1. GENERAL
	1. Section includes:
		1. Online chlorine analyzer for continuous monitoring of total residual chlorine in water. Ultra Low Range CL17sc must be used with Hach SC200 or SC1000 controller.
	2. Measurement Procedures
		1. The method of measuring total chlorine will be colorimetric. Instrument chemistry will employ N, N-diethyl-p-phenylenediamine (DPD) method.
	3. Alternates
		1. Other methods of total chlorine measurement such as amperometric, potentiometric, and iodometric that employ electrodes or other electrochemical techniques are not acceptable.
	4. System Description
		1. Performance Requirements
			1. Measurement range:
				1. 0.008 to 5 mg/L (ppm) total residual chlorine
			2. Accuracy
				1. ± 5% of reading or ± 0.010 mg/L (ppm), whichever is greater from 0 to 4 mg/L as Cl2; ± 10% from 4 to 5 mg/L as Cl2
			3. Precision
				1. ± 3% of reading or 0.005 mg/L (ppm), whichever is greater
			4. Lower Limit of Detection (LOD)
				1. 0.008 mg/L (ppm) at 25°C
			5. Resolution
				1. 0.001 mg/L (ppm)
			6. Cycle Time
				1. 2.5 minutes
	5. Certifications
		1. Complies with US EPA 40 CFR 141.74
		2. CE compliant for conducted and radiated emissions CISPR 11 (Class A limits), EMC Immunity EN 61326-1 (Industrial limits), and EN 50581
		3. North America: FCC Supplier’s Declaration of Conformance, IEC/EN 60529, ICES-003
		4. ACMA RCM
		5. South Korea KC Certificate
	6. Environmental Requirements
		1. Operational Criteria
			1. Sample flow rate
				1. 60 to 200 mL/minute through the analyzer
			2. Sample Filtration
				1. Y-strainer with 40-mesh screen or higher
			3. Inlet Pressure
				1. 4.5 to 75 psig (0.3 to 5.2 bar) supplied to Y-strainer; 1.5 to 5 psig (0.1 to 0.3 bar) supplied to analyzer
			4. Sample temperature
				1. 41 to 104 °F (5 to 40 °C)
			5. Operating temperature
				1. 41 to 104 °F (5 to 40 °C)
			6. Operating humidity
				1. 0 to 90% non-condensing relative humidity
	7. Warranty
		1. The product includes a one-year warranty from the date of shipment (EU: 2 years)
	8. Maintenance Service
		1. Scheduled Maintenance
			1. Monthly
				1. Reagent replacement
				2. Cell cleaning
			2. Semi-annually
				1. Analyzer tubing replacement
		2. Unscheduled Maintenance
			1. Y-strainer screen cleaning
2. PRODUCTS
	1. Manufacturer
		1. Hach Company, Loveland, CO
			1. Model Ultra Low Range CL17sc Online Total Chlorine Analyzer
	2. Manufactured Unit

The Ultra Low Range CL17sc Online Total Chlorine Analyzer consists of a sample and reagent pump, measurement cell, and if chosen can be shipped with buffer and indicator solutions.

* 1. Equipment
		1. Online Total Chlorine Analyzer
			1. Housed in an IP66-rated enclosure.
			2. Total residual chlorine measurements are taken every 2.5 minutes and results are displayed on a controller display in the range of 0.008 to 5 mg/L.
			3. Utilizes a built-in flow meter.
			4. Real-time flow rate is measured when sample is flowing through the analyzer and results are displayed on a controller display in mL / min.
			5. Connects to a standard controller, which controls and provides power to the analyzer.
			6. Performs a blank reference measurement check between analysis points to compensate for sample color, turbidity, and changes in light intensity due to voltage fluctuations or light source aging.
			7. Operates with an LED light source at a peak wavelength of 510nm.
			8. Capable of operating unattended for 30 days between chemical reagent changes and measurement cell cleaning.
			9. Utilizes a three-color status light to indicate operating status.
			10. Utilizes three measurement cycle indicator lights to display the phase of the measurement cycle being performed.
			11. Has a colorimeter measurement cell window for viewing sample inside cell.
			12. Provides step-by-step, on-screen instructions for all routine maintenance activities, including reagent changes, tubing changes, and cell cleanings.
		2. Standard Controller
			1. Provide Hach SC200 or SC1000 controller for online total chlorine analyzer operation.
				1. Hach SC controller provides:

Full functionality of Ultra Low Range CL17sc menu structure

Communication outputs

Relays

Guided routine maintenance

Calibration verification

Access to analyzer data logs

* + - 1. Options for communication outputs determined by controller selection. Hach SC controllers can be configured for:
				1. 4-20 mA
				2. Hart
				3. Modbus
				4. Profibus
	1. Components
		1. Standard Equipment
			1. Ultra Low Range CL17sc Online Total Chlorine Analyzer
			2. Installation kit
			3. Tubing kit
			4. User manual
		2. Dimensions: 12.9 x 13.5 x 7.0 inches (329 x 342 x 177 mm)
		3. Shipping weight: 9 lbs (4.1 kg) without reagent bottles, 11.2 lbs (5.1 kg) with full reagent bottles
	2. Instrument Options

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Must be selected at the time of order. Choose one or the other.

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 [ ] Standpipe installation kit

 [ ] Pressure regulator installation kit

* 1. Optional Accessories

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Select as many as required

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

[ ] Cell cleaning kit

[ ] Calibration verification kit

1. EXECUTION
	1. Preparation
		* 1. Mounting
				1. The Ultra Low Range CL17sc Online Total Chlorine Analyzer can be wall mounted only.
			2. Required Clearances
				1. Horizontal: 15.28 in (388 mm), 25.96 inches (660 mm) ideal
				2. Vertical: 13.5 inches (342 mm), if using standpipe installation kit leave additional 24 inches (610 cm) above top of analyzer
				3. Depth: 17.75 inches (451 mm)
			3. Sample inlet
				1. 0.25 inch OD polyethylene tubing, quick-disconnect fitting
			4. Sample outlet
				1. 0.50 inch ID flexible tubing
			5. Overflow drain
				1. 0.50 inch ID flexible tubing
			6. Air purge quick connect
				1. Optional with 3/8-inch quick-connect fitting and tubing; 0.003 m3/minute at 20 psig maximum
	2. Installation
		1. Contractor will install the analyzer in strict accordance with the manufacturer’s instructions and recommendation.
		2. Manufacturer’s representative will include a half-day of start-up service by a factory-trained technician, if requested.
			1. Contractor will schedule a date and time for start-up.
			2. Contractor will require the following people to be present during the start-up procedure.
				1. General contractor
				2. Electrical contractor
				3. Hach Company factory trained representative
				4. Owner’s personnel
				5. Engineer
	3. Manufacturer’s Service and Start-Up
		1. Contractor will include the manufacturer’s services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.
		2. Contractor will include a manufacturer’s Service Agreement that covers all the manufacturer’s recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
		3. Items A and B are to be performed by manufacturer’s factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
		4. Use of manufacturer’s service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION