



AIYI Technologies GTQ-AF110 Gas and Dust Detector Instruction Manual

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AIYI Technologies GTQ-AF110 Gas and Dust Detector



Specifications

- Model: GTQ-AF110/GTQ-AF111/GT-AF112-R/AG310/AG311 AG200
Anr-N/Anr-S
- Version: 11.31.21090021

Product Introduction

AIYI Technologies GTQ-AF110, GTQ-AF111, GT-AF112-R, AG310, and AG311 gas detection transmitters are suitable for detecting the content of combustible and toxic gases such as combustible gas, oxygen, and toxic gases in explosion hazard areas. The product adopts the integrated design of sound and light alarms, which can effectively warn of various gas leakage hazards; modular design, and easy maintenance; with infrared remote control, can be achieved without open cover operation. IP66 protection class can be applied to all kinds of bad occasions.

| | | |
|--|------------|--|
| Model Description: | GTQ-AF110 | 4-20mA signal catalytic combustible gas detector |
| | GTQ-AF111 | RS485 signal catalytic combustible gas detector |
| | GT-AF112-R | 4-20mA & HART signal infrared combustible gas detector |
| | AG310 | 4-20mA signal toxic gas detector |
| | AG311 | RS485 signal toxic gas detector |
| GTQ-AF110,GTQ-AF111 and GT-AF112-R are point-type combustible gas detectors for industrial and commercial purposes, and AG310 and AG311 are toxic gas detectors. | | |

Features

- Use high-performance sensors, quick response, safer and more reliable.
- Integrated design of large aperture sound and light alarm and numerical display.
- Modular design, plug-in replacement of each component, simple and convenient maintenance.
- Stainless steel + aluminum alloy material, the protection level of the whole table reaches IP66, which is suitable for harsh working conditions.
- High-brightness OLED display, LED status indicator, display rich information.

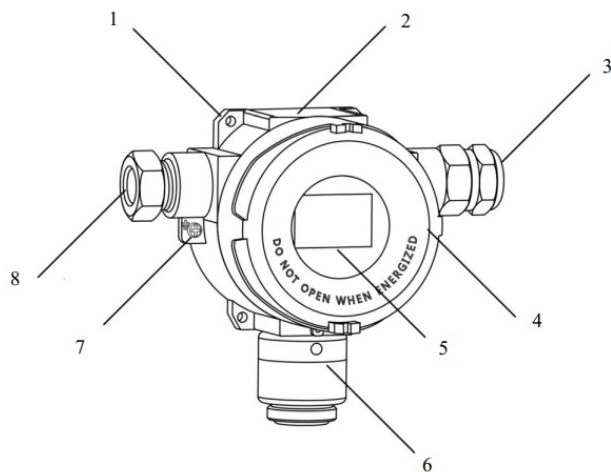
- Built-in low-report, high-report, and fault three switches, which can realize multi-level interlocking. Full English menu, infrared remote control operation, no need to open the cover on site.

The design, manufacture, and verification of this product follow or refer to the following national standards:

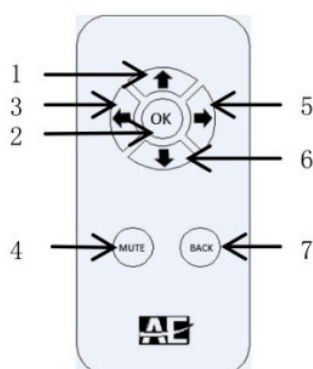
- GB15322.1-2019 "Combustible Gas Detector Part 1: Point-type Combustible Gas Detector for Industrial and Commercial Use"
- GB 3836.1-2010 "Explosive Atmosphere Part 1: General Requirements for Equipment"
- GB 3836.2-2010 "Explosive Atmosphere Part 2: Equipment Protected by Flameproof Enclosure "d"
- GB 3836.4-2010 "Explosive Atmosphere Part 4: Equipment Protected by Intrinsic Safety Type "i"
- GB/T 50493-2019 Code for Design of Detection and Alarm of Combustible Gas and Toxic Gas in Petrochemical Industry"
- GB 12358-2006 "General Technical Requirements for Gas Detector and Alarm in Working Environment"
- GB 16838-2005 "Environmental Test Methods and Severity Levels of Fire Electronic Products"
- GB/T 4208-2017 "Enclosure protection class (IP code)"
- GBZ 2.1-2007 "Occupational Exposure Limits for Hazardous Factors in the Workplace Part 1: Chemical Hazardous Factors"
- JJG365-2008 "Electrochemical Oxygen Analyzer"
- JJG 693-2011 "Combustible gas detection alarm"
- JJG 915-2008 "Carbon Monoxide Detection Alarm"
- JJG 695-2003 "Hydrogen Sulfide Gas Detector"
- JJG 551-2003 "Sulfur Dioxide Gas Detector"

Description

1. mounting hole
2. nameplate
3. buzzer
4. light Alarm
5. OLED display
6. sensor housing
7. grounding screw
8. Explosion-proof

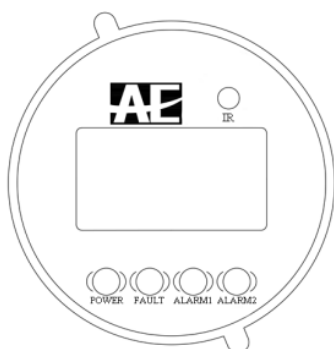


Remote control



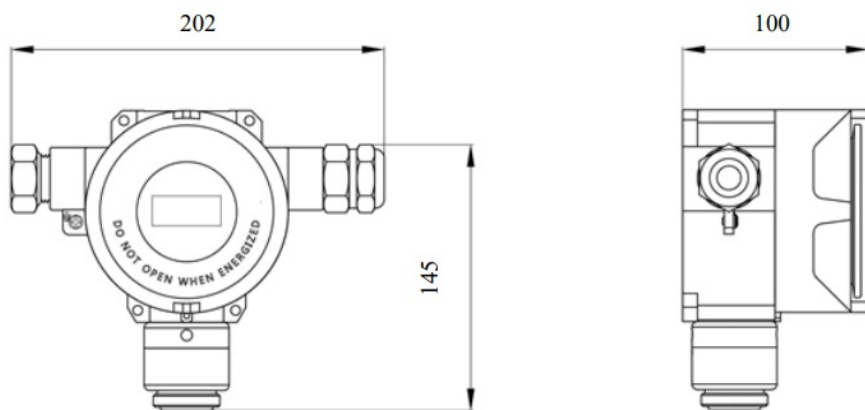
| | |
|------|----------------------------------|
| ↑ | Move up or number plus |
| ↓ | Move down or decrease the number |
| ← | Left |
| → | Right |
| OK | Confirm or enter the menu |
| MUTE | mute |
| BACK | Exit |

Display



| | |
|--------------|--|
| Infrared | Receive infrared remote signal |
| Power supply | Normal on, the green light is off when power-off |
| Fault | Normally off, yellow light is always on when fault occurs |
| Alarm1 | Normally off, and the red light is always on when the alarm-1 occurs |
| Alarm2 | Normally off, the red light is always on when the alarm-2 occurs |

Gas detector size(mm)



| Description | Specifications | GTQ-AF110 | GTQ-AF111 | GT-AF112-R | AG310 | AG311 |
|-----------------------------------|---|-----------|-----------|------------|-------|-------|
| Detected gas | | | | | | |
| Combustible gas | Catalytic combustion, infrared | ● | ● | ● | - | - |
| Toxic gas | Electrochemical, infrared, PID | - | - | - | ● | ● |
| performance | | | | | | |
| Measuring range | 0-100%LEL | ● | ● | ● | - | - |
| | See the gas selection table for details | - | - | - | ● | ● |
| Typical response time* | T90≤30S | ● | ● | ● | - | - |
| | T90≤30/60/180S | - | - | - | ● | ● |
| Linear accuracy* | ≤±3%FS | ● | ● | ● | ● | ● |
| Repeatability* | ≤3%FS | ● | ● | ● | ● | ● |
| Electrical characteristics | | | | | | |
| Power supply | 18-28VDC | ● | ● | ● | ● | ● |
| power consumption | ≤3.5W | ● | ● | ● | - | - |
| | ≤2W | - | - | - | ● | ● |
| output signal | 4-20mA | ● | - | ●+HART | ● | - |
| | RS485 | - | ● | - | - | ● |
| Wiring | Three-wire | ● | - | ● | ● | - |
| | Four-wire | - | ● | - | - | ● |
| Use cable | RVVP3*1.0mm ² | ● | - | ● | ● | - |
| | RVVP4*1.0mm ² | - | ● | - | - | ● |
| Relay output | 3relays(250VAC/5A 30VDC/5A) | ● | ● | ● | ● | ● |
| display | OLED display | ● | ● | ● | ● | ● |
| Indicator light | Power,fault,alarm-1, alarm-2,IR | ● | ● | ● | ● | ● |
| Operation | remote control | ● | ● | ● | ● | ● |
| Ingress Protection | IP66 | ● | ● | ● | ● | ● |
| Ambient Temp. | -40℃~70℃ | ● | ● | ● | - | - |
| | -20℃~60℃ | - | - | - | ● | ● |
| Humidity | 10~95%RH Non-condensing | ● | ● | ● | ● | ● |
| Work pressure | 80-120kPa | ● | ● | ● | ● | ● |

| Structural characteristics | | | | | |
|----------------------------|---|---|---|---|---|
| Body material | ADC12 aluminum alloy + 316L stainless steel | ● | ● | ● | ● |
| Thread interface | NPT1/2 | ● | ● | ● | ● |
| Weight | About 2kg | ● | ● | ● | ● |
| Size | 145*202*100mm(H*W*D) | ● | ● | ● | ● |

Note:

- This means it has this function, -which means it does not have this function.
 - Refer to attached table 1 for detailed detection gas.
 - Different gases will vary, and their response time, error, and repeatability are different. The data in the above table is for reference only. Please consult the manufacturer for details.

Installation

Packing list

Please check and count the goods before installation to confirm that the appearance of the packing box is complete. After unpacking, check the installation accessories and check whether they are complete. If there is any loss, please contact our company as soon as possible. Items not included in the packing list may be used during the installation process, please purchase by yourself. Under normal circumstances, the gas detection transmitter contains the following products and accessories:



DETECTOR *1



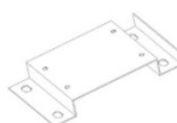
MANUAL *1



CERTIFICATE *1



(optional)
REMOTE CONTROL *



MOUNTING PLATE *1



BOLTS *1

Note: Remote is universal. For eco-friendly, each order equips one remote only.

Cautions

- Check if the Ex-mark is consistent with the site condition and if any appearance of obvious cracks and other defects, to ensure the perfect explosion-proof performance.
- The detector shall connect to the corresponding controller, and it is forbidden to connect with other brands or models' controllers; The controller must be installed in a non-hazardous area.
- Keep the power off during installation, and ensure that the ambient temperature and humidity are by the detector's operating requirements.
- The detector is designed for gas leak detection. Without permission from the manufacturer, it is forbidden to be

used for other purposes such as internal pipelines.

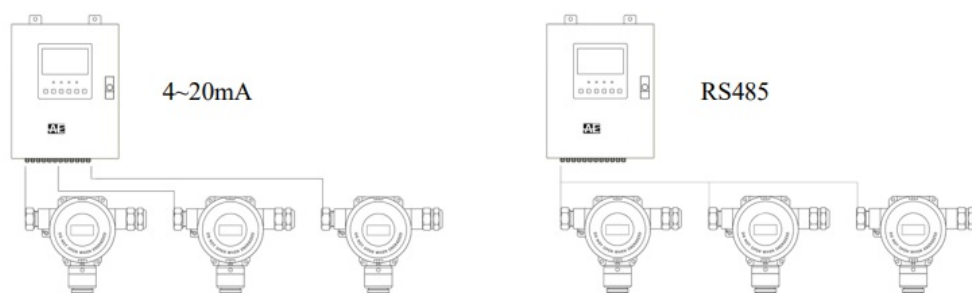
- The ingress protection grade of the detector is IP66 there is no need for rain cover; keep the sensor downward and no painting and blocking on it.
- Keep the detector far away from the high-power equipment.
- Catalytic combustion sensors require oxygen in the air, the absence of oxygen may cause the readings lower than the actual. The detector will not work properly in the oxygen below 10%VOL.
- Long-term presence of H₂S, halogen elements (fluorine, chlorine, bromine, iodine), heavy metals, organic solvents, and acid gases in the environment may cause distortion of the test results, and regular inspection or calibration is required. Be careful not to touch the internal circuit when wiring and the case of the meter must be grounded reliably.
- The installation, use and maintenance of the product should also comply with the instruction manual, “Electrical Equipment for Explosive Gas Atmospheres” (GB3836.13-2013) Part 13: Overhaul of Electrical Equipment for Explosive Gas Atmospheres, “Electrical Equipment for Explosive Gas Atmospheres” (GB3836.15-2017) Part 15: “Electrical Installation in Hazardous Locations (Except Coal Mines), “Electrical Equipment for Explosive Gas Environments” (GB3836.16-2017) Part 16: Inspection and Maintenance of Electrical Installations (Except Coal Mines) and “Electrical Equipment Installation “Code for Construction and Acceptance of Electrical Installations in Engineering Explosion and Fire Hazardous Environments” (GB50257-2017) and other relevant regulations.

Installation Preparation

- Complete gas detection transmitter components and installation accessories.
- Screwdriver, multimeter (if needed), and other installation tools.

Power supply and cables

The standard working power supply of the transmitter is 24VDC. Given the voltage drop caused by the cable resistance, it should be ensured that the supply voltage of the transmitter is not less than 18VDC. If it is directly connected to a DCS or PLC system, please ensure that the power supply of the transmitter and the resistance of the entire loop should be $\leq 600\Omega$. If the voltage cannot meet the minimum operating voltage of the transmitter, a repeater, explosion-proof box, and other equipment should be installed.



The transmitter and the controller are connected by shielded cables. Different cables should be selected according to different operating conditions. The cable laying should pay attention to the different wiring methods of the bus system and the branching system; it should comply with the national and industry specifications such as the “Electrical Safety Regulations for Explosive Hazardous Locations of the People’s Republic of China”; the wiring should not be parallel to the power cables and interfere with the communication. Cables are recommended. as follows:

| Model | AG310 | AG311 | GT-AF112-R | GTQ-AF110 | GTQ-AF111 |
|-------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Output signal | 4~20mA | RS485 | 4~20mA | 4~20mA | RS485 |
| Recommended cable | RVVP 3×1.0mm ² | RVVP 4×1.0mm ² | RVVP 3×1.0mm ² | RVVP 3×1.0mm ² | RVVP 4×1.0mm ² |
| Wiring | Three-wire | Four-wire | Three-wire | Three-wire | Four-wire |

For long-distance transmission, cables or repeaters should be replaced according to actual conditions.

Location selection

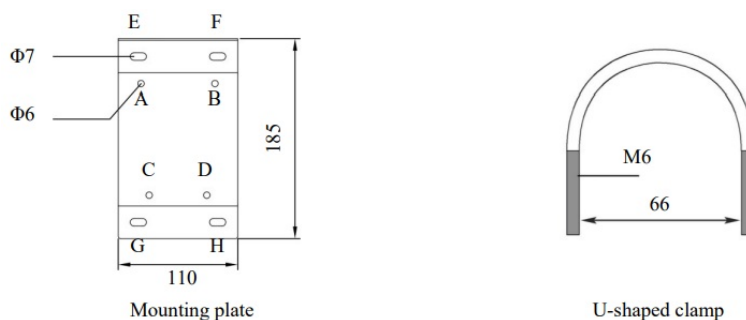
The installation position of the gas transmitter is crucial to achieve the best detection effect. When determining the location, it is recommended to consider the following factors: The requirements of the design drawings and the Design Code for the Detection and Alarm of Combustible Gas and Toxic Gas in Petrochemical Enterprises (GB50493-2019) shall be followed. The transmitter should be installed at the location where the gas flow rate is the maximum concentration or as close as possible to the gas leakage source. When installing indoors, if the source of leakage is outdoors, the instrument should be installed at the air inlet. The gas leakage source lighter than air is in a closed or semi-enclosed factory building. A transmitter should be installed above the leakage source, and a transmitter should be installed at the highest point in the factory building where gas can easily accumulate. Installation height selection: when heavier than air: the transmitter installation height should be 0.3-0.6m higher than the floor (floor surface); when it is lighter than air; the transmitter installation height should be 0.5-2m higher than the leakage source; and the specific gravity of the air When similar: the installation height of the transmitter is within 1m above and below the leakage source. The transmitter should be installed as far as possible in a place where there is no wind, dust, water, impact, vibration, corrosion, or electromagnetic interference.

For installation

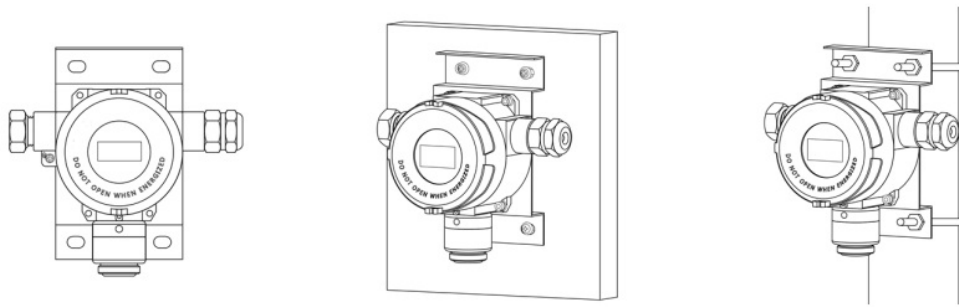
Use M5 screws (included in the accessories) to connect the transmitter to the mounting base ABCD. This product can be installed in wall-mounted or stand-pipe type.

- Wall-mounted installation: Use 4 6mm expansion tubes and self-tapping screws (included in the accessories) to fix the transmitter to the wall through the EFGH holes on the mounting base plate.
- Standpipe installation: Use the U-shaped clamp in the accessories to fix it on the cylinder or pipe (suitable for DN30- 65mm) through the EFGH hole of the installation bottom plate.

