Radon One Sensor



Provides real-time measurements of radon gas concentration. With its portability and extended multi-year battery life, this device ensures convenience and reliability in continuous indoor air quality monitoring. This sensor, belonging to the HOME sensor series, is intended to be used together with the *Aranet Home* mobile application for extended data browsing capabilities.

Product numbers

Product number	Color of rear body and buttons	Color of front panel (fascia)
TDSPSRH4.0BW	Black	White
TDSPSRH4.0BG	Black	Green
TDSPSRH4.0BY	Black	Yellow
TDSPSRH4.0BR	Black	Red

Radon detector characteristics

Type	α-decay event detection using ionization chamber	
Filling mechanism	Air diffusion	
Radon progeny filtering	Spunbound polyester	
Radon/Thoron discrimination	None	
Volume	152 cm^3	9.3 in^3
Efficiency	1 count/min at 99 Bq/m^3	1 count/min at 2.7 pCi/L

Sensor performance

General notes

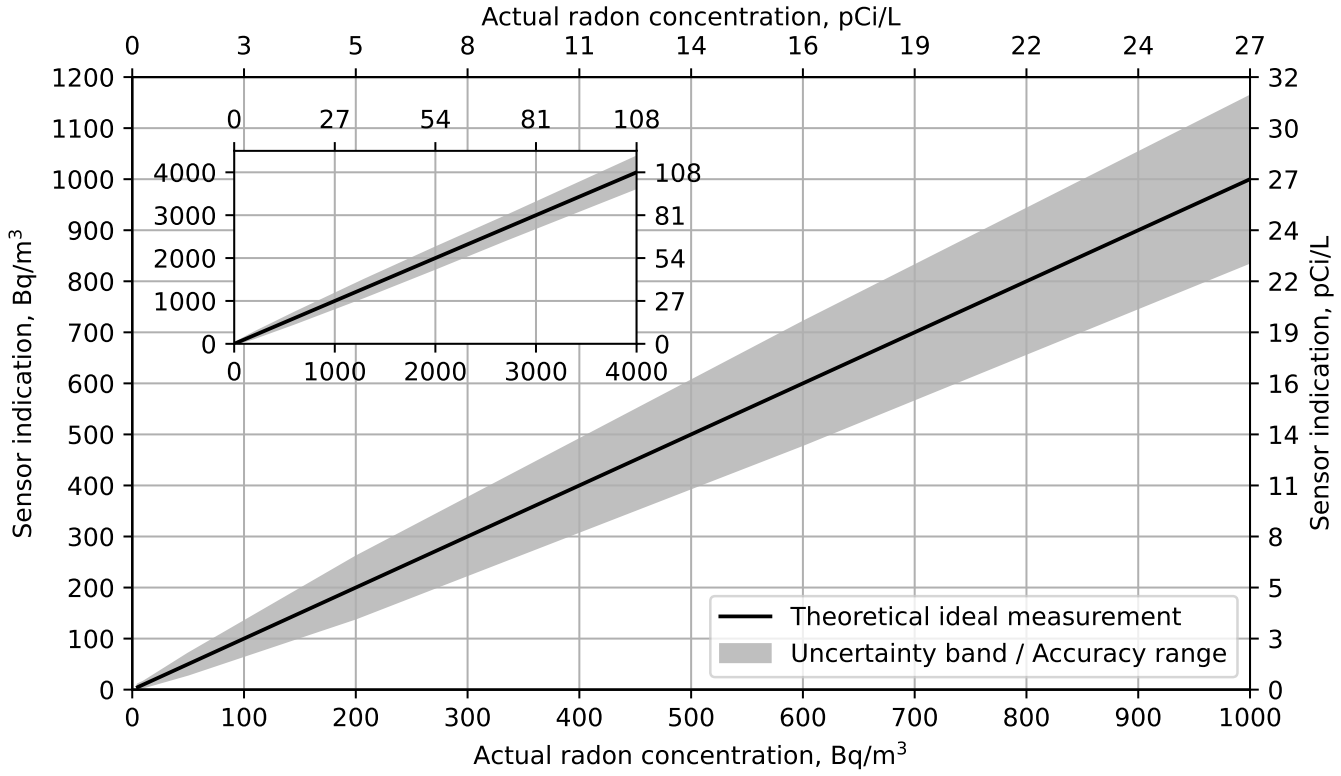
- 95 % of the sensors measure within these typical limits in equilibrium state at the time of sale. For evaluation of the total measurement error, long-term drift has to be taken into account.
- Measurement time constant τ refers to the time it takes for the sensor reading to reach 63 % of a new steady-state value in response to a step change in the environment. It essentially represents the speed at which the sensor adjusts to changes in the measured quantity.

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Radon concentration

Range	0–4000 Bq/m^3	0–108.10 pCi/L
Resolution	1 Bq/m^3	0.02 pCi/L
First reliable measurement in	1 h	(See notes below)
Accuracy of 24 h, 7 d, 30 d averages	±10%	
Accuracy of current concentration	Dependent on radon concentration	(See graph below)
Time constant τ	60 min	

- The device exhibits sensitivity to static electricity. Exercise caution when handling it, as activities like rubbing may temporarily introduce false measurements of increased radon concentration.
- The calibrated measurement range is outlined above. However, the device has the capability to display radon concentration values up to 7900 Bq/m^3 (214 pCi/L), although the listed accuracy is not guaranteed in such instances.
- The accuracy figure provided is applicable after the device has been operational for a minimum of one hour. Prior to this duration, precision may be compromised due to the limited averaging window for the α-decay event count.
- While the device shows no long-term drift in its radon detection accuracy, as with all ionization chamber radon detectors, it is subject to the gradual accumulation of long-lived radon progeny within the chamber. Over time, elements such as Pb-210, which has a 22-year half-life, will deposit inside the ionization chamber, generating additional α-decay events even in the absence of radon. This effect cannot be precisely predicted, as it depends on the cumulative radon exposure. We estimate a zero-shift of approximately 3 Bq/m^3 per 1 (MBq·h)/m^3 of radon exposure. For example, if the device were continuously exposed to 1000 Bq/m^3 of radon for five years, the indicated measurement could shift upward by around 150 Bq/m^3.



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General specifications

Ingress protection rating	IP20	
Operating temperature range	0–50 °C	32–122 °F
Operating relative humidity range	0–85 %, non-condensing	
Dimensions	105×80×71 mm	4.13×3.15×2.80 in
Weight (incl. batteries)	220 g	7.8 oz
Enclosure material	Polycarbonate	
Packaging includes	2 pcs AA alkaline batteries	

Bluetooth transmit power

Normal range (Default)	-12 dBm
Extended range	4 dBm

- Bluetooth transmitter power can be adjusted through the settings in the *Aranet Home* mobile application. Enable the extended range feature only if the sensor experiences poor connectivity with the mobile application during typical use, such as in large rooms or through walls. Note that enabling this feature will reduce the expected battery lifetime listed below.
- Radon One Sensor is compatible with smart devices conforming to Bluetooth specification 4.1 and up.
- Bluetooth is utilized to enable the functionality of the *Aranet Home* mobile application. When transferring data to *Aranet Home*, device memory provides **30 days historic data availability**.

Battery lifetime

	Bluetooth Off	Bluetooth On
Alkaline batteries	5.0 years	3.4 years
Lithium batteries	7.0 years	4.7 years

- Data provided for a device with an active Bluetooth connection considers it being paired with the *Aranet Home* mobile application. Battery life may vary depending on Bluetooth activity and data transmission frequency.
- 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).

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Important notes

- Do not leave the device in direct sunlight! Exposure to intense sunlight can adversely affect the performance and longevity of the e-ink display, potentially leading to issues like reduced contrast, diminished readability, or even permanent damage to the display pixels or electronic components. Moreover, sun exposure can also adversely impact accuracy of sensor readings.
- The device is not intended for use in environments with relative humidity above 85%, as this may impact measurement stability.

Compliance information

CE	Conformité Européenne
FC	Federal Communications Commission (USA)
IC	Innovation, Science and Economic Development Canada

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