



Winsen MC101 Catalytic Flammable Gas Sensor User Manual

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Winsen MC101 Catalytic Flammable Gas Sensor



Statement

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 - The specific such as color, appearance, sizes ...etc ..., please in kind
 - We are devoting ourselves to products development and technical innovation, so we reserve the right to improve the products without notice. Please confirm it is the valid version before using this manual. At the same time, users' comments on optimized using way are welcome.
 - Please keep the manual properly, in order to get help if you have questions during the usage in the future.
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MC101 Catalytic Flammable Gas Sensor

Product

MC101 adopts catalytic combustion principle, and its two arms of electric bridge consists of a test element and a compensate element. The resistance of the test element rises once it meets the combustible gases, in the same time, the output voltage of the bridge changes and the voltage variation rises in direct proportion to the gas concentration. The compensate element, as a conference, has the function of compensating temperature and humidity.

Features

- Bridge output voltage in linear
- Fast response
- Good repeatability and selectivity
- Resist H₂S poisoning & organosilicone.

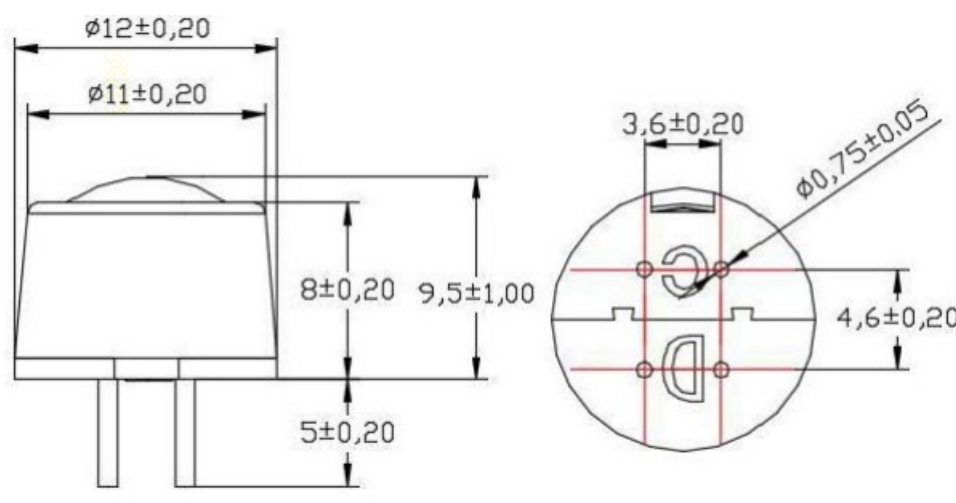


Fig1. Sensor Structure

Main Applications

It is used in household occasion to detect the leakage or concentration of combustible gases such as natural gas, LPG, coal gas and so on.

Parameters

Model		MC101
Sensor Type		Catalytic Type
Standard Encapsulation		Plastic
Working voltage(V)		3.0±0.1
Working current(mA)		110±10
Sensitivity (mV)	1% CH4	25 50
	1% C3H8	30 70
Linearity		≤5%
Measuring range(%LEL)		0 100
Response Time (90%)		≤10s
Recovery Time (90%)		≤30s
Working Environment		-40 +70℃ <95%RH
Storage Environment		-20 +70℃ <95%RH
Lifespan		5 years

