

## Installation

The sensor must be placed in an area that is representative of the conditioned space or zone. A mounting height between 4 and 6 feet is recommended. The sensor is comprised of three separate pieces: mounting plate, sensor pre-mounted on the case bottom and the sensor case top.

### WARNING

Before performing service or maintenance operations on the system, turn off main power switches to the unit. Electric shock can cause personal injury.

### NOTICE!

Use of cellular telephones or radio transceivers within two (2) feet of the sensor during calibration process could cause sensor interference, calibration errors and affect sensor accuracy. Please refrain from using these devices during sensor calibration.

### Step 1. Sensor Location

#### The sensor should be mounted:

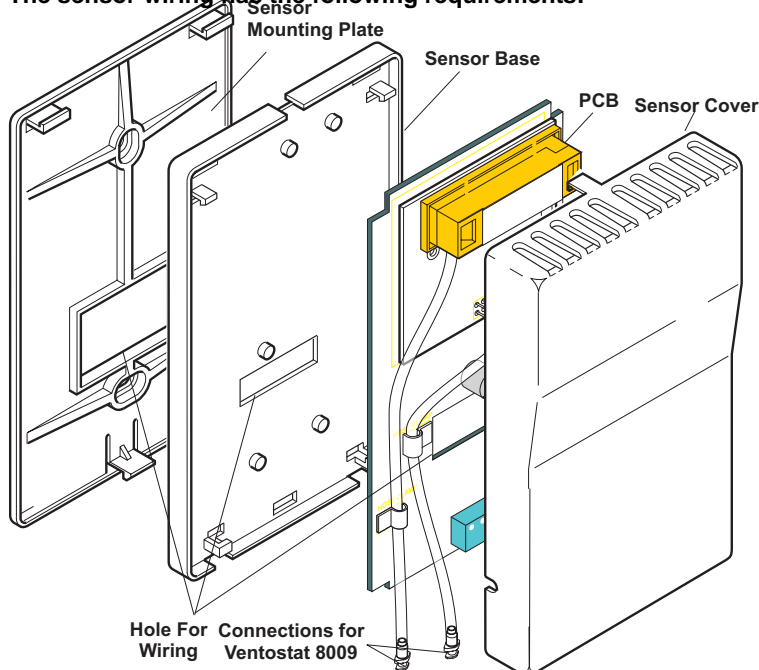
- On an internal wall near a return air grille or duct.
- At least 3 ft from a corner, 2 ft from an open doorway and 4 to 6 ft from the floor.
- Where temperature operating limits are 32° to 122° F

#### The sensor should NOT be mounted:

- Close to a window, on an outside wall, or next to a door leading to the outside.
- Close to or indirect airflow of areas such as open windows, drafts or overheat sources.
- In areas with poor air circulation, such as behind a door or in a alcove where there are dramatic temperature fluctuations or moisture accumulation.
- Where it may be exposed to direct occupant breathing such as near water coolers or coffee machines.

### Step 2. Wiring Requirements

#### The sensor wiring has the following requirements:



1. Power requirements: 18-36 VAC RMS 50/60 Hz at 4 VA.
2. Wiring must be in compliance with all applicable local and national codes.
3. A dedicated power supply is required.
4. Sensor wiring should be color coded for ease of maintenance and service.
5. Wiring should be 18 to 22 AWG (American Gauge Wire) stranded wire. 20 AWG is recommended.

### Step 3. Mounting the Sensor

The sensor can be mounted on a flat surface, wall or in a junction box.

#### Surface or wall mounting

1. Place the mounting bracket on the wall. Mark the desired location of the two mounting holes on the wall through the holes in the mounting plate.
2. Pull the wires through the wire hole in the middle of the mounting plate.
3. Drill two mounting holes in the wall in the location marked in Step 1.
4. Mount the sensor mounting plate with two wood screws and anchors.

## Ventostat® 8003 and 8009 CO<sub>2</sub> Sensor Product Manual



The Ventostat® 8003/8009 are the most economical and reliable carbon dioxide (CO<sub>2</sub>) sensors available in the marketplace. Each sensor comes standard with a 0-10 VDC output and our patented ABCLogic™ self-calibration system.

#### No Maintenance, No Calibration Required

Periodic sensor calibration is not required because each sensor comes with our automatic self calibration software. The 8003/8009 CO<sub>2</sub> sensors use TELAIRE's patented ABCLogic™ (Automatic Background Calibration) self-calibration system that eliminates the need for manual calibration where indoor CO<sub>2</sub> levels drop to outdoor levels during

unoccupied periods (e.g. during evening hours). ABCLogic™ will not work properly in applications where the space is unoccupied for less than four hours a day or where there are industrial sources of CO<sub>2</sub> in the building such as breweries or wineries. Other TELAIRE products are also available for these applications.

# TELAIRE®

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#### Junction Box Mounting

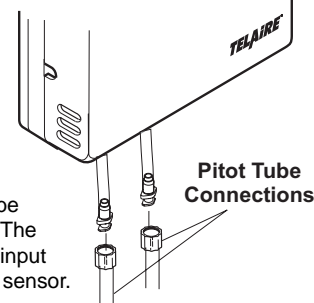
1. Run wires through knockout in a 2 x 4 in. junction box (field supplied).
2. Pull wires through the wire hole in the middle of the mounting plate.
3. Secure the sensor mounting plate to the junction box using two 6 x 32 machine screws.

#### Duct Mount

**Note:** The length of the Tygon® tubing is three feet. In order to maintain optimum accuracy, the tubing should not be lengthened. If the sensor is mounted closer than three feet, the excess tubing should be shortened to avoid interference with mechanical or moving devices.

#### Mounting the Pitot Tube

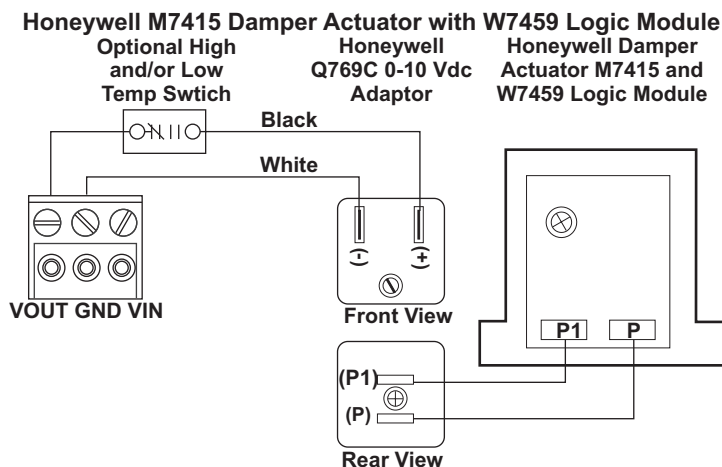
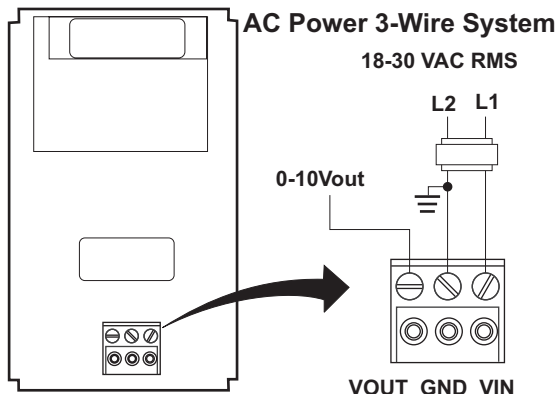
1. To mount the pitot tube, drill one 7/8" hole through the duct.
2. Insert the pitot tube and mark the two remaining holes for the mounting screws.
3. Punch or drill the two marked holes
4. Note the direction of airflow in the duct and note the marking on the pitot tube flange and insert so that it is properly aligned with the airflow.
5. To ensure an air tight seal, make sure the mounting surface of the duct is clear of dirt or obstructions. Then, attach the pitot tube to the duct with sheet metal screws or rivets.
6. Check the length of the tubing before attaching to the sensor. The tubing should connect without stretching or pulling. If the length is long enough to create a loop or bind in the tubing, it should be shortened.
7. To shorten the tubing, remove the connectors that attach to the sensor and cut the tubing to length.
8. Replace the tubing connectors by using a twisting or screwing motion. Verify the connection is secure.  
**Note:** If the tubing length has been shortened, be sure the in-line filter is replaced on the pitot tube connector marked with an "H".
9. Complete the installation by screwing the tube connectors to the input ports on the sensor. The tubing connectors can be attached to either input port. It will not affect the performance of the sensor.



