Liquid Analytical Solutions
From the World’s Most Trusted Source
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.
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.
The PERpH-X™ sensor family was designed to expand application flexibility by withstanding elevated temperatures up to 155° C. Incorporating several design innovations that increase sensor life in difficult applications: improved durability of the AccuGlass pH glass electrode, increased stability of the reference electrode and overall improvement of the mechanical design. PERpH-X technology uses a rebuildable concept and is offered with six electrolyte fill solutions to match the process chemistry. The resulting sensors live longer, respond faster, drift less, thereby minimizing maintenance and lowering cost of ownership.

**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 3300/3400/3500 sensors were engineered for high temperature processes which provide the harshest test of pH sensors.

The AccuGlass™ pH glass electrode provides exceptional resistance to thermal degradation, even at temperatures around 155° 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.
**TUpH** Family of **pH** and **ORP** Sensors

TUpH sensors are just that – TOUGH! TUpH sensors feature the industry proven AccuGlass and 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 non-glass pH electrodes, Models 370 and 371, 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 Varipol 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 cable.

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

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**General Purpose and Triple Junction 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.

**Triple Junction Models 389 and 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.

**General Purpose 399 and 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 3800 / 3800VP Sterilizable pH Sensors

The PUR-Sense™ line of pH sensors is specifically designed for stability in life science and sanitary applications, where autoclaving and steam sterilization are required. They are built on AccuGlass™ technology and exhibit unparalleled stability after exposure to high temperature sterilization.

For process compatibility, the 3800 series is available in three insertion lengths: 120mm, 225mm and 325mm. These lengths allow use of alternative mounting assemblies, such as the Tri-Clamp®, NPT x Pg 13.5 insertion adapter and a G 1.25” x Pg13.5 assembly.

The drift free reference design closely retains its calibration. The sensor is designed to withstand 140° C thus minimizing high temperature shock and increasing its life. Testing has shown that the sensor can withstand 50+ steam cycles and 30+ autoclave cycles providing a stable and reliable measurement after many cycles.

Each sensor has a quality test certificate that includes a list of wetted materials used and a calibration record for ease of compliance.

For more information, please refer to Product Data Sheet 71-3800.
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.

**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 Varipol 6.0 connector.
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
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.

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 1056, 54eC, 5081-C and Xmt-C instruments.

For more information, refer to Product Data Sheet 71-400 and 71-403.
Four-electrode Sensors
Emerson has recently introduced the Rosemount Analytical four-electrode conductivity sensor, the Model 410VP. The broad dynamic range—six orders of magnitude—makes the 410 VP sensor ideal for monitoring CIP (clean in place) applications in the food and beverage industries. The sensor is available in PEEK and meets the food contact requirements of 21CFR171. The Model 410 VP sensor is available with Tri-Clamp®, Varivent N, and G 1/4 fittings. For more information refer to Product Data Sheet 71-410VP.

Toroidal Conductivity Sensors
Emerson offers a full line of Rosemount Analytical toroidal (inductive) conductivity sensors. Toroidal sensors are ideal for use in corrosive liquids and in liquids containing suspended solids—applications for which metal electrode sensors are not suitable.

For applications where the sensor can be inserted into the process piping or submerged in a tank, choose either the Model 226 or 228 sensor. The rugged design and construction of these sensors enable them to tolerate the harshest conditions.

The Model 228 is a workhorse sensor and meets most process requirements. However, if high levels of suspended solids are present, the Model 226 sensor can be better choice. The large opening in the Model 226 tends to resist plugging from solids better than the smaller opening of the 228 sensor.

Both the Model 226 and 228 sensors are molded from durable, chemical resistant PEEK. The 228 sensor is also available in Tefzel®. A variety of mounting options are available, and a high pressure retraction device allows the 228 sensor to be inserted against pressure as high as 295 psig (2135 kPa abs).

For applications in the pharmaceutical and food and beverage industries where a sanitary design is required, choose the Model 225 sensor. The sensor is available in glass-filled PEEK, unfilled PEEK, and unfilled Tefzel®. The filled PEEK sensors conform to 3A sanitary standards, and an unfilled PEEK version molded from USP Class VI polymer is also available. The sensor is available with a 2-inch Tri-Clamp® process connection.

Rosemount Analytical also offers flow-through toroidal conductivity sensors. Flow-through sensors are ideal for viscous or fibrous liquids. Because no part of the sensor protrudes into the sample flow, there is no obstruction on which solids can accumulate.