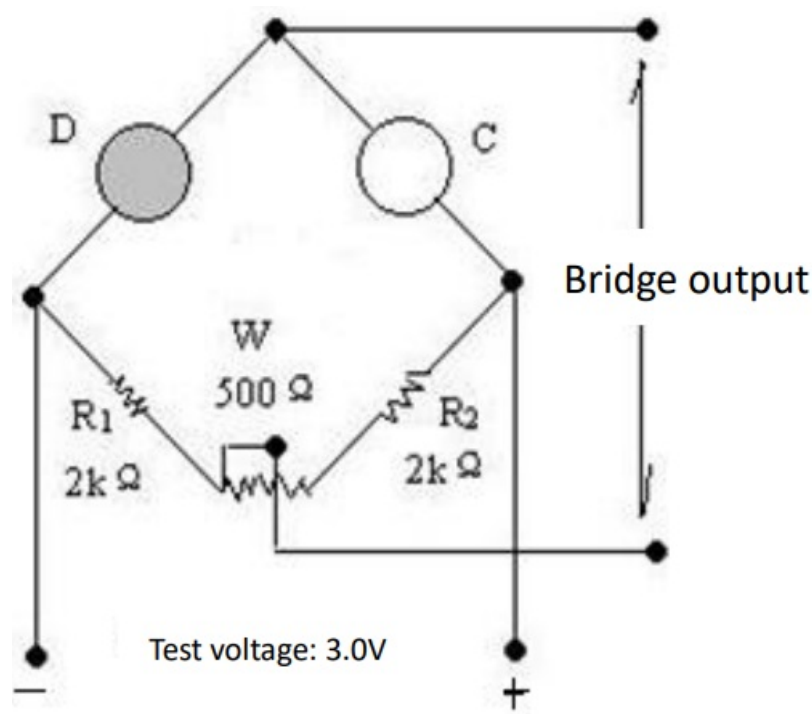


Fig2. Basic Test Circuit

Sensitivity and Response Feature

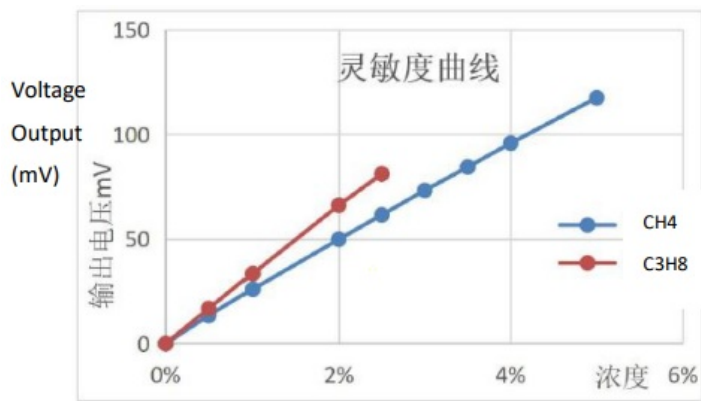


Fig3. Sensitivity Curve

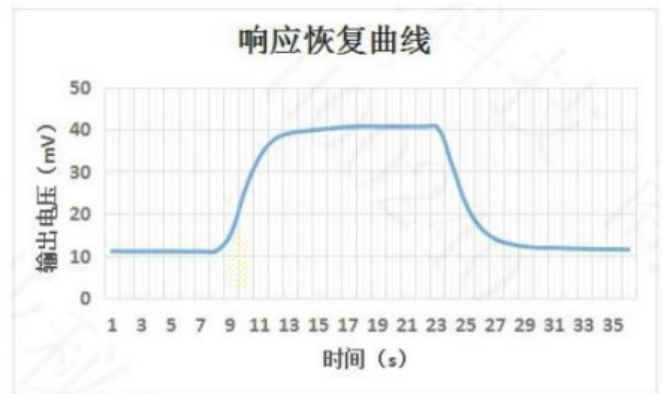


Fig4. Response and recovery curve

Changing of output signal at different temperature

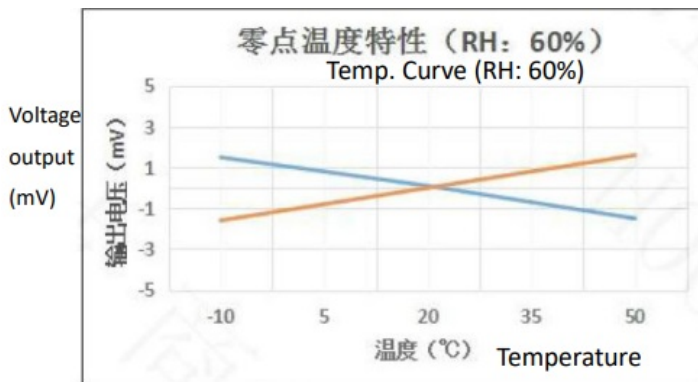


Fig5. Zero point at different temp.

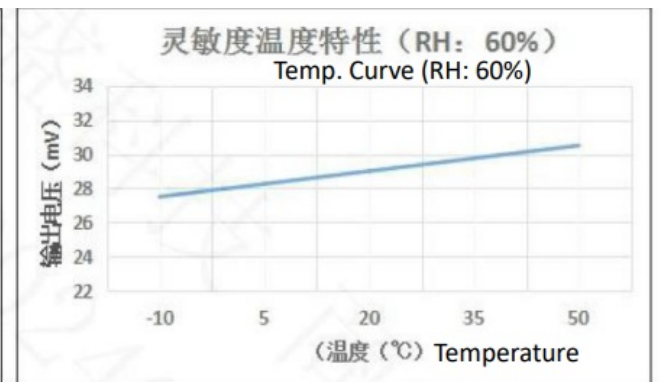


Fig6. Sensitivity at different temp.

Changing of output signal at different humidity

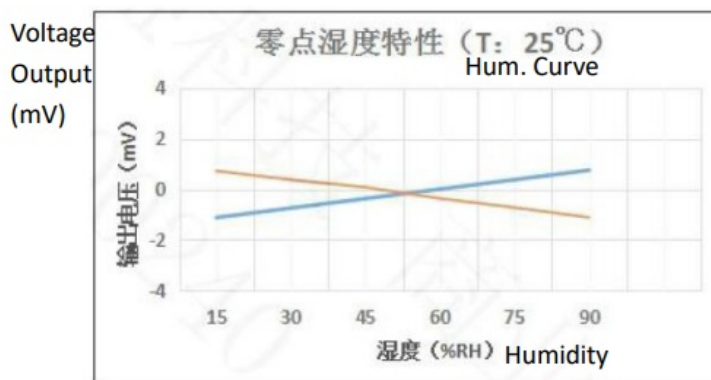


Fig7. Zero point at different humidity

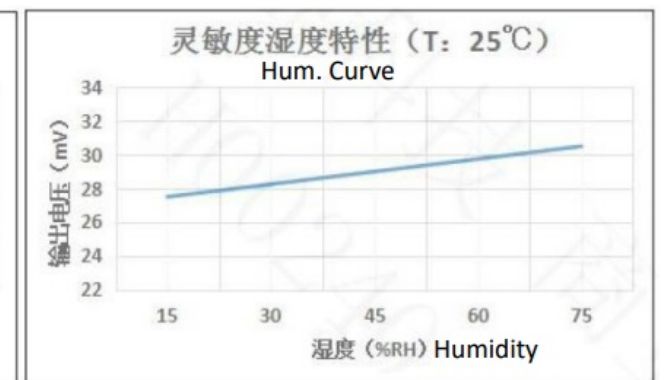


Fig8. Sensitivity at different humidity

Changing of output signal with different voltage supplying

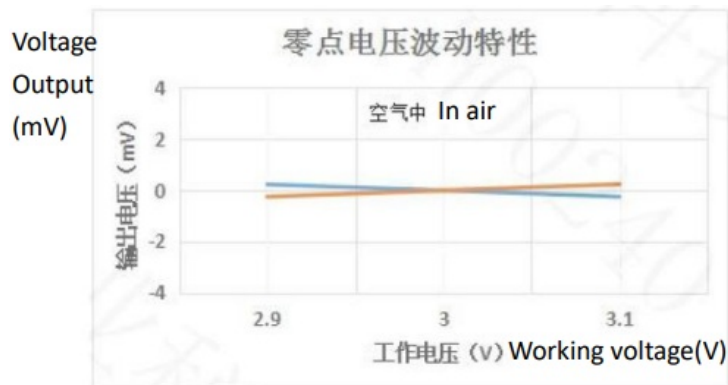


Fig9.Zero Drift with different voltage

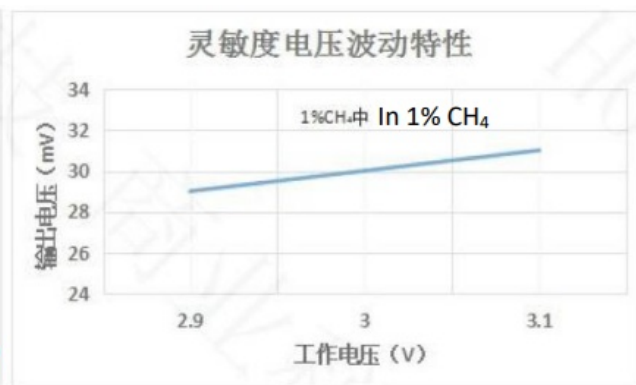


Fig10.Sensitivity with different voltage

Long-term Stability

The drift in air per year is within $\pm 2\text{mV}$, in 1%CH₄ is within $\pm 2\text{mV}$. For a short period storage (in 2 weeks), the sensor need be galvanical continuously for 8 hours to reach stability. For long period storage (one year), it need 48 hours.

