

Total Ammonia ($\text{NH}_3 + \text{NH}_4^+$) Monitoring System with optional monochloramine measurement

- Complete system includes an ammonium (NH_4^+) sensor, an analyzer, a constant head flow controller, and a flow cell. An optional pH sensor or monochloramine sensor is also available
- No expensive or messy reagents or troublesome sample conditioning systems
- Measures NH_4^+ ions and monochloramine in samples that have a pH as high as 9.5
- Includes Rosemount Model 56 dual channel analyzer
- Low Flow system provides stable measurements with minimal waste

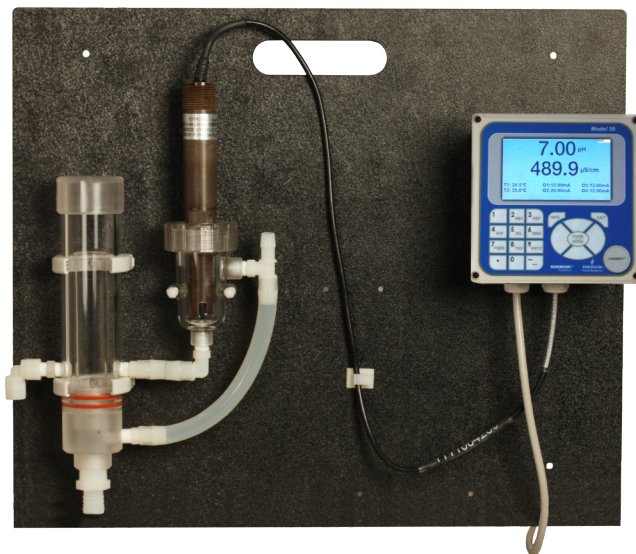
Applications

Emerson's Total Ammonia ($\text{NH}_3 + \text{NH}_4^+$) monitoring system measures the amount of Ammonium ions (NH_4^+) using the ion specific electrode and predicts the NH_3 concentration based upon the pH of the solution. The Rosemount Model 56 analyzer combines the two readings to provide Total Ammonia measurement. If the pH of the water is less than 8.5, then you can enter a fixed pH value correction in the Rosemount Model 56 analyzer. If the pH varies between 8.5 and 9.5 and the variation is more than ± 0.2 pH then use a continuous pH sensor that can provide real time correction for the Total Ammonia Measurement. You can connect dual channel Model 56 to the Ammonium ion specific electrode and the pH sensor to provide real time Total Ammonia Measurement.

For applications requiring Total Ammonia measurement and Monochloramine measurement, use our complete pre-assembled system that includes the 499ACL-03 monochloramine sensor along with our dual channel Model 56 analyzer.

Features

This all inclusive system requires no reagents or mechanical devices for operation. The ammonium sensor is an ion selective sensor with a monocrystal sensing element that has a virtually maintenance free solid state reference system.



Two Options for the Total Ammonia monitoring system

- pH range of < 8.5 : If the pH is less than 8.5 then the Total Ammonia monitoring system will consist of a 56 analyzer, a constant head overflow chamber, and an Ammonium sensor with a low flow cell and bubble shedding nozzle. The 56 analyzer can accept a fixed pH value to provide 4–20 mADC/HART output that is proportional to the Total Ammonia value.
- pH range of > 8.5 to 9.5 (and variation of ± 0.2 pH): If the pH fluctuates between 8.5 and 9.5 then we recommend continuous pH compensation for the Total Ammonia measurement. For this application the Total Ammonia monitoring system will consist of a Rosemount Model 56 dual channel analyzer, a constant head overflow chamber, a Rosemount ammonium sensor with low flow cell and bubble shedding nozzle, and a Rosemount 3900 pH sensor with low flow cell. The dual channel Rosemount Model 56 analyzer can accept input from the ammonium sensor and pH sensor and provide 4–20 mADC/HART output that is proportional to the Total Ammonia and pH readings.

Total Ammonia and monochloroamine monitoring system

We have combined two popular measurements for drinking water plants into a fully assembled system consisting of a Rosemount Model 56 dual channel analyzer, a constant head overflow chamber, a Rosemount ammonium sensor with a low flow cell and a bubble shedding nozzle, and a Rosemount Model 499ACL-03 monochloroamine sensor with a low flow cell and a bubble shedding nozzle.

Maintenance is fast and easy. Valves, rotameters, pressure regulators, etc. are things of the past. A constant head overflow sampler ensures the correct sample reaches the respective sensors. The ammonium sensor requires little maintenance — periodic calibration and cleaning is all that is necessary. The membrane-based monochloroamine sensor requires no special tools or fixtures to replace the membrane. A screw cap holds the pre-tensioned membrane in place. Replacing the electrolyte in the monochloroamine sensor only takes minutes.

Specifications – General

Sample requirements:

Pressure: 3 to 65 psig (122 to 549 kPa abs). A check valve in the inlet prevents the sensor flow cells from going dry if sample flow is lost. The check valve opens at 3 psig (122 kPa abs). If the check valve is removed, minimum pressure is 1 psig (108 kPa abs).

Temperature: 42 to 104 °F (5 to 40 °C)

Minimum flow: 3 gal/hr (11 L/h)

Maximum flow: 80 gal/hr (303 L/hr); high flow causes the overflow tube to back up.

Sample Conductivity: > 50 μ S/cm at 25 °C

Process Connection: ¼-in OD tubing compression fitting (can be removed and replaced with a barbed fitting for use with soft tubing).

Drain connection: ¾-in barbed fitting. Sample must drain to open atmosphere.

Wetted parts:

Overflow sample and flow cell: acrylic, polycarbonate, polyester, Kynar®, nylon, silicone

Ammonium sensor: Ultem®, Ryton®, and HDPE

Response time to step change in monochloramine concentration:

<80 sec to 95 % of final reading for inlet sample flow of 3 gph (11 L/hr).

Weight/shipping weight:

Ammonium monitoring system: 10 lb/13 lb (4.5 kg/6.0 kg) [rounded to the nearest 1 lb. (0.5 kg)]

Specifications – Ammonium Sensor

Total Ammonia range: 0 to 10 ppm Ammonium (additional ranges available, consult factory).

Accuracy: Accuracy depends on the accuracy of the chemical test used to calibrate the sensor.

Limit of Detection: 2×10^{-7} Molar, 0.004 ppm

pH Range: 5.5–9.5 pH (continuous)

Body Material: Ultem (Poly-Ether-Imide) and Ryton

Junction Material: Kynar

Measuring Membrane: Selective Ammonium Sensitive Membrane

Special Features: Cross linked polymer in the reference system is resistant to heat, solvents and to most chemicals. Sensor holds an excess of KCl, assuring saturation at all temperatures and extending the life of the sensor.

Storage and Shelf Life: At room temperature with closed protector cap, 1 year from date of manufacture.

Specifications – 3900 pH Sensor

Sensor Type: General purpose 3900

Measured Range: pH: AccuGlass 0–14

Materials of Construction: stainless steel, glass, Teflon®, poly-phenylene sulfide (PPS), EPDM and silicone

Materials of ORP: Platinum

VP8 Cable: use 24281-05, 4 ft cable

Specifications - 499ACL Monochloroamine sensor

Linear Range: 0–15 ppm (mg/L)

Wetted Parts: Noryl¹, Viton², silicone, wood, Zitex³ (PTFE)

Cathode: gold mesh

Accuracy: Accuracy depends on the accuracy of the laboratory method used to calibrate the sensor.

Linearity: 2 % (typ.)

pH range: Response is practically independent of pH between pH 7.0 and 10.0. Sensor current at pH 10.0 is within 5 % of sensor current at pH 7.0.

Drift: <2 % of reading per week

Interferences: free chlorine and other oxidizing agents.

Back Pressure: 0 psig (101 kPa abs). Sample must drain to atmosphere.

Temperature: 32 to 122 °F (0 to 50 °C)

Sample Flow:

With Low flow cell: 1 to 4 gal/hr (4 to 15 L/hr)

Process Connection: 1 inch MNPT Electrolyte Volume: 25 mL (approx.) Electrolyte Life: approx. 3 months

Cable Length with Variopole connector: 4 ft (p/n 23747-04)

(1) Noryl is a registered trademark of General Electric

(2) Viton is a registered trademark of E.I du Pont de Nemours

(3) Zitex is a registered trademark of Performance Plastic Corp.

Specifications - 56 Analyzer

Case: Polycarbonate

Display: Full color LCD, 3.75 x 2.20 in. (95 x 56 mm); display can be customized by the user.