The Model 222 sensor is constructed from Teflon®-lined carbon steel pipe. It is available in one-inch and two-inch pipe sizes. The Model 242 sensor is available in PEEK, Teflon®, and alumina and can accommodate line sizes ranging from one inch to four inches (DN 25 to DN 100). All flow-through toroidal sensors have metal rings that make electrical contact with the liquid being measured. The Model 222 sensor is available with carbon steel and 316 stainless steel contact rings. The 242 sensor is available with 316 stainless steel, Hastelloy C-276, and Carpenter 20-Cb3 contact rings.

For flow-through applications in the pharmaceutical and food and beverage industries choose the Model 245 sensor. The sensor uses Tri-Clamp® process connections and is available in line sizes between 0.5 and 2-inches.

Toroidal conductivity sensors can be used with Model 1055, 1056, 54eC, 5081-T and Xmt-T instruments.

For more information, refer to Product Data Sheets 71-226/228, 71-225 and 71-242.
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 level. The floating ball will also accommodate the Sensor Wash Head Assembly or any sensor with a 1-inch rear facing MNPT connection.

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 1056, 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.
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 two months. 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. 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. High 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.
**PH Independent Free Chlorine System**

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

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

**Packaged Free Chlorine and Monochloramine 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.

**Turbidity**

The Rosemount Analytical Clarity II™ Model T1056 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. The instrument incorporates an easy-to-use menu-driven user interface for programming, calibration and operation, as well as a backlight display. Choose among six languages for even more ease of use and flexibility.

For more information refer to product data sheet 71-T1056.
On-line Wet Chemistry Analyzers

Simplicity, ease-of-use and reliable operation characterize the line of wet chemistry analyzers available from Rosemount Analytical. The line includes Model CFA3030 Silica Analyzer, Model 3011 Sodium Analyzer, Model 3018 Hydrazine Analyzer and Model 3047 Phosphate Analyzer.

All analyzers have one button operation – one button starts, calibrates and puts the analyzer on-line. Using an optional built-in stream selector, the analyzers have a multiple sample option allowing measurement of as many as six sample streams sequentially. The analyzer performs self diagnostics monitoring critical functions and alerts the user when a problem exists.

For ease-of-use, pre-packaged reagents and standards are used, which means no messy chemical solutions to prepare and standardize as they come from the factory ready to use. Routine maintenance takes five minutes every three months.

For more information refer to these Product Data Sheets:
- Silica – PDS 71-Silica3030
- Sodium – PDS 71-Sodium3011
- Hydrazine – PDS 71-Hydrazine3018
- Phosphate – PDS 71-Phosphate3047

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 Varipol 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.
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 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.
Wireless Makes the Most Difficult Locations Accessible

The Model 6081 is a wireless transmitter that continuously monitors pH or ORP. Leveraging Wireless HART v7 communications protocol, advanced diagnostics can be enabled such as glass Impedance and reference impedance to support real-time reporting of sensor condition and health. Model 6081 is ideal for monitoring remote applications, difficult to access locations, and hazardous areas which are unsafe for human entry. The Model 6081 integrates seamlessly into Emerson Process Management’s wireless system, which supports many process measurements for most industrial, commercial and municipal applications.

Users are looking for ways to wring even more productivity (and costs) out of their operations. Wireless technology offers a cost-effective way to get the information – from additional process measurements to equipment diagnostics to inventory levels – needed to achieve those goals.

Model 6081 Transmitters

The Emerson wireless solution ensures data transmission reliability, best-in-industry security, and network stability. Emerson wireless covers many process measurements including flow, level, and pressure – all of which can be combined with liquid analysis by the Model 6081 on the same HART v7 network.

Check out these wireless solution advantages:

SECURITY – Built-in encryption, authentication, verification, key management, anti-jamming, and other security measures can make properly-implemented wireless networks as secure as many traditional wired ones – or more so.

SMART SENSOR – Sensor calibration is immediate with Smart Sensor technology, no need to calibrate in the field. The lab calibrated sensor holds the information until installed.

POWER – Advanced power-management techniques and low-power electronics help minimize power consumption so wireless devices can operate for years without battery replacement.

RELIABILITY – Self-organizing networks offer unprecedented reliability for wireless field networks, even when changes in the plant environment interfere with existing transmission paths.

INTEGRATION – Emerging industrial standards – such as those under development by ISO and the HART Communications Foundation – are addressing concerns about integration and long-term compatibility in wireless field networks.

COMPATIBILITY – The Model 6081 is compatible with the Rosemount 1420 Wireless gateway with HART v7 which enables communication with Emerson Process Management wireless networks.

ADVANCED DIAGNOSTICS – High accuracy and reliability are part of the design and are critical for monitoring applications. Continuous diagnostics monitor sensor performance and health.

COMMUNICATION – HART v7 Digital Communications for continuous diagnostics to monitor sensor performance and health.

