

COMBUSTIBLE GAS MONITOR



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Commonly used flammable gas explosion limit Table			
Name	Chemical formula	The explosion limit in air (V%)	
		LEL	UEL
Methane	CH ₄	5	15
Ethane	C ₂ H ₆	3	15.5
Propane	C ₃ H ₈	2.1	9.5
Butane	C ₄ H ₁₀	1.9	8.5
Gasoline(Liquid)	C ₄ -C ₁₂	1.1	5.9
Kerosene(Liquid)	C ₁₀ -C ₁₆	0.6	5
City gas		4	
liquefied petroleum gas		1	12
Turpentine(Liquid)	C ₁₀ -H ₁₆	0.8	

* The above parameters are for reference only

3.2 WARRANTY

- * AS8902 Combustible gas Monitor is warranted to be free from defects in material and workmanships for a period of one year after purchase.
- * This warranty not includes the sensor and battery pack after 6 month purchase period.

3.3 MANUFACTURING STATEMENTS

- * Thank you for buying and using Smart Sensor AS8902 Combustible Gas monitor.
- * The unit has been designed, manufacturing, tested and proven under professional quality team.
- * The unit should be reliable to use and operate under the reasonable care and maintenance described in this instruction manual.

3.4. ENCLOSURE

- * The used or nonfunctional battery, please follow the international environment regulation to settle.
- * Smart Sensor has the right to modify or change the design of the unit, operation manual or product specification prior without any further notice.

一、 NOTICE BEFORE USE

1.1 CAUTIONS AND WARNINGS

The user need to read and follow the procedures and conditions as below to prevent ant failure might be occurred during operating this instrument.

- ▲ Insufficient oxygen atmospheres may cause combustile gas readings be lower then actual corrected readings.
- ▲ Enriched oxygen atmospheres may cause combustile gas readings be higher then the actual corrected readings.
- ▲ The intruments need to be re-calibrated after the instrument has been used in an area of silicon vapors were present.
- ▲ Please always be kept clean of the sensor opening and the water barriers of the intrument.
- ▲ Please do not charge the battery or serving the unit in hazardous or enriched atmospheres condition.
- ▲ The intrument only suggested to be used by operated and serviced by qualified personnel whom has fully read and understood the instruction manual completely.
- ▲ Caution: high offscale readings indicate the enviroment might be reached to explosive concentration that is also a danger signal to represent the area is hazardous.
- ▲ The instrument is recommended to be calibrated the sensitivity with a 25%, 50% of full concentration pentane or methane. Please referring to the zero /calibration section of this instruction manual.

- ▲ This instrument is certified to be normal use within the temperature range of -20 deg. C to 40 deg. C only.
- ▲ The model of AS8902 must be used only with model AS8930 external sampling pump. (Excluded).

三、 OTHERS

3.1 MAINTENANCE

The following guideline should be followed to achieve good maintenance for AS8902 unit.

CLEANING:

- * If necessary, wipe the outside surface of the unit, please use the soft, clean cloth.
- * Never use any solvent or cleaning solutions.
- * Make sure the rubber buttons are free of dirt.
- * To clean the sensor opening, please use the clean, soft cloth or soft brush.

CHARGING THE BATTERY:

- * The lithium-ion battery suggested to be fully charged before using the AS8902.
- * To charge the battery, plug the connecting lead wire of the battery charger into the charging port located at the bottom of the unit. This port is protected by a rubber flap, so need to release the flap before charging.
- * The battery should be fully charged in 6 hours.
- * Once fully charged, the unit will be good enough to work for 18 hours operation, and work about 12 hours with AS8930 external sampling pump.
- * The shaded area of battery indicator shows full once the battery is fully charged.
- * If all shaded area only has one bar left, the battery needs to be charged at once.
- * When the battery is low, the unit might emit a periodic alarm sound to alert you to charge the unit.

2.11 ACCESSORY AS8930 SAMPLING PUMP

- * The AS8930 external sampling pump is available to work with all AS8902 series gas monitor but no exclude in any unit pack.
- * This pump mount into the AS8902 unit by 2 fasten screws. Please review to the assembly drawing attached.

1.2 UNIT PACKING

The gift box should be contain the following items

Description	Quantity
➤ AS8902 Combustible gases monitor	1PCS
➤ Operation manual	1PCS
➤ Carrying brouch	1PCS
➤ 3.7V rechargeable lithium battery	1PCS
➤ Battery charger	1PCS

1.3 PRODUCT SPECIFICATIONS

Sensor specification:			
Gas	Range	Resolution	T90
Combustile (LEL)	0~100%LEL	0.1%	35sec
Temperature and humidity range:			
Operating Temperature: -10~ 50°C(except LEL is 0 ~40°C)			
Operating Humidity : 15~95 % RH, typical			
Storage Temperature : 0~40°C			
Size: 120.20mm x 64.50mm x 38.30mm			
Weight: 200g			
Battery specification:			
Rechargeable lithium-ion battery, 3.7 Volts			
Battery working runtime: 18 hours. And 12 hours work with AS8930 sampling pump.(work in room temperature and no alarm conditions.)			

