

**1 YEAR**  
WARRANTY

# **Ω OMEGA®** **User's Guide**



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## **HHAQ-109** **Portable Multi-gas Detector**

## **User Guide**

- Thanks for our using our products.
- Before using this device, please read this manual carefully.

## **Safety Notice**

Before using this device, please read the below information:

- Do not use if the device is damaged. Before using, please check for cracks or parts missing. If the device is damaged or uncompleted, please contact Omega Engineering..
- We highly recommend you do the "bump test" described in Section 4.6 everyday to check performance of the device.

And please calibrate it by following Section 4.8 if the test value is beyond specific range.

- Bump test is to confirm the good response ability of the sensor, and to ensure that the audio, visual and vibration alarms work properly.
- Use only accessories specially designed for HHAQ-109.
- Use only the charger supplied with the device. Do not recharge the device in a hazardous area.
- If devices with catalytic or semiconductor sensor, are exposed to the target gas with concentration beyond its detecting range, the increase working load will badly affect its function or damage the device.
- Devices with catalytic or semiconductor sensor will be poisoned if exposed to environment containing lead chromate, sulfur compound, phosphorus compound or silicon; do not use the device in such environments.
- Please don't expose the device to the environment which consists of hydrogen sulfide, halogenated hydrocarbon or high corrosive gases for a long time. Otherwise, it will slow the response of the gas sensor and reduce the sensitivity. If the device has to be used in the above environment, please follow Section 4.3 to carry out the Bump test before using it.

- Please don't expose the device to an environment with electric shock, strong magnetic field or serious continuous mechanic shocking.
- Disposal of the Lithium battery inside should be handled by the qualified persons or dangerous goods handling operators.
- Unauthorized disassemble, adjustment or repair of the gas device is forbidden.
- Avoid dropping or severe vibration of the device.
- For any problem beyond the description of this manual, please contact Omega Engineering.

### **1. Brief introduction**

HHAQ-109 is a compact and lightweight multi gas detector that continuously measures combustibles, O<sub>2</sub>, CO, H<sub>2</sub>S and other toxic gases in ambient air. Its functional and watertight design (IP 66) incorporates a Bump proof, rubberized housing to meet the toughest requirements of harsh environments like underground tunnels, mines etc.

## **Main features:**

Friendly human-machine interface

Ultra-wide angle LCM screen

Self adjusting function to lower the testing error

Adjustable 2-level alarm levels; STEL and TWA alarm

Audible, visual and vibrative alarm signals

Self protection design for combustible gas sensor

Battery low voltage alert function

With real-time clock

Intrinsically safe design

## **2. Technical data**

Detection method: Diffuse naturally

Detecting gas: See the Table 1 and Table 2 on the last page

Response time:

O<sub>2</sub>, CO:  $T_{90} < 30s$

Indication error:  $\pm 5\%$  FS (O<sub>2</sub>) /  $\pm 5ppm$  (CO)

Working condition:

Temperature: -20°C~50°C Humidity: <95%RH (no condensation)

Power source: Lithium battery, DC3.7V 1800mAh

Charging time:  $\leq 6$  hours

Battery working time:  $\geq 200$  hours (no alarming status)

