BX176

Portable single gas detector

Operation manual

Please read this manual carefully and thoroughly
before using this product

Ver：HWWM161229CG

Safety information

Before using the detector, please carefully read the below safety information first and follow the operate 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.

Table of content

1. Brief introduction

BX176 portable single gas detector (hereinafter referred to as the detector) is an intrinsically safe equipment which can do continuous detecting to combustible gases and toxic gases. It is suitable for combustible and toxic gas leakage detection in underground pipes or mines, it effectively prevents the staffs' life safety from being harmed, and the facilities from being destroyed.

The detector, adopting excellent-quality sensor, and detect gases by natural diffusion. It has good sensitivity and repeatability. The detector adopts embedded MCU controller, easy to operate, and has complete function and high reliability.

The shell of the detector adopts special high strength engineering plastic and anti slip rubber composite, which has high strength and good hand feeling, and waterproof, dustproof.

2. Main features and specification

2.1 Main features

--Large LCD display;

--Adjustable low and high alarm level;

--Calibration point adjustable

--High concentration protection for combustible gas sensor;

--fault diagnoses for the combustible gas sensor;

--Low voltage alert;

--Real time clock display;

--Replaceable sensor module;

--Two level three types alarm (audible, visual, vibrating)

--Data uploading (optional);

--STEL and TWA alarm for toxic gases;

--Intrinsically safe.

2.2 Specification

Target gas: LEL, O_2, toxic gases etc.

Accuracy: ≤±5% F.S.

Response time: T90 <30s (LEL, CO, H_2S)

T90 <20s (Oxygen)

T90 <60s (NH_3, HCL)

Alarm method: Audible, visual, and vibration alarm

Indication: LCD indicates the time and state

Working temperature:

-40℃～70℃ (for combustible gas)

-20℃～50℃ (for toxic gas)

Working humidity: <95%RH (no dews)

IP rating: IP65

Power supply: DC3.7V, 1300mAh Li-ion battery

Continuously working time:

Combustible gas: ≮ 8h continuously

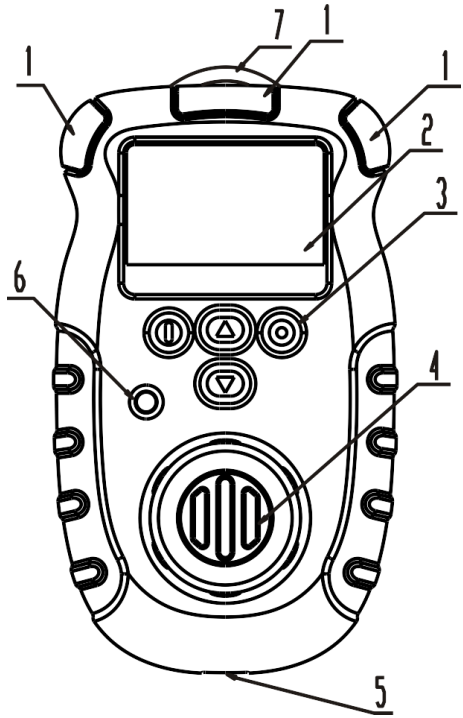
Toxic gas: ≥300h continuously (20℃)

Charging time: 4～6 hours

Dimension and weight: 104.0mm×60.8mm×30.5mm about 125g

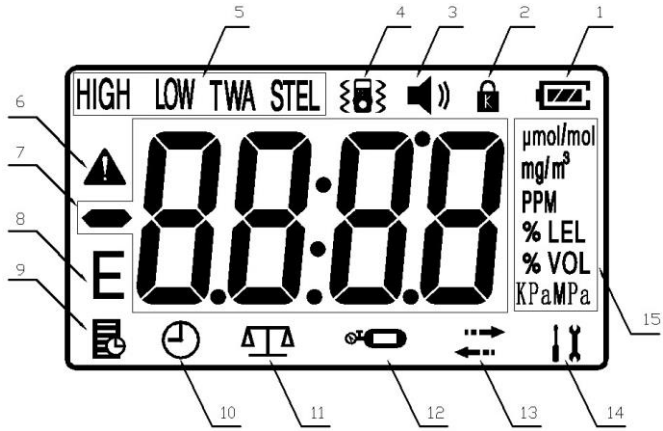
3. Structure and function

3.1 structure



1. Alarm light
2. LCD screen
3. Button
4. Gas sensing hole
5. Charge/data interface
6. Buzzer sound hole
7. Buckle

3.2 Display



NO.	Function
1	Battery voltage
2	Lock or password
3	Buzzer status
4	Vibration status
5	Alarm information
6	Alert or Maximum value
7	Data reading
8	Fault
9	History record（reserved）
10	Clock icon
11	Zero calibration
12	Calibration point or calibrating status
13	Data communication icon ①
14	Set up
15	Unit display

Note: ① This function is optional, please check whether your product have this function when you buy it.

3.3 Button's function

Button	Function
	● Power on，please press button  for more than 3s ● Cancel your parameter settings, press button  ● Calibration, when power off, press button  and  for more than 5s ● Power off, press button  for more than 3s
	1） Increase the setting value, press button  2） Check the device status, display current temperature, time, STEL and TWA②, maximum concentration③, press button  and  . 3） Set device parameter, press button  and  for more than 3s.
	1、 Decrease the setting value, press button 

	2、 Auto zero-translation, press button and for more than 3s ①
	● Confirm the setting parameters, press ● Close the alarm sound and vibration when alarm happens, press

Note: ①This operation need password verification.

②This function is only available for toxic detecting.

③Oxygen has maximum exposure value and minimum exposure value.

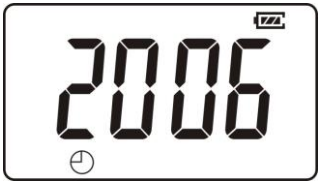
4. Operation

4.1 Power on

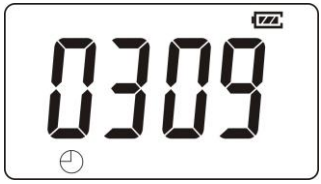
When the detector is power off, press for 3 seconds and the detector will be turned on. Then, the detector begins self-test as follows:

1. The LCD displays all of the screen elements, and the background light is on.
2. Give a sound of power on to test the buzzer function.
3. Test the vibration and alarm indication.
4. Show software version number

5. Show the date and time

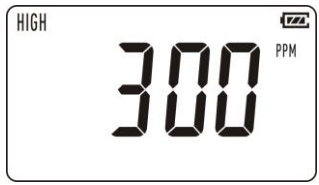


Year

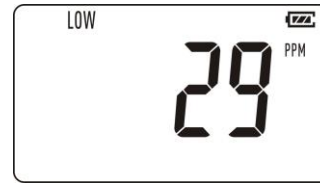


Month, date

6. Show high alarm and low alarm



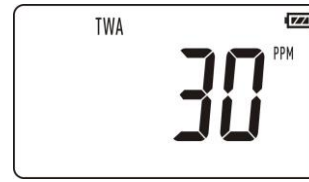
High alarm



low alarm

7. Show STEL and TWA value

STEL



TWA

Note: Only toxic detector have this interface.

8. Self-test completed.

After the self-test passed, the detector will start a short counting down and begin to warm up. After counting down finish, the screen will display as below and meantime the detector completely power on.

Note: If the self-test did not pass, related information will be shown, for details please check the content in alarm status, if no fault was found, the counting down will be 3s ~ 30s according to different type of sensors.

4.2 Power off

When the detector is power on and in detecting mode, press ,the screen will display as below

At the same time, buzzer will give several sound, 3s after, screen will display as below, you can lose the button then and the detector will power off.

Note: if the detector is not working in detecting mode, you can press continuously until it goes back to detecting mode.

4.3 Impact test

Every day before using the detector, please proceed the “impact test” for one time to make sure the detector is running well.

Test method: Power on the detector, put it in target gas or standard gas whose concentration is higher than the preset high alarm level. If the detector function well, then you can use the detector for detecting, if the detector’s reading is beyond the range of error, then please recalibrate it according 4.8, if the detector has no response or display fault, please contact to the seller.

4.4 Menu

The menu options include:

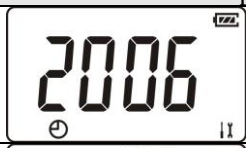
1. Date and time setup

2. Vibration on/off
3. Key sound on/off
4. Data communication mode ①
5. Password setting

Note: ① This function is only available when your purchased detector has this USB communication function integrated.

Under detecting mode, press and at the same time, screen will show as below and after one second go into user menu.

press or to choose the item you want to adjust, below is the display information of every item.

Screen display	Option meanning
	After screen display this figure,press and then you can adjust the time of the detector
	After screen display this figure,press and then you can turn it on or off the sound of the button.
	After screen display this figure, press and then you can turn it on or off the vibration for alarm.

	After screen display this figure,press and you can go into data communication mode.①
	After screen display this figure,press and then you can change the password of the detector（initial password is 0000）

Note: ① Only available when your purchased detector conclude this functon.

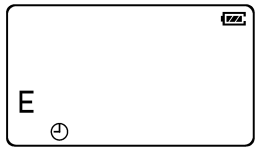
After enter the selected item, change the item content by pressing or , press to confirm, press to exit without save, below are the content meanning.

Screen display	Option meanning
	Turn off the function of this item
	Turn on the function of this item

4.5 Alarm information

Below sheet shows each alarm's display information

Alarm type	Display information
Low alarm: ● Slow sandhi alarm sound ● Alarm light flash ● vibration ①	

High alarm: ● extremely rapid sandhi alarm sound ● alarm light flash ● vibration ①	
High concentration protection: ② ● Slow sandhi alarm sound ● Alarm light flash	
Sensor fault: ● Rapid sandhi alarm sound	
STEL alarm: ● Slow sandhi alarm sound ● Alarm light flash ● Vibration ①	
TWA alarm: ● Slow sandhi alarm sound ● Alarm light flash ● Vibration ①	
Over-range alarm: ● Slow sandhi alarm sound ● Alarm light flash	
Time error: In this status the detector will try to restore the error automatically, if restoration succeed, the detector will enter time setup menu, you can set the detector's time to be correct, if restoration fail, the detector will power off	

automatically, please contact to the seller.	
Memmory error: In this status the detector will try to restore the error automatically, if restoration succeed, the detector will go to calibrating mode, please set the detector according to 4.7, if restoration fail, the detector will power off automatically, please contact to the seller.	
Undervoltage: ● Giving Sandhi alarm sound once per minute. ● This figure will disappear after voltage is too much lower, then the detector can work only for maximum 15minuts, please charge it in time otherwise it will power off automatically.	

Note：① Vibration only can be available when the vibration item setup is on.

②This function is only available in combustible gas detector.

If you want to turn off the alarm sound and alarm vibration under continuous alarm status, press, and then the detector screen will have two icons of and flashing.

4.6 Check the status

Under detecting mode, press and at the same time,screen will automatically display the time, current concentration, STEL value①, TWA value①, the biggest detecting concentration and the

smallest detecting concentration since power on② etc.

Note：①Only available in toxic gas detector.

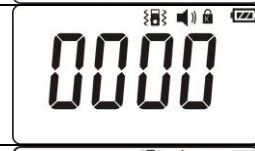
②Only available in Oxygen detector.

4.7 Automatic zero calibration

If the detector's reading is not "0" in clean air, you can use this below function to do zero calibration.

Under detecting mode, press and at the same time for one second, the detector will show password input interface, input the correct password and the detector will do zero calibration automatically.

The detector will display below information in turn.

status	Display content
Press and , the screen will display asright picture information, after one second it will go to next status.	
The right interface means inputing password is needed, the flashing bit value can be changed by pressing or .	
After enter the automatic zero calibration interface, the screen will display as the right interface, press to confirm proceeding automatic zero calibration.	

Note: the zero point calibration in Oxygen detector is in clean air, thus the concentration is 20.9％VOL instead of "0".

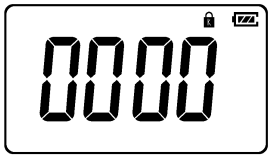
Warning: This operation must be done in clean air, otherwise the detector's accuracy maybe influenced.

4.8 Detector's calibration and alarm's adjusting

To recalibrate the detector or adjust the alarm point, please proceed according to below steps.

1）Enter calibration and alarm adjusting mode.

