



Portable Acetylene Gas Detector **LMAGD-A100**

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1. Safety Measures

Precautions:

- For the charger, it is a must to use the original charger; in the case of using the charger which are provided by other manufacturers, the specifications should be 4.2V, 2A or 5V, 2A, should be neither greater than 5V, 2A, nor less than 4.2V, 1A.
- It is prohibited for the live replacement of the sensor without disconnecting the power supply.
- At the time when the sensor calibration is carried out, and the nitrogen gas or the standard gas is introduced, the gas discharged from the gas cylinder should not be directly connected to the instrument with a hose, and it must be connected to a three-way flow diverter, at the same time of ensuring the ventilation amount is greater than or equal to 500 ml/min, excessive gas can be discharged away from the three-way bypass, to avoid the case that the internal pressure of the sensor gas chamber is greater than the normal value.
- The operations, such as installation, debugging, setting up, and so on, must be conducted by professionals.
- The calibration checking of the detector should be carried out regularly; the sensors that exceeded the valid service life and had failures must be replaced timely.
- Avoid using gases higher than the measurement range to impact the sensor.
- At the time of occurrence of failure, abnormality, and inaccurate detection, please conduct the operation of restoring the factory setting, which can usually solve the problem.

2. Introduction

Portable Acetylene Gas Detector LMAGD-A100 detects gas concentrations from low to high levels with real-time monitoring. It features 2.31-inch high-definition color screen for clear data display. Equipped with advanced sensors employing electrochemical, infrared, and catalytic combustion principles. Integrated with sound, light, and vibration alarms for safety alerts. Our Detector ensures gas concentration measurement in confined spaces, pipelines, and industrial environments.

3. Features

- Detects 1 to 4 gases
- Switchable units
- User-friendly interface
- Graphical trend display
- USB charging with protection

4. Specifications

Model No.	LMAGD-A100
Gas Detected	1 to 4 types, including toxic gases, oxygen, CO ₂ , inflammable gases, and TVOC
Detection Range	0 to 1, 10, 100, 1000, 5000, 50000, 100000 ppm, 200 mg/L, 100%LEL, 20%, 50%, 100%Vol
Resolution	0.001 to 1 ppm, 0.01 mg/L, 0.1% LEL, 0.01% Vol, 0.001% Vol
Detection Principles	Electrochemical, catalytic combustion, infrared, thermal conductivity, PID photoionization
Maximum Error	less than or equal to $\pm 3\%$ F.S
Linearity	less than or equal to $\pm 2\%$
Response Time	T90 less than or equal 30 seconds
Recovery Time	Less than or equal to 30 seconds
Working Temperature Range	-40°C to 70°C
Humidity Range	10% to 95% RH
Sample Gas Temperature Range	-40°C to 70°C
Temperature Accuracy	$\pm 0.5^\circ\text{C}$
Humidity Accuracy	$\pm 3\%$ RH
Display	2.31-inch high-definition color screen
Detection Mode	Built-in pump suction
Alarm Modes	Sound & light, vibration, or combined alarm
Data Storage	100,000 entries
Power Supply	3.7VDC, 4600mAh rechargeable polymer battery
Dimensions	178×67×40 mm
Packing Dimensions	190×80×50mm
Net Weight	300 g
Gross Weight	500 g

5. Applications

Portable Acetylene Gas Detector LMAGD-A100 ensures acetylene gas leak detection in industrial and confined spaces. It is suitable for gas monitoring in pipelines, chemical plants, and manufacturing facilities.

6. Instrument Introduction

6.1 Instrument Structure



Figure-1

6.2 Key definitions and Operations Instructions

Return key: ESC key. At the time of selecting the menu, return to the upper-level menu; under the state when the alarm is muted, press this key to mute.

Menu key: MENU key. Enter and exit the menu; at the time of alarming, press once to get the muting effect; after muted, in the top right corner of the display screen, the mute icon will appear, press the Return key (**ESC**) once to cancel the mute state.

① **Key:** Power key, confirmation key. Long press for 5 seconds to start up; after starting up, long press for 5 seconds to shut down.

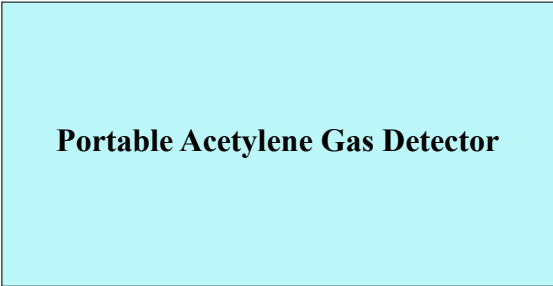
《《 **Key:** Direction key, movement of the cursor to the left will play the role of position shift at the time of modifying the numbers.

》》 **Key:** Direction key, movement of the cursor to the right will play the role of adjusting the numerical value and scrolling the pages at the time of changing the numerical value.

7. Software Operations

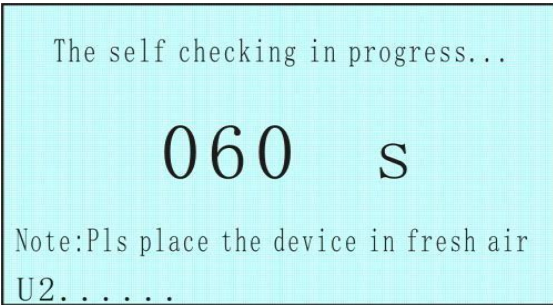
7.1 Explanation of startup

At the time of startup, the information about the company, the countdown time which is needed for the startup self-check, and sensor preheating will be displayed, as shown in **Figure 2** and **Figure 3**.



Portable Acetylene Gas Detector

Figure-2



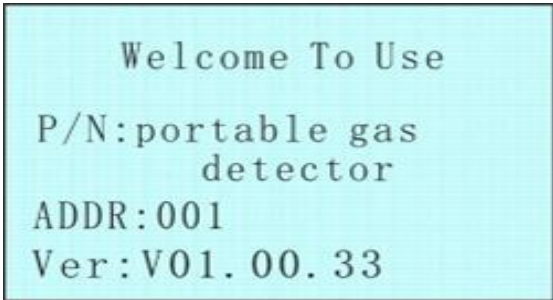
The self checking in progress...

060 S

Note:Pls place the device in fresh air
U2.....

Figure-3

At the time of startup, the address number and software version of this unit of equipment will be displayed, as shown in **Figure 4**.



Welcome To Use

P/N:portable gas
detector

ADDR:001

Ver:V01.00.33

Figure-4

Portable Acetylene Gas Detector LMAGD-A100

After the countdown was finished and the test screen was entered, enter the test interface, as shown in **Figure 5**.



