

#20910 – 9/7/23

Identification and Overview

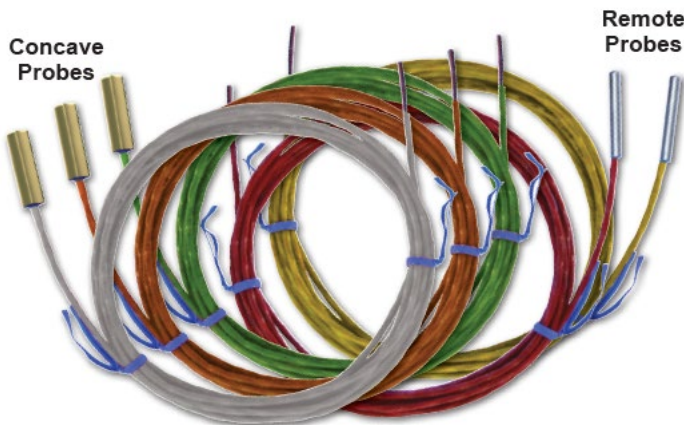
- Waterproof, Double Encapsulated Sensors
- Concave Probe or Remote Probes
- Optional Box Crossover or Box 2 Enclosure
- FEP-Jacketed Cable in 5 Color Choices

The Concave Probes feature a 1.35” long brass encapsulation shell with a concave indentation so that they fit on the outside of pipes such as condenser lines. Remote Probes feature a 1.75” long stainless steel probe without an indentation. Both probes come with FEP-jacketed cable in a choice of 5 colors and lead lengths.

Remote probes are commonly used in refrigerators, freezers, dry storage, car wash bays and other hard-to-access areas where immersion or duct sensors do not fit well.

Part #s:

- | | |
|---------------------------------|--------------------------------|
| N1-10K-2-CPFEP-10-A | N1-10K-2-CPFEP-25-A |
| N1-10K-2-CPFEP-5-A | N1-10K-2-CPFEP-5-BB2-A |
| N1-10K-2-RPFEP-100-A | N1-10K-2-RPFEP-10-A |
| N1-10K-2-RPFEP-10-BB2-A | N1-10K-2-RPFEP-10-BB4-A |
| N1-10K-2-RPFEP-10-BB-A | N1-10K-2-RPFEP-15-A |
| N1-10K-2-RPFEP-15-BB-A | N1-10K-2-RPFEP-18-BB-A |
| N1-10K-2-RPFEP-18-WP-A | N1-10K-2-RPFEP-20-A |
| N1-10K-2-RPFEP2-100-A | N1-10K-2-RPFEP2-10-A |
| N1-10K-2-RPFEP2-10-BB2-A | N1-10K-2-RPFEP2-18-A |
| N1-10K-2-RPFEP2-20-A | N1-10K-2-RPFEP2-50-A |
| N1-10K-2-RPFEP-50-A | N1-10K-2-RPFEP-5-BB4-A |
| N1-10K-2-RPFEP-5-WP-A | N1-10K-2-RPP-18-A |
| N1-10K-2-RPP-5-WP-HFW-A | |



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 $0.4^{\circ}\text{C}/\text{mW}$ @ 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
 $1\text{K}\Omega$ RTD (Pt) $3.85\Omega/^{\circ}\text{C}$
 100Ω RTD (Pt) $0.385\Omega/^{\circ}\text{C}$
 Nickel (Ni) $2.95\Omega/^{\circ}\text{F}$ for the JCI RTD

Lead Wire: 22awg stranded**Wire Insulation**

PP Etched Teflon leads, plenum rated
 RPP Flame Retardant PVC plenum
 cable
 RPFEP FEP jacketed plenum rated cable
 RPFEP2 FEP jacketed plenum and
 submersion rated cable

Probe

-PP Heat conductive plastic cup
 -RPP, RPFEP Rigid, 304 Stainless Steel, 0.25"
 OD

Probe Length

-PP 0.875" (22.2mm)
 -RPP, RPFEP 1.75" (44.5mm)

