

## Ventostat® Wall Mount

### Telaire Wall Mount CO<sub>2</sub>, Humidity and Temperature Transmitters



#### Features:

- 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.
- Lifetime CO<sub>2</sub> calibration guarantee when using ABC Logic™.
- Mounting plate with two-piece terminal blocks provide quick, easy wiring.
- Gas permeable, water resistant CO<sub>2</sub> diffusion filter prevents particulate and water contamination of the sensor.
- Locking screw secures cover and sensor to the mounting bracket for tamper resistance.
- Dual simultaneous analog outputs (V & mA) available for CO<sub>2</sub>.
- BACnet™ output versions
- Sensors are shipped factory calibrated.
- Temperature sensor on all models.
- Modern enclosure with customized branding available.
- CO<sub>2</sub>, humidity and temperature models.
- Two-piece design allows unit to be replaced without the need for rewiring.

## Amphenol

### Advanced Sensors

# Controlled Ventilation

Ventilation is an important part of maintaining a comfortable, healthy, productive environment for people. Improper ventilation can have a negative impact on occupant health and performance, increase the risk from litigation, and/or waste energy. Demand-controlled ventilation using CO<sub>2</sub> sensors prevents energy losses from over-ventilation while maintaining indoor air quality. The most energy savings potential is in buildings where occupancy fluctuates during a 24-hour period. Numerous organizations now require and/or recommend CO<sub>2</sub>-based ventilation control in different commercial HVAC applications. Some utility companies also offer rebates to building owners for installing CO<sub>2</sub> sensors.

Wall mount sensors are used to control a specific area such as a conference room, classroom, meeting hall, etc. The Telaire 8000 Ventostat series are easy to install and have a clean, modern look that suits most indoor environments.

## Ordering Information

Examples:

- T8100-D ABC Logic, display
- T8100-D-BAC ABC Logic, display, BACnet
- T8200-HD Dual channel, Humidity, Display
- T8300-BAC ABC Logic, pitot tube, BACnet
- T8100-DB ABC Logic, display, black case

The Telaire 8000 Ventostat series is available in a number of configurations. The primary configuration is determined by the type of CO<sub>2</sub> sensor included.

T8100 — uses a single channel sensor using Telaire patented ABC Logic for lifetime calibration. Single-channel sensors are used in spaces where there is not full-time occupation (most applications).

T8200 — uses a dual-channel optical system and three-point calibration process for enhanced stability, accuracy and reliability. Used in applications where there is full-time occupation 24 hours a day.

T8300 — uses a single channel sensor with pitot tube kit for duct measuring of CO<sub>2</sub>. ABC Logic enabled.

Notes:

1. This product is intended to be used in occupied building HVAC applications.
2. This product is not designed or intended for use in safety critical functions.



Note: Not all combinations are available, i.e., T8300 with humidity. Please see [www.ventostat.com](http://www.ventostat.com) to see the latest list of available part numbers.

Note: T8100-5P-R versions are conformally coated.



Black versions are for applications such as movie theaters

# Wall Mount Specifications

## Sensing Method

- Non-dispersive infrared (NDIR) absorption
- Gold-plated optics
- Patented ABC Logic self calibration algorithm

## CO<sub>2</sub> Measurement Range

T8100/T8200/T8300

0 to 2000 ppm (0 ppm = 0 V, 4 mA;

2000 ppm = 10/5V, 20 mA)

T8100/T8200/T8300 - 5P models

0 to 5000 ppm (0 ppm = 0 V, 4 mA;

5000 ppm = 10/5V, 20 mA)

T8200 (10P models) 0 to 10,000 ppm

(0 ppm = 0 V, 4 mA; 10,000 ppm = 10/5V, 20 mA)

T8200 (20P models) 0 to 20,000 ppm

(0 ppm = 0 V, 4 mA; 20,000 ppm = 10/5V, 20 mA)

## CO<sub>2</sub> Accuracy

± 30ppm or 3% of the reading shown, whichever is higher \*

## Power Supply Requirements

18-30 VAC RMS, 50/60 Hz, or 10.8 to 42 VDC,  
polarity protected

## Power Consumption

Typical 0.7 W at nominal voltage of 24V AC RMS

## Temperature Dependence

0.2% FS per °C (±0.11% per °F)

## Stability

T8100/T8300 - Single Channel

<2% of FS over life of sensor (15 years)

## T8200 - Dual Channel

<5% of FS or <10% reading annual over life of sensor  
(10 years)

## Pressure Dependence

0.135% of reading per mm Hg

## Warranty

24 months on mechanical defects

Calibration - lifetime warranty for T8100 and T8300 series

## Certifications

CE and RoHS compliant

## Signal Update

Every 5 seconds

*\*CO<sub>2</sub> accuracy statement excludes standard gas used for calibration that has an accuracy of 2%. In addition, there is a potential digital to analog error of up to 1%.*

