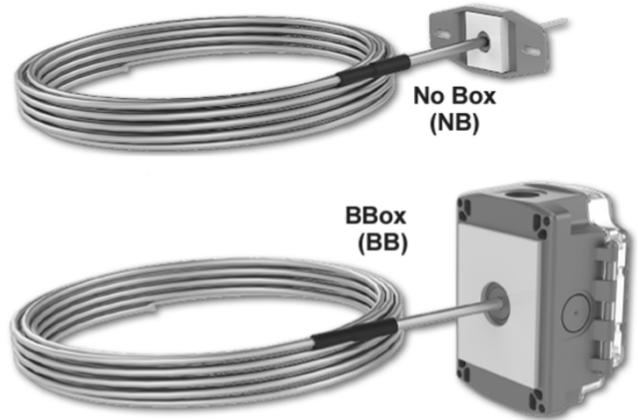


**Identification and Overview****Duct Mounted Thermistor and RTD Temperature Probe**

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

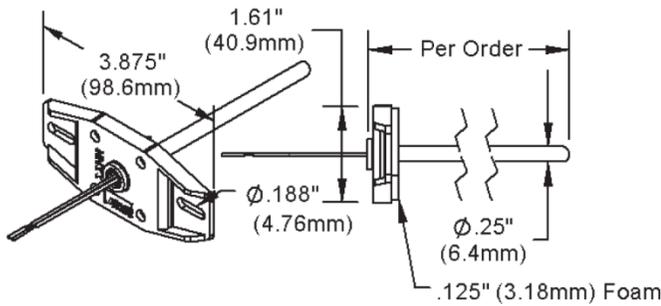
It can be ordered with all the most common Thermistors or RTDs used with virtually any BAS system. All thermistor and (385) RTD sensors come with standard accuracy as well as high accuracy models [XP] and [A] options respectively.



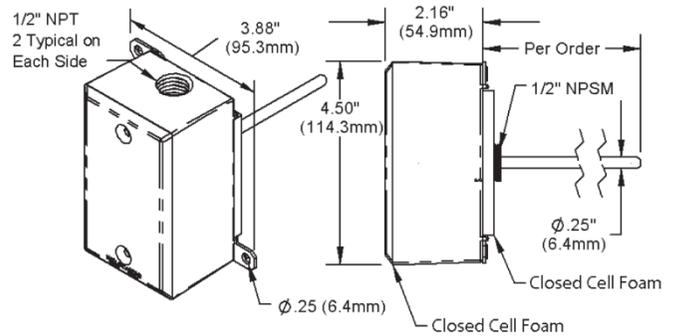
**Part #s:** N1-10K-2-D-12-BB-A  
N1-10K-2-D-12-NB-5-A  
N1-10K-2-D-12-WP-A  
N1-10K-2-D-18-BB-A  
N1-10K-2-D-18-WP-A  
N1-10K-2-D-2-BB4-A  
N1-10K-2-D-4-BB-A  
N1-10K-2-D-4-NB-18-A  
N1-10K-2-D-8-BB-A  
N1-10K-2-D-8-NB-15-A  
N1-10K-2-D-8-NB-18-A  
N1-10K-2-D-8-NB-5-A  
N1-10K-2-D-8-WP-A

