

## Ventostat® 8001/8002 Single Beam CO2 Ventilation Controllers

The Ventostat® 8001 and 8002 carbon dioxide (CO2) sensors and controllers are designed for Demand Controlled Ventilation DCV in buildings. This approach, using CO2 as an indicator of occupancy, allows ventilation based on actual occupancy while still maintaining ASHRAE recommended per-person ventilation rates. Over-ventilation of buildings can be reduced, energy can be saved and air quality can be optimized. The optional black case (8001B



# Commercial Grade

and 8002B) is UL94-V5 rated making these models suitable for mounting directly inside the ductwork. Typical applications for the 8001 and 8002 include office buildings, conference rooms, schools, retail stores, restaurants, gymnasiums, and movie theaters.



8 0 0 1



8 0 0 1 B



8 0 0 2



8 0 0 2 B

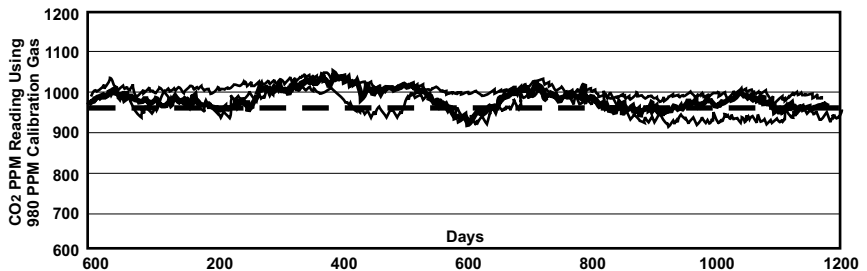
## Features/Benefits

- Telaire's Patented Absorption Infrared™ gas sensing engine provides high accuracy in a compact low cost package.
- Patented ABC Logic™ self-calibration system eliminates the need for manual calibration in most applications (see ABC Logic section).
- 10 years of Telaire® experience and reliability built in.
- Gold-plated optical sensor increases sensor life and durability.
- Attractive low profile case in either white or black to suit you building décor.
- Mounting plate with terminal block provides quick, easy wiring. Compatible with standard US and European junction boxes.
- Gas permeable, water resistant diffusion filter prevents particulate and water contamination of the sensor.
- Locking screw secures cover and sensor to the mounting plate for tamper resistance.
- Dual simultaneous analog output (V & mA).
- On-board relay (normally open or closed) with adjustable setpoint and dead-band.
- Choice of 9 pre-programmed "standard settings".
- Adjustable settings allow for simple configuration with economizers to deliver specific target cfm/person ventilation rates.
- Simple plug-in PC based user interface program allows for configuring and calibrating the sensor.
- On-board push-button interface and 2 line by 8 character display allows for quick, easy customizing (8002 models only).
- Optional enclosures available for wet and cold temperature environments.
- One-step calibration process (if necessary) can be completed in 5 minutes.
- The 8001B/8002B (Black Case) includes conformal coated PCB with a UL94-5V rated enclosure for direct in duct mounting or increased environmental durability.

## ABC Logic™ Provides Automatic Calibration

Telaire's 8001 and 8002 commercial CO<sub>2</sub> controllers use the patented **ABC Logic™** (Automatic Background Calibration) self-Calibration system that virtually eliminates the need for manual calibration in applications where the indoor CO<sub>2</sub> level drops to outside levels during unoccupied periods (e.g. during evening hours). **ABC Logic™** is a special software routine in the sensor that

remembers the background readings for 14 consecutive evenings and calculates if there is sensor drift and then corrects for it. **ABC Logic™** 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.



## Fast One Step Calibration

All 8000 Series CO<sub>2</sub> Sensors feature a fast one step calibration process should it ever be required. A zero calibration can be performed in 5 minutes by flowing gas to the calibration port and activating the calibration routine. If drift occurs in the sensor it usually affects the zero setting of the sensor only. If a two point calibration is desired, it can be performed using the UIP Program.

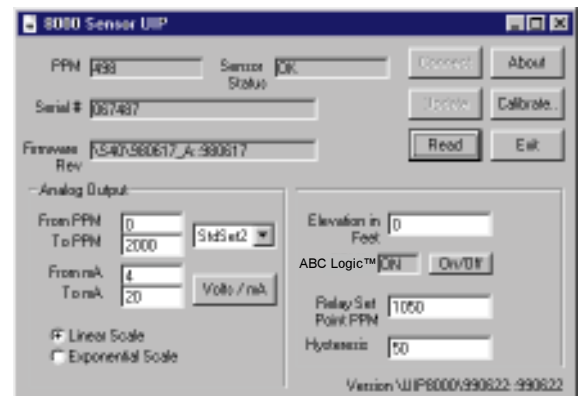
## 5-Year Calibration Guarantee

Telaire® is serious about calibration stability and backs Ventostat® 8001 and 8002 models with a 5 year calibration guarantee. If a Telaire® 8000 sensor drifts out of calibration range in the first five years of use it can be sent back to Telaire® for a free factory calibration. Further information on the guarantee is provided with every product.

## User Interface Program (UIP)

All Ventostat® 8000 series controllers can be connected to a PC using the UIP 2072 easy-to-use Windows® program. Simply connect to the sensor using the on-board RJ45 jack and you can adjust the output scaling, elevation adjustment, relay setpoint, relay

dead-band, select linear or proportional or exponential output, perform single-point or two-point calibration, and check ppm levels. Display units can also be adjusted using the keypad.



## CO<sub>2</sub> Engineering Specification

The CO<sub>2</sub> sensor for demand control ventilation shall be the 8001 or 8002 non-dispersive infrared sensor made by Telaire® (805-964-1699). The diffusion gas chamber in the sensor should incorporate a reflective, gold plated light pipe or waveguide surrounded by a gas permeable teflon based hydrophobic diffusion filter that prevents particulate and water contamination of the sensor. The sensor shall provide simultaneous analog outputs in volts and miliamps and shall have a gold bifurcated relay that can be operated as normally open or closed. The sensor shall incorporate elevation correction adjustment and ABC Logic™ (Automatic Background Calibration) software for self-correction of drift to better than ±10ppm per year. The sensor shall have an accuracy of ±75 ppm or 7% of the reading (whichever is greater). All adjustments to the sensor including output scaling, elevation adjustment, relay setpoint, relay dead-band, proportional or exponential output, and single-point calibration shall be made via computer connection to an on-board RJ45 jack. The 8002 product shall also be adjusted using the on-board push buttons and display. For ease of installation, the sensor shall have a detachable base with all field wiring terminals on the base. This product meets or exceeds specifications for the Ventostat® Model 2001V.

## Cross-Reference

The Ventostat® 8001 and 8002 controllers meets or exceeds the performance specifications and functionality for the Model Ventostat® 2001V and may be used as a direct substitute.

## Accessories



**1505 Water Resistant Enclosure for Harsh Environments**



**1551 Outside Air Enclosure for Temperatures to -20°F (-29°C)**



**1508 Aspiration Box For In Duct Mounting**



**2072 UIP For Customizing Settings and Calibration**



**2075 Calibration Kit For Performing Zero and Span Calibration.**



**Replacement Bottles For Replacing 2075 Gas Bottles**

Factory calibration available - Call for details.

## Models / Features

### Ventostat® 8001



- No Display
- Wall Mount
- 0-10,000 PPM

### Ventostat® 8001B



- No Display
- Wall or In-Duct Mount
- 0-10,000 PPM

### Ventostat® 8002



- Display
- Wall Mount
- 0-10,000 PPM

### Ventostat® 8002B

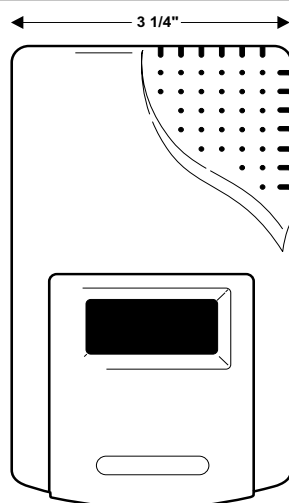


- Display
- Wall or In-Duct Mount
- 0-10,000 PPM

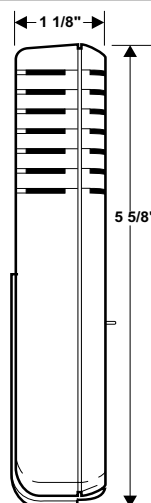


- All units are compatible with Accessory Enclosures, 2072 UIP and Calibration Kit.
- All units can be zero calibrated using a zero gas and on-board keypad.
- Black enclosures are UL94-5V Rated and electronics are conformally coated for direct in-duct mounting.
- Display units are provided with locking covers for hidden or visible display.

