

Overview and Identification

The duct temperature sensor comes in a variety of probe lengths and optional mounting enclosures shown below.

It can be ordered with all the most common Thermistors or RTDs used with virtually any BAS system. All thermistor and (385) RTD sensors come with standard accuracy as well as high accuracy models [XP] and [A] options respectively.

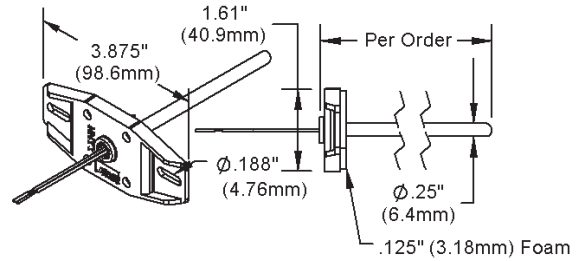


Fig. 1: Duct Unit with No Box (NB)

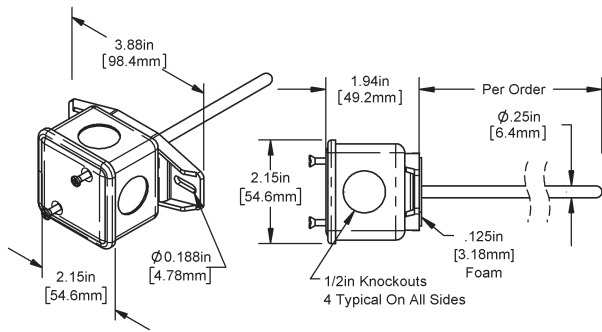


Fig. 2: Duct Unit with J-Box (Standard)

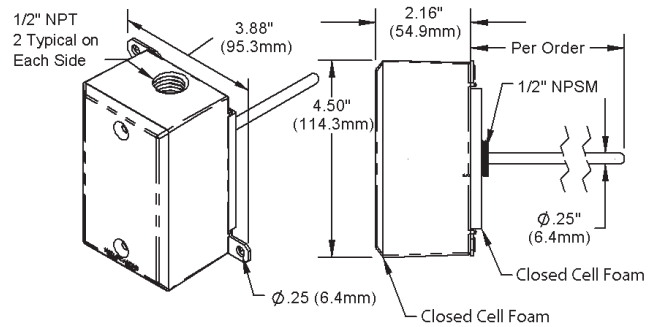


Fig. 3: Duct Unit with Weatherproof (WP) Enclosure

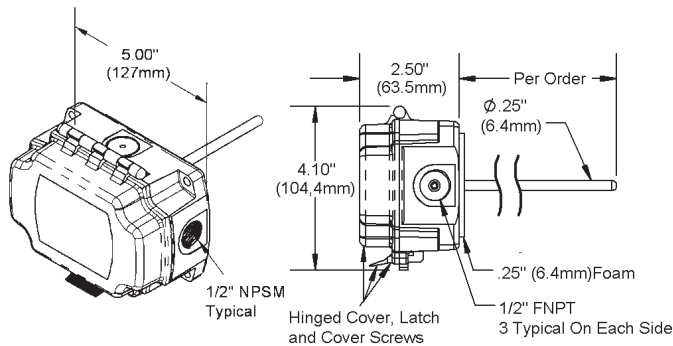


Fig. 4: Duct Unit with BAPI-Box (BB) Enclosure

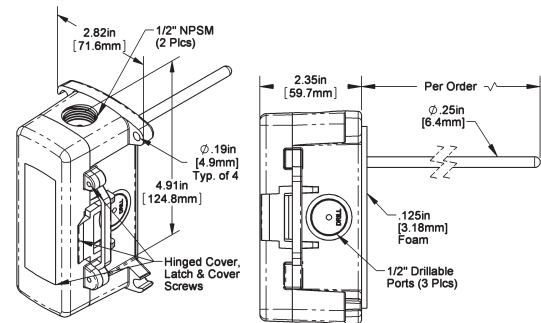
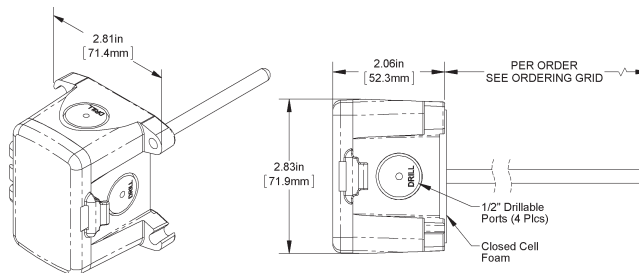


Fig. 5: Duct Unit with BAPI-Box 2 (BB2) Enclosure

Fig. 6: Duct Unit with BAPI-Box 4 (BB4) Enclosure

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



Specifications subject to change without notice.

