

# TECHNICAL DATA

# MQ-135 GAS SENSOR

## FEATURES

Wide detecting scope  
Stable and long life

Fast response and High sensitivity  
Simple drive circuit

## APPLICATION

They are used in air quality control equipments for buildings/offices, are suitable for detecting of NH<sub>3</sub>,NO<sub>x</sub>, alcohol, Benzene, smoke,CO<sub>2</sub>,etc.

## 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
R <sub>L</sub>	Load resistance	can adjust	
R <sub>H</sub>	Heater resistance	33 Ω ± 5%	Room Tem
P <sub>H</sub>	Heating consumption	less than 800mw	

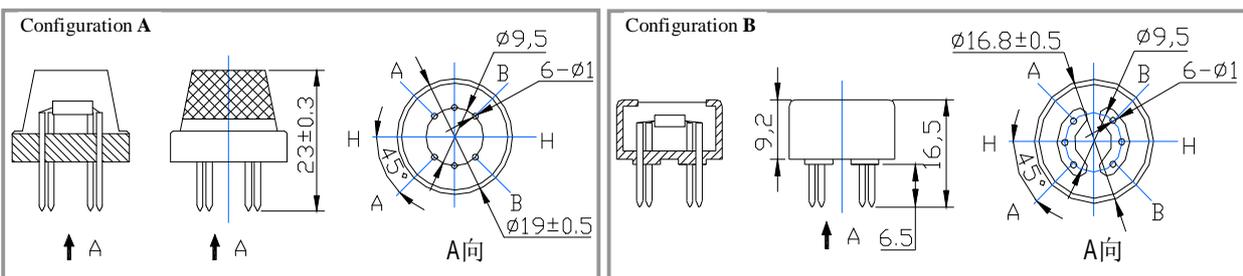
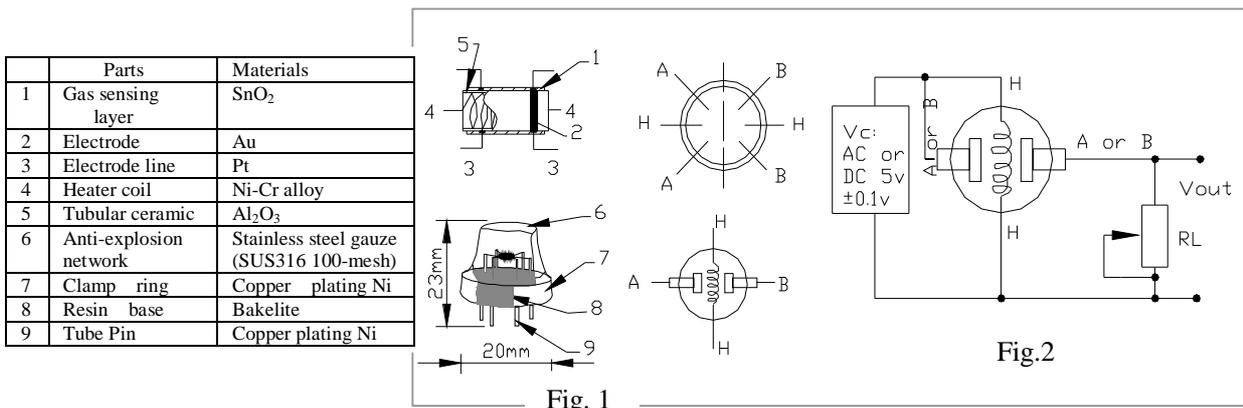
### B. Environment condition

Symbol	Parameter name	Technical condition	Remarks
Tao	Using Tem	-10℃-45℃	
Tas	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	Remark 2
R <sub>s</sub>	Sensing Resistance	30K Ω -200K Ω (100ppm NH <sub>3</sub> )	Detecting concentration scope: 10ppm-300ppm NH <sub>3</sub> 10ppm-1000ppm Benzene 10ppm-300ppm Alcohol
α (200/50) NH <sub>3</sub>	Concentration Slope rate	≤0.65	
Standard Detecting Condition	Temp: 20℃ ± 2℃ Humidity: 65%±5%	V <sub>c</sub> :5V±0.1 V <sub>H</sub> : 5V±0.1	
Preheat time	Over 24 hour		

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



Structure and configuration of MQ-135 gas sensor is shown as Fig. 1 (Configuration A or B), sensor composed by micro Al<sub>2</sub>O<sub>3</sub> ceramic tube, Tin Dioxide (SnO<sub>2</sub>) 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 envelope MQ-135 has 6 pins, 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-135