Figure-5

By pressing the Confirmation key "① key", it will be possible to switch between different displaying modes, and pressing » » key to switch the channels. There is a figure illustration for each mode (There will be a deviation between the figure and the actual product, so it is recommended to use the figure by referring to the actual product), as shown in **Figure 6**, **Figure 7**, **Figure 8**, and **Figure 9**.



Figure-6



Figure-7



Figure-8



Figure-9

7.2 Menu Operation Instructions

7.2.1 Zero-point calibration operation instructions

Only when the zero drift of the sensor is too large, or it is required to accurately detect very low concentrations, the zero-point calibration will be carried out. In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" key and "»" key to select the "zero-point calibration" menu, and press "①" to enter the interface of "zero-point calibration", as shown in **Figure 10**.



Figure-10

Select the channels to be calibrated, press "①" key to carry out the zero-point calibration; after the calibration is successful, it will display the statement "Calibration is successful", as shown in **Figure 11**, **Figure 12**, and **Figure 13**.



CHx	OFFset	Status
CO	0.1	CAL
H ₂ S	0.00	CAL
O ₂	20.90	CAL
CO ₂	420	CAL

Figure-11



CHx	OFFset	Status
CO	0.1	TRUEL
H ₂ S	0.00	CAL
O ₂	20.90	CAL
CO ₂	420	CAL

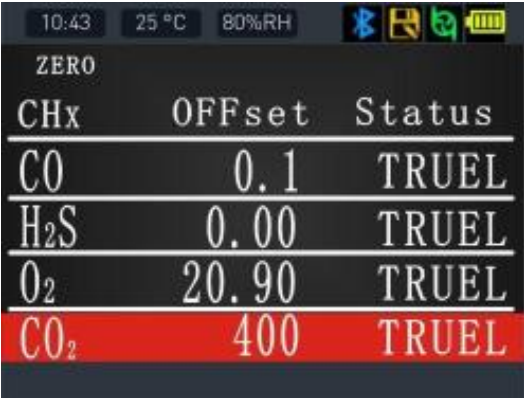
Figure-12



CHx	OFFset	Status
CO	0.1	FALSE
H ₂ S	0.00	CAL
O ₂	20.90	CAL
CO ₂	420	CAL

Figure-13

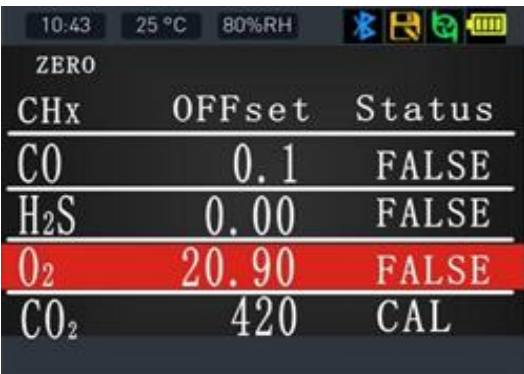
After the calibration of CO₂ in the air is successful, it will be displayed as about 400 ppm on the screen, as shown in **Figure 14**.



CH _x	OFF _{set}	Status
CO	0.1	TRUEL
H ₂ S	0.00	TRUEL
O ₂	20.90	TRUEL
CO ₂	400	TRUEL

Figure-14

If the calibration is not successful, it will display the statement "Calibration failed." if O₂ or N₂ was in the air, the zero-point calibration will fail, as shown in **Figure 15**.



CH _x	OFF _{set}	Status
CO	0.1	FALSE
H ₂ S	0.00	FALSE
O ₂	20.90	FALSE
CO ₂	420	CAL

Figure-15

7.2.2 Concentration calibration operation instructions

The deviation of the concentration, which was detected by the instrument from the standard gas concentration, can be corrected by calibrating the concentration or changing the display coefficients.

In the test interface, press the **"MENU"** key for 3 seconds to enter the menu, use "«" key and "»" key to select the **"Concentration calibration"** menu, as shown in **Figure 16**.



Figure-16

Then, press "①" key to enter the concentration calibration interface, as shown in Figure 17.



Figure-17

By default, the cursor will appear at the position of Level I concentration, press the "①" key to enter the setting of the concentration values, and use "《《" key and "》》" key to modify the numerical values, after finished the modification, press "①" key to save.

Note: The modified values can become valid only after the successful calibration; otherwise, at the next time of entering the menu, the value will return to the previous concentration value, as shown in Figure 18.



Figure-18

Portable Acetylene Gas Detector LMAGD-A100

Introduce the standard gas or the gas to be measured, move the cursor to the "calibration" position, and then press "①" key for calibration, if successful, it will display the statement of "Success", if unsuccessful, it will display the statement of "Failure", as shown in **Figure 19**, **Figure 20** and **Figure 21**.



Figure-19



Figure- 20

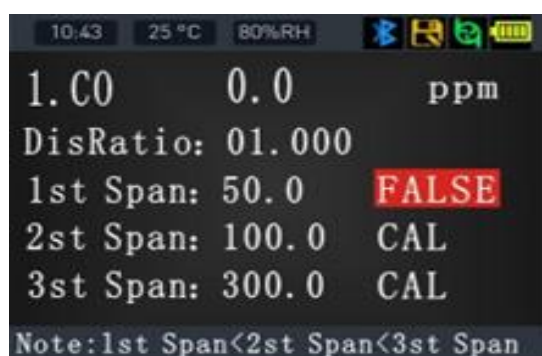


Figure-21

Precautions of the calibration:

Normally, calibration of Level I concentration will be enough to meet the accuracy requirements. After the concentration value to be calibrated or the concentration value of the standard gas was preset, and then the gas to be detected was introduced at 500 ml/min for 30 seconds, the calibration will be performed.

At the time of calibration, the three-way flow diverter should be connected so that the excessive gas can be discharged from the bypass and avoid the excessive pressure, which may cause the deviation of value.

Rules for setting calibration concentration values of three levels:

Level I concentration value < Level II concentration value < Level III Concentration value

Concentration calibration sequence for three levels:

Level I concentration calibration → Level II concentration calibration → Level III concentration calibration

If the concentration of the introduced standard gas is too low, the calibration may not succeed.

7.2.3 Operation instructions to restore factory settings

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" "»" key and "»»" "««" key to select the menu of "Restore the factory setting", and press "①" to enter the interface of "Restore the factory setting", as shown in Figure 22 and Figure 23.



