



# Low Power-Consumption CO2 Sensor (Model NO:MG-812)

Operating Manual

Version No:1.1

Valid from: 2016-04-12

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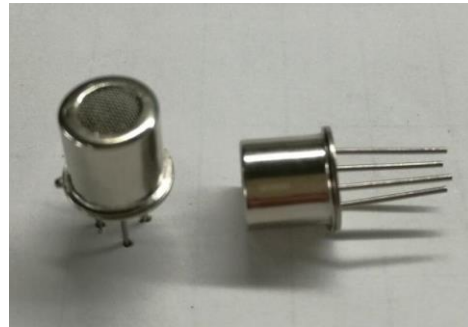
Please keep the manual properly, in order to get help if you have questions during the usage in the future.

Zhengzhou Winsen Electronics Technology CO., LTD.

# MG-812 Low Power-Consumption CO2 Sensor

## Production Description

MG812 gas sensor is chemical type gas sensor that adopts solid electrolyte cell principle, used to detect carbon dioxide. When sensors are exposed to CO<sub>2</sub>, battery is positive and negative electrode reaction, the sensor produces electromotive force between sensitive electrode and reference electrode, the output voltage signal can be detected carbon dioxide.



## Feature:

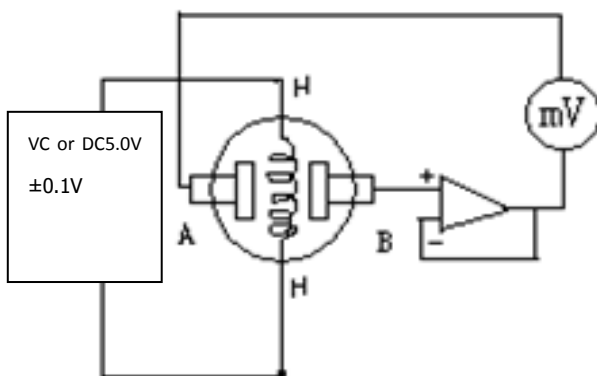
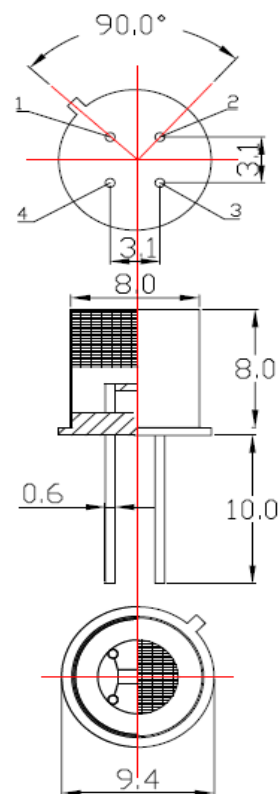
Small sizes, low power-consumption, high sensitivity and good selectivity. Less affection by temperature and humidity. Steady performance and repeatability.

## Application

Air quality control, ferment process control and CO<sub>2</sub> detection in green house.

**Technical Index Table 1**

|                                   |                               |
|-----------------------------------|-------------------------------|
| Model No.                         | MG812                         |
| Standard pack                     | Metal shell                   |
| Target gas                        | CO <sub>2</sub>               |
| Detection range                   | 350—10000ppmCO <sub>2</sub>   |
| Heater voltage V <sub>H</sub>     | 5.0±0.1 V                     |
| Heater resistance R <sub>H</sub>  | 60.0±5Ω                       |
| Heater current I <sub>H</sub>     | 90±10mA                       |
| Heater consumption P <sub>H</sub> | 450±50mW                      |
| Working temp Tao                  | -20~50°C                      |
| Storage temp                      | -20~70°C                      |
| Zero EM F                         | 200-500mV                     |
| Output signal ΔEM F               | ≧ 25mV/1000ppmCO <sub>2</sub> |



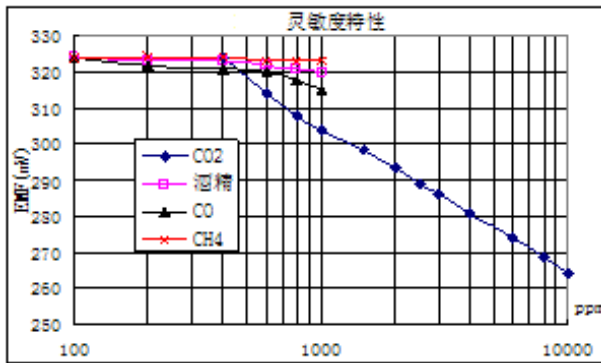
**Picture 1 Structure**

**Picture 2 sensor testing circuit.**

Inner resistance should be higher

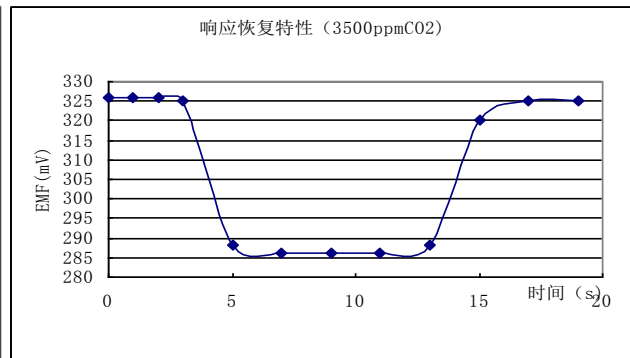
100GΩ

## Character Description



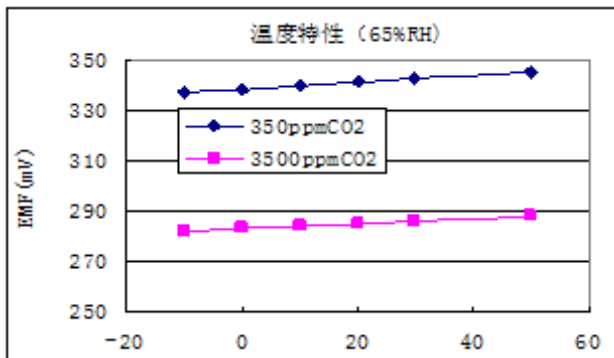
Picture 3 sensitivity

Vertical is output voltage, abscissa for gas concentration. All the tests in the figure is done under standard condition. The curve of the different colors represent in the output potential of gases.



