

MN-0615-CP01

## GAS LEAK DETECTOR OPERATION MANUAL



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MN-0615-CP01-E

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**I .General**

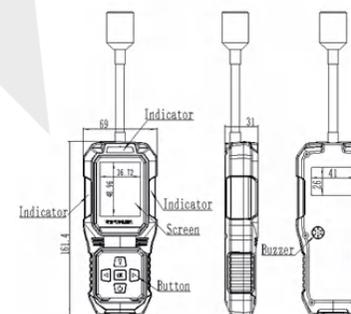
The combustible gas leak detector (hereinafter referred to as the leak detector) adopts the most advanced large-scale integrated circuit technology, international standard intelligent technology level design technology, and proprietary digital analog hybrid communication technology to design a fully intelligent gas leak detector. The leak detector uses free diffusion to detect gas. The sensitive component uses high-quality gas sensors, which have excellent sensitivity and outstanding repeatability. It is easy to use and maintain, greatly satisfying the requirements of industrial site safety monitoring for equipment reliability. The housing is made of high-strength engineering plastic, which has high strength, good feel, and is waterproof, dustproof, and explosion-proof.

This leak detector is widely used in industries such as petroleum, chemical, environmental protection, metallurgy, refining, gas transmission and distribution, bio-pharmaceuticals, and agriculture.

**II .Structural Features and Working Principles**

**2.1 Structural function comparison table**

The appearance structure of the device is shown in the following figure:



The device has five buttons, namely lighting, left, right, menu and power buttons. The identification and function of each button are defined as follows:

Identification	Name	Function definition
	Lighting button	Turn on, turn off the flashlight.
	Menu/confirm button	Short press on the main interface to enter the menu; short press on the general interface for function confirmation.
	Left	Move the selected cursor up/value, flip the option up
	Right	Move the selected cursor down/value, and flip the option down
	Power	Long press the power button when the device is turned off, long press the power button on the main interface; short press on the main interface to bring up the quick menu; short press on the regular interface for the back function.

The device has three indicator lights, namely normal, fault, and alarm indicator lights. The function of each indicator is defined as follows:

Name	Function definition
Normal indicator light (green)	The equipment is in a normal state, and the gas concentration does not exceed the alarm value
Malfunction indicator light (yellow)	The device is in a malfunctioning state.
Alarm indicator light (red)	Gas concentration exceeds the alarm value (low alarm, high alarm)

## 2.2 Leak Detector Structure.

The device is mainly composed of a shell, a circuit board, a battery, a display screen, sensors, a charger, and other components.

## III. Technical Parameters

Regular gas detection range: see attached table.

Indication method: LCD displays real-time data and status, LED, sound, vibration indicate alarms, faults, and under-voltage.

Working environment: Temperature -10°C to 55°C; Humidity < 95% RH (no condensation)

Operating voltage: DC3.7V (Lithium battery capacity 2000mAh)

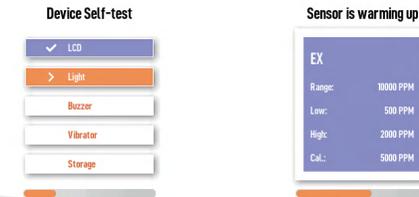
Dimensions: 161.4\*69\*31(mm) (excluding the length of the hose)

Weight: 0.27kg

## IV. Functions and Operation Instructions

### 4.1 Power On

Press and hold the power button while the device is turned off. The startup progress will appear, release the power button when the progress bar reaches 100%. The device will then enter the startup process. The device name, device hardware self-test, and sensor warm-up are displayed at startup. As shown in the figure below:

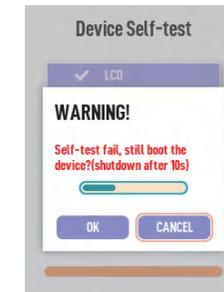


When an abnormal self-test item appears at startup, the startup operation will be interrupted and a prompt will pop up. Abnormal projects include the following two categories:

#### A. Exception items that can be skipped

Exception items that can be skipped include internal storage failures. When this exception occurs, the screen will display a prompt message and countdown progress bar. Before the countdown progress bar ends, use the left and right buttons to select whether to power on and confirm with the menu button.

