

## Q-Series Relative Humidity (RH) and Relative Humidity & Temperature (RH/T) Duct Sensors

### Product Description

Relative Humidity (RH) and Relative Humidity & Temperature (RH/T) duct sensors monitor the relative humidity or the relative humidity and temperature in a duct, depending on the model.

Sensors are directly wired to the controller via twisted pair and/or three conductor cables (18 to 22 AWG). The number and type of cables required depends on the model selected. All field wiring is terminated in a terminal block on the sensor body.

### Product Numbers

Table 1. Relative Humidity Only.

Product Number	Humidity Signal	Accuracy <sup>♦</sup>
QFM2100	0 to 10 Vdc	±5%
QFM3100		±2%
QFM2101	4 to 20 mA	±5%
QFM3101		±2%
QFM4101		±2% Certified

Table 2. Relative Humidity and Temperature.

Product Number	Temperature Signal	Humidity Signal	Accuracy <sup>♦</sup>
QFM2160	0 to 10 Vdc	0 to 10 Vdc	±5%
QFM3160			±2%
QFM4160			±2% Cert.
QFM2171	4 to 20 mA	4 to 20 mA	±5%
QFM3171			±2%
QFM4171			±2% Cert.
QFM2110	Pt 1KΩ	0 to 10 Vdc	±5%
QFM2120	Ni 1KΩ		
QFM2140	T1 PTC		
QFM3110	Pt 1KΩ		

\*Applies to humidity only

**NOTE:** Sensor tips on QFM31... and QFM41... models are field replaceable.

### Additional Reference Documents

Product Number	Technical Instructions
QFM21...	155-748
QFM3160	155-749
QFM4160	155-750

### Required Tools

- Phillips screwdrivers, #1 and #2
- Wire cutters/strippers
- Medium flat-blade screwdriver
- Tape measure
- Medium-duty electric drill
- Marker or pencil
- No. 26 (0.147-inch) drill bit
- Small level
- 7/8-inch drill bit or hole saw
- Two No. 8 × 1-inch sheet metal screws

### Expected Installation Time

One hour

### Prerequisites

- Ensure that the appropriate field wiring is installed.  
Appropriate wiring is one or more twisted pairs, or three conductor cables (plenum or non-plenum as required), within the maximum wiring run length for the individual equipment controller. The maximum recommended length is 750 feet (229 m).
- Ensure that all wiring complies with National Electric Code (NEC) and local regulations.

### Mounting Information

Locate the sensor:

- In the center of a duct.
- Away from fans, corners, heating and cooling coils, and so on.
- Where it receives adequate airflow for proper operation.

## Instructions

1. Drill a 7/8-inch diameter hole into the duct at the desired location of the sensor.
2. Decide if the sensor will be mounted directly to the duct or if the mounting flange will be used.
  - **Sensor Mounting Bracket Installation**
    - a. Use the bracket as a template, and drill two holes with a No. 26 (0.147-inch) drill bit. See Figure 1(B).
    - b. Attach the sensor mounting bracket and gasket to the duct using two No. 8 × 1-inch sheet metal screws. See Figure 1(C1).
    - c. Insert the sensor in the duct through the bracket and tighten the mounting screw to set the insertion depth. See Figure 1(C2).
  - **Direct installation:**
    - a. Remove the sensor cover.
    - b. Use the base as a template, and drill four holes with a No. 26 (0.147-inch) drill bit. See Figure 1(B).
    - c. Insert the probe through the gasket and into the hole. Secure the head to the duct with four No. 8 × 1-inch sheet metal screws.
3. Attach conduit or plenum wire to the sensor base. See Figures 1 and 2.
4. If you are using conduit, pull the field wiring through the conduit and into the sensor base.
5. Connect the field wiring to the sensor terminal block on the base. See Figures 3 through 7 for wiring diagrams.
6. Reinstall the sensor cover. See Figure 1(C6).  
 The installation is now complete.

