

Portable gas detection and alarm operating instruction



Catalog

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I. Product Features Overview

This portable gas detection alarm (hereinafter referred to as the alarm) is a user-friendly personal protective device capable of continuous gas concentration monitoring. It employs internationally advanced gas sensors and features an OLED high-brightness LCD display that shows gas concentration levels, temperature, as well as primary and secondary audible, visual, and vibration alarms. The device is powered by a rechargeable polymer lithium battery.

This alarm complies with:

GB3836.1-2010 "Explosive Atmospheres" Part 1: General Requirements for Equipment

GB3836.2-2010 "Explosive Atmospheres" Part 2: Equipment Protected by Flameproof Enclosures
"d"

GB3836.4-2010 'Explosive Atmospheres' Part 4: Equipment Protected by Intrinsically Safe 'i'
Protection and other relevant standards and requirements.

II. Characteristics

1. Adopting advanced imported sensors
2. It features three alarm modes: sound, light, and vibration.
3. OLED display can continuously and in real-time show gas concentration
4. Chinese menu mode
5. Real-time temperature display
6. Strong anti-electromagnetic and radio frequency interference
7. Power supply using rechargeable polymer lithium battery
8. The shell is made of high-strength, shock-resistant and drop-resistant materials.
9. IP68 ultra-high protection rating

III. Technical Specifications

1. Gas detection type and measurement range:

Table 1

No.	Gas Type	Measuring Range	Low/High Alarm
1	Carbon Monoxide (CO)	(0~1000/2000) $\mu\text{mol/mol}$	(24/100) $\mu\text{mol/mol}$
2	Hydrogen Sulfide (H ₂ S)	(0~100) $\mu\text{mol/mol}$	(10/20) $\mu\text{mol/mol}$
3	combustible gas (EX)	(0~100) %LEL	(25/50)%LEL
4	Oxygen (O ₂)	(0~30) %VOL	(19.5/23.5)%VOL
5	Ammonia (NH ₃)	(0~100) $\mu\text{mol/mol}$	(10/20) $\mu\text{mol/mol}$
6	Sulfur dioxide (SO ₂)	(0 ~ 100) $\mu\text{mol/mol}$	(10/20) $\mu\text{mol/mol}$
7	Benzene (C ₆ H ₆)	(0 ~ 100) $\mu\text{mol/mol}$	(3/6) $\mu\text{mol/mol}$
8	Hydrogen (H ₂)	(0 ~ 1000/2000) $\mu\text{mol/mol}$	(50/100) $\mu\text{mol/mol}$
9	Chlorine (Cl ₂)	(0 ~ 100) $\mu\text{mol/mol}$	(2/5) $\mu\text{mol/mol}$
10	nitric oxide (NO)	(0 ~ 100) $\mu\text{mol/mol}$	(10/20) $\mu\text{mol/mol}$
11	Nitrogen dioxide (NO ₂)	(0 ~ 100) $\mu\text{mol/mol}$	(10/20) $\mu\text{mol/mol}$
12	hydrogen cyanide (HCN)	(0 ~ 100) $\mu\text{mol/mol}$	(2/5) $\mu\text{mol/mol}$
13	Phosphine (PH ₃)	(0 ~ 10) $\mu\text{mol/mol}$	(2/5) $\mu\text{mol/mol}$
14	chlorine hydride (HCL)	(0 ~ 100) $\mu\text{mol/mol}$	(5/10) $\mu\text{mol/mol}$
15	hydrogen fluoride (HF)	(0 ~ 10) $\mu\text{mol/mol}$	(2/5) $\mu\text{mol/mol}$

(**Note:** Catalytic combustion sensors are used for flammable gases, electrochemical sensors for toxic gases, and PID photoionization sensors for benzene gas.)

2. Battery specifications: Rated voltage 3.7V, nominal capacity 2000mAh

3. Working current:

Normal current: $\leq 45\text{mA}$ (using electrochemical sensors)

$\leq 110\text{mA}$ (using catalytic combustion sensors)

Alarm current: $\leq 70\text{mA}$ (using electrochemical sensors)

$\leq 140\text{mA}$ (using catalytic combustion sensors)

4. Explosion-proof rating: Ex ib II C T3 Gb

5. Detection method: Diffusion-type

6. Response time:

Combustible: $T_{90} < 60\text{s}$

The response time to toxic gases is within 60 seconds.

7. Full charge continuous standby time: ≥ 30 days (electrochemical type)

8. Full charge continuous standby time: ≥ 24 hours (catalytic combustion type)

9. Usage environment:

Temperature : $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$

Relative humidity: $15\% \sim 95\%$, no condensation

10. Storage environment:

Temperature : $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Relative humidity $\leq 90\%$, no condensation

11. Charging temperature range: 0°C to 40°C

12. Implementation standard: GB12358-2006 (General Technical Requirements for Gas Detection and Alarm Devices in Workplaces)

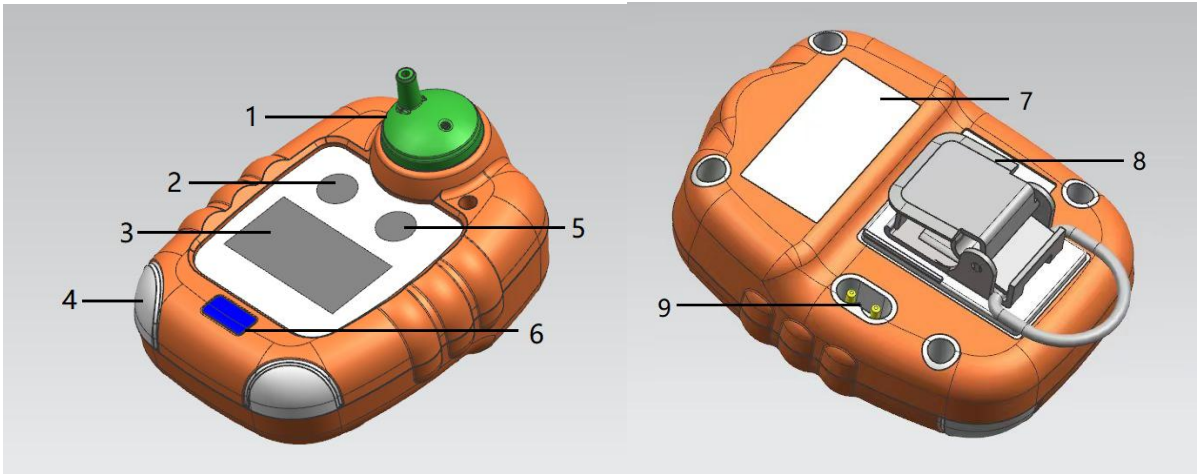
13. Shell materials: ABS, PC, anti-static TPE

14. Dimensions: $88\text{mm} \times 65\text{mm} \times 33\text{mm}$

15. Weight: Approximately 150 grams

IV. Appearance Description and Working Principle

(1) Appearance structure diagram (Figure 1)

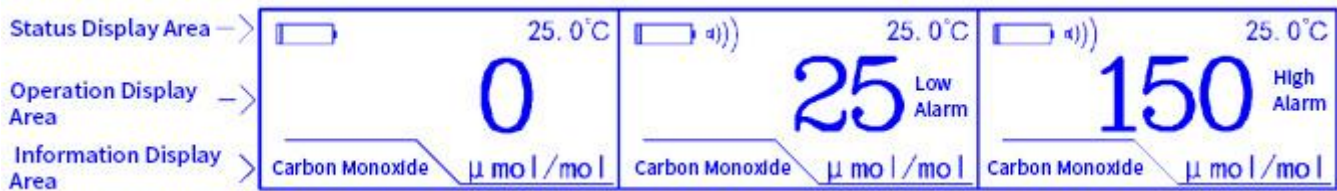


1. Standard Hood
2. E/Confirm Button
3. OLED LCD Display
4. LED indicator lights
5. Switch/Mode buttons
6. Gas type crystal indicator
7. Logo
8. Back clip
9. Charging port

graph 1

(2) Brief Description of Normal OLED Display Interface (Figure 2)

1. Status display area: shows battery level, buzzer alert, and ambient temperature
2. Work display area: shows the concentration values and alarm status of monitored gases;
3. Information display area: shows the type and unit of the measured gas



graph 2

(Use for non-mute , use for mute )

(3) Detailed explanation of the meaning of the light indicator

1. Blue light:

- Shining: The alarm is working normally, flashing every 4 seconds.

2. Red lantern:

- Flash: The alarm is in low alert mode, with the red light flashing 3 times every 2 seconds;
the alarm is in high alert mode, with the red light flashing 2 times every second.

(4) Key Details

The alarm has two buttons: the left one is the switch or mode button, and the right one is the confirmation button E.

1、 Function of the switch or mode button:

- Long press for about 3 seconds to power on when the device is off
- Long press for about 3 seconds to perform a shutdown operation in the non-setting interface
- Set the interface and password input interface. Short press this button to select or increment.
Long press this button to cancel.

