

BH-90a

Portable Single gas Detector User Manual

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Bosean Electronic Technology Co.,Ltd

ISO9001-2008

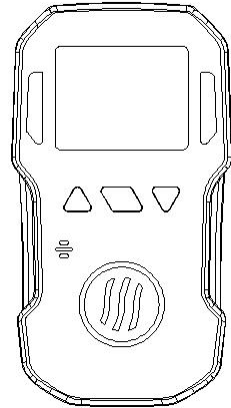
To avoid personal safety injury, Instrument damage and potential dangerous accident; do not use the product before reading this manual.

1. Description

BH-90a portable single gas detector can make continuous detection to combustible and toxic gases. It is suitable for combustible and toxic gas leakage detection in underground pipe or mines, and keeps the workers safe, prevents the facilities from being destroyed.

The detector, adopting excellent-quality sensor, makes detection in the way of natural diffusion. It has good sensitivity and reproducibility. The detector adopts embedded MCU controller, easy to operate.

The shell adopts special high strength material and anti-smooth rubber, with the characters of water-proof and dust-proof.



2. Features and specifications

2.1 Features

- Advanced MCU control with low power consumption;
- Adjustable low and high alarm level;
- Adjustable calibrating level;
- High concentration protection for combustibile gas;
- Self test for the combustibile gas sensor;
- Low battery indication;
- Self-adjustment function
- Visual and audible alarm with vibration;
- Advanced self-examination and self-renovation function
- Password management to avoid wrong operation;
- Explosive proof housing

2.2 Specifications

Range: See attached table 1.

Gas Detected: combustibile gas ($\text{CH}_4, \text{C}_3\text{H}_8, \text{H}_2$) and toxic gas, oxygen, Other rare toxic gas like ammonia, NO, PH_3 , NH_3 , NO_2 , HCN, SO_2 etc also available, Can be specified by the Customer in advance.

Alarm set points: see attached table 1.

Accuracy: $\leq \pm 5\%$ F.S.

Response time: $T < 30s$

Indication: LCD indicates the time and state

Indication of alarm, fault and low voltage with LED, sound, vibration

Operating Environment:

Operating temperature $-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$ (for combustible gas)

Operating temperature: $-10^{\circ}\text{C} \sim 55^{\circ}\text{C}$ (for toxic gas)

Humidity: $< 95\%$ RH non-condensing

Operating voltage: DC3.7V Li battery 1500mAh

Working time: $< 8h$ continuously

Charging time: $4h \sim 6h$

Sensor life: 2 years

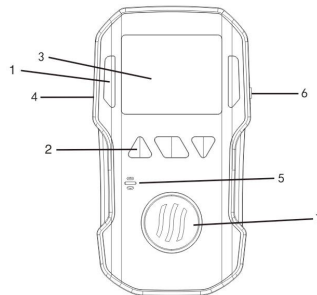
Protection category: IP65

Weight: about 130g (including battery but without accessories)

Dimension: $109\text{mm} \times 60\text{mm} \times 30\text{mm}$

3. Structure & Function

3.1 Appearance

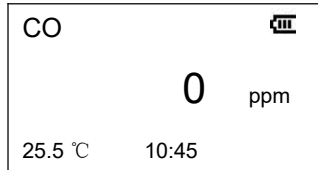


1	Alarm light	5	Buzzer
2	Buttons	6	USB charging connection
3	LCD screen	7	Sensor
4	Back clip		

3.2 Detector structure: the main shell, circuit boards, batteries, display, sensors, chargers of the components.

3.3 Principle: Electrochemical or Catalytic sensor or others.

4. Operation & Function



4.1 Display Elements

CO	Gas type	10:45	Time
	Full voltage	ppm	Concentration value
25.5 °C	Temperature		

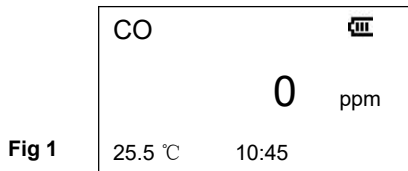
4.2 Push buttons

Push button	Description
	<ul style="list-style-type: none"> ● To active the detector, press and hold it for 5 seconds ● Press it to cancel the the operation; ● To deactivate the detector, press and hold it for 5 seconds ● Press it to set up the parameters
	<ul style="list-style-type: none"> ● Can check parameters, alarm record, low alarm, high alarm, zero calibration, calibration,time set.


