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**BH-90a**

**Portable Single gas Detector  
User Manual**

Ver : BSA20150424005

**Bosean Electronic Technology Co.,Ltd**

**ISO9001-2008**

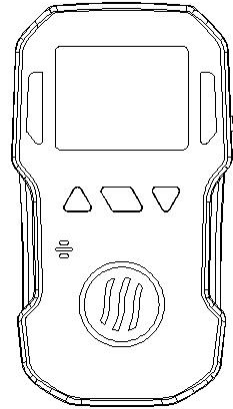
To avoid personal safety injury, Instrument damage and potential dangerous accident; do not use the product before reading this manual.

## 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,  $\text{PH}_3$ ,  $\text{NH}_3$ ,  $\text{NO}_2$ , HCN,  $\text{SO}_2$  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:  $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$  (for toxic gas)

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

Operating voltage: DC3.7V Li battery 1500mAh

Working time:  $\leq 8$ h continuously

Charging time: 4h~6h

Sensor life: 2 years

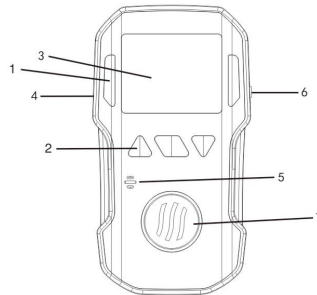
Protection category: IP65

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

Dimension: 100mm×60mm×30mm

### 3. Structure & Function

#### 3.1 Appearance

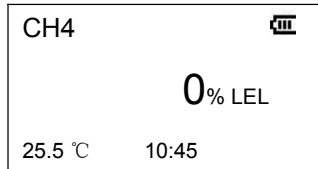


1	Alarm light	5	Buzzer
2	Buttons	6	USB charging connection
3	LCD screen	7	Sensor
4	Back clip		


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

**3.3 Principle:** Electrochemical or Catalytic sensor.


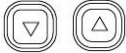
## 4. Operation & Function




### 4.1 Display Elements

CH4	Gas type	10:45	Time
	Full voltage	0%LEL	Concentration value
25.5 °C	Temperature		

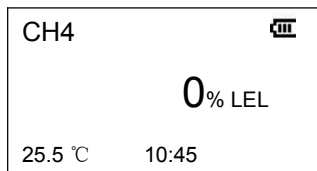
### 4.2 Push buttons

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

### 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”,it enters into detecting status.

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

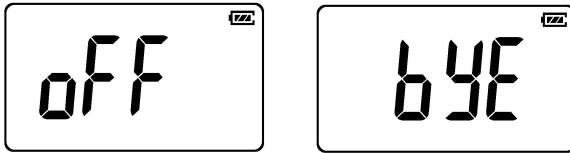


**Fig 1**

#### 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.



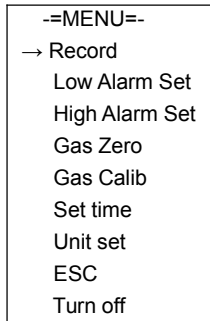
**Attentions :** When the detector is not detecting status, press ⊙ continuously till it returns to the detection mode.

#### 4.5 Menu Operating Instructions

The user menu contains the following options:

Alarm record, low alarm settings, high alarm settings, zero calibration, calibration, time set.















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

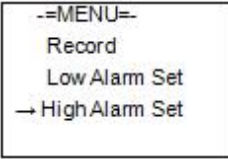







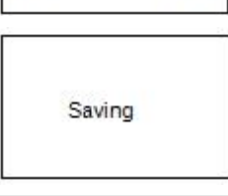
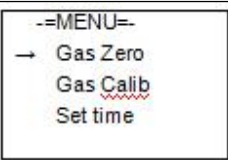





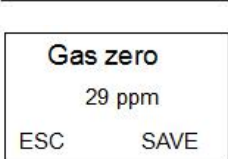
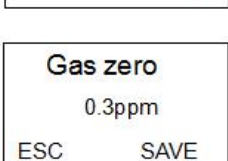



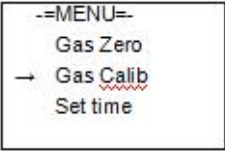
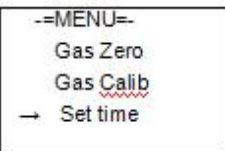




















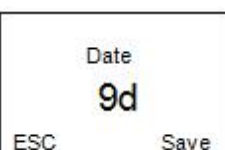

**Fig. 4**

Parameter setting of the detector

Display	Description
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<div data-bbox="151 199 386 343"> <p>Alarm Record 07-28 11:16 L-Alarm 07-28 13:51 H-Alarm 07-28 15:36 L-Alarm</p> </div> <p>Fig5</p> <div data-bbox="151 359 386 518"> <p>Clear records YES NO</p> </div> <p>Fig6</p> <div data-bbox="151 534 386 686"> <p>Clearing</p> </div> <p>Fig7</p>	<p>1. Alarm record:</p> <p>Move the cursor to Alarm record, press  to enter it as figure 5: Press the  and  keys to scroll. You can also press  on ESC to return to the normal detection interface. Press the button  in the alarm record interface, shown in Figure 6: Press the key  to indicate Yes, the page will show Figure 7: Please clear the record later. Press the key  again to enter the normal detection interface. If press , the record will not be cleared and the interface will go directly to the menu setting screen.</p>
<div data-bbox="151 710 386 869"> <p>-=MENU=- Record → Low Alarm Set High Alarm Set</p> </div> <p>Fig8</p> <div data-bbox="151 885 386 1045"> <p>Low Alarm Set 20%LEL ESC Save</p> </div> <p>Fig9</p> <div data-bbox="151 1061 386 1220"> <p>Saving</p> </div> <p>Fig10</p>	<p>2. Low alarm settings</p> <p>Press the button  in the menu interface, the interface shown in Figure 8: press  key to enter low alarm set interface show as Figure 9: press the button  to increase the value, press  to decrease the value, press the button  means save currently selected value, interface as shown in Figure 10: the instrument directly into the menu screen, press  on ESC to return to the normal detection interface.</p> <p>If there is no special requirement, the alarm parameters should not be modified</p>

	Fig11	<h3>3. High alarm settings</h3> <p>Press the button  in the menu interface, the interface shown in Figure 11: press  key to enter high alarm set interface show as Figure 12: press the button  to increase the value, press  to decrease the value, the instrument directly into the menu page, press the button  means save currently selected value, interface as shown in Figure 13: the instrument directly into the menu screen, press  on ESC to return to the normal detection interface.</p> <p>If there is no special requirement, the alarm parameters should not be modified</p>
	Fig12	
	Fig13	
	Fig14	<h3>4 zero function setting</h3> <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 15: press the button  for zero drift, as shown in Figure 16: the instrument directly into the menu settings page, press the button  to save the drift value, interface as shown in Figure 17: 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>
	Fig15	
	Fig16	
	Fig17	

 <p>--MENU-- Gas Zero → Gas Calib Set time</p>	<p>Fig18</p>	<p>5 Calibration settings function</p> <p>In order to avoid the user into this function affect the detector work. This function is set separately. Please contact the manufacturer or distributor for this operation.</p>
 <p>--MENU-- Gas Zero Gas Calib → Set time</p>	<p>Fig19</p>	<p>6.Time setting</p> <p>Press the button  in the menu interface, the interface shown as Figure 19: press  key to enter into the time setting page as Figure 20:press the button  to increase the value, press  to decrease the value, the instrument directly into the menu page, press the button  to save the year value, the instrument directly into the month setting screen as Fig.21, press  and  buttons to select the appropriate month, press the button  to save the month value, the instrument directly into the date setting screen as Fig.22, press  and  buttons to select the appropriate date, press the button  to save the date value, the instrument directly into the hour setting screen as Fig.23, press  and  buttons to select the appropriate hour, press the button  to save the hour value, the instrument directly into the minute setting screen as Fig.24, press  and  buttons to select the appropriate hour, press the  key to save the data portable gas detector display Is saved later, and then enter the menu settings interface, then press the  button portable gas detector into the normal detection interface.</p>
 <p>Year 2000y ESC Save</p>	<p>Fig20</p>	
 <p>Month 12m ESC Save</p>	<p>Fig21</p>	
 <p>Date 9d ESC Save</p>	<p>Fig22</p>	
 <p>Hour 20h ESC Save</p>	<p>Fig23</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 Cl<sub>2</sub>), 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

**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-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	0-5000ppm	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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