# 4 IN 1 GAS MONITOR MANUAL

## INSTRUCTION

1. This manual describes in detail the usage of the product, precautions, and related matters, before using the product, please read the manual carefully in order to show the best performance of the product.

2. Do not use the instrument in a flammable and explosive environment.

3. The discarded instruments cannot be disposed of together with domestic waste, please dispose of them in accordance with relevant national or local laws.

4. If the instrument has quality problem, or if you have any questions about the use of the instrument, please contact the local distributor or the shop (include online shop) which you buy the instrument from in time, and we will solve it for you as soon as possible.

5. If the company's products beyond the warranty period are faulty, you can hand it to our company to repair the product, and charge maintenance fee according to the company's regulations.

6. The company is not responsible for the warranty if the user disassembles and assembles our company's products by himself, and the product is damaged due to improper transportation, storage or failure to operate the meter according to the product manual, and without proof of purchase.

## I.    PRODUCT INTRODUCTION

The portable voice type four-in-one gas detector (referred to as the detector) is a safe device that can continuously detect the concentration of leaked gas. Adopt advanced integrated circuit technology, embedded microcomputer control, high-quality imported gas sensor, with excellent sensitivity and repeatability; Use dot matrix LCD display, support Chinese and English interface and Chinese and English voice prompts, user can quickly understand this product, easy to use and maintain; the shell is made of high-strength engineering plastics, Anti-seismic, high strength, high-end appearance and dust-proof, waterproof and explosion-proof functions.

This detector is widely used in toxic, harmful, and explosion-proof industries and places for safe monitoring, Such as petroleum, chemical, environmental protection, metallurgy, refining-chemical, gas, biochemical medicine, agriculture, fire protection, archaeology.

The detector can effectively predict the dangerous gas concentration and alarm to ensure that the life safety of the staff is not threatened and the production equipment is not damaged.

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

(1) GB3836.1-2010  《Explosive atmospheres. Part 1:Equipment. General requirements》

(2) GB3836.4-2010  《Explosive atmospheres Part 4:Equipment protection by intrinsic safety "i"》
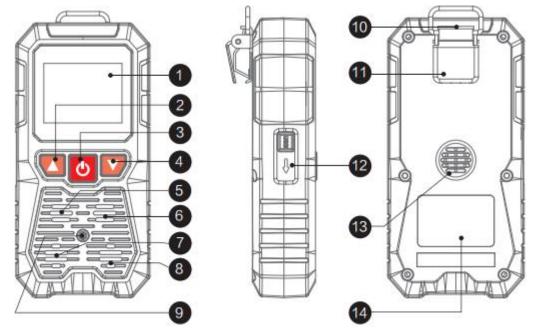
(3) GB15322.3-2003  《Combustible gas detectors Part 3: portable detectors for 0～100%LEL combustible gas》

(4) JJG693-2011  《Verification Regulation of Alarmer Detectors of Combustible Gas》

(5) JJG365-2008 Verification Regulation of Electrochemical Oxygen Meter

(6) JJG695-2003 Verification Regulation of Sulfur Hydrogen Gas Detectors

(7) JJG915—2008 Verification Regulation Carbon Monoxide Detectors

## II.    STRUCTURAL FEATURES

| | | | |
|---|---|---|---|
| 1. | Display | 8. | Carbon monoxide detection port |
| 2. | Up key | 9. | Calibration covers mounting base |
| 3. | Power button | 10. | Warning light |
| 4. | Down arrow | 11. | back clip |
| 5. | Oxygen detection port | 12. | Type-C USB |
| 6. | Hydrogen sulfide detection port | 13. | trumpet |
| 7. | Combustible gas detection port | 14. | nameplate stickers |



