澳瑞德
ALLRED

ARD2000

Remote Methane Leak Detector

User Manual

Qingdao ALLRED Electronics Co., Ltd. mainly produces Remote Methane Leak Detector, Infrared Flammable Gas Detector, Toxic Gas Detectors and other products. We are a wholly-owned subsidiary of Qingdao ALPTEC Safety Equipment CO.,LTD, and committed to development, sales and service of infrared principle gas detection products.

We promote the development of gas detection products through continuous innovation. Through research and breakthroughs in infrared spectroscopy technology, we launched long lifetime, water vapor resistant, and highly applicable infrared gas detector products and Remote Methane Leak Detector with the features of high sensitivity and ultra-long detection range. The performance and key indicators have reached the international leading level.

At present, our gas detection products have been recognized by our customers for the high quality and good service, and they play an active role in petrochemical, natural gas and other fields.

Therefore, whether in the past or in the future, we will focus on the field of gas detection, take customers' satisfaction as the ultimate goal, use reliable products to eliminate hidden dangers caused by dangerous gases, and protect customers' security with sincere service.

Contents

Precautions

Before using the instrument, you must read the instruction manual carefully and strictly follow the steps to operate and maintain!

The handheld detector has two lasers. When the device is turned on, the detecting laser is invisible and continuous. By pressing the switch button on the device, the green indicating laser can be turned off. The green indicating laser level is Class 3R. Protect your eyes from direct exposure!

Laser specifications

Detecting laser：

Maximum output power:≤10mW

Wavelength: 1653nm

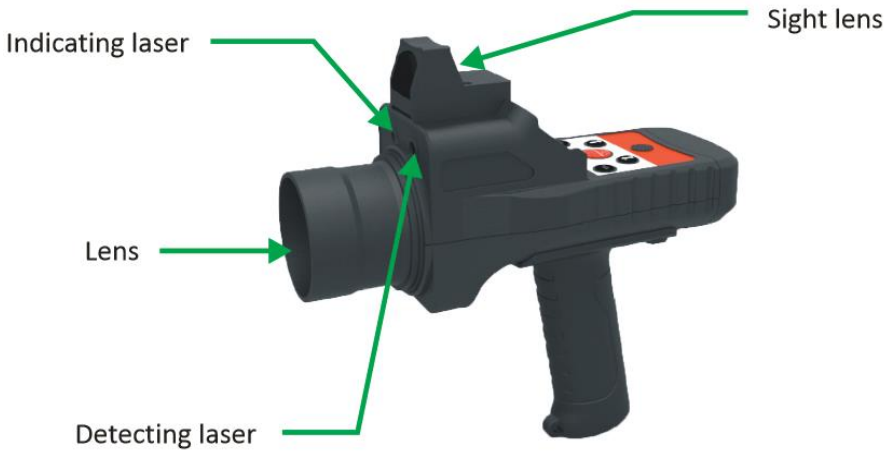
Laser Class: Class 1

Indicating laser：

Output power：≤5mW

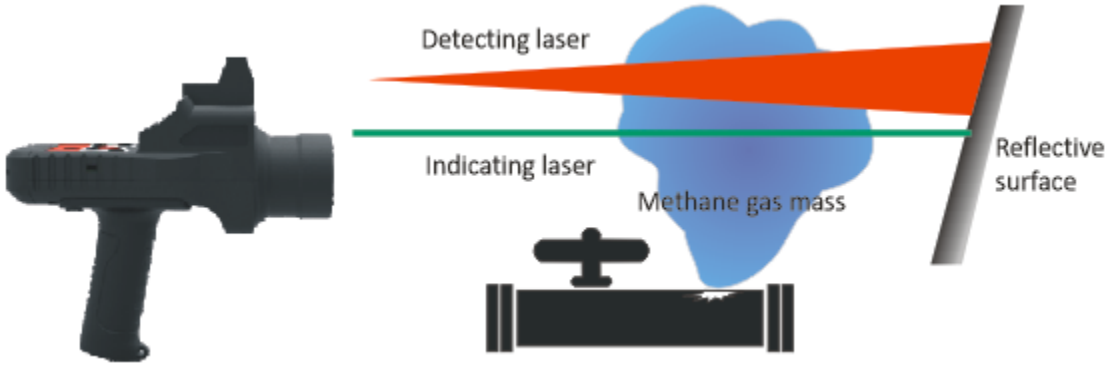
Wavelength: 530nm

Laser level: Class3R, direct exposure is potentially dangerous, avoid direct exposure to eyes



1. Introduction

ARD2000 Remote Methane Leak Detector uses international advanced tunable diode laser absorption spectroscopy technology (TDLAS), which can detect methane gas within a certain distance. At the same time, through optimization design and independent research and development, the measurement distance and accuracy of the detector are greatly improved, which is the most powerful safety guarantee for gas inspection and leak detection. Unlike traditional portable detectors, this Remote Methane Leak Detector does not need to place the probe in a gas-filled environment. Instead, the device emits a laser beam. The laser passes through the pipe or the space above the facility and hits the object at the other end. Reflected back to the receiver, and then converted into electrical signals, these signals are used to analyze the concentration of methane, the unit is ppm · m. By using WMS technology, the ARD2000 Remote Methane Leak Detector can achieve extremely high detection accuracy. The light at this wavelength is only absorbed by methane, so it only reacts to methane and is not affected by other gases, which greatly improves the accuracy of detection. Using the Remote Methane Leak Detector, the operator does not need to be in a dangerous environment, which not only protects the safety of the inspector, but also can inspect the overhead pipeline from a long distance, which improves the inspection efficiency. The detection reading is the product of the concentration of the laser passing through the methane gas mass and the thickness of the gas mass in ppm · m, as shown below:



2. Composition

The structure and accessories of ARD2000 Remote Methane Leak Detector are as follows:

3. Technical Parameters

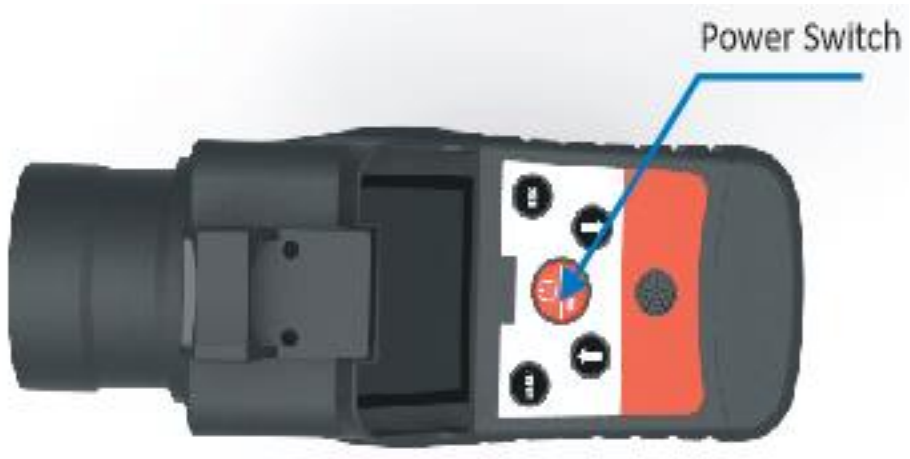
	ARD2000
Measurement Range	0 ppm.m to 99999 ppm.m
Sensitivity	5 ppm.m
Detection Distance	Take cement wall as reflective surface, detects natural gas leakage at a straight distance of 150 meters.
Laser Eye Safety	Detecting laser: Class I
	Indicating laser: Class III R. Protect your eyes from direct exposure
Response Time	0.1s
Ingress Protection	IP54
Explosion Proof Classification	ExibIIA T3
Operating Temperature	-20° to 50° C
Display and Alarm	LCD display + audible alarm
Battery Operating Life	8hours
Power	Rechargeable Lithium battery, 7.4V, 3500mAh
Aiming Method	Sight lens and indicating laser
Weight	0.65kg
Size	208mm*200mm*76mm

4.Operation Instruction

4.1 Turn on and Turn off

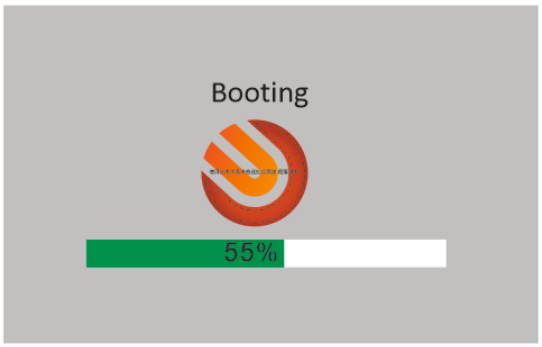
Turn on:

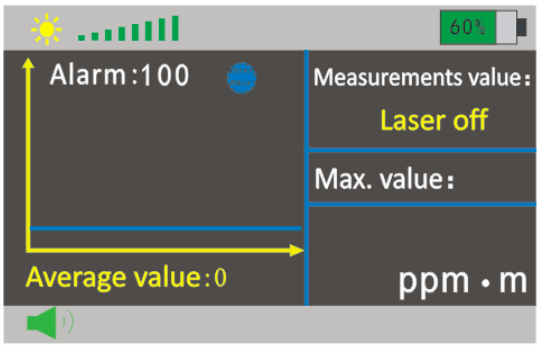
Press and hold the power switch on the front of the device, the display shows the warm-up and start-up interface, and then enter the detection interface. The laser is now turned off. Press the power switch briefly to turn on the laser.



Turn off:

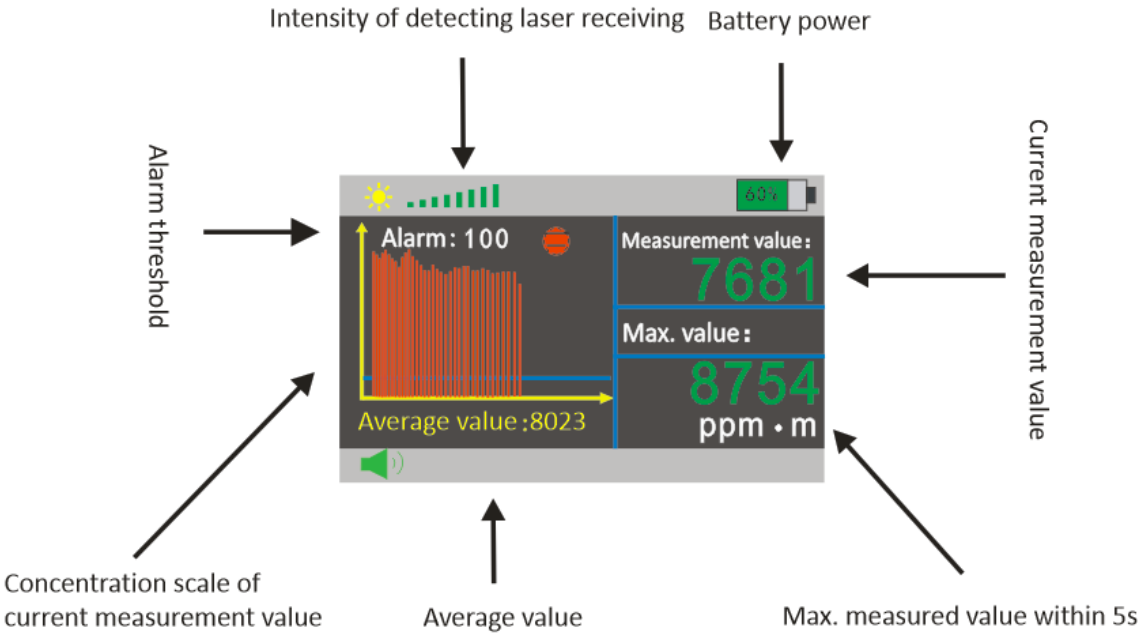
Long press the power switch on the front of the device again, the device and the display will be turned off.





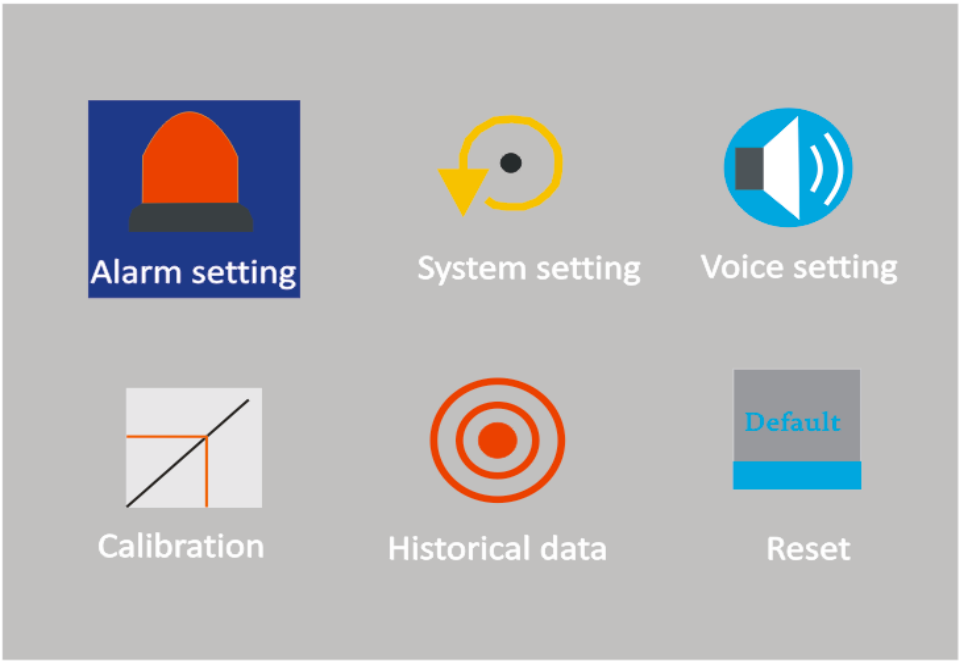
Warm up → Detecting interface

4.2 Menu Illustration



4.3 Change menu setting

Press the MENU key to enter the menu interface. The menu interface is as follows:

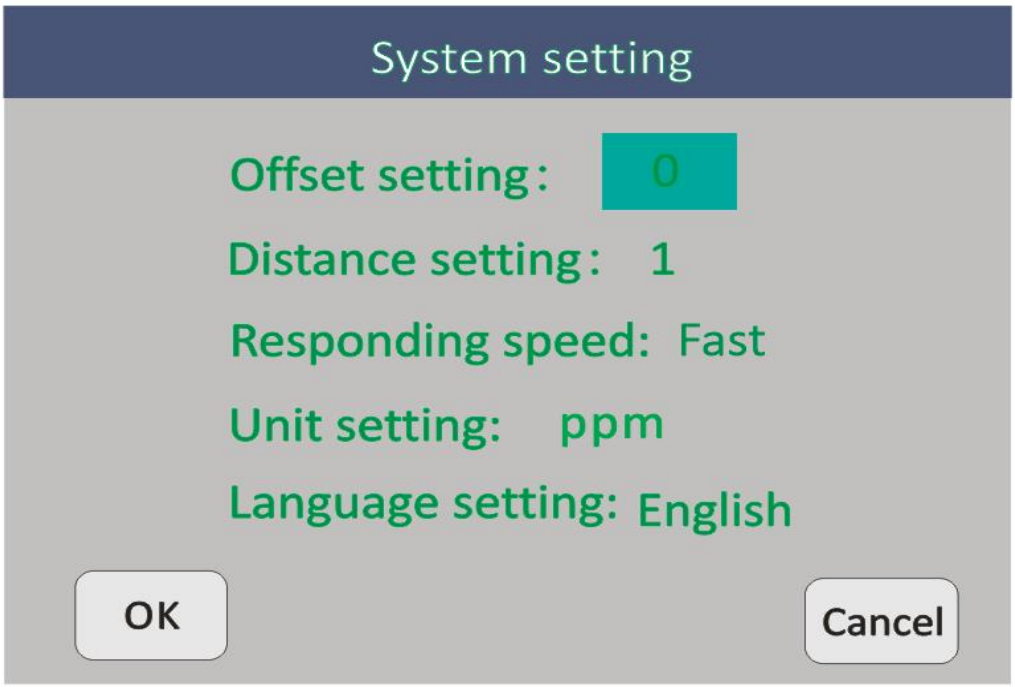


4.3.1 Alarm setting

On the main menu interface, move the cursor with the + and -buttons to select the alarm setting icon, and press the MENU key to enter the alarm setting. Use the + and - keys to change the size of the alarm value. Press MENU to confirm the changes and return to the main menu.

