Liquid Analytical Solutions

From the World's Most Trusted Source

ROSEMOUNT® Analytical

EMERSON™ Process Management

TRUSTED AROUND THE GLOBE:
THE MOST ADVANCED LIQUID ANALYSIS SOLUTIONS

UNMATCHED ACCURACY. SUPERIOR PERFORMANCE. WORRY-FREE DEPENDABILITY.

Our leading-edge instruments and applications expertise, along with unmatched customer service and support worldwide, put Emerson's Rosemount Analytical instruments in a league of their own. We help our customers maximize process performance, productivity, and profitability. Our solutions can provide reduced installation and maintenance costs while improving process quality. We offer a complete range of analyzers, transmitters and sensors for the continuous on-line measurement of pH, ORP, conductivity, dissolved oxygen, ozone, chlorine, turbidity and total suspended solids. All around the world, Rosemount Analytical products from Emerson prove their worth to thousands of customers every day.

WORLDWIDE STRENGTH

Emerson Process Management is part of Emerson, a global company that brings together technology and engineering to provide innovative solutions for our customers in a wide range of industrial, commercial and consumer markets. Our priority is to design, produce and deliver products, systems and solutions that make people's lives better.

SAFE AND RELIABLE LIQUID ANALYTICAL SOLUTIONS

Emerson has become the world leader in liquid analysis by designing and manufacturing products that set new standards in performance and reliability. Value Analysis and Value Engineering (VA/VE) assure the quality of both our products and their value to our customers. Plant and personnel safety are of prime importance in the design and manufacture of our products.

Our products are approved by organizations known worldwide: Factory Mutual (FM), Canadian Standards Association (CSA), and European (ATEX) for Electrical Equipment in hazardous locations. For increased EMI and RFI protection and safety, our global product line has been certified to meet CE standards and specifications. Adherence to these high standards assures our customers that they are getting the safest, most reliable products.

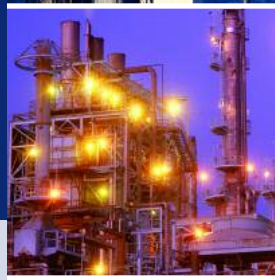
CUTTING-EDGE LIQUID ANALYTIC SOLUTIONS FOR *YOUR* INDUSTRY

PROVEN HIGHEST QUALITY ANALYSIS

Emerson's design, manufacturing, and quality assurance programs are fully documented and certified to ISO-9001 quality standards.

100% factory testing provides virtually trouble-free start-up and increased product life.

Through support, product knowledge, and commitment, Emerson assures a consistent approach to reliable quality.



Two-wire Transmitters for Demanding Environments

Rosemount Analytical two-wire transmitters are certified to be intrinsically safe when used with an appropriate safety barrier. The Models 5081 and Solu Comp® Xmt two-wire transmitters meet European CE requirements. The Model 5081 also meets the ATEX directive and is offered as FISCO configured. Both transmitters are weatherproof and corrosion-resistant. In addition, the transmitters meet NEMA 4X (IP 65) criteria. Models are available to fit virtually any process monitoring and control scheme, including Emerson Process Management PlantWeb®.

Model 5081 Transmitter

Solu Comp® Xmt™ Transmitter

Model 5081 Transmitters

The Model 5081 fits easily into any plant communication scheme. Use a simple analog output or choose FOUNDATION™ fieldbus or HART® digital communications. Digital communications in the Model 5081 bring all of the advantages of Emerson's Rosemount Analytical AMS windows to the user. Use AMS to setup and configure the transmitter, read process variables, and troubleshoot from a personal computer or host anywhere in the plant.

The Model 5081-P features predictive sensor diagnostics that not only alert the user when a pH electrode is cracked or broken, but also signal conditions of impending failure, such as plugged or coated reference junction, aged glass, non-immersed electrode and poisoned reference.

The Model 5081-C and 5081-T two-wire microprocessor transmitters measure conductivity using contacting and toroidal (inductive) sensors respectively. The 5081-C can also be configured to measure resistivity. The transmitters have a large two-line display that shows conductivity and temperature readings, and a high loop accuracy (within ±2% of actual conductivity and resistivity measurements).

The Model 5081-A transmitter measures dissolved oxygen (ppm and ppb level), free chlorine or ozone in a variety of process liquids. The transmitter is compatible with Model 499A sensors for oxygen, chlorine, and ozone, and with Hx438, Bx438 and Gx448 steam sterilizable oxygen sensors.

For more information on the Model 5081 transmitters, refer to Product Data Sheet 71-5081.

Solu Comp Model Xmt™ Transmitters

The Xmt is available for the measurement of pH, ORP, conductivity, dissolved oxygen, free chlorine, monochloramine and ozone. Available in panel mount or surface/pipe mount designs, the Solu Comp Xmt features a two-line display and simple-to-use, intuitive menus in six languages. The Xmt includes the HART and FOUNDATION™ fieldbus digital communications protocols, which enable the user to access valuable AMS functions. The 4-20 mA output with superimposed HART digital signal is fully scalable over the operating range of a sensor.

For more information on the Solu Comp Xmt family of transmitters, refer to Product Data Sheet 71-XMT.

Microprocessor Analyzers Meet Customer Requirements

Emerson's complete line of Rosemount Analytical microprocessor-based analyzers are recognized worldwide for their high quality, reliability, ease of installation, and low maintenance. These analyzers are ideally suited for general purpose installations where line power (115/230 VAC or 24 VDC) is more convenient and integral alarm contacts are required to fit the process control strategy. All analyzers provide scalable, isolated current outputs, easy-to-use display-driven menus, push button keypads, and advanced self-diagnostics. From the popular Model 54e Series to our dual-input/output 1056, our analyzers provide continuous on-line measurement of pH, ORP, conductivity, resistivity, dissolved oxygen, ozone, free chlorine and monochloromine.

The Model T1055 Clarity II™ dual sensor turbidimeter allows drinking water and wastewater plants to measure low-NTU turbidity for compliance with EPA and ISO regulations.

Model 1056 Intelligent Analyzers

The 1056 is a multi-parameter instrument with single or dual input. Choose from any combination of pH/ORP/ISE, Resistivity/Conductivity, % Concen-tration, Chlorine (Total, Free, Monochloramine, pH independent Free Chlorine), Oxygen, Ozone and Temperature. Dual measurement analyzers offer a wide choice of combinations, thus reducing the cost per loop, panel space and number of stocking units. One unit does it all.

Model 1056 Dual Measurement Analyzer

The modular design of the instrument allows signal input boards to be field replaced making configuration changes easy. It is easy to install with modular boards and removable connectors, along with easy to wire power, sensors, and outputs.

The Model 1056 has a large display with easy-to-read process measurements that are always displayed during programming and calibration routines. The menu screens are intuitive with advanced diagnostics and help screens. Seven languages are included with every analyzer: English, French, German, Italian, Spanish, and Portuguese.

Standard features include isolated inputs, seven embedded local languages, two 4-20mA current outputs, removable connectors for power and current outputs, four solid plugs for closure of openings, and panel mount hardware.

Exclusive Quick Start screens appear the first time the Model 1056 is powered. The instrument auto-recognizes each measurement board and the display prompts the user to configure each sensor in a few quick steps for immediate deployment.

For more information, refer to Product Data Sheet 71-1056.

Model 54e HART Analyzer

Model 54e HART Analyzers

Our Model 54e analyzers are so easy to use that an instruction manual is typically not needed. The dot matrix display spells out each function through multi-line menu screens and is configurable to read in English, French, German, Italian, or Spanish. Additional options include HART communication and PID and TPC control.

The Model 54epH features temperature-compensated predictive sensor diagnostics that can distinguish between the actual pH electrode condition and the effects of temperature. The Model 54e pH can be characterized to a specific process to predict sensor maintenance needs before a sensor failure occurs.

The Model 54eC conductivity analyzer uses either contacting or inductive (toroidal) conductivity sensors. The sensor type is selected by a keypad entry. This feature allows the user to stock one instrument for most conductivity applications.

The Model 54eA analyzer measures dissolved oxygen (ppm and ppb level), free chlorine, monochloramine and ozone. The analyzer features an on-board pressure sensor for easy calibration of oxygen sensors. For free chlorine measurements, the analyzer provides complete pH compensation from pH 6 to pH 9.5.

For more information, refer to Product Data Sheet 71-54e.

PERpH-X High Performance pH and ORP sensors

Rosemount Analytical PERpH-X high performance pH sensors incorporate several design innovations that prolong the life of the sensor in difficult applications. The 3300/ 3400 sensors were engineered for high temperature processes which provide the harshest test of pH sensors.

PERpH-X High Performance pH Sensors

The AccuGlass® pH glass electrode provides exceptional resistance to thermal degradation, even at temperatures above 145˚C. This means less breakage from thermal shock and improved speed of response for fast and accurate calibrations.

Most pH measurements fail due to reference electrode problems, fouled electrolytes or clogged reference junctions. The double junction design has a replaceable porous Teflon liquid junction that resists coating in dirty applications. The rechargeable KCl gel resists fouling. Replacing a clogged junction or recharging the electrolyte will rejuvenate most failed sensors.

A molded Ryton® body housed in a titanium tube provides a rugged, chemically resistant sensor. The construction is enhanced by the choice of EPDM, Viton® or Kalrez® o-rings.

The improved durability of the pH glass electrode, the increased stability of the reference electrode and the overall reliability of the mechanical design have produced sensors that live longer, respond faster and drift less thereby minimizing maintenance and lowering the total cost of ownership.

The PERpH-X sensor family was designed to expand application flexibility, one sensor can succeed in a variety of processes by using different reference electrolytes. Six different electrolyte Solutions Kits are available:

- High Temperature Kit
- Bio-Film Resistant Kit
- Poisoning Resistant Kit
- Oil Resistant Kit
- Scaling Resistant Kit
- Metals Resistant Kit

Each kit uses a specific chemistry formulated to extend the life of the reference electrode in its targeted application.

For more information, refer to Product Data Sheet 71-3300/3400

General Purpose pH and ORP Sensors

Rosemount Analytical general purpose sensors measure the pH or ORP of aqueous solutions in pipelines, open tanks, or ponds. General purpose sensors are suitable for many industrial applications where a low cost, high performance sensor is needed.

Models 389 & 389VP

The combination electrode features a peripheral ceramic junction. The triple-junction reference cell provides longer life in process solutions containing ammonia, chlorine, cyanides, sulfides, or other poisoning agents.

Models 399 & 399VP

These models feature an annular ceramic junction surrounding the pH/ORP-sensitive membrane. The double-junction reference cell is resistant to contamination by processes containing ammonia, chlorine, cyanides, sulfides, or other poisoning agents.

The glass pH electrode is available with either a standard hemi bulb or an optional flat bulb. Flat glass is well-suited for abrasive or coating applications. The hemi bulb is more durable and provides greater accuracy over the entire pH range.

Model 389 Sensor

Model 399 Sensor

TUpH™ Family of pH and ORP Sensors

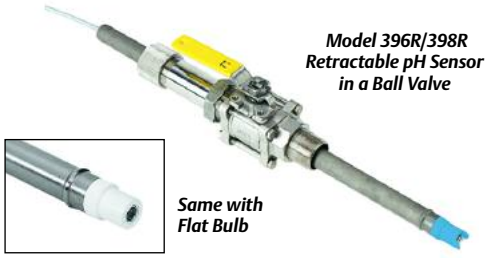
TUpH sensors are just that – TOUGH! TUpH sensors feature the industry proven AccuGlass and the patented TUpH reference electrode, designed to resist coating and minimize maintenance. The entire line incorporates three key features; a large surface area TUpH reference junction that resists coating, the Helical Reference Pathway that extends the life in poisoning environments and the SILCORE technology that improves the sensors mechanical and temperature durability. The TUpH family of pH/ORP sensors has many configurations designed to meet the needs found in pulp and paper, chemical, wastewater and other harsh process applications.

The 396 is the workhorse of the family, available in a valve retractable design, a high pressure insertion design and a poly propylene bodied insertion/submersion device with front and rear facing 1" MNPT threads. A 12 mm diameter version and a non glass pH electrode version are also available. The 398 offers improved chemical resistance for extended service in the harshest environments.

Combine the state-of-the-art TUpH sensor with Rosemount Analytical pH analyzers featuring predictive sensor diagnostics, and you have one tough-to-beat package.

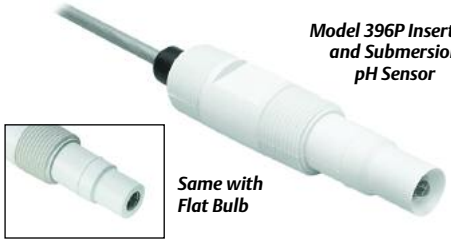
The optional Variopol 6.0 connector is designed with a robust, corrosion-resistant metal casing and gold-plated contacts to shield and assure a stable signal. All VP models use a mating watertight VP 6.0 cable.

For more information, refer to Product Data Sheets 71-TUpH, 71-TUpHVP, 71-Quik, 71-371, or 91-6020 for sensor mounting accessories.



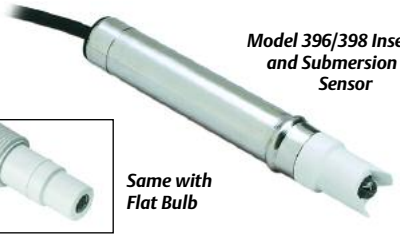
Model 396R/398R Retractable pH Sensor in a Ball Valve

Same with Flat Bulb



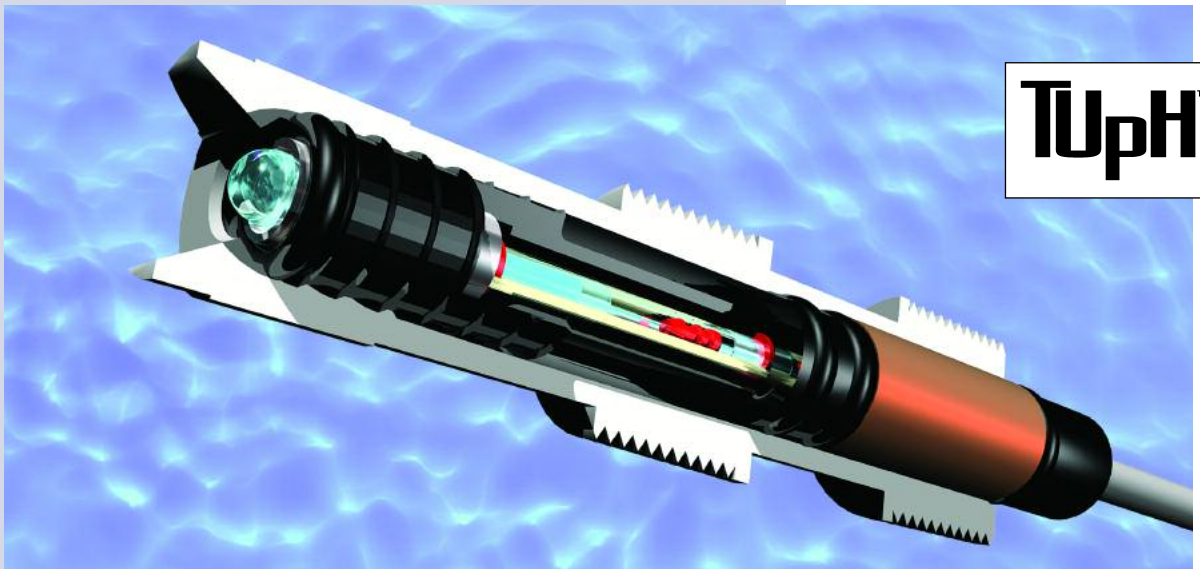
Model 396P Insertion and Submersion pH Sensor

Same with Flat Bulb



Model 396/398 Insertion and Submersion pH Sensor

Same with Flat Bulb



Specialty pH Sensors

Rosemount Analytical specialty sensors from Emerson are specifically designed to meet the special needs of a wide range of industries including biopharmaceutical, food processing, chemical, power, and semiconductor.