You can continue the boot process or shut down; if no operation is selected, it will automatically shut down after the countdown ends. The display interface is as follows.

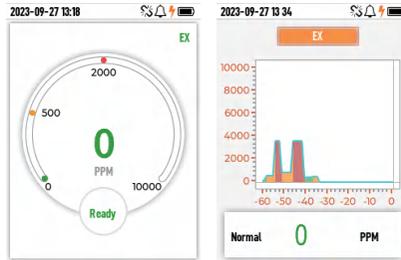


#### B. Items that cannot be skipped

Unskippable items include low battery, at this time the interface will display a low battery prompt and a progress bar. Shut down after the bar finishing.

### 4.2 Gas Detection

After the sensor preheating, enter the concentration real-time display interface. on this interface, the interface and the concentration display interface can be displayed by using the left and right button switch curve.as illustrated in following figure:

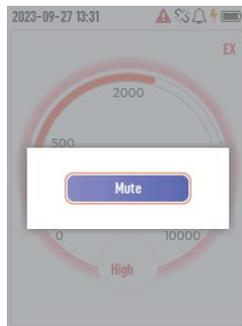


The notification bar at the top of the main interface shows the working status of the device, indicating the status of the corresponding function by the color and status of the icon. Specific definitions are shown in the table below:

Icon	Name	Definition
	Battery level	Show the remaining battery charge
	Alarm	Long display: sound on/off; Blinking: mute state
	Vibrating Reminder	Display: Vibration alert on; Hide: Vibration alert off
	Charging instructions	Blinking: Charging; Steady: Charging complete
	Alarm/fault	Red flashing: Device alarm; Yellow flashing: Device malfunction

### 4.3 Quick Menu

In the gas detection interface, the power button will pop up a shortcut menu, which includes the operation to eliminate the alarm sound. The interface is as follows:



The functions of quick operations are as follows:

#### 4.3.1 Eliminate beep codes

This menu item is used to silence the current alarm sound of the device for a period of time. When the alarm status of the device changes (new alarm)

When an alarm is triggered or an old alarm disappears, this function will automatically exit and start the alarm prompt again.

Note: This menu item will only be displayed if the “Buzzer” switch is turned on in the main menu -> system settings -> alarm prompt and the device is in the sound playback state.

### 4.4 Shutdown

Press and hold the power button on the device detection interface. Release the power button after the shutdown progress bar pops up and reaches 100%. The device will then power off. The interface is as shown in the following figure:



### 4.5 Charging

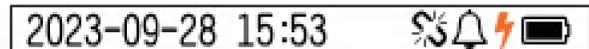
When you need to charge the device, please insert the power adapter into the power socket and connect the USB cable to the power adapter and the device's USB.

The Type-C interface starts charging the device. The device will have different charging indicators when it is in different working states during charging.

#### A. In the booted state

During the charging process, the battery icon on the device's notification bar flashes with a yellow lightning symbol on the left side, and the battery level cycles between 0 and 4 bars.

When charging is complete, the yellow lightning symbol stops flashing, and the battery level remains at 4 bars. You can now unplug the charger.



B. In the off state

When the device is charging, it displays “Charging...”. When charging is complete, the device displays “Charging complete”.