Enclosure Types:

Weatherproof: WP, w/ two $\frac{1}{2}$ " FNPT entries, (Bell
 box)
 BBox: BB, w/ four $\frac{1}{2}$ " NPSM & one $\frac{1}{2}$ "
 drill-out
 BBox 2: BB2, w/ three $\frac{1}{2}$ " NPSM & three $\frac{1}{2}$ "
 drill-outs

Enclosure Ratings:

Weatherproof: WP, NEMA 3R, IP14
 BBox: BB, NEMA 4, IP66, UV Rated
 BBox2: BB2, NEMA 4, IP66, UV Rated

Enclosure Material:

Weatherproof: WP, Cast Aluminum, UV rated
 BBox: BB, Polycarbonate, UL94V-0, UV
 rated
 BBox2: BB2, Polycarbonate, UL94V-0,
 UV rated

Ambient (Enclosure): 0 to 100% RH, Non-condensing

Weatherproof: WP, -40°F to 212°F , (-40° to
 100°C)

BBoxes: BB, BB2 -40 to 185°F , (-40 to
 85°C)

Units w/ Plenum-Rated Wire: -4 to 167°F (-20 to 75°C)

Agency:

RoHS, *CE
 PT= DIN43760, IEC Pub 751-1983, JIS C1604-1989
 *Passive Thermistors $20\text{K}\Omega$ and smaller are CE Compliant

