

Overview and Identification

The Averaging Sensor is for duct mounting and temperature measurement of stratified air across the duct to give the average temperature along the length of the sensor.

The flexible probe is made of aluminum and made in different lengths for a custom duct fit. The Averaging Sensor is available in multiple thermistor or RTD types as shown in the specifications. Enclosure mounting styles come in plastic or metal for both NEMA 1 and NEMA 4 applications and are all plenum rated.

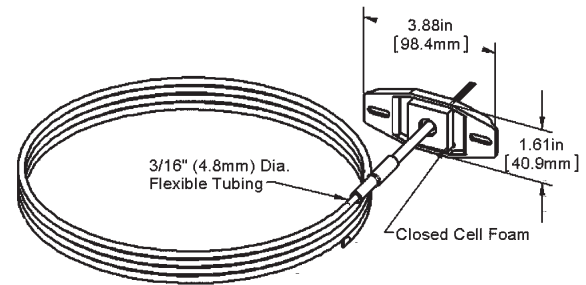


Fig 1: Duct Unit with No Box (NB)

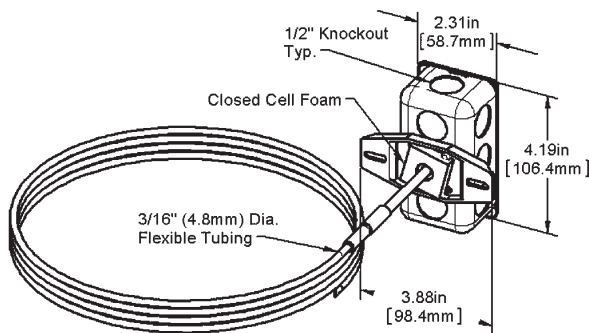


Fig 2: Duct Unit with J-Box (Standard)

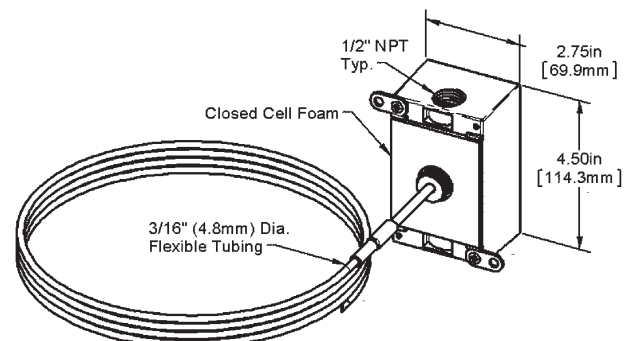


Fig 3: WeatherProof (WP) Duct Unit

Fig 4: BAPI-Box (BB) Duct Unit

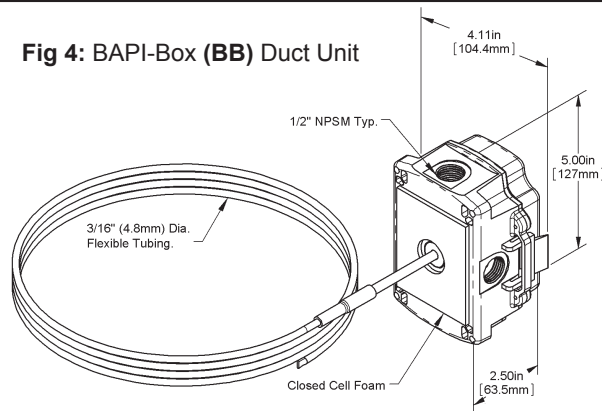


Fig 5: BAPI-Box 2 (BB2) Duct

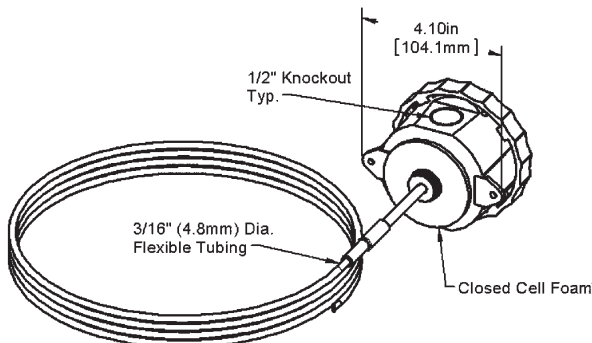
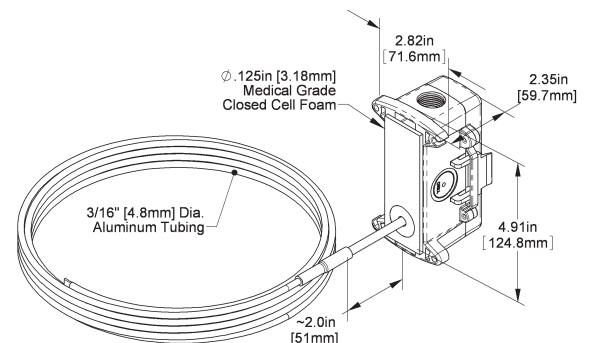


