E6000 Portable Multi-Gas Detector

Operation Manual

(Ver: HW1403180296)

Read this manual carefully before using this device.

SAFETY INFORMATION

Incorrect operation or unsuitable using environment may attenuate the instrument's performance. Therefore, please first read the below safety information carefully before using and then operate this device.

- Please don't use the defective device. Before using, please check if there is crack or spare part missing. If yes, please contact the seller immediately.
- It's suggested that the user carry out the "Bump Test" by following Clause 5.3 of this manual before using the device. If the device reading is beyond the specified range, please calibrate the device by following Clause 5.7 and 5.8 of this manual.
- Periodic Bump test will test the response feature of the sensor. Please make sure that the visual, audible and vibrative alarm signals are ok.
- Only accessories which are specified for E6000 or permitted by the seller are allowed to be used.
- Only the charger which is specified for E6000 is allowed to be used. It's forbidden to charge the device in the dangerous environment.
- Please don't expose the device to the exceeding-range gas environment for long time. Otherwise, it will badly influence the performance and even damage the device.
- If exposed to the environment consisting of leaded compound, sulfocompound, organic phosphorus compound or silicon, the gas sensor will be poisoned. Please don't use the device in the above environment.
- Please don't expose the device to the environment which consists of H2S, hydrocarbons gas or high corrosive gas for

long time. Otherwise, it will restrain the response of the gas sensor and reduce the sensitivity. If the device has to be used in the above environment, please follow Clause 5.3 to carry out the Bump Test before using it.

- Please don't expose the device to the environment which has electric shock, strong magnetic field or serious continuous mechanic shocking.
- There is a lithium battery inside the device. Please don't place the useless battery together with the rubbish. The useless battery should be discarded by qualified withdrawers.
- It's forbidden to disassembly, adjust or repair the device without permission.
- Please avoid the device falling from high place or serious shocking.
- Any other operation beyond this manual, please contact the seller.

1. Brief introduction

E6000 is a compact and lightweight multi gas detector that continuously measures combustibles, O_2, CO, H_2S and other toxic gases in ambient air. By using 6 sensors, it can detect at most 7 gases at the same time. Its functional and watertight design (IP 66) incorporates an Bump proof, rubberized housing to meet the toughest requirements of harsh environments.

2. Main features
- Advanced 16 digit MCU with low consumption
- Ultra-wide angle LCM screen
- Adjustable 2-level alarm points

- Adjustable calibration point
- Self protection design for combustible gas sensor
- Battery low voltage alert function
- With real-time clock
- Interchangeable smart sensor module design
- Self adjustment design
- Audible, visual and vibrative alarm signals
- Data communications function
- STEL/TWA alarm for toxic gases
- Design of self-test, self-diagnose and self-repairing
- Password management
- Intrinsically safe design

3. Technical specification

Detecting method: Natural diffusion

Target gas: Refer to the Annex-1 in the end of this manual

Response time:

Semi-conduct, catalytic, thermal conduct sensor ----------T90＜30s

O_2, CO, H_2S sensor-- T90＜30s

Other sensors --T90＜120s

Indication error range:

Combustible gas--- ±5% F.S.

Toxic gas--±5ppm

Working condition:

Temperature: -20℃～50℃   Humidity: ＜95%RH

Power source: Lithium battery (DC3.6V, 6600mAh)

Working time per charging: ≤ 30 hours continuously (no alarm)
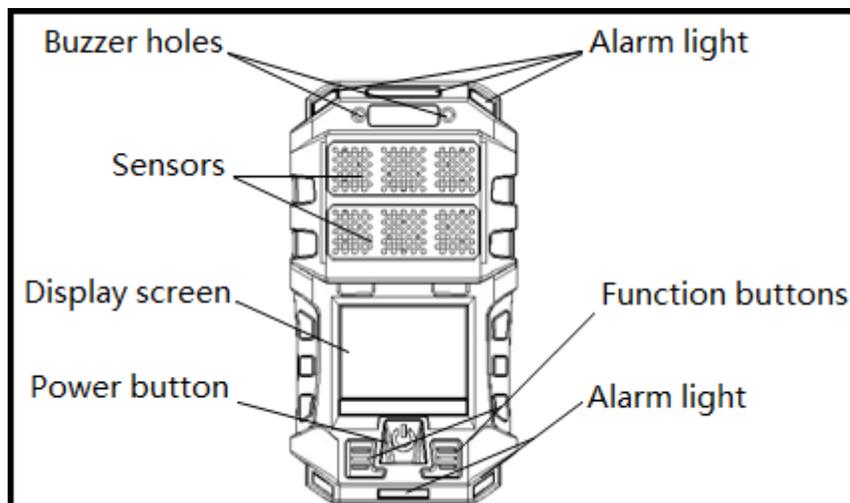
Charging time: ≤ 6 hours

Explosion –proof grade: Exia IIC T4 Ga
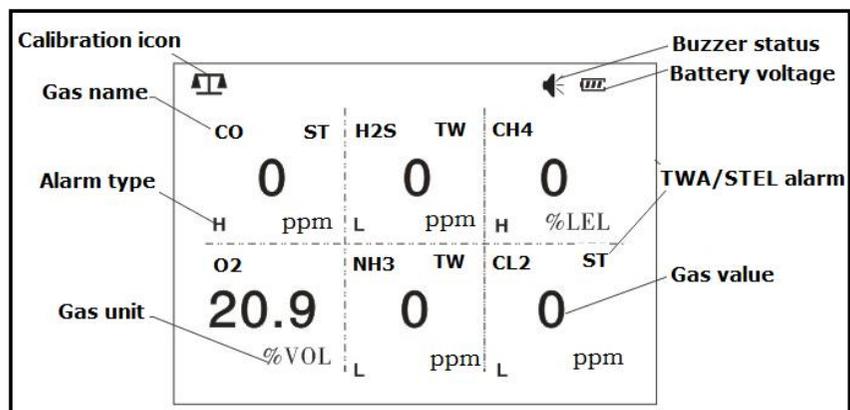
Ingress protection: IP66

Dimensions and weight: 168mm×91mm×45mm   about 500g

4.   Structure and functions

Appearance

Display information

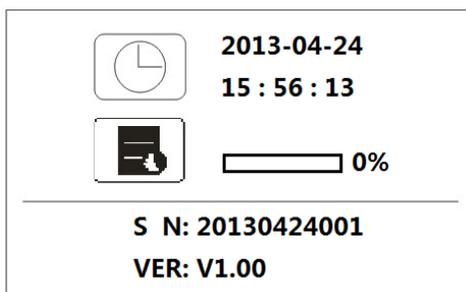## 5. Operation instructions

5.1 Power on

When machine is power off, hold for more than 3s and the device will be power on. The screen shows as below.

After power on, the detector will proceed self-test and display is as below drawing.

The device will make self test on the buzzer, alarm lights and vibrator automatically. After self-test, the device enters into normal detection status and the screen displays as below.
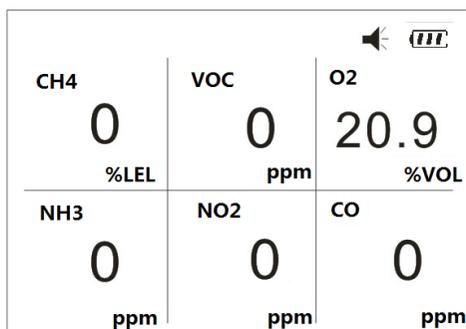
Note:

- If self-test fails, related information will be displayed. For details, please refer to Clause 10 Troubleshooting of this manual.
- If self test succeeds, the device enters into warm-up period of 3-30s, which depends on the sensor type.

5.2 Power off

In normal detection status, hold for 3 seconds and the screen will show "Shutting down…". Meanwhile, the buzzer will give out intermittent beep twice. Then machine is power off.

5.3 Bump test

Every day before using the device, the user is suggested carry out Bump test, so as to check if the device is working normally.

Test method:

When the device is power on, put it into high level gas environment, which is higher than the preset high alarm point of the device. If all the device's function is ok, then device can be used in the working area.
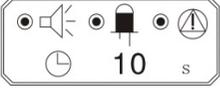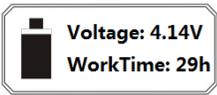
Note:

- If any reading on the screen is beyond the prescribed display error range, please follow Clause 5.7 and 5.8 of this manual to re-calibrate it.
- If detector does not response or showing errors, please contact the seller for repairing.

