Fixed Gas Detector

Operation Manual

DOSIFLOW
TECHNOLOGY

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1. Brief description

The fixed gas detector adopts advanced gas sensor, which can translate the gas concentration in the air to the digital signal output. The detector working with gas controller can be used to detect gas in refinery, chemical plant, LPG station, boiler room, painting plant and other places with gas exists.

2. Technical Information

2.1 Detection Principle

The system provides 24V standard DC voltage to the external detector, collecting standard (4-20) mA input signal to analyze and complete the digital display and alarm operation.

2.2 Scope of Application

This fixed gas detector can be connected with control panel, alarm information would be display in the control panel by uploading 485 or currency signal. Gas technical parameter settings shows as in Appendix. (For reference only, users can set parameters according to specific conditions.)

3. Specifications

Power	DC24V±3.6V	**Output**	4-20mA , Rs485
Consumption	≤2.5W	**Wire**	RVVP, 3*1.5mm^2
Environment			
Temperature	-10~55℃	**Humidity**	≤93% no dew
Pressure	86~106kPa	**Storage tem.**	-20~55℃
Ex			
Principle	Catalytic	**Gas**	Combustible gas
Method	Natural diffusion	**Resolution**	1%LEL
Range	0~100%LEL	**Precision**	±3%LEL
Response Time	≤30s(T_{90})	**Working**	Continuous
Sensor life	More than 1 year		
Electrochemica			
Principle	Electrochemical	**Gas**	Toxic gas
Method	Natural diffusion	**Resolution**	See attachment
Range	See attachment	**Precision**	±5%FS
Response Time	≤30s(T_{90})	**Working**	Continuous
Sensor life	More than 1 year		
Alarm			
Method	Sound(≥70dB),light, relay output		
Main load	AC:3A 250V AC; DC:3A 30V DC		
Backup load	AC:0.3A 125V AC; DC:1A 30V DC(Backup relay optional)		
Low alarm	Ex 20%LEL See attached table for other gases		
Dimensions			
Size	200×178×98mm(L×W×H)		
Material	Cast aluminum	**Weight**	About 2030g
Ex	Ex d IIC T6 Gb	**Protection**	IP65
Connection	M20*1.5(Internal thread) G1/2(Internal pipe thread)		
Optional			
Temperature	Range:-40~80℃ , Precision:±0.5℃(25℃)		
Humidity	Range:0~100%RH , Precision:±3%RH(5~95%RH,25℃)		

4. System Usage

The detector's appearance shows as the above in Fig1., there are installing holes behind the device. Users only need to connect relative equipment at the corresponding port according to the operation manual, after DC 24V connected, it will work properly.

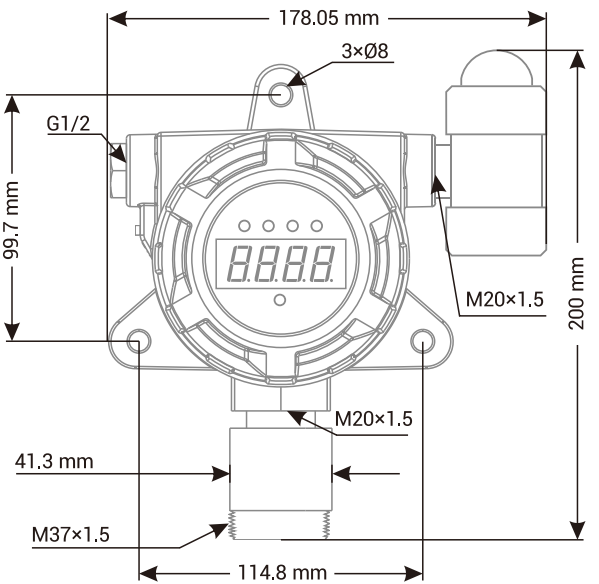


Fig 1

5. Wiring Instruction

5.1 Internal Wiring

The internal wiring of BH-60 has already been linked to the connecting terminal, user only need to connect wire to the terminal. User can see threeconnecting terminals after opening the shell. Shown as Fig 2:

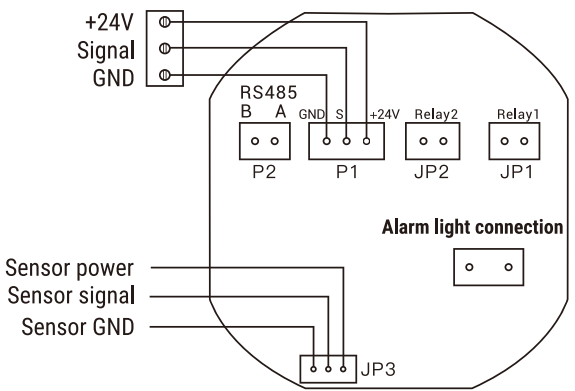


Fig 2 Gas Detector Connection

5.2 User Internal Wiring

5.2.1 Relay Interface

This connection is a out-put interface without power supply, which can be considered as a switch to control the device needed when using.

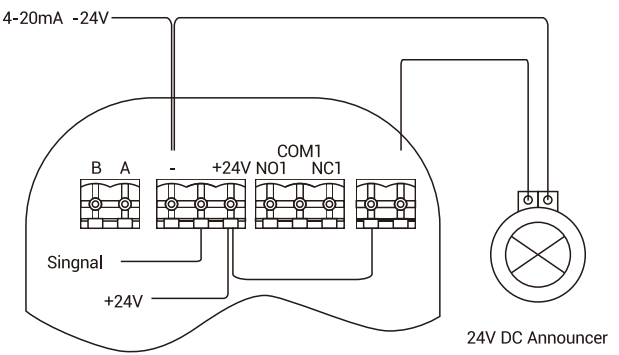


Fig 3

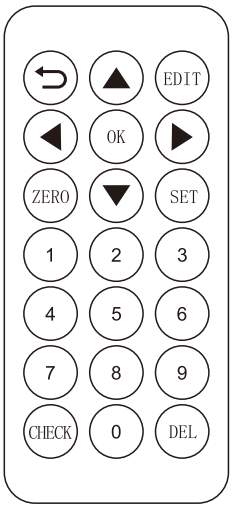
5.2.2 485 Terminal

Notice that AB can not be connected oppositely.

5.2.3 Signal Power Terminal

Three terminals are: right——24V+, middle——signal, left——24V- (GND)

5.3 Remote control instruction



	Return
	Direction key
EDIT	Edit
OK	Confirm
ZERO	Zero calibration
SET	Set
CHECK	Calibration
DEL	Delete
0	Number

Note: when using the remote control for the first time, please pull out the insulating sheet at the back of the battery to connect the circuit.

6. Installation and Connection

6.1 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.

6.2 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) with pipe screw thread nut (“2” in Fig. 4), then fix it up.

Table 1

1	Installation pipe	4	Fixation hole
2	Pipe screw thread nut	5	Gas Detector
3	Transferring tie-ins		

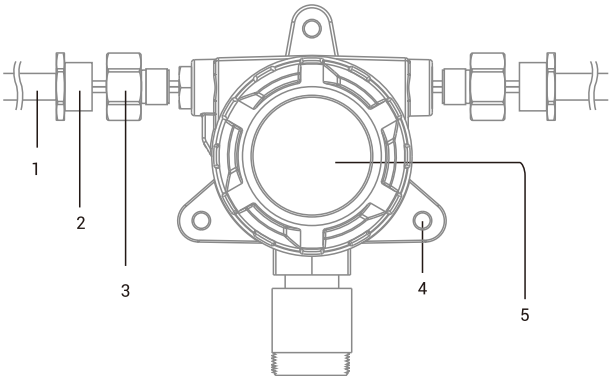


Fig 4

Method 2.(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 1, then fix the transmitter using three pieces of M8 bulge bolts to fix the detector in the corresponding installed orifice(As shown “3” in the Fig.3 and Fig. 4). Then choose transferring tie-in in the need of the customer, as shown in Fig.3; if not, as shown in Fig.4, fit it up and it's ok.

