sisco

Product introduction

This product is a small high-sensitivity radiation dose alarm instrument, mainly used to monitor X-rays, gamma rays and hard beta rays. The instrument uses a scintillation detector (Scintillation Detector), which has the characteristics of high sensitivity and accurate measurement.

Scintillation detectors are detected by using the flashes of ionizing radiation produced in certain substances, and are currently one of the most widely used and most widely used ionizing radiation detectors.

Basic working principle

The working principle of the scintillator detector is as follows: the incident radiation consumes and deposits energy in the scintillator, causing ionization and excitation of atoms (or ions, molecules) in the scintillator, and then the excited particles de-excite and emit scintillation photons with wavelengths close to visible light. The scintillation photons are injected into the photocathode of the photomultiplier tube through the light guide and emit photoelectrons. The photoelectrons are accelerated by the strong electric field between the dynodes and bombard the next dynode, and more photoelectrons are emitted, thereby realizing the multiplication of photoelectrons until Eventually it reaches the anode and generates an electrical signal in the output loop.

Application Scenario

Widely used in radiation protection detection of X, gamma rays and hard beta rays:

1. Surrounding environmental monitoring of nuclear radiation industrial sites/nuclear facilities
2. Medical X-ray / CT / radiotherapy equipment / radiation laboratory, etc.
3. Marble / ceramic tile / jade and other stone radiation
4. Suitable for nuclear contamination of food/items

Monitor the surrounding environment in real time, and give alarm prompts in time to ensure the safety of personnel.

Radiation Cumulative Dose Limits

Dose limits for personnel in the radiation industry:

Annual average effective dose for 5 consecutive years	20mSv
Effective dose in any year	50mSv
Annual Equivalent Dose to the Eye Lens	150mSv
Annual equivalent dose to extremities (hands and feet) or skin	500mSv

Dose Limits for Members of the Public:

Annual effective dose	1mSv
If the average annual dose for 5 years does not exceed 1mSv, the effective dose in a single year	5mSv
Annual Equivalent Dose to the Eye Lens	15mSv
Annual equivalent dose to extremities (hands and feet) or skin	50mSv

Exposures of members of the public to radiation sources, including exposures from authorized sources and practices and exposures received in intervention situations, but excluding occupational exposures, medical exposures and exposures to local normal natural background radiation. Note: According to GB18871-2002 Basic Standards for Ionizing Radiation Protection and Radiation Source Safety.

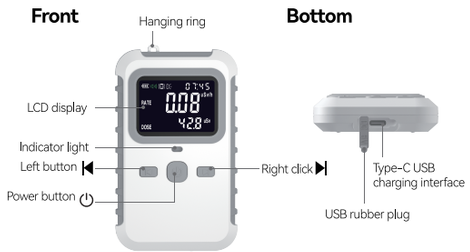
Main feature

- High sensitivity and large measuring range;
- Triple alarm of sound, light and vibration;
- Can store alarm records;
- Dose rate, cumulative dose, instantaneous alarm record query;
- Dose and dose rate alarm thresholds can be customized;
- Built-in lithium battery, can be charged through Type-C USB, no need to replace the battery;
- The real-time dose rate and the threshold indicator bar are displayed on the same interface, which is intuitive and easy to read.

Technical Parameters

Detector	Scintillator
Detectable species	Hard beta rays（β）、gamma rays（γ）、X-rays
Measuring range	Dose rate: 0.01μSv/h ~ 50mSv/h
	Cumulative dose: 0~9999mSv
Sensitivity	≥2.2cps/μSv/h (relative to 137Cs)
Energy response	40keV ~ 3MeV (for 137Cs)
Alarm threshold	0~5000uSv/h segment adjustable
Relative error	≤±15%
Power consumption	Test power consumption: ≦500mW
	Average working power consumption: ≦30 mW
Temperature	Working temperature: -20℃~40℃
	Storage temperature: -40℃~60℃
Humidity	Working humidity: 0~95%
	Storage humidity: 0~80%
Data storage	12 groups
Waterproof level	IPX4
Battery capacity	1000mAH
Charging method	Type-C USB 5V 1A input
Dimensions	64x19.2x109(mm)
Weight	About 88g

Product Structure Description



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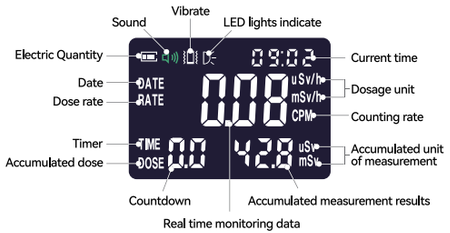

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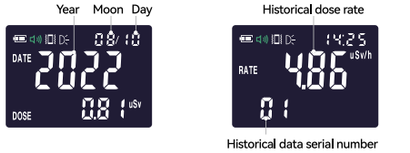


Instructions

1、Start up: Press and hold the "power button ⏻" for 3 seconds to turn on the machine,Enter the test mode,this machine will have a prompt tone, indicator light and vibration when starting up.

2、Shutdown: In the power-on state, press and hold the "power button ⏻" for 3 seconds, according to the sound, vibration, and light on settings, it will prompt beep/vibrate/flashing light and then power off.

3、How to view alarm thresholds: In the test mode, short press the "right button ⏭" once to view the alarm threshold.

4、How to view 12 groups of historical alarm values: In the test mode, short press the "left button⏮" one by one to view 12 sets of historical alarm data.