1.4 OUTLOOK OF THE INSTRUMENT

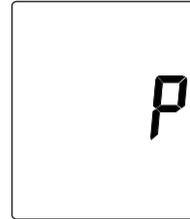


1.5 INTRODUCTIONS

The AS8902 Combustible gas monitor is a portable and handheld instrument that is capable to use continuously and simultaneously monitoring Combustible gas, the gas readings shows in one LCD display. The unit also provide user to configure high and low alarm. The unit will be audio and visual alarm once the alarm condition is exceeded.



9. If it shows F , it means the calibration is failed, need to recalibrate again.

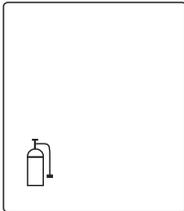
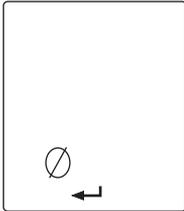


10. If no standard gas is used, please do not enter to this instrument calibration mode, for the pre-set value will be easy to be deleted.

2.10 INSTRUMENT CALIBRATION MODE



1. This is the final setting mode for zero/calibration mode.
2. The user wants to enter this mode with correct security code.
3. The unit could be easy to calibrate by using a cylinder of a standard gas.
4. To enter in this mode, to press both button of ▲ and ▼ in normal gas monitoring mode, and key in the correct security code to enter in this calibration mode.
5. To press ▲ button 4 times, then will enter to this instrument calibration mode. In this mode the display shows ∅ and ↵ icons, press button again for start the calibration with the icon cylinder is flashing.
6. Please make sure the unit is connected with the gas cylinder firmly before the cylinder icon flashing for 6 seconds.
7. Then to press the ↵ button, the display will shows cylinder and clock with the calibrating value.
8. If the calibration is succeeded, the display will shows P icon represent pass.



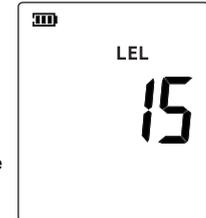
二、 OPERATION MANUAL

2.1 INSTRUMENTS OPERATION

1. To turn on the instrument AS8902, please depress and hold the ⏻ button for over 1 second, the unit will be turn on with a beep sound and vibration, then the LCD will light up all icon and segments.
2. Once the software countdown for 18 seconds then the unit will enter into the Gas Monitoring mode.
3. for to turn off the unit, please depress and hold the ⏻ button for over 3 seconds, then the unit will be power off after 3 beep sounds.
4. for to light up or turn off the backlight of the LCD display, please depress the ⏻ button.

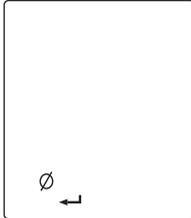
2.2 Gas Monitoring mode

1. Once the unit is power on, the display will show all 4 gas symbol with readings.
2. Then the unit is already started to continuously monitored and shows the readings on the LCD display. Once the gas level is increased, the corresponding read will be showed the existing gas concentration.
3. Also the battery life indicator is also display in the left upper corner, once the battery lift is decreased, the shaded showed of the battery icon is also decreased.
4. Once the gas concentration is exceed the high or low alarm limit (as well as TWA or STEL) the unit will be triggered the audio and visual alarm with vibration.

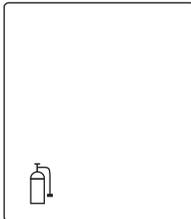


- Once the gas concentration is drop below the alarm level, the unit will go back to normal gas monitoring mode.
- For to access this mode, please depress ▲ button. Then the unit will enter to Zero/Calibration mode.

2.3 Zero/ calibration mode

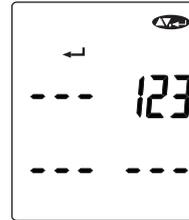


- Depress the ▲ button once from the gas monitoring mode, the unit will be put in the Zero/ Calibration mode.
- In this mode the icon ∅ and ← will be displayed along with the 4 gases readings.
- Depress the ← button once more time, the unit will escape to another Peak Value mode.
- If depress ∅ button the unit will start the Zero/ Calibration process. Once the CO, H2S and LEL sensors have finished the zeroing process, the Oxygen sensor will be start to SPAN.
- During this process the “CLOCK” icon and full Oxygen span value will be displayed.