2、 Confirm key E function:

- Confirm

(5) Working Principle

The alarm system samples multiple gases to be tested through diffusion. The sensor converts the collected gas concentration signals into voltage signals, which are then amplified. After sampling and intelligent calculation by the microcontroller, the measured concentration values are displayed. If the measured concentration exceeds the preset alarm threshold, the system triggers audible, visual, or vibrational alarm signals.

V. Alarm Operation Instructions

(1) Boot self-test:

- 1) Power on: To activate the alarm when it is off, hold the left button (switch or mode button) for more than 3 seconds.

2) Version information:

- When the alarm is powered on, it first displays the name, followed by version details (battery level, gas type, alarm threshold, range, and software/hardware versions):



Graph 3

- After the startup self-test completes, the system enters the normal measurement interface as shown in Figure 4.

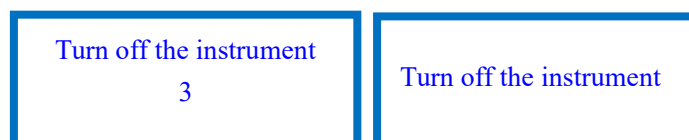


graph 4

- The alarm is on. Hold the left button and release before turning it off. The device will display the version information.

(2) Shut down:

In the normal measurement interface, hold the left button for over 3 seconds to display the instrument as shown in Figure 5. If you hold the left button (switch-mode key) without releasing, the progress counter will gradually decrease. When it reaches 0, the instrument will sound a long beep and then automatically shut down. If you release the left button (switch-mode key) during this process, the instrument will display the alarm version information and return to the normal measurement interface.



graph 5

(3) Measuring ability:

1) Normal operation condition:

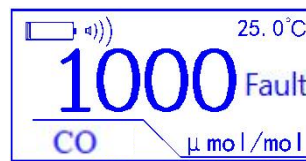
Under normal detection conditions, the alarm should display the standard measurement interface and the blue breathing indicator in the upper left corner should flash every 4 seconds.

2) Alarm status:

When the alarm is activated, the red light flashes and the alarm notification light illuminates. During low-level reporting, the red light flashes four times every 3 seconds; during high-level reporting, the red light flashes twice per second. If the alarm is not silenced, vibration is also permitted, with intermittent audible beeping and simultaneous vibration.

3) Fault condition:

When the alarm detects a fault, it emits a prolonged sound and displays a fault notification in the operational status display area.



graph 7

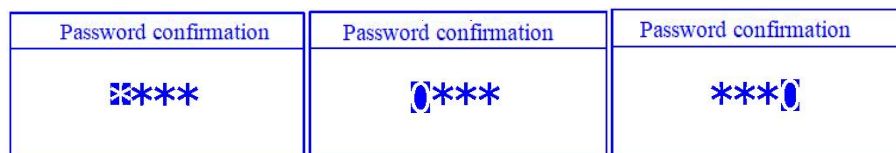
- 4) Mute: When the alarm or fault is active, press the left button (switch or mode) or Mute the right button (E) to stop the audible and vibration alerts. Press the right or left button again to restore the alerts.



graph 8

- (4) Password confirmation: The password is set to 0000.

- 1) Password input mode: When the alarm is powered on, long-press the right button (E) for about 3 seconds to enter the password input mode, as shown in Figure 9.



graph 9

- 2) Enter the password: The password consists of four digits. Press the left button (switch mode key) to cycle through digits 0-9, with each press incrementing by 1. Press the right button (E) to advance to the next digit. If the password is correct, press the right button (E) again to confirm and access the alarm function menu. If incorrect, the system will return to the normal measurement interface, requiring re-entry.

(5) Function Table:

The function panel includes zero calibration, range calibration, low reading setting, and high reading setting. Select by pressing the left button (switch or mode key), then long-press the right button (E) to confirm and enter the corresponding function interface. To exit, long-press the left button.



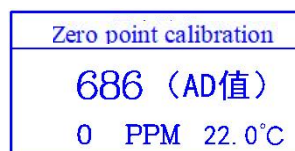
graph 10

1) Zero calibration

In the function menu, when the zero calibration option is selected, press and hold the E key for 3 seconds to enter the zero adjustment interface.

This operation should be performed in clean air or under zero-pressure air. After the AD value stabilizes, press and hold the left button (switch mode key) to exit, then press and hold the right button (E) confirmation key to complete calibration and return to the function table interface.

(Note: For oxygen detection, use air calibration. Introduce clean air through the air calibration interface. Once the AD value stabilizes, press and hold the right key (E) to confirm calibration. The display will show 20.9 after completion.)



graph 11

2) Range calibration

In the function menu, when the range calibration option is selected, press and hold the E key for 3 seconds to enter the gas calibration interface.

The standard gas is delivered to the sensor via the standard gas hood. After the AD value stabilizes on the display interface, adjust the reading to match the standard gas. Press the left button (switch/model button) once to increase the reading by 1, and press the right button (E) once to decrease it by 1. Hold the right button (E) to confirm, and hold the left button to exit.

量程校准 (标定)
1606 (AD值)
299 PPM 22.0°C

graph 12

3) Underreporting and Overreporting Settings

In the function menu, when the low or high reporting option is selected, press and hold the confirmation key (E) for 3 seconds to access the alarm value setting interface.

Low alarm setting	High alarm setting
24 $\mu\text{mol/mol}$	100 $\mu\text{mol/mol}$

graph 13

Press the left button (switch or mode) to increase, press the right button (E) to decrease. Long press the right button (E) to confirm, long press the left button to exit.

Note: The low alarm value cannot exceed the high alarm value.

The alarm point can be configured via software. The factory default settings are shown in Table 1 and may be adjusted according to specific requirements.

(6) Battery level indicator and charging

1) Battery level detection

The alarm continuously monitors battery status during operation. A full battery icon shows sufficient power, while the indicator bar gradually shrinks as the battery depletes. When the battery level drops below 10%, the alarm displays a low-power warning with audible alerts. If the battery drops further, the alarm triggers both audible and visual alerts, signaling immediate charging to prevent shutdown.

2) Charge

- Use the original charger to charge the device.
- When the red indicator light of the device is on, it indicates that the device is charging; when the green light is on, it indicates that the charging is complete.
- The alarm will shut down automatically when the battery is charged.

VI. Maintenance Precautions for Alarms

1. To maintain the measurement accuracy of the alarm, it should be calibrated regularly (typically every six months).
2. It should be avoided to impact the alarm sensor with high concentration gas frequently.
3. Non-professionals should not access the settings menu to avoid affecting the accuracy of instrument measurements or causing instrument malfunctions.
4. The sensitivity of combustible gas sensors can be affected by high concentrations of sulfides, halogen compounds, silicon-containing compounds, and lead-containing gases or vapors, a phenomenon also referred to as "poisoning." The use of the instrument in such environments should be avoided. If its use is unavoidable, the instrument must be tested and calibrated after each use to prevent future performance degradation.
5. The alarm should not be used in hypoxic conditions.
6. Gas sensors for flammable gases are calibrated at 50%LEL methane concentration during factory production. To monitor various flammable gases within the LEL range, calibrated with appropriate gas is required.
7. Do not clean the instrument with organic solvents, soap, or silicone-containing solutions to avoid damaging the sensor.
8. When wiping the shell, use a damp cloth to prevent static electricity.
9. Battery usage precautions:
 - This battery is explosion-proof and cannot be replaced with a regular battery.
 - Battery replacement must be performed by the original manufacturer. The manufacturer will not be liable for any repairs caused by unauthorized replacement.
 - Do not charge the alarm in dangerous places.
 - Do not replace batteries in dangerous locations.
 - Do not let the battery plug touch metal objects, otherwise, the battery may short circuit, discharge, heat up or leak.

VII. Diagnosis, Analysis, and Troubleshooting Methods for Common Faults

Table 3

No.	Common faults	Analyse	Solution
1.	The alarm indicates a system failure.	Instrument damage	Return to the factory for repair
2.	The alarm shows a fault.	Memory is corrupted or its contents have been overwritten. The sensor is damaged or loose.	Contact the manufacturer
3.	The alarm indicates sensor calibration has expired	Calibration out of time	Recalibration
4.	Silent, light, vibration alarm	Circuit fault of sound, light and vibration	Return to the factory for repair

VIII. Standard Configuration

1. Host (including sensors, lithium battery, and back clip)
2. 1 copy of the instruction manual
3. 1 set of power adapter
4. 1 standard mask
5. 1 Certificate of Conformity

IX. Warranty

1. Limited warranty:

Our company guarantees free repair services for any material or manufacturing defects in portable multi-gas detectors and accessories, valid for one year from the date of purchase.

2. Scope:

- The warranty is not applicable to damage during shipment, unauthorized repairs, misuse or abuse, use of incompatible parts or accessories, malfunctions caused by failure to follow the alarm's operation, maintenance or modification instructions, or claims after the warranty period.

X. Warning

Do not disassemble the product or charge the battery in hazardous areas with explosive gases. Failure to heed this warning may cause serious personal injury or death.