Model RE2001 with Solid Phase Reference Junction

Model RE2001

The Model RE2001 features a unique solid phase reference junction that is resistant to fouling and coating. Unlike traditional liquid junction designs, this combination electrode provides longer life in oily water or process solutions containing poisoning agents.

Model SE971 Twist-Lock® pH Sensor

The Twist-Lock® compatible design of the SE971 allows for easy installation and removal of the sensor from the process stream. Chemical and petrochemical plants equipped with the Twist-Lock adapter can take advantage of this low cost, reliable sensor to simplify their sensor maintenance requirements.

Model SE971 Twist-Lock pH Sensor

Model Hx338 Steam Sterilizable pH Sensor

Model Hx348 Steam Sterilizable pH Sensor

Model Hx338 Steam Sterilizable pH Sensor

The Hx338 is specifically designed for biopharmaceutical processes. The sensor's unique tri-triple reference technology helps to maintain a drift-free pH signal and performs exceptionally well against poisoning agents (sulfides, proteins, or sugars), even after numerous sterilization cycles. It is also excellent for applications in the chemical and food processing industries.

The Model Hx338 can be used with mounting assemblies having a PG 13.5 sensor connection. This 12 mm diameter sensor is available in five different lengths for various insertion depths. The sensor features a PG 13.5 thread for a simple process connection and a single-pole S7 connector plug for quick disconnection from a mating cable.

Model Hx348 Steam Sterilizable pH Sensor

The Hx348 provides an exceptional solution for difficult pH measurements. This combination pH sensor offers the unique tri-triple reference technology which eliminates flow sensitivity, maintains a steady reference signal, and performs exceptionally well in protein and sulfide bearing processes, even after numerous sterilization cycles. Applications for this sensor can be found in the biopharmaceutical, chemical, and food processing fields. The Model Hx348 is a combination pH sensor that uses an S7 connector plug for quick disconnection from the cable. It is offered in four different insertion lengths and in disposable or refillable designs.

Model 3200HP High Purity Sensor

The 3200HPis designed for the accurate measurement of pH in low conductivity, high purity (HP) water.

The 3200HP sensor is a panel mounted system consisting of a combination pH, reference, temperature sensor with integral solution ground, an electrolyte reservoir, a flow cell and a calibration cup holder. The 100 ohm platinum RTD is housed in a 316 SS solution ground near the pH glass electrode assuring fast and accurate temperature compensation.

Model 3200HP High Purity pH Sensor

Bx438 Dissolved Oxygen Sensor

Retractable Sensor Mounting Assembly

The key to an accurate measurement is a stable reference electrode that produces the same potential over many months of service whether in calibrating solutions or high purity water. The pHaser™ reference electrode is unaffected by the conductivity changes that occur when the sensor is moved between calibration buffers and low conductivity water, it continues to produce the same potential. This flowing reference electrode uses a laser drilled capillary for the liquid junction, the pHaser reference junction. The laser drilled capillary design is immune to drift caused by the long term plugging common to all ceramic reference junctions.

These features combined with the rapid response and stability of the AccuGlass™ pH electrode provides an unsurpassed level of performance in high purity water.

Bx438 Dissolved Oxygen Sensor

The Model Bx438 sensor is designed to monitor trace levels of dissolved oxygen in beer and other carbonated beverages. The Bx438 utilizes a robust membrane and is designed to withstand significantly more clean in place (CIP) cycles than other dissolved oxygen sensors.

The design of the membrane is the key to achieving high performance and decreased maintenance. The electrode construction guarantees excellent stability even after numerous sterilization cycles. The cost to maintain the Bx438 sensor is approximately one-third the cost required to maintain competitive dissolved oxygen sensors.

Retractable Sensor Mounting Assembly

Designed to be used with Rosemount Analytical steam sterilizable pH and DO sensors, the assembly is built to withstand clean-in-place cycles. The sensor can be withdrawn without interrupting the process. An integral safety mechanism prevents the assembly from being inserted into the process without the electrode being installed. While in the retracted position, the sensor can be cleaned with water or buffer solutions. The Retractable assembly is manufactured with 316 Stainless Steel and FDA approved EPDM o-rings.

Model 1056 Dual Measurement Analyzer

Model 54eA Analyzer

Model 5081-A Transmitter

Solu Comp Xmt Transmitter

Rosemount Analytical amperometric sensors can be used with the 1056, 54eA, 5081-A and Xmt-A instruments.

Amperometric Sensors

Emerson offers a complete line of Rosemount Analytical amperometric sensors for the determination of dissolved oxygen, ozone, and chlorine in water. These membrane-covered sensors are rugged and easy to maintain. Replacing a membrane requires no special tools, and routine maintenance takes only minutes. Sensors are available with either an integral cable or a Variopol 6.0 connector.

Analytical Sensors for Industrial and Municipal Applications

Emerson offers the largest selection of liquid analytical sensors in the world, designed to match the performance of its advanced Rosemount Analytical analyzers. We also have worldwide application support and service to help you choose the right sensor – whether it be for high purity water, pulp and paper, chemical processing, power, or wastewater and drinking water.

Sensor technology remains at the heart of our business. Emerson conducts extensive research and development programs to improve the performance and reliability of its Rosemount Analytical sensors. These programs have led to the development of improved pH glass (Accu-Glass® formulations), improved reference electrode design, and encapsulated conductivity sensors that prevent process intrusion. Every sensor is tested before leaving the factory to ensure trouble-free start-up.

ENDURANCE™ Conductivity Sensors

ENDURANCE™ Conductivity Sensors

Emerson offers a wide selection of Rosemount Analytical conductivity sensors. The ENDURANCE line of sensors have titanium electrodes, providing stability and ruggedness without sacrificing accuracy.

Available in 0.01, 0.1, and 1.0/cm cell constants, ENDURANCE sensors are suitable for the measurement of conductivity in samples ranging from ultra-pure water to cooling water. Process connections include screw-in (Model 400), retractable (Model 402), and sanitary flange (Model 403). All wetted plastics and elastomers in the 403 sensor comply with 21CFR177, and all wetted surfaces have a 16 micron-inch Ra finish. A fast response flow cell (Model 404) is also available.

For more information, refer to Product Data Sheet 71-400 and 71-403.

In the Models 400VP, 402VP, and 403VP, a Varipol multi-pin connector replaces the integral cable. The VP 6.0 connector has a robust, watertight, corrosion-resistant metal casing with gold-plated contacts, which ensures a stable and accurate signal. The connecting cable needs to be installed only once. There is no need to rewire the cable when the sensor is replaced. And, because the connection is at the sensor, the sensor can be removed from the process line without twisting the cable. ENDURANCE conductivity sensors can be used with Model 1055, 54eC, 5081-C and Xmt-C instruments.

For more information, refer to Product Data Sheet 71-400 and 71-403.

Model 400 with VP 6.0 Connector

Model 242 Flow-Through Sensor

Model 245 Flow-Through Toroidal Conductivity Sensor

Toroidal Conductivity Sensors

Emerson's also offers a full line of Rosemount Analytical toroidal (inductive) sensors that can be used in the harshest processes.

For flow-through installations where the samples are viscous, fibrous, or corrosive, Models 222 and 242 are ideal. Typical applications are found in the pulp and paper, chemical, and metals and mining industries. The Model 222 is constructed of Teflon-lined carbon steel pipe for use in high pressure or high temperature lines. The Model 222 is available in one and two-inch pipe sizes. The Model 242 sensor is available in over 250 different combinations to meet most applications. Line sizes range from one to four inches (25 to 100 mm). Contact rings, liners, and O-rings are available in a variety of materials. The Model 242 includes an integral temperature sensor.

The Model 245 Sanitary Flow-Through Toroidal Conductivity Sensor is available in 0.5, 1.0, 1.5, and 2 inch TriClamp® sizes. Wetted materials are FDA CFR Title 21, Parts 170 to 199 compliant. The sensor clamps into the process piping between TriClamp flanges. Special grounding rings are not needed because contact rings are built in. A separate temperature sensor can be ordered as an accessory.

All these features make the Model 245 sensor ideal for applications in pharmaceutical, biotech, and food and beverage industries.

