# SKY6000 Series Gas Detector Instruction Manual


## Please read carefully before using

Anyone who may use, maintain or repair the instrument should read this operating manual carefully and only follow the operating manual to achieve the design level. Otherwise the instrument will not work properly and will cause malfunction and damage to the instrument.

## Warning：

 The readings beyond the range indicate the concentration of the gas that may or will soon reach the explosion concentration or the concentration of casualties

 Replacing components can affect the intrinsic safety of the instrument.

 It is strictly forbidden to charge the meter in a hazardous area. Users must use the special charger equipped with this unit.

 Do not disassemble, recharge or replace batteries in hazardous locations.

 Charging must be turned off; the instrument must not be operated while charging or exporting data.

 Portable products, before entering the danger zone, doing electrostatic release of human body, and then carries the instrument into the zone.

 Do not use the computer's USB interface for communication in hazardous areas.

 Old and new batteries or batteries from different manufacturers cannot be mixed.

## Attentions：

To ensure maximum safety and performance, please read and follow the items and conditions listed below.

- The air intake of the sensor must be kept clean. Blocking the sensor's air intake may result in readings that are lower than the actual gas concentration or even the gas concentration. It is strictly forbidden to use compressed air to clean the air inlet of the sensor to avoid damage to the sensor.
- Catalytic Principle Flammable Gas Sensor and Infrared Principle Sensor can only accurately monitor designated gases. It should be noted, however, that the catalytic principle flammable sensor is not specific to a particular gas and will be able to react to other flammable gases.
- If the instrument is subject to physical impact or high pollution, the calibration cycle needs to be shortened.
- The sensitivity of flammable gas sensors will be affected by high concentrations of sulfides, halogen compounds, silicon-containing compounds, and gases containing “mercury” and “lead”,

steam, and high temperature organic acid gases. Avoid using them in environments containing the above chemicals. The instrument, if necessary, must be tested and calibrated after use to avoid affecting the accuracy of the instrument.

- The instrument is strictly prohibited from being used in a high concentration of flammable gas for a long time to avoid damage to the flammable sensor. If it is necessary, the instrument should be tested and calibrated after use to avoid affecting the accuracy of the instrument. If the flammable sensor is damaged, it needs to be replaced with a new one. The sensor can only be reused after it has been calibrated.
- Do not use organic solvents, soap or silicon-containing solutions to clean the instrument to avoid damaging the sensor.
- When sampling with a sampling tube, do not use a sampling tube made of silicone material or other sampling tubes that are not certified by the special source.
- A sudden change in air pressure or a blocked air circuit may cause temporary fluctuations in the instrument's oxygen readings.
- Large changes in pressure will result in incorrect readings. If the measured gas pressure is greater than 10% of the atmospheric pressure, it will affect the instrument reading and even damage the sensor. The instrument should be re-calibrated and the measured gas should be depressurized.
- It is forbidden to artificially use the gas shock sensor that exceeds the range of the instrument. If the over-range high-concentration gas impact occurs, the instrument must be re-calibrated.
- When replacing any one of the sensors, the instrument needs to be calibrated.
- Standard gas should be selected from the manufacturer or the nationally qualified enterprise.
- The calibration should be in a well ventilated environment to avoid contamination.
- It is strictly forbidden to calibrate the instrument under the condition of insufficient power supply.
- Do not use the instrument in an oxygen-rich environment.
- It is strictly forbidden to replace the components or structures that affect the explosion-proof performance at will, so as not to affect the explosion-proof performance.
- It is forbidden to expose the instrument to high concentration acid and alkali gas to avoid damage to the sensor.
- It is strictly forbidden for users to repair or replace parts without authorization.
- A sudden change in temperature can cause the output signal of the infrared sensor to be abnormal. After the transient is removed, the instrument will resume normal operation and the ambient temperature change rate should be limited to 2 ° C / min.
- If the gas sample flow rate changes excessively, it will also cause the infrared sensor output signal to be abnormal. After the transients are removed, the instrument will resume normal operation and the gas flow rate should be kept below 0.6 L/min.
- It is strictly forbidden to expose the infrared sensor to corrosive gas such as hydrogen sulfide.

It is strictly forbidden to cause condensation inside the sensor.

Condensation phenomenon inside sensor is strictly prohibited.

## Calibration Warning：

- Gas detection equipment is a safe life-saving measuring instrument. To ensure metering

accuracy, toxic and catalytic principles flammable gas sensors should be calibrated at least once every six months, while infrared sensors should be calibrated once a year.

- The gas detector needs to be carefully tested or calibrated after an alarm occurs.
- This instrument has the function of recording and querying the calibration date. Please check it frequently. Not only do users need to understand the parameters of the instrument, but they also need to understand the meaning of the test data obtained.

# Contents

# 1. Product Description

SKY6000 is a handheld portable gas detection alarm. The instrument can be flexibly configured with single or multiple gas sensors; it adopts 3.5-inch high-definition IPS LCD color screen, 150-degree wide viewing angle, Chinese and English operation interface; three alarms of sound, light and vibration, optional fall alarm function, underground The safety of the operator is more secure; the air inlet is equipped with a waterproof and dust proof filter, which is suitable not only for daily ambient air but also for the damp and dusty monitoring environment; the built-in gas pump with adjustable ten-speed flow can be used. Customized gas detection flow for different detection environments, can be detected normally under 6m/S high-speed airflow; strong resistance to electric transients, It also has the extended function of Internet of Things, long standby time of large-capacity lithium battery; high-strength engineering materials for instrument casing The unique shape design combines practical ergonomic operation.

# 2. Instrument characteristics

**3.5-inch large screen display, beautiful appearance, independent patent structure design**

With a 3.5-inch high-definition color screen, 150 degrees wide and wide viewing angle.

The air inlet is equipped with a dust proof filter as standard, which is suitable for the damp and dusty monitoring environment.

The novel air chamber structure makes the detection faster and obtains relevant structural design patents.

**Flashlight function, fall alarm function**

The flashlight function illuminates the darkness for certain workplaces, making downhole operations easier;

Optional fall alarm function to ensure the safety of underground workers is more secure;

**Multi-gas test, display mode switch**

The instrument can simultaneously detect up to 1-5 gas concentrations

Gas concentration data display, gas concentration real-time curve display mode can be switched at will

**Flexible and adjustable pump delivery system, multi-layer filter**

Built-in gas sampling pump, the pump's flow rate is adjustable in ten steps, which can customize the gas detection flow for different detection environments.

The instrument is equipped with a three-layer filter to efficiently filter oil, water, dust and other impurities. Even in the most demanding industrial environments, the test results can still be trusted.

**Powerful and more user-friendly**

Support multiple gas display units to switch freely, the concentration value is automatically converted by the system

Chinese and English free switching display

Timed shutdown function, intelligent setting

Sensor overload automatic protection

Micro-USB charging interface design can be charged anytime, anywhere with common data lines and mobile power
Standard storage function, support instrument viewing and computer download history; optional 8G large-capacity memory card, optional PC storage software download analysis data
Optional external portable Bluetooth printer for detecting data for mobile printing
One-click screen capture function, save test data and curve in picture form
Built-in wireless communication module, users can view and monitor test data in real time on computer web client and mobile phone applet, and carry out security control (optional)

## 3. Attachment configuration list

1) Standard accessories：
（1）Gas detector
（2）1 5V/2A charging head, 1 micro-USB data cable
（3）SKY6000 product manual
（4）1 certificate/warranty card
（5）Water trap filter 1
（6）1 set of suitcases

2) Optional accessories：
（1）A set of portable Bluetooth printers (including charging stand, rechargeable lithium battery)
（2）Set of high temperature smoke detectors
（3）A piece of data software CD
（4）Flexible bendable probe 1 set

## 4. Technical Parameters

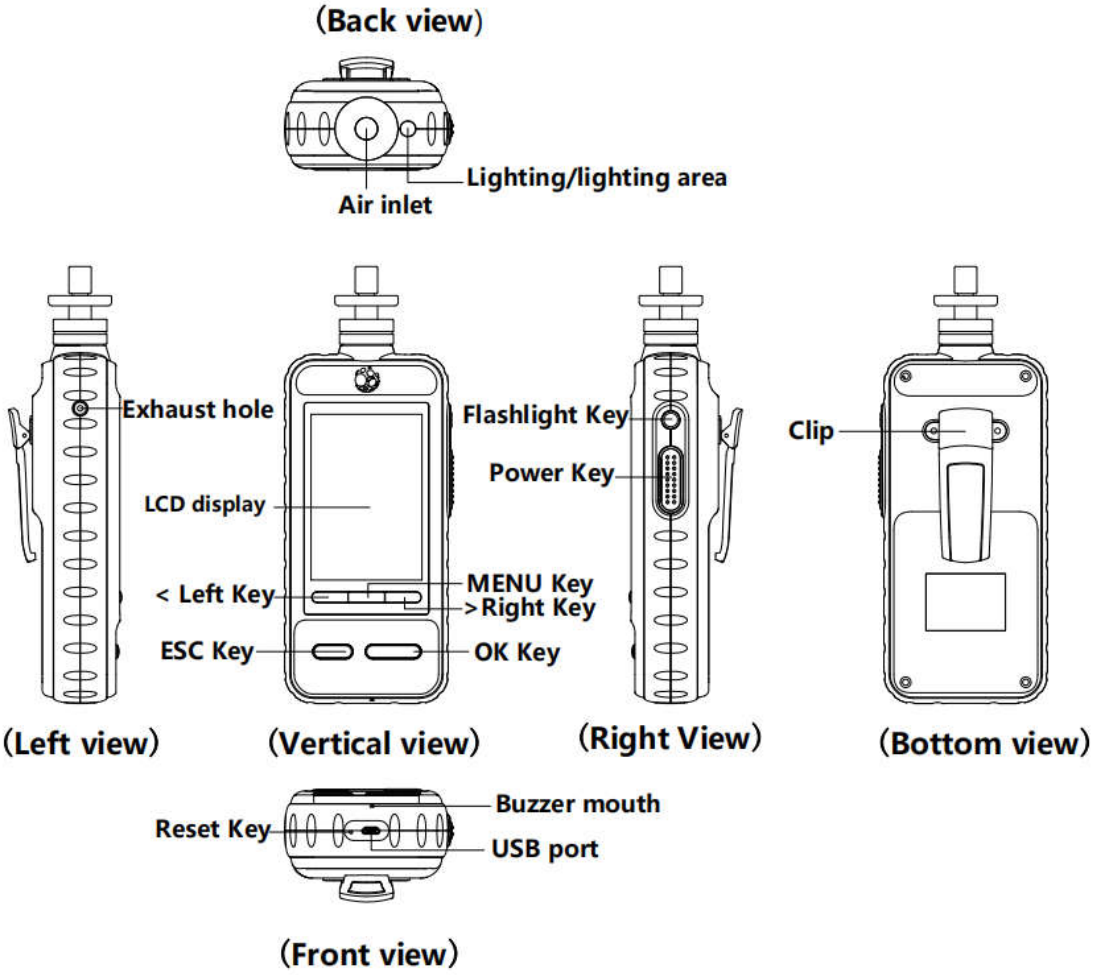
| | |
|---|---|
| Host size | 170*75*41mm（H x W x D）（No probe and water trap filter） |
| Host weight | About 400 grams |
| Sensor | Various principle sensors can be combined, up to 5 sensors (CO and H2S plus a combination of three sensors) |
| Pump flow | Pump flow is adjustable in ten steps, flow range: 0-500 mL/min |
| Display | 3.5 inch IPS color LCD display with resolution of 320*480 |
| Display content | Gas name or gas chemical formula, concentration data, unit of measurement, trend of gas curve, battery power, time, pump status, etc.<br>Optional: temperature, humidity, pressure, Bluetooth status, printer status, screen capture status, etc. |
| Alarm | Buzzer, searchlight and alarm status prompt on the display, low battery alarm |
| Data record | Automatic measurement data recording function, interval storage and alarm storage, can customize the recording time interval, standard storage of 100,000 history records or alarm records; optional independent 8G memory card, other capacity options. |
| Communication and | The TXT document for storing data can be quickly downloaded by |

| | |
|---|---|
| data download | connecting to the computer directly via USB; the TXT document can be converted into an Excel document by using the PC software. |
| Print function (optional) | Optional external Bluetooth printer |
| Print content (optional) | Real-time concentration data and historical data |
| Charger | Universal Micro-USB charging interface, 5V/2A standard charger |
| Battery | 3800mAh rechargeable lithium battery |
| Wireless network (optional) | LORA, BLUETOOTH |
| Network frequency (optional) | 398-525MHZ(LORA)、2.4GHZ BLUETOOTH |
| Wireless transmission distance (optional) | LORA (open space) up to 3500m, BLUETOOTH (Bluetooth) up to 10m |
| Language | Chinese and English bilingual switching |
| Environment humidity | 0 to 95% RH (no condensation) (moisture is too high, optional filter device) |
| Ambient temperature | -20°C~+50°C (Optional flue gas sampling probe, up to 1200°C flue gas concentration) |
| Environmental pressure | 96～106Kpa |
| Explosion-proof certification | II 2G Ex ia IIC T4 Ga IP66 |
| Product Standards | Q/WX005-2017 |
| Certificate | CPA metering type approval certificate CPA2018C256-44 Explosion-proof certificate CNEx18.1829<br>CE certification / EMC certification EN 50270-2015 ISO certification 0018Q312370R0S/4403 |

# 5. Product Description

1) Appearance description

The front of the instrument is the display area and the operation area, and the back is the back clip (carried). As shown below：




(1) Air inlet: measuring gas input port

(2) Lighting / lighting alarm area: lighting function / light alarm function

(3) Exhaust hole: measuring gas discharge port (can be connected to hose)

(4) Clip: can be attached to the belt or clothes

(5) LCD display: display gas concentration and various parameters

(6) Buzzer mouth: alarm sound outlet

(7) USB port: charge the instrument or connect to the computer to download data.

(8) Reset Key: Instrument reset (requires press and hold the power button to restart).

(9) MENU Key: enter the menu (in the detection interface); move the menu down one line (in the menu interface); select to modify the data position.

(10) ESC Key: cancel operation (set parameter); return to the previous menu or detection interface.

(11) OK Key: Confirm operation (setting parameters); enter the next level menu; print and screenshot (long press when detecting interface).

(13) Right (>) Key: Moves the cursor to the right; the value decreases.

(14) Power Key: long press to turn the instrument on/off; return directly to the detection interface.
(15) Flashlight Key: Turns the flashlight on/off.

**2) Key Description:**

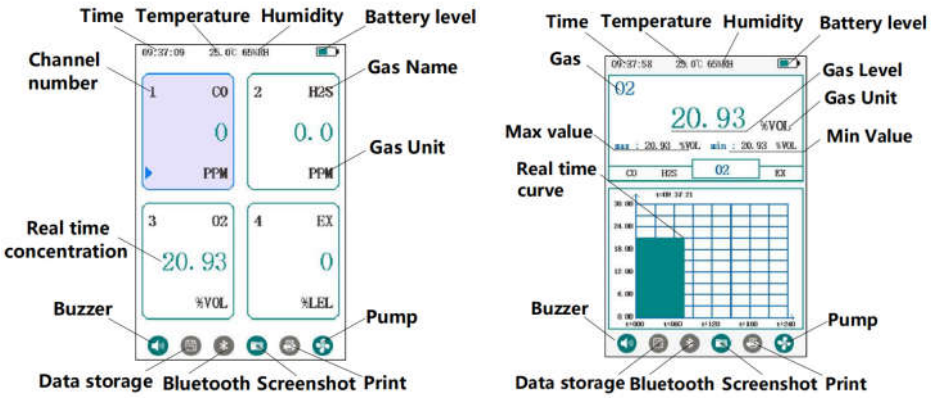
The instrument has a total of 7 keys, five of which are distributed on the front of the instrument, and the other two keys are distributed on the right side of the instrument, as shown in the figure above.:

<table>
<tr><th>Button status</th><th>MENU Key</th><th>ESC Key</th><th>OK Key</th><th>left（＜）Key</th><th>right（＞）Key</th><th>Power Key</th><th>Led Key</th></tr>
<tr><td>short press</td><td>Enter menu / Menu down②</td><td>Return / cancel</td><td>OK</td><td>Shift left/plus</td><td>Right shift/minus</td><td>Return detection interface</td><td>On/off lighting</td></tr>
<tr><td rowspan="2">Press①</td><td rowspan="2"></td><td>One-key switching unit③</td><td>print</td><td>On/off sound</td><td>On/off pump</td><td rowspan="2">On/off</td><td rowspan="2"></td></tr>
<tr><td colspan="2">Screenshot</td><td colspan="2">One key zero④</td></tr>
</table>

**Note:** 1. long key function is only when the instrument is in the detection interface.
2. Menu down is limited to the instrument in the menu interface, the menu moves down one line.
3. One-key switching unit function is limited to switching between PPM and mg/m3. The switching of other units needs to enter the “Menu Unit Setting” option setting.
4. One-key zero-return function means that all gas channels of the instrument are calibrated according to air content (ie, O2 is 20.93%VOL, N2 is 78.1%VOL, CO2 is 450ppm or 0.04%VOL, others are 0), so the instrument needs to be turned on in advance. Place it in pure air for 3-5 minutes to perform this operation, otherwise the instrument reading may be inaccurate.

# 6. Display

The following information is displayed on the display (left is the data display mode, right is the curve display mode)：




Time: refers to the current time of the instrument
Temperature: refers to the instrument ambient temperature (optional)
Humidity: refers to the instrument environment humidity (optional)
Battery level: refers to the remaining battery power
Real-time concentration: refers to the gas concentration measured by the instrument
Gas name: refers to the type of gas measured by the instrument
Gas unit: Refers to the current unit of measurement of the gas (Figure PPM, %VOL, %LEL, etc. are all gas units)
Channel number: refers to the sorting number of different gases
Real-time curve: refers to the real-time concentration curve of the current gas of the instrument
Maximum value: refers to the maximum concentration value of the instrument since the current gas is turned on.
Maximum value: refers to the minimum concentration value of the instrument since the current gas is turned on.
Buzzer: Indicates whether the buzzer is turned on or off (Green is on, gray is off)
Data storage: Whether the data storage is turned on or off Green is on, gray is off)
Bluetooth: Whether the Bluetooth function is turned on or off (Green is on, gray is off or not selected)
Screenshot: Whether the screen capture function is turned on or off (Green is on, gray is off)
Print: Whether the print function is turned on or off (Green is on, gray is off or not selected)
Pump: refers to whether the air pump is turned on or off (Green is on, gray is off)

# 7. Instructions

## 1) Turn on the Instrument

In the off state, press and hold the “Power” key on the right side of the instrument to turn on the instrument. When the display is lit, release the “Power” key.



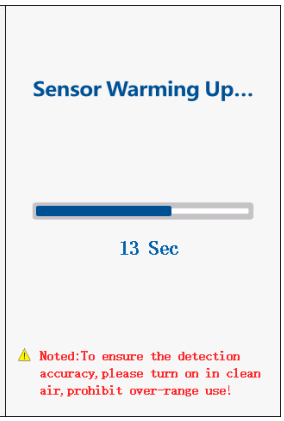
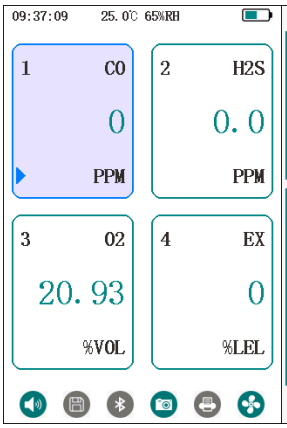



Figure1 Figure2 Figure3

When the instrument is turned on, it initially displays “Power On” and Yuante's logo: SAFEGAS (as shown in Figure 1, Figure 2), and then enter the sensor warming up waiting interface. Because there are differences in the warming up time of different sensors, when the sensors are configured differently, the instrument's warming up time is also different, please be patient.

After the power on is completed, the instrument enters the normal detection state. The instrument defaults to the data display mode (as shown in Figure 4). At this time, you can use the “<” and “>” keys to select a channel, and then press the “OK” key to enter the curve display mode (As shown in Figure 5).



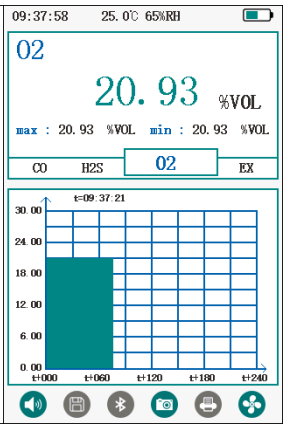




Figure 4 Figure 5

## 2) Turn off the instrument

Press the "power" key on the right side of the instrument for a long time in the normal measurement state or in the case of electricity. The display screen displays the "Power Off" interface (as shown in Figure 6). Press for 3 seconds for a long time, and the display screen closes. At this time, the instrument enters the dormant shutdown state; if it does not press for 3 seconds, the instrument returns to the detection interface.

Note: The instrument can only be shut down under the detection interface.

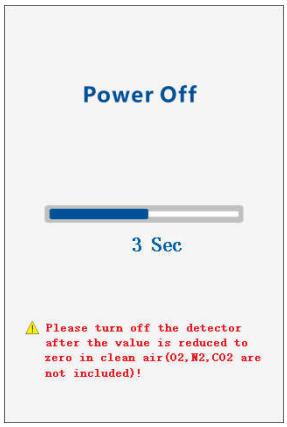



Figure 6

### 3) Battery Charging

The battery should be fully charged before use. When the power is insufficient, please charge the battery according to the following steps:

(1) Turn off the instrument.

(2) Place the instrument on a flat and tidy desktop or platform.

(3) Micro-USB connector insertion instrument.

(4) Connect the charging adapter to the power outlet until it is fixed, and the adapter lights up red. The instrument began to charge. The adapter lights up the red light to indicate that the instrument is charging; the green light to indicate that the instrument is fully charged; the normal charging time is about 4-6 hours.

**Power-on charging hazards:**

(1) Voltage instability during charging may cause burnout of sensors or circuit boards.

(2) When the sensor is charged while working, the temperature inside the instrument will rise, in that case may lead to the decrease of the service life of the sensor.

(3) In dangerous areas, the air composition is unknown, and the weak spark generated by plugging and unplugging the charging adapter may cause explosion.

Note: For safety, please shut down and charge in the safe area.

### 4) Gas Detection

When the instrument is started, the detector enters the gas detection interface. There are two different display modes of the instrument. They are data display mode and curve display mode. The display mode will be explained in below details:

After booting, the instrument automatically displays as data display mode. Pressing "OK" key in data mode can switch to curve display mode. Pressing "ESC" key in curve mode can return to data mode.

Note: If it is a single gas detector, only the curve display mode.

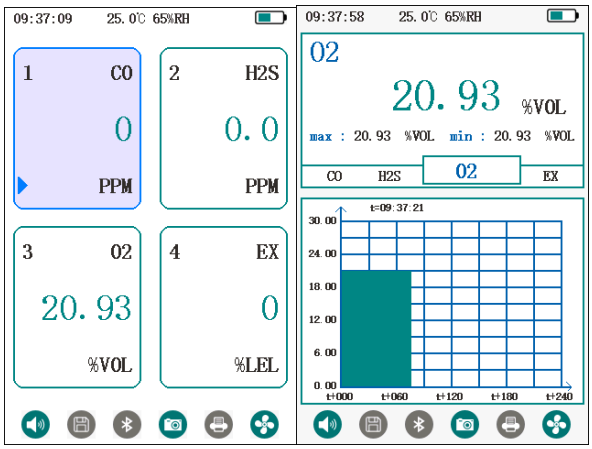



Figure 7




Figure 8

In the detection interface, the top from left to right is the current instrument time, temperature, humidity and battery power respectively; the bottom from left to right is the buzzer, data storage, Bluetooth function, screenshot, printing and the status icons of the pump, the icon is blue to indicate valid or open, and the icon is gray to indicate invalid or closed.

In the data display mode (Figure 7), the instrument will divide the display area into appropriate and independent small areas according to the actual number of effective gas channels. In each individual small area, the upper left is the serial number of the gas channel, the upper right is the gas type (such as carbon monoxide), the lower right is the gas concentration unit (such as PPM), and the middle large font data is the real-time concentration data of the gas channel.

In the curve display mode (Figure 8), the lower coordinate axis area is the real-time concentration curve of the selected gas. The X axis represents the time, and each cell represents 30 seconds. The Y axis represents the concentration, with a total of 10 cells, and each cell represents 10% FS (i.e. 1/10 of the range). The upper part of the curve shows the concentration parameters of the gas channel, the upper left is the gas type (such as oxygen), the middle data is the real-time concentration data of the gas channel, the lower right is the gas concentration unit (such as% VOL), and the lower part of the concentration data is the maximum and minimum of the gas channel since the start of the instrument.

### 5) Alarm status

When the instrument detects any gas concentration exceeding or below the set alarm value, the instrument will start alarm, buzzer continuously "beep-beep" sound, searchlight LED flashes, frequency is 1HZ; at the same time, the color of concentration data of alarm gas channel will change in the display screen, yellow means that the channel is low alarm (Figure 9), red means that the channel is high alarm (Figure 10)

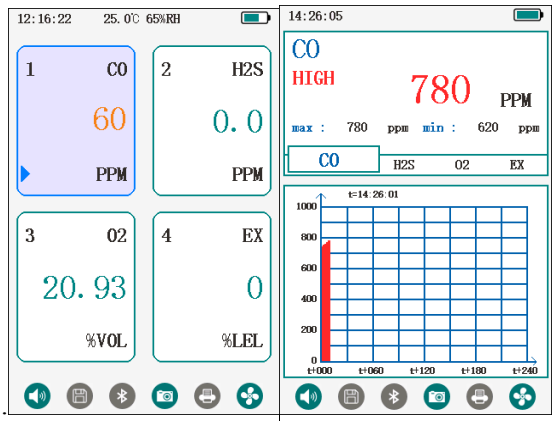



Figure 9




Figure 10

## 6) Low Battery

When the power is on, the instrument detects that the battery power is less than 10% (the battery symbol turns red) and triggers a low power alarm. The instrument beeps every five seconds and flashes the LED lamp in the searchlight area to remind the operator that the battery power is insufficient and needs to be recharged in time. When the instrument detects the battery to reach the protection voltage, it will directly force the automatic shutdown.

When the instrument shuts down automatically due to insufficient power, the display screen will display "low battery power, instrument shut down" for 1 second (Figure 12), and then the instrument will enter a dormant state.

After triggering the low power alarm, the user should shut down the instrument as soon as possible and charge it. The charging time is about 4-6 hours.

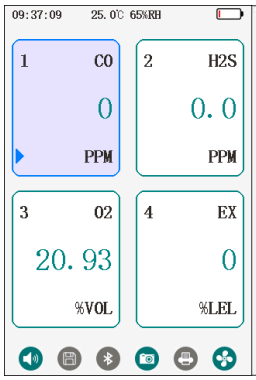



Figure 11

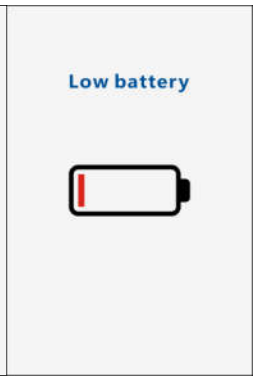



Figure 12

## 7) Menu Operation

In the gas detection interface (Figure 13), press the "MENU" key, and the instrument will immediately enter the main menu interface (Figure 14); in the main menu interface, press the "ESC" key to return to the gas detection interface.

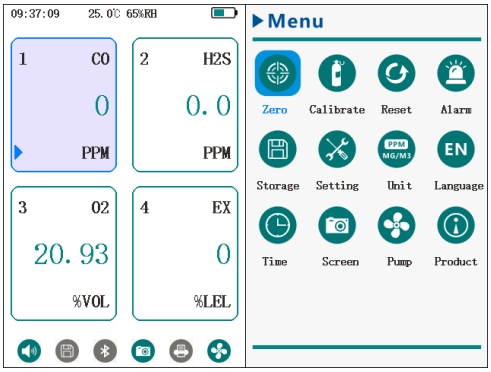



Figure 13




Figure 14

## 7.1) Zero Calibration

In the main menu interface, press the “<”and “>” two direction keys to move the cursor and select the "Zero Calibration" option (Figure 15). Then press the "OK" key to enter the "Zero Calibration" sub-menu (Figure 16). In the sub-menu interface, press the "ESC" key to return to the main menu interface.

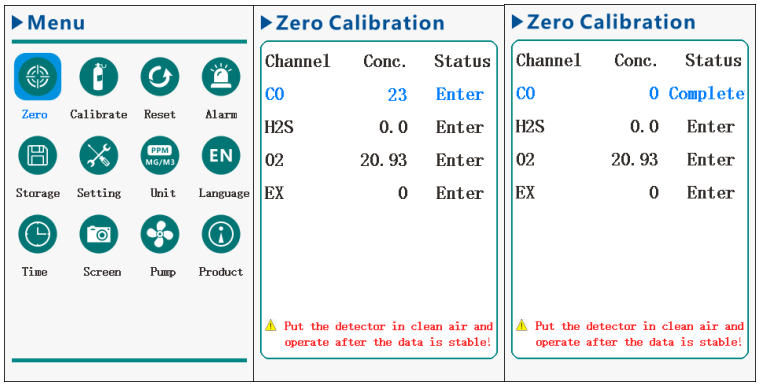



Figure 15




Figure 16




Figure 17

After entering the "Zero Calibration" menu (Figure 16), press the "<" and ">" keys to select the gas channel, after the concentration data is stabilized, press the "OK" key to complete the zero calibration (Figure 17).

In the "Zero Calibration" menu, you can press the "ESC" key to return to the menu at any time, or press the "Power" key to return to the detection interface.

**Note:**

1. For the gases in the air (such as carbon dioxide, oxygen and nitrogen), the instrument is calibrated at 450 PPM for carbon dioxide, 20.93% VOL for oxygen and 78.1% VOL for nitrogen.

2. Before performing this operation function, please turn on the instrument and put it in pure air for 3-5 minutes until the value displayed by the instrument is stable, otherwise the display data will be inaccurate.

## 7.2) Concentration Calibration

In the main menu interface, select the "calibration" option by moving the cursor with the two directional keys of “<”and“>” (Figure 18). Then press the "OK" key to enter the "conc. calibration" sub-menu (Figure 19). In the sub-menu interface, press the "ESC" key to return to the main menu interface.

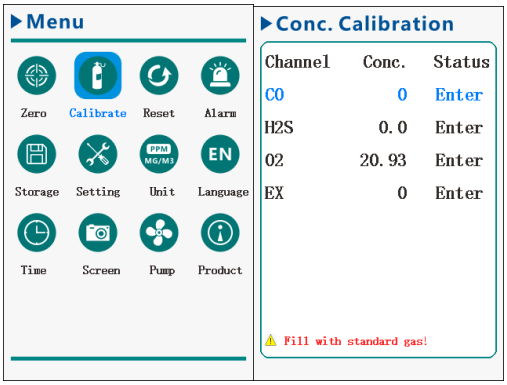



Figure 18 Figure 19

After entering the menu of "Calibration", select the gas channel by using the “<” and “>” keys and press the "OK" key to enter the sub-interface of "Calibration point" (Figure 21).

There are four choices in the menu of "Calibration point". They are "zero point", "first point", "second point" and "third point".

The concentration calibration process is as follows (the following example assumes that the standard gas is CO: 500ppm

(1) After the instrument is turned on and enters the detection interface, the standard gas with known concentration is connected to the intake of the instrument through the PTFE pipe (Figure 20).

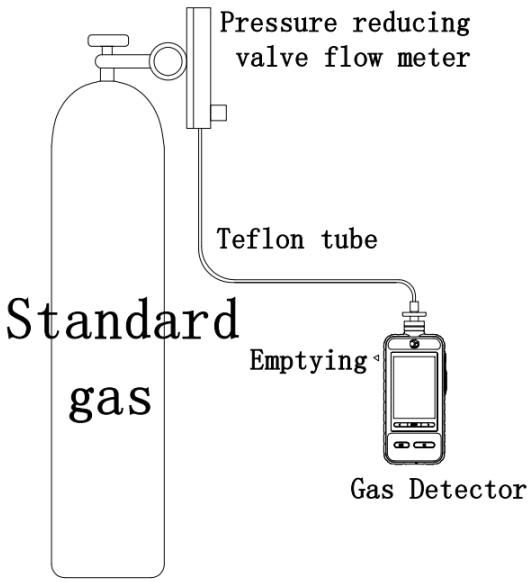



Figure 20

(2) Enter the "conc. calibration" of the instrument (Figure 19), select the gas (CO) to be calibrated by using the “<” and “>” keys, then press the "OK" key, and the instrument enters the " calibration point" interface (Figure 21);

(3) According to the actual standard gas concentration value (550 PPM), the nearest calibration point (second point) is selected by using the “<” and “>” keys (Figure 22).
(4) Press the "OK" key and enter the status to be calibrated. The value (set value) on the right side of the calibration point is selected (Figure 23)
(5) Modify the right-side value of the calibration point (set value) to the same standard gas as the one used (Figure 24) by using the“<”,“>”and `MENU' keys.
(6) Open the standard gas valve and pass the standard gas to the instrument at 400 ml/min (milliliter/minute) flow rate. After the real-time concentration displayed by the instrument ("Calibration point" upper right interface) is basically stable (Figure 25) (about 1-3 minutes, the stabilization time of different sensors is different), press the "OK" key, When the instrument beeps, the indicator light is on, and the calibration status is displayed as " success", that is, the calibration operation is completed (Figure 26).

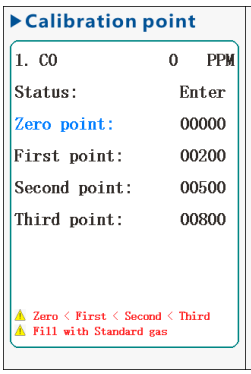



Figure 21

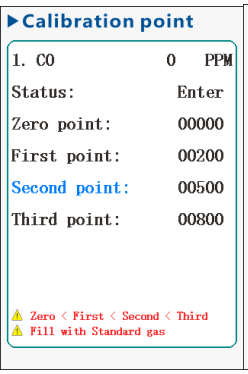



Figure 22

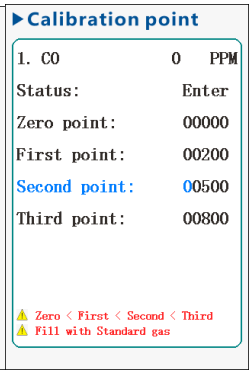



Figure 23

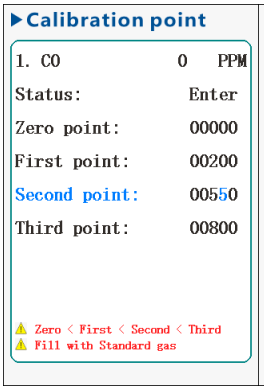



Figure 24

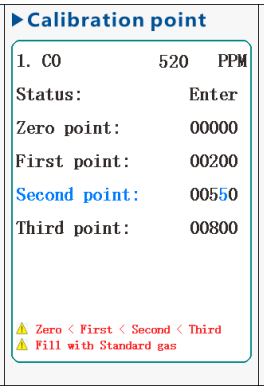



Figure 25

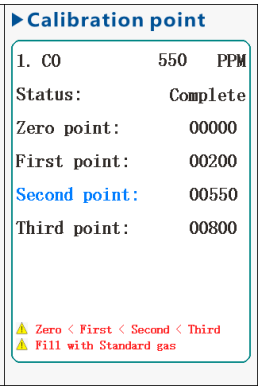



Figure 26

In the "Calibration point" interface, you can press the "ESC" key to return to the "channel selection" interface of the "conc. calibration" submenu at any time, or press the "power" key to return to the detection interface.

Note: 1.When performing this operation function, the pipeline of standard gas must be connected well, and the numerical value displayed by the instrument should be stable.
After setting, it can be calibrated, otherwise the display data will be inaccurate.
2. Setting value: please input the actual concentration of the current standard gas.
3. The principle of "zero point “<” first point “<” second point“<” third point" should be followed when selecting calibration points, otherwise the instrument calibration will fail.

### 7.3) Reset setting

In the main menu interface, press the “<” and“>” two directional keys to move the cursor and select the "Reset" option (Figure 27), then press the "OK" key to enter the "Reset setting" sub-menu (Figure 28); in the sub-menu interface, press the "ESC" key to return to the main menu interface.

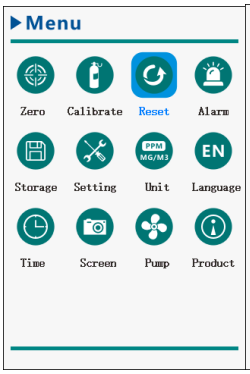



Figure 27

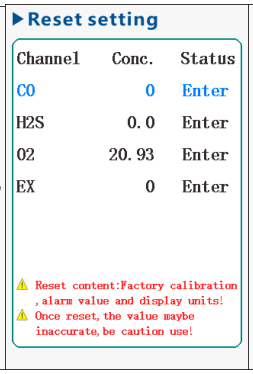



Figure 28

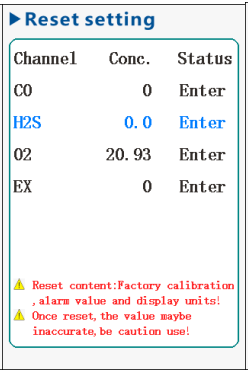



Figure 29

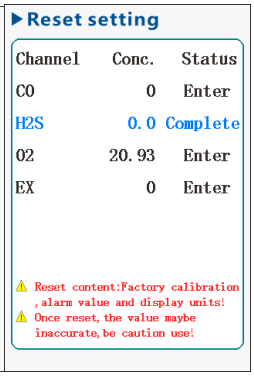



Figure 30

After entering the second menu of "Reset setting", select the gas channel by using the “<” and “>” keys (Figure 29). Press the "OK" key to complete the reset operation of the gas channel (Figure 30). In the "Reset setting" submenu, you can press the "ESC" key to return to the menu at any time, or press the "power" key to return to the detection interface.

Note: 1. Reset content includes factory calibration, alarm value and display units.

If the factory time is longer (more than 3 months), the concentration may not be accurate after the factory is restored, please operate cautiously!

### 7.4 Alarm Setting

In the main menu interface, press two directional keys to move the cursor and select the "Alarm" option (Figure 31), then press the "OK" key to enter the "Alarm Setting" sub-menu (Figure 32); in the sub-menu interface, press the "ESC" key to return to the main menu interface.

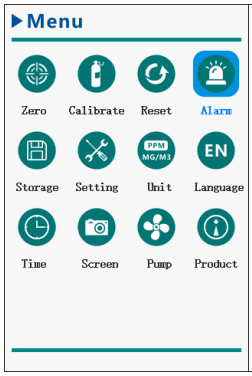



Figure 31

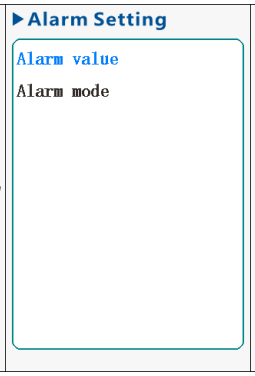



Figure 32

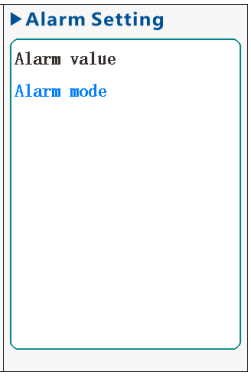



Figure 33

In the "alarm setting" submenu, select the "alarm value" option by press the“<” and“>” keys (Figure 32), press the "OK" key to enter the "alarm value" interface (Figure 34); press the < and > keys to select the channel to be modified (Figure 35); press the "OK" key, and the data on the right side is selected (Figure 36); The cursor selects the pre-modified number (Figure 37), and the selected

number can be modified by using the“<“and “>” keys (Figure 38); the alarm value can be modified by pressing the “OK” ( Figure 39).

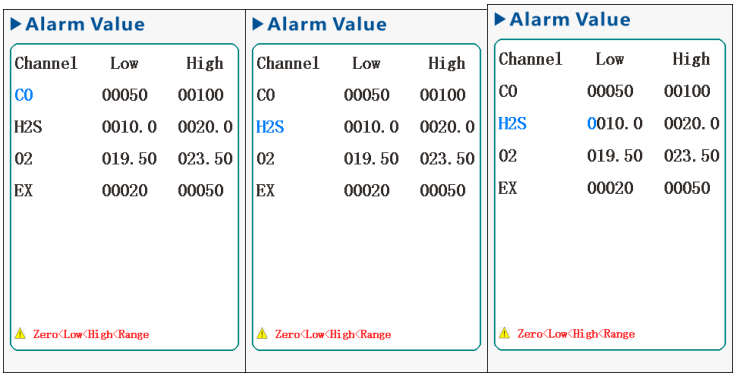



Figure 34 Figure 35 Figure 36

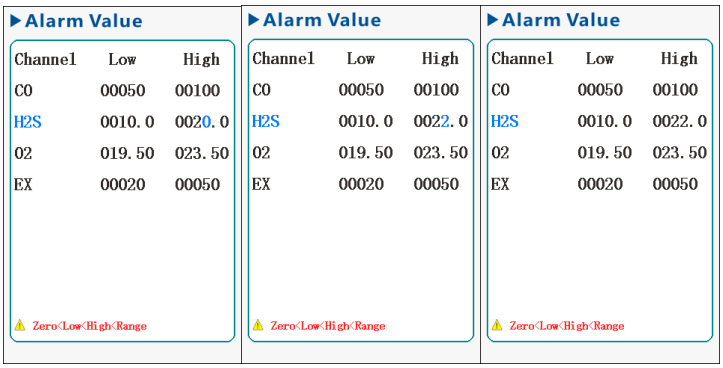



Figure 37 Figure 38 Figure 39

In the "alarm setting" submenu, select the "alarm mode" option by using the “<” and“>” keys (Figure 33). Press the "OK" key to enter the "alarm mode" interface (Figure 40). In the "alarm mode" menu, select the alarm mode by using the“<” and “>” keys (Figure 41). Press the "OK" key to open/close this alarm (Figure 42).

Note: Alarm mode can be chosen by users according to their needs.

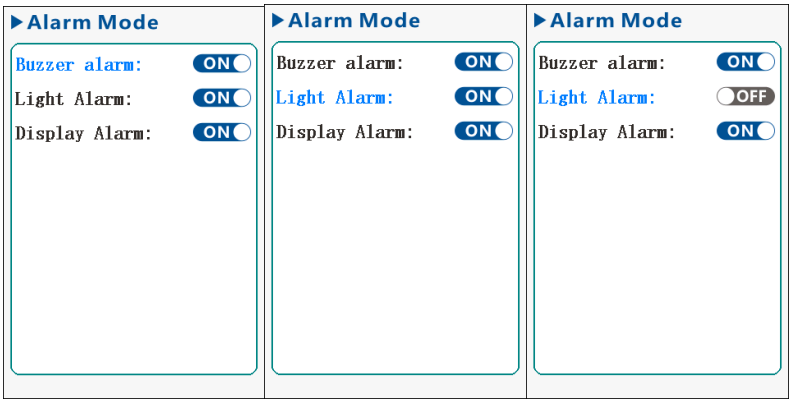



Figure 40 Figure 41 Figure 42

The default mode of factory alarm is: buzzer alarm, light alarm and display alarm. The definition of alarm mode is as follows:

| Alarm mode | Function introduction |
|---|---|
| Sound alarm, | buzzer alarm |
| Lighting alarm | searchlight flashing alarm |

| | |
|---|---|
| Display alarm | detect interface gas reading change color (High alarm: red, low alarm: yellow) |

## 7.5) Data Storage

In the main menu interface, press the “<” and “>” two directional keys to move the cursor and select the " Storage" option (Figure 43), then press the "OK" key to enter the "Data Storage" sub-menu (Figure 44); in the sub-menu interface, press the "ESC" key to return to the main menu interface.

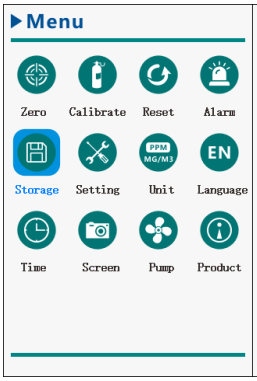



图 43

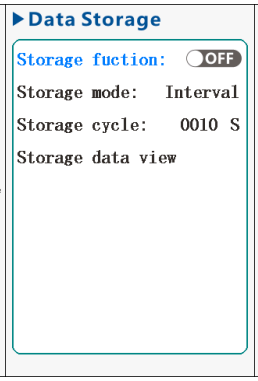



图 44

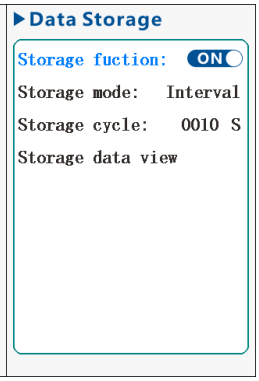



图 45

There are four options in the” Storage” menu (Figure 44). They are "Storage Function", "Storage Mode", "Storage cycle" and "Storage Data View".

Select the "Storage Function" option by moving the cursor pressing the “<”and “>” two directional keys and press the "OK" key to turn on/off the instrument storage function (Figure 45).

Use the “<” and“>” two direction keys to move the cursor and select the "Storage mode" option. Press the "OK" key and the right content is selected. At this time, pressing the“<“and“>” two direction keys can modify the storage mode of the instrument, and then press the "OK" key to complete the setting. The instrument can choose two ways of interval storage or alarm storage.

Select the "storage cycle" option by moving the cursor with the two directional keys (“<” and“>”). Press the "MENU" key to move the cursor to select the pre-modified number. Press the keys (< and >) to modify the selected number. After modifying the relevant values, press the "OK" key again to complete the settings. The optional cycle time of the instrument is 1-9999 seconds.

Select the "Storage Data View" option by moving the cursor using the < and > two directional keys (Figure 46). Press the "OK" key to enter the storage data view interface (Figure 47, If the printing function is selected, see figure 48; if there is no record storage, see figure 49). This menu contains six options (one of them), namely "Channel", " Page up", " Page down ", "Page number", "Delete record" and "print record" (optional).

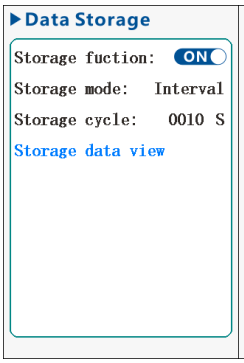



Figure 46

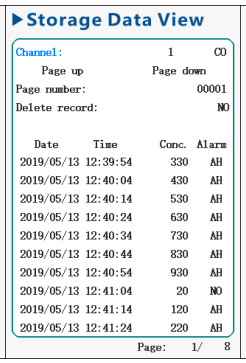



Figure 47

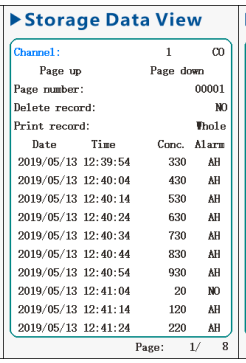



Figure 48

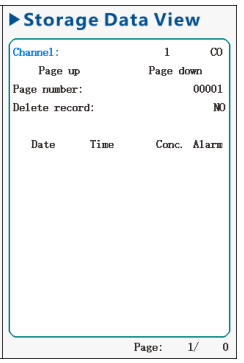



Figure 49

In the "Storage Data View" interface, the cursor is moved by the two direction keys of "<" and">" to select various options. The "Channel" can select the gas channel to be viewed; the "Page up" and "Page down" can view the data records of the previous page or the next page; the "Page Number" can choose to view the recorded data of the specified page; the "Delete Record" is deleted. In addition to all the recorded data of the instrument, the record is blank after deletion (Figure 49); "Print Record" (Optional) has four options: "Complete", " Header ", "This Page" and "Blank"; "Header" is the header information for printing; "This Page" prints 10 recorded data on this page; "Blank" prints a blank to facilitate paper production; and "Complete" print the first three items completely.

In the "Data Storage" menu, you can press the "ESC" key to return to the previous menu, or press the "Power" key to return to the detection interface.

Warm Tips: 1.The instrument only stores data records at the detection interface!

2. The deleted records will not be restored. It is suggested to back up to the computer before deleting them.

3. Before printing records, the Bluetooth module and the printing function should be opened in the "Instrument Setting" menu, and the Bluetooth printer should be placed next to the instrument after it is turned on.

### 7.6) Instrument Setting

In the main menu interface, select the "Setting" option by moving the cursor with the two directional keys of "<"and">" (Figure 50), and then press the "OK" key to enter the "Instrument Setting" sub-menu (Figure 51, Optional Printing Function Figure 52); in the sub-menu interface, press the "ESC" key to return to the main menu interface.

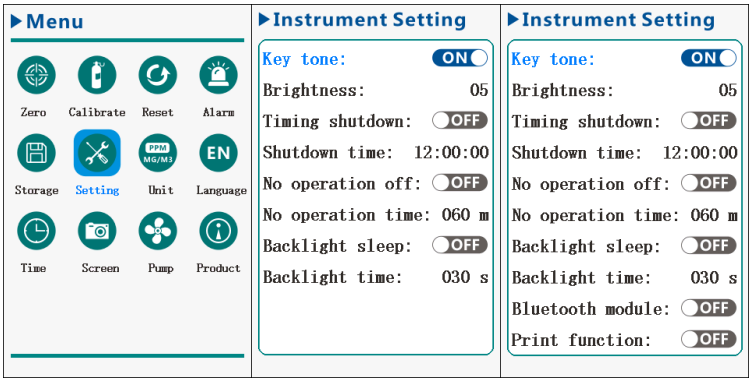



Figure 50 Figure 51 Figure 52

There are 10 options in the Instrument Settings menu (2 of them are optional). They are "Key tone", "Brightness", "Timing shutdown", "Shutdown time", "No operation off", "no operation time", "backlight sleep", "backlight time" and two options "Bluetooth module" and "Printing function". Each option can be selected by using the two directional keys"<"and">"

Press the < and > direction keys to move the cursor and select the "key tone" option. Press the "OK" key to turn on/off the instrument key tone.

Press the < and > direction keys to move the cursor and select the "Brightness" option. Press the "OK" key to select the data on the right side. Then, use the "<" and ">" keys to modify the value to adjust the brightness of the instrument screen. Press the "OK" key to complete the setting.

Press the < and > direction keys to move the cursor and select the "Timing Shutdown" option. Press the "OK" key to turn on/off the settings of the instrument.

Press the < and > direction keys to move the cursor and select the "Shutdown time" option. Press the "OK" key to select the right time. Use the "MENU" key to move the cursor to select the Pre-modification number. Press the "OK" key to complete the setup. Shutdown time is displayed in 24-hour format. This option is only valid when the "Timing Shutdown" option is turned on.

Press the < and > direction keys to move the cursor and select the "No operation off" option. Press the "OK" key to turn on/off the device's no-operation off settings. When this function is turned on, the instrument will shut down automatically when the time of the instrument reaches the set time.

Press the < and > direction keys to move the cursor and select the "no operation time" option. Press the right value of the "OK" key to be selected. Use the “<” and“>” keys to modify the setting time. Press the "OK" key to complete the setting. The content of this option is only valid when the "no operation off" option is turned on; the setting time is: 5 points, 10 points, 15 points, 20 points, 30 points, 45 points, 60 points, 90 points, 120 points.

Press the "<" and ">" to move the cursor and select the "Backlight sleep" option.

Press "OK" to turn on/off.

When this function is turned on, the instrument will automatically darken without alarm or operation screen within the set time. When there is an alarm or operation, the display screen automatically returns to normal.

Press the < and > keys to move the cursor and select the "backlight time" option. Press the "OK" to select the value on the right side, and press the "<" and ">" to modify the setting time. Press the "OK" key to complete the setting. This option is only valid when the "backlight sleep" option is turned on; Adjustable time: 5 seconds, 10 seconds, 15 seconds, 20 seconds, 30 seconds, 45 seconds, 60 seconds, 90 seconds, 120 seconds.

Press the "<" and ">" to move the cursor to select the "Bluetooth module" option (optional function). Press "OK" to turn on/off. When this function is turned on, the instrument will automatically connect to the Bluetooth printer (the power of Bluetooth printer should be turned on in advance).

Press the "<" and ">" to move the cursor and select the "Printing Function" option (optional function). Press "OK" to turn on/off it. "Bluetooth module" option should be turned on in advance before this function is enabled. After this function is enabled, press "OK" for 3 seconds on the detection interface to print the real-time concentration, or print the recorded data in the "storage data view" interface.

In the menu of "Instrument Settings", press "ESC" to return to the previous menu, or press "power" to return to the detection interface.

**Note:**

1. Bluetooth printer power shall be turned on in advance when "Bluetooth module" is turned on.
2. Bluetooth module consumes a lot of battery power, so it is best to turn off the "Bluetooth module" after printing.
3. The "printing function" can only be turned on after the "Bluetooth module" is turned on.
4. "Print function" and "Screenshot function" cannot be enabled at the same time.

## 7.7) Unit Setting

In the main menu interface, press "<" and ">" to move the cursor and select "Unit Setting" (as shown in figure 53);
Press "OK" to enter the sub-menu of "Unit Setting" (as shown in figure 54);
Press "ESC" to return to the main menu interface

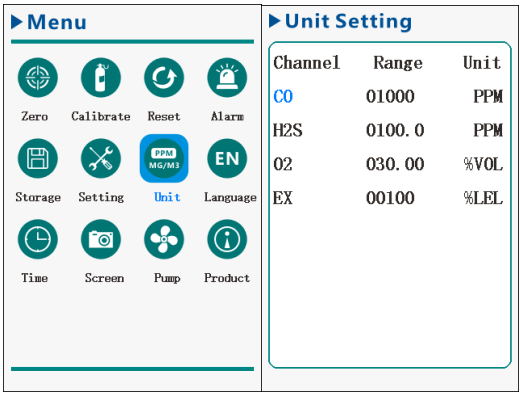



Figure 53 Figure 54

After entering the "Unit Setting" menu, press the "<" and ">" keys to select the gas channel (as shown in figure 55);
Press the "OK" to select the right unit (as shown in figure 56),
Press the "<" and ">" keys to select other gas units (as shown in figure 57), and then press the "OK" to complete the setting (as shown in figure 58).

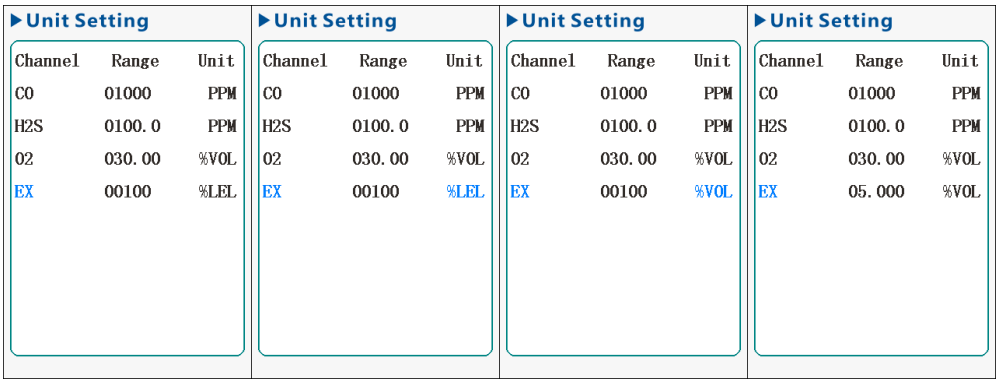



Figure 55 Figure 56 Figure 57 Figure 58

The instrument supports freely switching of seven display units such as PPM, PPB, %VOL, %LEL, ug/m3, mg/m3, g/m3, etc., and the concentration value is automatically converted by the system.
In the "Unit Setting" menu, press "ESC" to return to the previous menu or press "power" to return to the detection interface.

Note: After the new unit setting and conversion, if the range value of the channel exceeds the controllable range (more than 50,000 or less than 1), the new unit setup will be fail and the channel will revert to the original unit.

## 7.8) Language Setting

In the main menu interface, press "<" and ">" to move the cursor and select "Language Setting" (as shown in figure 59). Press "OK" to enter the "Language Setting" sub-menu (as shown in figure 60); Press the "ESC" to return to the main menu interface.

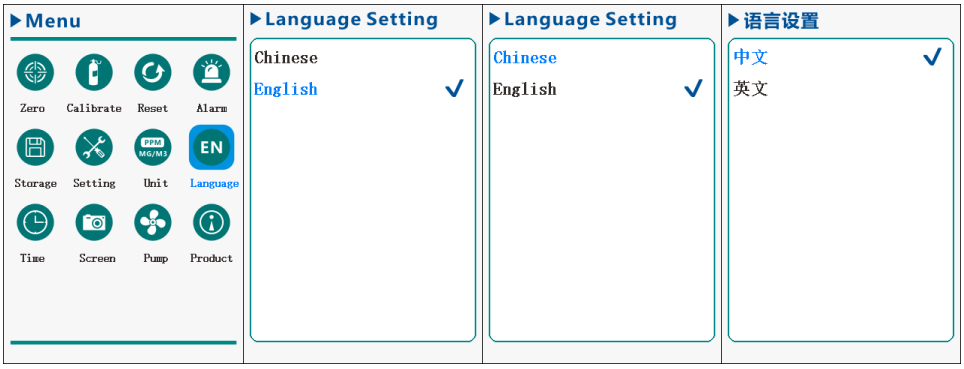



Figure 59 Figure 60 Figure 61 Figure 62

There are two options of "Language Setting", namely "Chinese" and "English". The "<" and ">" keys can be used to switch and select the two options (as shown in figure 61). After selecting the two options, press "OK" to complete the setting (as shown in figure 62).

In the menu of "Language Setting", press "ESC" to return to the previous menu at any time, or press "power" to return to the detection interface.

## 7.9) Time Setting

In the main menu interface, press "<" and ">" to move the cursor and select "Time Setting" (as shown in figure 63).

Press "OK" to enter the "Time Setting" (as shown in figure 64);

Press the "ESC" to return to the main menu interface.

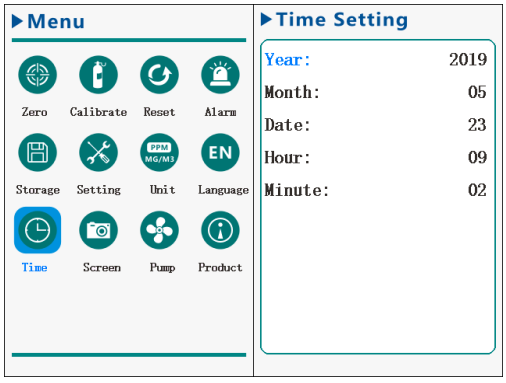



Figure 63 Figure 64

There are five options in the "Time Setting" menu, namely "year", "month", "day", "hour" and "minute".

Press the keys “<” and “>” to select one of the options (as shown in figure 65).

Press "OK" to select the value on the right (as shown in figure 66);

Press the keys "<" and ">" to modify the pre-selected values (as shown in figure 67). After modifying the relevant values, press "OK" to complete the setting (as shown in figure 68).

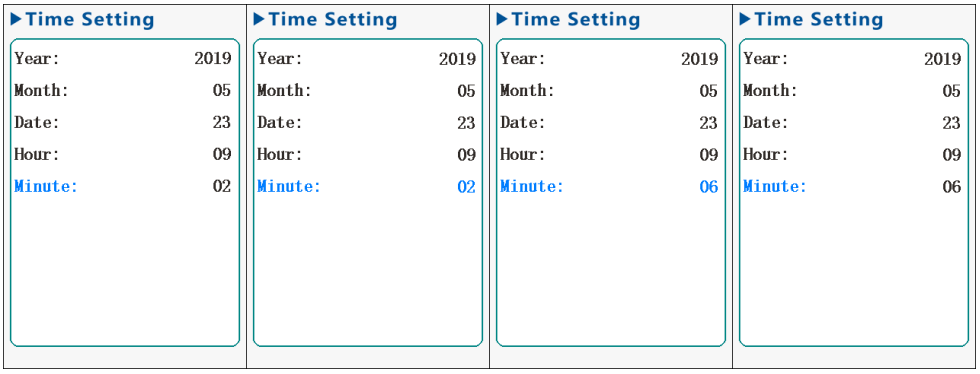



Figure 65 Figure 66 Figure 67 Figure 68

In the "Time setting" menu, press "ESC" to return to the previous menu at any time, or press "power" to return to the detection interface.

## 7.10) Screenshot Setting

In the main menu interface, press "<" and ">" to move the cursor and select " Screenshot Settings" (as shown in figure 69), and then press "OK" to enter the sub-menu of " Screenshot Settings" (as shown in figure 70, optional printing function, as shown in figure 71);Press the "ESC" to return to the main menu interface.

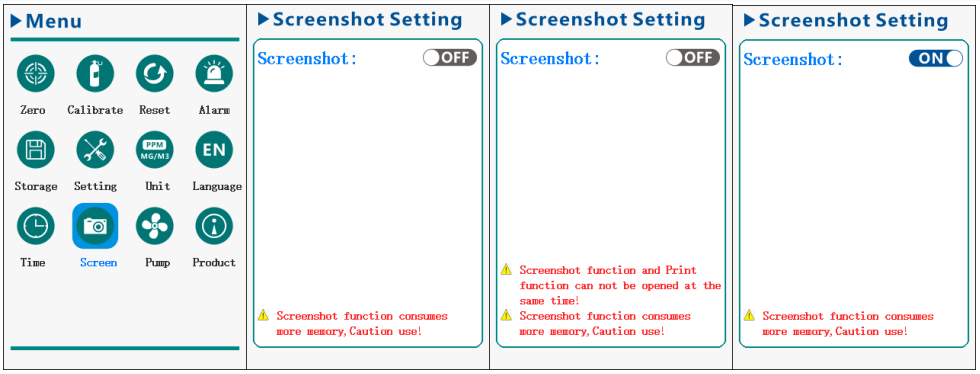



Figure 69 Figure 70 Figure 71 Figure 72

There is only one option in the "Screenshot Settings" menu.

Press "OK" to turn on/off the Screenshot function (as shown in figure 72).

When the Screenshot function is enabled and under the detection interface, long press "OK" + "ESC" key for 3 seconds, and the sound of the instrument and the searchlight flashing at 1Hz will be heard, and the display contents of the instrument will be saved in the form of pictures in the instrument.

To view the screenshot, you can use the instrument to connect to your computer, "open the USB disk→SCREEN_COPY Folder ", then you can view, copy, delete operations.

In the "Screenshot Settings" menu, you can press "ESC" to return to the previous menu at any time, or press "power" to return to the detection interface.

Noted:

1. The "Screenshot" function and "print" function cannot be opened at the same time.
2. The Screenshot function is only valid in the detection interface.
3. Using screenshot function save pictures needs more memory, careful use!

## 7.11) Pump Setting

In the main menu interface, press "<" and ">" to move the cursor and select "Pump Setting" (as shown in figure 73).

Press "OK" to enter the sub-menu of "Pump Setting" (as shown in figure 74);

Press the "ESC" to return to the main menu interface

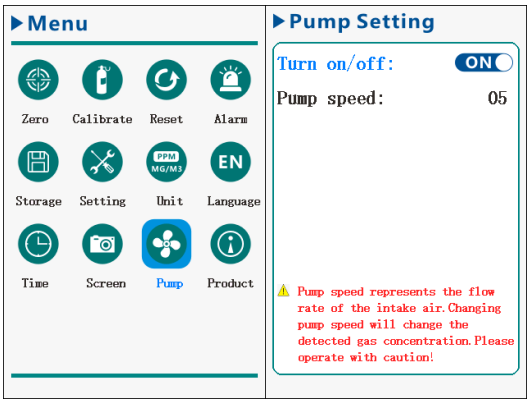



Figure 73 Figure 74

There are two options in the "Pump Setting" menu: "Turn on/off" and "Pump speed", press the "<" and ">" keys to select each option in turn.

Press the "<" and ">" keys to select the " Turn on/off " option, press "OK" to start/close the pump.

Press "<" and ">" keys to select the "Pump speed" option, press “OK” to select the value on the right of the key.

Press "<" and ">" keys to modify the value, and to control the pump flow, press "OK" to complete the settings.

In the menu of "pump setting", press "ESC" to return to the previous menu at any time, or press "power" to return to the detection interface.

Warning:

1. Turn off the pump will stop the detection, please operate carefully!
2. The pump speed represents the intake flow, change the pump speed will change the detection concentration, please be careful!

## 7.12) Product Information

In the main menu interface, use "<" and ">" to move the cursor and select "product info" (as shown in figure 75).

Press "OK" to enter the sub-menu of "product info" (as shown in figure 76, when VOC gas is present, as shown in figure 77);

Press the "ESC" to return to the main menu interface

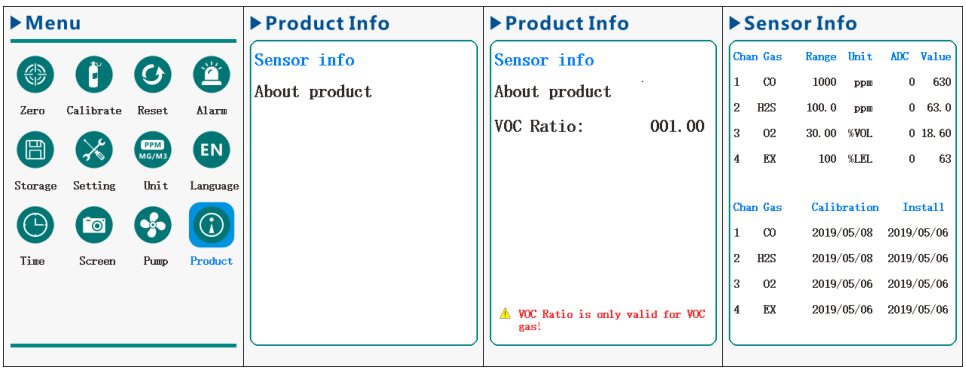



Figure 75 Figure 76 Figure 77 Figure 78

There are three options in the menu of "product info" (Only 2 options when there is no VOC), namely "sensor info", "about the device" and "VOC Ratio".
Press the keys "<" and ">" keys to select the corresponding options.
Press the keys "<" and ">" to select "sensor info" (as shown in Figure 76).
Press "OK" to enter the "sensor info" interface (as shown in Figure 78);
The interface displays the measuring range, unit, ADC, value of each gas channel, the latest calibration date of the sensor, and the date of sensor installation.
This interface content is only for users to view and reference
Press the keys "<" and ">" to select "about product" (as shown in Figure 79).
Press "OK" to enter the "about product" interface (as shown in Figure 80);
This interface displays information about the instrument: program version, date, battery voltage, and USB voltage. There is our company's official website or code at the bottom of the interface. If you need more information, please scan it.
This interface content is only for users to view and reference

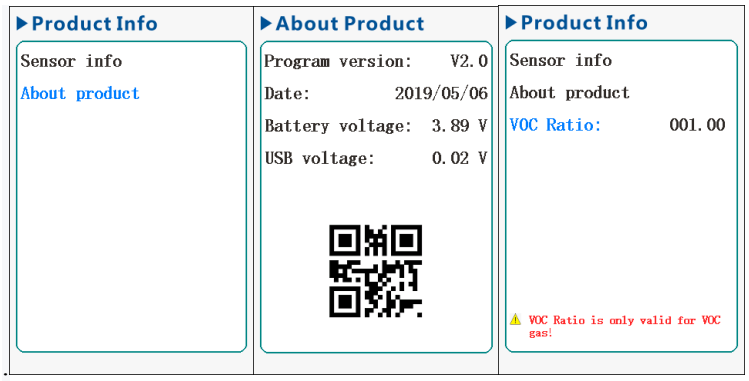



Figure 79 Figure 80 Figure 81

Press "<" and ">" keys to select "VOC Ratio" (only when there has VOC gas, as shown in figure 81), press "OK" to select the value on the right (as shown in figure 82), use "MENU" to move the cursor to select the pre-modified number (as shown in figure 83),
Press the keys "<" and ">" to modify the selected number (as shown in figure 84), and then press "OK" to complete the setting (as shown in figure 85).

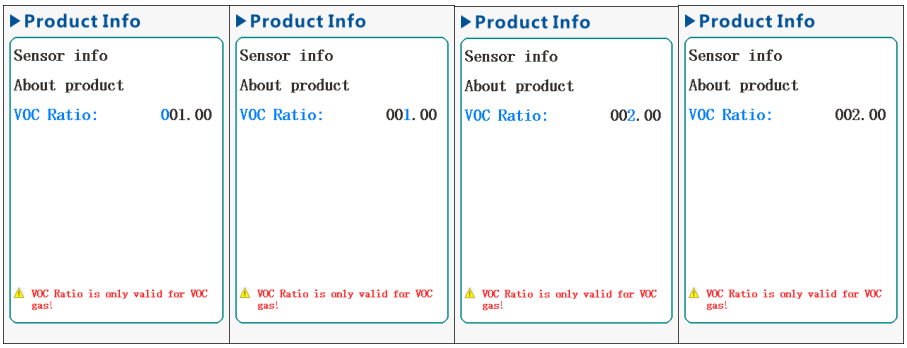



Figure 82 Figure 83 Figure 84 Figure 85

In the sub-menu of "Product info", press "ESC" to return to the previous menu or press "power" to return to the detection interface.

## 8) Data Download

Data download" operation can be directly connected to micro-USB data cable in any interface (mobile phone charging cable is also available), then can realize the connection between the instrument and the computer (as shown in figure 86)

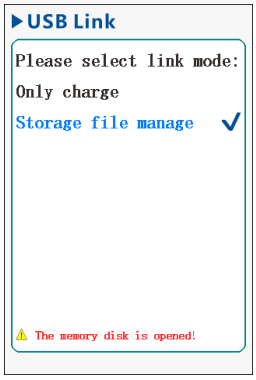



Figure 86

In the "USB Link" menu, please use the "<" and ">" keys to select the corresponding options. After entering the interface, the instrument defaults to the mode of "Storage file manage". At this time, history records and screenshots can be viewed on the computer and downloaded to the computer.

**The specific steps are as follows:**

(1) When the instrument is turned on and enters the detection interface, please use micro-USB data cable to connect the USB port of the instrument and the USB port of the computer. After connecting, the instrument displays the interface of "USB connection" (as shown in figure 86) and defaults to "Storage file manage" mode;

(2)Left mouse double click on "My Computer" on the computer, you can see that there is one more mobile storage disk in my computer (as shown in Figure 87), double click to open this storage disk (as shown in figure 88). The "HISTORY_DATA" folder stores history files and the "SCREEN_COPY" folder stores screenshots

（3）Open the "HISTORY_DATA" folder, and if any data is stored on the instrument, there will be a

TXT file named "record.txt" (as shown in figure 89).

（4）By "copy" or "cut" paste this file to the computer, then the data download is completed. Double-click or open the "record-txt" file with notepad to view the data stored by the instrument (as shown in figure 90).

(5)In the "My Computer" interface (Figure 87), click the "Unplug U disk" button, disconnect the instrument from the computer, and then remove the USB data cable after exiting.

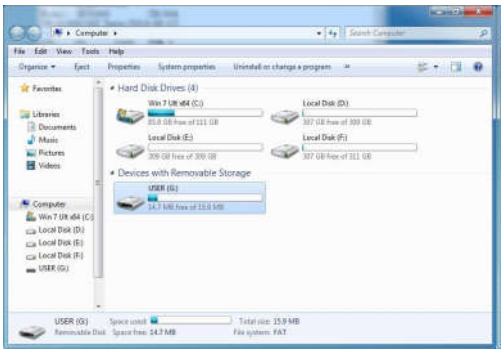


Figure 87

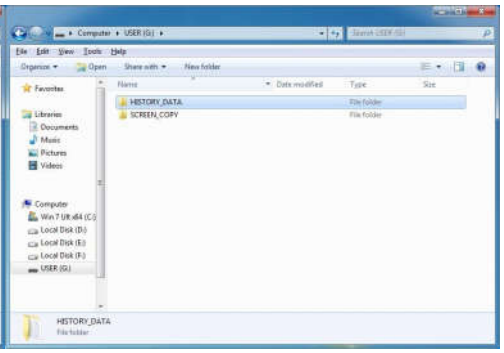


Figure 88

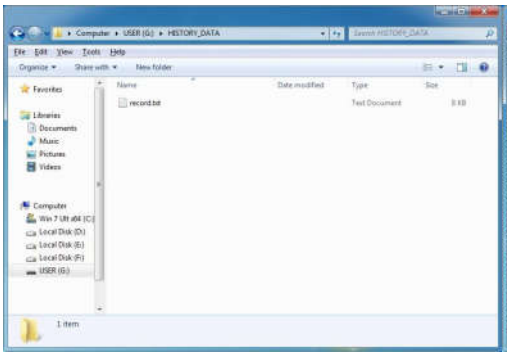


Figure 89

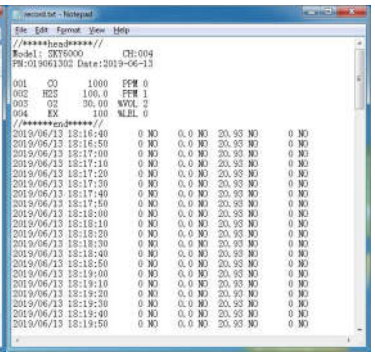


Figure 90

When you select the "charge only" option, the instrument enter charging mode and will not be connected to the computer, which is another way to disconnect from the computer. However, this charging will be very slow, and the charging instrument may break down when the sensor is working. Please noted that unstable working voltage can also lead to component damage; Charging while working will cause the instrument to get hot and affect the sensor life time.

Note:

1. Please connect the USB cable to the computer to download data!
2. Do not exit the interface during data downloading.

Warning:

1. If you do not exit the operation according to the normal process, such as: Forcefully removing USB data cable, insufficient power may lead to instrument data lost!
2. It is not recommended to use USB cable for charging in non-emergency situations. If you must use it, please do not use it for more than half an hour.

# 8. Common Failure and Solution

| Fault Phenomenon | Possible Cause of Fault | Solution |
|---|---|---|
| The instrument cannot be turned on | Voltage too low | Please charge in time |
| | System halted | 1. Press the “Reset” on the instrument<br>2. Please contact dealer or manufacturer for repair |
| | Circuit Fault | Please contact dealer or manufacturer for repair |
| No reaction to the detected gas | Circuit Fault | Please contact dealer or manufacturer for repair |
| Inaccurate display | Sensor out of service life | Please contact dealer or manufacturer for repair |
| | Long-term un-calibrated | Please timely calibrate |
| Time display error | The battery is completely running out | Charge in time and reset the time |
| | Strong electromagnetic interference | Reset time |
| Zero calibration function is not available | Excessive sensor drift | Calibrate or replace the sensor in time |
| | Use beyond range | Please contact dealer or manufacturer for repair |
| Full range is displayed on the normal detection interface of the instrument | Sensor fault | Please contact dealer or manufacturer for repair |
| Bluetooth doesn't work | Bluetooth cannot connect to the device | 1. Please confirm that the Bluetooth is enabled<br>2. Please confirm that the Bluetooth printer is enabled<br>3. Please contact dealer or manufacturer for repair |
| | Bluetooth connected, unable to print data | 1.Please confirm whether the printing function of the instrument has been turned on and the screenshot function has been turned off<br>2.Please confirm whether the Bluetooth printer has sufficient power |

# 9. Terms of service

**1) Warranty commitment**

The company promises that all the detectors manufactured by the company will be calibrated with standard gas of relevant specific concentration. After purchasing the products of the company, users need not operate the target point calibration operation of the detector by themselves without special circumstances, and the operation must be conducted under the guidance of professional and technical personnel. All the gas detectors purchased through our dealers will be guaranteed for 12 months from the date of purchase.

This commitment is only for the device, excluding accessories. During the service period, if the fault occurs due to the fault of the product components under normal use and maintenance (non-human factors), you will receive the free service provided by us after our inspection.

**2) Fault Maintenance Time**

When your device needs to be repaired, we will repair and return it to you within 7 working days after receiving the device. In case of special circumstances, if the repair cannot be completed within 7 working days, our staff will call you in advance to negotiate the repair date.

The above repair date does not include return time.

**3) Limited Guarantee**

Your products will continue to enjoy the promise of the original warranty period after being repaired by our repair agency.

When you need the warranty service, please show the valid warranty certificate, including the warranty card and invoice.

When there are not listed in the warranty scope of the circumstances, you may choose pay maintenance services.

If the maintenance parts exceed the free warranty period, please pay a certain maintenance service fee. The standard of maintenance service fee is provided by our maintenance agency.

We have the right not to provide warranty service for product damage caused by the following circumstances:

1. Man-made damage.
2. Damage caused by violation of operation rules and requirements.
3. Damage caused by flood, fire and other natural disasters.
4. Damage caused by bad operating environment.
5. The product shall be repaired, modified, modified or disassembled by unauthorized service personnel.

# 10. National Standards for Product Development, Design and Production

GB 3836.1-2010 《Explosive Environments -- Part 1: General requirements for equipment》

GB 3836.4-2010 《Explosive Environments -- Part 4: Equipment protected by intrinsically secure "I"》

GB 12358-2006 《General Technical Requirements for environmental gas detection and alarm devices in workplaces》

JJG 551-2003 《Verification Regulation of sulfur dioxide gas detector》

JJG 695-2003 《Verification Regulation for hydrogen sulfide gas detection & alarm device》

JJG 915-2008 《Verification Regulation for carbon monoxide alarm device》

JJG 693-2011 《Verification Regulation of combustible gas detection alarm》