

# TECHNICAL DATA

# MQ-4 GAS SENSOR

## FEATURES

- \* High sensitivity to CH<sub>4</sub>, 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 CH<sub>4</sub>, Natural gas, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.

## SPECIFICATIONS

### A. Standard work condition

| Symbol         | Parameter name      | Technical condition | Remarks  |
|----------------|---------------------|---------------------|----------|
| V <sub>c</sub> | Circuit voltage     | 5V±0.1              | AC OR DC |
| V <sub>H</sub> | Heating voltage     | 5V±0.1              | AC OR DC |
| P <sub>L</sub> | Load resistance     | 20K Ω               |          |
| R <sub>H</sub> | Heater resistance   | 33 Ω ± 5%           | Room Tem |
| P <sub>H</sub> | Heating consumption | less than 750mw     |          |

### B. Environment condition

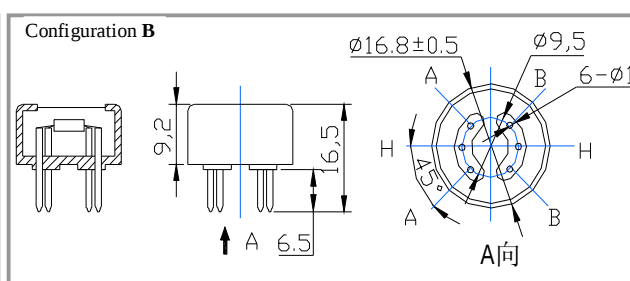
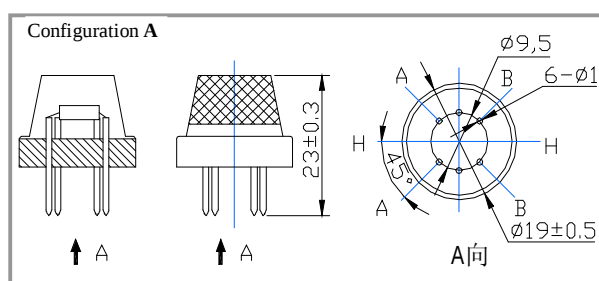
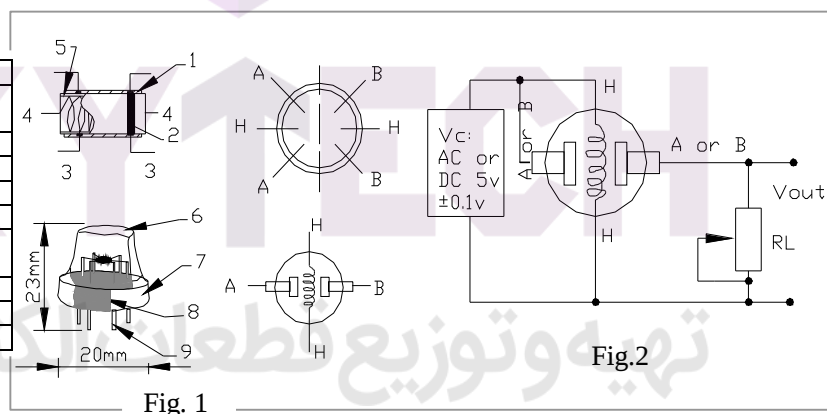
| Symbol          | Parameter name       | Technical condition                                                | Remarks                  |
|-----------------|----------------------|--------------------------------------------------------------------|--------------------------|
| T <sub>ao</sub> | Using Tem            | -10℃-50℃                                                           |                          |
| T <sub>as</sub> | Storage Tem          | -20℃-70℃                                                           |                          |
| R <sub>H</sub>  | Related humidity     | less than 95%Rh                                                    |                          |
| O <sub>2</sub>  | Oxygen concentration | 21%(standard condition)Oxygen concentration can affect sensitivity | minimum value is over 2% |

### C. Sensitivity characteristic

| Symbol                                  | Parameter name                     | Technical parameter                         | Ramark 2                                                                     |
|-----------------------------------------|------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|
| Rs                                      | Sensing Resistance                 | 10K Ω - 60K Ω<br>(1000ppm CH <sub>4</sub> ) | Detecting concentration scope:<br>200-10000ppm CH <sub>4</sub> , natural gas |
| α<br>(1000ppm/5000ppm CH <sub>4</sub> ) | Concentration slope rate           | ≤0.6                                        |                                                                              |
| Standard detecting condition            | Temp: 20℃ ± 2℃<br>Humidity: 65%±5% | Vc:5V±0.1<br>Vh: 5V±0.1                     |                                                                              |
| Preheat time                            | Over 24 hour                       |                                             |                                                                              |