4.3 Turn on


Press the button for 5s and then release it. The interface shows “Starting”, “LED Testing”, and then vibrates with “Motor Testing”, then beep and flashes with “Sound and Alarm Testing”, shows low alarm value, high alarm value, detecting range, it enters into detecting status.

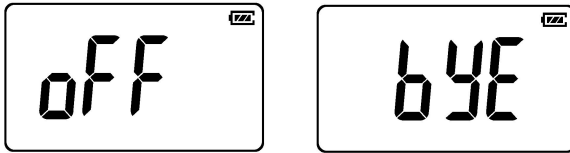
At this time, it displays the concentration of gas in the environment as figure 1.




4.4 Turn off

To deactivate the detector, press  key, then it displays the following information:

At this time, the buzzer gives beep sound. After 3 seconds, when it displays the following figure on the screen, loosen the  key. The detector is turned off.




Attentions: When the detector is not detecting status, press  continuously till it returns to the detection mode.

4.5 Menu Operating Instructions

The user menu contains the following options:

Zero calibration, calibration, time set, alarm record, low alarm settings, high alarm settings, unit set.

In the detection state, press  key, the screen displays the following screen, directly into user menu as shown in figure 4:

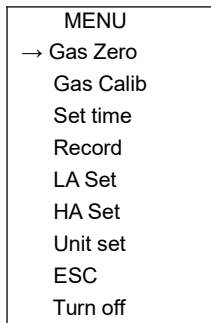

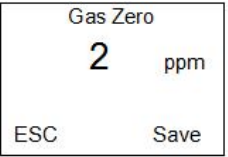
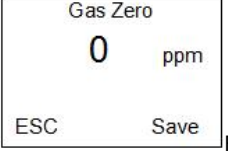
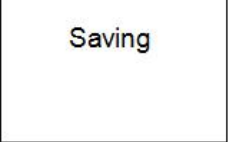





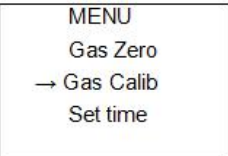
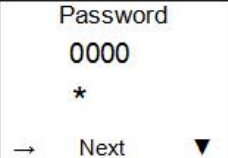






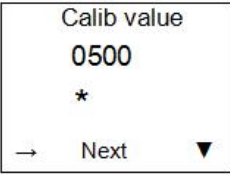
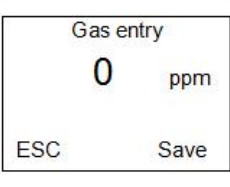
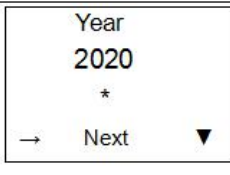

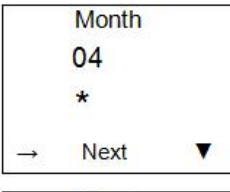
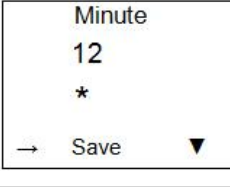
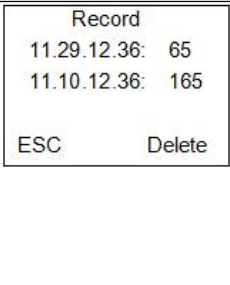



Fig. 4

Parameter setting of the detector

Display	Description
<div data-bbox="154 260 381 416">  </div> <p style="text-align: right;">Fig 5</p> <div data-bbox="154 435 381 592">  </div> <p style="text-align: right;">Fig 6</p> <div data-bbox="154 611 381 767">  </div> <p style="text-align: right;">Fig 7</p> <div data-bbox="154 786 381 927">  </div> <p style="text-align: right;">Fig 8</p>	<p>1. Zero function setting</p> <p>Press the button  in the menu interface, the interface shown as Figure 14: press  key to enter into the zero setting page as Figure 5: press the button  for zero drift, as shown in Figure 6: the instrument directly into the menu settings page, press the button  to save the drift value, interface as shown in Figure 7: the instrument directly into the menu screen, press the button  again, the instrument enters the normal detection interface.</p> <p>Warning: this operation is to ensure that the operation is carried out in clean air, otherwise the concentration of the reaction gas in the environment will affect the accuracy of the portable gas detector.</p>
<div data-bbox="154 1034 381 1190">  </div> <p style="text-align: right;">Fig 9</p> <div data-bbox="154 1209 381 1366">  </div> <p style="text-align: right;">Fig10</p>	<p>2. Calibration settings function</p> <p>Press the button  in the menu interface, move the cursor with  key, the interface shown as Figure 9: press  enter into the calibration setting page as Figure 10: press  to choose number, press  to adjust the number, input password 8888 and press the button  into calibration interface.</p> <p>Input the standard calibration gas value in the calibration interface as Figure 11, for example, CO, it is 500ppm on the gas cylinder, input 500, and press “Next” into gas entry interface as Figure 12.</p> <p>Please inject standard calibration gas, once the</p>

