

Portable gas detection and alarm instrument

operating instruction

OT135S



Henan Otywell Electronic Technology Co.,Ltd
ISO9001 Quality Management System Certified Enterprise

Thank you for using the series products of our company. When you are ready to use this product, please read the instructions carefully, and follow the relevant operation steps provided, so that you can fully enjoy the services provided by our company, and at the same time, avoid your misoperation and damage to the machine or other accidents.

Please keep this manual properly so that you can consult and get help in the future.

Copyright Statement

The copyright of this manual belongs to our company. Without written permission, no part of this manual shall be copied, translated or stored in the database or retrieval system, nor shall it be disseminated by any means of electronic, remake, recording or other means.

Our company adhering to the principle of scientific and technological progress, constantly committed to product improvement and improve product performance, the company reserves the right to make any product improvement without advance notice.

If the user does not install or replace the parts according to the manual, the resulting responsibility shall be responsible for the user.

Product and product color and style, please be subject to the physical object purchased.

User Service Guidelines

1. Before using the product, please carefully check whether the attachment, product qualification certificate and user warranty card

are complete according to the factory list of the product. If it is incomplete, please contact the seller or the manufacturer immediately.

2. The warranty period of this product is one year from the date of sale. If the users comply with the storage, transportation and use requirements, and the quality of the product is lower than the technical indicators, they can enjoy free maintenance with the warranty card.

3. For damage caused by violation of operation regulations and requirements, failure not caused by maintenance of the specially engaged technical service department designated by our company, or product quality problems caused by irresistible factors, our company will charge for maintenance.

4. When performing the product for repair, please show the product warranty card voluntarily. Those who cannot show the product warranty card will be used as a charging maintenance.

5. After product maintenance and repair, please show this manual. The maintenance personnel will fill in the attached Maintenance and Maintenance Record and sign. Meanwhile, please sign the Maintenance and Maintenance Records to confirm the maintenance and maintenance contents and give valuable comments. If it is a unit user, please stamp the official seal.

6. If you have any questions or dissatisfaction with the products and services provided by us, including product technology, quality, installation and maintenance, service attitude, charging standards and other issues, please contact us in time, and we will properly deal with your opinions.

Use instructions

- Before using the tester, read the following notes:
- Do not use the already damaged gas detectors. Before using the tester, check the housing for cracks or missing parts. If the tester is damaged or missing parts, please contact us or distributor immediately. Self-replacement of the components may compromise the internal safety of the detector.
- Do not expose the gas detector to electric shock or severe continuous mechanical vibration.
- Waste batteries and sensors should be discarded by qualified recyclers or hazardous goods disposal providers, and do not throw them into the trash can at will.
- It is forbidden to disassemble or put the battery into fire, and avoid short circuit at the positive and negative poles of the battery, otherwise it will cause fire or explosion.
- It is forbidden to remove, adjust or repair the detector without permission.
- It is strictly prohibited to open the instrument at the operation site! Never charge, remove or replace the battery in dangerous places!
- Do not splash water, chemical solvents, benzene or gasoline on the detector and avoid inhaling the detector.
- Prevent the machine from falling from high places or receiving violent vibration.
- In order to ensure the measurement accuracy of the detector, the detector shall be calibrated regularly (no more than 1 year).

- The artificial impact on the detector with high concentration of toxic gas should be avoided.
- When the sensor is disabled or exceeds its service life, it is prohibited.
- Before using the instrument, please read the instructions carefully and strictly follow the instructions.
- For any application or use faults beyond the description of this specification, please contact the dealer or manufacturer for resolution.

The appearance and color of the products in the product atlas are for reference only, and the supply is subject to the physical object. Our company reserves the right to modify the technical parameters of the atlas related products in advance. If you have any questions, please call our service hotline.

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1. Summary

The portable gas detector is a highly sensitive gas detector for industrial use. It is suitable for gas concentration detection in industrial and commercial use places: gas station, chemical workshop, hazardous chemical warehouse, petroleum and petrochemical places, laboratory and other places of gas detection. Can effectively ensure that the life safety of the staff is not infringed, the production equipment is not lost. The product can detect different gases according to different sensor types. Small size, simple operation, easy to carry, good vibration resistance. The product uses high resolution dot array liquid crystal display technology, which is more intuitive and clear.

