in a Weatherproof (WP) Enclosure

Specifications subject to change without notice.

Mounting

MOUNTING REMOTE PROBES TO PIPES: Follow the steps below when mounting the remote probe 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: 1/2" pipe x 4 = 2".

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

Fig. 7: Remote Probe Strapped to a Pipe

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

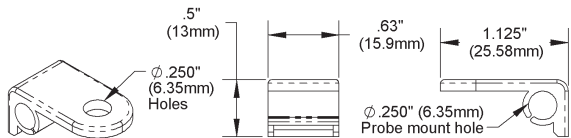


Fig. 8: Flexible Probe Bracket Break-Off Tab Dimensions and Mounting of Remote Probe

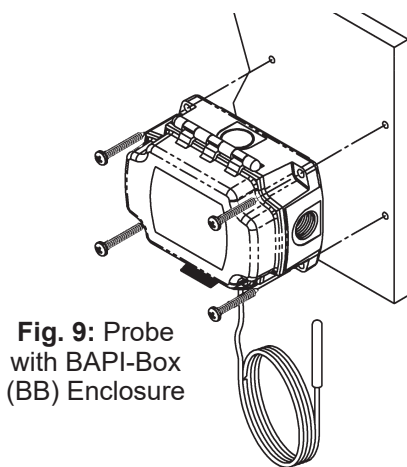
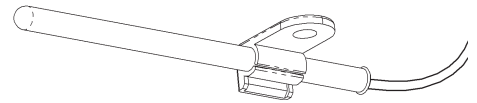


Fig. 9: Probe with BAPI-Box (BB) Enclosure

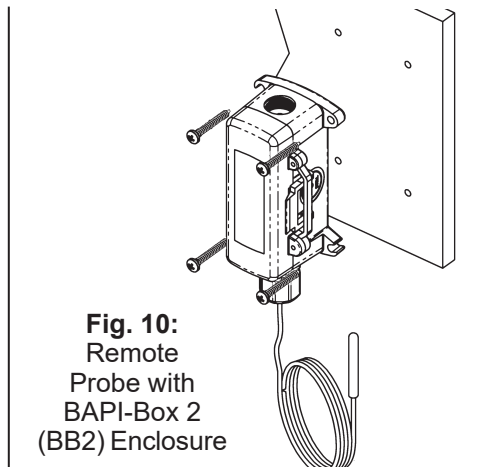


Fig. 10: Remote Probe with BAPI-Box 2 (BB2) Enclosure

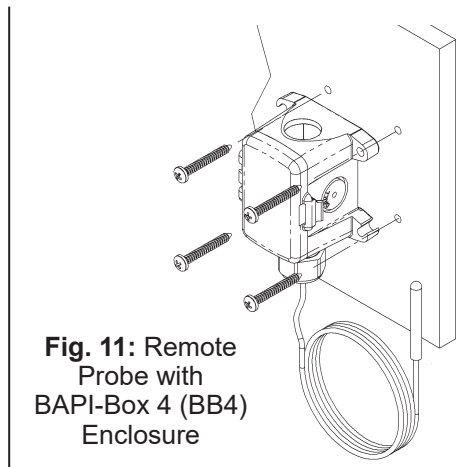


Fig. 11: Remote Probe with BAPI-Box 4 (BB4) Enclosure

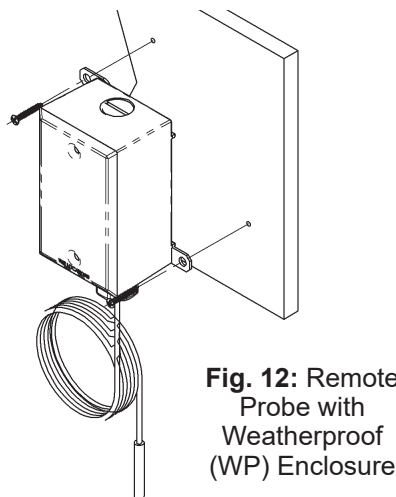


Fig. 12: Remote Probe with Weatherproof (WP) Enclosure

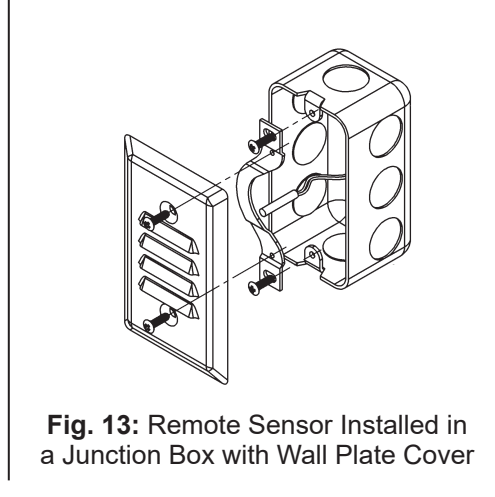


Fig. 13: Remote Sensor Installed in a Junction Box with Wall Plate Cover

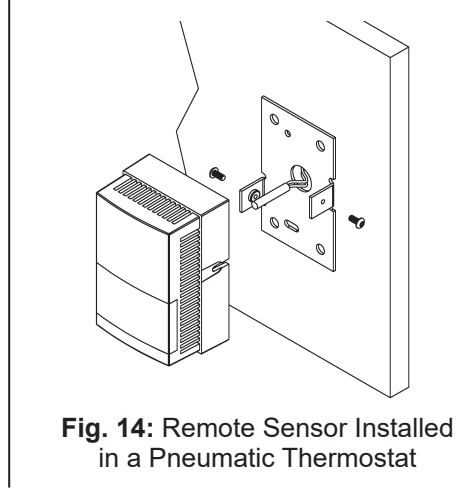


Fig. 14: Remote Sensor Installed in a Pneumatic Thermostat

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.

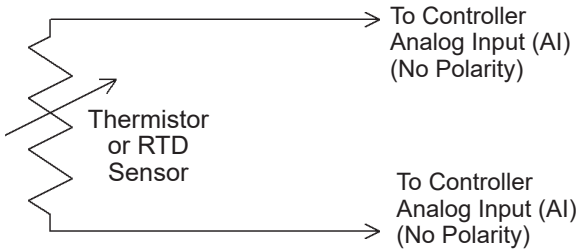


Fig. 15: 2 Wire Termination for Thermistor or RTD

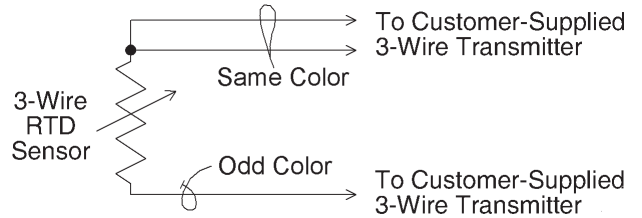


Fig. 16: 3 Wire Termination for RTD

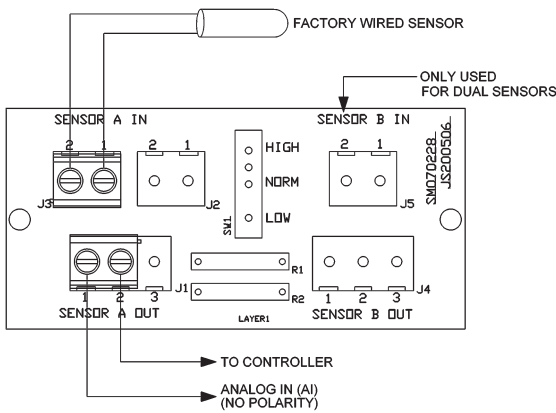


Fig. 17: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

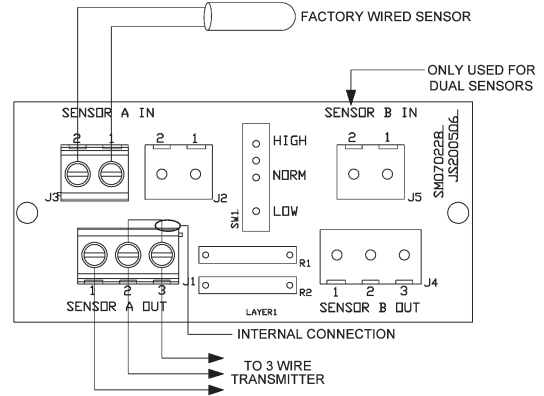


Fig. 18: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

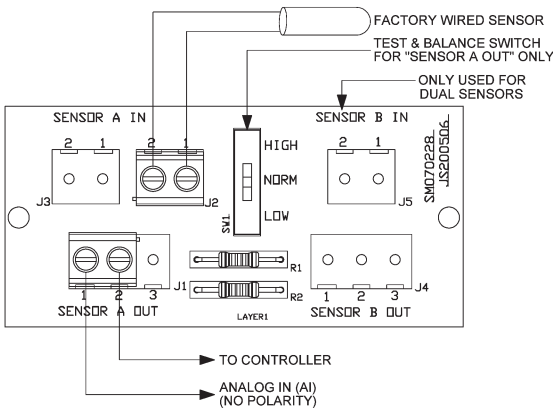


Fig. 19: Test & Balance (-TB) Option for 2 Wire Sensors Termination

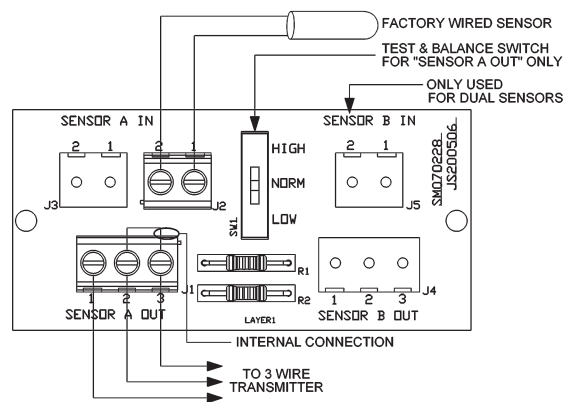


Fig. 20: Test & Balance (-TB) Option for 3 Wire Sensors Termination

Specifications subject to change without notice.



Diagnostics

Possible Problem:

Controller reports higher or lower than actual temperature

Possible Solutions:

- Confirm the input is set up correctly in the front end software
- Check wiring for proper termination & continuity. (shorted or open)
- Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct.

Specifications

Sensor: Passive

Thermistor..... NTC, 2 wire
RTD..... PTC, 2 or 3 wire

Thermistor: Thermal resistor

Temp. Output..... Resistance
Accuracy (Std) $\pm 0.36^{\circ}\text{F}$, ($\pm 0.2^{\circ}\text{C}$)
Accuracy (High) $\pm 0.18^{\circ}\text{F}$, ($\pm 0.1^{\circ}\text{C}$), [**XP**] option
Stability $< 0.036^{\circ}\text{F}/\text{Year}$, ($< 0.02^{\circ}\text{C}/\text{Year}$)
Heat dissipation $2.7 \text{ mW}/^{\circ}\text{C}$
Temp. Drift..... $< 0.02^{\circ}\text{C}$ per year
Probe range -40° to 221°F (-40° to 105°C)

RTD: Resistance Temperature Device

Platinum (Pt) 100Ω or $1\text{K}\Omega$ @ 0°C , 385 curve,
Platinum (Pt) $1\text{K}\Omega$ @ 0°C , 375 curve
Pt Accuracy (Std) .. 0.12% @Ref, or $\pm 0.55^{\circ}\text{F}$, ($\pm 0.3^{\circ}\text{C}$)
Pt Accuracy (High) . 0.06% @Ref, or $\pm 0.277^{\circ}\text{F}$ ($\pm 0.15^{\circ}\text{C}$), [**A**]option
Pt Stability $\pm 0.25^{\circ}\text{F}$, ($\pm 0.14^{\circ}\text{C}$)
Pt Self Heating $0.4 \text{ }^{\circ}\text{C}/\text{mW}$ @ 0°C
Pt Probe range -40° to 221°F , (-40 to 105°C)
Nickel (Ni) 1000Ω @ 70°F , JCI curve
Ni Probe range -40° to 221°F (-40 to 105°C)

Sensitivity: Approximate @ 32°F (0°C)

Thermistor Non-linear – Go to bapihvac.com click "Resources" and "BAPI Sensors Overview"
1K Ω RTD (Pt) $3.85\Omega/^{\circ}\text{C}$
100 Ω RTD (Pt) $0.385\Omega/^{\circ}\text{C}$
Nickel (Ni) $2.95\Omega/^{\circ}\text{F}$ for the JCI RTD

Lead Wire: 22awg stranded

Wire Insulation

-PP..... Etched Teflon leads, plenum rated
-RPP Flame Retardant PVC plenum cable
-RPFEP FEP jacketed plenum rated cable
-RPFEP2 FEP jacketed plenum and submersion rated cable

Probe

-PP..... Heat conductive plastic cup
-RPP, RPFEP ... Rigid, 304 Stainless Steel, 0.25" OD

Probe Length

-PP..... $0.875''$ (22.2mm)
-RPP, RPFEP ... $1.75''$ (44.5mm)

Enclosure Types: (Part number designator in bold)

J-Box: **-JB**, w/ eight $\frac{1}{2}''$ knock-outs
Weatherproof: .. **-WP**, w/ two $\frac{1}{2}''$ FNPT entries, (Bell box)
BAPI-Box:..... **-BB**, w/ four $\frac{1}{2}''$ NPSM & one $\frac{1}{2}''$ drill-out
BAPI-Box 2: **-BB2**, w/ three $\frac{1}{2}''$ NPSM & three $\frac{1}{2}''$ drill-outs
BAPI-Box 4: **-BB4**, w/ three $\frac{1}{2}''$ drill-outs & one $\frac{1}{2}''$ open port

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
BAPI-Box 4: **-BB4**, IP10
(IP44 with Knockout Plug in the open port)

Enclosure Material: (Part number designator in bold)

J-Box: **-JB**, Galvanized steel, UL94H-B
Weatherproof:.... **-WP**, Cast Aluminum, UV rated
BAPI-Box:..... **-BB**, Polycarbonate, UL94V-0, UV rated
BAPI-Box 2: **-BB2**, Polycarbonate, UL94V-0, UV rated
BAPI-Box 4: **-BB4**, Polycarbonate & Nylon, UL94V-0

Ambient (Enclosure): 0 to 100% RH, Non-condensing

J-Box:..... **-JB**, -40°F to 212°F , (-40° to 100°C)
Weatherproof:.... **-WP**, -40°F to 212°F , (-40° to 100°C)
BAPI-Boxes: **-BB**, **BB2**, **BB4** -40 to 185°F , (-40 to 85°C)
Units w/ Plenum-Rated Wire: -4 to 167°F (-20 to 75°C)

Agency:

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

*Passive Thermistors 20K Ω and smaller are CE Compliant

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