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Capital Controls® Series **1770**

Chlorine Residual Analyzer

Capital Controls® is the recognized world leader in amperometric chlorine analyzer technology. The Series 1770 is the latest addition to this family of residual analyzers, providing a reagentless amperometric analyzer designed for the continuous measurement of free chlorine in drinking water, swimming pools and recirculating process waters.

The amperometric analyzer is EPA approved for on-line chlorine residual monitoring in drinking water. The Series 1770 is factory tested and shipped as a 0-2 mg/l free chlorine analyzer. Ranges are field selectable from 0-1 mg/l to 0-20 mg/l. These analyzers also incorporate a constant electrode cleaning system to eliminate signal drift.

High and low alarm set points with LED light alarm status indicators are standard. The extra large gold and copper electrodes provide greater signal strength. Additionally, temperature variations are compensated with a thermistor.

The entire electronics are protected with a NEMA 4 enclosure. All components and controls are easily accessible from the front of the unit.

- Continuous on-line operation
- Low cost
- Field-proven
- No reagents for cost effective monitoring
- Direct measurement of free chlorine residual
- High and low alarm points
- 4-20 mAdc output
- NEMA 4 enclosure
- 5% accuracy
- Field selectable monitoring ranges up to 20 mg/l
- Meets EPA requirements for direct reporting

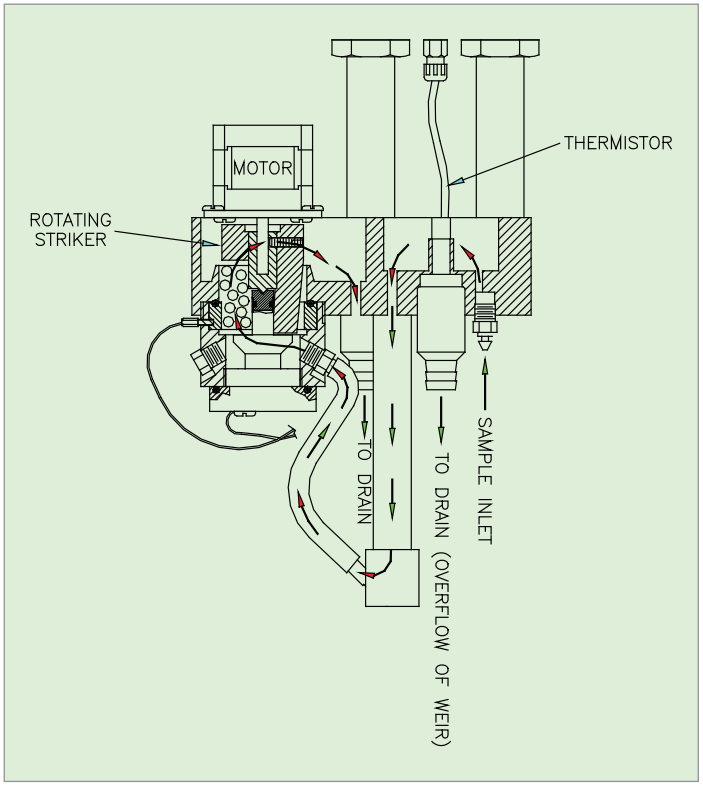

Figure 1 - Series 1770 Flow Diagram

Applications

For drinking water, swimming pools and recirculating waters with a relativity stable pH and low particulate concentrations.

- **Drinking water disinfection:** Drinking waters require continuous monitoring of chlorine residual as specified by the U.S. Safe Drinking Water Act
- **Swimming pool disinfection:** Require low cost, monitoring of free chlorine
- **Cooling water biofouling:** Cost effective control of slime and algae in piping and heat exchangers and cooling towers by monitoring free chlorine
- **Industrial process water:** Accurate monitoring of residual chlorine in industrial process waters

The Series 1770 reagentless analyzer is ideal for the conditions and applications listed above. The 1870E residual analyzer provides a more stable and sensitive signal. This is accomplished in acidic solutions through buffer addition. This is often needed in wastewater and other waters where conditions are harsh or otherwise changing. Buffered analyzers are also necessary when a high degree of accuracy is required. Consult De Nora Water Technologies for the analyzer needed for your application.

Design Features

No reagents: Because the applications have a relatively stable pH, the accuracy and reliability can be maintained at 5% of full scale without the need of costly reagents

High and low alarm set points: Monitor and control free chlorine within a concentration band by using high and low alarm set points that are easily adjusted on the front panel. LED lights indicate an alarm has occurred. Latching alarm is field selectable

Large cell: The extra large gold and copper electrodes provide maximum signal strength

NEMA 4 enclosure: Protects the electronics and the faceplate. Provides easy 1/4 turn accessibility to the set points and the zero and span calibration trim. Also accessible through the front are all controls and switches for range selection and the 4-20 mAdc output features

Easy mounting: The Series 1770 Chlorine Residual analyzer is supplied with four mounting brackets for simple wall mounting

Accurate: The 5% accuracy of the unit is ideal for monitoring and control of most clean water samples

Principle of Operation

The sample liquid is delivered to the sample chamber at a rate of 150 ml/minute. The incoming sample overflows the weir into the sample cell, the remainder goes to drain. The sample then passes through the annular space between the two fixed electrodes in the sensing cell. As it passes, a small direct current is generated in direct linear proportion to the amount of residual present in the sample. The residual value is displayed on the digital indicator in milligrams per liter free chlorine.

