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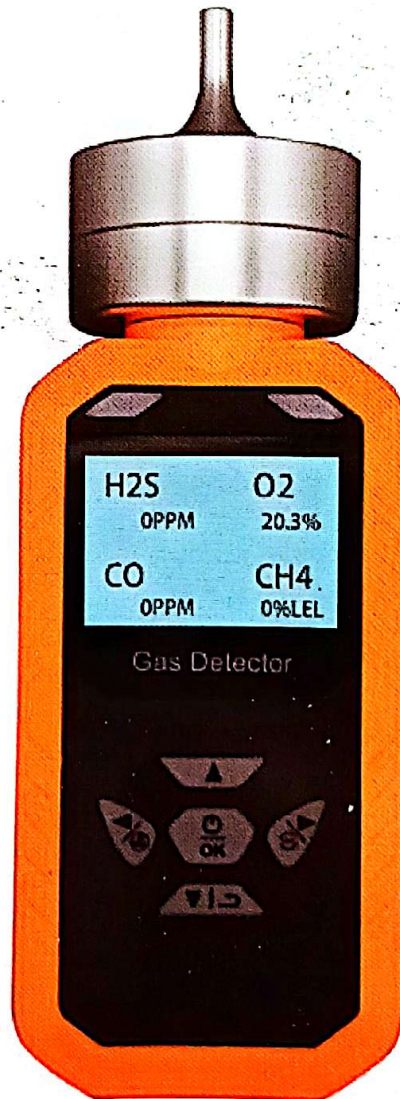
H2S

EX

O2

Pump-suction voice type multi-function gas detector

user's manual



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Thank you for using our company's products. when you are ready to use this product, please read this manual first, and use it in accordance with the relevant operating instructions provided, so that you can fully enjoy the products and services provided by our company, and avoid unnecessary behavioral damage or other accident.

1.Product description

The pump-suction voice-type four-in-one gas detector (hereinafter referred to as the detector) is a safe device that can continuously detect the concentration of leaked gas. It adopts advanced integrated circuit technology, embedded microcomputer control, high-quality imported gas sensor, with excellent sensitivity and excellent repeatability; using a dot-matrix LCD display, supports Chinese and English interfaces and Chinese and English voice prompts, users can quickly understand this product, it is easy to use and maintain; the shell is made of high-strength engineering plastics, with good shock resistance, high strength, high-grade appearance and dust-proof, waterproof and explosion-proof functions.

This detector is widely used in petroleum, chemical, environmental protection, metallurgy, refining, gas, biochemical medicine, agriculture, fire protection, archaeology and other industries and places that need to safely monitor toxic and harmful gases and prevent explosions. The detector can effectively predict the dangerous gas concentration and alarm to ensure that the life safety of the staff is not threatened and the production equipment is not damaged.

The design, manufacture and verification of this product comply with the following national standards:

Gb3836.1—2010 "Explosive Atmosphere Part 1: General Requirements for Equipment"

GB3836.4-2010 "Explosive Atmospheres Part 4: Equipment Protected by Intrinsically Safe "I"

GB15322.3-2003 "Portable Combustible Gas Detector Part 3: Portable Combustible Gas Detector with a Measuring Range of (0-100)%LEL"

JJG693—2011 "Verification Regulations for Combustible Gas Detection Alarms"

JJG365—2008 "Regulations for the Verification of Electrochemical Oxygen Meters"

JJG695—2003 "Hydrogen Sulfide Gas Detector Verification Regulations"

JJG915—2008 "Regulations for the Verification of Carbon Monoxide Detection Alarms"