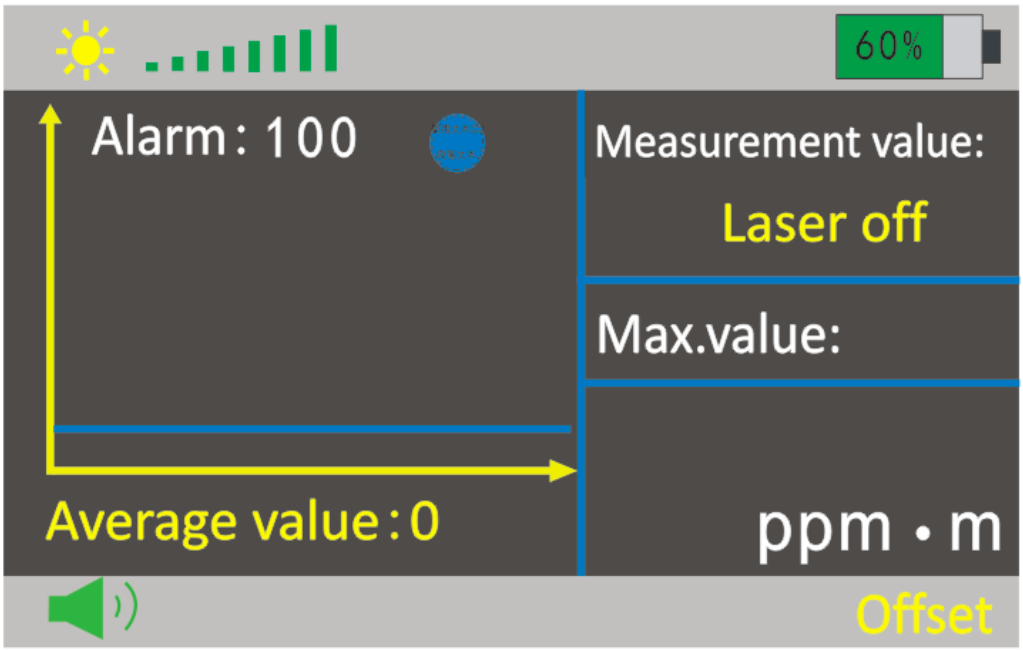
4.3.2 System setting

On the main menu interface, move the cursor with the + and- keys to select the system setting icon, and press MENU enter the system setting.



Offset setting:

Use the + and-keys to change the offset value. Press MENU to confirm the changes and return to the main menu.



When the device is in a known stable high-concentration methane environment and in environments with poor long-range reflective conditions, the offset setting can be used to eliminate the known environmental concentration values and background noise measurements in poorly reflective environments, and then detect maximum methane leaks.

After the offset value is set, there will be an offset icon prompt in the lower right corner of the main menu interface.

Distance setting:

Use the + and-keys to change the distance value. Press MENU to confirm the changes and return to the main menu.

The distance can be set from 1 to 10, corresponding to the ARD2000 measurement distance from near to far. For example, when measuring a nearby pipeline or other nearby unknown leaks, you can set the distance value to 1 to improve near-site measurement accuracy; when measuring a distant leak or a high-rise building, you can increase the distance value to increase the detection distance.

Responding speed:

Use the + and-keys to change the response speed. Press MENU to confirm the changes and return to the main menu.

The distance setting can be set to "fast", "medium" and "slow", corresponding to the response speed of ARD2000 from fast to slow.

Unit setting:

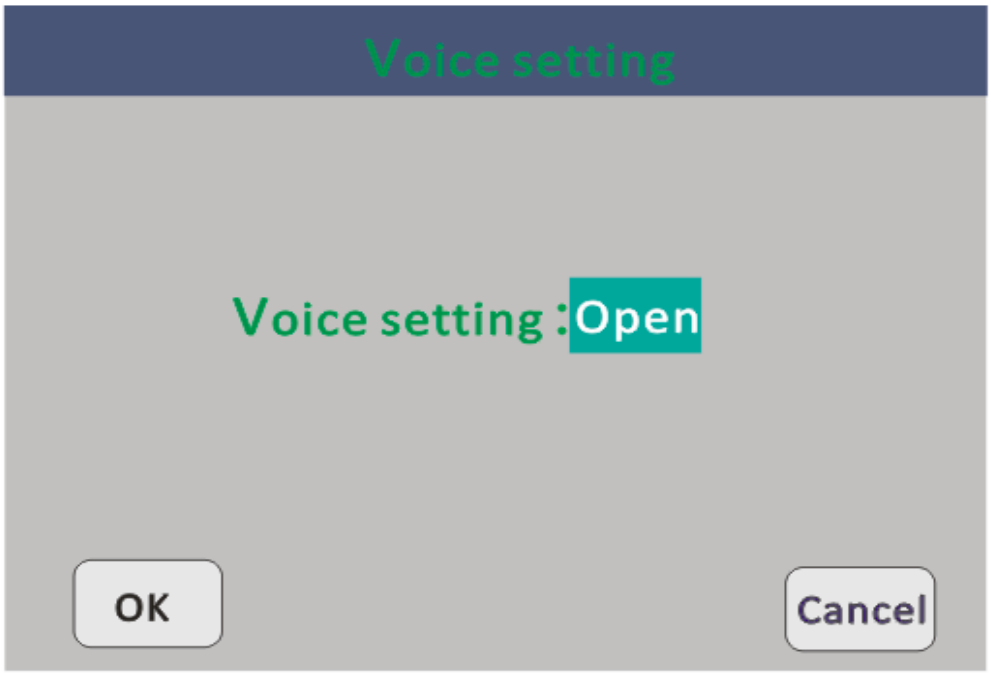
Use the + and-keys to change the unit setting. Press MENU to confirm the changes and return to the main menu.

Unit setting can be set to "ppm", "% LEL" or "% VOL".

Language setting:

Change the language setting with the + and-keys. Press MENU to confirm the changes and return to the main menu. The language can be set to "Chinese" or "English".

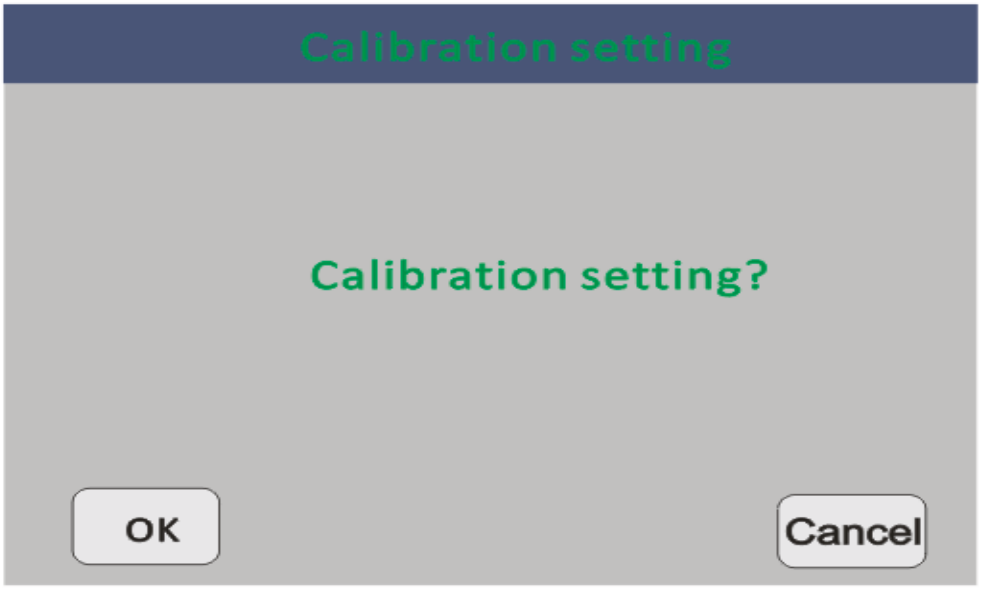
4.3.3 Voice setting:



On the main menu interface, move the cursor with the + and- keys to select the sound setting icon, and press the MENU to enter the sound setting.

Use the + and-keys to turn the sound on and off. Press MENU to confirm the changes and return to the main menu.

4.3.4 Calibration:



On the main menu interface, move the cursor with the + and-buttons to select the calibration setting icon, and press the MENU key to enter the calibration setting. Press the MENU key to confirm the system. Within 10 seconds of the countdown, place the device directly in the calibration chamber in the safety protection box. After three minutes, the calibration is successful, the device alarms, remove the device, and the calibration is complete.

