

FNIRSI 菲尼瑞斯

GC-02

核辐射检测仪使用手册

NUCLEAR RADIATION DETECTOR USER MANUAL



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NOTICE TO USERS

- This manual provides a detailed introduction to the product. Please read this manual carefully to ensure you obtain the best state of the product.
- Please keep this manual properly.
- Do not use the instrument in flammable and explosive environments.
- Waste batteries and instruments cannot be disposed of together with household waste. Please dispose of them in accordance with relevant national or local laws and regulations.
- If there are any quality issues with the device or if you have any questions about using the device, please contact “FNIRSI” online customer service and we will solve it for you in the first time.

1.PRODUCT INTRODUCTION

FNIRSI GC-02 is a nuclear radiation detector newly launched by FNIRSI, featuring exquisite exterior design, compact size, and strong portability. Using high-precision Geiger Miller counters to accurately detect ionizing radiation (γ The intensity of radiation, X-rays, etc.). Equipped with a 1.5-inch IPS high-definition LCD screen, the interface is clean and tidy, and the data is clear at a glance. You can view real-time values, average values, maximum values, and cumulative values. It can also set alarm values, customize sleep and shutdown times, and support switching between 8 languages. Added timed monitoring mode and history view, capable of recording 10 sets of data, save without losing. Built in 850mA rechargeable lithium battery, with battery

endurance of up to 6 hours. FNIRSI GC-02 is the ideal tool for detecting nuclear radiation anytime, anywhere, making you feel at ease, accurate, and convenient.

2.PRODUCT FEATURES

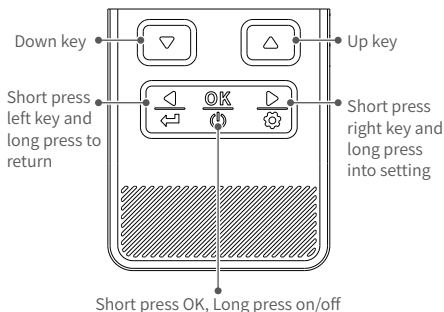
- X-ray detection γ Radiation and β Radiation.
- High sensitivity and diverse working environments.
- Operating interface in eight languages: Chinese, English, Russian, German, Japanese, Portuguese, Spanish, and Korean, easy to operate and use.
- Regular monitoring.
- Save power down data.
- Selection of two combined alarm methods: Light / Sound.
- The product can set the current alarm value and cumulative alarm value.

3.PRODUCT PARAMETERS

Product Parameters	Nuclear Radiation Detector
Size	106.5x44.5x25mm
Detection Radiation Type	Ionizing radiation (γ -rays, X-rays, etc.)
Detector	Energy compensation GM tube (Geiger counter tube)
Dose Current Rate	0.00-1000 μ Sv/h (1mSv/h)
Cumulative Dose Equivalent	0.00 μ Sv-500.0mSv

Product Parameters	Nuclear Radiation Detector
Energy Range	48keV-15Mev $\leq \pm 30\%$ (for ^{137}Cs -)
Language	Chinese, English, Russian, German, Japanese, Portuguese, Spanish, Korean
Sensitivity	80CPM/ μSv (for Co-60)
Dosage Unit	$\mu\text{Sv/h}$ 、 $\mu\text{Gy/h}$ 、mR/h、CPS、CPM
Battery Capacity	850mAh
Alarm Method	Light, Sound

4.BUTTONS & FUNCTIONS INTRODUCTION



5. PANEL INTRODUCTION

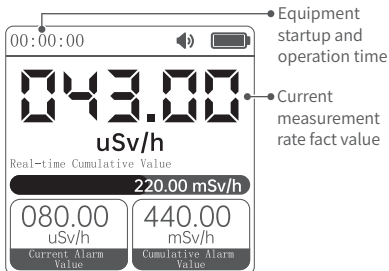
5.1 ON/OFF

Turn on and off by long pressing the Ok key.

5.2 Panel introduction

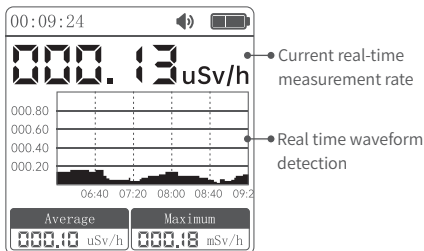
General page

This page detects real-time dose and dynamically observes cumulative measurement results, alarm thresholds, and status. After turning on, it automatically enters this page to detect parameters.



