

Industrial Fixed Detector

GD-700 User Manual



Please read carefully before using

Foreword

You are welcome to use the instrument of this product, and hope that this manual will bring you convenience when you use the instrument. If you find any unclear, wrong or excessively lengthy place in this manual, please contact the agent or after-sales service department in time.

Before you perform any operation on this instrument, please read this operation manual carefully, and keep the manual properly so that you can refer to it in time for help in the future.

It is forbidden to disseminate all the contents of this manual without permission; this manual only provides relevant information.

The company is committed to continuous improvement of product performance, and the company reserves the right to improve any content in the manual without prior notice.

Please refer to the actual product for the color and style of the product and product.

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1` 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:

- Before using the instrument, please read the product manual carefully.
- It is strictly forbidden to open the cover when the power is on at the scene.
- It is strictly forbidden to replace the sensor with power on.
- The installation, debugging, setting and other operations must be carried out by professionals.
- Gas calibration inspection should be carried out regularly, and the sensors that have exceeded the valid period of use and have faults should be replaced in time.
- It is strictly forbidden to input gas with a gas concentration higher than the measuring range to impact the sensor.
- Prevent the instrument from falling from a high place or subject to severe shocks.
- It is strictly forbidden to expose the instrument to a high-concentration corrosive gas environment to work for a long time to prevent damage to the sensor.
- It is strictly forbidden to use it under high temperature and high humidity. If the humidity is high, it must be equipped with a filter dehumidification device.
- Users are not allowed to repair or replace parts without authorization.
- Man-made damage is not covered by the warranty.
- It is not allowed to change the components or structures that affect the explosion-proof performance at will, so as not to affect the explosion-proof performance.

2` Attentions

- Electricity safety: Ensure that the instrument shell is properly grounded.
- For safety reasons, this product can only be operated and maintained by professionals, and this manual must be fully read and understood before operation and maintenance.
- Because the instrument is a bit heavy, at least two people are required when installing it, pay attention to it, and carry it carefully. Otherwise, it may cause physical injury.
- When carrying the instrument, please wear gloves, otherwise it may cause injury.
- During the installation process, be careful not to allow wire heads or other debris to enter the left channel port of the instrument, otherwise it may cause fire, malfunction, or malfunction.

Calibration warning:

- The gas detection instrument is a safety and life-saving measuring instrument. In order to ensure the accuracy of measurement, toxic and catalytic combustible gas sensors should be calibrated at least once every six months, and infrared sensors should be calibrated once a year.
- The gas detector needs to be carefully tested or calibrated after an alarm occurs.

3` Product Description

GD700 Industrial Fixed Detector is a fixed pump suction detection instrument used in complex working environments such as emission gas, oil and gas industry, pipelines, laboratories, etc. Its built-in brushless pump and suction sampling method make the detection fast and accurate. It committed to providing users with a reliable, accurate and safe gas detection program.

4` Product features

2.4-inch high-definition color screen, wide viewing angle, low power consumption Built-in micro sampling pump
4-20mA current signal, RS485 digital signal, 1 set of relay signal output
Infrared remote control, convenient and quick
Supports multiple gas units switch

5` Attachment configuration list

Standard accessories:

- (1) One gas detector
- (2) One infrared remote controller
- (3) One water and dust filter
- (4) One manual
- (5) Certificate of conformity, warranty card
- (6) Packing box

Optional accessories:

- (1) Switching power supply
- (2) Alarm light
- (3) High temperature probe
- (4) Mounting brackets
- (5) Power adapter(24V DC)
- (6) Other

6` Technical Parameters

Product size: 286*202*96mm (H x W x D)

Product weight: 3.4kg (3.8kg with alarm light)

Sensor: Electrochemical principle, PID principle, infrared principle, catalytic combustion principle Gas measurement range: To be specified

Resolution: To be specified

Precision: $\leq \pm 5\%$ F.S or $\leq \pm 10\%$ F.S (depend on sensor type)

Pump flow: 0.6(± 0.1)L/Min

Display: 2.4-inch high-definition color display

Display content: gas molecular formula, concentration, unit, pump status, etc.

Alarm: buzzer, alarm status prompt on the display

Power supply: 12~24V DC

Installation method: wall-mounted

Working hours: 24 hours uninterrupted monitoring

Language: Chinese and English

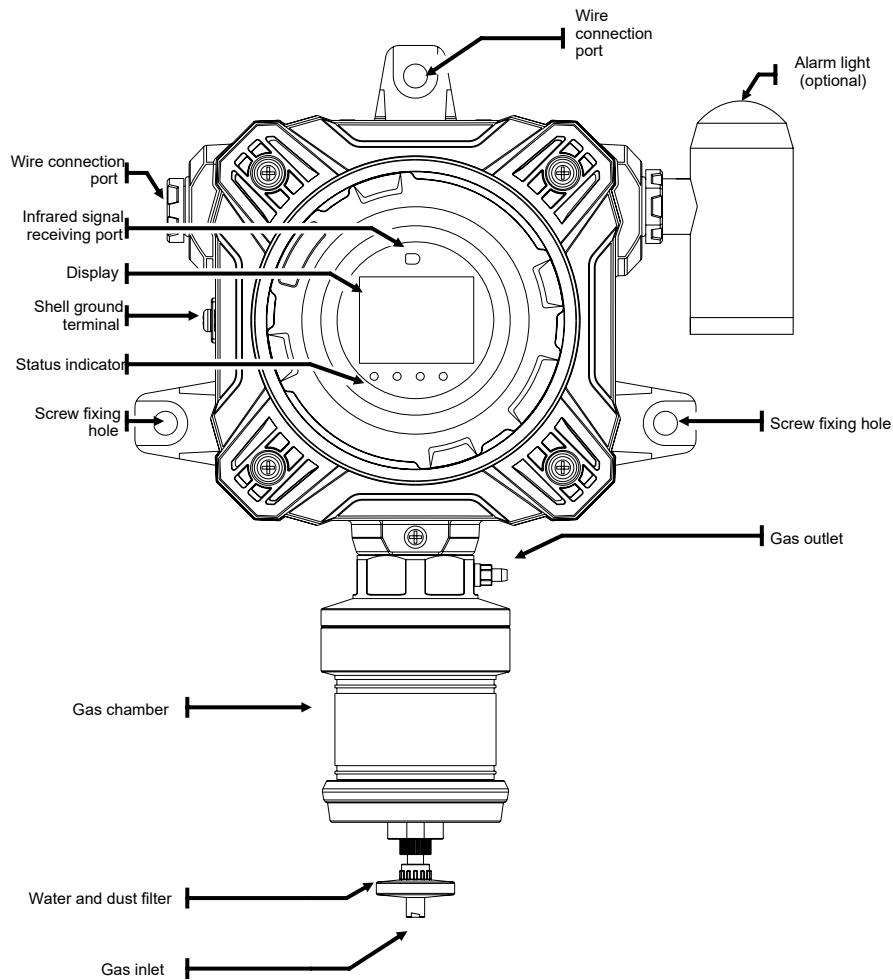
Expansion: PC software

Humidity: 0~95%RH (non-condensing) (optional external filter will be needed if the humidity is too high)

Temperature: -10°C~ +55°C (optional sampling probe will be needed if the temperature is too high) Explosion-proof grade: Ex d IIC T6 Gb

7` Instrument installation

Product structure



The detector installation avoids the following environmental influences:

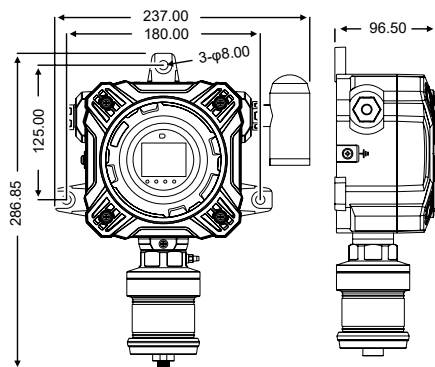
- Environment temperature over device working temperature range.
- Environment humidity over device working humidity range.
- Environment pressure over device working pressure range
- High wind speed.
- Mechanical vibration.
- Strong electromagnetic radiation environment.
- high voltage environment.
- Electricity leakage.

Installation size

The upper and lower spacing of the three fixed holes of the instrument and the size of the device are as shown in the figure below.

The left side is the wiring area, and the right side is the alarm.

*** As shown in the figure, the housing grounding mark " $\perp$ ", the instrument must be properly grounded to avoid personal safety accidents or instrument damage caused by leakage or static electricity.**



Installation types

GD700 is a pump suction detector, which can be connected to tube/hose for detection, and the installation position can be selected flexibly.

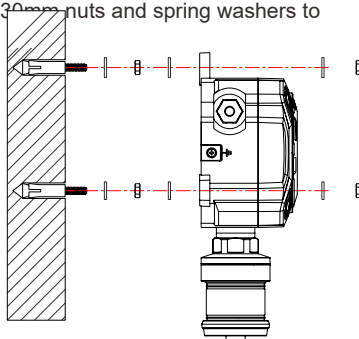
size of the hole of the detector (above), fix three 6mm expansion bolts on the wall, fix them with screws,

Wall-mounted: This installation method is often selected for normal indoor inspection.

According to the nuts and spring washers, and then use 6x30mm nuts and spring washers to fix the expansion bolts on the wall, as shown.

Note: The installation location must be well grounded or insulated. Leakage of electricity may cause the detector to work abnormally.

* Other installation methods such as horizontal pipe, vertical pipe can be adjusted according to site conditions



Sampling tube selection

The sampling tube should be made of materials that have no chemical reaction with the gas to be detected and no adsorption, and the tube should not exceed 50 meters.

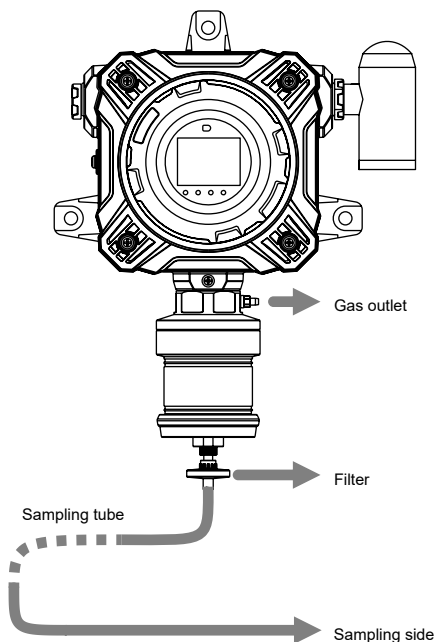
Sampling point selection

The sampling point should be close to the leak source within a distance of 1 m or the area where workers stay.

To detect toxic gases lighter than the air index, the sampling point should be installed above the use environment, and the smaller the detection point, the higher.

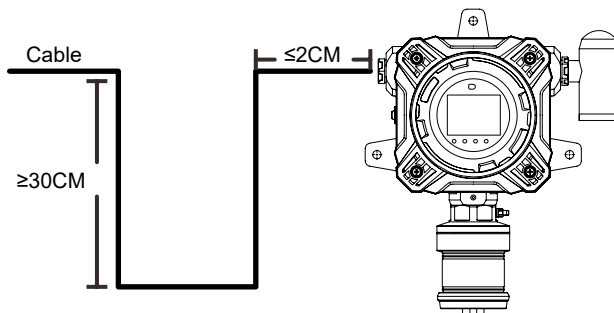
To detect harmful gases heavier than the air index, the sampling point should be installed below the operating environment.

Commonly, gas weight is similar to air, their sampling point installation height should be 1.5 meters above the ground .



Wire connection instructions

In outdoor areas with a lot of dust, rain or water mist, dust-proof, moisture-proof and rain-proof treatment (such as installing a rain cover) is required, and the wiring is recommended as shown in the picture below, which can prevent rain from pouring back and affect the internal circuit board of the instrument.



Warning: The wire connection must be operated by professionals, otherwise it may cause electric shock or damage the instrument.

***Note: During the wire connection process, it is forbidden to power on.**

Cable selection:

1. RS485 transmission cable: Please use shielded twisted pair cable, the theoretical maximum transmission distance is about 1200m, and the actual transmission distance is less than the theoretical value. If long-distance transmission is required, signal transmission repeaters can be used, but no more than 8 repeaters on one wire (repeaters need to be purchased separately).

2. 4-20mA transmission cable: Please use shielded cable with a core diameter of 0.75mm or more.

*The transmission distance of 4-20mA is determined by the load resistance. The maximum load of this

detector is 500Ω (when powered by 24V). The load resistance includes the input resistance of the control system (controller, PLC, DCS, etc.) and the internal resistance of the cable. Under the condition that the input resistance of the control system remains unchanged, the transmission distance is calculated with reference to the following formula:

Reference distance = $(500 - R_c) \div R_m$

* R_c -input resistance of control system, R_m -resistivity of transmission cable.

Wiring interface

J1 on left is the relay control interface: COM (common end), NO (normally open end).

J2 terminal on left, the interfaces from top to bottom are: 24V (DC power-positive), GND (power ground), A (RS485A-positive end), B (RS485B-negative end).

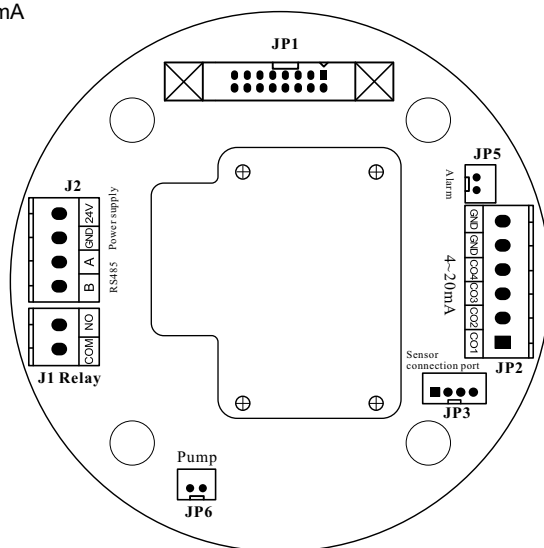
JP5 Alarm light interface

JP2 terminal on right is the 4-20mA interface

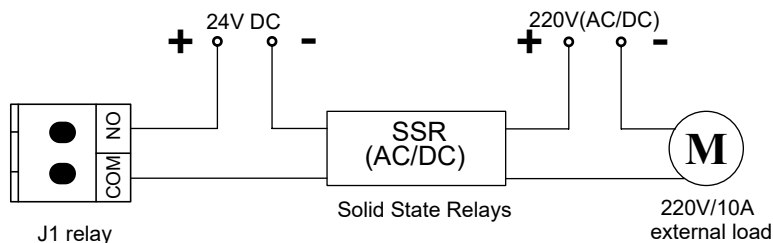
JP3 terminal on right is the

digital probe interface, from top to bottom are:

GND (power ground), followed by sensor channels COM4, COM3, COM2, COM1.



Application example: At the site, the detector detects harmful gas and reaches the alarm value. The detector screen and indicator lights prompt an alarm, and if an optional alarm light is installed, there will be an audible and visual alarm. At this time, the normally open end of the relay closes the circuit, (as shown in the figure below), which can drive the fan for ventilation or drive the alarm system.



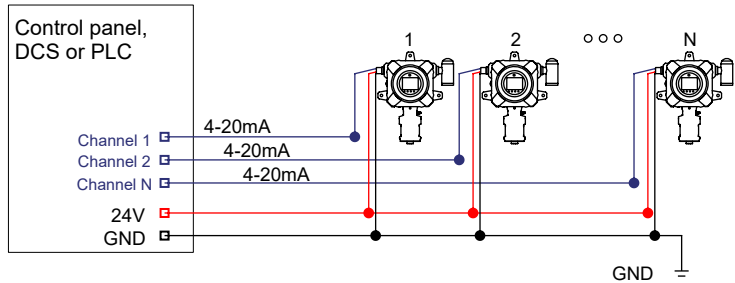
Warning: When the instrument alarms, you must leave the workplace as soon as possible. Otherwise, serious personal injury or personal injury may be caused.

Please re-calibrate and check the detector afterwards to avoid the expansion of equipment errors and cause false alarms.

