



CAPITAL CONTROLS

Capital Controls' AZTEC® CL1000 Residual Analyzer represents the latest advance in residual analysis. Through microprocessor-based electronics, this instrument offers precise control of the critical components in the measurement of chlorine. These include pH and temperature. The result is the most accurate analyzer on the market today.

The amperometric-based instrument is designed to continuously analyze free or total chlorine, iodine, bromine, or other oxidants for water, wastewater, cooling water, and other process water applications with a three-electrode arrangement. This arrangement establishes a constant potential on the working electrode to provide optimum accuracy, excellent stability, and sensitivity of one part per billion.

The AZTEC® CL1000 Residual Analyzer features a large dot-matrix graphical display with automatic ranging capabilities from 0-60 mg/l. The analyzer includes on-screen instruction and self diagnostics. Display resolution is up to 0.001 mg/l with an optional graphical viewing mode.

Six adjustable alarm relays and dual 4-20 mAdc output signals are standard. All user controls are provided through four membrane buttons on the display face. The analyzer incorporates a constant, direct-drive electrode cleaning system which eliminates signal drift and the need for frequent recalibration.

The analyzer sample is gravity fed, eliminating the need for a sample pump. Reagents are added automatically with a solenoid valve controlled by a precise pH feedback control loop. Sample temperature variations are compensated with a 100 ohm RTD. Sample flow is monitored with an infrared flow detector.

The AZTEC® CL1000 Residual Analyzers are constructed of corrosion resistant materials and are modular in design for serviceability and ease of maintenance. Each unit is pre-piped and pre-wired, requiring only field connection to service points. All components and controls are accessible from the front of the unit to permit ease of observation of solution level and sample flow.

AZTEC® Residual Analyzer Series CL1000



- ◆ Continuous on-line operation
- ◆ Microprocessor-based
- ◆ Dot matrix graphical display
- ◆ 1 ppb sensitivity
- ◆ Auto ranging to 60 mg/l
- ◆ Data logging and trending
- ◆ Automatic pH adjustment
- ◆ On-screen instruction and self-diagnostics
- ◆ Six programmable alarm relays
- ◆ Direct measurement of free or total chlorine

Applications

- ◆ **Wastewater:** Feed-forward dechlorination control; Effluent monitoring to parts per billion.
- ◆ **Drinking water disinfection:** Drinking waters require continuous monitoring of chlorine residuals as specified by the U.S. Safe Drinking Water Act; Influent and finished water monitoring and control
- ◆ **Food and beverage:** Zero verification after carbon filtration
- ◆ **Pharmaceuticals:** Zero verification after carbon filtration; simplification of validation procedures
- ◆ **Cooling water monitoring and control:** Control of slime and algae in piping and heat exchangers
- ◆ **Industrial process control:** Verification and control of chlorine or other oxidants used in production processes

Design Features

- ◆ **Data logging and trending:** Statistics for up to 28 days; previous 7 days; or previous 24 hours are logged and can be viewed in graphical format
- ◆ **Automatic ranging from 0- 60 mg/l:** The analyzer provides automatic ranging capabilities from 0-60 mg/l without any hardware or software modifications
- ◆ **1 ppb sensitivity:** The three-electrode arrangement and feedback control of the sample pH and temperature enables accurate, low parts per billion dechlorination
- ◆ **Automatic reagent addition:** A precise pH feedback control loop provides automatic adjustment of reagent addition to maintain the optimal sample pH and minimize reagent consumption.
- ◆ **Three electrode arrangement:** The three-electrode arrangement establishes a constant potential on the working electrode to provide optimum accuracy, excellent stability, and sensitivity of one part per billion.
- ◆ **Ease of use:** On-screen instruction and self diagnostics provide visual data to efficiently configure, operate, and maintain the analyzer.
- ◆ **Six programmable alarm relays:** Each relay is independently configurable to be high, low, attention, or fail.
- ◆ **Dual output signals:** Dual 4-20 mAdc or 0-20 mAdc output signals are provided for residual level monitoring and control; each output signal is isolated into 1000 ohms maximum impedance.
- ◆ **Accurate:** The 1% accuracy of the unit is ideal for precise monitoring and control of water, wastewater, and industrial process water
- ◆ **Automatic cleaning:** A continuous direct-drive cleaning system maintains a constant level of electrode cleanliness
- ◆ **Mounting:** Easy mounting is accomplished through the mounting panel where all components are attached.
- ◆ **NEMA 4X:** The electronics enclosure is NEMA 4X for protection

Principle of Operation

A sample of liquid is delivered to the sample inlet chamber at an approximate rate of 350 ml/ minute. The excess overflows to drain. The flow to the analyzer is monitored by a unique infrared flow detection system.

The sample then passes to a mixing chamber where pH 4 buffering solution is added and mixed with the sample. The sample pH is measured and used in a feedback control loop to adjust the reagent addition with a solenoid valve. A 100 ohm RTD compensates for temperature variation.

The buffered sample then passes through an annular space between two 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. A third, reference electrode located downstream of the sensing cell establishes a constant potential on the working electrode to provide an accurate, stable residual indication. The surface of the two electrodes in the sensing cell are kept clean by the continuous action of PVC balls agitated by a motor-driven, rotating striker assembly. The constant cleaning action of the PVC balls minimizes signal drift and recalibration to provide an accurate residual measurement.

The residual value is displayed on the on the display in ppm, mg/l, ppb, µg/l or in graphical format.

Technical Data

Series CL1000

GENERAL

Quality Standards: ISO 9001 Certified
Compliance: CE, UL (optional)
Residual Measured: Free Chlorine; Total Chlorine; Bromine; Iodine; (Consult Factory for other oxidants)
Instrument Range: Automatic ranging from 0-60 (mg/l)
Display: 3" x 4", dot-matrix, graphical display
Data Logging: Up to 28 days; previous 7 days; previous 24 hours
Resolution: 0.001 mg/l for below 10 mg/l, 0.01 for 10-60 mg/l
Sensitivity: 0.001 mg/l or 1 ppb
Configurable Residual Units: mg/l, ppm, ppb or mg/l
Analyzer Location: As close as possible to sample point
Speed of Response: Four (4) seconds from sample entry to display indication. 90% of full scale response within 1½ to 2 minutes.
Ambient Temperature: 32°F-140°F (0°C-60°C)
Languages: (American) English, U.K. English (for other languages, consult factory)
Power Requirements: Automatic power selection for 100-250 Vac, 47-63 Hz, 1 phase
Power Consumption: 50 Watts
Output Signal: Dual 4-20 mAdc or 0-20 mAdc, isolated into 1000 ohms maximum
Digital Output: RS232/485 communication capabilities
Relay Contacts (Six): Each relay is independently configurable to be high, low, attention, or fail. The fail relay can be set by a hardware jumper to indicate a power failure. There are also settings for hysteresis, delay, and action. Alarm contacts rated 5A @ 240 Vac, resistive load.

Model Information Code

Model CL1000

A Compliance

01 - Standard Unit (CE)
03 - UL Approved

B Language

01 - American English
02 - U.K. English

D Documentation

01 - Standard
02 - QC2

C Buffer

01 - Acetate/Acid Buffer
02 - Acetate/Acid Buffer and Potassium Iodide

SAMPLE

Sample Flow: 350-450 ml/min at 5 psi minimum (10 psi maximum)
Sample Temperature: 32°F-120°F (0°C-50°C)
Sample Supply: Continuous. Where sample interruption may be required, provision must be made to keep electrodes wet.
Sample Limitations: Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration. Samples containing high concentrations of metal ions, oils, or certain corrosion inhibitors may effect analyzer operation. Consult factory for specific applications.
Accuracy: 1% of reading or ±0.002 mg/l, whichever is greater, for residual levels below 20 mg/l; 5% of reading for residual levels from 20-60 mg/l (see sample limitations)

Residual Requirements:

Residual	Reagent
Chlorine (Free)	pH buffer
Chlorine (Total)	pH buffer & potassium iodide
Iodine	pH buffer
Bromine	pH buffer and potassium iodide
Other Oxidants	Consult Factory

INSTRUMENT

Electronics Enclosure: NEMA 4X

Electrodes:

Measuring - Gold

Anode - Copper

Reference - Ag/AgCl

Shipping Weight: 22 lbs (10 kg)

Dimensions: 19 x 15 x 8" (475 x 375 x 200 mm)

Equipment Options:

Sample Pump

Self-flushing Y-Strainer

Optional Accessories:

16 week supply of pH buffer

1 lb. Potassium Iodide

Pressure reducing valve

Patented purging circuit

Warranty and Capability

Capital Controls offers a one (1) year limited warranty on all residual analyzers.

Capital Controls 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) (total chlorine) (bromine) (iodine) residual in the sample. The analyzer shall provide automatic ranging for 0-60 mg/l of (free chlorine) (total chlorine) (bromine) (iodine) in water, within 0.002 mg/l or 1% of the reading, whichever is larger for residual levels below 20 mg/l or within 5% of the reading for residual levels from 20-60 mg/l. The microprocessor-based analyzer shall display the residual in mg/l, ppm, ppb, or µg/l.

The analyzer shall contain a removable cell assembly consisting of gold and copper electrodes that are continuously cleaned by the action of small captured spheres moving in a spatial action between the electrode surfaces. A third Ag/AgCl electrode shall fix the potential on the working electrode to provide a stable residual indication to one part per billion.

The sample flow to the electrodes shall be continuous at a rate of 350-450 ml/minute at 5 psig and shall be automatically temperature compensated from 32-120°F (0-50°C) with a 100-ohm RTD. An infrared flow detector shall monitor flow. A pH probe shall continuously monitor and provide feedback control of the buffer solenoid valve to maintain the sample pH at (4.4 for total chlorine residual measurement) (4.9 for free chlorine residual measurement).

The analyzer shall be a microprocessor-based instrument with a 3" x 4" dot-matrix graphical display housed in a NEMA 4X electronics enclosure. The analyzer shall provide data logging and trending for up to 28 days; previous 7 days; or previous 24 hours. Display resolution shall be 0.001 mg/l for below 10 mg/l residuals, and 0.01 mg/l for 10-60 mg/l.

The analyzer shall provide on-screen instruction and self diagnostics. All user controls shall be provided through four membrane buttons on the display face.

The analyzer shall include six (6) adjustable alarm relays that are independently configurable to be high, low, attention, or fail. The fail relay shall be selectable, by a hardware jumper, to indicate a power failure. The analyzer shall include settings for hysteresis, delay, and action. Alarm contacts shall be rated 5A @ 240 Vac, resistive load.

The analyzer shall have universal power recognition from 100-250 Vac, 47-63 Hz, 1 phase power. The analyzer shall provide dual isolated 4-20 mAdc or 0-20 mAdc into a maximum of 1000 ohms. The analyzer shall have RS232/485 communication capabilities.

Design improvements may be made without notice.

Represented by:



CAPITAL CONTROLS

Severn Trent Services Inc.

3000 Advance Lane Colmar, PA 18915

Tel: 215-997-4000 • Fax: 215-997-4062

Web: www.capitalcontrols.com

E-mail: marketing@capitalcontrols.com

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• INDIA • ITALY • MALAYSIA