The surface of both electrodes are kept clean by the continuous action of PVC spheres agitated by a motor. This constant cleaning reduces signal drift and the need for recalibration, and provides an accurate residual measurement. A thermistor compensates for sample temperature variation. (See Figure 1).

High and low set points are independently adjusted from 0 to 100% of the selected range. When a set point is exceeded, a corresponding light on the face of the unit will illuminate. Each set point can be connected to an external alarm, controller, etc.

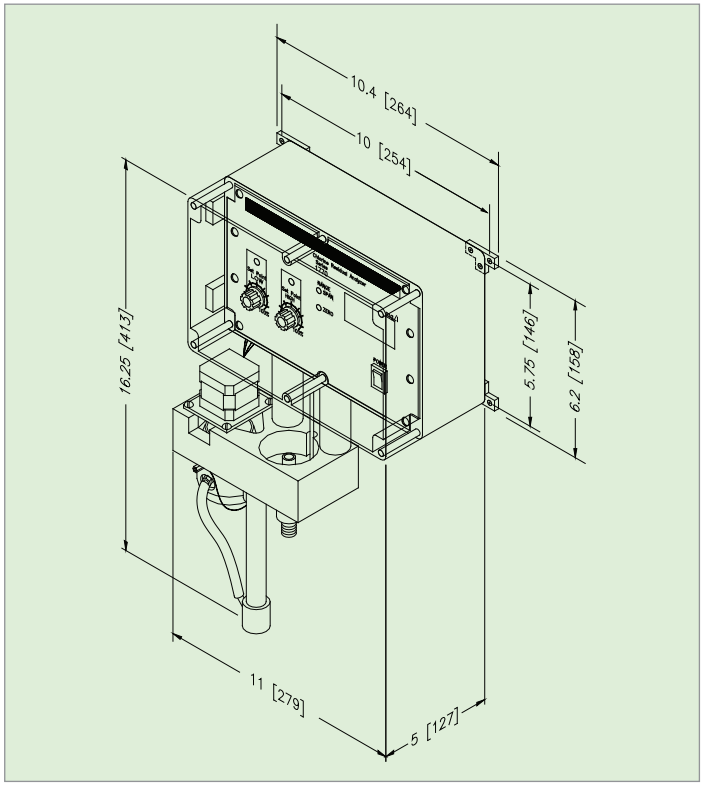

Figure 2 - Dimensions (For reference only)

Technical Data Series 1770

Sample

Sample Flow: 150 ml/minute at atmospheric pressure

Sample Supply: Continuous. Where sample interruption may be required, provision must be made to keep electrodes wet with fresh water

Sample Temperature Range: 32° to 120°F (0° to 50°C)

Ambient Temperature: 32°F to 120°F (0°C to 50°C)

Analyzer Location: Indoor, as close as possible to sampling point to reduce sample dead time

Sample Limitations: Samples containing large and rapid pH changes, high concentrations of metal ions or certain corrosion inhibitors may effect analyzer operation

Electrodes: Gold and copper

Display: LED, to show residual reading

General

Instrument Range: Shipped as 0-2 mg/l, filed selectable as 0-1.0, 0-2.0, 0-5.0, 0-10.0 and 0.20.0

Resolution: 0.01 mg/l from 0-5 mg/l and below 0.1 mg/l from 0-10 mg/l and above

Accuracy: 5% of range

Sensitivity: 0.01 mg/l

Speed of Response: 4 seconds from sample entry to display indication. 90% residual change to 1½ to 2 minutes

Power: 120/240 Vac, 50/60 Hz, 11VA

Relay Contacts: 5 amps at 240 Vac or 24 Vdc, resistive load, SPDT

Output Signal: 4-20 mAdc, isolated into 800 ohms maximum

Indicator: 3-1/2 digit, LED display in milligrams per liter (mg/l)

Enclosure: NEMA 4

Shipping Weight: 12 lbs. (5.5 kgs)

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Warranty and Capability

De Nora Water Technologies offers a one (1) year limited warranty on all residual analyzers.

De Nora Water Technologies is ISO 9001 certified to provide quality and precision materials. Disinfection technologies, water quality monitors and instrumentation for water and wastewater are areas of specialization. Over 35 years of industrial and municipal application experience in the water and wastewater industries is incorporated into the equipment design to provide high quality comprehensive solutions for the global market.

Brief Specification

The residual analyzer shall continuously analyze a water sample in an amperometric type of cell and produce a current proportional to the free chlorine residual in the sample. The range of the analyzer shall be field selectable for 0 to 1.000, 2.000, 5.00, 10.00, 20.00 mg/l. The residual analyzer electronics shall be mounted in a NEMA 4X enclosure. The electrodes shall be fixed and shall be continuously cleaned by the action of small spheres moved in a spatial action between the surfaces by a motor-operated striker.

The amperometric analyzer is EPA approved for on-line chlorine residual monitoring in drinking water. Automatic temperature compensation shall be provided. The sensing cell shall consist of fixed gold and copper electrodes. The isolated output signal shall be 4-20 mAdc into a maximum of 800 ohms. The cell shall be kept clean by a motor direct-driven plastic striker agitating small PVC spheres against both electrodes to keep dirt and other interfering substances from the face of the electrodes and eliminate signal drift. The cleaning operation shall be continuous. Separate high and low set points shall be provided and shall be adjustable from the front of the unit from 0-100% of the range. Each set point shall have a corresponding light on the face of the unit. A latching contact option shall provide band control.

The analyzer shall operate from a 120/240 Vac, 50/60 Hz single phase power supply.

The residual analyzer shall be Capital Controls Series 1770.

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