Under power off status, press and at the same time for 5s, the detector will start self-test, short time after self-test finish, it will indicate password is needed,see as below interface:

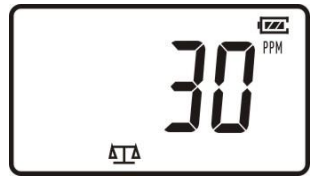


Input correct password, it will start a counting down of 30s and then it will enter zero point calibrating mode.

Note： Since all parameters in this calibrating mode may harm the user's safety, please operate carefully. Within 3s after screen indicates password is needed, if there is no operation or the input password is incorrect, the detector will power off automatically, this is to protect the calibrating parameters from misoperation when user enter this menu accidently. If you forget the password, please contact to the seller.

2) Zero point adjusting mode

Under zero point adjusting mode, the detector will show a concentration value which is detected currently, see the interface as below:



Under this situation, if press or no operation withinoneminute, the detector will consider current concentration to be as “0” and step into calibration point adjusting mode, if press, the detector will skip the calibrating step and go into alarm setting mode directly, for more details please refer to item 5) and 6).

Note： In this mode, the detector must be put in clean air environment, otherwise the detector’s accuracy can be influenced. When entering next mode, if screen show icon of “E”, it means the environment is not clean air, or the sensor is fault, please change to another place for adjusting or contact to the seller.

3）calibration point adjusting mode

In this mode, the screen display a flickering concentration value, press or to change the value. This value means that concentration of target gas will be used during calibration. See as below picture:

At this time, press or if there is no operation within one minute, the detector will consider the current value to be the calibration gas concentration value and go into calibrating mode.

Note： Adjusting range for calibration point please refer to attached list 1.

4）Span calibration

In span calibration mode, the detector will show a detecting value in current situation, see as below picture.

At this time, cover the gas sensing hole of the detector by using calibration cap, open the gas valve, adjust the gas flow to be 120mL/min, when the detector detect the gas available for calibration within 30s, it will start the analysis program for calibrating automatically, and the display value will slowly go up to calibration concentration which you already set, a few seconds after then, the calibration will be completed and screen go to next interface of alarm adjust automatically. Or else, if calibration fails, screen will show “E000”.

Note： ①The gas flow is taking CO gas as an example, forothergases calibration, please contact to the seller.

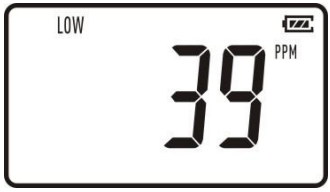
② During span calibration, please do not press anybuttons, otherwise the calibrating accuracy will be influenced or even the detector can not work.

③ If the input gas cannot reach to half of the calibration concentration within 30s, or if the input gas concentration is beyond the sensor drift range in 3 minutes, the icon "E" will light on, which means the input gas is not suitable for calibration or the sensor is fault, please contact to the seller.

If your detector is Oxygen detector, it will skip 3) and 4).

5）Low alarm adjust

In this status, you can change the low alarm concentration,the screen show as below picture and the figure is flickering, press or to adjust the flickering figure to be the low alarm value you want, and then press to confirm, meantime, it will step into high alarm adjust interface.

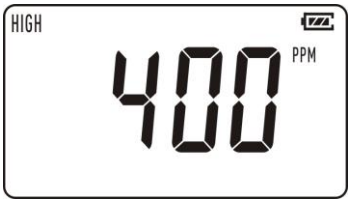


Note： For Low alarm adjusting range please refer to attached list 1.

6）High alarm adjust

In this status, you can change the high alarm concentration, the screen show as below picture and the figure is flickering, press or to adjust the flickering figure to be the high alarm value you want, then press to confirm, meantime, the

detector will power off automatically.



Note: For High alarm adjusting range please refer to attached list 1.

5. Charge the battery

When the detector indicates low voltage or the detector automaticaly power off due to undervoltage, please charge the battery for the detector in time：after the detector is power off, connect the charger plug to the detector's charging jack, and then connect the AC adaptor to AC220V electricity power source, the detector will show charging status. After the battery indicator icon in the screen is full and doesn't change any more, the charging is completed and you can pull the plug out.

Warning:

1. When the detector is power off, If you charge the detector, you cannot turn on the detector for detecting.

2. Please do not charge the detector in detecting work spot since spark maybe generated when your plug the charger, which is dangerous;

3. Please do not charge the detector when detector is power on, the charging may take more time.

6. Data communication (Optional)

Note：To realize this function, one CD and communication cable must be equipped together with your purchased detector.

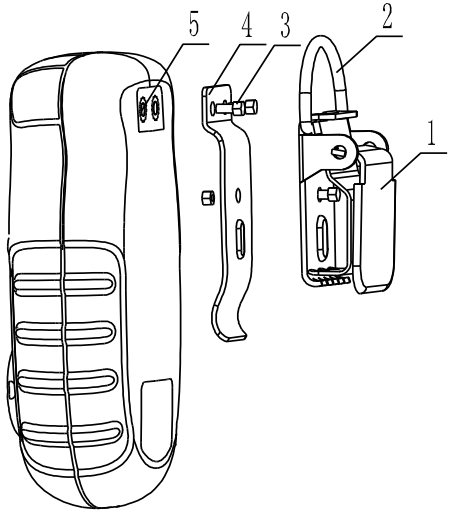
Take the communication cable and plug the mini USB portinto the bottom terminal of the detector, connect the other side USB port of the cable with USB terminal of the computer, then install the software from the CD. For detail operation, please read the manual of the software in the CD.

7. Sensor replacement

The detectoradopt modular sensor, please mind the durable years and replace the sensor in time. We suggest your calibrate the sensor every half year to ensure the detector's accuracy.

Note: Sensor module is suggested to be changed by the seller or professional engineers authorized by the seller or the manufacturer.

8. Accessories



1	Alligator clip	3	Location hole	5	Insert nut
2	Hang ring	4	Belt clip		

9. Trouble shooting guidance

Failure	Possible failure cause	Solution
Cannot power on	Low voltage	Charge the detector in time
	System halted	Contact to the seller
	Circuit fault	Contact to the seller
No response to gas	response time incomplete	Wait for sensor response
	Circuit fault	Contact to the seller
Inaccurate detect	Sensor overdue	Replace the sensor
	Long time no calibration	Recalibrate the sensor
Time error	Battery voltage exhausted	Charge the detector in time and set the time again
	Electro Magnetic Interference	Set the time again
Zero translation function unavailable	Sensor drift too much	Calibrate the sensor or replace the sensor in time
Detecting mode show“-0”	Sensor drift	Zero translation
Detecting mode show as below picture: 	Sensor fault	Replace the sensor

Attached gas list 1:

Target gas	**Detecting range**	**Low alarm adjust range**	**High alarm adjust range**	**Low alarm**	**High alarm**	**TWA alarm**	**STEL alarm**
CH_4	0-100%LEL	10%LEL～25%LEL	25%LEL～80%LEL	20%LEL	50%LEL		
C_3H_8	0-100%LEL	10%LEL～25%LEL	25%LEL～80%LEL	20%LEL	50%LEL		
H_2	0-100%LEL	10%LEL～25%LEL	25%LEL～80%LEL	20%LEL	50%LEL		
H_2	0-1000ppm	20ppm～150ppm	150ppm～500ppm	35ppm	250 ppm		
H_2S	0-100ppm	5ppm～15ppm	15ppm～30ppm	10ppm	15ppm	10ppm	15ppm
CO	0-1000ppm	25ppm～100ppm	100ppm～500ppm	35ppm	200ppm	35ppm	200ppm
CO	0-2000ppm	25ppm～100ppm	100ppm～500ppm	35ppm	200ppm	35ppm	200ppm
O_2	0-30%vol	16%vol～19.5%vol	22.5%vol～24%vol	19.5%vol	23.5%vol		
C_2H_5OH	0-100%LEL	10%LEL～25%LEL	25%LEL～80%LEL	20%LEL	50%LEL		
NH_3	0-100ppm	20ppm～30ppm	30ppm～70ppm	25ppm	50ppm	25ppm	35ppm
CL_2	0-20ppm	3ppm～10ppm	5ppm～15ppm	5ppm	10ppm	0.5ppm	1.0ppm
SO_2	0-100ppm	1ppm～3ppm	3ppm～10ppm	2ppm	5ppm	2ppm	5ppm