



MACView®
MEASUREMENT
TECHNOLOGY

MACView®

continuous measurement of ammonia in livestock

**AMMONIAK
GAS SENSOR**



Ammonia in livestock

Ammonia or NH₃ has a widespread use in many industrial and agricultural sectors and is one of the most produced substances in the world. Dealing with ammonia also takes place in livestock farming. Stables with calves, pigs and poultry generally have a climate in which increased CO₂ and ammonia concentrations are present. These concentrations of ammonia are generally difficult to measure. With the introduction of the MACView®-NH₃ Gas Sensor, reliable and continuous measurement in stables has become accessible.

Ammonia concentrations in the atmosphere occur from a few ppbs. Ammonia is toxic to humans if it occurs in concentrations from a few ppm and requires an effective solution for detection and protection in most industrial environments. Traditional sensor technologies (such as electrochemical and semiconductor detectors) show serious disadvantages in selectivity, service life, accuracy, functional safety and the high costs of maintenance.

EMS has developed an ammonia sensor especially for livestock farming based on the principle of optical measurement technology that no longer has these disadvantages. With this measurement technology, accurate and reliable continuous measurement can be made.



Application 1: Space measurement ammonia and CO2

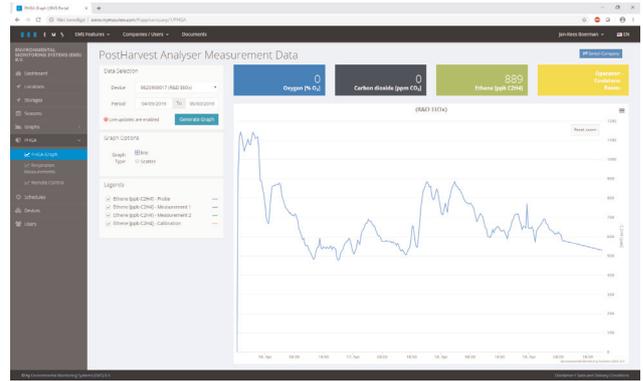
The ammonia emissions come from metabolic activities related to bacteria in the livestock farming of poultry, cattle and pigs. Ventilation in the stables must be managed to prevent critical exposure of animals to ammonia which in the long term results in animal stress and inflammation, reduced health and productivity. It is useful to monitor the concentrations of ammonia and to link the measurement signal to the ventilation. Processes can thus be made transparent and the climate is improved fully automatically via the climate computer by controlling the ventilation in the house on the basis of the ammonia concentration. This improves processes and animal welfare. This ultimately results in lower costs and higher quality and production.



Preventie van luchtweginfecties door NH3 monitoring

Application 2: Measurement ammonia, CO2 emissions

Measurement of ammonia and CO2 emissions For livestock farming, it is useful to know the actual emissions per house. With the measuring system it is possible to make clear what the actual ammonia and CO2 emissions are. This is possible when an optional air flow sensor for air quantities is connected to the sensor. The flow rate from the stable is therefore measured, and the total ammonia and CO2 emissions are determined from this. Changes in concentrations are caused by changes in processes in the house.



Eenvoudige toegang via www.mymacview.com

Application 3: Efficiency measurement NH3 scrubbers

Efficiency measurement of NH3 air scrubbers by determining the efficiency of ammonia from air scrubbers, disruptions of the air scrubbers can be observed easily and above all quickly. The samples are taken fully automatically by the sensor at the entrance and the exit of the air washer. The efficiency measurement allows the farmer to easily monitor the entire system with just 1 sensor.

www.mymacview.com

All data is available quickly and easily via the mymacview.com portal. The measured concentrations are automatically sent from the MACView®-NH3 sensor via the internet to the portal. The user can log in to the portal with a login name and password. Graphs of the measured concentrations are visible on the portal. The portal also offers options for downloading data in well-known file formats such as Excel, PDF, or images. It is possible to make settings where the user is periodically (for example every day at a fixed time) informed with the measurements of the last 24 hours. Alarms can be set that are sent by e-mail. From the portal, rights can be assigned by the owner or user and users can be created who can view the data.



