

#19817 – 3/2/18

Overview

The Thermobuffer Temperature Sensor is for temperature sensing in walk-in freezers or refrigerators. The buffers are made in different lengths and are made to be filled with food grade glycol to slow down the temperature response to more closely mimic the contents of the freezer or refrigerator. The buffers are stainless steel, and the sensors are available in two mounting styles, a NEMA 4 plastic enclosure for wall mounting or a hanging bracket.

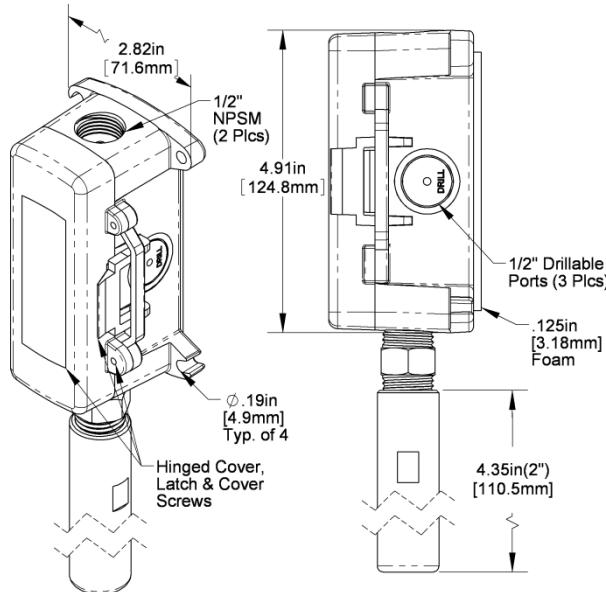


Figure 1: 2" Thermobuffer in a BB2 Enclosure
Part # NSB-10K-2-TB-M304-2-BB2

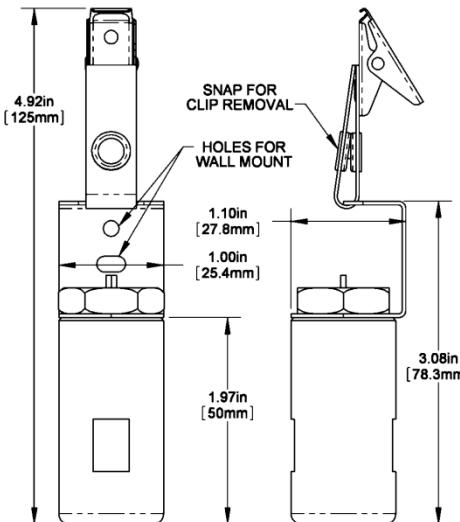


Figure 2: 1" Hanging Bracket Thermobuffer
Part # NSB-10K-2-TB-M304-1-HB-NB-10

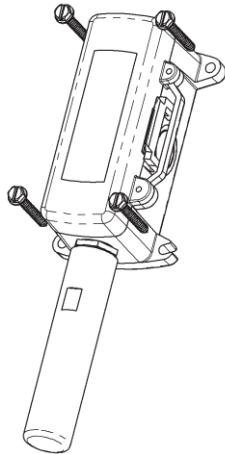
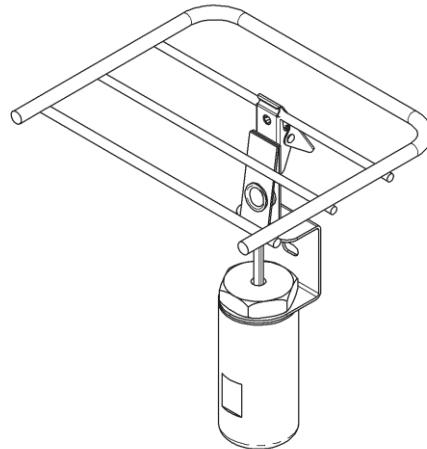
Specifications

Sensor	Passive, NTC, 2 wire
Thermistor	Thermal resistor (NTC)
Temp. Output	Resistance, 10k Type 2
Accuracy (std)	$\pm 0.36^\circ\text{F}$, ($\pm 0.2^\circ\text{C}$)
Stability	$< 0.036^\circ\text{F}/\text{Year}$, ($< 0.02^\circ\text{C}/\text{Year}$)
Heat dissipation	2.7 mW/°C
Temp. Drift	$< 0.02^\circ\text{C}$ per year
Probe range	-40° to 221°F (-40° to 105°C)
Lead Wire	22 AWG stranded
Insulation	Etched Teflon, Plenum rated
Probe	304 Stainless Steel (SS), 0.25" OD
Probe Process Connection	
-TB	304 SS Double threaded 1/2" NPT
Probe Length	Probe tip to thread start
1"	0.75"
2"	3.5"
Buffer Chamber Dimensions	
1" Buffer	2.75"H x 1"Dia
2" Buffer	5.1"H x 1"Dia
Mounting	
Plastic Box	4 extension tabs (ears), 7/16" hole,
Hanging Bracket	SS bracket with 1/8" holes or 3/8" spring clip