The detector can use built-in pump suction or natural diffusion detection method, sensitive components use high quality gas sensor, with excellent sensitivity and excellent repeatability; the instrument uses embedded microcomputer control, simple operation, complete function, high reliability, with a variety of adaptive ability; small and beautiful portable design not only make you love, more convenient for you to move to use. The tester shell is made of high strength engineering plastic, composite anti-skid rubber, high strength, good feel, and waterproof, dustproof and explosion-proof.

1.1 Normative references to documents

The design, manufacture and verification of this product shall comply with the following national standards:

GB / T 3836.1-2021 Explosive environment- -Part 1: General requirements for equipment

GB / T 3836.4-2021 Explosive environment- -Part 4: Equipment protected by an intrinsically safe "i" type

GB / T 4208-2017 Housing protection class (IP code)

GB 12358-2024 General technical requirements for environmental gas detection and alarm instrument in workplaces

1.2 Product Terminology

"LEL" refers to the lower explosion limit. The lowest concentration of combustible gas in the air, which is called the explosion lower limit- % LEL. In English: Lower Explosion Limited. When the concentration of combustible gas in the air reaches its lower explosion limit, we call the available gas environmental explosion risk in this place 100%, that is, 100% LEL.

% VOL:% of gas volume.

ppm: one per million of gas volume.

μ mol / mol (micromolar per mole) is the unit of substance.

Conversion: 1ppm=1 μ mol / mol.

1.3 Product functions

- It can be connected with restricted space detector and portable detector, and supports simultaneous interconnection
- Support Beidou GPS positioning, 4G upload (optional)
- Bluetooth, WiFi and other wireless communication methods (Both cannot be opened at the same time)
- Magnetic suction type charging port, more convenient
- Acoustic and optical vibration alarm, undervoltage alarm, fault alarm; fall alarm, distress alarm, one-key call for help
- Multiple alarm mode settings: low alarm, high alarm, TWA and STEL

- Multi-level calibration, zero automatic tracking; can restore the factory setting, concentration calibration error operation automatic identification and prevent
- Switch between English and Chinese interface
- Unit free switch
- 30,000 pieces of data can be stored, and the storage time interval and mode can be set

2. Technical indexes

- Detection gases: combustible / toxic and harmful gases / oxygen, etc
- Sampling method: built-in pump suction type or natural diffusion type
- Display mode: liquid crystal display
- Response time: $\leq 30\text{s}$
- Ambient temperature: $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Relative humidity: (20~93)%
- Power supply voltage: DC 3.7 V
- Battery capacity: 3000 mAh lithium-ion rechargeable battery
- Charging time: $< 5\text{ h}$
- Working time: $\geq 10\text{ h}$ (Standby)
- Weight: about 288 g
- Pressure limit: 86 kPa $\sim$ 106 kPa
- Overall dimensions: L 189 mm $\times$ W 70 mm $\times$ H 45 mm (without crocodile clip)

3. Description of the product operation function

3.1 Overall appearance and function indication of the product



graph 1-1



graph 1-2

order number	name
1	Built-in pump suction sampling air intake
2	Calibration housing / built-in pump suction sampling housing
3	Air inlet / outlet port
4	Outlet outlet / air inlet
5	liquid crystal display
6	key
7	speaker
8	pilot lamp
9	Magnetic suction charging port
10	Natural diffusion type air inlet

The product has two testing methods:

(1) Built-in pump suction: as shown in Figure 1-1, if the product adopts this sampling method, you need to install 2 and tighten the screws, exhaust air from 1 to 3 and 4; during product calibration, exhaust air from 1 to 3 and 4.

(2) Natural diffusion: As shown in Figure 1-2, if the product adopts this sampling method and needs to remove 2,10 is the air inlet; for product calibration, install 2, air from 3, air from 4 (or air from 4, air from 3).

3.1.1 Description of the key press



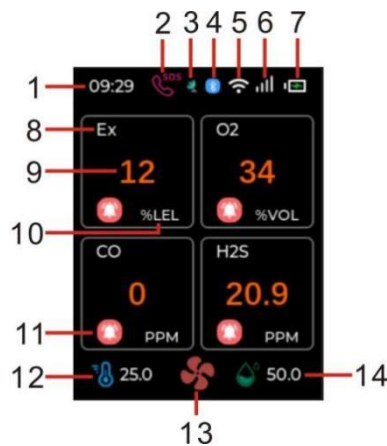
graph 2

key	function declaration
Left key	Turn the pages to the left / select up
power switch	Power on / off / long to return / short to confirm (Description: press the shutdown button on the main display interface and the return key in other interfaces)
right-hand button	Turn the page to the right / select down

3.1.2 Description of the indicator light

The product has two indicators that are on or out at the same time. If the indicator is green, it indicates the current normal detection status; if the indicator is yellow, the current fault status; if the indicator is red, it indicates the current alarm status.