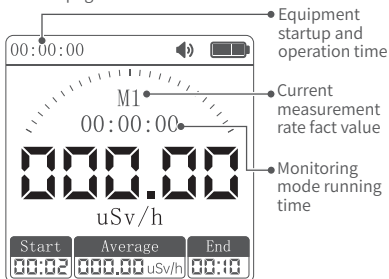
Curve Record Page

This page is convenient for observing a dynamic curve of surrounding radiation dose, analyzing the average and maximum values. Press the left and right keys to switch to curve recording mode, and the page is as follows:



Timed monitoring page

This page is convenient for setting a start and end time without the need for human observation of the surrounding dose situation. It can automatically monitor the changes in the surrounding radiation amount based on the set time. After monitoring, it will be automatically saved to the history page. Press the left and right keys to switch to monitoring mode, and the page is as follows:



The monitoring mode can record measurement values within a specified time range. Long press "down" to set the start time, long press "up" to set the end time.

When the device running time is equal to the start time, the monitoring mode starts recording, and the interface display changes from [Figure 1] to [Figure 2] status, at this point, the monitoring mode starts timing the running time and records the cumulative value, average value, and maximum value, the three values are displayed in a cycle, when the equipment running time reaches the deadline, the interface changes to [Figure 3], completing the measurement from start to deadline.



Figure 1



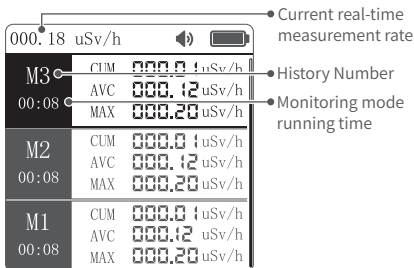
Figure 2



Figure 3

History records page

This page reflects some radiation levels previously recorded on a regular basis, making it easy for users to analyze historical data, and can record up to 10 groups. Press the left and right keys to switch to monitoring mode history, and the page is as follows:



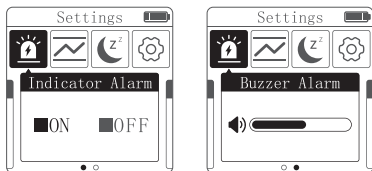
The first historical record is the latest record, and the cumulative value, average maximum value, and running time will be dynamically updated.

5.3 Setting

Long press the settings button to enter the settings menu. Long press the return button on the settings page to return to the monitoring page. Press the left and right keys to switch between setting options, press the OK key to enter the lower level menu, and long press the return key to exit the lower level menu.

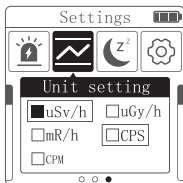
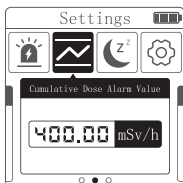
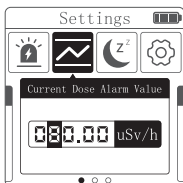
5.3.1 Setting of indicator light alarm and buzzer alarm

Switch to the indicator light alarm and press the OK key to enter the lower menu. Press the up and down keys to switch options, and then press the OK key to set it to take effect; Press the left and right buttons to switch to the buzzer alarm settings, and press the up and down buttons on the buzzer alarm interface to adjust the sound level.



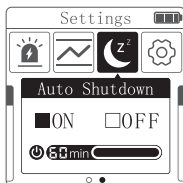
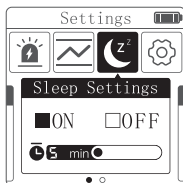
5.3.2 Current dose alarm value, cumulative dose alarm value, and unit settings

Switch to the current dose alarm value and press the OK key to enter the lower menu. Press the left and right keys to switch to the cumulative dose alarm value and unit settings; Press the OK key under the current dose alarm value and cumulative dose alarm value to set the alarm value. The unit setting can take effect by selecting the corresponding unit using the up and down keys and then pressing the OK key.



5.3.3 Hibernation settings, automatic shutdown

Switch to the automatic shutdown setting. Press the up and down keys to select "ON" or "OFF" and then press the OK key to set it to take effect. Press the OK key under "ON" and you can use the up and down keys to set the sleep time or automatic shutdown time.



