

## TotalSense Series Outdoor Air Quality Sensor

Build a complete air quality system for indoor, duct, and outdoor  
 Seven environmental sensors: PMx, VOC, CO2, RH, T, ambient light, barometric pressure  
 BACnet/Modbus or analog outputs with set-point relay  
 Pair with an IOTBuddy for BACnet IP or IOT Connection



### DESCRIPTION

The TotalSense Series Outdoor AQ sensor provides more data for more advanced ventilation control while drastically reducing installation cost and time on a project. It includes a comprehensive selection of AQ sensing with carbon dioxide (CO2), relative humidity (RH), and temperature plus options for total volatile organic compounds (TVOC), barometric pressure and particulate matter (PM). This sensor is enclosed in an outdoor rated enclosure to protect electronics from rain, overhead watering systems and harmful UV rays.

### APPLICATIONS

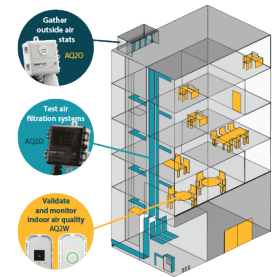
- Measure outdoor air quality for indoor/outdoor comparison to meet ASHRAE 62.1 standard for air quality
- Energy management/building control
- Contributes toward satisfying Feature A08 and T06 under the WELL Building Standard®
- Dual Channel CO2 version is perfect for greenhouses



Fully configurable display

|   |                       |
|---|-----------------------|
| ★  ±30PPM CO2   | ★  TEMPERATURE        |
| ★  ±2% RELATIVE HUMIDITY  | ★  PARTICULATE MATTER |
| BAROMETRIC PRESSURE   | TVOC                  |
| ★ Industry leading accuracy.<br>• NDIR CO2 element, ±30ppm, ±3%<br>• ±2% relative humidity ppm. | AMBIENT LIGHT         |

Choose from to 7 environmental sensors



Build a full validation system

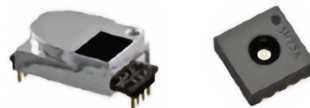
### Built for building automation.



Available with analog or...



BACnet/Modbus protocols or up to 3 analog outputs



Replaceable CO2, RH, and temp sensors



Made in USA; 7 year warranty on electronics

**FEATURES**

- NEW! Configure and update firmware with the [SenvaSync](#) app
- Reduce installation costs with multiple sensors in a rugged, easy-mount outdoor enclosure
- Specify the exact product for your application with made in USA
- Sense unhealthy particulates or TVOC's
- Industry-leading temperature and barometric pressure compensated CO2 sensing with non-dispersive infrared sensing element (NDIR), 15+ year life expectancy on CO2 sensing element; ±30ppm, ±3% of reading
- Tamper-proof
- Field-replaceable RH, Temp, and CO2 sensors ease maintenance
- 7-year limited warranty / 3 years on CO2 sensor - 2 years on all others

**ORDERING**

|                      |                                 |                                  |                              |  |  |   |                              |                      |
|----------------------|---------------------------------|----------------------------------|------------------------------|--|--|---|------------------------------|----------------------|
| AQ2                  | <input type="text" value="O"/>  | -                                | <input type="text"/>         | <input type="text"/>                           | <input type="text"/>   | <input type="text"/>  | <input type="text"/>         | <input type="text"/> |
| <b>Mounting Type</b> | <b>Output Type</b>              | <b>CO2 Sensor</b>                | <b>Humidity Sensor (RH)</b>  | <b>Total Volatile Organic Compounds (TVOC)</b> | <b>Particulate Matter (PM)</b>   | <b>Temperature***</b>   | <b>Display</b>               |                      |
| O = Outdoor          | A = Analog<br>B = BACnet/Modbus | A = None<br>D = Dual Channel CO2 | A = None<br>2 = 2% RH Sensor | A = None<br>V = TVOC                           | A = None<br>C = CO*<br>P = PM 1.0, 2.5, 4.0, 10.0<br>O = O3**<br>Q = PM + O3**<br>R = PM + CO*<br>L = Ambient Light+ | A = None<br>B = Transmitter<br>C = 100PtRTD<br>D = 1000PtRTD<br>E = 10K Type 2<br>F = 10K Type 3<br>G = 10K W/ 11K<br>H = 3K<br>I = 2K2<br>J = 1K8<br>K = 20K | X = None<br>D = OLED Display |                      |

\* CO sensor only available with RH, Temp, and Display for calibration purposes.