## CO<sub>2</sub> Warm-up Time

- < 2 minutes (operational)
- 10 minutes (maximum accuracy)

## Operating Conditions

- 32°F to 122°F (0°C to 50°C)
- 0 to 95% RH, non-condensing

## Storage Conditions

-40°F to 158°F (-40°C to 70°C)

## Flammability Classification

UL94 5VA

## Passive Thermistor Type (not Bacnet version)

NTC 10 K Ω thermistor

## Thermistor Accuracy

±1°C (15° to 35°C)

## RH Sensing Element

Capacitive polymer sensor

## RH Range

0% to 99% RH (non-condensing)

## RH Accuracy (25°C)

±2.5% RH (20 to 80% RH)

±3.5% RH (<20% and >80% RH)

## Active Temperature Accuracy

±0.8°C @ 22°C

## Active Temperature Range

32°F to 122°F (0 to 50°C)

*Note: Active analog output standard and only available on T8100-R and T8100-H versions.*

## Output

### Analog Version

- 0 to 10 V (100 Ω output impedance) and
- 4 to 20mA (R<sub>L</sub> maximum 500 Ω) available simultaneously

### BACnet Version

- MS/TP
- RS485
- Baud rates 38400 or 9600



Ventostat wall mount dimensions

Note: Applies when used in typical indoor ambient air. Consult Telaire if other gases or corrosive agents are part of the application environment.

### CO<sub>2</sub> Calibration Guarantee

Telaire is serious about minimizing maintenance, so each single-channel sensor (T8100/T8300) comes with a lifetime calibration guarantee. And each dual channel sensor has a two-year calibration guarantee (T8200).

### Calibration Interval

For T8100 and T8300 series, no calibration is required due to ABC Logic. For T8200 series, annual calibration is recommended for the best accuracy. However, most applications using T8200 series could extend the calibration interval. For the humidity sensor, no calibration is required. Replacement humidity sensors are available.

If a Telaire 8000 series single channel sensor drifts out of calibration range, it can be sent back to Telaire for a free factory calibration. Further information on the guarantee is available on our website.

### T8200 – Dual Channel

The T8200 dual channel sensor can be described as a CO<sub>2</sub> channel that measures gas concentration and a reference channel that measures the sensor signal intensity. The dual channel sensor performs periodic self-calibrations using the reference channel. The self-calibrations are approximately every 24 hours. During the self-calibration the sensor ppm reading is frozen, it will not react to changing CO<sub>2</sub>. The calibration time is adjustable but nominally two minutes.

Telaire recommends periodic gas calibration depending on the application accuracy requirements. While the reference channel corrects for changes over time, a field calibration using nitrogen gas or alternatively ambient calibration will immediately restore the highest level of accuracy. Refer to the calibration manual for details.

## Sensor Accuracy & Field Calibration

### CO<sub>2</sub> ABC Logic Self Calibration

T8100 and T8300 single channel sensors employ the patented ABC (Automatic Background Calibration) Logic self-calibration system. ABC Logic 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, calculates if there is a sensor drift, and then corrects for it.

With ABC Logic enabled, the sensor will typically reach its operational accuracy after 25 hours of continuous operation at a condition that is exposed to ambient reference levels. Sensors will maintain accuracy specifications with ABC Logic enabled, given that it is at least three times in 14 days exposed to the reference value and this reference value is the lowest concentration to which the sensor is exposed.

# Multi Measurement

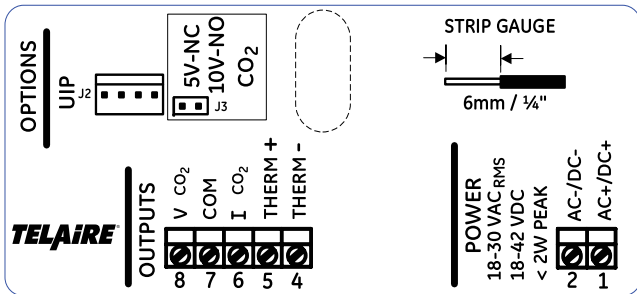


Display versions scroll between ppm CO<sub>2</sub>, %RH Humidity and °F Temperature when the option is selected.

## Wiring Features

### Non-Display Wiring

No display, basic functionality for CO<sub>2</sub> and passive thermistor only.



