

Gas CH2O Sensor Specification

XKC-G22-CH2O-NPN

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1. Overview

Solid-state electrochemical sensing technology is a new technology in the field of electrochemical detection. This technology is based on the principle of electrochemistry, uses a proton membrane instead of traditional electrolyte, outputs signals according to the electrochemical reaction of different gases, and accurately measures the gas concentration through the signal quantity.

Formaldehyde, with the chemical formula CH₂O or HCHO, is a colorless gas with a strong pungent odor. Soluble in alcohol and ether. Acute formaldehyde poisoning is a systemic disease mainly caused by eye and respiratory system damage caused by exposure to high concentrations of formaldehyde vapor. When its concentration reaches 0.08-0.09mg/m³ per cubic meter of air, children will experience mild asthma. When the indoor air reaches 0.1mg/m³, there is odor and discomfort; when it reaches 0.5mg/m³, it can irritate the eyes and cause tearing; when it reaches 0.6mg/m³, it can cause throat discomfort or pain. When the concentration is higher, it can cause nausea and vomiting, cough and chest tightness, asthma and even pulmonary edema; when it reaches 30mg/m³, it will cause immediate death.

2. Technical Parameters

1. Performance parameters

project name	parameter
Input voltage	DC 5V~24V
load current	<100mA
Quiescent Current	<10 mA
detect gas	formaldehyde (CH ₂ O)
Resolution	0.01ppm
Repeatability	<2% output value
Threshold	0.06ppm
Maximum load	20ppm
Response time	(T ₉₀) <15S
Zero output (in clean air)	-0.10ppm~ 0.02ppm
Sampling method	Diffusion
output method	NPN

2. Working conditions

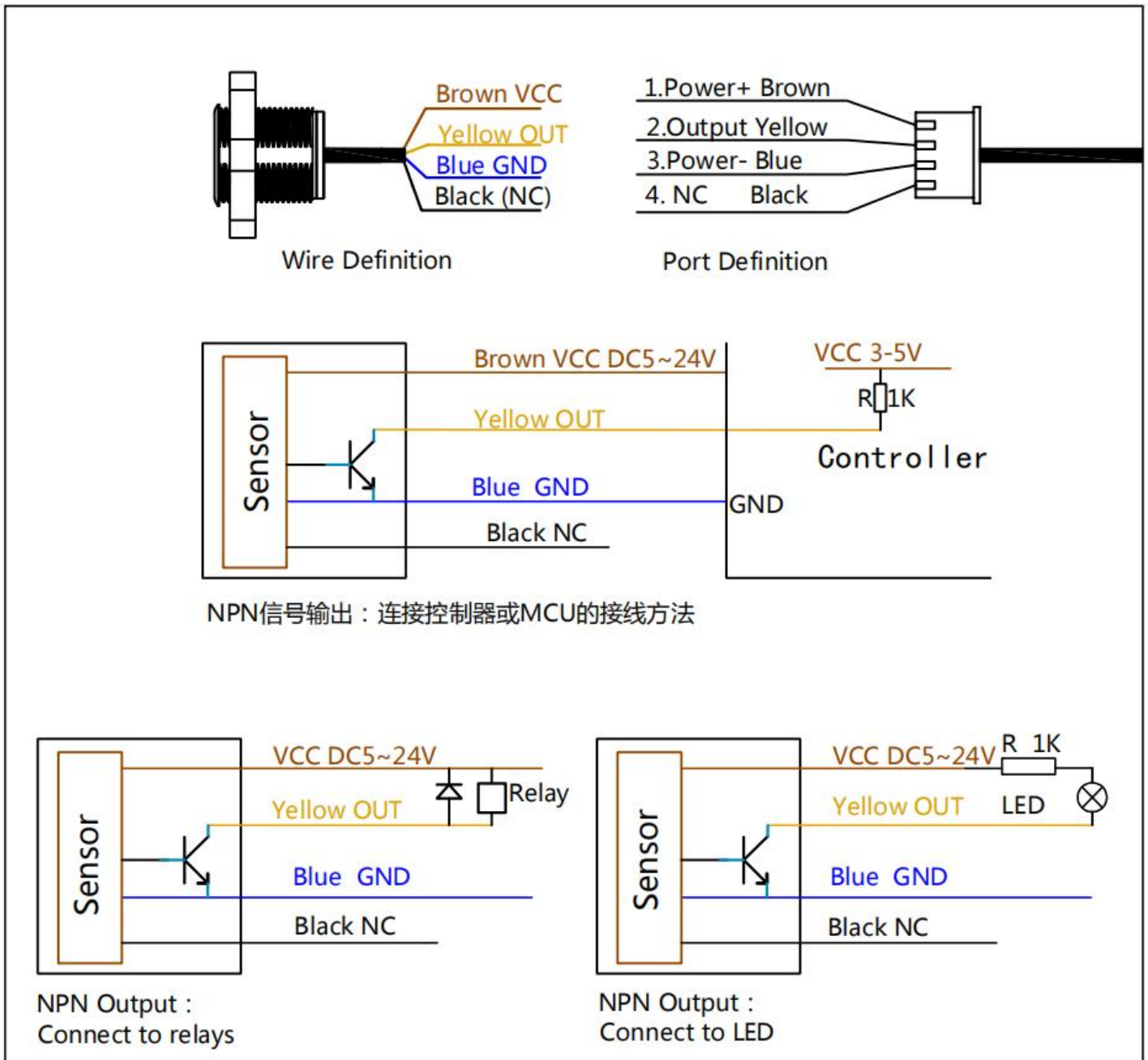
project name	parameter	
pressure range	1±0.1 standard atmospheric pressure	
Expected service life	3 years (in air)	
Recommended storage environment	+10°C ~ + 30°C	
range of working temperature	continue working	-10°C ~ + 50°C
	intermittent work	-10°C ~ + 55°C
Operating humidity range	15%RH ~ 90%RH (No condensation)	
long term stability	<2% Signal value/month	

3. Physical properties

project name	parameter	
size	L*W*H = 30.35 * 47.4 * 47.4MM	
line length	50cm (±10MM) (batch can be customized)	
Shell material	Black PC V0 fireproof material	
Safety standard certification	CE	

3. Wiring Principle

Simplified schematic diagram of NPN output wiring principle



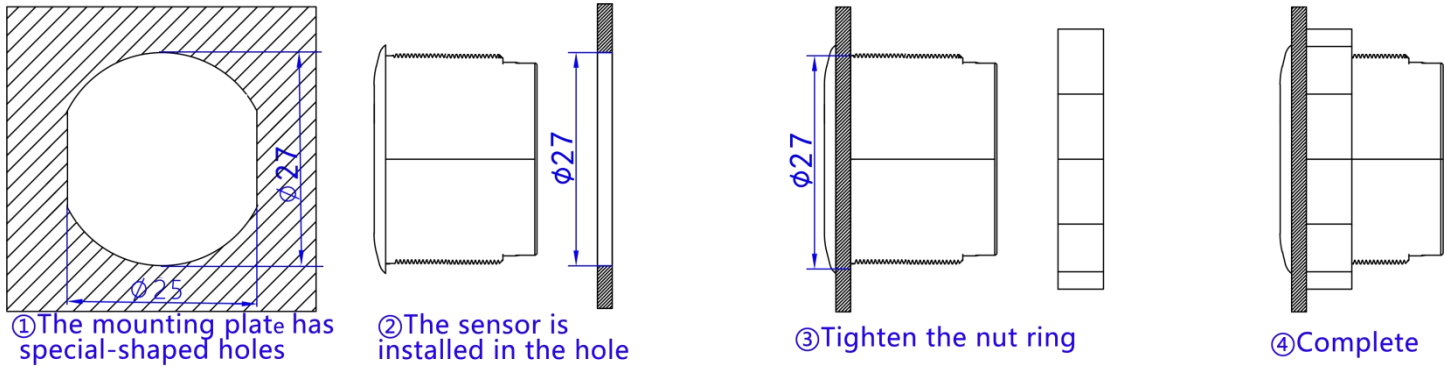
NPN output drives small relays (coil current $\leq 100\text{mA}$) working principle:

- (1) When CH₂O(g) is sensed, the transistor is turned on, and the relays turn on;
- (2) When CH₂O(g) is not sensed, the transistor is turned off, and the relays turn off;

4. Instructions method

Method 1.

Tighten with nut ring.



Method 2.