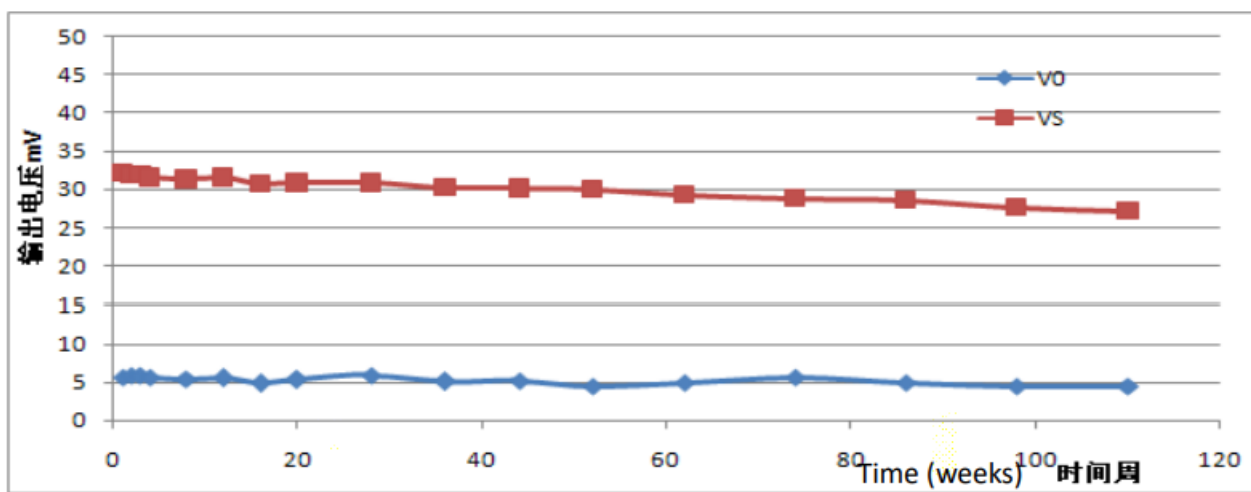


Fig11. Zero and Sensitivity stability curve

Cautions

Following conditions must be prohibited

- **Exposed to organic silicon steam**

Sensing material will lose sensitivity and never recover if the sensor absorbs organic silicon steam.

Sensors must avoid exposing to silicon bond, fixture, silicon latex, putty or plastic contain silicon environment.

- **High Corrosive gas**

If the sensors are exposed to high concentration corrosive gas (such as H₂S, SO₂, Cl₂, HCl etc.), it will not only result in corrosion of sensors structure, also it cause sincere sensitivity attenuation.

- **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.

- **Touch water**

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

- **Freezing**

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

- **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.

- **Pins connection**

When the sensor is connecting to the circuit, one of detection part pins and one of compensation part pins connects as the signal output. The other one of detection part pins connects negative electrode, while the other one of compensation part pins connects positive electrode. The part with D mark is the detection one the other part with C mark is the compensation one showing on the bottom part of the sensor.

Following conditions must be avoided

- **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.

- **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.

- **Long time storage**

The sensors resistance will drift reversibly if it's stored for 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 long galvanical aging time for stability before using. The suggested aging time is 24 hours at least if the storage time is more than half an year.

- **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.

- **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.

- **Concussion**

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


- **Usage Conditions**

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



- Soldering flux: Rosin soldering flux contains least chlorine
- Homothermal soldering iron
- Temperature 3 50
- Time less than 5 seconds

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

Documents / Resources

 Catalytic Flammable Gas Sensor Model MC101 User's Manual Version 1.1 2020-06-01 (2020-07-16) Zhengzhou Winsen Electronics Technology Co., Ltd.	Winsen MC101 Catalytic Flammable Gas Sensor [pdf] User Manual MC101 Catalytic Flammable Gas Sensor, MC101, Catalytic Flammable Gas Sensor, Flammable Gas Sensor, Gas Sensor
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References

-  [Winsen Gas Sensor_CO2 Sensor_Air Quality Sensor_Dust Sensor_CO Sensor-Winsen Electronics](#)
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