Working Together To Bring You Best-In-Class Analytical Solutions
**Hamilton™ pH Sensors**

Hamilton’s™ series of combination pH sensors have been specifically designed to meet the severe requirements of the pharmaceutical and biotech industries.

These sensors feature the most recent technological advancements in reference systems, reference electrolytes, reference junctions, and formulations of pH glass.

These advancements ensure excellent long-term stability and accuracy, after the repeated sterilization typical of the pharmaceutical industry. The gel-filled (diffusion) type electrodes offer the convenience of low maintenance and high stability, while the refillable liquid (flowing) type electrodes couple superior stability and accuracy.

**Yokogawa SC24V Differential pH/ORP Sensor**

The Model SC24V differential pH/ORP sensor is unique, offering maintenance free operation without any reference problems. The SC24V is designed for difficult applications where conventional sensors are ineffective. These include such measurements as brine solutions and applications as diverse as electrolysis processes and cheese manufacturing.

The differential measuring principle combines the normal potential generated by the pH glass with the potential from a Sodium pNa glass. In applications where Sodium-, Potassium- or Calcium-salt is present the glass will generate a stable reference voltage. The Cation Reference has NO junction, there is NO path from the process to the internal element; so NO poisoning can occur. Also since there is NO junction, there is NO plugging or coating problems to worry about and there is NO electrolyte depletion problem, because there is NO electrolyte.

This means the measurement can be done, eliminating problems caused by aging and pollution of the liquid junction, that are typically experienced with a conventional reference electrodes.

**Hamilton™ Sanitary pH Armatures**

Normally the sensors in a bioreactor are mounted through the side of the reactor where they are exposed and vulnerable to accidental damage. To address this problem, the sensors are protected from mechanical damage and ambient moisture by rugged, but simple protection sleeves. Insertion and Retractable assemblies are available for a variety of sanitary connections, including 25mm ports and Tri-clamps.

**Yokogawa pH Analyzers**

Yokogawa has been providing best-in-class analyzers for many years. The loop-powered FLXA21 features a robust NEMA 4x design, complete on-line (real-time) sensor diagnostics, easy auto-calibration, and HART®, FOUNDATION Fieldbus™, or PROFIBUS® communication options.

The EXAxt PH450 features even greater operation and application flexibility. The intuitive touchscreen interface with full language prompts allow for easy commissioning, calibration, troubleshooting, and access to stored data. Choose to display in five different languages or select the Trend Graph display for a graphical history of the process values.
Yokogawa Inductive Conductivity Sensors and Analyzers

The model ISC40 Inductive Conductivity sensor, seamlessly molded in FDA approved PEEK with USP class VI rating, has a wide measuring range of 1 to 2 million microSiemens. It is compatible with a variety of process adapters including Tri-Clamps, and the fact that it is immune from the effects of fouling, coating, and polarization makes the sensor virtually maintenance free.

Yokogawa's Inductive Conductivity analyzers feature highly sophisticated compensation circuits that eliminate the measuring errors normally associated with inductive conductivity analyzers. Yokogawa's analyzers offer the highest accuracy and long-term stability in the market.

The model FLXA21 loop-powered analyzer has communication options ranging from HART®, FOUNDATION Fieldbus™, and PROFIBUS®. The model ISC450's intuitive touchscreen interface and multi-language capability provides easy, clear access to process, diagnostic, and trend graph data.

Yokogawa Contacting Conductivity Sensors and Analyzers

Whether used for measuring the purity of Water For Injection (WFI) or Clean In Place (CIP) processes, accurate and reliable conductivity measurements are critical in the Pharmaceutical industry. The best-in-class model FLXA21 loop-powered analyzer and the intuitive SC450 feature polarization and fouling diagnostics, pure water and electrolyte custom temperature compensation, as well as USP chapter 645 conductivity tables built-in.

Hamilton™ Conductivity Sensors

Hamilton's™ Conductcell™ line of 4-Pole conductivity sensors feature open cell geometry that allows for a wide range of conductivity combined with a minimal footprint. The sensors are made of FDA approved material and are compatible with sanitary 25mm port or Tri-clamp process connections.

The compact model SC4A conductivity sensors are designed to meet the demanding requirement of high purity water conductivity applications. The sensors are made of FDA approved materials, polished to pharmaceutical requirements, compatible with a variety of sanitary process connections, and have cell constants that are factory calibrated to three significant digits.
Dissolved Oxygen is one of the most important parameters controlled in the Pharmaceutical and Biotech industries today. Since their introduction in 1997, Hamilton’s OXYFERM family of oxygen sensors has become a world leader because of the sensors’ signal performance and low maintenance requirements.

The OXYFERM sensors are designed to withstand the harsh conditions present during process, sterilization, and cleaning. The 316 stainless steel body features a membrane that combines the selectivity of TEFLONTM, the permeability of Silicone, and the mechanical strength of stainless steel mesh. The membrane is pre-mounted in a stainless steel membrane cap that allows for safe and easy replacement of electrolyte or membrane in the infrequent instances when maintenance is needed. Armatures are available for sanitary 25mm ports as well as Tri-clamp process connections.

The performance of the OXYFERM sensor is unmatched in the industry. The design of the membrane allows a 90% response in a time of 30 to 60 seconds. The stabilization or polarization time of a newly installed sensor is typically less than 15 minutes. The design of the sensor negates effects of low rate and increases the life of the sensor. The graph illustrates the excellent performance of the sensor, even after 100 sterilizations without performing maintenance. Other types of oxygen sensors subjected to the same conditions require regeneration after 5 to 10 sterilization cycles.

Yokogawa can offer two flexible solutions to meet the dissolved oxygen analyzer requirements in the Pharmaceutical and Biotech industries.

The 115 VAC powered, model DO402G, features the flexibility of two 4-20 mA analog outputs as well as 4 programmable dry-contact alarms. The DO402G can display percent saturation, mg oxygen/l water and ppm DO.

The model FLXA21 is a 24VDC loop-powered analyzer. It has communication options ranging from HART®, FOUNDATION Fieldbus™, and PROFIBUS®. The FLXA21 offers automatic temperature compensation for both % saturations and ppm.

Both analyzers provide a simple-to-use “push button” user interface and feature compensation for temperature, atmospheric pressure and salinity to ensure the best measurement accuracy. The flexibility of the analyzers also allows compatibility with a number of dissolved oxygen sensors from many different manufacturers.
The clear path to operational excellence

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VigilantPlant is Yokogawa’s automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

Represented by: