

Duct-Mounted Humidity Sensor (P/N 203-5771)

Installation Instructions

Overview

Emerson specs a duct-mounted relative humidity (RH) sensor with a 0-5VDC output for use in building control and anti-sweat control applications using Emerson input boards.

Specifications

Sensing Element	Digitally profiled thin-film capacitive
Accuracy	±2% RH over the range 20%-90% RH
Stability	±1% @ 20°C (68°F) annually for 2 years
Operating Humidity Range	0-100% RH
Temperature Coefficient	±0.03% RH /°C over 0-60°C (32-140°F)
Analog Output	0-5VDC; 3-wire, observe polarity
Scaling	0-100% RH
Input Power	12VDC
EMC Conformance	EN 50081-1, EN 50082-1, EN 61000-4-4, EN 61000-4-5, EN 61000-4-3, ENV 50204, EN 1000-4-6

Choosing a Mounting Location

Select a supply air duct that draws air from the area in which you wish to measure relative humidity. You may mount the sensor in any orientation provided the sensor element is in the air stream.

Mounting

1. Cut a small circular hole in the duct large enough for the sensor tube to fit through.
2. Bolt the sensor enclosure against the outside of the duct wall so that the sensor element fits through the hole and into the duct. The enclosure may be mounted horizontally (as shown in *Figure 1*) or vertically. The screws should be tight enough for the foam gasket around the bottom of the sensor to form an airtight seal between the hole in the duct wall and the outside air.

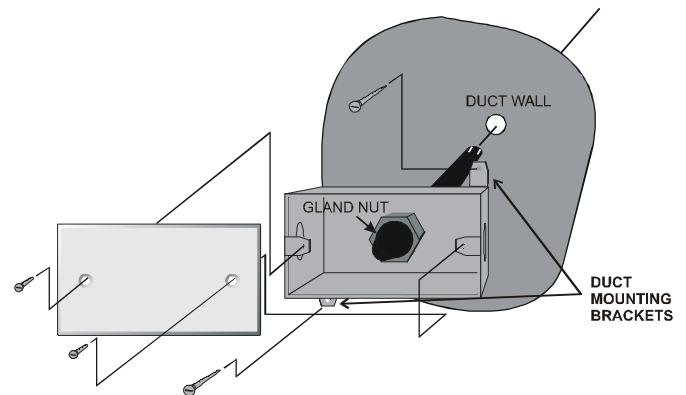


Figure 1 - Humidity Sensor Exploded View

Wiring

NOTE: Do not clip or shorten the wires leading from the sensor tube! This will allow enough slack to remove the sensor element without having to unmount the enclosure.

1. Use Belden #8771 shielded three-conductor cable or equivalent.
2. Connect the RED, BLACK, and WHITE wires to the RED, BLACK, and GREEN wires from the sensor using the wire nuts supplied in the kit. Use the remaining wire nuts to cap and insulate the unused leads (BLUE, ORANGE, and YELLOW). Clip the shield (BARE) wire.
3. On the input board, connect the SHIELD and BLACK wires to the 0V terminal. Connect the WHITE wire to the SIG terminal of the input board.
4. Connect the RED wire to the +12V power terminal on the input board.
5. Locate the input dip switch for the sensor point, and set to the OFF position (LEFT for MultiFlex, DOWN for 16AI). Refer to the input board's user manual for locations of the input dip switches.

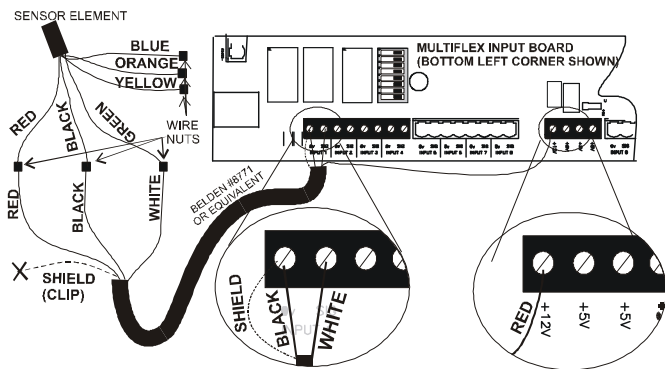


Figure 2 - Sensor and Input Board Wiring

Finishing the Installation

Once the duct sensor is mounted and the sensor and board wiring is complete, check the gland nut that secures the sensor tube and tighten it if necessary (see Figure 1 for the location of the gland nut). Attach the cover plate (with the foam gasket included) to the sensor enclosure using the screws provided. Tighten all conduit connections, and cap all unused holes in the sensor enclosure.

Calibration and Replacement

The sensing element of the 203-5771 duct-mount RH sensor is pre-calibrated and will require no physical adjustment. If the sensor drifts over time, the sensor can be “recalibrated” by replacing the pluggable sensing element. Contact Emerson to order replacement elements (P/N 203-5795).

To replace a sensor element, **pull the sensor’s power connection from the input board.** Remove the cover plate of the enclosure, loosen the gland nut, and slide the sensor tube out through the enclosure until the sensor element is completely out of the duct and the tip of the tube can be accessed. Unscrew the top of the sensor tube to expose the pluggable RH sensor element.

Note the orientation of the sensor element before unplugging it and plug the new sensor element in using the same orientation. Replace the top when finished, reinsert the tube into the duct, tighten the gland nut, and restore power to the sensor. There is no other calibration method needed, and no adjustments are present in the unit.

NOTE: Do not expose sensor element to the fumes of curing RTV silicone rubber. Doing so will damage the calibration of the element.