Home Electronic Radon Equipment

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Types of Monitors

- Continuous Radon Monitor/CRM- (Professional)- electronic device that is capable of automatically recording a retrievable time series of numeric measurements of radon concentration averaged over time intervals of 1 hour or less

- Consumer Digital Radon Monitors
  - Similar to an electronic integrating device- one reading off of device (1d, 1w, long term)
  - Similar to a continuous monitor- data retrieved through an app/cloud base

Examples of Monitors



EcoQube



EcoBlu



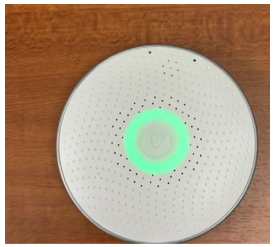
RadonEye



Lüft



View Radon



Wave Radon



Corentium Home

Previous Work/Research

- In 2024 KSU evaluated 8 different monitors
  - Based on previous research done in Canada by Pam Warkentin et. al
  - Exposed for 7 d, at three different radon concentrations
  - Performance evaluated based on the MS-PC 2022 *Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air*

- Evaluation of consumer digital radon measurement devices: a comparative analysis

KSU Findings

- For highest radon concentration tested (27.7 pCi/L to 29.4 pCi/L)
  - All 8 monitors fell within 0 ± 25% requirement for the individual percent error (IPE)
  - All 8 monitors fell within the ± 15% minimum performance requirement coefficient of variation (CV)
- For radon concentration between 12.8 pCi/L to 15.5 pCi/L
  - 7 of the 8 monitors fell within the IPE requirement
  - All 8 monitors fell within the ± 15% minimum performance requirement coefficient of variation (CV)
- For ambient room radon concentrations
  - 6 of the 8 monitors fell within the IPE requirement
  - 5 of the 8 monitors fell within the ± 15% minimum performance requirement coefficient of variation (CV)

C-NRPP's Approach

- https://c-nrpp.ca/consumer-grade-electronic-radon-monitors/
- "Although the electronic radon monitors listed here provide results quickly, **it is important to leave them in place for at least 3 months to get an accurate representation** of your average radon level."
  - **Short-term radon measurements can be misleading (either much lower or much higher than your actual average radon level).**
- Follow these guidelines when testing your home for radon:
  - Place your radon monitor in a room that is occupied for at least 4 hours each day. For detailed instructions on placing your radon monitor, click here.
  - Test your home for a minimum of 3 months, preferably during the heating season when indoor radon levels are typically the highest.

C-NRPP's Approach Continued

- Follow these guidelines when testing your home for radon:
  - If you only have access to a digital monitor for less than 91 days, we recommend that you follow up with a long-term radon test. You can find a list of online retailers here: https://takeactiononradon.ca/test-for-radon/radon-test-kits/
  - Consider the long-term average radon level when deciding whether to mitigate your home. Electronic radon monitors each have a different method of averaging the data; we recommend you read the manufacturer's user guide to determine how to read the long-term average radon level.
- The table summarizes the different devices that have been tested. These devices cannot be professionally calibrated and are not approved by C-NRPP for use by radon measurement professionals.

C-NRPP's Approach

	Make/Model	Manufacturers stated Accuracy	Frequency of Reading	Digital Display or cell-phone app	Battery or Plug-in	Approved Find details here:
	Airthings Corentium Home Link to manufacturer's website.	±10% (after 7 days at 200 Bq/m3), ±5% after 2 months of monitoring	12 hours 24 hours 7 days (first reading will take 24 hrs)	Short-term and long-term average shown on monitor display.	Battery	APPROVED ✔
	Airthings View Link to manufacturer's website.	After 30 days at 200 Bq/m3, ±10% on the 7 day average and +/- 5% on the 2 month average	Hourly	Short-term average shown on monitor display; long-term average shown on app.	Battery or plug in (USB-C)	APPROVED ✔
	Aranet RN+ Link to manufacturer's website.	±8% Accuracy of 24 h, 7 d, 30 d averages	Can be adjusted to show 10 min, 24h, 7 d or 30d	Display on device shows either short-term or long-term level depending on setting. Long-term shown on app.	Battery	APPROVED ✔
	Ecosense EcoQube Link to manufacturer's website.	±10% at 370 Bq/m³ after 10 hours of measurement	Takes measurements every 10 minutes; displays an hourly rolling average	Hourly levels are displayed on LED; short-term and long-term averages, and hourly data points on the mobile app.	Plug in	APPROVED ✔
	Ecosense RadonEye RD200 Link to manufacturer's website.	±10% at 370 Bq/m³ after 10 hours of measurement	Takes measurements every 10 minutes; displays an hourly rolling average	Hourly levels are shown on the OLED display; short-term and long-term averages are available in the mobile app	Plug in	APPROVED ✔
	SunRadon Luft Link to manufacturer's website.	±10% (after 7 days at 200 Bq/m3)	Hourly, (Initial reading takes 90 mins)	Long-term and short-term averages shown on the app. Color coded indication of levels on monitor display.	Plug in	APPROVED ✔