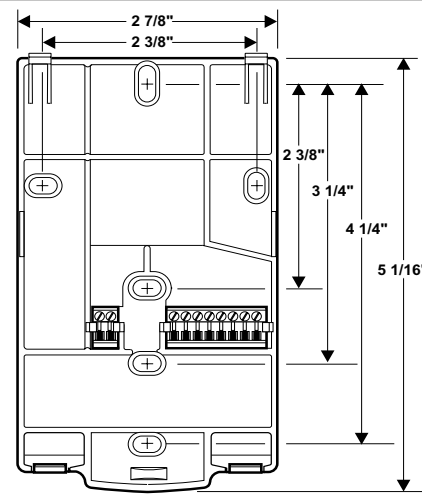
## Dimensions



Front View of Sensor



Side View with Mounting Bracket



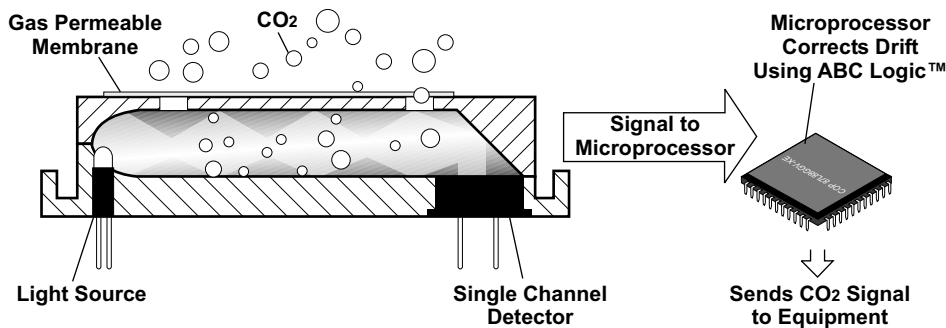
Mounting Bracket

## How The Commercial Grade Sensor Works

Telaire's CO<sub>2</sub> sensor can detect gases based on the fact that gases will absorb light at very specific wavelengths in the infrared spectrum. In the Telaire® sensor, gas diffuses through a gas permeable membrane and into the sample chamber. The gas permeable membrane allows gas molecules to pass freely but prevents the entry of particulates. A light source at one end of the chamber generates a broad band of infrared energy that is directed through the sample chamber. Because much of the light bounces off the gold plated walls of the sensor, a longer effective sample path

can be achieved in a small distance.

At the other end of the sensor is a special optical filter installed on top of a light detector. The optical filter is designed to only admit light at the wavelength where CO<sub>2</sub> is known to absorb light. The small change in light intensity caused by a change in CO<sub>2</sub> concentrations is then measured by the detector and converted into a CO<sub>2</sub> measurement by a microprocessor. The microprocessor also automatically calibrates and corrects the sensor for long term drift using Telaire's patented ABC Logic™ self calibration software.



## Specifications

### Method

Single Beam Absorption Infrared  
Diffusion sample method

### Performance

#### Measurement Range

0-2000 ppm factory default  
Adjustable to 10,000 ppm.

#### Accuracy

±75ppm or 7% whichever is greater

#### Elevation (Pressure) Correction

Add 0.13% of reading per mm Hg decrease from 760 mm Hg (On-board correction, user set with UIP software), preset at sea level

#### Response Time 0-90%

<1 minute

#### Warm-Up Time @ 25°C

<2 minutes

#### Operating Conditions

15-32°C (60-90°F)

0 – 95% RH, non-condensing

#### Storage Temperature

-40 – 70°C

#### Agency Certification

FCC Part 15 Class B / CE

Black Case - UL94-5V Rated

### Input/Output

#### Power

18-30 VAC RMS, 50/60 Hz -half-wave rectified

18-42 VDC polarity protected

1.75 VA maximum average power

2.75 VA peak power

#### Analog Output (Simultaneous)

0-10 VDC (100 Ohms output impedance)

4-20 mA (RLmax = 500 Ohms)

#### Relay Output

Normally Open and Normally Closed (wire either way), gold bifurcated, 2A max. @ 24VAC. Adjustable setpoint (with UIP software kit), factory set at 1000 ppm, 50 ppm hysteresis

#### Wiring

18-28 AWG stranded copper wire only. 2 wires each for power, analog output, relay

#### Digital I/O

RS-232 interface for use with optional PC software and cable in UIP kit 2072

### Warranty/Other

#### Warranty

18 months parts and labor

#### Calibration

5-year calibration guarantee



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