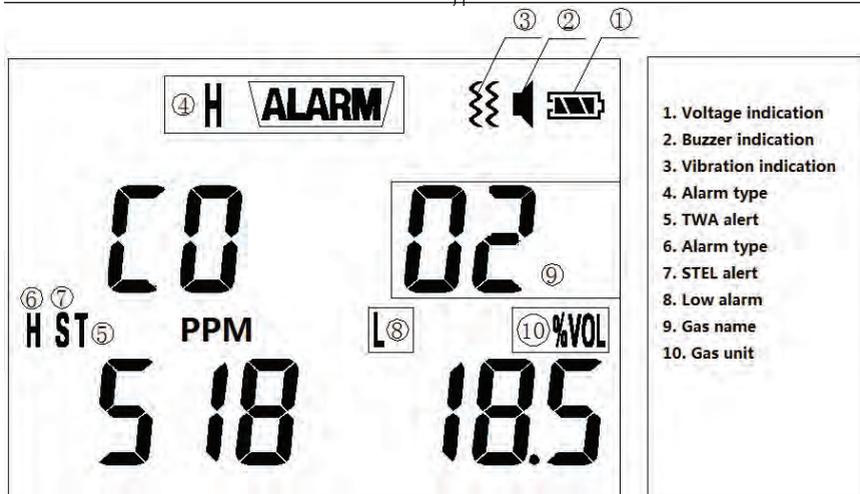
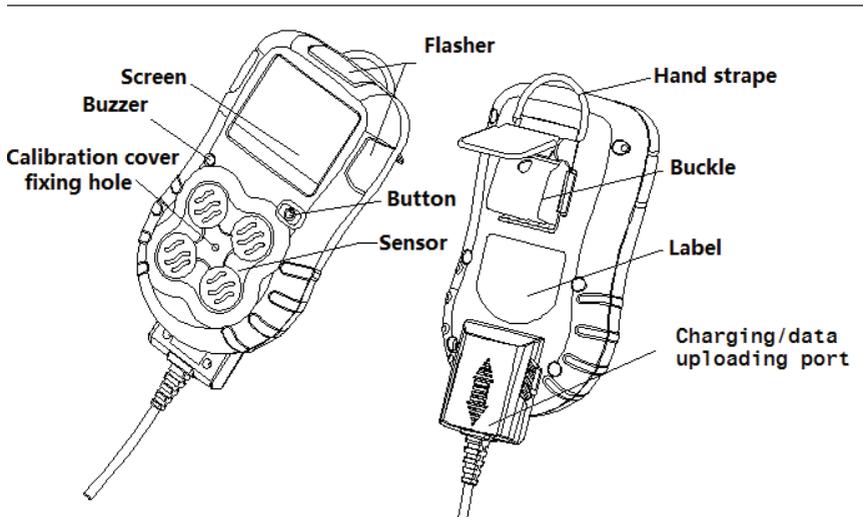
Explosion proof: Exia II CT3 Ga

Ingress protection: IP66

Dimension: L\*W\*H 120mm×68mm×30mm

Weight: About 160g

### 3. Structure drawing and display information



Button function:

- |   |   |
|---|---|
|  | <ul style="list-style-type: none"><li>● Power on: Hold button for 1 second and then release it</li><li>● Power off: Hold button for 3 seconds till the screen is off</li><li>● Open backlight: Press button once</li><li>● Mute and cancel vibration: During alarming status, press button once</li><li>● Check device status: In the status of power on, backlight is on and detection status, press button once and the screen will show the device status including the max. value, the min. value, STEL value, TWA value, present time, serial number and version number.</li><li>● Calibration: After the device entering detection status, hold button for more than 20 seconds. The screen will first turn off and then turn on. When the screen shows calibration status, release the button.</li></ul> |
|---|---|

## 4. Operation instruction

### 4.1 Power on

When the device is powered off, hold the button for 1 second and then release it. The buzzer gives sound once and the device is on. The screen will in turn display power one interface, warm-up interface, self test information, high alarm level, low alarm level, TWA value, STEL value etc. And then, the device enters into detection mode. On the screen, it shows the value of the target gases.

**Note:** The device is initially set as auto zero calibration after power on, always power on the device in the clean air. Otherwise, the device will not work properly.

### 4.2 Power off

In the power on mode, hold the button for 3 seconds. Buzzer will give 3 long sounds and 2 short sounds. Then the device is off.

### 4.3 Alarming

- When the gas concentration in the air reaches or exceeds the

preset alarm levels, the device will give audible, visual and vibrative alarming signals. If the user cannot leave this environment, he can cancel the audible and vibrative signals by pressing the button, so as to save the battery voltage.

- If the target toxic gas concentration reaches or exceeds the preset value, the device will also give STEL and TWA alert signals.
- The device will also give sensor fault alert signal and low voltage alert signal. On the screen, it will show the relative signal indication.

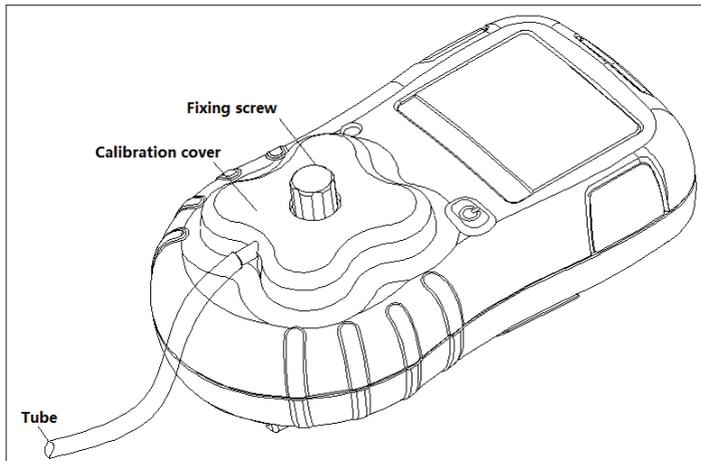
**Note:** The functions of STEL alert, TWA alert, sensor fault alert and low voltage alert must be activated in advance when using.

