

****Notes to Users**:**

Please take care of the sensor of the instrument, which is fragile. Any person tending to use, maintain or repair the product shall carefully read this Operation Manual. The instrument may achieve the designed performance only when it is operated in strict compliance with the manufacturer's instructions. Please observe the following suggestions during maintenance and use of the instrument, so as to extend its service life.

1. Do not drop, knock or violently shake the instrument; otherwise the detector may be damaged.
2. In case the instrument is left idle for a long time, please take out the battery.
3. Please keep the instrument dry during storage or use, for humidity may cause damage to it.

4. If the instrument fails to work normally, please sent to designated authorized service.

The final power of interpretation owe to our company.

The Company reserves the right to upgrade the product or modify this Manual without notification to the user.

 **Warning** 

For safety reasons, the instrument must be operated serviced by qualified persons only. Please read and understand the Manual completely before operating or servicing.

To avoid flames caused by any existing flammable gas, please disconnect the power before repairing the instrument.

Take care when replacing the battery, so as to avoid short circuit between the positive and negative poles of the battery.

The instrument adopts non-plug sensor. In case of any malfunction, please contact our specialists.

To replace any original part of the instrument with part provided by other manufacturers other than the Company may weaken the safety of the product. Any unauthorized modification or maintenance may result in damage to the instrument.

Power: please use AAA battery.

Electrostatic hazards: the instrument may be wiped clean only with a damp cloth.

Long-term storage: stable operation of the instrument is based on proper use and maintenance of it. If the instrument is to be kept aside for a long time, please turn it off, and take out the battery and place it where it is dry.



Notes and suggestions to use and operation

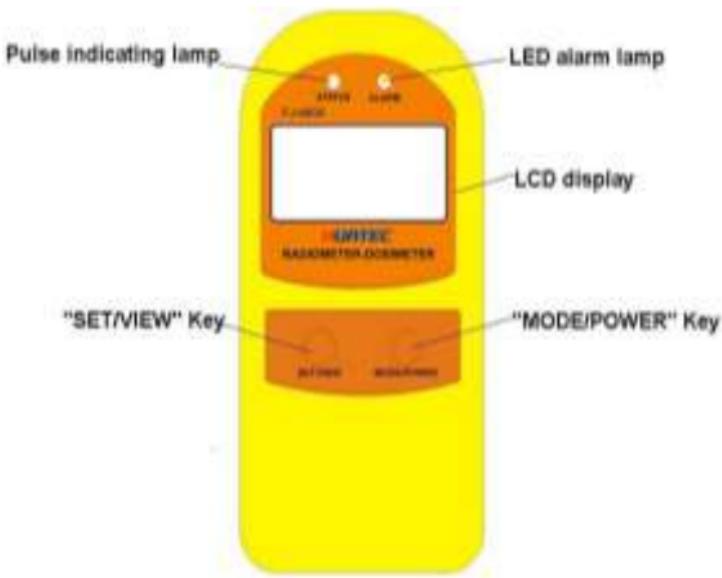
The instrument provides three single alarming modes, i.e. sound, flash and vibration, and three combined alarming modes, i.e. sound + flash, sound + vibration, and flash + vibration. When the battery is low, please turn off the combined mode of sound + vibration (for this mode consumes larger power and thus may result in failure of the instrument) and replace the power supply in time.

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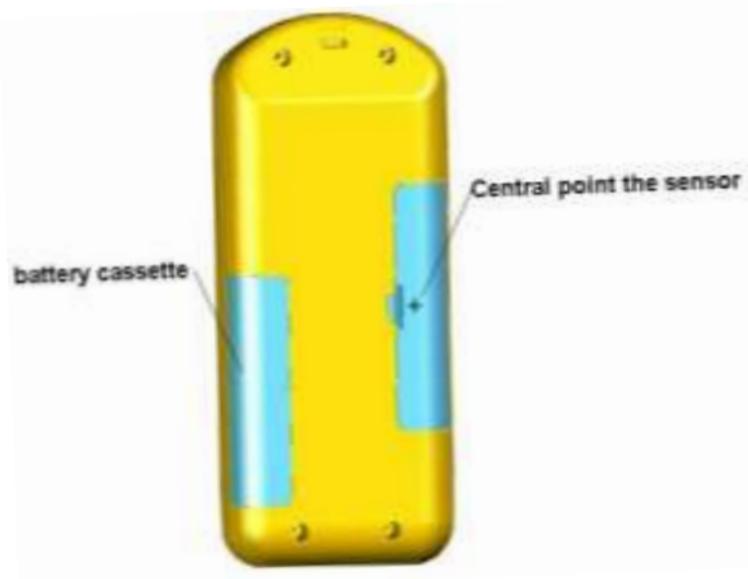
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1. Operation panel



Front View



Back View

The operation panel of the instrument consists of LCD display, Alarm indicating lamp,

Pulse indicating lamp, Function key "MODE/POWER" and Function key "SET/VIEW". The LCD display may show the current time, mode, dose rate, accumulated dose value and battery power.