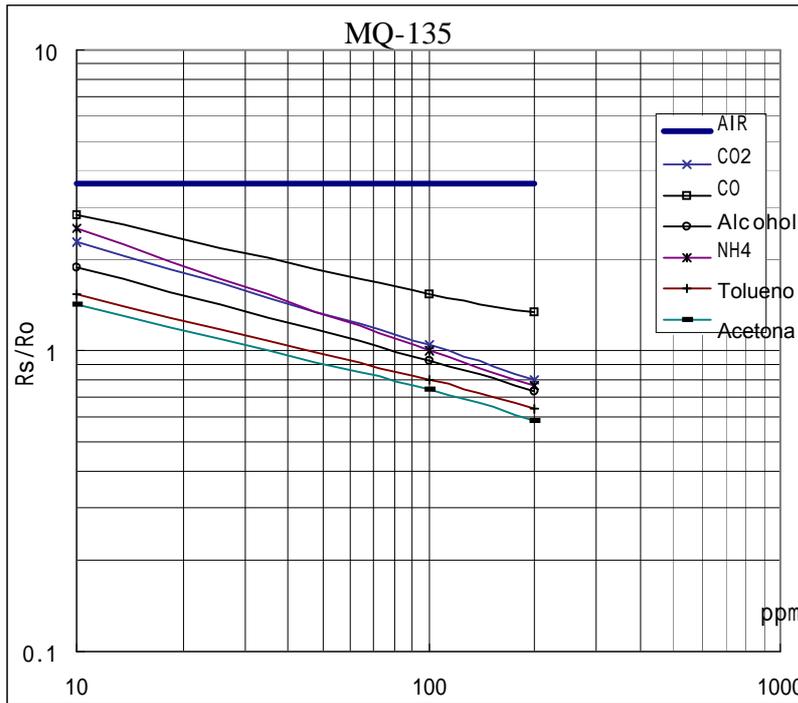


Fig.3 shows the typical sensitivity characteristics of the MQ-135 for several gases.

in their: Temp: 20°C、  
Humidity: 65%、  
O<sub>2</sub> concentration 21%  
RL=20kΩ

Ro: sensor resistance at 100ppm of NH<sub>3</sub> in the clean air.

Rs: sensor resistance at various concentrations of gases.

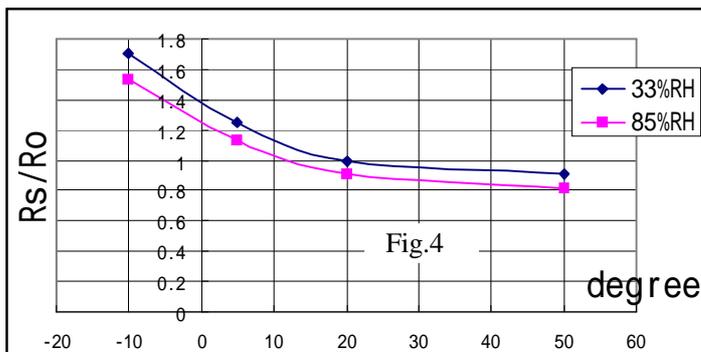


Fig.4 shows the typical dependence of the MQ-135 on temperature and humidity.

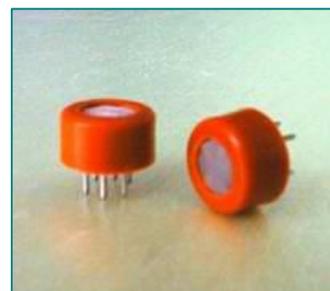
Ro: sensor resistance at 100ppm of NH<sub>3</sub> in air at 33%RH and 20 degree.

Rs: sensor resistance at 100ppm of NH<sub>3</sub> at different temperatures and humidities.

**SENSITIVITY ADJUSTMENT**

Resistance value of MQ-135 is different 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 100ppm NH<sub>3</sub> or 50ppm Alcohol concentration in air and use value of Load resistance that (R<sub>L</sub>) about 20 KΩ (10KΩ to 47 KΩ).

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



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## **Notification**

### **1 Following conditions must be prohibited**

#### 1.1 Exposed to organic silicon steam

Organic silicon steam cause sensors invalid, sensors must be avoid exposing to silicon bond, fixture, silicon latex, putty or plastic contain silicon environment

#### 1.2 High Corrosive gas

If the sensors exposed to high concentration corrosive gas (such as  $H_2S_z$ ,  $SO_x$ ,  $Cl_2$ ,  $HCl$  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 fluorin.

#### 1.4 Touch water

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

#### 1.5 Freezing

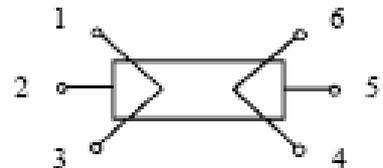
Do avoid icing on sensor's surface, otherwise sensor would lose sensitivity.

#### 1.6 Applied voltage higher

Applied voltage on sensor should not be higher than stipulated value, otherwise it cause down-line or heater damaged, and bring on sensors' sensitivity characteristic changed badly.

#### 1.7 Voltage on wrong pins

For 6 pins sensor, if apply voltage on 1、3 pins or 4、6 pins, it will make lead broken, and without signal when apply on 2、4 pins



### **2 Following conditions must be avoided**

#### 2.1 Water Condensation

Indoor conditions, slight water condensation will effect sensors performance lightly. However, if water condensation on sensors surface and keep a certain period, sensor' sensitivity will be decreased.

#### 2.2 Used in high gas concentration

No matter the sensor is electrified or not, if long time placed in high gas concentration, if will affect sensors characteristic.

#### 2.3 Long time storage

The sensors resistance produce reversible drift if it's stored for long time without electrify, this drift is related with storage conditions. Sensors should be stored in airproof without silicon gel bag with clean air. For the sensors with long time storage but no electrify, they need long aging time for stbility 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 effect the sensors performance badly.

#### 2.5 Vibration

Continual vibration will result in sensors down-lead response then repture. 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

For sensor, handmade welding is optimal way. If use wave crest welding should meet the following conditions:

2.7.1 Soldering flux: Rosin soldering flux contains least chlorine

2.7.2 Speed: 1-2 Meter/ Minute

2.7.3 Warm-up temperature:  $100\pm 20^{\circ}C$

2.7.4 Welding temperature:  $250\pm 10^{\circ}C$

2.7.5 1 time pass wave crest welding machine

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