

PerGar PerGarah0k9ze4vm

PerGar Nuclear Radiation Detector

Model: PerGarah0k9ze4vm

1. INTRODUCTION

This manual provides essential information for the safe and effective operation of your PerGar Nuclear Radiation Detector. This device is designed to measure the strength of ionizing radiation, specifically beta particles, gamma rays, and X-rays, using a Geiger-Muller counter. Please read this manual thoroughly before using the device to ensure proper functionality and safety.

2. SAFETY INFORMATION

- Always handle the detector with care to prevent damage.
- Do not attempt to open or modify the device, as this may compromise its accuracy and safety.
- Keep the device away from extreme temperatures, humidity, and direct sunlight.
- Ensure batteries are inserted correctly according to polarity markings.
- Dispose of batteries responsibly according to local regulations.
- This device is for detection purposes and should not be used as a substitute for professional radiation safety equipment or advice.

3. PRODUCT OVERVIEW

The PerGar Nuclear Radiation Detector is a compact, handheld device featuring a clear display and intuitive controls for easy operation.



Figure 3.1: Front view of the PerGar Nuclear Radiation Detector. The device is yellow with a black screen and several control buttons below it, including ON, OFF, and buttons for sound, alarm settings, and light.

3.1 Components and Controls

- **Display Screen:** Shows real-time radiation readings, alarm status, and settings.
- **ON Button:** Powers on the device.
- **OFF Button:** Powers off the device.
- **Speaker Icon Button:** Controls sound settings.
- **Triangle/Play Button:** Likely used for navigating menus or confirming selections.
- **Lightbulb Icon Button:** Controls backlight or alarm light.





*Geiger-Muller counter
Ernest Rutherford*



Figure 3.2: Top-down angled view of the detector, showing its compact form factor and the side ventilation grilles.

4. SETUP

4.1 Battery Installation

1. Locate the battery compartment on the back of the device.
2. Open the battery compartment cover.
3. Insert two (2) AA batteries (not included), ensuring correct polarity (+/-) as indicated inside the compartment.
4. Close the battery compartment cover securely.

4.2 Powering via USB

The device can also be powered or charged using a USB 5V 2A input. Connect a compatible USB cable to the device's USB port and to a power source.

5. OPERATING INSTRUCTIONS

5.1 Powering On/Off

- To power on the device, press the **ON** button.
- To power off the device, press the **OFF** button.

5.2 Detection Principle

The PerGar Nuclear Radiation Detector utilizes a Geiger-Muller counter. This counter employs a gas tube or small chamber as a probe. When ionizing radiation (beta particles, gamma rays, or X-rays) enters the tube, it ionizes the gas, producing a pair of ions. These ions are then amplified to generate an electrical pulse of a consistent size, which is recorded by the device. This process allows for the measurement of the number of radiation events per unit time.



Use a gas tube or small chamber as a probe Each ray ionized in tube produce a pair of ions

Figure 5.1: Illustration of the Geiger-Muller counter principle: A gas tube or small chamber acts as a probe. Each ray ionized in the tube produces a pair of ions, which are then detected.

5.3 Real-Time Measurement

Upon powering on, the detector will begin real-time measurement of radiation levels. The current radiation dose will be displayed on the screen in $\mu\text{Sv/h}$ (microsieverts per hour).

5.4 Intelligent Alarm System

The device features an intelligent alarm system to alert you when radiation levels exceed preset thresholds.

1. **Setting Alarm Values:** Access the alarm setting option (refer to the device's on-screen menu for navigation, typically using the triangle/play button). Set your desired current dose alarm value and cumulative dose alarm value.
2. **Alarm Activation:** If the detected radiation dose exceeds the set alarm threshold, the monitor will automatically activate the alarm. This occurs whether the detector screen is active or in sleep mode.
3. **Alarm Modes:** The device offers three combined alarm modes: light, vibration, and sound. These can typically be configured within the alarm settings menu.



Automatically alarm if detected radiation dose exceed alarm threshold

Figure 5.2: The detector automatically alarms if the detected radiation dose exceeds the alarm threshold, providing a critical safety feature.

6. APPLICATIONS

The PerGar Nuclear Radiation Detector is suitable for a wide range of environments where ionizing radiation may be present. Its versatility makes it an essential tool for various professional and personal applications.

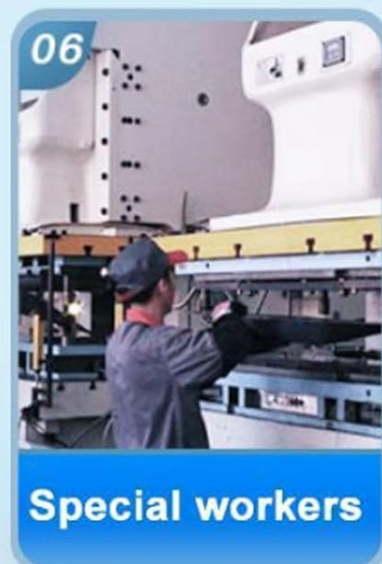


Figure 6.1: Various application scenarios for the radiation detector. These include use in hospitals, laboratories, nuclear power plants, for inspecting imported food, detecting unidentified radiation sources, and for personnel working in environments with potential radiation exposure.

Common applications include, but are not limited to:

- Home decoration radiation assessment
- Geological surveys
- Iron and metal testing
- Vehicle inspection
- Nuclear power plant monitoring
- Industrial radiation safety
- Radiology departments and laboratories
- Environmental monitoring

7. MAINTENANCE

- Clean the device regularly with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- Avoid dropping the device or subjecting it to strong impacts.
- When not in use for extended periods, remove the batteries to prevent leakage.
- Store the detector in a cool, dry place, away from direct sunlight and corrosive materials.

8. TROUBLESHOOTING

Problem	Possible Cause	Solution
Device does not power on.	Low or dead batteries; incorrect battery installation.	Replace batteries with new ones, ensuring correct polarity. Check USB connection if using external power.
Inaccurate or inconsistent readings.	Environmental interference; device malfunction.	Move to a different location away from potential interference. If problem persists, contact customer support.
Alarm not sounding.	Alarm settings configured incorrectly; volume off.	Check alarm threshold settings. Ensure sound/vibration options are enabled in the settings menu.

9. SPECIFICATIONS

Feature	Specification
Sensor Type	Energy compensation tube
Detectable Types	Beta, Gamma, and X-rays
Energy Range	20keV - 3.0MeV $\leq$ +30% (137Cs-)
Sensitivity	80cpm/ μ Sv/(Co-60)
Test Accuracy	0.01 μ Sv/h
Real-Time Range	0 - 99.99 μ Sv/h
Real-Time Error	$\leq$ 10%
Average Error	$\leq$ 3%
Power Supply Mode	2 x AA batteries (not included)
Charging Input	USB 5V 2A
Item Weight	5.7 ounces
Package Dimensions	6.69 x 3.94 x 2.36 inches
Model Number	PerGarah0k9ze4vm

10. WARRANTY AND SUPPORT

For warranty information, technical support, or service inquiries, please refer to the contact details provided with your purchase documentation or visit the official PerGar website. Keep your purchase receipt as proof of purchase for any warranty claims.

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