

**Item No. 520
Chlorine Residual Analyzer****520.1 Description**

This item shall consist of the furnishing and installation of all labor, materials, equipment and incidentals necessary to install chlorine residual analyzers. The chlorine residual analyzers shall generate 4-20 mA signals to be used in the control system loop for the system, and shall be considered an integral part of the complete and operating system.

520.2 Quality Assurance

Manufacturer's Representative for Startup and Testing: The services of the Manufacturer's technical representative shall be provided for pre-startup installation checks, startup assistance, training of Owner's operating personnel, and troubleshooting.

520.3 Products**A. Chlorine Residual Analyzers**

Chlorine residual analyzers shall be of either amperometric type, or DPD Colorimetric type. The analyzers shall be designed to measure chlorine residuals with a residual measurement range as scheduled below. The analyzers shall utilize liquid reagents.

1. Amperometric Type Analyzers

Electrodes shall be gold measuring electrode, and a copper reference electrode. The measuring and counting electrodes shall not be membrane enclosed.

The accuracy of the units shall be 1/2 percent of full scale minimum. The sensitivity of the units shall be 0.01 mg/l. High and low residual alarms shall be provided with each unit. Analyzer shall come complete with a 6-foot power cord with ground plug.

Solid state strip chart recorders, cabinet mounted in each analyzer shall record chlorine residual based on a 4-20 mA signal received from the analyzer.

Analyzer response shall be 4 seconds from sample entry to display indication. Full scale residual change shall occur in less than 2 minutes.

The output signal from each unit shall be an isolated 4-20 mA DC analog signal into 800 ohms input impedance.

The units shall contain an operating panel with a highly visible numeric display featuring a three-digit LCD display. The panels shall display the following:

- a. mg/l of chlorine residual.
- b. High, low alarm setpoints.

The analyzers and recorders shall require 120-Volt, 1-phase, 60-Hertz power supply. Alarm contacts shall be rated 10 amperes at 120 VAC or 24 volts DC. Electronics enclosures shall be rated NEMA 4X. Reset shall be automatic upon correction of condition.

Each analyzer shall come complete with all accessories required for operation, including, but not limited to:

- a. Reagent pumps (if required by Manufacturer for system operation).
- b. Drain hose.
- c. pH test papers.
- d. Potassium iodide (1 year supply).
- e. Tube of grit.
- f. Low pH buffer (1 year supply).
- g. One gallon of detergent.
- h. Y-type strainer.
- i. Reagent mixing kit.
- j. Pressure reducing valve.
- k. Spare parts kit.
- l. One-year supply of charts and ink for each recorder.

The chlorine residual analyzers shall be CL10SC as manufactured by Hach Company, or approved equal.

2. DPD Colorimetric Analyzers

The analyzers shall have detection range of 0-5 mg/l for free residual chlorine and resolution of 0.01 mg/l. Analyzers shall have an accuracy of better than 5 percent of the reading or plus or minus 0.05 mg/l, whichever is greater. Sample frequency shall be a minimum of once every 2-1/2 minutes.

Chlorine analyzers shall be Model CL17 Free Residual Chlorine Analyzer, as manufactured by Hach Company, or approved equal.

520.4 Construction Methods

The chlorine residual analyzers shall be carefully handled and installed in such a manner as to prevent damage to any part of the system. The chlorine residual analyzers shall be carefully handled and installed in accordance with the Manufacturer's installation instructions.

The chlorine residual analyzers shall be tested as part of the complete system. Upon completion of the installation an acceptance test shall be performed in accordance with the Manufacturer's recommendations.

520.5 Measurement

Chlorine Residual Analyzers will be measured by the number of analyzers installed. The plan quantities for the number of analyzers will be used as the measurement for payment for this item. Payment shall not be made for analyzers failing the system test.

520.6 Payment

All work performed as required herein and measured as provided under "Measurement" will be paid for at the unit bid price. The bid prices shall include full compensation for furnishing all labor; all materials; all royalty and freight involved; all hauling and delivering on the road; and all tools, equipment and incidentals necessary to complete the work. Payment will not be made for unauthorized work or work that does not pass the system testing.

Pay Item: Chlorine Residual Analyzer Each

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