The Model 225 Clean-In-Place (CIP) Sensor is designed for applications in the pharmaceutical and food and beverage industries where processing equipment is routinely cleaned with caustic at temperatures up to 100°C. Process installation is made with a customer supplied two-inch Tri-Clamp. The sensor is available in an unfilled PEEK version that meets 3-A sanitary standards. A version molded from USP Class VI PEEK is also available.

Model 225 CIP Sensor

The Model 226 Submersion/ Insertion Sensor has a large bore design, making it ideal for applications with a high solids content. The sensor is available in PEEK only.

Model 226 Submersion/ Insertion Sensor

The Model 228 Submersion/ Insertion Sensor is available in durable, chemically resistant PEEK and Tefzel®. The Model 228 has robust construction that stands up to high vibration conditions. A variety of mounting options are available. A high pressure retraction device allows insertion to 295 psrg.

Model 228 Submersion/ Insertion Sensor

The Model 247 Toroidal Conductivity Sensor is ideal for cooling water, boiler blowdown, and metal plating applications. The Model 247 is constructed with a solvent-welded CPVC body. The sensor is easy to install.

Model 228 Insertion Assembly

Toroidal conductivity sensors can be used with Model 1055, 54eC, 5081-T and Xmt-T instruments.

For more information, refer to Product Data Sheets 71-200, 71-242, 71-245 and 71-247.

Application-Specific Sensors

These Rosemount Analytical sensors are designed to meet specific measurement requirements, including dissolved oxygen, free chlorine, total chlorine, monochloramine, ozone and trace dissolved oxygen.

Model 499A DO Dissolved Oxygen Sensor

DO Sensor with Sensor Washer Head

Dissolved Oxygen Sensors

The Model 499A DO sensor accurately measures dissolved oxygen in a variety of applications, particularly municipal and industrial wastewater treatment. Calibration is easy. Just expose the sensor to air and press a button. The analyzer measures the barometric pressure and temperature, calculates the solubility of oxygen in water, and calibrates the sensor.

For process liquids that foul and coat the membrane, like those found in wastewater aeration basins, the Air Blast Cleaner System Model DO-03/04 is available. Complete system includes sensor, analyzer, sensor washer head, mounting hardware, and air compressor. The Air Blast Cleaner system can keep the sensor functioning up to 3 months or longer without cleaning.

The floating ball system Model BB11 is a flotation device designed to mount the DO sensor Model 499ADO and keep it at a fixed distance in the process, regardless of changes in height of the process. The floating ball will also accommodate the Sensor Wash Head Assembly or any sensor with a 1 inch rear facing MNPT connection.

Sensor Floating Ball System

For more information, refer to Product Data Sheets 71-499ADO, 71-DO-03/04 and 71-BB11.

Free Chlorine Sensors

Choose the Model 499ACL-01 sensor to measure free chlorine and say goodbye to messy and expensive reagents and sample conditioning systems. The Model 499ACL-01 measures free chlorine in samples having pH between 6.0 and 9.5. The analyzer automatically compensates for the effect of pH on the raw signal (a separate pH sensor is required). If the pH of the sample varies less than 0.2, pH correction is generally not needed. The linear range of the sensor is 0-5 ppm. The dual slope calibration feature available in the Model 1055, 54eA, 5081-A and Xmt-A instruments permits the sensor to be used between 0 and 20 ppm. For more information, refer to Product Data Sheet 71-499ACL-01.

Model 1056 Dual Measurement Analyzer | *Model 54eA Analyzer* | *Model 5081-A Transmitter* | *Solu Comp Xmt Transmitter*

These Rosemount Analytical instruments permit the 499ACL-01 sensor to be used between 0 and 20 ppm.

Model TCL Total Chlorine Sample Conditioning System

Model 499 OZ Sensor

Total Chlorine

The Model TCL is a sample conditioning system, sensor and analyzer for the determination of total chlorine in water. The system is reagent-based and measures true total chlorine. The reagent, a solution of potassium iodide in vinegar, lasts one month. Sample usage is small – about 15 mL per minute. For more information, refer to Product Data Sheet 71-TCL.

Monochloramine

The Model 499ACL-03 measures monochloramine in drinking water and wastewater. Like the Model 499ACL-01 sensor for measuring free chlorine, the monochloramine sensor requires no reagents or sample conditioning systems. The linear range of the sensor is 0-20 ppm. For more information, refer to Product Data Sheet 71-499ACL-03.

Ozone

Use the 499A OZ sensor to measure ozone in a wide variety of processes, including drinking water and bottled water. The sensor easily measures ozone concentrations as high as 1 ppm. For higher levels, such as those used in cleaning and sanitizing, consult the factory. For more information, refer to Product Data Sheet 71-499AOZ.

Trace Dissolved Oxygen

The 499A TrDO sensor is the perfect choice for measuring trace dissolved oxygen in boiler feedwater in steam electric power plants. The sensor has a rapid come-down time following maintenance and calibration. Sensor accuracy (±1 ppb), lack of flow sensitivity, and rapid response time rival more costly sensors on the market. For more information, refer to Product Data Sheet 71-499ATrDO.

Model 499A TrDO Sensor

Model FCLi Free Chlorine System

Free Chlorine System

The Model FCL*i* free chlorine system is intended for the determination of free chlorine in fresh water. It uses no expensive sample conditioning systems or messy reagents to control pH, nor does it require an auxiliary pH sensor for pH correction.

The Model FCL*i* uses a three electrode, membrane-covered amperometric sensor. It includes an easy-to-use analyzer that is fully programmable. The analyzer, flow cel and flow controller are mounted on a back plate and sensor cables are pre-wired to the analyzer. To eliminate wiring hassles, quick disconnect Variopol cable is standard. Because the FCL*i* uses a constant head device to control flow, no pressure regulators or valves are needed. Flow requirements are very low – only 2 gph. The measurements are reagent free.

For more information, refer to Product Data Sheet 71-FCL*i*.

FCL/MCL Free Chlorine Systems

Packaged Free Chlorine and Monochloromine Systems

Emerson offers a complete line of innovative Rosemount Analytical liquid analysis tools. The Models FCL and MCL are complete systems for the determination of free chlorine and monochloramine in water. The analyzer, flow cells and flow controller are mounted on a back plate and sensor cables are pre-wired to the analyzer. Just mount the plate, bring in the sample, provide a drain, connect power, and attach the sensors to the pre-wired Varipol cables. Because the FCL and MCL use a constant head device to control flow, no pressure regulators or valves are needed. Flow requirements are very low – only 3 gph (11 L/hr). And the measurements are completely reagent free.

For more information, refer to Product Data Sheets 71-FCL and 71-MCL.

Clarity II™ Dual-sensor Turbidimeter

Turbidity

The Rosemount Analytical Clarity II™ dual-sensor turbidimeter allows water treatment facilities to comply with U.S. EPA and International ISO regulations for measurement of water clarity. The system includes an electronic analyzer, a low-NTU optical sensor, and a measurement chamber with a two-stage debubbler. The turbidimeter meets EPA 180.1 and ISO 7027 specifications for turbidity measurement when installed with the appropriate optical sensor. 4-20 mA analog outputs can be enabled for interfacing to recording devices and control systems. An optional alarm board is available with three relays. The instrument incorporates an easy-to-use menu-driven user interface for programming, calibration and operation, as well as a backlit display. Choose among six languages for even more ease of use and flexibility.

For more information refer to product data sheet 71-T1055.

Model PC-1 Particle Counter

Particle Counter

The Model PC-1 Particle Counter is intended for the determination of particle count and size distribution in a variety of process streams. The Model PC-1 has eight programmable size channels that can be configured over the dynamic range of 2-400 µm. The counts/mL are displayed on the main screen and the first four channels have independent configurable 4-20 mA output signals. The dedicated software (Tracware) trends current data, automatically archives data every 24 hours, prepares reports, and is as easy-to-use as point-and-click.

