

Series A15

Residual Chlorine Monitor



Series A15 Residual Chlorine Monitors provide simple and reliable measurement of disinfection system residuals. The monitor is based on a polarographic membraned sensor which measures residual chlorine directly, in most cases without the need for sample pretreatment of any kind. The result is a system that provides dependable measurements continuously, without the need for expensive chemicals or time consuming maintenance. Potable water systems, cooling towers, activated carbon filtration systems, RO water systems, and effluent streams are some of the many applications for the unit.

Electronic Monitor

The Residual Chlorine Monitor electronics package provides a real time display of chlorine concentration, external alarm and control outputs, and an isolated analog output. The monitor is housed in a compact 1/4 DIN

panel mounted aluminum enclosure, and is also available in a NEMA 4X Fiberglass enclosure suitable for hostile environments. Five switches located on the front panel provide access to monitor programming functions and allow operators to view information such as sample temperature, alarm setpoints, and analog output value. An access code number is required in order to change any of the calibration or setup parameters, protecting the system from unauthorized tampering.

Series A15 monitors provide two selectable display ranges: 0-2 PPM or 0-20 PPM. The low range display provides resolution to 0.001 PPM while the high range display provides 0.01 PPM resolution. For special applications, a 0-200 PPM range is configurable. An isolated 4-20 mA output is provided for external recording or data logging.

This output may be programmed for any required span using the front panel switches, and many be changed to 0-20 mA and used with a shunt resistor to provide zero based voltage outputs if required.

Contact outputs provided in the monitor include two programmable control relays with variable deadband and variable time delay functions. Control relays may be programmed for on/off, pulse frequency, or pulse duration modes of operation for chemical feed control. An additional alarm relay is provided which will actuate on either low or high chlorine condition, or on the failure of the control system to maintain a proper residual concentration. All variables such as alarm or control setpoints, deadband, and time delay are programmable from the front panel keys.

Residual Chlorine Sensor

Residual chlorine measurement has traditionally been done by injecting chemicals into the sample and measuring the products of a chemical reaction, frequently the amount of iodine released in a reaction with potassium iodide. ATI's chlorine sensor eliminates the need for chemical addition by directly measuring chlorine in a solution.

The sensor consists of a pair of electrodes immersed in a conductive electrolyte and isolated from the sample by a chlorine permeable membrane. Chlorine migrates through the membrane in a process called diffusion, and is reduced to chloride on the surface of the working electrode. This process causes a flow of electrons through an external measuring circuit, with the current flow being linearly

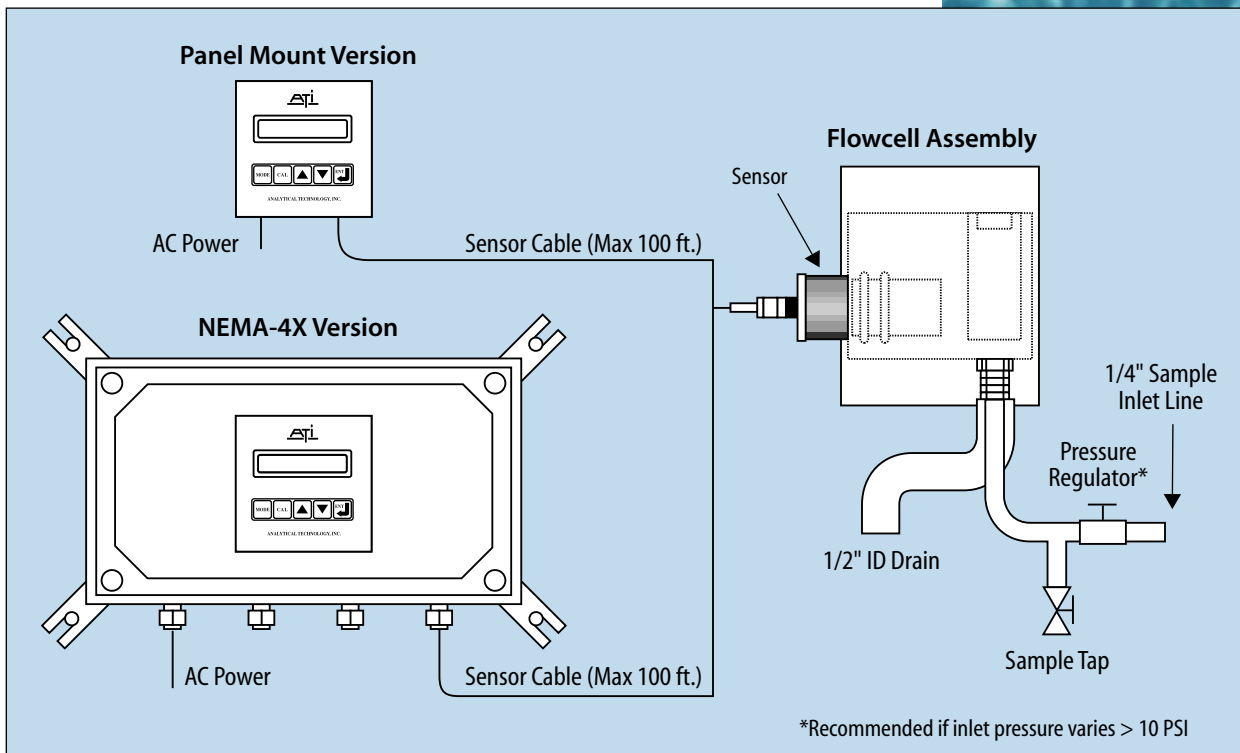


proportional to chlorine concentration. The absolute response of the sensor is also temperature dependent, and an RTD in the sensor provides a temperature input to the electronics to allow for automatic temperature compensation.

Residual chlorine sensors have been developed for two different measurements. One version of the sensor is optimized for the measurement of free chlorine. This sensor is best suited to free chlorine measurements in potable water, cooling towers, and industrial wash water, and can be used for monitoring concentrations as high as 0-200 PPM. The second version of the sensor is designed for chloramine measurement. This sensor is well suited to chloramine treated potable water systems and to certain wastewater systems where chloramine residuals predominate. Free chlorine sensors should always be used with a flowcell assembly and may require CO₂ buffering if the pH is above 8. Chloramine sensors may be used either submerged or in a flowcell. Submerged sensors require flow velocities of at least 0.4 ft./sec. for proper operation.

Flowcell Assembly

Residual chlorine sensors provide the best sensitivity and stability when sample flow is controlled. A constant-head overflow assembly is provided to control both flowrate and pressure in the area of the membrane. The sample inlet flow and pressure from the system being monitored can vary widely without any affect on the measurement. The only requirement is that the inlet flowrate be kept above the minimum flow of about 7 gallons per hour. The flowcell assembly is constructed of clear acrylic to allow observation of sensor condition so that any fouling can be easily seen.



Specifications

Display: 16 character alpha-numeric liquid crystal display with back light.

Measurement Range: 0-2.000 and 0-20.00 PPM standard, 0-200.0 PPM optional with jumper.

Sensitivity: 0.001 PPM above 0.020 PPM

Repeatability: ± 0.05 PPM

Linearity: 0.5%

Response Time: 90% in <60 seconds.

Analog Output: Isolated 4-20 mA, 600 ohms max.

Output Range: Programmable for any range from 0-1 PPM to 0-20 PPM.

Control Relays: Two SPDT, 5A., 230 VAC resistive, with programmable set points.

Control Relay Function: Programmable On/Off, Pulse Width Modulation (PWM), or Pulse Frequency Modulation (PFM)

Alarm Relay: One SPDT, 5 A. 230 VAC resistive, with programmable set points.

Electrical Connections: To plug-in terminal blocks.

Power: 120/230 VAC, 50/60 Hz., 5 VA max.

Electronic Enclosure: NEMA 1 panel mount standard, NEMA 4X Fiberglass optional.

Operating Temperature: Electronics -20° to +50°C, sensor 0-50°C.

Operating Humidity: 0-99% non-condensing.

Sensor Temperature Compensation: Automatic -2°C to +52°C.

Sensor: Polarographic membraned sensor.

Sensor Materials: Noryl and stainless steel.

Sensor Interconnect Cable: 25-ft. standard, max. 100 ft.

Accessories: Spare membranes, electrolyte, and o-ring kit standard.

Flowcell: Clear cast acrylic.

Flowcell Inlet: 1/4" I.D. tubing hose barb (1/8" FNPT in flowcell).

Flowcell Drain: 1/2" I.D. tubing hose barb (3/8" FNPT in flowcell).

Flow Rate: 7 GPH (0.5 1/min.) minimum, 30 GPH (2 1/min.) maximum.

Ordering Information

Model A15/B-C-D

Suffix B - Measurement Type

62 - Free Chlorine

63 - Combined Chlorine (Chloramines)

Suffix C - Enclosure

1 - Panel Mount

2 - NEMA 4X Wall Mount

Suffix D - Sensor Style

1 - Sensor with Clear Flowcell

2 - Submersible Sensor (Chloramine sensor only)

3 - Sensor with Sealed Flowcell

Accessories

00-0048 Junction box

00-0628 Pipe mounting hardware
(for submersion sensor)

31-0001 5-c sensor interconnect cable

00-0139 Monitor handrail mounting kit

00-0259 CO₂ buffer injection system

55-0003 Rotameter for CO₂ system



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