BS03

Fixed Gas Detector Operation Manual

AMTECH INDUSTRY CO.,LTD

ISO9001:2008

Safety Information

Before using the device, please first carefully read and follow the following information to operate the device:

- Please don't use the defective detector. Before using, please check if there is crack or spare part missing. If yes, please contact the seller.
- In order to keep the accuracy, please calibrate it once before the first time using.
- Working voltage of the detector is DC18V to DC30V and recommended voltage is DC24V. The voltage exceeding DC30V will damage the detector.
- Before using, please make sure the housing is fixed.
- There should be no speedy gas flow on the installation place. Otherwise, it will influence the detection result.
- Please don't expose the device to the gas which concentration is exceeding the range. Otherwise, it will influence the accuracy and shorten the sensor life.
- Please don't paint the sensor parts or detector.
- Only sensor spare parts which are specified for BS03 are allowed to be used.
- It's suggested calibrate the sensor once every 6 months.
- In order to avoid damage human beings, please operate it when power off. Before opening the cover, make sure there is no mixture gas of combustible gas and air. Otherwise, it will possibly cause fire or explosion.
- Please avoid water or dust to come into the housing.
- Please
- Please don't expose the device to the environment which has electric shock, strong magnetic field or serious continuous mechanic shocking.

8. Normal problem and solution

Problem	Possible reason	Solution
It displays FAUL	Wrong wire connection, wire broken, or sensor damaged	Re-connect the wire or replace the sensor
No response to the gas	Sensor damaged	Replace the sensor
	Circuit Fault	Contact the seller
Wrong connection to the controller	Wire connection fault	Check the connection
	Electric circuit fault	Contact the seller

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- When no using, please take out the battery from the remote controller.
- Installation must abide by the national and local regulations.
- It's forbidden to disassembly, adjust or repair the device without permission.
- All the operation inside the device must be carried by professional persons.

1. Brief introduction

BS03 fixed gas detector, adopting high-quality catalytic gas sensor and SMD arts and crafts, has advantages of good reproducibility, disturbing-proof against temperature and humidity, long life-span and easy operation.

The signal output is standard 4-20mA. It is widely used in refineries, chemical plant, LPG station, gas boiler, and Spray-Paints etc where gas leakage easily.

2. Technical data

Gas	Range	Resolution	L-alarm	H-alarm
LEL	0-100%LEL	1%LEL	20%LEL	50%LEL
LEL Vapor	0-100%LEL	1%LEL	20%LEL	50%LEL
CO	0-1000PPM	1PPM	35PPM	200PPM
H_2S	0-100PPM	1PPM	10PPM	15PPM
NH_3	0-100PPM	1PPM	25PPM	50PPM
CL_2	0-20PPM	0.1PPM	5PPM	10PPM
O_2	0-30%VOL	0.1%VOL	19.5%VOL	23.5%VOL
SO_2	0-500PPM	1PPM	10PPM	50PPM
CO2	0-6000PPM	1PPM	1500PPM	2000PPM

Sensor type: Catalytic or electrochemical gas sensor

Gas sampling: Natural diffusion

Power supply: DC24V±25%

Power consumption: ≤3W

Working method: Continuous monitoring

Error rate: ≤±5%F.S.

Indication method: 4-digit LED light

Condition display: 3 LED lights indicate fault alarm, L-alarm level alarm and H-alarm level

Operation: Infrared remote control

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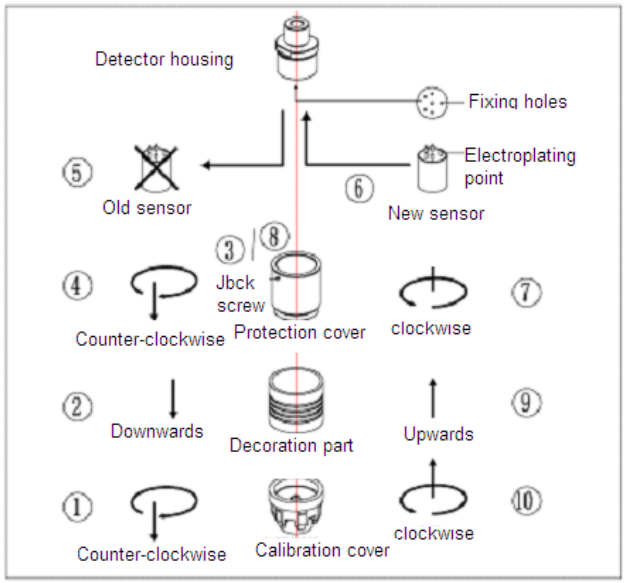
follow the following steps to replace it:



7.1 Take off the calibration cover in counter-clockwise.

7.2 Pull out the decoration part downwards.

7.3 Screw off the jackscrew from the sensor protection cover.

7.4 Take off the protection cover in counter-clockwise.

7.5 Take out the old sensor.

7.6 Put the new sensor into the sensor cover.

Note: Please put the new sensor into the correct fixing holes. It's forbidden to rotate the sensor.