Figure-22

CHx	OFFset	Status
CO	0.0	Default
H ₂ S	0.00	Default
O ₂	20.90	Default
CO ₂	515	Default

Figure-23

Select the channel to be restored, then press "①" key to enter. It is possible to select "Restore the concentration", "Restore the alarm", "Fully restore" and then press "①" key to restore; if restoring is successful, it will display the statement of "Success"; if unsuccessful, it will display the statement of "Failure", as shown in Figure 24, Figure 25 and Figure 26.



Figure-24

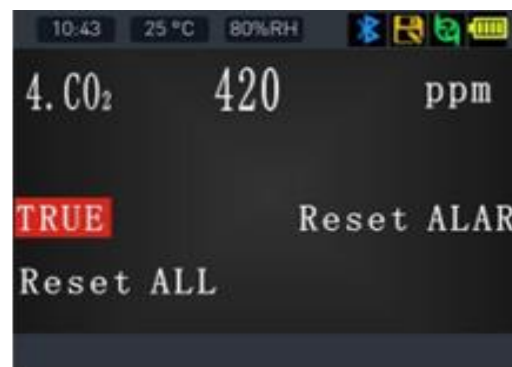


Figure-25



Figure-26

At the time of setting error or inaccurate detection of the concentration, it is required to carry out the operation of restoring the factory setting; if it is poor performance which was caused by human factors, it will be possible to restore, and the parameters which can be restored to the factory setting are: zero-point calibration, concentration calibration values, alarm values, alarm method, alarm mode, and maximum range, and so on.

7.2.4 Data recording operation instructions

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" key and "»" key to select the menu of "data recording", and press "①" key to enter the interface of "data recording", as shown in **Figure 27**.



Figure-27

Press "①" key to select the channel for the query of the records, use "«" "»" key "»", and the "①" key to modify the start time and end time, as shown in **Figure 28**, **Figure 29**, and **Figure 30**.

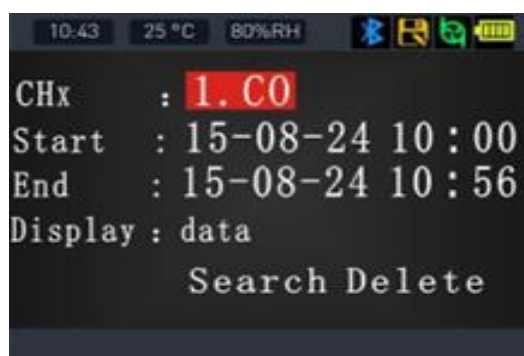


Figure-28

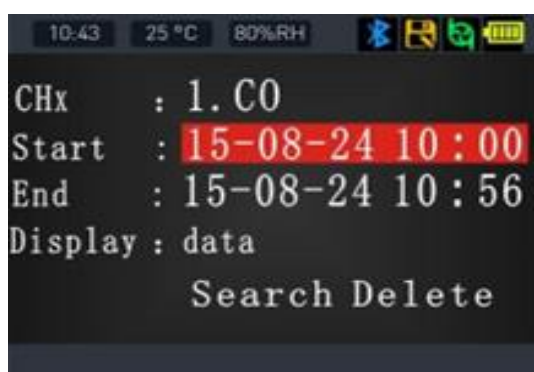


Figure-29

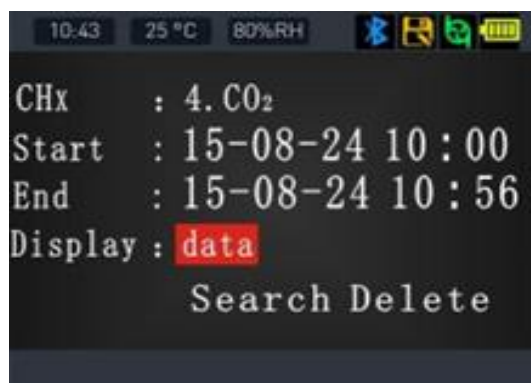


Figure-30

Press "①" key to select "All Data" or "Alarm data".

Select "Start query", press "①" key for query, and press «" «" and "»» " keys to scroll the pages when browsing, as shown in **Figure 31**.

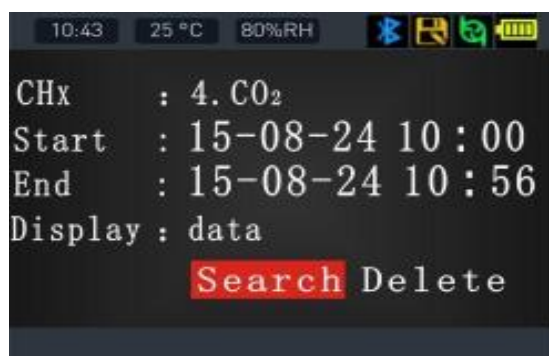


Figure-31

If there is no record for the query, it will be as shown in **Figure 32**.



Figure-32

Go to "System settings" → "Storage settings" to check whether the storage function is enabled or not. Select the "timing storage" that is the real-time storage function, and set the storage cycle (time interval).

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As shown in the figure, follow the following steps for startup as shown in **Figure 33**, **Figure 34**, **Figure 35**, **Figure 36**, and **Figure 37**.



Figure-33

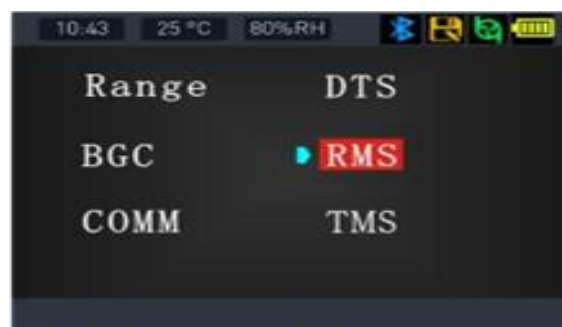


Figure-34

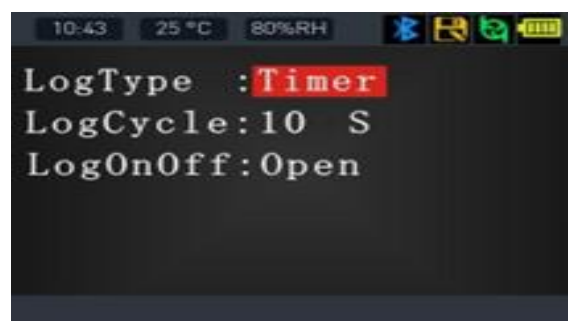


Figure-35

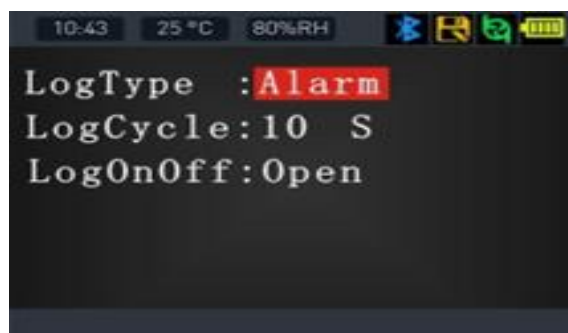


Figure-36

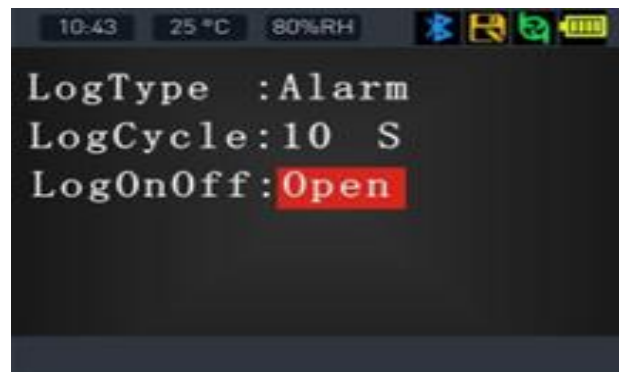


Figure-37

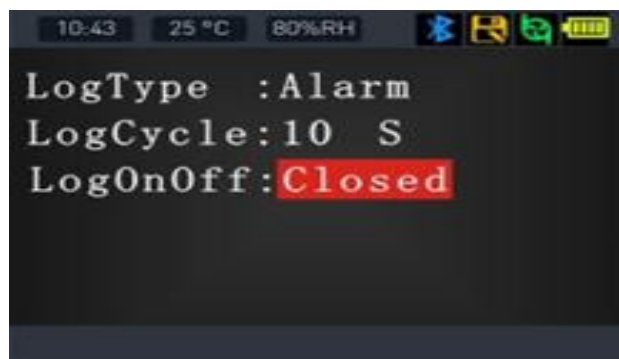


Figure-38

7.2.5 Alarm setting operation instructions

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use the "《《" key and "》》" key to select the menu of "Alarm setting", and press "①" key to enter the interface of "Alarm setting"; use "《《" key and "》》" key to select the "Alarm numerical value", "alarm parameters", "Alarm mode", and press "①" key to enter, as shown in **Figure 39** and **Figure 40**.



Figure-39



Figure-40

Alarm value setting, as shown in **Figure 41**, **Figure 42**, and **Figure 43**.

It is possible to use "①" key and the "《《" key and "》》" key to modify the high/low limit value.

Low limit value: That is the Level I alarm value, and it can be modified; high limit value: that is the Level II alarm value, and it can be modified.

CH _x	AL Value	AH Value	Note
CO	0050.00	0200.00	NO
H ₂ S	020.00	050.00	NO
O ₂	019.00	023.00	NO
CO ₂	0020.0	0050.0	NO

Figure-41

CH _x	AL Value	AH Value	Note
CO	0050.00	0200.00	NO
H ₂ S	020.00	050.00	NO
O ₂	019.00	023.00	NO
CO ₂	0020.0	0050.0	NO

Figure-42



CHt	AL Value	AH Value	Note
CO	0050.00	0200.00	NO
H ₂ S	020.00	050.00	NO
O ₂	019.00	023.00	NO
CO ₂	0020.0	0050.0	NO

Figure-43

Alarm parameter setting, as shown in **Figure 44**.



Figure-44

Use " «" Key and " »" key to switch the cursor, and use "Ⓢ" key to select the parameters.

Alarm method: Press "Ⓢ" key to select sound & light, vibration, sound & light + vibration, no alarm, as shown in **Figure 45**.



Figure-45

Alarm sound: 3 kinds of sound can be selected, as shown in **Figure 46**.



Figure-46

Alarm hysteresis: That is the alarm return difference, it is possible to set the alarm return difference for each channel; if it is set as 0, as long as the value reaches the set value of alarm, the alarm will be activated immediately; if it is not desired to have frequent occurrence of alarming at the critical point of the set value of alarm, then, the alarm hysteresis should be set to a certain value, and use "①" key and "《" key and "》" key to modify, as shown in **Figure-47**.



Figure-47

Alarm mode: Generally, no setting is needed, because it has been set by default already.

The default setting of O₂ and N₂ is <AL>AH alarm; the default setting of other gases is >AL>AH alarm, and it is possible to modify or set to "Turn off alarm" (Note, if "Turn off alarm" is selected, then, when the measured concentration value is higher than the alarm value, no alarm will be generated), as shown in **Figure 48** and **Figure 49**.

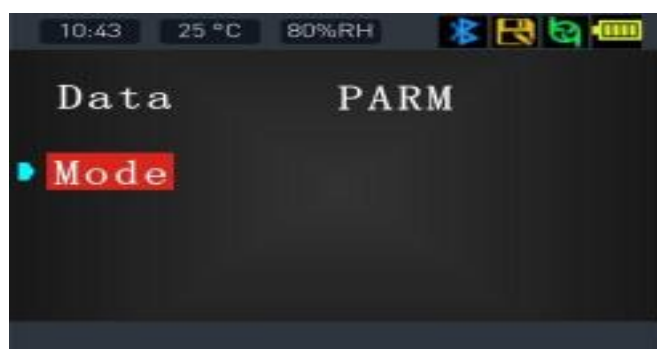


Figure-48

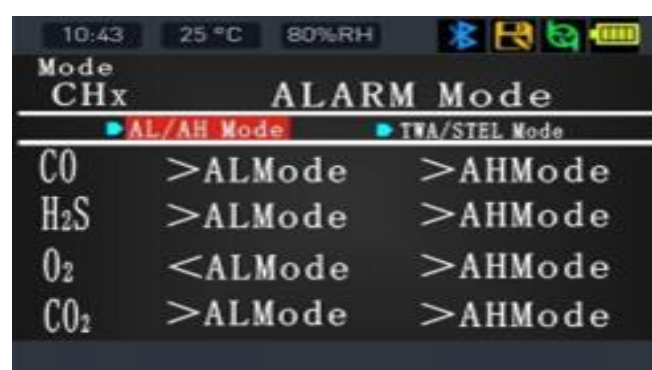


Figure-49

7.2.6 System setting operation instructions

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" key and "»" key to select the menu of "System setting", and press "①" key to enter the interface of system setting, as shown in **Figure 50**.



Figure-50

Setting of range: It will display the maximum detection range of each gas, and has been set up before leaving the manufacturer. When some sensors are measuring under overload conditions, the sensor may be damaged. As shown in **Figure 51** and **Figure 52**.



Figure-51

CHx	Max	unit
CO	1000.0	ppm
H ₂ S	100.00	ppm
O ₂	030.00	%VOL
CO ₂	0100.0	%LEL

Figure-52

Setting of time: Modify date and time, after pressing "⌚" key, use the "«" key and "»" key to select and modify, and then, press "⌚" key to save, as shown in **Figure 53** and **Figure 54**.



Figure-53

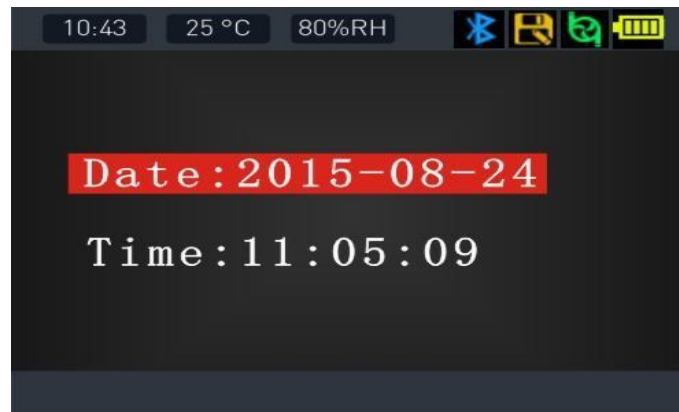


Figure-54

Setting of background: Based on personal preference, it is possible to modify the font color, background color, and backlight sleep time, and it is also possible to select "**Restore Default**" to restore the default settings.

Use "«" "»" key and ">>>" key to select and modify, then press "⏏" key to save, as shown in Figure 55, Figure 56, and Figure 57.

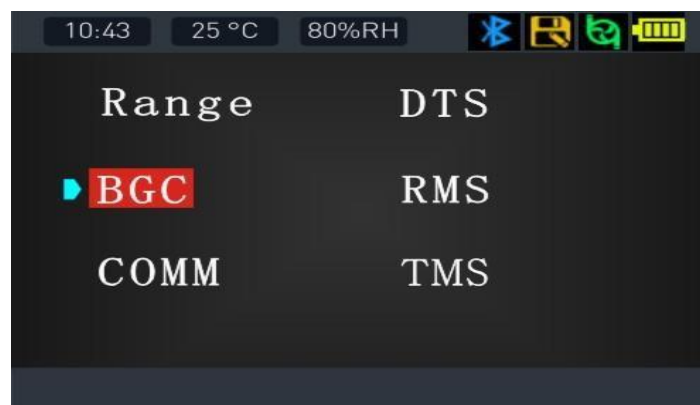


Figure-55



Figure-56

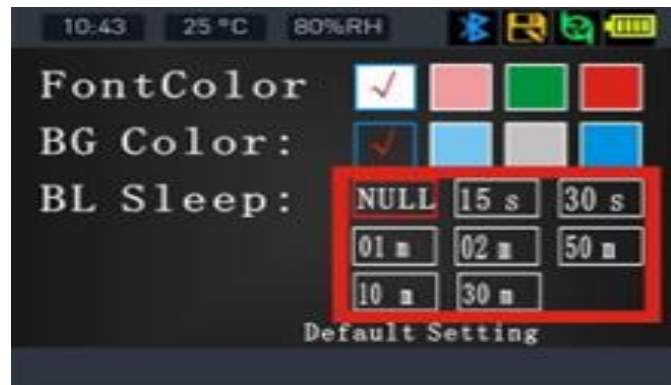


Figure-57

Setting of storage: Move the cursor to "Setting of storage", press "①" key to enter the setting interface. As shown in **Figure 58**.



Figure-58

Storage method: It is possible to set two modes, which are the timing storage and alarm trigger; "timing storage" is to store the data for one time during each period of storage cycle, as shown in **Figure 59**.

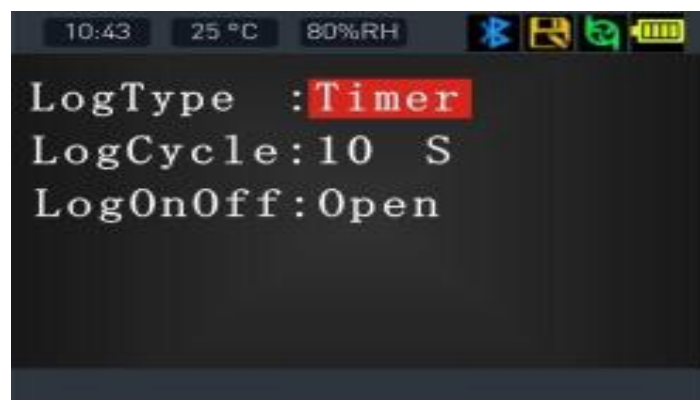


Figure-59

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Alarm Trigger storage mode is to store only the data about the alarm; only when the concentration value reaches the alarm setting value, the storage will begin; and if there is no alarm, the storage will not begin, as shown in **Figure 60**.

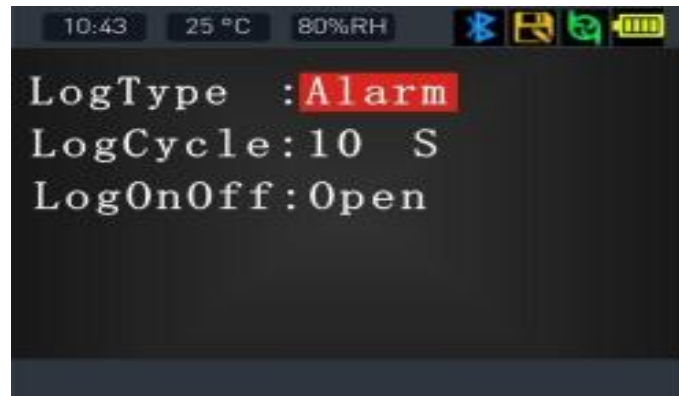


Figure-60

Storage cycle: The time interval for storing the data, which can be possible to set as 1-9999 seconds, and it is valid only for the timing storage. As shown in **Figure 61**.

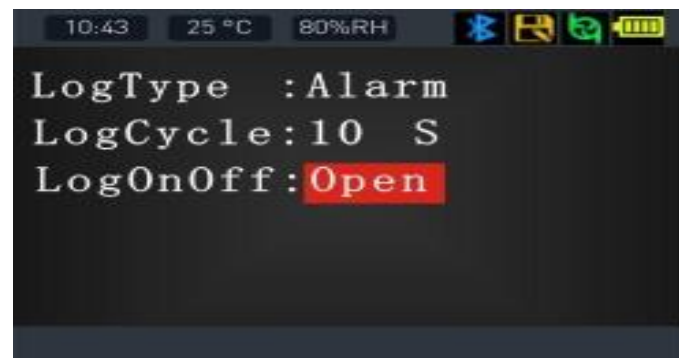


Figure-61

Storage function: Select turn on or turn off the data storage function, as shown in **Figure 62**.

