

BS03 Combustible Gas Detector Operation Manual

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8.11 The seal ring should be changed when it is aged.

When the infrared remote controller is not used, please take the battery out, so as to prolong the life of the battery and to avoid influence by leakage.

Declaration

To keep continued product improvement, **Hanwei** reserves the right to change design features without prior notice

"F-4" and you can press "Confirm" to continue with the other setups or you can press "Cancel" to return to normal condition.

Please be kindly noted that this operation is forbidden when the detector is working.

6.5 Setup in the factory

This setup function of BS03 is only available in factory and unavailable to the customers. When it displays "F—5", "Confirm" key is noneffective. You can press "Confirm" to continue with the other setups or you can press "Cancel" to return to normal condition.

7. Normal fault and Settlement

Fault description	Reason	Settlement
No response for detection gas	Sensor broken	Change sensor
	Circuit fault	Factory maintain
Abnormal connection with Controller	Wire connection Fault	Check the wire connection
	Circuit Fault	Factory maintain

8. Notification

- 8.1 Avoid using in corrosive gas, lampblack, dust and waterlogging places, avoid strong shock.
- 8.2 Avoid fast flowing gas passed the sensor directly, otherwise it would effect the testing result;
- 8.3 Do not using the transmitter in high gas concentration much higher than its detection range, or it would loss the sensor life;
- 8.4 If the detection gas such as mixed combustible gas, liquid steam etc which is different with calibration gas, there would be certain error between testing results and actually gas concentration.
- 8.5 In order to keep the detector accuracy, it's better to make calibrate every half a year;
- 8.6 The sensors life combustible gas is more than 3 years, and electrochemical sensor is two years.
- 8.7 Connect the cable according to the Ex request. The end of the cable need to be treated properly and should be connected to Ex junction box or equipment. When the detector doesn't need to work with the controller, the block is not allowed to take off the cable entrance and the block have to be kept in the cable entrance closed with the seal ring.
- 8.8 The detector should be connected to the terra.
- 8.9 Don't open the cover when the power is on.
- 8.10 Pay attention to not break the Ex surface.

Precautions:

To avoid personal safety injury, Instrument damage and potential dangerous accident; do not use the gas detector before reading this manual.

1. Introduction

BS03 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, so it is suitable for gas detection for industrial use. It can transfer the gas concentration in air into digital signal output. It adopts output of 4-20mA three-line electric current signal, which has advantages of long-distance transmit and good disturb-proof. It is suitable for gas detection in refineries, chemical plant, LPG station, gas boiler, and Spray-Paints etc where gas leakage easily.



2. Main Technical Information:

Detection principle: Catalytic sensor

Target gas: Combustible gases as Alkyl, Ethanol, Olefin, Ketone and gasoline

Sample manner: Natural diffusion

Detection range: 0~100%LEL

Distinguishing rate: 1%LEL

Accuracy: F.S.±5%LEL Alarming levels±3%LEL

Indication method: 4 LED lights

Condition display: 3 LED for Fault alarm, Low alarm High alarm

Debug method: Infrared control

Response time: <30s Resume time: <30s

Working condition: Tem.: -40℃~70℃ Relative Hum: <93%

Explosion Proof: Ex d II CT6

Power supply: DC12V~DC 26V ≤3W

Output signals: Electric current: 4~20mA

Frequency: 200~1000Hz (optional)

Switch output: Two (The first level alarm is 20%LEL and the second is 50%LEL)

Install screw thread: G1/2;

Cable dimension: ≥1.5mm²×3 Transmit distance: ≤1000m

Weight: ≤2000g

Pressure Limit: 86kPa~106kPa;

3. Shell Structure & Dimension

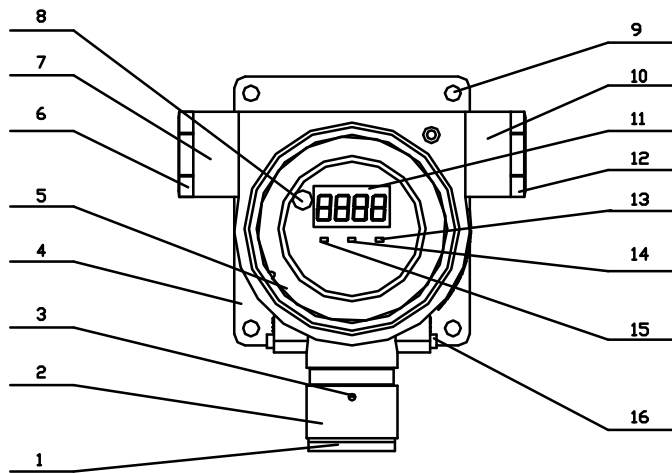


Fig.1 Structure of the Shell

1	Protection cover	9	Fix-up hole
2	Chamber of the sensor	10	Line-out hole
3	Locknut	11	Digital display
4	Downside shell	12	Line-out nut
5	Upside shell	13	The second alarm LED
6	Line-in nut	14	The first alarm LED
7	Line-in hole	15	Fault light
8	Tele-control receiving window	16	Earthing nut

4. Dimension

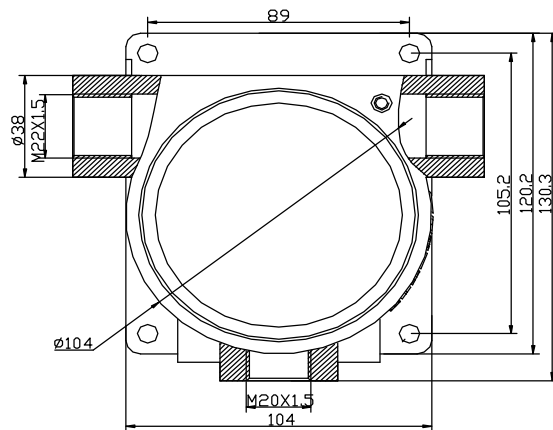


Fig.2 Dimension

level minus the balance);

- 4、 Second level alarm: “XXXX”%LEL(XXXX is more than or equal to the second level alarm. The first level alarm (red) and the second level alarm (red) . (When the concentration is lowing down, you can cancel the second alarm only when the level is less than the second alarm level minus the balance);
- 5、 Setup of first level alarm: “F--1”;
- 6、 Setup of second level alarm: “F--2”;
- 7、 Calibration of Zero point: “F--3”;
- 8、 Calibration of the single point: “F--4”;
- 9、 Setup in the factory: “F--5”(Unavailable to the customers).

6.1 Setup of the first level alarm

In normal condition, press “Setup” key once, it displays “F-1” and then press “Confirm”, it displays “20”(The pre-set first level alarm). You can press “+” or “-”keys to change this figure (in the range of 10-29). Then press “Confirm” to save this change and it will go to effect after you exit. Then the screen displays “F-1”, and you can press “Confirm” to continue with the other setups, or you can press “Cancel” to return to normal condition.

6.2 Setup of the second level alarm

In normal condition, press “Setup” key twice, it displays “F-2” and then press “Confirm”, it displays “50”(The pre-set first level alarm). You can press “+” or “-”keys to change this figure (in the range of 30-50). Then press “Confirm” to save this change and it will go to effect after you exit. Then the screen displays “F-2” and you can press “Confirm” to continue with the other setups or you can press “Cancel” to return to normal condition.

6.3 Calibration of the Zero Point

Put BS03 into the clean air. In normal condition, press “Setup” key three times, it displays “F-3” and then press “Confirm”, it displays “XXXX” (The A/D of the present environment). When the figure on the screen is steady, press “Confirm” to save this change and calibrate it. It will go to effect after you exit. Then the screen displays “F-3” and you can press “Confirm” to continue with the other setups or you can press “Cancel” to return to normal condition.

Please kindly noted this operation must be carried our in clear air, and it's forbidden when the detector is working.

6.4 Calibration of the single point

After some time of use, the result of the detector may be not so correct due to drift of the sensor. In view of the need of the customer to calibrate the detector, BS03 has the function of single point calibration. Put BS03 into the calibration gas with known concentration (in the range of 10%~90%LEL). In normal condition, press “Setup” key four times, it displays “F-4” and then press “Confirm”, it displays “50”(The pre-set calibration level). You can press “+” or “-”keys to change this figure (in the range of 10-90). Then press “Confirm” to save this change and it will go to effect after you exit. Then the screen displays

cable first, then fix the transmitter.

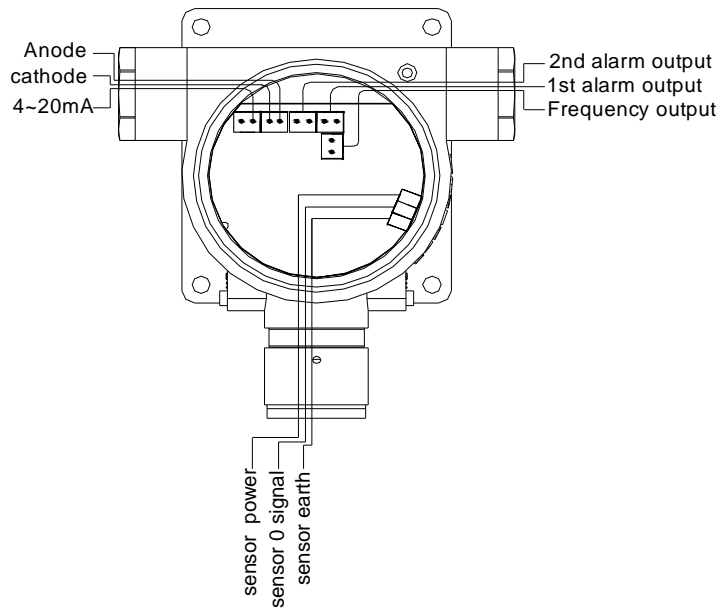


Fig.7 Cable Connection

6. Operation illustration

The remote control keys include "Setup", "Confirm", "Cancel", "+" and "-".

Attentions: "Setup", "Confirm" and "Cancel" keys are single-spring keys. These keys 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 keys and can be springed by continuous pressing. Function setup can only be affected after pressing "Confirm" key, and after setup, press "Cancel" key to return to the normal mode. Effective setup can be kept till the next setup, even if without power.

Illustration of display:

- 1、 Normal: "XXXX"%LEL, LED off;
- 2、 Fault: "FAUL", the fault LED(Yellow one) on;
- 3、 First level alarm: "XXXX"%LEL(XXXX is the figure more than or equal to the pre-set first alarm level, but less than that of the second level alarm), the first level alarm LED (red) on. (When the concentration is lowing down, you can cancel the alarm only when the level is less than the first alarm

5 Installation and Connection

5.1 Installation position

According to the gas specific gravity and wind direction, fix the detector 1m within the leakage, so that the detector can response quickly. Otherwise, in some point of the leakage place gas is beyond the level, while the gas in the installation place is not.

Fix the detector 30cm higher than the installation place with the sensor head downwards.

5.2 Installation Manner

Please choose the places without corrosive gas, lampblack, duct and avoid waterlogging etc in the detection field. Please refer the suitable installation method as follows:

Method 1. If there are transverse or vertical siphon with G1/2 Screw thread in installed places, please connect the two terminals of the detector (Like the "Line in and out hole" with NO. 7/10 in Fig.1) with the transferring tie-ins ("3" in Fig. 3), then connect and screw down the pipe screw thread nut, as "2" in Fig.3, then fix it up.

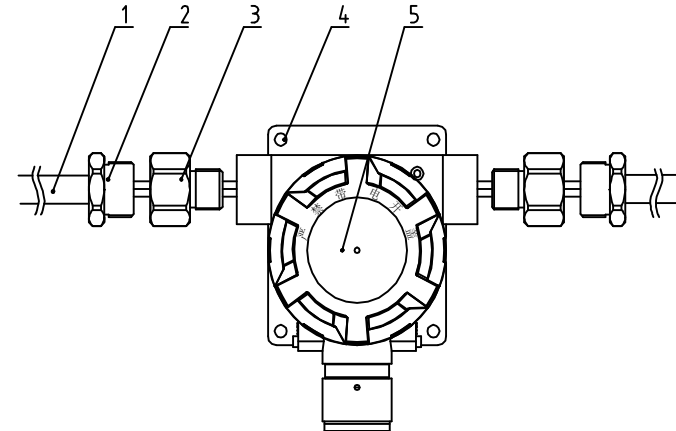


Fig.3

1	Installation pipe	4	Fixation hole
2	pipe screw thread nut	5	BS03 Detector
3	transferring tie-ins		

Method (Wall-hung method): If the user need to install the detector on the wall, please choose an appropriate metope according to the transmitter structure dimension in Fig 2, then fix the transmitter using three pieces of M6×70 bulge bolts to fix the detector in the corresponding installed orifice(As shown "3" in the Fig.4 and Fig. 5). Then choose transferring tie-in in the need of the customer, as shown in Fig.4; if not, as shown in Fig.5,

fit it up and it's ok.