<b>Specifications</b>	
<p><b>Sensor:</b> Passive</p> <p>Thermistor ..... NTC, 2 wire</p> <p>RTD ..... PTC, 2 or 3 wire</p> <p><b>Thermistor:</b></p> <p>Thermal resistor Temp. Output      Resistance</p> <p>Accuracy (Std)..... ±0.36°F, (±0.2°C)</p> <p>Accuracy (High)..... ±0.18°F, (±0.1°C), [XP] option</p> <p>Stability..... &lt; 0.036°F/Year, (&lt;0.02°C/Year)</p> <p>Heat dissipation..... 2.7 mW/°C</p> <p>Temp. Drift ..... &lt;0.02°C per year</p> <p>Probe range ..... -40° to 221°F (-40° to 105°C)</p> <p><b>RTD:</b> Resistance Temperature Device</p> <p>Platinum (Pt) ..... 100Ω or 1KΩ @0°C, 385 curve,</p> <p>Platinum (Pt) ..... 1KΩ @0°C, 375 curve</p> <p>Pt Accuracy (Std) ..... 0.12% @Ref, or ±0.55°F, (±0.3°C)</p> <p>Pt Accuracy (High) 0.06% @Ref, or ±0.277°F (±0.15°C), [A]option</p> <p>Pt Stability ..... ±0.25°F, (±0.14°C)</p> <p>Pt Self Heating ..... 0.4 °C/mW @0°C</p> <p>Pt Probe range ..... -40° to 221°F, (-40 to 105°C)</p> <p>Nickel (Ni)..... 1000Ω @70°F, JCI curve</p> <p>Ni Probe range ..... -40° to 221°F (-40 to 105°C)</p> <p><b>Sensitivity:</b> Approximate @ 32°F (0°C)</p> <p>Thermistor ..... Non-linear</p> <p>1KΩ RTD (Pt)..... 3.85Ω/°C</p> <p>100Ω RTD ..... 0.385Ω/°C</p> <p>Nickel (Ni)..... 2.95Ω/°F for the JCI RTD</p> <p><b>Lead Wire:</b> 22awg stranded</p>	<p><b>Wire Insulation:</b> Etched Teflon, Plenum rated</p> <p><b>Probe:</b> 304 Stainless steel, 0.25" OD</p> <p><b>Probe Length:</b> 2', 4', 8' or per order</p> <p><b>Duct Gasket:</b> 1/4" Closed cell foam (impervious to mold)</p> <p><b>Enclosure Types:</b></p> <p>No Box:..... NB, intended for open wiring</p> <p>Weatherproof:..... WP, w/ two ½" FNPT entries, (Bell box)</p> <p>BBox:..... BB, w/ four ½" NPSM &amp; one ½" drill-out</p> <p>BBox 4:..... BB4, w/ three ½" drill-outs, one ½" open port</p> <p><b>Enclosure Ratings:</b></p> <p>No Box:..... NB, No rating</p> <p>Weatherproof:..... WP, NEMA 3R, IP14</p> <p>BBox:..... BB, NEMA 4, IP66, UV Rated</p> <p>BBox 4:..... BB4, IP10, (IP44 with Knockout Plug in open port)</p> <p><b>Enclosure Material:</b></p> <p>No Box:..... NB, Nylon 66, UL94H-B</p> <p>Weatherproof:..... WP, Cast Aluminum, UV rated</p> <p>BBox:..... BB, Polycarbonate, UL94V-0, UV rated</p> <p>BBox 4:..... BB4, Polycarbonate &amp; Nylon, UL94V-0</p> <p><b>Ambient (Enclosure):</b> 0 to 100% RH, Non-condensing</p> <p>All Boxes: ..... -40 to 185°F (-40 to 85°C)</p> <p>Weatherproof:..... WP, -40°F to 212°F (-40° to 100°C)</p> <p>No Box..... NB, -40 to 212°F (-40 to 100°C)</p> <p>No Box w/ Plenum-Rated Wire: NB, -4 to 167°F (-20 to 75°C)</p> <p><b>Agency:</b></p> <p>RoHS PT= DIN43760, IEC Pub 751-1983, JIS C1604-1989</p>

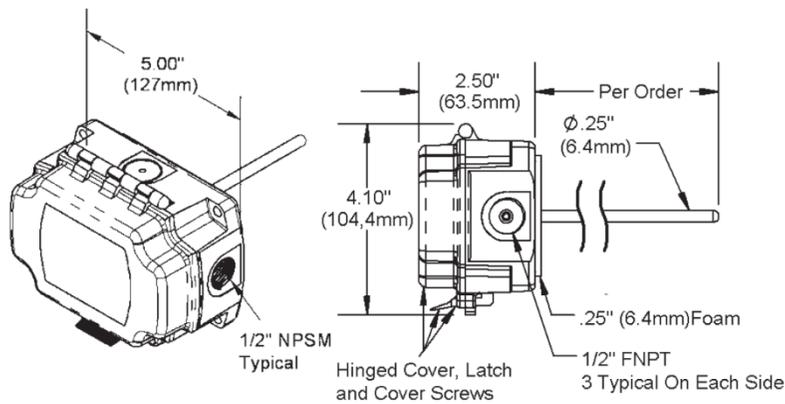
**Dimensional Drawing**



Duct Unit with No Box (NB)

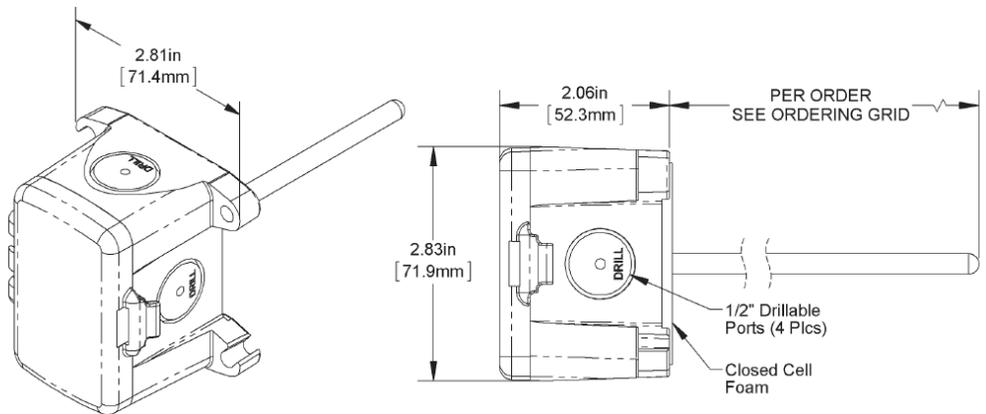


Duct Unit with Weatherproof (WP) Enclosure



Duct Unit with BBox (BB) Enclosure

Duct Unit with BBox 4 (BB4) Enclosure

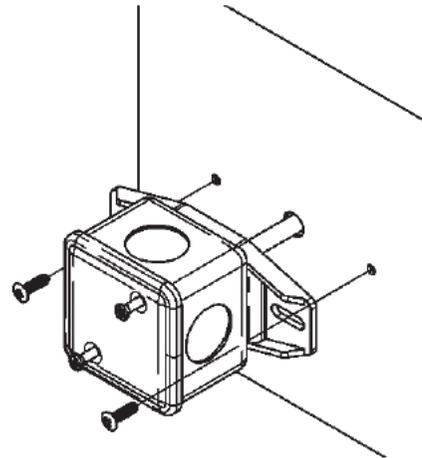
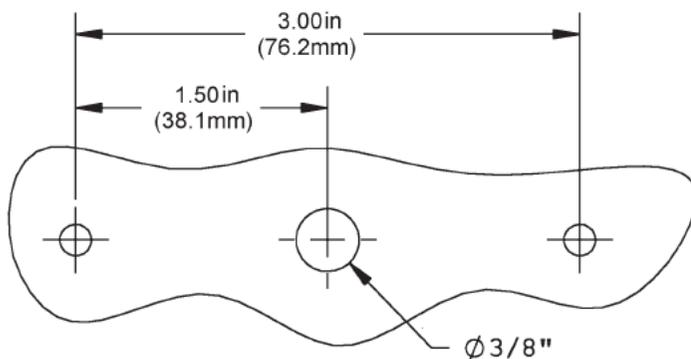


**Mounting**

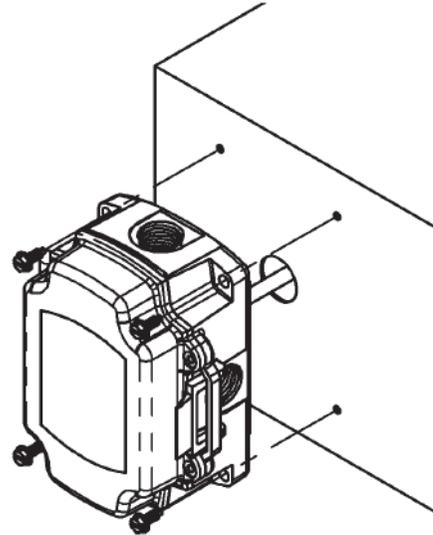
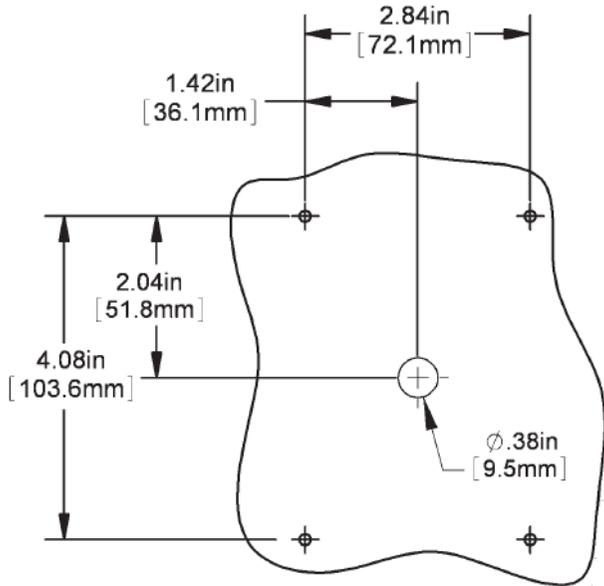
1. Place the sensor in the middle of the duct away from temperature stratified air, coils or humidifiers to achieve the best temperature reading.
2. Drill the probe hole as depicted on this page for the enclosure being used. Insert the probe into the duct.
3. Mount the enclosure to the duct using #8 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.

**NOTES**

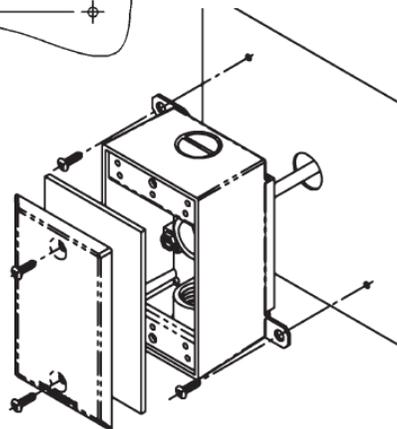
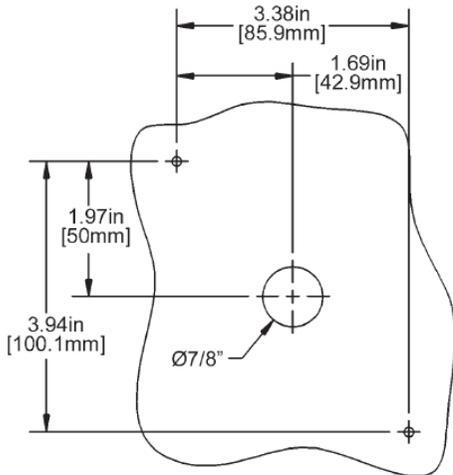
- Do not drill into the water tight enclosures (BB, BB2, WP) which will violate the NEMA and/or IP rating.
- Use caulk or Teflon tape for your conduit entries to maintain the appropriate NEMA or IP rating for your application.
- Conduit entry for outdoor or wet applications should be from the bottom of the enclosure.