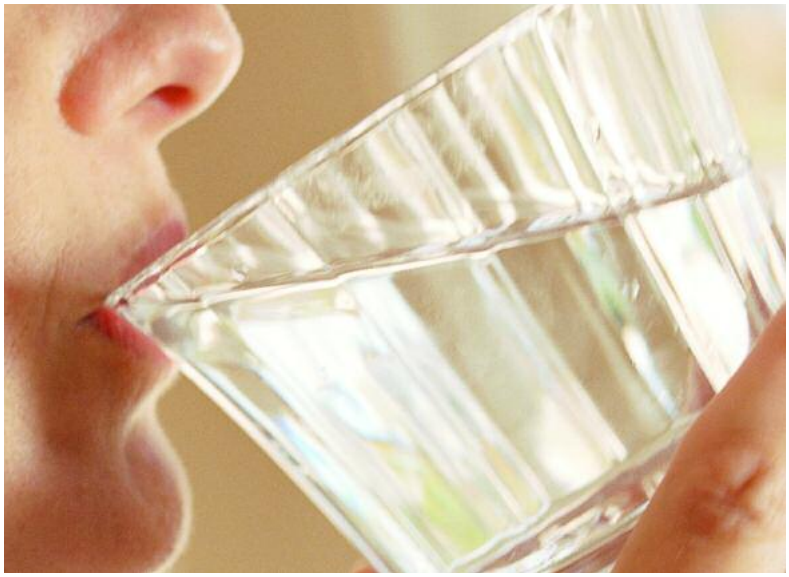
For more information, refer to Product Data Sheet 71-PC1.

REFRAC-A1 Process Refractometer

Process Refractometer

The all-in-one REFRAC-A1 measures the refractive index to determine the concentration of a variety of binary mixtures, including sugar in water (Brix), alcohol and carbohydrates in beer, fat in dairy products, and acids in water. The optical head is mounted on a 2.5" TriClamp process connection and is compatible with air or water cooling up to 150°C. All the electronics are integral to the measuring head. Windows-based software is included for custom configuration and percent calculations. On-line cleaning systems are available to ensure measurement accuracy in applications that may coat the optical prism.

For more information, refer to Product Data Sheet 71-REFRAC.



Model WQS Water Quality System

Water Quality System

The Model WQS Water Quality System is intended for the determination of pH, ORP, conductivity, temperature, free chlorine or monochloramine, oxygen, turbidity, and particle index in fresh water. The system combines user-specified instruments and sensors to create a customized system for monitoring water quality.

The system is designed for quick startup and low maintenance. No reagents – free chlorine and monochloramine sensors are completely reagent free. The system is prewired and plumbed with Variopol quick-disconnect sensors. It operates with low sample flow: <3gph (183 mL/min). There is a choice of digital outputs between HART and FOUNDATION fieldbus.

The WQS provides constant surveillance of water quality events that may affect the security of your distribution network. It helps ensure that acceptable water quality parameters are maintained throughout the distribution system and assists in meeting the requirements of the Surface Water Treatment Rule.

For more information refer to product data sheet 71-WQS.

Drinking Water Treatment

A typical drinking water plant takes water from a lake, river, or well, and treats it through coagulation, sedimentation, filtration, and disinfection to purify it into drinking water. Harmful organisms are killed by adding a combination of ozone, chlorine and ammonia.

The disinfection process is monitored and controlled by the continuous measurement of ozone and/or chlorine. A count of filtered-out particles and turbidity measurement is required for reporting purposes. The turbidity is indicative of filter performance. Particle counters are gaining more acceptance since they provide a more detailed measurement of water clarity and are better at anticipating filter breakthrough.

Solutions

pH Measurement
- Effluent pH monitoring

Chlorine Measurement
- Monitoring chlorine in drinking water and wastewater

Total Chlorine
- Measure total chlorine in water

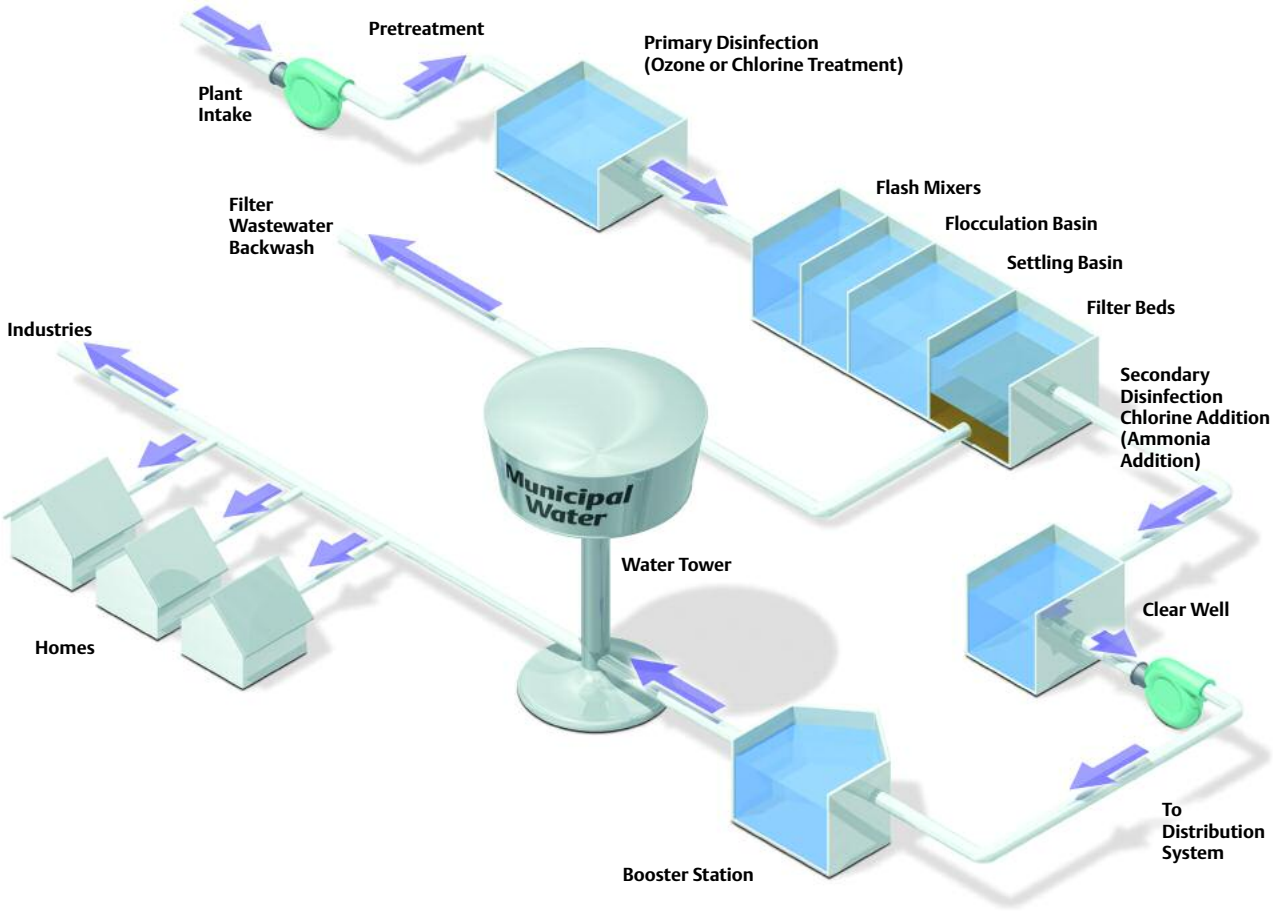
Ozone Measurement
- Monitoring and controlling ozone for disinfection in industrial and municipal applications

Turbidity Measurement
- Monitoring of potable water and wastewater

Monitoring Suspended Solids
- Monitoring suspended solids and sludge control

Model 1056 Analyzer

Clarity II Turbidity System



Wastewater Treatment

Wastewater is generated by homes, businesses, and industries and is treated in two major steps, primary and secondary treatment, with disposal of solids during both steps. Analytical measurements such as pH, ORP, and suspended solids are performed during the primary treatment stage in order to monitor the removal of solids from the wastewater.

Secondary treatment relies upon biological processes to further purify the wastewater, and maintaining proper dissolved oxygen (DO) levels is critical to this process. The DO sensor Model 499ADO is the perfect choice for maintaining the proper amount of oxygen required by microorganisms during biological processes.

Final treatment consists of chlorination and dechlorination and uses the Model 499ACL chlorine sensor. The final effluent is monitored for compliance and reporting purposes, and can include pH and chlorine measurements.

Solutions

pH Measurement
- Effluent pH monitoring

Chlorine Measurement
- Monitoring chlorine in final treatment

Dissolved Oxygen Measurement
- Monitoring and controlling oxygen in activated sludge process

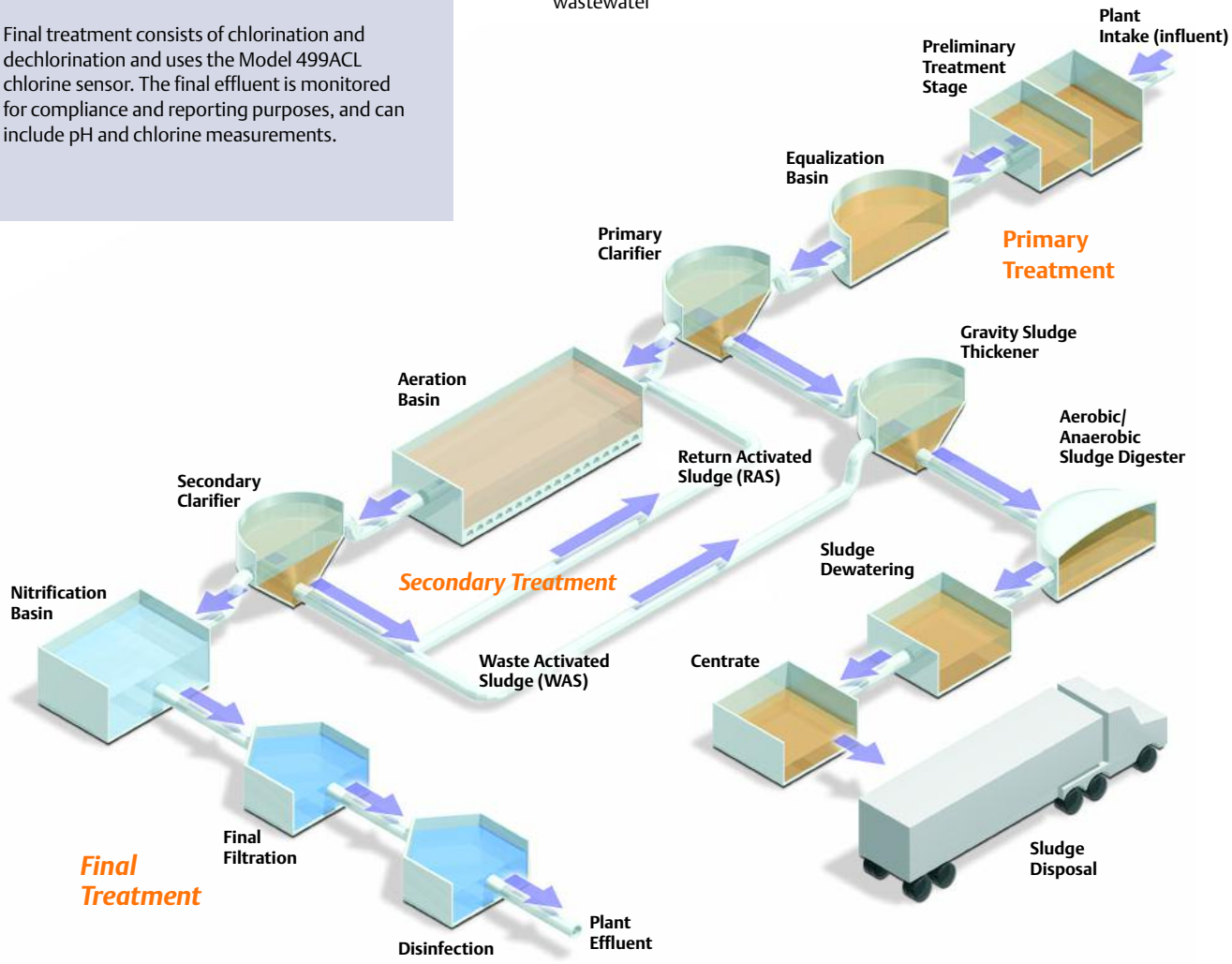
Conductivity Measurement
- Monitoring conductivity at influent and outfall

Turbidity Measurement
- Monitoring of potable water and wastewater

Total Suspended Solids
- Monitoring suspended solids and sludge control

Model 1056 Analyzer

Model 499A DO Dissolved Oxygen Sensor



Power Generation

To generate power, a steam electric power plant needs to supply high-purity, superheated steam to the turbines that power the electric generators. A major goal of plant chemical control is preventing solids from building up in the heat exchanger and boiler tubes. With water ever-present, corrosion threatens every metal surface in a power plant. The working fluid threatens the integrity of the plant equipment: condensers, heaters, pumps, piping, boilers and turbines.

Corrosion and deposition cost the power industry billions of dollars every year in reduced efficiency and equipment failures! Good water chemistry can help to reduce some of those costs and is best achieved with online liquid analysis.

Solutions

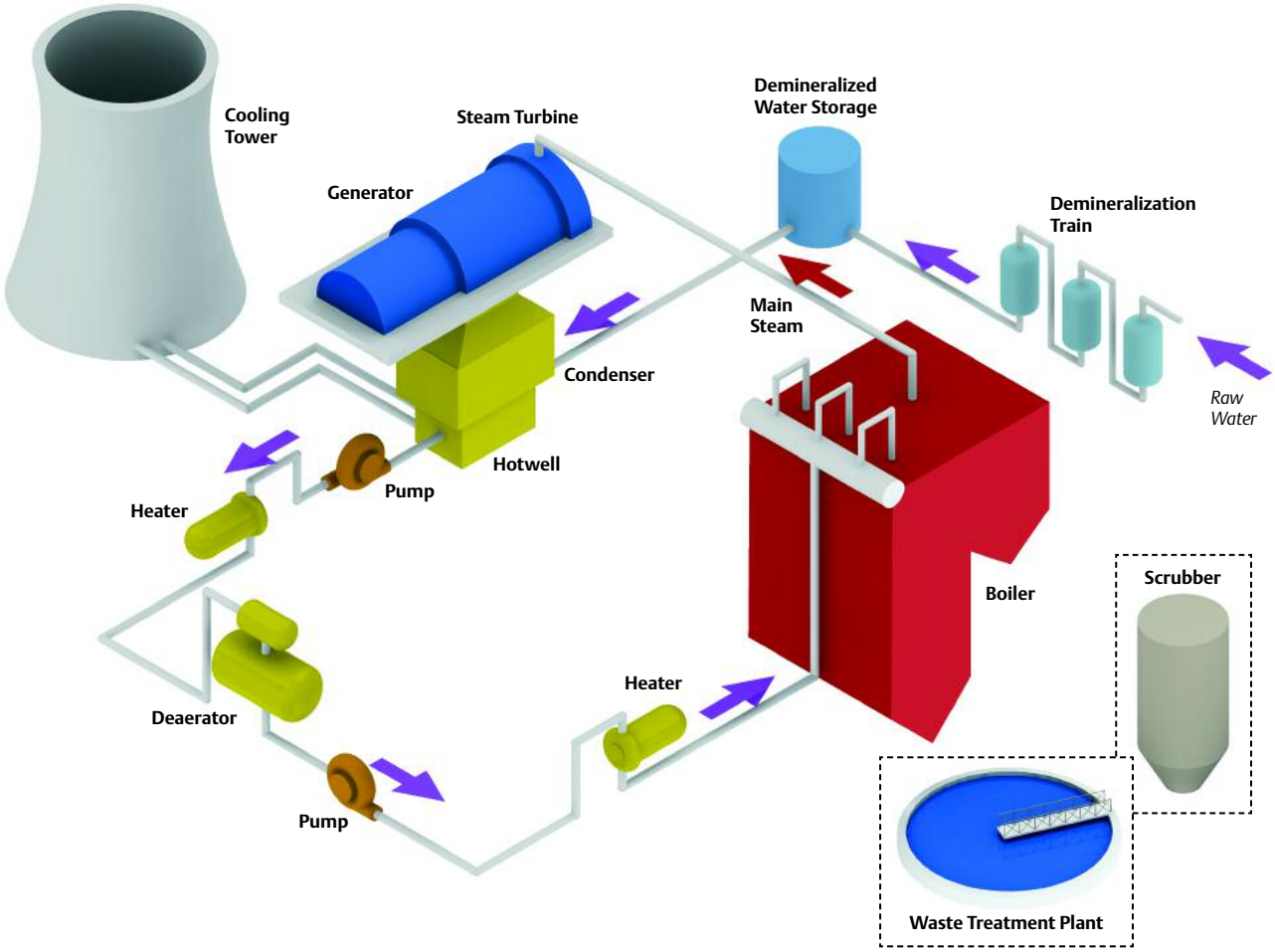
pH Measurement
- FGA scrubbers and cooling water
- Monitoring of condensate, feedwater, boiler water and steam