5.4 Menu explanation

5.4.1 Common menu

In the normal detection interface, press both [icon] and [icon] simultaneously and the device enters into common menu setting interface. Below is the button function:

Menu	Submenu	Remarks
[clock icon] **DATE** **TIME**	2013-04-24 11:14:23	When changing the date or time, the selected bit will blink.
[picture icon] **ALARM** **MODE**	⊙ ◁⊱ ⊙ ▮ ⊙ ⌇	When changing the mode, the selected bit will blink.
[record icon] **RECORD** **GAP**	🕐 10 s	Set time gap for record saving.
[heart icon] **CAUTION** **MESSAGE**	⊙ ◁⊱ ⊙ ▮ ⊙ ⚠ 🕐 10 s	Black box means this item is selected.
[battery icon] **BATTERY** **MESSAGE**	Voltage: 4.14V WorkTime: 29h	Display battery voltage and remaining work time

 BACKLIGHT TIME		Backlight time will be increased by 5s each time.

After entering into certain submenu, the user can change the item

value by pressing and save the setting by pressing .

The user can also exit without saving changes by pressing .

5.4.2 Advanced menu

In the interface of common menu interface, press both and

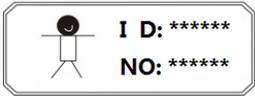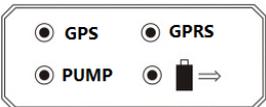 simultaneously twice. The screen shows password inputting

interface. Input the password by pressing to increase the

bit value and press to confirm the input password. After

inputting the correct password, press to enter into advanced

menu interface. Select the submenu item by pressing and

enter into selected submenu by pressing .

Menu	Submenu	Remarks
SAFETY DEPLOY	I D: ****** NO: ******	To set user's ID.
ZERO CAL.	⏳ Zero moving......	Zero calibration
DATA UPLOAD		Data upload
PERIPHE CONFIG.	○ Sensor ◉ COM	One mode must be selected
POWER MANAGE	◉ GPS ◉ GPRS ◉ PUMP ◉ 🔋⇒	Activate the other function
LANGUAGE SELECT	○ ENGLISH ◉ 中文	One mode must be selected.

Note: Initial password for entering advanced menu is "0000".

5.5 Gas detection

The device moniters and displays gas concentration in real time. Once the gas concentration reaches the preset alarm point, it will initiate alarms.

Note:
- Do not block sensors in detecting process.
- To prolong life span, external filters are suggested in detecting process.
- Long time storage, serve physical shock and excessively high concentration may cause zero drift of the gas sensors. If finding the reading in clean air is not zero, please make zero calibration by following Clause 6.7 and 6.8 of this manual.

5.6 Status review

In normal detection mode, press button in normal operation mode and the screen will show automatically current temperature, time, STEL value①, TWA value①, the maximum leval of gas②, the minimum level of gas② since power on.

Note:
①Only for toxic gas.   ②Only for oxygen.

5.7 Auto zero calibration

In normal detection mode, hold both and buttons for about 1 seconds. The device asks for inputting password. After inputting correct password, the device enters into advanced menu interface.

Move the cursor to [icon] icon and press [button] button. The device will make zero calibration automatically. In the end, a "√" icon displays for gas succeed and "×" for gas failed .

5.8 Calibration

WARNING!

**Calibration must be carried out by qualified person. Otherwise, the device may work wrongly.**

5.8.1 Enter the setting interface

While the device is power off, hold both [button] and [button] buttons simutaneously for about 3 seconds. Then, the device first performs a self test as after power on and after a short delay, the device asks for inputting the password.

Input Password:

0000

After inputting correct password, the device enters into the setting interface shown as below.

SPAN CAL.   ALARM SETTING

CHANNEL SETTING   PASSWORD
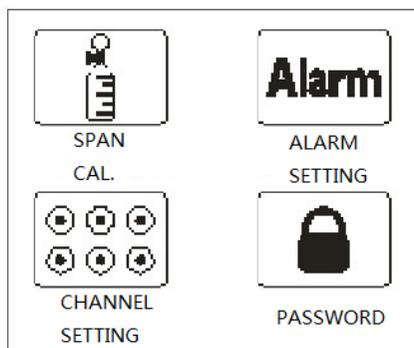
Press ⬜ to move the cursor and the selected icon turns black.

Then press ⬜ to enter the submenu.

5.8.2 Zero calibration

Select ⬜ icon and press ⬜ to enter auto zero calibration interface, shown as below. When finished, a "√" icon displays for gas succeed and "×" for gas failed .