Advantages

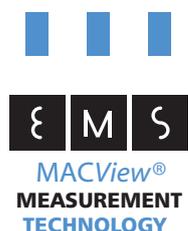
- Extremely high selectivity of the ammonia measurement.
- No cross sensitivities.
- The sensor is not affected by exposure to hydrogen sulphide (H₂S), CO₂, water vapor, temperature, combinations of aromatic compounds such as C_xH_x alkanes (methane, ethane), nitrogen oxides, CO, H₂.
- Functional safety, continuous status reporting.
- Virtually unlimited sensor life.
- Easy maintenance, automatic calibration, (no regular replacement and / or calibration of the sensor itself) (of course, filters must be replaced over time by the user himself).
- High sampling rate, 1 measurement every 15 minutes.
- Efficiency monitoring is possible through the 2 inputs.
- Pump and valves are integrated.
- Sensor functions well in all percentages of relative humidity and in a temperature range of -5 ° C to 40 ° C.

These properties make the sensor excellent for measuring ammonia concentrations in the agricultural environment.

Summary

The MACView®-NH₃ Gas Sensor is a reliable gas measurement system that has overcome the disadvantages of other measurement principles. The use of this system focuses more on monitoring, process monitoring and prevention. Particularly for farmers who want to know which processes are taking place in and around the barn, this measurement system provides a clear insight into the business process and air quality. By understanding these processes, the business process can be further optimized and improved. Part of this process is: Reduction of emissions, reduction of disease pressure, improvement of air quality, improvement of the process and a clean and safe working environment. A simple tool is made available through the mymacview.com portal to view data. No tricky software or technology, no software installations.

The MACView®-NH₃ Gas Sensor is pure ease of use.



TECHNICAL SPECIFICATIONS

MACView®-Ammonia Gas Sensor

Manufacturer	Environmental Monitoring Systems (EMS) B.V.
Type	MACView®-NH3 Gas Sensor (Ammonia)
Applications	<ol style="list-style-type: none"> 1. Room measurement of ammonia and CO2 in stables 2. Emission measurement of ammonia and CO2 from stables 3. Efficiency measurement of air washers / purifiers on the removal of ammonia from the air. (input / output)
Measurement principle	Optical PED [P] D principle. Solid state Paired Emitter Detector (Photo) Diode. Based on a combination of physical and chemical wavelength change
Measurement range	0 to 30 ppmV / 0 to 50 ppmV
Accuracy ammonia	+ - 0.2% of the measuring range, standard deviation 0.09 ppmV
Resolution measurement	0.01 ppmV
Measurement speed	15 minutes per sample
Optional sensor	<ol style="list-style-type: none"> 1. CO2 (Carbon dioxide) sensor can be added. 2. Flow sensor to measure the amount of air emissions
Measuring range CO2	0 to 10.000 ppmV, 1 ppm resolution
Temperature range	-5°C to +40° C
Relative humidity	0% to 99% RH (non condensing)
Sample inputs	2 separate sample inputs for sampling 2 suction points, suitable for efficiency measurement on air washers / purifiers
Reading	Through the internet browser and user portal: www.mymacview.com , there are graphs, data downloads, and operation
Data connection	Standard GPRS / UMTS (2G / 4G) with SIM card present (worldwide coverage)
Status reading	Graphic display, NH3 concentration indication and menu with intuitive operation
Analog outputs	2 pieces 4-20 mA or 0-10 Volts (adjustable) for connection to climate computer
Digital signals	<ul style="list-style-type: none"> - 1 digital input for various applications - 1 digital output for alarms and various applications
Maintenance	Changing of filters can be carried out by the user
Calibration	At the bottom of the system, 2 small 1 liter gas bottles can easily be connected. This means that the system calibrates itself periodically, without this having to be carried out by the user or a service organization.
Housing material	Stainless steel powder-coated IP67 housing
Housing dimensions	Height x width x depth: 361 x 245 x 180 mm
Housing weight	12.4 kg