



Thermal Conductor Gas Sensor  
(Model: MD61)

# Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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

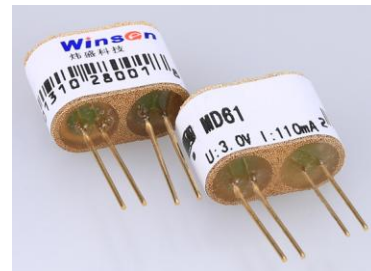
## MD61 Thermal Conductor Gas Sensor

### Profile

MD61 gas sensor consists of an active element and a reference element with the same resistance, both elements are placed in a Wheatstone bridge circuit. Along with the analyzing gas contents change, the overall thermal coefficient of mixed gases changes correspondingly. When the active element meet the combustible gas, its resistance become smaller, and when It meet reducing gas, its resistance become larger(air background). Then the output voltage of the bridge changes and the voltage variation rises in direct proportion to the gas concentration. The reference element performs as a benchmark while for temperature compensation.

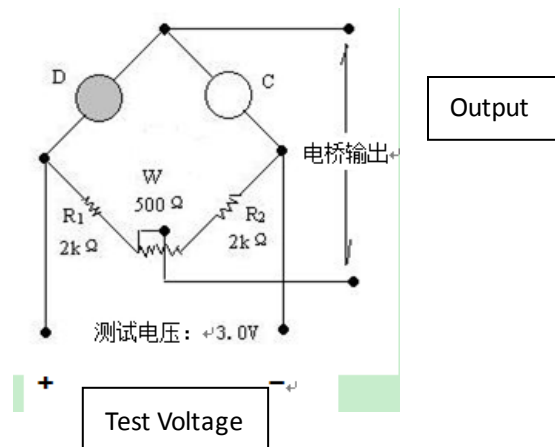
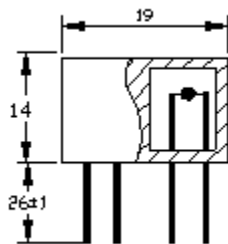
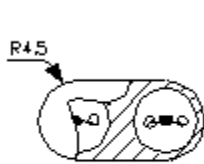
### Features

- Linear output signal
- Good reproducibility and reliable performance
- Good stability
- Resistant to catalyst poisoning
- Detecting without Oxygen or short of oxygen



### Main Application

Industrial spot for CH4, H2, and other inert gas detecting

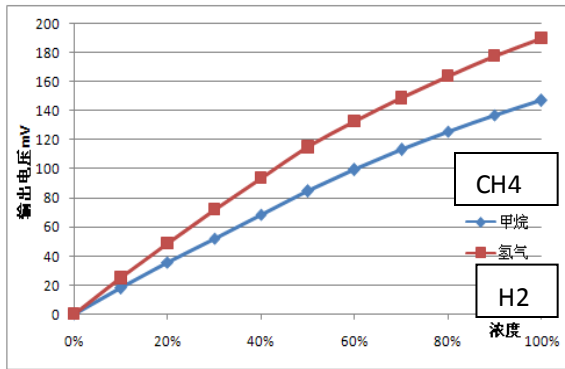


### Specification

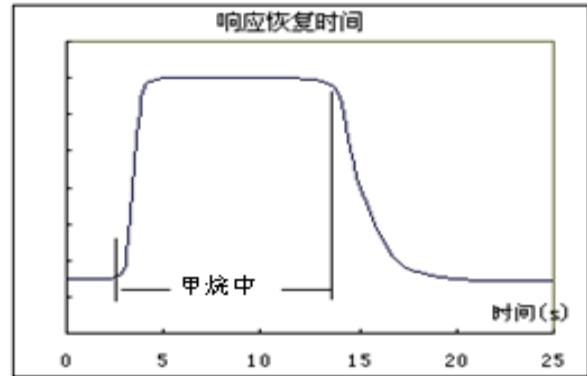
Detection Gas	CH4, H2, Inert Gas
Type	Thermal conduction
Standard Encapsulation	Metal, Metallurgy powder mesh
Detection Range	0~100%VOL
Working Voltage(V)	3.0±0.1 (DC)
Working current(mA)	≤120 mA
Sensitivity (mV/10%CO <sub>2</sub> )	≥15
linearity	≤8%
Response time (90%)	≤15 s
Resume time (90%)	≤30 s
Using Environment	-20~+50°C < 95%RH
Storage Environment	-20~+70°C < 70%RH
Dimension (mm)	19×9.5×14

**Sensitivity and Response Characteristic**

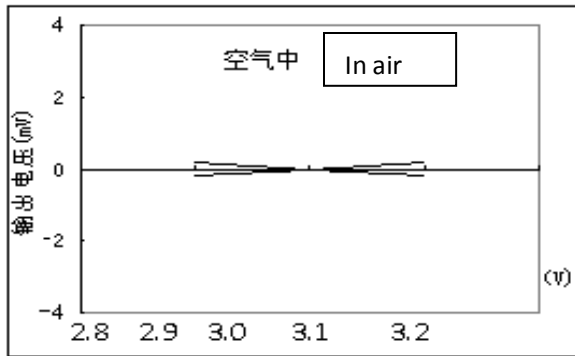
Sensitivity curve



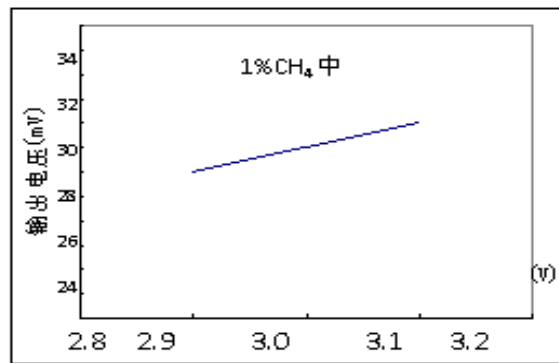
Response and recovery time



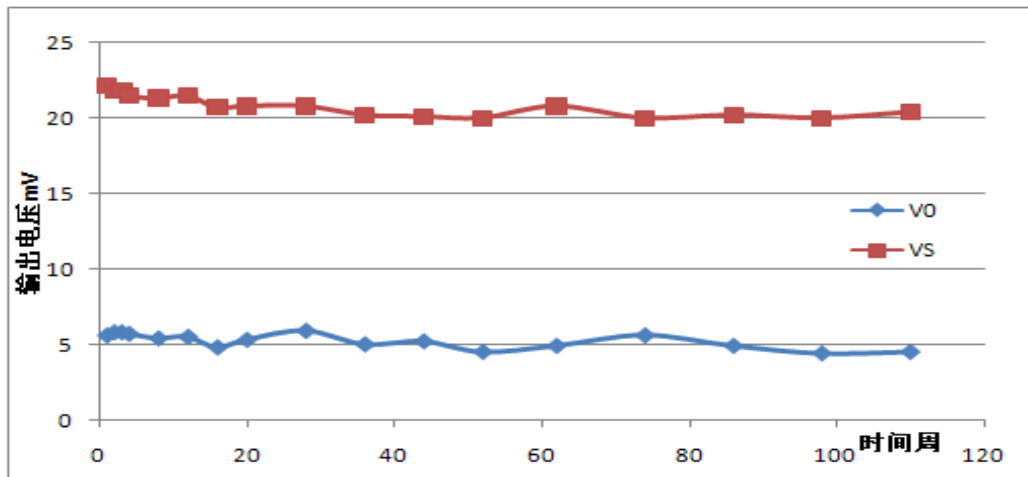
Zero point with different voltage



Sensitivity with different voltage



Long term stability



The absolute value of the drift in air and in 10% CH<sub>4</sub> is less than 2 mV per year. For a short period storage (in 2 weeks), the sensor need be galvanical continuously for 8 hours to reach stability, for long-term (more than one year) storage, it need more than 48 hours.

## Cautions

### 1 .Following conditions must be prohibited

#### 1.1 High Corrosive gas

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

#### 1.2 Alkali, Alkali metals salt, halogen pollution

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

#### 1.3 Touch water

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

#### 1.4 Freezing

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

#### 1.5 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.

#### 1.6 Connection in the circuit

When the sensor is connecting into the circuit, connect the two pins in the middle as signal output. If the heat transfer coefficient of detecting gas is smaller than air, please connect the other pin of the D(detector) part to negative electrode while take the other pin of the C(compensator) part to positive electrode. If the heat transfer coefficient of detecting gas is bigger than air, please connect the other pin of the D(detector) part to positive electrode while take the other pin of the C(compensator) part to negative electrode.

NOTE: The part marked "■" is detector(D) part while the other part is compensator(C) part.

### 2 .Following conditions must be avoided

#### 2.1 Water Condensation

Indoor conditions, slight water condensation will influence sensors' performance lightly. However, if water condensation stays 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. If it is stored for half year or

longer, the suggested aging time is one day before using.

#### 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

2.7.2 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.

**Note: To keep continual product development, we reserve right to change design features without prior notice !**

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