Conductivity Measurement
- Monitoring of reverse osmosis and ion exchange demineralizers
- Concentration of regeneration chemicals
- Cation and degassed cation conductivity in condensate (Larson-Lane System)
- Monitoring of the steam/water cycle

Dissolved Oxygen Measurement (ppb)
- Monitoring of condensate and boiler feedwater

Model 1056 Analyzer

Model 3200 HP Sensor



Paper Production

There are many processing steps used to turn wood into paper products. In chemical pulping, strong liquors are used to delignify the wood chips, and the spent liquors are constantly being collected and regenerated. Conductivity measurement is used to monitor the strength of these liquors and control the pulping process. The pulp slurry undergoes bleaching, blending, and refining prior to being run in the paper machine. pH control during these stages is essential for consistent quality. Emerson's pH and conductivity devices are used in these challenging applications to obtain these benefits with a minimum of routine maintenance.

Solutions

pH Measurement

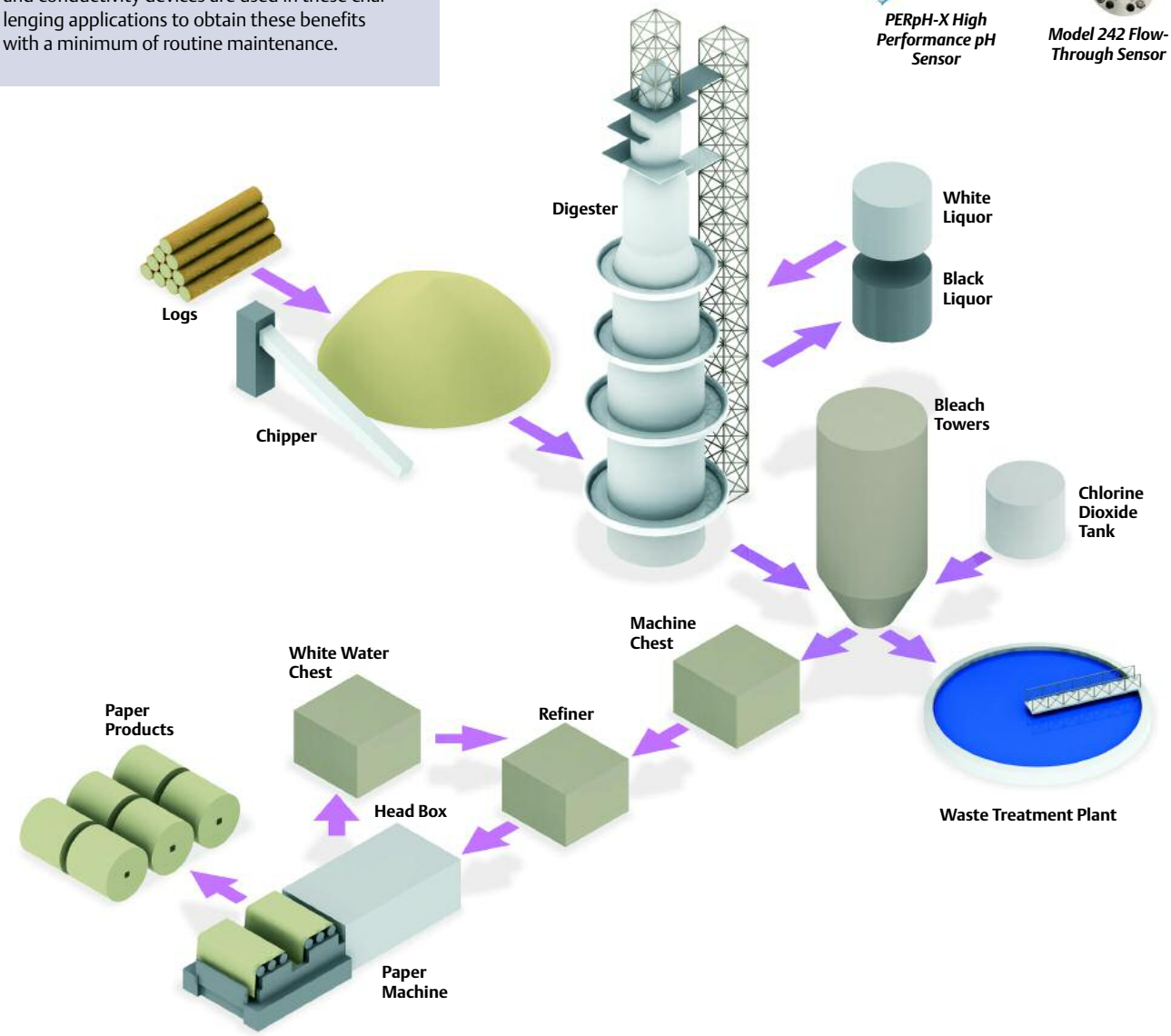
- Control of the wet end of the paper machine
- ClO_2 bleach lines
- pH measurement in the head box
- General pulp stock pH measurements

Conductivity Measurement

- Alkali concentration monitoring in kraft white liquor and weak white liquor
- Brown stock filtrate monitoring
- Pulp digestion in the kraft process

PERpH-X High Performance pH Sensor

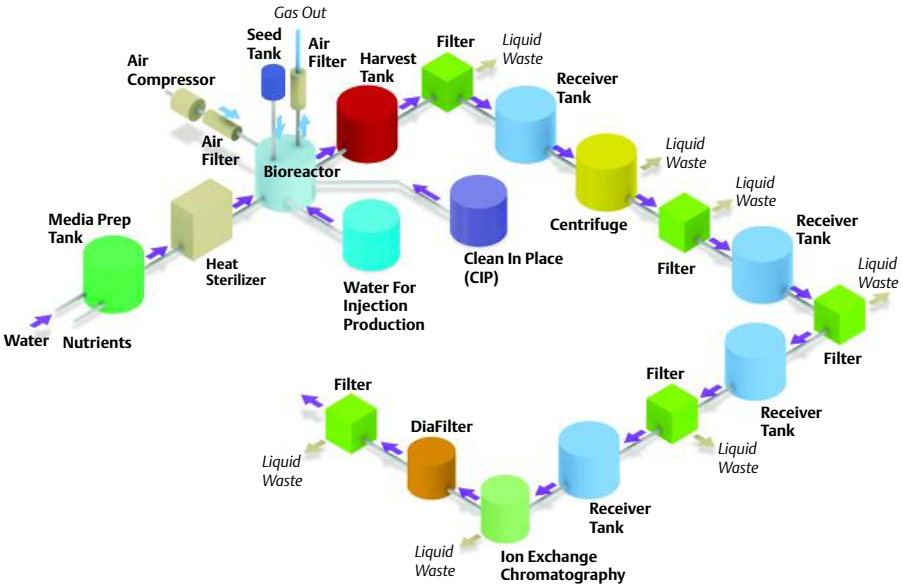
Model 242 Flow-Through Sensor



Pharmaceutical Production

Conductivity is a critical measurement for Water-for-Injection (WFI). Conductivity measurements must adhere to the latest USP guidelines. Sensors need to be calibrated to NIST standards and have surface finishes < 16 Ra. The Model 403 sensor meets these guidelines. Conductivity transmitters must provide alarms for raw, uncompensated conductivity based on the water temperature. The Model 1055 has the latest USP tables programmed into it, listing acceptable conductivity level vs. temperature.

