

BX616

Portable multi gas detector Operation manual



Read this manual carefully before using the device

Ver: HWWM161228CG

Service guidelines

1. Thanks for using our products. Before operation, please read this manual carefully in case any accidents or damage to the device due to misoperation.
2. If user install, repair or replace parts on the device privately without following this manual, we shall not take any responsibilities.
3. Within 12 months after delivery date, this device deserves free maintenance if its function quality cannot reach to its technical specification when user comply with demands of storage, shipping and operation conditions required in this manual.
4. Any quality problem due to incorrect operation shall be charged.
5. If you have any suggestion or comment on our product or service, please contact to us by following the contact information on the last page of this manual

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Safety information

Before using the detector, please carefully read the below safety information first and follow the operation requirement:

1. Please don't use the defective detector. Before using, please check if there is scratch on the detector or spare part missing.
2. Every day before using the detector, you're suggested to follow 4.3 and do "impact test" to be make sure the detector works well.
3. "Impact test" is suggested to be done periodically to guarantee the good performance of audible , visual and vibration alarm.
4. Accessories approved by the seller are only permitted to be used on the detector.
5. Only use the charger which comes with the machine to charge the detector in safe environment, charging in dangerous place is absolutely prohibited.
6. Detectors using catalytic sensor or semi-conductor sensor cannot exposure to gases which the concentration is over the detector's range, otherwise it will increase the detector's load and interfere its performance or even damage the detector.
7. Detectors using catalytic sensor or semi-conductor

sensor cannot exposure to gas environment which contain lead compounds, sulfur compounds, phosphorous compounds or silicon, otherwise it will poison the catalytic sensor or the semi-conductor sensor.

8. Detectors using catalytic sensor or semi-conductor sensor cannot exposure to gas environment which contain hydrogen sulfide, halogenated hydrocarbon or high corrosive environment, otherwise it will restrain the sensor's response, decrease the sensor's sensitivity. If you have to use the detector in above environment, please do "impact test" after detection finish.
9. The detector cannot exposure to electric shock, strong electromagnetic or severe continuous mechanical vibration environment.
10. Do not put the used battery of this detector together with other garbage.
11. Privately disassemble, adjust, or repair the detector is prohibited.
12. The detector should be protected from falling down from high above or severe vibration.
13. Any application or using trouble beyond this manual, please contact to the seller.

1. Brief introduction

BX616 is a multi-gas detector which can detect the combustible gases, O₂, CO and H₂S gases in the air. Its functional and watertight design (IP 66) incorporates a Bump proof, rubberized housing to meet the toughest requirement of harsh environment like underground tunnels, mines etc.

2. Features and specification

2.1 Main features

- Intrinsically safe design
- 100000 records storage capacity including peak value
- Calibration point adjustable
- Adjustable 2-level alarm levels; STEL and TWA alarm
- Audible, visual and vibration alarm
- Self-protection design for combustible gas sensor
- Battery low voltage alert function
- Data uploading
- Self-test when power on
- Self-diagnostic and auto-correction function.

2.2 Technical specification

Detection method: Diffuse naturally

Detecting gas: See attached table on the last page

Response time: $T_{90} < 30s$

Indication error: $\pm 5\%$ FS

Working condition:

Temperature: $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$

Humidity: $< 95\%RH$ (no condensation)

Power source: DC3.7V 1800mAh Lithium battery

Charging time: ≤ 6 hours

Battery working time: ≥ 8 hours (no alarm status)

