

Liquid Analytical Instrumentation for Process Control



ELECTRO-CHEMICAL DEVICES

pH
ORP
Turbidity
Specific Ion
Conductivity
Water Analyzers
Dissolved Oxygen

INDUSTRIAL APPLICATIONS

Petro-Chemical Processing
Biotech & Pharmaceutical
Waste Water Treatment
Chemical Processing
Power Generation
Food & Beverage
Semi-Conductor
Industrial Water
Drinking Water

With **Electro-Chemical Devices** (ECD), you not only have access to a broad product line with application specific instruments and sensors you are also supported by a company with years of successful installations and application experience. This industry knowledge has been incorporated into each instrument and sensor design we manufacture. The following guide is a partial list and provides as an overview to various industrial applications that utilize ECD's products for a solution. Contact ECD and our worldwide sales representatives to solve your measurement requirements.

the liquid
analytical
instrument
experts
since 1977

Waste Water Treatment

Application	Measurements	Recommended Products
Incoming Sample	pH	Biofilm coating - use spray cleaner, T23, S10 sensor with 2005145 pH electrode
Primary Clarifier	Turbidity, Ammonium	Turbidity - Triton TR8 - High Range Ammonium Measurement - Hydra NH4-N
Biological Treatment (Aeration Basin)	Dissolved Oxygen, pH, Ammonium, Nitrate, Suspended Solids	Dissolved Oxygen - Triton DO8 pH Measurement - T23 or C22 with S10 pH Sensor with 2005145 pH electrode Ammonium - Model Hydra NH4-N Analyzer Nitrate - Model Hydra NO3-N Analyzer Suspended Solids - Triton TR8, High Range
Secondary Clarifier	Suspended Solids, Nitrate	Activated Sludge Return - Triton TR8 - High Range Effluent from overflow or centrifuge - Triton TR8 Nitrate - Model Hydra NO3-N Analyzer
Sludge Thickening	Suspended Solids	Sludge to Digester - Triton TR8 - High Range Effluent from overflow - Triton TR8
Sludge Digester	Suspended Solids, pH, ORP	Feed from Sludge Thickening - Triton TR8, High range pH & ORP Sensors Model S10
Denitrification	Nitrate	Nitrate - Model Hydra NO3-N Analyzer
Chlorination and Dechlorination	Free Chlorine, Total Chlorine	FCA-22 Free Chlorine Analyzer TCA-22 Total Chlorine Analyzer
Effluent	pH, ORP, Conductivity, Dissolved Oxygen, Turbidity	pH & ORP Sensors Model S10 with T23 or C22 Toroidal Conductivity S10 Sensors with T23 or C22 Dissolved Oxygen - Triton DO8 Turbidity - Triton TR8

S10 & S17 Sensors

Multiple individual measurement parameters in the same mechanical configuration - **pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity & Resistivity**. Features Include: Replaceable application specific sensor cartridges, Various process fittings with adjustable insertion lengths, Industrial housing materials for compatibility with process fluid.



Petro-Chemical Processing

Application	Measurements	Recommended Products
Sour water/gas	pH	Sulfides poison electrodes - use T28 PHS10/17 and 2005130
Overhead crude	pH	Oil coating and sulfides - use T28 and PHS10/17 and 2005130
Waste Water Treatment	pH, ORP, Turbidity Dissolved Oxygen, Free & Total Chlorine, pION	Coating and scaling - use T28 and PHS10/17 and 2005145, ORP for sulfide removal Turbidity - Triton TR8 - High Range / Low Range Dissolved Oxygen - Triton DO8 or S10 Sensor FCA-22 Free Chlorine Analyzer TCA-22 Total Chlorine Analyzer
Cooling Towers	pH, ORP, Conductivity Cooling Tower Control	Biofilm coating - use spray cleaner, T28, S10 and 2005145 pH, 2005067 ORP and Toroida Model 2122 Cooling Tower Controller

Food and Beverage

Application	Measurements	Recommended Products
Concentration Control	Conductivity	Highly conductive use a T23 and a KYNAR toroidal sensor.
Waste Water Treatment	pH Dissolved Oxygen	Oily and Coating use a T23 with an S10/17 sensor and 2005145 electrode.
CIP Control	pH, Conductivity, Resistivity	Two measurements on the C22, Toroidal on the wash and resistivity on the rinse cycle.
Vegetable or Fruit Rinse Wash	Chlorine Dioxide	Use Model CDA-22 Chlorine Dioxide Analyzer The CDA-22 design avoids dirty rinse water from easily fouling or clogging the analyzer.



Turbidity and Suspended Solids

The Triton TR8 uses the nephelometric method for determining the turbidity of the sample. This method directs a light beam into the sample where it is scattered by suspended particles. The light is measured at an angle of 90°. The sensor uses a long lived near infrared LED source, has self monitoring diagnostics, and Factory Calibration stored in its memory that assures trouble free service.

Electronics and Semi Conductor

Application	Measurements	Recommended Products
Concentration Control	Conductivity	Highly conductive use a T23 and a KYNAR toroidal sensor
Rinsing	pH, Conductivity	The solutions are getting more dilute use T23 and RS10/17, also possible pH neutralizations
Waste Treatment	pH, ORP Dissolved Oxygen pION	Possible Fluoride Ion measurement, coating issues use a T23, PHS10/17 and 2005145
De-ionized Water	pH, Resistivity	Resistivity is the control parameter, use T23 and RS10/17, pH is a check, use PHS10/17
Resin Regeneration	Conductivity Resistivity	Two measurements on the C22, Toroidal on the wash and resistivity on the rinse cycle.

Metals and Mining

Application	Measurements	Recommended Products
Chrome Reduction	pH, ORP	Easy application, but aggressive. Use T23 with PHS10/17 sensor with 2005130 electrode.
Cyanide Destruction	pH, ORP	Potential poisoning of the electrode. Use T23 with PHS10/17 sensor with 2005130 electrode.
Waste Water Treatment for Steel Manufacturing	pH	Oily coatings use a T23 with an S10/17 sensor and 2005169 electrode.
Copper Floatation	pH	Mineral coating, use spray cleaner and T23 with S10 sensor with 2005169 electrode
Chemical Concentration	Conductivity pION	Highly conductive, use T28 and a S10 KYNAR Torodial sensor
Rinse applications	pH, Conductivity	Wide pH swings, use T23 PHS10/17 and 2005145 electrode

Transmitters and Controllers

ECD manufactures a family of transmitters, controllers, and analyzers for multiple measurement parameters. The T23 Transmitter is a loop powered 4 to 20 mA general purpose instrument. The Model T28 is a loop powered 4 to 20 mA transmitter used in hazardous locations. The C22 controller is a programmable instrument with numerous control functions.

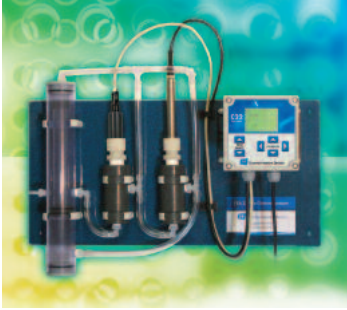


Pulp and Paper

Application	Measurements	Recommended Products
Liquor Recovery	pH, Conductivity	Caustic and corrosive use T28, Titanium PHS17, 2005130 and 1" Toroidal
Head Box (Paper)	pH	The T23 with a PHS10 and 2005145 for variable insertion length and easy cleaning
Filtrate	Turbidity	Monitor cloudy filtrate and white water with high dry content - Triton TR8
Pulp Stock	pH, Conductivity	Aggressive and Coating use T28 and PHS17 with 2005160 and Toroidal for conductivity