3.2 Main display interface



graph 3

order number	name	order number	name
1	present time	8	Check the gas name
2	SOS call for help	9	Test the gas concentration values
3	fixed position	10	Test the gas concentration units
4	PDA	11	Alarm status symbol
5	WiFi	12	Current device internal temperature
6	4G	13	Pump switch symbol
7	Current surplus power	14	Current humidity inside the equipment

The current interface displays the information for the four detected gases. Press the left or right button to enter the specific information interface of one of the detection gas, as shown in Figure 4, this interface shows the current interface of the detection gas name, detection gas concentration, historical maximum gas concentration, historical minimum gas concentration, time-weighted average concentration (TWA), short time contact allowable concentration (STEL) and the concentration curve. Press the left or right button to switch pages left or right to view specific information about other detected gases.



graph 4

3.3 Switch on instructions

Long press the power button, the indicator light is on, and the system prompt sounds. Release the button, and enter the main display interface after the screen completes self-test and preheating.

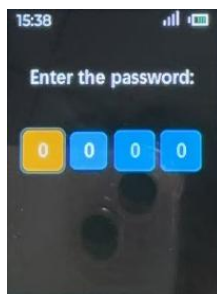
3.4 Shutdown instructions

In the main display interface, long press the power button, release the button when the indicator light turns red and the system turns down.

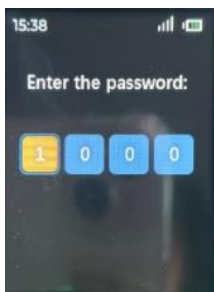
3.5 Menu

In the main display interface, short press the power button (if there is no operation for a long time, the screen will be dark to reduce power consumption. At this time, short press the power button will

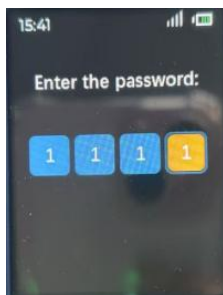
brighten the screen first, and then short press), the system jumps out of the input password interface, as shown in Figure 5. At this time, the yellow cursor on the first number, representing the first number can be editable. The initial password is "1111", and the user can enter the menu list with the left and right keys and power keys (now the confirmation function to enter "1111") with the input. Press the right key short to change the first number to 1 (press the left key short to 9), as shown in Figure 6. Press the power key to confirm, move the yellow cursor to the second number, short press the right button to change the second number to "1"; and so on, make the four numbers to "1", as shown in Figure 7, short press the power key, namely successful input, the system jumps to the main menu interface, as shown in Figure 8. The menu list includes: channel setting, time setting, system setting, alarm record, zero setting, calibration, upload setting, history record, factory recovery, BT & WiFi, GNSS.



graph 5



graph 6



graph 7



graph 8

3.5.1 Channel setting

In the main menu interface, select the "Channel Settings" menu item with the left button or the right button, and short press the power key to enter the channel Settings interface, as shown in Figure 9. Users can set the name of gas, gas unit, gas concentration value, decimal places, range, alarm 1, alarm 2 and other information of each channel. Short press the power key to confirm the selection of this channel, then press the right button (if press the right button directly, it will enter another channel), select the parameters to be modified, as shown in Figure 10, first press the power key to confirm, and then modify this parameter.

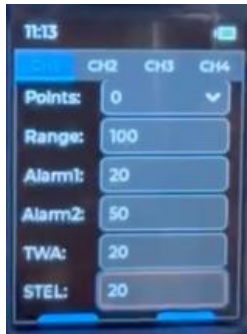
If you modify the parameters with the pull-down arrow, press the left or right button to select, as shown in Figure 11; If you modify the parameters without the pull-down arrow, press the power button to confirm, as shown in Figure 12, then the system will jump a "please input" interface, as shown in Figure 13, directly input with the soft keyboard at the bottom of the interface, input complete must select "" for confirmation!

After setting the parameters, press the right button to select "Save" and press the power button to confirm; If you do not want to save this modification, select "Cancel" and press the power button to confirm, as shown in Figure 14.

After pressing the steps above to complete the menu setting, the system will automatically return to the main menu interface; if you do not want to continue modification in a menu interface, long press the power button, the system will automatically return to the main menu interface.



graph 9



graph 10



graph



graph 12



graph 13



graph 14

3.5.2 Time setting

In the main menu interface, select the "Time Set" with the left button, press the power key and enter the time setting interface, as shown in Figure 15. Users can set the value of year, month, day, time and second in this interface. After setting it up, select "Save" and press the power button to confirm.



graph 15

3.5.3 System Settings

In the main menu interface, use the left button or select the "System Settings" menu item with the right button, and short press the power key to enter the system Settings interface, as shown in Figure 16-1. The user can set the channel function in this interface, close or open a channel; make language setting, select Chinese or English; adjust the backlight brightness to brighten or dim the screen; select the working mode —— pump suction or diffusion, as shown in Figure 16-2 (if the pump suction is selected, the pump starts working, the pump suction starts, the pump switch symbol; if the main display screen is selected, the pump suction vibration sound disappears, and the pump switch symbol on the main display interface disappears).



graph 16-1



graph 16-2

3.5.4 Alarm record

In the main menu interface, use the left or right button to select the "alarm record" menu item, and short press the power button to enter the alarm record interface, as shown in Figure 17. Users can view the historical alarm record in this interface, which displays the alarm date, the alarm time, the gas name of the alarm, the alarm status, the gas concentration during the alarm, and the current page / general page. Press the left or right key to turn the page, as shown

in Figure 18. Long press the power button to return to the main menu interface.



graph 17



graph 18



graph 19

3.5.5 Zero-point setting

In the main menu interface, select the "Zero setting" menu item with the left or right button, and short press the power key to enter the zero setting interface, as shown in Figure 19. This interface displays the gas channel and gas name, real-time zero AD value, historical zero value, and the graph. Select the gas channel requiring zero translation. After the real-time value is stable, select "Save" and short press the power key to confirm the zero translation.

3.5.6 The calibration

In the main menu interface, select the "Calibration" menu item with the left button or the right button, and short press the power button to enter the calibration interface, as shown in Figure 20. The user can select the gas channel required to be calibrated, as shown in Figure 21. After the selection, the user can adjust the standard gas value, as shown in



graph 20

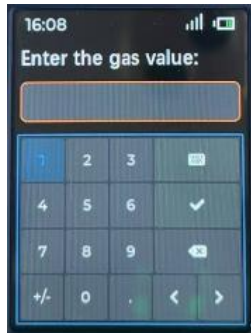
Figure 22. After pressing the power key, the system jumps out of the "Please input standard gas value" interface and input the value, as shown in Figure 23.



graph 21



graph 22



graph 23

3.5.7 Upload Settings (optional)

In the main menu interface, use the left button or right click the "upload setting" menu item, and short press the power button to enter the upload setting interface, as shown in Figure 24. In this interface, you can view the 4G upload QR code and SN number, and upload the detection data to the Zhihui cloud platform.



graph 24



graph 25

The operation instructions of Zhihui Cloud platform are as follows:

(1) In the computer end and the mobile phone end can be viewed, here mainly introduces the computer end operation method. Access the address <https://www.zhihuiyun-iot.com> on the computer side and enter the login interface.

(2) Log in the system for the first time needs to register account information. Click (Account Registration) to jump to the registration interface immediately and register information according to the prompt.

(3) After entering the platform, select "Smart Security" —— "Portable gas detector" and enter the detector monitoring interface.

(4) Click "Equipment Management" —— "Add Equipment", fill in the equipment information as required, enter "Equipment Model", "Equipment Serial Number (SN)", "Note", "Installation Location"; click "Next", fill in the notification information and click "Finish".

(5) If successful, click "Data Monitoring" to view the real-time monitoring data and historical data of the device.

(6) Click "Alarm Management" to view the alarm information, work order list and my work order in a certain period of time.

(7) Click "Notification Management" to reconfigure or delete the previously added notification information.

(8) Click "Data Report" to systematically view the statistical data or export the statistical reports.

3.5.8 Historical records

In the main menu interface, left or right select the "History" menu item, and short press the power button to enter the history interface, as shown in Figure 25. This interface displays the current date and time, as well as the gas name and the current concentration of the gas. "373 / 373" below Figure 25 indicates "Current page / history total pages". Press the left or right button to turn the page.

3.5.9 Restore the factory

In the main menu interface, use the left button or right button to select "Restore the factory", short press the power key and enter password 5656 to restore the factory.

3.5.10 BT&WiFi

In the main menu interface, select the "BT & WiFi" menu item with the left or right button, and short press the power button to enter the BT & WiFi interface. This interface displays the switch status and information of Bluetooth and WiFi, as shown in Figure 26, when both Bluetooth and WiFi are closed. Press the left button, the orange box will jump to the switch icon behind the WiFi. Press the power button to change WiFi from closed state to open state, as shown in Figure 27. Then press the power button, and WiFi changes from open to off. Follow the same method to turn Bluetooth on or off. After the modification, select Save, press the power key to determine the save settings; select Cancel to save no settings.



graph 26



graph 27



graph 28

3.5.11 GNSS

In the main menu interface, select the "GNSS" menu item with the left or right button, and short press the power key to enter the GNSS interface. This interface can locate the current position of the device and see the latitude, longitude, altitude, speed and other parameters, as shown in Figure 28.

Note: When the system power is low, the power indicator will flash continuously. Please shut down and charge the product! When charging, the screen shows "in charging"; when charging is finished, the screen shows "charging is finished".

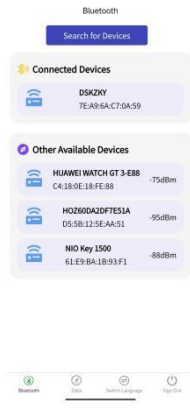
3.6 A Bluetooth connection

Users can view the real-time detection data of the product through the mobile APP. First, open the Bluetooth of the device according to the 4.5.10 operation instructions, then download the exclusive APP on the mobile phone, open the Bluetooth and location of the mobile phone, and you can use it. Open the mobile phone APP, and

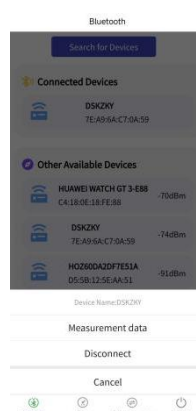
display the available devices below, as shown in Figure 29. Select the device to connect, and display it in the "Connected Devices" column, as shown in Figure 30. Click the device and pop up, as shown in Figure 31. Click "Measurement Data", and the real-time data interface will pop up to display the name of the device, the current power of the device, the name of the gas, gas concentration, unit, status and other information of each channel, as shown in Figure 32. Click on the "Real-time Data" directly, and you can also enter the real-time data interface. Click "Switch to English" to switch between Chinese and English.



graph 29



graph 30



graph 31



graph 32

3.7WiFi connection

The following steps to open the WiFi connection are used to use:

- (1) Mobile phone preparation: download the exclusive APP on the mobile phone, and connect to WiFi on the mobile phone.
- (2) Device WiFi on: open device WiFi according to the 3.5.10

operating instructions.

(3) Equipment WiFi distribution network: in the shutdown state, press the upper key and the power button at the same time, the equipment will enter the WiFi distribution network state. Open mobile phone download exclusive APP, as shown in figure 33, click "EspTouch", "password" mobile connection WiFi password, as shown in figure 34, click "confirm", wait for a period of time, the mobile phone display "EspTouch", as shown in figure 35, the device above the screen status bar display WiFi icon, represent the WiFi distribution network has been successful.

(4) Data viewing on the Zhihui Cloud platform: the real-time detection data of the device can be viewed on the Zhihui Cloud platform.



graph 33



graph 34



graph 35

3.8 Fall-down alarm function

The product has a fall alarm function. When the product falls, the product will call for SOS, as shown in Figure 36. Press the left button or the right button to cancel the alarm.

3.9 SOS call function

The product has the SOS call function. At the same time, press the left and right keys to open the SOS call, and press the left or right keys to cancel the alarm.



graph 36

3.10 Interconnection function

When the device is in the SOS call and drop alarm, all other devices and platforms connected to the device can receive the alarm information.

4. Notes for use

- (1) Prevent the machine from falling from high places or suffering from violent vibration.
- (2) In the presence of a high concentration of gas, the local machine may not be used normally.
- (3) Please operate and use the machine in strict accordance with the instructions, otherwise it may cause inaccurate test results or damage to the machine.

