USER MANUAL

RADON DETEKTOR

PCE-RD 65

ENGLISH

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

PRODUCT INTRODUCTION

The radon detector is a portable radon concentration monitor. It is mainly used to monitor the α-ionizing radiation formed by radon decay. It employs a semiconductor radon sensor and can quickly detect radon concentration.Equipped with a color TFT 2.0 screen, the convenient UI menu interface combined with independent keys makes the operation easier. When the detected value exceeds the alarm threshold, it will alarm to reminder users to take measures promptly.

APPLICATION OCCASIONS

Widely used for environmental radon level monitoring in mines, basements, and poorly ventilated residential buildings, as well as for investigation and evaluation of radon concentration in the 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 (United States standards)	≤4pCi/L (equivalent to 148Bq/m³)
WHO standards	≤100Bq/m³,when >300 Bq/m³, it is strongly recommended to take corrective measures.
EURATOM (European standards)	<300Bq/m³

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.

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.
- Has a built-in temperature and humidity sensor to detect changes in temperature and humidity inside the device in real time. (optional)
- Patented radon filtration and radon signal screening technology and an adaptive integration algorithm.
- With air vents on three sides with high diffusion effect, enabling radon gas to quickly diffuse into the device.
- 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
- This device provides the function of viewing radon concentration historical records.The single record can view the data overview of up to 504 days. One data is saved 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 monitor ing, 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 SPECIFICATIONS

- Sensor: Semiconductor radon sensor + temperature and humidity sensor (optional)
- 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
- Temperature and humidity: The detected and displayed temperature or humidity might be little higher than normal because the sensor is inside the device which is self-heated when working
- 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 out of range every hour after exceeding the limit.
- Detection environment: -10 ... 45°C,-14 ... 113°F RH < 90% (inaccurate data when working out of range)
- Size and weight: Diameter 80mm, height 40mm, about 123g
- Battery capacity: 2000mAh

KEY INSTRUCTIONS

◀ Click the left key to modify the selection left or up.

❙❙ Long press to turn on and off. Short press to confirm function selction.

▶ Click the right key to modify the selection to the right or down

OPERATING INSTRUCTIONS

Power on

Press and hold the ❙❙ 3s, the green light turns on, the buzzer beeps once, and the screen lights up to complete the power-on. For the first power-on, language, date and clock settings will pop up, and then a boot animation of about 3s will appear.

Power off

- Press and hold the ❙❙ 3s, and the shutdown confirmation interface will pop up. Move the cursor to switch to Yes, and short press ❙❙ to complete the shutdown.
- Press and hold the ❙❙ 10s to force shutdown.

Exit Measure

After power-on, the device directly enters the Measure interface. Click the ❙❙ to exit the Measure interface and enter the main menu interface.

Enter Measure

Under the main interface, move the cursor to the **Measure** and click ❙❙ to enter the measurement interface.

Data switching in the Measure interface

Short press the ◀ or the ▶ to switch between Accumulated AVG, 24h Value, 48h Value, 72h Value, 96h Value, and Accumulated Peak to view different types of detection data.
The default state is Accumulated AVG, and if there is no operation for 50s, it will automatically switch to Accumulated AVG.

Data

» Select the **Data** in the main menu, short press the ❙❙ , and then select the data to be viewed.
6h VAL: Represents the integrated radon concentration value in every 6-hour interval.
Average: Represents the cumulative average value from power-on to this time period.
Usually, the Average generally has smaller fluctuations due to long-term cumulative averaging, while the 6h VAL has larger fluctuations but can reflect changes in radon concentration more timely.

» Select **History**, and short press ❙❙ to switch different numbered historical data. Each time a remeasurement is done, a historical data with a number will be generated.

» Select **View**, after clicking the ❙❙ short press the ◀ or the ▶ to select and view data up and down. Click the ❙❙ key again to exit data browsing.

» Select **Delete**, short press the ❙❙ 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 ❙❙ , a pop-up box will appear for secondary confirmation (if the number of the historical record to be deleted is 0001, that is, the historical record currently being detected, then the measurement will start again).

