

USER MANUAL

RADON DETECTOR

PCE-RD 40



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

TECHNICAL SPECIFICATIONS

Sensor	Semiconductor radon sensor
Measurement range	3.3Bq ... 37kBq/m³ (0.09 ... 1000pCi/L)
Measurement accuracy	±15%
Time for first data display	6 hours
Reliable data measurement time	6 hours later (when radon concentration is higher than 190Bq/m³); 12 hours later (when radon concentration is 94 ... 190Bq/m³); 24 hours later (when radon concentration is lower than 94Bq/m³).
Data update time	60 minutes
Battery life	45 days (in screen-off state)
Charging interface	TYPE-C interface (green light is on continuously when charging, turns off when fully charged)
Charging time	About 3.5 hours to fully charge (in shutdown state)
Alarm time	Sounds for 20s every hour after exceeding the limit.
Detection environment	-10 ... 45°C (-14 ... 113°F) RH<90% (inaccurate data when working out of range)
Battery capacity	2000mAh

MAIN FEATURES

- » Utilizes a semiconductor radon sensor.
- » Equipped with a color TFT 2.0 screen and a graphical UI interface for simpler and more convenient operation.
- » Patented radon filtration and radon signal screening technology and an adaptive integration algorithm.
- » Data is displayed for the first time 6 hours later. The value within the recent 6 hours is the real-time measurement value of the current environment. At the same time, it records various viewable data such as accumulated average, 24h value, 48h value, 72h value, 96h value, accumulated peak, etc.
- » The radon concentration alarm threshold and alpha particle sound can be set, and the sound switch can be controlled.
- » This device provides the function of viewing radon concentration historical records. The single record can view the data overview of up to 504 days. It records once every 6 hours, and there are up to 10 sets of detection records.
- » Automatically starts re-measuring when powered on, and can also be manually re-measured.
- » There is a countdown prompt for the first data update to make it more intuitive to know when the data will be updated.
- » In the screen-off state, it enters a low-power consumption mode. While having ultra-long battery life, it can still perform normal data monitoring, data recording and radon concentration alarm.
- » Language: Chinese, English
- » The colored progress bar can indicate different color zones according to the change of radon concentration value.
- » Has calendar and clock functions. After shutdown, the clock can operate normally.

TECHNICAL SPECIFICATION

The PCE-RD 40 is a portable radon concentration monitor designed to measure alpha ionizing radiation generated by radon decay. Equipped with a semiconductor radon sensor, it enables rapid detection of radon levels. The device features a color TFT 2.0 screen and an intuitive UI menu interface combined with keys for simplified operation. When the detected radon concentration exceeds the preset alarm threshold, the system triggers an audible and visual alert to promptly notify users, ensuring timely safety measures can be implemented.

The Radon Detector is widely used for environmental radon level monitoring in mines, basements, and poorly ventilated residential buildings, as well as for investigation and assessment of radon concentration in soil at civil construction project sites.

LIMITS ON RADON CONCENTRATION

The radon concentration standard varies from region to region (148 Bq/m³ by default), but there are generally some basic standards.

EPA (USA standards)	≤4pCi/L (equivalent to 148Bq/m ³)
WHO standards	≤100Bq/m ³ , when >300 Bq/m ³ , it is strongly recommended to take corrective measures.
EURATOM (European standards)	<300Bq/m ³

The simplest way to reduce indoor radon concentration is to enhance indoor ventilation. When the radon concentration exceeds 4 pCi/L (148 Bq/m³), ventilate for at least 10 minutes or more.

Note: 1 pCi/L = 37 Bq/m³.

KEY DESCRIPTION

Key	Identification	Function definition
	Left/Up	Left or up to choose
	Power	Power on/off; confirm
	Right/Down	Right or down to choose

OPERATING

- » After power-on, the device directly enters the Measure.
- » Press the POWER button to exit the Measure and enter the main menu.
- » Move the cursor to the Measure and press the POWER to enter the measurement interface again.
- » Press the LEFT or the RIGHT button to switch between Accumulated AVG Value, Latest 24h Value, Latest 48h Value, Latest 72h Value, Latest 96h Value, and Accumulated Peak Value to view different types of detection data.
- » The default state is Accumulated AVG Value, and if there is no operation for 50s, it will automatically switch to Accumulated AVG.

Retest

- » Select the Retest on the main menu and short press the POWER button to confirm.
- » Short press the LEFT or the RIGHT button to choose Yes or No and confirm. If you choose Yes, it will return to the Measure.
- » After the retest, the data of the previous test will be saved and the test data will be reset.

Data

Select the Data in the main menu, short press the POWER button, and then select the data to be viewed.
6h VAL: Represents the integrated radon concentration value in every 6-hour interval.

- » Select History, and short press POWER to switch different numbered historical data. Each time a remeasurement is done, a historical data with a number will be generated.
- » Select View, after pressing the POWER button, short press the LEFT or the RIGHT button to select and view data up and down. Press the POWER button again to exit data browsing.
- » Select Delete, short press the POWER button and a deletion interface will pop up. According to needs, you can select Delete The Current Record, Delete All Records and Delete all But This. After short pressing the POWER button, a pop-up box will appear for secondary confirmation (if the number of the historical record to be deleted is 1, that is, the historical record currently being detected, then the measurement will start again).