 <p>Calib value 0500 * → Next ▼</p>	<p>value is stable after 2 minutes, press “SAVE” calibration is done. The rate of flow 500ml/min is recommended.</p>
 <p>Gas entry 0 ppm ESC Save</p>	
 <p>Year 2020 * → Next ▼</p>	<p>3. Time setting Press the button  in the menu interface, move the cursor with ▼ key, choose the set time, the year interface shown as Figure 13: press → to move the *, press ▲ to adjust number, press Next to confirm.</p> <p>After set year, press next, you can set month, date, hour, minute, Press “SAVE” to complete the time set.</p>
 <p>Month 04 * → Next ▼</p>	
 <p>Minute 12 * → Save ▼</p>	
 <p>Record 11.29.12.36: 65 11.10.12.36: 165 ESC Delete</p>	<p>4. Alarm Record Enter alarm record interface, display date and max alarm value, it save the max alarm value every 3 minutes as shown Figure 16, “11.29.12.36” means 29th November 12:36, “65” display the max alarm value within 3 minutes. Press “ESC” return main interface, Press ▼ to delete the record as shown Figure 17.</p>

<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Deleting</p> </div> <p style="text-align: right;">Fig17</p>	
<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">Low alarm set</p> <p style="text-align: center;">050</p> <p style="text-align: center;">* ppm</p> <p>→ Save ▼</p> </div> <p style="text-align: right;">Fig18</p>	<p>5. Low alarm setting</p> <p>Enter "LA set" menu, use ▲ to adjust the cursor, use ▼ to adjust the value, choose the right value and press "SAVE". then it will return the normal detecting interface show as Figure 18. If no special requirement, please do not revised alarm value.</p>
	<p>6. High alarm setting</p> <p>The setting is same as low alarm setting. Note: High alarm value never lower than low alarm value. If no special requirement, please do not revised alarm value.</p>
<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">Unit set</p> <p>→ ppm</p> <p style="text-align: center;">mg/m³</p> <p style="text-align: center;">Save</p> </div> <p style="text-align: right;">Fig19</p>	<p>7. Unit set</p> <p>Enter "Unit set" function show as Figure 19, choose the suitable unit and save it. Note, this function can be used on the PPM unit gas.</p>
<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">MENU</p> <p style="text-align: center;">Unit set</p> <p>→ ESC</p> <p style="text-align: center;">Turn off</p> </div> <p style="text-align: right;">Fig20</p>	<p>8. ESC</p> <p>Under the menu function interface, choose ESC, press  to return normal detecting interface.</p>
<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">YES OR NO</p> <p style="text-align: center;">YES NO</p> </div> <p style="text-align: right;">Fig21</p>	<p>9. Turn off</p> <p>Under the menu function interface, choose "Turn off", press ▲ to turn off, press ▼ to return normal detecting interface.</p>

4.6 Alarm information

The following table shows the details of each alarm:

Alarm type
Low alarm: Short slow alarm tone; The alarm indication is yellow; The red alarm light flashes; Device vibrates .
High alarm: Abnormal harsh alarm tone; The alarm indication is red; The red alarm light flashes; Device vibrates.
Low battery alarm: When the device is in low battery, it will give slow short alarm every minute to remind user.

4.7. Charging

Please charge the detector when it shows low battery or the detector can't be turned on due to low battery. Before charging, please turn off the detector to avoid any potential damage. When the battery mark on the screen is full and doesn't change any more, it means the charging is completed, you can pull off the charger.

Warning: During charging status, the detector can't detect the gas leakage. Please do not try to charge it at testing places to avoid fire or explosion. Please do not charge it when the detector is working to avoid potential damage.

