

Portable gas detection alarm

operating instruction

G40S



Henan Otywell Electronic Technology Co.,Ltd.
ISO9001 Quality Management System Certified Enterprise

Thank you for using the products of our company. When you are ready to use this product, please be sure to read this manual carefully and follow the relevant operation steps provided so that you can fully enjoy the services provided by our company and avoid your misoperation that may damage this machine or cause other accidents.

Please keep this manual properly so that you can refer to it and get help when you need it in the future.

Copyright

This manual is copyrighted by our company. Without written permission, no part of this manual may be reproduced, translated, stored in a database or retrieval system, and no means or methods such as electronic, photocopying, recording, etc., may be used to disseminate this manual.

Our company adheres to the principle of scientific and technological progress, and is constantly committed to product improvement and performance improvement. The company reserves the right to retain any product improvement without prior notice.

If the user does not install or repair the parts according to this manual, the user shall be responsible for the resulting liabilities.

The product and the color and style of the product are subject to the actual purchase.

User service guidelines

1. Before using this product, please check the accessories, product certificate of conformity and user warranty card according to the list of products before leaving the factory. If you find that they are not complete, please contact the seller or manufacturer immediately.

2. The warranty period of this product is one year from the date of sale. If the quality of the product is lower than the technical indicators, the user can enjoy free maintenance with the warranty card if he/she complies with the storage, transportation and use requirements.

3. The company will charge for the repair of damage caused by violation of operating regulations and requirements, faults caused by non-designated technical service department of our company or product quality problems caused by force majeure factors.

4. When the product is repaired, please show the product warranty card actively. If you cannot show the product warranty card, the repair will be charged.

5. After maintenance or repair of the product, please show this manual. The maintenance personnel will fill in and sign the attached "Maintenance and Repair Record." At the same time,

please sign the "Maintenance and Repair Record" of the maintenance personnel to confirm the maintenance and repair content and provide valuable comments. If you are a corporate user, please affix the official seal.

6. If you have any questions or dissatisfaction with the products and services provided by us, including product technology, quality, installation and maintenance, service attitude, charging standards and other issues, please contact us in time, we will properly handle your opinions.

Use instructions

Before using the detector, please read the following precautions:

- Do not use damaged gas detectors. Before using the detector, check for cracks or missing parts on the housing. If the detector is damaged or missing parts, please contact our company or dealer immediately. Replacing components yourself may damage the internal safety of the detector.
- Do not expose gas detectors to electric shock or severe continuous mechanical vibration.
- Waste batteries and sensors should be disposed of by qualified recyclers or hazardous waste handlers, not thrown into the trash.
- Do not disassemble the battery or put it into fire, and avoid short circuit of positive and negative terminals of the battery, otherwise it will cause fire or explosion.
- It is forbidden to dismantle, adjust or repair the detector without permission.
- It is strictly prohibited to open the cover of the instrument while energized at the operation site! It is strictly prohibited to charge, disassemble or replace the battery in dangerous places!
- Do not splash water, chemical solvents, benzene or gasoline on the detector, and avoid inhaling these substances into the detector, otherwise it may cause the detector to malfunction.
- Prevent the machine from falling from a height or subjected to severe vibration.
- In order to ensure the measurement accuracy of the detector, the detector should be calibrated regularly (not more than 1 year).
- It is necessary to avoid frequent artificial impact of high concentration toxic gas on the detector.
- Do not continue to use the sensor if it has failed or exceeded its service life.
- Before using this instrument, please read the instruction manual carefully and operate it in strict accordance with the instructions.
- Any application or use of the fault beyond the description in this manual should be addressed to the dealer or manufacturer.

The appearance and color of the products in the product catalog are for reference only. The supply is subject to the actual goods. Our company reserves the right to modify the technical parameters of the products in this catalog without prior notice. If you have any questions, please call our service hotline.

catalogue

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1. Overview

The portable gas detection alarm is a high-sensitivity gas detection and alarm instrument for industrial use. It is suitable for gas concentration detection in industrial and commercial settings: gas stations, chemical workshops, hazardous materials warehouses, petrochemical sites, laboratories, and other places. It effectively ensures the safety of personnel and prevents damage to production equipment. The product can detect different gases based on various sensor types. Compact in size, easy to operate, portable, and with good vibration resistance. The product uses high-resolution dot matrix LCD display technology, providing a more intuitive and clear display.