Fig 6: Weather Tight Enclosure (EU) Duct Unit

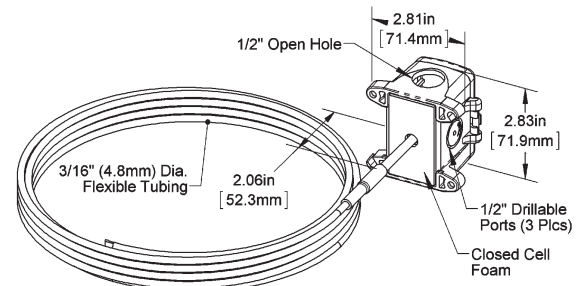


Fig 7: BAPI-Box 4 (BB4) Duct Unit

(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 or top of the duct as shown in Fig 8 or Fig 9 so the flexible probe can enter the duct in a convenient place. Drill the probe and mounting holes as depicted for the enclosure being used. (**No Box, Handy Box, BB, BB2, WP, EU, BB4**).
2. Insert the probe by unrolling the sensor into the duct carefully to avoid kinking the sensor. Serpentine the duct with the sensor at least twice across the stratified air in the duct to achieve the best average temperature reading. At the sensor reversing points a turning bracket (BA/FPB) can be used to support the sensor and to avoid kinking the sensor.
3. Mount the enclosure to the duct using BAPI recommended #8 screws through a minimum of two opposing mounting tabs provided. Weatherproof (WP) enclosures will 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: Be sure not to drill into the weatherproof enclosures (**BB, BB2, WP, EU, EUO**) which will violate the NEMA and/or the IP rating.

Note 2: Be sure to 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.

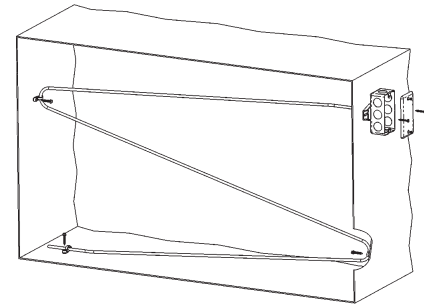


Fig 8: Flexible Sensor Horizontal Mount (Best for Vertical Stratification)

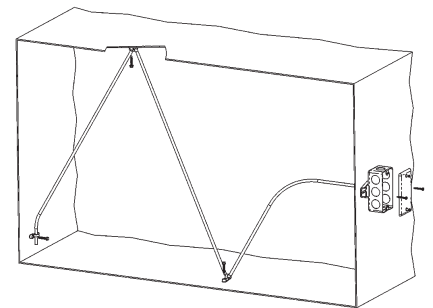


Fig 9: Flexible Sensor Vertical Mount (Best for Horizontal Stratification)

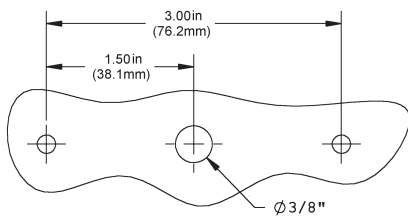


Fig 10: Junction Box or No Box (**NB**) Mounting Holes and installation

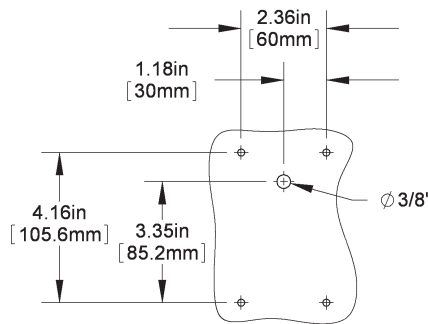
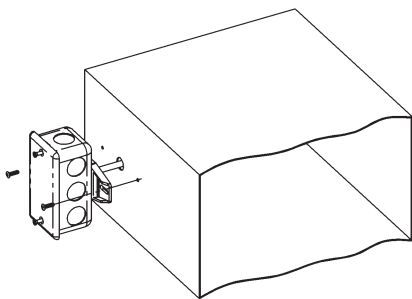


Fig 11: BAPI-Box 2 (**BB2**) Mounting Holes and installation.

