



User Manual



PDM Single Gas Detector

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Description

The PDM is a portable multigas monitor designed to warn the user about the presence of dangerous concentrations of oxygen, combustible, or toxic gases in the atmosphere. It is simple to operate. The PDM alerts the workers to danger through acoustic alarm, flashing LEDs, and vibration when the concentration exceeds the safety gas levels. The PDM shows the gas concentration in real time and identifies the maximum and minimum concentration. The settings values can be modified through the optional WatchGas IR-Link.



Warning

- Any unauthorized attempt to repair or modify the product and any cause of damage beyond the intended use voids any warranty and liability.
- Activate the product only if sensor, display, and beeper port are clear from contaminants, dirt, dust and debris. Remove any debris on the surfaces of the sensor, LED or beeper port before use.
- Test the performance of the gas sensor regularly.
- Test the products functioning of LEDs, alarm and vibration on a regular basis.
- Use the product under the conditions instructed, including the temperature, humidity and pressure range. Use in other conditions may cause malfunction or failure.
- The sensor inside the device may indicate the gas concentration differently according to the environment such as temperature, pressure and humidity. Calibrate the detector under the same or similar conditions in which it will be used.
- Extreme changes in temperature may cause drastic changes of the gas concentration. (e.g. using the detector where there is a huge gap between the inside and outside temperature). Wait for the concentration to become stable before use.
- Severe pressure or impact may cause drastic changes of the gas concentration. Therefore, use the device when the concentration is stable. Severe pressure or impact may cause malfunction in the sensor or the device.
- The alarms are set according to international standards and must be changed by an authorized expert.
- Do not attempt to replace the battery and sensor. The PDM is a disposable product.
- IR communication should be done in a safe area where there is no risk of explosion or fire.
- Incorrectly changing settings in the available software with IR-link may pose a risk, which can result in trauma or death.



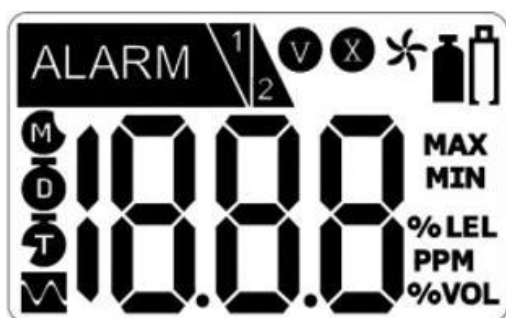
Caution

- Only use the device after reading and understanding this manual!
- This product is not a measurement instrument, but a gas detector.
- Cease use and consult the manufacturer if the calibration or self-test fail continuously.
- Perform a fresh air calibration in clean air without gases at least every 30 days.
- Do not activate the product past the activation date.
- Clean the exterior of the device with soft cloth and do not clean it with chemical detergent.

1. Product Overview

DETECTOR COMPONENTS

1. Gas sensor
2. Gas type sticker
3. LCD display
4. Key
5. Beeper port
6. Alarm LEDs
7. IR port



DISPLAY SYMBOLS

ALARM	Alarm
1	Low Alarm
2	High Alarm
V	Firmware Version
X	Stabilization Fail
*	Fresh Air Calibration
Gas canister	Standard Gas Calibration
M	Remaining Months
D	Remaining Days
T	Remaining Hours
MAX	Max Concentration Value
MIN	Min Concentration Value
%LEL	Unit of Measurement
PPM	
%VOL	
Battery icon	Lifetime less than 30 days or low battery

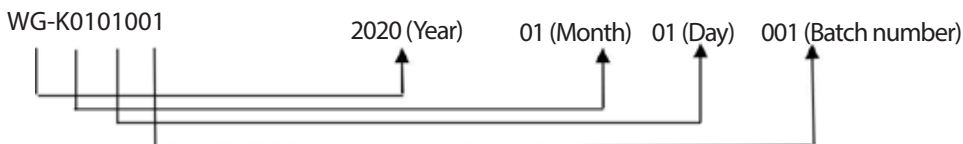
2. Activation

2.1 CHECK ACTIVATION DATE

The activation date is printed on the box. Do not activate past the activation date.

2.2 SERIAL NUMBER

The serial number gives the following information:



WG stands for WatchGas. I = 2018, J = 2019, K = 2020 etc.