7.7 Then install in turns protection cover, jackscrew, decoration part and calibration cover. The replacement is completed.

7.8 Electrify the detector and calibrate the detector.

figure on the screen is steady, press “Confirm” to remember this figure and calibrate it. It will go to effect after exiting from this mode. The screen displays “F-3”. The user can press “Confirm” to make the other setting or press “Cancel” to return to the normal status.

Note: Zero calibration must be carried in the clean air. It's forbidden to calibrate zero when the target gas exists in the working place.

6.6Single point calibration

6.6.1 After using for some time, the result of the detection may be not so correct because of the sensor drift. Consider of the convenience of the user, the device is designed with the function of single point calibration.

6.6.2 Procedure: Put the device into the calibration gas with known concentration (Suggested inputting half of the detection range gas for 2-3 minutes). In normal status, press “Setup” four times and it displays “F-4”. Then press “Confirm” and it displays “50”(The pre-set calibration level). This figure can be changed by pressing “+” or “-”. And then press “Confirm” to remember this figure. Then it displays “XXXX” (The A/D of the present environment). When the figure on the screen is steady, press “Confirm” to remember this figure and calibrate it. It will go to effect after exiting from this mode. The screen displays “F-4”. The user can press “Confirm” to make the other setting or press “Cancel” to return to the normal status.

Note: Please don't carry the above calibration when the detector is working or there is no calibration gas.

7. Sensor replacement

In normal working environment, the life of catalytic sensor is 3 years and electrochemical sensor is 2 years. When the sensor life is overdue, the detection result may be not accurate. Please contact the seller for replacing the sensor.

Before replacing the sensor, please first cut off the power supply and

Response time: ≤30s (LEL) / ≤60s (toxic gas)

Working temperature: -40℃～70℃ (LEL) / -20℃～50℃ (toxic)

Working humidity: ＜93%RH

Explosion-proof: Ex d Ⅱ CT6

Protection: IP55

Pressure Limit: 86-106kPa

Signal output: 4～20mA

2 relay output

Install screw thread: G3/4"

Cable dimension: ≥1.5mm^2×3

Transmit distance: ≤1000m

Dimensions and weight: l×b×h, mm 210×200×105 about 2100g

3. Construction illustration

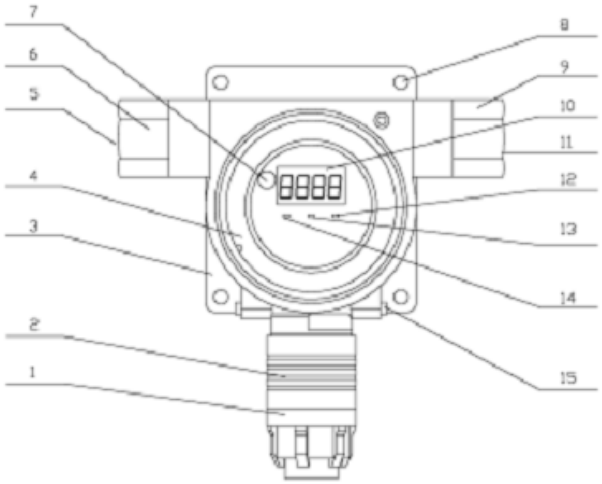


Fig. 1 BS03 Gas Detector

No.	Name	No.	Name
1	Calibration cap	9	Pipe connector
2	Decoration	10	Display screen
3	Lower cover	11	Wire connection hole
4	Upper cover	12	H-alarm LED
5	Wire connection hole	13	L-alarm LED
6	Pipe connector	14	Fault / Power LED
7	Remote receiver window	15	Ground nut
8	Fixing hole		

4. Installation

4.1 Installation position

4.1.1 For petrol gas, oil gas and alcohol gas etc. which is heavier than the air, the position is 0.3m-0.6m higher than the ground.

4.1.2 For natural gas, CH4 etc which is lighter than the air, the position is 0.5m-2m higher than the gas source.

Note: Gas density more than 0.97kg/CBM, then it's heavier.

Gas density less than 0.97kg/CBM, then it's lighter.

4.1.3 The position should be far away from shocking, shattering, strong electromagnetic interference. Around the position, there should be at least 0.3m empty place.

4.1.4 The position should be within 1m around the possible gas leakage area, such as valve, pipe connection point, gas outlet place. Please try to install it nearer to the above places, but avoid influencing the working of the other equipments. Please avoid the environment of high temperature and humidity. Also please keep it from water swashing, oil and mechanical damage. Please also consider the convenience of maintenance and calibration.

High concentration protection: FAUL; 3 LED are on (only for LEL)

Low alarm: gas concentration; red low alarm LED on

High alarm: gas concentration; red low and high alarm LED on

Low alarm setting: “F--1”

High alarm setting: “F--2”

Zero calibration: “F--3”

Single point calibration: “F--4”

Factory setting: “F--5”(Unavailable to the customers).

6.3 Low alarm setting

In normal status, press “Setup” once and it displays “F-1”. Press “Confirm”, it displays “50”(The pre-set first level alarm). This figure can be adjusted by pressing “+” or “-”. After setting completed, press “Confirm” to save the result. The device exits to the normal status. The setting will affect. The screen displays “F-2”. The user can press “Confirm” to make the other setting or press “Cancel” to return to the normal status.

6.4 High alarm setting

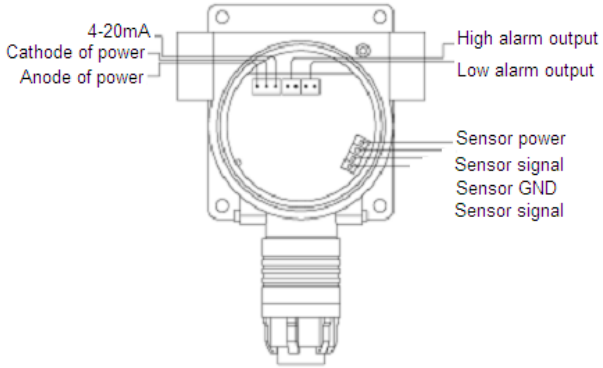
In normal status, press “Setup” twice and it displays “F-2”. Then press “Confirm”, it displays “20”(The pre-set first level alarm). This figure can be adjusted by pressing “+” or “-”. After setting completed, press “Confirm” to save the result. The device exits to the normal status. The setting will affect. The screen displays “F-1”. The user can press “Confirm” to make the other setting or press “Cancel” to return to the normal status.

6.5 Zero calibration

After the detector work normally for more than 10 minutes, put the device into the clean air. (For O2 / N2 gas detector, the device should be put into pure N2 gas environment). In normal status, please press “Setup” three times, it displays “F-3”. Then press “Confirm”, it displays “XXXX” (The A/D of the present environment). When the

1000m.

5.5 After checking all the connection well, install the display PCB and the front cover. Make sure O-type circle is put on and connected with the cover tightly.



6. Operation instruction

6.1 On the remote controller, there are totally fives buttons as follows: “Setup”, “Confirm”, “Cancel”, “+” and “-”. On the spot, it's forbidden to replace the batteries.

Note: “Setup”, “Confirm” and “Cancel” are single-spring buttons. These buttons can only be springed once even if you press them continuously, and the interval between two springs should not be less than 1 second. “+” and “-” are continuous-spring buttons and can be springed by continuous pressing. Setting can only be affected after pressing “Confirm”. After setting, press “Cancel” to return to the normal mode. Effective setting can be kept till the next setup, even if without power.

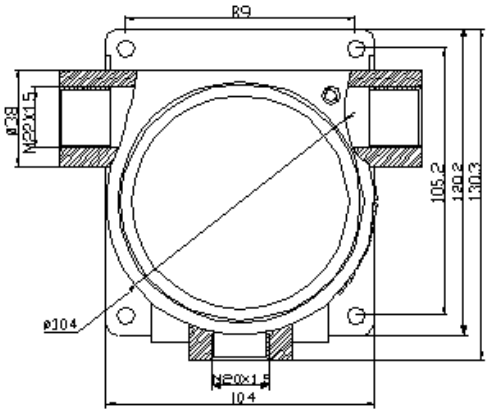
6.2 Illustration of display:

Normal: gas concentration

Sensor fault: FAUL; yellow LED is on (only for LEL)

4.1.5 For large scale detection, we suggest install 1pc every 10-12 square meters, so as to get the best detection result.

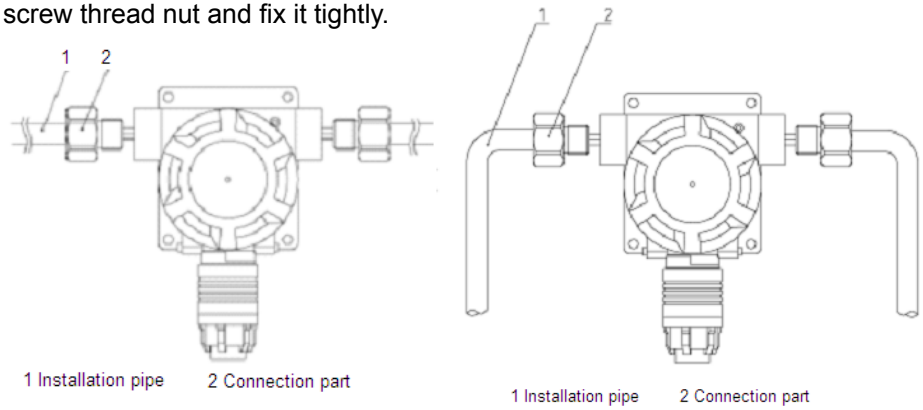
4.2 Dimensions



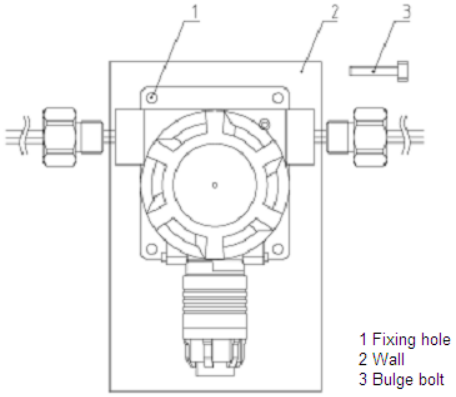
4.3 Installation methods

Note: Fix the detector with sensor head downwards. According to the installation place, fix the detector onto the wall or gas pipes. Details as follows:

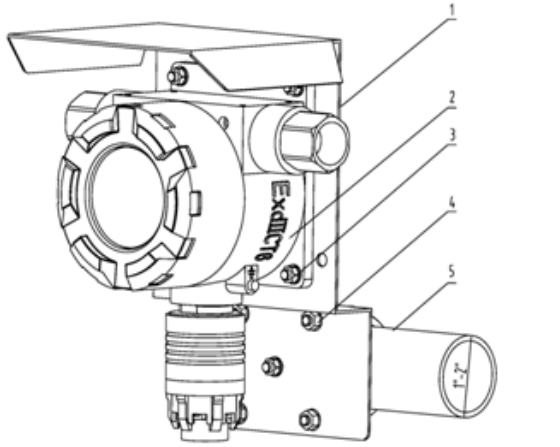
Method 1: If there are transverse or vertical siphon with G3/4 Screw thread in installed places, please connect the two terminals of the detector to the gas pipes. Then connect and screw down the pipe screw thread nut and fix it tightly.



Method 2: If the user needs to install the detector on the wall, please choose an appropriate metope according to the detector dimensions. Then fix the detector by using 3 pieces of M6×70 bulge bolts in the corresponding
installed orifice.



Method 3: If there is 1" to 2″ (diameter) pipe, the user can use 2 U-type bolts to fix the hanging plate on the pipe, and then fix the detector onto the plate. Or, the user can first fix the detector onto the plate and then fix the plate on the pipe.



1. Anti-sunshine installation plate 2. Detector
3. Fixing bolt 4. U-type bolt 5. Gas pipeline

5. Wire connection

Note: Wire connection must be carried when power off.

5.1 Screw down the cover in counter-clockwise way. Then use a cross-type screw to screw down the 3 bolts and take off the display PCB.

5.2 Screw down the pipe connector in counter-clockwise way. Take out the explosion-proof pad. In turns, put 3-line wire to the internal of the enclosure through the pipe connector, compaction circle, air-proof closing plug and the wire connection hole. According to the explosion-proof requirement, please don't take out the explosion-proof closing plug from the unused wire connection holes. Please don't throw away any part inside the enclosure or the PCB.

5.3 All the wires should be connected to the terminals. The terminal instruction is as follows:

24V	GND	Iout	H. S	L. S
1	2	3	4	5

Icon	Name	Function	Specifications
24V	Anode of power	Power input	DC24V±25%
GND	Cathode of power	Power input	DC24V±25%
Iout	Current output	Current output	4～20mA
H.S	High alarm	High alarm output	Switch relay
L.S	Low alarm	Low alarm output	Switch relay

5.4 After the correct wire connection, take out the useless wire from the enclosure. Then tighten the compaction circle, rubber air-proof circle and wire. Explosion-proof soft tube can also be connected with the device directly.

Note: The size of the wire between the controller and detector should be not less than 6mm, and the distance should be note more than