Overview

Carrier Immersion Thermistors provide a predictable and accurate output over the specified temperature range. Each sensor configuration is designed and manufactured for long-term quality and performance. Carrier incorporates standard features such as double encapsulation and etched Teflon leads where applicable.

Part Numbers

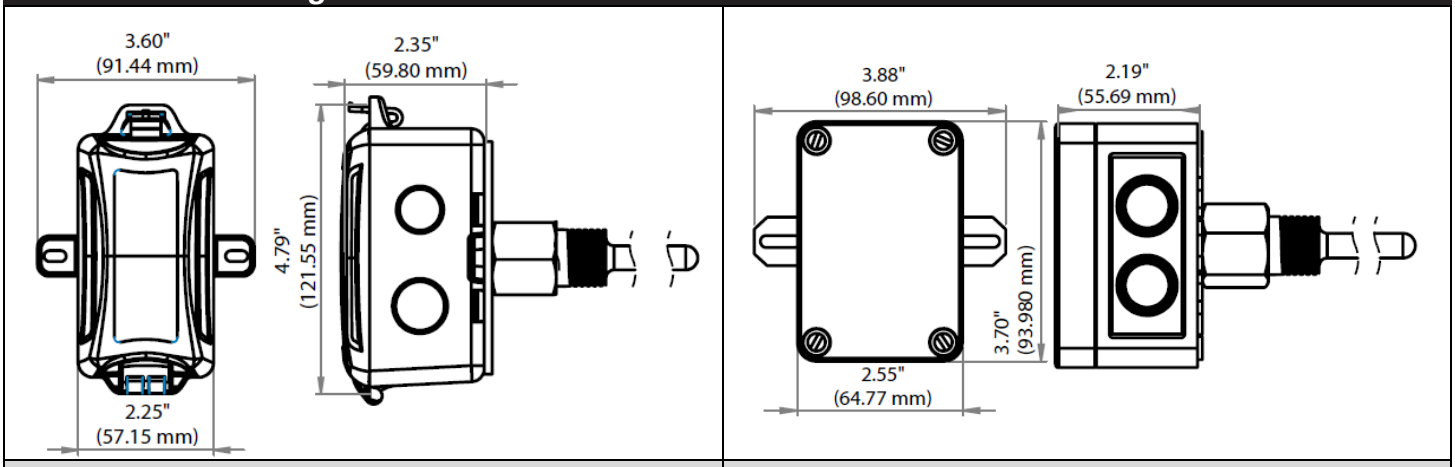
NSA-A/CP-I-2.5-4X **NSA-A/CP-I-4-4X** **NSA-A/CP-I-6-4X** **NSA-HH/CP-I-2.5-PB-C**

NSA-HH/CP-I-4-PB-C **NSA-HH/CP-I-6-PB-C**

Specifications

Number Sensing Points:	One
Storage Temperature Range:	-40 to 85 °C (-40 to 185 °F)
Operating Humidity Range:	0 to 90% RH, non-condensing
Probe Diameter | Thermowell Bore Diameter:	0.250” (6.35mm) | 0.260”
Probe Material | Thermowell Material:	304 Stainless Steel | 304 Series Stainless Steel
Wire Size	22 AWG (0.65 mm)
Thermowell Instrument | Process Thread Size:	½” NPS (National Pipe Straight) Female Thread | ½” NPT (National Pipe Tapered) Male Thread
Enclosure Specifications (Temperature, Material, Flammability, NEMA/IP Ratings)	**“-PB” Enclosure**: ABS Plastic, UL94-HB, -30 to 90 °C (-22 to 194 °F), Plenum Rated **“-4X” Enclosure**: Polystyrene Plastic, UL94-V2, -40 to 70°C (-40 to 158°F), NEMA 4X (IP 66)
Sensor Output @ 25 °C (77 °F): (Lead Wire Colors)	10 KΩ nominal (White/Green)
Immersion Length	**NSA-xxx-2.5**: 2.5” (63.50 mm) | **NSA-xxx-4**: 4.0“ (101.60 mm) **NSA-xxx-6**: 6.25” (158.75 mm)
Probe Length	**NSA-xxx-2.5**: 4.31” (109.47 mm) +/- 0.13” (3.30 mm) **NSA-xxx-4**: 5.81“ (147.57 mm) +/- 0.13” (3.30 mm) **NSA-xxx-6**: 7.81” (198.37 mm) +/- 0.13” (3.30 mm)

Dimensional Drawing



PLASTIC BOX (-PB)	NEMA -4X (-4X)

Figure 1

Installation

Carrier's standard Immersion sensors are made to install into a ½" NPT female thread. Typically a Threadolet or Tee is installed into the pipe, but a hole can also be drilled and tapped.