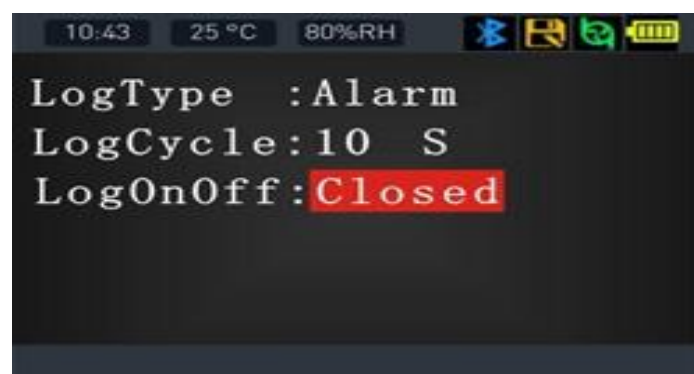


Figure-62



Figure-63

Setting of communication: When there is no connection with the computer or data transmission, there will be no need for setting, as shown in **Figure 63**.

Equipment address: The address number of the local host can be set as 1-255.

Communication interface: The mode of automatic recognition communication.

Baud rate: Communication speed, generally select 9600. As shown in **Figure 64**.



Figure-64



Figure-65

Timing measurement: If the value was set, after startup, once the set time, the measurement will stop automatically; when needed to measure again, just press the "PUMP" key the switch the pump on to start the measurement again, as shown in **Figure 65**.

The default measuring time is 0 seconds; if this value is not modified, this function will not work; when it is modified to a certain value, this function will start working; if it is required to use the timing measurement function, in general cases, it is necessary to modify the value to be 30-60 seconds, press the pump switch of "PUMP" key for one time to start the measurement; once reached the set time, stop the measurement.

Interface of Timing Measurement: The set time and the remaining time will be displayed at the bottom part of the display screen, as shown in **Figure 66** and **Figure 67**.



Figure-66



Figure-67

7.2.7 Unit setting operation instructions

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" key and "»" key to select the menu of second page of "Unit setting", press "①" key to enter the interface of setting, as shown in **Figure 68**.



Figure-68

Automatic conversion between various units is possible to switch between the following units, as shown in **Figure 69** and **Figure 70**.
PPM, Vol%, LEL%, ppb, PPHM, mg/m³, mg/l, g/m³.

10:43	25 °C	80%RH	Bluetooth	Wi-Fi	GPS	Battery
UNIT						
CH _X	MW	Unit				
CO	1000.0	ppm				
H ₂ S	100.00	ppm				
O ₂	030.00	%VOL				
CO ₂	0100.0	%LEL				

Figure-69

10:43	25 °C	80%RH	Bluetooth	Wi-Fi	GPS	Battery
UNIT						
CH _X	MW	Unit				
CO	1000.0	mg/m ³				
H ₂ S	100.00	mg/m ³				
O ₂	030.00	mg/m ³				
CO ₂	0100.0	%LEL				

Figure-70

7.2.8 Other setting operation instructions

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use "«" key and "»" key to select the menu of second page of "Other setting", press "①" key to enter the interface of setting, as shown in **Figure 71**.

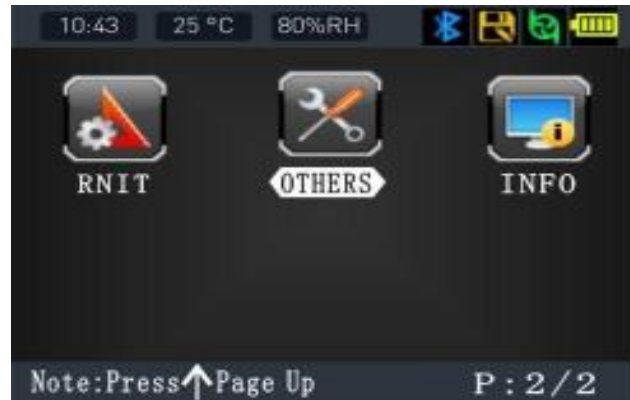


Figure-71

Preheating time: It is the time for preheating and stabilizing, which is needed by the sensor, and it is not recommended for modification, as shown in **Figure 72**.

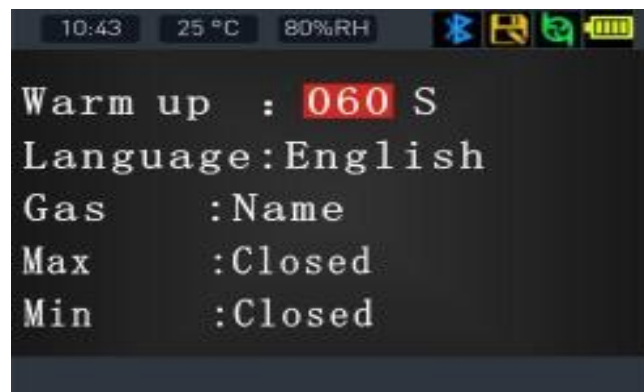


Figure-72

Language options: The Default language is English, as shown in **Figure 73**.

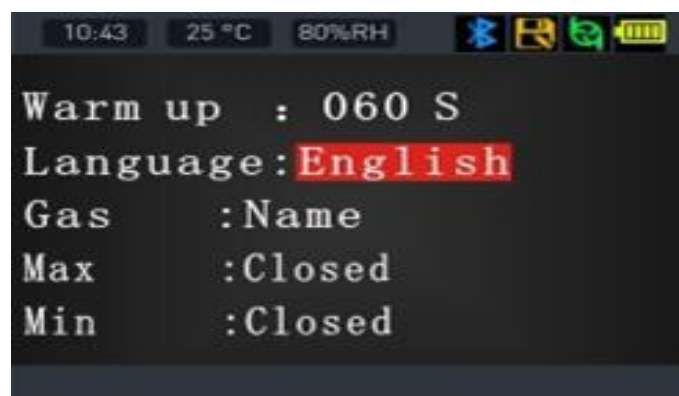


Figure-73

Name of the gas: The molecular formula will be displayed by default, as shown in **Figure 74**.

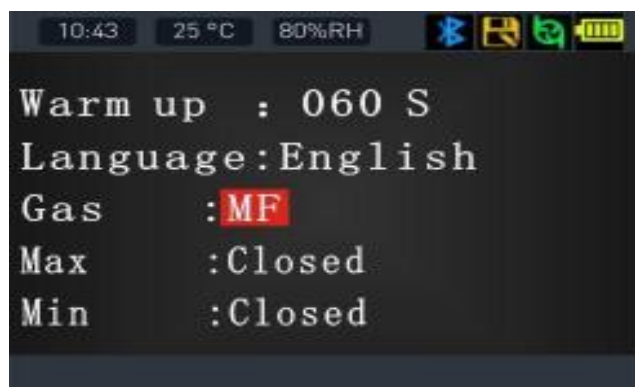


Figure-74

Display the maximum value:

Select Open, then the maximum value of the measurement of this time and the maximum value of the last measurement in the single-channel interface will be displayed.

Display the minimum value:

Select Open, then the minimum value of the measurement of this time and the minimum value of the last measurement in the single-channel interface will be displayed. As shown in **Figure 75**.

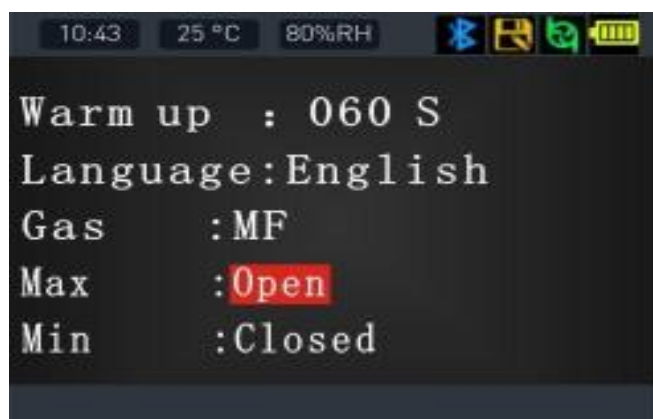


Figure-75

7.2.9 Explanation about local host information

In the test interface, press the "MENU" key for 3 seconds to enter the menu, use the " ««" key and " »» " key to select the menu of the second page of "Local information", press "①" key to enter the interface of view, as shown in **Figure 76**.

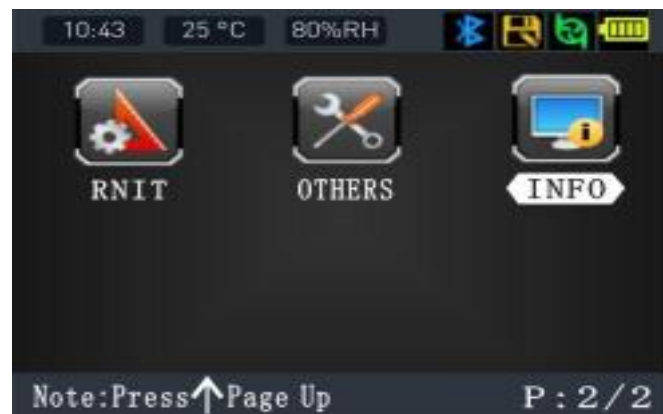


Figure-76

Equipment information: It is possible to view the relevant information about this equipment, as shown in **Figure 77** and **Figure 78**.



Figure-77

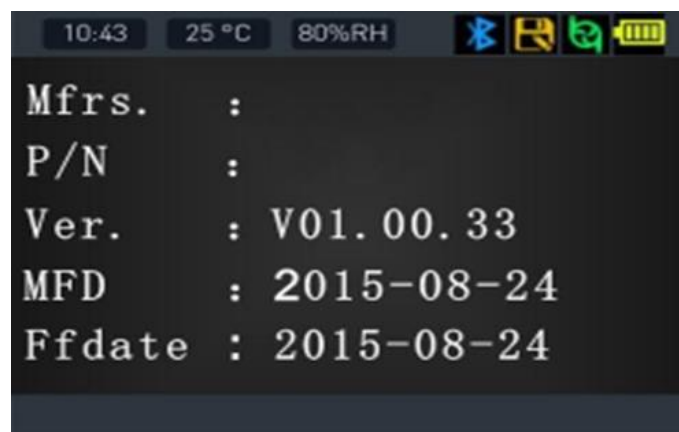


Figure-78

Sensor information: It is possible to view the service life and the used years of the sensor on this equipment, to avoid the extended use, which will affect the accuracy and reliability, as shown in **Figure 79** and **Figure 80**.



Figure-79

Sensor Info					
CH _x	Life		CAL Date	replaceDate	
CO	×	24	Mth	2015-08	2017-09
H ₂ S	×	24	Mth	2015-08	2017-09
O ₂	×	24	Mth	2015-08	2017-09
CH ₄	×	24	Mth	2015-08	2017-09

Figure-80

Repair records: Record the repair information of this equipment, as shown in **Figure 81** and **Figure 82**.

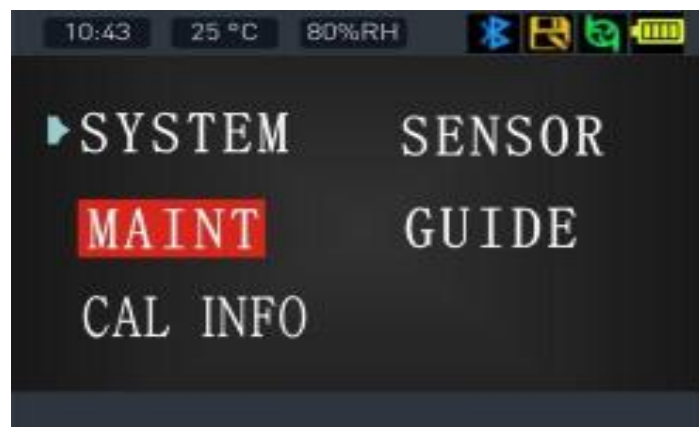
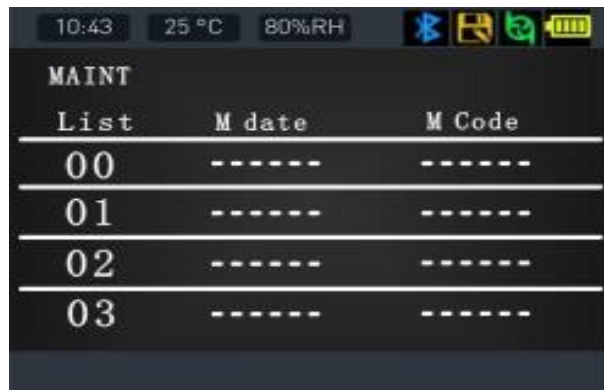


Figure-81



The screenshot shows the maintenance menu of the LMAGD-A100. At the top, the status bar displays the time 10:43, temperature 25 °C, humidity 80%RH, and icons for Bluetooth, file transfer, and battery. The main menu is titled 'MAINT' and contains a table with three columns: 'List', 'M date', and 'M Code'. The table lists four items: 00, 01, 02, and 03, each with corresponding date and code fields.

List	M date	M Code
00	-----	-----
01	-----	-----
02	-----	-----
03	-----	-----

Figure-82

Guidance about the failures: It will introduce the simple troubleshooting methods for the failures; at present, it cannot be viewed temporarily, as shown in Figure 83.

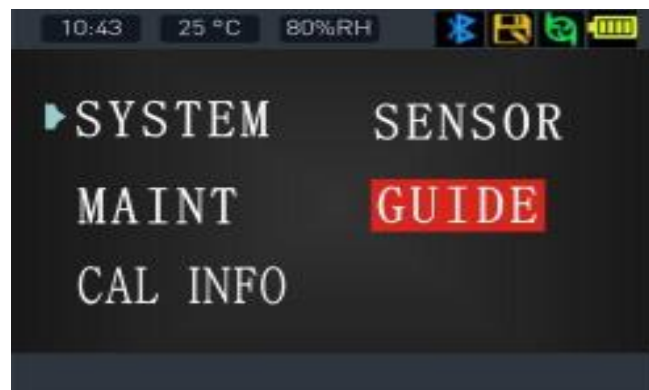


Figure-83

8. Maintenance

During the normal use of the detector, the valid service life of most sensors is 24-36 months. Within the valid service life, one time of periodic sensor calibration should be performed every 6 months or 1 year, to ensure the accuracy and effectiveness of the gas detection function. The sensors that exceeded the valid service life and had failures must be replaced.

1) **Sensor replacement**

If the sensor fails, kindly replace and recalibrate it.

2) **Sensor calibration**

Never operate when the standard gas is not ready. At the time of mis-operation, it is necessary to restore the factory setting through the operations. Refer to **7.2.3 Operation instructions to restore factory settings**.

9. Troubleshooting

Common failures and countermeasure solutions:

Failure 1: It is not possible to detect when the concentration is low.

Countermeasure solutions:

- 1) Check whether the pump is working or not; when the pump is working properly, there is a slight vibration, and if the finger is used to block the gas inlet for 2 seconds, it is possible to feel the obvious suction force. And then, check whether the gas inlet of the filter is clogged or not, or whether the gas leakage and no suction force were caused by the poor sealing of the connection joint or not.
- 2) Introduce the nitrogen gas for the zero-point calibration or carry out the zero-point calibration in clean air, and after the calibration is finished, carry out the detection immediately.
- 3) If it is still impossible to detect the gas to be measured after the zero-point calibration, then it is necessary to conduct the operation of restoring the factory setting.
- 4) If it is still impossible to detect after restoring the factory setting, then it will be necessary to introduce the nitrogen gas again, or carry out the zero-point calibration in clean air again, and after the calibration is finished, carry out the detection immediately.
- 5) Check whether the connection cable of the sensor has been damaged by human factors or if there was poor contact.
- 6) If it is still not possible to detect out after the above mentioned four steps are done, then, it will be necessary to check whether the gas to be measured exist or not on the spot, or whether the concentration of the detected gas is very low indeed; if it is lower than the minimum detection limit value of the instrument, it will not be possible for the detection.

Failure 2: There is no gas to be detected in the air, but the value fluctuates greatly or bounces wildly.

Countermeasure solutions:

- 1) In general, it belongs to the normal range if the short-term fluctuation range of zero point is less than 1% of the maximum range; under the situation without the presence of the gas to be measured, it belongs to the normal range if the long-term drift is less than 2% of the maximum range; if exceeded this range, it is necessary to check whether the gas to be measured exists or not on the spot, or the great fluctuations of air temperature and humidity resulted in the instability of the numerical values, and in general cases, the great fluctuations in temperature and humidity may cause the great fluctuations of the numerical values of the measurement by the instrument in a short period; after the air the temperature and humidity became constant, the numerical values will become relatively stable too.
- 2) Verify whether the zero-point calibration or target point calibration was carried out for the instrument or not; if the zero-point calibration was carried out in the case when the gas to be measured existed, it might be impossible to detect the gases at low concentrations.

If the target point calibration was carried out in the case when the gas to be measured existed, but the concentration value after calibrated did not match the actual concentration value, it might cause that the fluctuation of the numerical values of the instrument is very great, or the numerical values which are measured is relatively small; for these 2 cases, it is possible to be solved through the operation of Restoring the factory setting.

- 3) If the problem still could not be solved, it will be necessary to verify whether the gases of high concentrations had been introduced or the gases of high concentrations had impacted the sensor; if the sensor had been impacted, after 24 hours of aging through connecting the power supply to the instrument, the numerical values are till instable or the numerical values still could not decrease further, the sensor may be damaged due to the impact, and it will be necessary to replace the sensor.

Failure 3: Detection result is inaccurate

Countermeasure solutions:

- 1) Check whether the gas concentration on the spot is accurate or not; sometimes, the difference between the theoretical value and the actual value is great. The best method is to verify the accuracy of the instrument by introducing the standard gases.
- 2) If the use time of the sensor was too long, there might be some errors of the measurement values; if the sensor itself has almost been close to the service life, even at the moment after the calibration, it can be used normally, soon, it will become not possible to work properly again, so, it is recommended to replace the sensor.

Failure 4: The alarm is activated even when the numerical value is 0 or the alarm value in the air has not been reached.

Countermeasure solutions:

- 1) Check whether the alarm has been modified or not.
- 2) Check whether the alarm method, alarm mode have been modified or not.
- 3) Check whether the alarm status is the concentration alarm or the failure alarm. The concentration alarm will display the words of AL or AH, and the red indicator light may flash; the failure alarm will light yellow.
- 4) If the alarm is caused by the man-made modifications, it can be resolved by restoring to the factory settings; and the failure alarm requires further checking about whether it is caused by the short circuit, open circuit, poor contact, or sensor failure.

Failure 5: It is not possible to communicate with the computer

Countermeasure solutions:

- 1) Check the equipment address; the address that was set in the communication software must be the same as the equipment address of the instrument.
- 2) At the computer hardware - Equipment Manager - Port, check whether the serial ports corresponding to the RS485 / RS232 converter are connected or not. For the equipment with a USB interface, it is also necessary to detect whether the serial ports are connected or not, and whether the serial port numbers are correct or not.

10. Accessories

Accessory	Quantity	Unit
USB charger	1	Piece
Aluminium Instrument Case	1	Piece



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