	Manufacturer / Brand	Model / Link to Health Canada recall (when applicable)	NOT APPROVED
	Air Steward	Recalled by Health Canada	✖
	Bootu	RN-80	✖
	Boyd Gresham	Radon Detector – Recalled by Health Canada	✖
	CRADTEC	PRM-02H	✖
	CRADTEC	PRM-03H	✖
	Funny Kitchen	HRDM-02 – Recalled by Health Canada	✖
	HAKINAKU	Smart Radon Gas Detector	✖
	Hanchen	Home Radon Detector- Recalled by Health Canada	✖
	INKBIRD	Home Radon Meter – Recalled by Health Canada	✖
	INKBIRD	INK-RD2 – Recalled by Health Canada	✖
	LifeBasis	INK-RD2 – Recalled by Health Canada	✖
	LifeBasis	LCARM001 – Recalled by Health Canada	✖
	Radon Guard	Recalled by Health Canada	✖
	Spolehli	Radon Detector – Recalled by Health Canada	✖

C-NRPP Approval Process

Accuracy

$$Relative\ Percent\ Error\ (\%) = \frac{(Measured\ Mean - Reference\ Value)}{Reference\ Value} \times 100\%$$

Precision

$$Relative\ Standard\ Deviation\ (\%) = \frac{Standard\ Deviation}{Measured\ Mean} \times 100\%$$

From the calculated Relative Percent Error and Relative Standard Deviation for each instrument model an overall measurement error will be calculated.

Measurement Error

$$Measurement\ Error\ (\%) = \sqrt{(Relative\ Percent\ Error)^2 + (Relative\ Standard\ Deviation)^2}$$

- Manufacturer submits request
- 3 Electronic Radon Monitors per model undergo four rounds of testing (each round is 7d)
  - Ambient Level Checks: 30-50 Bq/m3 , 21°-22°C, 20-30% RH
  - 200 Bq/m^3, 18°-22°C, 20-50% RH (winter)
  - 200 Bq/m^3, 30°C, 70% RH (summer)
  - 400 Bq/m^3 18°-22°C, 20-50% RH
  - 1000 Bq/m^3 18°-22°C, 20-50% RH
- Monitors receive a “recommended” status when it achieves a Grade of A or B

Performance Indicator	Acceptable Range
Accuracy – RPE (%)	Less than or equal to 20%
Precision – Relative Standard Deviation (%)	Less than or equal to 20%
Measurement Error (%)	Grade of A or B

Consumer Product Recall- Canada

Consumer product recall

Various Life Basis brand Radon Detectors recalled due to inaccurate radon detection

▸ Brand(s)

Last updated: 2025-05-30

Summary

Product: Various Life Basis brand Radon Detectors
Issue: Consumer products - Chemical hazard
What to do: Immediately stop using the recalled radon monitoring device and dispose of it in accordance with municipal electronic waste requirements.



Affected products

The recalled products were sold on Amazon.ca and may have been offered for sale on other websites.

Filter items | Showing 1 to 2 of 2 entries | Show 10 entries

This recall involves the following Life Basis radon detectors:

Model Name	SKU Number	Amazon.ca Standard Identification Number (ASIN)	Dates sold in Canada
Life Basis Radon Detector	LSRM001	B0B41M8X3W	October 2023 to April 2024
Life Basis Smart Radon Detector	LCARM001	B0CLRMJ7KW	May 2024 to October 2024

Industrial & Scientific › Test, Measure & Inspect › Airflow & Air Quality › Indoor Air Quality Meters



Click to see full view



LifeBasis Radon Detector, Portable Radon Tester for Home, 0-500 pCi/L Range

Long & Short-Term Radon Monitoring, Battery Operated, Updated Version with Battery Included-Black

Visit the LifeBasis Store

4.2 ★★★★☆ (269)

