TECHNICAL DATA

FEATURES

- High sensitivity to CH₄, Natural gas.
- Small sensitivity to alcohol, smoke.
- Fast response.
- Stable and long life.
- Simple drive circuit.

APPLICATION

They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of CH₄, Natural gas, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.

SPECIFICATIONS

A. Standard work condition

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter name</th>
<th>Technical condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vc</td>
<td>Circuit voltage</td>
<td>5V±0.1 AC OR DC</td>
<td></td>
</tr>
<tr>
<td>Vh</td>
<td>Heating voltage</td>
<td>5V±0.1 ACOR DC</td>
<td></td>
</tr>
<tr>
<td>Pl</td>
<td>Load resistance</td>
<td>20KΩ</td>
<td></td>
</tr>
<tr>
<td>Rh</td>
<td>Heater resistance</td>
<td>33Ω ±5% Room Tem</td>
<td></td>
</tr>
<tr>
<td>Ph</td>
<td>Heating consumption</td>
<td>less than 750mw</td>
<td></td>
</tr>
</tbody>
</table>

B. Environment condition

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter name</th>
<th>Technical condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tao</td>
<td>Using Tem</td>
<td>-10°C-50°C</td>
<td></td>
</tr>
<tr>
<td>Tas</td>
<td>Storage Tem</td>
<td>-20°C-70°C</td>
<td></td>
</tr>
<tr>
<td>RH</td>
<td>Related humidity</td>
<td>less than 95%Rh</td>
<td></td>
</tr>
<tr>
<td>O₂</td>
<td>Oxygen concentration</td>
<td>21%(standard condition)Oxygen concentration can affect sensitivity</td>
<td>minimum value is over 2%</td>
</tr>
</tbody>
</table>

C. Sensitivity characteristic

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter name</th>
<th>Technical parameter</th>
<th>Remark 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs</td>
<td>Sensing Resistance</td>
<td>10KΩ - 60KΩ (1000ppm CH₄)</td>
<td>Detecting concentration scope: 200-10000ppm CH₄, natural gas</td>
</tr>
<tr>
<td>α</td>
<td>Concentration slope rate</td>
<td>≤0.6</td>
<td></td>
</tr>
</tbody>
</table>

Standard detecting condition:

| Temp: 20°C±2°C | Humidity: 65%±5% | Vc: 5V±0.1 |

Preheat time: Over 24 hour

D. Structure and configuration, basic measuring circuit

![Image of MQ-4 Gas Sensor](image_url)

**Parts and Materials**

1. Gas sensing layer: SnO₂
2. Electrode: Au
3. Electrode line: Pt
4. Heater coil: Ni-Cr alloy
5. Tubular ceramic: Al₂O₃
6. Anti-explosion network: Stainless steel gauze (SUS316 100-mesh)
7. Clamp ring: Copper plating Ni
8. Resin base: Bakelite
9. Tube Pin: Copper plating Ni
Structure and configuration of MQ-4 gas sensor is shown as Fig. 1 (Configuration A or B), sensor composed by micro $\text{Al}_2\text{O}_3$ ceramic tube, Tin Dioxide ($\text{SnO}_2$) sensitive layer, measuring electrode and heater are fixed into a crust made by plastic and stainless steel net. The heater provides necessary work conditions for work of sensitive components. The enveloped MQ-4 have 6 pin, 4 of them are used to fetch signals, and other 2 are used for providing heating current.

Electric parameter measurement circuit is shown as Fig. 2

**E. Sensitivity characteristic curve**

Fig. 3 is shows the typical sensitivity characteristics of the MQ-4 for several gases.

- **Temp:** 20℃
- **Humidity:** 65%
- **$\text{O}_2$ concentration:** 21%
- **$R_L=20\,\Omega$**

$R_o$: sensor resistance at 1000ppm of $\text{CH}_4$ in the clean air.

$R_s$: sensor resistance at various concentrations of gases.

Fig. 4 is shows the typical dependence of the MQ-4 on temperature and humidity.

$R_o$: sensor resistance at 1000ppm of $\text{CH}_4$ in air at 33%RH and 20 degree.

$R_s$: sensor resistance at 1000ppm of $\text{CH}_4$ in air at different temperatures and humidities.

**SENSITIVITY ADJUSTMENT**

Resistance value of MQ-4 is difference to various kinds and various concentration gases. So, when using this components, sensitivity adjustment is very necessary. We recommend that you calibrate the detector for 5000ppm of $\text{CH}_4$ concentration in air and use value of Load resistance ($R_L$) about 20K $\Omega$ ($10K\,\Omega$ to 47K $\Omega$).

When accurately measuring, the proper alarm point for the gas detector should be determined after considering the temperature and humidity influence.