



Winsen MC227D Catalytic Flammable Gas Sensor User Manual

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Catalytic Flammable Gas Sensor
(Model: MC227D)
User's Manual
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Zhengzhou Winsen Electronics Technology Co., Ltd

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Statement

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Thanks for purchasing our product. In order to let customers use it better and reduce the faults caused by misuse, please read the manual carefully and operate it correctly in accordance with the instructions. If users disobey the terms or remove, disassemble, change the components inside of the sensor, we shall not be responsible for the loss.

The specific such as color, appearance, sizes ...etc., please in kind prevail.

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.

MC227D Catalytic Flammable Gas Sensor

Product

MC227D 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
- Good stability and reliability
- Resist H₂S poisoning & organosilicone.

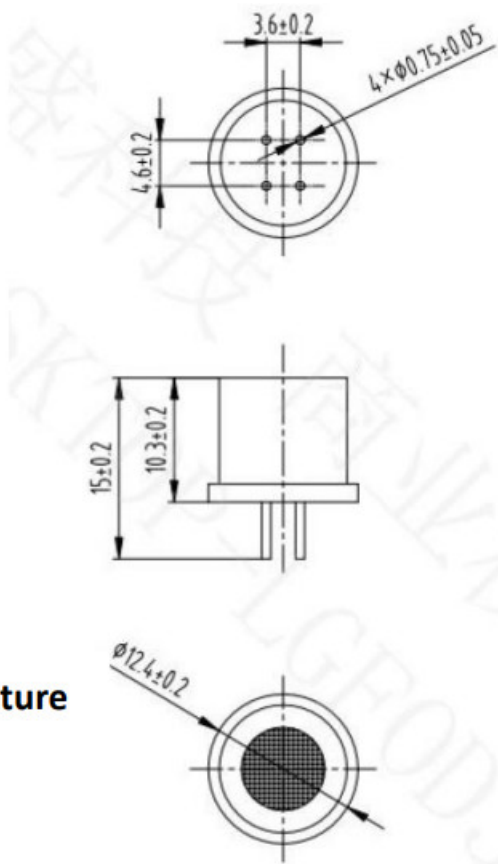


Fig1. Sensor Structure

Main Applications

It is widely used in public places (not industrial occasion) to detect the concentration or leakage of combustible gases such as natural gas, LPG, coal gas.

Parameters:

Model		MC227D
Sensor Type		Catalytic Type
Standard Encapsulation		Plastic base & metal cap
Working voltage(V)		2.5±0.1
Working current(mA)		150±10
Sensitivity (mV)	20%LEL CH ₄	12 35
	20%LEL C ₃ H ₈	10 30
Linearity		≤5%
Measuring range(%LEL)		0 100
Response Time (T ₉₀)		≤10s
Recovery Time (T ₉₀)		≤30s
Working Environment		-40 +70°C <95%RH
Storage Environment		-25 +70°C <95%RH
Lifespan		5 years

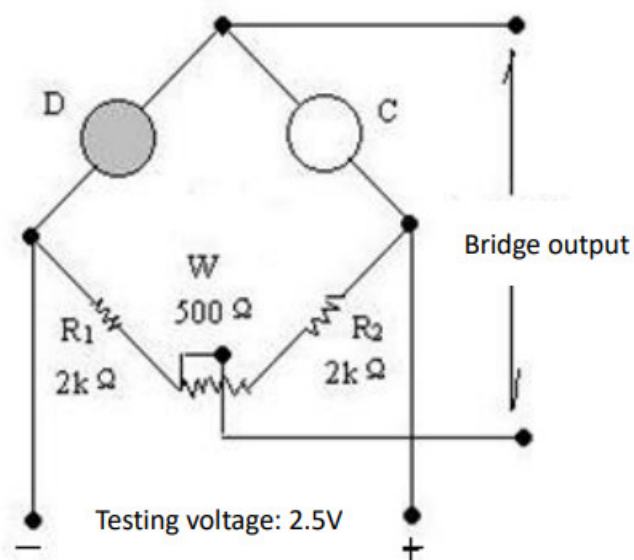


Fig2. Basic Test Circuit

Sensitivity and Response Feature

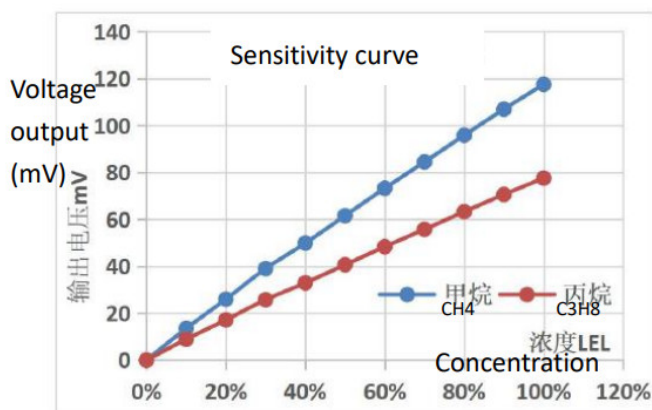


Fig3. Sensitivity Curve

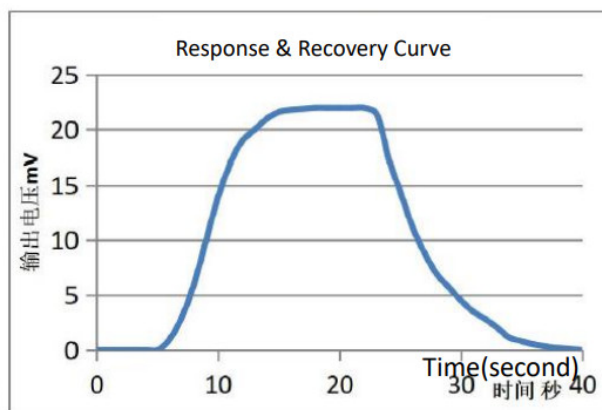


Fig4. Response and recovery

Changing of output signal at different temperature

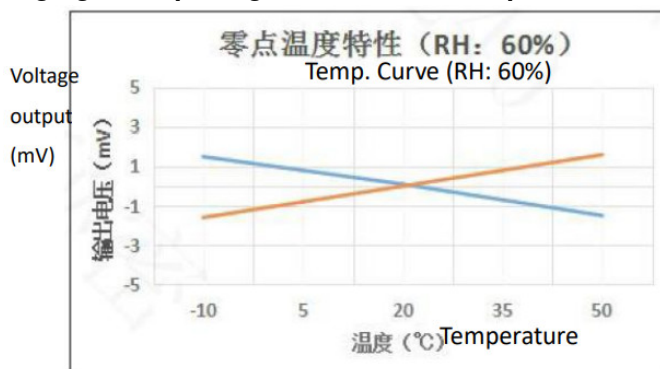


Fig5. Zero point at different temp.

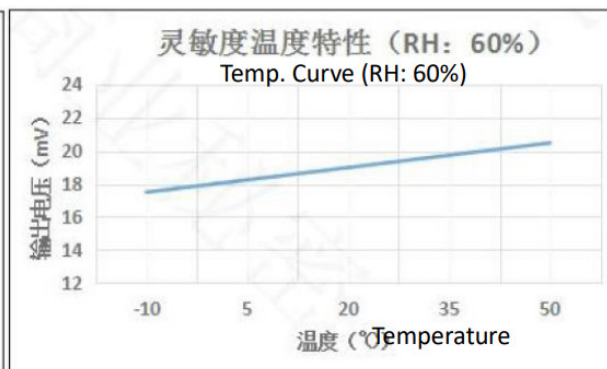


Fig6. Sensitivity at different temp.

Changing of output signal at different humidity

Voltage
Output
(mV)

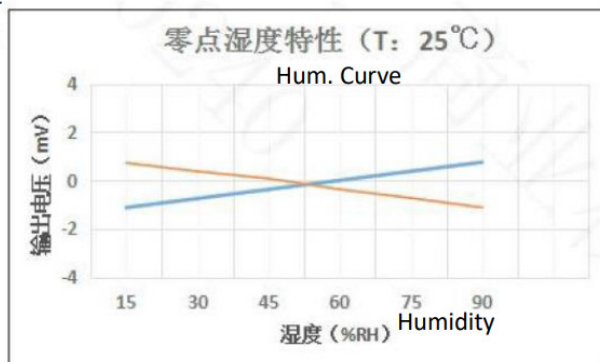


Fig7.Zero point at different humidity

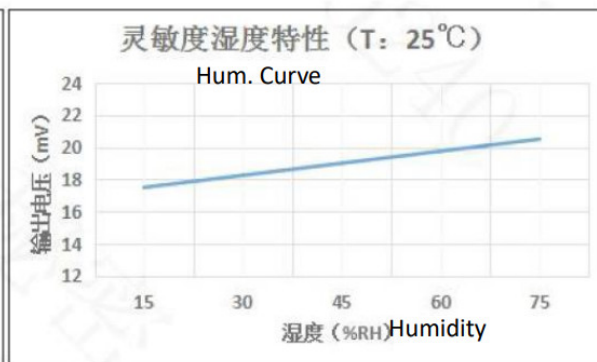


Fig8. Sensitivity at different humidity

Changing of output signal with different voltage supplying

Voltage
Output
(mV)