**Main Display Interface**



Time — 18:58:08 — Battery indication

Oxygen concentration — O2 20.9% VOL

Hydrogen sulfide concentration — H2S 0 PPM

Combustible gas concentration — EX 0% LEL

Carbon monoxide concentration — CO 0 PPM

## III.   TECHNICAL PARAMETERS
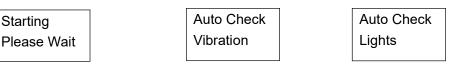
| Conventional gas detection range | | | | |
|---|---|---|---|---|
| Gas type | Range | Low alarm point | High alarm point | Resolution |
| CO | 0~1000 PPM | 50 PPM | 150 PPM | 1 PPM |
| H2S | 0~100 PPM | 10 PPM | 35 PPM | 1 PPM |
| Ex | 0~100% LEL | 20% LEL | 50% LEL | 1% LEL |
| O2 | 0~30% VOL | 19.5% VOL | 23.5% VOL | 0.1% VOL |

| Other parameters | |
|---|---|
| **Display error** | ≤±5%FS |
| **Response time** | <30 seconds |
| **Indication** | LCD (liquid crystal display) real-time data and system status, light, vibration，and real voice recording (Chinese and English) prompt |
| **Working environment** | -10°C~ 55°C; Humidity < 95%RH condensation |
| **Operating Voltage** | DC 3.7V (Lithium battery capacity 2000mAh) |
| **Charging time** | 4h-6h |
| **Standby time** | It can be used for more than 10 hours when it is fully charged |
| **Charging Specification** | Type-C DC 5V 1A |
| **IP grade** | IP65 |
| **Sensor life** | 1 year |
| **Sensor principle** | Electrochemical and catalytic combustion |
| **Dimension** | 133*65*30mm |
| **Weight** | 205g |

## IV. SETTING AND OPERATING

4.1 Switching on and off and charging instructions

4.1.1 Power on

When the detector is off, press and hold the power button ⏻ for about 3 seconds, you will see the LCD screen displaying software version interface, and the indicator light flashes twice and then release the button. At this moment, the LCD screen displays welcome page about power on. At the same time, you can hear the voice prompt of "Welcome to the Multifunctional Voice Gas Detector".

| Starting Please Wait | Auto Check Vibration | Auto Check Lights |
|---|---|---|

Please keep the air around clean when the detector on the page of waiting for startup.

During the turning on period, the detector will perform vibration and light self-test, please pay attention to observe whether it is normal. If above state is normal, indicating that the sound, display, light, and vibration self-test have passed.

| Ex | |
|---|---|
| Alarm L | 20%LEL |
| Alarm H | 50%LEL |
| Alarm R | 100% LEL |

| O2 | |
|---|---|
| Alarm L | 19.5%VOL |
| Alarm H | 23.5%VOL |
| Alarm R | 30.0%VOL |

```
            CO                                    H2S
Alarm L      50PPM                    Alarm L      10PPM
Alarm H      150PPM                   Alarm H      35PPM
Alarm R     1000PPM                   Alarm R     100PPM
```

After the meter opening is completed, the gas main page of normal standby is displayed, which can be seen in real time Gas concentration. Press the button ▲ to view the system status information.

```
18:58:08      [████]                   BAT           [████]
   O2       H2S                        Testing    25min
20.9% VOL   0PPM                       Date      22.02.23
   Ex       CO                         Time       18:58:08
0%LEL       0PPM
```

## 4.1.2 Shutdown

Press the ⏻ button for 3 seconds at the gas display main page, and the screen will display Shutdown confirm screen.
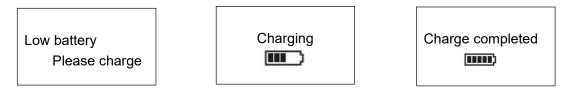
Press the left button " ▲ " to shut down successfully.

Press the right button " ▼ " to cancel the shutdown and return to the main page of gas detection.

```
          POWER OFF


      Y e s          N o
```

## 4.1.3 Charging indication

When plugging in the USB charging cable while the power is off, the current quantity of power will be displayed on the screen; When the quantity of electricity is only 1 bar, a low battery page will pop up on the screen every 60 seconds, and a voice prompt of "low battery, please charge"; when the quantity of electricity is less than 1 bar, the detector will automatically shut down to prevent internal data loss, and unforeseen damage to sensitive components inside the instrument due to insufficient voltage.

```
Low battery              Charging              Charge completed
   Please charge          [██▮ ]                   [████]
```
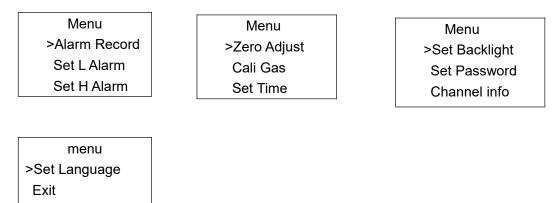
## 4.2 Setting menu

The detector menu has alarm record, low alarm setting, high alarm setting, zero setting, calibration setting, time setting, backlight setting, password setting, channel information and language switching functions.

When the main page of gas concentration is displayed, press the ▼ key to enter the

menu selection.

| Menu |
| --- |
| >Alarm Record |
| Set L Alarm |
| Set H Alarm |

| Menu |
| --- |
| >Zero Adjust |
| Cali Gas |
| Set Time |

| Menu |
| --- |
| >Set Backlight |
| Set Password |
| Channel info |

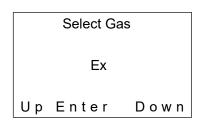| menu |
| --- |
| >Set Language |
| Exit |

4.3 Alarm record

When the arrow in the menu selection arrow points to the alarm record, press the ⏻ key to view the alarm record; press the ▲ ▼ key to turn the screen to query the previous alarm records in turn; press the ⏻ key again to switch the option page, select "Delete" to clear all records, or select "Return": return to the record query page; "Exit": return to the main menu.

| Ex: 18.4%LEL |
| --- |
| Status: Alarm L |
| Date: 22-02-23 |
| Time: 18 : 58 : 08 |
| Up   Enter  Down |

| Options |
| --- |
| > Return |
| Delete |
| Exit |

4.4 Low alarm setting

When the menu selection bar arrow points to the low alarm setting, press the ⏻ key to switch to the channel interface of the low alarm; you can press the ▲ or ▼ key to select the combustible gas, oxygen, carbon monoxide and hydrogen sulfide channel; after selecting the channel to be set, press the ⏻ key to enter the low alarm concentration setting page; the user can adjust the actual required alarm concentration according to the increase or decrease, press the ⏻ key to enter the save confirmation page, and select the ▲ or ▼ key to confirm whether to save the modified value.

| Select Gas |
| --- |
| Ex |
| Up Enter  Down |

| Set Low |
| --- |
| Ex    20%LEL |
| Up   Enter   Down |

| Save? |
| --- |
| Yes            No |

## 4.5 High alarm-setting

When the menu selection bar arrow points to the high alarm setting, press the ⏻key to switch to the channel interface of the high alarm; you can press the ▲ or ▼ key to select the combustible gas, oxygen, carbon monoxide and hydrogen sulfide channel; after selecting the channel to be set, press the ⏻key to enter the high alarm concentration setting page; the user can adjust the actual required alarm concentration according to the increase or decrease, press the ⏻key to enter the save confirmation page, and select the ▲ or ▼ key to confirm whether to save the modified value.

```
        Select Gas


            O2


Up      Enter      Down
```

```
         Set High


     O2      20%LEL


Up       Enter      Down
```

```
         Save?


Yes               No
```

## 4.6 Zero setting

When the menu selection bar arrow points to zero settings, press the ⏻ key and input the password 1111 to enter the zero point setting, switch to the channel interface of the zero point setting channel; you can press the ▲ or ▼ key to select the combustible gas, oxygen, carbon monoxide and hydrogen sulfide channel; after selecting the channel to be set, press the ⏻key to enter the zero point setting page; the page displays the current gas concentration data; press the ▲ key to save and set the current value as the new zero point of the gas.

In order to prevent mis-operation, if the detector detects a large difference between the gas value and the zero value, it will prompt "Data Abnormal, Failed to Save"

```
        Password


          1 1 1 1


Up      Enter      Down
```

```
        Zero Adjust


            2


Enter       Exit
```

Warning: Please do this operation in clean air (oxygen must be in pure nitrogen) to ensure the current air is no zeroing gas required mark. Otherwise, the concentration of reactive gas in the environment will affect the detection accuracy of the detector to varying degrees.
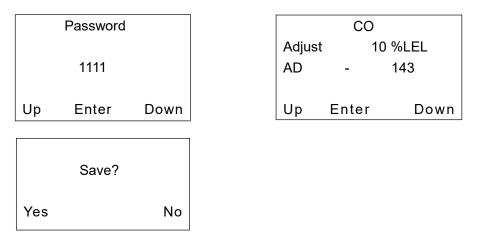
## 4.7 Calibration setting

Prepare the gas cylinder, pressure limiting valve, flow meter, air pipe, and calibration gas
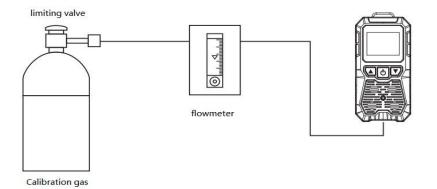
mask before calibration.

