

# CHLORTROL Series 17-5000 Analytical Instruments



## Dissolved Ozone Permanganate and Anaflour Fluoride Analyzers



- ◆ Continuous on-line operation
- ◆ Field Proven Reliability
- ◆ Easy Maintenance
- ◆ 60 day reagent supplies
- ◆ Field Selectable ranges
- ◆ Continuous cell cleaning system
- ◆ Isolated 4-20 mAdc output
- ◆ Low cost

## CAPITAL CONTROLS

The Series 17-5000 analyzers are amperometric devices designed to provide continuous measurement of the concentration of water treatment chemicals. The analyzers use 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 the specific chemical 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.

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.

Each 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. Analyzers may also be supplied in free standing cabinets together with recorders or controllers. Refer to Bulletin 210.0070 for dimensional information.

## ENGINEERING SPECIFICATIONS

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

**Measurement:** Concentration of Fluoride, Ozone and Permanganate dissolved in water.

**Standard Operating Ranges:**

Dissolved Ozone: 0-0.5 and 0-1 mg/l  
Fluoride: 0-1 and 0-2 mg/l  
Permanganate: 0-0.5, 0-1, and 0-2 mg/l  
(Other ranges available on special order)

**Sample Conditioning:** Where settleable solids are present in the sample flow, a flushing "Y" strainer should be installed in the sample line, near to the analyzer.

**Interferences:** Turbidity and chemicals normally found in raw and treated waters do not affect analyzer operation. However, the presence of some chemicals will require the use of different reagents to assure proper operation.

**Fluoride Without Hexametaphosphate:** Dilute acetic acid is used for pH adjustment. A dechlorinating agent is also added to remove chlorine residual from the sample.

**Fluoride With Hexametaphosphate:** Dilute nitric acid is used for pH adjustment. Varying aluminum and phosphate concentrations will adversely affect operation.

**Dissolved Ozone:** Aluminum concentrations above 0.1 mg/l or copper concentrations above 0.2 mg/l require the use of a sample conditioning chemical.

**Permanganate:** Dilute sulfuric acid is used to adjust pH of the sample to eliminate interferences from residual chlorine.

**Sample Requirements:**

Temperature: 33 to 122°F (1 to 50°C)  
Flowrate to Flushing "Y" Strainer: 5 to 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:** 33 to 122°F (1 to 50°C)

**Materials of Construction:** All materials in contact with the water sample resist corrosion from the treated 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.

**Power Requirements:** 110/120, 220/240 V ac  $\pm 10\%$ , 50/60 Hz, at 8 watts max.

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

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

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

**Sensitivity:** The analyzer will recognize and respond to ozone and permanganate concentration changes as low as 0.01 ppm and fluoride changes as low as 0.02 ppm.

**Accuracy:**  $\pm 2\%$  of span.

**Mounting:** Wall (floor cabinet mounting optional)

**Reagent Containers:** Appropriate plastic container(s) will be supplied with each analyzer for the reagent(s) specific to the particular analysis.

**Shipping Information:**

Wall Mounted:

Weight: 79 lbs. (35.8 kg)

Cubeage: 12.8 cu. ft. (0.36 cu. m)

Cabinet Mounted:

Weight: 150 lb. (68 kg)

Cubeage: 32 cu. ft. (0.91 cu. m)

Overall Dimensions: 18" (457 mm) W x 24" (610 mm) H x 4 7/8" (125 mm) D

## EQUIPMENT DESCRIPTION

The Analyzer shall be of the amperometric type for the measurement of (fluoride, 0 to \_\_ppm), (permanganate 0 to \_\_ppm), (dissolved ozone 0 to \_\_ ppm). It shall be suitable for wall mounting.

The water sample to be analyzed shall flow through a glass tube rotameter having Kynar® end fittings, and a 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. When settleable solids are present in the water sample, 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 (fluoride) (permanganate), (ozone) concentration in the water sample 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 analyzer shall be supplied with a motor driven reagent feed pump to introduce the proper chemicals into the water sample. Appropriate plastic reagent containers shall be provided for each analyzer. Reagent containers shall hold a 30 day supply of chemicals.

The following ranges shall be switch adjustable in the indicating transmitting instrument [0-0.5 or 0-1 mg/l, 0 (ozone)] [0-1.0 or 0-2.0 mg/l (fluoride)] [0-0.5, 0-1.0, or 0-2.0 mg/l (permanganate)]. 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 (120V)(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 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.

All components of the analyzer shall be installed on a PVC panel for wall mounting. The analyzer shall be Series [17F5000 (fluoride)][17L5000 (ozone)] [17P5000 (permanganate)] as manufactured by Capital Controls.

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## OPTIONAL EQUIPMENT

Additional chemicals – a one month supply is provided with each unit.  
Capital Surge Buster™  
Remote indicator/recorder/controller

## ORDERING INFORMATION

Model Number  
Chemical to be measured  
Voltage and Frequency  
Range in mg/l  
Optional Equipment

## RELATED SPECIFICATIONS

Capital Controls Company Inc. manufactures several types of analyzers and systems.

## MODEL NUMBER DESIGNATION

	17	5	A
<b>Analyzers</b> _____			
	17		
<b>Dissolved Chemical Measurement</b>			
Anaflor™ Fluoride Analyzer _____	F		
Permanganate Analyzer _____	P		
Ozone Analyzer _____	L		
<b>Dissolved Interfering Chemicals</b>			
Hexametaphosphate (Flouride) _____		1	
Aluminum and/or Copper _____		2	
None _____		0	
<b>Power Supply</b>			
120 Vac _____			1
240 Vac _____			2
<b>Measurement Range, mg/l</b>			
0-0.5(Ozone and Permanganate only) _____			2
0-1.0 (All) _____			3
0-2.0 (Fluoride and Permanganate only) _____			4
Other _____			0
<b>Design Level</b> _____			A
<b>Destination</b>			
Domestic _____			1
Overseas _____			2

Design improvements may be made without notice.

Represented by:



## CAPITAL CONTROLS

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