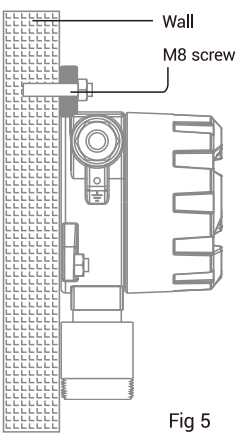
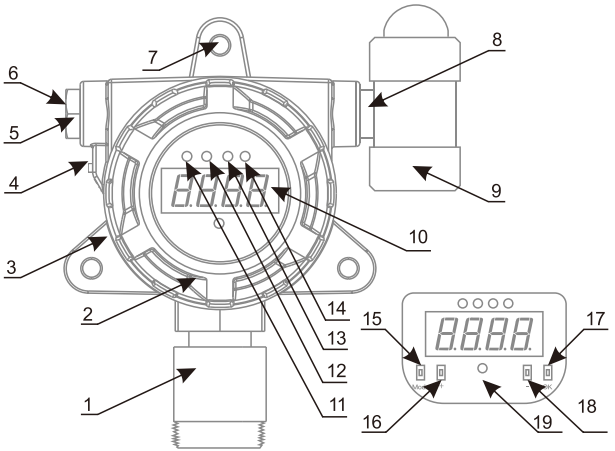


Fig 5

7. System function operating instruction(For LED display type)

System function instruction



No.	Name	No.	Name
1	Sensor head	11	Normal
2	Front	12	First alarm
3	Lower shell	13	Second alarm
4	Ground nut	14	Fault alarm
5	Pipe joint	15	Mode button
6	Wiring hole	16	“+” funcion button
7	Fixing nut	17	OK
8	Wiring hole	18	“-” funcion button
9	Alarm light	19	Infrared receiver
10	Diaplay		

Note:

The description of this article applies to LED display type.

7.1 Control Panel Instruction

The control panel shown as picture below, is consist of display window, status indicator lamp, first & second alarm light, and four buttons---- “ + ” “ - ” “ mode” “OK” . Please refer to user operating instructions for details.



Fig 6

In normal status, the indicating light flashes, signal measuring gas value shows in the display window, normal indicating light keep on; when it gives out alarm, first or second alarm light will be turned on, and relay will be closed.

7.2 Operation Steps

Turn on the device, user can see values displayed in the window.Parameter settings:

Step 1: press “set” button, it will display “PSD”, then display “0000” as below:



psd



0000

Step 2: input password (user password is “1234”). “up” and “down” button can select numbers from 1 to 9. Then press “set” button to choose next number you need to set, press “up” or“down” button to select numbers from 1 to 9 again.



password

Step 3: press “OK” button, it will display “good” if password correct, then enter into channel selection. It will display “bad” if password wrong, and exit to password input.



good



bad

Step 4: press “OK” button to enter into function menu after selected channel, it will display “F-01”, select function from “ F-01” to “F-09” by pressing “up” “down” button.



