

Wireless Air Velocity Sensors

General Description

The wireless air velocity sensor measures the pressure difference between two input ports, the temperature, and altitude determines the speed at which the air is moving in a system and transmits the measurement to ICARE.

- Measurement range: -50 m/s to 50 m/s
- Calibrated and temperature compensated

Principle of Operation

The sensor measures the pressure difference between two ports. When viewing the sensor from the top, the right inlet port is the positive or high side pressure input. When the pressure on this port is greater than the left port the sensor produces a negative pressure reading. When the pressure is greater on the left port the sensor produces a positive pressure reading. Combined with the temperature and the altitude, the sensor determines at what rate the air is flowing in a system.

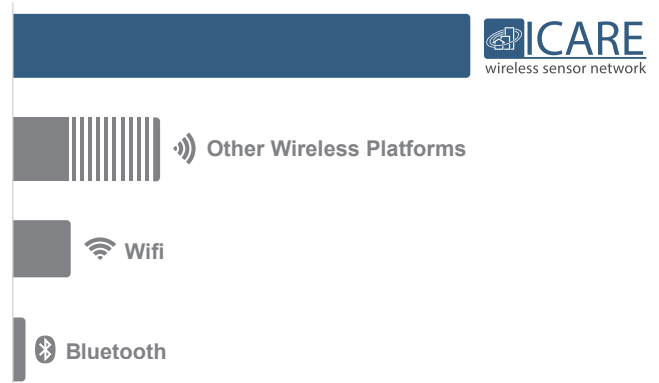
Example Applications

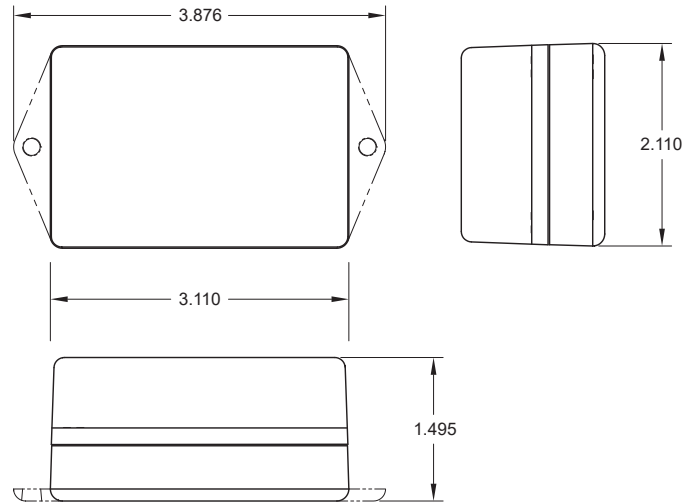
- Building/Room Pressure
- Air Flow
- Variable Air Volume Filter Status
- Duct Pressure
- Clean Rooms
- Hospitals
- Fume Hoods
- Computer Rooms
- Many additional applications

Features of ICARE Sensors



- Wireless range of 1,200+ feet through 12+ walls *
 - Frequency-Hopping Spread Spectrum (FHSS)
 - Improved interference immunity
 - Improved power management for longer battery life ** (12+ years on AA batteries)
 - Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
 - Onboard data memory stores up to 3200 readings per sensor:
 - 10-minute heartbeats = 22 days
 - 2-hour heartbeats = 266 days
 - Over-the-air updates (future proof)
 - Online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email
- * Actual range may vary depending on environment.
 ** Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