Installation accessories size



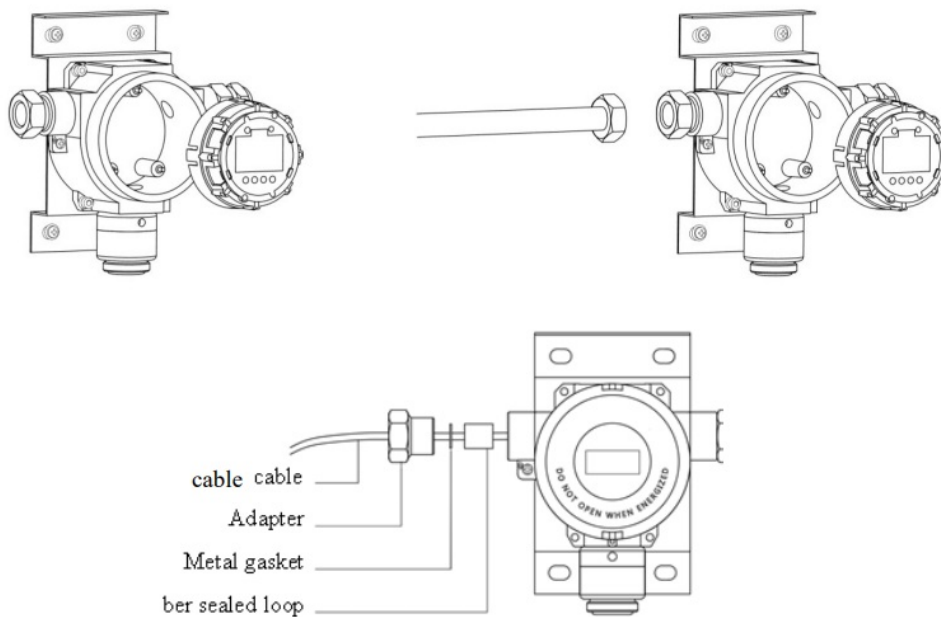
Installation diagram



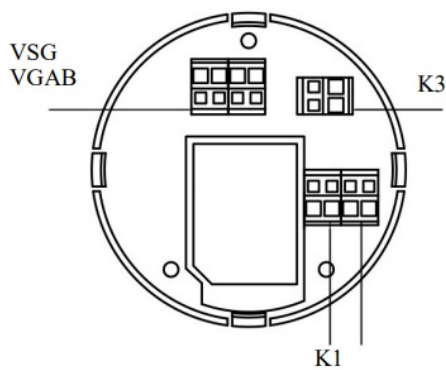
Wiring

- unscrew the detector cover counterclockwise.
- with your fingers buckle the recess around the panel part, and slowly pull out the circuit module up. Note that do not operate with violence. Because there are cable links between the circuit module and the sensor.
- Tighten the cable to the desired size, and then unscrew the compression nut, metal gasket, and rubber seal of the detector connector. After passing through the parts, the cable is inserted into the detector cavity, and the cable is tightened with the tightening nut.
- Use cold-pressed terminals for crimping at all wiring parts to avoid short circuits, bifurcation, or falling off of wire ends.
- Unplug the wiring terminal, select the corresponding terminal port to connect with the cable, plug it back into the wiring terminal after the wiring is firm, and restore the circuit module to its original position after pressing the wire. For wiring terminals, please refer to 1.2 Appearance and Structure.
- Ground the grounding screw of the enclosure by the regulations, and the grounding point should be prepared for corrosion protection.

Wiring

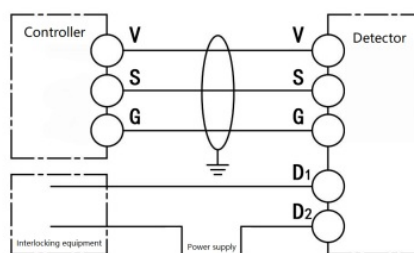
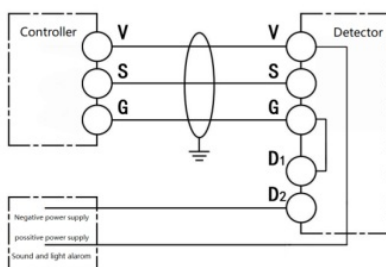
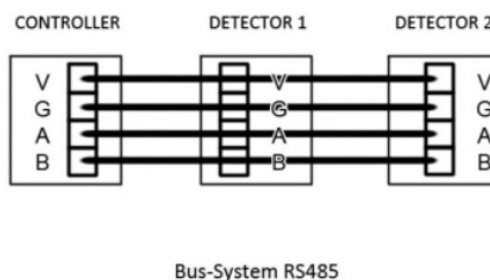
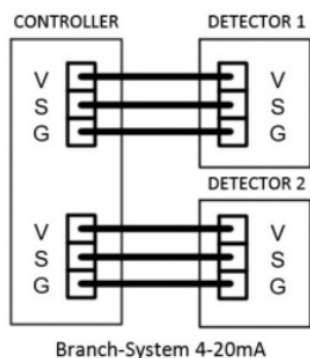


Terminals

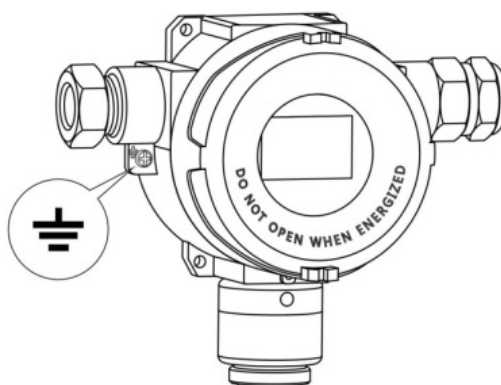


| | |
|-----|------------------------------|
| V | 24V power supply positive |
| S | 4~20mA signal output |
| G | 24V power supply negative |
| A B | RS485 signal output |
| K1 | Alarm-1 relay contact output |
| K2 | Alarm-2 relay contact output |
| K3 | Fault relay contact output |

Note: can only use one of the two in 4~20mA and RS485 output, pay attention to distinguish the actual.



Ground connection



Power-on test

- After powering on, the screen displays the software version number, screen detection, and 30s countdown after sensor detection to enter the main interface.
- Keep at least 20 minutes of power on at first time. And take it as a normal phenomenon if any alarm happens

because of the initialization. After the detector works in normal status, it will continuously display the gas concentration and output signal of 4- 20mA or RS485.

- Before powering on the system, verify that the wiring and installation are correct, and then power on after confirmation.

| Gas | principle | Time | Gas | principle | Time |
|---|----------------------|------|-----|-----------------|------|
| Combustible gas | catalytic combustion | 0.5h | O2 | Electrochemical | 0.5h |
| Toxic gas | Electrochemical | 1h | ETO | Electrochemical | 72h |
| CO2 | Infrared | 1h | VOC | PID | 0.5h |
| The above time is for reference only, please consult the manufacturer for details | | | | | |

- Due to the characteristics of the sensor, the transmitter needs to be warmed up/polarized for a period of time after it is energized before it can work normally. Sensors of different principles have different warm-up times. Generally speaking.
- Before the transmitter works normally, there may be inaccurate values, false alarms, etc. Please wait patiently. During this period, do not perform any operations such as calibration or parameter changes.
- If the transmitter still does not work normally after the warm-up/polarization time, please refer to the attached Table 5 to troubleshoot or directly consult the manufacturer.

Operation and Maintenance

Operation

- The transmitter can use infrared remote control to realize live operation without opening the cover, which is safe and reliable. For remote control operation, please refer to 1.2 Appearance and Structure.
- Point the remote control at the infrared window of the transmitter and press the “OK” button, and the transmitter will pop up a password input box. Enter the password (6 “OK” keys) to enter the menu. The detailed functions of the menu are as follows:

| | | |
|---|-----------------------|--|
| <div> <div>1. ALARM SET</div> <div>2. ZERO CAL</div> <div>3. SPAN CAL</div> <div>4. 485 ADDR SET</div> </div> | 1、Alarm setting | Set the upper limit alarm and lower limit alarm of the transmitter |
| | 2、Zero calibration | Carry out transmitter zero point calibration |
| | 3、Span calibration | Carry out transmitter range calibration |
| | 4、485 address setting | Set the RS485 address |
| <div> <div>5. FACTORY SET</div> <div>6. SELF TEST</div> <div>7. SAVE & EXIT</div> </div> | 5、Factory settings | Factory settings such as temperature coefficient, display unit, etc. |
| | 6、Self-check | Alarm self-check, check system version |
| | 7、Save and exit | Save and return to the main interface |

Alarm setting

- Enter the alarm setting, you can select the lower limit alarm setting or the upper limit alarm setting through the “up” and “down” keys. After selection, press the “OK” key to enter the alarm value setting state.
- The upper limit alarm value is higher than the set value alarm, and the lower limit alarm value is lower than the set value alarm. Note that oxygen is higher than the high alarm, lower than the low alarm, and other poisonous gases and combustible gases are higher than the alarm value.

