

# CHLORTROL 5000 Series 17B5000 Residual Chlorine Analyzer



## CAPITAL CONTROLS

The CHLORTROL 5000™ Residual Chlorine Analyzer is an amperometric device designed to provide continuous measurement of the concentration of residual chlorine in water. The analyzer uses a flow-through measurement cell containing two dissimilar metal electrodes. As the water sample flows past the electrodes, a current is generated which is directly proportional to chlorine concentration. One of the electrodes is rotated by an electric motor, which imparts a swirling velocity to the water sample. The electrode rotation at constant speed provides reproducible electrolytic conditions and makes the cell output independent of sample flow variations. Inert plastic non-abrasive pellets in the cell keep the electrodes in a clean condition through scouring action. Either free or total chlorine residual may be measured by proper reagent selection.

A solid-state amplifier and signal conditioner converts the generated current signal to an isolated 4-20 mAdc output suitable for use with standard electronic secondary instruments. Necessary zero and span adjustments are part of the circuitry and automatic temperature compensation of the cell output is included to eliminate errors due to changes in sample water temperature. The operating range is field selectable, and RFI immunity is built in.

The analyzer is also supplied with a digital indicator to eliminate the need for additional instrumentation at the point of measurement, and is wall-mounted for operating and maintenance convenience. For systems with the analyzer and associated instruments contained in the same floor-mounted cabinet, refer to Bulletin 210.0070.



- ◆ **Continuous on-line operation**
- ◆ **Field Proven Reliability**
- ◆ **Easy Maintenance**
- ◆ **60 day reagent supplies**
- ◆ **Multiple ranges - field selectable up to 20 mg/l**
- ◆ **Continuous cell cleaning system**
- ◆ **Isolated 4-20 mAdc output**
- ◆ **Low cost**

## ENGINEERING SPECIFICATIONS

**Measurement Principle:** Amperometric type with bare electrodes

**Type of Measurement:** Free or Total chlorine residual

**Operating Ranges:** 0-0.25, 0-0.5, 0-1, 0-2, 0-5, 0-10, and 0-20 mg/L (field selectable)

**Sample Conditioning:** For wastewater applications, where total chlorine residual is measured, a flushing "Y" strainer is recommended for installation in the sample line, close to the analyzer.

**Interferences:** Turbidity and chemicals normally found in raw and treated waters do not affect cell operation. However, potassium permanganate and ozone do have an adverse effect.

### Sample Requirements:

Temperature: 33 to 122 °F (1 to 50 °C)

Flowrate to Flushing "Y" Strainer: 5-10 gpm (19 to 38 l/m)

Flowrate to measuring cell: 100 cc/m

Pressure: Reasonably constant between 5 and 25 psig (34 to 172 kPa)

**Temperature Compensation:** A thermistor provides automatic signal compensation for changes in sample temperature.

**Ambient Temperature Limits:** 33 to 122°F (1 to 50 °C)

**Power Requirements:** 110/120, 220/240 A ac ±10%, 50/60 Hz, at 8 watts max.

**Meter Indication:** Direct reading 3 ½ digit LCD display with 0.5 inch (13mm) high characters

**Materials of Construction:** All materials in contact with the water sample resist corrosion from chlorinated water, waste water, and added reagents. All electronics are housed in a glass-filled polyester case with a polycarbonate cover having a NEMA 4X (IP 66 per IEC529) rating.

**Output:** 4-20 mA dc into 600 ohms max. with built-in signal isolation

**Sensitivity:** The analyzer will recognize and respond to residual changes as low as 0.001 mg/l chlorine.

**Accuracy:** ±2% of span

**Speed of Response:** Withing 5 seconds from sample entry to display indication.

**Mounting:** Wall

**Reagent Containers:** When acetic acid is used for pH control, one 8 gal (30 l) opaque plastic container is furnished for free chlorine residual measurement. Two containers are furnished when total chlorine residual is measured. When carbon dioxide is used for pH control, one less container is furnished.

### Shipping Information:

Weight: 79 lbs. (35.8 kg)

Cubage: 12.8 cu ft (0.36 cu m)

**Overall Dimensions:** 18" (457 mm) W x 24" (610 mm) H x 4 7/8" (124 mm) D

## OPTIONAL EQUIPMENT

- Additional Chemicals (a one month supply is provided with each unit, except for CO<sub>2</sub> which, when used, is provided by the customer)
- Amperometric Titrator for calibration
- Recorder (10 in circular chart) with 7-day or 24-hour chart speed.
- Recorder (4 in strip chart) with 1.2 in/hr or 2.5 in/hr chart speed.
- Controller

## EQUIPMENT DESCRIPTION

The Residual Chlorine Analyzer shall be of the amperometric type for the measurement of (free)(total) chlorine residual over a range of 0 to mg/l, and be suitable for wall mounting.

The water sample to be analyzed shall flow through a glass tube rotameter having Kynar® end fittings, and direct reading scale. A needle valve shall be used to set the optimum sample flow rate. A thermistor shall be included to automatically compensate for varying water temperature, and a static mixer to ensure that the reagents are thoroughly mixed before the sample enters the measuring cell. For wastewater Installations, a flushing "Y" strainer shall be provided for field installation in the sample line near the analyzer.