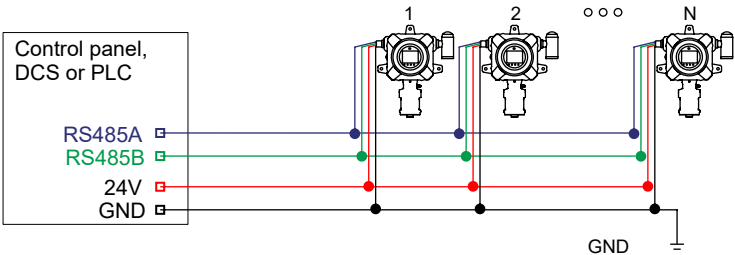
Connection diagram of multiple instruments

4-20mA current signal output mode and RS485 digital signal output mode are different in wiring; the following example power supply connection mode is for reference only, and the power supply mode can be selected according to the actual situation during installation.

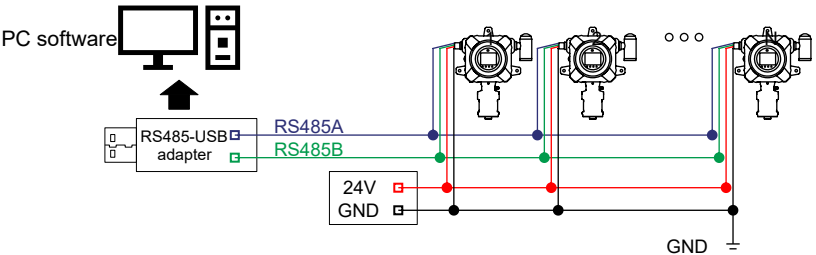
A. 4-20mA current signal output connection mode. (must be grounded together)



A. RS485 digital signal output connection mode 1. (can be independently grounded)

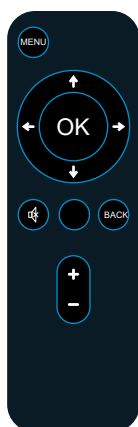


C. RS485 digital signal output connection mode 2. (can be independently grounded)



8` Remote controller instruction

Note: When using, please aim at the infrared receiving port above the display screen to operate. The instrument is equipped with a remote controller with a total of 11 buttons. as the picture shows.



Key	Function
MENU	Enter the menu
Mute	Turn off the sound
PUMP	Power on or off the pump
BACK	Cancel/Return/Unit Switch
OK	Confirm
↑	Shift Up
↓	Shift Down
←	Shift left
→	Shift Up right
+	Plus
-	Minus

- 1.MENU key: enter the menu (in the detection interface).
- 2.Mute key: Turn off the alarm sound of the instrument (in the detection interface).
3. PUMP key: switch the pump on and off (in the detection interface).
4. BACK key: cancel; return to the previous menu or detection interface,Double-click the BACK button on the detection interface to switch the unit (only $\mu\text{mol/mol}$ and PPM).
- 5.OK key: confirm; enter the next level menu.
- 6.Up key: Move the cursor up.
- 7.Down key: Move the cursor down.
- 8.Left key: move the cursor to the left; select the position to modify the data.
- 9.Right key: move the cursor to the right; choose to modify the data position.
- 10.Add key: increase the value.
- 11.Minus key: decrease the value.

9` Function Description

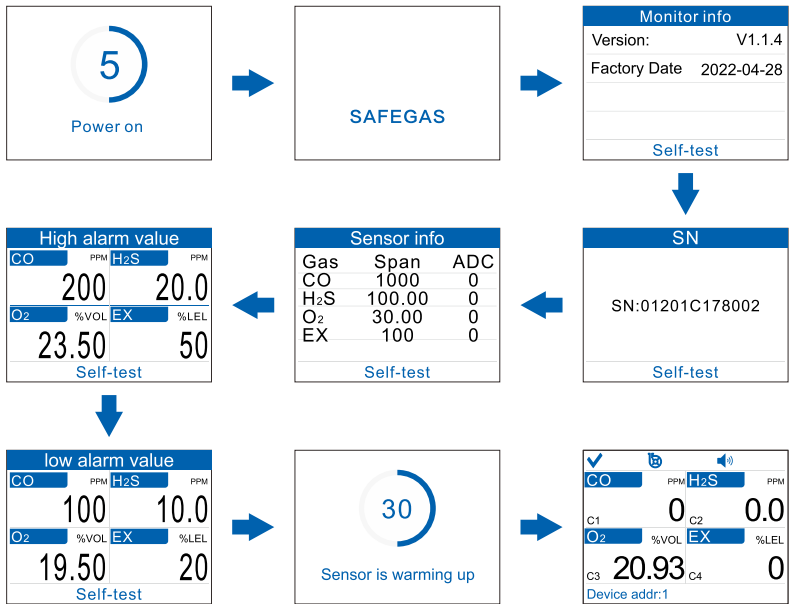
1 Power On/Off

1.1 Power On

- 1) In the power-off state, check whether the power cord on the left side of the instrument is in good condition and has no foreign objects.
- 2)When connect with the power, the instrument power on.

When the instrument power on, it will initially display "Power On" (if it cannot be displayed normally, the instrument may be faulty, please contact the agent or after-sales service department at that time), then enter the self-test, and then enter the instrument preheating countdown.

After the startup is complete, the reading and various function icons will be displayed on the screen.



1.2 Power Off

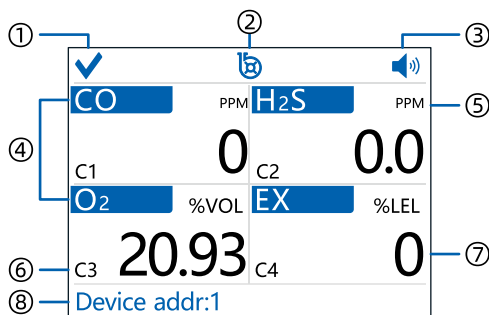
In the normal measurement state or when there is power, just disconnect the power.