When the menu selection bar arrow points to Calibration Settings, press the ⏻key and enter the password: 1111, switch to the channel interface of the calibration setting; you can press the ▲or ▼ key to select the combustible gas, oxygen, carbon monoxide and hydrogen sulfide channel; after selecting the channel to be set, press the ⏻key to enter the calibration setting page; open the pressure limiting valve of the gas cylinder prepared with the standard concentration, and adjust the flow to 200-400ml/min. Connect to the gas detector through the trachea and calibration gas mask. Observe the AD value displayed on the instrument. At this time, the AD value should be rising, wait for about 1 minute until the AD value rises to the peak value and is stable and not floating. Adjust the concentration value of the gas to be calibrated by ▲and ▼. For example, if the carbon monoxide concentration of the gas cylinder is 250ppm, the concentration value displayed on the instrument should be adjusted to 250ppm. Press ⏻to enter the save confirmation page, and select ▲or▼ to confirm whether to save it.

In order to prevent misoperation, if the detector detects a large difference between the calibration value and input gas, it will prompt "Data Abnormal, Failed to Save"

| Password |
|:---:|
| 1111 |
| Up    Enter    Down |

| CO | | |
|:---|:---:|:---:|
| Adjust | | 10 %LEL |
| AD | - | 143 |
| Up | Enter | Down |

| Save? |
|:---:|
| Yes                    No |

Warning: Non-professional personnel are strictly forbidden to carry out this operation, Otherwise, all consequences will be borne by themselves!

The detector has been uniformly calibrated at the factory. If the you want to re-calibrate, please strictly follow the steps, first zero point setting, and then re-calibration setting. If the user operates this setting incorrectly, please contact the manufacturer in time to return it for re-calibration.
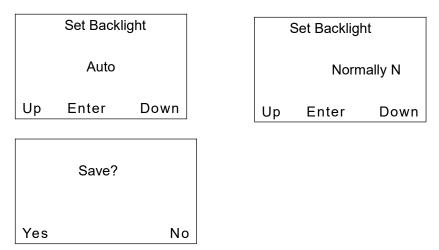
## 4.8 Time setting

When the menu selection bar arrow points to Time Settings, press the ⏻key to switch to the time setting interface; press the ▲ key to increase the value and press the ▼ key to decrease the value. Press the ⏻key to confirm switching seconds, minutes, hours, days, months, years, and finally save it.

```
           Set Time


          22—02—23
          18 : 58 : 08

Up        Enter      Down
```

Since the clock chip of the detector internal will affect the clock error due to temperature, electromagnetic interference, and insufficient battery power, it is recommended that the user set the time every once in a while.

## 4.9 Backlight setting

When the menu selection bar arrow points to the backlight setting, press the ⏻key to switch to the backlight setting interface; switch the backlight setting option by press the ▲ key or the ▼ key; "Automatic" means that you press the button every time, the backlight will wake up and re-time for 30 seconds. When the time is over, the LCD backlight will turn off.

"Always on" means that when the user needs to observe the gas changes for a long time in a place with insufficient light, the always-on function setting can be selected, and the LCD backlight will always remain on.

```
      Set Backlight                    Set Backlight


         Auto                            Normally N

Up    Enter    Down                Up    Enter    Down
```

```
        Save?



Yes                  No
```

## 4.10 Password setting

When the menu selection bar arrow points to Password Settings, press the ⏻key to switch to the password validation interface; enter the verification password, and press the⏻ key to jump to the password setting page; the factory default password is 1 1 1 1. In order to prevent others misoperation, the user can reset a new password.

```
  ┌─────────────────────────┐        ┌─────────────────────────┐
  │       Password          │        │     New Password        │
  │                         │        │                         │
  │        1111             │        │       0 0 0 0           │
  │                         │        │                         │
  │  Up   Enter   Down      │        │  Up    Enter    Down    │
  └─────────────────────────┘        └─────────────────────────┘
```

Note: Please keep the password properly, once lost, it can only be returned to the factory to restore the factory setting.