\*\* Ozone (O3) only available with Temp/RH for calibration purposes

\*\*\* Choose Transmitter option for OLED temperature display and temperature readings over BACnet/Modbus.

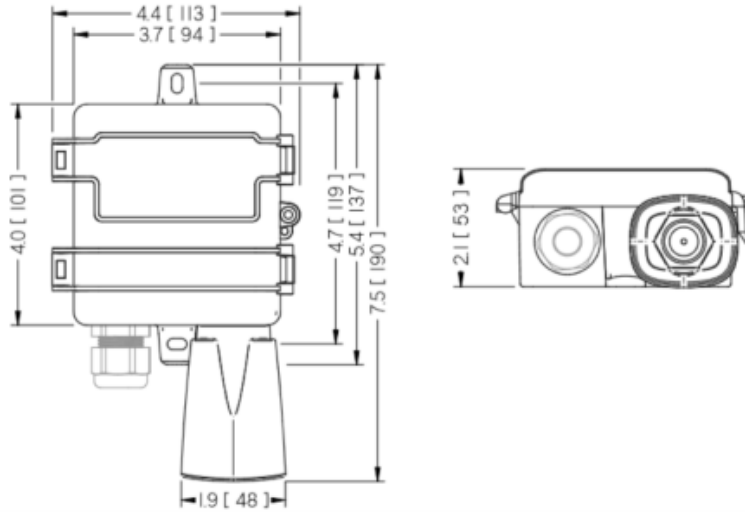
Thermistor versions not available to display on OLED or to read over BACnet/Modbus.

+ Ambient light is only available on select models with temp and RH, consult factory.

**Example**    Mount    Output    CO2    RH    TVOC    PM    Temp    Display  
 AQ2     -                        

(TotalSense outdoor sensor with BACnet/Modbus RS-485, Temp, Dual Channel CO2, 2% RH, VOC, PM, 10K Type 3 Temp, OLED Display)

**DIMENSIONS**



**Warning:** The datasheet is designed for reference only. Refer to installation instructions that accompany the product and heed all safety instructions. Product improvement is a continuing process at Senva. Changes may occur to products without prior notice.

**SPECIFICATIONS**

|  |  |  |
|--|--|--|
| Power Supply                                   |  | 16-30VDC/24VAC(1), 3.5W nominal, 4W max.   |
| Analog Outputs                                 | Quantity   | 3 outputs  |
|  | Source   | CO <sub>2</sub> ,%RH,Temp,PM,TVOC,Ambient Light,CO,Ozone   |
|  | Scale  | 0-5V, 0-10V, 4-20mA (switch selectable, programmable per output)                                   |
| Protocol Outputs (Communications version only) | Protocol   | BACnet MS/TP or Modbus RTU   |
|  | Connection   | 3-wire RS-485, with isolated ground  |
|  | Data Rate  | 9600, 19200, 38400, 57600, 76800, 115200 (switch selectable)                                       |
|  | Address Range  | 0-127 (switch selectable)  |
| Relay Set-point                                | Type   | Solid-state output, 1A @ 30VAC/DC, N.O.  |
|  | Source   | CO <sub>2</sub> setpoint, RH setpoint, Temp setpoint, TVOC setpoint, air quality, off (selectable) |
|  | Polarity   | NO/NC (selectable)   |
| CO <sub>2</sub> (optional)                     | Type   | Non-dispersive Infrared (NDIR)   |
|  | Accuracy   | ±(30ppm +3% of reading) (400-2000ppm), @-10-50°C   |
|  |  | ±(50ppm +5% of reading) Standard (2000-5000ppm),   |
|  |  | ±(50ppm+3% of reading) Dual Channel (2000-5000ppm),  |
|  |  | ±(100ppm+10% of reading) (5000-10000ppm)   |
|  | Drift with ABC disabled (Standard)                                 | 35ppm/month  |
|  | Drift with ABC disabled (Dual Channel)                             | 5ppm/month   |
|  | Resolution   | 1 PPM  |
|  | Range  | 0-2000 PPM (Default) (Programmable up to 10,000 PPM)   |
|  | Response Time  | 90 seconds to 90% reading  |
| Sample Rate                                    | 1s   |  |
| Temp and Pressure                              | Compensated. Barometric pressure also readable over communications |  |
| Relative Humidity (optional)                   | Type   | Digital CMOS   |
|  | Accuracy(2)  | ±2% over 0 to 80%RH range  |