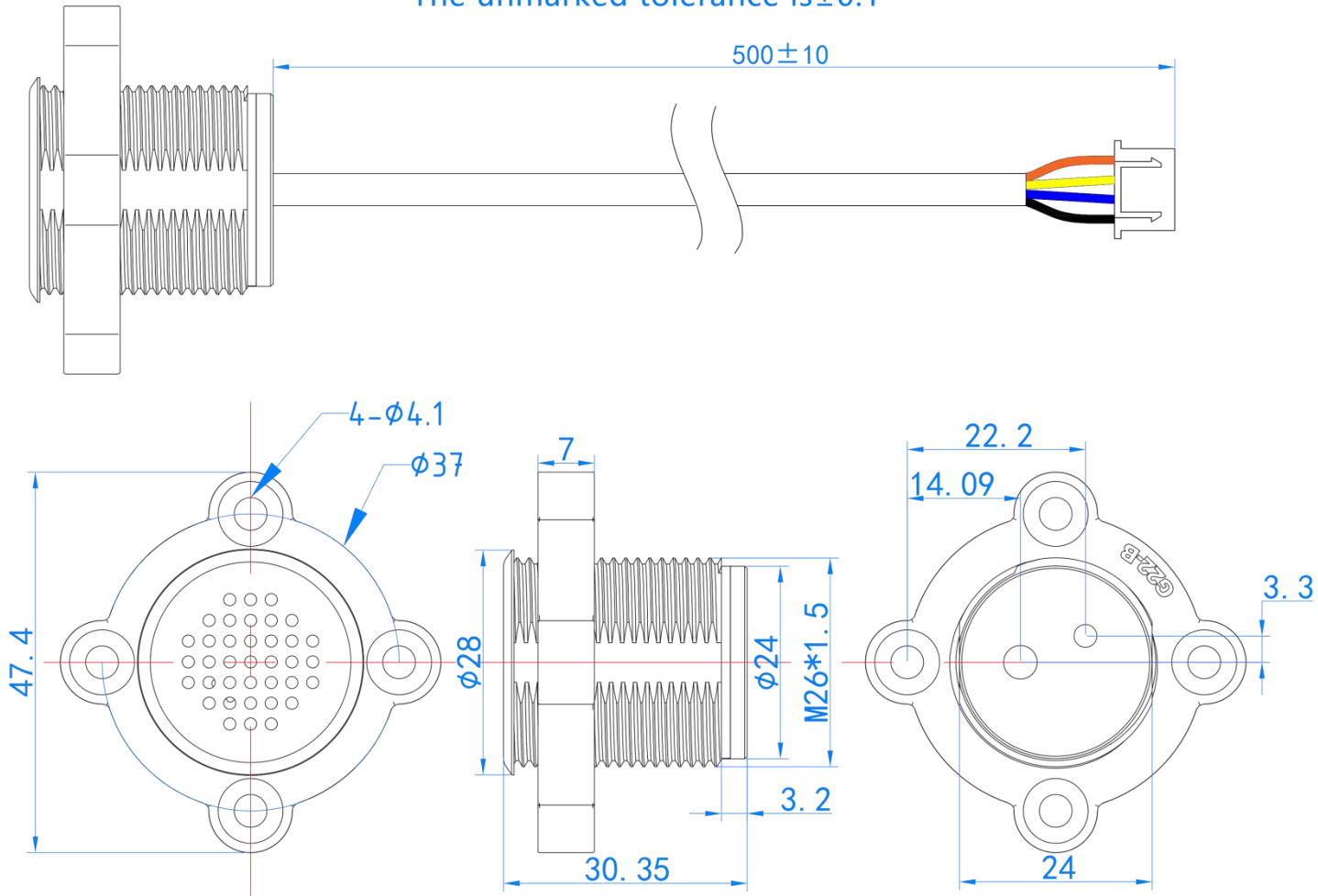
Draw the mounting holes on the panel where the sensor needs to be installed, and place the bolts in the mounting holes of the sensor to tighten to achieve front or rear fixation.

5. Installation method

When the sensor is powered on and working normally, when the sensor senses that the CO reaches the alarm concentration, the indicator light is on and the output is low; when the CO does not reach the alarm concentration, the indicator is off and the output is high-impedance state.

6. Dimensions

The unmarked tolerance is ± 0.1





7. Matters needing attention

The aging time before use is not less than 48 hours;

It is recommended that the air inlet hole of the sensor be installed vertically downwards or horizontally;

The equipment using this sensor should be confirmed to be in normal state before use (portable instrument) and during use (fixed point detector);

Prolonged use in an over-range and high-concentration gas environment will cause damage to the sensor;

The sensor should not be subjected to excessive shock or vibration;

Do not disassemble the sensor at will, disassembling the sensor will cause the leakage of electrolyte and cause harmful consequences;

Avoid contact with organic solvents (including silicone rubber and other adhesives), paints, pharmaceuticals, fuel oils and high-concentration gases;

All electrochemical sensors cannot be completely encapsulated with resin materials, nor can they be immersed in an oxygen-free environment, otherwise the performance of the sensor will be damaged;

All electrochemical sensors should not be used or stored in environments containing corrosive gases, which can damage the sensor;

The sensor intake channel must not be blocked and polluted;

All the above performance specifications are measured under ambient conditions: temperature 20° C, relative humidity 50%, and one atmosphere (100kPa).

Calibration with the target gas is recommended. If a cross-sensitive gas is used for calibration, the accuracy of its calibration and measurement cannot be guaranteed.

Cross-sensitivity will vary by $\pm 30\%$ and may vary with sensor production batch and sensor life.

The above-mentioned cross-sensitivity includes, but is not limited to, the above-mentioned gases, and the sensor may be responsive to other gases.

8. Specification version

Version	Release date
V11	June 15, 2022
V12	October 25, 2022