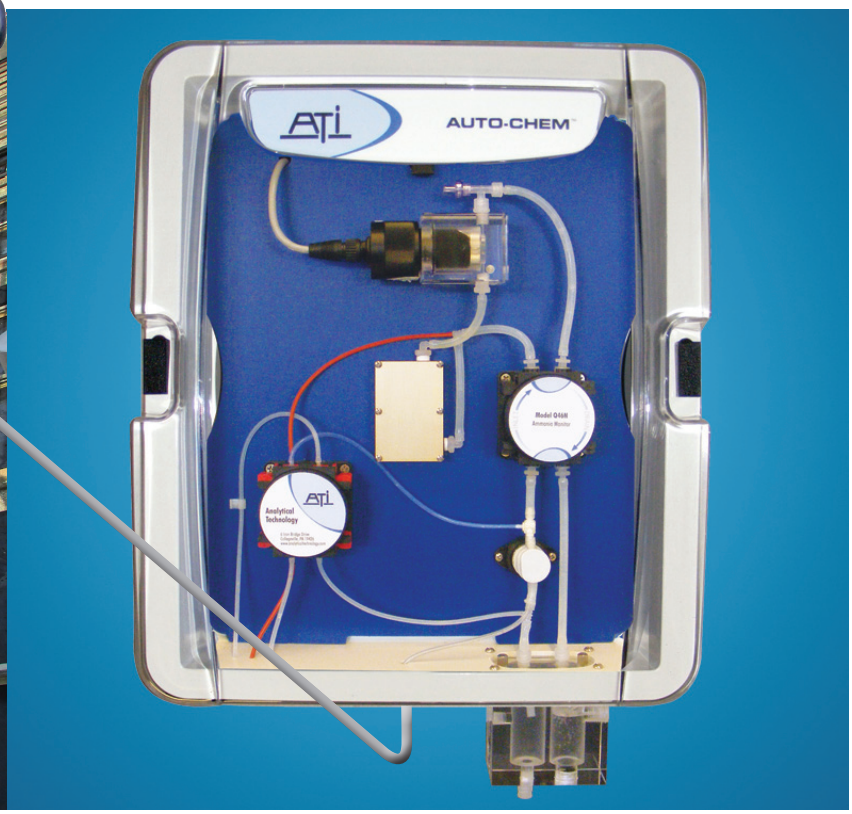
AmmoniaMonitor
Model Q46N



On-Line monitoring of Ammonia in water is of increasing importance due to the increased emphasis on nutrient reduction in lakes, streams, and estuaries. Unfortunately, simple direct measuring sensors have not proven sufficiently reliable, and rather complicated systems have been developed to address the measurement problem. These systems can be used but require substantial maintenance and are expensive to purchase. ATI has developed a new approach to on-line monitoring of ammonia that is easier to operate and less expensive than competitive systems, but with the reliability you need.

- Fast response time for real time ammonia measurement
- Simple chemical system uses inexpensive reagents
- Display of Free Ammonia, Monochloramine, and Total Ammonia for chloramination systems
- Automatic response verification for ammonia breakthrough applications
- Multiple digital communication options: Profibus, Modbus, or Ethernet

Call **800.959.0299** to speak with a sales representative
or visit us on the web at **www.analyticaltechnology.com**

ATi ANALYTICAL TECHNOLOGY, INC.

(ES) Equipements Scientifiques SA - Département Bio-Tests & Industries - 127 rue de Buzenval BP 26 - 92380 Garches
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APPLICATIONS

Chloraminated Potable Water

Wastewater Effluent

Potable Water Intake

Ammonia Chillers

Aquariums

Fish Farms

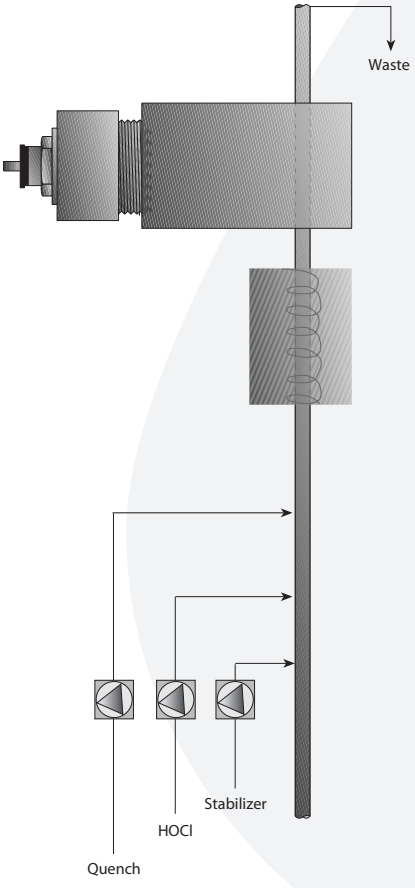
OPERATION

Ammonia measurement is accomplished by the addition of three reagents, each of which is fed using a multichannel peristaltic pump. A stabilizer chemical is injected first to stop calcium precipitation in the tubing. After that, a solution containing free chlorine is injected which results in the conversion of ammonia to monochloramine.

$$NH_4^+ + HOCl \longrightarrow NH_2Cl + H^+ + H_2O$$

The third reagent added quenches the above reaction by removing the excess free chlorine. This ensures that free ammonia in the sample stream is converted to monochloramine, and dichloramine formation does not occur.

Once chloramine formation is complete, the sample is temperature stabilized and pumped to a flowcell containing a special amperometric membraned sensor. This sensor measures the monochloramine formed in the chemical system and produces a highly linear output that is amplified and displayed in the monitor.



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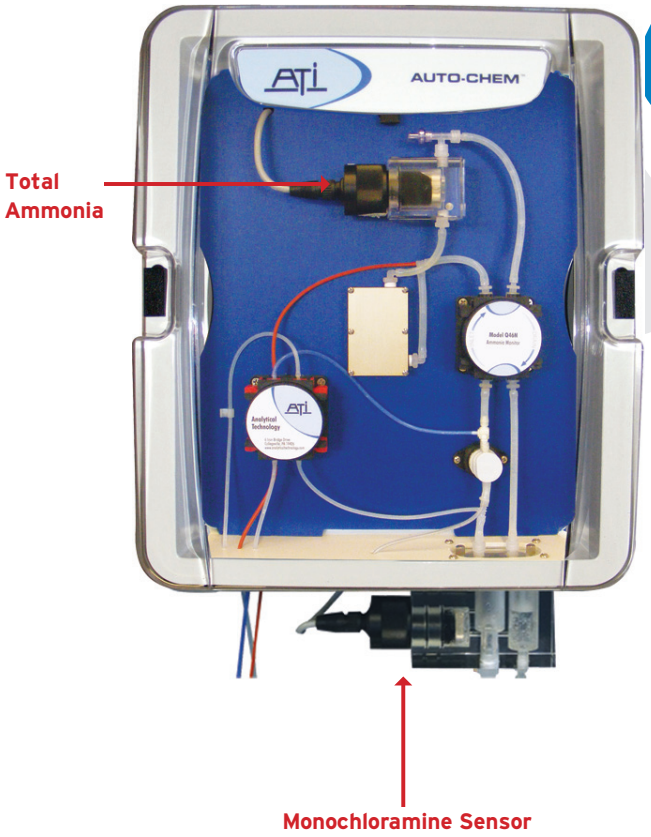
CHLORAMINATION SYSTEM MONITORING

Chloramination in potable water treatment has become common, especially in utilities with large distribution systems. The use of chloramines to reduce disinfection by-products and to provide disinfectant protection throughout a large pipe network has proven useful but does present potential water quality problems if not controlled properly.

A carefully controlled chloramination system will result in the conversion of all free chlorine to monochloramine with only a slight excess of ammonia. This excess ammonia, called “free ammonia”, should be kept as low as possible to avoid the formation of nitrites and nitrates in the distribution system.

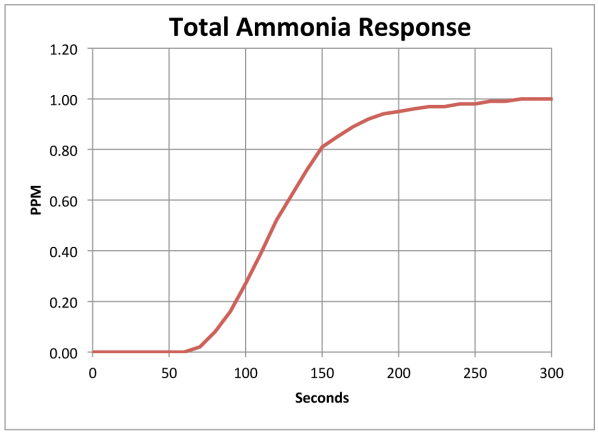
Minimizing the free ammonia concentration requires the accurate measurement of free chlorine to pace the ammonia addition, and also requires an accurate measurement of residual free ammonia. A special version of the Q46N Ammonia Monitor provides the capability of monitoring free ammonia by continuously measuring both total ammonia and monochloramine concentrations. Free ammonia concentration is then derived from these values.

Two sensors integrated into the Auto-Chem chemistry system provide the required measurements. A sensor located in the inlet assembly measures monochloramine concentration in the chloraminated water. After addition of reagents, a second sensor measures the total ammonia concentration. The electronic monitor subtracts the monochloramine ammonia from the total ammonia and displays the free ammonia value.



AMMONIA RESPONSE VERIFICATION

Total ammonia monitors are frequently used in applications where ammonia is not normally present. Under normal operating conditions, refrigeration systems utilizing ammonia chillers have no ammonia in the process water. An ammonia monitor would display 0 PPM until a leak occurs. The Q46N Total Ammonia Monitor provides an automatic response verification system that confirms that the system is functioning properly. At user programmed intervals, a 1 PPM ammonia solution is introduced into the sample stream and the response is monitored to confirm the system is functioning properly. Outputs and alarms are inhibitied during the test and an alarm is generated if the unit fails to respond. This system is not used for applications where ammonia is normally present but is very useful for ammonia breakthrough applications.



Typical System Response Time

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Q46N SPECIFICATIONS

ELECTRONIC MONITOR

Measurement	Total Ammonia (as NH_3 or NH_3-N) Free Ammonia, Monochloramine (as NH_2Cl or NH_2Cl-N)
Display Range	0 – 5.00 PPM for Total Ammonia 0 – 10.00 for Monochloramine (Free Ammonia Systems only)
Response Time	90% in 180 seconds
Accuracy	± 0.05 PPM or 2% of Full Scale
Sensitivity	0.01 PPM
Zero Stability	± 0.01 PPM per month
Electronic Linearity	± 0.5%
Span Drift	Generally less than 5% per month (Application dependent)
Analog Outputs	Two Isolated 4-20 mA, 575 ohms max. (TNH3 Systems) Three Isolated 4-20 mA, 575 ohms max. (FNH3 Systems)
Power	100-240 ±10% VAC, 50/60 Hz., 5 VA max.
Relays	Three SPDT, contacts rated 6 amp @ 250 VAC, 5 amp @ 24 VDC
Digital Output	Options for Profibus-DP, Modbus-RTU or TCP/IP, or Ethernet-IP
Display	4 digit, 0.75″ numeric LCD with 12 character second line, LED back light
Enclosure	NEMA 4X (IP-66) Polycarbonate, V-0 flammability
Operating Temp.	Electronics: -40-60° C
Auto-Verification	Programmable from 1-999 hours (Total NH_3 Only)

CHEMISTRY MODULE

Sensor	Amperometric Membraned Sensor
Interconnect Cable	10 ft. (3 m) standard, 100 ft. (30 m) maximum
Sample Pump	Peristaltic Pump, 13 cc./min.
Reagent Pump	Peristaltic Pump, 0.1 cc/min.
Reagent Usage	25 days per gallon (3.8 L)
Inlet Sample Flow Rate	1-10 GPH (60-600 cc/min) at Inlet Overflow Assembly
Sample Inlet	¼″ I.D. Hose Barb
Sample Drain	½″ I.D. Hose Barb
Power	120 VAC or 240 VAC, 50/60 Hz., 60 VA Maximum
Operating Temp.	2-45° C
Size	15.2″ H x 13.2″ W x 7.1″ D (386 x 335 x 180 mm)
Weight	17 lbs. (7.7 Kg.)

ORDERING INFORMATION

Model Q46N-A-B-C Ammonia Monitoring System

Suffix A - Measurement
1 - Total Ammonia Only
2 - Free Ammonia, Monochloramine & Total Ammonia

Suffix B - Power
1 - 120 VAC, 50/60 Hz.
2 - 230 VAC, 50/60 Hz.

Suffix C - Digital Output
1 - None
2 - Profibus-DP
3 - Modbus-RTU
4 - Ethernet-IP
5 - Modbus-TCP/IP

ACCESSORIES

07-0100 Universal Junction Box, NEMA 4X
31-0027 9-c Sensor interconnect cable, max. 100 ft.
05-0094 Panel mount bracket kit
47-0005 2″ U-bolt, 304 SS
09-0074 Ammonia Reagent A Buffer, 1 Pkg.
09-0075 Ammonia Reagent C Stabilizer, 1 Pkg.
51-0066 Hydrogen Peroxide, 27%, 500 cc bottle (drop shipped, US only)

NOTE:

Each system is supplied complete with Monitor, chemistry module, reagent bottle brackets, reagent pickup tubing assemblies, and spare parts kit. A 20 ft. cable is provided for connection of the sensor inside the chemistry module to the Q46N monitor. Note that Free Ammonia systems (suffix A2) have three 4-20 mA outputs.

ANALYTICAL TECHNOLOGY, INC.

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Represented by:

Q46N (12/15)

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