2 User Interface

2.1 Detection interface description

The detection interface on the instrument displays the sensor type, indication and other functional status information.

The top are: self-test status (passed "✓", failed "✗"), air pump (pump running-blue dynamic; pump stop-gray), alarm (on-blue; off-gray)



1) Self-test status: blue ✓ self-test is successful and the device is normal; gray ✗ means the device is abnormal in self-test, please contact the manufacturer.

2) Air pump status: blue on, gray off.

3) Sound status(Optional): blue on, gray off. It's the optional function. If detector with alarm light, then have this function.

4) Gas name: The name of the gas type is in the blue box.

5) Gas unit: Small black characters are gas units.

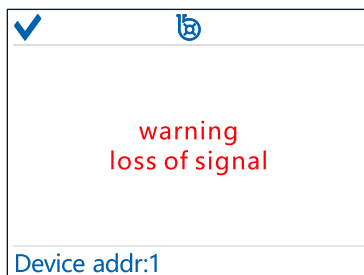
6) Channel number: Corresponding to output 4-20mA interface CO1, CO2, CO3, CO4 (page 12).

7) Concentration reading: The black characters are the gas concentration readings.

8) Address number: detector address

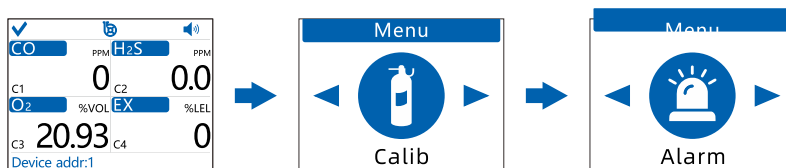
When the following screen appears, please check the device.

Loss of signal: The detector is not connected or has poor contact. After the reconnection is correct, the interface still appears, please contact the manufacturer.



2.2 Main menu interface operation

In the gas detection interface, short press the "MENU" button, the instrument will enter the main menu interface immediately; press the "BACK" button in the main menu interface to return to the gas detection interface.

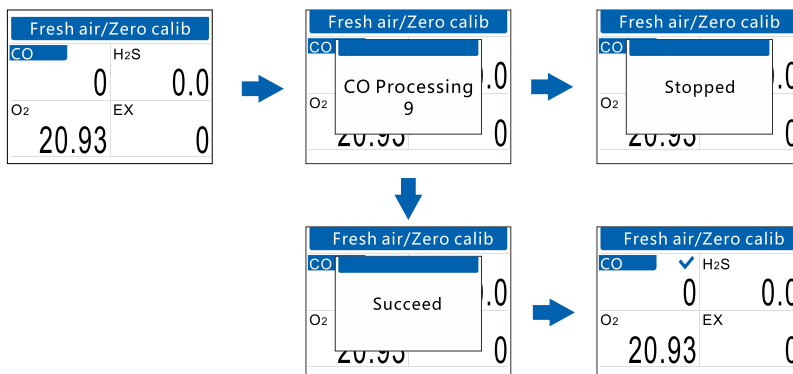


2.3 Calibration

2.3.1 Fresh air/zero calibration

In the fresh air/zero point calibration interface, press the "←" and "→" keys to select the sensor to be calibrated, and then press the "OK" key to enter the calibration state, and then enter the 30-second countdown. During the calibration countdown period, you can press "BACK" Key to cancel zero calibration..

* In the "fresh air/zero point calibration" interface, you can press the "BACK" key to return to the previous menu.



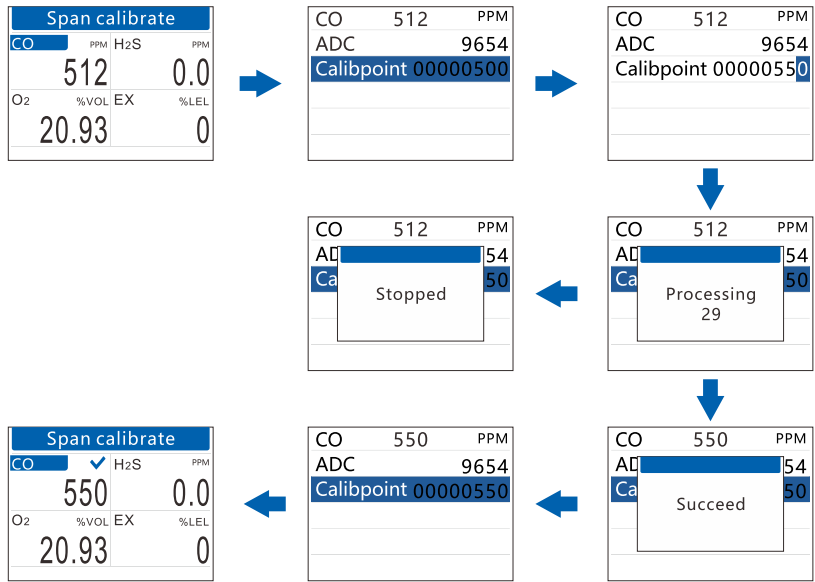
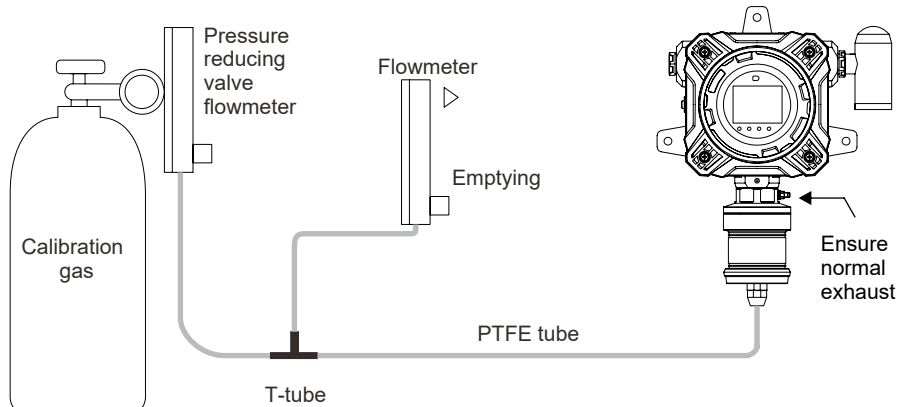
Notice:

1. For gases originally existing in the air (such as carbon dioxide, oxygen, nitrogen), the instrument is calibrated as 450PPM for carbon dioxide; 20.93% VOL for oxygen; 78.1% VOL for nitrogen.
2. Before do this operation, it is recommended to start up and warm up for 10~20 minutes.
3. When performing this operation, please turn on the instrument and place it in pure air for 3-5 minutes, and wait for the value to stabilize before proceeding, otherwise the displayed data will be inaccurate.

2.3.2 Span Calibration

The pump flow of YT-98H is about 0.6(±0.1)L/min. The instrument must be connected to the standard gas cylinder through a T-shaped calibration tube (tee joint), and the other end is connected to the flow meter. During ventilation calibration, ensure that the emptying of the bypass flow meter is above 100mL/min.

In the span calibration interface, press the "OK" key to enter the span calibration sub-interface.



There is an option in the span calibration sub-interface. At the same time, the gas type, real-time concentration value, unit and ADC value are displayed at the top.

The span calibration process is as follows (the following example assumes that the calibration gas is 550PPM CO):

After the instrument is turned on and enters the span calibration interface, connect a calibration gas with a known concentration to the the instrument through a PTFE tube.

According to the actually used calibration gas concentration value (550PPM), use the "↑" and "↓" keys to move the cursor to select the closest calibration point.

Press the "OK" key to enter the parameter setting mode, use the "←" and "→" keys to move the cursor to select the pre-modified number, and the "+" and "-" keys to modify the selected number, and set the value on the right (set fixed value) is modified to be the same as the calibration gas used.

Open the valve of the calibration gas cylinder, and input the calibration gas into the instrument at a flow rate of 0.9L/min (ml/min) or more. After the real-time concentration (upper middle) displayed on the instrument is basically stable (about 1-3 minutes, The stabilization time of different sensor is different), press the "OK" button, then the instrument enters the 30-second countdown for calibration, the calibration operation is completed after the screen displays "success".

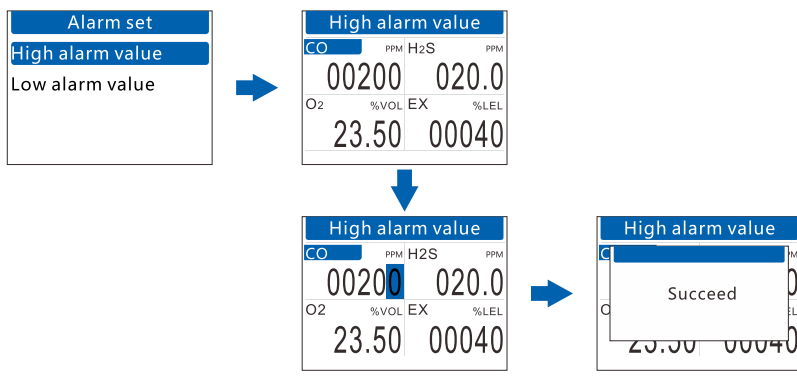
Notice:

- 1. During the calibration countdown period, you can press the "BACK" key to terminate the standard gas calibration.**
- 2. When performing calibration, please confirm that the standard gas pipeline has been connected. Please perform calibration after the value displayed is stable, otherwise will cause inaccurate measurement.**
- 3. Setting value: the actual concentration of the calibration gas currently input.**
- 4. When selecting the calibration point, please follow the principle of "zero point < calibration point ≤ range", otherwise the calibration will be failed.**

2.4 Alarm set

2.4.1 High alarm value, low alarm value

There are 2 alarm values, high alarm value and low alarm value, take the high reporting limit as an example. In the alarm setting interface, press the "←" and "→" keys to move the cursor to select and enter the high alarm limit setting interface.



High alarm value set:

- Press the "OK" key to confirm the input, and then press the "+" and "-" keys to modify the value.
- Press the "←" and "→" keys to move the cursor.
- After entering the value, press the "OK" key to confirm.

Notice:

1. The high alarm value cannot be lower than the low alarm value.
2. The low alarm value or the high alarm value cannot be higher than the range.

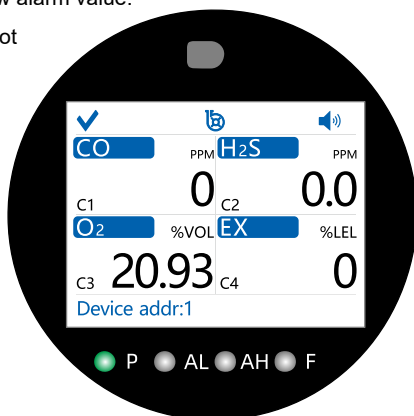
* Indicator status:

Power: After power on, the green light is on.

Low alarm : no low alarm, light is off; low alarm, red light is on.

High alarm: no high alarm, light is off; high alarm, red light is on.

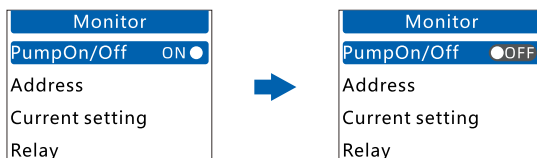
Fault: no fault, no light; self-test fault, orange light on.



2.5 Monitor 2.5.1

Pump On/Off

In the main menu interface, use the "←" and "→" keys to move the cursor and select the "Monitor" option, then press the "OK" key to enter the "Monitor" submenu.

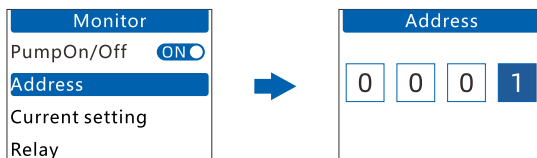


In the monitor interface, use the "←" and "→" keys to move the cursor to select the "pump on/off" option, and press the "OK" key to turn on and off. In addition, press the PUMP key will also turn on or turn off the pump on any interface.

In the "monitor" interface, press the "BACK" key will return to the previous menu.

2.5.2 Address

When multiple detectors are connected to the control panel, in order to distinguish each detector, we need to set a different address value for each detector. In the monitor setting interface, use the "↑"、"↓" direction keys to move the cursor and select "address". Then press the "OK" key to enter the "address" setting interface. In the address setting interface, press the "BACK" key will let you return to the main menu interface.



Address setting:

- Press the "OK" key to confirm the input, and then press the "+" and "-" keys to modify the value.
- Press the "←" and "→" keys to move the cursor.
- After entering the value, press the "OK" key to confirm..

In the "Address" menu, you can press the "BACK" key at any time to return to the previous menu.

Note: There is only one address for each detector. Do not set the same value for multiple detectors. The effective address range is 001~200!

For example: two four-gas detectors.

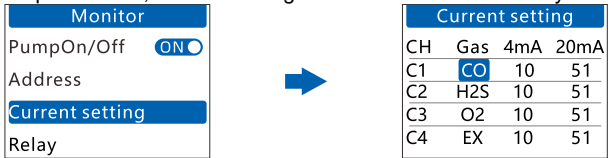
Detector 1, the address is set to 001, then the channel C1 is 001, the channel C2 is 002, the channel C3 is 003, and the channel C4 is 004;

Detector 2, the address is set to 005, channel C1 is 005, channel C2 is 006, channel C3 is 007, and channel C4 is 008.

By analogy, the set address is determined by the channel quantity.

2.5.3 Current Setting

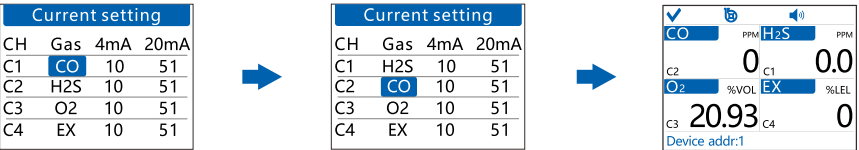
In the "Current Setting" interface, you can fine-tune and calibrate the corresponding line of the output signal, or adjust the output channel. In the instrument setting interface, use the four direction keys to move the cursor to select the gas, 4mA or 20mA option, and use the "+" and "-" keys to adjust the parameters, and the settings will take effect immediately.



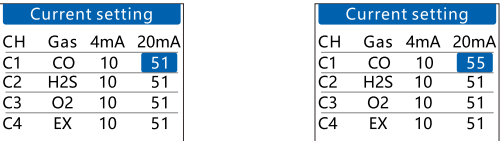
Output channel adjustment: Arrow keys to select gas, "+" , "-" keys to adjust the gas, the change will take effect immediately. This setting is displayed synchronously in the detection interface. Such as: C1 and C2 channel gas exchange, return to the detection interface

After that, the channel display corresponding to CO and H2S will also be corresponding to C2 and C1.

Current signal fine-tuning: select the 4mA or 20mA option of the channel which has the connection error with the arrow keys, connect the multimeter to check and verify, press the "+" and "-" keys to adjust, after the multimeter shows that the parameters meet the requirements, press the "BACK" key to exit the setting interface .



In the "current setting" menu, you can press the "BACK" key at any time to return to the previous menu.

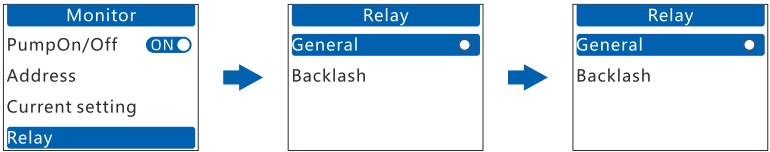


2.5.4 Relay

There are 2 options in the "Relay" menu, which are "General" and "Backlash". Use the "↑" and "↓" keys to switch between the two options. After selected, press "OK" to complete the setting In "Relay" setting interface, press "back" will let you back to previous menu.

General: The detector changes from normal to alarm state, and the relay control interface is normally closed or normally open; the detector changes from alarm to normal state, and the relay control interface is normally open or normally closed.

Example: When the detector alarms (low or high alarm), the relay normally open end interface closes the circuit to drive the ventilation system or the alarm system to remind the operator; when the detector returns to normal state, the relay normally open end interface returns to the open circuit state and closes the ventilation system or alarm system.



