

# Datasheet ACM2000

## Carbon monoxide gas sensor

- Long life
- Stable output
- Fast response
- Low power consumption

## Summary

ACM2000 carbon monoxide electrochemical sensor is the latest product rolled out by Aosong. This sensor detects CO concentration by measuring redox current in a two-electrode configuration. It demonstrates the merits of fast-response and long-life. Similar two-electrode CO sensors in the market can be substituted directly with this sensor. For more information about ACM2000 or other products, please contact us.

## Application scenario

ACM2000 sensor can work as the CO sensitive component in CO analyzers. CO analyzers can be applied for CO concentration detections in the following scenarios:

- Residential
- Fire Detection
- Ventilation Control
- Industrial Environment Detection



Figure 1. Carbon monoxide sensor ACM2000

# 1. Technical specification

MEASUREMENT	
Measurement range	0~500 ppm
Maximum overload	1000 ppm
Sensitivity	> 15 nA/ppm
Response time T90	≤ 45 s (0 to 50 ppm)
Zero drift (-10~50°C)	≤ 10 ppm
Repeatability	≤ 5%
Output drift	< 10%/annum
Operating life	5 years in normal use
Storage life	6 months in original packaging
ELECTRICAL	
Resolution	1 ppm
Recommended load resistor	10 Ω
MECHANICAL	
Housing material	NORYL
Weight	<6 g
Orientation	Any
ENVIRONMENTAL	
Temperature range	-10 ~ 50°C
Pressure range	0.9 ~ 1.1 Bar
Humidity range	15 ~ 90% RH (non-condensing)

Notice:

1. All measurements were conducted at 20°C, 50% RH, and 1 Bar pressure. Sensor performance may be varied under environmental conditions.
2. It is recommended to use a sensor within storage life, although a brand-new sensor beyond storage life usually can still work under the suggested storage condition.
3. Sensor performance may be compromised by harsh storage environments, such as high temperature, low humidity, or low oxygen.
4. Sensitivity of a toxic gas electrochemical sensor usually refers to the ratio of the current output from a sensor to the target gas concentration. For instance, if the current output is 2000 nA in 100 ppm target gas, the sensitivity will be 2000 nA/100 ppm = 20 nA/ppm. Current output under a specific target gas concentration can also be calculated by sensitivity. If the sensitivity is 30 nA/ppm and gas concentration is 200 ppm, the current output will be 30 nA/ppm \* 200 ppm = 6000 nA.

## 2. Dimension

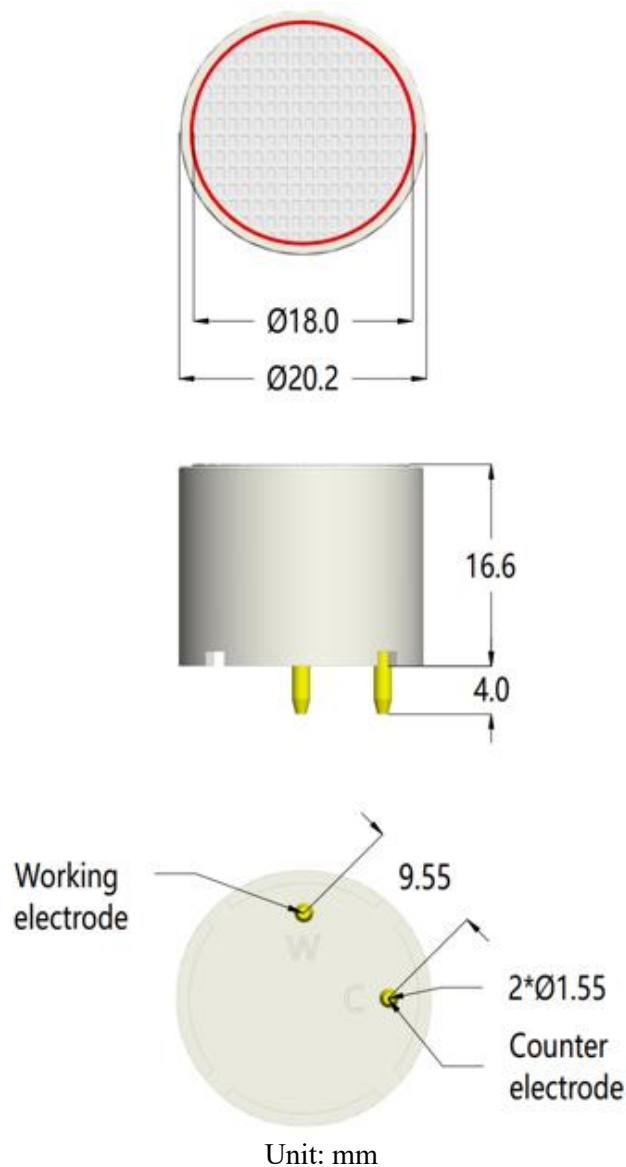


Figure 2. ACM2000 dimensions. All tolerances are  $\pm 0.1$  mm except tolerance of pins ( $\pm 0.05$  mm).

## 3. Application note

### 3.1 Installation

ACM2000 is designed to operate under harsh conditions. However, high concentration organic vapor and direct solvent contact should be avoided during installation.

When using a sensor with a printed circuit board (PCB), PCB should be cleaned with a degreasing agent before installation; otherwise, the condensed additive vapors, such as rosin, might clog the protective ventilation film membrane. Do not apply glue directly on or near ACM2000 as the solvent may cause cracking of the housing plastic.