Dissolved Oxygen and pH are two critical measurements in the bioreactor. These tight control parameters affect product yields and speed of reaction. In addition, these sensors must withstand steam-in-place (SIP) cleaning since residual buffer solutions may affect the drug harvest campaign. The Hx338 pH sensor and the Hx438 Dissolved Oxygen sensor withstand frequent SIP cleaning cycles, providing highly accurate measurements with fast response times.



Solutions

pH Measurement
- Steam sterilizable pH measurement

Conductivity Measurement
- Clean-in-place (CIP) monitoring and control
- Complete monitoring of water purification systems for water-for-injection (WFI) systems

Dissolved Oxygen Measurement
- Steam sterilizable dissolved oxygen measurement

Ozone and Chlorine Measurements
- Monitoring of disinfection and sanitization processes

Solu Comp® Xmt™ Transmitter

Model 245 Sanitary Sensor

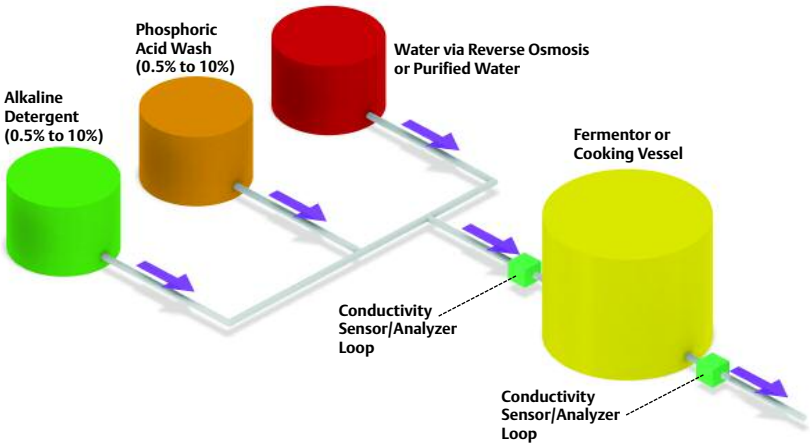
Model Hx438 Steam Sterilizable Sensor

Food & Beverage Production

Process piping and vessels used in the food and beverage industries require periodic cleaning without disassembly (CIP – clean in place) to remove residue from previous batches and to sanitize both the process piping and vessels. Since the various cleaning solutions used are more conductive than the water used for flushing and final rinsing, conductivity can be used to monitor the various cleaning steps and the final rinse.

The cleaning solutions used for CIP are used for several cleanings; conductivity can often be used to monitor the strength of the cleaning solutions to indicate the need for replenishment.

One of the major requirements for sensors used in CIP applications is that they be sanitary in design. The Model 245 Sanitary Flow-Through Toroidal Conductivity Sensor mounts directly into the cleaning lines via Tri-Clamp flanges.



CHEMICAL PROCESSING

Model 5081 pH/ORP Transmitter

Model ENDURANCE Sensors

pH Measurement

- Continuous or batch neutralization of acid/alkaline waste
- Coagulation and flocculation in industrial water treatment
- Scrubber control
- Leak detection for heat exchangers
- Cooling water monitoring

Conductivity Measurement

- Chemical concentration control for acid, base, and salt solutions
- Sulfuric acid production
- Scrubber control
- Interface detection between aqueous and non-aqueous solutions
- Boiler blowdown

TEXTILE INDUSTRY

Model 226 Sensor

pH Measurement

- pH monitoring and control in indigo dyeing

Conductivity Measurement

- Caustic concentration control in mercerization
- Sulfuric acid concentration control in wool carbonizing

OIL, GAS, AND PETROLEUM REFINING

Model 5081 pH/ORP Transmitter

Model 228 Sensor

pH Measurement

- Corrosion control of crude overhead towers
- Monitoring effluent of API separators
- pH control in quench towers
- pH control in sour water strippers

Conductivity Measurement

- Interface monitoring and control in pipes and storage tanks
- Mud logging (with Model 226)

MINING AND METAL PROCESSING

Model 396P Insertion/submersion pH Sensor

Model 228 Sensor

pH Measurement

- Chromium (VI) reduction and removal in electroplating process (pH/ORP)
- Cyanide destruction (pH/ORP)
- Control of copper flotation process
- Control of metal plating solutions

Conductivity Measurement

- Measuring caustic concentration in metal cleaning processes
- Measuring chemical concentration and monitoring rinse water

ELECTRONICS & SEMICONDUCTOR INDUSTRIES

Model 403 Sensor

Resistivity Measurement

- Monitoring of ultra-pure water
- Monitoring and control of rinsing processes

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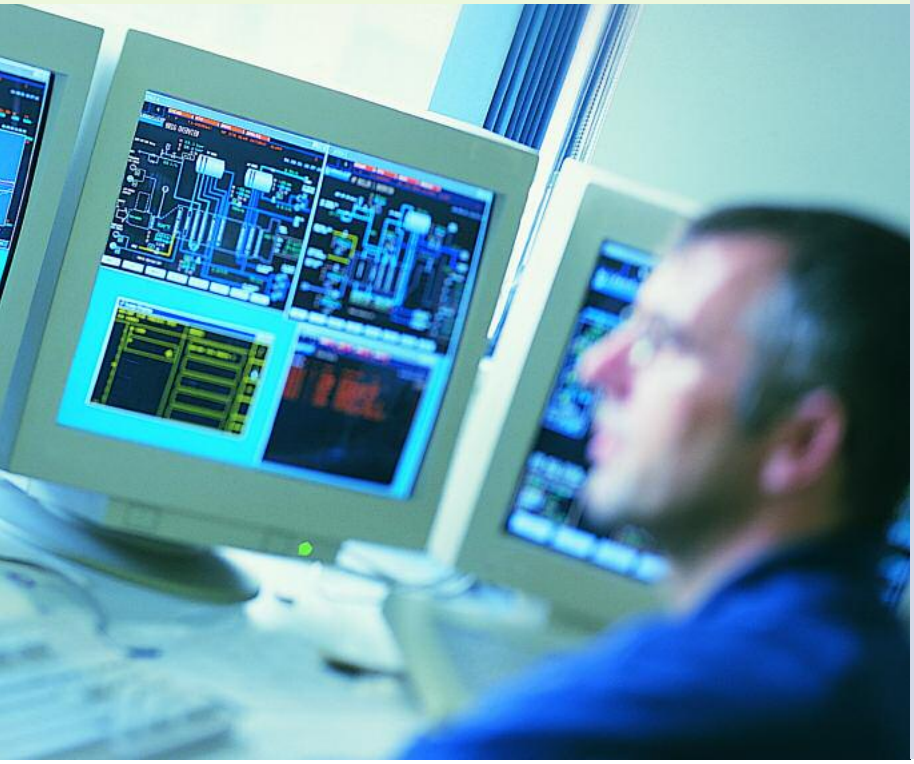
Rosemount Analytical field devices are core components of the PlantWeb digital plant architecture, and capture rich diagnostic data about the health of the device, as well as the process itself. Device functionality is presented at the user interface in ways that are consistent, intuitive, and easy to use.

PlantWeb architecture consists of intelligent field devices, scalable platforms and integrated modular software, all working together. The result is optimal plant performance by getting the right information to the right user, in time to make a difference. The advanced diagnostics in Rosemount Analytical sensors, alert users to device or process problems, before they happen. Control in the field can provide more reliable process control.



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The Rosemount Analytical Customer Support Center is staffed with trained professionals to make certain that customers receive the right answers, right now. Timely technical support and order administration is available with just one toll-free call to 1.800.854.8257, 5 am to 5 pm PST (in the USA). Globally, we have established international sales offices (see back page) staffed with factory-trained professionals. Reliable worldwide support for any Emerson product is only a phone call away.

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Maintenance Programs

Technical Training Programs

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For more information on any of the products listed in this brochure and their applications, please contact your nearest Rosemount Analytical sales office. To request copies of our literature, call 800.854.8257 or visit our website.

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