

## QPM Series Indoor Air Quality Duct Sensors

### Product Description

The QPM Series Indoor Air Quality Duct Sensors are designed for applications where precise, stable sensing of carbon dioxide (CO<sub>2</sub>), temperature, or relative humidity sensing is required. Model QPM2102 senses both volatile organic compounds (VOCs) and CO<sub>2</sub>, with the output signal automatically switching to reflect the higher of the two values.

These sensors are directly wired to the controller with 18 to 22 AWG (recommended) multi-conductor shielded cable. The number of conductors required depends on the model selected. All field wiring is terminated in a terminal block on the sensor body. The output signal is field selectable for 0 to 10V or 0 to 5V.

Siemens CO<sub>2</sub> + VOC sensors are designed to help maximize occupant comfort and are not suitable for use in life safety applications.

### Product Numbers

Product Number	Description
QPM2100	CO <sub>2</sub> sensing only
QPM2102	CO <sub>2</sub> and VOC sensing only
QPM2102D	CO <sub>2</sub> and VOC sensing with display
QPM2160	CO <sub>2</sub> and temperature (active) sensing only
QPM2160D	CO <sub>2</sub> and temperature (active) sensing with display
QPM2162	CO <sub>2</sub> , rh and temperature (active) sensing only
QPM2162D	CO <sub>2</sub> , rh and temperature (active) sensing with display
QPM2180	CO <sub>2</sub> and temperature (passive) sensing only (depending on connected sensing element-- LG-Ni1000, Pt1000, Pt100, or NTC 10K Ω.)

### Additional Reference Documents

Technical Instructions CE1N1962  
 Technical Specification Sheet 149-909

### Expected Installation Time

One hour

### Required Tools

- Phillips screwdrivers, No. 1 and No. 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

### Prerequisites

- Ensure that the appropriate field wiring is installed.  
 Appropriate wiring is 8 to 22 AWG (recommended) multi-conductor shielded cable (plenum or non-plenum as required), within the maximum wiring run length for the individual equipment controller. See *Wiring Diagrams* to determine the required number of conductors. The maximum recommended length is 750 feet (229 m).
- Ensure that all wiring complies with National Electric Code (NEC) and local regulations.
- Allow up to 96 hours for unit to reach published accuracy.

### Mounting Information

Locate the sensor:

- In the center of a duct.
- Away from fans, corners, heating and cooling coils, and so on.
- Away from direct sunlight (for example, not on a rooftop). To ensure correct operation, the sensor's ambient temperature must be between 23°F and 133°F (–5°C to 45°C).
- Where it receives adequate airflow for proper operation.
- Where it can be easily accessed for service.

- If used in connection with steam humidifiers, the distance to the humidifier must be a minimum of 9.8 feet (3 m). The distance should be as great as possible, but no more than 33 feet (10 m).

**NOTES:** To ensure degree of protection IP 54, the sensor must be fitted with the cable entry pointing downward.

Handle the immersion rod carefully. The internal sensing elements are susceptible to impact and shock.

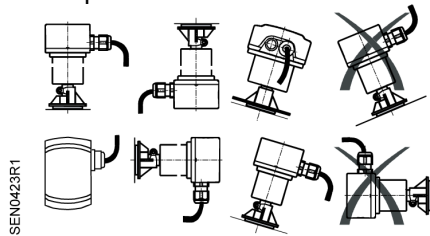


Figure 1. Acceptable Mounting Positions.

## 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. Remove the sensor cover, using the indented tabs. See Figure 2.

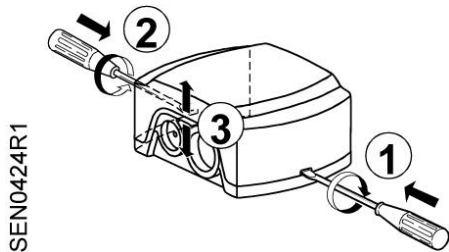


Figure 2.

- b. Use the bracket as a template, and drill two holes with a No. 26 (0.147-inch) drill bit.

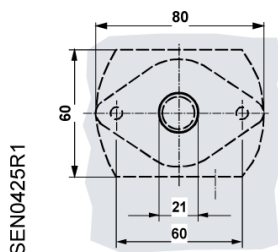


Figure 3. Drilling Template.

- c. Attach the sensor mounting bracket and gasket to the duct using two No. 8 x 1-inch sheet metal screws. See Figure 4 ④.

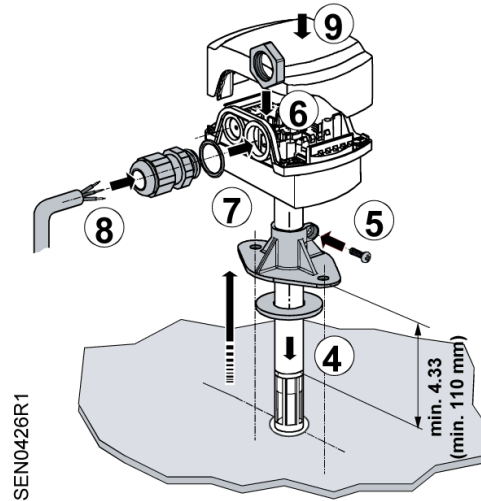


Figure 4.

- d. Insert the sensor in the duct through the bracket and tighten the mounting screw to set the insertion depth. See Figure 4 ⑤.