## Step 4. Wiring the Sensor

Perform the following procedure to wire the sensor:

1. Run the wall wiring through the wire hole in the sensor base.
2. Align the top clips and secure the bottom clips of the sensor base to the wall mount plate.
3. Gently rock the case from top to bottom, using gentle pressure. A "snap" sound will indicate that the sensor is secure.
4. Separate the wires into two bundles. One bundle should contain the wires for the CO<sub>2</sub> (J7) and the other bundle should contain the wires for the temperature sensor and 3 wire building communication system (if applicable).
5. Remove the connector from the sensor base.
6. Terminate the wires to the connector.
7. Replace the connectors onto the sensor base.
8. Push excess wire back through the hole. Align the sensor top over the sensor base.



## Step 5. Sensor Start Up

Perform the following procedure to start up the sensor:

Once the installation is complete, apply power to the sensor. A two minute warm up will take place.

Measure and read the temperature and CO<sub>2</sub> sensor levels by using a meter or checking the readings at the attached controller. Be sure the CO<sub>2</sub> levels are above the minimum, up to the maximum acceptable level in the range.

Replace the sensor cover once the test is complete.

## Specifications

<b>Sensing Method</b>	Single beam absorption infrared
<b>Sample Method</b>	Ventostat 8003 - Diffusion Ventostat 8009 - Flow through
<b>Measurement Range</b>	0-2000 ppm
<b>Sensitivity</b>	±20 ppm
<b>Typical Accuracy</b>	±50 ppm + 3% of reading (Against factory certified calibration gas at 25°C at standard pressure after initial ABCLogic™ calibration period)
<b>Non Linearity</b>	<1% of FS
<b>Temp Dependence</b>	Temperature ± 0.15% FS per °C
<b>Pressure Dependence</b>	0.13% of reading per mmHg
<b>Response Time</b> (0 to 90% step change)	<2 minutes (sensor response) w/ 1 meter sampling tubes at a worse case duct velocity of 1.3 m/s response time including sampling is <12 minutes
<b>Warm-up Time (@ 25°C)</b>	2 minutes 30 minutes for full operating accuracy
<b>Operating Conditions</b>	15 to 32°C 0-95% RH, non-condensing
<b>Storage Temperatures</b>	-40 to 70°C
<b>Agency Certifications</b>	FCC, CE
<b>Calibration Interval</b>	ABCLogic™ Automatic Self Calibration Software
<b>Power</b>	18-30 VAC RMS, 50/60 Hz - Half wave rectified (dedicated) 1.75 VA maximum average power 3.25 VA peak power
<b>Analog Output</b>	0 to 10 V (source 10 mA, sink 10 mA) 100 ohm output impedance
<b>Design Life</b>	15 years typical
<b>Connections</b>	Removable Screw Terminal (18-22 AWG wire) 1 - Vout (Analog 0-10 V output) 2 - Gnd (Ground) 3 - Vin (24 VAC (+))

## Troubleshooting Guide

### Symptom

Suspect the sensor is not operating

### Remedy

- Check the voltage between pins Vin and Common. The voltage should be: 18-30 RMS or 18-42 VDC.
- Ensure that the two pins on the sensor that connect to the 3-pin terminal block are not broken, bent, or damaged.
- Check the voltage on pins Vout and COM. The voltage should be between 2 and 10 VDC.
- If there is not an output signal call Telaire or your distributor/dealer for a return authorization number.

### Symptom

Suspect the sensor is out of calibration.

### Remedy

- Allow the sensor to operate for 14 days and ABCLogic™ will bring it to within specification or call Telaire® or your dealer for Return authorization number.

**Note:** The 8003 and 8009 sensors cannot be field calibrated.

## Warranty

Telaire seeks to present reliable information concerning the composition, properties and use of its products, however; (1) All advice concerning selection and use of any product is provided at no charge and with no warranty. (2) No warranty is made hereby. Products described herein are warranted to conform to Telaire specifications only at the time of sale. All sales are subject to Telaire standard terms and conditions, which are reproduced on the reverse side of each invoice. All warranties of merchantability and fitness of purpose are disclaimed and remedy for any breach of warranty is limited to replacement of the defective product. (3) Telaire assumes no responsibility for any patent liability arising from the use of any product in a process, manner or formula not designed by Telaire.

Protected by the following patents, other patents pending:

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