

Differential Pressure Sensor

Sensor for remote detection of an HVAC air filter condition. This device, belonging to the PRO sensor series, includes Aranet Sub-GHz ISM band radio which wirelessly transmits sensor measurements to the Aranet PRO base station.



Product numbers

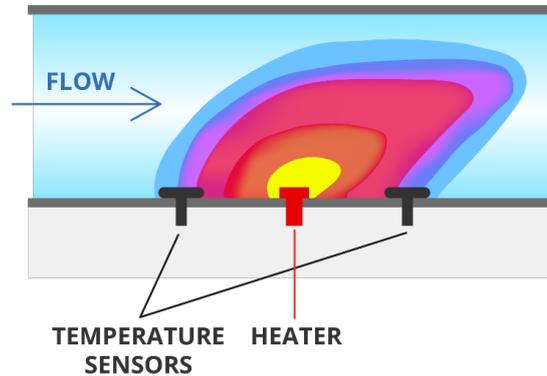
| | |
|----------------|----------|
| European Union | TDSPDP02 |
| United States | TDSPDPU2 |
| Asia | TDSPDPU2 |

Differential pressure measurement performance

| | | |
|----------------------|--------------------------------------|-----------|
| Pressure range | ±500 Pa | |
| Resolution | 0.02 Pa | |
| Accuracy | ±(0.10 Pa + 3 % of reading) | |
| Long term drift | 0.05 Pa/year | |
| Response time (99 %) | <1 s | |
| Temperature | -20–60 °C | -4–140 °F |
| Calibrated for | Air, N ₂ | |
| Gas compatibility | Air, N ₂ , O ₂ | |

- Accuracy is provided at temperature 25 °C (77 °F) and absolute pressure 966 mbar.
- Long term exposure to high concentrations of O₂ at high temperatures can reduce the product lifetime.

Differential pressure measurement principle



The differential pressure is measured by thermal sensor elements using a flow-through technology. The image above illustrates the principle embedded in the sensing element: The gas flows through the sensor, linking both sides of the differential pressure measurement. Gas moves from a region of high relative pressure to one of lower relative pressure. A controlled heat flux is applied to the gas through an embedded heating element, while two temperature sensors gauge this heat flow rate. Measuring this flow rate allows for the calculation of the differential pressure.

General specifications

| | | |
|-----------------------------------|---------------------------|----------------|
| Ingress protection rating | IP65 | |
| Operating temperature range | -40–60 °C | -4–140 °F |
| Operating relative humidity range | -40–140 % | |
| Dimensions | 160×90×45 mm | 6.3×3.5×1.8 in |
| Weight (incl. battery) | 250 g | 9 oz |
| Enclosure material | Polycarbonate | |
| Power supply | 2 pcs AA batteries | |
| Packaging includes | 2 pcs AA alkaline battery | |

Aranet radio parameters

| | | |
|----------------------------|-------------------|--------|
| Line of sight range | 3 km | 1.9 mi |
| Transmitter power | 14 dBm | 25 mW |
| Data transmission interval | 1, 2, 5 or 10 min | |
| Data protection | XXTEA encryption | |

Battery lifetime

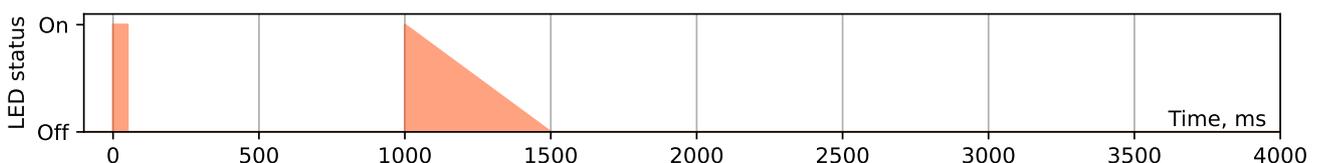
| Measurement interval | Alkaline battery lifetime | Lithium battery lifetime |
|----------------------|---------------------------|--------------------------|
| 1 min | 3.9 years | 5.4 years |
| 2 min | 6.8 years | 9.8 years |
| 5 min | 10 years | >10 years |
| 10 min | 10 years | >10 years |

- Battery lifetime data has been obtained by mathematical extrapolation and is provided for descriptive purposes only and is not intended to make or imply any guarantee or warranty.
- Battery lifetime tests and calculations performed assuming device is at 20 °C (68 °F) and using *Fujitsu Premium LR6G07* (alkaline) and *Energizer Ultimate Lithium L91* (lithium) AA batteries as reference.
- The operating temperature range may vary based on the battery type used. Generally, the range for alkaline batteries is between -20–50 °C (-4–122 °F), whereas for lithium batteries, it is -40–60 °C (-40–140 °F).

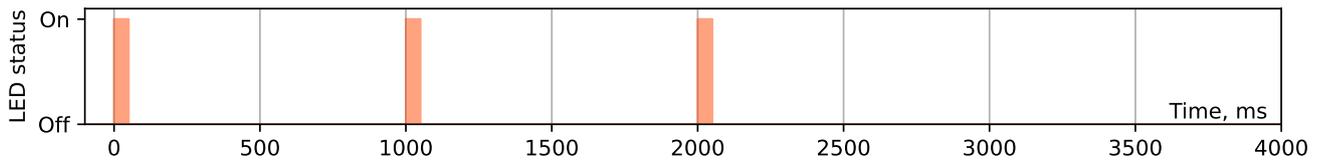
Pairing process description

As part of the Aranet PRO product series, this device enables wireless sensor reading transmission to the Aranet PRO and PRO Plus base station. Here's how to pair the sensor with the base station:

- Place the sensor within 20 m (60 ft) of the base station during pairing. Once paired, it can communicate over a much greater distance (up to 3 km / 1.9 mi line of sight).
- If the sensor uses a power supply unit, unplug it. Open the sensor casing and remove the battery for at least 20 seconds. Alternatively (for newer hardware revisions), locate the PAIRING button on the sensor PCB which can be used to initiate pairing without the removal of battery.
- Access the SENSORS menu in the base station Web GUI. Set the measurement interval and select PAIR SENSOR to start the pairing process.
- Within a 2-minute window, insert the battery or press the PAIRING button on the sensor PCB (for newer hardware revisions) to initiate pairing.
- A successful pairing is indicated by the sensor appearing in the Web GUI and a specific LED blink sequence on the sensor PCB (one to three short blinks followed by a longer fade-out blink of the LED):



- If pairing fails, the sensor won't appear in the Web GUI, and the LED blink sequence will consist only of three short blinks. In this case, repeat the procedure closer to the base station.



- After successful pairing, customize parameters like name and tags in the Web GUI. Close the sensor casing and install it in the desired location.

Compliance information

CE Conformité Européenne

FC Federal Communications Commission (USA)

IC Innovation, Science and Economic Development Canada