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

Product number	Radio band	To be used in
TDSPDP02	EU868	European Union
TDSPDPU2	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPDPU2	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
Not available	JP923	Japan
Not available	KR923	South Korea

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 compatability	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 O_2 at high temperatures can reduce the product lifetime.

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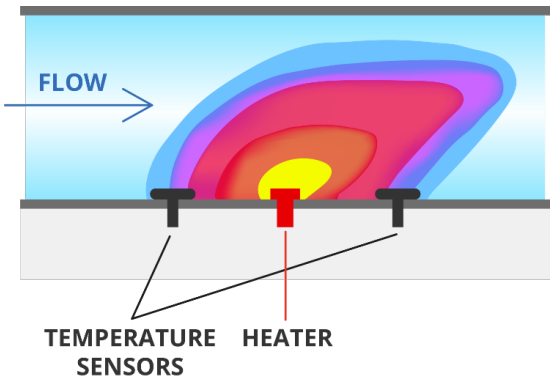
Differential pressure measurement principle



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	

- Specifically for JP923 radio band, reduced transmitter power of 13 dBm (20 mW) is used.

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Aranet radio bands and channels

Radio band	Channel 1	Channel 2	Channel 3	Channel 4
EU868	868.1 MHz	868.3 MHz	868.5 MHz	—
US920	917.3 and 922.9 MHz	917.5 and 923.1 MHz	917.7 and 923.3 MHz	917.9 and 923.5 MHz
AS923	923.1 MHz	923.3 MHz	—	—
JP923	923.0 MHz	923.4 MHz	—	—
KR923	923.1 MHz	923.3 MHz	—	—

- This table outlines the radio channels utilized by Aranet Sub-GHz radio technology for transmitting sensor data to the base station, complying with the legislation in various regions. To determine availability of this product in your region and the corresponding channels used, refer to the *Product numbers* table at the beginning of this document.

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:

- **Preparing for pairing:** 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).
- **Power off the sensor:** If the sensor comes with a battery-disconnect pull tab, leave it in place for now. For battery-powered sensors that are already on, open the casing and remove the battery for at least 20 seconds. If the sensor uses a power supply, unplug it. For newer hardware versions, locate the PAIRING button on the sensor PCB which can be used to initiate pairing without the removal of battery.
- **Start the pairing process:** Access the SENSORS menu in the base station Web GUI. Set the measurement interval and select PAIR SENSOR to start the pairing process.

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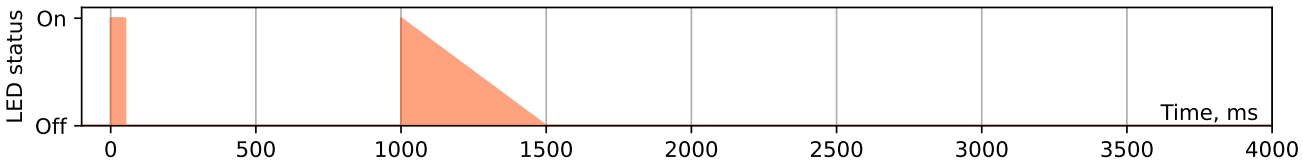
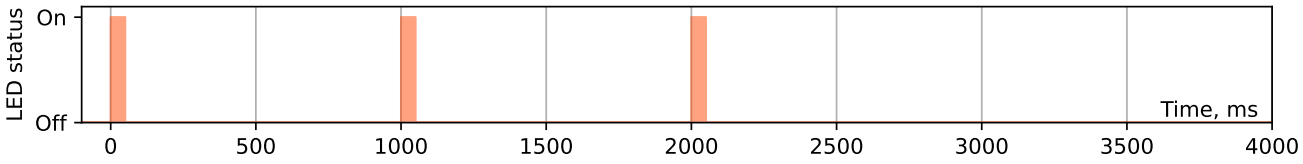
- **Power on the sensor:** Within 2 minutes, pull the battery tab, reinsert the battery, connect the power supply, or press the `PAIRING` button to initiate pairing.
- **Confirm successful pairing:** A successful pairing is indicated by the sensor appearing in the Web GUI and a specific LED blink sequence on the sensor PCB (one to three short blinks followed by a longer fade-out blink of the LED):



- **Troubleshooting:** 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 process closer to the base station.



- **Final setup:** 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

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