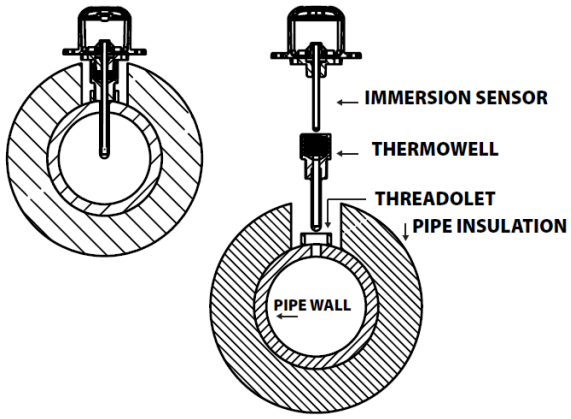


Figure 2

The pipe/system will need to be drained, unless a Hot Tap is being used. The recommend drill size is 23/32 in. (18 mm). Drill the hole, and tap the hole with ½"-14NPT. Always use proper thread sealants on tapered pipe threads of the thermowell. Screw the thermowell into the Threadolet, Tee, or tapped hole, using a wrench to tighten it firmly. Refill the system and check for leaks. Best practice is to apply thermal grease to the end of the probe, but not required. Insert and push the sensor probe into the thermowell. Turn the sensor probe assembly clockwise to tighten down completely. Refer to the **Wiring Instructions** to make necessary connections.

