USER MANUAL

G20


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1 Safety Precautions

Introduction to safety precautions of the device

1.1 Safety precautions

Please read the following carefully before operating this device and ensure correct operation.

DANGER

Please check the structure and assembly of the device before each use to promptly detect structural dangers such as deformation and fracture!

DANGER

The device complies with the Ex ib IIC T4 Gb intrinsic safety and explosion-proof standard requirements and can be used in an explosive gas environment, but do not charge the device in an explosive gas environment!

CAUTION

This device is a high-precision leak detector for detecting the dispersion of gas leaks. Do not inhale natural gas at concentrations exceeding the instrument's measurement range (like methane ≥10,000 ppm or ethane ≥1,000 ppm)!

CAUTION

Using a wrist strap can prevent the device from accidentally falling, thereby extending the lifespan of the device. It is recommended to always wear the wrist strap around the neck during use.

CAUTION

Do not allow water into the device, or colliding, throwing and dropping the device, as it may cause damage to the device or operation failure!

CAUTION

Do not attempt to repair or replace components! When the device doesn't work properly or displays an error message, please refer to the relevant description in this manual for recovery operations or call for after-sales service.

DANGER

Do not use non-original charger to charge! Check whether the charging port and charger are damaged or not before charging to avoid short circuit.


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2 Introduction

Introduction of packaging, structure and working principle

The high-precision portable laser gas detector is designed to measure trace concentrations of natural gas. Equipped with a pump – assisted sampling system, it can be used with probes, electric vehicles to inspect micro-leaks in underground pipelines, pressure regulating stations, outdoor risers and similar infrastructure. .

2.1 Packing list

Take the device and all accessories out of the carry case[1] , and check if the accessories are complete by comparing the following list[2]. If you find any missing or damaged items, please contact us immediately.

ID	Product Name	Quantity
1	Detector (with hand strap）	1
2	Precision filter	5 (pairs)
3	Condensation filter	2
4	Probe (including spare filter element)	1 (set)
5	Self-locking mini quick-release connector Group A and Group B	1 (set)
6	Charger (charging plug, charging cable）	1 (set)
7	Documents (manual)	1 (set)

1. The carry case is water-proof, moisture-proof and dust-proof. Please store it in the carry case when not in use.

2. The configuration may change, please refer to the configuration in the carry case.

2.2 Composition of the Device

The main-screen and sub-screen of the detector are located at the front, the air intake and outlet are located on the side, the charging port and switch button are located at the rear, and the buzzer window and expansion port are located at the top.

[1] Main-screen

[2] Sub-screen

[3] Exhaust port

[4] Air intake

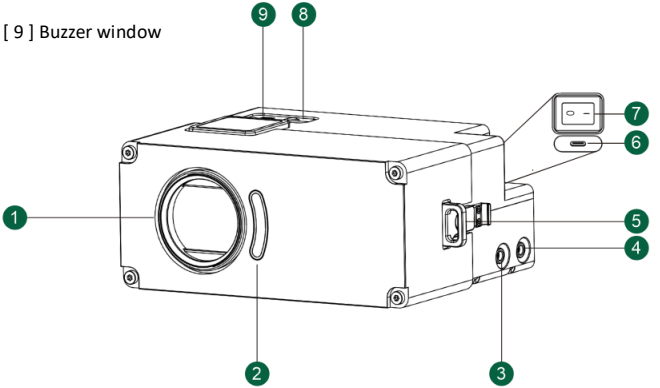
[5] Strap connection buckle

[6] Charging port

[7] Switch button

[8] Expansion port

[9] Buzzer window

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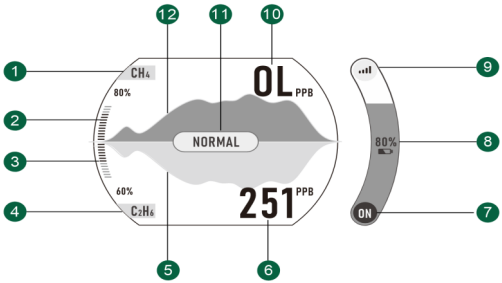
3 Operation interface

Introduction of interface, related operations and button functions.

3.1 User Interface

The device shows information to the user through the main-screen, sub-screen and the buzzer, and responds to operations with buttons.



