TotalSense™ Series
Indoor Environmental and Air Quality Sensor Matrix

Industry's first IAQ sensor with PIR motion detection
Nine environmental sensors: PIR, PMx, VOC, CO_2, RH, T, ambient light, barometric pressure
BACnet/Modbus and/or analog outputs with set-point relay

DESCRIPTION

The TotalSense™ Series provides more data for more advanced ventilation control while drastically reducing installation cost 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 + Formaldehyde (TVOC/CH_2O), particulate matter (PM), Carbon Monoxide (CO), barometric pressure, 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 (in addition to monitored elevated CO2 levels). This technology provides a much faster trigger for ventilation allowing for cleaner and safer indoor spaces while still saving energy.

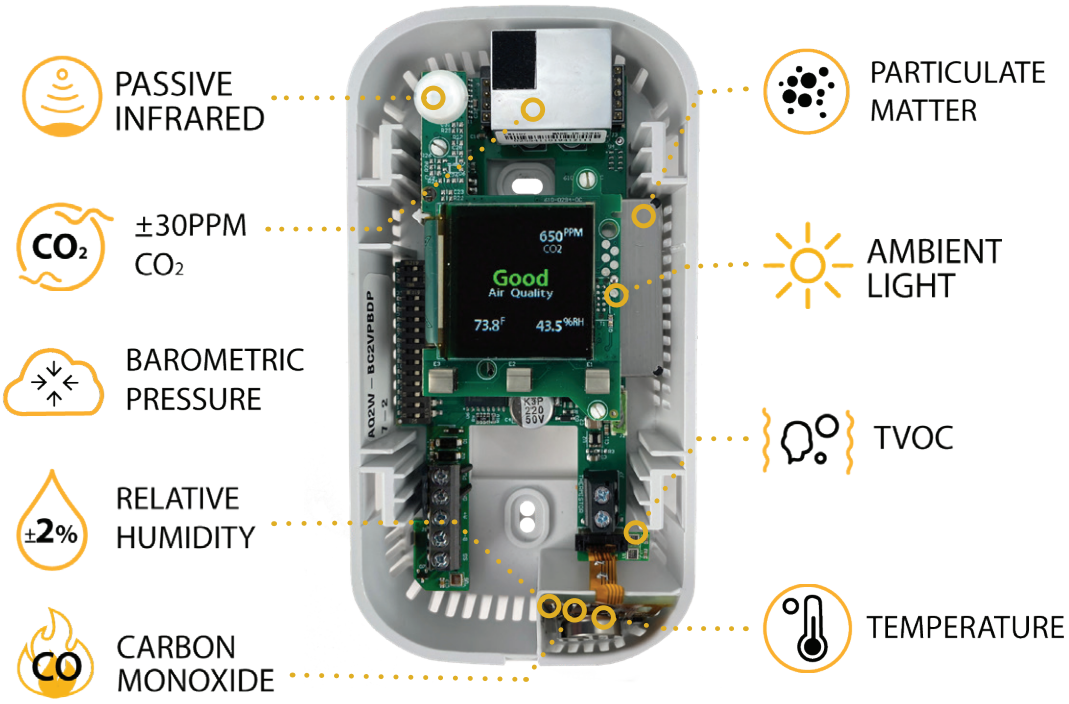
APPLICATIONS

- Verify effectiveness of IAQ strategies in post covid environment
- Energy management/building control
- Facilitates compliance with ASHRAE 62.1 standard for air quality

Made in USA

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

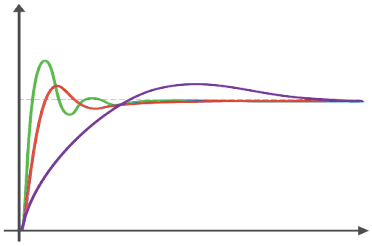
NINE TECHNOLOGIES FOR OPTIMUM INDOOR AIR QUALITY



OPTIONS

Versatile Display or AQ ring

- Fully customizable
- Good/Fair/Poor settings and color icons available



NEW

PID Control for CO2 or Temp

- Use PID feature on any analog output for local control of dampers or heat valves
- New models available with BACnet/ Modbus PLUS analog

Configuration App - Senva Sync

- Fast installation. Edit display, analog, or PID settings and load to one or many devices at a time - no device power needed!

PIR Motion Sensing

NEW

- Trigger ventilation or lighting based on occupant movement
- Automatic PIR wake-up for OLED display - highly visible readings whenever a room is occupied

Analog outputs or BACnet MSTP / Modbus RTU

- Compreshensive data
- Intregrated set-point relay (programmable)

TVOC and PM Sensors

- Detect unhealthy airborne particulates down to 0.3 µm or VOC's for a comprehensive understanding of indoor air quality.

ORDERING

AQ2 ☐ - ☐

Package
W = Surface

Output Type
A = Analog
B = BACnet/ Modbus
NEW D = Dual Analog + BACnet/ Modbus

CO2
A = None
C = CO2
D = Dual Channel CO2

Relative Humidity
A = None
2 = 2% RH

VOC
A = None
V = VOC

Advanced Sensors*
A = None
P = Particulate Matter (PM)
*C = CO*****
*R = PM + CO*****

Temperature Output**
A = None
B = Transmitter
C = 100Pt RTD
D = 1000Pt RTD
E = 10K Type 2
F = 10K Type 3
G = 10k w/11k
H = 3k
I = 2k2
J = 1k8
K = 20k

Display
X = None
D = OLED Display
S = OLED display with solid cover
R = Air Quality Ring

Accessories***
Blank = No Accessories
C = 1k Ω SP Slider
F = 10k Ω SP Slider
E = 910 Ω offset resistor
S= Slider override PB
O = Thermistor Override PB
U = User PB
B = Push button read over comms
T = 20k Ω offset resistor

PIR Sensor
P = PIR Sensing

(coming soon!) **COMMS Add-on Device**

IoT - ☒ ☒

Input
A = Analog
B = Comms

Output
W = WiFi
E = Ethernet
P = POE

*PM Available on AQ2W-B versions only. Advanced Sensor options "O" and "Q" only available on AQ2W-BC2VOB... models.
**Choose transmitter option for temperature display or BACnet/Modbus temp readings. Thermistor versions will be equipped with an isolated resistive thermistor circuit, so cannot be read on the display or over BACnet/Modbus.
***Slider and pushbutton options not available with PM sensor. Call for additional slider, offset, and override options.
****CO sensor only available with display option for calibration purposes.

SPECIFICATIONS

Power Supply	Non-Display	16-30VDC/24VAC[1], 3.5W nominal, 4W max.
	Display or LED Ring	24-30VDC/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	CO2, 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_2 setpoint, RH setpoint, Temp setpoint, TVOC setpoint, PIR motion detection, Air Quality, off (selectable)
CO_2 (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 140°F (-20 to 60° C) @ RH>90%; -4 to 176°F @ RH=50%

Temperature Transmitter (Optional)	With RH option	Without RH option
Type	Silicon Band-gap	NTC Thermistor
Nominal Accuracy	±0.3° C (operating range)	±0.5° C (operating range)
Maximum Accuracy [2]	±0.5° C (at 25° C), ±1.0° C	±1.0° C (at 25° C), ±2.0° C
Resolution	0.1° C	0.05° C
Response time	30s	30s
Sample rate	3s	100 milliseconds

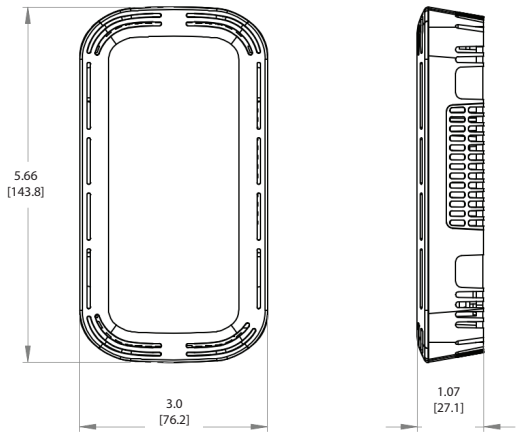
TVOC (Optional)	Type	MOS
	Gas	Total VOC
	Formaldehyde CH_2O Sensitivity	Responsive to Formaldehyde concentrations 50-1000 ppb
	Range	0-32,000 µg/m^3 (Display may be programmed to show PPB)
	Response Time	<10s
	Output	0-2,000 µg/m^3 (default) programmable up to 32,000 µg/m^3

1. *One side of transformer, secondary is connected to signal common. Dedicated transformer is recommended.*
2. *Models with PM sensor included achieve* ±5% accuracy over 0 to 80%RH range and an additional temperature shift of up to +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.)*

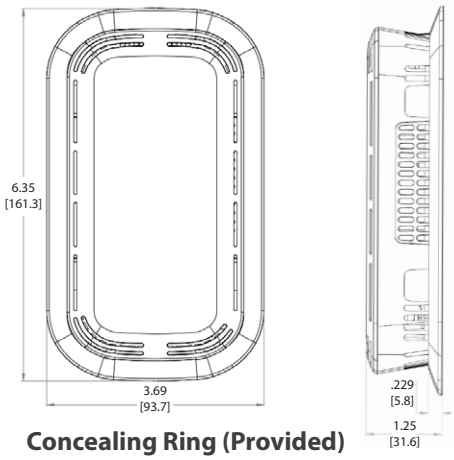
SPECIFICATIONS

PMx (Optional) CLASS 1 LASER PRODUCT	Type	Optical
	Size range µm/m^3	1.0, 2.5, 4.0, 10.0 (each range is 0.3 µm-x.x µm)
	Size Range #/cm^3	0.5, 1.0, 2.5, 4.0, 10.0 (each range is 0.3 µm-x.x µm) (comms readings only)
	Scale	0-1,000 µg/m^3
	Lower detection limit	0.3 µm
	Precision	±10 µg/m^3 (0-100µg/m^3); ±10% (100-1,000 µg/m^3)
	Long-Term Drift	±1.25 µg/m^3 / year
Carbon Monoxide NEW	Type	Electrochemical
	Detection Range	0-200 ppm
	Accuracy	±5% Full scale @20ºC
	Resolution	1 ppm
	Response Time	<30 seconds to 90%
	Sensor Life	5 years
	Certifications	UL2034 recognized component
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/ft^2), 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 the WELL Building Standard®

DIMENSIONS



Standard Surface Mount



Concealing Ring (Provided)

- Conceal oversized drywall cutouts or European junction boxes

Warning: *Refer to installation instructions that accompany product and heed all safety instructions.*