Identification and Overview

Wall Plate Temperature Sensors with Pushbutton Override

- Etched Teflon Leadwires and Foamback Insulator
- Override Pushbutton
- Limited Lifetime Warranty

Wall Plates are ideal for areas where a discreet, rugged zone sensor is required. All Wall Plates feature ¼" closed cell foam backing which covers the plate and insulates it from wall temperature. All units also feature etched Teflon leadwires and double encapsulated sensors to create a watertight package that can perform in the real world.

Override

A momentary Override is available as a Pushbutton — Low Profile. . The Low Profile Model is water resistant for washdown/ wipedown applications.

Color and Finish

Wall Plates are available in stainless steel.

Part #: N1-10K-2-SP-O2-A

Specifications

Sensor: Passive

Thermistor: Thermal resistor (NTC)

Temp. Output: ..... Resistance

Accuracy(std):..... ±0.36°F, (±0.2°C)

Accuracy (High) ... ±0.18°F, (±0.1°C), **[XP]** option

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)

RTD: Resistance Temperature Device (PTC)

Platinum (Pt)..... 100Ω and 1KΩ @0ºC, 385 curve,

Platinum (Pt)..... 1KΩ @0°C, 375 curve

Pt Accuracy (std) . 0.12% @Ref, or ±0.55°F, (±0.3°C)

Pt Stability..... ±0.25°F, (±0.14°C)

Pt Self Heating..... 0.4 °C/mW @0°C

Pt Probe Range ... -40° to 221°F, (-40 to 105°C)

Nickel (Ni) ..... 1000Ω @70°F, JCI curve

Ni Probe Range ... -40° to 221°F (-40 to 105°C)

Sensitivity:..... Approximate @ 32°F (0°C)

Thermistor:..... Non-linier

RTD (Pt) ..... 3.85Ω/°C for 1KΩ RTD

0.385Ω/°C for 100Ω RTD

Nickel (Ni): ..... 2.95Ω/°F for the JCI RTD

Lead Wire: ..... 22AWG Stranded

Insulation:..... Etched Teflon, Plenum rated

Enclosure: ..... Stainless Steel Plate

Foamback:..... 0.25" Closed Cell Foam

Mounting: ..... 2x4" J-box or Direct Wall

Ambient (Encl.): 0 to 100% RH, Non-condensing

-40°F to 185°F, (-40° to 85°C)

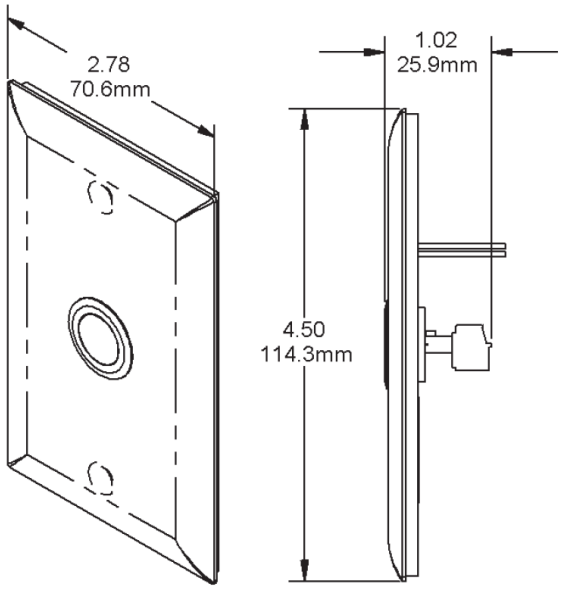
Agency: ..... RoHS, CE, PT = DIN43760,

IEC Pub 751-1983, JIS C1604-1989

Options: ..... Override Switch

O2 ..... N.O. switch, 4 to 48 VDC, 150mA max

Dimensional Drawing



Mounting

Ensure the plate does not touch the wall when it is mounted as this will lead to slower response rates when the environment changes.

Mounting hardware is provided for both junction box and drywall installation.

Junction Box

1. Pull the wire through the wall and out of the junction box, leaving about 6” free.
2. Terminate the unit according to the guidelines in Termination on page 1.
3. Secure the plate to the box using the #6-32 x 1/2” mounting screws provided or with security screws which are sold separately.
4. Tighten screws until the foam gasket on the back plate is compressed about 50%. Ensure the plate doesn’t touch the wall (Fig 1). Verify visible air gap between plate and wall.

Note: Louvered wall plates require a mounting adapter bracket for J-Box mounting. The bracket is not shown in the diagram

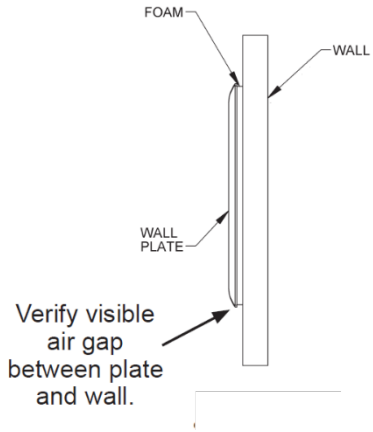


Figure 1: Side View of Mounted Plate

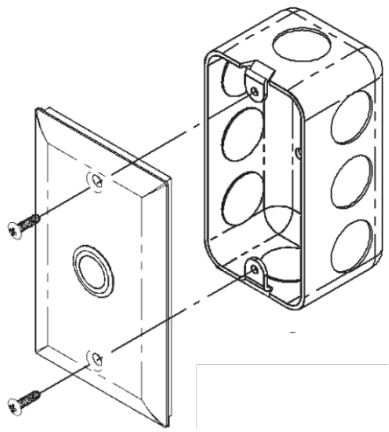


Figure 2: J-Box Mounting

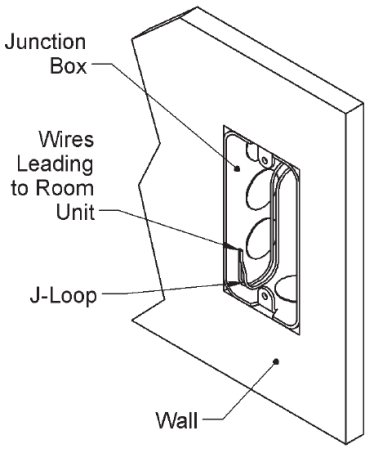
Drywall Mounting

1. Place the plate against the wall where you want to mount the sensor and mark out the two mounting holes.
2. Drill two 3/16” holes in the center of each marked mounting hole. Insert a drywall anchor into each hole.
3. Cut hole between the mounting holes that clears the apparatus mounted on plate. Pull the wire through the wall hole cut in step 2, leaving about 6” free.
4. Terminate the unit according to the guidelines in Termination on page 1.
5. Secure the plate to the drywall anchors using the #6 x 1” mounting screws provided. Tighten screws until the foam gasket on the back plate is compressed about 50%. Ensure the plate doesn’t touch the wall.

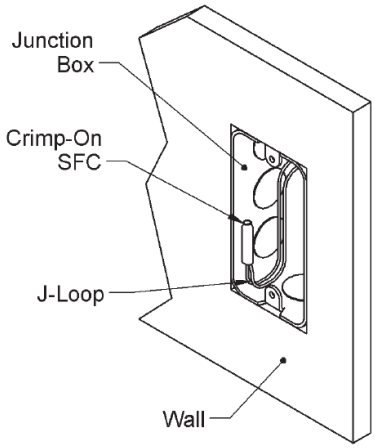
Tip	In any wall-mount application, the wall temperature and the temperature of the air within the wall cavity can cause erroneous readings. The mixing of room air and air from within the wall cavity can lead to condensation, erroneous readings and premature failure of the sensor. To prevent these conditions, seal the conduit leading to the junction box or fill the box with insulation.

J-Loop Termination Technique

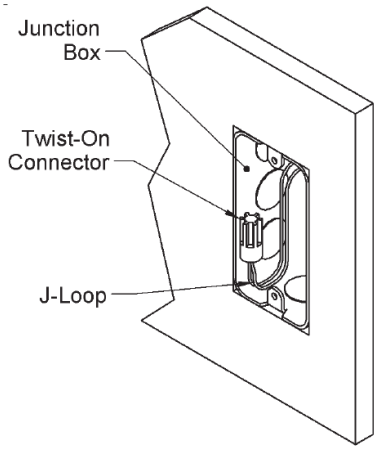
Incorporating a “J-Loop” (also known as a drip loop) into all terminations adds an additional layer of protection against moisture and oxidation by directing moisture away from the connection. The idea is to place the wire junction as high as possible and form a “J” with the leadwires. The bottom of this “J” should be below the junction point. Any moisture that collects on the leadwires is pulled downward by gravity to the bottom of this loop and away from the junction.



J-Loop Technique



J-Loop with Crimp-On Seal-ant Filled Connector



J-Loop with Twist-On Seal-ant Filled Connector

Termination

All wiring must comply with the National Electric Code (NEC) and local codes.

Warning	Wire the product with power disconnected. Proper supply voltage, polarity, and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and will void the warranty.

Caution	Do NOT run this device’s wiring in the same conduit as AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines.

Tip	We recommend using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs.

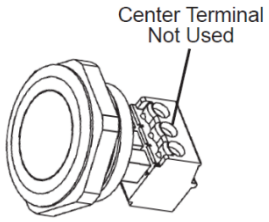
Sensor Termination:

Terminate the sensor wires to your controller wires using sealant filled connectors. The wallplate’s foam back insulates the temperature sensor from the wall temperature and/or conduit drafts.

Table 1: Temperature Sensor Lead Wire Colors							
Thermistors		**Thermistors**		**Platinum RTDs - 2 Wire**		**Nickel RTD**	
1.8KΩ	Orange/Red	10K-3Ω	Yellow/Red	100Ω	Red/Red	1KΩ	Green/Green
2.2KΩ	Brown/White	10K-3(11K)Ω	Yellow/Blue	1KΩ	Orange/Orange	**Silicon RTD**	
3KΩ	Yellow/Black	20KΩ	White/White	**Platinum RTDs - 3 Wire**		2KΩ	Brown/Blue
3.25KΩ	Brown/Green	47KΩ	Yellow/Orange	100Ω	Red/Red/Black	**Semiconductors**	
3.3KΩ	Yellow/Brown	50KΩ	White/Blue	1KΩ	Orange/Orange/Black	LM334	Red/Black
10K-2Ω	Yellow/Yellow	100KΩ	Yellow/White			AD592	Red/Black
						AD592-10K	Red/Black/White

Override

The Wall Plate Pushbutton Override is a dry contact, normally-open switch. The contacts close for as long as you hold the switch down. All switches are for NEC Class 2 circuits only. The Low Profile Override (O2) has three screw terminals that accommodate 16 to 28 gauge wire. The center terminal is not used.



Switch Contact Rating: 125 milli-amps

Diagnostics

Possible Problems:	**Possible Solutions:**
General troubleshooting	• Determine that the input is set up correctly in the controller's and building automation software. • Check wiring for proper termination or corrosion. • 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 you have. 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.
Temperature reading is incorrect	• Ensure 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 table. If the measured resistance is different from the temperature table by more than 5% call technical support. Don't forget to reconnect the wires. • Make sure that the sensor leads are not touching
Override is not working correctly	Check that the resistance across the override output is less than 5 ohms when the override switch is pushed.

Appendix – Symbols Key

 **Warning**	Potential for death, serious injury, or permanent damage to a system.

 **Caution**	Potential for injury, damage to a system, or system failure.

 **Tip**	Useful information not related to injury or system damage.