5.3.4 Language, backlight, restoring factory settings, about

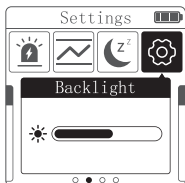
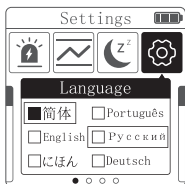
Switch to backlight, restore factory settings, and about.

Language setting: Press the up and down keys to select the corresponding language and then press the OK key

Backlight: The brightness of the backlight can be adjusted by pressing the up and down keys.

Restore factory settings: Press the up and down keys to confirm and then press the OK key to restore the factory settings.

About: Display device model, version number, and other information.



6.CONVERSION OF RADIOACTIVE UNITS

① International standards (1990)

Radioactive workers: 20mSv/year (10 μ Sv/hour)

General public personnel: 1mSv/year (0.52 μ Sv/hour)

② Unit conversion

1 μ Sv/h=100 μ R/h 1nc/kg.h=4 μ R/h

1 μ R=1 γ (The unit used for prospecting in the pronuclear industry)

Radioactivity:

1Ci=1000mCi

1mCi=1000 μ ci

1Ci=3.7 $\times$ 10¹⁰Bq =37GBq

1mCi=3.7 $\times$ 10⁷Bq =37MBq

1 μ Ci=3.7 $\times$ 10⁴Bq=37KBq

1Bq=2.703 $\times$ 10⁻¹¹Ci=27.03pci

Exposure:

1R=103mR=106 μ R

1R=2.58 $\times$ 10⁻⁴c/kg

Absorption metering:

1Gy=103mGy=106 μ Gy

1Gy=100rad 100 μ rad=1 μ Gy

Measurement equivalent:

1Sv=103mSv=106 μ Sv

1Sv=100rem 100 μ rem=1 μ Sv

Other:

1Sv is equivalent to 1Gy

1g radium=0.97Ci $\approx$ 1Ci

Radon unit:

1Bq/L=0.27em=0.27 $\times$ 10⁻¹⁰Ci/L

③ Calculation of Radioisotope Decay Values

$A=A_0e^{-\lambda t}$ $T_{1/2}$;

A₀:How much time has passed since the known source A,
calculate it based on the radioactive decay calculation
table.

④ The relationship between radiation source and distance

The intensity of the radioactive source is inversely proportional to the square of the distance.

$X=A r/ R^2$ A: Radioactivity of point source;

R: Distance from source;

r: Exposure rate constant.

Note: Ra-226 (t 1608) $r= 0.825$ lun. m²/hour. curie

Cs 137 (t 29.9 years) $r= 0.33$ lun. m²/hour. curie

Co 60 (t 5.23 years) $r= 1.32$ lun. m²/hour. curie

Calculate radioactive shielding based on the radioactive decay calculation table:

Reduce by half and 1/10 of different substances (cm)						
Radioactive source	Pencil		Iron		Concrete	
	Halving	1/10	Halving	1/10	Halving	1/10
Cesium-137	0.65	2.2	1.6	5.4	4.9	16.3
Iridium-192	0.55	1.9	1.3	4.3	4.3	14.0
Cobalt-60	1.10	4.0	2.0	6.7	6.3	20.3

7.NOTE

Nuclear radiation detectors are precision instruments, please pay attention to protection. The following suggestions will be beneficial for instrument maintenance and extended service life.

①During storage and use, try to keep it dry and avoid excessive humidity which can cause malfunctions and damage to the instrument.

②Do not use the instrument roughly to prevent it from falling or knocking, otherwise it may cause varying degrees of damage to the instrument

③When the battery level is displayed low, it should be charged in a timely manner. When there is a severe undervoltage, the instrument may experience abnormal phenomena such as inability to switch on or off, screen failure, etc.

※ If the instrument cannot function properly, contact our company's after-sales service or directly return it to our company for repair.

8.PRODUCT MAINTENANCE

●Please keep it dry and clean the dirt on the surface of the instrument with a soft cloth before use, and do not use cleaning agents or solvents.

●Please recycle and utilize damaged instruments, accessories, and packaging materials in a manner that meets environmental requirements.

●Please turn off the device promptly when not in use for a long time.

●Do not disassemble or replace components without permission to avoid malfunctions.

●Please store in a dry place when not in use.

9.CONTACT US

Any FNIRSI's users with any questions who comes to contact us will have our promise to get a satisfactory solution +an extra 6 months warranty to thanks for your support!

By the way, we have created an interesting community, welcome to contact FNIRSI staff to join our community.

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