Note: Make sure full charge for at least once within 1 months

If do not use it for a long time.

5. Possible fault and corresponding solution

Possible fault	Possible reason	Corresponding solution
No response to alarm	Wrong alarm point	Please reset the alarm point
	Fault of electric circuit	Please contact the manufacturer

No response to gas detected	Zero drift	Calibrate zero point
	Fault of electric circuit	Please contact the manufacturer
Inaccurate indication	Sensor is overdue	Please contact manufacturer to replace gas sensor
	Uncalibrated for long time	Please calibrate it in time
Insufficient working hours	Fault of Charger	Please change charger
	Fault of the Device	Please contact the manufacturer
Can not charge electricity	Fault of Charger	Please change charger
	Fault of the Device	Please contact the manufacturer

6. Notices

- 6.1 Falling down from high places or strong shake is prohibited.
- 6.2 The detector may not work properly at interferential high-concentration gas.
- 6.3 To avoid incorrect result or possible damage to the detector, please operate and handle the detector in accordance with the manual.
- 6.4 The detector should be not stored or used neither under the circumstance with caustic gas (such as Cl₂), nor under the other rugged circumstances, including excessive high or low temperature, high humidity, electromagnetic field and strong sunshine.
- 6.5 If there is dust on the surface of the detector after a long-term use, please clean it lightly with clean soft cloth. The surface may be scraped or destroyed with caustic solvent or hard things.
- 6.6 To assure the testing accuracy, the detector should be calibrated periodically. And the calibration period should be less than one year.
- 6.7 Please put the used Lithium batteries to the appointed places or send to our company. Don't discard them into the dustbin randomly.

7. Standard accessories:

Gas detector	1pc
Calibration cap	1pc
Charger	1pc
User manual	1pc
Suit case packaging	1pc
Warranty card	1pc
Quality card	1pc

Affix. Table1

Model	Range	L-alarm	H-alarm
□BH-90A-CH4	0-100%LEL	20%LEL	50%LEL
□BH-90A-C3H8	0-100%LEL	20%LEL	50%LEL
□BH-90A-H2	0-100%LEL	20%LEL	50%LEL
□BH-90A-H2	0-1000ppm	35ppm	250 ppm
□BH-90A-H2S	0-100ppm	10ppm	15ppm
□BH-90A-H2S	0-100ppm	10ppm	20ppm
□BH-90A-CO	0-1000ppm	35ppm	200ppm
□BH-90A-CO	0-1000ppm	30ppm	60ppm
□BH-90A-C2H4O	0-20ppm	10ppm	15ppm
□BH-90A-C2H4	0-100%LEL	20%LEL	50%LEL
□BH-90A-C2H4	0-20ppm	5ppm	10ppm
□BH-90A-O2	0-30%vol	19.5%vol	23.5%vol
□BH-90A-C2H5OH	0-100%LEL	20%LEL	50%LEL
□BH-90A-NH3	0-100ppm	25ppm	50ppm
□BH-90A-CL2	0-20ppm	5ppm	10ppm
□BH-90A-O3	0-20ppm	5ppm	10ppm
□BH-90A-O3	0-10ppm	2ppm	5ppm
□BH-90A-O3	0-50ppm	5ppm	10ppm
□BH-90A-SO2	0-20ppm	2ppm	5ppm
□BH-90A-SO2	0-100ppm	2ppm	5ppm
□BH-90A-PH3	0-20ppm	0.3ppm	5ppm
□BH-90A-PH3	0-5ppm	0.3ppm	2ppm
□BH-90A-CO2	0-5000ppm	1000ppm	2000ppm
□BH-90A-CO2	0-50000ppm	1000ppm	2000ppm
□BH-90A-NO	0-250ppm	20ppm	50ppm
□BH-90A-NO2	0-20ppm	5ppm	10ppm
□BH-90A-HCN	0-500ppm	10ppm	20ppm
□BH-90A-HCN	0-50ppm	10ppm	20ppm
□BH-90A-HCL	0-50ppm	10ppm	20ppm
□BH-90A-CH2O	0-10ppm	2ppm	5ppm
□BH-90A-VOC	0-100ppm	20ppm	50ppm
□BH-90A-VOC	0-1000ppm	50ppm	200ppm
□BH-90A-C6H6	0-100ppm	20ppm	50ppm

Declaration

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

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