CH4	VOC	O2
0	0	20.9
%LEL	ppm	%VOL
NH3	NO2	CO
0	0	0
ppm	ppm	ppm

In the auto zero calibration mode, press ⬜ and the device enters maunal zero calibration interface, shown as below.

CH4	VOC	O2
20419	32699	21935
NH3	NO2	CO
33074	32570	32845

When the AD value of the sensor is stable, press to make zero calibration manually. After that, a "√" icon displays for gas succeed and "×" for gas failed, shown as below.

5.8.3 Span Calibration

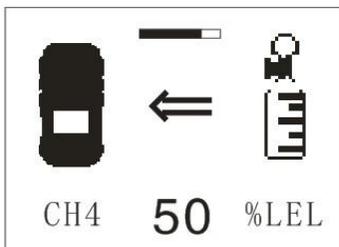After zero calibration, the device displays a countdown interface, shown as below.
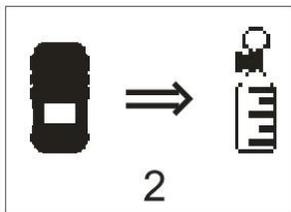
After that, it displays the calibration gas level, shown as below:
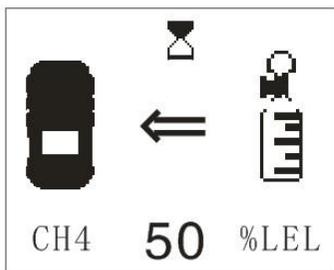

If the level needs to be changed, press to enter the below interface:

Press to move the cursor and press to change the figure. After changing the figure, press button to save and enter the gas inputting mode, shown as below:
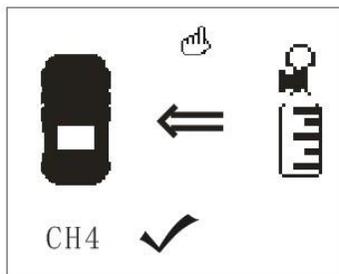

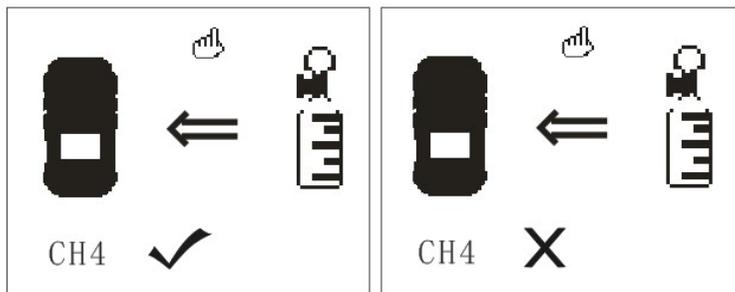When the device senses the input gas, it displays as below:

During this period, if needint to change to manual calibration mode,

press . Below is the manual calibration interface.

Press ▤ again to confirm manual calibration. The below 2 drawings show the succeeded and failed manual calibration.

Once finishing calibration one sensor, the device starts to calibrate the next sensor one by one. The operation is same as above.

During calibration period, press ▤ and the user can skip calibration for some specific sensors.

5.9 Alarm point setting

Press ▤ to move the cursor to the **Alarm** incon and press ▤ button to enter the submenu. Screen shows as below.

	H	L	ST	TW
CH4	50	20	----	----
VOC	200	0	200	35
H2S	15	10	15	10
NH3	50	25	35	25
NO2	10	5	15	10
CO	200	35	200	35

Press to move the curso to the figure which needs to be

adjusted and press when the figure flashes. Then it enters
into the setting interface, shown as below.

Press button to adjust the figure and press to move

the cursor. After adjusting, press button to save. Then the
device enters setting interface of the next alarm point.

Note:

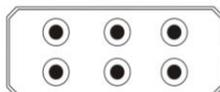H---High alarm point   L---Low alarm point

ST---STEL alert point   TW---TWA alert point

5.10 Channel setting

Press to move the cursor to icon and press
to enter the sumenu. The screen displays as below.

Press to move the cursor to the target channel and this

channel box flashes. Press to select or not. If selected, the
center is black; if cancelled, it's white.
Note:

Select---means this channel is open.

Cancel---means this channel is closed.

Keep preessing until all the channgels have been set. The device will save the setting and exit to the normal detection mode.

Closed channels will have a displayed in the channel box. Otherwise, it is open.

5.11 Password setting

Move the cursor to the incon and press button to enter the submenu, shown as below.

