

# APA 6000™ Ammonia/Monochloramine Analyzer

Ammonia/Monochloramine

DW

## Features and Benefits

### Total Chloramination Control

Many water utilities have switched to chloramination to lower risk of DBPs and provide long-lasting residual disinfection with monochloramine. Experience proves that the chloramination process can be extremely effective, but only if the concentration of ammonia and chlorine in the system remain in proper balance.

The APA 6000™ Ammonia/Monochloramine Analyzer continuously monitors all critical chloramination parameters.

- free ammonia ( $\text{NH}_3$ )
- total ammonia ( $\text{NH}_3 + \text{NH}_4^+ + \text{NH}_2\text{Cl}$ )
- monochloramine ( $\text{NH}_2\text{Cl}$ )

### Direct Measurement with Less Interferences

Relying on data from a total chlorine analyzer is not adequate when using chloramination. While chlorine levels remain constant, falling levels of ammonia can trigger an increase in di- and trichloramines (see graphs, page 2). Excessive ammonia can cause increased biogrowth in the distribution network.

By measuring monochloramine directly, the APA 6000 analyzer eliminates interferences from free chlorine, organic chloramines, and other chlorinated species. The same instrument also provides ammonia concentrations.

### Reliable Data for Complete Residual Control

Samples are measured every 5 minutes. The APA 6000 analyzer provides a single source of data and a single integrated source for control outputs to manage the addition of ammonia and chlorine in the system. All values can be expressed as mg/L,  $\mu\text{g/L}$ , ppm, or ppb. Menu-selectable conversion for displaying units in terms of N or  $\text{Cl}_2$  is available. All three chloramination values can be displayed simultaneously.

### Versatile Design

A rotary valve, auto burette, mixing chamber, and colorimetric detector are at the heart of the APA 6000 analyzer. The rotary valve directs the flow of samples, reagents, and standards through the analyzer. (Up to two separate sample streams may be monitored with an optional sequencing kit.) The high-resolution autoburette aspirates and dispenses samples selected by the valve. The mixing chamber combines the sample (or standard) with the reagents, and the detector monitors the color change. Reagents are housed in a separate compartment that contains spills and provides UV protection.



*The APA 6000 Ammonia/Monochloramine Analyzer affordably monitors all three critical chloramination parameters—free ammonia, total ammonia, and monochloramine. The system consumes less than 1 liter of reagents per month*

### Simple and Reliable Operation

The system autocalibrates, cleans, primes, and displays alarms on the front panel. A menu-driven interface lets you set the frequency of these functions. Calibration cycles can be programmed for automatic or on-demand use. Reagent performance is verified during calibration of the analyzer.

### Method of Analysis

A modified Phenate method is used to colorimetrically determine monochloramine values. The addition of an excess of hypochlorite at the proper pH provides total ammonia values. The instrument then calculates free ammonia values.

### Low Reagent Use

The method uses small amounts of sample (typically 30 to 40 liters/month) and reagent (typically less than 1 liter/month per reagent). The patented CSIA (Carrierless Sequential Injection Analysis) method is used for fast analysis with low consumption of reagents and sample.

DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



**Be Right™**

## Specifications\*

### Range

0.02 to 2.0 mg/L as N (0.1 to 10.0 mg/L as  $\text{Cl}_2$ )

### Accuracy

$\pm 5\%$  of reading or  $\pm 0.02$  ppm as N (0.1 mg/L as  $\text{Cl}_2$ ), whichever is greater

### Detection Limit

$\leq 0.01$  mg/L as N;  $\leq 0.05$  mg/L as  $\text{Cl}_2$

### Repeatability

$\pm 3\%$  of reading or  $\pm 0.01$  ppm as N (0.05 mg/L as  $\text{Cl}_2$ ), whichever is greater

### Response Time

<5 minutes for 90% for single channel

### Analysis Method

Colorimetric, modified Phenate

### Speciation

Free and total ammonia ( $\text{NH}_3$ ) and monochloramine ( $\text{NH}_2\text{Cl}$ ); concentration expressed as N or  $\text{Cl}_2$

### Cycle Time

5.0 minutes per analysis for 1 sample stream (up to 2 streams measured with optional sequencing kit)

### Sample Inputs

2 sample streams with optional hardware

### Sample Flow

100 to 1,000 mL/min to sample inlet block

### Sample Temperature

5 to 50°C (41 to 122°F); 95% relative humidity, non-condensing

### Sample Filtration

0.5  $\mu\text{m}$  or smaller

### Sample Pressure

2.5 to 100 psig at Basic Water Conditioning Filter; 0.5 to 30 psig maximum at sample inlet block

### Reagent Use

1 liter per month per reagent

### Calibration Cycle

User-selectable, from twice per day to weekly; approximately 45 minutes per cycle

### Grab Sample

Kit provided.  
Volume: 60 mg @ 5 to 50°C

### Alarms

Two SPDT alarm relays included; total of up to 14 programmable alarm relays (with optional Signal Output Modules)

### Outputs

Two 4-20 mA outputs included; total of up to 14 programmable 4-20 mA outputs (with optional Signal Output Modules) with up to four PID control loops

### Network Connectivity

AquaTrend® network, using the LonWorks® protocol

### Node-to-Node Distance

400 m (1320 ft.) maximum

### Display

Displays data for all three parameters in numeric and graphical format

### Compliance

UL, CSA and EIC safety standards, FCC and certification, European RFI standards, European EMI standards

### Installation Category

II

### Power Requirement

95-240 Vac, 50/60 Hz, 150 VA

### Enclosure

**Instrument:** NEMA 4X (Indoor) and IEC 529 (IP 66), ABS plastic, with provision for air purge; panel-, benchtop-, or wallmountable (brackets included)  
**Reagents:** Fully enclosed latch cases with protected ducting for instrument drain

### Dimensions

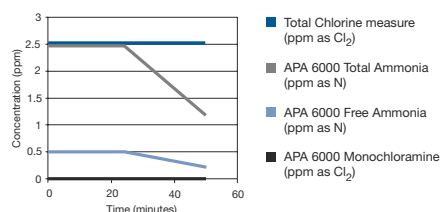
522 x 627 x 527 mm (21 x 25 x 21 in.)

### Weight

25.5 kg (56 lbs.)

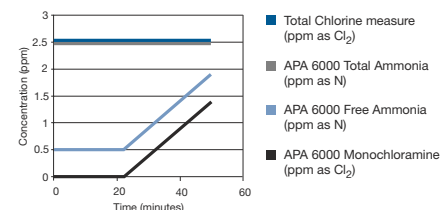
\*Specifications subject to change without notice.

## Consequences of Varying Ammonia Levels



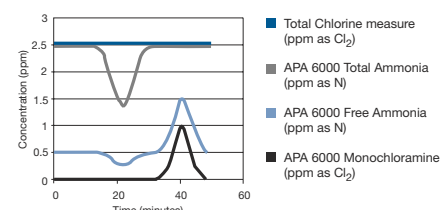
### FALLING AMMONIA LEVELS

A total chlorine analyzer will not detect a sudden drop in ammonia levels because the chlorine feed is unchanged. Although the chloramination system appears to be functioning properly, the concentration of di- and trichloramines in the system may be rising quickly.



### RISING AMMONIA LEVELS

Rising ammonia levels will also remain undetected by a total chlorine analyzer because the concentration of chlorine is not affected by the change in free ammonia. Rising levels of free ammonia promotes increased biogrowth.



### FLUCTUATING AMMONIA SUPPLY

Even if ammonia levels fluctuates randomly, a total chlorine monitor will not signal that a problem is developing. To completely understand how the chloramination system is operating—and to control the process—all three critical chloramination parameters must be monitored.

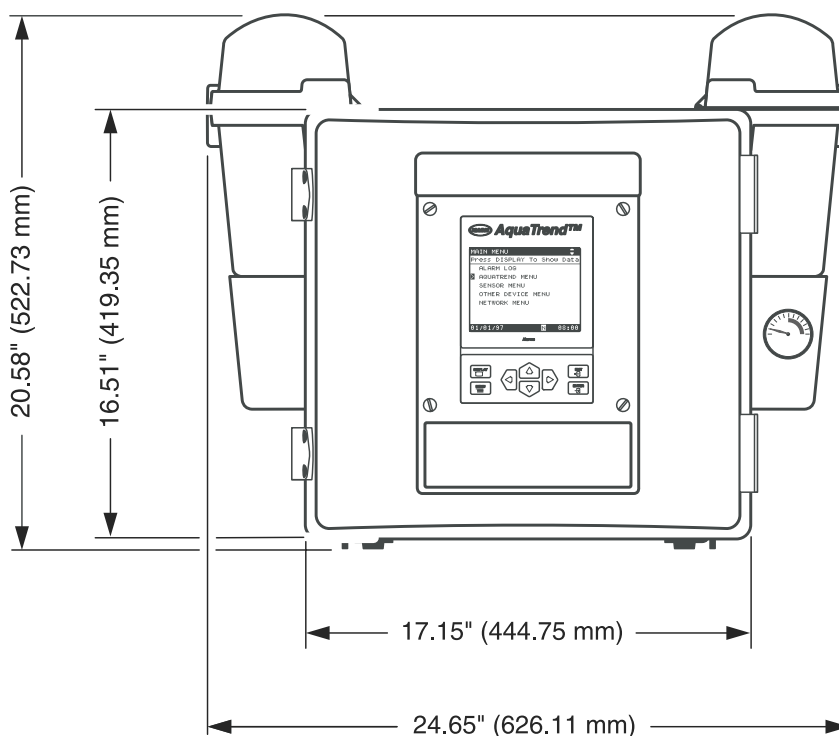
## Engineering Specifications

1. The Ammonia/Monochloramine analyzer shall be a microprocessor-controlled process analyzer designed to use a modified Phenate method to colorimetrically monitor total ammonia, free ammonia, and monochloramine at a wavelength of 650 nm.
2. The analyzer shall use the patented technique of CSIA.
3. The measurement range shall be 0.02 to 2.00 mg/L (parts per million) as nitrogen or 0.1 to 10 mg/L as chlorine. The analyzer accuracy shall be  $\pm 5\%$  or  $\pm 0.02$  mg/L as N, whichever is greater.
4. The analyzer shall display data in a numeric or graphical format with the capability to read all three species at once.
5. The analyzer shall be capable of automatic calibration, cleaning, and self-priming.
6. The analyzer shall include a grab sample kit for grab-sample analysis without interrupting continuous sample flow to the analyzer.
7. Two user-selectable recorder/controller outputs of 4-20 mA, with expansion capability up to 14, shall be provided.
8. Recorder output span shall be user-adjustable over the entire span of the analyzer.
9. Two unpowered SPDT relays, also with expansion capability up to 14, shall be provided for internal alarms.
10. Two relay contacts shall be rated for 5A resistive load at 230 Vac.
11. Alarms shall be capable of being programmed for sample concentration alarms, analyzer system warning, and analyzer system shutdown.
12. The analyzer components shall be housed in a NEMA-4X (indoor)/IP66 plastic enclosure designed for bench-, wall- or panel-mounting.
13. The analyzer shall be warranted for one full year against defects in materials and workmanship and shall include a 30-day supply of standards and reagents.
14. The analyzer shall be designed to meet UL 3101-1, CSA C22.2 No. 1010.1 and EN610101-1 (IEC 1010-1) safety standards.
15. The analyzer shall comply with Class A limits for radio and noise emission as specified by the FCC and EN55011 (CISPR11).
16. The analyzer shall be Model APA 6000 Ammonia/Monochloramine Analyzer manufactured by Hach Company.

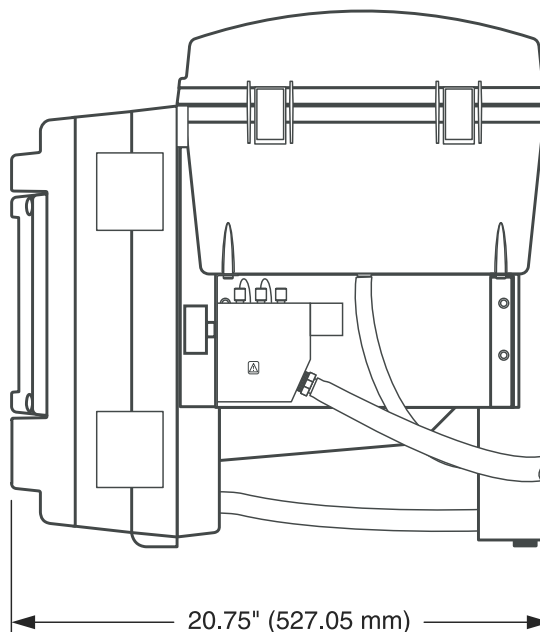
## Dimensions

The Ammonia/Monochloramine Analyzer should be installed as close as possible to the sampling point. To control the Ammonia/Monochloramine Analyzer from a remote location, connect an optional Remote AquaTrend Interface. The analyzer can be bench-, wall-, or panel-mounted. All necessary mounting hardware is included with the instrument.

### FRONT VIEW



### SIDE VIEW



## Ordering Information

The APA 6000 Ammonia/Monochloramine Analyzer is supplied with an Installation Kit (including Grab Sample Kit), Maintenance Kit, Tool Kit, and Manual.

**55006-10** APA 6000 Ammonia/Monochloramine Analyzer, 0.02 to 2 mg/L as N (0.1 to 10.0 mg/L as Cl<sub>2</sub>)

### Reagents

**60014-00** Reagent Set (includes reagent 1, 2, 3, and cleaning solution)

**60015-00** Standard Set ( includes standard 1 and 2)

**27763-53** Reagent 1, Indicator Solution, 1 L

**27764-53** Reagent 2, Buffer Solution, 1 L

**27765-53** Reagent 3, Hypochlorite Solution, 1 L

**27766-53** Standard 1, 0 mg/L NH<sub>3</sub>, 1 L

**27767-53** Standard 2, 2.0 mg/L NH<sub>3</sub>, 1 L

**26964-53** APA Acid Wash (cleaning solution), 1 L

**28764-53** APA Acid Surfactant Wash, 1 L

### Optional Accessories

**51350-00** AquaTrend Instrument with SOM

**52156-00** Cable Termination Kit

**54352-00** PS2401 Power Supply, 115 Vac

**54353-00** PS2401 Power Supply, 230 Vac

**46306-00** Power Cord, 120 Vac, north American plug

**46308-00** Power Cord, 240 Vac, continental European plug

**51045-00** Sample Sequencing Kit (for optional 2-stream operation)

**62037-00** Grab Sample Kit

**52074-00** Serial I/O Module

**51250-00** Signal Output Module

**51200-00** Remote AquaTrend

**62028-00** Maintenance Kit

**51339-00** APA 6000 Micro Filter System, 115 V

**51339-01** APA 6000 Micro Filter System, 230 V

**62009-00** Sample Sequencing Kit

**46618-00** Y-strainer Kit

### Cables

**52157-XX** 22 gauge, 2-conductor cable, communication only, sold by the foot (also available in 100- to 1000-foot lengths)

**52158-XX** 20 gauge, 4-conductor cable, communication only, sold by the foot (also available in 100- to 1000-foot lengths)

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