

# CDA330 / FCA330 / TCA330

## Chlorine and Chlorine Dioxide Analyzers

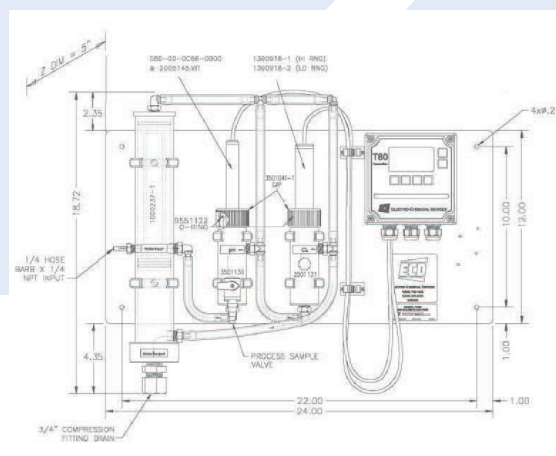


# CDA330 Sensors

The CDA330 is a panel mounted, ready to use Chlorine Dioxide Analyzer. It is designed to monitor free chlorine in drinking water, rinse water, cooling water or other fresh water samples from 0.05-20 ppm chlorine as the standard range or 0.01-5 ppm with the low range sensor. The CDA330 is compliant with EPA method 334.0 for measuring drinking water.

The CDA330 features a plug and play design that incorporates a flow control device, a chlorine dioxide sensor, optional pH sensor and the LXT330 controller conveniently mounted on a PVC panel. Connect the sample and drain lines, connect the power and outputs and it is ready to use. Factory calibrated, calibration is accomplished by DPD comparison. Chlorine Dioxide ( $\text{ClO}_2$ ) exists as a gas in solution, it does not dissolved like other chlorine compounds and is therefore not affected by the pH of the solution.  $\text{ClO}_2$  is approximately 10 times more soluble than chlorine in water but it is extremely volatile and can be easily removed from dilute aqueous solutions with minimal aeration. Chlorine Dioxide diffuses through the PTFE membrane of the sensor and is reduced to chloride ion by the addition of electrons from the cathode. Silver from the anode is then oxidized to silver chloride. The electrons released from the gold cathode and the electrons accepted on the silver anode result in a current flow which is proportional to the chlorine dioxide concentration in the medium.

Temperature affects the  $\text{ClO}_2$  permeability of the PTFE membrane, increasing the temperature increases the output of the sensor about 4% per  $^\circ\text{C}$ . The chlorine flow cell includes a temperature sensor that allows the LXT330 controller to perform automatic temperature compensation of the measurement. The CDA330 is 110-240 VAC or 24 VDC powered and allows either parameter to be graphically displayed with user defined Line, Bar or Gauge style graphs. The standard configuration has (2) 4-20 mA outputs, (3) alarm relays and MODBUS RTU.



Amperometric chlorine sensors are flow sensitive, the minimum required flow by the sensor is 0.5 ft/sec, above this value the output is virtually flow independent. A "Constant head" Flow control Device (CFD) maintains the optimum flow past the sensor over a wide range of incoming sample flow rates. The minimum flow required for the CFD is 10 gal/hr and the maximum flow is 80 gal/hr with the sample going to drain at atmospheric pressure.

The Auto Clean option includes a solenoid actuated spray cleaner that uses either 30 psi process water or air. An easily adjusted timer controls the period and duration of the cleaning cycle.

## Benefits

- Complete System, Easy Installation, Ready to Use
- No Expensive Reagents
- Eliminates Pressure Regulators and Rotameters
- Dual Measurements, Single Parameter or Dual Parameter displays, MODBUS RTU, Spray Cleaner (optional for fouling applications)

## Features

- Panel Mounted System Plumb and Play Design
- Amperometric Design
- Automatic Flow Control
- LXT330 Controller
- Compliant with EPA Method 334.0