> Input Password:
> 0000

Press to adjust the figure and press button to move

the cursor. After setting, press to save the new password.

WARNING!
After setting the new password, please remember it clearly.

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6. Battery charging

If low voltage alert is activated or the device cannot be power on, please charge the device immediately in safety area.

Correct the charger connector first to the charge port of the device when power off. Then, connect the plug of the charger to the

suitable power source. The device will be power on automatically and a battery symbol is displayed on the screen. The symbol shows the charging status. When the symbol is all balck and no changes, the charging is finished. When charged enough, the battery symbol is full of black color. Then please disconnect the charger from both the device and power source.

WARNING!

- **It's forbidden to charge the device in working area.**
- **During charging, the detector has no detection function.**
- **Avoid charging when device is power on. Otherwise, the charging speed will be influenced.**

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7. USB communications (optional function)

This function is only available for the device which includes CD and USB data cable.

Connect the USB data calbe correctly between the device and computor. Then, run the matching program as insturcted in the manual for the software.

For details, please refer to the software manual.

8. Using and replacement of sensor modules

The device adpots smart sensor modules, which are suggested be calibrated every 6 months If life span is overdue, please contact the seller for replacement.

9. Standard accessories

Hand ring	1 pc	Alligator clip	1 pc
Calibration cover	1 pc	Operation manual	1 copy
Charger	1 pc		

How to use the clips and hand ring?

● Belt clip, alligator clip and hand ring could be screwed to the back of the instrument when necessary.

● If belt clip is used more frequently, the user can remove the alligator clip first and then install the instrument.

10. Troubleshooting

Normal problem	Possible reasons	Solution
Not power on	Too low voltage	Charge it immediately
	System breakdown	Contact the seller
	Circuit fault	Contact the seller
No response to gas	Warm-up not finished	Wait till it finishes
	Circuit fault	Contact the seller
Reading of gas level not accurate	Sensor overdue	Contact the seller
	Sensor drift	Re-calibrate it
Time and date are not correct	Battery voltage has been used up	Charge it and re-set the time and date
	Intense electromagnetic interference	Reset the time and data
Zero calibration function not available	Too much sensor drift	Re-calibrate or replace the sensor module
Display "-0" in normal detection status	Sensor drift	Make zero calibration

11. Using notice

- Do not drop it from high place and protect it from servere shocking.

- The instrument may not function properly in an atmosphere with gas of excessively high concentration level.

- Please follow this manual to operate the device. Otherwise, it will cause incorrect readings or damage to the device.

- Do not store or operate the device in an enviroment containing corrosive gas or vapor (for example chlorine of high concentration). Do not expose the device to other harsh environments (including excessive cold, heat, humidity, electromagnetc field and intense light).

- Clean the housing of the device by using damp cloth. Do not use corrosive agents or hard object which may cause damage or scuffing on the housing.

- Operations of disassembly, repalcement and must be carried qualified person.
- It's suggested re-calibrate the device once every 6 months.
- Considering environmental protection, do not throw away the old batteries and sensors freely. Please send them to the specified place.

- It's forbidden to charge the device and upload data to the computer in the hazardous area.

For any application or trouble beyond description in this manual, please the seller for advice.

Annex1—Gas List

Gas	Detection range	L-alarm point	H-alarm point	TWA (ppm)	STEL (ppm)
CH_4	0-100%LEL	20%LEL	50%LEL	N/A	N/A
C_3H_8	0-100%LEL	20%LEL	50%LEL	N/A	N/A
H_2	0-100%LEL	20%LEL	50%LEL	N/A	N/A
H_2	0-1000ppm	35ppm	250ppm	N/A	N/A
O_2	0-30%vol	19.5%vol	23.5%vol	N/A	N/A
H_2S	0-100ppm	10ppm	15ppm	10	15
CO	0-1000ppm	35ppm	200ppm	35	200
CO	0-2000ppm	35ppm	200ppm	35	200
CO2	0-6000ppm	-	-	-	-
NH_3	0-100ppm	25ppm	50ppm	25	35
CL_2	0-20ppm	5ppm	10ppm	0.5	1.0
SO_2	0-100ppm	2ppm	5ppm	2	5
NO	0-1000ppm	-	-	-	-
NO2	0-20ppm	5ppm	10ppm	-	-
HCL	0-100ppm	20	50	-	-
HF	0-20ppm	5ppm	10ppm	-	-

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