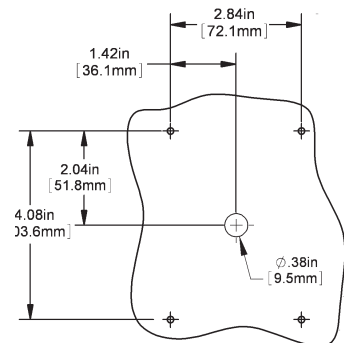
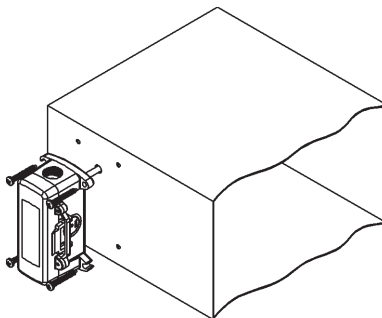
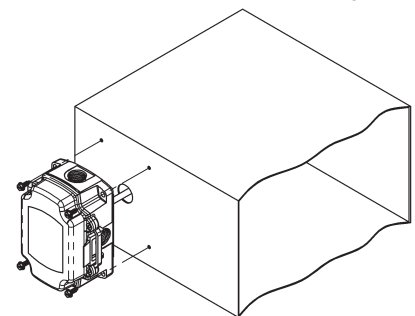


Fig 12: BAPI-Box (**BB**) Enclosure Mounting and installation Holes (Rotate 90° for Horizontal Mounting)



Specifications subject to change without notice.

Mounting continued...

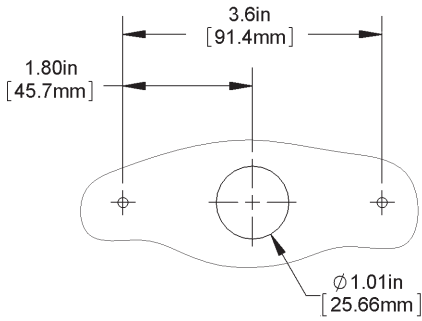


Fig 13: Weather Tight (EU or EUO) Encl. Mounting Holes and Installation

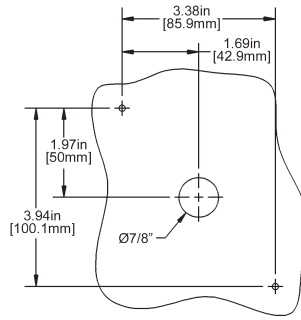
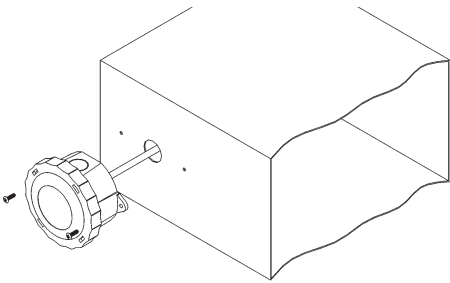


Fig 14: Weatherproof Box (WP) Mounting Holes and Installation

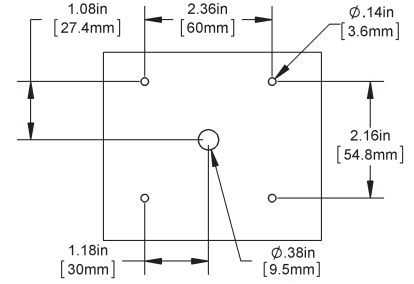
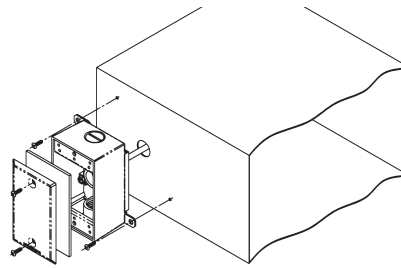
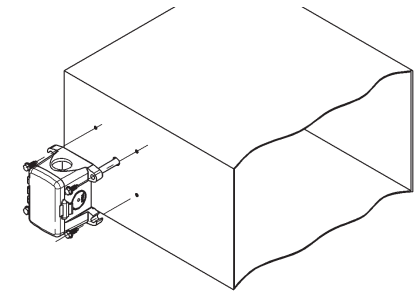


Fig 15: BAPI-Box 4 (BB4) Enclosure Mounting Holes and Installation



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.

