

PART 1 GENERAL

- 1.1 Section includes:
 - A. Chlorine analyzer for monitoring of free or total /or free and total residual chlorine at a ppm reading
- 1.2 Measurement Procedures
 - A. The approved EPA method of measuring free or total chlorine will be colorimetric. Instrument chemistry will utilize the N, N-diethyl-p-phenylenediamine (DPD) method.
- 1.3 Alternates
 - A. Other methods of chlorine measurement such as amperometric, potentiometric, and iodometric that employ electrodes or other electrochemical techniques are not acceptable.
- 1.4 System Description
 - A. Performance Requirements
 - 1. Measurement range:
 - a. 0 to 10 mg/L (ppm) free and/or total residual chlorine
 - 2. Accuracy
 - a. $\pm 5\%$ of reading or ± 0.03 mg/L (ppm), whichever is greater
 - 3. Precision
 - a. 5% of reading or 0.01 mg/L (ppm), whichever is greater
 - 4. Minimum detection limit
 - a. 0.01 mg/L (ppm)
 - 5. Resolution
 - a. 0.01 mg/L (ppm)
 - 6. Repeatability
 - a. 0.03 mg/L (ppm)
 - 7. Cycle Time
 - a. 2 to 10 minutes for free or total and 2.5 to 10 minutes for free and total
- 1.5 Certifications
 - A. CE approved
 - B. General Purpose UL/CSA 61010-1 compliant for conducted and radiated emissions CISPR 11 (Class A limits), EMC Immunity EN 61326-1 (Industrial limits), and EN 61010-1
 - C. IP65 dust and water ingress protection rating
- 1.6 Environmental Requirements
 - A. Operational Criteria
 - 1. Sample flow rate
 - a. 9 to 16 GPH (35 to 60 LPH)
 - 2. Sample pressure
 - a. 4.4 to 14.5 psi (0.3 to 1 bar), 7 to 10 psi (0.48 – 1 bar) is the preferred operating pressure
 - 3. Sample temperature
 - a. 33.8 to 113 °F (1 to 45 °C)
 - 4. Ambient operating temperature
 - a. 35.6 to 122.6 °F (2 to 50 °C)
 - 5. Operating humidity

- a. 90% non-condensing

1.7 Warranty

- A. The product includes a two-year warranty from the date of shipment

1.8 Maintenance and Service

A. Scheduled Required Maintenance

1. Monthly

- a. Reagent replacement depends on measurement cycle testing times

2. Annually

- a. Analyzer tubing replacement and pump heads

B. Unscheduled Maintenance

- 1. Incoming water filter cleaning, frequency is determined by the condition of the feed water

PART 2 PRODUCTS

2.1 Manufacturer

A. Chemical Injection Technologies

- 1. Model WATERGUARD® WG-702 Chlorine Analyzer controller for, Free or Total / Free and Total Chlorine Residual

2.2 Manufactured Unit

- A. The WG-702 Chlorine analyzer consists of an analyzer, mounting board, pre-filter, pressure regulator and gauge, extra cable entry / cable strain reliefs, washers and 6 foot power cord (USA 120V).

2.3 Equipment

- A. The analyzer must be housed in an IP65 (NEMA 4 equivalent) rated enclosure with gasketed door.
- B. The analyzer shall be capable of measuring free and/or total residual chlorine without changing out of installed components.
- C. A measurement shall be taken every 2 to 10 minutes for free or total and 2.5 to 10 minutes for free and total the results displayed by a three digit LCD readout in the range of 0 to 10 mg/L.
- D. The analyzer must have universal auto switching for 110VAC / 230VAC / 12 VDC selectable power.
- E. The analyzer shall have Real Time Clock (RTC) standard (3.6V Lithium battery) in case of power failure.
- F. The analyzer must perform an automatic zero calibration between analysis points to compensate for sample color, turbidity, and changes in light intensity due to voltage fluctuations or light source aging.
- G. The analyzer shall operate with a LED light source at a peak wavelength of 510 nm.
- H. The analyzer must be able to operate unattended for 30 and up to 60 days between chemical reagent changes utilizing level sensing floats within the reagent bottles notifying the operator of low level reagent
- I. The analyzer must have automatic reagent mixing and colorimetric cleaning functions standard, cleaning the site tube prior and after each sample
- J. The analyzer has two feed control (relay) operation modes to operate chemical feed pumps. Available control options are:
 - 1. On/off control where the concentration alarm outputs activate or deactivate a pump when chlorine levels fall below or exceed acceptable levels via adjustable set points

2. Proportional control where the 4-20mA output current is scaled to pace a feed pump proportional to output.
3. The analyzer must have dry contact relays for alarm outputs
- K. The analyzer has standard optically isolated analog outputs, selectable as 0/4 to 20mA, field programmable over any portion of the analyzer range. The 4-20mA output scale should have the ability to be inverted.
- L. The analyzer has two standard SPDT relay alarms, with contacts rated for 5 amp resistive loads at 230V AC power. Alarm options include concentration set point, analyzer system warning, and analyzer system shut down.

2.4 Components

A. Standard Equipment

1. WG-702 Free or Total / Free and Total Chlorine analyzer controller uncluding machined acrylic flow cell with flow proximity indicator and sampling valve port, incoming 130 micron water filter with shut off valve, pressure reducing valve and gauge, powder coated aluminum mounting board with front standoffs for unit removal and reagent check valves
2. One-Month Supply of reagents for free or total / free and total chlorine
3. User manual

B. Dimensions & Weight:

1. Controller unit : 26.4 x 13 x 5.1 inches (670 x 330 x 130 mm)
2. Mounting board: 31.5 x 21.7 x 0.2 inches (800 x 550 x 5 mm)
3. Installed Weight (approximate): 24.3 lbs (11 kg) not including reagent added weight
4. Shipping dimensions (approximate): 35 x 26 x10 inches (890 x 660 x 25 mm)
5. Shipping weight (approximate): 40 lbs (18 kg)

2.5 Optional Accessories

- A. Maintenance kit with reagent pump head, reagent pump tubing, grease for pump heads and check valves
- B. pH monitoring and Temp
- C. ORP monitoring and Temp
- D. Conductivity monitoring
- E. Turbidity monitoring
- F. GPRS or Ethernet modem
- G. Up to six (6) 4-20mA outputs

PART 3 EXECUTION

3.1 Preparation

1. Mounting
 - a. The WG-702 Free and/or Total Chlorine analyzer shall be wall mounted only.
2. Required Clearances
 - a. Horizontal: 15.5 in (394 mm), 33 inches (838 mm) ideal
 - b. Vertical: 25 inches (635 mm)
 - c. Depth: 24 inches (610 mm)
3. Sample inlet

- a. 0.25 inch ID tubing
- 4. Sample cell outlet
 - a. 0.25 inch ID tubing
- 5. Drain
 - a. 0.5 inch NPT
- 6. Power
 - a. 3 prong grounded 110 volt or 230 volt plug and receptacle or hard wired. The distance from the unit shall be 5 foot from the electrical outlet unless hard wired

3.2 Installation

- A. Customer shall install the analyzer in strict accordance with the manufacturer's instructions and recommendation.
- B. The product sales representative or qualified technician will include a half-day of start-up training if requested.
 - 1. Customer will schedule a date and time for start-up.
 - 2. Customer may require the following people to be present during the start-up procedure.
 - a. General contractor
 - b. Electrical contractor
 - c. Chemical Injection Technologies factory trained representative
 - d. Owner's personnel
 - e. Engineer

END OF SECTION