|                                    |                          |   |
|------------------------------------|--------------------------|---|
|                                    | Resolution               | 0.05%RH   |
|                                    | Response time (3)        | 30s   |
|                                    | Sample rate              | 3s  |
|                                    | Operating range          | 0 to 100%RH (non-condensing)  |
|                                    | Operating conditions (4) | 41 to 140oF (5 to 60° C) @ 20% to 80%RH   |
| Temperature Transmitter (optional) | Type                     | Silicon Band-gap  |
|                                    | Nominal Accuracy         | ±0.3° C (operating range)   |
|                                    | Maximum Accuracy (2)     | ±0.5° C (at 25° C), ±1.0° C   |
|                                    | Resolution               | 0.01° C   |
|                                    | Response time            | 30s   |
|                                    | Sample rate              | 3s  |
| TVOC (optional)                    | Type                     | MOS   |
|                                    | Gas                      | Total VOC   |
|                                    | Range                    | 0-10,000 µg/m3  |
|                                    | Response Time            | <10s  |
|                                    | Accuracy (5)             | ±20 µg/m3 + 15% at 1 to 500 µg/m3 (typical)   |
|                                    | Output                   | 0-2000 µg/m3 (default) Programmable up to 10,000 µg/m3  |
| PMx (optional)                     | Type                     | Optical   |
| CLASS 1 LASER PRODUCT              | Size Range               | PM1.0, PM2.5, PM4.0, PM10.0   |
|                                    | Scale                    | 0-1000 µg/m3  |
|                                    | Lower detection limit    | 0.3 µm  |
|                                    | Precision                | ±10 µg/m3 (0-100µg/m3); ±10% (100-1000 µg/m3)   |
| Carbon Monoxide                    | Type                     | Electrochemical   |
|                                    | Detection Range          | 0-200 ppm   |
|                                    | Accuracy                 | 5% of reading   |
|                                    | Resolution               | 1 ppm   |
|                                    | Response Time            | 60 seconds  |
|                                    | Sensor Life              | 5 years   |
|                                    | Certifications           | UL2034 Recognized Component   |
| Ozone                              | Type                     | PMOS  |
|                                    | Ozone Detection Range    | 20-500 ppb  |
|                                    | Accuracy                 | ±15% of FS @ 20° C  |
| Ambient Light                      | Type                     | Phototransistor   |
|                                    | Scale                    | 0-300 fc (lm/ft2)   |
|                                    | Precision                | ±15%, across Full Range   |
| Operating Environment              | Temperature              | -4 to 122° F (-20 to 50° C). Devices including PM or CO sensors rated (-10 to 50° C) CO sensors can intermittently operate down to -20°C. |
|                                    | Humidity                 | 0-95% non-condensing  |
| Agency                             | Compliance               | CE, RoHS  |
| Enclosure                          | Material                 | ABS/Polycarbonate   |
|                                    | Dimensions               | 7.5”h x 4.4”w x 2.1”d   |
|                                    | Conduit Opening          | Tapped 1/2” NPT   |
|                                    | Rating                   | IP43 or NEMA 3R   |

(1) One side of transformer, secondary is connected to signal common.

(2) Models with PM sensor included achieve ±3% accuracy over 0 to 80%RH range and an additional temperature shift of up +0.5° C

(3) Time for reaching 63% of reading at 25° C and 1 m/s airflow

(4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading (+3%RH after 60 hours.)

*\* Product improvement is a continual process at Senva and product features and specification may change without prior notice. Refer to instructions that accompany the product for installation and wiring.*