

User Manual

Radiation Meter

PCE-RAM 8



1. Product Introduction

- This product is a built-in high sensitivity reform counter as a detector of radiation dose monitoring instrument, mainly used to monitor all kinds of radioactive workplaces of X, Beta, Gamma ray radiation, with high sensitivity, fast response, accurate measurement, wide range and so on.
- Widely used in nuclear power plant, iron and steel chemical industry, radiation processing enterprises, radiation therapy, reflex laboratory, home decoration radiation and other fields of staff for personal safety protection monitoring.

2. Main Features

- Monitor X, β , γ rays, high sensitivity, fast response time
- Measure the dose rate in real time and record the cumulative dose
- Over dose alarm, dose rate and metering rate alarm threshold adjustable
- With time calendar function
- Buzzer alarm function
- Low power display function

3. Description of Instrument Panel

1-LCD Display with Backlight

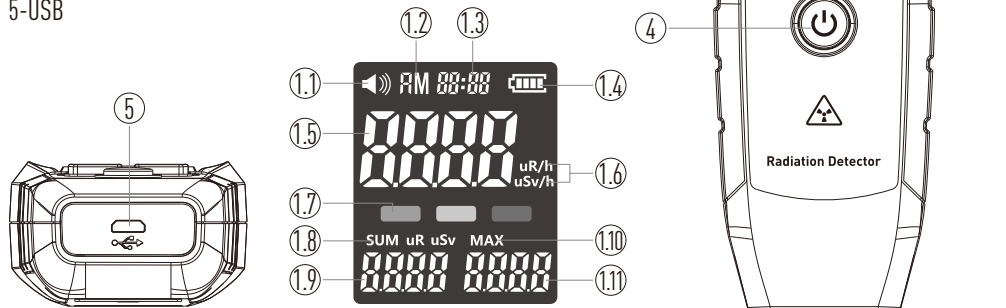
- 1.1-Pulse and Button Sound Switch
- 1.2-12 Hour System Symbol
- 1.3-Clock
- 1.4-Battery Symbols
- 1.5-Real-Time Values
- 1.6-Unit of Measurement
- 1.7-Scope Indication
- 1.8-Cumulative Value Symbol and Unit
- 1.9-Cumulative Value
- 1.10-Maximum Symbol
- 1.11-Maximum Value

2-Set Function Setting Button (Buzzer sound switch, 24-Hour switch setting, Time setting, Alarm threshold setting)

3- $\mu\text{Sv/h}$ and $\mu\text{R/h}$ Unit Measurement Switch Button

4-Power Switch and Menu Switch Button

5-USB



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4. Technical Indicators

Sensor	GM Counter
Detection Ray	X, β , γ Radial
Range	0.01 $\mu\text{Sv/h}$ to 9999 $\mu\text{Sv/h}$
Cumulative Radiation	0.001 μSv to 9999 μSv
Sensitivity	80CPM/ μSv (Co-60)
Energy Range	48keV to 3.0MeV
Accuracy	$\leq \pm 10\%$ (^{137}CS 1msv/h)
Minimum Resolution	0.01 $\mu\text{Sv/h}$
Operating Temperature	0 to 40°C/32 to 104°F
Storage Temperature	-10 to 60°C/14 to 140°F
Alarm Method	Audible alarm
Power Supply	3.7V Rechargeable Battery

5. Safety Standard for Human Radiation Dose

Dose limits for workers in the radiation industry	
Average effective dose for 5 consecutive years	20mSv
Effective dose in any year	50mSv
Annual equivalent dose for extremities (hands or feet) or skin	500mSv
Annual equivalent dose of eye lens	150mSv
Dose limits for members of the public	
Annual effective dose when the average annual dose for 5 consecutive years does not exceed 1mSv	5mSv
Individual annual effective dose	1mSv
Skin annual equivalent dose	50mSv
Annual equivalent dose of eye lens	15mSv

6. Instrument Operation Instruction

6-1. Instrument Switch

1. Long press the **Switch** Button for about 3 seconds to start the instrument; Long press the on button again for about 3 seconds to shut down the instrument.
2. When the instrument is on, the LCD backlight will automatically reduce the brightness after no operation for one minute.
3. Press any button again to turn on the LCD backlight again without automatic shutdown function.

6-2. Instrument Switching Unit

1. Press the **Unit** Button to switch between $\mu\text{Sv/h}$ and $\mu\text{R/h}$, not only the current measured value, but also the cumulative value and the maximum value (Save the current last display unit each time you shut down).
2. Unit switching formula: $1\mu\text{Sv/h} = 100\mu\text{R/h}$

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6-3. Instrument Menu Setting

Short press the **Set** Button to enter the menu setting mode, you can set pulse and key sound switch, 24 hours and 12 hours switch, time, alarm threshold of measured value, alarm threshold of cumulative value.