The detection alarm uses a natural diffusion method, with sensitive elements made of high-quality gas sensors, offering excellent sensitivity and outstanding repeatability; the instrument is controlled by an embedded microcomputer, making it easy to operate, fully functional, and highly reliable, with multiple adaptive capabilities; its compact and aesthetically pleasing design not only makes it hard to put down but also facilitates portability. The alarm's casing is made of high-strength engineering plastic combined with anti-slip rubber, providing high strength, a good feel, and protection against water, dust, and explosions.

It is adapted for areas containing explosive gas mixtures in zones 1 and 2 containing II A, II B and II C; dust tight enclosures are used in zones 21 and 22.

1.1 Normative reference documents

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

GB/T 3836.1-2021 Explosive Environments Part 1: General Requirements for Equipment

GB/T 3836.4-2021 Explosive Environments Part 4: Equipment Protected by Intrinsic Safety
"i"

GB/T 4208-2017 Enclosure protection class (IP code)

GB 12358-2024 General technical requirements for environmental gas detection and alarm instrument in workplaces

1.2 Product terminology

"LEL" refers to the lower explosive limit. The lowest concentration at which flammable gases in air will explode when exposed to an open flame is called the lower explosive limit—abbreviated as %LEL. In English: Lower Explosion Limited. When the concentration of flammable gases in air reaches its lower explosive limit, we say that the explosion risk level of the flammable environment in this place is one hundred percent, or 100% LEL.

%VOL: Percentage of gas volume.

ppm: one millionth of the volume percentage content of a gas.

μmol/mol (micromole per mole) is the unit of amount of substance.

Conversion: 1ppm=1μmol/mol.

2. Main technical indicators

	methane	oxygen	carbon monoxide	hepatic gas
Sensor type	Catalytic combustion type	Electrochemical type	Electrochemical type	Electrochemical formula
measuring range	(0 ~ 100) %LEL	(0 ~ 30) %	(0 ~ 1000) μmol/mol	(0 ~ 100) μmol/mol
Level 1 alarm	20%LEL	19.5%	50μmol/mol	15μmol/mol
Level 2 alarm	50%LEL	23.5%	150μmol/mol	35μmol/mol
indicating error	±5%FS	±3%FS	±5 μmol/mol or ± 10% is sufficient	±2μmol/mol or ± 10% is sufficient

Note: Only the detailed parameters of the four conventional gases are displayed. For other gases, please refer to the gas parameter table or consult customer service!

- Detection gas: combustible/gas/toxic and harmful gas/oxygen, etc
- Sampling method: natural diffusion
- Display mode: LCD display
- Response time: less than 30s
- Environmental temperature: -25°C~+55°C
- Relative humidity: (20~93)%
- Display mode: LCD display
- Power supply voltage: DC 3.7 V
- Battery capacity: 3000 mAh lithium ion rechargeable battery
- Charging time: <5 h
- Working time:> 12 h (continuous)
- Explosion-proof mark: Ex ia II C T4 Ga/Ex ia III C T₂₀₀130°C Da
- Protection class: IP66 or above
- Product weight: approximately 210 g

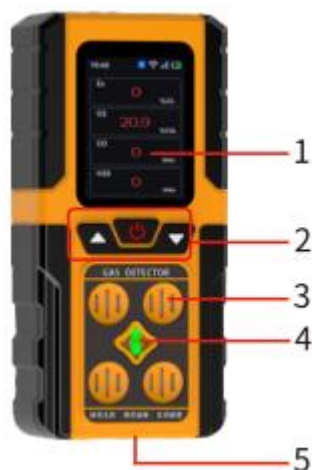
- Pressure limit: 86kPa~106kPa
- Size: L 120 mm x W 56 mm x H 31 mm