Retest

» Select the **Retest** on the main menu and short press the ❙❙ to confirm.

» Short press the ◀ or the ▶ to choose YES or NO and confirm. If you choose YES, it will return to the Measure interface. After the retest, the data of the previous test will be saved and the test data will be reset.

Settings

This interface includes six sub-menus, namely

» Alarm
» ECO
» Unit
» Language
» Time
» Admin

Alarm
It includes the modification of the alarm threshold for radon concentration and the switch for α-particle sound alarm.

» After entering the Settings menu, select **Alarm** and short press the ❙❙ to confirm. Click the ◀ or the ▶ to select **Alarm Threshold** or **Particle Sound** and confirm.

» Short press the ◀ or the ▶ 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 ❙❙ to confirm the settings.

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

» After entering the Settings menu, select **ECO** and short press the ❙❙ to confirm. Short press the ◀ or the ▶ to choose **Sleep** or **Volume** and confirm.

» Short press the ◀ or the ▶ to select the sleep time. The default is 10min (including 30s, 1min, 2min, 5min, 10min, 15d) or the volume switch. The volume is on by default. Short press the ❙❙ to confirm the settings.

Unit

» After entering the Settings menu, select **Unit** and short press the ❙❙ to confirm. Short press the ◀ or the ▶ to choose radon concentration unit or temperature unit and confirm.

» Short press the ◀ or the ▶ to select the radon concentration unit, either Bq/m³ or pCi/L, and the temperature unit can be either °C or °F. Short press the ❙❙ to confirm the settings.

Language

After entering the Settings menu, select **Language** and short press the ❙❙ to confirm. Short press the ◀ or the ▶ to choose **Chinese** or **English**, and then short press the ❙❙ to confirm the settings.

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

» After entering the Settings menu, select **Time** and short press the ❙❙ to confirm. Short press the ◀ or the ▶ to choose **Year or Month or Day or Hour or Minute or Second** and confirm.

» Short press the ◀ or the ▶ to select the corresponding time value, and click the ❙❙ to confirm the settings.

Admin
This function is not available to the public.

Alarm
This function is used to quickly turn off or turn on the alarm sound.
Select the **Alarm** on the main menu, short press the ❚❚ to confirm, then short press the ▶ or choose YES, and short press the ❚❚ to confirm turning off or turning on the alarm sound.

About
Select the **About** on the main menu, short press the ❚❚ to confirm, and then short press the ▶ or page down to the bottom.The device name and version are displayed in detail.

Screen Lock
Press the ◀ and the ▶ 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 jump 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 intense vibration of the instrument to prevent affecting the detection accuracy.
- Due to the randomness of radon gas 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 gas, residual radon and radon daughters will be adsorbed inside the equipment. Depending on the degree of radon pollution, it takes 24 hours to 3.8days (maximun) to decay. Therefore, after measuring high-concentration radon gas, please wait 24 ... 48 hours later to restart.
- When the battery is charging, the internal temperature of the equipment will increase. Therefore, the measured temperature data is the device inside, not the ambient temperature.

Q&A

The screen doesn't show data and the value shows"--". What does it mean?
Answer: The minimum test time for the first data appearance is 6 hours. Please continue to wait.

What does the occasional green light flashing mean?
Answer: When the device detects alpha decay of radon gas, the green indicator light will flash once.

What does the occasional"beep"of the buzzer mean?
Answer: If the particle sound function is turned on, when the device detects alpha decay of radon gas, the buzzer will sound once.

What is the total count?
Answer: It is the count value of detecting alpha decay of radon gas. The radon concentration value is calculated by integrating this count value.

How to accurately measure when the environmental humidity is higher than 90%?
Answer: 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).

What does the red light flashing mean?
Answer: When the radon concentration exceeds the alarm limit, the red light and buzzer will simultaneously trigger an alarm.

WHAT IS RADON GAS

Radon gas 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 accumulate high concentrations of radon gas, 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.

SAFETY TIPS

This device is not waterproof. Please do not drop or subject the instrument to severe vibration to avoid damage.

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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