# Specifications

Sensor Specifications	
<b>Sensor</b>	Polarographic, Gold/Silver, PTFE membrane, Digital Communication
<b>Measurement Range</b>	Chlorine: 0.05 to 20 ppm (High Range) 0.01 to 5 ppm (Low Range) pH: 0 to 14 pH
<b>Temperature</b>	32° to 122°F (0° to 50°C)
<b>Flow</b>	38 L/hr to 300 L/hr (10 gal/hr to 80 gal/hr)
<b>Wetted Materials</b>	PVC, PP, PVDF, PTFE, Glass, 316 SS
<b>Process Connections</b>	Input 1/4" barb fitting, Drain 3/4" barb fitting
<b>Response Time</b>	T90 in 2 minutes
<b>Electrolyte Life</b>	Up to 12 months

Analyzer Specifications	
<b>Measurements</b>	Chlorine: 0.05 to 20 ppm (Standard Range) 0.01 to 5 ppm (Low Range) pH: 0 to 14 pH
<b>pH Compensation</b>	Not needed, ClO <sub>2</sub> , not pH dependent
<b>Display</b>	2.75"W x 1.5"H (128 x 64 pixels) LCD, Black on Grey background, Blue on White background with LED back-light
<b>Enclosure</b>	IP65, weatherproof, 1/2 DIN 5.7"L x 5.7"W x 3.5"D
<b>Outputs</b>	(1) 4-20 mA for Chlorine Dioxide, set to Sensor Range (1) 4-20 mA for pH (optional), set 0-14 pH
<b>Alarm Relay Ratings</b>	Three (3) SPDT, 1 form C, 250 VAC, 10 Amp
<b>Input Power</b>	Standard: 100-240 VAC, 50/60 Hz, 4W, protected with 250V, 1A, Slow Blow Fuse Optional: 24 VDC (18-36 VDC @ 250 mW minimum)
<b>Options</b>	HART Protocol Spray Cleaning (100V or 240V) High Flow CFD NEMA 4X System enclosure with clear or opaque door
<b>Accessories</b>	Photometric Tester Kit, Calibration/Validation Testing Strips Membrane Replacement Kit Sensor Polish Kit

The FCA330, Free Chlorine Analyzer, and TCA330, Total Chlorine Analyzer, are panel mounted, ready to use Free Chlorine and Total Chlorine Analyzer. It is designed to monitor free and total chlorine in drinking water, rinse water, cooling water or other fresh water samples from 0.05-20 ppm  $\text{Cl}_2$ . It features a plug and play design that incorporates a flow control device, a pH sensor, a chlorine sensor and the LXT330 controller conveniently mounted on a PVC panel.

## FCA-330 Sensors

### Free Chlorine Sensor

Free Chlorine exists in solution as a pH dependent ratio of hypochlorous acid (~100% at pH 5) and hypochlorite ion (~100% at pH 10). The Free Chlorine Sensor measures only the hypochlorous acid component of the free chlorine and the analyzer calculates the balance using either the measured pH or a user defined fixed value. The use of the pH sensor provides accurate compensation for samples between pH 6 and pH 9.5 and eliminates the need for an expensive sample conditioning system to control the pH of the solution. The LXT330 controller allows either parameter to be graphically display with user ranges allowing easy trend analysis.

## TCA-330 Sensors

### Total Chlorine Sensor

Total Chlorine is the combined amount of free chlorine, chloramine, organic and bound chlorine in the sample. The TCA Sensor is a three electrode Amperometric sensor with a gold cathode, silver halide anode and 304 SS counter electrode. The counter electrode provides a stable base potential that minimizes drift. The TCA sensor has a microporous membrane that allows ions to diffuse in and out of the sensor. The various chlorine species in the measured solution diffuse into the sensor and react with the acidic potassium iodide electrolyte to form iodine.

The iodine is reduced at the cathode back to iodide and the current flow between the cathode and silver iodide anode is proportional to the total chlorine. The use of the pH sensor provides accurate compensation for samples between pH 4 and pH 12 and eliminates the need for an expensive sample conditioning system to control the pH of the solution. The LXT330 allows either parameter to be graphically displayed with user defined ranges allowing easy trend analysis.