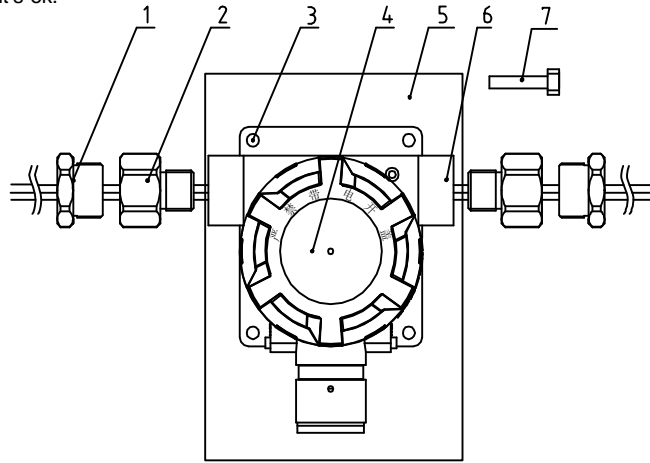


Fig. 4 Wall-hung method 1

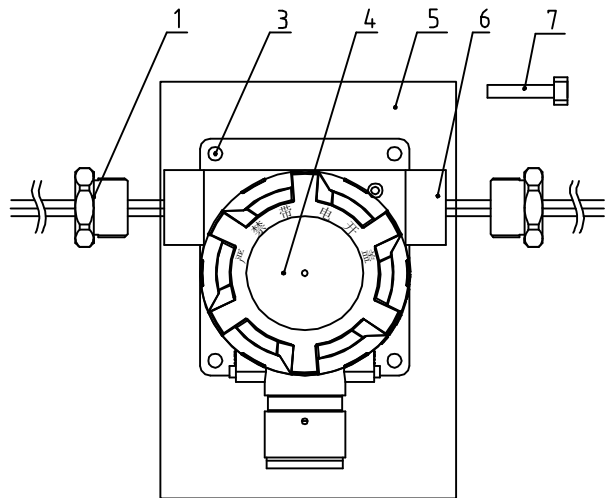


Fig. 5 Wall-hung method 2

1	pipe screw thread nut	5	metope
2	BS03 transferring tie-ins	6	Line in and our holes
3	Fixation hole	7	bulge bolts
4	BS03 detector		

Method 3(Pipeline fixation): When there is 26mm pipeline, you can use two fixation devices and 4 M6 bolts fix the detector through the installation holes on the pipeline.

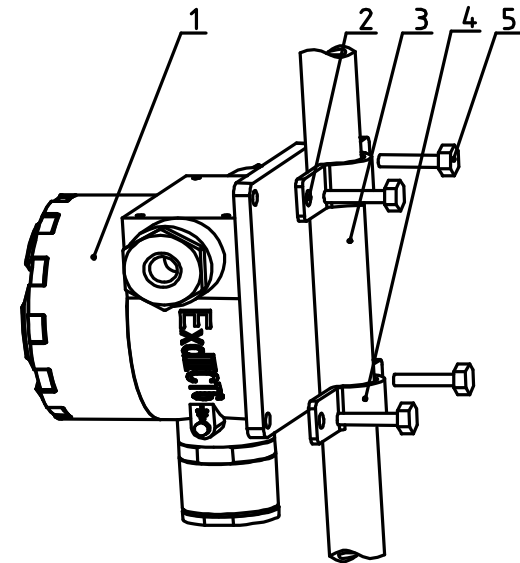


Fig 6 pipeline fixation

1	BS03 Detector	4	Fixation devices
2	Installation holes	5	Fixation bolts
3	pipeline Installation		

5.3. Cable Connection

Notification for wire connection:

Fix the transmitter following 5.1 and 5.2 installation and fixup steps, then screw off its front cover, pull on a three-core transmitted cable through input hole, then pull cushion, rubber airproof loop to the shell.

Connect the marked lead to the corresponding connection terminal, check the connection with no problem, then draw out the extra cable in the shell and screw down the compaction Nut, and rubber airproof loop, encasp the cable. Anti-explosion tube can also be connected with this transmitter.

Using the three-core cable which is no less than 1.5mm² (≤1000m) to connect the controller and detector.

After checking all steps correct, screw down the front cover. Also you can connect the