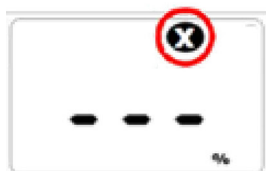
2.3 GETTING 24 MONTHS OF USE

The battery and the sensor of the PDM are not replaceable. Make sure the battery doesn't get drained before the 24 months are over. To reach 24 months of use:

- Only push the key when needed
- Do not allow the PDM to be in alarm situations for more than 2 minutes a day.
- Connect to IR-Link only when necessary.

2.3 ACTIVATION

Press and hold down the key () for three seconds, after the three second countdown the monitor will turn on. Gas type and firmware version (eg. v2.2) will be displayed. During a 10 seconds countdown, the device will stabilize itself. After stabilization is complete,  will appear on the display screen and the device will move to the detection mode.



In the event that stabilization of the device fails,  will appear on the display and gas measurement mode will not be entered. In this case, perform calibration or contact authorized reseller for repair/return information.

Caution

Although the PDM is calibrated before it leaves the factory, a proper calibration is advisable before using it at the work site. The user should check whether the device is properly detecting hazardous concentrations and make sure that the detecting section of the device is not blocked with materials impairing the detection.

3. Mode

3.1 MEASUREMENT MODE



When activated, in the detection mode, gas concentration or remaining battery life appears on the screen. Oxygen concentration is displayed in percent by volume (%VOL) and toxic concentration is displayed in parts per million (ppm).

3.2 DISPLAY MODE



In the Detection Mode, by pressing pushbutton for one second, the following icons will appear in order:

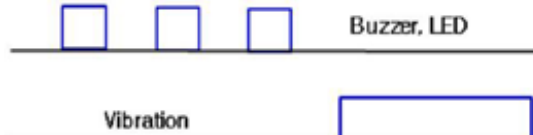
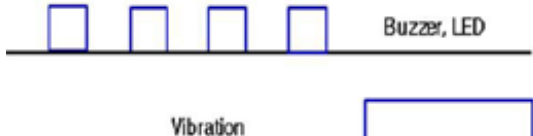
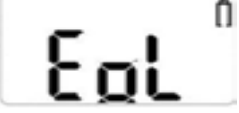
MIN (only for oxygen) -> **MAX** -> CLR -> Remaining Life time (M, D, T) -> Low alarm set point -> High alarm set point -> Firmware version -> Calibration Concentration

At the last step, if you press the key or do not push any button for a second, the PDM will return to Detection Mode.

3.3. ALARMS / BATTERY / TEST FAILURE DISPLAY

When a gas concentration exceeds alarm set points,  or  will be displayed and the device will vibrate, flash its LEDs, and beep. To stop alarms, evacuate immediately to a clean air location.

When bump test or calibration failed,  will be displayed and the PDM will beep intermittently.

Alarm	Alarm standard	LCD Display	Alarm and Vibration
Low alarm	Gas concentration exceeds low alarm threshold	 + concentration	
High alarm	Gas concentration exceeds high alarm threshold	 + concentration	
Remaining Life	Less than 30 days		
End of life	Past 24 months		Lifetime is over. Replace PDM.
Test Failure	Failure of sensor test, calibration or self-test		
Battery Low			
Bump Test Due	Bump test period		Press the button to turn off the alarm
Calibration Due	Calibration period		Press the button to turn off the alarm

Caution

The alarm limits are set based on international standards. Only change these levels to make them conform to local rules and regulations.

3.4. ALARM SET POINTS

Gas	O ₂	CO	H ₂ S	H ₂	SO ₂	Cl ₂	NH ₃	NO ₂
Low alarm	19%	25 ppm	5 ppm	100 ppm	1 ppm	1,5 ppm	20 ppm	5 ppm
High Alarm	23%	25 ppm	5 ppm	100 ppm	1 ppm	1,5 ppm	20 ppm	5 ppm

3.5. DEFAULT CALIBRATION CONCENTRATIONS

GaS	O ₂	CO	H ₂ S	H ₂	SO ₂	Cl ₂	NH ₃	NO ₂
Concentration	0,0% Vol. (99,9% N ₂)	100 ppm	50 ppm	500 ppm	10 ppm	10 ppm	100 ppm	10 ppm

4. Event Log

Last 30 events are stored on the PDM. Once 30 events are stored, the oldest log events get overwritten. Stored log events can be transferred via WatchGas-IR Link.

Each alarm event is recorded as follows:

Types of alarms

Alarm concentration in ppm or %

Peak concentration

5. Calibration

Caution

Initial calibration is performed on all devices prior to shipment. Once received, calibration should be regularly depending on frequency of use.