Note:

1. Please use the original charger and cable to charge the device. Third-party chargers and charging cables may damage the device. Some computers may not be able to charge the device because the output power of the USB port is too low.
2. Please do not charge the device at the testing site to avoid sparks from plugging and unplugging the charger, which may cause fire or explosion.
3. Please try to charge the device while it is turned off to improve the charging speed.
4. When the device is not in use for a long time, please keep it fully charged. Be careful to check the remaining power level of the device every certain period of time, and charge the device in a timely manner. Otherwise, the battery may be damaged.
5. When the device is turned on and the battery is low (the battery icon in the top right corner of the device is empty and starts flashing), the device will give a low battery alert every 1 minute (when the alert sound is turned on). After 20 minutes, the device will automatically shut down.

**V .Menu Operation Instructions**

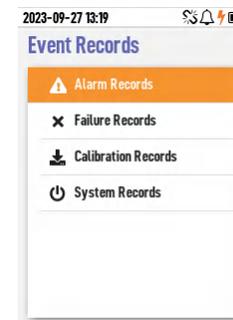
Short press the menu button on the gas concentration display interface to enter the main menu. The main menu includes event records, alarm settings, calibration, system settings, advanced menu, and about 6 menu items. See the figure below:



**5.1 Event recording**

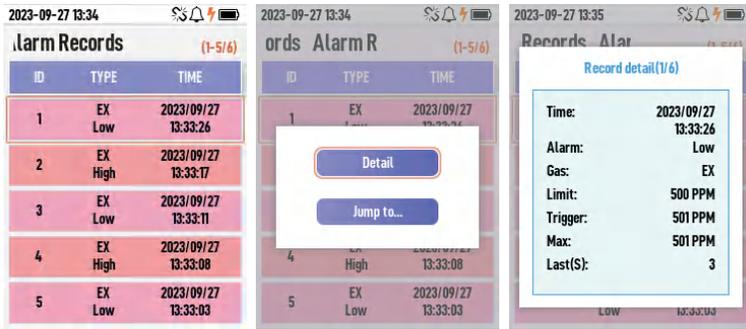
The event log menu is used to query the device's alarms, faults, calibration, and operation records.

On the main menu page, use the left and right buttons to scroll to the event log, then press the menu button to enter the event log menu. Select the corresponding record category through the left and right buttons to enter the corresponding event list. See below:



In the event list, use the short press menu button to flip pages, use the left and right buttons to move the selected item, and use the long press menu button.

You can view the details of the record and jump to a specific record entry by calling up the shortcut menu. See the figure below:



5.1.1 Alarm record

The alarm record of the equipment includes the underreport and overreport alarm triggered during the gas detection of the equipment. The alarm record records the alarm trigger time, alarm type, gas type, alarm point, the starting value of gas concentration triggering the alarm, the maximum value of gas concentration after triggering the alarm, and the duration of the alarm.

5.1.2 Fault Record

The fault record of the equipment includes the record of abnormal equipment parameters, abnormal parameters, concentration over-limit, sensor failure and hardware failure. The fault record of the equipment records the time of abnormal occurrence and the type of abnormality.

5.1.3 Calibration records

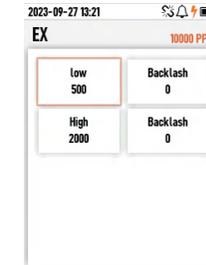
The calibration records of the equipment records the zeroing and calibration operations on the equipment and their related calibration data. Calibration records are divided into two categories: standard-zeroing and calibration. The zero record records the time, operation type, sensor gas type, calibration point and hardware sampling value of the equipment zero operation, and the calibration record records the time, operation type, sensor gas type, calibration point, calibration value and hardware sampling value.