3 Product functions

- It can be connected with portable detector, and supports interconnection with the same machine
- Support 4G upload; support Beidou GPS positioning(Optional)
- Bluetooth, WiFi and other wireless communication methods
- The screen supports 0° and 180° flip for easy viewing
- Type-C charging port, more convenient
- Sound, light and vibration alarm, under-voltage alarm, fault alarm; fall alarm, call for help alarm, one-key call for help
- Multiple alarm mode Settings: low alarm, high alarm, interval alarm, TWA, STEL
- Multi-level calibration, zero point automatic tracking; factory setting can be restored, concentration calibration error operation automatic identification and prevention
- Switch between Chinese and English interfaces
- Unit free switching
- It can store 30,000 pieces of data with configurable storage time interval and mode

4. Product operation function description

4.1 Overall appearance and function indication of the product



order number	name
1	liquid crystal display
2	key
3	air intake
4	pilot lamp
5	Charging port

Figure 1

4.1.1 Button description



Figure 2

The product has three buttons:

Up key: Flip left / select up.

Power button: power on button / power off button / long press is the return button / short press is the confirm button. (Note: long press is the power off button on the main display interface, and long press is the return button on other interfaces)

Press the key: turn the page to the right/down to select.

4.1.2 Indication light description

The product has an indicator light. If the indicator light is green, it indicates that the current is a normal detection state; if the indicator light is yellow, it indicates that the current is a fault state; if the indicator light is red, it indicates that the current is an alarm state.

4.2 Main display interface

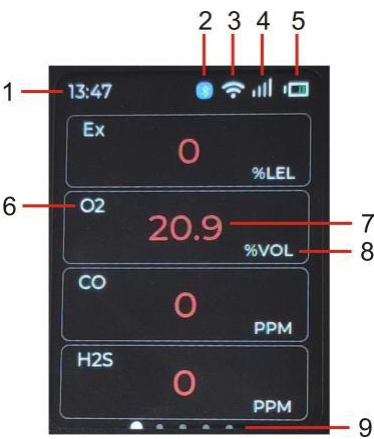


Figure 3

The current interface displays information about four detection gases. Pressing the key allows you to enter the specific information interface for one of

these gases, as shown in Figure 4. This interface displays the name of the current detection gas, its concentration, historical maximum gas concentration, historical minimum gas concentration, time-weighted average concentration (TWA), short-term exposure limit (STEL), and concentration curve. Pressing the up or down keys switches between pages to view detailed information about other detection gases.

For convenience of use, the product has the function of automatic page flipping. When holding the product on the front, the page is 0°; when the product is inverted, the page automatically flips 180°, which is convenient for users to view data.

order number	name	order number	name
1	present time	6	Name of gas to be detected
2	PDA	7	Detect gas concentration
3	WiFi	8	Unit of gas concentration
4	4G	9	Current page / total pages
5	Current remaining charge		



Figure 4

4.3 Startup instructions

Long press the power button, the indicator light will be on, accompanied by vibration, and the system prompt sound will be heard. At this time, release the button, the screen will display the QR code of the official account for about 30s, and then enter the main display interface.

4.4 Shutdown instructions

On the main display interface, long press the power button, and release the button when the indicator light is on and accompanied by vibration. The system shuts down.

4.5 Menu List

On the main display interface, short press the power button, and the system will prompt you to enter a password. As shown in Figure 5, at this point, the yellow cursor is on the first number, indicating that the first number can be edited. The initial password is "1111." Users can use the up and down keys along with the power button (which serves as the confirm function) to input "1111" to access the menu list. Short pressing the key changes the first number to "1" (short pressing the up key changes it to "9"), as shown in Figure 6. Short pressing the power button confirms, moving the yellow cursor to the second number, and short pressing the key changes the second number to "1"; continue this process until all four numbers are "1," as shown in Figure 7. Short pressing the power button completes the input, and the system transitions to the main menu interface, as shown in Figure 8. The menu list includes: Channel Settings, Time Settings, System Settings, Alarm Records, Zero Point Settings, Calibration, Upload Settings, Historical Records, Factory Reset, BT&WiFi.