2. Structure function comparison table

2.1 Detector structure



2.2 Working principle

Electrochemical and catalytic combustion

3、 Technical characteristics


Conventional gas detection range

Gas type	Range	Low alarm point	High alarm point	Resolution
EX	(0-100) %LEL	20%LEL	50%LEL	1%LEL
H2S	(0-100) ppm	10ppm	35ppm	1ppm
CO	(0-1000) ppm	50ppm	150ppm	1ppm
O2	(0-30) %vol	19.5%vol	23.5%vol	0.1%vol
For other combination gases, please contact the company				
Display error	≤±5%FS			
Response time	T<30s			
Finger way	LCD liquid crystal display real-time data and system status, lighting, vibration and real voice recording (Chinese and English) prompts			
Working environment	Temperature -20℃-50℃; Humidity<95%RH condensation			
Operating Voltage	DC3.7V (Lithium battery capacity 3000mAh)			
Charging time	4h-6h			
Standby time	Continuously for more than 8 hours when fully charged			
Sensor life	2 years			
Protection class	Ip65			
Physical dimension	210mm x71mm x54mm			
Weight	330g			
Detection method	Pump suction			

4、 Setup and Operation



4.1 Key Description






There are five function buttons in the middle of the instrument

(Long press the switch/OK button) 
OK

(Data plus key) ▲

(data subtract/return) ▼ | ↵

(Left shift/pump switch)and(Move right)  

Button	 OK				
Gas detection interface	Long press the switch	None	Password interface	Air pump switch	None
Password interface	Confirm	Digital plus	Number minus	Shift left	Move right
Menu interface	Enter submenu	Move up	Move down	None	None
Modify the digital interface	Confirm	Digital plus	Number minus	Shift left	Move right

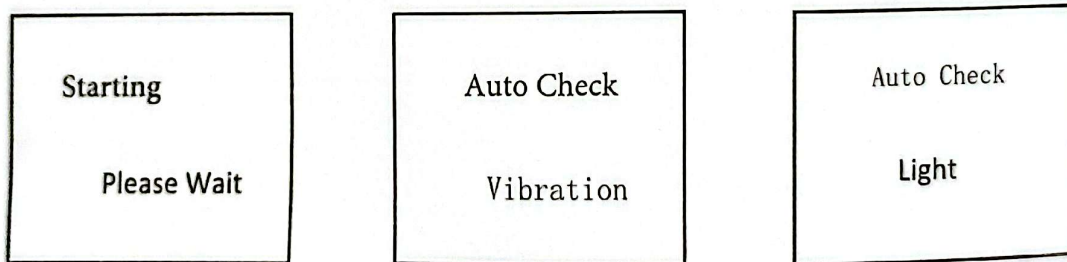
Notice

1. The button "short press" means pressing it once, and "long press" means pressing it for 3 seconds.
2. Double-click the "Confirm" button in the alarm state to temporarily cancel the sound and light vibration alarm.

Power-on, power-off, and charging status


4.1a Power-on

When the detector is turned off, press and hold the middle power button for about 3 seconds, see the LCD screen display the software version interface, and release the button after seeing the indicator light flashes twice, at this time, the LCD screen displays the boot welcome page. At the same time, you can hear the voice prompt of "Welcome to the Multifunctional Voice Gas Detector"




Please keep the air around the detector clean on the page waiting to be turned on. During the booting process, the detector will perform vibration and light self-test, please pay attention to observe whether it is normal. The above status is normal, indicating that the sound, display, light, and vibration self-test have passed

EX Alarm L 20%LEL Alarm H 50%LEL Alarm R 100%LEL	O2 Alarm L 19.5% Alarm H 23.0% Alarm R 30.0%	H2S Alarm L 10PPM Alarm H 35PPM Alarm R 100PPM	CO Alarm L 50PPM Alarm H 150PPM Alarm R 1000PPM
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After the startup is completed, the gas main page of normal standby is displayed, and the real-time gas concentration can be seen. Press the  button to view the system status information

EX	O2
0%LEL	20.9%
H2S	CO
0PPM	0PPM

BAT	
Testing	90min
Date	18. 8. 31
Time	12: 30:15

4.1b Shutdown

Press and hold the detector for 3 seconds in the state of the gas display main page, and the screen will display the shutdown confirmation interface.