**No Box (NB) Mounting Holes**

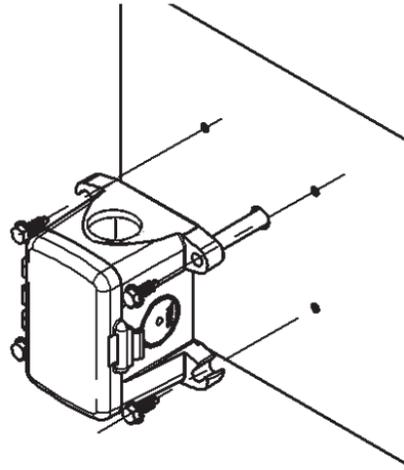
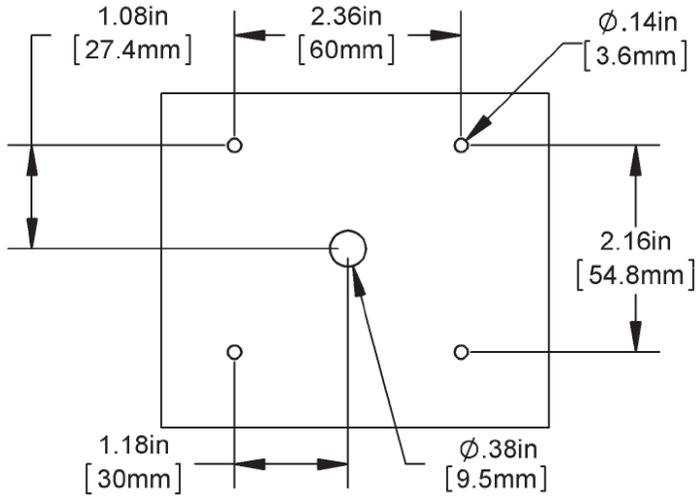
**BBox (BB) Enclosure Mounting Holes, Rotate 90° for Horizontal Mounting**



**Weatherproof (WP) Enclosure Mounting Holes**



**BBox 4 (BB4) Enclosure Mounting Holes**



**Wiring and Termination**

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. Tests show that inaccurate signal levels are possible when AC power wiring is present in the same conduit as the sensor wires.



