Overview and Identification

BAPI's Outside Air temperature Sensor is available with multiple thermistors or RTDs as shown in the specifications section. The probe is made to protect the sensor from rain, sleet, snow or bird droppings.

Enclosuress come in plastic or metal for both **NEMA 3R** and **NEMA 4** applications and are all UV rated.

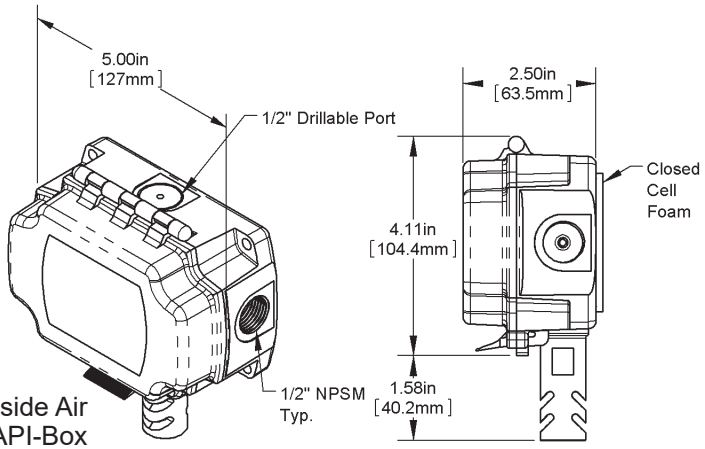

Fig. 1: Outside Air Sensor in a BAPI-Box **(-BB)** Enclosure

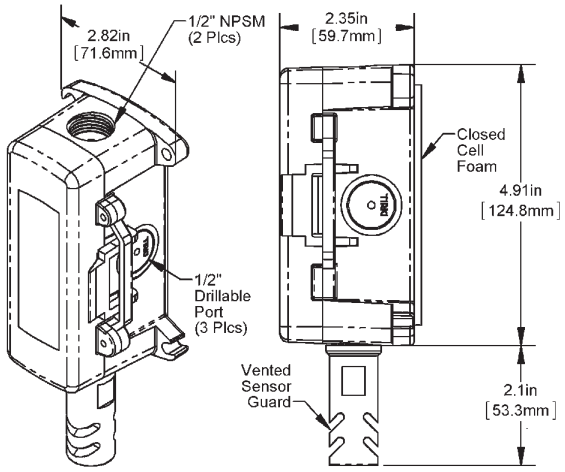

Fig. 2: Outside Air Sensor in a BAPI-Box 2 **(-BB2)** Enclosure

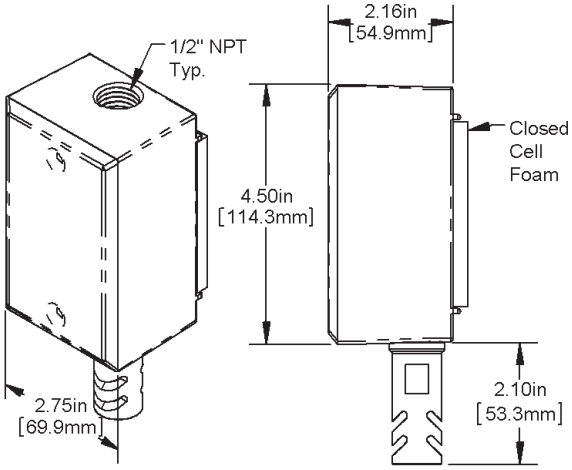

Fig. 3: Outside Air Sensor in a Weatherproof **(-WP)** Enclosure

Specifications subject to change without notice.

Mounting

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 figs 4-6. 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 enclosures and secure with provided cover security screws.

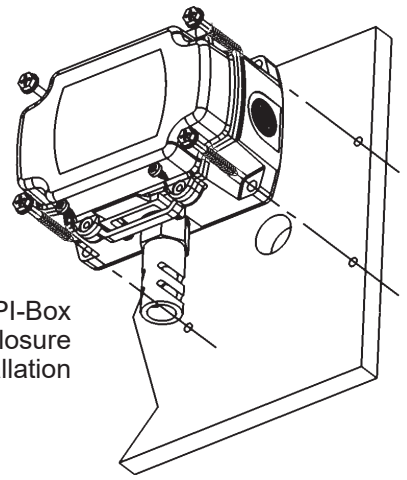

Fig. 4: BAPI-Box **(-BB)** Enclosure Installation

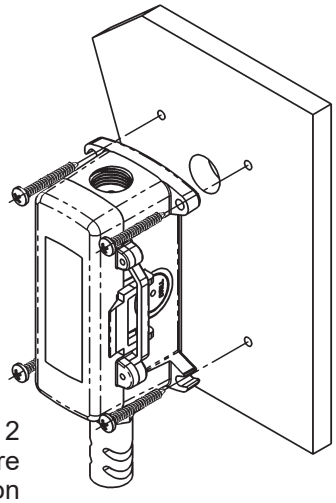

Fig. 5: BAPI-Box 2 **(-BB2)** Enclosure Installation

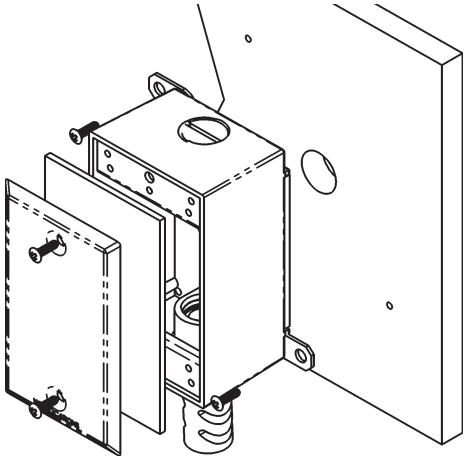

Fig. 6: Weatherproof **(-WP)** Enclosure Installation

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.

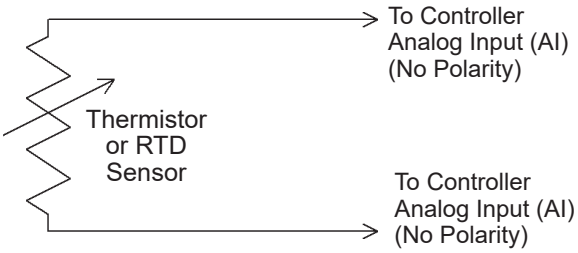

Fig. 7: 2 Wire Termination for Thermistor or RTD

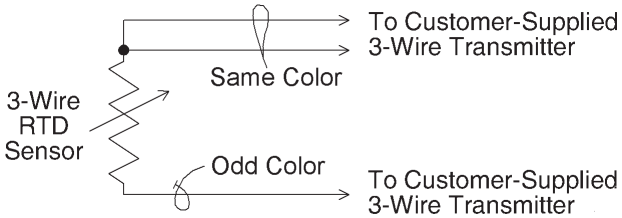

Fig. 8: 3 Wire Termination for RTD

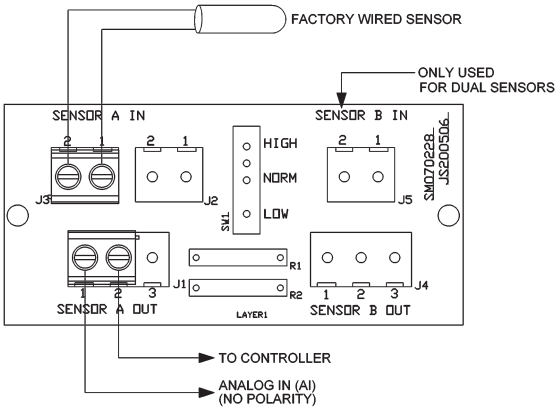

Fig. 9: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

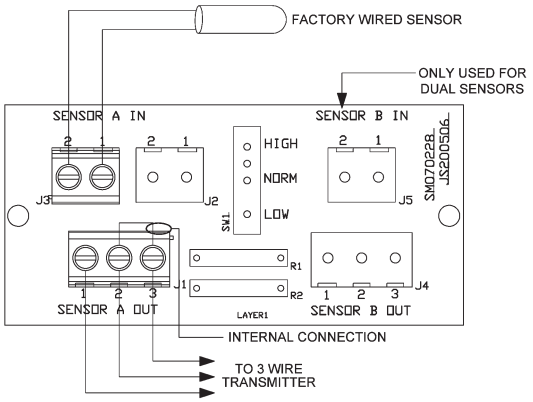

Fig. 10: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

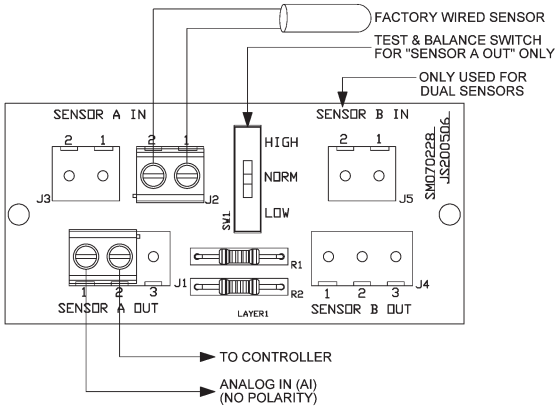

Fig. 11: Test & Balance (-TB) Option for 2 Wire Sensors Termination

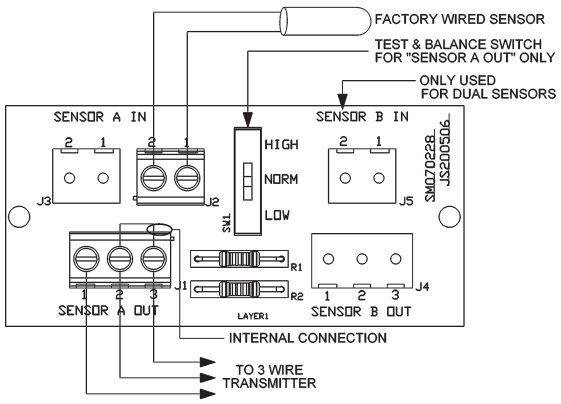

Fig. 12: Test & Balance (-TB) Option for 3 Wire Sensors Termination

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) ..... ±0.36ºF, (±0.2ºC)
Accuracy (High) ..... ±0.18ºF, (±0.1ºC), **[XP]** option
Stability ..... < 0.036ºF/Year, (<0.02ºC/Year)
Heat dissipation .... 2.7 mW/ºC
Temp. Drift..... <0.02ºC per year
Probe range ..... -40 to 221ºF (-40 to 105ºC)

RTD: Resistance Temperature Device
Platinum (Pt) ..... 100Ω or 1KΩ @0ºC, 385 curve,
Platinum (Pt) ..... 1KΩ @0ºC, 375 curve
Pt Accuracy (Std) .. 0.12% @Ref, or ±0.55ºF, (±0.3ºC)
Pt Accuracy (High) 0.06% @Ref, or ±0.277ºF, (±0.15ºC), **[A]**option
Pt Stability ..... ±0.25ºF, (±0.14ºC)
Pt Self Heating ..... 0.4ºC/mW @0ºC
Pt Probe range ..... -40 to 221ºF, (-40 to 105ºC)
Nickel (Ni) ..... 1KΩ @70ºF, JCI curve
Ni Probe range ..... -40 to 221ºF (-40 to 105ºC)

Sensitivity: Approximate @ 32ºF (0ºC)
Thermistor ..... Non-linier – Go to bapihvac.com click “Resources” and “BAPI Sensors Overview”
1KΩ RTD (Pt) 3.85Ω/ºC
100Ω RTD (Pt) 0.385Ω/ºC
Nickel (Ni) ..... 2.95Ω/ºF for the JCI RTD

Lead Wire: 22awg stranded

Wire Insulation: Etched Teflon, Plenum rated

Probe: Vented polycarbonate shield, ½” OD

Probe Length: 1.2” w/ ½” NPT threads

Wall Gasket: Closed cell foam (impervious to mold)

Enclosure Types
Weatherproof .. **-WP,** w/ two ½” FNPT entries, (Bell box)
BAPI-Box ..... **-BB,** w/ four ½” NPSM & one ½” drill-outs
BAPI-Box 2 ..... **-BB2,** w/ three ½” NPSM & three ½” drill-outs

Enclosure Ratings
Weatherproof .. **-WP,** NEMA 3R, IP14
BAPI-Box ..... **-BB,** NEMA 4, IP66
BAPI-Box 2 ..... **-BB2,** NEMA 4, IP66

Enclosure Materials
Weatherproof .. **-WP**, Cast Aluminum, UV rated
BAPI-Box ..... **-BB**, Polycarbonate, UL94V-0, UV rated
BAPI-Box 2 ..... **-BB2**, Polycarbonate, UL94V-0, UV rated

Ambient (Enclosure)
Weatherproof ..... **-WP,** -40ºF to 212ºF, (-40º to 100ºC)
BAPI-Boxes..... **-BB, -BB2,** -40ºF to 185ºF, (-40º to 85ºC)
Humidity ..... 0 to 100% RH, Non-condensing

Agency
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

Specifications subject to change without notice.