

## TotalSense Series IAQ/Occupancy Sensor

Industry's first IAQ sensor with PIR motion detection

Ten environmental sensors: PIR, PMx, VOC, CO2, CO, O3, RH, T, ambient light, barometric pressure

Optional OLED to display environmental readings and setpoint

BACnet/Modbus or analog outputs with set-point relay

Pair with an IOTBuddy for BACnet IP or IOT Connection



### DESCRIPTION

The TotalSense Series provides more data for more advanced ventilation control while drastically reducing installation costs and time on a project. It includes a comprehensive selection of IAQ sensing with carbon dioxide (CO2), relative humidity (RH), and temperature plus options for occupancy detection (PIR), total volatile organic compounds (TVOC), particulate matter (PM), Carbon Monoxide (CO), and ambient light. More than an IAQ sensor, it's the first fully configurable Indoor Environmental Quality (IEQ) sensor matrix. Motion detection (PIR) can initiate ventilation upon occupancy, providing air exchanges the instant people are present, allowing for cleaner and safer indoor spaces while still saving energy.

### APPLICATIONS

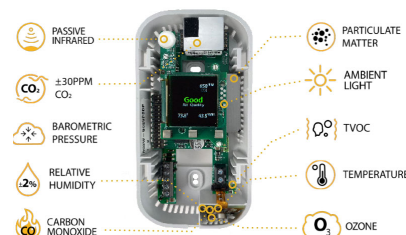
- Verify the effectiveness of IAQ strategies in post covid environment
- Energy management/building control
- Facilitates compliance with ASHRAE 62.1 standard for air quality
- Contributes toward satisfying Feature A08 and T06 under the WELL Building Standard®



Display, AQ ring, and standard designs



PIR Motion Detection (optional) - Detect occupancy for quicker and safer ventilation

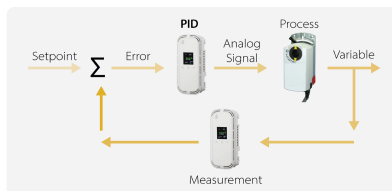


Configure up to ten sensors

### TAMPER PROOF



Tamper proof push-in lock tabs - great for schools!



NEW! PID control - program any analog output for local control of dampers or valves

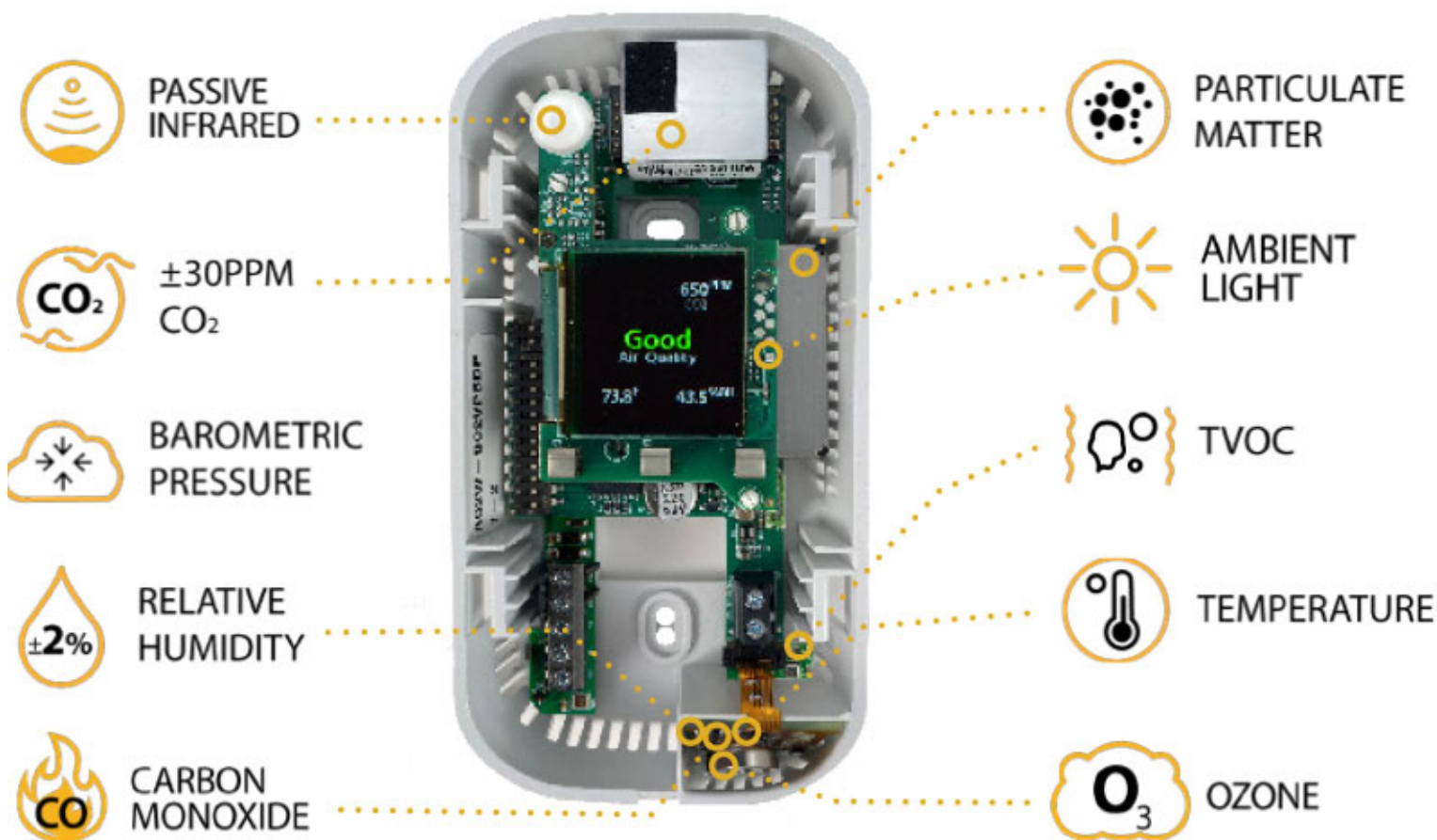


RESET monitors are tested and certified for your RESET Air Projects.

## FEATURES

- NEW! Save even more using an analog output for local PID control
- NEW! Dual BACnet/Modbus PLUS analog output version for BAS connection plus local analog control
- NEW! Configure and update firmware with the [SenvaSync](#) app
- Specify the exact product for your application with made in USA quality
- NEW! Use PIR occupancy sensor to enable auto-wakeup of display
- Color display and Air Quality Ring for tenant assurance (programmable)
- NEW! Use PIR occupancy sensor to enable auto-wakeup of display
- Initiate ventilation immediately upon occupancy detection for healthier buildings and energy savings
- Industry-leading temperature and barometric pressure compensated CO2 sensing with non-dispersive infrared sensing element (NDIR), 15+ year life expectancy on CO2 sensing element;  $\pm 30\text{ppm}$ ,  $\pm 3\%$  of reading
- Capacitive touch buttons make setup and use simple
- Slim and sleek surface-mount enclosure is tamper-proof and easy to install
- Field-replaceable sensors ease maintenance
- Set-point sliders and pushbuttons are also available to meet the requirements for any job
- 7-year limited warranty / 3 years on CO2 sensor - 2 years on all others

## TEN SENSING TECHNOLOGIES



AQ2	W	-										
<b>Mounting Type</b> W = Wall Mount	<b>Output Type</b> (1)(3)(4)(5)(7) A = Analog B = BACnet/Modbus D = Dual Analog + BACnet/Modbus		<b>CO2 (2)</b> A = None C = CO <sub>2</sub> D = Dual Channel CO <sub>2</sub>	<b>Humidity Sensor (RH) (3)</b> A = None 2 = 2% RH Sensor	<b>Total Volatile Organic Compounds (TVOC)</b> A = None V = TVOC	<b>Advanced Sensors</b> (4)(6)(7) A = None C = CO O = O <sub>3</sub> P = (PM) Particulate Matter 1.0, 2.5, 4.0, 10.0 Q = PM + O <sub>3</sub> R = PM + CO	<b>Temperature</b> (3)(5) A = None B = Transmitter C = 100PtRTD D = 1000PtRTD E = 10K Type 2 F = 10K Type 3 G = 10K W/ 11K H = 3K I = 2K2 J = 1K8 K = 20K	<b>Display</b> (1)(5)(6)(7) X = None D = OLED Display S = OLED w Solid Cover R = Air Quality Ring	<b>Optional Accessories</b> Blank = None (See below for options)			
<b>Setpoint Slider (7)</b> Blank = None C = 1K Ω F = 10K Ω G = 20K Ω T = 200-900 Ω	<b>Slider Offset Resistor</b> Blank = None E = 910 Ω K = 6K Ω		<b>Pushbutton (7)</b> Blank = None S = Slider Override Pushbutton (8) O = Thermistor Override Pushbutton (9) U = Stand Alone PB Terminals B = Comms Only PB (No Terminals)	<b>PIR Sensor</b> Blank = None P = PIR Sensing								

