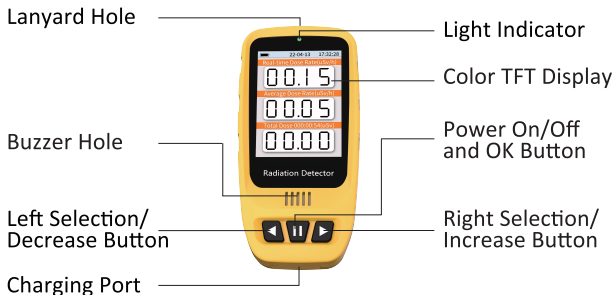


Nuclear Radiation Detector  
HFS-20  
Operation Manual



## I. Product Profile

The Model HFS-20 is one small with high sensitivity radiation dosimeter. It is mainly used to monitor the X,  $\beta$  ray, and  $\gamma$  ray. It has the characteristics such as high sensitivity and accurate measurement; selecting and using the strong performance microprocessor and configured TFT 2.0 colorful screen, humanization design, and easy to operate. Furthermore, it has a strong anti-interference ability. With sound and light alarm function, the alarm threshold value can be reset by the user. The Alarm will sound when reading reaches its threshold. Remind workers to pay attention to safety in time. The main technical index of this unit is in accordance with national and international standards.

## II. Application Areas

Widely applied in the environment where existing ionize radiation, used for radiation dose supervise and protection for individuals. Such as home improvement radiation, irradiation processing enterprises, hygiene and epidemic prevention, radiation treatment, nuclear lab, nuclear station, import & export commerce inspection, building materials, petroleum chemical, geological survey, used steels and iron, Industrial NDT, and others.

### III. Radiation Dose Limits

#### Limit on Dose from Occupational Exposure:

Annual Average effective dose in consecutive 5 years	20mSv
Effective Dose in any one year	50mSv
Equivalent Dose to the Lens of the Eye	150mSv
Equivalent Dose to the Skin, Hands and Feet	500mSV

#### Limit on Dose from Public Exposure:

Annual Effective Dose	1mSv
In special circumstances, a higher value could be allowed in a single year, provided that the average over 5 years does not exceed 1 mSv per year	5mSv
Equivalent Dose to the Lens of the Eye	15mSv
Equivalent Dose to the Skin, Hands and Feet	50mSv

## General Radiation Knowledge:

International standard 1990 (Our country execute this standard)

Radiation staff: 20mSv/year (10uSv/hour)

Common public: 1mSv/year (0.52uSv/hour)

## IV. Main Characteristics

- Real-time measure the dosage and calculate the accumulated dosage
- It has calibration functions.
- Real-time dose rate alarm threshold and total dose alarm threshold all can be reset (continuously adjustable)
- Able to check the start time of the current total dose
- It has a timing measurement function. And you can also set the "Measurement Time" range from 0 to 999 hours.
- It has an over-limit alarm function.
- Able to save the historical record of the recent 10 timing measurement
- It has a calendar/clock function. It will guarantee the clock stay running properly after power off.
- Battery operation and has the battery power icon.
- It has a sensor failure reminding function (the screen will prompt "Equipment already damaged")
- If the detector screen is in sleep, detects the radiation dosage exceeding the alarm threshold value, the monitor will automatically alarm. And it will automatically jump to the radiation measurement page.

## V. Technical Parameters

- Sensor: GM counter tube
- Measuring range: 0.08uSv-50mSv
- Measuring precision: -17%...+25% based on 137Csy
- Battery Duration: 14 days (continue measure and not open particle sound)
- Charging Port: Type-C port (When the battery is charging, the color of the LED will remain green, once at 100% the LED will turn off.)
- Alarm responding time  $t_d$ : <10s
- Alarm threshold deviation: -17%...+25%
- Size: 90.3\*45\*20.3mm
- Weight: 58g

## VI. Key Instructions

- ⓘ : Power on/off and OK button
- ◀ : Left Button—Left Selection/Value Decrease Button
- ▶ : Right Button—Right Selection/Value Increase Button

## VII. Operation Instructions

### 1. Power on:

Press and hold the ⓘ button for 3 seconds to turn the device on. It reaches the detection interface after turning on.

### 2. Power off:

Press and hold the ⓘ button for 3 seconds to turn the device off.

Note: If the “🔒” shows on the upper screen, then the unit will not turn off even press the ⓘ button.

If you want to power it off, please enter into the “Schedule” page, click "Stop Timing" and confirm. Then you can turn the unit off.

