



# ZP04 Flammable Gas Detection Module (Model:ZP04)

Manual V1.1

Zhengzhou Winsen Electronics Technology Co., Ltd

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**Zhengzhou Winsen Electronics Technology CO., LTD.**

# ZP04 Flammable Gas Detection Module

## Profile

ZP04 adopts semiconductor sensor, which has basic functions of household gas leak alarm, electric power light, warm-up light, fault lamp, output signal of alarm lamp; buzzer, relay, output signal of electromagnetic valve; input signal of testing button, canceling warm-up button input. This module can be used for complete device development of household gas leak alarm.

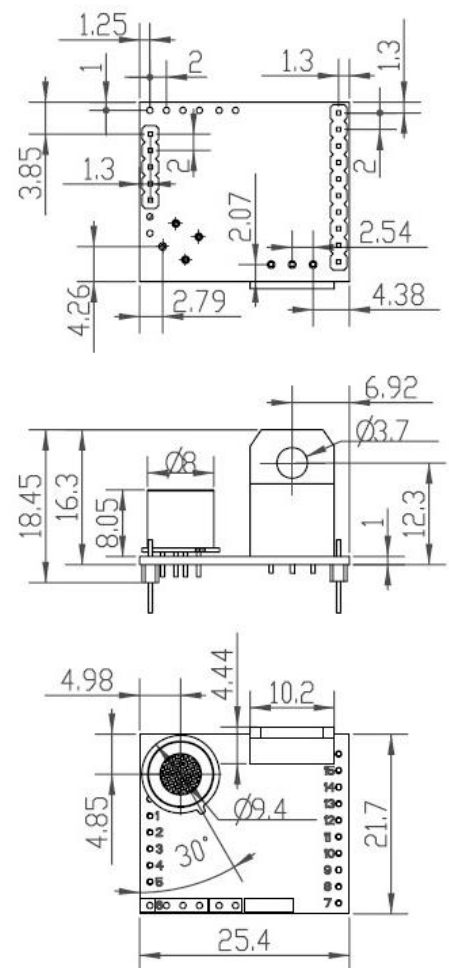


## Application

Household gas leak alarm, gas leak controller

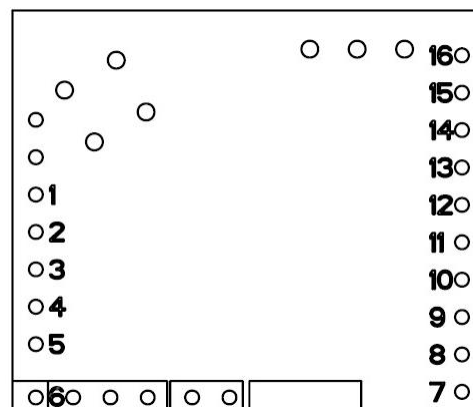
## Parameters

Model	ZP04
Detection Gas	Natural gas, LPG, Artificial coal Gas
Detection Range	1~25%LEL
Type of sensor	Flat surfaced semiconductor type
Response time	< 30s
Resume time	< 50s
Working Voltage	9~12 V
Working Current	< 80mA
Output	To be external connection with 4 LED, 2 buttons, 1 buzzer, 1 DC relay and 1 electromagnetic valve
Accuracy	±3%LEL
Expected Lifespan	>2 year
Standard Working Conditions	Temperature:-10 ~ 55℃ Humidity:0 ~ 95%RH
Storage Conditions	Temperature:-20 ~ 70℃ Humidity:20% ~ 95%RH
Dimension:	25.4x21.7x22.6mm (LxWxH)



