



# R160 Differential Air Pressure Sensor

*The R160 Differential Air Pressure Sensor monitors and reports the differential air pressure reading between two points, enabling greatly enhanced data center air pressure/air flow monitoring and optimization.*

## Features & Benefits

- ♦ **Wire-free Sensor Tag Provides Wireless Differential Pressure Data**
- ♦ **Ideal for Optimizing Data Center Air Flow and Cooling Systems**
- ♦ **Reports Differential Air Pressure Between Two Points**
- ♦ **Fully Compatible with RF Code's Sensor Manager and Asset Manager Software Solutions**
- ♦ **Easy-to-Deploy, "Wire-free" Monitoring**
- ♦ **Sensor Tag Easily Mounts to Flat Surfaces, Walls or Pipes**
- ♦ **Tubing Can Be Routed Above /Below Floors, along Walls, Plenums or Air Ducts**
- ♦ **Low Power Consumption for Long Battery Life**

RF Code's R160 Differential Air Pressure Sensor monitors and reports the differential air pressure reading between two points (e.g., above vs. below a raised floor or room vs. plenum). While the pressure ranges found in the data center can exceed 0-0.5" H2O/0-125 Pa, the pressure differentials found in the plenum are often only 0.01" H2O/2.5 Pa, requiring a sensor to be both accurate and precise in order to assure proper monitoring. Periodically reporting its unique ID along with the sensor data observed by the tag, the R160 is designed for use in combination with an RF Code fixed reader infrastructure and the RF Code software stack (Zone Manager, Sensor Manager or Asset Manager).

The R160 sensor is housed in an impact-resistant, flame-retardant ABS plastic enclosure that can be mounted with strong adhesive on the back of the case, or via hardware/screws or zip-ties through the mounting holes. The unit ships with 8 feet of flexible tubing (plenum rated UL 94V2, UL 1820) to achieve physical separation between the +/- sensor terminals (e.g., position the end of the "+ tube" below a raised floor and affix the "- tube" above the raised floor).

The tag is designed for years of reliable performance with a battery life that exceeds 5 years in most deployment environments. The tag is powered by three (3) CR2032 replaceable batteries with a very low duty cycle and a 10-second beacon rate. The R160's form factor ensures clear signal transmission in high-density deployments; install the sensor above the raised floor for best RF transmissions (assuming the readers are also above the raised floor).

Featuring a low-battery alert, the tag will continue to report pressure data for at least three months following the initial alert. After that, the tag will broadcast its unique ID and a low battery indication with each beacon, but will not report pressure data until the batteries are replaced. Exposure to extreme temperatures will shorten the battery life. RF Code warrants all sensor tags to be free from defects in materials and workmanship for a period of 1 year.

In the typical data center, there is hardly any variation in pressure above the raised floor, but the air pressure under the raised floor can vary due to under-floor blockages and positioning of the air conditioning units. The air flow rate through perforated tiles varies across the data center, making it hard to manage the proper placement of servers. Installers may route cables and other blockages under the floor, creating air dams and causing hot spots above the floor. Some designers elect to leave the floor void empty - this can have the opposite effect, creating "weather systems" under the raised floor with large air circulations and moving eddies; this can cause wild swings in CFM through the perforated tiles as the eddies shift under the flooring.

Typically, when differential air pressure is monitored for control purposes, one channel (tube) of the pressure sensor is placed on a wall or column above the raised floor and the other pressure channel (tube) is placed under the raised floor. The highest pressure zones exist near the CRACs; it is best to install sensor tubes no closer than 10 feet from the CRAC.

*The wire-free R160 Differential Air Pressure Sensor gives you real-time data on the air pressure conditions inside your data center, enabling effortless air pressure monitoring and greatly enhancing your ability to optimize air pressure and air flow in your data center.*



# RF Code R160 Differential Air Pressure Sensor Specifications

## OPERATION

Operating Frequency	433.92 MHz
Unique Tag ID Codes	> 540,000 unique IDs per Group Code
Typical Transmission Range	> 30 ft in the data center
Radiated Emissions	71.8 dBuV/m at 3 meters (maximum)
Stability	Saw stabilized
Differential Pressure Range	+/- 2.0" H2O or +/- 500 Pa
Zero Point Accuracy	0.001" H2O or 0.2 Pa
Span Accuracy	±3.0% of reading
Resolution	±0.001" H2O or ±0.25 Pa
Sampling Rate	60 seconds

## ENCLOSURE

Width	4.25 in (107.95 mm)
Depth	2.25 in (57.15 mm)
Height	1.00 in (25.4 mm)
Case Weight (with tag)	3.25 oz (92 grams)
Tubing Length	8 feet (2.44 meters)
Tubing Plenum Rating	UL 94V2, UL 1820
Construction	Injection-molded flame-retardant ABS enclosure, UL rating: 94-5VA
Durability	Tough, impact resistant and temperature stable
Mounting Options	Industrial-strength adhesive or screw-mountable or zip-tie through mounting holes

## ENVIRONMENTAL

Operating Temperature	-20° C to +70° C (-4° F to +158° F)
Storage Temperature	-40° C to +80° C (-40° F to +176° F)

## POWER

Battery Type	Three (3) Lithium CR2032 replaceable coin cells
Smart Tag Features	Low battery indication
Battery Life	> 5 years (typical)