4.11 Channel Information

When the menu selection bar arrow points to channel information, press the ⏻ key to display the low concentration alarm threshold, high concentration alarm threshold and maximum range information of combustible gas, oxygen, carbon monoxide and hydrogen sulfide in sequence;

```
  ┌─────────────────────────┐        ┌─────────────────────────┐
  │          Ex             │        │          O2             │
  │  Alarm L    20%LEL      │        │  Alarm L   19.5%VOL     │
  │  Alarm H    50%LEL      │        │  Alarm H   23.5%VOL     │
  │   Alarm R  100% LEL     │        │  Alarm R   30.0%VOL     │
  └─────────────────────────┘        └─────────────────────────┘


  ┌─────────────────────────┐        ┌─────────────────────────┐
  │          CO             │        │          H2S            │
  │  Alarm L     50PPM      │        │  Alarm L     10PPM      │
  │  Alarm H    150PPM      │        │  Alarm H     35PPM      │
  │  Alarm R  1000PPM       │        │  Alarm R    100PPM      │
  └─────────────────────────┘        └─────────────────────────┘
```

4.12 Language switching

When the menu selection bar arrow points to a language switch, press the ⏻ key to jump to the language setting page; switch the language setting option by press the ▲ key or press the ▼ key; press the ⏻ key to save it. (The detector support Chinese and English language switching, and the prompt voice played is consistent with the voice set by the system)

```
  ┌─────────────────────────┐        ┌─────────────────────────┐
  │       Language          │        │       Language          │
  │                         │        │                         │
  │       Chinese           │        │       English           │
  │                         │        │                         │
  │  Up   Enter   Down      │        │  Up    Enter    Down    │
  └─────────────────────────┘        └─────────────────────────┘
```

4.13.Exit

When the menu selection bar arrow points to exit, press the middle key ⏻, the system exits the menu selection and return to the main page of displaying real-time gas concentration.

```
┌─────────────────────────────┐
│ 18:58:08          ▊▊▊▊▊)     │
│     O2           H2S         │
│  20.9% VOL       0PPM        │
│     Ex            CO         │
│      0% LEL      0PPM        │
└─────────────────────────────┘
```

**FUNCTION USAGE**

5.1 Real-time display

   After the detector is turned on, the LCD screen is in a standby state that displays the four concentrations of combustible gas, oxygen, carbon monoxide and hydrogen sulfide in real time. Press any key to turn on the LCD backlight (the backlight stays on for 30s after any operation).

5.2 Combustible gas alarm

When the concentration of combustible gas is detected higher than the lowest alarm threshold set by the system, the detector will broadcast "Please note that the concentration of combustible gas exceeds the standard" and continue to simulate the alarm sound; the alarm light above the detector and the internal vibration motor are opened simultaneously; when the detector detects that the concentration of combustible gas returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

5.3 Oxygen alarm

When the concentration of oxygen is detected lower than the lowest alarm threshold set by the system, the detector will broadcast "Please note that the oxygen concentration is too low". If it is higher than the maximum alarm threshold set by the system, the detector will broadcast "Please note that oxygen concentration exceeds the standard" and continue to simulate the alarm sound; the alarm light above the detector and the internal vibration motor are opened simultaneously; when the detector detects that the concentration of oxygen returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

Remark: The concentration of oxygen in normal air is 20.9%, the user can adjust the low alarm threshold and high alarm threshold according to actual need.

5.4 Carbon monoxide alarm

When the concentration of carbon monoxide is detected higher than the lowest alarm threshold set by the system, the detector will broadcast "Please note that the concentration of carbon monoxide exceeds the standard" and continue to simulate the alarm sound; the alarm light above the detector and the internal vibration motor are opened simultaneously; when the detector detects that the concentration of carbon monoxide returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

5.5 Hydrogen sulfide alarm

When the concentration of hydrogen sulfide is detected higher than the lowest alarm threshold set by the system, the detector will broadcast "Please note that the concentration of hydrogen sulfide exceeds the standard" and continue to simulate the

alarm sound; the alarm light above the detector and the internal vibration motor are opened simultaneously; when the detector detects that the concentration of hydrogen sulfide returns to the minimum alarm threshold, the alarm state of voice, light and vibration disappears.