Backlash: The detector triggers the high alarm state, and the relay control interface is normally closed or normally open; when the detector returns to the normal state from the high alarm, the relay control interface is normally open or normally closed.

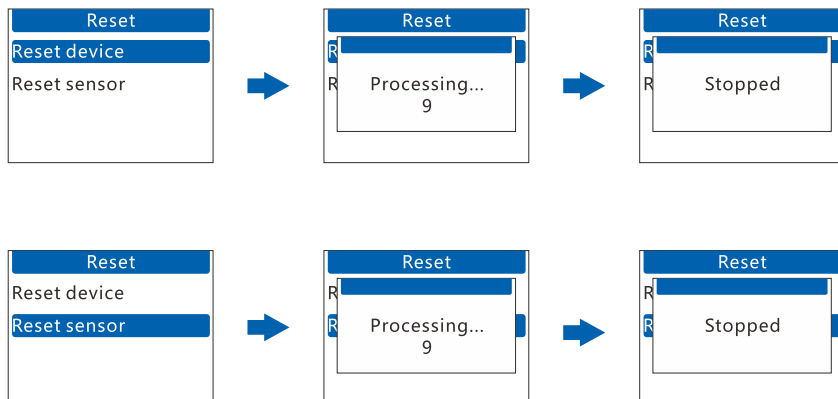
For example: when the detector triggers a high alarm, the normally open port of the relay closes the circuit to drive the ventilation system or alarm system to remind the operator; the detector returns to the normal state, the normally open port of the relay returns to the open state, and the ventilation system or alarm system is turned off.

*Specific applications need to take into account the characteristics of special gases such as oxygen.

2.5.5 Reset

Reset device: This function can restore all settings (except the sensor calibration parameters) to the factory settings.

Reset sensor: this function can restore the instrument's sensor to the factory calibration settings. Reset operation:



- First press the "↑" and "↓" keys to select and press "OK" to confirm. Then a 10-second countdown will be displayed. During the countdown, press the "BACK" to terminate the reset. In the "Reset" interface, press the "BACK" key back to previous menu.

Note: The reset operation is irreversible. After reset, the parameters set by user will be cleared and can't be restored. Please use it carefully.



2.5.6 Language Setting

The instrument supports both Chinese and English Language.

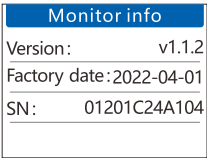


- First press the "↑" and "↓" keys to select and press "OK" to confirm to switch. In the "Language" setting interface, press the "BACK" key will let you back to previous menu.

2.6 Info

2.6.1 Monitor Info

Monitor info including Version and Date.



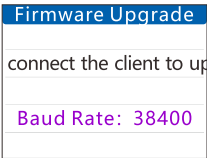
2.6.2 Sensor Info

Sensor info including gas type, measure range and ADC value

Sensor Info		
Gas	Span	ADC
CO	1000	56
H ₂ S	100.00	54
O ₂	25.00	13533
EX	100	1218

2.6.3 Firmware Upgrade

For online upgrade, you need to use the PC terminal to operate. For details, please consult the sales staff or check the relevant operating instructions.



10` Common faults and solutions

Fault phenomenon	Possible cause of failure	Solution
Sensor failure	Over range used	Replace the sensor with a new one and use it properly
	Sensor loose	Please contact dealer or manufacturer for repair
	Use in non-detection environments	
	Personal operation error	
No response to detected gas	Circuit failure	Please contact dealer or manufacturer for repair
Display is not accurate	Sensor expired	
	Long-term uncalibrated	Please calibrate in time
Zero calibration function not available	Too much sensor drift	Calibrate or replace sensors in time
	Over range used	Please contact dealer or manufacturer for repair
When the instrument detects normally, the interface shows the full scale	Sensor failure	
Self-test failed	Sensor could not be found	1,Restart the instrument 2,Please contact dealer or manufacturer for repair

11` Terms of Service

Warranty Commitment

The company promises that all the detectors delivered by the company will be calibrated with the relevant specific concentration of standard gas. After purchasing the company's products, users do not need to do span calibration without special circumstances, and the operation must be performed by professional technicians.

This commitment is only available for detector and does not include accessories.

Repair time

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

The aforementioned restoration dates do not include shipping time.

Limited Liability Warranty

After your product is repaired by our maintenance agency, you will continue to enjoy the promise of the original warranty period.

When you need warranty service, please present a valid warranty certificate, including warranty card and a invoice or purchase contract.

When the situation listed in the warranty description is not covered by the warranty, you can choose a paid maintenance services.

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

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

- 1) Human-induced damage.
- 2) Damage caused by violation of operating regulations and requirements.
- 3) Damage caused by all natural disasters such as floods, fires, etc.
- 4) Damage caused by harsh use environment.
- 5) This product is repaired, altered, modified or disassembled by unauthorized service personnel.

12` National standards for product development, design and production

Explosion-proof standard:

GB 3836.1-2010 "Explosive Atmospheres Part 1: General Requirements for Equipment"

GB 3836.2-2010 "Explosive Atmospheres Part 2: Equipment Protected by Flameproof Enclosure "d""

Gas verification standards (taking conventional four gases as an example):

JJF 1421-2013 "—Outline of Type Evaluation of Carbon Oxide Alarms"

JJF 1363-2019 "Type Evaluation Outline of Hydrogen Sulfide Gas Detector"

JJG 365-2008 "Regulations for the Verification of Electrochemical Oxygen Meters" JJG 693-2011 "Regulations for the Verification of Combustible Gas Detection Alarms"

Other:

GB 12358-2006 "General technical requirements for ambient gas detection and alarm instruments in workplaces"