Languages: English, French, German, Italian, Spanish, Portuguese, Chinese, Russian, and Polish.

Ambient Temperature and Humidity: 14 to 140 °F (-10 to 60 °C); RH 5 to 95 % (non-condensing). Between 23 and 131 °F (-5 to 55 °C) there is no visible degradation in display response or performance.

Storage temperature: -4 to 140 °F (-20 to 60 °C)

Power: 85 to 265V AC, 47.5 to 65.0 Hz, 20 W

RFI/EMI: EN-61326

LVD: EN-6101-01



Outputs: Four 4–20 or 0–20 mA isolated current outputs; assignable to measurement or temperature; fully scalable; maximum load 550 Ω. HART digital signal is superimposed on output 1.

Alarms and Timers: Four relays, fully configurable as a setpoint alarm, interval timer, TPC, bleed and feed timer, delay timer, date and time timer, and fault alarm.

Relays: Form C, SPDT, epoxy sealed.

Relay Contact ratings:



5 A at 28 VDC or 300V AC (resistive)

1/8 HP at 120/240V AC

Control features: PID control (analog output) and time proportional control or TPC (relays) are standard.

Data logger: Data automatically stored every 30 seconds for 30 days; older data removed to make room for new data. The following data are automatically stored:

Monochloramine: Date and time, ppm, temperature, raw sensor current.

Ammonia: Date and time, Ammonia, temperature, mV, glass impedance, and reference impedance (if available)

pH: Date and time, pH reading, temperature, mV, glass impedance and reference impedance

Event logger: Stores up to 300 events with data and time stamp: faults, warnings, calibration data, calibration results (pass or fail), power on/off cycles, and hold on/off. Alarm relay activation and deactivation can also be stored. Older events are automatically removed to make room for new events. Data and event downloading: through USB port on front panel.

Graphic display: Dual graphical display shows measurement data on the y-axis and time on the x-axis. Y-axis is fully assignable and scalable. X-axis can be set to one hour, one day, seven days, or 30 days.

Digital communications: HART digital communications is standard.

Hazardous Location Approvals: For more information refer to the 56 product data sheet 71-56. Approvals apply to the analyzer only. The FCL is not suitable for use in hazardous areas.

Ordering Information

Single channel ammonium monitoring system for process with pH between 8 to 8.5	
SQP10102-LQD	Sample handling system includes: constant head flow controller, low flow cell with bubble shedding nozzle, vented ¾" adapter with all necessary tubing and fittings. All components mounted and wired on back-plate ready for use.
Rosemount analyzer model 56-03-22-38-HT	Single channel advanced feature analyzer pre configured for ammonium sensor
Rosemount ammonium sensor PN S10046-LQD	Ammonium sensor with integral cable
Dual channel ammonium monitoring system with real time pH compensation (pH between 7 to 9.5)	
SQP10103-LQD	Sample handling system includes: constant head flow controller, low flow cell with bubble shedding nozzle for ammonium sensor, low flow cell for pH sensor, vented ¾" adapter with all necessary tubing and fittings. All components mounted and wired on back-plate ready for use.
Rosemount analyzer model 56-03-22-32-HT	Single channel advanced feature analyzer pre configured for ammonium sensor
Rosemount ammonium sensor PN S10046-LQD	Ammonium sensor with integral cable
Rosemount pH sensor PN 3900VP-02-10	pH sensor with variopole connector
Cable PN 24281-05	4' variopole cable for pH sensor
Dual channel ammonium and monochloroamine monitoring system	
SQP10103-LQD	Sample handling system includes: constant head flow controller, low flow cell with bubble shedding nozzle for ammonium sensor, low flow cell with bubble shedding nozzle for monochloroamine sensor, vented ¾" adapter with all necessary tubing and fittings. All components mounted and wired on back-plate ready for use.
Rosemount dual channel analyzer model 56-03-22-34-HT	Dual channel advanced feature analyzer pre configured for ammonium sensor and monochloroamine sensor
Rosemount ammonium sensor PN S10046-LQD	Ammonium sensor with integral cable
Rosemount monochloroamine sensor PN 499ACL-03-54-VP	Monochloroamine sensor with variopole connector
Cable PN 23747-04	4' variopole cable for monochloroamine sensor

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