Dimensional Drawing

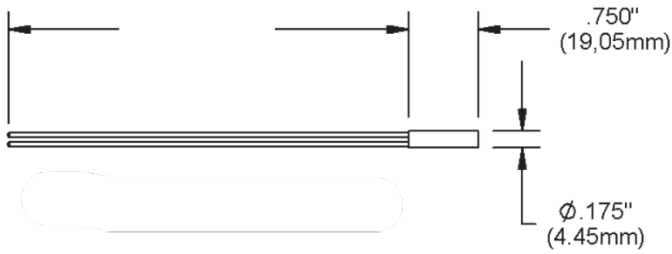


Figure 1: Remote Sensor

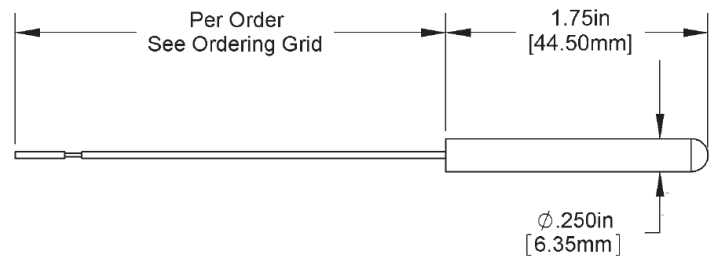


Figure 2: Remote Probe

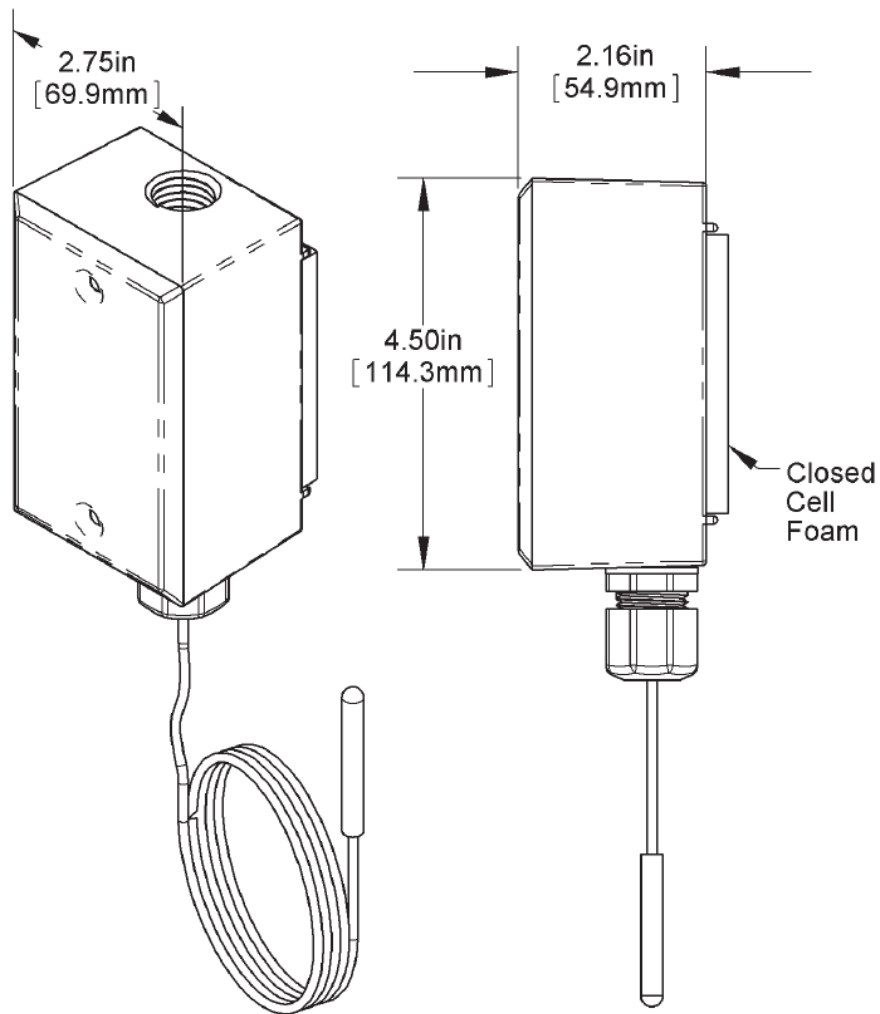


Figure 3: Remote Probe in a Weatherproof (WP) Enclosure

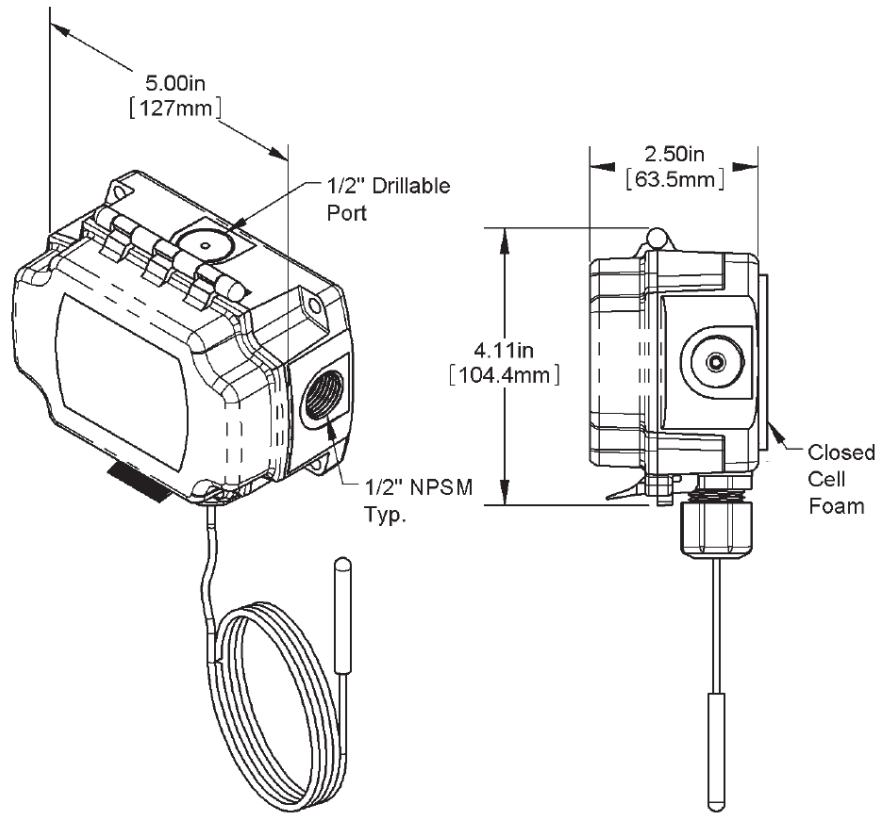


Figure 4: Remote Probe in a BBox (BB) Enclosure

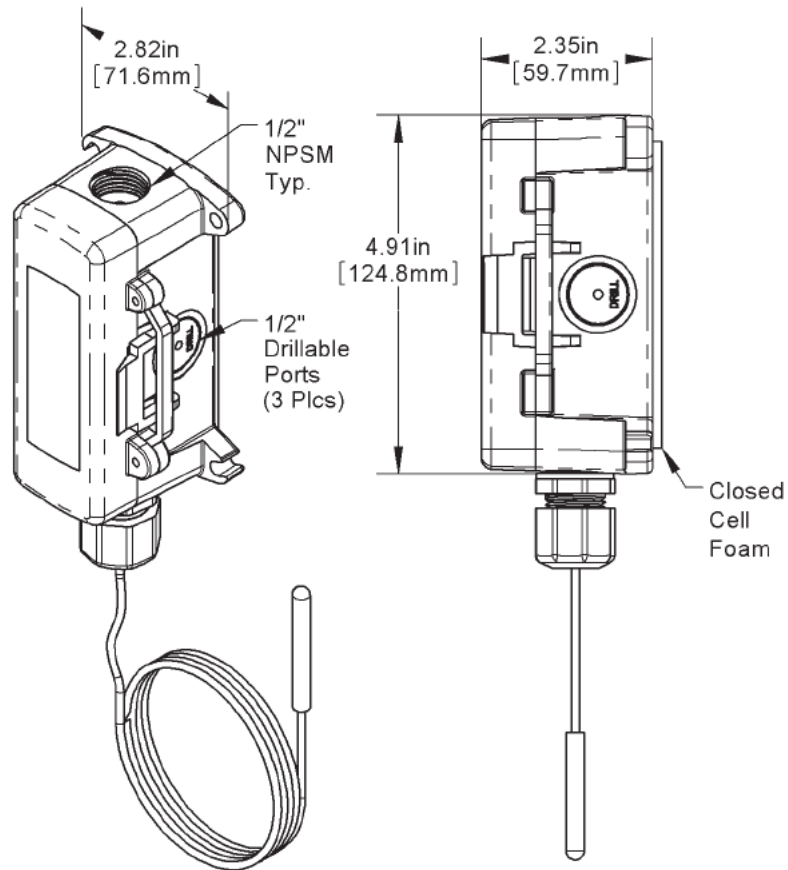


Figure 5: Remote Probe in a BBox2 (BB2) Enclosure

Mounting

Mounting Remote Probes To Pipes

Follow the steps below when mounting the remote probe to a pipe.

1. Secure Sensor To Have Good Contact With Bare Pipe
2. Insulate Over The Sensor (See Notes Below)

Note: Insulation should be installed a minimum of 4 pipe diameters on each side of the sensor.

Example: 1/2" pipe x 4 = 2".

Insulation should be 2" on each side of the sensor wrapped all the way around the pipe.