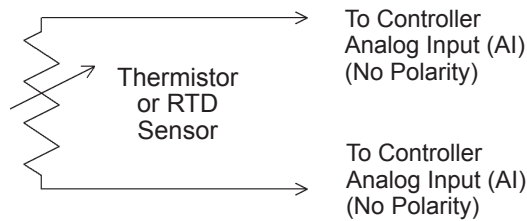


Fig. 16: 2 Wire Lead Wire Termination for Thermistor or RTD

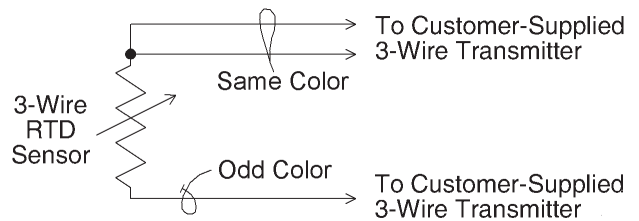


Fig. 17: 3 Wire Lead Wire Termination for RTD

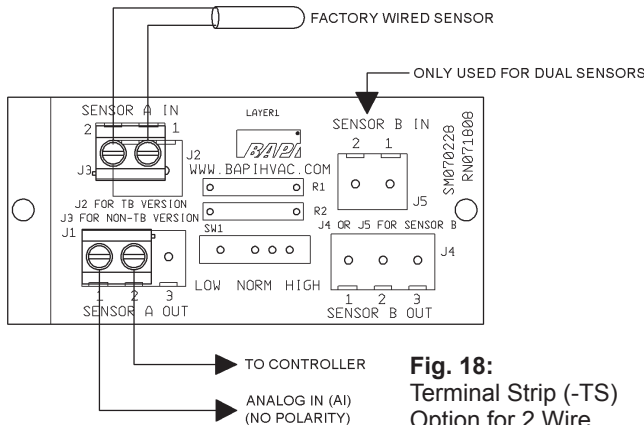


Fig. 18: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

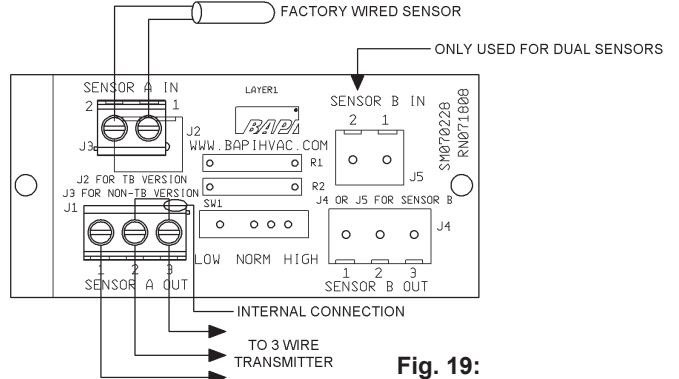


Fig. 19: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

Specifications subject to change without notice.

Wiring & Termination continued...