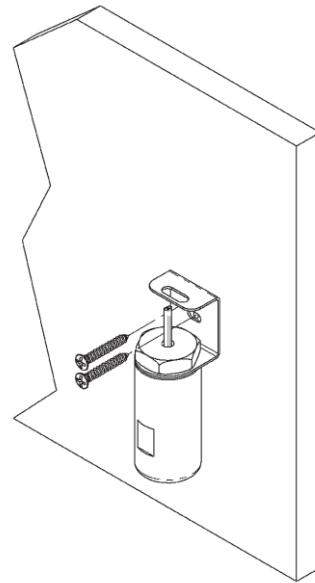
Enclosure Types	
BB2 Box	With three 1/2" NPSM and three 1/2" drill-outs
Hanging Bracket	Intended to hang from shelving
Enclosure Ratings	
BB2 Box	NEMA 4, IP66
Hanging Bracket	No rating
Enclosure Materials	
BB2 Box	Polycarbonate, UL94V-0, UV rated
Hanging Bracket	304 SS bracket and clip
Buffer Chamber Construction	
M-304	Machined 304 Stainless Steel, 0.7" core
Liquid Fill	Food Grade Glycol (Customer provided)
1" Buffer	5 mL
2" Buffer	20 mL
Color	
BB2 Box	Warm White (beige)
SS Buffer	Polished Stainless Steel
Ambient (Enclosure):	0 to 100% RH, Non-condensing
BB2 Box	-40°F to 185°F, (-40° to 85°C)
Hanging Bracket	-40°F to 122°F, (-40° to 50°C)
Agency	RoHS, CE

Specifications subject to change without notice

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Assembly and Installation**Figure 3:** 2" Thermobuffer in a BB2 Box Enclosure Installation**Figure 4:** 1" Hanging Bracket Rack Installation

1. Fill the buffer with customer-provided glycol to the amount shown in Table 1.
2. Wrap the probe threads with Teflon tape with at least 4 wraps so a water tight seal is established.
3. Insert the probe into the buffer and screw in for a secure water tight fit.
4. Towel off excess fluid which may leak out during assembly and check for leaking. If the assembly leaks, use a 15/16ths wrench to snug up the probe to the buffer. More tape may also be needed. Food-safe silicon may also be used.
5. Select a location on a wall or hanging from a wire rack near the contents you wish to monitor.
6. Mount the Thermobuffer with the buffer facing down (probe on top). Any other orientation is not recommended due to leaking concerns.
7. We recommend the surface mount enclosure be positioned over the refrigerator wire way hole using the rear knock out. Pull the wiring into the unit and terminate using sealant-filled connectors. Best practice is to caulk the wiring hole after the wiring is installed. Secure with mounting screws and ensure that the foam backing compresses to about 50% of its thickness to make a gasket type seal against the surface.

**Figure 5:** 1" Hanging Bracket Wall Installation
(Customer provided pcrews)**Table 1**

Buffer Size	Recommended Fluid Fill
1" Buffer	0.17 Fluid oz (5mL)
2" Buffer	0.67 Fluid oz (20mL)

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Wiring and Termination

Carrier recommends using twisted pair of at least 22AWG 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. Tests show that inaccurate signal levels are possible when AC power wiring is present in the same conduit as the sensor wires.

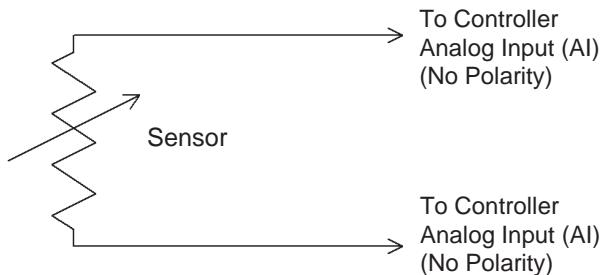


Figure 6: 2 Wire Lead Wire Termination for Thermistor

Diagnostics

Problems:

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 and continuity (shorted or open).
- Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct.