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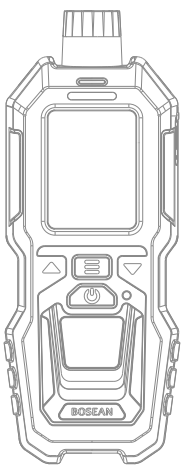
BTYMQ-BX403

Portable Multi Gas Detector

Operation Manual(V1.0)



Henan Bosean Technology Corporation Limited

Add: Block 10, Yida Technology New Park, No.16 JinZhan Road, National High-Tech Zone, Zhengzhou 450001, Henan, China

Tel: +86 371 86533226 Fax: +86 371 86533226

E-mail: sales@bosean.com Web: www.bosean.net

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1. Product Description

The BTYMQ-BX403 portable multi-gas detector (referred to as "the detector") comes with a built-in pump for gas detection. It utilizes high-quality gas sensors that provide excellent sensitivity and repeatability, making it easy to operate and maintain. This instrument is highly reliable for alerting you to hazardous gas levels, thus protecting your safety and property. The detector's casing is made from high-strength engineering plastics combined with anti-slip rubber, ensuring durability and a comfortable grip. It is also waterproof, dustproof, and explosion-proof. The device can be used widely across various industries, including petroleum, chemical manufacturing, environmental protection, metallurgy, refining, biomedicine, agriculture, scientific research, and educational institutions.

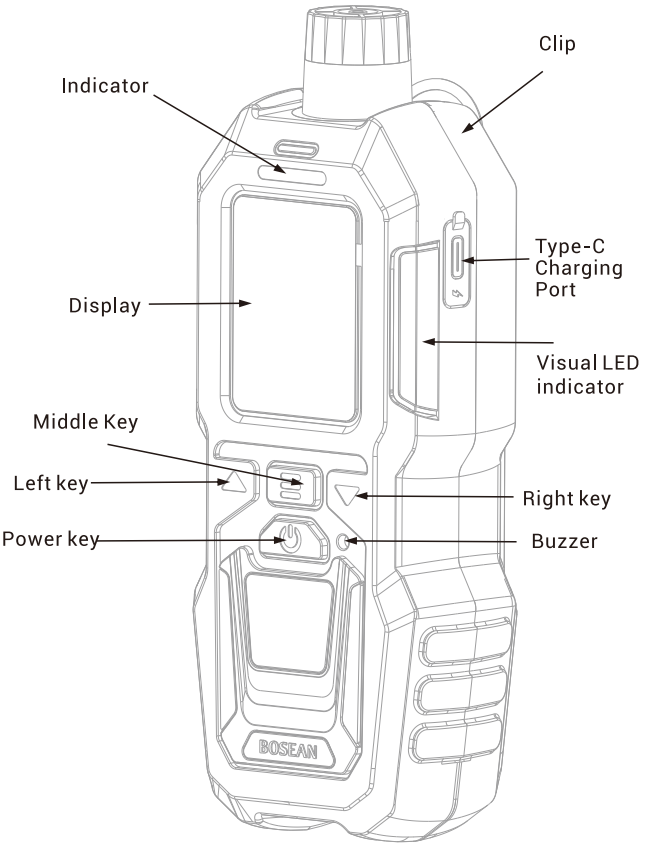
The detector integrate various detection principles, such as electrochemical, catalytic, semiconductor, thermal conductivity, and optical methods, can detect up to four gases simultaneously, providing users with reliable, accurate, and safe gas detection solutions.

2. Main Features

User-friendly GUI operation interface.
Built-in pump for gas sampling.
High-resolution color display, automatic screen rotation.
Four-button operation, easy and intuitive operation.

1. Alarms are indicated by flashing LEDs, audible alarm, flashing alarm icons on display and internal vibrating alarm.
2. Support gas unit switching
3. Support five-point calibration, allowing the detection to be more accurate.
4. Type-C data cable allows the detector to connect to the host computer to transmit data and upgrade the software.
5. Multi-language support in English, Chinese, support customize other languages.
6. Support 4G data transmission, configurable data transmission interval, support cloud platform data viewing, equipment grouping and send alarm message to group members With 4G enabled, GPS positioning and real-time coordinate display are supported.
7. Support Bluetooth communication, allowing the user to view data through the mobile app.
8. Support screen rotation.
9. Support TWA and STEL alarms.
10. Equipped with Fall alert
11. Numeric display mode and curve display mode
12.Support NFC, APP-Device binding, Bluetooth, Network management and other functions.
13. Dust/Waterproof IP Rating: IP66

3. Components



4. Technical Specification

Gas Type	Range	Low Alarm	High Alarm	Resolution
CH_4	(0～100)%LEL	20%LEL	50%LEL	1%LEL
H_2S	(0～100) ppm	10ppm	35ppm	1ppm
CO	(0～1000) ppm	50ppm	150ppm	1ppm
O_2	(0～30.0)%VOL	19.5%VOL	23.5%VOL	0.1%VOL

Response Time	T90≤30s
Working Environment	Temperature -10℃~+55℃ Humidity ≤93%RH(no dew)
Working Voltage	DC3.7V(Lithium battery capacity 4000mAh)
Display	2.4inch color display
Alarm Method	Visual and audible alarms, display icon flashing alarm and vibration alarm; support fall alert, TWA/STEL alarm.
Sampling Method	Pumping distance ⩽ 20 meters (with hose).
Gases Monitored	Can detect up to four gases simultaneously
Data Transmission	Bluetooth standard, 4G/positioning optional.
Language	Multi-language support includes English and Chinese, with options to customize additional languages.
Charging Adapter	5V/2A standard charger
Data Storage	6000 historical data records for each channel: The detector is capable of recording monitoring data for the last 100 hours(peak values captured every minute). This data can be accessed through a host computer or an mobile app via Bluetooth. 1000 alarm records: This data can be viewed on the device and through a host computer or an mobile app via Bluetooth.
Standby Time	⩾8h
Charging Time	<7h
Sensor Life	2 years
Dimensions	L×W×H, mm:186.3*70.7*45.3
Weight	About 420g

5. Operations

5.1 Start-up Tests

Long press the power key for 3 seconds to turn on the detector. The display will light up and the detector will perform startup tests, including visual, audible, and vibration alarms. After warming up, the detector will enter the monitoring screen(See Fig 1)

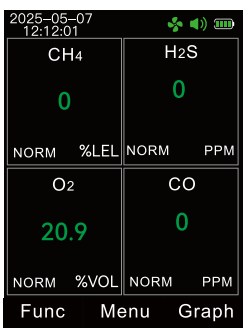


Fig 1

5. 2 Display description

5. 2. 1 Display Elements

2025–05–07 12:12:01	Displays the current date and time. If the mobile network function is enabled, the time can be updated automatically once.
	Bluetooth Status Indicator. After enabling the Bluetooth function, this indicator displays the current Bluetooth connection status. The icon will flash when connecting to Bluetooth and will be continuously displayed when the connection is successful. Bluetooth will automatically turn off if the connection is not established within 5 minutes.
	The pump status indicator. When the pump is on, the icon is green and rotates clockwise. When the pump is off, the icon is gray and remains stationary. When the pump is faulty, the icon is red and rotates clockwise.(Click the power button to quickly turn the air pump on or off.)
	When a person falls, the fall alert icon will be displayed (as shown in Figure 5), and the buzzer will sound continuously, with the LED indicator light remaining on. To cancel the fall alert, press the left and right buttons simultaneously for 2 seconds while on the monitoring screen.
	Alert/Mute Icon. This icon indicates whether the buzzer and vibration are turned on or muted.
	GPS indicator: When GPS is enabled, it shows the GPS status. A flashing icon indicates it is waiting for positioning, while a constant display means positioning was successful.
	4G Status Indicator. Once the mobile network function is enabled, this indicator shows the current network connection status. The icon will flash while connecting to the server and will remain on when the connection is successful.After successful connection, the signal strength is displayed by the number of signal bars.

	Battery life indicator. The battery icon is divided into four sections, and it changes to  when the power is depleted.

5.2.2 Main Interface Display Instructions

The detector operates in a normal detection state as shown in Figure 1, allowing it to monitor gas concentration in real time.

When the detected gas concentration is below the preset low alarm threshold (when the oxygen concentration is above the low alarm threshold but below the high alarm value), the status bar will display "Normal".

If the gas concentration rises above the preset low alarm threshold (meaning the oxygen concentration is at or below the preset low alarm threshold), the detector enters a low alarm state. The status bar will read "Low Alarm," and the buzzer will emit a sound every 0.5 seconds. Additionally, the LED indicator will flash, the vibrator will activate, and if the screen is off, it will light up simultaneously.

If the detected gas concentration exceeds the preset high alarm threshold, the detector enters a high alarm state. The status bar will read "High Alarm," and the buzzer will emit a sound every 0.25 seconds. Additionally, the LED indicator will flash, the vibrator will activate, and if the screen is off, it will light up simultaneously.

If the gas concentration surpasses the sensor's range, the detector will indicate an over-range state. In this case, "OL" will replace the numeric gas reading, the status bar will display "Over Limit," and the buzzer will sound every 0.25 seconds, with the LED indicator flashing and the vibrator vibrating. The screen will also light up if it is turned off.

When the TWA (Time-Weighted Average) or STEL (Short-Term Exposure Limit) alarm function is enabled, if the gas concentration is at or above the preset alarm threshold, the detector will alert you by displaying "TWA" or "STEL" on the status bar. The buzzer will

emit three sounds, while the LED indicator and vibrator will activate three times. The screen will also light up if it is off.
Even with the mute function enabled, if a new alarm occurs, the buzzer and vibrator will reactivate. Once the gas concentration returns to a normal level, the status bar will revert to "Normal," and the alarm will be automatically silenced.
In cases where multiple alarm statuses are detected in the same gas channel, only the highest priority alarm will be triggered. The alarm priority is as follows:
Normal < TWA < STEL < Low Alarm < High Alarm < Over Limit.

5.3 Mute, Bluetooth, 4G, Fall alert

To access the "Function Settings" interface, click the left button on the main interface (as shown in Figure 2). In this interface, use the right button to select a function, the middle button to toggle the function on or off, and the left button to return to the previous screen.
1. When the mute function is activated, the switch status icon changes to ; the alarm status icon changes to . If the detector is in an alarm state and the mute function is enabled, the buzzer and vibrator are deactivated while the LED indicator and alarm indicator continue to flash.
2.When the fall alert function is activated, the switch status icon changes to . If a fall is detected, the indicator icon will display, a prompt box will appear (as shown in Figure 3), the buzzer will sound, and the LED indicator will remain on. To cancel the fall alert, press and hold the left and right buttons simultaneously for 2 seconds.
3.When the Bluetooth function is activated, the switch status icon changes to ; the indicator icon is displayed and begins to flash. Once a connection with the Bluetooth APP is established, the icon is permanently displayed and the message "BLE Connect" appears. If the device disconnects from the Bluetooth app, the display will show "BLE Disconnect".

4. When the mobile network function is activated, the switch status icon changes to . The network icon starts to flash. When a connection with the cloud platform is successful, it will be permanently displayed and the message "NET Connect" will appear. After disconnection from the cloud platform, the message "NET Disconnect" will be shown.
When the interface displays a "Low Battery, Net Disconnect!" or "Low Battery,Failed To Open" message, it means the current battery level is insufficient to maintain mobile network functionality. Please charge the device timely.

5.When the GPS positioning function is activated, the status icon will change to and the GPS icon will be displayed, starting to flash. Once positioning is successful, the GPS icon will be displayed continuously, and a prompt will appear stating, "GPS positioning successful."