1. ALARM SET
2. ZERO CAL
3. SPAN CAL
4. 485 ADDR SET

HIGH ALARM
LOW ALARM
BACK

HIGH ALARM SET
0025

5. FACTORY SET
6. SELF TEST
7. SAVE & EXIT

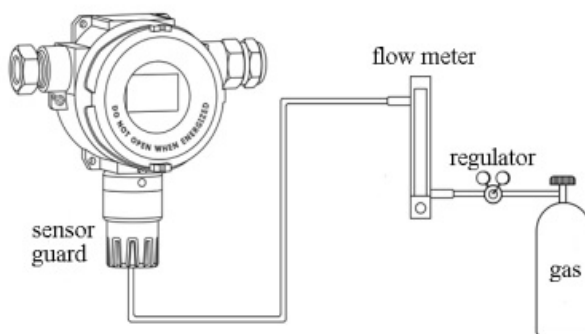
- Press “Left” or “Right” to switch the digits, and the “Up” or “Down” keys to adjust the value. After the setting is completed, press the “OK” key to save and return to the previous menu. Continue to press the “down” key to the save and exit option of the main menu, and press the “OK” key to save and return to the main interface.

Calibration Preparation

- Before calibration, you need to prepare: zero point standard gas, span standard gas, calibration pressure reducing valve (including flowmeter), matching calibration cover, and calibration hose.
- Connect the calibration gas cylinder, calibration pressure-reducing valve, hose, calibration cover, and transmitter tightly one by one, open the valves one by one to ventilate, and calibrate after the transmitter value is stable.
- The calibration operation needs to unscrew the upper cover of the transmitter, and safety measures must be taken before calibration. If there is a remote control, there is no need to open the cover.

Zero calibration

- Advice adopting pure N₂ to do zero calibration.



Zero gas and span gas

Calibration pressure reducing valve
(including flow meter)

Calibration hose (about 0.7m)

Calibration hood

Detector

- Open the regulator slowly at 0.5L/min, and prepare the zero calibration until a stable reading on the detector.

1. ALARM SET
2. ZERO CAL
3. SPAN CAL
4. 485 ADDR SET

ZERO CAL
YES
NO

ZERO. . .

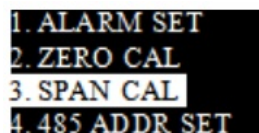
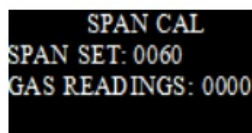
ZERO OK

- Enter the zero calibration menu, press the “up” key or “down” key to select YES, and then press the “OK” key to save and return to the previous menu.
- Continue to press the “down” key to the save and exit option of the main menu, and press the “OK” key to save and return to the main interface. Continue to press the “down” key to the save and exit option of the main menu, and press the “OK” key to save and return to the main interface.

Span calibration

- Select the specified concentration standard gas, see Attached Table 3 for details.

- Slowly open the gas cylinder valve, adjust the flow meter knob to 0.5L/min, ventilate and wait for the value to stabilize, and start calibration.

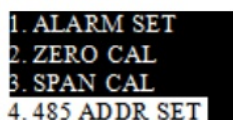
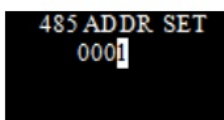
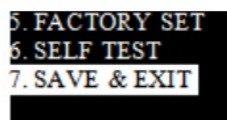





- Enter the range calibration menu, press the “left” key and “right” key to switch the digits, and the “up” key or “down” key to adjust the value, after the setting is completed, press the “OK” key to save and return to the previous menu.
- Continue to press the “down” key to the save and exit option of the main menu, and press the “OK” key to save and return to the main interface.
- The above operation is recommended to be repeated 3 times to ensure the stability of the instrument.

485 address setting

•

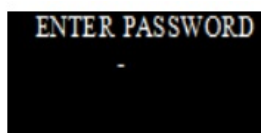
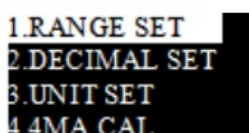
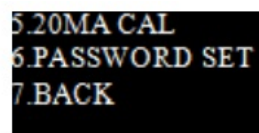




For RS485 signal transmitters, the address can be set in the 485 address setting menu.

- Enter the 485 address setting menu, press “Left” and “Right” to switch the digits, and the “Up” or “Down” keys to adjust the value. After the setting is completed, press the “OK” key to save and return to the previous menu. Continue to press the “down” key to the save and exit option of the main menu, and press the “OK” key to save and return to the main interface.

Factory setting

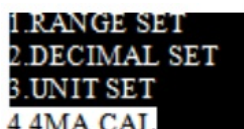
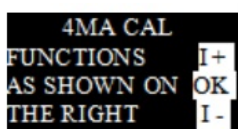
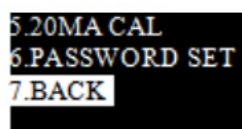
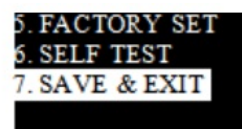
- The factory setting menu can make advanced settings for the transmitter unit, range, temperature coefficient, and other parameters. The password is 6 “up” keys.

Change the transmitter parameters to professional parameter settings. Improper operation is very likely to cause the meter to fail to work normally. It is not recommended that the user modify it by himself. Please contact the manufacturer if you need to modify it.

4mA/20mA current correction

For 4-20mA transmitters, when the transmitter output signal does not match the actual concentration, it can be adjusted in the current correction option. Connect the multimeter to the transmitter S and G terminals respectively.

Enter the 4mA current calibration menu, check the current value on the multimeter, and press the “up” key or “down” key to adjust the output current until the multimeter value is displayed as 4mA after the setting is completed, press the “OK” key to save and return to the previous menu. The 20mA current correction operation is

the same as the 4mA current correction operation.

Self-check

- The self-inspection menu can perform product self-inspection and query the system version.
- After entering the alarm self-test, the transmitter will check the indicator light and alarm light in turn.



- The system version can display the current transmitter software version number.

Maintenance

- For keeping the stable work of the detector, advise doing calibration every 90 days. Especially in hard field conditions.
- The operation of the detector, calibration, and other maintenance work should be carried out by qualified professionals.
- Keep using the recommended calibration gas by the manufacturer.
- Do not open the cover when energized.
- Lighter and high-concentration gas is prohibited to use for testing the detector.
- Replace the sensor in time once the sensor life is over.
- Using original parts provided by the manufacturer during the maintenance and replacement of the parts. The non-company replacement parts may affect the performance and safety of the instrument itself. If the user repairs themselves or replaces parts themselves, the company will hold no responsibility for any problems.
- Keep the instrument clean and if the gas sensor cover (part 6 on page 2) is blocked, it may affect the detection sensitivity and even damage the instrument.

Appendix

Attached is Table 1 Gas detector selection table

| Gas | | Measure range | principle | AG31X | GTQ-AF11X | GT-AF112-R |
|------------------|--|-----------------------------|----------------|-------|-----------|------------|
| Combustibl | EX | 0~100%I.F.I. | Catalytic | - | ● | ● |
| oxygen | O ₂ | 0-30%VOL 0-25% | Electrochemica | ● | - | - |
| Carbon | CO | 0-1000μmol/mol | Electrochemica | ● | - | - |
| Hydrogen | H ₂ S | 0-100μmol/mol | Electrochemica | ● | - | - |
| Chlorine | CL ₂ | 0-10μmol/mol | Electrochemica | ● | - | - |
| Sulfur | SO ₂ | 0-20μmol/mol | Electrochemica | ● | - | - |
| Ammonia | NH ₃ | 0-100μmol/mol | Electrochemica | ● | - | - |
| Nitric | NO | 0-250μmol/mol | Electrochemica | ● | - | - |
| Nitrogen | NO ₂ | 0-20μmol/mol | Electrochemica | ● | - | - |
| Hydrogen | HCL | 0-30μmol/mol | Electrochemica | ● | - | - |
| ozone | O ₃ | 0-1μmol/mol | Electrochemica | ● | - | - |
| Ethylene | C ₂ H ₄ O | 0-20μmol/mol | Electrochemica | ● | - | - |
| formaldehy | CH ₂ O | 0-20μmol/mol | Electrochemica | ● | - | - |
| Methanol | CH ₃ OH | 0-20μmol/mol | Electrochemica | ● | - | - |
| Phosphine | PH ₃ | 0-5μmol/mol | Electrochemica | ● | - | - |
| hydrogen | H ₂ | 0-1000μmol/mol | Electrochemica | ● | - | - |
| Fluorine | F ₂ | 0-1μmol/mol | Electrochemica | ● | - | - |
| Hydrogen | HF | 0-10μmol/mol | Electrochemica | ● | - | - |
| Hydrogen | HCN | 0-50μmol/mol | Electrochemica | ● | - | - |
| Phosgene | COCL ₂ | 0-1μmol/mol | Electrochemica | ● | - | - |
| Arsenide | AsH ₃ | 0-1/20μmol/mol | Electrochemica | ● | - | - |
| Silane | SiH ₄ | 0-50μmol/mol | Electrochemica | ● | - | - |
| Acrylonitril | C ₃ H ₃ N | 0-20μmol/mol | Electrochemica | ● | - | - |
| Carbon | CS ₂ | 0-20μmol/mol | Electrochemica | ● | - | - |
| Ethanol | C ₂ H ₅ O | 0-20μmol/mol | Electrochemica | ● | - | - |
| Sulfur | SF ₆ | 0-1000μmol/mol | Infrared | ● | - | - |
| carbon | CO ₂ | 0-5%/100%VOL | Infrared | ● | - | - |
| Toluene | C ₇ H ₈ | 0-20μmol/mol | PID | ● | - | - |
| Xylene | C ₈ H ₁₀ | 0-20μmol/mol | PID | ● | - | - |
| benzene | C ₆ H ₆ | 0-20μmol/mol | PID | ● | - | - |
| acetic acid | C ₂ H ₄ O ₂ | 0-1000μmol/mol | PID | ● | - | - |
| Organic Volatile | VOC | 0-20μmol/mol 0-1000μmol/mol | PID | ● | - | - |

Attached Table 2: VOC gas selection table

| Gas Name | Formula | Factor |
|--------------------------|----------|--------|
| Butane, n- | C4H10 | 46.29 |
| Butanol, 1- | C4H10O | 4.01 |
| Isooctane | C8H18 | 1.08 |
| Isopentane | C5H12 | 6 |
| Terpinolene | C10H16 | 0.46 |
| Isobutylene | C4H8 | 1 |
| Isobutane | C4H10 | 8 |
| Isooctyl alcohol | C8H18O | 1.5 |
| Isopropanol | C3H8O | 4.35 |
| Diisopropylamine | C6H15N | 0.7 |
| Hexene, 1- | C6H12 | 0.9 |
| Hexan-2-one | C6H12O | 0.8 |
| Hexane n- | C6H14 | 3.28 |
| Ethoxyethanol, 2- | C4H10O2 | 29.83 |
| Ethylene glycol | C2H6O2 | 20 |
| Ketene | C2H2O | 3 |
| Vinyl bromide | C2H3Br | 1 |
| Vinyl chloride | C2H3Cl | 2.1 |
| Ethylene | C2H4 | 8 |
| Butyl acetate, n- | C6H12O2 | 2.42 |
| Isoamyl acetate | C7H14O2 | 1.6 |
| Isobutyl acetate | C6H12O2 | 2.25 |
| Isopropyl acetate | C5H10O2 | 2.2 |
| Ethyl acetate | C4H8O2 | 3.63 |
| Methyl acetate | C3H6O2 | 5.18 |
| Propionaldehyde | C3H6O | 1.68 |
| Ethyl mercaptan | C2H6S | 0.69 |
| Ethanolamine | C2H7NO | 3 |
| Ethanol | C2H6O | 8.72 |
| Ethylene oxide | C2H4O | 15 |
| Chloroethanol 2- | C2H5ClO | 10 |
| Iminodi(ethylamine) 2,2- | C4H13N3 | 0.9 |
| Nitric oxide | NO | 8 |
| Acrylic Acid | C3H4O2 | 2.74 |
| Bromoethane | C2H5Br | 5 |
| Dibromochloromethane | CHBr2Cl | 10 |
| Bromobenzene | C6H5Br | 0.7 |
| Octane, n- | C8H18 | 1.58 |
| Octene, 1- | C8H16 | 0.69 |
| Nitroaniline 4- | C6H6N2O2 | 0.8 |
| Nitrobenzene | C6H5NO2 | 1.7 |
| Isoprene | C5H8 | 0.69 |
| Allyl alcohol | C3H6O | 2.07 |
| Allyl chloride | C3H5Cl | 4.5 |
| Amlyl acetate, n- | C7H14O2 | 1.8 |