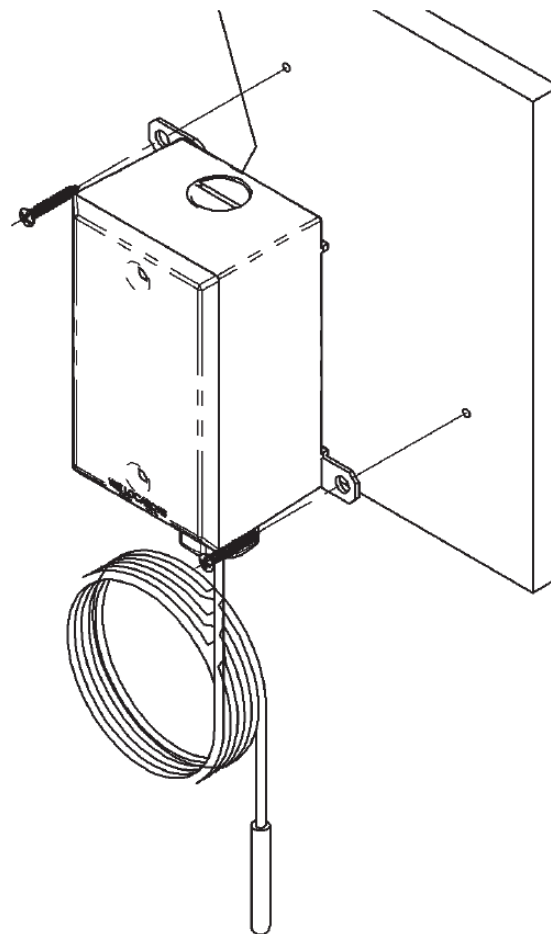
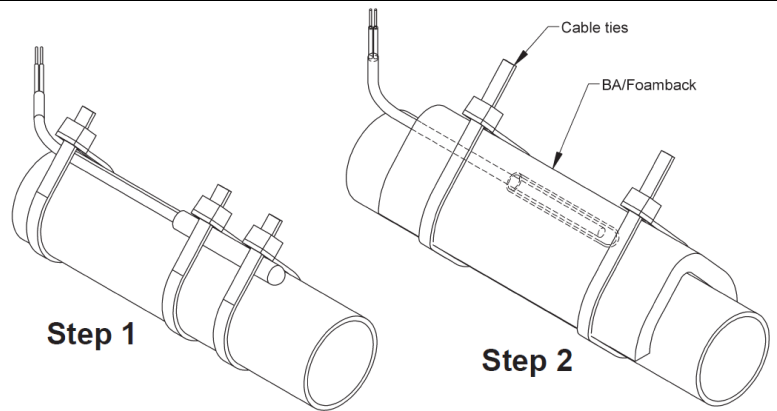


Figure 6: Remote Probe with Weatherproof Enclosure

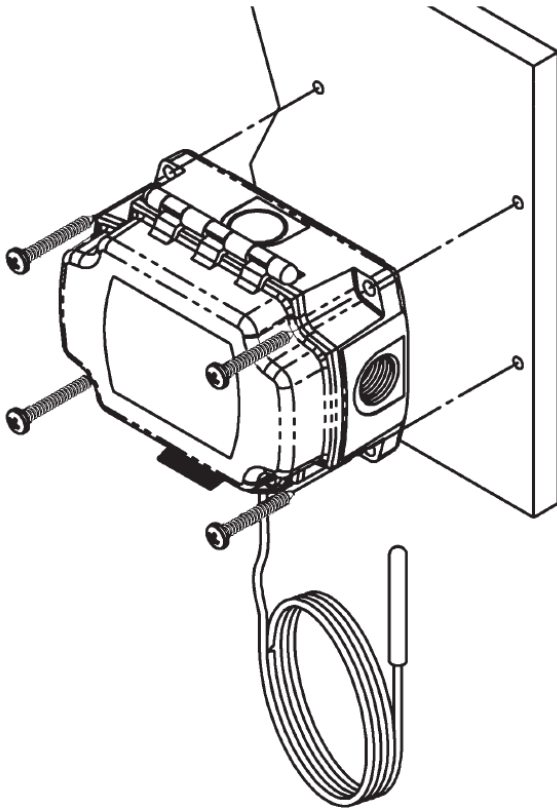


Figure 8: Remote Probe with BBox Enclosure

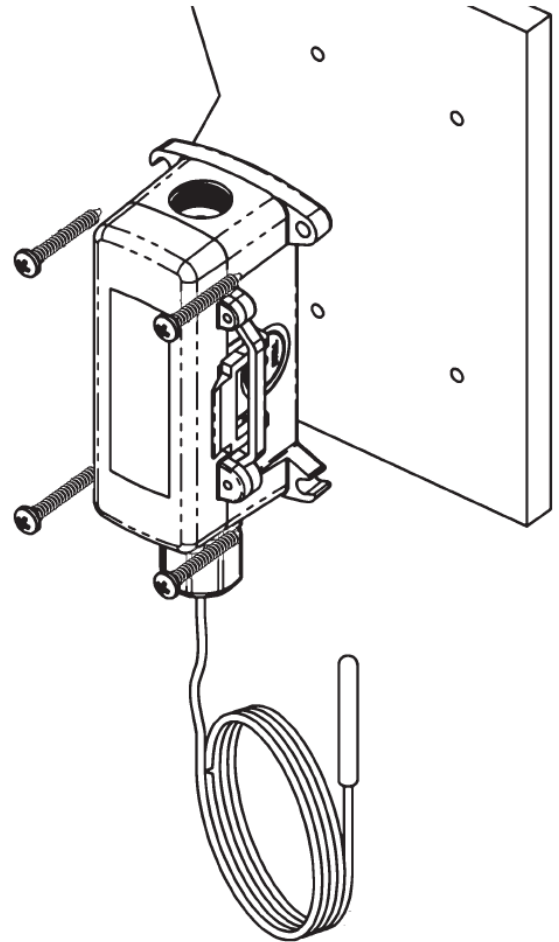


Figure 7: Remote Probe with BBox2 Enclosure

Wiring & Termination



Caution

- 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.
- All wiring must comply with the National Electric Code (NEC) and local codes.



Tip

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

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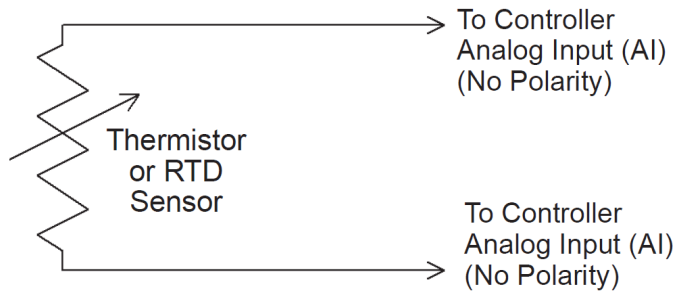


Figure 9: 2 Wire Termination for Thermistor or RTD

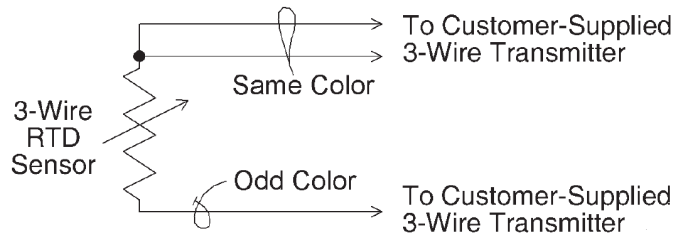


Figure 10: 3 Wire Termination for RTD

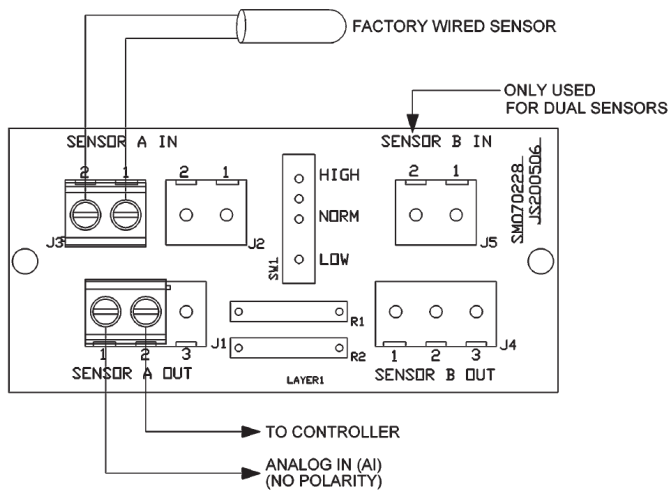


Figure 11: Terminal Strip (-TS) Option for 2 Wire Sensors Termination

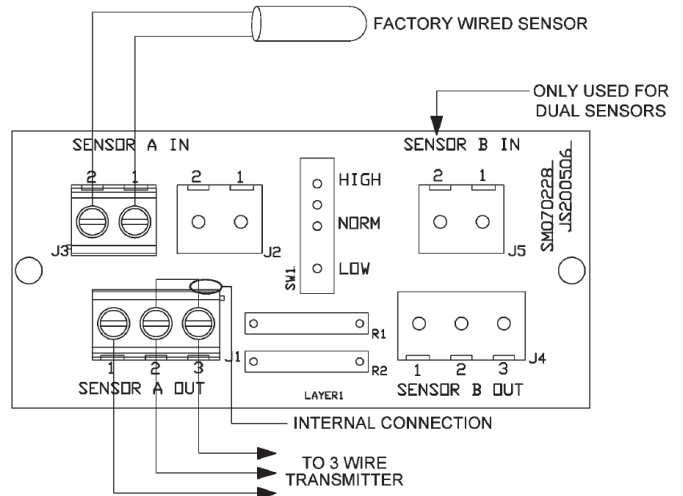


Figure 12: Terminal Strip (-TS) Option for 3 Wire Sensors Termination

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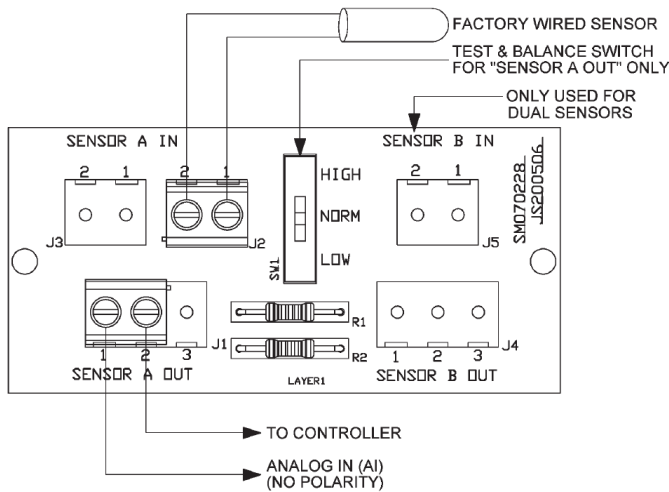


Figure 13: Test & Balance (-TB) Option for 2 Wire Sensors Termination

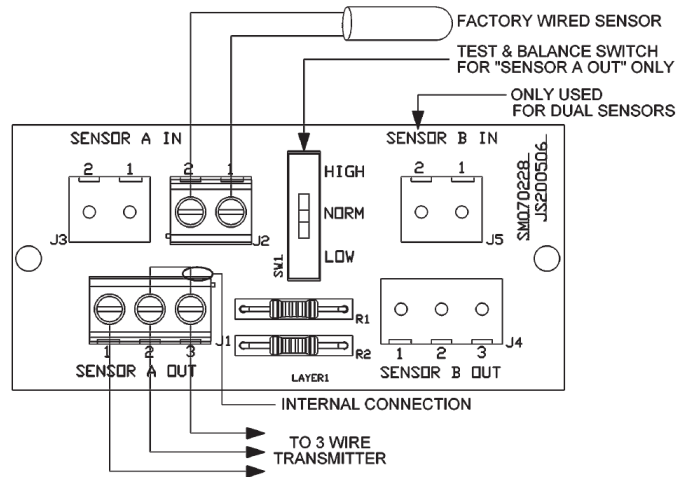


Figure 14: Test & Balance (-TB) Option for 3 Wire Sensors Termination

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

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