The sampling cell shall contain two dissimilar metal electrodes which continually detect the chlorine concentration and generate a proportional current signal. The cell shall be provided with non-abrasive plastic pellets which are continually impelled against the electrodes to prevent any foreign material from adhering to the electrode surfaces. The noble metal electrode shall be rotated by a motor drive to provide the impelling force for the cleaning pellets and to eliminate the need for close control of sample flow rate.

The reagent feed pump shall be a motor-driven, peristaltic type, and shall pump the necessary chemicals. When acetic acid is used for pH control, an 8 gal (30L) capacity plastic reagent container shall be provided for chemicals when free chlorine is being measured. Two 8 gal containers are provided when total chlorine is being measured. When full, this container shall hold a 60 day supply. Measurement with CO<sub>2</sub>, for pH control requires one less container.

The following ranges shall be switch adjustable in the indicating transmitting instrument: 0-0.25, 0-0.5, 0-1.0, 0-2.0, 0-5.0, 0-10.0, and 0-20.0 mg/l. The transmitter shall contain a 3 1/2 digit LCD indicator with 1/2 inch (13mm) high characters, and all the electronic circuitry in a corrosion resistant enclosure having a NEMA 4X (IP 66 per IEC 529) rating. The circuit board shall be coated with Humiseal® having a minimum thickness of 0.002" to meet the requirements of MIL E-810, thus increasing corrosion resistance. Power supply shall be (120)(240V) 50/60 Hz. The instrument shall have ambient temperature limits of 33 to 122°F (1 to 50°C) and RFI immunity from a 5 watt walkie-talkie at a one meter distance. The transmitted signal shall be 4-20 mA<sub>dc</sub> into 0-600 ohms, linearly proportional to the range selected. The measuring and transmitting system shall be traceable to "Standard Methods" without any calculated or inferred values.

A one month supply of chemicals shall be provided for the analyzer, except that carbon dioxide (CO<sub>2</sub>,) when used shall be provided by the customer.

All components of the analyzer shall be installed on a PVC panel for wall mounting. The chlorine residual analyzer shall be Series 17B5000 CHLORTROL 5000 as manufactured by Capital Controls.

### Optional Equipment

Additional Chemicals -a one month supply is provided with each unit, except that CO<sub>2</sub>, when used shall be provided by the customer.

Amperometric Titrator for calibration  
Capital Controls Surge Buster™

Remote Indicator/recorder/controller

### ORDERING INFORMATION:

Model Number  
Type of residual  
Voltage and frequency  
Range in mg/l  
Free or Total chlorine residual  
Normal, seawater or breakpoint service  
Acetic acid or CO<sub>2</sub> for pH control  
If CO<sub>2</sub>, with or without gas pressure reducing station  
Optional Equipment

### RELATED SPECIFICATIONS:

Capital Controls manufactures several types of Chlorine Residual Analyzers and Systems.

Refer to Specification 17SB5000 for the CHLORTROL 5000™ and associated instrumentation contained in the same floor-mounted cabinet.

Refer to Specification 17SD4000 for the Z-CHLOR® Center Zero Dechlorination Control System, designed for use when the maximum chlorine residual permitted is low or even zero.

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HUMSEAL® is a registered trademark of Chase Corporation.*

*Z-CHLOR is a registered trademark of Capital Controls.*

**MODEL INFORMATION CODE**

	<u>17B5</u>			<u>A</u>		
<b>CHLORTROL 5000™</b>						
Analyzer with Bare Electrode	17B5					
<b>RESIDUAL MEASURED (pH CONTROL)</b>						
Chlorine (Acetic Acid or CO <sub>2</sub> )		1				
Breakpoint - Free Chlorine (Acetic Acid)		3				
<b>POWER SUPPLY</b>						
120V 50/60 Hz			1			
240V 50/60 Hz			2			
<b>MEASUREMENT RANGE, mg/l</b>						
0 to 0.25				1		
0 to 0.50				2		
0 to 1.0				3		
0 to 2.0				4		
0 to 5.0				5		
0 to 10.0				6		
0 to 20.0				7		
<b>TYPE OF RESIDUAL BEING MEASURED (pH CONTROL)</b>						
Free Chlorine (Acetic Acid)					1	
Total Chlorine (Acetic Acid)					2	
Free Chlorine (CO <sub>2</sub> )					3	
Total Chlorine (CO <sub>2</sub> )					4	
Free Chlorine (CO <sub>2</sub> ) Dual pressure reducing station w/rotameter provided					5	
Total Chlorine (CO <sub>2</sub> ) Dual pressure reducing station w/rotameter provided					6	
<b>DESTINATION</b>						
Domestic						1
Overseas						2

Design improvements may be made without notice.

Represented by:



**CAPITAL CONTROLS**

**Severn Trent Water Purification, Inc.**  
 3000 Advance Lane Colmar, PA 18915  
 Tel: 215-997-4000 • Fax: 215-997-4062  
 Web: www.severntrentservices.com  
 E-mail: marketing@severntrentservices.com

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 INDIA • ITALY • MALAYSIA