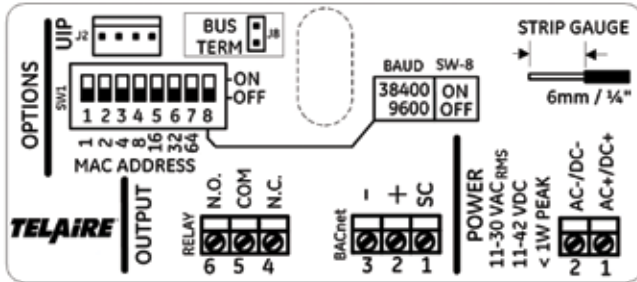
Non-Display Wiring

### Display Wiring

Digital display, functions of CO<sub>2</sub> and thermistor are standard. Humidity and active temperature options are available. Display scrolls all measurements that are included.



Display Wiring



BACnet Wiring



## Smaller Enclosures

Smaller enclosure versions are available for regional preferences.



Dimensions: 81.4 mm x 86.4 mm

## 8300 Pitot Tube Configuration

The pitot tube kit is used for duct measurement of CO<sub>2</sub>. The pitot tube is installed in the duct and the sensor is mounted remotely, which allows for easy access.



Pitot Mounting Configuration



T8300-D with Pitot

## Enhanced Field Serviceability

The Ventostat 8000 series features a field-replaceable Relative Humidity (RH) sensor tip module that allows the end user to replace the sensor on-site while maintaining  $\pm 2.5\%$  RH accuracy. The user simply powers off the unit, installs the new sensor module and powers back the unit. This virtually eliminates the need for time consuming and costly factory calibration, while reducing downtime during service intervals to near zero. The sensor is protected from dust contamination by a specially designed filter as shown in the photo below.



T8300 with Pitot

# Ventostat Accessories

## Enclosure Specifications

### T1508 Aspiration Box for Duct Mounting

The Model 1508 is designed for in-duct sampling of CO<sub>2</sub> concentrations at flow rates greater than 400 fpm. Clear cover allows for observation of the sensor. They will accommodate any of the Ventostat 8100 or 8200 series, and can be used for temperature and RH when fitted. Enclosure is screwed to the duct with probe inserted into air stream. Air sampling probe is 1-inch (25.4mm) diameter and 8-inch (203.2mm) long. Enclosure (ABS plastic) has knockouts for conduit connection. Note: Wiring penetrations must be sealed prior to use. CO<sub>2</sub> sensor not included.



T1508 Aspiration Box for Duct Mounting

### T1505 Splash Resistant Enclosure

The Model 1505 is designed to protect the 8000 series in damp or wet environments as might occur in agricultural, industrial or food processing environments. This enclosure (ABS plastic) is designed to protect the sensor from dripping or sprayed water. Any wall mount model of the Ventostat 8000 series sensor can be installed inside the enclosure. The transparent cover allows for viewing of the sensor/display. Four diffusion ports allow for entry of CO<sub>2</sub>. Knockouts are provided for conduit connection. Response time of the sensor is slowed to approximately 30 minutes to measure a 90% step change in concentrations. Enclosure is designed to screw directly to a wall. CO<sub>2</sub> sensor not included.

### T1552 Outside Air Enclosure

The Model 1552 is a rugged weatherproof enclosure (ABS plastic), designed to allow the 8000 series sensor to operate in an outdoor environment and/or where ambient temperatures are below freezing. The 1552 is ideal for monitoring outside air or CO<sub>2</sub> as a surrogate for combustion fumes in parking garages, tunnels and loading docks. This enclosure features a temperature control circuit and internal heaters to maintain the sensor within its normal operating temperature range, even if temperatures outside the enclosure are as low as -20°F (-29°C). Four diffusion ports allow for entry of CO<sub>2</sub>. Response time of the sensor is slowed to approximately 30 minutes to measure a 90% step change in concentrations. Enclosure is designed to screw directly to a wall. CO<sub>2</sub> sensor not included. Power consumption is 24V, 1.5 Amp (max), and includes the Ventostat 8000 series.



T1505 Splash Resistant Enclosure and  
T1552 Outside Air Enclosure

## Ventostat UIP Software

The Ventostat UIP software allows you to modify the standard settings on the T8100, T8200 and T8300 series products.

### The software features:

- Altitude adjustment for maximum accuracy performance
- Analog output adjustment
- Single point and span gas calibration
- Turn on and off ABC Logic™
- Change temperature display units
- Graphing and logging of CO<sub>2</sub>, temperature and %RH (H Versions only)

The software can be used by distributors to make modifications to the Ventostat prior to shipping to the customer, as well as to make adjustments in the field. The USB cable supplies power to the Ventostat, negating the need for a separate power supply.

The T2090 UIP software kit is supplied with a USB-to-Ventostat cable and software CD.



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## Advanced Sensors

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176

TestEquipmentDepot.com