| Gas Name | Formula | Factor |
|----------------------------|---------|--------|
| Amyl alcohol | C5H12O | 3.2 |
| Pentan-3-one | C5H10O | 0.8 |
| Pentan-2-one | C5H10O | 0.79 |
| Pentane, n- | C5H12 | 7.88 |
| Piperylene | C5H8 | 0.66 |
| Glutaraldehyde | C5H8O2 | 0.9 |
| Carbon tetrabromide | CBr4 | 3 |
| Diketene | C4H4O2 | 2.2 |
| Tert-butanol | C4H10O | 2.62 |
| Triethylamine | C3H9N | 0.5 |
| Nitrogen trichloride | NCI3 | 1 |
| Trimethylbenzene mixtures | C9H12 | 0.34 |
| Trimethylbenzene, 1,3,5- | C9H12 | 0.34 |
| Nonane, n- | C9H20 | 1.27 |
| Benzonitrile | C7H5N | 0.7 |
| Gasoline vapors | | 1.05 |
| Gasoline vapors | | 0.8 |
| Pyridine | C5H5N | 0.75 |
| Bis(2,3-epoxypropyl) ether | C6H10O3 | 3 |
| Bromoform | CHBr3 | 2.8 |
| Chlorobenzene | C6H5Cl | 0.45 |
| Hydrogen sulfide | H2S | 4 |
| Benzenethiol | C6H5SH | 0.7 |
| Chlorotoluene, o- | C7H7Cl | 0.45 |
| Biphenyl | C12H10 | 0.4 |
| Hydrazine | H4N2 | 3 |
| Asphalt, petroleum fumes | | 1 |
| Mineral spirits | | 0.8 |
| Cumene | C9H12 | 0.58 |
| Furfural | C5H4O2 | 1.38 |
| Furfuryl alcohol | C5H6O2 | 2 |
| Camphene | C10H16 | 0.45 |
| Methyl mercaptan | CH4S | 0.7 |
| Methyl bromide | CH3Br | 1.9 |
| Cresol, p- | C7H8O | 1.05 |
| Cresol, o- | C7H8O | 1.05 |
| Cresol, m- | C7H8O | 1.05 |
| Methanol | CH4O | 206.37 |
| Toluene | C7H8 | 0.51 |
| Methylamine | CH5N | 1.4 |
| Ethyl formate | C3H6O2 | 29.83 |
| Cyclohexene | C6H10 | 0.75 |
| Cyclohexane | C6H12 | 1.16 |
| Cyclohexanone | C6H10O | 1.03 |
| Cyclohexanol | C6H12O | 2.9 |

| Gas Name | Formula | Factor | Gas Name | Formula | Factor |
|---------------------------|---------|--------|---------------------------------|-----------|--------|
| Cyclohexylamine | C6H13N | 0.98 | Acetone | C3H6O | 0.71 |
| Acetaldehyde | C2H4O | 4.86 | Ethyl acrylate | C5H8O2 | 2 |
| Propylene oxide | C3H6O | 7 | Propane-1,2-diol, total | C3H8O2 | 10 |
| Cyclopentane | C5H10 | 4 | Epichlorohydrin | C3H5ClO | 8 |
| Chlorotrifluoroethylene | C2ClF3 | 1 | Ethyl benzene | C8H10 | 0.54 |
| Diisobutylene | C8H16 | 0.64 | Styrene | C8H8 | 0.44 |
| Diisopropyl ether | C6H14O | 0.68 | Benzyl chloride | C7H7Cl | 0.55 |
| Divinylbenzene | C10H10 | 0.4 | Benzaldehyde | C7H6O | 0.86 |
| Diethyl ether | C4H10O | 0.88 | Anisole | C7H8O | 0.47 |
| Diethylamine | C4H11N | 1 | Benzyl formate | C8H8O2 | 0.77 |
| Dioxane 1,4- | C4H8O2 | 1.5 | Benzyl alcohol | C7H8O | 1.25 |
| Dioxane 1,2- | C4H8O2 | 1.5 | Phenylenediamine, p- | C6H8N2 | 0.6 |
| Chlorine dioxide | ClO2 | 1 | Aniline | C6H7N | 0.5 |
| Dibromoethane 1,2- | C2H4Br2 | 2 | Benzene | C6H6 | 0.5 |
| Dichloroethylene 1,2- | C2H2Cl2 | 0.75 | Butene, 1- | C4H8O | 1.15 |
| Dichloromethane | CH2Cl2 | 39 | Crotonaldehyde | C4H6O | 1 |
| Dichlorobenzene o- | C6H4Cl2 | 0.5 | Ethyl amine | C2H7N | 1 |
| Carbon disulfide | CS2 | 1.4 | WMD Methyl salicylate | C8H19O4 | 1 |
| Dimethoxymethane | C3H8O2 | 1.4 | WMD N-Mustard Gas | C4H18SCl2 | 1.1 |
| Dimethyl ether | C2H6O | 1.3 | Dimethylhydrazine, 1,1- | C2H8N2 | 1 |
| Dimethyl sulphide | C2H6S | 0.5 | Tetrahydrofuran | C4H8O | 1.55 |
| Dimethylaniline, NN- | C8H11N | 0.6 | Methylpropan-2-ol, 2- | C4H10O | 3.5 |
| Xylene, m- | C8H10 | 0.44 | Triethylamine | C6H15N | 0.9 |
| Dimethylamine | C2H7N | 1.4 | Toluene-2,4-diisocyanate | C9H6N2O2 | 1.6 |
| Dicyclopentadiene | C10H12 | 0.81 | Tetrafluoroethylene | C2F4 | 1 |
| Diphenyl ether | C12H10O | 0.8 | Trichloroethylene | C2HCl3 | 0.65 |
| Chlorotoluene, p- | C7H7Cl | 0.5 | Turpentine | C10H16 | 0.6 |
| Hydroquinone | C6H6O2 | 0.8 | Phenyl-2,3-epoxypropyl ether | C9H10O2 | 0.8 |
| Butene, 1- | C4H8 | 1 | Tetrachloroethylene | C2Cl4 | 0.7 |
| Ethyl butyrate | C6H12O2 | 0.95 | Ethyl hexyl acrylate, 2- | C11H20O2 | 1 |
| Isobutyraldehyde | C4H8O | 1.2 | Methylcyclohexanone 2- | C7H12O | 0.95 |
| Butyl mercaptan | C4H10S | 0.54 | Methylcyclohexanol, 4- | C7H14O | 2.4 |
| Butadiene diepoxide, 1,3- | C4H6O2 | 4 | Methylcyclohexane | C7H14 | 1.1 |
| Butadiene | C4H6 | 0.83 | Dimethylheptan-4-one, 2,6- | C9H18O | 0.8 |
| Isobutanol | C4H10O | 3.5 | Isopropyl chloroformate | C4H7O2Cl | 1.6 |
| Butylamine, 2- | C4H11N | 0.9 | Epoxypropyl isopropyl ether, 2, | C6H12O2 | 1.1 |
| Butylamine, n- | C4H11N | 1 | Methylpentane-2,4-diol, 2- | C6H14O2 | 4 |
| Iodomethane | CH3I | 0.4 | Ethyl chloroformate | C3H5O2Cl | 83 |
| Vinyl acetate | C4H6O2 | 1.1 | Ethyl (S)-(-)-lactate | C5H10O3 | 3 |
| Propyl acetate, n- | C5H10O2 | 2.5 | Methyl sulphide | C2H6S | 0.5 |
| Acetic Acid | C2H4O2 | 36.15 | Dimethylformamide | C3H7NO | 0.9 |
| Diesel Fuel | | 0.75 | Dimethylethylamine, NN- | C4H11N | 0.8 |
| Methyl acrylate | C4H6O2 | 3.4 | Dimethyl disulphide | C2H6S2 | 0.23 |
| Propene | C3H6 | 1.4 | Diethylaminopropylamine, 3- | C7H18N2 | 1 |
| Propan-1-ol | C3H8O | 4.8 | Diethylaminoethanol, 2- | C6H15ON | 2.7 |
| Bromopropane, 1- | C3H7Br | 1.3 | Kerosene | | 0.83 |

