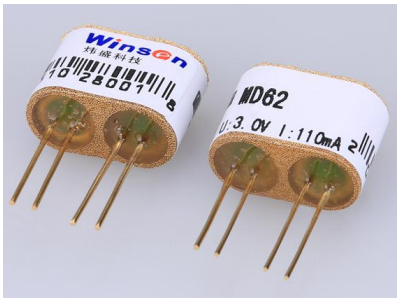
MD62 Thermal Conductor CO_2 Gas Sensor

MD62 gas sensor consists of an active element and a reference element with the same resistance, both elements are placed in a wheatstone bridge circuit, The analyzing gas contents changes, the overall thermal coefficient of mixed gases changed correspondingly; when the active element meet the combustible gas, its resistance become smaller, when It meet other gas, , Its resistance become larger(air background), the bridge circuit output the voltage change, this change increase according to gas concentration, the reference element as a benchmark while for temperature compensation.

Features

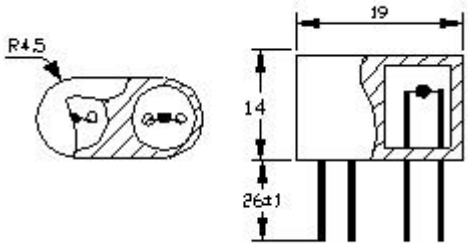
- Linear output signal
- Good reproducibility and reliable performance
- Resistant to toxicosis
- Detecting without Oxygen or short of oxygen

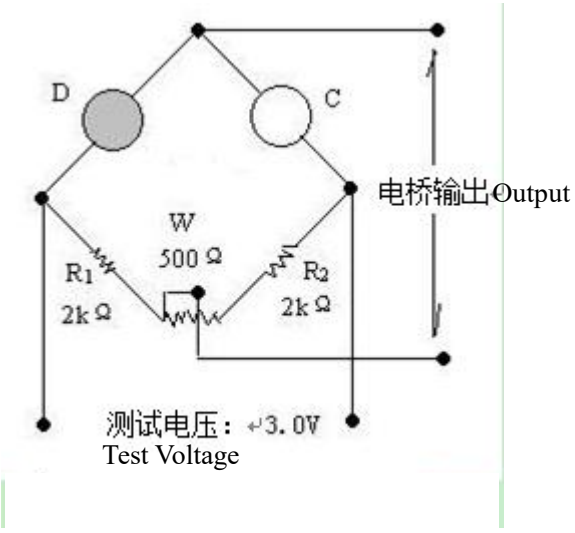


Application

Industrial spot for CO2 detecting.

