

# *Continuous, On-Line Monitoring of Dissolved Ammonia*



*Unique Reaction Chemistry Measurement Technology  
Optionally Measures Free Ammonia and Monochloramine*

*Model Q45N*

Dissolved NH<sub>3</sub> Monitor

# Continuous Measurement of Total Dissolved Ammonia

## Applications

- **Wastewater Treatment**
- **Potable Water Treatment**
- **River and Stream Water Quality**
- **Refrigeration Chillers**

Continuous monitoring of ammonia in water and wastewater streams is becoming increasingly important for plant operations and process control. Unfortunately, on-line ammonia monitors are generally very expensive, complex, and labor intensive instruments. Most are automated versions of ammonia selective ion electrode methods better suited to laboratory measurements. Others are automated colorimetric devices or instrumental methods that are difficult to justify on a cost basis.

ATI has developed a completely new approach to on-line monitoring of ammonia that is far less expensive and much simpler than conventional monitoring equipment. The Q45N Dissolved Ammonia Monitor uses reaction chemistry that converts ammonia in solution to a stable monochloramine compound equivalent in concentration to the original ammonia level. The chloramine concentration is then measured with a unique amperometric sensor that responds linearly to chloramines while eliminating interference from excess free chlorine in solution.

Q45N monitors are available in two versions, one that includes all components conveniently integrated into a Nema 4X fiberglass enclosure, and a second that separates the monitor from the chemistry system for applications where a more convenient display location is desired. A sample inlet filter assembly attached to the side of the enclosure allows filtered sample to be drawn from the inlet flow. Sample must be pumped to the inlet assembly at a rate high enough to insure the desired response time for the measurement system. Excess sample is bypassed to any convenient drain location.

The electronic display and alarm package provides the user interface to the system. Ammonia concentration is displayed on a large format LCD display with secondary display for other operating variables. Operating ranges for the ammonia monitor

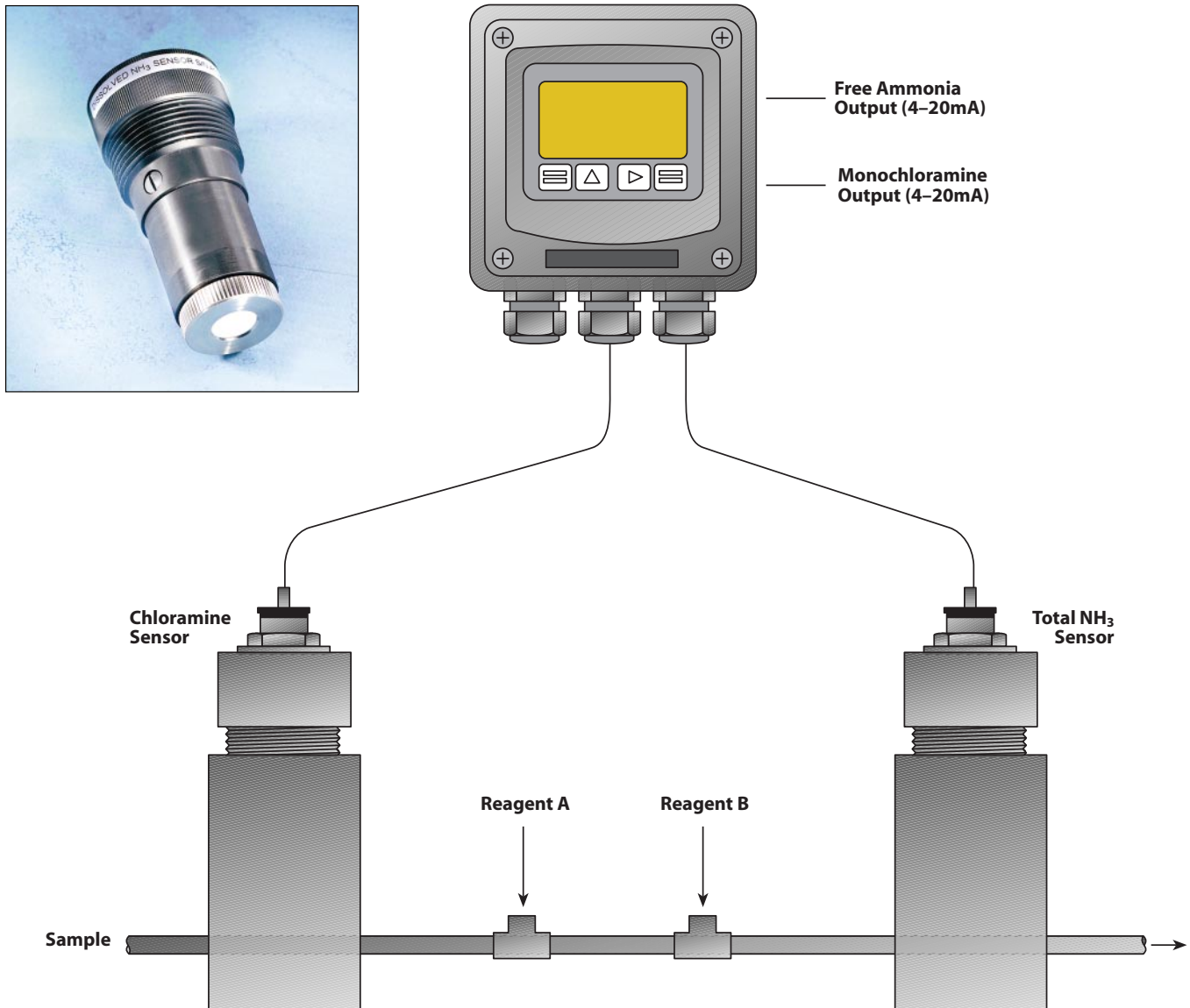


are 0-2 or 0-20 PPM, with a low end resolution of about 0.05 PPM. Response time to changes in ammonia concentration is less than 60 seconds to 90% of a step change in concentration, making the system much faster responding than competitive monitors. Two programmable alarm relays are available for local alarm functions, and two analog 4-20 mA output signals are provided for interface to plant DCS, telemetry, or other supervisory instrumentation.

ATI's Q45N monitoring package for dissolved ammonia provides the measurement stability needed to avoid complicated automatic calibration systems. Unlike typical ammonia SIE sensors subject to significant drift problems, the amperometric sensor provides excellent repeatability for long periods of time. And because the measurement utilizes chloramine conversion for measurement, the sample is inherently subjected to biocidal conditions, eliminating long term biofouling on the sensor.

This new ammonia system represents a major step forward in providing users with a monitor that is both simple to operate and economical to purchase, selling for 50% of the cost of many competitive ammonia monitors. Contact your local ATI representative for additional assistance in the application of this system to your requirements.

# Chloramination Process Monitoring



Chloramination is increasingly being used in potable water systems to limit THM formation and insure disinfection in large distribution systems. Proper control of this process requires the addition of sufficient ammonia to insure that only monochloramine is formed while limiting the amount of excess ammonia to a minimum.

An enhanced version of the Q45N Dissolved Ammonia Monitor is available that provides an excellent tool for monitoring the chloramination process. This system employs two separate sensors, the first measuring monochloramine and the second measuring total ammonia after reagent addition.

From these measurements, the monitor will calculate "Free Ammonia" concentration, which effectively is the excess ammonia that has not combined with chlorine.

This Free Ammonia version can provide two separate 4-20 mA outputs and those outputs may be programmed to track Free Ammonia, Total Ammonia, or Monochloramine concentration. For chloramination systems, it provides operating personnel with continuous confirmation that the process is running correctly, or warns of process problems.

# Model Q45N Specifications

Measurement:	Total ammonia (as $\text{NH}_3 - \text{N}$ )	Power:	115 or 230 VAC, 50/60 Hz, 5 VA max.
Optional:	Free Ammonia (as $\text{NH}_3$ ) and Monochloramine	Alarm Relays:	Two SPDT, 5 A @ 230 VAC resistive
Sensor Type:	Amperometric membraned cell	Relay Coil:	Programmable either normally energized or normally de-energized.
Range:		Enclosure:	Nema 4X Fibreglas, wall mount
Ammonia:	0-2.000 PPM minimum, 0-20.00 PPM Maximum	Controls:	4 membrane switches on front of monitor.
Monochloramine:	0-10.00 PPM	Operating Temperature:	0° to +40° C
Response Time:	90% in 120 seconds	Sample Inlet:	1/2" FNPT
Accuracy:	± 0.1 PPM or 2% of full scale	Sample Drain:	1/2" FNPT
Sensitivity:	0.05 PPM minimum	Recommended Sample Flow:	0.1-0.5 GPM (0.4 - 2.0 LPM)
Zero Stability:	± 0.02 PPM per week	Size:	15.2" H x 13.0" W x 7.1" D (386 x 335 x 180 mm)
Electronic Linearity:	± 0.5%	Weight:	17 lbs. (7.7 Kg.)
Span Drift:	Generally less than 5% per month (application dependent)		
Zero Drift:	± 0.03 PPM		
Analog Output:	Two isolated 4-20 mA, 575 ohms max.		

## Ordering Information:

**Note:** The basic ammonia monitor is supplied with the spare parts necessary to run the instrument for approximately 12 months, with the exception of reagents. An initial supply of reagents to operate for approximately 45 days is supplied as part of the base price. Additional reagents may be purchased in concentrate form.

### Suffix A - Measurement

- 1 - Total Ammonia only
- 2 - Free Ammonia & Monochloramine

### Suffix B - System Style

- 1 - Integrated single enclosure system
- 2 - Separate monitor and chemistry module (25 ft. cable)

### Suffix C - Power

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

## Typical System:

