

Overview

The **BA/#-O** is for Outside Air mounting and temperature measurement. The probe is made to protect the sensor from rain, sleet, snow or bird droppings. The **BA/#-O** is available in multiple thermistor or RTD's as shown in the specifications. Enclosure mounting styles come in plastic or metal for both **NEMA 3R** and **NEMA 4** applications and are all UV rated.

Identification

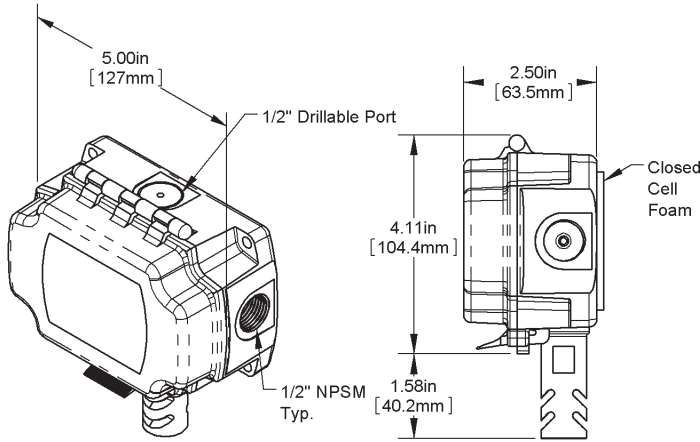


Fig 1: Outside Air Sensor in a BAPI-Box (-BB) Enclosure

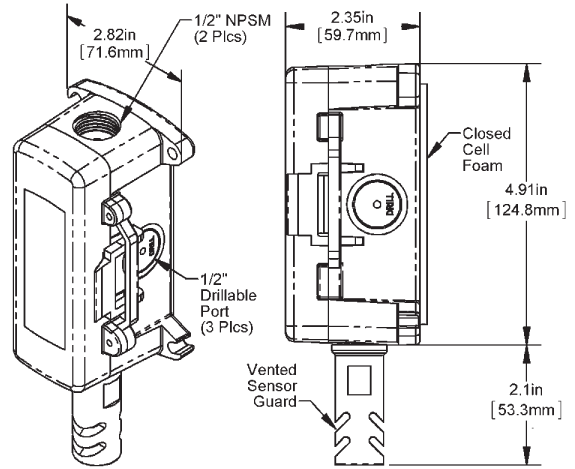


Fig 2: Outside Air Sensor in a BAPI-Box 2 (-BB2) Enclosure

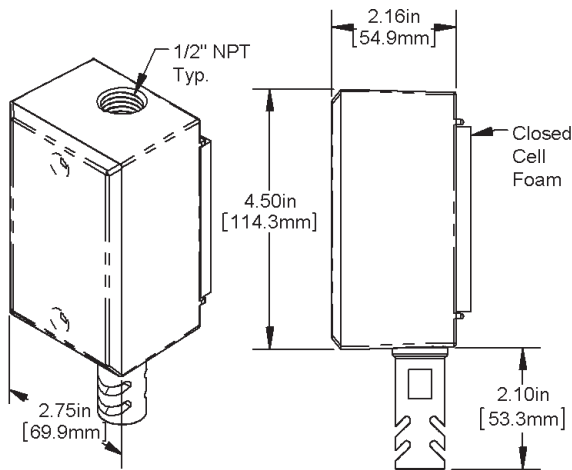


Fig 3: Outside Air Sensor in a Weatherproof (-WP) Enclosure

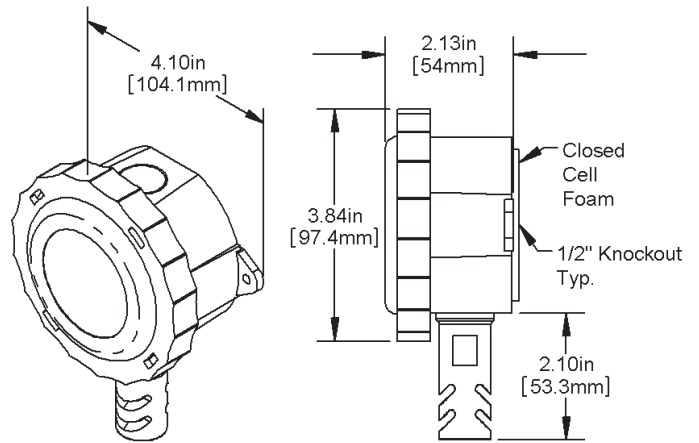
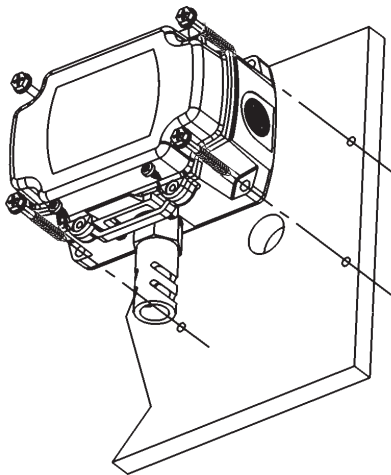
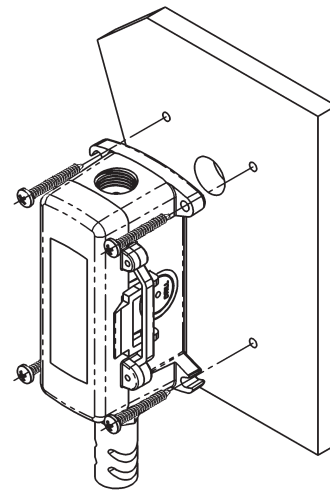
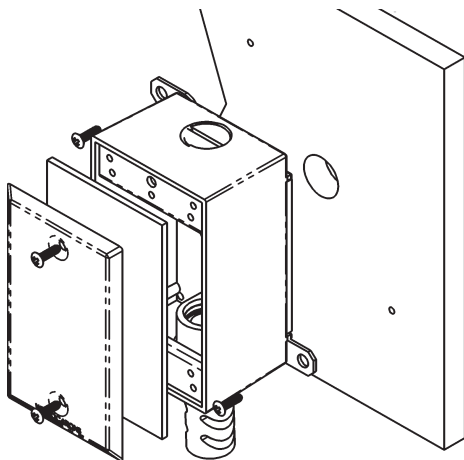
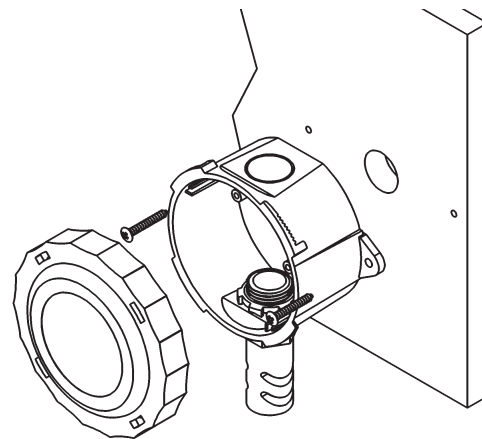


Fig 4: Outside Air Sensor in a Weather Tight (-EU) Enclosure

Specifications subject to change without notice.

Mounting**Fig 5: BAPI-Box (-BB) Enclosure Installation****Fig 6: BAPI-Box 2 (-BB2) Enclosure Installation****Fig 7: Weatherproof (-WP) Enclosure Installation****Fig 8: Weather Tight (-EU) Enclosure Installation**

Outside Air (OSA) sensor placement is critical to good performance. The OSA sensor must be mounted in the shade away from building windows, doors or vents. They should never be in direct sunlight or you will have higher than expected temperature readings by as much as +30%. The ideal shaded location in the Northern hemisphere is on the North side of the building. In the Southern hemisphere the South side of the building is ideal.

The sensor shield and probe should always point down and mounted between four feet above the ground/roof and one foot minimum below the eave. (Note: Four feet keeps the sensor above the ground or roof top radiation and one foot under the eave prevents measurement of trapped heat from under the eave.)

Drill the mounting holes and mount as shown in the figures 5-8. Snug up the mounting screws to ensure that the foam backing compresses to about 50% of its thickness to make a gasket type seal against the wall surface.

Route the wires into the box and terminate with sealant filled connectors to prevent water from attacking the connection, thereby preventing costly callbacks. Best practice is to caulk the wiring hole after the wiring is installed. Close the cover of the BB, BB2 or WP boxes and secure with provided cover screws or twist on the cover of the EU box to the second click.

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.

