

Datasheet ACM3000

Carbon monoxide gas sensor

- Stable output
- Fast response
- Low power consumption
- High linearity

Summary

ACM3000 is a three-electrode electrochemical carbon monoxide sensor, carbon monoxide concentration is reflected by measuring redox current between electrodes. It has features of fast-response and stable output. Similar three-electrode carbon monoxide sensors in the market can be replaced by this sensor directly.

Application

ACM3000 sensor carbon monoxide sensor can be applied to devices and scenarios that need to measure carbon monoxide concentration. For example, it can be used in carbon monoxide analyzer, carbon monoxide alarm, carbon monoxide fire alarm in equipment, such as inadequate combustion of gas water heater, range hood, automobile emission detection in underground parking, home and business air cleaning equipment, industrial environment detection.



Figure 1. Carbon monoxide sensor ACM3000

1. Technical specification

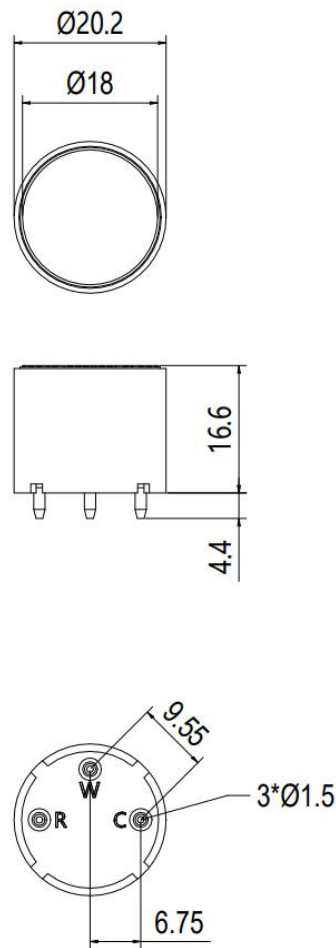
Table 1. Technical indicators of ACM3000

MEASUREMENT	
Measurement range	0~1000 ppm
Maximum overload	2000 ppm
Sensitivity	70 ± 15 nA/ppm
Response time T ₉₀	≤15 s (0 to 500 ppm)
Baseline Offset	±2 ppm
Repeatability	≤3%
Output drift	<2%/month
Operating life	2 years in normal use
Storage life	6 months in original packaging
ELECTRICAL	
Resolution	< 1 ppm
Recommended load resistor	10 Ω
Bias voltage	0 mV
Output current	< 0.2 mA (2000ppm)
MECHANICAL	
Housing material	NORYL
Weight	<6 g
ENVIRONMENTAL	
Temperature range	-20~55 °C
Recommended storage temperature	10~30 °C
Pressure range	0.9~1.1 bar
Humidity range	15 ~ 90% RH (non-condensing)

Note:

1. All measurements were conducted at 20°C and 50% RH under 1 bar. The performance of ACM3000 may be varied by environmental conditions.
2. It is recommended to use a sensor within storage life, although a brand-new sensor beyond storage life usually still can work under the suggested storage condition.
3. The performance of ACM3000 may be affected by harsh storage environments, such as high temperature, low humidity, and low oxygen.
4. The sensitivity of an electrochemical sensor for toxic gas usually refers to the ratio of the current output to the target gas concentration. For instance, the current output of a sensor is 2000 nA when the sensor is in 100 ppm target gas. The sensitivity of the sensor will be 2000 nA/100 ppm = 20 nA/ppm. The current output of a sensor can also be calculated when the sensitivity and concentration of target gas are known. For instance, the sensitivity is 30 nA/ppm and gas concentration is 200 ppm; then, the current output will be 30 nA/ppm * 200 ppm = 6000 nA.

2. Dimension



Unit: mm

Figure 2. Dimension of ACM3000. The tolerance of pins is ± 0.05 mm, and other tolerances are ± 0.2 mm.

3. Application note

3.1 Installation

ACM3000 is designed to work under harsh conditions. However, high concentration organic vapor and direct solvent touch should be avoided during installation.

Welding is prohibited, because welding may cause defects, such as pin corrosion, skew, poor electrical contact and electrolyte leakage. When a printed circuit board (PCB) is used with ACM3000, 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 ACM3000 as the solvent may cause cracking of the housing plastic.