Mounting

1. Place the sensor in the middle of the duct away from temperature stratified air, coils or humidifiers to achieve the best temperature reading.
2. Drill the probe hole as depicted on this page for the enclosure being used. Insert the probe into the duct.
3. Mount the enclosure to the duct using BAPI recommended #8 screws through a minimum of two opposing mounting tabs. Weatherproof (WP) enclosures require assembly of the mounting tabs on opposite corners. A 1/8 inch pilot screw hole in the duct makes mounting easier through the mounting tabs. Use the enclosure tabs to mark the pilot hole locations.
4. Snug up the sensors so that the foam backing is depressed to prevent air leakage but do not over-tighten or strip the screw threads.

Note 1:

Do not drill into the water tight enclosures (BB, BB2, WP) which will violate the NEMA and/or IP rating.

Note 2:

Use caulk or Teflon tape for your conduit entries to maintain the appropriate NEMA or IP rating for your application.

Note 3:

Conduit entry for outdoor or wet applications should be from the bottom of the enclosure.

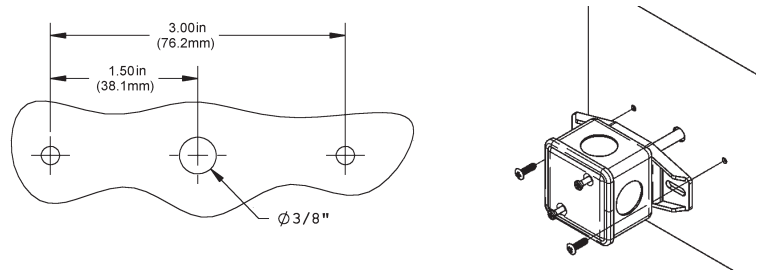


Fig. 7: Junction Box or No Box (NB) Mounting Holes

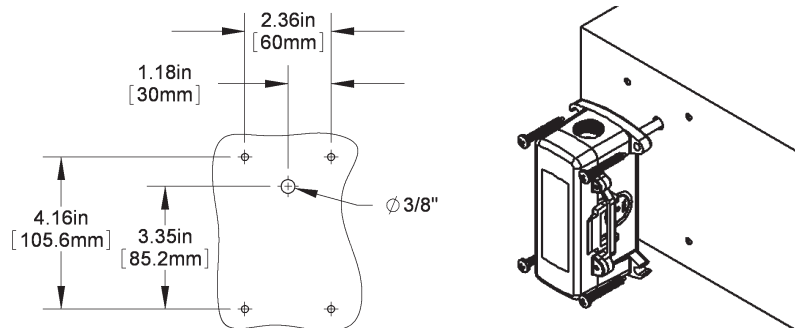


Fig. 8: BAPI-Box 2 (BB2) Enclosure Mounting Holes

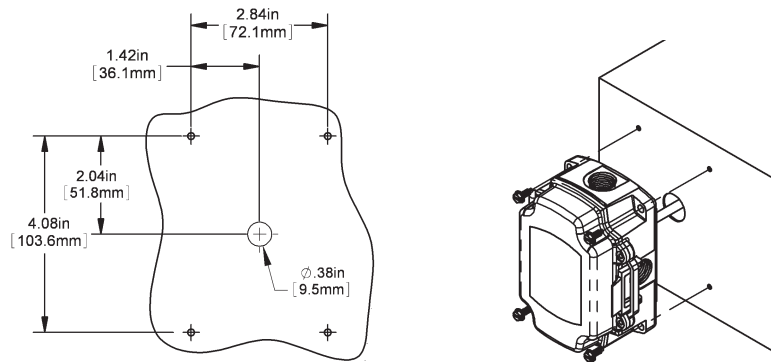


Fig. 9: BAPI-Box (BB) Enclosure Mounting Holes, Rotate 90° for Horizontal Mounting

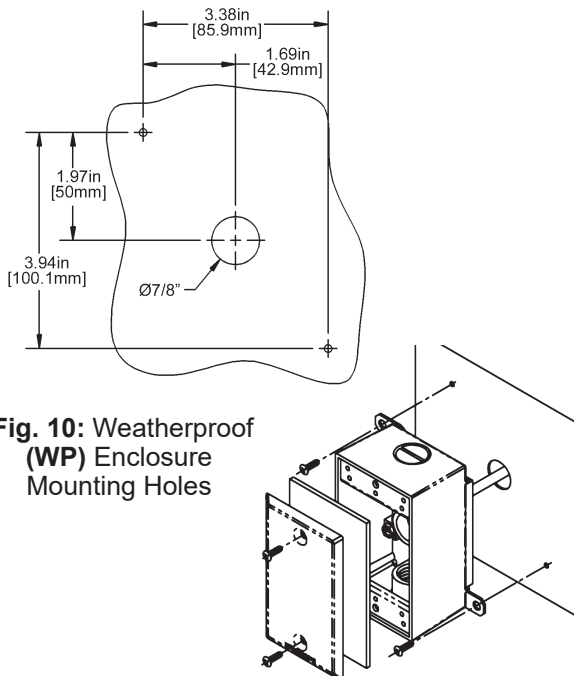


Fig. 10: Weatherproof (WP) Enclosure Mounting Holes

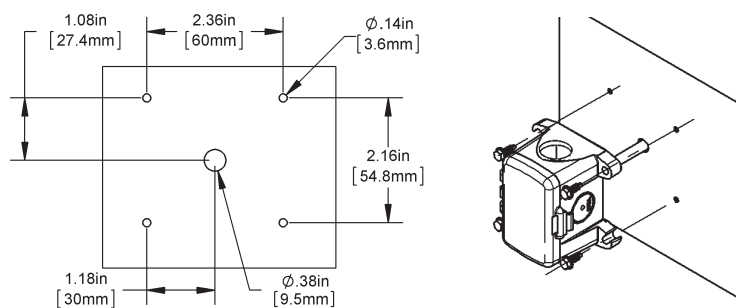


Fig. 11: BAPI-Box 4 (BB4) Enclosure Mounting Holes

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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.

