Nuclear Radiation Detector FS300 Operation Manual

I. Safety precautions for equipment

This X-γ-β is a precision instrument. Please keep it properly. The following suggestions will facilitate instrument maintenance and prolong its lifetime.

1. Try to keep dry during storage and use. Excessive humidity will cause damage to the instrument.
2. There are glass products and fragile products inside the instrument. Do not drop, knock or vibrate violently, otherwise the detector will be damaged
3. If the unit is not using for a long time, please take out the battery and store it in a dry place.
4. If the instrument cannot work properly, please do not disassemble it by yourself. Please send it to the designated authorized service point for maintenance.
5. Please use standard AA No.5 batteries or AA No.5 rechargeable batteries.
6. Any unauthorized modifications or repairs may cause damage to the instrument.
7. If you suspect that the instrument may fail at work, please power the unit off and evacuate from the dangerous place quickly. Please contact the manufacturer as soon as possible.

II. Function Overview

The X-γ-β Personal radiation dosimeter has a built-in high-sensitivity Geiger counter as a sensor, which is mainly used to monitor the radiation of X, γ, and hard β rays in various radioactive workplaces. It has the characteristics of fast response and a wide measurement range. It can display the dose equivalent rate and cumulative dose in the workplace. When the unit is powered off, the calendar & time setting, the cumulative does value will not be cleared. Widely used in nuclear power plants, nuclear sewage, accelerators, isotope applications, industrial X γ、β Radioactive stone, marble, radioactive radiation, radioactive medical treatment, CT radiation, iodine 131, iodine 125, cobalt source treatment γ Personnel in the fields of radiation, radiation laboratory and environmental monitoring around nuclear facilities shall conduct personal safety protection monitoring and radiation prompt.

Product Features:

1. Monitoring X-rays, γ Ray and hard β Ray.
2. The instrument has high sensitivity and can measure background radiation.
3. The equipment has a built-in multi-language operation interface.
4. It monitors and displays the real-time dose rate, average dose rate, and cumulative dose. It will alarm when the preset dose rate is exceeded.
5. It saves the setting and cumulative dose when the unit is powered off.
6. The unit has dose rate alarm and particle alarm prompts, and the alarm sound can be turned on and turned off.
7. This unit can be powered by two disposable or rechargeable AA batteries. Or use the USB cable that came with the unit to power the device.
8. The real-time dose rate alarm value can be reset.
9. The sound and light alarms can be turned on or turned off. And the brightness of the alarm light can be adjusted.

III. Technical specifications

Detection ray: γ、X and hard βray
Sensor: energy compensation GM tube (Geiger counter tube)
Measuring range:
a. Dose equivalent rate: 0.00 ~ 999 μSv/h (max. 1mSv/h)
b. Average equivalence rate at 5 minutes: 99.0 μSv/h
c. Cumulative dose equivalent: 0.00μSv ~ 99999 μSv (99.0mSv)
Energy range: 30kev ~ 1.5MeV ≤± 30% (for 137Cs)
Relative inherent error: ≤± 10% (137Cs 1msv/h)
Sensitivity: 80cpm/μSv/h (for Co-60)
Dose rate alarm threshold: the factory default setting is 0.50 μSv/h, user can reset the alarm value
Measurement display: the dose rate reading updates every second, and the alarm response time is 1 second
Working Temperature: - 15 ℃ ~ + 50 ℃
Working humidity: ≤ 95%
Power supply: Two disposable/rechargeable AA batteries, or use the USB cable that came with the unit. (Please remove the disposable AA batteries when you plug the unit into the USB power.)
Size: 132x70x25mm
Weight: 107g (Not including battery)

IV. Key function description

[MENU/OK] button: enter the parameter setting menu/confirm operation.
[BACK] button: return to the upper menu from the lower menu.
[Switch/Power] button: turn on and off the unit/light up the LCD.
[▼] button: Down button/minus
[▲] button: Up button/plus

Charge Port
LCD Display
Switch/Light
Return
Light Indicator
Menu/Confirm
Select Up
Select Down