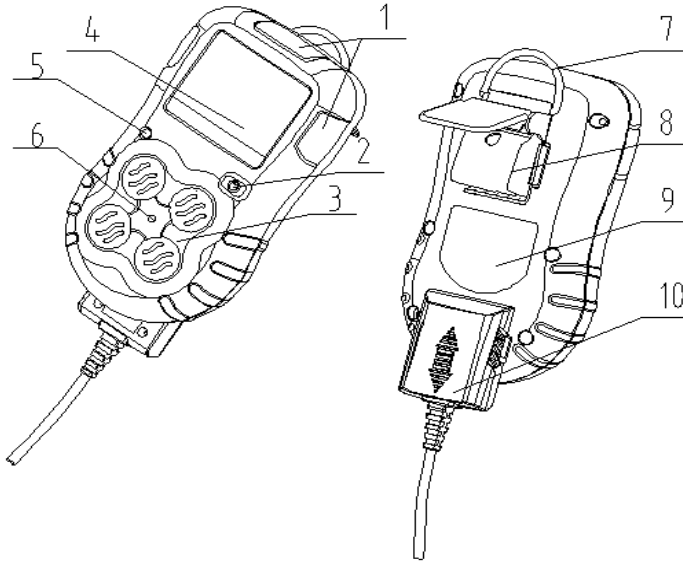
Ingress protection: IP66

Dimension: L*W*H 120mm×68mm×30mm

Weight: About 220g

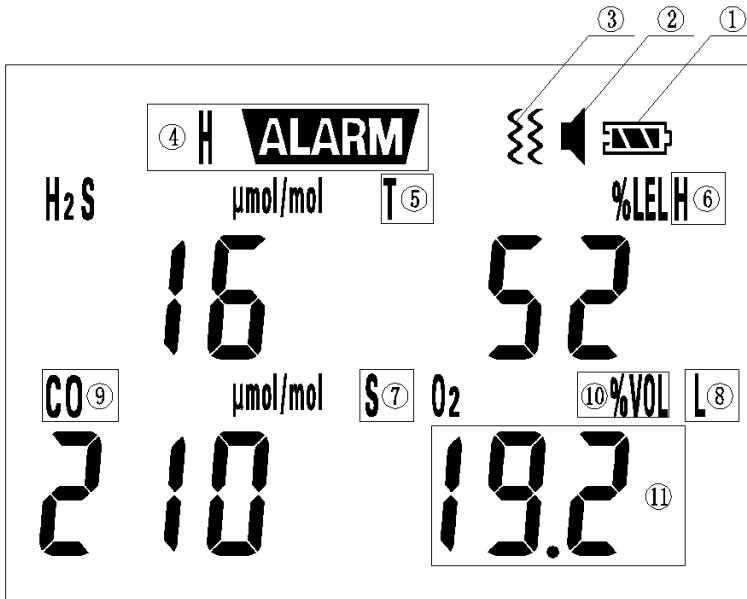
3. Structure and Function

3.1 Appearance



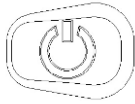
- 1 Alarm indicator
- 2 Button
- 3 Sensor channel
- 4 Display screen
- 5 Buzzer
- 6 Calibration cap fasten hole
- 7 Hand strap
- 8 alligator clip
- 9 Label
- 10 charging/ communication port

3.2 Display information



- ① Battery voltage indication
- ② Sound indication
- ③ Vibration indication
- ④ Alarm indication
- ⑤ TWA alarm indication
- ⑥ High alarm indication
- ⑦ STEL alarm indication
- ⑧ Low alarm indication
- ⑨ Gas name
- ⑩ Unit

3.3 Button Function



The button

- Power on: Hold it for 1 second and then release it
- Power off: Hold it for 3 seconds till the screen is off
- Open backlight: Press it once
- Mute and cancel vibration: During alarm status, press it once
- Check device status: Press it once.
- Calibration: In detecting status, hold it for more than 20 seconds. The screen will be turned off and then turn on again, after the screen shows calibration status, release the button.

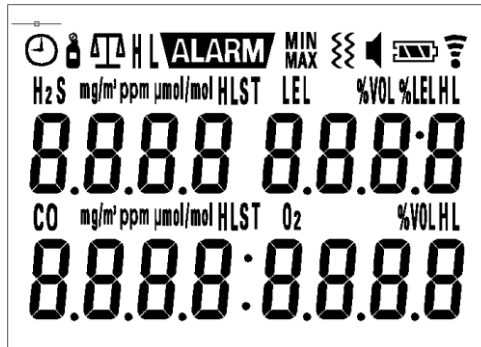
Note: The initial alarm method is buzzer + flasher + vibrator. If the user needs to set the alarm method, please install the software by using the CD and then modify the settings on the PC.

4. Operation instruction

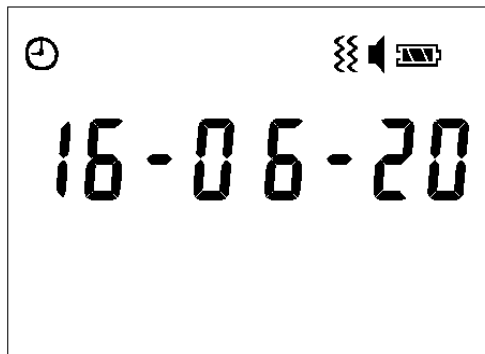
4.1 Power on

When the device is at power off status, hold the button for 1 second and then release it. The buzzer gives sound once and the device is power on. The screen will in turn display the below interface,

1. Full digit display, background light self-test.



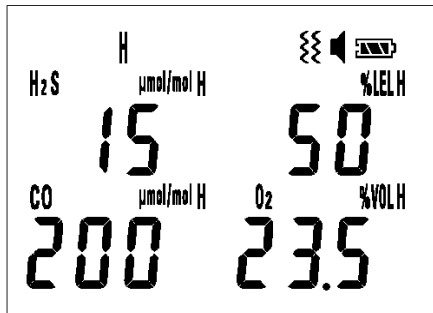
2. Time display, buzzer self-test



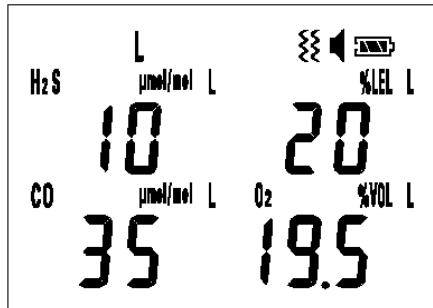
3. Version display, vibration self-test



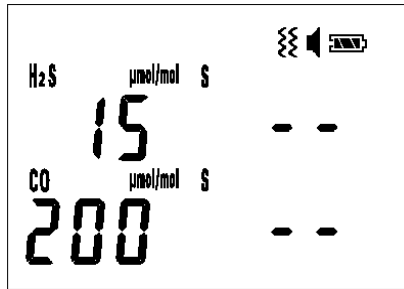
4. High alarm value display, red light self-test



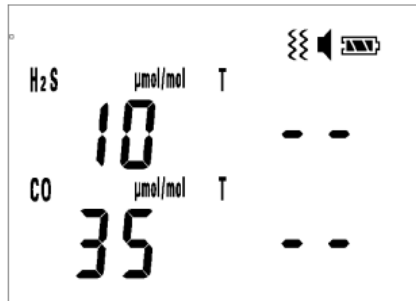
5. Low alarm value display, yellow light self-test



6. STEL alarm display, green light self-test



7. TWA alarm display



8. Count down



After all above display finish, the device will enter into detection status. On the screen, it will show the concentration value of the target gases.

Note: The device is initially set as auto zero calibration after power on, so please power on the device in the clean air. Otherwise, we are not responsible for the result due to your abnormal operation.

4.2 Power off

In the detection status, hold the button for 3 seconds. Buzzer gives long-time sound 3 times and short-time sound twice. Then the device will be power off.

4.3 Alarm

When the gas concentration in the air reaches or exceeds the preset alarm levels, the device will give audible, visual and vibrative alarm signals. In short time if the user cannot leave this environment, he can cancel the audible and vibrative signals by pressing the button, so as to save the battery voltage.

If the target toxic gas concentration reaches or exceeds the preset value, the device will also give STEL and TWA alert signals.

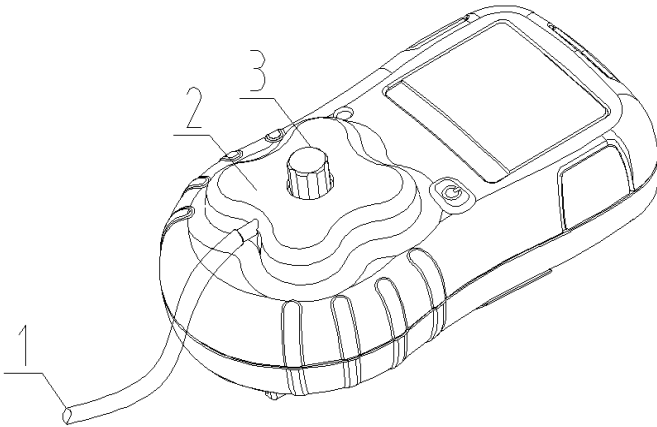
By the way, the device will also give sensor fault alert signal and low voltage alert signal. On the screen, it will show the relative signal indication. Please be noted.

Note: The function of STEL alert, TWA alert, sensor fault alert and low voltage alert must be activated in before using.

4.4 Device status check

In detecting status, press the button once and the screen will show the device status including the max. value, the min. value, STEL value, TWA value, present time, serial number and version number.

4.5 Calibration



- 1 Gas input
- 2 Calibration cap
- 3 Fasten screw

When the device is in detection status, hold the button for more than 20 seconds. The screen will firstly turn off and then turn on. When the screen shows calibration status, release the button. The screen will display as below:

1. Enter calibration interface



2. Sensor warm up



3. Zero calibration



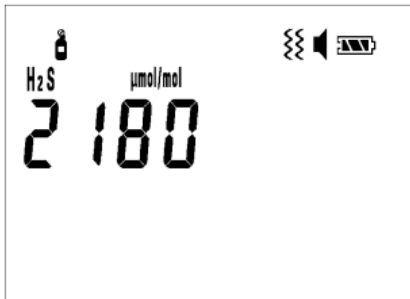
Please put the BX616 device in clean air when you are doing zero calibration

4. Gas input



The screen will display calibrating concentration, after you input the standard gas, the BX616 detector will start to analyze.

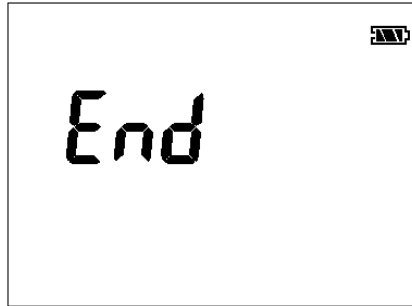
5. Auto calibration



6. Calibration succeed



7. Calibration is over



If you are going to calibrate more than one type gas, just repeat the above process is ok. Also you can input mixed gas with different kinds of gases, the BX616 detector can analyze all the input gases together and then finish the calibration at one time.

4.6 Impact test

In order to make sure the BX616 works well, user is suggested to do “impact test” every time before using.

Test method: After the device is power on, put it in to the target gas or standard gas environment with high concentration that is beyond the high alarm level. If the device works fine and reading is correct, then user can carry it for detection purpose.

If the device’s reading is beyond regular error range, please recalibrate it following 4.5.

If the device does not response or display faulty (error), please contact to the seller.

5. Data communication

By using the configured software, user can set the parameter of the device and download testing data to computer.

Please use standard configured communication cable to connect the device with computer, then you can run our configured software.

Warning: DO NOT connect the device with computer in the detection site, the connection or disconnection of the cable may cause spark which may lead to fire or explosion.

6. Charging

When the device cannot be power on due to low battery voltage, please charge the device through the supplied charger. Connect the device with AC100~240V power source, the device will be automatically power on and the screen shows the charging icon. When the screen icon shows the battery voltage is full, please disconnect the device with power source.. Then the device can work normally again.

Warning:

1. When you charge the device in power off status, the device cannot be power on and detect.

2. It's forbidden to charge the device on working site, so as to avoid any fire or explosion.

3. Please charge the device when it is power off, so as to ensure the charging efficiency.

Note:

Please charge the device once every 3 months if the device is not used for long time.

Charging the device in the environment that temperature is below than 0°C may possibly damage the battery.

7. Sensor maintenance

The device adopts modular sensor. Please pay attention to the life span of the sensor modules. When the sensor module is overdue, please replace it with new one.

In order to guarantee the device's accuracy, it's suggested to re-calibrate the sensor modules at least once every 6 month.

Please ask the seller or professional maintenance person to replace the sensor if needed, after plugging the new sensor module into the device, please calibrate the new sensor by the device before using.

8. Trouble shooting guidance

Troubles	Analysis	Solution
Cannot power on	Too low voltage	Charge it in time
	Dead lock	Contact the seller
	Circuit fault	Contact the seller
No response to gas	Warming up	Wait till it ends
	Circuit fault	Contact the seller
Testing reading incorrect	Sensor overdue	Contact the seller
	Not calibrated for long time	Calibrate the sensor
Time display is not correct	Battery used up	Charge the device
	Electromagnetic interference	Reset the time
Gas displayed is negative value	Sensor drift	Make zero calibration
Sensor fault displayed on the screen	Sensor fault	Contact the seller

9. NOTICE

- Avoid dropping or shocking seriously.
- Please strictly follow this manual to use the device. Otherwise, it will cause incorrect detection result or damage the device.
- It's forbidden to use and store the device in the corrosive environment (like high concentration of CL2) or harsh environment (like exceeding high or low temperature, high humidity, electromagnetic field, strong sunshine etc.).
- After long time use, if there is dust on the interface, please use clean soft cloth to clean it. Otherwise, surface will be scratched or damaged.
- In order assure the detection accuracy, re-calibration period is every 6 months.
- Considering the environmental protection, please abandon the used Lithium battery to the specific area and do not throw them into the trash.
- For any problem which is not described on this manual, please contact the seller in time.
- Disassembling, modifying and repairing the device should be carried out by the authorized personnel.
- It's forbidden to charge the device and upload the data to PC in the dangerous environment.

Attached Table

Gas	Detection Range	Preset Low Alarm	Preset High Alarm	TWA	STEL
O ₂	0-30%vol	19.5%vol	23.5%vol	/	/
H ₂ S	0-100ppm	10ppm	15ppm	10ppm	15ppm
CO	0-1000ppm	35ppm	200ppm	35ppm	200ppm
LEL	0-100%LEL	20%LEL	50%LEL	/	/

Gas	Detection Range	Low Alarm Setting range	High Alarm setting range
O ₂	0-30%vol	16%vol~19.5%vol	22.5%vol~24%vol
H ₂ S	0-100ppm	5ppm~15ppm	15ppm~30ppm
CO	0-1000ppm	25ppm~100ppm	100ppm~500ppm
LEL	0-100%LEL	10%LEL~25%LEL	25%LEL~80%LEL