- Direct Installation:
  - a. Remove the sensor cover, using the indented tabs. See Figure 2.
  - b. Use the base as a template, and drill four holes with a No. 26 (0.147-inch) drill bit. See Figure 3.
  - c. Insert the probe through the gasket and into the hole. Secure the head to the duct with four No. 8 x 1-inch sheet metal screws.
  - d. Attach conduit or plenum wire to the sensor base.
  - e. If you are using conduit, pull the field wiring through the conduit and into the sensor base.
  - f. Connect the field wiring to the sensor terminal block on the base. See Figure 7 through Figure 10 for wiring diagrams.
  - g. Reinstall the sensor cover. See Figure 4 ⑨.

The installation is now complete.

## Installing Sensing Temperature Elements (QPM2180 Only)

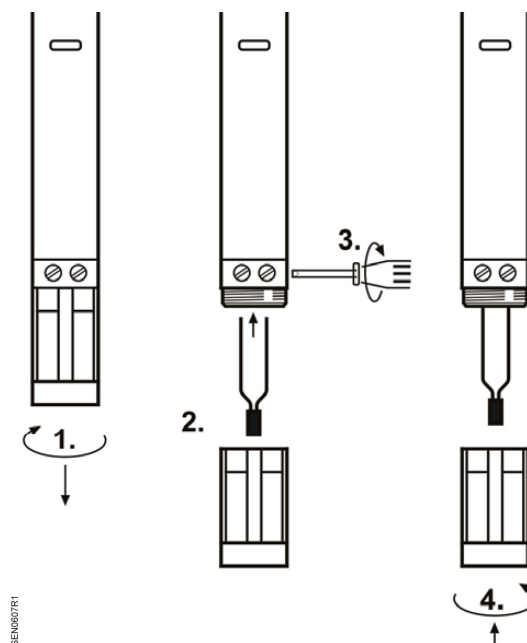
The QPM2180 is shipped with four sensing elements: NTC 10K Ohm, Platinum 1000, Nickel 1000 and Platinum 100 (packaged separately).



**Figure 5. Sensing Element Selections.**

To install the sensing element of your choice, follow the instructions depicted in Figure 6:

1. Remove the protective end cap.
2. Insert the element.
3. Using a small, flat-blade screwdriver, tighten the sensor's two mounting screws.
4. Replace the protective end cap.



**Figure 6. Installing the Sensing Element.**

## Wiring Diagrams

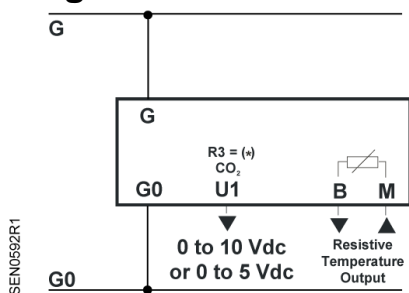


Figure 7. QPM2180.

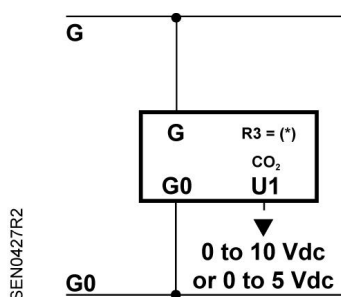


Figure 9. QPM2100, QPM2100D.

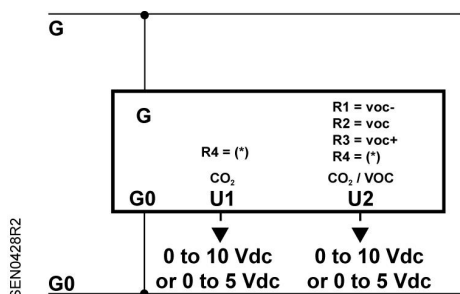


Figure 11. QPM2102, QPM2102D.

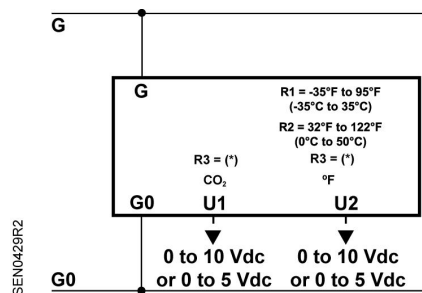


Figure 8. QPM2160, QPM2160D.

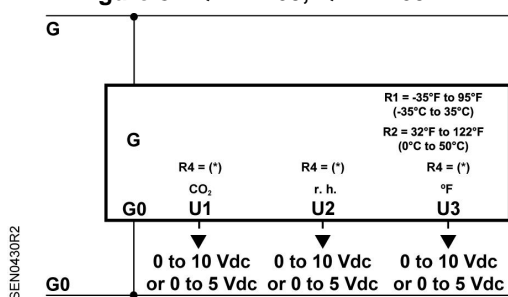


Figure 10. QPM2162, QPM2162D.

G System voltage 24 Vac (SELV)  
G0 System ground and measuring neutral  
U1 Signal output 0 to 10 Vdc or 0 to 5 Vdc  
U2 Signal output 0 to 10 Vdc or 0 to 5 Vdc

U3 Signal output 0 to 10 Vdc or 0 to 5 Vdc  
R..(\*) Signal output with R... = 0 to 10 Vdc;  
without R... = 0 to 5 Vdc  
B, M Passive temperature output (interchangeable)

NOTE: See *QPM Series Indoor Air Quality Duct Sensors Technical Instructions (CE1N1962)* for information on positioning the jumpers on the setting elements.

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