History - Cumulative Dose | History-Year Month Day/Time | History - Group 1 Dose Rates

5、wake up from sleep: Press any key to wake up in sleep state.

6、Charging function: The battery symbol flashes while charging, and the LED lights up in red, and the red light turns off when fully charged.

7、Prompt function: Over-threshold alarm prompt, detector failure alarm prompt, low battery prompt, and over-range alarm.

8、low voltage function: When the battery voltage is lower than 3.5V±0.1V, the battery icon is empty and flashes to indicate charging. When the battery voltage is lower than 3.5V for 10 minutes, it will automatically power off.

9、Reset: In the test mode, press and hold the "left button ⏮" and "right button ⏭" for 3s at the same time;Enter to restore factory settings, short press "left button ⏮" or "right button ⏭" to switch between YES and NO, RSt is displayed in the middle, then short press the "power button ⏻" to confirm whether to restore the factory, and all data except the date will be cleared.

10、How to enter setup mode

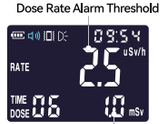
10.1 In the test state, press and hold the "right button ⏭" for 3 seconds to enter the setting mode, short press the "power button ⏻" to enter the next setting option, short press the left and right buttons to increase or decrease the value, after the setting is completed, press and hold the "right button ⏭" for 3 seconds to save the settings and Automatically exit from the setting mode or without operation after 10 seconds, save the settings and return to the measurement interface.

Set mode

10.2 After entering the setting mode, the setting options are dose rate-cumulative dose-alarm mode-display unit-countdown time-hour-minute-month-day-year-current actual cumulative dose value.

11、Set mode –Change dose rate

11.1、Dose rate alarm threshold segment adjustable settings:
0.5uSv/h，1.0uSv/h，2.5uSv/h，5.0uSv/h，
10.0uSv/h，20.0uSv/h，30.0uSv/h，50.0uSv/h，
0.1mSv/h，0.2mSv/h，0.3mSv/h，0.5mSv/h，
1.0mSv/h，2.0mSv/h，3.0mSv/h，5.0mSv/h。



11.2、Accumulated dose alarm threshold segment adjustable setting:
50.0uSv，100.0uSv，200.0uSv，300.0uSv，500.0uSv，
1.0mSv，2.0mSv，5.0mSv，10.0mSv，20.0mSv，50.0mSv。

12、Setting mode – change the alarm mode:
By default, sound + vibration + flashing lights are turned on. In the setting mode, short press the "Left button ⏮" and "Right button ⏭" to select the alarm mode. You can choose to open all alarm modes, close all alarm modes, or one or two alarm modes.

13、Setup Mode – Change Unit CPM:

Display unit setting: the default is uSv/h(mSv/h).
In the setting mode, select uSv/h or CPM by short pressing the "Left key ⏮" and "Right key ⏭".

Count rate

14. Setting mode – change the countdown time:

Countdown time setting: the counter can count 0-99 minutes, turn on the timer, display TIME and timing minutes, once the timer time is up, according to the sound, vibration, and light settings, the product will prompt an alarm, and display TIME and 00 and flash , press any key to cancel the alarm and clear the display of TIME and 00. Setting the time to 00 means no countdown.

Countdown

15. Setting mode – change year

Change year

Setting mode – change month/day

Change month/day

15.1、Time setting: switch in the order of hour-minute-month-day-year, short press the "left button ⏮" and "right button ⏭" to adjust the correct time.

16、Setting mode – reset the cumulative dose: In the setting mode, after setting the year, press the "power button ⏻" shortly, the cumulative dose value on the setting interface will flash, short press the left or right button and the cumulative dose value will display 0.00, and short press the power button to switch to the next setting option without clearing it.

17、Turn off the alarm prompt: When the alarm exceeds the threshold, short press any key to turn off the alarm prompt.

⚠ Safety warning

The instrument accidentally dropped	Please confirm whether the radiation dose indication is normal and whether it will be updated. If any abnormality is found, please send it for inspection and maintenance in time.
The use environment contains explosive and flammable gas or dust	Do not use the instrument in an environment with explosive, flammable gas or dust.

Precautions

- Please read this instruction manual carefully before use;
- Please turn off the instrument when not in use;
- When the instrument has a low battery warning, please charge it in time to ensure the accuracy of the measured value;
- It is forbidden to immerse the instrument in any liquid, and it is forbidden to place it in a high or low temperature environment for a long time;
- It is forbidden to collide, drop and mix with sharp objects, and it is forbidden to disassemble by yourself;
- Do not use it in an environment with strong electromagnetic interference;
- Keep the instrument out of the reach of children.

Warranty Card

Cardholder		Contact number	
Address			
Model		Date of manufacture	

Quality commitment and after-sales service

- This product can only be guaranteed if it is used under normal conditions during the product warranty period (within one year from the date of purchase).
- For the following damages caused by the user, please forgive us for not being able to provide free warranty

  Repair service:
  - Failure caused by unauthorized disassembly and modification of the product;
  - Failure caused by accidental drop during use or handling;
  - Damage caused by human misuse;
  - failure due to lack of reasonable maintenance;
  - Failure or damage caused by accidents, natural disasters.
- When requesting free warranty service, please attach a receipt that can prove the date of purchase.
- Repair services beyond the scope of warranty will be charged according to the corresponding regulations.
- When requesting free warranty service, please take this product to the distribution points of the company for repair.
- If the product is damaged after the warranty period expires, it can be repaired at the distribution point with the purchase receipt.

Radiation detector (Scintillator)

User's Guide