

# ECtox

## Long Lifetime

## Ammonia Gas Sensor Device

## Datasheet





## Product Overview

The Ammonia Gas Sensor Device, in combination with the principle of coulometry, delivers a high-precision gas detection technology. The higher the ammonia concentration the faster the sensor will be drained. Therefore the sensor lifetime will deteriorate rapidly and more maintenance will be needed.

The ammonia concentration in the livestock industry has various negative effects on the animals and our environment. In a high ammonia concentrated environment the livestock has a higher risk of contracting a disease. The air surrounding the farm, both inside and outside, is polluted and has a pungent smell.

ECtox's big advantage, while continuously working with a high ammonia concentration, is its long lifetime. A pump easily transports the gas to the sensor without the need to calibrate. The sensor can be used for livestock farms, ammonia leakage detection and cooling storages. The output signal, RS485 (Modbus), will effortlessly connect with a gas detector, DCS, PLC or wireless systems.



## Features

- Smart measuring system
- Works on back Ammonia concentration continually
- Combined with intelligent algorithms it has better adaptability to the environment
- Higher accuracy in detection and stable zero point
- With pump, no calibration with NH<sub>3</sub> gas needed
- New microcircuit design, strong anti-electromagnetic interference ability
- No temperature and humidity influence
- RS485 output, 5-12V DC power
- Stainless steel housing, water and dust proof, anti-corrosion
- The detection range is automatically adjusted to the concentration range of the measured gas, from ppb to higher ppm level
- Continuously monitors its own fault conditions, Sensor, Pump, Power etc.
- RoHS eco-friendly design
- Self-monitoring of the sensor function

## Application

- Livestock farming
- Leakage detection
- High concentration monitoring
- High temperature conditions
- Process Ammonia monitoring
- Cooling storage



NH<sub>3</sub> Ammonia

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## Easy Gas Sensor Device Innovations

### Principle

The ECtox device contains an EC Sense solid electrolyte NH<sub>3</sub> gas sensor featuring long lifetime, robustness and selectivity. Based on a specific electrochemical reaction and in combination with a sample pump the device measures Ammonia concentration in a wide range.

The gas reaches the working electrode of the sensor by a certain pump volume, which is always constant. All NH<sub>3</sub> in the offered gas volume will be consumed by the sensor. It creates a signal peak, which is proportional to the Ammonia concentration in the measuring gas. No calibration is necessary due to the coulometric measuring principle.

The sampling system is good for different densities, the speed of diffusion and convection is usually slow or depends on the environment, and temperature and different concentration influenced the speed of molecular motion. Sampling System let gas easy going to sensor.

### Cross Sensitivity

Gas	Formula	Concentration (ppm)	Response(ppm)
Carbon Dioxide	CO <sub>2</sub>	1000	0
Carbon Monoxide	CO	50	0
Chlorine	Cl <sub>2</sub>	10	-1
Hydrogen	H <sub>2</sub>	100	0
Hydrocarbons (unsaturated)	/	/	n.a
Hydrogen Sulfide	H <sub>2</sub> S	50	20
Hydrogen Cyanide	HCN	10	<-5
Isopropanol	C <sub>3</sub> H <sub>7</sub> OH	1000	n.a
Nitric Oxide	NO	25	<-3
Nitrogen Dioxide	NO <sub>2</sub>	10	-10
Sulfur Dioxide	SO <sub>2</sub>	50	0

Note:

1 ) The above interference factors may differ from sensor to sensor and service life, please refer to the actual test results.

2 ) This table is not complete for all gases, and the sensor may be sensitive to other gases.

### Order Informations

Product Name	Part Number	Range	Resolution
Ammonia Gas Sensor Device	05-ECtox-NH <sub>3</sub> -500-01	0-500ppm	0.1ppm
Ammonia Gas Sensor Device	05-ECtox-HT-NH <sub>3</sub> -500-01	0-500ppm	0.1ppm
Cable	02-LEMO-HXT-1423-1M-01	1m	
	02-LEMO-HXT-1423-10M-01	10m	
Fixed Assembly	02-ECtox-Bracket-SS-01	Optional accessories	

Note: 05-ECtox-HT in above order information are for higher temperature application.

## Specification

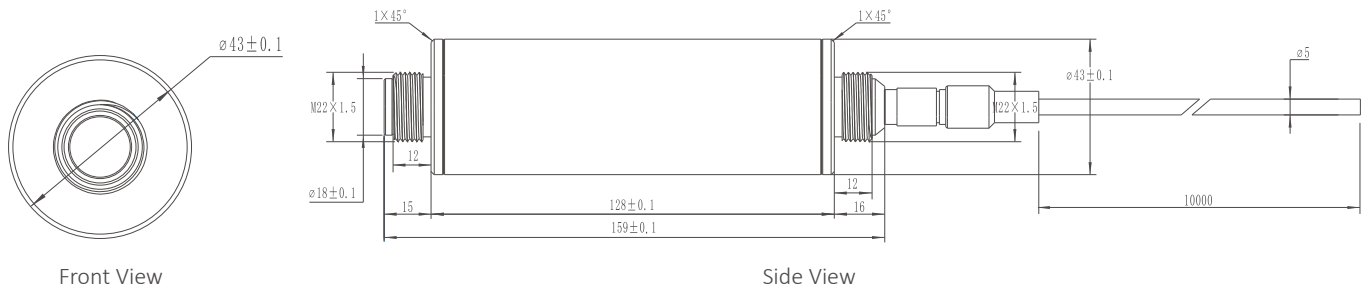
Principle	Solid Polymer Electrochemical Detection Technology		
Detection of gas	Ammonia		
Detection Range	0-500ppm	Resolution: 0.1ppm	Lowest Detection Limit: 1ppm
Full-scale accuracy error	± 5% F.S		
Repeatability	≤ 2%		
Settling time	Note: Exposure to harsh chemicals, high concentrations of alcohol, acetone, and ethanol gas during storage may lead to extended warm-up time		
Response time	Dependent on the selected measuring period, between 1 to 10min		
Calibration Gas	The gas distribution standard uses clean air as the background gas, the humidity is 50%, and the normal temperature environment		
Sensor expected life time	≥ 2 years Note: Temperature (0-25) °C, humidity (30-50)% RH, the measured gas concentration is within the range, there is no gas environment that affects the warm-up time mentioned above		
Long-Term Drift	< 1% /month		
Output	RS485 (Modbus protocol), Baud rate: 9600 4Pin Leomo Cable with 1m (Other lengths on request)		
Get data command	See ECtox protocol document for details		
Working Voltage	5V to 12V DC		
Maximum Current Consumption	1A		
Maximum Power Consumption	5W		
Working temperature	-20°C to +55°C		
Optimal working temperature	25°C		
Working humidity	15 ~ 95% RH. Non-condensing		
Optimum working humidity	50% RH.		
Working pressure	Atm ± 10% Keep Stable Pressure		
Size	159 x 43 (mm)		
Weight	ECtox: 450g		
Temperature and humidity sensor data	Temperature Range: -40 to +85°C		Relative error: ± 0.2 °C
	Humidity measurement range: 10 to 95% RH. non-condensing		Relative error: ± 2%
Warranty	12 months		

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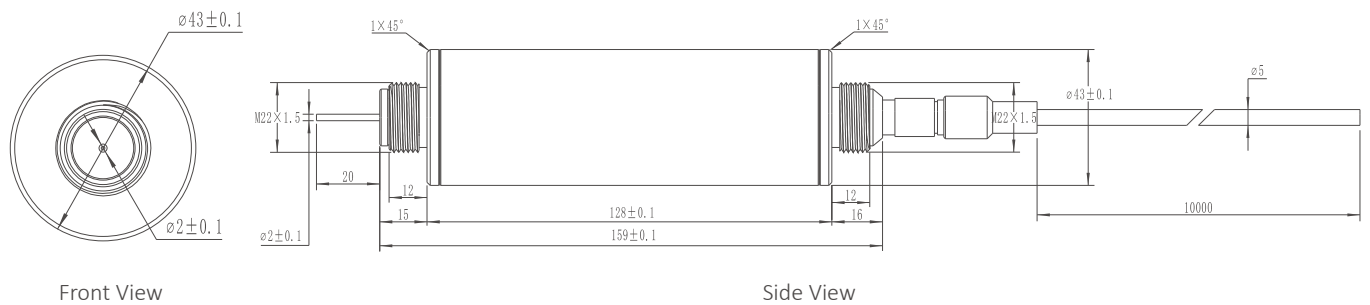
## Easy Gas Sensor Device Innovations

### Mechanical Drawing (unit: mm)

05-ECtox-NH<sub>3</sub>-500-01 Dimension Diagram

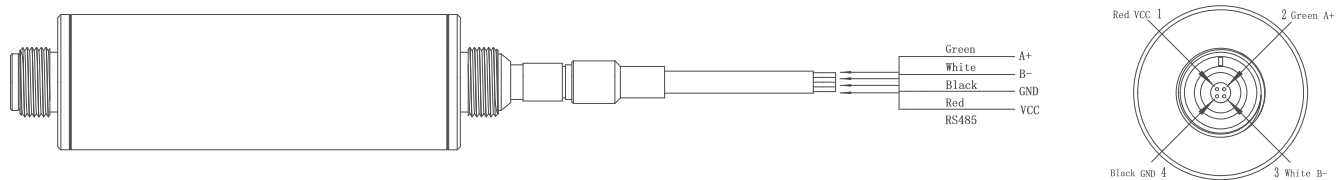


05-ECtox-HT-NH<sub>3</sub>-500-01 Dimension Diagram

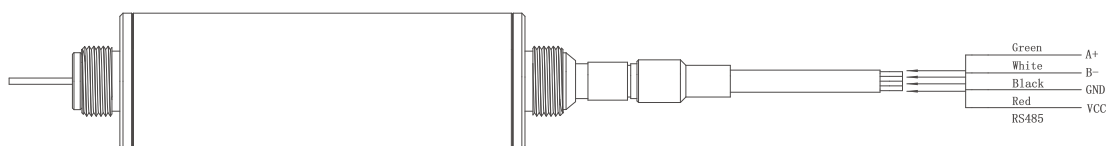


### Connection

05-ECtox-NH<sub>3</sub>-500-01 Connection



05-ECtox-HT-NH<sub>3</sub>-500-01 Connection



## Disclaimer

EC Sense Performance data stated is based on test conditions with new sensors at 25°C, 55%rH and 1 atm, using EC-Sense calibration Systems and AQS Testing System. Cross sensitivity gases are not target gases. Relations and performance can change, also with ageing of the sensor. In the interest of continued product improvement, EC-Sense reserves the right to change design features and specifications without prior notification. We do not accept any legal responsibility for customer applications of our sensors. EC-Sense accepts no liability for any consequential losses, injury or damage resulting from the use of this document, the information contained within or from any omissions or errors here in. This document does not constitute an offer for sale and the data contained is for guidance only and may not be taken as warranty. Any use of the given data must be assessed and determined by the user there of to be in accordance with federal, state and local laws and regulations. All specifications outlined are subject to change without notice.

## Warning

The EC-Sense sensor is designed to be used under various environmental conditions. During storage, assembly and operation, due to the principle and characteristics of the liquid electrochemical sensor, in order to ensure normal use, users should strictly follow this article when using this module. General-purpose PCB circuit board application methods and illegal applications will not be covered by the warranty. Although our products have high reliability, we recommend checking the module's response to the target gas before use to ensure on-site use. At the end of the product's service life, please do not discard any electronics in household waste. Please dispose it in accordance with local government regulations on electronic waste recycling.





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