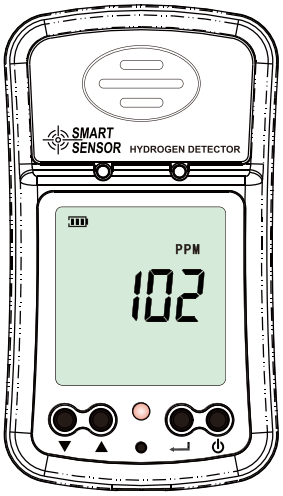
SMART SENSOR

Hydrogen Gas Meter



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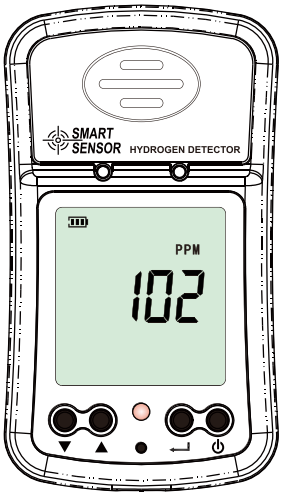

INTRODUCTIONS

- Thank you again for your purchase of our products, thank you very much.
- The AS8909 Hydrogen gas meter is a portable and handheld instrument that is capable to use continuously monitoring Hydrogen gas, when detected Hydrogen gas, the concentration will shows in the LCD display. The unit also provided user to configure high and low alarm. The unit will have audio and visual alarm once the alarm condition is exceeded.
- Before use this product, please read the instruct manual carefully, it will guide you how to operate it and use a simple test method, so sure you apply all excellent performance of this good design product.

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3.5 DECLARATION

- You, as the end user, are legally bound (Battery ordinance) to return all used batteries and accumulators, disposal in the household garbage is prohibited!. You can hand over your used batteries/accumulators at collection points in your community or wherever batteries/accumulators are sold!
- Deposit: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle.Our company reserve all the copyright, above user manual and related contents, if no any signed and approved document provided by “Smart Sensor Holding Co., Ltd.”, can't be plagiarize at any different way, reprint or copy. Also included other method, for example, digitalize, electronic etc.

3.5 Appendix (Hydrogen Gas)

Explosion Limit of Hydrogen Gas:	
Concentration of Hydrogen Gas (V%)	Reaction
Less than 4%	No explosion at fire source
4%~75.6%	Explosion at fire source.
Large than 75.6%	No explosion at fire source, can be ignite and burn out stable with visible flame.

- Above information only for reference.

Version :6-AS8909-0116-00

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1.NOTICE BEFORE USE THIS METER

1.1 Warning and precaution

Not suitable operation and use in a bad environmental, will reduced the performance and accuracy of this meter, to safety and effective to use this meter, please read the following operation procedure and used it in suitable environment.

1. Please read the instruction manual carefully before use the unit.
2. The gas sensor window and gas filter must be keep cleaned,
3. If window was block or gas filter dirty, will cause gas sensor reading less than the actual measured concentration.
4. The sudden change to the air pressure will cause the fluctuation of the carbon dioxide measured reading.
5. Charge the battery or repair the unit, must be in a safety environment to operate this action.
6. Prohibited charge the unit battery under a well.
7. Replacement parts or Sensor is not recommended, it will cause seriously safety problem.
8. Repair the unit must be handled by a authority person or agent, non-approved parts replaced to the unit will caused mal-function of the unit or wrong measure of the unit. Also reading the user manual before repair is highly recommended.
9. Notice: If the gas reading over the highest unit and then suddenly drop down or reading unstable, that means the tested gas is over the exploded range, it is very danger situation.
10. The operation range of this unit is from -10 degree C to 50 degree C.

3.4 COPYRIGHT

Our company reserve all the copyright, above user manual and related contents, if no any signed and approved document provided by " Smart Sensor Holding Co., Ltd.", can't be plagiarize at any different way, reprint or copy. Also included other method, for example, digitalize, electronic etc.

All the contents at information of this manual is secrecy and belong to the owner. All the related copyright , business mark, business name, patent and other intellectual property right are exclusive to "Smart Sensor Holding Co., Ltd". (except any declaration).

Any information (but not only included data, graphic, instruction documents, software list, signal or target program code), if no any signed and approved document provided by " Smart Sensor Holding Co., Ltd.", any time can't be direct or indirect disclose to third party.

All above information and contents are be confirmed and accuracy, trusty. Our company is no any liability for the user to use this product in their own way.

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3.2 SAMPLING PUMP

Sampling pump can be use with gas series monitoring meter. Sampling pump can't be operate separately, must be work up our gas series main unit, it get power from main unit by two contact pin located in top side of front panel.The gas flow is 0.5SCFH (0.25LPM), can be sampling gas maximum 50 feet by suitable gas tube.

3.3 WARRANTY

We warranty, our gas series meter of “Smartsensor”, is included from defects in material and workmanships for a period of one year after purchase.
This warranty included the sensor, battery pack and gas sample pump (gas pump is optional parts for AS8909).

3.4 MANUFACTURING STATEMENTS

Thank you for buying and using Smart Sensor AS8909 Hydrogen 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.

⑪ All parts can't to change or replaced with other un-authority parts, highly recommended ship it back to a authority agent for repair. Don't connect the unit to other instrument.
⑫ If you need to use sample pump, you must buy our AS8930 sample pump, it design to fit in this unit.
This unit must be work with the built in lithium battery, don't be replacement with other lithium battery. Under the exploded environment, don't dis-assembly the battery. Before the battery fully discharge, please charge it on time, otherwise the battery life will be shorten due to fully discharge it.
⑬ If unit don't used for a long period, please fully charged it before storage, it can prevent the battery fully discharge to shorten the battery life.
⑭ Prohibit to dis-assembly the cabinet in dangerous environment
⑮ This product comply with following regulation and standard JJG693: JJG695: JJG915: and GB3836 series anti-explosion standard.

1.2 PACKING LIST AND ACCESSORIES

The gift box should be contain the following items, if you find any items missing or missing page of the instruction manual, please contact our sole agent that they sell this product to you.

- Hydrogen gas meter -------1pc
- Instruction manual----------1pc
- USB cable ----------1pc
- Charging adaptor----------1pc

1.3 CERTIFICATION

EXPLOSION CERTICATION
EXPLOSION MARKING : Exic II CT3 Gc
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1.4 PRODUCT SPECIFICATIONS

Sensor specification：		
Gas	Range	Resolution
Hydrogen（H_2）	0~1 000ppm	1 ppm

Other specification：			
Operation current	16mA	Short circuit current	<3A
Operation voltage	3.7V	maximum open circuit voltage	<4.2V
Battery type	KXD-N3310	Display Type	Segment type LCD
Operation humidity	15% ~95%	Operation temperature	-10℃ ~ 50℃
Storage temperature	0~40℃	Weight	200 gram
Dimension	120.20mm X 64.50mmX 38.30mm		
Battery working runtime	160 hours (AS8909), 12 Hours (with gas pump, but no alarm)		

NOTICE: If security code was changed or user forget security code, please refer to security code setup mode at page 9.

3.OTHERS ISSUE

3.1 WARRANTY AND MAINTENANCE

The following guidelines should be followed to achiever good maintenance for unit.

CLEANING:

-If necessary, wipe the outside surface of the instrument, please use the soft, clean cloth.
-Never use any solvent or cleaning solutions.
-Make sure the rubber buttons are free of dirties.
-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.
-To charge the battery, plug the connecting lead wire of the battery charger into the charging port located at the bottom of the unit. The port is protected by a rubber flap, so need to release the flag before charging.
-The battery should be fully charged in 6 hours
- Once fully charged, the unit will be good enough to work for 160 hours operation, and work about 12 hours with external sampling pump.
-The shaded area of the battery indicator shows full once the battery is fully charged.
-If all shaded area only have one bar is left, the battery need 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.

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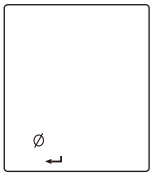
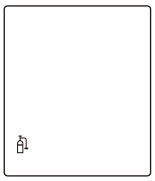
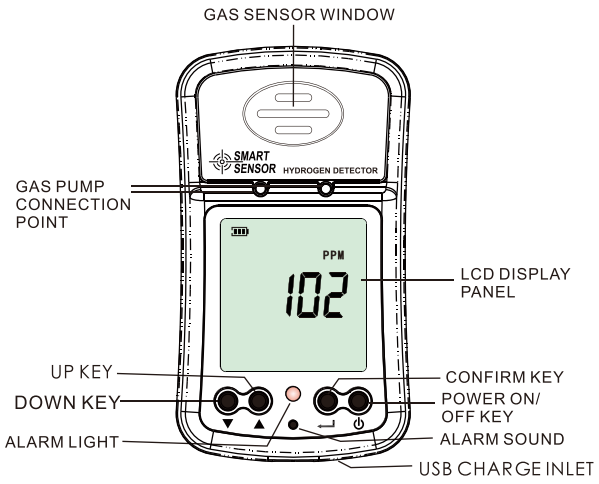




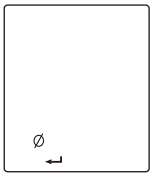
a calibration silicone tube, one end connected to sampling pump (AS8930) inlet, and the other end connected to Cal gas cylinder with a passive flow adjustment valve. If you to calibrate the unit without sampling pump (As8930), just connect the one end of the calibration silicone tube to the inlet of the unit, the other end to the Cal gas cylinder through a passive flow adjustment valve. Move the unit for calibration to a cleaned air environment, at normal monitor mode, press [▼] and [▲] key at the same time, enter the correct security code then go to the calibration mode, after go to this mode, press [▲] four times, unit will go to fast calibration mode, when go into this mode the screen will display [Ø] and [↵] icon, then press [↵] key go to the fast calibration mode setup mode, at that mode the LCD screen will have flashing ”cal. Gas bottle” icon show you it is ready for calibration, please put the calibration cup firmly cover the gas window area , use a silicone tube connect the calibration cup to the air flow valve of cal. Gas bottle, after connected the tube, press [↵] key to start the calibration, at the moment the screen will show [ ] [ ]icon and the calibration value (the calibration value is not fix). Finished this step instrument will go to next step, if the screen display flashing “P” icon, it means the calibration success. If screen shown “F”, means calibration failed, need to calibrate again by press [↵] key as before (repeat the procedure).

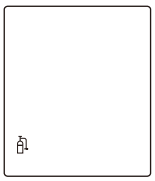
1.5 OUTLOOK OF THIS INSTRUMENT

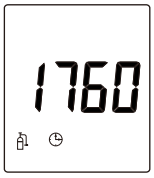


1.6 INTRODUCTION

This instrument is a portable and handheld hydrogen Gas meter that is capable to use continuously monitoring Hydrogen gas, when detected Hydrogen gas, the concentration will shows in the LCD display. The unit also provided user to configure high and low alarm. The unit will have audio and visual alarm once the alarm condition is exceeded







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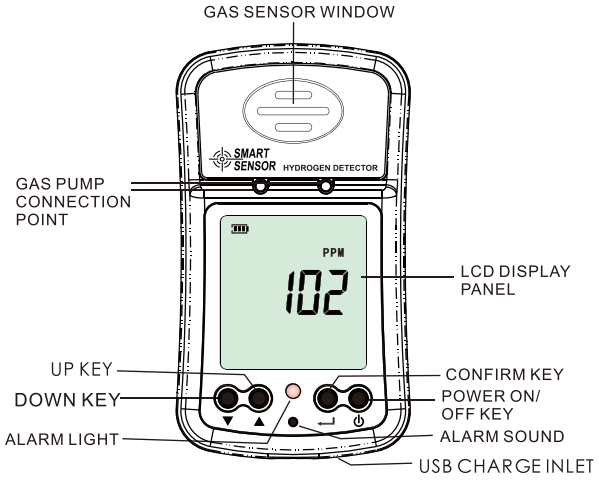

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2. OPERATION INSTRUCTION

2.1 INSTRUMENTS OPERATION

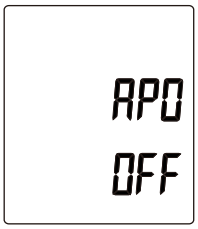
① To turn on the instrument AS8909, please depress and hold the [⏻] button for 2 second, the unit will be turn on with a beep sound and vibration, then the LCD will light up all icons and segments. Then the LCD will show the software version code. Then the unit will go to 70 seconds warn up countdown time, when countdown completed, unit will enter normal gas monitoring mode.

② 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.

③ For light up or turn off the backlight of the LCD display, please depress the [↵] button at the normal gas monitor mode.

④ At normal gas monitor mode, depress [▼] button until LCD display shown “APO” and “ON” (or“OFF”), then press [▼] button to select “ON” or “OFF”, “ON” means the unit will turn off after 10 minute if in this period no any button activated. “OFF” means no auto power off function. Press [↵]key to confirm this selection then unit back to normal gas monitor mode(as below fig.). When unit set to auto power off mode, at normal gas monitor mode, LCD have a “ ◷ ” icon shown, if unit set to no auto power off, no “ ◷ ” icon display on LCD.

Auto Power Off



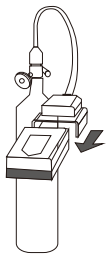
Non-Auto Power Off

digit keep flashing, then repeat the setup again for second and third digit. Completed this setup the display will shown the new security code. This moment if you press [↵] key will back to security code setup mode again., you can re-enter your new security code again: In security code flash, if you press [⏻] key, will return to normal Hydrogen gas monitor mode, but all new enter can't be saved. If already have security code, but the user can't input the correct code, then the user can't make any calibration or change the setup value for low and high alarm setting. If enter the correct security code, user can change the security code, user can make any setup changes as required.
WARM HINTS: If you forgot the security code, you can press down the [▼] [▲] and [↵] button at the same time at the security screen, then you can go to the security code setup mode to setup a new security code.

2.9 INSTRUMENT IN CALIBRATION MODE

The last setup screen is the Zero point calibration and concentration setup point calibration mode. Only at the setup mode and the user input the correct security code, you can get into the instrument calibration mode. Related how to calibrate the instrument, please read the below “Calibration mode' section in detail.

2.10 CALIBRATION MODE



This instrument have fast calibration function, only need a calibrated gas bottle can perform the fast calibration for the gas sensor.
This unit can be easy calibrated by a standard Cal gas bottle. Use the easy calibrate function, you can finished the calibration as one step. You can calibrate the unit along, or calibrate it with sampling pump as per left hand photo shown. If unit under calibration is connected with sampling pump (AS8930), please use

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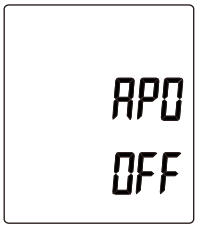
Auto Power Off



Non-Auto Power Off

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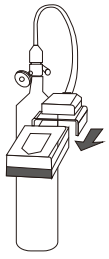
digit keep flashing, then repeat the setup again for second and third digit. Completed this setup the display will shown the new security code. This moment if you press [↵] key will back to security code setup mode again., you can re-enter your new security code again: In security code flash, if you press [⏻] key, will return to normal Hydrogen gas monitor mode, but all new enter can't be saved. If already have security code, but the user can't input the correct code, then the user can't make any calibration or change the setup value for low and high alarm setting. If enter the correct security code, user can change the security code, user can make any setup changes as required.
WARM HINTS: If you forgot the security code, you can press down the [▼] [▲] and [↵] button at the same time at the security screen, then you can go to the security code setup mode to setup a new security code.

2.9 INSTRUMENT IN CALIBRATION MODE

The last setup screen is the Zero point calibration and concentration setup point calibration mode. Only at the setup mode and the user input the correct security code, you can get into the instrument calibration mode. Related how to calibrate the instrument, please read the below “Calibration mode' section in detail.

2.10 CALIBRATION MODE



This instrument have fast calibration function, only need a calibrated gas bottle can perform the fast calibration for the gas sensor.
This unit can be easy calibrated by a standard Cal gas bottle. Use the easy calibrate function, you can finished the calibration as one step. You can calibrate the unit along, or calibrate it with sampling pump as per left hand photo shown. If unit under calibration is connected with sampling pump (AS8930), please use

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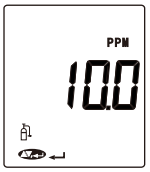
2.7 HYDROGEN CONCENTRATION VALUE CALIBRATION



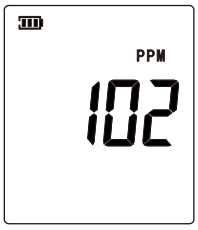
At the high alarm setting mode, press [▲] button, unit will go to Hydrogen concentration value calibration mode, in this mode the screen will show [/ /] , icons along with concentration setup point value. Depress [↵] button again, this moment the digits of setting point value will be flashing, adjust the value by press [▲] button or [▼] button to match the value of the Cal. Gas bottle marked. After completed, depress [↵] key to save the setting. If you want to change the setting point again, depress [↵] button again, then you can adjust the value again as before. If you depress [▼] button, you will go to security code setting mode. When the set point value flashing at concentration calibration setting mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

WARNING: If end user no any concentration calibration equipment, don't make any value change of the concentration setting point, otherwise once you change the setting point, all the reading will be changed and you need to recalibrate it with professional person. Be Careful.

2.8 SECURITY CODE SETTING MODE

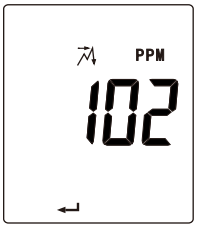
Left hand figure shown us is the security code setting mode screen, the display show 123 is the factory pre-set security code. If no need to change, press [▲] button will go to calibration mode. If you need to change the security code, press [↵] button, at this time the first digit of security code will flash, press [▲] and [▼] to change to desired digit, if finished press [↵] button to confirm the enter. Then will move the second digit, second

2.2 HYDROGEN GAS MONITOR MODE



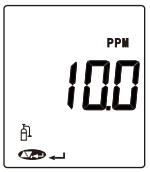
After unit turn on, it will go to normal Hydrogen gas monitor mode, it will real time monitor the Hydrogen gas changes without stop, and show up the update value on the LCD display, if the value over the maximum detection range, LCD display with show [HI]. On the left hand side corner, have a battery icon to show the battery power condition, if the power reduced, the bar inside the battery icon will decrease. If the hydrogen gas concentration lower or higher the user preset value, the unit will activated the alarm signal. At the alarm mode, unit will alarm with a low frequency voice (low concentration alarm), or high frequency voice (high concentration alarm), light alert and vibration alert also active at the same time. At the normal hydrogen monitor mode, user can change it to next detection mode by press [▲] button once.

2.3 PEAK VALUE DISPLAY MODE



At normal hydrogen monitor mode, depress [▲] once key go to “Peak value” display mode. Under this mode, the screen will show the peak value of the detected gas [ ] and [↵] icon also display at the same time, as the figure shown, press [↵] button once with reset the peak value to normal monitor value.

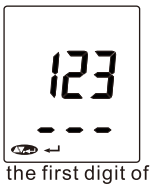
2.7 HYDROGEN CONCENTRATION VALUE CALIBRATION



At the high alarm setting mode, press [▲] button, unit will go to Hydrogen concentration value calibration mode, in this mode the screen will show [/ /] , icons along with concentration setup point value. Depress [↵] button again, this moment the digits of setting point value will be flashing, adjust the value by press [▲] button or [▼] button to match the value of the Cal. Gas bottle marked. After completed, depress [↵] key to save the setting. If you want to change the setting point again, depress [↵] button again, then you can adjust the value again as before. If you depress [▼] button, you will go to security code setting mode. When the set point value flashing at concentration calibration setting mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

WARNING: If end user no any concentration calibration equipment, don't make any value change of the concentration setting point, otherwise once you change the setting point, all the reading will be changed and you need to recalibrate it with professional person. Be Careful.

2.8 SECURITY CODE SETTING MODE



Left hand figure shown us is the security code setting mode screen, the display show 123 is the factory pre-set security code. If no need to change, press [▲] button will go to calibration mode. If you need to change the security code, press [↵] button, at this time the first digit of security code will flash, press [▲] and [▼] to change to desired digit, if finished press [↵] button to confirm the enter. Then will move the second digit, second

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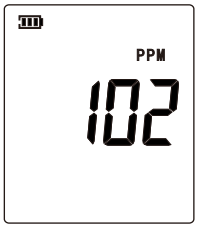
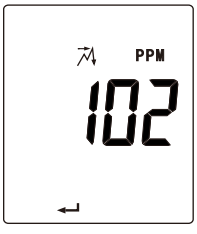
2.2 HYDROGEN GAS MONITOR MODE



After unit turn on, it will go to normal Hydrogen gas monitor mode, it will real time monitor the Hydrogen gas changes without stop, and show up the update value on the LCD display, if the value over the maximum detection range, LCD display with show [HI]. On the left hand side corner, have a battery icon to show the battery power condition, if the power reduced, the bar inside the battery icon will decrease. If the hydrogen gas concentration lower or higher the user preset value, the unit will activated the alarm signal. At the alarm mode, unit will alarm with a low frequency voice (low concentration alarm), or high frequency voice (high concentration alarm), light alert and vibration alert also active at the same time. At the normal hydrogen monitor mode, user can change it to next detection mode by press [▲] button once.

2.3 PEAK VALUE DISPLAY MODE



At normal hydrogen monitor mode, depress [▲] once key go to “Peak value” display mode. Under this mode, the screen will show the peak value of the detected gas [ ] and [↵] icon also display at the same time, as the figure shown, press [↵] button once with reset the peak value to normal monitor value.

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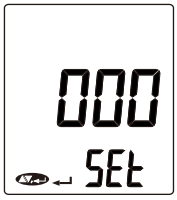
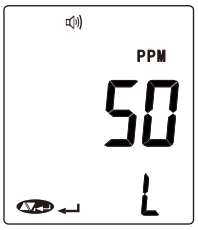
2.4 SET UP MODE



At normal Hydrogen monitor mode, depress [▲] and [▼] button at the same time, unit will go to setup mode, in this mode, user can change the setting of low concentration alarm, high concentration alarm, change the calibration setup up value. Also can change the security code, (factory pre-set code is "123"). If you have setup a security code, depress [▲] and [▼] can change the value of the code, when you value is correct, you can go to the low alarm setup mode. After input the first digit security code correct value, depress [↵] key to confirm, then continue go to setup the second digit security code, repeat the steps as above mentioned for both second and last digit. After finished three security code input, depress [↵] to confirm the input.

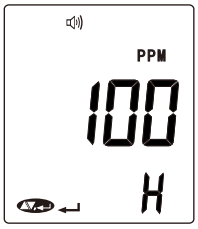
2.5 LOW ALARM SETTING MODE



At normal Hydrogen monitor mode, depress [▲] and [▼] button at the same time, input the correct secret code, depress [↵]key will go to Low alarm set up mode.When unit will go to setup mode, Low alarm setting mode is the first configuration screen, the display will show the [🔊] [👁] [↵] & "L" icon, also shown the low alarm setup value of Hydrogen gas, if no need to change it, press [▲] button direct go to high alarm value setup screen. if you need to change the setting, press [↵] button, this moment the low alarm value will flashing, to adjust the value by press [▼] or [▲] button. Once the value confirmed and

