TotalSense™ Series
Indoor Environmental and Air Quality Sensor Matrix

NEW

Industry's first IAQ sensor with PIR motion detection
Eight environmental sensors: PIR, PMx, VOC, CO2, RH, T, ambient light, barometric pressure
BACnet/Modbus 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 (TVOC), particulate matter (PM) 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. PIR and ambient light sensors can also be utilized for light harvesting for additional energy savings and code compliance.

APPLICATIONS

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

INTERNATIONAL WELL BUILDING INSTITUTE™

Made in USA

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

Modbus   BACnet   ISO   RoHS   CE

FEATURES

- Reduce installation costs with multiple sensors in a standard size enclosure
- Specify the exact product with over 25,000 unique combinations
- Color display and Air Quality Ring for tenant assurance (programmable)
- Initiate ventilation immediately upon occupancy detection for healthier buildings and energy savings
- Sense unhealthy or offensive air with TVOC.
- Detect a variety of PM sizes to indicate airborne respiratory droplets, allergens, and other dangers
- Industry-leading temperature and barometric pressure compensated CO2 sensing with non-dispersive infrared sensing element (NDIR), 15+ year life expectancy on CO_2 sensing element; ±30ppm, ±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 PM, RH, Temp, and CO_2 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 CO_2 sensor - 2 years on all others

Versatile display (optional)

Slim surface-mount enclosure
Setpoint slider and user pushbutton options

OPTIONS

Versatile Display

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

Non-Display for more discreet sensing

- Display + cover option also available for ease of setup

GOOD   FAIR   POOR

Air Quality Ring

- Provides occupants assurance without confusing metrics
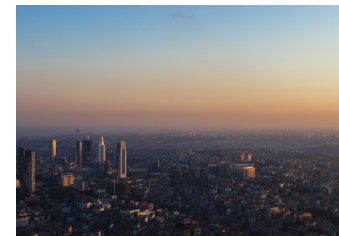- Green/yellow/red

PIR Motion Sensing

- Trigger ventilation or lighting based on occupant movement

Built for building automation.

Available with analog or...

Modbus

ASHRAE **BACnet**®

Analog outputs or BACnet MSTP / Modbus RTU

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

TVOC and PM Sensors

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

EIGHT TECHNOLOGIES FOR OPTIMUM INDOOR AIR QUALITY

PIR (Passive Infrared) Motion detector typically used for lighting control that can also be used to immediately indicate occupancy and deliver fresh air

CO_2 (Carbon Dioxide) Detect levels of CO_2 indicating occupancy to trigger ventilation (field replaceable)

PM$_x$ (Particulate Matter) Detect the presence of airborne bacteria, dust, pollen, and other airborne particulates. Can be used to determine the effectiveness of filtration (field replaceable)

Ambient Light Adjust lighting levels based on natural light for energy savings

TVOC (Total Volatile Organic Compounds) Monitor for toxins from chemical by-products of manufacturing, paints, cleaning products, solvents, and more

Temperature Maintain comfort levels (field replaceable)

RH (Relative Humidity) Monitor humidity - regulating humidity levels ensures occupant comfort and may minimize risk of spreading pathogens (field replaceable)

Barometric Pressure Used to compensate CO2 readings

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 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 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	CO2 setpoint, RH setpoint, Temp setpoint, TVOC setpoint, PIR motion detection, Air Quality, off (selectable)
CO2 (Optional)	Type	Non-dispersive Infrared (NDIR)
	Accuracy	$\pm$(30ppm + 3% of reading) (400-2,000ppm), -10-50°C, 0-85%RH $\pm$(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	$\pm$0.3° C (operating range)	$\pm$0.5° C (operating range)
	Maximum Accuracy [2]	$\pm$0.5° C (at 25° C), $\pm$1.0° C	$\pm$1.0° C (at 25° C), $\pm$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
	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

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	PM1.0, PM2.5, PM4.0, PM10.0
	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
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

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ORDERING

| AQ2 ☐ - ☐	☐	☐	☐	☐	☐	☐	☐☐☐
Package	**Output Type**	**CO2**	**Relative Humidity**	**VOC**	**Particulate Matter***	**Temperature Output**	**Display**

Package
W = Surface

Output Type
A = Analog
B = BACnet/Modbus

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

Relative Humidity
A = None
2 = 2% RH

VOC
A = None
V = VOC

Particulate Matter*
A = None
P = PM 1.0, 2.5, 4.0, 10.0

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

PIR Sensor
P = PIR Sensing

*PM Available on AQ2W-B Surface mount + BACnet/Modbus versions only
**Additional SP sliders and offset resistors available upon request
**Slider and pushbutton options not available with PM sensor. Call for additional slider and override options.

DIMENSIONS

5.66 [143.8]
3.0 [76.2]
1.07 [27.1]

Standard Surface Mount

6.35 [161.3]
3.69 [93.7]
.229 [5.8]
1.25 [31.6]
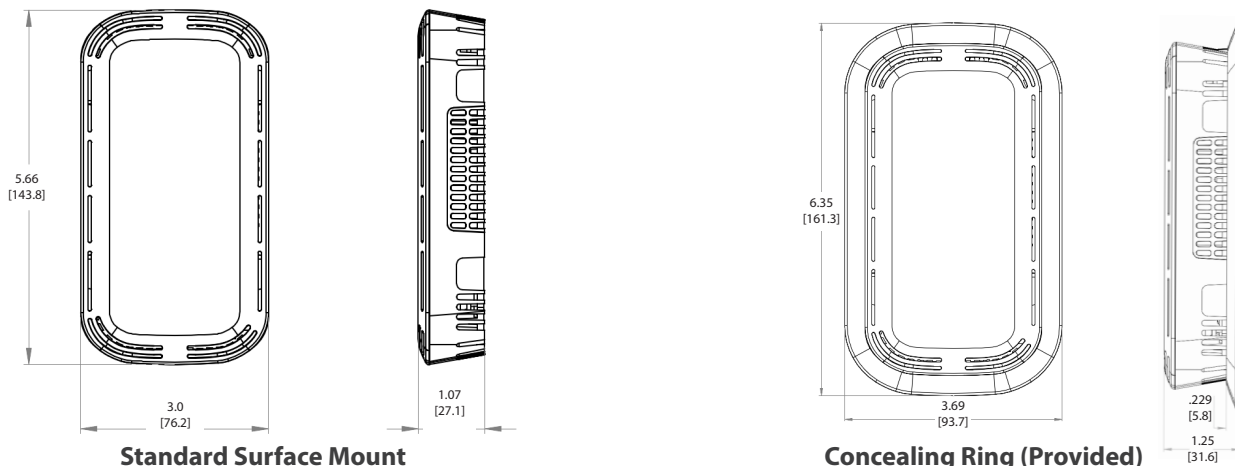
Concealing Ring (Provided)
▪ Conceal oversized drywall cutouts or European junction boxes