[1] Methane identification

[2] Methane-ethane graph similarity

[3] Laser intensity, which decreases when gas is inhaled or the chamber is contaminated

[4] Ethane identification

[5] Ethane curve

[6] Ethane concentration value

[7] Pump status

[8] Battery level

[9] Wireless connection status

[10] Methane concentration value

[11] Device status

[12] Methane curve

3.2 Button function

Button	Name	Short press	Double click	Long press
	Main button	Turn off pump/check battery level	Turn on pump	Turn on/ off

Button function

[1] The button is non self-locking, pressing and releasing is a valid button operation.

[2] In powered-off state, short pressing the button can check the power level. After pressing the button, hear a short "beep" sound, the sub-screen lights up and displays the power level.

[3] In powered-off state, long pressing the button (for over 2 seconds) can get it powered on. At this time, you will hear a short "beep" sound, the pump starts, both the main and sub-screens light up at the same time, and the concentration window and power level are displayed.

[4] In powered-on state, a short press of the button will deactivate the pump. This action triggers a short beep from the buzzer, turns off the pump, and switches the device to standby mode.

[5] In powered-on state, double-clicking the button quickly can turn on the pump. At this time, you will hear two short “beep” sound and the pump is turned on, the device returns to normal state from standby mode.

[6] In powered-on state, long pressing the button (for over 2 seconds) can turn off the power. Then you’ll hear a long "beep" sound, both the main and sub-screens go off, and the pump is turned off.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4 Device Usage

Introduction to the usage, operation steps and related settings.

4.1 Charging

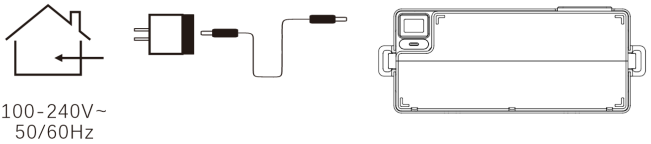
Please use the original charger to charge the device. The charger includes a charging cable and a charging plug. The charging port is located at the back of the device.

Proceed as follows:

[1] Plug one end of the charging cable into the charging plug, and then plug the charging plug into the socket. Make sure the socket is powered on.

[2] Plug another end of the charging cable into the charging port at the back of the device.

[3] After clicking the button, you will hear a short “beep” sound, the sub-screen will display the dynamic changes in battery level. When the battery level icon is full, the sub-screen will all display green and the value will show 100%, indicating that the battery is fully charged.



Check Battery

When the device is powered off, click the button to check the battery level [1]. After a short “beep” sound, the screen displays the current battery level icon.

1. Battery power is affected by the service life and ambient temperature, it is recommended to start the device indoors in winter, the heat generated by the device itself helps to improve the battery performance, if the battery's endurance is seriously reduced, please contact the after-sales service.

2. Please use the original charger to charge the device to avoid slow charging, failure to fully charge or even failure to charge.

4.2 Main Unit Usage

[1] Appearance inspection

Visually inspect the air tube and filter element for water accumulation and contamination, inspect the appearance of the device for damage, contamination and deformation.

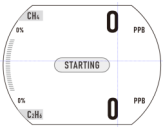
[2] Install sampling accessories

Connect the sampling accessories (a probe) to the air intake and ensure that the air tube is not blocked or severely bent. If it is bent, the pump will be forced to shut down and fail to detect. It is necessary to restart the operation of shutting down and turning on the pump to restore detection capability.

[3] Power on

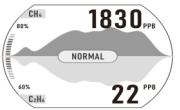
Long press the button until hearing a short “beep” sound. The device will turn on and start self-check. The main screen will display "STARTING". and the sub-screen will display the battery level. After initialization is complete, a short “beep” sound will be heard, and after about 30 seconds, the device status display area will show "NORMAL". The main screen will start to display concentration value and curves, and the device is ready to work.

[4] Detection and alarm



After starting up, the pump actives automatically, and the detection can start when it is shown "NORMAL".

When gas is inhaled, the methane exceeds the atmospheric background level (typically around 2000ppb) by 200ppb, and the similarity between methane and ethane concentration curves exceeds 90%, the device triggers an alarm and the buzzer sounds. As the methane concentration rises, the buzzer sounds more frequently and rapidly. At this time, the interface status area displays a red "ATTENTION" warning.