5.1. FRESH AIR CALIBRATION

Press and hold the key for 5 seconds to enter the calibration mode ( ,  icon and 'CAL' mark will appear on the LCD.

Press the key for three seconds to initiate calibration. When calibration begins, a countdown (starting at 10) will appear on the screen.



Once completed,  will appear on the LCD.



If calibration fails,  will appear on the LCD. Check that the air is clean and that no contaminants are blocking the sensor opening and try again. If fresh air calibration fails repeatedly, contact WatchGas.

Caution

Calibration should be performed in a fresh-air environment that is free for any contaminants and other gases. Preferably, do not perform calibration in a confined space.

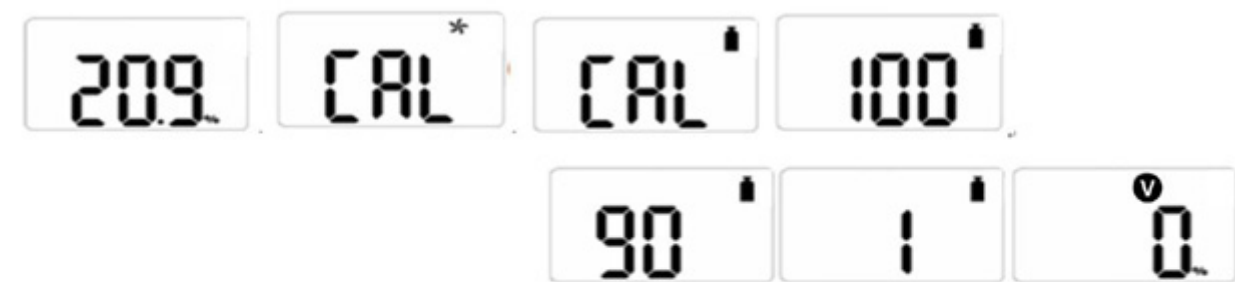
5.2. STANDARD GAS CALIBRATION

Attach the calibration adapter to the PDM and to a gas cylinder with a concentration matching the calibration concentration. Check 3.1. Display Mode to check the calibration concentration.

Press and hold the key for 5 seconds to enter calibration mode (🔋), ✳ icon and 'CAL' mark will appear on the LCD. Press the key again for a second, to switch to standard gas calibration, 🔋 appears.

Start the flow of the gas cylinder by opening the valve.

Press the key for three seconds to initiate calibration. When calibration begins, a countdown will appear on the screen. The duration of the countdown depends upon the sensor type.



Once completed, V will appear on the LCD. After a few seconds, the PDM will return to detection mode.



If calibration fails, X will appear on the LCD.

Check that the gas cylinder is not empty and that it has not expired. Also make sure that no contaminants are blocking the sensor opening and try again. If standard gas calibration fails repeatedly, contact WatchGas.

5.3. RETURN TO THE MEASUREMENT MODE

In the standard calibration mode 🔋, press the key for a second to toggle fresh air calibration, standard calibration, and ESC. In the ESC mode, press the key for 3 seconds, the PDM will get out of the calibration mode and return to detection mode.



6. Self Test & Bump test

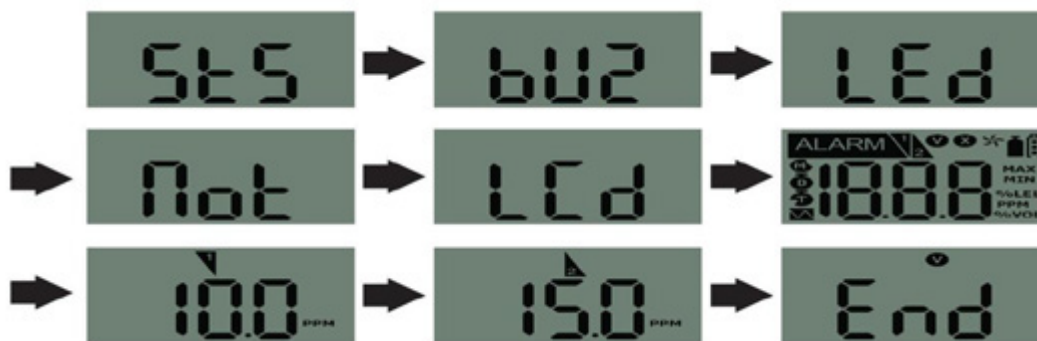
6.1 SELF TEST

The default interval of the Self-Test is 20hr, meaning the PDM will ask for a self test after each 20 hours of use.

The interval is configurable via IR-Link between 8~20 hours. The self test can also be switched off via IR-Link.