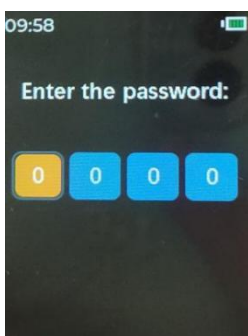


Figure 5

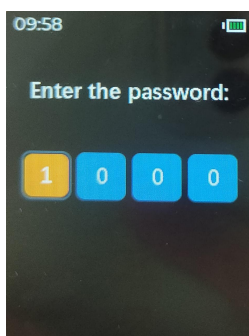


Figure 6

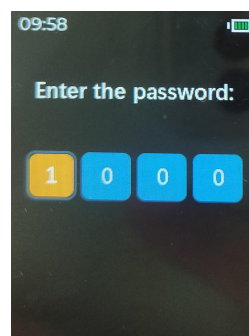


Figure 7

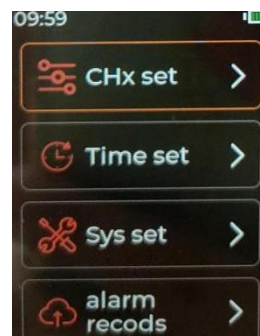


Figure 8

4.5.1 Channel settings

On the main menu interface, use the up or down key to select the "Channel Settings" menu item. Shortly press the power button to enter the channel settings interface, as shown in Figure 9. Users can set the gas name, gas unit, decimal places of gas concentration value, range, alarm 1, and alarm 2 for each channel in this interface. Shortly press the power button to confirm the selection of this channel, then press the key (if you directly press the key, it will enter another channel). Select the parameter you want to modify, as shown in Figure 10. First, press the power button to confirm, then modify the parameter.

If you need to modify parameters with a drop-down arrow, simply press the up or down key to select, as shown in Figure 11; if you need to modify parameters without a drop-down arrow, first press the power button to confirm, as shown in Figure 12, then the system will display an interface asking you to "enter $\times \times \times$," as shown in Figure 13. You can directly input using the soft keyboard at the bottom of the screen. After completing the input, be sure to select " $\sqrt{}$ " before confirming!

After setting the parameters, press the key to select "Save", and press the power button to confirm; if you do not want to save this modification, select "Cancel", and press the power button to confirm, as shown in Figure 14.

After completing the menu setting according to the above steps, the system will automatically return to the main menu interface; if you do not want to continue to modify a certain menu interface, long press the power button, and the system will also automatically return to the main menu interface.

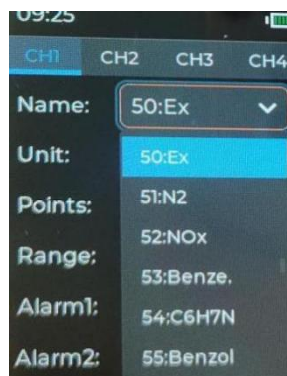


Figure 9

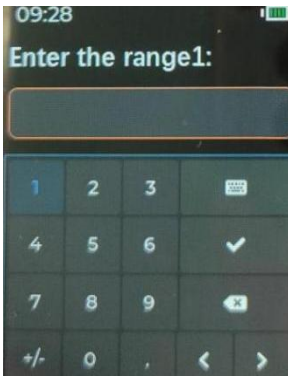


Figure 10



Figure 11



Figure12



Figure 13

Figure 14

Figure 15

Figure 16

4.5.2 Time Settings

In the main menu interface, use the up or down key to select the "time setting" menu item. Short press the power button to enter the time setting interface, as shown in Figure 15. Users can set the values of year, month, day, hour, minute and second in this interface. After setting, select "Save" and press the power button to confirm.

4.5.3 System Settings

In the main menu interface, use the up or down key to select the "System Settings" menu item. Short press the power button to enter the system settings interface, as shown in Figure 16. Users can set channel functions here, turning a channel on or off; they can also configure language settings, choosing between Chinese and English; additionally, they can adjust the backlight brightness to make the screen brighter or dimmer.

4.5.4 Alarm records

In the main menu interface, use the up or down keys to select the "Alarm Record" menu item. Short-press the power button to enter the alarm record interface, as shown in Figure 17. Users can view historical alarm records on this interface. The interface displays the alarm date, alarm time, name of the alarmed gas, alarm status, gas concentration at the time of the alarm, and the current page/total pages. Pressing the up or down keys allows you to navigate through pages, as shown in Figure 18. Long-pressing the power button returns to the main menu interface.



Figure 17

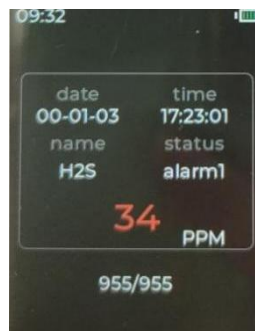


Figure 18



Figure 19

4.5.5 Zero setting

In the main menu interface, use the up or down key to select the "Zero Point Setting" menu

item. Shortly press the power button to enter the zero point setting interface, as shown in Figure 19. This interface displays the gas channel and gas name, real-time zero point AD value, historical zero point value, and curve graph. Select the gas channel for which you need to perform zero point translation. Once the real-time value stabilizes, choose "Save," and briefly press the power button to confirm, completing the zero point translation.

4.5.6 Calibration

In the main menu interface, use the up or down key to select the "Calibration" menu item. Shortly press the power button to enter the calibration interface, as shown in Figure 20. Users can choose the gas channel that needs to be calibrated, as shown in Figure 21. After selection, users can adjust the standard gas value, as shown in Figure 22. Shortly pressing the power button will bring up the "Enter Standard Gas Value" interface. Input the concentration of the standard gas, as shown in Figure 23. Then introduce the standard gas for calibration. Wait until the values stabilize, and select the "Save" button to save the settings.



Figure 20



Figure 21



Figure 22

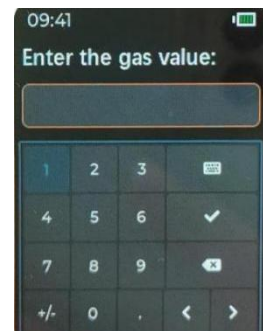


Figure 23

4.5.7 Upload Settings (optional)

In the main menu interface, use the up or down key to select the "Upload Settings" menu item, and short press the power button to enter the upload Settings interface, as shown in Figure 24. In this interface, you can view the 4G upload QR code and SN number, and upload the detection data to the Zhihui Cloud platform.

The operation instructions of Zhihui Cloud platform are as follows:

(1) You can view it on both the computer and mobile terminals. Here, we mainly introduce the operation method on the computer terminal. The APP installation package and WeChat mini program code for mobile terminals are placed at the back cover, which can be scanned to download and view. The operation method is the same. On the computer terminal, visit the address <https://www.zhihuiyun-iot.com> to enter the login interface.

(2) To log in to the system for the first time, you need to register your account information. Click (Account Registration) to jump to the registration interface immediately, and register according to the prompts.

(3) After entering the platform, select "Smart Security" —— "Portable gas detector", click to enter the monitoring interface of the detector.

(4) Click "Device Management" —— "Add Device", fill in the device information according to the requirements, input "device model", "device serial number (SN)", "Remarks", "installation location"; click "Next", fill in the notification information, click "Complete".

(5) Add successfully, click "Data Monitoring" to view real-time monitoring data and historical data of the device.

(6) Click "Alarm Management" to view alarm information, work order list and my work order within a certain period of time.

(7) Click "Notification Management" to reconfigure or delete the previously added notification information.

(8) Click "Data Report" to view statistical data in the system or export statistical report.

4.5.8 Historical records

On the main menu interface, use the up or down keys to select the "History" menu item. Short-press the power button to enter the history interface, as shown in Figure 25. This interface displays the current date and time, along with the gas name and its current concentration. Below Figure 25, "373/373" indicates "Current Page / Total Number of History Pages." Short-press the up or down keys to turn pages and view the history.

4.5.9 Restore factory

In the main menu interface, use the up or down key to select the "Restore factory" menu item, short press the power button, enter the password 5656, you can restore factory.

4.5.10 BT&WiFi

On the main menu interface, use the up or down key to select the "BT&WiFi" menu item. Short press the power button to enter the BT&WiFi interface, which displays the on/off status and information of Bluetooth and WiFi, as shown in Figure 26. At this point, both Bluetooth and WiFi are off. Press the up key, and the orange box will jump to the switch icon behind WiFi. Short press the power button, and WiFi changes from off to on, as shown in Figure 27. Short press the power button again, and WiFi changes from on to off. The same method can be used to turn Bluetooth on or off. After making changes, select "Save" and short press the power button to confirm the saved settings; select "Cancel" to not save the settings.

Note: When the system power is insufficient, the power indicator will flash intermittently. Please shut down in time and charge the product with Type-C data cable! When charging, the screen displays "Charging"; when charging is completed, the screen displays "Charging is complete".



Figure 24



Figure 25



Figure 26



Figure 27

4.6 Bluetooth connection

Users can view real-time detection data of products through the mobile APP. First, follow the operation instructions in 4.5.10 to turn on the device's Bluetooth, then download the dedicated APP on your phone, enable Bluetooth and location on your phone, and you are ready to use it. Open the mobile APP, and the available devices will be displayed at the bottom, as shown in Figure 28. Select the device you want to connect to, and it will be connected and displayed in the "Connected Devices" section, as shown in Figure 29. Click on the device, and a pop-up window will appear, as shown in Figure 30. Click on "Measure Data," and a real-time data interface will open, displaying information such as the device name, current battery level, gas names for each channel, gas concentration, units, and status, as shown in Figure 31. You can also directly click on "Real-time Data" to enter the real-time data interface. Click on "Switch Language" to switch between Chinese and English.

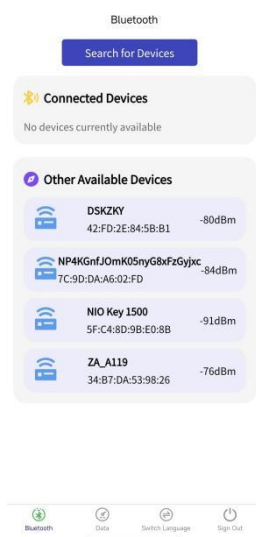


Figure 28

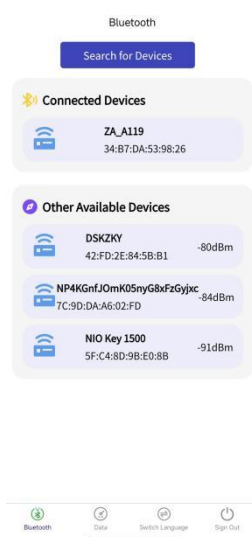


Figure 29

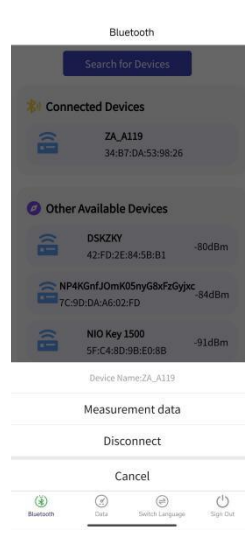


Figure 30

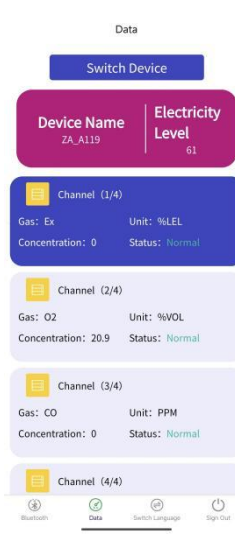


Figure 31

4.7 WiFi linkage

The steps to open the WiFi connection are as follows:

(1) Mobile phone preparation: Download the exclusive APP on the mobile phone and connect to WiFi on the mobile phone.

(2) Turn on the device WiFi: Turn on the device WiFi according to the operation instructions in 4.5.10.

(3) Device WiFi Configuration: In the off state, simultaneously press the power button and the on button to turn on the device, which will enter the WiFi configuration mode. At this point, open the dedicated APP downloaded on your mobile device, as shown in Figure 32, click "EspTouch," and enter the WiFi password connected to your mobile device in the "Password" field, as shown in Figure 33. Click "Confirm," wait for a moment, and the mobile device will display "EspTouch Complete," as shown in Figure 34. The status bar at the top of the device screen will show a WiFi icon, indicating that the WiFi configuration has been successfully completed.

(4) View data on the Zhihui Cloud platform: The real-time detection data of the device can be viewed on the Zhihui Cloud platform.

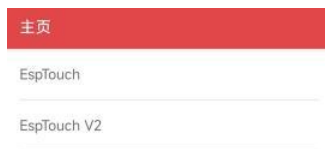


Figure 32



Figure 33



Figure 34

4.8 Fall alarm function

The product has a fall alarm function. When the product falls, the product will call SOS for help, as shown in Figure 35. Press the up key or down key to cancel the alarm.



