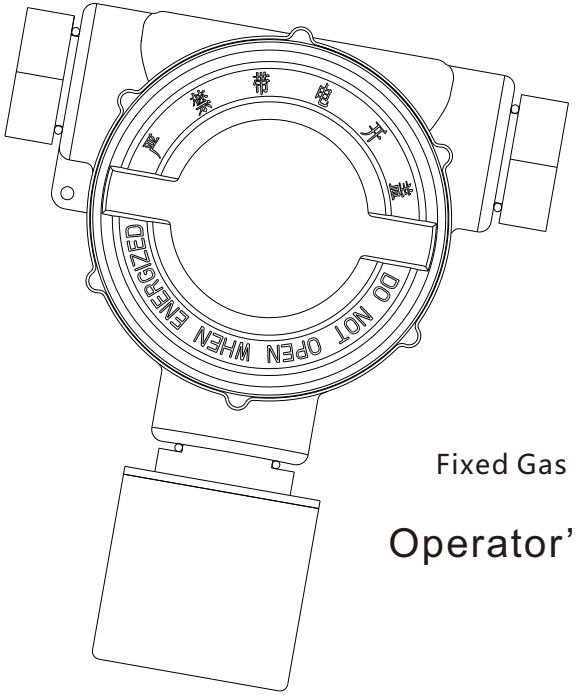
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ISO9001: 2015 Quality Management System Authenticated Company



Fixed Gas Detector

Operator's Manual

Nanjing AIYI Technologies Co., Ltd.

COMPANY

Nanjing AIYI Technologies Co., Ltd. is a joint-stock high-tech enterprise that combines the R&D, production and sales of optic-mechanical-electric products. We are dedicated to providing complete domestic & industrial, gas & dust safety solutions to customers.

With our expertise in safety and excellent public praise, standardized quality management system and all-sided service system throughout the years, AIYI Technologies has already become a leading brand in the gas & dust safety industry in China. AIYI Technologies has been providing products and services for Chinese and foreign well-known enterprises and has extended its businesses in pharmaceuticals, agrochemicals, environmental protection, automobile, fodder and food. The product quality and professional service of AIYI Technologies have been highly regarded and widely acclaimed among customers.

Willing to work with
clients all over the world

to establish long term and stable cooperative
relations of mutual benefit.

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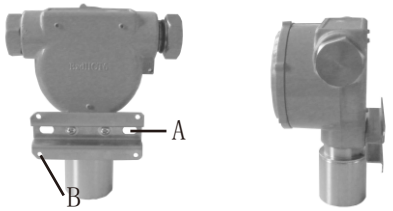
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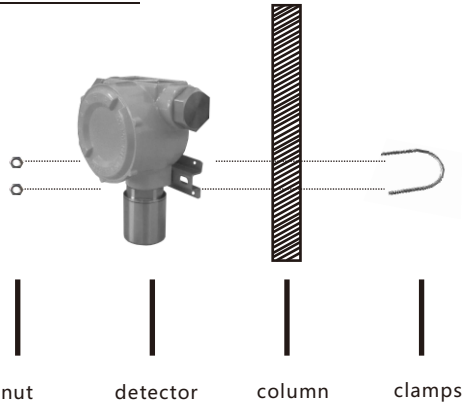
Preparation



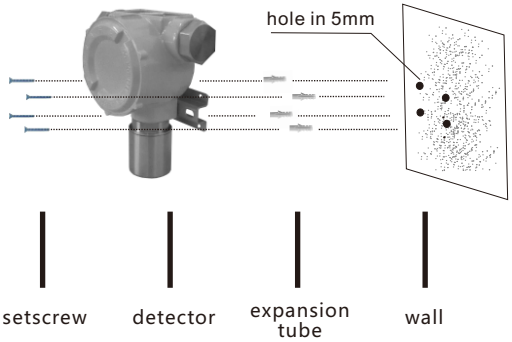
A-Rabbet of lathedog B-Mounting hole of setscrew

Mounting height: (If the detecting gas)
Heavier-than-air, shall install at 0.3m-0.6m above the ground;
Lighter-than-air, shall install at 0.5m-2m above the gas source;
Similar-to-air, shall install around 1m scale of gas source.

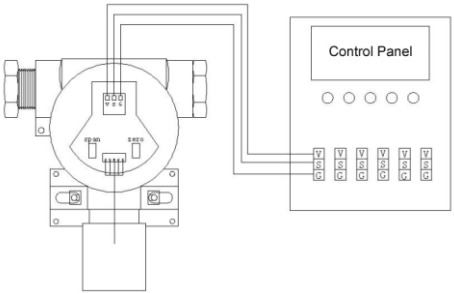
Post mount



Wall mount



Wiring diagram(4-20mA)



V-positive pole, S-signal pole, G-negative pole.

Note: for Rs485 wiring diagram, see Page 8.

Introduction

The detector can be widely applied in places such as petrochemical engineering, chemical engineering, steel, metallurgy, pharmaceuticals, electricity, food, and logistics where the monitoring of flammable and toxic gas is needed.