4.3.5 Historical data

On the main menu interface, move the cursor with the + and-buttons to select the historical data icon, and press MENU to view the historical data. Press the MENU key to confirm the historical data and return to the main menu.

The historical data stores the measurement data records of the last 30 times.

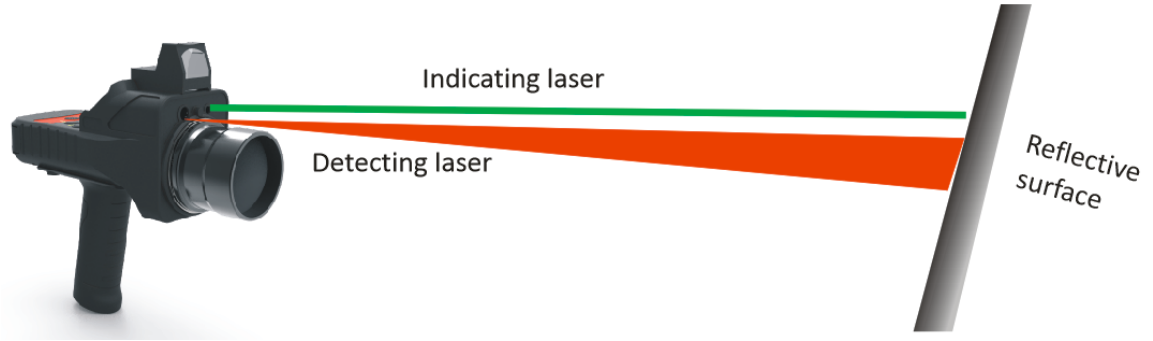
4.3.6 Reset

On the main menu interface, move the cursor with the + and-buttons to select the factory reset icon, and press MENU to enter the factory reset. Press MENU to restore the factory and return to the main menu.

4.4 Detecting Methods

4.4.1 Aiming instructions

The ARD2000 Remote Methane Leak Detector has two aiming methods to assist detection. The first is a green indicating laser. The green indicating laser is suitable for short-range aiming and aiming in weak sunlight. The second is a sight lens, which is suitable for long-distance sighting and sighting in strong sunlight.



☆ **Indicating laser aiming**

After the device is turned on, the indicating laser and detecting laser are turned off. Short press the power switch on the front of the device to turn on the indicating laser and detecting laser at the same time.

☆ **Sight lens use effect**

When the device is turned on, the sight lens is also open, and when the device is turned off, the sight lens is off at the same time. The specific aiming effect is as follows:

☆ **Sight lens deviation adjustment**

When deviation of the sight lens is found, the accuracy can be corrected by adjusting the crews in up dan down direction or left and right direction.

Up and down adjustment

Left and right adjustment

4.4.2 Measuring

When the laser emitted by the device passes through the natural gas leaking air mass, the methane gas will absorb the laser. The absorbed laser light is received by the detector through diffuse reflection, and the concentration information of the methane gas leakage is obtained through data collection and processing. Methane cylinder density (ppm · m) means: methane concentration (ppm) × air mass thickness (m).

☆ **In order to ensure that the ARD2000 Remote Methane Leak Detector can properly measure methane gas, the following conditions must be met:**

There is methane gas accumulation in the laser path;

The laser can pass through the gas;

The laser can be reflected back to the receiver through the reflective surface;

☆ **During the detection operation, the moving speed of the handheld detector will also affect the detection result. Please observe the following points during operation:**

You should try to maintain a uniform moving scan;

Focus on the detection of leaking valve ports, exhaust ports, cracks, etc .;

When the position of the pipeline is known, detect according to the S-shaped scanning path;

☆ **Common misuses**

The detecting laser is facing the sky, and the light signal cannot be returned;

The detecting laser is directed at the glass at a vertical angle, and the optical signal interferes, causing a false alarm. Therefore, there must be a certain angle with the glass when testing through the glass;

