



## **Specifications for the Hydro Model RAH-210 Residual Analyzer** **Specification RAH-210**

### Amperometric Residual Analyzer

#### **1.01 GENERAL**

##### **1.01.1 Completeness**

The system shall be complete with all components, equipment, and appurtenances.

##### **1.01.2 Quality Assurance**

All materials and components shall be new and unused of first quality by well-known manufacturers. Inferior materials or components shall not be allowed.

#### **1.02 MANUFACTURER**

The manufacturer shall be Hydro Instruments, Telford, PA, USA or approved equal. The residual analyzer shall be Hydro Instruments Model RAH-210 Residual Analyzer.

#### **1.03 RESIDUAL ANALYZER**

##### **1.03.1 General**

1. The residual analyzer shall employ a galvanic cell with a gold cathode and copper anode to obtain continuous measurements of the targeted species.
2. The residual analyzer shall be capable of measuring free chlorine without the need for any reagent chemicals using software compensation for temperature and pH.
3. The residual analyzer shall be capable of measuring total chlorine, chlorine dioxide, iodide, and bromine chloride with the use of reagent chemicals.
4. The measurement cell shall be self-cleaning through the action of a continuously driven motor cleaning mechanism.
5. The residual analyzer shall always include a temperature sensor and allow the input of the process water pH for software pH compensation.
6. Optional reagent feed system shall be available.

##### **1.03.2 Galvanic Measurement Cell**

1. The galvanic measurement cell shall use a gold cathode and copper anode to obtain continuous measurements of the target species. The current signal generated by this cell shall be read by the residual analyzer monitor/controller.

2. The measurement cell shall have a 4 second speed of response and a full-scale reaction time of 90 to 120 seconds.
3. An A/C motor shall continuously drive a quantity of small PTFE (Teflon) cleaning balls around the space between the electrodes to clean the surfaces and prevent deposits building up.
4. A thermistor shall be installed in the measurement cell to provide a temperature reading of the sample water.
5. The residual analyzer sample water inlet shall include a coarse mesh screen to prevent larger particles from entering the measurement cell.
6. A sample feed rate control valve, constructed from machined type-1 PVC and having a PVDF (Kynar) v-notch style valve stem shall be provided for precise sample flow control.
7. A sample water inlet weir shall help to maintain the appropriate sample water flow rate of 500 ml/minute (8 GPH).

#### 1.03.3 Optional Reagent Feed System

1. The residual analyzer shall be capable of incorporating an optional reagent feed system.
2. The reagent feed system shall consist of a storage container and an automatic metering valve. The automatic metering valve shall be driven by the motor that is used to drive the cleaning balls inside the measurement cell
3. The reagent feed system shall allow for continuous reagent feed for approximately one week without need for refilling the reagent storage container.
4. The reagent feed system shall be used to inject pH buffer solution when required to minimize the effect of pH fluctuations on residual measurement.
5. The reagent feed system shall be used when required to inject other chemical solutions in order to facilitate the measurement of certain target chemical species.

#### 1.03.4 Standard Monitor/Controller Electronics

1. Shall include two-line, 20 characters per line digital display and four push button interface.
2. Shall include a complete PID control software program, which can be enabled and disabled in the field and offer proportional, set-point or compound loop control analog output signal(s) for chemical feed control.
3. Shall accept input signals from the galvanic measurement cell electrodes, thermistor, pH probe and proportional (flow meter).
4. Shall be capable of zero and span calibrations for the cell input signal through software.
5. Shall be capable of software compensation for temperature fluctuations and also for temperature and pH effects on free chlorine measurements.
6. Shall provide power to operate the continuously driven AC motor.
7. Shall include two (2) optically isolated 4-20mA output signals, each field-selectable for indication of measurement cell reading, pH, temperature or control signal output.