Overview

The Duct Temperature Sensor is a passive resistive sensor. It comes in a variety of probe lengths and optional mounting enclosures shown below. The sensors come with standard accuracy.

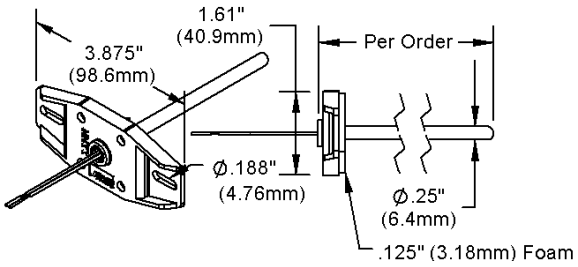


Figure 1: Duct Unit with no box
Part #s:
NSB-10K-2-D-4-NB-5 (4” probe, 5’ leads)
NSB-10K-2-D-4-NB-10 (4” probe, 10’ leads)
NSB-10K-2-D-4-NB-15 (4” probe, 15’ leads)
NSB-10K-2-D-8-NB-10 (8” probe, 10’ leads)
NSB-10K-2-D-12-NB-10 (12” probe, 10’ leads)
NSB-10K-2-D-18-NB-10 (18” probe, 10’ leads)

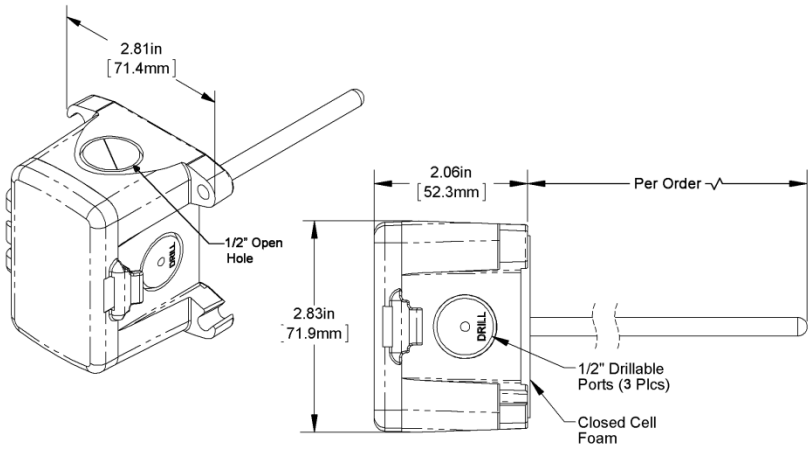


Figure 2: Duct Unit with BB4 Enclosure
Part #s:
NSB-10K-2-D-4-BB4 (4” probe)
NSB-10K-2-D-8-BB4 (8” probe)
NSB-10K-2-D-12-BB4 (12” probe)
NSB-10K-2-D-18-BB4 (18” probe)
A Pierceable Knockout Plug (Part #NSB-PKP-100) is available for the open port in the BB4.

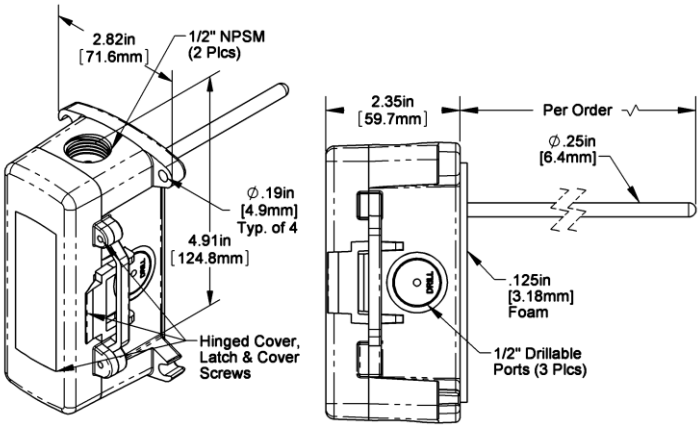


Figure 3: Duct Unit with BB2 Enclosure
Part #s:
NSB-10K-2-D-4-BB2 (4” probe)
NSB-10K-2-D-8-BB2 (8” probe)
NSB-10K-2-D-12-BB2 (12” probe)
NSB-10K-2-D-18-BB2 (18” probe)

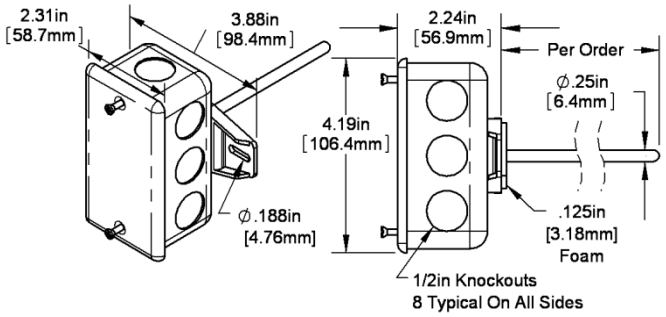


Figure 4: Duct Unit with standard J-Box
Part #s:
NSB-10K-2-D-4 (4” probe)
NSB-10K-2-D-8 (8” probe)
NSB-10K-2-D-12 (12” probe)
NSB-10K-2-D-18 (18” probe)
NSB-50K-D-4-C (4” probe)

Specifications subject to change without notice.

#20787 – 10/26/20

Specifications

Sensor	Passive, NTC, 2 wire
Thermistor	Thermal resistor
Temp. Output (Std)	Resistance Accuracy ±0.36ºF, (±0.2ºC)
Stability	< 0.036ºF/Year, (<0.02ºC/Year)
Heat dissipation	2.7 mW/ºC
Temp. Drift	<0.02ºC per year
Probe range	-40º to 221ºF (-40º to 105ºC)
Sensitivity	Approximate @ 32ºF (0ºC)
Thermistor	Non-linear
Lead wire	22AWG stranded
Wire Insulation	Etched Teflon, Plenum rated
Probe	304 Stainless steel, 0.25” OD
Probe Length	4”, 8”, 12”, or 18" or per order
Mounting	Extension tabs (ears), 3/16” holes
Duct Gasket	1/4” Closed cell foam (impervious to mold)

Enclosure Types

No Box (NB)	Intended for open wiring
J-Box (JB)	With eight ½” knock-outs
BB2 box	With three ½” NPSM and three ½” drill-outs
BB4 box	With three ½” drill-outs, one ½” open port

Enclosure Ratings

No Box (NB)	No rating
J-Box (JB)	NEMA 1
BB2 box	NEMA 4, IP66, UV Rated
BB4 box	IP10 (IP44 with Knockout Plug in open port)

Enclosure Material

No Box (NB)	Nylon 66, UL94H-B
J-Box (JB)	Galvanized steel, UL94H-B
BB2 box	Polycarbonate, UL94V-0, UV rated
BB4 box	Polycarbonate and Nylon, UL94V-0

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

No Box (NB)	-40 to 212ºF (-40 to 100ºC)
J-Box (JB)	-40 to 212ºF (-40 to 100ºC)
BB2, BB4	-40 to 185ºF (-40 to 85ºC)
Agency	RoHS PT= DIN43760, IEC Pub 751-1983, JIS C1604-1989

Specifications subject to change without notice.

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. 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 watertight enclosures 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.

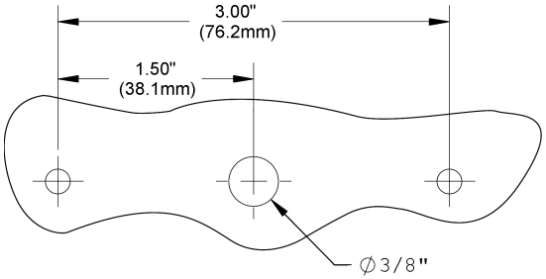


Figure 5: Junction Box or No Box Mounting Holes

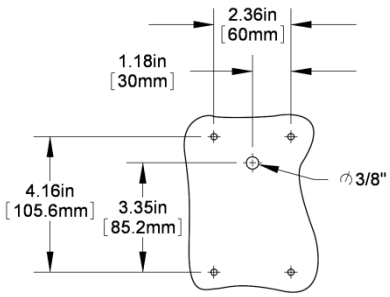


Figure 6: BB2 Enclosure Mounting Holes

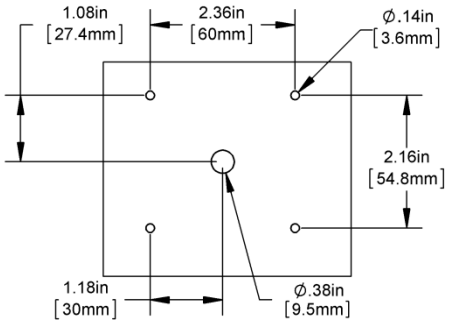
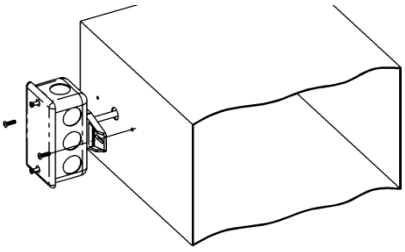
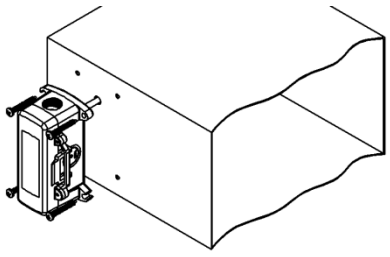
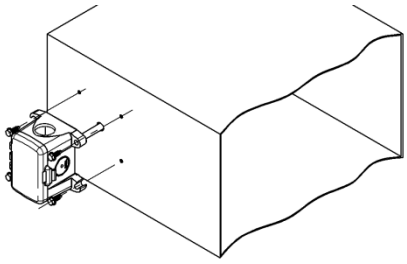


Figure 7: BB4 Enclosure Mounting Holes







Wiring and Termination

Carrier® recommends using twisted pair of at least 22 AWG for runs under 100 feet, and sealant filled connectors for all wire connections. Runs from 100 to 500 feet should use shielded 22 AWG. 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.

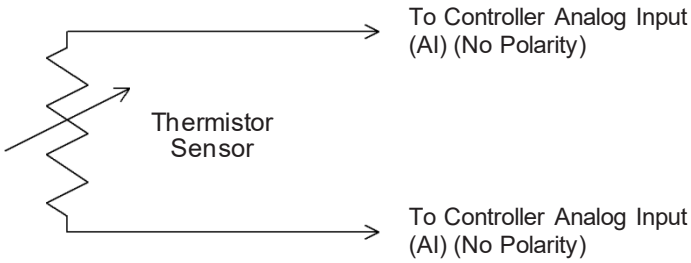


Figure 8: 2 Wire Lead Wire Termination for Thermistor

Diagnostics

Problems:	**Possible Solutions:**
Controller reports higher or lower than actual temperature	- Confirm the input is setup correctly in the controller to which the sensor is attached - Check wiring for proper termination and continuity. (shorted or open) - Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct. - Add or subtract an offset for the sensor in the controller

Specifications subject to change without notice.