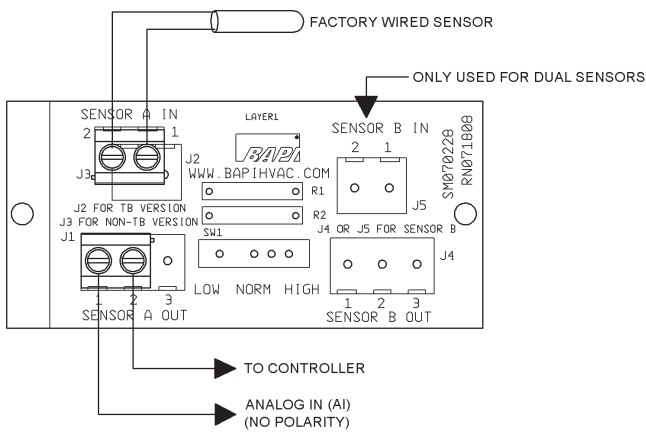
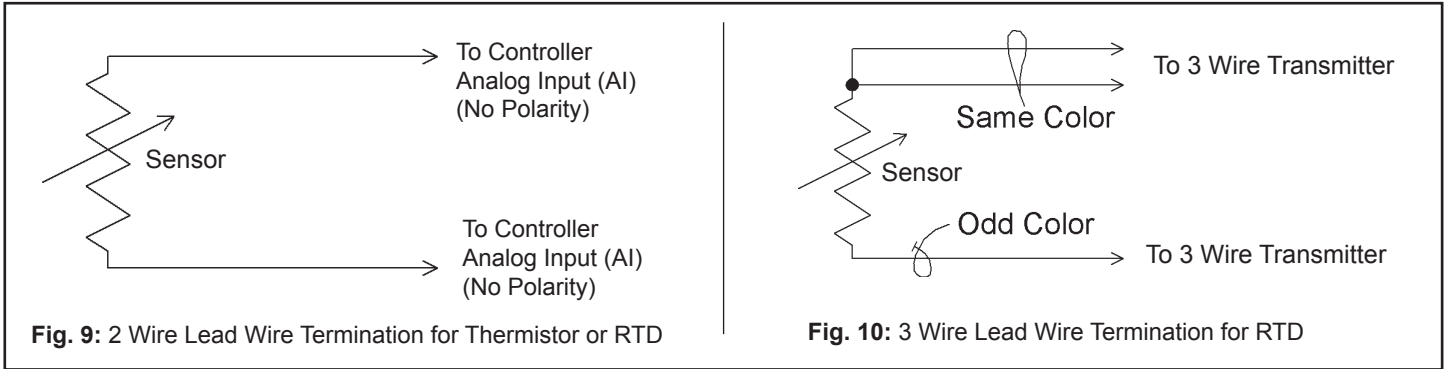