We recommend using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs

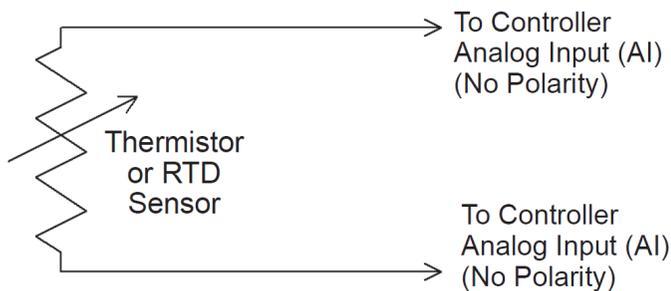


Figure 1: 2 Wire Termination for Thermistor or RTD

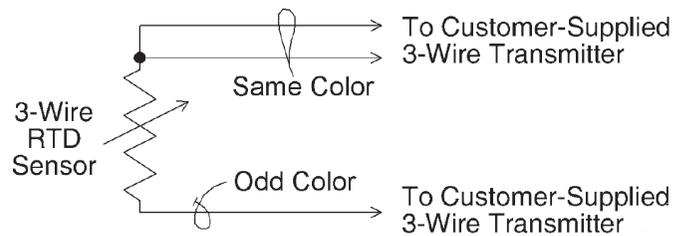


Figure 2: 3 Wire Termination for RTD

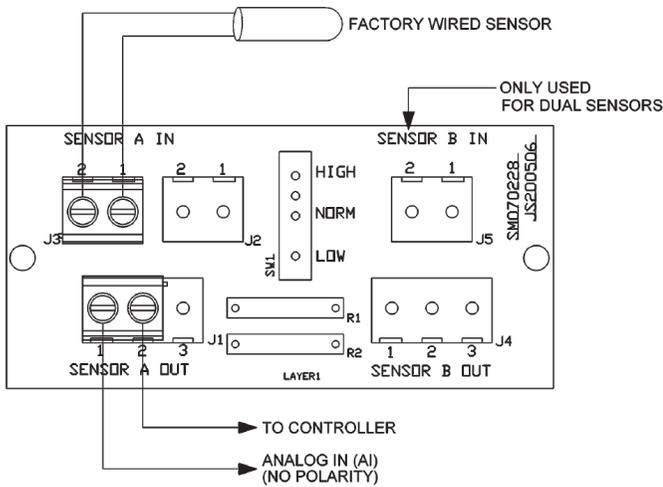


Figure 3: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

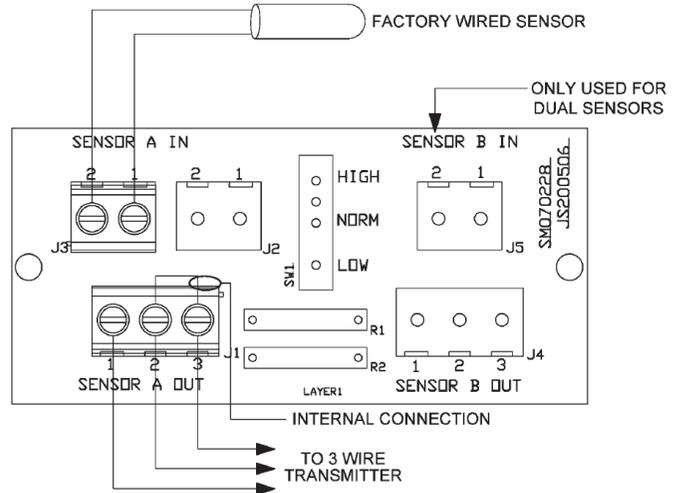


Figure 4: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

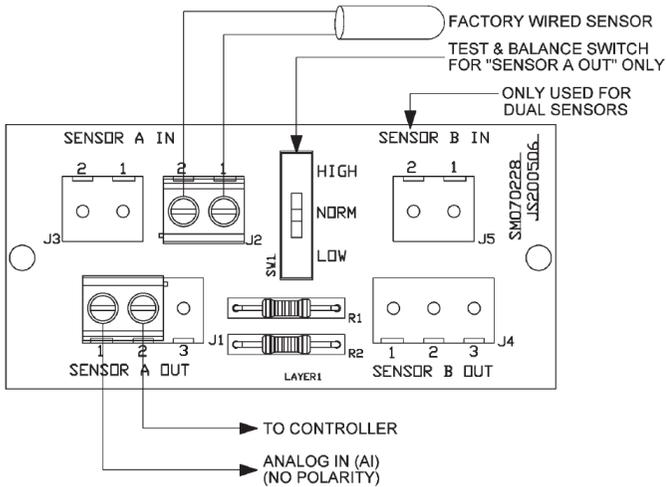


Figure 5: Test & Balance (-TB) Option for 2 Wire Sensors Termination

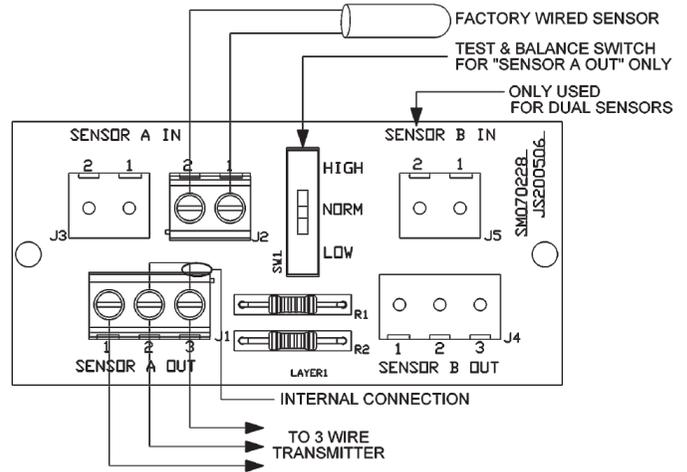


Figure 6: Test & Balance (-TB) Option for 3 Wire Sensors Termination

**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.

**Appendix – Symbols Key**

 <b>Warning</b>	Potential for death, serious injury, or permanent damage to a system.
 <b>Caution</b>	Potential for injury, damage to a system, or system failure.
 <b>Tip</b>	Useful information not related to injury or system damage.