#### 4.4 Device status checking

When powering on, backlight is on and detection status, press the button once and the screen will show the device status including the max. value, the min. value, STEL value, TWA value, present time, serial number and version number.

## 4.5 Calibration

- With the device in detection mode, hold the button for more than 20 seconds. The screen will firstly turn off and then turn on. When the screen shows calibration status, release the button.
- After warm up, the device will begin zero calibration automatically. Please put the device in clean air.
- When the screen shows the calibration gas point, please follow the drawing on next page to input a standard calibration gas. If you do not have a standard calibration gas, do not attempt to calibrate this instrument yourself. Doing so will compromise its accuracy. The device will automatically analyze the input gas and the complete the input gas and the complete the calibration of the sensors. After successful calibration, the screen will show the calibrated sensor name and relative information.



#### 4.6 Bump test

In order to make sure the device is working normally, it is suggested to do a bump test once every day before using.

##### **Test method:**

- a. After the device is powered on, put it in to the target gas or standard gas environment which is above the high alarm level. If the device works normally, then user can carry it for detection purpose.
- b. If the detector reading is above the normal indication error range, then please follow the above Section 4.5 to re-calibrate the device.
- c. If the device doesn't response to the gas, please contact Omega Engineering.

## 5. Charging

When the device cannot be powered on due to low voltage, please charge the device through the supplied charger. After correctly connecting the device with the AC100~240V power source, the device will be automatically power on and show the charging icon. When the screen icon shows the battery voltage is full, please unplug the device, and use normally.

### **Warning:**

- In charging status, the device has no detection function.
- It's forbidden to charge the device on working site, so as to avoid any fire or explosion occurring.
- Please charge the device when it is power off, so as to ensure the charging efficiency.

### **Note:**

- Please charge it once every 3 months if the device is not used for long time.
- It's forbidden to charge the device in the environment which temperature is below than 0°C, because it will possibly damage the battery.

## 6. Sensor using and replacement

The device adopts sensor module. During using, please note the life span of the sensor modules. When the sensor module is expired, contact Omega Engineering to purchase a new module.

In order to assure the accuracy, it's suggested to re-calibrate the sensor modules once every 6 month.

If replacement modules are purchased, the package includes the sensor module and calibration parameter file. After plugging the new sensor module onto the device, please import the parameter file into the device through the software on the PC.

## 7. Trouble shooting

| Fault                                | Reason                       | Solution                           |
|--------------------------------------|------------------------------|------------------------------------|
| Cannot power on                      | Too low voltage              | Charge device                      |
|                                      | Dead lock                    | Contact Omega                      |
|                                      | Circuit fault                | Contact Omega                      |
| No response to gas                   | Warming up                   | Wait till it ends                  |
|                                      | Circuit fault                | Contact Omega                      |
| Value displayed is not correct       | Sensor overdue               | Contact Omega                      |
|                                      | Not calibrated for long time | Calibrate the sensor               |
| Time display is not correct          | Battery is used up           | Charge the device and set the time |
|                                      | Electromagnetic interference | Reset the time                     |
| Gas value displayed is negative      | Sensor drift                 | Make zero calibration              |
| Sensor fault displayed on the screen | Sensor fault                 | Contact Omega                      |

## **8. Using notice**

- Avoid dropping or shocking the device.
- If using in high concentration gas environment, the device can not work normally.
- Please strictly follow this manual to use the device. Otherwise, it will cause the incorrect detection result or damage the device.
- Do not use or store the device in any corrosive environment or harsh environment (like exceeding high or low temperature, high humidity, electromagnetic field, strong sunshine etc.).
- After long term use, if there is dust on the interface, please use clean soft cloth to clean it. Otherwise, surface will be scratched or damaged.
- In order assure the detection accuracy, recommended re-calibration period is every 6 months and cannot be more than 1 year.
- Dispose of Lithium battery in accordance with local requirements.
- For any problem not described in this manual, please contact Omega Engineering.
- Disassembling, modifying and repairing the device should be carried out by authorized personnel.
- Do not charge the device or upload the data to PC in hazardous environments.

**Attached Table 1**

| <b>Gas</b>     | <b>Detection Range</b> | <b>Preset Low Alarm</b> | <b>Preset High Alarm</b> | <b>TWA</b> | <b>STEL</b> |
|----------------|------------------------|-------------------------|--------------------------|------------|-------------|
| O <sub>2</sub> | 0-30%vol               | 19.5%vol                | 23.5%vol                 | /          | /           |
| CO             | 0-1000ppm              | 35ppml                  | 200ppml                  | 35ppml     | 200ppml     |



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If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
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