Fig. 11: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

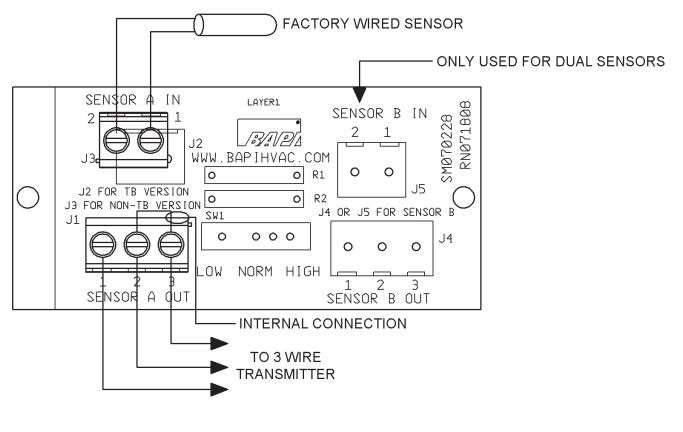


Fig. 12: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

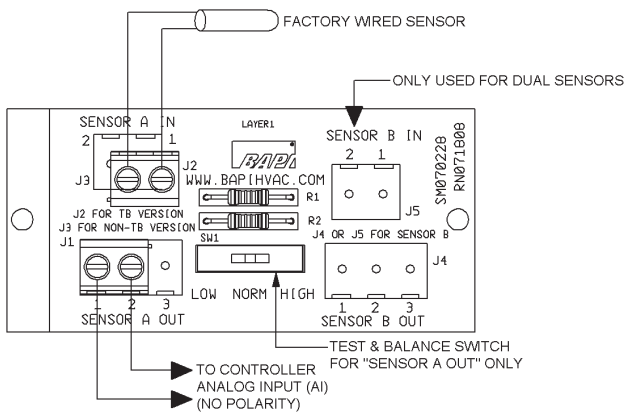


Fig. 13: Test & Balance (-TB) Option for 2 Wire Sensors Termination

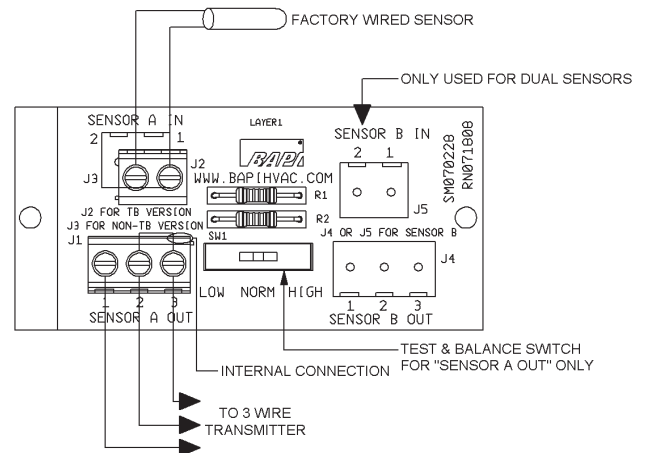


Fig. 14: Test & Balance (-TB) Option for 3 Wire Sensors Termination

Specifications subject to change without notice.



Diagnosics

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	Lead wire	22awg stranded
Thermistor	NTC, 2 wire	Wire Insulation	Etched Teflon, Plenum rated
RTD	PTC, 2 or 3 wire	Probe	Vented polycarbonate shield, 1/2" OD
Thermistor	Thermal resistor	Probe Length	1.2" w/ 1/2" NPT threads
Temp. Output	Resistance	Mounting	Extension tabs (ears), 3/16" holes
Accuracy (Std)	±0.36°F, (±0.2°C)	Wall Gasket	Closed cell foam (impervious to mold)
Accuracy (High)	±0.18°F, (±0.1°C), [XP] option	Enclosure Types	
Stability	< 0.036°F/Year, (<0.02°C/Year)	Weather Proof	-WP, w/ two 1/2" FNPT entries, (Bell box)
Heat dissipation	2.7 mW/°C	BAPI-Box	-BB, w/ four 1/2" NPSM & one 1/2" drill-outs
Temp. Drift	<0.02°C per year	BAPI-Box 2	-BB2, w/ three 1/2" NPSM & three 1/2" drill-outs
Probe range	-40° to 221°F (-40° to 105°C)	Weather Tight	-EU, w/ two 1/2" drill-outs
RTD	Resistance Temperature Device	Enclosure ratings	
Platinum (Pt)	100Ω or 1KΩ @0°C, 385 curve,	Weatherproof	-WP, NEMA 3R, IP14
Platinum (Pt)	1KΩ @0°C, 375 curve	BAPI-Box	-BB, NEMA 4, IP66
Pt Accuracy (Std)	0.12% @Ref, or ±0.55°F, (±0.3°C)	BAPI-Box 2	-BB2, NEMA 4, IP66
Pt Accuracy (High)	0.06% @Ref, or ±0.277°F, (±0.15°C), [A]option	Weather Tight	-EU, NEMA 4, IP66, UV rated
Pt Stability	±0.25°F, (±0.14°C)	Enclosure materials	
Pt Self Heating	0.4 °C/mW @0°C	Weatherproof	-WP, Cast Aluminum, UV rated
Pt Probe range	-40° to 221°F, (-40 to 105°C)	BAPI-Box	-BB, Polycarbonate, UL94V-0, UV rated
Nickel (Ni)	1000Ω @70°F, JCI curve	BAPI-Box 2	-BB2, Polycarbonate, UL94V-0, UV rated
Ni Probe range	-40° to 221°F (-40 to 105°C)	Weather Tight	-EU, Plastic, UL94V-0, UV rated
Sensitivity	Approximate @ 32°F (0°C)	Ambient (Enclosure)	0 to 100% RH, Non-condensing
Thermistor	Non-linear	Weatherproof	-WP, -40°F to 212°F, (-40° to 100°C)
	Go to bapihvac.com "Sensor Specs"	BAPI-Boxes	-BB, -BB2, -40°F to 185°F, (-40° to 85°C)
1KΩ RTD (Pt)	3.85Ω/°C	Weather Tight	-EU, -40°F to 185°F, (-40° to 85°C)
100Ω RTD (Pt)	0.385Ω/°C	Agency	
Nickel (Ni)	2.95Ω/°F for the JCI RTD		RoHS, CE (CE for all sensors below 10KΩ) PT = DIN43760, IEC Pub 751-1983, JIS C1604-1989

*Passive Thermistors 20KΩ and smaller are CE Compliant

Related Products

- BA/SFC1000-100** Sealant filled crimp connectors (100 connectors)
- BA/SFC2000-100** Sealant filled crimp twist on wire nuts (100 nuts)