F-01

7.3 Function Instruction

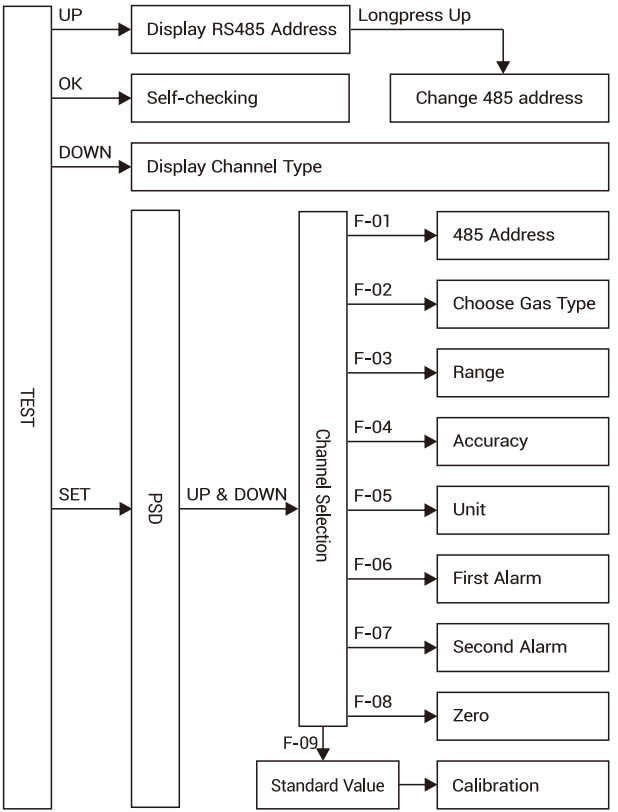
Please check table 2 for detailed functions.

For example, select “F-03” and then press “OK” button to enter into range setting, user can set maximum range. After setting, press “OK” button and it will display “F-03”, if you want to continue to set different functions, just do as the above steps. Or press “ESC” to get back to channel selection, and then press “ESC” button again to exit from settings completely.

Table 2 Function Instruction

Key	Function	Key	Function
F-01	485 address	F-06	First alarm
F-02	Gas type	F-07	Second alarm
F-03	Range setting	F-08	Gas zero
F-04	Precision set	F-09	Gas calibration
F-05	Unit set		

7.4 Function Level Diagram



7.5 Detailed Function Instruction

Common function settings are mainly: first alarm, second alarm, 485 address, 4-20mA/485 channel selection, time, etc.

Infrequently used function settings are mainly factory settings, such as gas type, gas zero and gas calibration, which would influence the accuracy of gas detection, so user must operate carefully, in case device not working properly.

Other common functions mainly are: quick review of device address, self-testing, alarm record, time, etc.

7.5.1 F-01 485 Address Settings

485 address of each channel is fixed, the first channel is 01, the second channel is 02, the third is 03 and the forth is 04.

The address of the main engine after being connected to MODBUS bus system as slave can be set.

Changing 485 address by pressing “up” or “down” button, the address starts from 1, and 99 is the maximum.



R-1~ R-99

7.5.2 F-02 Gas Type (Factory Settings)

By pressing “up” or “down” button to change the value, gas type selection please refer to table 3



C–18



C–0

Table 3 Gas Type Description

Display	Gas	Display	Gas	Display	Gas
C-0	EX	C-7	CL2	C-14	CLO2
C-1	CO	C-8	NH3	C-15	C2H4O
C-2	O2	C-9	H2	C-16	CH4
C-3	H2S	C-10	HCN	C-17	Spare gas
C-4	SO2	C-11	HCL	C-18	Spare gas
C-5	NO	C-12	PH3		
C-6	NO2	C-13	O3		

7.5.3 F-03 Range Setting

By pressing “up” or “down” button to change values; by pressing “SET” button to move cursor. By pressing “OK” button to save setting.

7.5.4 F-04 Precision Setting

By pressing “up” or “down” button to change values, 1. is an integer, 0.1 is one decimal point, 0.01 is two decimal point.



1 0.1 0.01

Note:

Range, first alarm and second alarm must be reset after changing precision.

7.5.5 F-05 Unit Setting

By pressing “up” or “down” button to change unit types, U-01 is ppm, U-02 is %vol, U-03 is %LEL.



U–01 U–02 U–03

7.5.6 F-06 First Alarm Value

By pressing “up” or “down” button to change values. By pressing “SET” button to move cursor. By pressing “OK” button to save setting. If gas is o2, first alarm value is the lower limit alarm.

7.5.7 F-07 Second Alarm Value

By pressing “up” or “down” button to change values. By pressing “SET” button to move cursor. By pressing “OK” button to save setting.

7.5.8 F-08 Gas Zero

The difference between Gas zero testing interface and testing interface is that the decimal point in gas zero testing interface keeps flashing.

Press “OK” button to finish the gas zero adjustment when gas zero environment meet its standard. And the interface will enter into testing interface automatically. (the decimal point will not flash any more.)

7.5.9 F-09 Gas Calibration

When enter into the calibration interface, it will remind user to input calibration value first. By press“OK” button to move the cursor. By pressing “up” or “down” button to change input values. After pressing “OK” button, it will indicate good, and then user will come into the calibration interface. the decimal point keeps flashing. The difference between Gas zero testing interface and testing interface is that the decimal point in gas zero testing interface keeps flashing.

Press “OK” button to finish the gas calibration.

Note:

1 The calibration value of the three calibration points should be increased sequentially, that is, the calibration value 1<calibration value 2<calibration value 3

2 The password required to enter the calibration function is: 0000

7.5.10 Other Functions

Under testing interface: Pressing “up” button to get a quick review of the device's 485Modbus address.

Pressing “OK” button, all indicating light of the system are turned on, digital tube all on, relay close, both sound and light alarm on under alarm status. System will return normal status after 5 seconds.

Pressing “down” button, system will display the present gas type of each channel.

7.5 Notice for User Operation

During the process of parameter settings, if user do not press any button for 30 seconds, system will exit parameter settings and get back to testing mode.

When over range occurs, system will display E-01.



E–01

8. Troubleshooting Guide

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

9. Notices

9.1 Avoid using in corrosive gas, lampblack, dust and water logging places, avoid strong shock.

9.2 Avoid fast flowing gas passed the sensor directly, otherwise it would effect the testing result;

9.3 Do not using the transmitter in high gas concentration much higher than its detection range, or it

would loss the sensor life;

9.4 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.

9.5 In order to keep the detector accuracy, it's better to make calibrate every half a year;

9.6 The sensors life combustible gas is more than 3 years, and electrochemical sensor is two years.

9.7 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.

9.8 The detector should be connected to the terra.

9.9 Don't open the cover when the power is on.

9.10 Pay attention to not break the Ex surface.

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

Declaration

To keep continued product improvement, we reserve the right to change design features without prior notice

Appendix

Gas	Range	L-alarm	H-alarm
CH4	0-100%LEL	20%LEL	50%LEL
C3H8	0-100%LEL	20%LEL	50%LEL
H2	0-100%LEL	20%LEL	50%LEL
H2	0-1000ppm	35ppm	250 ppm
H2S	0-100ppm	10ppm	15ppm
H2S	0-100ppm	10ppm	20ppm
CO	0-1000ppm	35ppm	200ppm
CO	0-1000ppm	30ppm	60ppm
C2H4O	0-20ppm	10ppm	15ppm
C2H4	0-100%LEL	20%LEL	50%LEL
C2H4	0-20ppm	5ppm	10ppm
O2	0-30%vol	19.5%vol	23.5%vol
C2H5OH	0-100%LEL	20%LEL	50%LEL
NH3	0-100ppm	25ppm	50ppm
CL2	0-20ppm	5ppm	10ppm
O3	0-20ppm	5ppm	10ppm
SO2	0-20ppm	2ppm	5ppm
SO2	0-100ppm	2ppm	5ppm
PH3	0-20ppm	0.3ppm	5ppm
PH3	0-5ppm	0.3ppm	2ppm
NO	0-250ppm	20ppm	50ppm
NO2	0-20ppm	5ppm	10ppm
HCN	0-500ppm	10ppm	20ppm
HCN	0-50ppm	10ppm	20ppm
HCL	0-50ppm	10ppm	20ppm
CH2O	0-10ppm	2ppm	5ppm
VOC	0-100ppm	20ppm	50ppm
C6H6	0-100ppm	20ppm	50ppm
CO2	0-5000ppm	1000ppm	2000ppm
CO2	0-50000ppm	1000ppm	2000ppm

Note: other gases not be listed, please contact with supplier.

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