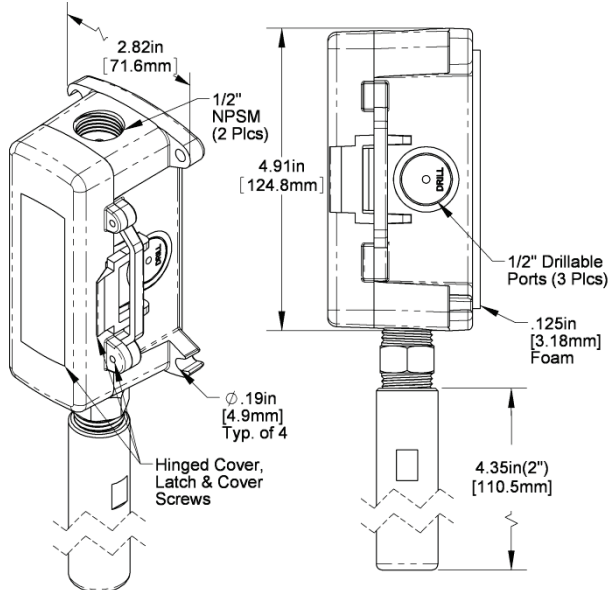


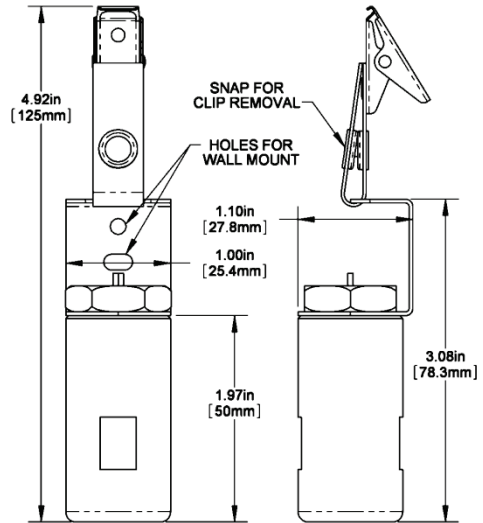
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### Overview

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

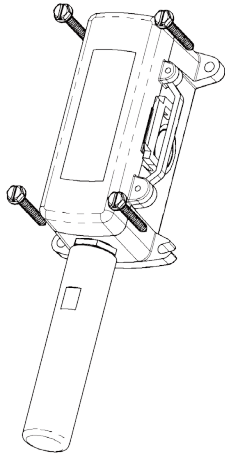
|                                  |  |
|----------------------------------|--|
| <b>Sensor</b>                    | Passive, NTC, 2 wire                           |
| <b>Thermistor</b>                | Thermal resistor (NTC)                         |
| Temp. Output                     | Resistance,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

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

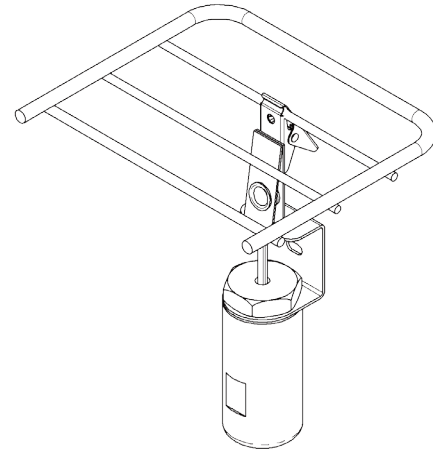
Specifications subject to change without notice

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### Assembly and Installation

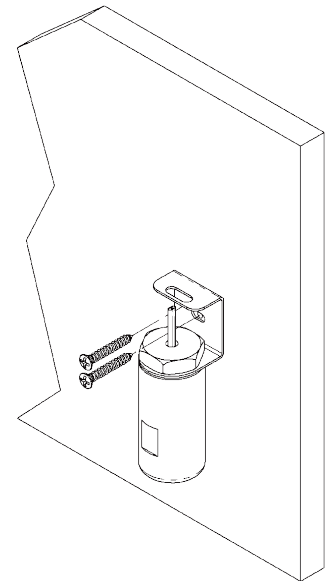


**Figure 3:** 2" Thermobuffer in a BB2 Box Enclosure Installation



**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 prews)

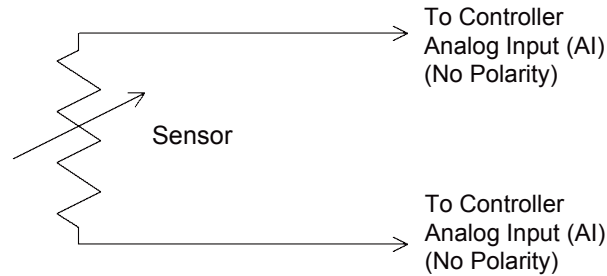
| Table 1     |                        |
|-------------|------------------------|
| Buffer Size | Recommended Fluid Fill |
| 1" Buffer   | 0.17 Fluid oz (5mL)    |
| 2" Buffer   | 0.67 Fluid oz (20mL)   |

Specifications subject to change without notice

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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.