

M402 Module

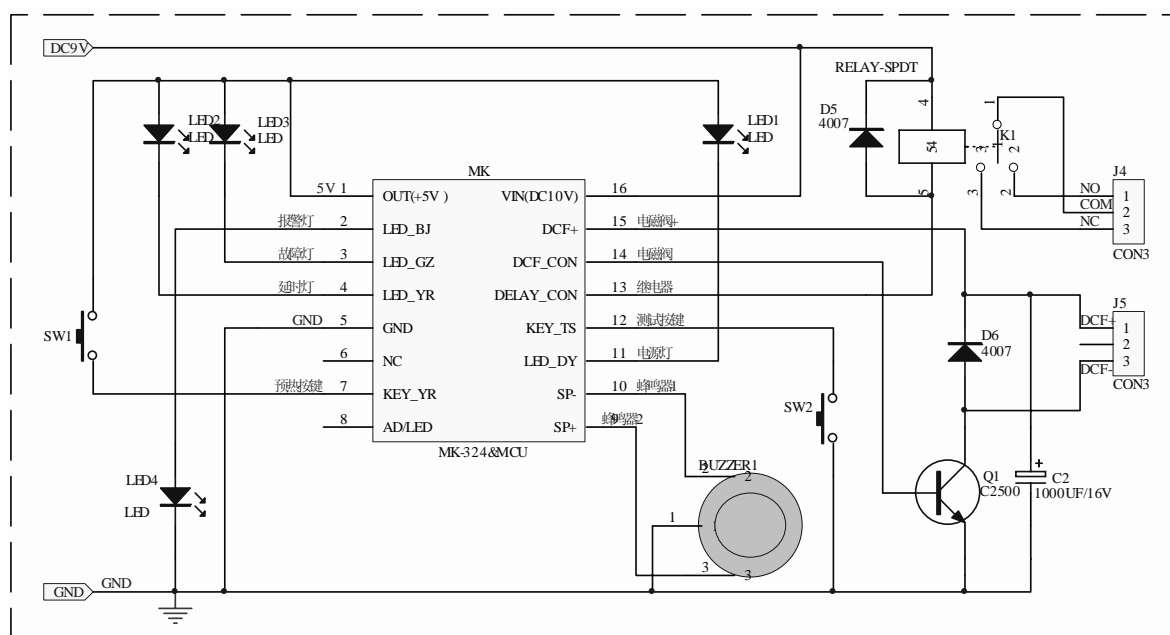
M402 adopts semiconductor sensor, which has basic functions of household gas leak alarm: electric power light, warm-up light, fault lamp, output signal of alarm lamp; buzzer, relay, output signal of electromagnetic valve; input signal of testing button, canceling warm-up button input. This module can be used for complete device development of household gas leak alarm.



1, Technical specification:

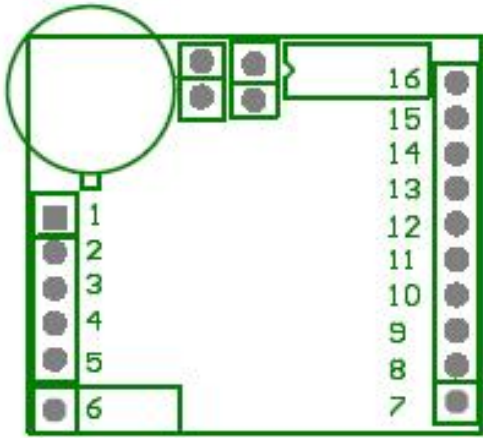
Target Gas:	Natural gas, LPG, Artificial coal Gas
Detection Range:	1~ 25%LEL
Type of sensor:	MP series
Response time:	< 30s
Resume time:	< 50s
Working Voltage:	5.0 ±0.3V
Working Current:	< 80mA
Output:	To be external connection with 4 LED, 2 buttons, 1 buzzer, 1 DC relay and 1 electromagnetic valve
Accuracy:	±5%LEL(5.0±0.1V)
Life Expectancy:	>3 years
Standard Working Condition:	Temperature:0 ~ 55℃
	Humidity:20% ~ 90%RH
Storage Condition:	Temperature:-20 ~ 70℃
	Humidity:20% ~ 90%RH
Dimension:	26.9×24.2×24.2mm (L×W×H)

2, Application field: Household gas leak alarm, gas leak controller, fuel gas leak shutoff valve.

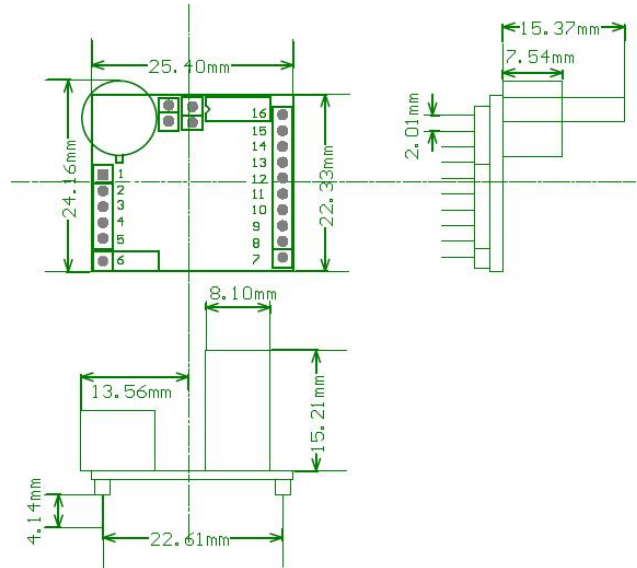


M402 recommended diagram of application principle

3, Physical dimension:



M402 diagram of pin



M402 diagram of external dimension

4, Functional description of pin:

Attn: 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 Nos.	Function	Functional description
Pin1	DC5V	+5Voutput
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 high 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

5, 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.

6, Calibration:

Required equipments: DC12V-adjustable electric power, air box with vent fan, injector, sample gas bag, M402-calibrated fixture.

(1) Calibration method of alarm point 1: installing the module on M402-calibrated fixture and being aged by switching on electric power for 3 minutes. Through injecting into the definite concentration of gas and adjusting the comparative-point potentiometer, M402 will be on the state of alarm, and this point is comparative-point alarm.

(2) Calibration method of alarm point 2: According to the particularity of sensor, you can work out the value of alarm point. When M402 is welding, the potentiometer will be substituted by the fixed resistance, and this point is comparative-point alarm.

(3) Inspection of alarm point: Open the box of calibration, then make module connect up electric power again till the 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.

7, 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.

8, Diagram of application principle BOM:

Nos.	Material label	Material name	Model and specification of material	Quantity
1	MK	Module	M402	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	Electromagnetic relay	DC9V	1
7	Q1	Dynatron	C2500	1
8	LS1	Buzzer	9V piezoelectric buzzer	1
9	SW1、SW2	Feather-touch switch		2
10	C1	Electrolytic capacitor	1000uF/16V	1

Henan Hanwei Electronics Co., Ltd