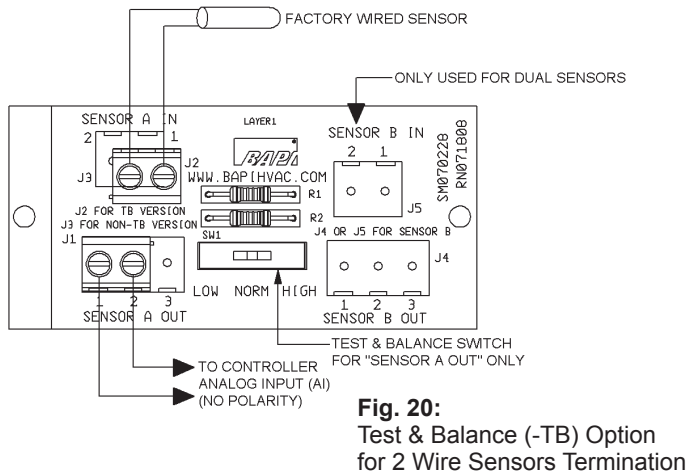


Fig. 20:
Test & Balance (-TB) Option
for 2 Wire Sensors Termination

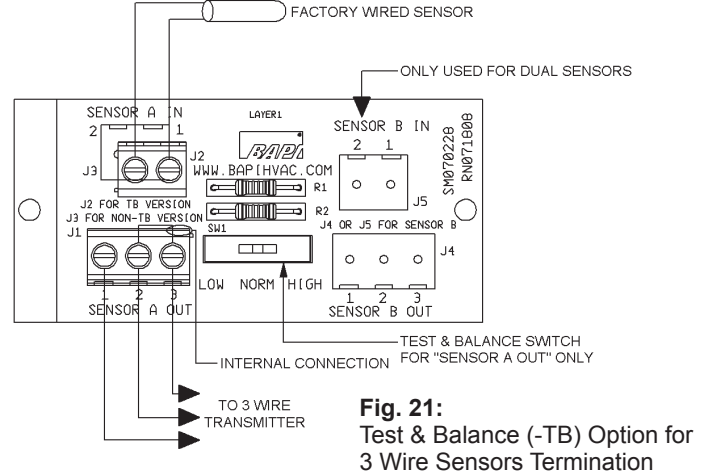


Fig. 21:
Test & Balance (-TB) Option for
3 Wire Sensors Termination

Diagnostics

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)
- Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct.

Specifications

Sensor	Passive
Thermistor	4 sensors in < 24' probes 9 sensors in ≥ 24' probes
RTD	Continuous sensor, 2 or 3 wire
Thermistor	Thermal resistor (NTC)
Temp. Output	Resistance per order
Accuracy	(std) ±0.36°F, (±0.2°C)
Accuracy	(Hi) ±0.18°F, (±0.1°C), [XP] option
Stability	< 0.036°F/Year, (<0.02°C/Year)
Heat dissipation	2.7 mW/°C
Temp. Drift	<0.02°C per year
Probe range	-40° to 221°F (-40° to 105°C)
RTD	Resistance Temp Device (PTC)
Platinum (Pt)	100Ω and 1KΩ @0°C, 385 curve
Platinum (Pt)	1KΩ @0°C, 375 curve
Pt Accuracy (std)	0.12% @Ref, or ±0.55°F, (±0.3°C)
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)
Nickel (Ni)	1000Ω @70°F, JCI curve
Ni Probe range	-40° to 221°F (-40 to 105°C)
Sensitivity	Approximate
Thermistor	Non-linear
	Go to bapihvac.com "Sensor Specs"
RTD (Pt)	3.85Ω/°C for 1KΩ RTD 0.385Ω/°C for 100Ω RTD
Nickel (Ni)	2.95Ω/°F for the JCI RTD
Lead Wire	22awg stranded, Etched Teflon, Plenum rated
Probe	Flexible Aluminum tube, 0.19" OD
Probe Length	8', 12', 24' per order
Duct Gasket	1/4" Closed cell foam (impervious to mold)
Mounting	Extension tabs (ears), 3/16" holes

Enclosure Types

J-Box	-JB, w/eight 1/2" knockouts
No Box	-NB, intended for open wiring
Weather Proof	-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" drillouts
BAPI-Box 4:	-BB4, with three 1/2" drill-outs, one 1/2" open port
Weather Tight	-EU, -EUO, w/two 1/2" knockouts

Enclosure Ratings

J-Box	-JB, NEMA 1
No Box	-NB, No rating
Weather Proof	-WP, NEMA 3R, IP14
BAPI-Box	-BB, NEMA 4X, IP66
BAPI-Box 2	-BB2, NEMA 4X, IP66
BAPI-Box 4:	-BB4, IP10 (IP44 with Knockout Plug installed)
Weather Tight	-EU, NEMA 4X, IP66
Weather Tight	-EUO, NEMA 4X, IP66, UV rated

Enclosure Materials

J-Box	-JB, Galvanized steel, UL94H-B
No Box	-NB, Nylon 66, UL94H-B
Weather Proof	-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
Weather Tight	-EU, ABS Plastic, UL94V-0
Weather Tight	-EUO, ABS Plastic, UL94V-0, UV rated
Ambient (Encl.)	0 to 100% RH, Non-condensing
All BAPI-Boxes	-BB, BB2, BB4, -40°F to 185°F, (-40° to 85°C)
Weather Tight	-EUO, EU, -40°F to 185°F, (-40° to 85°C)
J-Box & No Box	-JB, NB, -40°F to 212°F, (-40° to 100°C)
Weatherproof	-WP, -40°F to 212°F, (-40° to 100°C)

Agency

RoHS, *CE
PT=DIN43760, IEC Pub 751-1983,
JIS C1604-1989
*Passive Thermistors 20KΩ and smaller are CE

Specifications subject to change without notice.