Figure 35

4.9 SOS distress call function

The product has the SOS call function. At the same time, press the up key and down key to

open the SOS call, press the up key or down key to cancel the alarm.

4.10 Interconnection function

When the product is SOS calling for help and falling alarm, other devices and platforms connected to the device can receive its alarm information.

5. Precautions for use

- (1) Prevent the machine from falling from a height or subjected to violent vibration.
- (2) It may not be able to work normally in the presence of high concentration gas.
- (3) Please operate and use in strict accordance with the instructions, otherwise it may lead to inaccurate test results or damage to the machine.
- (4) The product shall not be stored or used in an environment containing corrosive gases (such as high concentration of chlorine gas, etc.), nor shall it be used and stored under other harsh conditions (including high and low temperature, high humidity, electromagnetic field and strong sunlight).
- (5) If the surface of the machine is dirty after long-term use, please wipe it gently with a clean soft cloth dipped in water, but do not use corrosive solvents and hard objects to wipe the surface of the machine, otherwise it may cause scratches or damage to the surface of the machine.
- (6) In order to ensure the detection accuracy, the machine should be calibrated regularly, and the verification period shall not exceed one year.
- (7) It is recommended that the service life of infrared sensor and semiconductor sensor is 5 years, and that of catalytic combustion sensor and electrochemical sensor is 2 years.
- (8) Please remove the lithium battery and sensor of the discarded detector and send it to the designated place or return it to our company. Do not throw it into the garbage can at will.
- (9) If any application or use fault exceeds the description in this manual, please contact our company for solution.
- (10) The battery pack cannot be disassembled or replaced in the explosive gas environment, nor can the battery pack be charged. In the explosive gas environment, the plug-in devices that have not been certified for explosion protection cannot be used, nor can the sensors be replaced.
- (11) Products with explosion-proof certificates shall not be replaced or modified at will to affect the explosion-proof performance of components or structures.
- (12) In the corresponding national standards, there are clear provisions on the selection, installation or use of electrical design in explosive dangerous places. The installation or use units should strictly abide by these provisions to ensure the explosion-proof safety of electrical equipment in explosive dangerous places.
- (13) Charging must be carried out in a safe place and charged with the professional charger provided by the machine.

6 Common faults and solutions

fault phenomenon	Possible cause of failure	process mode
The machine cannot be started	voltage below level	Please recharge in time
	system halted	Contact the dealer or manufacturer for repair
	fault	Contact the dealer or manufacturer for repair
No response to the test gas	The circuit is faulty or the sensor life has expired	Contact the dealer or manufacturer for repair
The display is inaccurate	Sensor expired	Contact the dealer or manufacturer for repair
	Not calibrated for a long time	Please mark it in time
The time display is incorrect	The battery is completely dead	Charge and reset the time as soon as possible
	Strong electromagnetic interference	Reset the time
The zero calibration function is not available	The sensor drifts too much	Calibrate or replace the sensor in time
It does not show zero in a clean air environment	Sensor drift	Perform zero calibration
The normal detection interface of the instrument shows full range	Sensor malfunction	Contact the distributor or manufacturer to replace the sensor

7. Warranty and maintenance

(1) The warranty period of this product is one year (except for wear and tear parts). If the product fails under normal use, you can enjoy free factory maintenance service. Damage caused by man-made or natural disasters or non-normal use is not covered by the warranty.

(2) If the sensor life expires, please contact us for replacement of new sensor.

(3) If the user cannot troubleshoot, the detector can be sent back to our company for maintenance, and we will troubleshoot the fault as soon as possible and return it to the user.

8. Storage

The products shall be stored in a ventilated room with ambient temperature of $-10^{\circ}\text{C}\sim+55^{\circ}\text{C}$ and relative humidity not greater than 85%, and the air shall not contain harmful gases or impurities

that corrode the products.

9. Accessories

The supporting detector provides one packing box, one portable gas detector, one charger, one calibration hood, one instruction manual, one certificate of conformity and one warranty card.

Henan Otywell Electronic Technology Co.,Ltd.

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