### 3. Radiation Measurement

Click the "Measure" on the menu screen, enter into the measurement interface.

Able to check the Real-time value, average value, accumulate dosage value, and total measuring time.

Measuring range of Real-time dose rate: 0.08uSv-50mSv

Measuring range of Average dose rate: 0.08uSv-50mSv

Measuring range of Accumulate dosage: 0.1uSv-9999mSv

### 4. Timing Measurement

Enter into the "Schedule" interface. You can set the "Start Delay" range from 0 to 99 hours. And you can also set the "Measurement Time" range from 0 to 999 hours.

Click the "Start Timing", the unit starts counting down.

When the "Start Delay" countdown reaches zero, the Real-time dose rate, average dose rate, accumulated time, and accumulated dosage will all reset to zero. And the unit starts to statistic radiation dosage and total dosage ratio. It will start measuring when counting down finished.

The device will automatically save the measuring data after finishing the timing measurement. You can review the measurement data in the "Records" interface.

Note: "Start Delay" is the counting down of timing measurement. You can set hour, minute, and second.

## 5. History Records

All timing measurement data is stored in the “Records” interface.


The max storage of the device is ten pieces of timing measurement data.






If the device has stored ten historical records, the newly created record will automatically overwrite the oldest one.

## 6. Data Clearing

Click the “Delete” menu and enter into the interface.

“Delete Current Data” is clearing the average value and accumulating time on the measurement page. “Delete History Data” is clearing all data in the “Records” interface.

Attention: The Records cannot be recovered once they’ve been cleared. When “” shows on the upper screen, it means the timing measurement is in progress. At this time, unable to access the “Delete” interface.

Calibrate factors: Select “Calibrate Factor” and double click it, then it will pop out “Password: 0000” on the bottom of the screen. Click  to adjust the password to “0018”. Press , then click  or  modify the CF value. Click  again to save the changes. It is used to calibrate the error(20uSv - 1uSv).

Note: Default Cf=1.00

## 7. Alarm Limit Setting

Setting range of real-time dosage alarm limit value:

0.1uSv-999uSv

Setting range of accumulated dosage alarm limit value:

1uSv-9999uSv

The unit will alarm when the reading exceeds the limit value.

## 8. Unit Setting

Enter into the “Unit” setting page, select “Unit” and click it. Click ◀ or ▶ can switch the unit from “uSv” to “uGy”. You can also change the device language from English to Chinese in this interface.

## 9. Sound Setting

This interface can set the Alarm Volume and Alarm Times. If you set the Alarm Volume to 0, then the detector only has light blinking with no sound when the reading exceeds the Alarm limits.

Particle Sound: “OFF” closed, “ON” open. The device will sound if Particle Sound is set to ON and has ion enter into sensor.

## 10. Clock setting

Able to set the date in the “Clock” interface: Year-Month-Day

Time setting: Hour-Minute-Second

Note: advice to set the date & time to the local time and date before using the detector.

## 11. Sleep setting

Screen Sleep: Able to select how long you want the device to wait before turning the screen off when you're not using your device. The time unit is minute (Min). The screen will keep lighting up when it is set to “🔒”.

Auto Shutdown: Able to set the automatic power-off time. You can select in the range from 1 hour to 9 hours in unit of hours. The automatic power-off function will be disabled when it is set to “🔒”, only can long time press ⏻ to power off.

Screen Brightness: Adjust the brightness of the screen.



## VIII. Notices

1. Please turn the device off when it is not in use. The unit must retain a full charge before going into storage for long periods of time. And the battery should be recharged every 12 months.
2. Please charge in time when the device occurs low power to guarantee the accurate measurement value.
3. Enable the Particle sound will reduce the battery duration of the unit.

## IX. Safety Reminding

Instrument unexpected fallen	Please confirm if the radiation reading is normal, whether there are any updates. If it appears to be abnormal, please don't place the device in high-strength radiation places.
When the unit shows message "Equipment already damaged"	If an abnormality is found, please don't apply the unit in high-strength radiation places.
The operating environment contains inflammable and explode gas or powder dust	Please don't use the device in an inflammable and explode gas or powder dust environment.
Waterproof	Please attention that the waterproof grade of the unit is IP40. It cannot be exposed to rain or water spray environment.

Energy responding	For the X-ray, It can only be used as a reference for testing radiation intensity, unable to meet energy responding requirements.
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Note: The GM sensor is located on the right side of the instrument.

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