Elbow Assembly

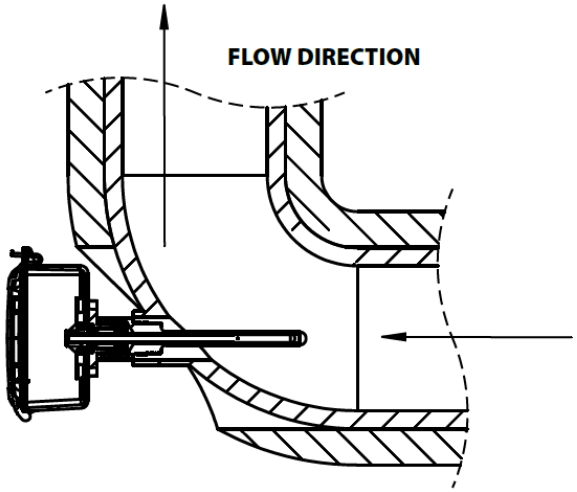


Figure 3

Tee Mount Assembly

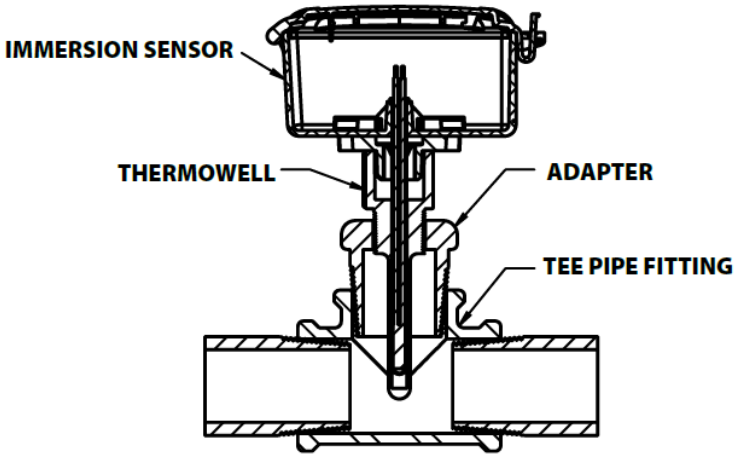


Figure 4

Temperature Wiring

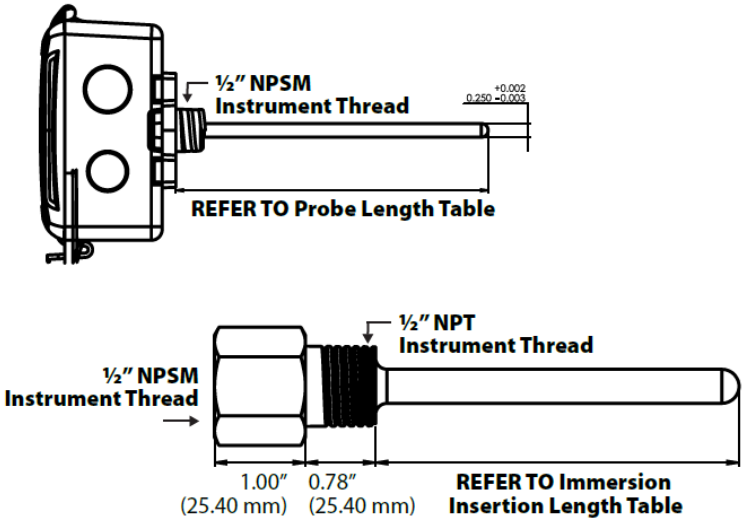


Figure 5

Wiring Instructions

PRECAUTION Do not run the wiring in any conduit with line voltage (24/120/230 vac).

Open the cover of the enclosure. Carrier recommends 16 to 26 AWG twisted pair wires or shielded cable for all sensors. Signal wiring must be run separate from low and high voltage wires (24/120/230VAC). These Carrier thermistors and RTD temperature sensors are both non-polarity and non-position sensitive. All thermistor type units are supplied with (2) flying lead wires, and all RTD's are supplied with (2) or (3) flying lead wires – see Figure 6. The number of wires needed depends on the application.

Connect thermistor/RTD wire leads to controller analog input wires using wire nuts, terminal blocks, or crimp style connectors. All wiring must comply with all local and National Electric Codes. After wiring, attach the cover to the enclosure.

NOTE When using a shielded cable, be sure to connect only (1) end of the shield to ground at the controller. Connecting both ends of the shield to ground may cause a ground loop. When removing the shield from the sensor end, make sure to properly trim the shield to prevent any chance of shorting. Note: If the controller requires a (2) wire input for a RTD, connect the (2) common wires (same color) together. If the controller requires (3) wires, use (3) individual wires.

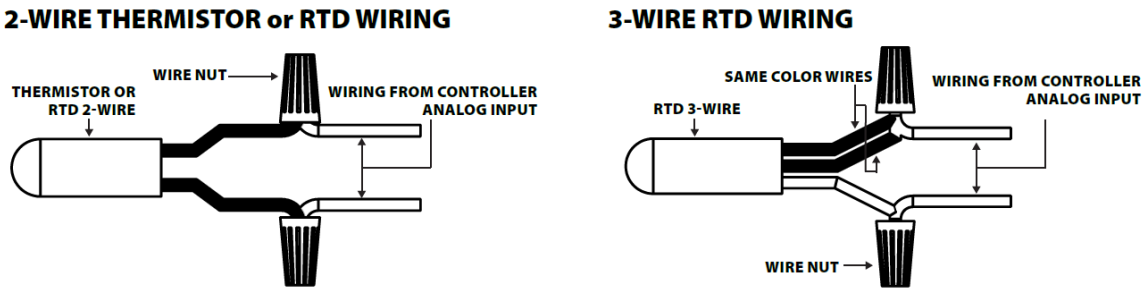


Figure 6

Troubleshooting

Problem	Solution
Sensor reading is incorrect	• Verify sensor wiring to controller is not damaged and has continuity. • Verify sensor or wires are not shorted together. • Verify controller is setup for correct sensor curve. • Disconnect wires from sensor terminal block, tighten terminal block screws down, and take a resistance (ohm) reading with a multimeter. • Compare the resistance reading to the Temperature Vs Resistance Curves online: http://www.workaci.com/content/thermistor-curves-0 • Verify proper mounting location to confirm no external factors are affecting reading.
Sensor reads infinity/very high resistance	Sensor or wires are open.
Sensor reads low resistance	Sensor or wires are shorted together.
Erratic readings	• Condensation on PCB board • Bad wire connections.

W.E.E.E. Directive

At the end of their useful life the packaging and product should be disposed of via a suitable recycling center. Do not dispose of with household waste. Do not burn.