The system is made of gas detector, control panel and visual & sound alarm, and the gas concentration data will be uploaded to gas detection alarm controller. The controller collectively displays the gas concentration data of different monitoring points, and visual & sound alarm will be set off in case that any concentration exceeds over the default value. Linkage feature can be realized and the data can be also uploaded to host systems such as DCS/PLC.

Sensor

The sensors we adopt is advanced catalytic combustion sensor, electrochemical sensor, infrared sensor and PID sensor. The working principle of catalytic combustion is as below:

Combustible gas sensor adopts the latest generation of high-level anti interferential catalytic combustion components. The sensor and the two fixed resistors constitute the detection bridge, when the air containing flammable gases diffuse on the surface of the detection element, rapid combustion will happen on the surface of the catalyst, then reaction heat on the detection element will make a increasing wire resistance, detection bridge will output a voltage signal. The magnitude of the voltage signal is proportional to the flammable gas concentration, and it will be amplified and convert the data (% LEL) to the standard 485 signal.

Definitions

LEL: The lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (arc, flame, heat).
VOL: volume, the certain gas concentration ratio in gas mixture.
ppm: parts per million by volume
Zero Calibration: reset the instrument to zero In fresh air or pure nitrogen.
Span Calibration: put the instrument into a sample gas with certain concentration, reset the measured value of instrument to the certain concentration.

Structure

Main structure:
Gas detector, the aluminum shell, stainless steel sensor cover; the main shell is above the sensor cover, the bottom has a vent; the junction of the main shell and the sensor cover is a sealed ring; inlet the outlet on both sides of the instrument adopts a hexagonal locknut.

Design of ingress protection :
The gas detector has the following design to prevent impurities from entering the interior of the instrument.
A. The upper and lower covers of the housing are sealed with rubber rings.
B. With the hexagonal locknut to ensure that the rain can not enter it, but pay attention to make an appropriate outer diameter of cable, to ensure that the locknut is tightened and there is no gap.
C. The sensor is a weak waterproofing position in the entire instrument, because the sealing process of the gas sensor is complex, so the sensor is designed for the downward structure.

Specifications

Repeatability: <2%
Zero drift: <±2%(F.S) /6h
Work Temp: -40~+70℃
Humidity: <93%RH
Sensor life: 18 months
Sampling type: diffusion
Work type: fixed continuously work
Work voltage: 12-30VDC
Work current: <160mA（Max）
Output signal: 4-20mA/Rs485
Relay output(optional): (250VAC/5A 24VDC/5A）
Material: Aluminum & stainless steel
Dimensions：139mm×166mm×79mm
Weight：≤1.2kg
Cable： shield cable, 1.5mm
Distance：<1000m
Installation：post mount
Ex grade：ExdIICT6
Ex certificate No.: CE081634
Inlet port size: G1/2 hexagonal locknut

Install location

The location of the gas detector is critical for achieving the best possible detection. shall take care of the following factors: such as the density of gas leaks, the proportion of gas measured, the impact of the surrounding buildings, the wear degree of production equipment, wind and perennial weather conditions, position.

The following recommendations for the user's reference:

A. The instrument should be installed at the downwind direction of leakage.

B. When installing indoors, if the source of the leak is outdoors, the instrument shall be installed at the air inlet.

C. The combustible gas release source is located in the equipment area of open or semi-open layout. When the detection point is located on the upper wind side of the minimum frequency wind direction of the release source, the distance between the combustible gas detection point and the release source should not be greater than 15 meters; The minimum frequency of the source of the wind side of the wind, the combustible gas detection point and the release of the source should not be greater than 5 meters.

D. combustible gas release source in a closed or semi-enclosed plant, can be set up a detector each 15 meters, and the detector from any release source should not be greater than 7.5 meters.

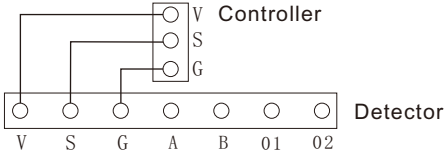
E. If the leakage of lighter combustible gas is in a closed or semi-enclosed plant. The detector should be provided above the leakage and the detector should be located at the highest point in the plant.

Install method

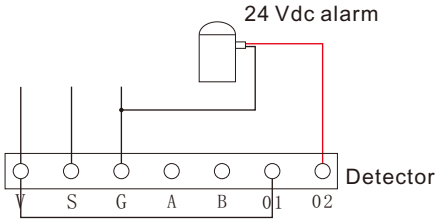
There are two installation ways: post mount and wall mount, see details in QUICK INSTALL.

On-site wiring diagram

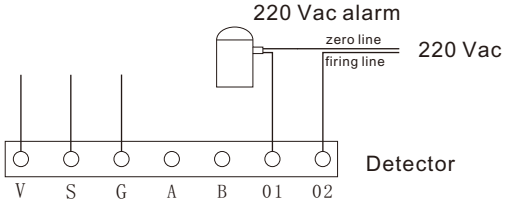
Power supply



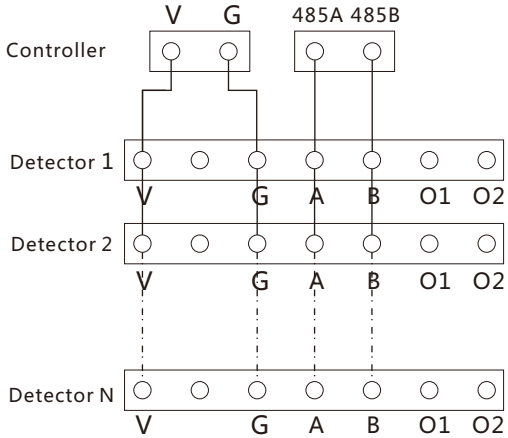
24Vdc alarm



220Vac alarm



Wiring Diagram (Rs485)



Zero calibration

Passing the pure Nitrogen gas (or Fresh air) through the gas detector by a pressure relief valve and a flow meter in 300mL / min flow, After 30 minutes till a stable reading on display, then do operations as below:

Detector with display: open the cover and press the Fn key to enter the menu, then select ZERO CAL and select Yes. Long press Fn to confirm it. In final, select Save and Exit to finish calibration. Then recalibrate it twice more to keep the stability.

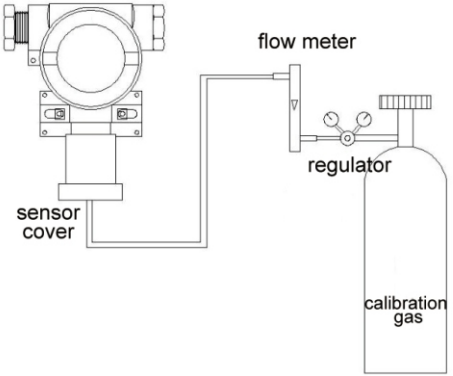
Detector without display: open the cover and long press S2 key till lamp D4 flashing. then release S2 key to finish calibration. Then recalibrate it twice more to keep the stability.

Span calibration

Passing the calibration gas (better 60%F.S.) through the gas detector by a pressure relief valve and a flow meter in 300mL / min flow, After one minute till a stable reading on display, then do operations as below:

Detector with display: open the cover and press the Fn key to enter the menu, then select SPAN CAL and input the gas concentration of the calibration gas. Long press Fn to confirm it. In final, select Save and Exit to finish calibration. the reading will be same with calibration gas. Then re-calibrate it twice more to keep the stability.

Detector without display: open the cover and long press S2 key till the lamp D4 remain lit, and release it to finish Span calibration. Then re-calibrate it twice more to keep the stability.



Attentions

1. the less wire between detector and controller, the better. And shall protect it with explosion stack.
2. keep the sensor downward, if not, the detector will work improperly.

3. When installing the wiring, do not touch the internal circuit of the instrument, and the instrument housing needs to be connected to a reliable ground line.
4. When testing instrument online, please check whether the connection between the instrument and the host is correct and whether the voltage provided by the host is (12 ~ 30) VDC.
5. The user cannot replace the sensor himself, and the instrument shall be calibrated once a year.
6. The protective hole of the sensor need to be purged with low-pressure compressed air regularly, or the impurities may plug the protective hole and that will affect the detection sensitivity.
7. 12 months warranty from sale, Warranty is voided by abuse including mechanical damage, alteration, or repair not in accordance with the instruction manual.
8. The inside sensor has an acid solution, so the user shall not disassemble it, but also pay attention not to damage the front film of the sensor. If any improper operation makes the acid leakage on the skin, shall be washed promptly with water for at least10 minutes.
9. Remove the circuit board and parts by the user themselves is not recommended.

Trouble-shooting

fault	reason	solution
unstable readings	sensor failure	replace sensor
	wrong span calibration	re-calibrate
	circuit failure	modify span potentiometer to reduce the gain
	circuit failure	return to factory
slow response	block on sensor cover	clean the sensor cover
	sensor failure	replace sensor
	circuit failure	return to factory

Packing list

1. gas detector — one set
2. operator's manual — one copy
3. product certificate — one copy
4. accessories — one set

Ordering instructions

Model-[gas type] - [display] -[work voltage]

Note:

Gas detected : single gas each device

Display : display on the detector

Calibration Record

Client _____ Contact _____ Date _____

Name _____ Model _____ ID _____

Factory _____ S/N _____

Add. : □ factory □ site lab Temp. ____℃ Humidity ____%RH Other _____

Standard: □JJG365-2008 □JJG693-2004 □JJG695-2003 □JJG915-2008 □Other

1.Visual & Power-on check : _____

2.Indication Error

Standard	Actual			Average	Results (%FS)
	1	2	3		

3.Repeatability

1	2	3	4	5	6	Results (%)

4.Response Time

1	2	3	T

5.Alarm Error

Standard	Alarm value	Actual			Average	Results

6.Drift

Time								Zero Drift	Span Drift
Zero Drift									
Span Drift									

☐ Test Conclusion _____

☐ Calibrate Conclusion _____

Calibrated by _____

Confirmed by _____