(1) Ambient light detection standard on all models selected with BACnet/Modbus and D= OLED Display Option.

(2) Barometric pressure sensing included standard on all models with CO2!

(3) Models with RH have a separate temp sensor that reads to the display and BACnet/Modbus, if chosen with any temperature selection.

(4) All PM options only available with BACnet/Modbus models.

(5) Only Transmitter and RH option is shown on display and readable via BACnet/Modbus. Thermistor versions not available to display on OLED or to read over BACnet/Modbus. See note (3).

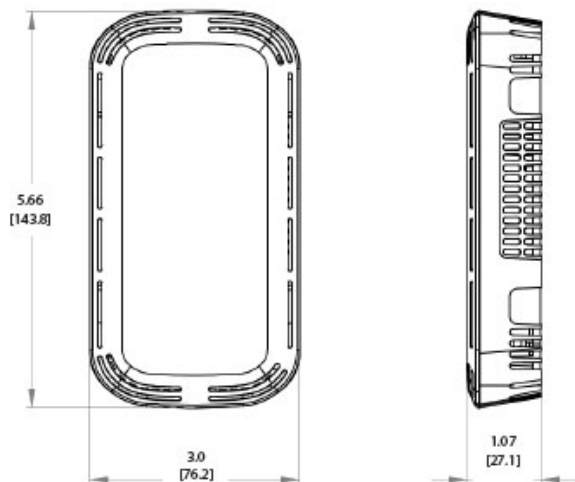
(6) CO sensor only available with display and Temp/RH for calibration purposes.

(7) Slider and pushbutton options not available with PM sensor. Call for

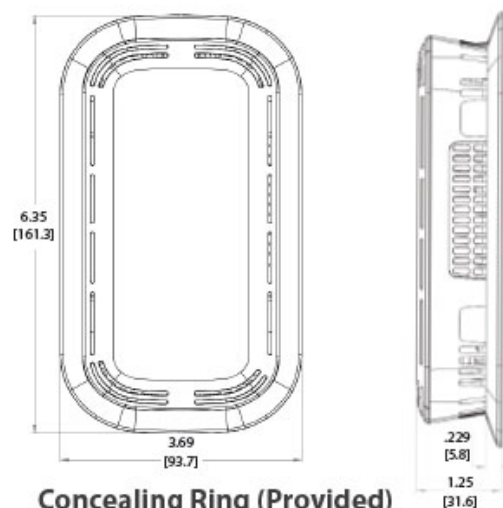
	Mount	Output	CO <sub>2</sub>	RH	TVOC	PM	Temp	Display	PIR
<b>AQ2</b>	W	B	C	2	V	P	F	D	P
<b>AQS</b>	-		CO <sub>2</sub>	Replacement CO <sub>2</sub> Sensor					
<b>AQS</b>	-		D	CO <sub>2</sub>	Replacement Dual CO <sub>2</sub> Sensor				

(TotalSense Wall mount with BACnet/Modbus RS-485, Temp, CO2, 2% RH, VOC, PM, 10K T3 Temp, OLED, PIR Sensor)