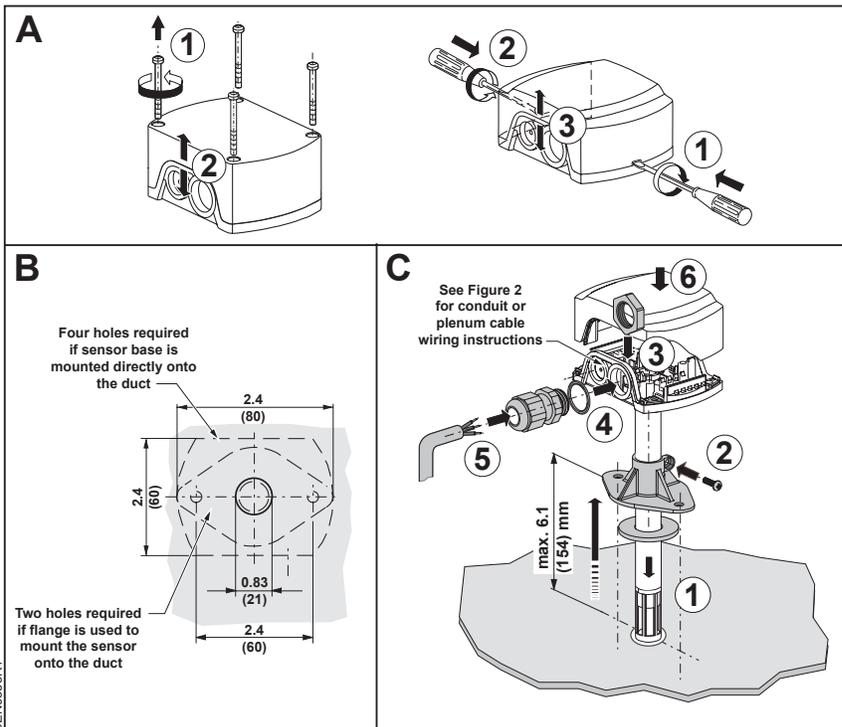


Figure 1. RH/T Duct Sensor Installation.

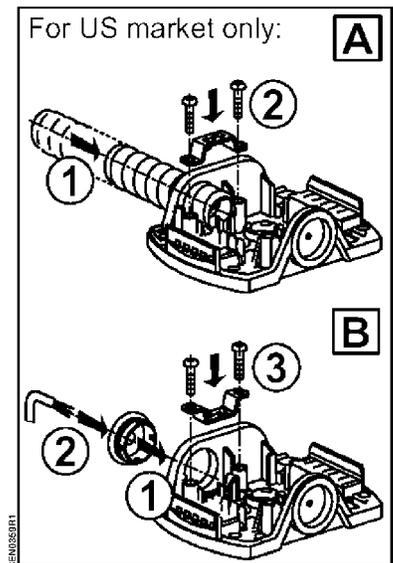


Figure 2. Conduit or Plenum Cable Wiring Installation.

**NOTE:** Figure 2 shows how to connect the conduit or plenum cable to the sensor head.

## Wiring Diagrams

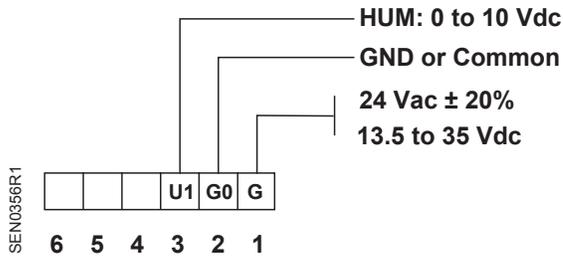


Figure 3. Rh Sensors, 0 to 10 Vdc.

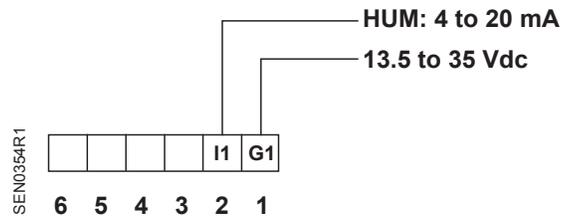


Figure 4. Rh Sensors, 4 to 20 mA.

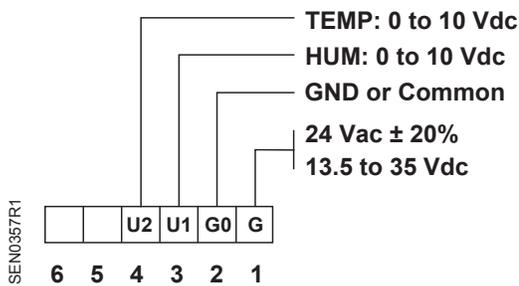


Figure 5. Rh/T Sensors, 0 to 10 Vdc.

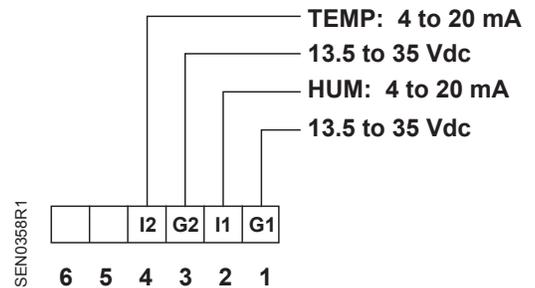


Figure 6. Rh/T Sensors, 4 to 20 mA

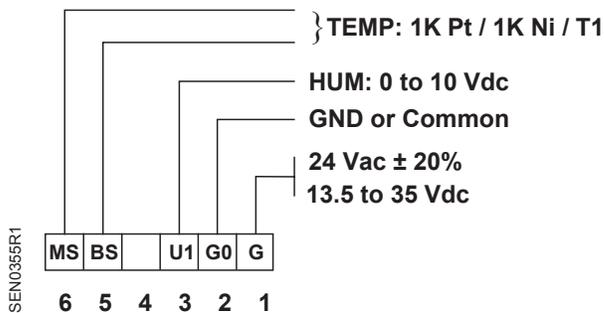


Figure 7. Rh/T Sensors, Thermistor RTD, 0 to 10 Vdc.

**NOTE:** For individual panel wiring details, see the appropriate hardware manual.

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