Structure and Basic Test circuit

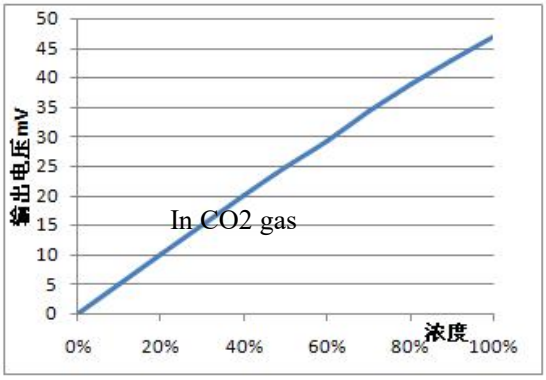


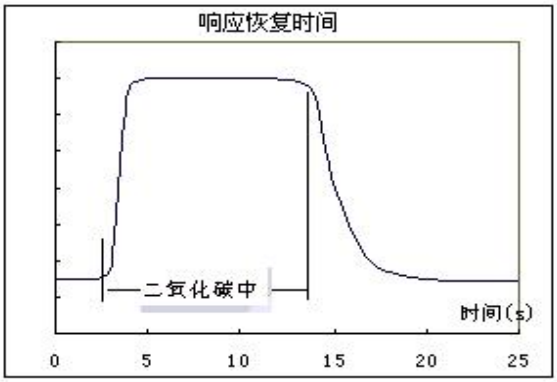


Specification

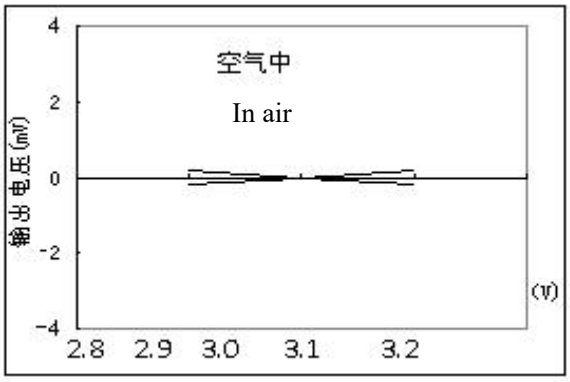
Detection Gas	CO2
Type	Thermal conduction
Working Voltage (V)	3.0±0.1 (DC)
Working current(mA)	≤120 mA
Sensitivity (mV/10%CO_2)	≥5
linearity	≤5%
Response time (90%)	≤15 s
Resume time (90%)	≤30 s
Using Environment	-20—+50℃ <95%RH
Storage Environment	-20—+70℃ <95%RH
Dimension（mm）	19×9.5×14
Explosion-proof	Exdib I

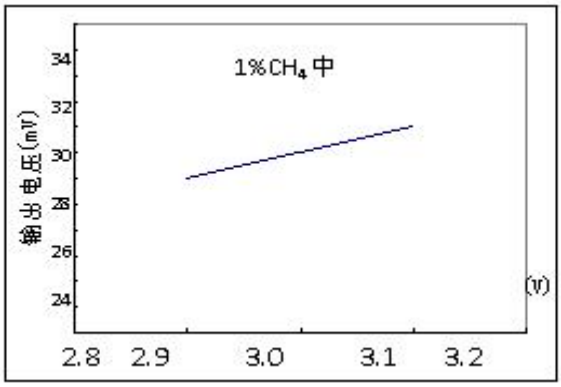
Sensitivity and response characteristic



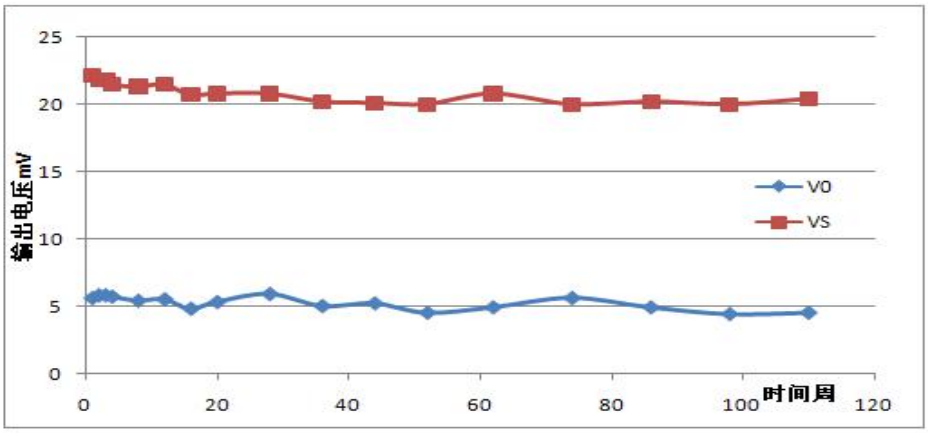


Output signal dependency on working voltage





Long term stability



The absolute value of the drift in air is less than 2 mV per year, in 30%CO2 the absolute value of drift is less than 2mV. For a short period storage (in 2 weeks), the sensor need 8 hours preheating to stabilize, for long-term (more than one year) storage, it need more than 48 hours' preheating.

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_2S, SO_X, Cl_2, HCl etc.), it will not only result in corrosion of sensors structure, also it cause sincere sensitivity attenuation.

1.2 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.

1.3 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, 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.

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 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