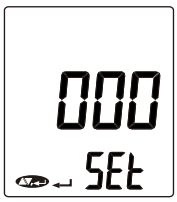
completed, press [↵] button to save it. Factory pre-set low alarm value is 50ppm. If you want to change the low alarm setting again, press the [↵] button for re-enter this setting mode again for further adjusted setting if required:
Depress [▲] button, the unit will go to high alarm setting mode . When the alarm value flashing at low alarm setup mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

2.6 HIGH ALARM SETTING MODE



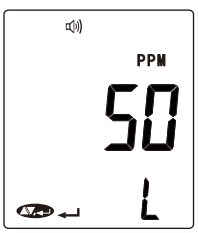
At the low alarm setting mode, press [▲] button, unit will go to high alarm setting mode, in this mode the screen will show [🔊 / 👁 / ↵] , icons along with "H" letter on the right hand side, also will display the high alarm pre-set value. If no changes required, press [▲] button move to Hydrogen concentration calibration setting mode.If required changes is needed, press [↵] button, this moment the first digit of high alarm value will be flashing.To adjust the value by press [▲] button or [▼] button. Once the setting is confirmed and completed, press [↵] button to store the value. The factory pre-set high alarm value is 100ppm. If you want to change the high alarm value, press [↵] button to re-enter this high alarm setting mode again for further adjust setting if required. Depress the [▲] button to move the Hydrogen concentration calibration setting mode. When the alarm value flashing at high alarm setup mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

2.4 SET UP MODE



At normal Hydrogen monitor mode, depress [▲] and [▼] button at the same time, unit will go to setup mode, in this mode, user can change the setting of low concentration alarm, high concentration alarm, change the calibration setup up value. Also can change the security code, (factory pre-set code is "123"). If you have setup a security code, depress [▲] and [▼] can change the value of the code, when you value is correct, you can go to the low alarm setup mode. After input the first digit security code correct value, depress [↵] key to confirm, then continue go to setup the second digit security code, repeat the steps as above mentioned for both second and last digit. After finished three security code input, depress [↵] to confirm the input.

2.5 LOW ALARM SETTING MODE



At normal Hydrogen monitor mode, depress [▲] and [▼] button at the same time, input the correct secret code, depress [↵]key will go to Low alarm set up mode.When unit will go to setup mode, Low alarm setting mode is the first configuration screen, the display will show the [🔊] [👁] [↵] & "L" icon, also shown the low alarm setup value of Hydrogen gas, if no need to change it, press [▲] button direct go to high alarm value setup screen. if you need to change the setting, press [↵] button, this moment the low alarm value will flashing, to adjust the value by press [▼] or [▲] button. Once the value confirmed and

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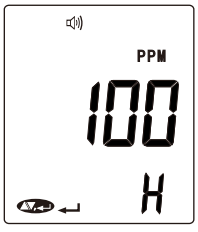
completed, press [↵] button to save it. Factory pre-set low alarm value is 50ppm. If you want to change the low alarm setting again, press the [↵] button for re-enter this setting mode again for further adjusted setting if required:
Depress [▲] button, the unit will go to high alarm setting mode . When the alarm value flashing at low alarm setup mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

2.6 HIGH ALARM SETTING MODE



At the low alarm setting mode, press [▲] button, unit will go to high alarm setting mode, in this mode the screen will show [🔊 / 👁 / ↵] , icons along with "H" letter on the right hand side, also will display the high alarm pre-set value. If no changes required, press [▲] button move to Hydrogen concentration calibration setting mode.If required changes is needed, press [↵] button, this moment the first digit of high alarm value will be flashing.To adjust the value by press [▲] button or [▼] button. Once the setting is confirmed and completed, press [↵] button to store the value. The factory pre-set high alarm value is 100ppm. If you want to change the high alarm value, press [↵] button to re-enter this high alarm setting mode again for further adjust setting if required. Depress the [▲] button to move the Hydrogen concentration calibration setting mode. When the alarm value flashing at high alarm setup mode, press [⏻] button once, the unit will be back to the normal gas monitoring mode, but all the change will not be save.

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