Buzzer Hole
Battery Slot

V. Basic operation method

1. Power on

Put two No. 5 AA batteries in the unit. Or use the USB cable that came with the unit to connect the power source. Press and hold the Power button for 3 seconds, and the device screen will light up. After powering it on, the real-time dose rate, average dose rate and total dose reading show on the screen, indicating that the unit is in the normal detection state. The LCD screen is shown in Figure 1 below:


```
0.05              12:02:19

    0.04uSv/h

0.00uSv/h        0.09uSv
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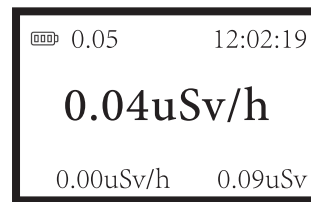
(Figure 1)

2. Shutdown

Press and hold the [Switch/Power] button for 3 seconds, and the instrument will shut down automatically.
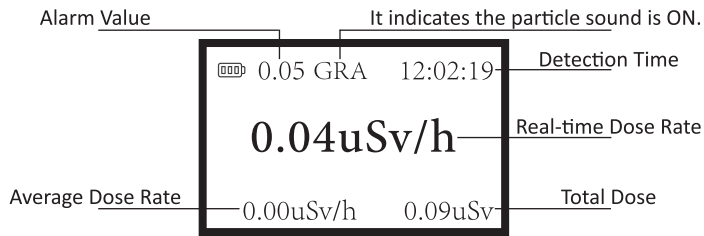
3. Measurement

After the instrument is turned on, it enters the measurement state. There are three measured values shown on the screen: one is dose rate, and the unit can be uSv/h. Second, it can display the average dose rate in 5 minutes. Third, it can display the cumulative value of the dose rate over a long time, that is, the cumulative dose. The cumulative measurement is based on 10 uSv as a measurement. When the cumulative dose reaches 10 uSv, the number and unit of the instrument will change from 10.00uSv to 0.01mSv (10uSv = 0.01mSv). When there is another 10 uSv dose added, the number will rise, that is, it will become 0.02 mSv. When the cumulative measurement is cleared, the device measured with unit uSv, which can be accumulated to 99.0msv at most, and the data will not be cleared while the device is powered off.

When the real-time dose rate exceeds the preset alarm threshold, the instrument will alarm according to the set alarm mode. And it will show "Peril" next to the dose rate value.

4. Function description of the detection interface:

Alarm Value — 0.05 GRA   12:02:19 — Detection Time

It indicates the particle sound is ON.

0.04uSv/h — Real-time Dose Rate

Average Dose Rate — 0.00uSv/h   0.09uSv — Total Dose

(Figure 2)

Prompt: If "GRA" is displayed on the screen, the particle sound is on. If "Err" is displaying, it indicates that the sensor is damaged.

VI. Parameter setting

The parameters of the unit that can be modified: Alarm value, System clock, Alarm mode, and Display settings.

1. Enter parameter setting status

In the measurement state, press the [MENU/OK] button to enter the Menu interface; As shown in the figure below:

Alarm value
System clock
Alarm mode
Display settings
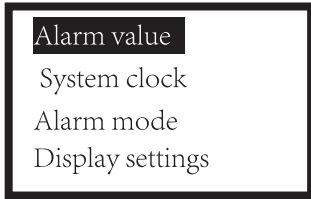
(Figure 3)

Press [▼] or [▲] to move the cursor to select the item to be set.
After selecting the menu, press the [MENU/OK] button to set the parameters. If you want to exit the parameter setting, press the [Return/Back] button, and it will return to the upper menu without saving the current change.
Note: in the parameter setting state of the unit, pressing [MENU/OK] means that the user wants to select the current option and enter the submenu of the option. If the item has no submenus, save the modified value of the current item and return it to the upper menu. Pressing [Return/Back] means that the user gives up the current modified value and returns to the superior menu.

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4. Alarm mode

In the main menu, press [▼] or [▲] to select the third menu "Alarm mode", and then press [MENU/OK] to enter the interface. At this time, the screen shown in the following figure is displayed:

Alarm mode
Sound alarm
Particle Sound
Brightness
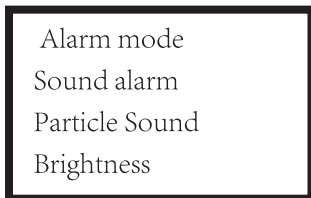
(Figure 6)

a. Select the "Sound alarm" by pressing the [▼] or [▲] button, Press the [MENU/OK] button to enter the interface, the sound alarm can be turned on or turned off.
b. Select the "Particle sound" by pressing the [▼] or [▲] button, Press the [MENU/OK] button to enter the interface, the particle sound can also be muted or unmuted.
c. The screen light brightness can be adjusted (between 0-20) by pressing the [▼] or [▲] button.

5. Display settings

In the main menu, press [▼] or [▲] to select the fourth menu "Display settings", and then press [MENU/OK] to enter the interface. At this time, the screen shown in the following figure is displayed;

Display settings
Language setting
Contrast ratio
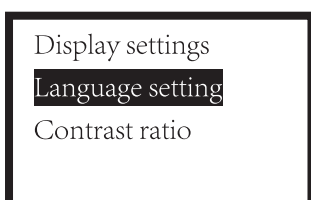
(Figure 7)

a. Select the "Language Setting" and press [MENU/OK] to set the language. Press [MENU/OK] to confirm, and the system will become the set language interface.
b. Select the "Contrast ratio" and enter the setting interface, and modify the value of contrast through the [▼] or [▲] buttons to change the effect of the LCD screen display.

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2. Alarm value setting

In the main menu, select the first menu item "Alarm value", and then press [MENU/OK] to enter the interface. At this time, the screen shown in the following figure is displayed;

Alarm Value
Dose Rate Alarm
Delete dose
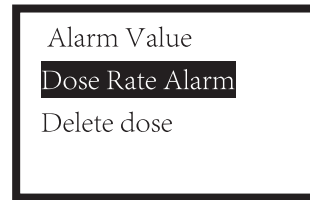
(Figure 4)

a. Dose rate alarm value: Press the [▼] or [▲] button to select "Dose Rate Alarm", and then press [MENU/OK] to enter the dose rate alarm value interface. The factory default setting is 0.50 uSv/h, users can adjust and set the alarm value.
b. Reset the cumulative dose: Select "Delete dose", press [MENU/OK] to enter the deletionoperation interface, press [▼] or [▲] to select "Yes" or "No" to decide whether to delete the cumulative dose.

3. System clock

In the main menu, press [▼] or [▲] to select the second menu "System clock", and then press [MENU/OK] to enter the interface. At this time, the screen shown in the following figure is displayed:

System clock
Date: May 15, 2026
Time: 07:08:35
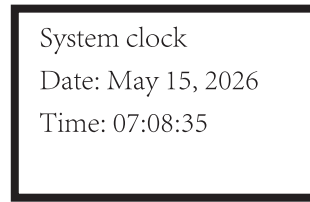
(Figure 5)

In the System clock screen, Press the [MENU/OK] button, and "26" in "2026" flashes. At this time, press the [▼] or [▲] key to modify the value of "26", then press the [MENU/OK] key, and it will save the year setting. Then the month value will flash, press the [▼] or [▲] button to change the month setting and press the [MENU/OK] to save. When the value of "second" is updated; Press [MENU/OK] to save the settings and return to the upper menu.

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VII. Reference standard for radioactive radiation

1. Radiation Dose Limits

Occupational exposure: 20msv / year (10) μ SV / hour)
Public people exposure: 1msv / year (0.52 μ SV / hour)
Suggest setting the general public's radiation alarm limit to 0.5 uSv/h.
Suggest setting the Occupation's radiation alarm limit to 2.5 uSv/h.
The dose rate below 0.25 belongs to environmental radiation and does not affect the human body.
When the dose rate is between 0.25 and 0.50, there is trace radiation but not exceeding the standard.

2. Knowledge of unit conversion:

1 uSv/h=100 uR/h
1 n Ckgh-1/h = 4 uR/h
1 uR/h=1 γ (units used for prospecting in the original nuclear industry)
1 Bq = 2.703 X 10-11 Ci = 27.03 pci

VIII. Others

Package includes:
1*Nuclear Radiation Detector
1*USB Cable
1*User Manual

GZAIR provides full after-sales service to all customers. If you have any questions or concerns, please email us via gzairservice@outlook.com and we will answer you within 24 hours.

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