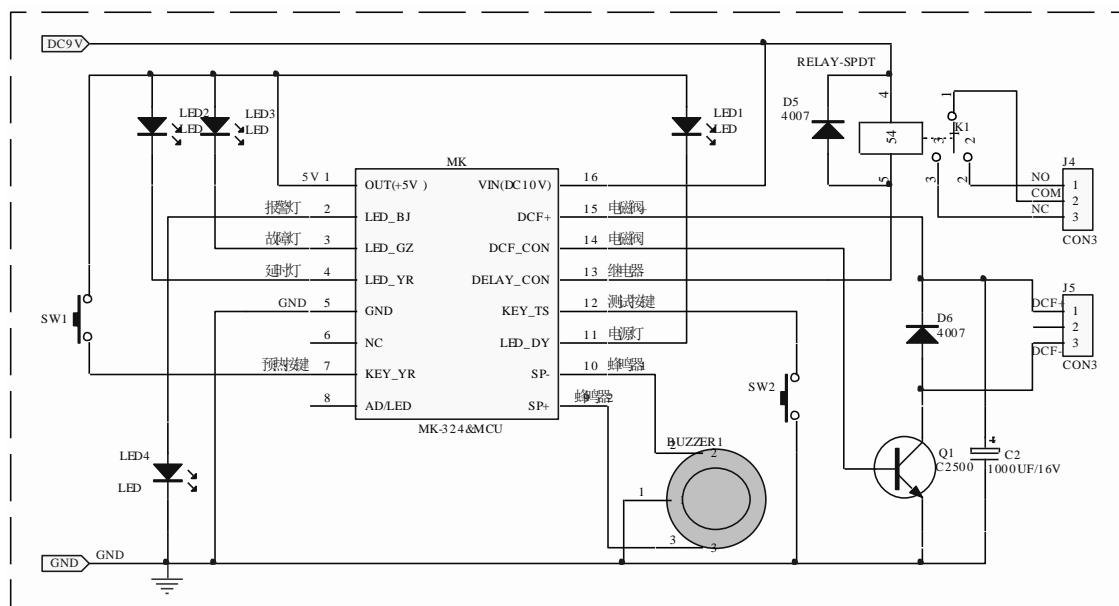
## Pin Function Description

Caution: When VCC=5V, the minimum of high level is 4.2V (10mA Source Current), and the maximum of low level is 0.7V (10mA Sink Current).



Pin No.	Function	Functional description
Pin1	DC5V	+5V output
Pin2	Alarm lamp LED drive	To output high level when alarming
Pin3	Fault lamp LED drive	To output low level when it has fault
Pin4	Warm-up lamp LED drive	To output low level during the warm-up course
Pin5	GND	Direct current supply
Pin6	NC	Hang in the air
Pin7	Keystroke	To cancel warm-up by knobbing down this button during the warm-up course
Pin8	NC	Hang in the air
Pin9	Buzzer drive 1	Piezoelectric buzzer (three-terminal)oscillator output
Pin10	Buzzer drive 2	Piezoelectric buzzer (three-terminal)oscillator output
Pin11	Electric Power lamp LED drive	To output low level during normal operating period
Pin12	Keystroke	To detect basic function by knobbing down this button during normal operating period
Pin13	Relay drive	To output low level and connect with relay directly when giving alarm
Pin14	Electromagnetic valve drive	To output high level when giving alarm(specific refer to application circuit)
Pin15	Electromagnetic valve drive	To charge electromagnetic valve in voltage regulation and capacity during normal operating period
Pin16	VCC	Modular power input +9V

## Application Principles



ZP04 recommended diagram of application principle

## Diagram of application principle BOM

No	Material label	Material name	Model and specification of material	Quantity
1	MK	Module	ZP04Module	1
2	D1、D2	Kenotron tube	1N4007	2
3	LED1	Light emitting diode	Green	1
4	LED2、LED3	Light emitting diode	Yellow	2
5	LED4	Light emitting diode	Red	1
6	K1	Dynatron	DC9V	1
7	Q1	Buzzer	C2500	1
8	LS1	Feather-touch switch	9V piezoelectric buzzer	1
9	SW1、SW2	Electrolytic capacitor		2
10	C1	Dynatron	1000uF/16V	1

## Installation instruction

This module connects with external part by adopting PH2.0 configuration of single-row inserting pin. When using it, you just need insert the module into pre-set circuit. If the joint strength of the module need to be enhanced, you can weld the module on the circuit board directly.

## Calibration

Required equipment : DC12V-adjustable electric power, air box with vent fan, injector, sample gas bag, ZP04-calibrated fixture.

A. Calibration method of alarm point 1: install the module on ZP04-calibrated fixture and being aged by switching on electric power for 3 minutes. Through inject into the definite concentration of gas and adjust the comparative-point potentiometer, ZP04 will be on the state of alarm, and this point is comparative-point alarm.

B. Calibration method of alarm point 2: According to the particularity of sensor, you can work out the value of alarm point. When ZP04 is welding, the potentiometer will be substituted by the fixed resistance, and this point is comparative-point alarm.

C. Inspection of alarm point: Open the box of calibration, then make module connect up electric power again till warm-up of module is over. Now make a good seal of the air box, and then inject gas into the air box slowly to inspect whether the alarm point of module is satisfied to requirements. If not, please repeat the above steps.

## Precautions

1. The module should be calibrated in the environment of undisturbed gas.
2. Do not make the module contact with high concentration gas for long time, or the sensitivity will decline rapidly.
3. Although the module has a good capability of anti-seismic, it should not be shocked excessively.

## Cautions

### 1 .Following conditions must be prohibited

#### 1.1 Exposed to organic silicon steam

Module will lose sensitivity and never recover if it absorbs organic silicon steam. Module must avoid exposing to silicon bond, fixture, silicon latex, putty or plastic contain silicon environment.

#### 1.2 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 sincere sensitivity attenuation.

#### 1.2 High Corrosive gas

If the module is 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 sensor's heating material and pins, also it causes

sensitivity and performance attenuation.

### 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.

## 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 sensing material surface and keep a certain period, sensors' sensitive will decrease.

### 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 the module is stored for long time without electrify, this drift is related with storage conditions. Modules should be stored in airproof bag without volatile silicon compound. For the modules with long time storage but no electrify, they need long galvanical aging time for stability before using. The suggested aging time as follow:

Stable3.

Storage Time	Suggested aging time
Less than one month	No less than 48 hours
1 ~ 6 months	No less than 72 hours
More than six months	No less than 168 hours

### 2.4 Long time exposed to adverse environment

No matter the modules 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 module's performance badly.

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