MS3500
Ammonia Monitor for Wastewater

multisensor systems
sensing measuring protecting

Product Description

The MS3500 is an Ammonia Monitor designed to measure Ammonia in treated and **untreated Waste Water**.

It provides on-line, real time monitoring for process control, environmental protection and the protection of plant in water treatment facilities.

The use of a **non-contact measurement system** virtually eliminates fouling, corrosion of probes and sensitivity to water conditions. The MS3500 provides low cost of ownership through high reliability together with long servicing and validation periods.

The MS3500 combines innovative sensor and instrument engineering with proven sampling techniques to provide a reliable and efficient system for measuring Ammonia in the harshest conditions.

Supplied in a robust enclosure the MS3500 can be deployed on site with **minimum preparation** and no need for protection from the environment.

Applications

- **Raw Waste Water** Flows
- Waste Water Treatment Process Control
- Treated Waste Water Discharge monitoring
- Sludge de-watering Ammonia measurement

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Background

The Multisensor Systems MS3500 is a non-contact system for measuring Ammonia levels in the most arduous of conditions at the head of a waste water treatment facility. Its intended applications are to provide data for process control, with resultant reductions in energy and chemicals needed for treatment, to allow monitoring of the re-circulation of high Ammonia loads and in process monitoring.

The system comprises a sampling chamber filled by a vacuum pump, a sensor head, pneumatics and an instrument which provides the user interfaces, communications and control functionality.

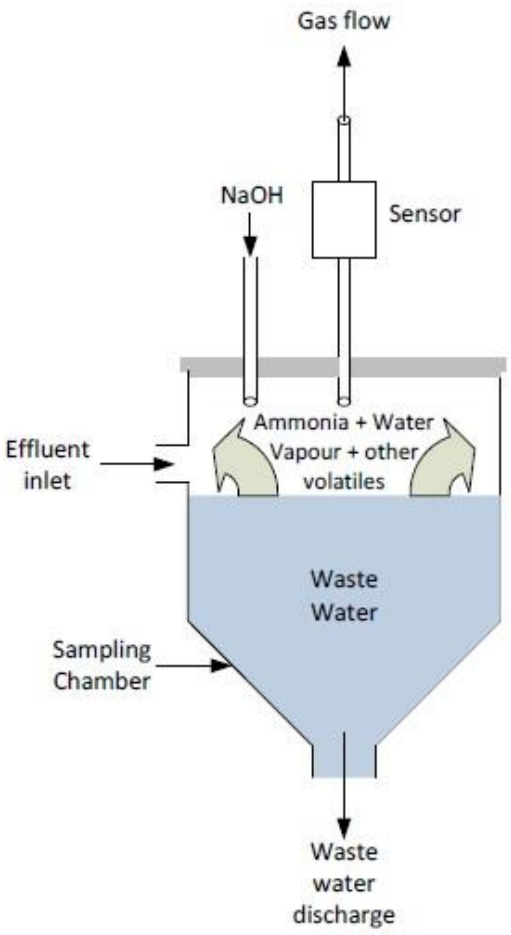
The system is enclosed in a temperature controlled enclosure which can be positioned outside without further components or cost

Principle of Operation

The principle of operation is the measurement of headspace gases from a sample tank containing the waste water to be measured.

The MS3500 works by passing water through a sample tank as shown in the figure. Sodium Hydroxide (NaOH) is added to increase the pH of the waste-water, converting $NH4^+$ to Ammonia. According to Henry's Law, the concentration of gases in the headspace is proportional to the concentration of the substance in the water. The Ammonia and other volatiles in the waste water will pass into the headspace above the waste water where it will be trapped. This will continue until an equilibrium is reached.

A sample of the headspace gas is then passed across sensors in the MS3500 sensor head which respond to the Ammonia in the headspace but reject other contaminants. This response is then analysed by the instrument and a concentration value is generated based upon the relationship between the concentration present in the headspace and that in the water.



Key Benefits

- Energy reduction through accurate process control
- Reduced use of chemicals
- Low maintenance costs
- High reliability

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Typical Wastewater Application

The customer needed a way to measure ammonia levels in the wastewater coming into the works. This was to allow them to implement a feed forward control of their process as part of a plant optimisation project.

After a successful 1 year trial, three units are to be installed in the same WwTP.

The WwTP serves a population equivalent of 1 million people. Thanks to the MS3500 the operator of the plant will be able to better monitor the ammonia levels, identify where and when peaks occur and take appropriate actions. In terms of savings there's an expectation that the improved process control will result in the instruments paying for themselves in less than 2 years.

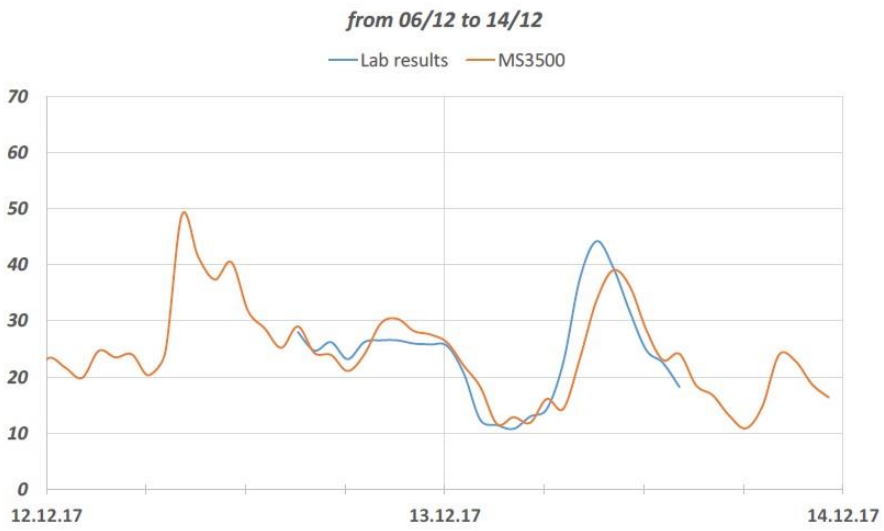
Additionally the system will identify the timing of peaks to locate industrial dumping into the sewer network for prosecution of those responsible.

Typical Performance

Typical response compared to measurement from a certified laboratory.

Various trials and tests have been carried out at various locations.

The system performed well with minimum maintenance required, no blockages and consistent trending.



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Key Performance Parameters

Parameter	Operational Requirements		Notes
	Minimum	Maximum	
Supply Voltage	90 V AC	240 V AC	50 Hz or 60 Hz
Power Consumption at 20 ˚C operating temp		70 W	
Power Consumption at 5 ˚C operating temp		250 W	Includes heater
Sample lift height		6 m	
Working Temp: Ambient	-10 ˚C	50 ˚C	In still air
Working Temp: Water	1 ˚C	50 ˚C	
Sampling Period	30 mins	60 mins	User selectable. High concentrations may limit the minimum time period allowed
System Enclosure	Glass Reinforced Plastic		
NaOH Consumption	30 l/year		60 minute sampling
Detection range	1 ppm	200 ppm	
Repeatability	-2%	+2%	
Analogue Output	4 mA	20 mA	Scalable to range required, max load 900 R
Analogue Output Isolation	400 V		Continuous. Opto-isolated.
Digital Interfaces	Profibus, Modbus		WiFi, 4G, Bluetooth also available
Relay Voltage		50 V	2x, Alarm 1 and Alarm 2 Relays with NO and NC contacts
Relay Current		5 A	
Weight	25 kg		
Dimensions	750 x 750 x 350 mm		Option: Mounted on frame

Validation Period

6 Months - using Validation Kit available from Multisensor Systems or Authorised Distributor

Consumables

Every 6 Months: Air Filter Contents (Active Carbon), Dust Filter Element
Every 12 Months: Sample Tank Seals