6. When the screen flip function is activated, the status icon will change to If you flip the device upside down, the screen display will rotate accordingly.

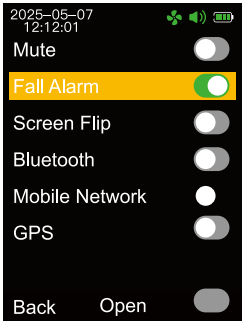


Fig 2

Fig 3

5.4 Menu

After entering the main menu screen, press the left or right button to select a submenu option, click the middle button to confirm your selection. See the table below for submenu icons and function descriptions.

Icon	Name	Description
	Main Menu	Return to the main menu screen. Note: If there is no operation under the menu screen, the system will automatically return to the monitoring mode after 10 seconds.
	Gas Zero	To perform a gas zero calibration
	Gas Calib	To perform a gas calibration
	Gas Setting	To set parameters of the gas channel
	Records	To view alarm records of the gas channel
	Sys Setting	To set system parameters
	Sys Info	To view device information, battery information and calibration information
	Sys Reset	To perform a factory reset
	Sys Update	To upgrade the system
	Power off	To turn off the device

5.5 Detailed Description of Menus

5.5.1 Zero calibration

To perform gas zero calibration, select the gas zero calibration icon from the main menu and press the middle button to enter the zero calibration screen (refer to Figure 4). You can return to the main menu by pressing the left button. Use the right button to select a gas type. Use the middle button to carry out a gas zero calibration. If the calibration is successful, a "Setting Success!" prompt will appear on the display (see Figure 5), to indicate success. If it fails, a "Setting Failure!" prompt will be displayed (see Figure 6).

Fig 4

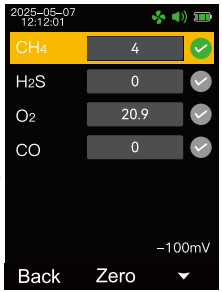


Fig 5

Fig 6

5.5.2 Gas Calibration

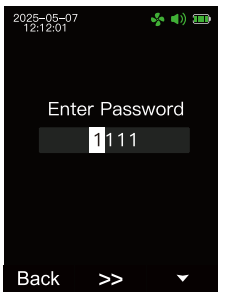
Select the gas calibration icon in the main menu and press the middle button to enter password input mode. Use the middle button to move the cursor and the right button to edit the value. Enter the password "1111" (as shown in Figure 7) and press the middle button to access the channel selection screen (see Figure 8).

In this page, press the right button to select the channel to be calibrated, and access the gas calibration screen by pressing middle button(as shown in Figure 9). You can press the left button to return to the previous screen. Press the middle button to initiate the editing process. Use the middle button to move the cursor, use the right button to edit the calibration value, use the left button to cancel the operation. Once editing is complete, press the middle button to move the cursor to the last digit and press the middle button again to confirm and perform the calibration. You can also modify the values of Zero-TLV and Calib-TLV.

After a successful calibration, a "Setting Success!" prompt box will appear on the display (see Figure 10). If the calibration fails, a "Setting Failure!" prompt will be shown (see Figure 11).

Note: The detector supports single-point calibration by default. If multi-point calibration is required, please contact the manufacturer.

Fig 7



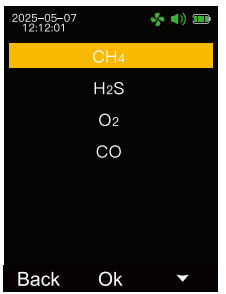


Fig 8

Fig 9

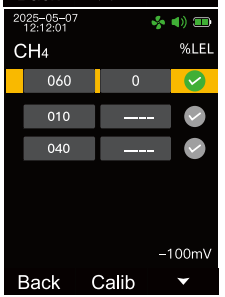


Fig 10

5.5.3 Channel Settings

Select the gas settings icon from the main menu to access channel selection screen(refer to Figure 12). Press the right button to select a channel and press the middle button to confirm your selection(See Figure 13).

In gas setting screen, you can switch units and edit the low alarm value, high alarm value. You can also enable the TWA/STEL alarms and modify their values.

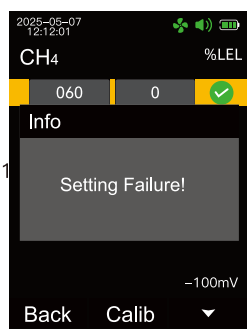
1.When the unit cannot be switched, a corresponding warning dialog box pops up(See Figure 14)

2.The low alarm value must be greater than 0. If set to 0, a warning dialog box will pop up (see Figure 15).

3.The low alarm value must be smaller than the high alarm value. If the low alarm value exceeds the high alarm value, a warning dialog box will appear (see Figure 16).

4.The TWA and STEL threshold values must be greater than 0. Setting them to 0 will trigger a corresponding warning dialog box (see Figure 15).

Fig 11



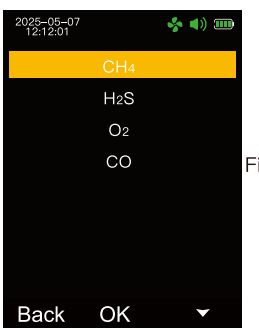


Fig 12

Fig 13

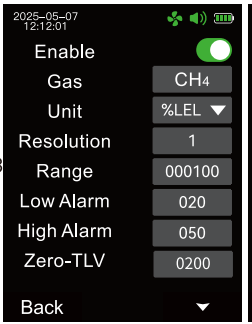


Fig 14

Fig 15

Fig 16

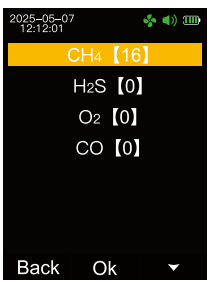
5.5.4 Data logging

Select the record icon from the main menu and press the middle button to access the channel selection screen (see Figure 17). Press the right button to select a channel and the middle button to confirm your selection, press the left button to return to the previous screen.

Note: In the channel selection screen, the number in brackets [] indicates the number of alarms for this channel.

In this screen, you can view the alarm value, unit, alarm type, and alarm time. Use the middle and right buttons to navigate through the records, while the left button returns you to the previous screen. To clear alarm records, long press the middle button to enter password input mode (see Figure 19). Edit the password with the right button and move the cursor with the middle button. Enter the password "1111" (as shown in Figure 20). After entering the password, you will be able to clear the alarm records of the current channel(see Figure 21). Press the left button to cancel the operation, or press the right button to confirm clearing. Once the clearing is complete, a "Delete Success!" prompt box will appear (see Figure 22).

Fig 17



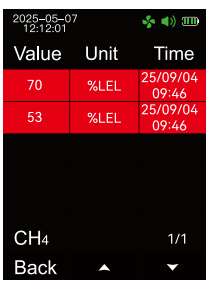
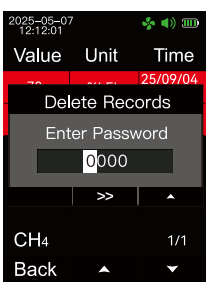


Fig 18

Fig 19



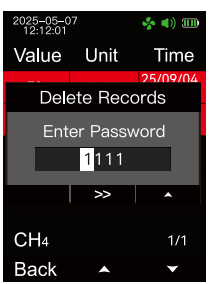
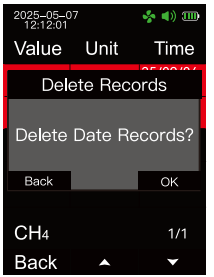


Fig 20

Fig 21



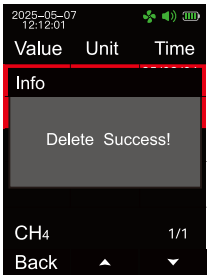


Fig 22

5.5.5 System settings

To access the system settings, select the system settings icon in the main menu and press the middle button to enter the settings screen (as shown in Figure 23).
Press the left button to return to the main menu, Press the right button to switch the menus, press the middle button to confirm an option.
Language: Configure the system language.
Backlight: Adjust the backlight timeout. Setting it to "Always" "30s" "60s" "120s" means the backlight will stay on continuously. When the backlight is off, the green operating indicator at the top of the device will flash twice every five seconds.
Bluetooth: After enabling Bluetooth, you can view the device's Bluetooth name and MAC address (as shown in Figure 24).
Mobile Network: Once the mobile network and GPS is activated and connected to the platform, you can set and view parameters such as data transmission cycle (range: 60 to 600 seconds), group alarm, network number, IP address, GPS, latitude and longitude etc. (as shown in Figure 25).
Date and Time: To edit the currently selected date or time, press the right button. Use the middle button to move the cursor (as shown

in Figure 26).
Pump Calibration: To calibrate the pump. (Defualt: Level 2: 500mL/min)
Pump Flow: To select the flow rate of the pump.
Storage interval: Set an interval to record the peak value within that time frame. Press the middle button to move the cursor, and press the right button to edit the value at the cursor. (Range: 5 to 9999 seconds)

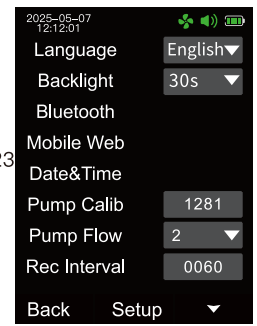


Fig 23

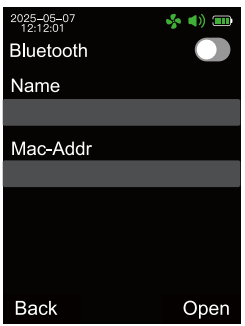


Fig 24

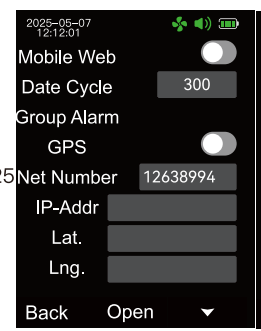


Fig 25

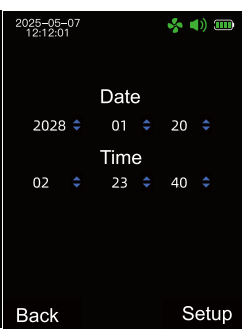


Fig 26

5.5.6 System information

To view system information, select the system information icon in the main menu and press the middle button (as shown in Figure 27). You can switch options by pressing the right button and enter specific information screens by pressing the middle button.
Device Information: Check the software version and device number (as shown in Figure 28).
Battery Information: View current battery voltage and charging status (as shown in Figure 29)

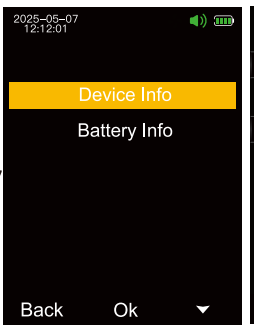


Fig 27

Fig 28

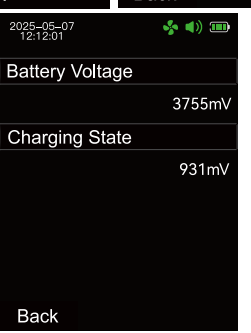


Fig 29

5.5.7 Factory Reset

To perform a factory reset, select the system reset icon in the main menu and press the middle button to enter the password input mode (as shown in Figure 30). The password is "1111." Press the right button to confirm and access the factory reset screen(as shown in Figure 31) . Press the left button to return to the previous menu. Press the right button to perform a factory reset. After a successful reset, a dialog box titled "Settings Success!" will appear (see Figure 32).

Fig 30

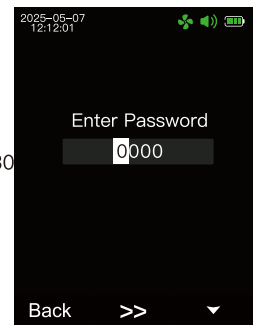


Fig 31

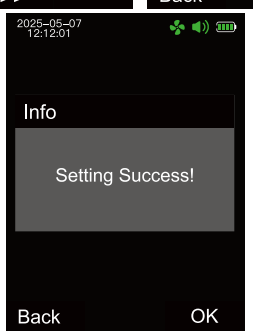
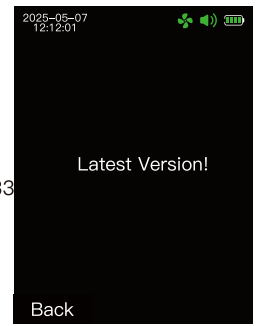


Fig 32

5.5.8 System upgrade

Select the system update icon from the main menu and press the middle button to access the system upgrade screen. If the system does not detect an upgrade package, the screen will display a relevant message (see Figure 33). If an upgrade package is available, it will be indicated on the screen (see Figure 34).

Fig 33



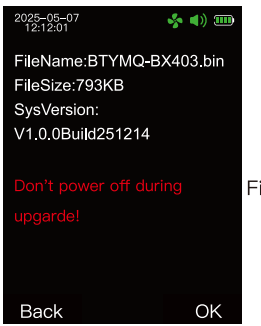
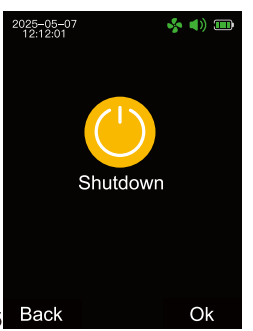


Fig 34

5.5.9 Power off

In the main interface, long press the Power button to enter the power-off screen (see Figure 35). Press the left button to return to the previous menu and the right button to power off the device. The detector will shut down once the progress bar completes.

Fig 35



5.6 Curve Display

Press the right button on the main screen to access the "Curve" display (see Figure 36).
On this page, you can view the maximum and minimum gas detection values, as well as the trend curve of changes over a specified time range. Detection values can also be checked here if the TWA/STEL function is enabled. Use the left and right buttons to switch between gas types, and press the middle button to return to the main screen.

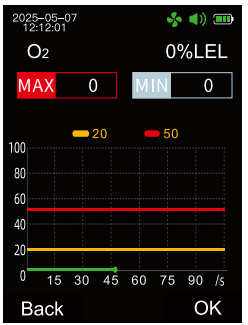


Fig 36

6.Charging

If you see the prompt "Battery Low!" or if the detector cannot be turned on due to low voltage, please charge it immediately. When the detector is off and detects a charging operation, it will automatically turn on and display the charging status (see Figure 37). "Complete" will appear on the screen after charging finishes (see Figure 38).

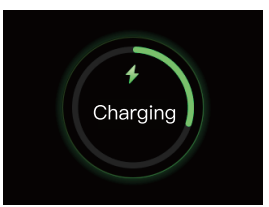


Fig 37

Fig 38

Under-voltage

When the battery is low, the screen will display "Battery Low!" every two minutes (see Figure 39), accompanied by a four-beep warning from the buzzer ("Ding-Ding-Ding-Ding").

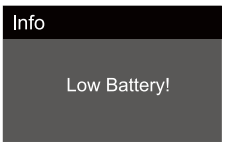


Fig 39

Shut down

If the battery power drops below the normal operating voltage, the device will initiate an automatic shutdown countdown (see Figure 40), and will shut down once the countdown ends.

Fig 40

Note: Do not charge the detector while it is powered on to avoid slowing down the charging process, and do not charge the device in hazardous environments to prevent fire or explosion from potential sparks during charging.

7.Warning

1.Prevent the instrument from falling or experiencing severe vibrations.
2.Do not disassemble, modify, or repair the instrument without authorization.
3.Avoid using the device in high concentration gas environments.
4.Follow the instructions and specifications in the manual strictly; failure to do so may lead to inaccurate results or damage to the instrument.
5.Do not store or use this product in environments containing corrosive gases (such as high concentrations of chlorine) or in harsh conditions, including extreme temperatures, high humidity, or strong electromagnetic fields.
6.If the surface of the instrument becomes dirty over time, gently clean it with a soft cloth slightly dampened with water. Avoid using corrosive solvents or abrasive objects to prevent scratches or damage.
7.To ensure the accuracy of the instrument's detection capabilities, regular calibration is required, with a maximum calibration interval of one year.
8.Batteries cannot be removed or replaced, and charging in explosive gas environments is strictly prohibited. Do not connect any non-explosion-proof certified external devices to the instrument, and avoid replacing sensors in explosive gas environments.

8.Storage

The instrument should be stored in a well-ventilated room with an environmental temperature ranging from -20°C to 55°C. The relative humidity must not exceed 85%, and the air should be free of harmful gases or impurities that could corrode the instrument.

9.Troubleshooting

Fault 1
Unable to turn on
Cause
1）Low battery
2）System has frozen
3）Circuit failure
Solution
1）Please charge the device promptly.
2）Please contact the dealer or manufacturer for repair.
3）Please contact the dealer or manufacturer for repair.

Fault 2
No response to gas detection
Possible Cause
1）Circuit failure
Solution
1）Please contact the dealer or manufacturer for repair.

Fault 3
Detection value is inaccurate
Cause
1）Sensor has expired
2）Not calibrated recently
Solution
1）Please contact the dealer or manufacturer to replace the

sensor.
2）Not calibrated recentlyPlease calibrate the device promptly.

Fault 4

Time display error

Cause
1）Battery completely depleted
2）Strong electromagnetic interference
Solution
1）Please charge the device and reset the time promptly.
2）Please reset the time.

Fault 5

Zeroing calibration failed

Cause
1）sensor drift
Solution
1）Modify the zero-TLV and calib-TLV in the channel settings.

Fault 6

Display shows full scale in monitoring mode

Cause
1）Sensor failure
Solution
1）Please contact the dealer or manufacturer to replace the sensor.

Fault 7

Bluetooth error "BLE Error: 0"

Cause
1）Device faulty
Solution
1）Contact the dealer or manufacturer for repair.

Fault 8

Bluetooth error "BLE Error: 1"

Cause
1）Communication issue with Bluetooth APP
Solution
1）Please restart the Bluetooth APP.

Fault 9

Mobile network error "NET Error: 0"

Cause
1）Device faulty
Solution
1）Contact the dealer or manufacturer for repair.

Fault 10

Mobile network error "NET Error: 1"

Possible Cause
1）Weak network signal or unpaid SIM card
Solution
1）Please check the network signal or billing status.

Fault 11

Mobile network error "NET Error: 2"

Cause
1）Device number error
Solution
1）Check if the device number matches the label in the system information.

Fault 12

Mobile network error "NET Error: 3"

Cause
1）Weak network signal
Solution
1）Please check the network signal.

Fault 13

GPS error "GPS Error: 0"

Cause
1）Device faulty

Solution
1）Contact the dealer or manufacturer for repair.

Fault 14

GPS error "GPS failed"

Cause
1）Weak GPS signal
Solution
1）Please move the device to an open

10.Accessories and Others

Accessories	Quantity
Packaging Box	1
Gas Detector	1
Charging Set	1
USB Data Cable	1
Instruction Manual	1
Warranty Card	1
Tube	1
Air Filter Element	2

Appendix A-
Industrial Gas Detection Online Monitoring Platform User Guide

1. Android users: Scan the QR code via the mobile browser to download the app.
iOS users: Search for Cycle Analytics Cloud in the App Store to download the app.
2. A comprehensive user manual, Industrial Gas Detection Online Monitoring Platform User Guide, can be obtained by scanning the provided QR code. Network and Bluetooth-based operation shall be performed in accordance with the steps outlined in the manual.

Android APP

User Guide

Platform service address

https://intlcloud.bosean.com/