1.1. LCD display (Figure 1)



Figure 1

1.2. User interface Icons

Icon	Indication
Speaker icon	Sound
Vibration icon	Vibration
Light icon	Light

	Impulse (acousto-optic indicating signal for different frequencies is given according to radiance)
	Alarm clock
	Battery power
RATE	Dose rate
DOSE	Accumulated dose
$\mu\text{Sv/h}$	Dose rate unit (Sievert): $\mu\text{Sv/h}$, mSv/h
mSv	Accumulated dose unit: μSv , mSv

2. Technical parameters

- Types of measured Ray: X, γ and β rays
- Measurement range:
Radiation equivalent dose rate(EDR):
 $0.01 \mu\text{Sv/h} - 10\text{mSv/h}$
- Radiation equivalent dose(ED):

0.01 μ Sv - 9999Sv

- Energy ranges of measurement:
40KeV - 3.0MeV
- Relative errors of energy dependence(^{137}Cs): $\leq\pm25\%$
- Basic relative errors::
 $\leq\pm10\%$ (when 20 μ Sv/h)
- Adjustable range of alarm threshold level relative to radiation dose rate: adjustable within the range
- Adjustable range of alarm threshold level relative to radiation dose: adjustable within the full range
- Response time of alarm: ≤6 seconds
- Display unit:
EDR :(μ Sv/h、 mSv/h、 Sv/h)
ED:(μ Sv、 mSv、 Sv)
- Power: one AAA battery

- Dimension: 125*55*26 (mm)
- Weight: 100g (excluding battery)

3. Functions

- Alarm of exceeded programmed threshold levels
- Retention of maximum EDR
- Clock and alarm clock
- Light indication for pulse: to give light indications of different frequencies based on the strength of radiation – the stronger the radiation is, the higher the frequency is.
- To save radiation equivalent dose(ED)and parameters: the instrument will automatically save the radiation equivalent dose(ED) and parameters at an interval of every ten minutes.

4. Operation description of the functional

keys

4.1. Introduction to the keys

The instrument has two keys, i.e. "MODE/POWER" and "SET/VIEW", as shown in (**Figure Front View**).

4.1.1. Function of key "MODE/POWER":

- Turn on/turn off
- Switch measuring modes
- Setting selection

4.1.2. Function of key "SET/VIEW":

- View the alarm value
- Enter the setting mode
- Parameter setting

4.2. Operation of the keys

4.2.1. Turn on and turn off

Turn on: the instrument will start up automatically after the battery is installed, and the equivalent dose rate(EDR)measurement

mode will be enabled automatically; or hold down the key "MODE/POWER" when the instrument is off to turn on the instrument.

Turn off: hold down the key "MODE/POWER" when the instrument is on to turn it off.

4.2.2. Interface switch

The working Interface can be switched when key "MODE/POWER" is pressed.

Interfaces: equivalent dose rate(EDR), equivalent dose(ED):, maximum equivalent dose rate, clock and alarm clock.

5. Interfaces switch and parameter setup

5.1. Equivalent dose rate interface and parameter setup

5.1.1. Equivalent dose rate(Figure 2)

In the equivalent dose rate interface, the RATE icon, the currently measured equivalent dose rate and unit are displayed. The equivalent dose

rate is refreshed every second, and the measurement unit will automatically switch to $\mu\text{Sv/h}$ or mSv/h according to the value of the equivalent dose rate.



Figure 2

5.1.2. View and set up the EDR alarming mode and alarming value

In the equivalent dose rate interface, press key "SET/VIEW", and the alarm value of the equivalent dose rate and "RATE ALARM VALUE" icon will be displayed (Figure 3). it will automatically return to the equivalent dose rate measurement interface after 6 seconds.



Figure 3

Hold down key "SET/VIEW" for 3 seconds, it will enter into the setting interface of alarming mode and alarm value.

In this interface, first need to set the alarm mode; if the icon flashing ,it indicates the corresponding function can be set. Press key "SET/VIEW" to turn on or turn off the current function. "ON"indicates the current function is enabled (Figure 4); "OFF" indicates the current function is not enabled (Figure 5).



Figure 4



Figure 5

If it is unnecessary to change the current option, press key "MODE/POWER "to switch to the next function. The mode of the sound, vibration, light and pulse can be set in sequence.

When the pulse work indicating icon is flashing, press the key "MODE/POWER" again, then the unit of equivalent dose rate alarm value (uSv/h) will flash, press key "SET/VIEW" to select proper alarm value unit. In practice, "uSv/h "is generally selected (Figure 6). After the unit of alarm value is selected and confirmed, press key "MODE/POWER" again, at this time, the

rightmost digit of the alarm value will flash; press key "SET/VIEW", a proper digit from 0 to 9 can be selected; then press key "MODE/POWER" again to set the next bit digit; when all bits of the alarm value have been set, then press key "MODE/POWER", at this time, all digits flashing; 6 seconds later, the setting will be automatically saved, and it will return to the equivalent dose rate measurement interface.

