



Technology that Breathes

Wireless Differential Pressure Sensors

General Description

The Sense IoT wireless differential pressure sensor measures the pressure difference between two input ports and transmits the measurement to the Sense IoT system.

- Measurement range: -500 Pa to 500 Pa
- Calibrated and temperature compensated

Principle of Operation

The differential pressure 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.

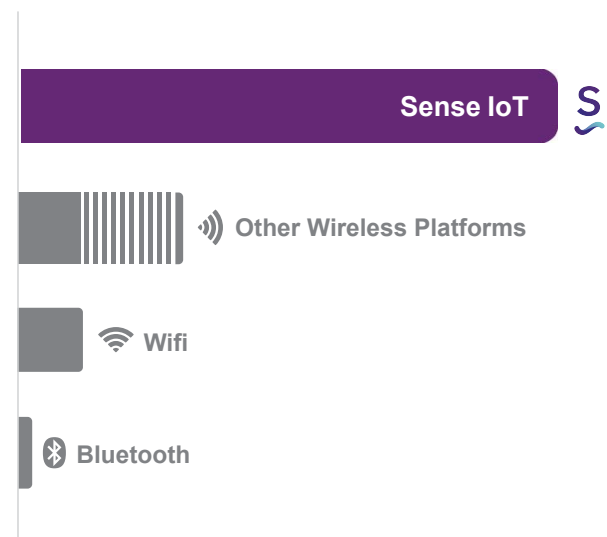
Example Applications

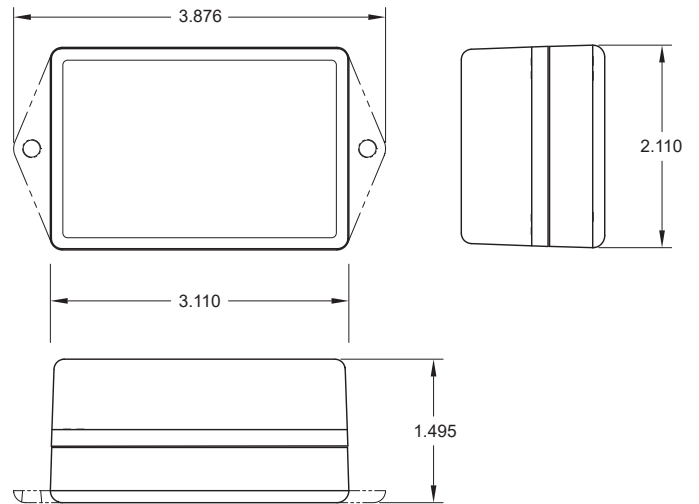
- Building/Room Pressure
- Air Flow
- Variable Air Volume Filter Status
- Duct Pressure
- Clean Rooms
- Hospitals
- Fume Hoods
- Computer Rooms
- Many additional applications

Features of Sense IoT Sensors


- Wireless range of 350 meters through 12+ walls *
 - Frequency-Hopping Spread Spectrum (FHSS)
 - Improved interference immunity
 - Improved power management for longer battery life ** (12+ years on AA batteries)
 - Encrypt-RF® Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
 - Onboard data memory stores up to 512 readings per sensor:
 - 10-minute heartbeats = 3.5 days
 - 2-hour heartbeats = 42 days
 - Over-the-air updates (future proof)
 - Sense IoT online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and
- * 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



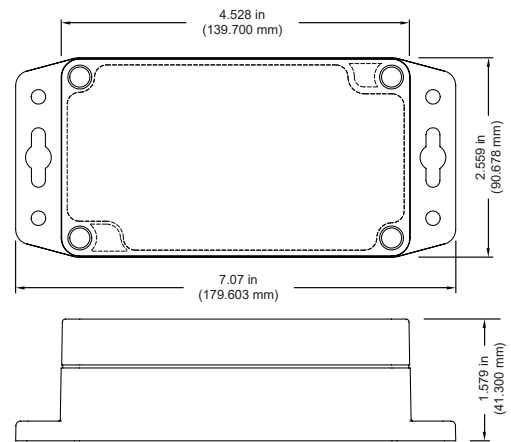


Sense IoT Differential Pressure Sensor | Technical Specifications





Supply voltage	2.7–3.8 VDC (3.0–3.8 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 with Alkaline Batteries -40°C to 85°C 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
Accuracy	3% of reading +/- 0.1 Pa
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, N ₂
Media compatibility	Air, N ₂ , O ₂ , non-condensing
Temperature measurement range	-40°C to 85°C
Calibrated temperature measurement range	-20°C to 85°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 512 sensor messages
Wireless range	350m non-line-of-sight
Wireless operation	900 MHz—Frequency-Hopping Spread Spectrum 868 MHz and 433 MHz—Frequency-Agile Wireless
Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)
Weight	3.7 ounces
Certifications	 900 MHz product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950

* 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.



Sense IoT Industrial Wireless Differential Pressure Sensor | Technical Specifications

Supply voltage	2.7–3.8 VDC (3.0–3.8 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	
Included battery	Max temperature range	-40° to +85°C
	Capacity	1800 mAh
Optional solar feature	Solar panel	5VDC/30mA (53mm x 30mm)
	Charging temperature range	0° to 45°C
	Max temperature range	-20° to 60°C
	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	
Accuracy	3% of reading +/- 0.1 Pa	
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	
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 512 sensor messages	
Wireless range	350m non-line-of-sight	
Security	Encrypt-RF® (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 product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1. 868 and 433 MHz product tested and found to comply with: EN 300 220-2 V3.1.1 (2017-02), EN 300 220-2 V3.1.1 (2017-02) and EN 60950

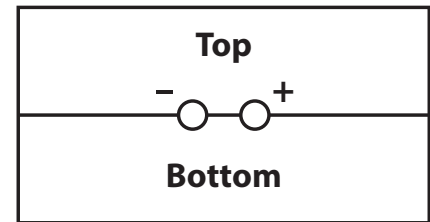
* Hardware cannot withstand negative voltage. Please take care when connecting a power device.

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

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

Sense IoT 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

Sense IoT 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

sense^{IoT}

For more information about our products or to place an order, please contact our sales department at 03 8640 0123.

Visit us on the web at www.senseiot.com.au.

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