3.2 Recommended circuit

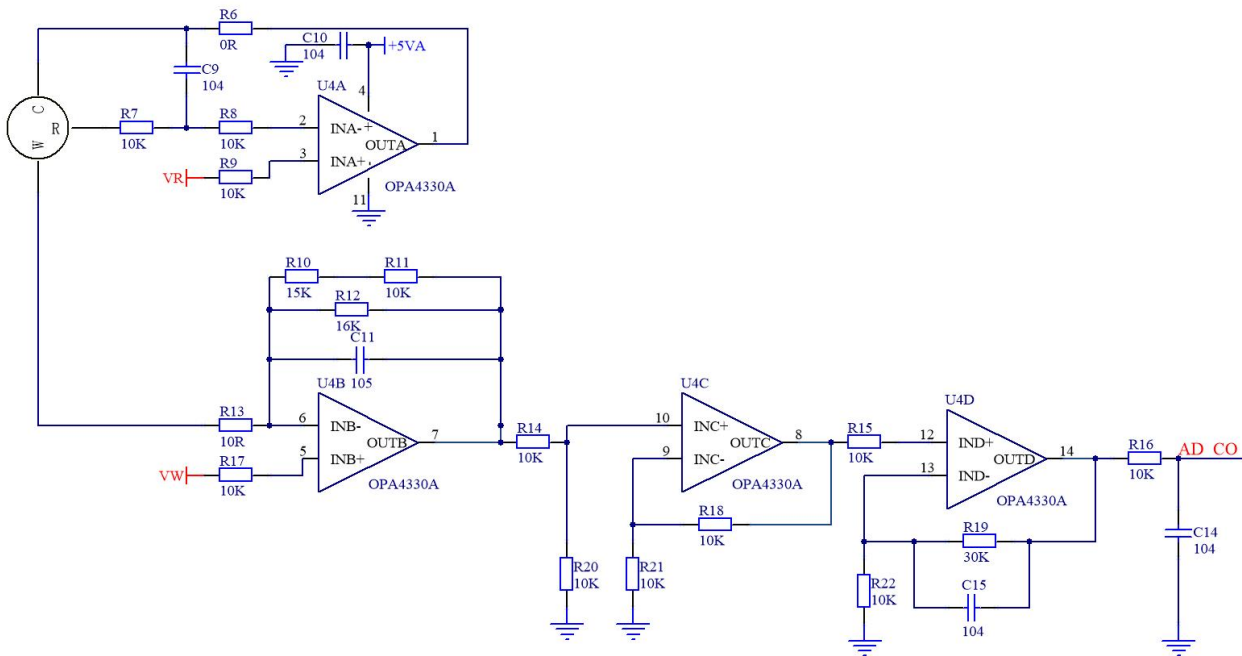


Figure 3. Recommended application circuit for ACM3000.

3.3 Application

- Direct welding of the pins is prohibited.
- A 24 hours warm-up time is necessary for:
 - a) the first usage;
 - b) the two electrodes of ACM3000 are left open-circuited for a long period;
 - c) the purpose to reuse after long-term nonuse.
- A typical warm-up time is 15 min for an ACM3000:
 - 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.
- Long-term usage under corrosive gases must be avoided.
- Zero calibration should be conducted in clean air.
- Intensive vibration and impact on ACM3000 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.
- High concentration organic vapor and direct solvent contact should be avoided.

3.4 Cross-sensitivity

Table 2. Cross-sensitivity of ACM3000

Gas	Concentration (ppm)	CO reading (ppm)
H ₂	100	32
NO ₂	5	0
Ethanol	200	0
H ₂ S	50	0
SO ₂	20	0

The cross-sensitivity data in Table 2 is for reference only. These values are obtained based on tests conducted on a small number of sensors and the values may vary from batch to batch. Calibration with professional instrument should be carried out for the most accurate measurements.

3.5 Pin definition

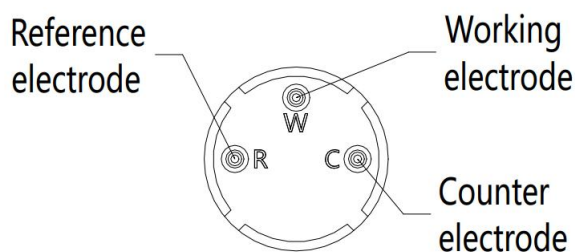


Figure 5. ACM3000 pin definition diagram

4. Storage

- Organic solvents and vapors during storage must be avoided.
- Working electrode and reference electrode should be short-circuited during storage.

Warning and personal injury

Do not apply this product to safety protection devices or emergency stop equipment, and any other applications that may cause personal injury due to the product's failure. Do not use this product unless there is a special purpose or use authorization. Refer to the product datasheet and application guide before installing, handling, using or maintaining the product. Failure to follow this recommendation may result in death and serious personal injury.

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Description of warranty period

Accessories category	Shelf Life
ACM3000	One year

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