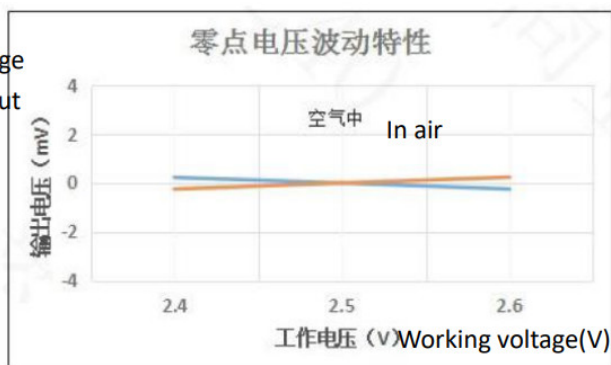


Fig9.Zero Drift with different voltage

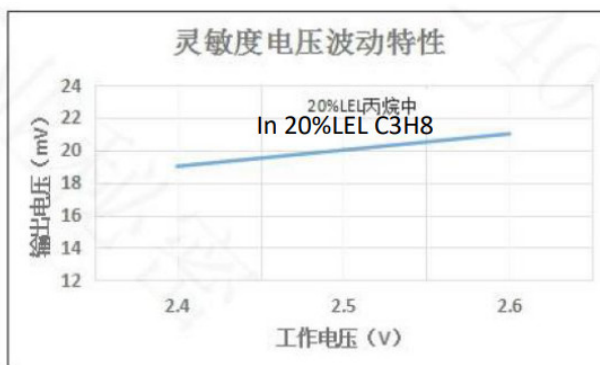


Fig10.Sensitivity with different voltage

Long-term Stability

The drift in air per year is within $\pm 2\text{mV}$, in 20%LEL C3H8 is within $\pm 5\text{mV}$. 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

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 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_2S , SO_2 , Cl_2 , 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 spattered 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.

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 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 a year.

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.

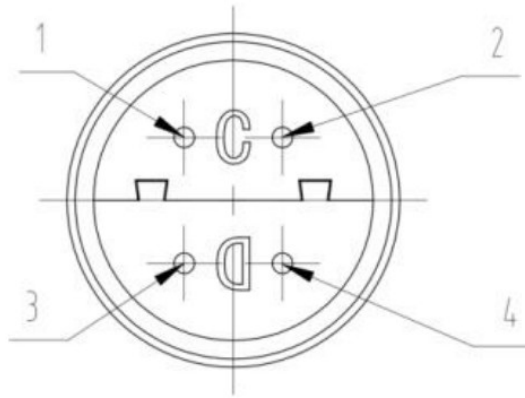
2.6 Concussion

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

3. Usage suggestions

3.1 Pins connection

When the sensor is connecting to the circuit, Pin1 connects to positive pole and Pin3 connects to negative pole. Connects Pin2 to Pin4 as output signal. The part with "D" mark on the sensor bottom is the detection one, the other part with "C" mark is the compensation one.



3.2 Soldering

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

- Soldering flux: Rosin soldering flux contains least chlorine
- Homothermal soldering iron
- Temperature 350°C
- Time less than 5 seconds


If disobey the above using terms, sensors performance will get worse.

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Documents / Resources

 <p>Catalytic Flammable Gas Sensor (Model: MC227D) User's Manual Version 1.0 Valid from 2017.1.01 Zhengzhou Winsen Electronics Technology Co., Ltd.</p>	<p>Winsen MC227D Catalytic Flammable Gas Sensor [pdf] User Manual MC227D Catalytic Flammable Gas Sensor, MC227D, Catalytic Flammable Gas Sensor, Flammable Gas Sensor, Gas Sensor, Sensor</p>
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References

- [Winsen Gas Sensor CO2 Sensor Air Quality Sensor Dust Sensor CO Sensor-Winsen Electronics](#)
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