5.1.4 Runing record

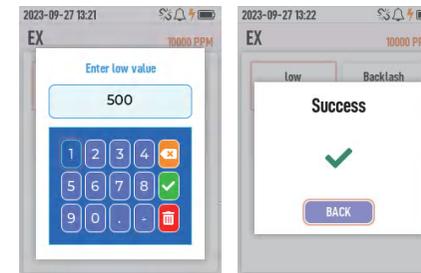
The operation record of the equipment records the operation record of the equipment switching machine and charging. The operation record records the relevant information when the equipment starts on, off, charging start and charging stop. For different records to contain different data content. Details are as follows:

5.2 Alarm settings

The alarm settings menu is used to set the alarm parameters for the gas. Press the menu button after flipping through the alarm settings using the left and right buttons on the main menu page to enter the alarm settings menu. The following image:



In the gas alarm setting page, you can select the alarm parameters to set by pressing the button, enter the new alarm parameter and save it. See below:



The definition of each parameter is as follows:

A. Low alarm

When the gas concentration exceeds the set value, it will be triggered and alarm

B. Underreporting return difference

In order to prevent the gas concentration alarm from shaking near the low quoted value, resulting in repeated record, the state can be lifted when the gas concentration decreases to the low quoted value minus the low reported difference.

C. High alarm

It is triggered when the gas concentration exceeds the set value.

D. Overreporting return difference

In order to prevent the gas concentration from shaking near the high quoted value, leading to repeated entry and exit from the high reported alarm state, the high reported alarm state can be lifted only when the gas concentration is reduced to the high reported value minus the high reported return difference.

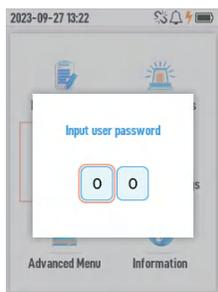
Note: All the set points on this page have the function of input error prompt. When the input value is wrong, please check according to the cause of the prompted error.

5.3 Calibration

The calibration and calibration menu provides users with zeroing and calibration functions for gas sensors.

On the main menu page, use the left and right buttons to scroll to the calibration option, then press the menu button to enter the password verification page.

Enter the default user password (11) and press the menu button to enter the calibration menu. Enter password by pressing the left and right buttons, the selected position can be increased or decreased by one. Press the menu button briefly to move the cursor to the right, and press and hold the menu button to confirm. See the figure below:



On the gas calibration page, you can perform zeroing and calibration operations for the specified gas sensor. Click the “Cal Zero” button to start gas zeroing. The zeroing operation will be completed after the progress is finished; introduce the specified concentration standard gas of degree, enter the gas calibration value and click the “sensor calibration” button to start gas calibration, wait for the progress to complete. The gas calibration operation can be completed afterwards. See the figure below:



A. Sensor zero calibration:

This function is used to calibrate the sensor's zero point. Depending on the type of gas, it needs to be carried out in clean air or pure nitrogen.

Before calibration, the sensor needs to stabilize - after a period of time, zero calibration can be started.

B. Sensor Calibration:

This function is used to calibrate the sensor's displayed value through a standard gas. Before calibration, it is necessary to introduce standard gas for a certain period of time. Calibration can only be performed after the values have stabilized.

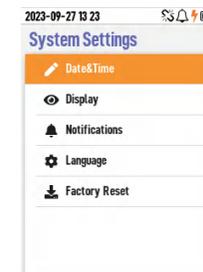
Note: For this device, when using standard gas, it is necessary to reduce the pressure through a pressure reducing valve and ensure that the output gas flow is greater than 0.5L/minute, otherwise the equipment may be damaged.

5.4 System settings

The System Settings menu is used to set the system time, display, alarm prompts, language, and factory reset functions.

On the main menu page, use the left and right buttons to navigate to “System Settings” and press the menu button to enter the “System Settings” menu.

On the “System Settings” menu page, use the left and right buttons to select the corresponding item to enter the corresponding settings page. See the figure below:



### 5.4.1 Period

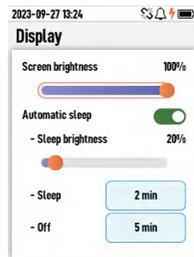
This menu is used to set the device's date and time. Adjust the value by pressing the left and right buttons, and press the menu button briefly to move to the right.