### D. Structure and configuration, basic measuring circuit

| Parts                          | Materials                               |
|--------------------------------|-----------------------------------------|
| 1 Gas sensing layer            | SnO <sub>2</sub>                        |
| 2 Electrode                    | Au                                      |
| 3 Electrode line               | Pt                                      |
| 4 Heater coil                  | Ni-Cr alloy                             |
| 5 Tubular ceramic              | Al <sub>2</sub> O <sub>3</sub>          |
| 6 Anti-explosion gauze 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  $Al_2O_3$  ceramic tube, Tin Dioxide ( $SnO_2$ ) 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

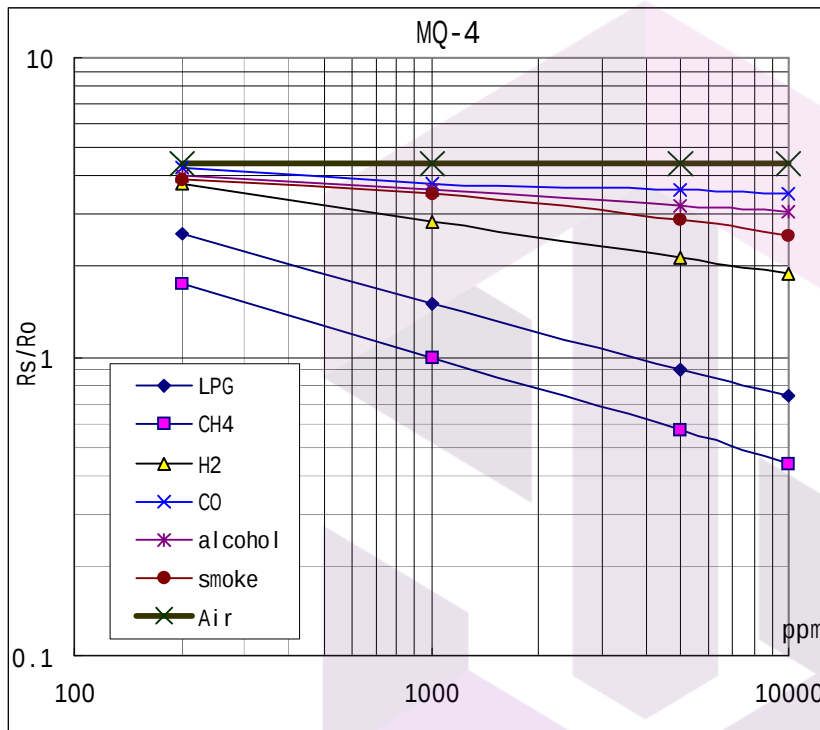


Fig.2 sensitivity characteristics of the MQ-4

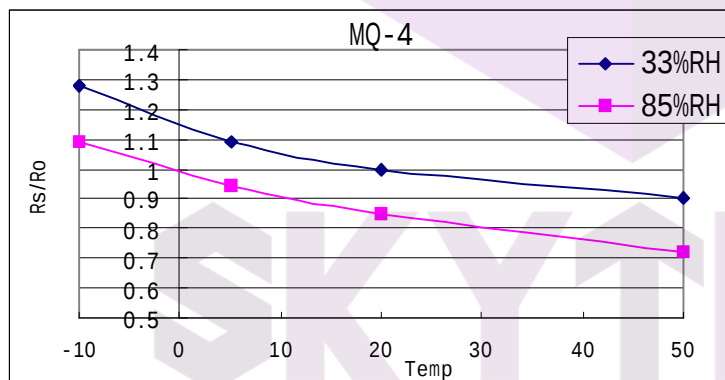


Fig.4 is shows the typical dependence of the MQ-4 on temperature and humidity.  
 $R_o$ : sensor resistance at 1000ppm of  $CH_4$  in air at 33%RH and 20 degree.  
 $R_s$ : sensor resistance at 1000ppm of  $CH_4$  in air at different temperatures and humidities.

### 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  $CH_4$  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.