Overview

The 50K Temperature Sensor is an analog temperature sensor in a ZS plastic housing, for use as an external sensor for the TB/TBPL BACnet thermostat.

The 10K Temperature Sensor is an analog temperature sensor in a ZS2 plastic housing, for use as a replacement for existing analog 10K temperature sensors, or in other non-communicating analog-only 2 wire device applications.

Figure 1: Analog Button Sensor
Part numbers: NSB-ZS2-50K-A
                NSB-ZS2-10K-2-A

Wiring

Description	2 conductor, shielded or unshielded, CMP, plenum rated cable	**Color Code**	Black, white
		Shielding	Not required
Conductor	22 AWG (7x0096) bare copper	**UL temp rating**	32–167°F (0–75°C)
Maximum length	500 feet (152 meters)	**Voltage**	300 Vac, power limited
Insulation	Low-smoke PVC (or equivalent)	**Listing**	UL: NEC CL2P, or better

Specifications

Sensor	Passive Thermistor,	**Color Code**	Black, white
Thermistor	Thermal resistor	**Dimensions**	
Temp. Output	Resistance	Width: 2.75" (6.99 cm)	
Accuracy (Std)	±0.36°F, (±0.2°C)	Height: 4.75" (12.07 cm)	
Stability	< 0.036°F/Year, (<0.02°C/Year)	Depth: 13/16" (2.01 cm)	
Heat dissipation	2.7 mW/°C	**Encl. Type**	ZS2 Housing
Temp. Drift	<0.02°C per year	**Enclosure Ratings**	NEMA 1
Thermistor range		**Encl. Material**	Plastic, UL94
10K – -40°F to 302°F (-40°C to 150°C)		**Ambient (Encl.)**	0 to 100% RH, Non-condensing -40°F to 185°F, (-40° to 85°C)
50K – -55°F to 311°F (-55°C to 155°C)		**Agency**	RoHS, CE
Output			
10K-2 Thermistor	10K ohms @ 77°F (25°C)		
50K Thermistor	50K ohms @ 77°F (25°C)		
Lead wire	2 conductor, 22 AWG stranded wire		
Wire Insulation	Etched Teflon, Plenum rated		
Wiring	Two 22 AWG wires (non-polar)		

Specification subject to change without notice

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Mounting and Wire Termination

1. Turn off the controller power.
2. Use a hex screwdriver to open the sensor housing; turn the two setscrews clockwise until they stop turning.
3. Pull out the bottom of the backplate, and then pull off the backplate.
4. Pull the cable through the wire guide in the backplate.

3.30 in
(8.38 cm)
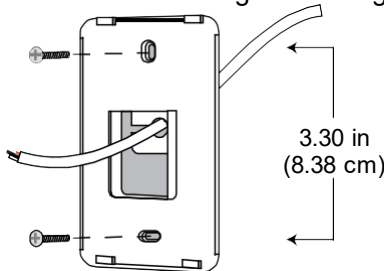
5. Use 2 screws to mount the backplate to the wall or outlet box. Partially cut, then bend and pull off the outer jacket of the cable. Do not nick the inner insulation.
6. Strip approximately 0.25 inch (0.6 cm) of the inner insulation from each wire.
7. Cut the shield wire off at the outer jacket, then wrap the cable with tape at the outer jacket to cover the end of the shield wire.
8. Insert the 2 wires into the sensor's screw terminal connector.
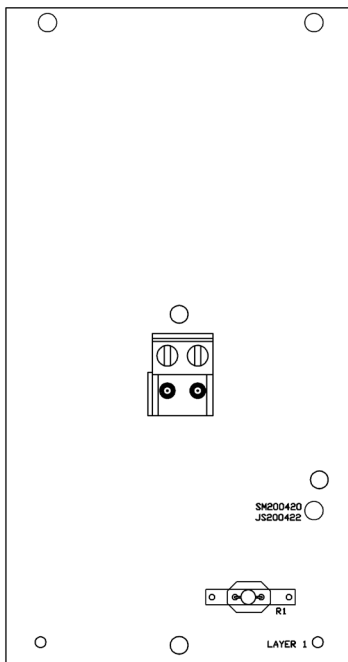
9. Attach the sensor's cover and circuit board to the mounted backplate, inserting the top first.
10. Turn the setscrews counterclockwise until the cover cannot be removed.
11. Connect the other end of the wiring to the controller's analog port.
12. Turn on the controller's power.

Maintenance

Clean any debris out from around the sensor housing as required.

Troubleshooting

- Verify the input is set up correctly in the controller software, and building automation software.
- Check wiring for proper termination.
- Check for corrosion at either the controller or the sensor. Clean off the corrosion, re-strip the interconnecting wire and reapply the connection. In extreme cases, replace the controller, interconnecting wire and/or sensor.
- Label the terminals that the interconnecting wires are connected to at the sensor end and the controller end. Disconnect the interconnecting wires from the controller and the sensor. With the interconnecting wires separated at both ends, measure the resistance from wire-to-wire with a multimeter. The meter should read greater than 10 Meg-ohms, open or OL depending on the meter used. Short the interconnecting wires together at one end. Go to the other end and measure the resistance from wire-to-wire with a multimeter. The meter should read less than 10 ohms (22 gauge or larger, 250 feet or less). If either test fails, replace the wire.
- Ensure the temperature sensors wires are connected to the correct controller input terminals and are not loose.
- Check the wires at the sensor for proper connections.
- Measure the physical temperature at the temperature sensor's location using an accurate temperature standard. Disconnect the temperature sensor wires and measure the temperature sensor's resistance across the sensor output pins with an ohmmeter. Compare the temperature sensor's resistance to the appropriate temperature sensor. If the measured resistance is different from the temperature table by more than 5%, call technical support. Remember to reconnect the wires.
- Make sure the sensor leads are not touching one another.
- Determine if the sensor is exposed to an external air source different from room environment, such as a conduit draft. If so, fill the junction box with fiberglass insulation or plug the conduit.