[5] Pump off

To extend battery life during operation, click the button to deactivate the sampling pump. A short beep will sound, confirming the pump is turned off.

[6] Shutdown

The shutdown operation is the same as the startup operation. Long press the button and hear a long "beep" sound, the device shuts down.

[7] Connect to APP

For details on this function, please refer to the software manual.

4.3 Calibration

The device is of high precision level. During daily use, it will be automatically calibrated regularly through the atmospheric background without user intervention.

5 Maintenance and Trouble-shooting

Introduction to maintenance and related components and corresponding trouble-shooting

5.1 Routine maintenance

In order to keep the device in a good status, please follow below recommendations for routine maintenance.

[1]Stored in the carry case	Not in use for a long time
[2]Charge the device	Necessarily or not in use for a long time
[3]Use soft and wet cloth to clean device's outer surface	Necessarily
[4]Clean the filter system	See Section5.2 for detail

CAUTION

Please pay attention to water, foreign objects and dust on the road during inspection, and do not immerse the air tube into water, which may cause filtration system failure and even damage the detection gas cell. Excessive dust will also affect the performance of the instrument and reduce the life of the filtration system.

Do not use the instrument as a tool to hit or collide with other hard objects.

5.2 Other components maintenance

Filtering system maintenance

The laser gas sampling cell inside the device is a precision optical component that is easily contaminated by dust and water, causing malfunctions. Therefore, the sampled air needs to be well filtered before entering the device.

The filtering system consists of a three-stage filter: a condensate filter located on the sampling air pipe, a fine filter element located on the gooseneck probe, and precision filter sheet located at the air inlet position of the device. The service life of the filter components will vary depending on the use environment and frequency.

TIPS

Please clean and inspect at least **once a week**, replace contaminated and damaged components in time to extend the service life of the device.

[1] Inspection:

Place the gas collection unit and turn off the pump and device power.

Check the sampling air pipe, clean dust and foreign objects, and replace the air pipe if necessary.

Remove the condensate filter and check for accumulated water or excessive dust contamination inside.

Remove the gooseneck filter element and check whether the filter element is discolored or contaminated.

[2] Replace the condensate filter:

The condensate filter is located on the sampling air pipe. The air pipes on both sides can be directly pulled out for removal and replacement.

When the device prompts you to do so, please replace the filter in time.

The free spare parts are in the carry case. If you have any additional needs, please contact the after-sales service for purchase.

[3] Replace precision filter sheet:

The precision filter sheet is located at the air inlet position. It can be seen after disassembling the air intake part. Please pay attention to the internal rubber sealing ring and install it with the rough surface facing the device.

The free spare parts are in the carry case. If you have any additional needs, please contact after-sales for purchase.

Maintenance of Battery

The device is equipped with an intelligent lithium-ion battery pack, when not in use for extended periods, it should be charged to 50%~80% of its capacity and stored in a dry and cool environment. Additionally, the battery should be re-charged every month to prevent irreversible capacity loss due to low battery capacity caused by self discharge during prolonged storage.

TIPS

To extend the battery life, it is recommended to perform a full charge and discharge cycle at least once a month. This involves charging the battery to 100% and then using the device until the low battery reminder appears.

5.3 Troubleshooting

The device has a self-diagnostic function. If an error occurs there will be a long and two short "beep" sounds, and an error code like "E001" will be displayed on the screen. The meaning of the code, device behavior and recommended methods of handling are as follows:

[E001] Temperature control is out of range

1. Turn off and move the device to room temperature for 1 hour

2. Reboot. Please contact for after-sales service if the error repeats

[E005 / E006 / E202] Temperature control can't be stabilized

1. Turn off and move the device to room temperature for 1 hour

2. Reboot. Please contact for after-sales service if the error repeats

[E102 / E103] Battery temperature is abnormal

1. Turn off and move the device to room temperature for 1 hour

2. Reboot. Please contact for after-sales service if the error repeats

[E104 / E105] Battery failure

Turn off and reboot. Please contact for after-sales service if the error repeats

[E101] Core module is abnormal

Turn off and reboot. Please contact for after-sales service if the error repeats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