- Pulse and Button sound: ON and OFF two state options
- 24 hours switch: 24 hours and 12 hours can be selected
- Time format: hour: minute
- Measurement Alarm threshold: 0.00-9999 μ Sv/h, the default is 0.5 μ Sv/h
- Cumulative alarm threshold: 0.000-99.99 μ Sv/h, the default value is 3.0 μ Sv/h

6-3-1. Set Pulse and Button Sound Switch

1. Press the **Set** Button once, then “ \blacktriangleleft ” will flash, LCD will display “**ON**” or “**OFF**”, through “ \blacktriangle ” or “ \blacktriangledown ” change the value, then press the **Menu** Button to confirm saving and enter the 24-hour setting mode, or long press the **Set** Button to exit the setting mode directly.
2. When the acoustic switch is on, the meter will emit a “drop” sound after detecting radiation rays, the stronger the radiation signal is, the faster the sound frequency will be.

6-3-2. Set the Switch Between 24 Hour System and 12 Hour System

1. Press the **Set** Button once, switch mode through “**Menu**”, switch to LCD display “**12H**” or “**24H**”, through “ \blacktriangle ” or “ \blacktriangledown ” change the value.
2. Then press the **Menu** Button to confirm saving and enter the time setting mode, or long press the **Set** Button to exit the setting mode directly.

6-3-3. Set Time

1. Press the **Set** Button once, switch mode through “**Menu**”, switch to the hour of time for flashing, through “ \blacktriangle ” or “ \blacktriangledown ” change the value, then press the **Menu** Button to confirm saving and enter the minute setting mode, or long press the **Set** Button to exit the setting mode directly.
2. Press the **Set** Button once, switch mode through “**Menu**”, switch to the time minute flash, through “ \blacktriangle ” or “ \blacktriangledown ” change the value, then press the **Menu** Button to confirm saving and enter the alarm threshold setting mode, or long press the **Set** Button to exit the setting mode directly.

6-3-4. Set the Alarm Threshold of the Measured Value

1. Press the **Set** Button once to switch mode through the “**Menu**”, at this time, the LCD only flashes the value of measurement display.
2. Through “ \blacktriangle ” or “ \blacktriangledown ” change the value, press the **Menu** Button to confirm saving and enter the cumulative threshold setting mode, or long press the **Set** Button to exit the setting mode directly.

6-3-5. Example Set the Cumulative Threshold

1. Press the **Set** Button once to switch modes through the “**Menu**”, at this time the LCD only flashes the ones bit of the accumulated value, changing the value by “ \blacktriangle ” or “ \blacktriangledown ”.
- Press the **Menu** Button for the first time to set the cumulative value threshold to one decimal place;
 - Press the **Menu** Button a second time to set the cumulative value threshold to two decimal places;

- Press the **Menu** Button a third time to set the cumulative value threshold to three decimal places.
 - Press the **Menu** Button a fourth time to save the threshold and exit setting mode.
2. When the cumulative value threshold exceeds 10, the cumulative value threshold can only be set to two decimal places, then press the **Menu** Button for the third time to exit the setting mode.
 3. Hold down the **Set** Button to exit the setting mode.

7. Alarm Type

1. Alarm of exceeding the measured value threshold: If the current measured value exceeds the set measured value threshold, the instrument will make a long alarm.
2. Alarm of exceeding the accumulated value threshold: If the current accumulated value exceeds the set accumulated value threshold, the instrument will sound two alarms within one second.
3. When the battery of the instrument blinks in the space, the instrument will emit a short and rapid alarm sound, at this time, you can press any button to stop the current low power alarm.

8. Range Display Type

μ Sv/h	0.00 μ Sv/h to 0.50 μ Sv/h	0.50 μ Sv/h to 1.00 μ Sv/h	1.00 μ Sv/h to 1000 μ Sv/h
Level	Good	Normal	Bad
Display	Green	Yellow	Red

9. Battery Charge

- The Detector has built-in batteries, so you do not need to replace the batteries.
- When the battery level symbol blinks, it indicates that the battery is low, use a 5V/1A adapter to charge the battery.
- Please remove the battery before long storage or transportation to prevent battery leakage.

10. Maintain

- Meters should be cleaned with damp cloth and non-irritating cleaner when necessary.
- Do not use corrosive or irritating cleaners.
- Please keep the instrument in the allowed temperature and humidity environment for use and storage.

11. Disposal

For the disposal of batteries in the EU, the 2006/66/EC 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.