## DIMENSIONS



**Standard Surface Mount**



**Concealing Ring (Provided)**

- Conceal oversized drywall cutouts or European junction boxes



**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	Non-Display	16-30VDC/24VAC(1), 3.5W nominal, 4W max.
	Display or LED Ring	16-30VDC/24VAC(1), 4.3W nominal, 5W max.
Interface	OLED (optional)	1.5" Organic LED Display, 128x128, color
	Air Quality Ring	Color changing (red/yellow/green) LED Air Quality Ring
Analog Outputs (Analog or Dual version only)	Quantity	Up to 3 outputs
	Source	CO <sub>2</sub> , RH%, Temp, Temp slider, TVOC (selectable)
	Scale	0-5V, 0-10V, 4-20mA (switch selectable, programmable per output)
Protocol Output (Comms or Dual 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
Relay (Standard except for PM models)	Type	Solid-state output, 1A @ 30VAC/DC, N.O.
	Polarity	NO/NC (selectable)
	Source	CO <sub>2</sub> setpoint, RH setpoint, Temp setpoint, TVOC setpoint, PIR motion detection, Air Quality, off (selectable)
CO <sub>2</sub> (Optional)	Type	Non-dispersive Infrared (NDIR)
	Accuracy	±(30ppm + 3% of reading) (400-2,000ppm), -10-50°C, 0-85%RH
		±(50ppm + 5% of reading) (2,000-5,000ppm), -10-50°C, 0-85%RH
		>5,000ppm consult factory
	Resolution	1 ppm
	Range	0-2,000 PPM (Default) (Programmable up to 10,000ppm)
	Response time	90 seconds to 90% reading
	Sample rate	1s
	Temp and Pressure Compensation	Yes, barometric pressure readable over comms
Relative Humidity (Optional)	Type	Digital CMOS
	Accuracy(2)	2% models, +/-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)	-4 to 140oF (-20 to 60° C) @ RH>90%; -4 to 176oF @ RH=50%
Temperature Transmitter	With RH option	Without RH option
(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	0.1° C
	Response time	30s
	Sample rate	3s
TVOC (Optional)	Type	MOS
	Gas	Total VOC
	Formaldehyde CH2O Sensitivity	Responsive to Formaldehyde concentrations 50-1000 ppb
	Range	0-32,000 µg/m3 (Display may be programmed to show PPB)
	Response Time	<10s
	Output	0-2,000 µg/m3 (default) programmable up to 32,000 µg/m3
PMx (Optional)	Type	Optical
CLASS 1 LASER PRODUCT	Size Range	PM1.0, PM2.5, PM4.0, PM10.0
	Scale	0-1,000 µg/m3
	Lower detection limit	0.3 µm
	Precision	±10 µg/m3 (0-100µg/m3); ±10% (100-1,000 µg/m3)
	Long-Term Drift	±1.25 µg/m3 / year
Carbon Monoxide	Type	Electrochemical
	Detection Range	0-200 ppm
	Accuracy	±5% FullScale @20° C
	Resolution	1 ppm
	Response Time	60 seconds
	Sensor Life	5 years
	Certifications	UL2034 Recognized Component
Ozone	Type	PMOS
	Accuracy	±15% of fs @20° C
	Ozone Detection Range	20-500 ppb
PIR (Optional)	Type	Passive Infrared
	Axis X field of view	140o, 15 ft (4.5m)
	Axis Y field of view	76o, 15 ft (4.5m)
Ambient Light	Type	Phototransistor
	Scale	0-100 fc (lm/ft2), readable over comms
Operating Environment	Temperature	32 to 122oF (0 to 50oC)
	Humidity	0-95% non-condensing
Enclosure	Material	ABS Plastic
	Dimensions	5.67"h x 3.00"w x 1.07"d (With concealing ring: 6.35"h x 3.69"w x 1.25"d)
Compliance	Agency	CE, RoHS
	Accreditations	RESET Air Accredited Monitor
	Standards	Facilitates compliance with ASHRAE 62.1 standard for air quality

Contributes toward satisfying Feature A08 and T06 under WELL Building Standard®

- (1) One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.
- (2) Models with PM sensor included achieve  $\pm 5\%$  accuracy over 0 to 80%RH range and an additional temperature shift of up  $+0.5^{\circ}\text{C}$
- (3) Time for reaching 63% of reading at  $25^{\circ}\text{C}$  and 1 m/s airflow
- (4) Long term exposures to conditions outside normal range at high humidity may temporarily offset the RH reading ( $+3\%\text{RH}$  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.*