



TB600B&C Gas Module

— User Guide —

Contents

| | |
|---|---|
| Storage | 2 |
| Packaging and transportation | 2 |
| Steps for usage | 2 |
| 1. Wiring..... | 2 |
| 2. Stabilization time..... | 2 |
| 3. Diffusion..... | 2 |
| 4. Temperature and humidity effects..... | 2 |
| Precautions | 3 |
| Sensor quality inspection | 4 |
| Disclaimer | 4 |
| Warning | 4 |

Thank you for choosing EC Sense TB600B/C Gas Module. Please read this document in detail before use in order to employ our products correctly and effectively.

Storage

The solid polymer sensor can be stored for more than 1 year at a humidity of 20%- 95% and a temperature of -5°C to +25°C. Ensure that the storage environment is free of gases and substances that may contaminate the sensor. The more than 12 hours polarization time of the sensor can fully activate the electrolyte and restore the best detection state at a storage time of more than half a year.

- The best storage environment is: Temperature -5°C to +25°C , relative humidity 25%- 95% (non- condensing).
- The storage environment must be kept clean of any pollution gas, organic gas, dust and smoke.
- Avoid storage with alcohol (ethanol), perfume, sodium silicate, and polyurethane liquids and solids.

Packaging and transportation

- Avoid prolonged direct sunlight during transportation, prevent rainwater penetration.
- Transport packaging should be protected by shock-proof bubble film or non-odor environmentally friendly sponge.
- During long-term long-distance transportation, the temperature in the sensor package should be kept as close as possible to 40°C and the maximum temperature should not exceed 55°C (do not store or use at this temperature for a long time).
- During the transportation of the finished product, seal the air inlet of the sensor as tight as possible to prevent the contaminated gas from entering the sensor, which will cause the gas value being too high or the stabilization time being too long when using the product for the first time.

Steps for usage

Wiring

- Perform the corresponding wiring according to the identification of the output signal port of the structure diagram. Please refer to the 4Pin signal line label in the "Structure Diagram" above. For the power supply, see the voltage and current ranges marked in the indicators. Note: incorrect wiring will cause the module to malfunction or damage the module.

Stabilization time

- The module is equipped with a plug-and-play function. The module requires a short stabilization time after power-on, usually within 1 minute. However, if the concentration of the contaminated gas is high during storage, transportation or on-site environment, the stabilization time will increase. If the on-site ambient air is highly fluid, there will be fluctuations in the data. Please pay close attention to the on-site environment status. As soon as the output signal is stable and there is no strong convection and air exchange, such as open windows, open doors, fans, air conditioners, fresh air systems, etc., detection can begin.
- (Note: detection modules of different ranges have differences in the first power-on stabilization time under different storage and measurement environments.)
- When the module is stable, the gas is usually present in normal air. Please refer to the gas data released by the nearest local environmental monitoring station for reference.

Diffusion

- The module is used with a diffuse detecting ambient gas, which means the airflow diffuses naturally into the sensor. If the environment has a flow rate, it is necessary to ensure that the flow rate is within 500ml and stable. The change in flow will cause the signal to fluctuate. When the flow is large, there will be a change in pressure that will cause a shift in the sensor signal value. The flow velocity generates pressure, and the change in pressure causes the output signal to change. The signal increases when the pressure increases and the sensor signal changes when the pressure changes abruptly. Avoid a negative pressure environment, environment as this will cause irreparable physical damage to the sensor.

Temperature and humidity effects

- The module has been corrected for temperature compensation through an intelligent algorithm, which is suitable for the detection environment from 0°C to 40°C. The sensor can work in the environment from -40°C to +55°C. In the temperature range, there are detection values outside the temperature compensation. The deviation is large. If you have special requirements, please contact the original factory for customization.
- The sensor is not affected by normal humidity fluctuations. However, rapid humidity fluctuations will cause instantaneous peak changes, mainly due to condensation on the sensor surface caused by humidity changes, changes and prevent outside air from entering the sensor. But the sensor will become stable in a short amount of time. Frequent and rapid changes in temperature or humidity will affect the chemical materials and cause the sensor life to be unexpectedly reduced. Due to the principle and characteristics of electrochemical sensors, changes in the environment have varying levels of effects on the chemical electrolyte inside the sensor. The EC Sense sensor module analyzes the changes of the sensors current data in detail through different environmental temperature and humidity impact tests, and combines the temperature and humidity sensor data to perform algorithmic compensation. During use of the sensor, pay attention to sudden changes in temperature and humidity, as these will cause abnormal fluctuations in the sensor data. The sensor has a good adaptability to the environment. Generally, it can fully adapt and stabilize to the new environment within 5-10 minutes.
- The sensor module must not be used and stored for a long period of time in a high-temperature and low-humidity environment with a humidity below 10% and a temperature above 55°C. Failure to do so may result in a reduced sensor life, failure or invalid test data.

Precautions

- The main function of the gas sensor is to detect the gas composition and content. Please do not let any part of the sensor get in contact with liquids;
- Different gas sensors have different measurement concentration ranges. Do not measure high-concentration gases for an extended period of time during use;
- The white or yellow sheet on the sensor is a waterproof and breathable film, please be careful not to scratch or pull it off;
- Do not block or contaminate the surface of the sensor. Sometimes the blockage of the hole is the cause of reduced sensitivity and slow response time;
- Please do not exchange the sensors of different gas modules. Doing so will cause measurement errors, as all parameters of each sensor and each circuit board are matched and calibrated, and there will be deviations after the exchange;
- Once the ES1 sensor is unplugged and re-inserted into the circuit board, please check that the three electrodes of the sensor correspond to the socket on the circuit board correctly to avoid irreversible damage to the sensor after reverse insertion;
- Excessive shock or vibration, such as shell rupture or exposure of the internal structure, result in non-guaranteed validity of the sensor output;
- Pins must not be broken or bent. Doing so may damage the internal structure of the sensor;
- After prolonged use in a high-concentration gas environment, the sensor only slowly returns to the initial state. The recovery speed is proportional to the overrange multiple;
- The sensor should avoid contact with highly concentrated and highly viscous gases over a long period of time;
- Please do not disassemble the sensor at will, it will damage the sensor;
- Measurement range and accuracy: Select a gas sensor whose measuring range and accuracy match the actual application requirements and gas concentration range. Otherwise, the gas cannot be distinguished, accurate data cannot be obtained and evaluated and the sensor may be damaged;
- Due to the principle and characteristics of the electrochemical sensor, the sensor should be kept in continuous operation for as long as possible to ensure long life and the best operating condition;

Sensor quality inspection

- Each sensor produced by EC Sense has a factory inspection test report and a comprehensive performance test of the main indicators of the sensor. In the sensor manufacturing process we will perform four index tests in different process links to screen out nonconforming products. Prior to the production and delivery of the material, each sensor is tested before entering the warehouse. The sensors are installed in the gas distribution test system and standard gas is continuously introduced in full volume for 3-5 minutes. After the test is completed, the system will automatically generate a standard sensor test report (including: serial number, sensitivity, response time T50, T90, return zero time, zero current, maximum current value) in strict accordance with the preset system parameters of the qualified standard product. If the sensors exceed the standards, they get rejected and treated as nonconforming products.
- All modules are calibrated with standard gas to ensure the consistency and accuracy of the sensor.

Disclaimer

The EC Sense performance data stated above is based on data obtained under test conditions using the EC Sense gas distribution system and AQS test software. In the interest of continuous product improvement, EC Sense reserves the right to change design features and specifications without notice. We do not accept any legal responsibility for any loss, injury or damage caused thereby. EC 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

EC Sense sensors are designed for use in a variety of environmental conditions. However, due to the principles and characteristics of solid polymer electrochemical sensors and to ensure normal use, users must strictly follow this article during storage, assembly and operation of the module. General-purpose PCB circuit board application methods and illegal applications / violation of the application will not be covered by the warranty. Although our products are highly reliable, we recommend checking the module'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.



**Business Centre
Europe and the rest of the world**

EC Sense GmbH
Wangener Weg 3
82069 Hohenschäftlarn, Germany
Tel: +49(0)8178-99992-10 Fax: +49(0)8178-9999-211
Email: office@ecsense.com
www.ecsense.com www.ecnose.de

**Business Centre
Asia**

Ningbo AQSystems Technology Co., Ltd.
F4-17 Building, Zhong Wu Technology Park No.228,
Jin Gu Bei Road, Yinzhou District NingBo,
Zhejiang Province, P.R. China Post Code: 315100
Tel: +86(0)574 88097236, 88096372
Email: info@aqsystems.cn
www.ecsense.cn, www.ecnose.de