Overall Pick

$67.99

FREE Returns

Color: **Black**



- 【Importance of Radon Measurement】Radon is the second cause of lung cancer, accurate detection of your surroundings environment daily is essential so that you can make small adjustments to improve the quality of your air. Life Basis radon detector is help you easily monitor your air quality, protect you and family.
- 【Long and Short Term Average Reading】The long term average represents the average radon value for the on going measurement, max one year. Used to identify any potential risk; The short term average alternates between showing the average radon value for last-day or the last-7-day. Used primarily to see the effect of measures to reduce the radon level
- 【No Lab Fees and Time】No need to spend a lot of money and make appointments for lab personnel to come to your home to take measurements. Simply turn on the radon meter and you can easily monitor your radon level continuously in real time without spending extra your time and money

CRCPD Advisory

- CRCPD Radon Testing with Consumer Digital Radon Monitors



CRCPD Publication 25-4

Advisory: Radon Testing with Consumer Digital Radon Monitors

*Any home can have dangerous levels of **radon gas**. It is the number one cause of lung cancer for people who never smoked and the second leading cause of lung cancer overall. The U.S. Environmental Protection Agency (EPA) recommends all homes be tested for radon and provides information on how it may impact your health: Health Risk of Radon | US EPA*

The EPA recommends either hiring a certified/licensed radon professional or using a test kit to measure radon in your home.

To locate a professional in your state, visit: How can you find a qualified radon service provider in your area? | US EPA

*To test for radon yourself, there are **two types of devices** you can use:*

1

A **Radon Test Kit** is sent to a laboratory for analysis after the kit has been placed for the minimum amount of time. Test kits need to be approved for use by an independent third-party.

To learn more about these kits, how often to test, and how to place one in your home, visit *A Citizen's Guide to Radon: The Guide to Protecting Yourself and Your Family from Radon*

To obtain an approved test kit, visit *Purchase a test kit | National Radon Program Services* or *Radon | American Lung Association*. Test kits may also be purchased through retail stores.

2

A **Consumer Digital Radon Monitor** measures radon continuously and is available for purchase online and in retail stores. The accuracy and reliability of these monitors have not been verified by an independent third-party. However, these monitors provide continuous results in real-time so may be beneficial

If you use a Consumer Digital Radon Monitor, carefully follow the manufacturer's instructions paying special attention to:

- Where and how to **place the monitor**.
- The recommended length of time to test. The minimum length for any radon test is **48 hours**.
- When and how to **read the results**. Some Consumer Digital Radon Monitors have different time frames for radon results.

***Note:** If you share your monitor with others, reset the monitor and provide the manufacturer's instructions to the next user.*

To begin the test, place the monitor in the lowest lived-in level of the home
DO NOT MOVE THE MONITOR until the test is complete

For tips on how to place your monitor, visit *EPA's A Citizen's Guide to Radon*.

After reviewing results, users should verify results using an approved testing method by:

- Hiring a certified/licensed radon professional, or
- Using an approved test kit to measure radon in your home

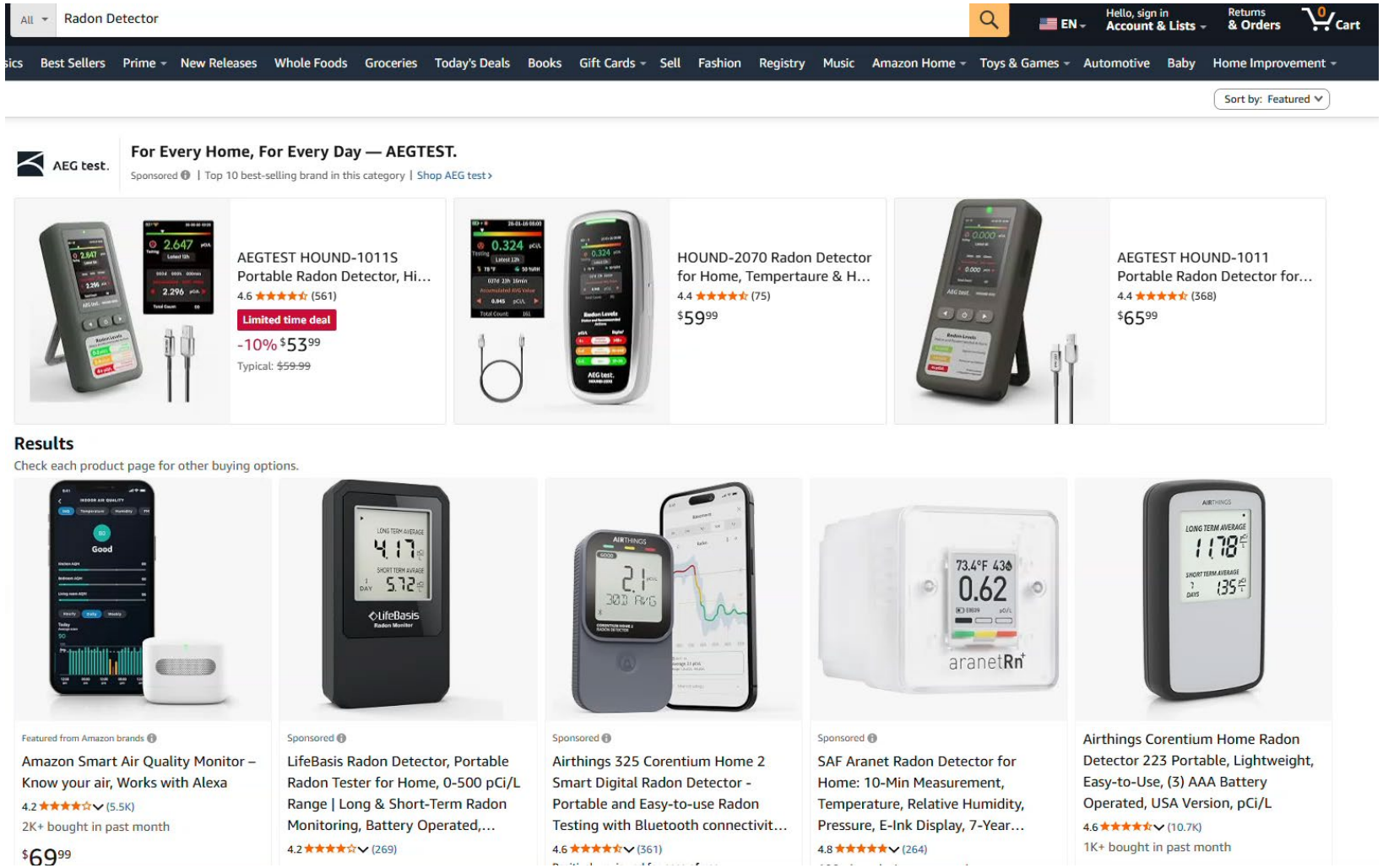
- ***If you are considering whether your home needs mitigation:***
  Because the accuracy and reliability of these monitors have not been evaluated by an independent third-party, results may be higher or lower than actual radon levels. Long-term testing is advised for mitigation decisions due to seasonal changes and other conditions.
- ***If you are checking whether your radon mitigation system is continuing to work properly:***
  Because monitors may lose their accuracy and reliability over time, users should verify radon levels periodically using an approved method.
- ***If you are considering selling your home:***
  Due to time constraints and the need for reliable results, CDRMs should never be used in real estate transactions. Some states require, and real estate agents expect, the test for a real estate transaction be performed using an approved method.

Key Messages:

- Visit *Health Risk of Radon | US EPA* to understand the health risks associated with different radon levels and recommendations on when to mitigate your home.
- Consumer Digital Radon Monitors are **NOT** for testing during real estate transactions.
- Consumer Digital Radon Monitors are **NOT** for making radon mitigation decisions.

CRCPD
https://crcpd.org/radon/
info@crcpd.org

How Many Home Monitors Are There?



Why is this a problem?

- New monitors will continue to be made/flood industry
  - Are they accurate and reliable?
- No research for long term accuracy/precision of at home devices

How should you respond to phone calls?

- Generally two types of calls:
  - I want to purchase a monitor, which one should I buy?
    - Advise consumer that these consumer devices are great for general knowledge but are not to be made for mitigation decisions; recommend starting with a short term radon test kit or having professional measurement performed
    - Explain general differences in monitors
      - Long term vs. short term
      - App/cloud vs. display
      - Minimum of 48 hours of data
      - Closed building conditions
    - Consider purchasing a device from a manufacturer that also has professional devices

How should you respond to phone calls?

- Generally two types of calls:
  - I already purchased a monitor, is it accurate?
    - How was the test performed? Closed house conditions/length of test?
    - What is monitors intended testing duration?
    - Recommend performing a test using a short term radon test kit to confirm readings
    - If homeowner is interested in performing a comparison check walk them through procedure

Possible Solutions

- AARST Consortium MS-PC 2022 Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air
  - The proposed revisions to MS-PC address two new chapters regarding consumer-grade electronic radon monitors.
    - The purpose is to set precedence on appropriate quality, accuracy disclosures and uniform purchaser instructions for such monitors that lack critical features required for professional use monitors.

- KSU Radon Chamber thinking of ways to offer spiking services to the states with lending library programs
  - Currently working on a pilot program to see if this would be achievable
    - Limited chamber space

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