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

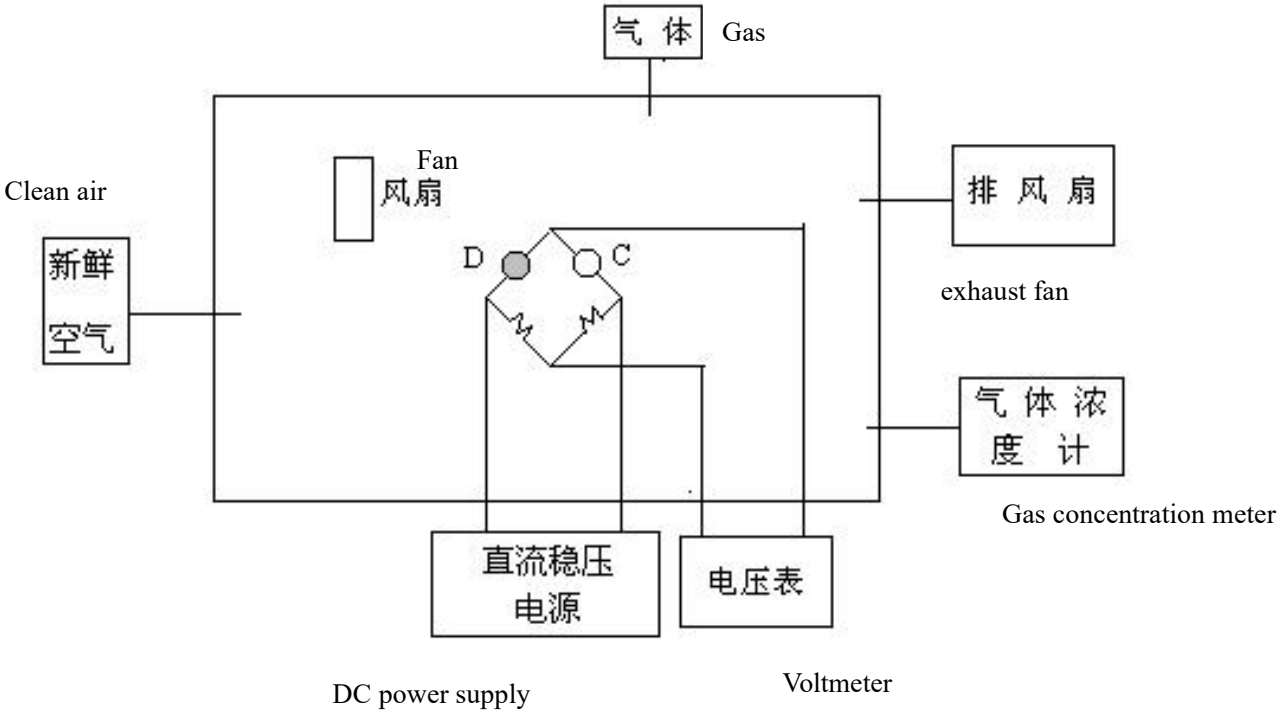
- Soldering flux: Rosin soldering flux contains least chlorine
- homothermal soldering iron
- Temperature： 250℃
- Time：less than 3 seconds

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℃
- Welding temperature：250±10℃
- One time pass wave crest welding machine

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

Attachment: component test steps



1.Test device:

a. The material of the test box is metal or glass, and does not absorb gas. The volume of the box is more than 1 liter for each pair of components.

b. The infrared gas analyzer is recommended to measure gas concentration.

c. The gas in the box should be stirred, but not directly against the components. The air velocity is lower than 0.5m/s.

d. Fresh outdoor air.

e. DC stabilized power supply. The impedance of the millivoltmeter is greater than 100KΩ.

f. Before each test, use the exhaust fan to ventilate, and the ventilation volume per minute is greater than 10 times the volume of the box.

g. The components are installed in the test chamber in the same posture in the horizontal direction. Changing the posture will produce different thermal convection.

2. Gas concentration adjustment:

The gas concentration in the box is adjusted by volume method, which can be calculated by the following formula: V(ml)=V1×C×10-6 ×(273+TR)/(273+TC)

V: injected gas volume (ml); V1: box volume (ml); C: gas concentration to be adjusted (ppm)

TR: Room temperature (℃); TC: Temperature in the box (℃).

3. Measurement:

A. Aging: Before the measurement, use the rated voltage to power on for more than 8 hours. If the components are stored for a long time, it is recommended to age for more than 24 hours on.

B. Measurement: After pre-aging, measure the output voltage Va in the air. The test gas is injected into the test box to spread it to the whole box, It usually takes more than 1min. Measure the output voltage Vg of the component in the test gas. The gas sensitivity is expressed as: S=(Vg-Va)/C. Among them: C is the gas concentration.

Precautions

△The sensitivity of components should be calibrated with standard gas samples regularly.

△In the process of debugging, the heating voltage or current should be strictly controlled, and should not exceed 5.0V or 200mA to avoid burning the components.

△It should be placed in a dry, non-corrosive gas environment after long-term use.

△Beware of vibration, drop and mechanical damage to the components. Please refer to this description in detail before using the components.

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