AQSnet20
Gas Detector
Datasheet

> Overview

AQSnet20 can measure the gas concentration, air temperature and humidity, and output the data through the RS485 Modbus-RTU protocol. The sensor responds quickly, has anti-interference technology, and can be calibrated to ensure measurement accuracy. The equipment is powered by 5V DC, can be used with other equipment without complicated installation, and can easily be integrated into larger systems.

Solid polymer electrochemical technology is a revolutionary innovation in the field of electrochemical detection. This technology is based on the principle of electrochemical catalytic reaction caused by the target gas leading to a electrical signal that is direct proportional to the gas concentration.

The sensor module is composed of three catalytic electrodes, a solid electrolyte, and gas diffusion holes. The gas reaches the working electrode of the sensor through the diffusion holes, an electrochemical redox reaction occurs on the porous micro-surface of the electrode, the solid electrolyte conducts electron transfer, and generate a current signal as an output. The current signal can characterize the gas concentration.

> Features

◆ Electrochemical detection of solid polymers.

◆ A wide temperature range of -40 ℃ to 50 ℃.

◆ Measures temperature and humidity.

◆ Easy to install and mount.

◆ Factory calibration also supports user self-calibration.

◆ High-precision measurements even in the most demanding environments.

◆ Robust design for long-term exposure to environments with high ammonia concentration.

> Application

◆ Gas Monitoring in Industrial Manufacturing Processes

◆ Animal Husbandry and Smart Public Toilet Gas Monitoring

◆ Landfill and Sewage Treatment Plant Gas Monitoring

◆ Environmental Monitoring

◆ Industrial Gas Emission Monitoring

› Specifications

The Basic Parameters

Supply Voltage	5～24V DC (推荐12V电源)4.5 ~ 5.5V DC (recommended 5V power supply).
Supported Protocol	MODBUS-RTU RS485
IP Rating	IP65 (The equipment should be protected from direct sunlight and rain over long periods of time)
Operating Temperature	-40 °C to 50 °C (best operating temperature 20 °C to 35 °C).
Operating Humidity	15% to 95% RH (non-condensation) (best operating humidity 50% RH).
Ambient Pressure	Atmospheric pressure ± 10 %.
Cable Length	2 meters

Gas Sensor Parameters

Gas	Please see "Gas List"
Range	Please see "Gas List"
Resolution	Please see "Gas List"
Accuracy	± 5% (Mesurement value)

Temperature & Relative Humidity Sensor Parameters

Parameters	Range	Resolution	Accuracy
Temperature	-40 °C to +50 °C	0.1 °C	± 0.5 °C
Humidity	15%~95% RH	0.1% RH	± 5 %

Power

Operating Current	6mA（典型值5V DC），3.2mA（典型值12V DC）

Performance Reference

	Parameters	Min	Typical	Max	Unit
RS-485 mode	Warm-up Time[1]	-	5[2]	-	minutes
	Poll Rate[3]	-	1	-	seconds
	Response Time[4]	-	30	-	seconds

[1] The time from when the sensor is powered on to when the data is read. Note the parameter when the sensor is powered on.

[2] If started in an environment with clean air it requires less time.

[3] The measurement data update interval, after the power-up warm-up time, if the power supply continues, the sensor periodically updates the reading at this interval.

[4] T90<30 s

Sensor Wiring

Yellow Wire	RS485+/ A / T+
Green Wire	RS485-/ B / T-
Red Wire	VCC+
Black Wire	VCC- (GND）

› Order Information

05-AQSnet20- [A] - [B] - [C] -01

Gas Type	Range	Temperature and Humidity Sensor
CO_2	100	TH
NH_3	5000	/
……	……	

Example 1 (Toxic Gas):
05-AQSnet20-NH_3-100-01
05-AQSnet20: AQSnet20 Gas Detector
NH_3: Detects Ammonia (NH_3)
100: Measurement range is 0-100 ppm

Example 2 (Carbon Dioxide Gas):
05-AQSnet20-CO_2-5000-TH-01
05-AQSnet20: AQSnet20 Gas Detector
CO_2: Detects Carbon Dioxide (CO_2)
5000: Measurement range is 0-5000 ppm
TH: Equipped with temperature and humidity sensor

Note: TH indicates that it is equipped with a temperature and humidity sensor, which is only included in the CO_2 sensor

› Gas List

No.	Gas	Gas Formula	Range	Resolution	Response Time
1	Carbon Dioxide	CO_2	400-5000 ppm	1 ppm	< 3 s (T90 < 40 s)
2	Hydrogen Sulfide	H_2S	0-100 ppm	0.1 ppm	< 3 s (T90 < 30 s)
3	Ammonia	NH_3	0-100 ppm	0.1 ppm	< 3 s

Disclaimer

The AQ Sense performance data stated above is based on data obtained under test conditions using the AQ Sense gas distribution system and AQ Sense test software. In the interest of continuous product improvement, AQ Sense reserves the right to change design features and specifications without notice. We are not responsible for any loss, injury or damage caused by this. AQ Sense assumes no responsibility for any indirect loss, injury or damage resulting from the use of this document, the information contained therein or any omissions or errors herein. This document does not constitute an offer to sell. The data it contains are for informational purposes only and cannot be considered a guarantee. Any use of the given data must be evaluated and determined by the user to comply with federal, state and local laws and regulations. All specifications outlined are subject to change without notice.

⚠️ **Warning**

AQ Sense devices are designed for use in a variety of environmental conditions. However, due to the principles and characteristics of sensors and to ensure normal use, users must strictly follow this article during storage, assembly and operation of the device. Although our products are highly reliable, we recommend checking the device's response to the target gas prior to utilization to ensure on-site use. At the end of the products service life, please do not discard any electronics in the domestic waste, instead follow the local governments electronic waste recycling regulations for disposal.

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