Alarm

It includes the modification of the alarm threshold for radon concentration and the switch for alpha particle detection alert.

- » Select Alarm and short press the POWER button to confirm.
- » Short press the LEFT or the RIGHT button to select the alarm threshold for radon concentration. The default value is 148 Bq/m³ (including 100 Bq/m³, 148 Bq/m³, 200 Bq/m³, 300 Bq/m³, 400 Bq/m³, 600 Bq/m³, 800 Bq/m³) or the particle sound switch. The particle sound is off by default. Short press the POWER button to confirm the settings.

ECO

The ECO mode can set the sleep time and volume switch.

- » After entering the Settings , select ECO and short press the POWER button to confirm. Short press the LEFT or the RIGHT button to choose Sleep or Sound and confirm.
- » Short press the LEFT or the RIGHT button to select the sleep time. The default is 10min (including 30s, 1min, 2min, 5min, 10min, 15d) or the sound switch. The sound is on by default. Short press the POWER button to confirm the settings.

Time

It includes the settings for year, month, day, hour, minute and second.

- » After entering the Settings, select Time and short press the POWER button to confirm. Short press the LEFT or the RIGHT button to choose Year or Month or Day or Hour or Minute or Second and confirm.
- » Short press the LEFT or the RIGHT button to select the corresponding time value, and click the POWER button to confirm the settings.

Unit

- » After entering the Settings, select Unit and short press the POWER button to confirm. Short press the LEFT or the RIGHT button to choose radon concentration unit or temperature unit and confirm.
- » Short press the LEFT or the RIGHT button to select the radon concentration unit, either Bq/m³ or pCi/L. Short press the POWER button to confirm the settings.

Admin

Select the Admin on the main menu, short press the POWER button to confirm. Press the LEFT or the RIGHT button to select Chinese or English, and then press the POWER to confirm the setting.

This Admin function is not available to the public.

About

Select the About on the main menu, short press the POWER button to confirm, and then short press the RIGHT button to page down to the bottom. The device name and version are displayed in detail.

Screen Lock

Press the LEFT and the RIGHT key simultaneously to lock or unlock the screen. When the screen is locked, if the current interface is not in the measurement interface, it will automatically switch to the measurement interface.

PRECAUTIONS

- » When the instrument indicates low battery power, please charge it in time to ensure the normal monitoring of the measuring equipment.
- » Avoid vibrations of the instrument to prevent affecting the detection accuracy.
- » Due to the randomness of radon alpha decay, when measuring low-concentration radon, the count value may exhibit an uneven distribution phenomenon, or there may be slight differences in measurement results between different devices. This is a normal phenomenon and not an inaccuracy of the instrument.
- » After measuring high-concentration radon, residual radon and radon daughters will be adsorbed inside the equipment. Complete decay may take between 24 hours and 3.8 days, depending on the radon pollution level. Therefore, after measuring high-concentration radon, it is recommended to wait 24-48 hours before obtaining effective measurement data every time the measurement location is changed.

Q&A

Q: The screen doesn't show data and the value shows --. What does it mean?

A: The minimum test time for the first data appearance is 6 hours. Please wait.

Q: What does the occasional green light flashing mean?

A: When the device detects alpha decay of radon, the green indicator light will flash once.

Q: What does the occasional BEEP of the buzzer mean?

A: If the particle sound function is turned on, when the device detects alpha decay of radon, the buzzer will sound once.

Q: What is the total count?

A: It is the count value of detecting alpha decay of radon. The radon concentration value is calculated by integrating this count value.

Q: How to accurately measure when the environmental humidity is higher than 90%?

A: The current high detection environment humidity will affect the detection result. It is recommended to control the relative environmental humidity within 90%, or place granular desiccant at the bottom or on both sides of the air inlet of the instrument (note not to use powder desiccant).

Q: What does the red light flashing mean?

A: When the radon concentration exceeds the alarm limit, the red light and buzzer will simultaneously trigger an alarm.

WHAT IS RADON?

Radon is a dangerous radioactive gas. It is colorless, odorless, and tasteless, and cannot be detected by human senses alone. Its density is eight times that of air. Basements, schools, and houses with underground facilities are prone to accumulate high concentrations of radon, which is very dangerous! The half-life of radon is 3.82 days, but it is always present in our surrounding environment. Moreover, the period with the highest radon concentration is at dawn when most people are sleeping.

Hazards: When inhaled into the body, the alpha particles emitted during radon decay can cause radiation damage to the human respiratory system and lead to lung cancer. It is especially fatal to infants and pregnant women. According to the average radon level in a country, radon is estimated to cause 3% to 14% of all lung cancers.

Sources: Radon mainly exists in the soil, and natural building materials are the most important source of indoor radon.

Commonly used control measures: The simplest and most effective way to reduce indoor radon concentration is to enhance indoor ventilation. When the radon concentration exceeds 4 pCi/L (148 Bq/m³), ventilate for at least 10 minutes or more.

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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