Press the left button "◀" to shut down successfully.

Press the right button "▶" to cancel the shutdown and return to the main page of gas detection.

POWER OFF	
YSE	NO


4.1c Charging indication


When the USB charging cable is plugged in when the power is off, the current battery level will be displayed on the screen

When the battery is only 1 bar left, a low battery page will pop up on the screen every 60 seconds, and there will be a voice prompt of "low battery, please charge"

When the power is less than 1 bar, the detector will automatically shut down to prevent the loss of data inside the detector and the unexpected damage to the sensitive components inside the instrument due to insufficient voltage.


Low Battery
Charging

Charging


Charge End


4.2 Setting menu

The detector menu has alarm record, low alarm setting, high alarm setting, zero setting, calibration setting, time setting, backlight setting, password setting, channel information, language switching function

When the main page of gas concentration is displayed, press the () button. Prompt for password (factory default password is set to 1111)

Password		
1 1 1 1		
Up	Enter	Down

After entering the correct password through the key, enter the menu selection

```

Menu
>Alarmrecord
Set L Alarm
Set H Alarm

```

```

Menu
>Zero Adjust
Cali gas
Set Time

```

```

Menu
>Set Backlight
Set Password
Channel Info

```

```

Menu
>Set Language
Exit

```

4.3 Alarm record

When the arrow in the menu selection bar points to the alarm record, press the middle confirm button to view the alarm record; press the up and down arrows to turn the screen, and the previous alarm records can be inquired in turn; press the middle button to switch to the option page, and by selecting "Delete" to clear all records, or select "Return": return to the record query page; "Exit": return to the main menu;

```

O2      Alarm L
        19.4%
        18.8.32 12:27:40
Up Enter Down

```

```

Options
> Return
Delete
Exit

```

4.4 Low alarm settings

When the arrow in the menu selection bar points to the low alarm setting, press the middle confirmation key to switch to the interface for selecting the low alarm channel; you can select the combustible gas, oxygen, hydrogen sulfide and carbon monoxide channels through the ►, ◀ keys; select the channel to be set. Then press the (●) key to enter the low alarm concentration setting page; the user can adjust the actual required alarm concentration according to the key, press the confirm key to save

```

Select gas
EX
Up Enter Down

```

```

Set Low
EX      20%LEL
Up Enter Down

```



```

Save
?
Y      N

```


s

4.5. High alarm settings

When the arrow in the menu selection bar points to the high alarm setting, press the middle () key to switch to the interface for selecting the high alarm channel; you can use the up and down keys to select combustible gas, oxygen, hydrogen sulfide, and carbon monoxide channels; select the required settings After selecting the channel, press the () key to enter the high alarm concentration setting page; the user can adjust the actual required alarm concentration according to the key, and press the confirm key to save.

Select gas EX p Enter Down	Set High EX 50%LEL Up Enter Down	Save ? Y N
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4.6 Zero setting

When the arrow in the menu selection bar points to the zero point setting, press the middle confirmation key to switch to the interface for selecting the zero point setting channel; you can use the ◀, ▶ keys to select the combustible gas, oxygen, hydrogen sulfide and carbon monoxide channels; after selecting the channel to be set Press the () key to enter the zero point setting page; the current gas concentration data is displayed on the page; press the left ◀ key to save, and set the current value as the new zero point of the gas.

In order to prevent users from misoperation, the detector detects that the difference between the gas value and the zero value is too large, and it will prompt "Data Abnormal, Failed to Save"

Zero Adjust 2 YES NO

Warning: Please do this operation in clean air (oxygen must be in pure nitrogen) to ensure that there is no required zeroing gas in the current air. Otherwise, the concentration of reactive gas in the environment will affect the detection accuracy of the detector to varying degrees!

4.7 Calibration settings

Prepare the gas cylinder, pressure limiting valve, flowmeter, gas pipe, and three-way valve before calibration.

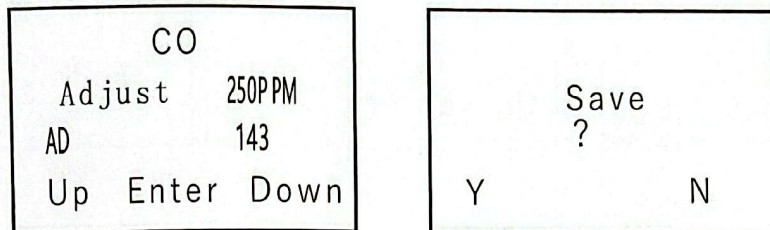
When the arrow in the menu selection bar points to the calibration setting, press the middle confirmation key to switch to the interface for selecting the calibration setting channel; you can select the combustible gas, oxygen, hydrogen sulfide and carbon monoxide channels through the "▲" and "▼" keys; After setting the channel, press the enter key to enter the calibration setting page;

Open the pressure limiting valve of the gas cylinder prepared with the standard concentration, and adjust the flow to 200-400ml/min. Connect to our gas detector through a trachea and a three-way valve. Observe the AD value

displayed on the instrument. At this time, the AD value should be rising. Wait for about 1 minute until the AD value rises to the peak value and is stable and not floating. Use "▲" and "▼" to adjust the concentration value of the gas to be calibrated.

For example, if the carbon monoxide concentration of the gas cylinder is 250ppm, the concentration value displayed on the instrument needs to be adjusted to 250ppm. Click OK to save. Calibration succeeded

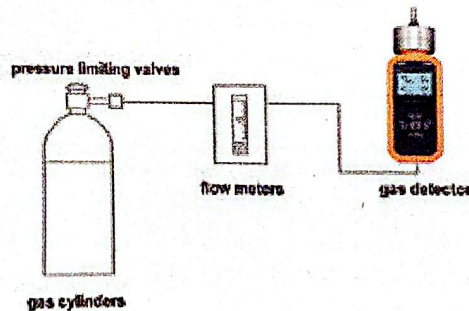
In order to prevent users from misoperation, the detector detects that the difference between the calibration value and the input gas is too large, and it will prompt "Data Abnormal, Failed to Save"



This operation must be carried out with standard concentration gas, pressure reducing valve, flowmeter, three-way joint and gas connection, otherwise it is prohibited to use.

When calibrating the gas, be sure to turn on the gas pump, and connect the gas tube between the gas cylinder and the detector to a three-way joint to ensure the smooth flow of the gas.

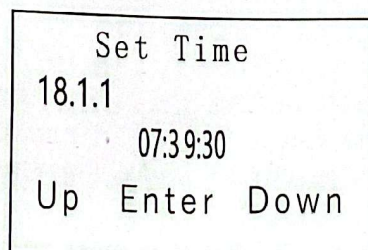
Warning: This operation is strictly prohibited for non-professionals, otherwise all consequences will be borne by yourself! The detector has been calibrated and tested uniformly before leaving the factory. If the user wants to re-calibrate, please strictly follow the steps, first zero-calibrate (if modifying the zero-crossing fine-tuning value, you need to change the fine-tuning value to 0) and then re-calibrate the concentration. If the user misuses this setting, please restore the factory setting in time.



Calibration diagram

4.8 Time setting

When the arrow in the menu selection bar points to the time setting, press the middle confirmation key to switch to the setting time interface; modify the value by pressing the () key. Then switch between seconds, minutes, hours, days, months, years, and finally save.



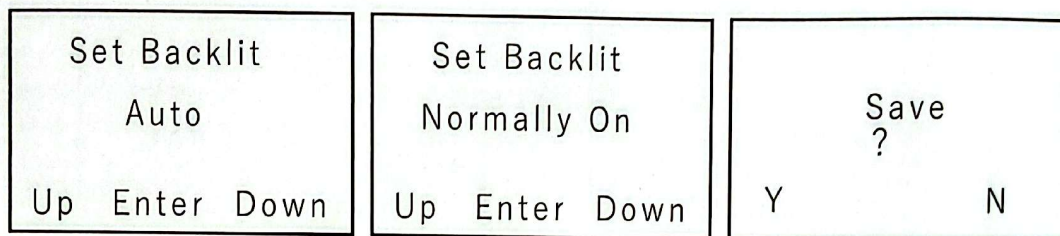
Since the internal clock chip of the detector will affect the clock error due to temperature, electromagnetic interference, insufficient battery power, etc., it is recommended that the user set the time every once in a while.

4.9 Backlight settings

When the arrow in the menu selection bar points to the backlight setting, press the middle () key to switch to the backlight setting interface; switch the backlight setting options by pressing the ◀ key and pressing the ▶ key;

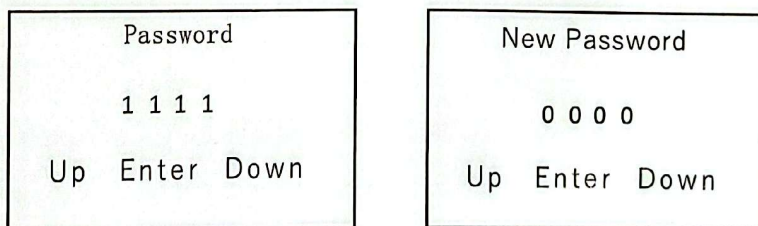
"Auto" means that the backlight will wake up every time you press the button and re-time for 30 seconds, and the LCD backlight will turn off after the time expires.

"Always on" means that when the user needs to observe the gas changes for a long time in a place with insufficient light, the always-on function setting can be selected. The LCD backlight will always stay on



4.9 Password setting

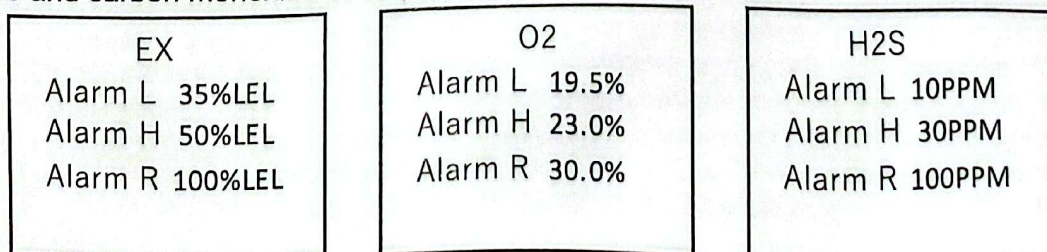
When the arrow in the menu selection bar points to the backlight setting, press the middle () key to switch to the password setting interface; before setting the password, you need to re-verify the password on one side, and the password setting page will be jumped after the password verification is correct; the factory default The password is 1111, in order to prevent others from misoperation, the user can reset the new password;



Note: Please keep the password properly, once lost, it can only be returned to the factory to restore the factory settings

4.9 Channel information

When the arrow in the menu selection bar points to the channel information, press the middle () key to display the low concentration alarm threshold, high concentration alarm threshold and maximum range information of combustible gas, oxygen, hydrogen sulfide and carbon monoxide in sequence;



CO
Alarm L 50PPM
Alarm H 150PPM
Alarm R 1000PPM

4.12 Language switch

When the arrow in the menu selection bar points to the channel information, press the middle confirmation key to jump to the language setting page; press the ◀ key and press the ▶ key to switch the language setting options; press the (●) key to save.

(The detector supports Chinese and English language switching, and the played prompt voice is consistent with the voice set by the system)

Language
Chinese
Up Enter Down

Language
English
Up Enter Down

4.13 EXIT

When the arrow in the menu selection bar points to exit, press the middle () key, the system exits the menu selection and returns to the main page of displaying real-time gas concentration. When you enter the menu again, you need to re-enter the verification password.

EX	O2
0%LEL	20.9%
H2S	CO
OPPM	OPPM

5、 Function usage

5.1 After the detector is turned on, the LCD screen is in a standby state that displays the four concentrations of combustible gas, oxygen, hydrogen sulfide and carbon monoxide in real time. Press any key to turn on the LCD backlight (the backlight remains for 60S after any operation).

5.2 Combustible gas alarm

When it is detected that the concentration of combustible gas is higher than the minimum alarm threshold set by the system, the detector will voice broadcast "Please note that the concentration of combustible gas exceeds the standard" and will always simulate a siren alarm sound; the alarm light on the detector and the internal vibration motor simultaneously Turn on; when the detector detects that the concentration of combustible gas returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

5.3 Oxygen alarm

When the detected oxygen concentration is lower than the minimum alarm threshold set by the system, the detector will voice broadcast "Please note that the oxygen concentration is too low", and if it is higher than the maximum alarm threshold set by the system, the detector will voice broadcast "Please note, Oxygen concentration exceeds the standard" and has been simulating the alarm sound of the siren; the alarm light on the detector and the internal vibration motor are turned on at the same time; when the detector detects that the concentration of combustible gas returns to the minimum alarm threshold, the voice, light and vibration alarm status disappears.

Remarks: The concentration of oxygen in normal air is 20.9%, the user can adjust the low alarm threshold and high alarm threshold according to actual needs

5.4 Hydrogen sulfide

When it detects that the concentration of hydrogen sulfide is higher than the minimum alarm threshold set by the system, the detector will voice broadcast "please note that the concentration of hydrogen sulfide exceeds the standard" and will always simulate a siren alarm sound; the alarm light on the detector and the internal vibration motor simultaneously Turn on; when the detector detects that the concentration of hydrogen sulfide returns to the minimum alarm threshold, the alarm status of voice, light and vibration disappears.

5.5 Carbon monoxide

When it is detected that the concentration of carbon monoxide is higher than the minimum alarm threshold set by the system, the detector will voice broadcast "Please note that the concentration of carbon monoxide exceeds the standard" and will always simulate the alarm sound of the siren; the alarm light on the detector and the internal vibration motor are turned on at the same time; When the detector detects that the concentration of carbon monoxide returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

5.6 Alarm data saving

After the detector triggers an alarm, when the detected alarm gas returns to within the set normal threshold, the detector will save the current alarm information to the internal storage of the detector, and according to the low concentration alarm threshold and high concentration alarm threshold set by the user Distinguish between low and high. Users can query through the alarm record in the menu bar.

O2	AlarmL
19.4%	
18.8.32	12:27:40
Up	Enter Down

Remark:

1.The alarm voice supports Chinese and English voice alarm, which is consistent with the system language setting

2. When the detector triggers an alarm, quickly double-click the middle () key to turn off the sound, vibration, and light alarm. When all gases return to within the preset alarm threshold, the detector re-enters the warning state

Warn:

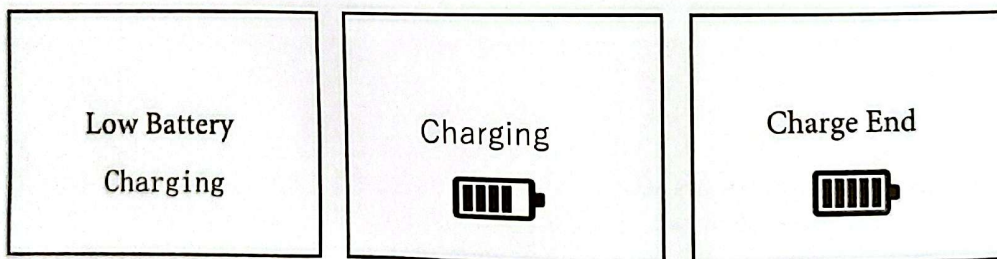
1. The detector will only trigger an alarm when it is turned on and on the gas detection page;
2. Please do not charge the detector at the gas monitoring site to avoid fire or explosion caused by sparks during plugging and unplugging.
3. Try not to charge the detector when it is turned on, so as not to affect the charging speed.
- 4 The detector has the function of intelligent tracking zero point, please turn it on when the air is clean.

6. Charging function

1. The detector has a built-in large-capacity rechargeable battery, which can be used for continuous standby monitoring for more than 10H when fully charged; when the detector indicates that the battery is insufficient or cannot be used normally due to low voltage, please charge it in time; plug the AC plug of the charger into On the AC220V AC power supply, connect the other end of the 5V USB power cable to the charging jack of the detector. When the detector is off, it will automatically turn on after plugging in the power supply and display the charging status. Charging is complete when 100% battery is displayed on the detector screen.

2. Please try to use the original adapter charger and USB charging cable

3. The detector cannot be turned on normally when charging is in the off state. You can unplug the USB charging cable after charging is complete, and then restart the detector to perform gas monitoring operations.



7. Precautions for use

1. Prevent the machine from falling from a height or being subjected to severe vibration.
2. In the presence of high-concentration gas, the detector may not work normally.
3. Please operate and use in strict accordance with the instructions, otherwise it may cause inaccurate test results or damage the detector.
4. This product should not be stored or used in an environment containing corrosive gases (such as chlorine gas with a large concentration), nor in other harsh environments, including excessively high and low temperature, high humidity, electromagnetic fields and use and store the unit under strong sunlight).
5. If there is dirt on the surface of the detector after long-term use, please wipe it gently with a clean soft cloth dipped in water. Do not use corrosive solvents and hard objects to wipe the surface of the detector, otherwise it may cause scratches on the surface of the detector. or damaged.

6. In order to ensure the detection accuracy, the detector should be calibrated regularly, and the calibration period should not exceed 1 year.
7. Please remove the lithium battery and sensor of the discarded portable gas detector and send it to the designated place or return to our company. Do not throw it into the trash can at will.
8. For any application or use failure beyond the description in this manual, please contact our company for solutions.
9. Do not disassemble or replace the battery pack or charge the battery pack in an explosive gas environment. Do not use non-explosion-proof certified peripheral plug-in devices in explosive gas atmospheres, nor replace sensors.
10. This product has obtained explosion-proof certification, and users are not allowed to arbitrarily replace or modify components or structures that affect explosion-proof performance.

8、 Common faults and solutions

Fault	Failure cause	Operation
Can not turn on	Low battery	Please get charging
	Detector's down	Please contact the factory
	Circuit fault	Please contact the factory
No detect value	Circuit fault	Please contact the factory
Detecting not true	Sensor over life	Please contact the factory to change
	Long time no cali	Get to calibration
Time display wrong	Battery power is exhausted	Please get charging and re-setting time
	Strong electromagnetic	Re-setting time
Set zero fault	The sensor zero drift too high	Calibrate it or change sensor
After detection the value not back to 0 (except O2)	Zero drift	Zero calibrate
Detector display whole range	Sensor bad	Change new sensor

9. Storage

The detector should be stored in a ventilated room with an ambient temperature of $-10^{\circ}\text{C} \sim 55^{\circ}\text{C}$ and a relative humidity of not more than 85%. Avoid direct sunlight, and the air cannot contain harmful gases or impurities that corrode the detector.

10. Package

Packing box	1
Portable gas detector	1
Charger	1
USB line	1
Manual	1
mask	1

The detector has been inspected and qualified before leaving the factory and a certificate of conformity has been issued. If any damage is found during transportation, please contact the manufacturer for replacement in time.