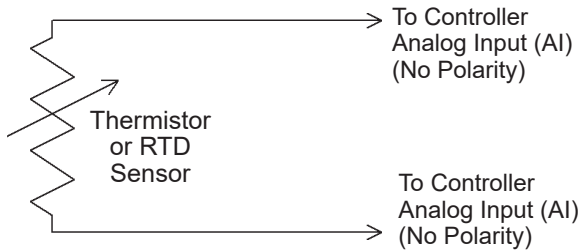


Fig. 12: 2 Wire Termination for Thermistor or RTD

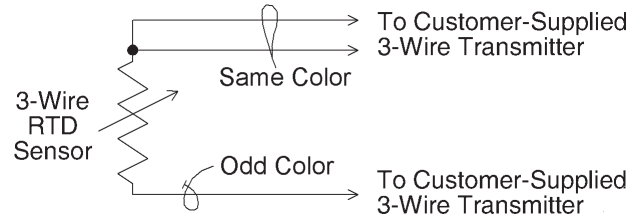


Fig. 13: 3 Wire Wire Termination for RTD

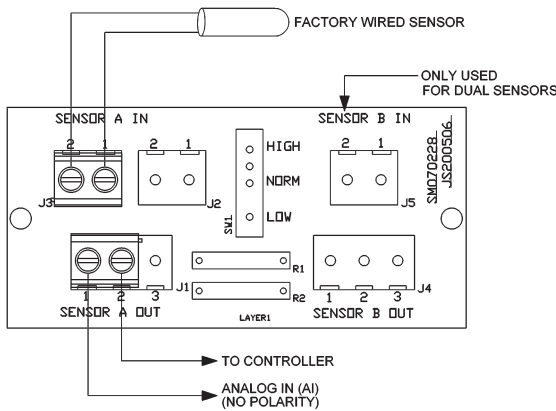


Fig. 14: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

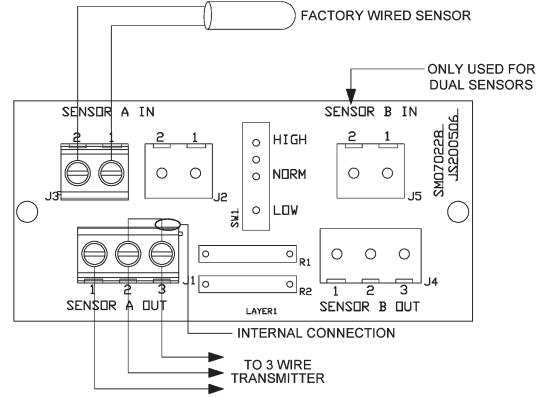


Fig. 15: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

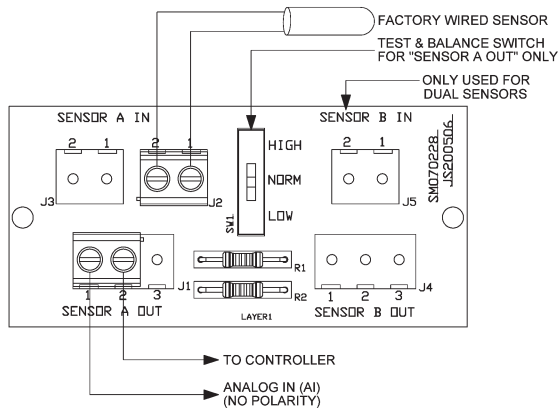


Fig. 16: Test & Balance (-TB) Option for 2 Wire Sensors Termination

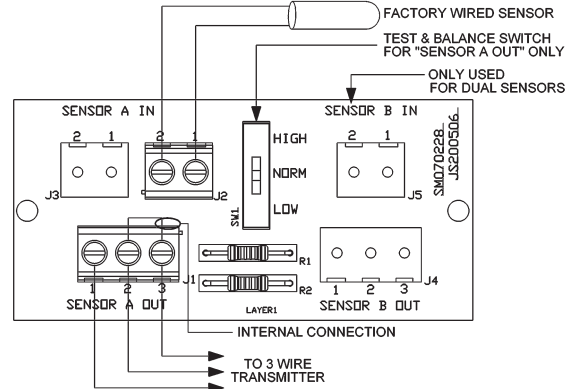


Fig. 17: Test & Balance (-TB) Option for 3 Wire Sensors Termination

Specifications subject to change without notice.



Diagnostics

Possible Problems:

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)
- Measure the temperature at the temperature sensor's location using an accurate temperature standard. Disconnect the temperature sensor wires and measure the temperature sensor's resistance with an ohmmeter. Compare the temperature sensor's resistance to the appropriate temperature sensor table on the BAPI website. If the measured resistance is different from the temperature table by more than 5%, call BAPI technical support. BAPI's website is found at www.bapihvac.com; click on the "Resources" then "BAPI Sensors Overview" and then click on the type of sensor you have.

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"
 $1\text{K}\Omega$ RTD (Pt) $3.85\Omega/^{\circ}\text{C}$
 100Ω RTD $0.385\Omega/^{\circ}\text{C}$
 Nickel (Ni) $2.95\Omega/^{\circ}\text{F}$ for the JCI RTD

Lead Wire: 22awg stranded

Wire Insulation: Etched Teflon, Plenum rated

Probe: 304 Stainless steel, 0.25" OD

Probe Length: 2', 4', 8' or per order

Duct Gasket: 1/4" Closed cell foam
(impervious to mold)

Enclosure Types: (Part number designator in bold)

No Box: **-NB**, intended for open wiring
 J-Box: **-JB**, w/ four 1/2" knock-outs
 Weatherproof: .. **-WP**, w/ two 1/2" FNPT entries, (Bell box)
 BAPI-Box: **-BB**, w/ four 1/2" NPSM & one 1/2" drill-out
 BAPI-Box 2: **-BB2**, w/ three 1/2" NPSM & three 1/2" drill-outs
 BAPI-Box 4: **-BB4**, w/ three 1/2" drill-outs, one 1/2" open port

Enclosure Ratings: (Part number designator in bold)

No Box: **-NB**, No rating
 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 open port)

Enclosure Material: (Part number designator in bold)

No Box: **-NB**, Nylon 66, UL94H-B
 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

All BAPI-Boxes: **-BB, BB2 & BB4**, -40 to 185°F (-40 to 85°C)
 Junction Box: ... **-JB**, -40 to 212°F (-40 to 100°C)
 Weatherproof: .. **-WP**, -40°F to 212°F (-40° to 100°C)
 No Box: **-NB**, -40 to 212°F (-40 to 100°C)
 No Box w/ Plenum-Rated Wire: **-NB**, -4 to 167°F (-20 to 75°C)

Agency:

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

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