5.6 Alarm data preservation

After the detector triggers an alarm, if you detected that the alarm gas is restored to the normal threshold range, the detector will save the current alarm information to the internal storage of the detector, and according to the low concentration alarm threshold and high concentration alarm threshold set by the user, it can be divided into low alarm and high alarm respectively User can inquiry them through the alarm record in the menu column.

| |
|---|
| Ex：24%LEL |
| State：Alarm L |
| Date：22-02-23 |
| Time：18 : 58 : 08 |
| Up     Enter     Down |

Remark:

1. The alarm voice supports Chinese and English voice alarm, which is consistent with the system language setting.

2. When the detector triggers an alarm, quickly double-click the middle button to turn off the sound, vibration, and light alarm. When all gases return to the preset alarm threshold range, the detector re-enters the warning state.

Warning:

1.The alarm will be triggered only after the detector is turned on and on the gas detection page

2. Please do not charge the detector at the hazardous gas monitoring site to avoid fire or explosion caused by sparks during plugging and unplugging.

3. Try not to charge the detector when it is turned on, so as not to affect the charging speed.

4 The detector has the function of intelligent tracking zero point, please turn it on when the air is clean.

**CHARGING FUNCTION**

1. The detector has a built-in large-capacity rechargeable battery,  which can be used for standby monitoring continuously for more than 10H in a fully charged state; when the detector prompt the battery is low, please charge it in time.

2. Use the TYPE-C charging cable and connect to the USB 5V power supply (the output current of the power supply is not less than 1A) to charge the detector. Full display, charging completed.

3. The detector cannot be turned on when charging in the off state. You can unplug the charging cable after charging is completed, and then turn on the detector for gas monitoring operation.

```
┌─────────────────────┐        ┌─────────────────────────┐
│ Low Battery         │        │                         │
│                     │        │ Charging Completed      │
│    Please charge    │        │        ▐▌▌▌▌▐            │
│                     │        │                         │
└─────────────────────┘        └─────────────────────────┘
```

**NOTE**

1. Prevents the unit from falling from height or violent vibration.

2. In the presence of high concentrations of gas, the detector may not work properly.

3. Please operate and use in strict accordance with the instructions, otherwise it may cause inaccurate test results or damage to the detector.

4. This product should not be stored or used in an environment containing corrosive substances (such as high concentrations of chlorine, silicon-containing gas, etc.), nor in other harsh environments, including excessively high and low temperature, high humidity, electromagnetic field and strong sunlight.

5. Please wipe it gently with a clean soft cloth dipped in water if you find the detector have dirt. Do not use corrosive solvents and hard objects to wipe the surface of the instrument, otherwise the surface of the detector may be scratched or damaged.

6. In order to ensure the detection accuracy, the detector should be calibrated regularly, and the calibration period should not exceed 1 year.

7. For any application or failure beyond the description in this manual, please contact our company for solution.

**COMMON FAULTS AND SOLUTIONS**

| Trouble phenomenon | Possible fault cause | Solution |
|---|---|---|
| Unable to turn on | Low voltage | please charge the instrument in time |
| | Crash | Please contact distributor or manufacturer for repair |
| | Circuit failure | Please contact distributor or manufacturer for repair |
| No reaction to the detected gas | Circuit failure | Please contact distributor manufacturer for repair |
| Inaccuracy display | Sensor overdue | Please contact distributor manufacturer to replace sensor |
| | Not calibrated for a long time | please calibrate in time |
| Time display error | Battery power completely exhausted | Charge it in time and reset the time |
| | Strong electromagnetic interference | Reset the time |
| Zero setting failed | Excessive sensor drift | Calibrate or replace the sensor in time |
| The normal detection interface of the instrument does not return to zero (except for | Sensor drift | To perform a zero calibration |

| oxygen) | | |
|---|---|---|
| When the instrument normal detection interface display full range | Sensor fault | Please contact distributor or manufacturer to replace sensor |

### STORE

The detector should be stored in a ventilated room with an ambient temperature of -10°C ~ 55°C and a relative humidity of not more than 85%. Avoid direct sunlight, and the air cannot contain harmful gases or impurities to corrode the detector.

### PACKING LIST

Please carefully check whether all accessories of the instrument are complete according to the following list. If incomplete, please contact the distributor or manufacturer in time.

| Name | Number |
|---|---|
| Host machine | 1 |
| Type-C line | 1 |
| Gift box | 1 |
| Manual | 1 |
| Carrying case | 1 |