When the interval is activated, STS message will flash. The message will flash until users perform the Self test.

Once you press the button, it will test buzzer, LED, Vibration, LCD, and show alarm thresholds. After the test is completed, END message with  icon will be displayed. (Users are required to check the test processes.)



6.2. BUMP TEST

The interval of Bump test is 1~365days, and the default is switched off.

To initiate the bump test, set the bump test interval.

Once the bump test interval expires, Bts message will flash.

Put the PDM in the docking station with a valid and full gas cylinder.

Alternatively, attach the calibration adapter to PDM and a valid and full gas cylinder.

Press and hold the key for 3 seconds, the TST message will be displayed for 45 seconds (To cancel, press the button for one second). Within the 45 seconds, start the flow from the gas cylinder. If no gas is applied, the bts message will flash again.

If the test is successful, SUC message with  will be displayed for 30 seconds. Stop the flow, remove the calibration adapter.

If the test fails, FA message with  will be displayed and BTS message will be flashing until the test is successful. If the bump test repeatedly fails, contact WatchGas.

7. Specifications

Model	PDM					
Detectable gas ranges	O ₂	CO	H ₂ S	SO ₂	NH ₃	H ₂
	0-30%Vol	0-500ppm	0-100ppm	0-200ppm	0-100ppm	0-1000ppm
Resolution	O ₂	CO	H ₂ S	SO ₂	NH ₃	H ₂
	0.1%Vol	1ppm	0.1ppm	0,1ppm	1ppm	1ppm
Output Specifications	LCD display of current reading with alarm sounder and vibrator					
Sensor Technology	Electrochemical Cell					
Power Supply	DC 3.6V, 1.2Ah Lithium battery					
Operating Life	24 months, based on 2 minutes of alarm per day					
Operating Temperature	-30°C ~ 50°C					
Operating Humidity	5% ~ 95% RH (Non-condensing)					
Dimensions	49mm(W) x 84mm(H) x 40mm(D)					
Weight	93g (Toxic), 104g (O2) (Battery, clip included)					
Alarm	95dB					
Enclosure Material	Polycarbonate and rubber					
IP Rating of Enclosure	IP67					
Approval	ATEX: II 1g Ex ia IIC T4	INMETRO: Ex ia IIC T4 Ga	CSA: C1, D1, Groups A, B, C, D, T4	IECEX: Ex ia IIC T4 Ga	EAN-13: PDM-H ₂ : 8719992974948 PDM-SO ₂ : 8719992974955 PDM-NH ₃ : 8719992974962 PDM-H ₂ S: 8719992974979	

8. Certificates

Intrinsic Safety: The detector is in conformity of the following standards

IECEX: Ex ia IIC T4 Ga 1

IECEX KTL 15.0018



Ex ia IIC T4 Ga

Class I, Zone 0, AEx ia IIC T4 Ga

Class I, Division 1, Groups A, B, C, D, T4

C22.2 No. 60079-0:2015; C22.2 No. 60079-11:2014;

C22.2 No. 61010-1-12:2010; UL 61010-1,

Ed. 3; UL 913, Ed. 8; UL 60079-0, Ed. 6; UL 60079-11, Ed. 6

ATEX:  2198  II 1 G Ex ia IIC T4 Ga IP67

KRH16ATEX1048

Directive 2014/34/EU

KCS: Ex ia IIC T4



KTL 16-KA2BO-0457

INMETRO Ex ia IIC T4 Ga

BVC16.5919



Compliance: Electromagnetic Compatibility Directive 2014/30/EU

Standards:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- IEC 60079-0: 2011 Ed. 6
- IEC 60079-11: 2011 Ed 6
- UL 61010-1, Ed. 3
- UL 913, Ed. 8
- UL 60079-0, Ed. 6
- UL 60079-11, Ed. 6
- C22.2 No. 60079-0:2015
- C22.2 No. 60079-11:2014
- C22.2 No. 61010-1-12:2012
- EN 60079-0: 2012+A11:2013
- EN 60079-11: 2012

Manufacturing Approval:

The detector manufacturer is certified compliant with ISO 9001:2000 provisions

9. Limited Warranty

WATCHGAS warrants this product to be free of defects in workmanship and materials-under normal use and service-for two years from the date of purchase from the manufacturer or from the product's authorized reseller.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing, or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up to manufacturer specifications during the applicable warranty period, please contact the product's authorized reseller or WATCHGAS service center at +31 (0)85 01 87 709 for repair/return information.



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