Wireless Range Comparison



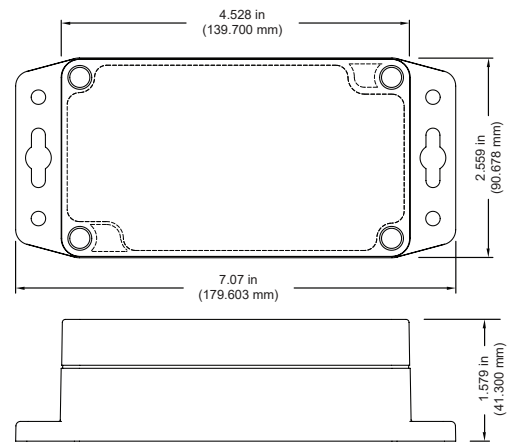


Commercial Wireless Air Velocity Sensor | Technical Specifications



Supply voltage	2.7–3.6 VDC (3.0–3.6 VDC using power supply) *
Current consumption	0.2 μ A (sleep mode), 0.7 μ A (RTC sleep), 570 μ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)
Operating temperature range (commercial version) **	-18°C to 55°C (0°F to 130°F) with Alkaline Batteries -40°C to 85°C (-40°F to 185°F) with Lithium Battery **
Pressure range	-500 Pa to 500 Pa
Allowable overpressure	100 kPa
Rated burst pressure	500 kPa
Max humidity for long-term exposure	40°C dew point
Range at 0 m Altitude Range at 5000 m Altitude Range at 8000 m Altitude	0-30m/s 0-40m/s 0-50m/s
Span repeatability	0.5% of reading
Span shift due to temperature variation	< 0.5% of reading per 10°C
Offset stability	< 0.05 Pa/year
Calibrated for	Air, N2
Media compatibility	Air, N2, O2, non-condensing
Temperature measurement range	-40°C to 85°C (-40°F to +185°F)
Calibrated temperature measurement range	-20°C to 85°C (-4°F to +185°F)
Temperature resolution	0.1°C
Temperature accuracy	+/- 2°C (-10°C to +60°C) +/- 3°C (-40°C to +85°C)
Temperature repeatability	+/- 0.1°C
Integrated memory	Up to 3200 sensor messages
Wireless range	1,200+ ft non-line-of-sight
Wireless operation	900 MHz—Frequency-Hopping Spread Spectrum 868 MHz and 433 MHz—Frequency-Agile Wireless
Security	256-bit key exchange and AES-128 CTR)
Weight	3.7 ounces
Certifications	  Industry Canada 900 MHz wireless product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1.

* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.



Industrial Wireless Air Velocity Sensor | Technical Specifications

Supply voltage	2.7–3.6 VDC (3.0–3.6 VDC using power supply) *	
Current consumption	0.2 μ A (sleep mode), 0.7 μ A (RTC sleep), 570 μ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)	
Operating temperature range (board circuitry and battery)	-40°C to +85°C (-40°F to +185°F) **	
Included battery	Max temperature range	-40° to +85°C (-40° to +185°F)
	Capacity	1500 mAh
Optional solar feature	Solar panel	5VDC/30mA (53mm x 30mm)
	Charging temperature range	0° to 45°C (32° to 113°F)
	Max temperature range	-20° to 60°C (-4° to 140°F)
	Included rechargeable battery	600 mAh/>2000 charge cycles (80% of initial capacity)
	Solar efficiency	Optimized for high and low-light operation ***
Pressure range	-500 Pa to 500 Pa	
Allowable overpressure	100 kPa	
Rated burst pressure	500 kPa	
Max humidity for long-term exposure	40°C dew point	
Range at 0 m Altitude	0-30m/s	
Range at 5000 m Altitude	0-40m/s	
Range at 8000 m Altitude	0-50m/s	
Span repeatability	0.5% of reading	
Span shift due to temperature variation	< 0.5% of reading per 10°C	
Offset stability	< 0.05 Pa/year	
Calibrated for	Air, N2	
Media compatibility	Air, N2, O2, non-condensing	
Temperature measurement range	-40°C to 85°C (-40°F to +185°F)	
Calibrated temperature measurement range	0.1°C	
Temperature resolution	0.1°C	
Temperature accuracy	+/- 2°C (-10°C to +60°C) +/- 3°C (-40°C to +85°C)	
Temperature repeatability	+/- 0.1°C	
Integrated memory	Up to 3200 sensor messages	
Wireless range	1,200+ ft non-line-of-sight	
Security	256-bit key exchange and AES-128 CTR)	
Weight	4.7 ounces	
Enclosure rating	NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof	
UL rating	UL Listed to UL508-4x specifications (File E194432)	
Certifications	 	900 MHz wireless product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1.

* Circuits cannot withstand negative voltage. Please take care when installing batteries.

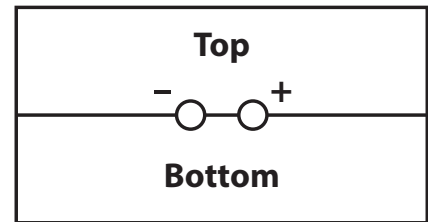
** At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

*** Solar feature works indoors with low light. Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

Note

Do not connect any tubing to the pressure ports without the sensor lid securely installed. The lid helps keep the sensor in place and stabilizes and supports the pressure ports.

Pressurizing the positive side will produce a positive reading. Pressurizing the negative side will produce a negative reading.



Commercial Grade Sensors

ICARE commercial grade sensors are designed for applications in ordinary environments (normal room temperature, humidity and atmospheric pressure). Do not use these sensors under the following conditions as these factors can deteriorate the product characteristics and cause failures and burn-out.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxides gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils chemical liquids or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality.

Industrial Grade Sensors | Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure

ICARE's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed water).

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure



For more information about our products or to place an order, please contact our sales department at 586-899-1150.

Visit us on the web at www.icaremonitoring.com.

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