Long press the menu button to save the selected position, short press the power button to return to the previous menu level. See the figure below:



### 5.4.2 Display settings

This menu is used to set the device's backlight brightness and automatic sleep parameters. Press the menu button to select the corresponding item. Adjust the value with the left and right buttons, automatically save and take effect after setting, press the power button briefly to return to the previous menu. See the following figure:



The specific functions of the settings items on this page are described as follows:

#### A. Screen brightness:

Used to adjust the brightness of the screen during normal operation. Set the range from 10% to 100%.

#### B. Automatic sleep switch.

Turn on/off the auto sleep function. After the function is turned on, when the device is not in operation and at rest, it will enter a sleep state and reduce the screen brightness to reduce power consumption after reaching the time set for turning off the screen; when the time set for turning off the screen is reached, the display will be turned off to further reduce power consumption.

#### C. Sleep brightness:

The brightness of the screen after the device enters auto sleep. Set the range from 10% to 100%.

#### D. Enter hibernation.

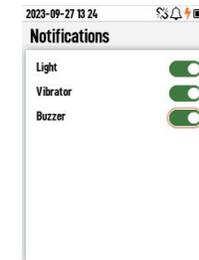
Set the time for the device to go to sleep after no operation. The options are 15 seconds, 30 seconds, 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 10 minutes.

#### E. Turn off the screen.

Set the time to turn off the screen after the device is inactive. The options are Off, 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 10 minutes.

### 5.4.3 Alarm Reminder

This menu is used to set the device's alarm notification method, including indicator lights, vibrators, and buzzers. Press the menu button briefly to select the corresponding item, use the left and right buttons to adjust the switch status, set it to automatically save and take effect, and press the power button briefly to return to the previous menu. See the figure below:



The function of the settings items on this page is as follows:

#### A. Indicator light:

Turn the device's LED reminder function on or off.

#### B. Vibrator:

Turn on or off the device's vibrating reminder function.

C. Buzzer:

Turn the device's buzzer reminder function on or off.

5.4.4 Language settings

This menu is used to set the system's language type. Currently only “Chinese” and “English” are supported, please select the corresponding option from the pop-up menu. The language type can be switched to the specified setting.

5.4.5 Factory reset

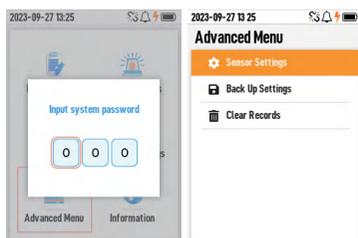
This menu is used to restore the system settings to the factory state. When the device has saved the factory settings, the device parameters can be restored to the factory state through this menu. Select OK in the pop-up dialog box to resume the factory setup operation and wait for the recovery progress to complete.

Note: This operation cannot be canceled during the process and cannot be recovered after the operation is executed. Cancel operation during recovery process. If some data cannot be successfully recovered, please try to restore factory settings again.

5.5 Advanced Menus

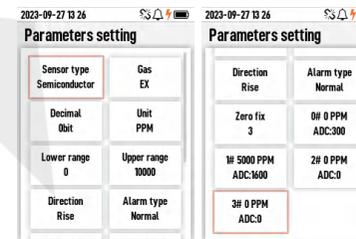
Warning: If some improper operations in this section may damage the equipment or cause some abnormal functions of the equipment, please strictly follow the operation described in the instructions. When modifying the parameter, please confirm that you know the meaning of the parameter to avoid the device working error. If there is an abnormal equipment work, please try to solve it by restoring the factory Settings. If it cannot be solved, please contact the after-sales service for processing.

The advanced menu is used to set the device's sensor parameters, save factory settings, and clear event records. On the main menu page, press the menu button after flipping through the pages with the left and right buttons to access the password verification page, and enter the password by pressing the buttons the default maintenance password (222) and long press the menu button to enter the advanced menu. On the Advanced Menu page, select the corresponding items through the left and right buttons to enter the corresponding settings page. See below:



5.5.1 Sensor settings

This menu is used to view the sensor's corresponding parameters. After entering this menu, you can view the sensor type, gas type, decimal places, unit, range upper and lower limits, signal direction, alarm type, zero extinction, and other parameters of the sensor, and perform multi-point calibration of the sensor. See the figure below:



The item features of this page are as follows:

A. Sensor type:

The type of the current sensor.