The PlantWeb™ Difference

With Emerson’s Smart Wireless solutions, the benefits of PlantWeb can be extended to areas that were previously out of physical or economic reach. With applications ranging from Process and Asset Monitoring to Workforce Productivity and Business and Plant Management, there are no limits to the benefits Smart Wireless can deliver.
FOUR-WIRE ANALYZERS

Microprocessor Analyzers
Meet the Highest of Standards

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 monochloramine.

The Model T1056 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, % Concentration, Chlorine (Total, Free, Monochloro-mine, pH independent Free Chlorine), Oxygen, Ozone, Turbidity, 4-20 mA input, 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.

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, Portuguese and Chinese.

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 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 54e pH 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.
To generate power, a steam electric power plant needs to supply high-purity, superheated steam to the turbines that power the electric generators. The goal of plant chemical control is minimizing waterside and steamside corrosion to prevent solids from building up in the heat exchanger and boiler tubes.

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 those costs through accurate, on-line analysis.
A drinking water plant takes raw water from a lake, river, or well and treats it to kill or deactivate harmful microorganisms.

Continuous analyzers monitor the process. Turbidimeters measure water clarity, which is a good indicator of filter performance. Free chlorine, chloramine, or total chlorine sensors measure disinfection residuals, allowing plant operators to calculate the CT values used to measure disinfection effectiveness. Chlorine or ozone sensors monitor primary disinfectant levels. pH sensors measure the acidic or basic nature of the water, which is important in the CT calculation. The pH also gives an indirect indication of the corrosiveness of the product water.

**Drinking Water Treatment**

**Solutions**

**pH Measurement**
- Effluent pH monitoring

**Chlorine Measurement**
- Monitoring free chlorine, chlorine and monochloramine in drinking water

**Ozone Measurement**
- Monitoring and controlling ozone for the primary disinfection

**Turbidity Measurement**
- Monitoring clarifier and filter effluents

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**TYPICAL APPLICATIONS**

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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 and ORP 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, turbidity 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

For more information on industries and applications, see us on the web at [www.raihome.com](http://www.raihome.com)
TYPICAL APPLICATIONS

Metals and Mining

The Mining Industry requires robust equipment for reliability in mining processes. Rosemount Analytical sensors are designed for these difficult processes and provide measurements of pH, ORP and conductivity that are specifically designed for long life and reliable results in high solids applications. Featured products for this industry include the Model 242 Flow Through Conductivity Sensor, the coating resistant model 396P TUpH pH sensor, and the high performance PERpH-X model 3500 pH sensor. These sensors are recommended with the easy to use dual channel model 1056 analyzer for reduced maintenance, troubleshooting, and training costs.

Solutions

**pH Measurement**
- Cyanide-based extraction
- Flotation for copper sulfide separation
- Minimize waste products

**Conductivity Measurement**
- Phase difference for product concentration
- Steel impurities removal treatment
- Tailing discharge monitoring

![Diagram of pH Measurement in Flotation Cells]
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.

**Paper Production**

**Solutions**

**pH Measurement**
- Control of the wet end of the paper machine
- ClO₂ 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
As world potable water supplies become scarcer, utilities and governments are increasingly turning to desalination of ocean and brackish water to meet growing demand. There are two basic desalination technologies: thermal distillation and membrane separation (reverse osmosis). Both methods extract fresh water from the salty water source, leaving behind even saltier wastewater. Pretreatment of the raw water to control scaling and fouling and, in the case of thermal distillation, to control corrosion is an important part of the desalination process.

Conductivity is perhaps the most important process measurement in a desalination plant. Conductivity sensors are reliable and inexpensive, and they provide a continuous measurement of the concentration of dissolved salts in the product water. Other measurements are pH, chlorine, and turbidity. Chlorine and turbidity are used primarily to check that the product water meets local public health standards.
Solutions

Conductivity Measurement
- Product water quality
- Raw water, permeate, and reject in reverse osmosis
- Raw water, condensate, and brine discharge in thermal methods

Turbidity Measurement
- Product water quality

pH Measurement
- Product water quality
- Raw water after pretreatment

Chlorine Measurement
- Product water quality
- Dechlorination of RO feedwater

Reverse Osmosis
Desalination

Freshwater Storage
Intake
Distribution
Post-Treatment
Pre-Treatment
High-Pressure Pumps
Membrane Tubes
Analizer
Model 1056
Analyzer
PERpH-X
High Performance
pH Sensor
Model 400
Conductivity 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 3800 pH sensor and the Dissolved Oxygen sensor withstand frequent SIP cleaning cycles, providing highly accurate measurements with fast response times.

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.

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 sanitation processes
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