Note: During setting interface, if no key is operated more than 6 seconds, the instrument will automatically save the setting and return to the measurement interface.



Figure 6

5.2. Equivalent dose(ED) interface and parameter setup

5.2.1. Equivalent dose(ED) interface

In the equivalent dose(ED) interface, the display shows "DOSE" icon, the current equivalent dose value and unit (Figure 7). The measurement unit will automatically switch among uSv, mSv and Sv according to the equivalent dose value.



Figure 7

5.2.2. View and set up the alarm value of equivalent dose(ED)

In the equivalent dose(ED) interface, press key "SET/VIEW" to show the equivalent dose alarm value and unit, as well as the "DOSE ALARM VALUE" icon (Figure 8).



Figure 8

Hold down key "SET/VIEW" for at least 3 seconds it will enter the interface of setting equivalent dose(ED)alarm value. Select the unit of alarm among uSv, mSv and Sv first;

After the unit of alarm value is selected and confirmed, press key "MODE/POWER" again, at this time, the rightmost digit of alarm value flashes; press key "SET/VIEW", and the digit can be modified. The operation is the same with that of setting the equivalent dose rate

alarm value.

After setting of the four digits of the alarm value is completed, press key "MODE/POWER" again, and the equivalent dose value will flash; at the same time, the "DOSE VALUE" icon will be displayed (Figure 9).



Figure 9

At this time, if key "SET/VIEW" is pressed, the "dEL" icon will be displayed (Figure 10), indicating to delete the equivalent dose value. If there is no need to delete the equivalent dose value, please press the key "SET/VIEW" again to switch to the equivalent dose value flash, and then press key "MODE/POWER" for confirmation. it will automatically quit the

current interface. If no operation is done morethan 6 seconds, the instrument will confirm the current setting and return to the equivalent dose interface.



Figure 10

Note: the equivalent dose value cannot be restored once deleted. Therefore, please record it before operation.

5.3. Maximum equivalent dose rate interface

In the maximum equivalent dose rate interface, the "RATE MAX "icon and the maximum equivalent dose rate measured during the measuring process will be displayed (Figure 11).



Figure 11

In the maximum equivalent dose rate mode, hold down key "SET/VIEW" to enter the reset interface; press key "SET/VIEW" again to select whether to reset; when all digits are zero, it means to reset; when the dose rate is displayed, it means not to reset; then press key "MODE/POWER" for confirming the operation.

5.4. Clock setup

"TIME" icon and the current time are displayed (Figure 12).



Figure 12

In the clock interface, hold down key "SET/VIEW" to enter the clock setting interface, at this time, the clock can be set. Similar to the setting of alarm value, key "SET/VIEW" can be used to change the digits, and key "MODE/POWER" can be used to adjust positions of the digits.

The clock setting includes hour, minute, month, date and year. After the leftmost digit of hour is set, press key "MODE/POWER" to set month and date (Figure 13), and the "—" icon is displayed in the middle.



Figure 13

After the leftmost digit of month is set, press key "MODE/POWER" to set year (Figure 14). Press key "SET/VIEW", the currently flashing digit can be modified.



Figure 14

If no operation is done morethan 6 seconds, the instrument will confirm the current setting and return to the clock interface.

5.5. Alarm clock setup

"ALARM TIME" icon and preset alarm clock time will be displayed (Figure 15).



Figure 15

In the alarm clock interface, hold down key "SET/VIEW" to enter the alarm clock setting interface. First, select whether to turn on the function of alarm clock. When the "ON" icon is displayed, indicating the alarm clock is set on; when "OFF" is displayed, indicating the alarm clock is set off.

After the function of alarm clock is set, press key "MODE/POWER" again, and the time value of the alarm clock will flash; press

key "SET/VIEW", and the digital value can be modified; press key "MODE/POWER", it will switch to the next digit. After setting of the four digits is complete, press key "MODE/POWER", and the four digits will flash simultaneously. If no operation is done morethan 6 seconds, the instrument will confirm the current setting and return to the alarm clock interface.

6. Explanation of other prompts

6.1. 1 Prompt for low battery

When the battery is low, the battery icon on the upper right corner will be empty and flash. At the same time, the "Lobt" icon will be displayed every 3 seconds (Figure 16). When low battery is indicated, please replace the battery in time,otherwise, it will result in inaccurate measured data or abnormal work of the instrument.



Figure 16

6.2. Prompt for Err1 and solution

If the "Err1" icon is displayed (Figure 17), it means the sensor has not detected any signal within 120s.



Figure 17

Solutions:

- 1) Low battery may results in abnormal work of the instrument. Replace the battery, and the problem can be solved.

2)The sensor has been damaged or the corresponding circuit fails. If the problem has not been solved by replacing the battery, the instrument shall be returned to the factory for repairs.

7. Maintenance bond

The warranty period of the instrument is one year (From the day when you have it). During this period, any belongs to under normal usage circumstance cause because of the product quality's problem of breakdown, our company will be responsible for giving free maintainance.