(4) This product shall not be stored or used in an environment containing corrosive gases (such as high concentration of chlorine gas, etc.), and shall not be used or stored in other harsh environments (including too high and too low temperature, high humidity, electromagnetic field and strong sunlight).

(5) If after long-term use, when there is dirt on the surface of the machine, please gently wipe with a clean soft cloth dipped in water, and do not use corrosive solvent and hard objects to wipe the surface of the machine, otherwise it may cause the machine surface scratch or damage.

(6) In order to ensure the detection accuracy, the machine shall be calibration regularly, and the verification period shall not exceed one year.

(7) It is recommended that the service life of infrared sensors and semiconductor sensors is 5 years, and the service life of catalytic combustion sensors and electrochemical sensors are 2 years.

(8) Please remove the lithium battery and sensors of the discarded detector and send them to the designated place or return to our company. Do not throw them into the trash can.

(9) Please contact us for any application or use failure beyond this specification.

(10) The battery pack cannot be removed or replaced in an explosive gas environment, nor can the battery pack be charged. In the explosive gas environment can not use without explosion-proof certification of peripheral plug equipment, also can not replace the sensor.

(11) The products that have obtained the explosion-proof certificate are not allowed to randomly replace or change the components or structures that affect the explosion-proof performance.

(12) In the corresponding national standards, there are clear regulations on the electrical design selection, installation or use of the explosion danger places, and the installation or use units shall strictly abide by these regulations to ensure the explosion-proof safety of the electrical equipment in the explosion dangerous places.

(13) Charging must be carried out in a safe place, and charged with a professional charger equipped with the machine.

5. Common faults and solutions

fault phenomenon	Possible cause of failure	process mode
Fail to switch on	voltage below level	Please charge in time
	system halted	Please contact the dealer or the manufacturer for a repair service
	fault	Please contact the dealer or the manufacturer for a repair service
No reaction to the detected gas	Circuit failure or sensor life expired	Please contact the dealer or the manufacturer for a

		repair service
The display is inaccurate	Sensor extended	Please contact the dealer or the manufacturer for a repair service
	Long-term uncalibrated	Please make a timely calibration
Time display error	The battery is completely exhausted	Charge in time and reset the time
	Strong electromagnetic interference	Re-set the time
The zero-point calibration function is not available	The sensor has drifted too much	Calibrate or replace the sensor promptly
Show not zero in the clean air environment	Sensor drift	Zero point calibration
The normal detection interface of the instrument displays the full range	Sensor failure	Please contact the dealer or the manufacturer to replace the sensor

6. Warranty and maintenance

(1) The warranty period of this product is one year (except for vulnerable parts). If the normal use situation fails, you can enjoy free factory repair and maintenance services. The damage caused by man-made and natural disasters and abnormal use does not belong to the scope of warranty.

(2) If the sensor life expires, please contact us to replace the new sensor.

(3) If the user cannot troubleshoot the fault, we can send the detector back to our company for maintenance, and we will remove the fault at the fastest speed and return it to the user.

7. storage

The product shall be stored in a ventilation room with ambient temperature of $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$ and relative humidity not more than 85%, and the air shall not contain harmful gases or impurities that can corrode the product.

8. Accessories

Supporting products to provide a gas detection and alarm instrument, a set of charger, a calibration cover, a manual, a certificate and warranty card.

Schedulached gas parameters

The gas is measured	measuring range	resolution ratio	Low value	High report value
combustible EX	0-100%LEL	1%LEL	20	50
Oxygen O2	0-30%VOL	0.1%VOL	19.5	23.5
Hydrogen sulfide, H2S	0-100ppm	1ppm	15	35
carbon monoxide CO	0-1000ppm	1ppm	50	150
NO2 dioxide NO 2	0-20ppm	0.1ppm	5	10
natural gas	0-100%LEL	1%LEL	20	50
methane	0-100%LEL	1%LEL	20	50
CO2, CO 2	0-5000ppm	1ppm	1500	2500
nitric oxide NO	0-250ppm	1ppm	50	150
nitrogen	0-100%VOL	0.1%VOL	76.5	80.5
SO2, SO 2	0-20ppm	0.1/1ppm	5	10
Chlorine Cl2	0-20ppm	0.1ppm	5	10
NH3 ammonia gas	0-100ppm	0.1/1ppm	15	35
Hydrogen H2	0-1000ppm	1/10ppm	50	150

Please contact us for many more product parameters

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