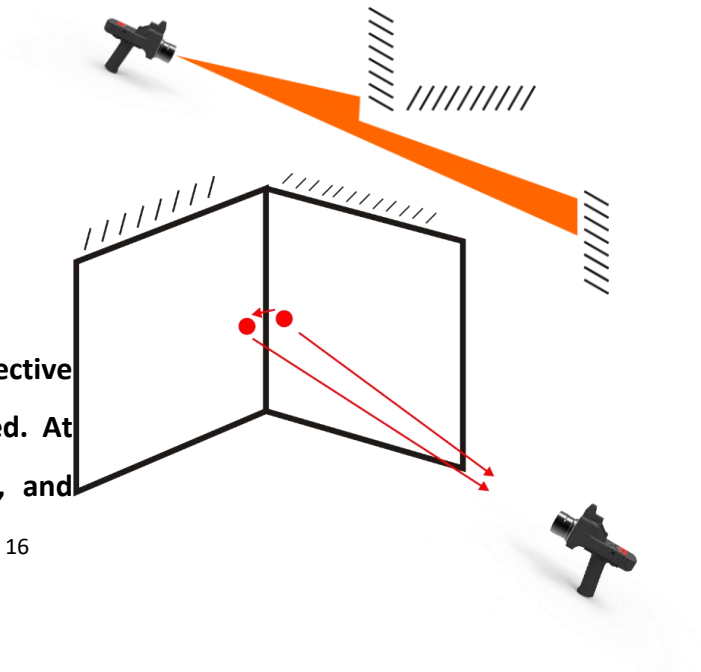
During the detection, the moving speed is too fast, causing a sudden change in the signal and easily causing false alarms;

The detection distance is less than 1 meter. At this time, the laser optical system is in a poor state. Try to avoid measuring in this state.

☆ **When there are factors that cause rapid gas diffusion, such as high winds and high temperatures, the gas cannot be concentrated, which affects the detection effect. Operators should consider similar situations in actual operations.**

☆ **ARD2000 Remote Methane Leak Detector can detect methane leakage at a limit distance of 150 meters. The actual detection limit distance will vary depending on the environment. The longer the distance, the weaker the reflected laser energy and the lower the accuracy of the detection result. When abnormal changes in the alarm value are found at a long distance, you should move to a close distance and check carefully.**

☆**When the detecting laser is blocked by some objects, the distance will be abruptly changed, and false alarms may occur.**



☆ **When detecting a corner against a high reflectance background, two reflective indicating laser pointers can be observed. At this time, false alarms may be caused, and**

other angles should be changed to test again to determine whether it is a leak alarm.

☆ When the laser passes through a thin PE pipe, the detecting laser may penetrate the PE pipe to detect the methane gas in the pipe, and the pipeline detection should be avoided at this time.

4.4.3 Alarm information

Alarm of concentration

When the ARD2000 Remote Methane Leak Detector detects a methane gas (ppm · m) that exceeds a set threshold, it will send an audible alarm signal through a buzzer, and the alarm value will be displayed on the LCD.

light intensity is too weak / too strong alarm

When the reflected light signal received by the ARD2000 Remote Methane Leak Detector is too weak or too strong (measurement accuracy cannot be guaranteed), the LCD screen displays "light intensity too weak / light intensity too strong".

Temperature control fault alarm

When the ARD2000 Remote Methane Leak Detector detects a problem with the internal laser temperature control (which will cause inaccurate measurements and affect its life), it will display a temperature control failure on the LCD screen.

5. Common problems and solutions

☆Unable to detect known methane gas

When the device does not display any alarm information, but cannot send an alarm when the known methane gas is detected, you should use the gas chamber provided with the device for calibration. For the calibration method, refer to section 4.3.3.

☆Temperature control failure

When the device shows a temperature control failure, you can try to restart the device and observe whether the device continues to have such failure. If the failure continues to occur, you should contact our after-sales department.

☆Light intensity is too weak for a long time

When the device shows that the light intensity is too weak for a long time, first of all, check whether there are large particles blocking the laser emission port. If there is no blocking of the laser emission port, please contact our after-sales department.

☆For other failures not listed, please contact our after-sales department

6. Routine maintenance

In order to keep the equipment in good condition, maintenance should be performed

Maintenance project	Frequency
Wipe the exterior surface of the instrument with a damp cleaning cloth	Often
Clean the window of the handheld detector with an alcohol-based glass cleaning cloth	When the window has obvious dust and pollutants
Calibration	Once a year
Charge	End of each use

7.After-sales service

One-year warranty and lifetime upgrade maintenance. If you have problems during use, please contact our company.