Chemical Processing

Application	Measurements	Recommended Products
Neutralizations	pH	Typically aggressive - use T28, PHS10/17 & 2005169
Concentration Control	ORP, Conductivity	Highly conductive - use T28 and KYNAR Toroidal P/N CS10/17
Waste Water Treatment	pH, ORP, Turbidity Dissolved Oxygen Free & Total Chlorine pION	Potential coating problems - use T23, PH10/17 and 2005145 Turbidity - Triton TR8 - High Range / Low Range Dissolved Oxygen - Triton DO8 or S10 Sensor FCA-22 Free Chlorine Analyzer TCA-22 Total Chlorine Analyzer
Gas Scrubbers	pH, ORP, Conductivity	Caustic and corrosive - use T28, PHS17 and 2005130 pH and 2005067 for ORP.
Cooling Towers	pH, ORP, Conductivity Cooling Tower Control	Biofilm coating - use spray cleaner, T28, S10 and 2005145 pH, 2005067 ORP and Toroidal Model 2122 Cooling Tower Controller



Sanitizer and Water Analyzers

ECD manufactures various analyzers for multiple measurement parameters. For example, the disinfectant/sanitizer product line of analyzers includes: the Models FCA-22 Free Chlorine Analyzer, TCA-22 Total Chlorine Analyzer, and CDA-22 Chlorine Dioxide. The advanced sensor and controller technologies allow installation and commissioning to be completed in just a few simple steps.

Biotech & Pharmaceutical

Application	Measurements	Recommended Products
Product recovery	pH Conductivity	Solvents and high Salt concentrations use T28 PHS10/17 with 2005169 and Toroidal sensor
Waste Treatment	pH, ORP Dissolved Oxygen	Oil coating and sulfides - use T28 and PHS10/17 and 2005130
High Purity Water	pH, Conductivity Resistivity	Resistivity is the control parameter, use T23 and RS10/17, pH is a check, use PHS10/17
Resin regeneration	Conductivity Resistivity	Two measurements on the C22, Toroidal on the wash and Resistivity on the rinse cycle.
Fermentation	pH, ORP Dissolved Oxygen	Steam Sterilizable electrodes - SE Series and SF Series fittings used to optimize cell growth

Drinking Water

Application	Measurements	Recommended Products
Intake Water	Chlorine Dioxide	Use the CDA-22 Chlorine Dioxide Analyzer for color and odor control
Filtration	pH Turbidity	pH adjustment for flocculation, use T23 with S10/17 sensor with 2005145 electrode Turbidity for filter backwash, use the Triton TR8 Measure turbidity after filtration with Triton TR8
Contact Tank	pH Free & Total Chlorine pION	For final pH adjust use T23 with S10/17 sensor with 2005145 electrode Monitor Chlorination, FCA-22 Analyzer Monitor Chloramine, TCA-22 Analyzer Measure Fluoride Ion with T23 and S10/17 pION

Dissolved Oxygen Measurement

The ECD Triton DO8 optical dissolved oxygen sensor combines the high technology of Fluorescence Quenching with a rugged, easy to install design. The DO8 provides the best solution for long term measurements in aeration basins, aquaculture and all types of environmental water.



Power Generation

Application	Measurements	Recommended Products
Boiler Water	pH, Conductivity, Resistivity, pION, Boiler Blowdown System	Each boiler will have 4-6 conductivity, resistivity and pH measurements, T23 with RS10 or PHS10. Model 61 Boiler Blowdown System to measure conductivity and blowdown boiler
De-mineralizers	pH, Conductivity, Resistivity	Noisy and expect shorter electrode life, use T23 and PHS10/17 sensor with 2005145 electrode
Resin Regeneration	Conductivity Resistivity	Two measurements with the C22, Toroidal on the wash and resistivity on the rinse cycle.
Cooling Towers	pH, ORP, pION, Cooling Tower Control System, Free & Total Chlorine	Biofilm coating is the problem use a spray cleaner with the T23 and PHS10 with 2005145 electrode Model 2122 Cooling Tower Control System for pH and conductivity to control acid or base feed Model FCA-22 Free Chlorine Analyzer Model TCA-22 Total Chlorine Analyzer
Gas Scrubbers	pH, ORP Conductivity	Coating with lime needing regular cleaning use T23 with PHS17 and 2005160

Aquaculture - Environmental

Application	Measurements	Recommended Products
Fish Farming	Dissolved Oxygen	The TRITON DO8 to maintain the oxygen for optimal growing conditions.
Aquatic Parks and Aquariums	pH, ORP, pION Free Chlorine	The T23 or C22 with S10/17 ORP sensor to control ozonation to improve water clarity, The FCA-22 Free Chlorine Analyzer for water sanitation at Aquatic Parks Monitor low level chlorine to protect sea life
Environmental Monitoring	pH, ORP, pION Nitrate, Ammonium	Monitor Streams, rivers, ponds, lakes, etc. Use S10/17 pION to monitor specific ions. The Hydra Analyzer to monitor Nitrate or Ammonium ions from agricultural runoff.

Industrial Applications



Sentinel T23

The SENTINEL Pre-pHault diagnostic option is available on the C22 and T23 instruments. When coupled with a SENTINEL ready sensor it provides a visual indication of the life expectancy of the measuring electrode.

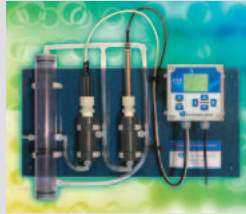


The HYDRA Nutrient Analyzers are designed for monitoring nitrification and denitrification processes in a waste water treatment plant. The HYDRA-NH₄ measures ammonium and the HYDRA-NO₃, nitrate ion.



Model T23

The Model T23 transmitter provides simplicity in a powerful package. This 24 VDC loop powered, 4-20 mA transmitter is available in pH, ORP, pION, Dissolved Oxygen, Conductivity or Resistivity configurations.



Easy to use, plumb and play designs for measuring Chlorine. The FCA-22 for Free Chlorine, the TCA-22 for Total Chlorine and the CDA-22 for Chlorine Dioxide. Amperometric designs that require no reagents.



Model T28

The Model T28 microprocessor based two wire transmitter is FM and CSA approved for Class I, II, and III Division I Groups A through G environments allowing installation in intrinsically safe and explosion proof applications.

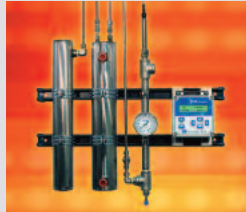


The Triton TR8 is a nephelometric turbidity analyzer designed for use in water and wastewater. There are two versions, a Low Range for FNU values < 500 and a High Range for turbidities up to the % solids range.



System C22

The System 22 controller features a Multi-Bus architecture that allows up to (4) inputs and (6) 4-20 mA outputs and (8) field configurable SPDT relays in be monitored from this 1/2 DIN NEMA 4X controller.



The Model 61 Automatic Boiler Blowdown Control System from ECD provides a reliable solution for the continuous control of the surface blowdown rate for commercial and industrial boilers.



Triton DO8

The ECD Triton DO8 optical dissolved oxygen sensor combines high technology with a rugged, easy to install design. The DO8 is the best solution for measurements in aeration basins aquaculture and environmental H₂O.



The Model 2122 Cooling Tower Control System (CTCS) from ECD is an integrated system designed to control the acid feed, blow down and inhibitor/biocide feed to a Cooling Tower.



S10 / S17

The Model S17 Ball Valve Retractable sensor and the Model S10 insertion, immersion sensor are modular field rebuildable sensors. These 3/4" O.D. sensors include a signal conditioner, temperature and sensing electrodes.



The rugged SE Series pH electrodes and SF Series fittings are in-situ steam sterilizable or autoclavable. The pH electrodes are a sealed gel filled design and the 316 SS fittings meet the EHEDG criteria.

Specifications subject to change without notice.

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