B. Gas type:

The gas type of the current channel sensor.

C. Decimal places:

The number of decimal places (precision) of the current channel sensor.

D. Unit:

The display unit for the current channel sensor.

E. lower limit of measurement range:

The lower limit of the current channel sensor's range.

F. Upper limit of measurement range:

The upper range of the current channel sensor.

G. Signal direction:

The direction of the current channel sensor's signal.

H. Alarm type:

The alarm mode of the current channel sensor. Non-oxygen:  $\geq$  Low alarm value triggers low alarm,  $\geq$  High alarm value triggers high alarm; Oxygen:  $\leq$  Low alarm value triggers low alarm,  $\geq$  High alarm value triggers high alarm.

I. Extinguish Zero.

Eliminate the displayed values near zero.

J. 0# Calibration information:

Zero-point information, shown below is the zero-point ADC sampling value. Click to start zeroing.

**K. 1# calibration information:**

Calibration point 1 information. The ADC sampling value for calibration point 1 is shown below. Click and enter a calibration value to calibrate this point.

**L. 2# calibration information:**

Calibration point 2 information. The ADC sample value for calibration point 2 is shown below. Click and enter a calibration value to calibrate this point.

**Note:**

1. The parameters in the sensor settings have been adjusted at the factory. Please do not modify them manually. Errors may cause abnormal sensor operation and equipment failure.

2. When calibrating the sensor, please do not interval the calibration points, otherwise the calibration will not be valid.

3. Since calibrating a certain point will remove the calibration point information after that point, please follow 1#-2#-3 #order for calibration, and do not order calibration.

4. The calibration gas concentration of the calibration point can only be in increasing order, otherwise calibration cannot be performed.

**5.5.2 Save factory settings**

This operation is used to backup the current device settings parameters, so that users can restore the factory settings in case of device parameter abnormalities and correct device parameters.

Note: This operation cannot be canceled during the process, otherwise it will result in a failed factory reset.

**5.5.3 Clear event records**

This function is used to clear all events saved in the event log.

Note: This operation cannot be undone after clearing the records.

**5.6 About**

The menu is used to display the working state of the device, mainly including device information and operating status information. See the figure below:



**VI. Precautions for Use**

- Prevent the unit from falling from a height or being violently shaken.
- This unit may not be able to be used properly in the presence of high gas concentrations.
- Please operate and use strictly according to the instructions, otherwise the test results may be inaccurate or the machine may be damaged.
- This product should not be stored or used in an environment containing corrosive gases (such as high concentrations of chlorine, etc.), nor should it be used or stored in other harsh environments, including excessively high or low temperatures, high humidity, electromagnetic fields, and intense sunlight.
- If there is dirt on the surface of the machine after long-term use, please wipe the surface of the machine gently with a clean soft cloth dipped in water, and do not use corrosive solvents or hard objects to wipe the surface of the machine. Otherwise, the surface of the machine may be scratched or damaged. To ensure the accuracy of the detection, this machine should be calibrated regularly, and the calibration period should not exceed one year.
- Any application or usage problems beyond what is described in this manual, please contact our company for solutions.

Do not disassemble or replace the battery pack in explosive gas environments, and do not charge the battery pack. In explosive gas environments, do not use non-explosion-proof certified peripheral devices in the environment, and do not replace the sensors.

**VII. Storage**

The detector should be stored in a ventilated room with an ambient temperature of -10°C to 55°C and a relative humidity not exceeding 85% RH.

The content must not contain harmful gases or impurities that corrode the detector.