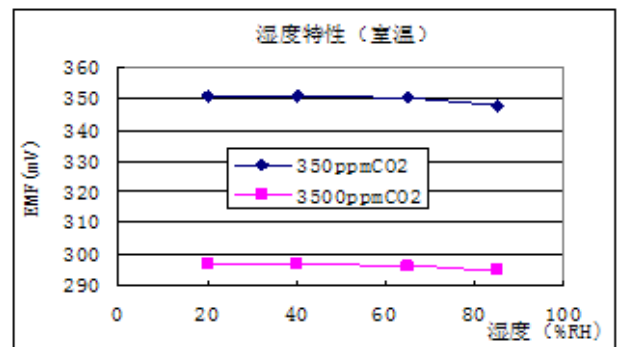
Picture 4 Response and Resume

Put sensor into gas and move it away, check the output signal changing.



Picture 5 Temperature character

vertical is output voltage, abscissa for gas concentration.



Picture 6 Humidity character

vertical is output voltage, abscissa for gas concentration.

## Cautions

### 1. Following conditions must be prohibited

#### 1.1 Exposed to organic silicon steam

Sensing material will lose sensitivity and never recover if the sensor absorbs organic silicon steam. Sensors must be avoid exposing to silicon bond, fixture, silicon latex, putty or plastic contain silicon environment.

#### 1.2 High Corrosive gas

If the sensors are exposed to high concentration corrosive gas (such as H<sub>2</sub>S, SO<sub>2</sub>, Cl<sub>2</sub>, HCL etc.), it will not only result in corrosion of sensors structure, also it cause sincere sensitivity attenuation.

#### 1.3 Alkali, Alkali metals salt, halogen pollution

The sensors performance will be changed badly if sensors be sprayed polluted by alkali metals salt especially brine, or be exposed to halogen such as fluorine.

#### 1.4 Touch water

Sensitivity of the sensors will be reduced when splattered or dipped in water.

#### 1.5 Freezing

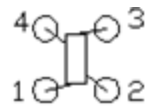
Do avoid icing on sensor's surface, otherwise sensing material will be broken and lost sensitivity.

#### 1.6 Applied higher voltage

Applied voltage on sensor should not be higher than stipulated value, even if the sensor is not physically damaged or broken, it causes down-line or heater damaged, and bring on sensors' sensitivity characteristic changed badly.

#### 1.7 Voltage on wrong pins

On 4-pin type sensor, 1, 3 is for the heating electrode, 2, 4 is for the test electrode,. If voltage on wrong pins, users won't get any signal or the sensor will be ruined.



Picture 7 sensor pin

### 2 . Following conditions must be avoided

#### 2.1 Water Condensation

Indoor conditions, slight water condensation will influence sensors' performance lightly. However, if water condensation on sensors surface and keep a certain period, sensors' sensitive will be decreased.

#### 2.2 Used in high gas concentration

No matter the sensor is electrified or not, if it is placed in high gas concentration for long time, sensors characteristic will be affected. If lighter gas sprays the sensor, it will cause extremely damage.

#### 2.3 Long time storage

The sensors resistance will drift reversibly if it's stored for a long time without electrify, this drift is related with storage conditions. Sensors should be stored in airproof bag without volatile silicon compound. For the sensors with long time storage but no electrify, they need to be long galvanized aging time for stability before using. The suggested aging time as follow:

**Stable2.**

| Storage Time         | Suggested aging time   |
|----------------------|------------------------|
| Less than one month  | No less than 48 hours  |
| 1 ~ 6 months         | No less than 72 hours  |
| More than six months | No less than 168 hours |

#### 2.4 Long time exposed to adverse environment

No matter the sensors electrified or not, if exposed to adverse environment for long time, such as high humidity, high temperature, or high pollution etc., it will influence the sensors' performance badly.

#### 2.5 Vibration

Continual vibration will result in sensors down-lead response then break. In transportation or

assembling line, pneumatic screwdriver/ultrasonic welding machine can lead this vibration.

## 2.6 Concussion

If sensors meet strong concussion, it may lead its lead wire disconnected.

## 2.7 Usage Conditions

2.7.1 For sensor, handmade welding is optimal way. The welding conditions as follow:

- Soldering flux: Rosin soldering flux contains least chlorine
- homothermal soldering iron
- Temperature: 250°C
- Time: less than 3 seconds

2.7.1 If users choose wave-soldering, the following conditions should be obey:

- Soldering flux: Rosin soldering flux contains least chlorine
- Speed: 1-2 Meter/ Minute
- Warm-up temperature: 100±20°C
- Welding temperature: 250±10°C
- One time pass wave crest welding machine

If disobey the above using terms, sensors sensitivity will be reduced.

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