### 3.2 Application circuit

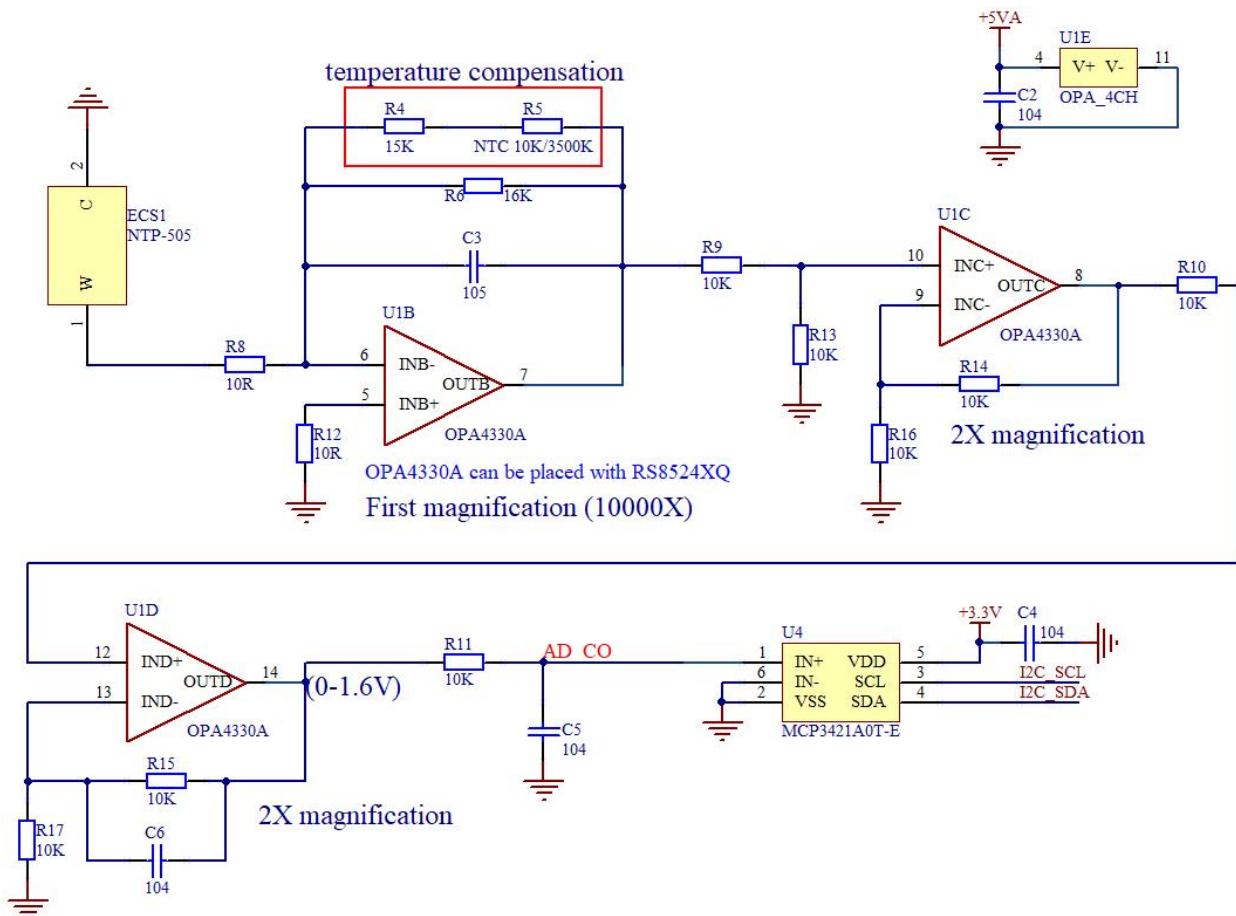


Figure 3. Application circuit of ACM2000.

### 3.3 Application

- A 24 hours warm-up time is necessary for the first usage.
- A typical warm-up time is 15 min for a sensor: a) which is kept short-circuited by the shorting spring or the application circuit; b) which goes through a short period of a power outage. A 24 hours warm-up time is necessary if the two electrodes are left open-circuited for a long period or the sensor is planned to reuse after long-term nonuse.
- Long-term usage under corrosive gases must be avoided.
- Zero calibration should be conducted in clean air.
- Intensive vibration and impact on the sensor must be avoided.
- Long-time measurement in an oxygen-free environment must be avoided.
- Do not remove the protective ventilation film.
- The protective ventilation film facing straight against the gas flow should be avoided.
- Sensors recover slower after a long-time measurement of high gas concentration.
- Response time T90 will be irreversibly longer after working at high temperature for a long period.

### 3.4 Cross sensitivity

Gas	Concentration (ppm)	CO reading (ppm)
H <sub>2</sub>	100	30
NO <sub>2</sub>	5	0
Ethanol	200	0
H <sub>2</sub> S	50	0
SO <sub>2</sub>	20	0

**Notice:**

The cross sensitivity data above is for guidance only. These values are based on tests conducted on a small number of sensors and they may vary from batch to batch. Calibration with the instrument should be carried out for the most accurate measurements.

## 4. Storage

- Organic solvents and vapors during storage must be avoided.
- Working electrode and counter electrode should be short-circuited during storage.
- Storage must be avoided at extremely high/low temperature and in extremely low humidity conditions.

## Warning and personal injury

It is the user's responsibility to determine the suitability of the sensor, please follow the instructions for the carbon monoxide analyzer and carbon monoxide sensor replacement. To ensure proper operation of the instrument equipped with the sensor, it is required to confirm the sensor function by exposure to the target gas before each use of the sensor or instrument. The sensors contain corrosive acid, please do not disassemble the sensors at will. Failure to follow the instructions could result in death or serious personal injury. The company will not be liable for all compensation for personal injury and death arising therefrom and exempts any claims that may arise from the company's managers and employees, as well as affiliated agents, distributors, etc., including various costs, and claims fees, attorney fees, etc.

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Description of warranty period of main components

Accessories Category	Shelf Life
ACM2000	One year

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