Low Power Consumption Infrared Gas Sensor

(Model：MH-T4041A)

User's Manual

Version ：1.0

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Zhengzhou Winsen Electronic Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD

MH-T4041A Low Power Consumption Infrared Gas Sensor

Description

MH-T4041A low-power infrared gas sensor is a general-purpose intelligent infrared gas sensor (hereinafter referred to as the sensor), using non-dispersive infrared (NDIR) principle to detect hydrocarbon combustible gases in the air. It has good selectivity, ultra-low power consumption, no oxygen dependence, stable performance, long life, and built-in temperature compensation.The sensor is a compact and high performance sensor which combines the mature infrared absorption gas detection technology with micro-machining and excellent circuit design. It is easy to use, can directly replace catalytic combustion elements, so it is widely used in various occasions where combustible and explosive gases exist.

Feather

* High sensitivity, high resolution, fast response time, ultra-low power consumption
* Provides a variety of output modes, such as UART and analog voltage
* Temperature compensation, excellent linear output, excellent stability, long service life
* Anti-water vapor interference, no poisoning, can directly replace the catalytic combustion principle sensor

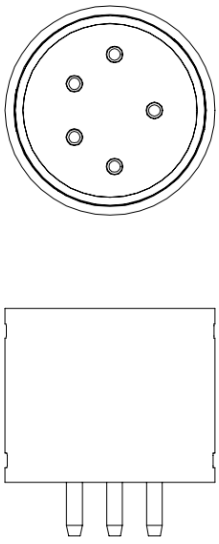
Main Application

* HVAC Refrigeration and Indoor Air Quality monitoring
* Industrial Process and safety protection monitoring
* Agricultural and animal husbandry production process monitoring

Technical Parameter

sheet 1

Model No.	MH-T4041A
Detection Gas	Hydrocarbon flammable gases
Working voltage	3.3V～5.5V DC(powered by the safety grid)
Average Current	＜0.8mA
Deteciton Range	0～10% Vol optional(refer to sheet 2)
Interface level	3V
Output signal	UART
	0.4V～2V（No low energy consumption request optional）
Preheat Time	10s
Reponse Time	T90＜15s
Working Temperature	-20℃ ～60 ℃
Working Humidity	0～95%RH(non-condensing)
Dimension	Φ20mm×21.7mm
Weight	8g
Life time	＞5 years
Protection Level	IP54
Power end, communication end Intrinsicsafety parameter	Ui=7.5VDC， Ii=265mA， Pi=0.5W， Ci=10μF， Li=0mH



Picture1: sensor external view

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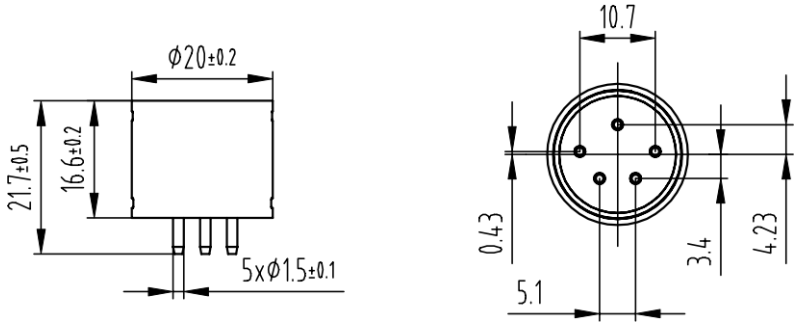
Common range and accuracy (other range and detection gas can be customized)

Sheet2						
Gas	Molecular formula	Range	Resolution	Decimal place	Accuracy	Note
Methane	CH4	0～5.00% Vol	0.01% Vol	2 decimal	0～50%FS(±3%FS) 50%～100%FS(±5%FS)	Temperature Compensation
		0～10.00% Vol		2 decimal		
Propane	C3H8	0～100% LEL	1% LEL	None		
Isobutane	C4H10	0～100% LEL	1% LEL	None		

Product size drawing (size tolerance ±0.2 mm)

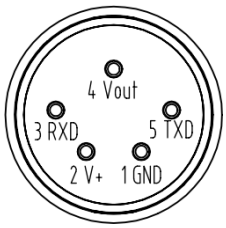


Picture 2：Sensor structure diagram

Pin definition

Sheet 3

Sheet NO.	Definition
Pin 2	V+ input voltage
Pin 1	GND
Pin 4	Vout (0.4V～2V optional)
Pin 3	UART(RXD) 0V～3V data input
Pin 5	UART(TXD) 0V～3V data output



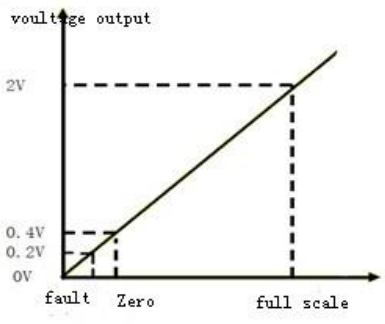
Picture 3. Pin Definition

Output Mode

Serial port output (analog voltage output is optional)

Vout output voltage range (0.4V ~ 2V), corresponding to gas concentration (0 ~ full scale).

Connect the sensor Vin to 5V, GND to the power supply, and Vout to the ADC input. After the preheating time, the sensor outputs a voltage value from the Vout terminal that characterizes the gas concentration.



Safety and explosion proof

The product complies with GB3836.1-2010 "Explosive environment Part 1: General requirements for equipment" and GB3836.4-2010 "Explosive Environment Part 4: Equipment protected by intrinsically safe" i "standards; The explosion-proof mark is ExibⅡB T4 Gb, which is suitable for zone 1 and Zone 2, containing class IIA, class T1 ~ T3 flammable gas, vapor and air mixing explosive environment;It has passed the inspection by the National Explosion-proof Electrical Product Quality Inspection Center and obtained the explosion-proof certificate.When in use, please pay attention to the following items:

1. The intrinsic safety power supply must be used to power the sensor, otherwise the explosion-proof performance will be affected.

2. Do not replace the sensor in a dangerous place.

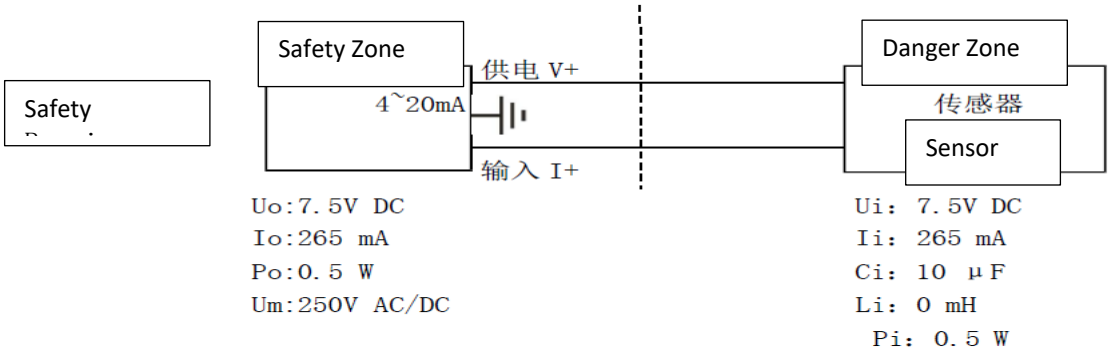
3. Do not disassemble or replace sensor components to avoid affecting explosion-proof performance.

4. It is not allowed to replace components or structures, so as not to affect explosion-proof performance.

5. The installation and wiring of the safety gate shall be carried out in accordance with the safety gate instruction manual, and the safety gate shall obtain the explosion-proof certificate。

Connection diagram of intrinsically safe explosion-proof system

The on-site installation must comply with the relevant regulations of the GB3836.15—2000 "Electrical Equipment for Explosive Gas Environment Part 15: Electrical Installation in Hazardous Locations (Except Coal and Mines).



The distribution parameters of the connecting cable between the safety barrier and the sensor should meet:
Cc≤Co-Ci Lc≤Lo-Li Ui≥Uo Ii≥Io Pi≥Po

Note:

Uo: Maximum output voltage of safety barrier.

Io: Maximum output current of safety barrier

Po: Maximum output power of safety barrier

Co: Maximum external capacitance of safety barrier

Lo: the maximum external inductance of the safety barrier (see the safety barrier instructions for the above parameters book)

Cc: Maximum allowable distributed capacitance of connecting cable

Ui: sensor maximum input voltage

Ii: Maximum sensor input current

Pi: sensor maximum input power

Ci: Maximum internal capacitance of the sensor

Li: Maximum internal inductance of the sensor

Lc: Maximum allowable distributed inductance of connecting cable.

Cautions for Maintenance

1. The sensor should be calibrated regularly, the recommended calibration period is 6 months.
2. Do not use the sensor in a high dust density environment for a long time.
3. The sensor should be kept away from heat sources and avoid direct sunlight or other thermal radiation.
4. Please use sensors in the sensor power supply scope.
5. Do not cut or weld the sensor pins

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