RS485 communications

Baud rate: 2400 Data bits: 8 bits Stop bit: 1-bit Parity: NONE

Host

| | | | | | |
|------------|---------|-----------------|------------------|------------------------|---------------------|
| 0X55 | 0X03 | 0X01 | 0X01 | 0x00 0X00 0X00 0X00 | CRCL CRCH |
| Start code | Host ID | address code | function code | Four-byte data bits | Two check digits |

Slave

| | | | | | |
|---------------|-------------|-----------------|------------------|------------------------|---------------------|
| 0X55 | 0X01 | 0X01 | 0X01 | 0x00 0X00 0X00 0X00 | CRCL CRCH |
| Start code | Slave ID | address code | function code | Four-byte data bits | Two check digits |

E.g:

The host queries the probe with address 1:

- 0X55 0X03 0X01 0X01 0X00 0X00 0X00 0X00 0X8A 0X19 (The address defaults to 4 zeros Standard CRC check)

Slave machine answer:

- 0X55 0X01 0X01 0X01 0X00 0X00 0X42 0X70 0X98 0X9D The actual analytical concentration is 60

Appendix 4: Recommended calibration gas table

| Gas | Measure Range | Span Gas | Concentration |
|-------------|---------------|----------|---------------|
| CH4 | 100%LEL | CH4 | 60%LEL |
| O2 | 30%VOL | O2 | 20. 9%VOL |
| CO2 | 5%VOL | CO2 | 3%VOL |
| CO | 1000µmol/mol | CO | 700µmol/mol |
| | 500µmol/mol | | 300µmol/mol |
| VOC | 1000µmol/mol | I-C4H8 | 700µmol/mol |
| | 20µmol/mol | | 15µmol/mol |
| H2 | 1000µmol/mol | H2 | 700µmol/mol |
| H2S | 100µmol/mol | H2S | 80µmol/mol |
| NH3 | 100µmol/mol | NH3 | 60µmol/mol |
| HCL | 30µmol/mol | SO2 | 60µmol/mol |
| CL2 | 10µmol/mol | CL2 | 10µmol/mol |
| SO2 | 20µmol/mol | SO2 | 15µmol/mol |
| NO2 | 20µmol/mol | CL2 | 10µmol/mol |
| C2H4O (ETO) | 20µmol/mol | C2H4O | 10µmol/mol |
| HF | 10µmol/mol | CL2 | 10µmol/mol |
| PH3 | 5µmol/mol | H2S | 5µmol/mol |
| COCL2 | 1µmol/mol | CL2 | 1µmol/mol |

Note: Due to the inevitable error in the concentration of the standard gas, the above concentration values are for reference only. For gases and special ranges not listed in the parameter table, please consult the manufacturer directly.

Appendix 5: Troubleshooting

| FAULTS | REASONS | SOLUTIONS |
|-------------------|--|---|
| No output signal | Wrong wiring | Re-wiring |
| | Wrong power supply | Check power supply |
| | Circuit fault | Return to factory |
| | The sensor cable is broken | Return to factory |
| Lower readings | Sensor failure | Replace sensor modular |
| | Need calibration | Re-calibration |
| | Reading drift | Re-calibration |
| Higher readings | Sensor failure | Replace sensor modular |
| | Need calibration | Re-calibration |
| | High-concentration gas shock | Return to factory |
| | Reading drift | Re-calibration |
| Unstable readings | Sensor failure | Replace sensor modular |
| | Interference | Check if it's grounded well |
| | On preheating | Wait a while after power-on |
| | Calibration failure | Re-calibration |
| | Circuit fault | Return to factory |
| Slow response | Sensor failure | Replace sensor modular |
| | Dust blocking the explosion-proof disc | Clean up the dust of the explosion-proof disc |
| | Circuit fault | Return to factory |

Nanjing AIYI Technologies Co., Ltd.

Address: Building 13, No. 1318 Qingshuiting East Road, Jiangning District, Nanjing 210000, Jiangsu, China

Tel: 0086-25-87756351

Fax: 0086-25-87787362

Web: www.aiyitec.com


Email: sales@autequ.com

FAQs

Q: What should I do if the device displays an error during operation?

A: If you encounter errors, refer to the troubleshooting section of the manual or contact customer support for assistance.

Documents / Resources

| | |
|--|---|
|  <p>Need the Device Operation Manual or other documents of this device?</p> <p>Scan the QR code</p> | <p>AIYI Technologies GTQ-AF110 Gas and Dust Detector [pdf] Instruction Manual GTQ-AF110, GTQ-AF111, GT-AF112-R, AG310, AG311, GTQ-AF110 Gas and Dust Detector, GTQ-AF110, Gas and Dust Detector, and Dust Detector, Dust Detector, Detector</p> |
|--|---|

References

- [!\[\]\(effbd7993c63c039a58fd3395789cf3f_img.jpg\) **China Portable Gas Detector, Gas Detection System, Gas Analyzer Manufacturers, Suppliers, Factory - AIYI Technologies**](#)
- [**User Manual**](#)

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