### Amperometric Chlorine Sensor

Amperometric Chlorine Sensors are flow sensitive, the minimum required flow by the sensor is 0.5 ft/sec, above this value the output is virtually flow independent. A "Constant head" Flow control Device (CFD) maintains the optimum flow by the sensor over a wide range of incoming sample flow rates. The minimum flow required for the CFD is 10 gal/hr and the maximum flow is 80 gal/hr with the sample going to drain at atmospheric pressure.

### Amperometric Chlorine Sensor

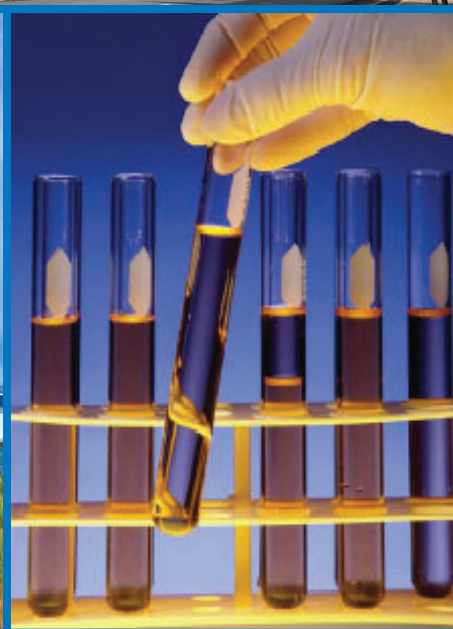
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# Specifications

Sensor Specifications	
<b>Sensor</b>	FCA: Polarographic, Gold/Silver, PTFE membrane TCA: Amperometric, Three (3) electrode, Gold-Cathode/Silver-Silver Halide- Anode/304 SS counter enclosure
<b>Measurement Range</b>	Chlorine: 0.05 to 20 ppm (standard range) FCA: 0.01 to 5 ppm (low range) TCA: 0.005 to 2 ppm (low range) pH: 0 to 14 pH
<b>Temperature</b>	FCA: 32° to 122°F (0° to 50°C) TCA: 32° to 113°F (0° to 45°C)
<b>Flow</b>	38 L/hr to 300 L/hr (10 gal/hr to 80 gal/hr)
<b>Wetted Materials</b>	FCA: PVC, PP, PVDF, PTFE, Glass SS TCA: PVC, PP, PVDF, PTFE, Glass, 304 & 316 SS
<b>Process Connections</b>	Input 1/4" barb fitting, drain 3/4" barb fitting
<b>Response Time</b>	T90 in approximately 2 minutes
<b>Electrolyte Life</b>	FCA: Up to 12 months TCA: Up to 6 months

Analyzer Specifications	
<b>Measurements</b>	Chlorine: 0.05 to 20 ppm (standard range) FCA: 0.01 to 5 ppm (low range) TCA: 0.005 to 2 ppm (low range) pH: 0 to 14 pH
<b>pH Compensation</b>	FCA: 5-10 pH TCA: 4-12 pH
<b>Display</b>	2.75"W x 1.5"H (128 x 64 pixels) LCD, Black on Grey background, Blue on White background with LED back-light
<b>Enclosure</b>	IP65, weatherproof, 1/2 DIN 5.7"L x 5.7"W x 3.5"D
<b>Outputs</b>	(1) 4-20 mA for Chlorine (FCA or TCA), set to sensor range (1) 4-20 mA for pH, set to 0-14 pH
<b>Input Power</b>	Standard: 100-240 VAC, 50/60 Hz, 4W, protected with 250V, 1A, Slow Blow Fuse Optional: 24 VDC (18-36 VDC @ 250 mW minimum)
<b>Alarm Relay Ratings</b>	Three (3) SPDT, Form C, 250V, 10 Amp
<b>Options</b>	HART Protocol Spray Cleaning (100V or 240V) High Flow CFD NEMA 4X System enclosure with clear or opaque door
<b>Accessories</b>	Photometric Tester Kit, Calibration/Validation Testing Strips Membrane Replacement Kit Sensor Polish Kit



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