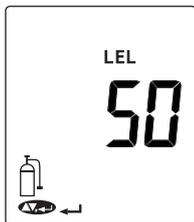
- Once the process is completed, the display will shows the SPAN and  icon
- To depress the ← button, the unit will begin to calibrate the remaining sensors one by one with same process.
- The calibration gas are the fixed concentration value, to calibrate the instrument by using a blended cylinder containing 25ppm H2S, 100ppm CO, 25% or 50% LEL Methane or pentane, and 19% Oxygen at 0.5 LPM flow speed.

2.9 SECURITY CODE SETTING CODE



- The next setting is the security code setting, The display will show (enter) (up/down/enter) and the manufacturing preset security 123.
- If no change is required, press ▲ button to move into other LEL setting mode.
- If security code need to be changed, press ↻ button, then the preset code will be flashing.
- To adjust the first digit, press ▲ or ▼ button, once the value is confirmed, press ↻ button to set the second digit.
- Continue this procedure until three digits are set the display will show (enter) (up/down/enter) icons along with the new security code.
- If further change of security code is required, press ↻ Re-enter this setting mode again.
- If no change is needed, press ▲ button move to next LEL setting mode.
- Pressing the ⏻ button will bring you back to the security mode again, with no changes on security code is saved.
- Pressing ⏻ button second time , the display will be back to normal gas monitoring mode.

2.8 LEL SETTING



1. LEL is the final configuration setting mode, after press  button, the LEL and the value readings will be flashed.
 2. Once the setting is finished, the new setting value will show on the display, then press  button to confirm.
 3. To press the  button the unit will back to the normal gas monitoring mode.
 4. If press the  button, it will back to first setting mode again.
- Remarks: LEL is the low explosion level of the combustible gas in normal air.

2.4 PEAK VALUE SETTING MODE



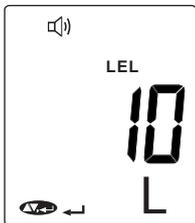
1. To depress the  button from Zero /Calibration mode, the unit will entered to Peak value setting mode.
2. In this mode, the display will shows all 3 gases peak gas readings and the  lowest readings of oxygen sensor, with PEAK and ENTER icon are displayed.
3. To depress  button will reset all peak value of the current readings of 4 gases.
4. To depress  button, then the unit will enter to TWA value mode.

2.5 CONFIGURATION MODE



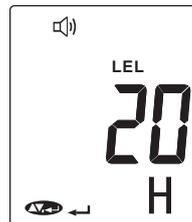
1. To depress the  or  button simultaneously during the software countdown time for 18 seconds will put this unit into the Configuration Mode.
2. In this mode, the unit is allow the user to change the high, low TWA and STEL alarm level as well as the security code (if desired)
3. Once the Configuration Mode is entered, the security code screen is displayed.
4. The preset code is 123, the first code will flash, then depress  or  button for change the first code, then depress  button for second and third code number setting.
5. Once the security code is set and confirmed, depress the  button to escape the unit to other alarm setting mode.

2.6 LOW ALARM SETTING MODE



1. Low alarm setting mode is the first configuration screen, the display will show the (speaker) (down) (enter) and (up/down/enter) icons along with the four low alarm set readings of the 4 gases.
2. If the change is desired, press ← button, the first gas low alarm value will be flashing.
3. To adjust the value by depress ▲ or ▼ button.
4. Once the setting is confirmed and completed, press ← to next gas low alarm setting.
5. To press ← button for re-enter this setting mode again for further adjusted setting if required.
6. To press the ▲ button to move the setting to high alarm setting mode.
7. To press the ⏻ button, the unit will back to low alarm setting mode with no changes will be saved.
8. To press ⏻ button for second time, the unit will be back to the original gas monitoring mode.

2.7 HIGH ALARM SETTING MODE



1. In the mode the display will show (speaker) (H) (enter) and (up/down/enter) icon along with the 4 gases high alarm value.
2. If no change is required, press ▲ button to move to nest setting mode.
3. If the changed is needed, press ← button to have the first high alarm value will be flashing.
4. To adjust the value by press ▲ button or ▼ button.
5. Once the setting is confirmed and completed, press button to next high alarm setting.
6. The preset high alarm value is 20 LEL, if any change is required, press ⏻ to remain in this high alarm setting mode.
7. To press ▲ button to enter LEL standard gas mode.
8. When the alarm setting value are flashing, to press ⏻ button once, it will back to high alarm setting mode again, but with all alarm set value will be deleted.
9. To press ⏻ button once more, the unit will back to normal combustible gas monitoring mode.
10. Please be aware, the high alarm setting value is not a storage /fix value, it change in every setting.