talkline

Endress+Hauser
People for Process Automation

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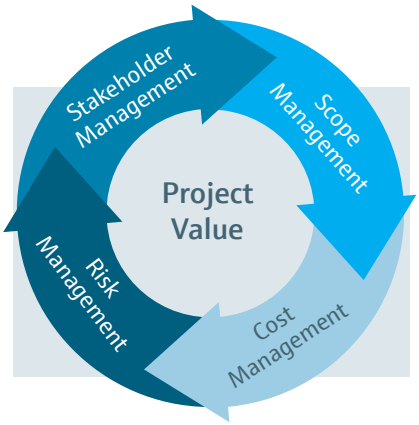
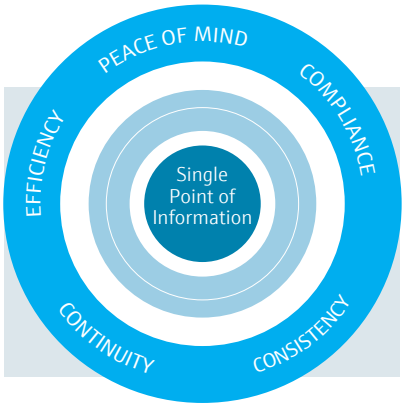
4 Project Management Services

Reduce risks, effectively manage costs and improve the overall success of your project.



6 Documentation Services

Providing the right information at the right time, with complete traceability.

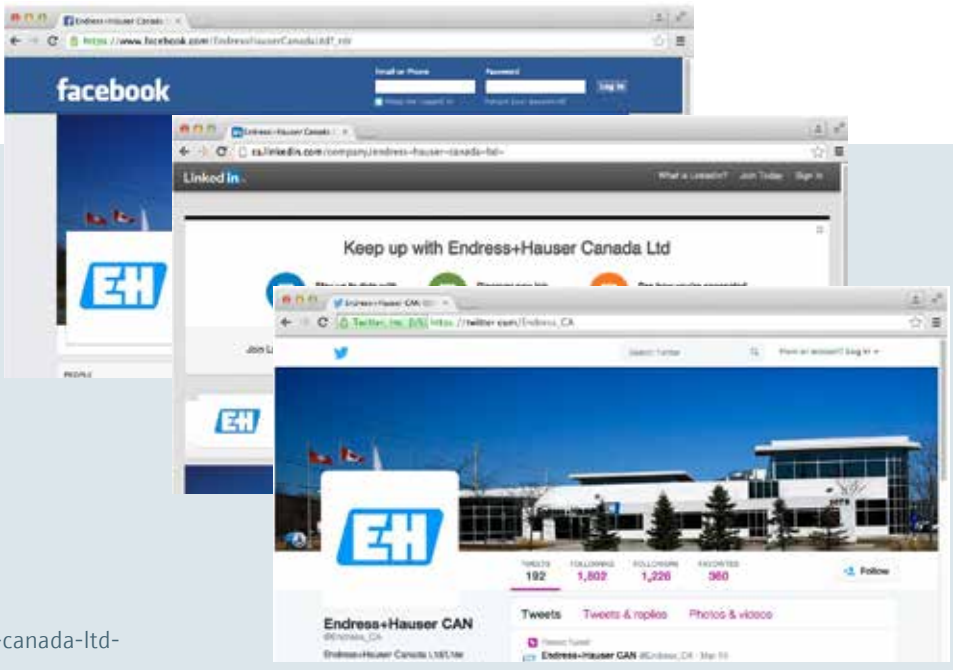


7 Project Logistics Coordination

Our professional logistics coordination services save you time and money.

Connect with us

For the latest updates, events and process automation news, join us on our social channels. Visit Endress+Hauser Canada Ltd on Facebook, Twitter and LinkedIn.



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Our valued friends, customers and business partners

Dear Reader,

Welcome to the long-awaited arrival of the spring/summer season! We have certainly all endured a winter that didn't seem to want to end. I know that for most of us, the arrival of warmer temperatures has definitely had a positive effect. As we enter summer and the third quarter of the year, I sincerely hope you will plan some vacation time. Canadian summers can be somewhat short, so make plans to spend some quality time with family and friends.

The first two quarters of 2015 were marked with continued challenges and mixed results as many companies continue to be affected by the price of oil and the reduction in activities in that industry, and those who serve it.

We are a mere six months into 2015, yet we are already starting to see signs of more favourable economic conditions across many industries. Economic challenges are not new. Many industries are cyclical. Others are perhaps more impacted by local and international economics. Nonetheless, the majority of companies facing these challenges are committed to serving their respective industries for the long haul. Even in tough business climates, Endress+Hauser remains committed to its customers and business partners—and continues to make investments so that our experts are close to you—and can support you in your business objectives. One such investment is our Edmonton Customer Training and Calibration facility which we introduced in the first quarter issue of *Talkline* (*Talkline* 71). We look forward to giving you more details on the progress of construction of this new facility in our September 2015 issue.

Remember, we are here to help you be as competitive and successful as possible in the markets you serve. Our products, services and solutions, along with our many decades of experience can be applied such that they deliver tangible results to your bottom line.

We are all focused on working with you towards the achievement of your goals. Wishing each and every one of you continued success in 2015!

Sincerely,

Richard

Richard Lewandowski
CEO

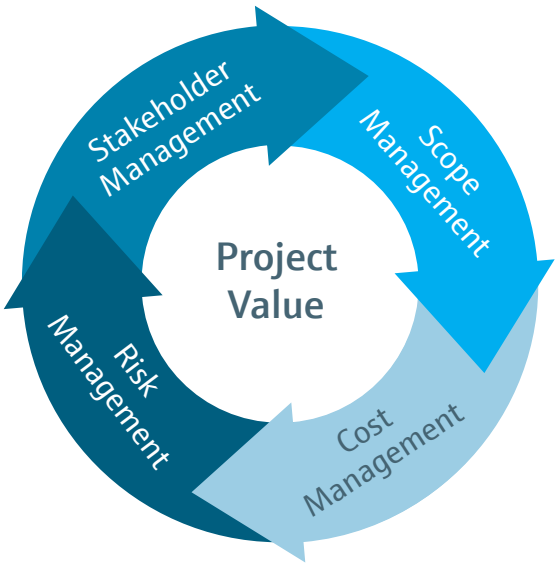
Project Management Services

It takes time and effort to proactively manage a project. Reduce risks, effectively manage costs and improve the overall success of your project.

Why Project Management Matters

Leading organizations across sectors and geographic borders have been steadily embracing project management as a way to control spending and improve project results. When the recession began, this practice became even more important. Executives discovered that adhering to project management methods and strategies reduced risks, cut costs and improved success rates – all vital to surviving the economic crisis.

– PMI White Paper 2010



The Value Endress+Hauser Project Managers Provide

Contact

Single point of contact for all project information and deliverables

Communication

Coordination and communication across all Endress+Hauser departments and factories, as well as any third-party contacts and all customer stakeholders

Integrity

Operate with **integrity**, **honesty** and open communication

Going Beyond

Going beyond the traditional definition of Project Management

High-quality

Ensure **high-quality** deliverables

Reporting

Regular **progress reporting**

Hands-On

More **hands-on and technical**

Scope

Manage changes to scope and revisions, and minimize impact on schedule and cost where possible

Standardization

Doing the same things the same way and providing standardization

Bottom line — it takes time and effort to proactively manage a project.

Customers are shifting the responsibility of managing the project to their suppliers and partners, and this is now a common expectation in project business.

Endress+Hauser Professional Project Management Benefits

Saving cost and effort with proactive scope management

Many projects have difficulty with managing scope, which results in additional effort and cost to the project. Having better project management processes results in being able to manage scope more systematically.

Resolving problems more effectively

Some people spend too much time and energy dealing with problems because they do not know how to resolve the problems to begin with. Having a proactive issues management process helps to ensure that problems are resolved as quickly and effectively as possible.

Mitigating future risk before the problems occur

Project managers identify and manage risks throughout the lifecycle of the project. Proper risk management processes result in potential problems being identified and managed before the problems actually occur.

Managing expectations

Many problems on a project can be avoided with proactive and multilevel communication. In addition, many of the conflicts that arise on a project are not the result of a specific problem, but because of surprises. Project managers focus on proactive formal and informal communication with all stakeholders, which results in fewer surprises.

Building a higher-quality product the first time

Project managers use their experience and knowledge to determine customer requirements and help the team understand the needs of the customer in terms of quality. Once those needs are defined, the team can implement quality control and quality assurance techniques to meet the customer expectations.

Improving cost management

Project managers help decrease project costs from the beginning of a project through ensuring better project definition, better estimating, more formal budgeting and better tracking of the project actual costs against the budget. This results in better financial predictability and control.

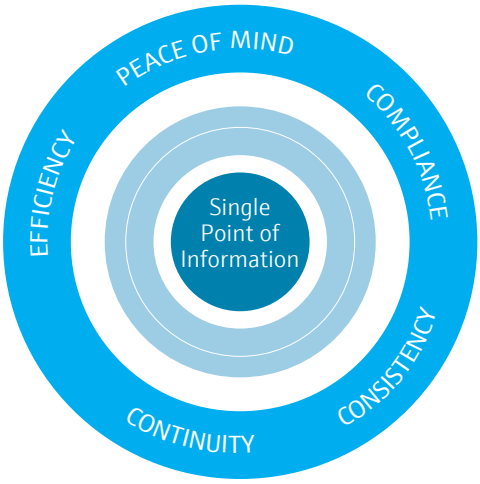
Fostering partnerships through professionalism, collaboration and dedication to quality.

- Every project is going to encounter issues. Let's proactively resolve them.
- Every project will face potential risks. Let's mitigate these before they happen.
- Let's communicate proactively and manage expectations.
- We help you manage the scope of your project, avoiding deadline and cost overruns.
- We build quality into our processes. Together, we do it right the first time!

ISO 9001:2008

Documentation Services

Providing the right information at the right time, with complete traceability.



Why Project Documentation Matters

Organizations are faced with ever-growing requirements to meet Regulatory and Safety standards, which can create an overwhelming amount of documentation.

Having a complete and compliant documentation package can help ease the burden of identifying and distributing relevant information. Endress+Hauser's Documentation Services can help manage this documentation in a consistent and efficient manner.

The Value Endress+Hauser Documentation Services Provide

Custom Documentation

Project Data Books
- Tab-based on customer document codes
- Custom bookmarks based on customer requirements

Dimensional instrument drawings with wiring detail
- Including project specific title block and tagging

Custom CAD design work
- Fixtures
- Mechanical Design
- Drafting Services

A partnership to achieve success.

Documentation is an important part of a project. Without it, time, effort and money can be wasted trying to track down and identify required pieces of information, and getting it to those who need it.

The need for proper documentation is growing, and Endress+Hauser is able to meet these requirements with our professional documentation services.

Knowing that the required documentation is provided in an easily navigated format provides peace of mind that information is only a click away. ISO 9001:2008

Project Logistics Coordination

Our professional logistics coordination services save you time and money.

Why Project Logistics Coordination Matters

In today's project needs, logistics has become much more than delivering products from point A to point B. Customers' expectations are that their suppliers and partners take on more of the logistics coordination activities.

The Value Endress+Hauser Logistics Coordinators Provide

- Direct point of contact for customer's expeditors or logistics
- Coordination and communication between Endress+Hauser's factories and project managers
- Point of contact for questions regarding international shipping rules and regulations

- Provide export documentation (international documents for projects with FCA terms)
- Customized packing lists
- Customized commercial invoices
- Flexibility to use Endress+Hauser or customer-provided templates
- Production and shipment status updates

- Export control according to current standards
- Screening
- Compliance with Migra's Canadian Export Guide
- Third-party inspections
- Consolidation services

- Product familiarity
- Specialized labelling
- Custom tagging
- Photo documentation of packing
- Oversee quality of finished packaging

- Expediting and change orders
- Review of logistics terms and conditions in RFQ packages
- Risk management related to logistics and delivery schedules as it applies to Incoterms 2010

- Estimation of weights and dimensions
- Shipping quotes
- Custom wood crating and marking
- Ocean crating

A partnership based on quality and great customer service.

Project business is becoming increasingly important, and professional logistics services help save time and money.

Customers' needs are expanding, and Endress+Hauser can handle many of these requirements with our portfolio of logistics services.

Endress+Hauser's logistics coordinators close the gap.

ISO 9001:2008

Measuring pH of Ultrapure Water in Power Industry Applications

By Fred Kohlmann, Product Marketing Manager Analytical, Endress+Hauser

Measuring the pH of ultrapure water requires specialized sensors, meticulous installation and proper maintenance.

Water covers more than 70 percent of the earth's surface and has varying degrees of purity in its natural form, ranging from crystal clear pure mountain spring water to highly saturated brine sea water.

In the power generation industry, ultrapure water is used as a source to make steam to drive turbines and other uses. Ultrapure water does not cause corrosion or lead to stress cracking in equipment such as turbine blades, stainless steel lines, steam circuits and cooling systems. Power companies use a great deal of ultrapure water, upward of 500,000 gallons per day for large plants. The ultrapure water can be processed from city water, a nearby river or even seawater.

In most cases, the systems for producing ultrapure water are supplied by specialists in electrodionization, membrane, reverse osmosis and other techniques for purifying water, and all require monitoring of pH. Not only is pH monitoring required when the water is purified, it's also required as the water is used to ensure correct pH is maintained.

The bottom line in power plants is that improperly conditioned water—based on a number of parameters, of which the two main two are conductivity and pH—leads to corrosion and scale, which leads to inefficient operation and damage to vital parts.

In the boiler, deposits cause heat transfer problems, reducing steam production capability. Corrosion from these deposits weakens the metal, leading to tube leaks that negatively impact the production of steam. Large boilers, condensers, economizers and superheater tube leaks can lead to failure of adjacent tubes and are actually the largest cause of forced boiler shut downs.

The purity of the steam that passes through the turbine can cause deposits and corrosion from minerals, organics and detergents that are present in plant water sources. Deposits on the turbines can cause pressure drops and unbalance the turbine leading to a reduction in speed and generation capacity.

Unfortunately, conductivity measurement by itself does not provide enough water quality information for ultrapure water chemistry; therefore, pH must also be incorporated. Unless controlled, the effects of improper water treatment parameters will cause boiler tube failures and loss of efficiency due to coating of the tubes resulting in higher energy costs and ultimately higher operational costs. Boiler manufacturers have tight specifications on the min and max water quality parameters, pH being one of them.

Water's Tough

Water in its pure state is one of the most aggressive solvents known. Also known as the "universal solvent," water, to one degree or another, will dissolve virtually everything to which it is exposed. Because pure water has a deficiency of ions, it is looking for equilibrium with the ions it comes in contact with, and so it will want to strip these ions away from its host.

For the purposes of this article, pure water is defined as having a conductivity of between 0.055 to 10 µS/cm, or 18.2 to 0.1 megohms-cm. Common manufacturer specifications for pH sensors can indicate a conductivity range of 10 µS/cm or greater.

Herein lies the first hurdle to best measurement practices: to find pH sensors that are specifically designed to measure water with conductivity less than 10 µS/cm. Fortunately, some pH sensors may be able to measure down to 0.1 µS/cm, but these are specialized instruments

and must be specified, installed and maintained accordingly.

There is a deficiency of ions in pure water, and pH sensors have the reputation of being noisy when measuring pH in these low ionic strength solutions. In simple terms, the signal is noisy because the sensor is looking for ions to capture and measure and has a hard time finding them, causing the measured value to meander up and down the pH scale.

Using two or more brand new pH sensors from the same manufacturer — even right after being freshly calibrated in 7 and 4 pH buffers — the sensors may show differing values due to static charges and reference junction potential errors. Pure water is a poor conductor of electricity, and so static charges are an issue as water flows through the piping systems, requiring extra care in proper grounding for signal stability and noise rejection.

Also, extraneous EMI and RFI interference can disturb the sensor's electrical circuitry, especially in a power plant where high-voltage equipment is present. Walkie-talkie transmissions and electric motors or valves being cycled on and off can also create electrical noise. These interferences can result in signal spikes that push the pH signal high or low for brief moments, or can freeze the signal in place.

pH sensors use a two-electrode scheme as the measurement apparatus — an active or measuring electrode and a reference electrode. The active electrode can have an input impedance of 100 megohms in high ionic strength solutions such as a pH 7 buffer. So in the best of circumstances, pH measurement has at least a 100 megohm obstacle to overcome. If that same impedance is added to the very low ionic strength of ultrapure water, it adds measurement complexity as there is now a larger resistance for the signal to traverse through the low ionic solution.

The reference junction serves as the return or ground path for the pH measurement. Any shifting of the electrical resistance in the reference path will change the overall resistance of the measurement and cause a shift in pH reading. This equates to a noisy signal. A charge buildup at the reference junction can change as the process changes (e.g., when valves or pumps are cycled), or remain at a constant state and attenuate the pH signal.

Should any air be introduced into the piping system of the pH sensor, this will add CO_2 into the solution, which tends to acidify the actual pH value. Therefore, closed loop systems are needed for a constant and uniform measurement.

Consider the practice of taking a grab sample from a closed loop system for pH analysis. When one walks the sample back to the chemistry lab for analysis, what happens to the sample as it is exposed to the atmosphere? It likely changes, sometimes substantially, leading to a preference for in situ sensors.

Changes in the flow rate past a sensor can also lead to changes in the pH measurement. These changes are referred to as streaming current potentials. Changes in process flows cause changes in the reference junction potential and lessen the ability of the glass electrode to maintain its hydrated outer gel layer.

Problems can occur in pH sensor cable connections, terminal strips and plugs. Connectors can become loose, corroded or have moisture accumulate across the connections. These situations lead to changes in the resistance of the pH measurement and degradation of the signal.

Long runs of cables without the aid of preamplification or signal conversion from analog to digital can lead to changes in the capacitance and resistance of the cable, which can affect the pH readings. Signal cables are also a means by which EMI and RFI can gain access to the transmitter circuitry, also causing measurement errors.

Table 1 provides some best practices for installing and maintaining pH sensors.

Inside pH Sensors

There are pH sensors available from many manufacturers designed specifically for measuring pH in low ionic fluids of 10 µS/cm or less. The use of low resistance glass and double and triple reference junctions

Table 1 Best Practices

- Make the pH measurement in a sealed piping system
- Maintain a slow continuous flow rate past the pH sensor, about 100 mL/min
- Use conductive piping and fittings, 316 SS is common practice
- Keep cable runs as short as possible
- Maintain tight, dry and corrosion-free electrical sensor connections
- Store unused pH sensors in a solution to maintain hydration—4 or 7 pH buffer
- Use digital pH sensors instead of analog

as well as flowing reference junctions are employed with high degrees of success. Ceramic junction materials tend to have less "memory" and facilitate fast response times.

pH sensors using a flowing junction reference system (Figure 1) tend to be more accurate as they minimize junction potentials, but they also require more maintenance. These types of systems use a reservoir of potassium chloride (KCl) solution pumped through the sensor's reference element, and use either gravity or compressed air to maintain a constant overpressure as compared to the process being measured.

Process fluid will eventually find its way through the junction and into the filling solution of the reference electrode. When this happens, it dilutes the KCl inhabiting this physical space. This dilution of the KCl will eventually lead to a change in the reference chemistry and to measurement inaccuracies. Flowing reference style sensors deliver a fresh KCl solution through the junction and provide a constant non-changing electrical reference path. These sensors also deliver a pH reading much faster than traditional sealed reference electrodes.

Sealed reference type pH sensors employ salt rings or circular pinhead type reference junctions. Salt ring type junctions may employ gelled KCl solutions to maximize the junction surface area and keep KCl flow at an optimum rate. Some of these sensors styles may also employ an internally charged or pressurized reference. As these sensor types are considered closed systems they have no reservoir to maintain, and the entire sensor is replaced as its reference becomes contaminated, or as the solution within the reference gets depleted or becomes unusable.

Temperature compensation of the pH signal is very important to making accurate pH measurements of ultra-pure water (Figure 2). An entire paper discussing this subject could be written but is not within the scope of this article. As temperature changes, so does the pH sensor's millivolt output. Specifically, the electrode produces more millivolts/pH as the temperature increases, and as the pH goes farther in either direction from 7 pH. This change is predictable and linear, and can be compensated for in the pH analyzer by using the Nernst equation in the circuit design.

The Nernst equation (Figure 3) is a general mathematical equation that describes and predicts the pH electrode's output based on a number of factors, all of which are constant, with just one variable, temperature.

Modern pH measurement systems incorporating temperature compensated pH sensors are the norm. Any pH sensor that comes without an integral temperature element or a transmitter that only accepts a manual or fixed temperature compensation network should be avoided. A fast acting/responding temperature element should be mounted in the bulb of the pH sensor for best results.

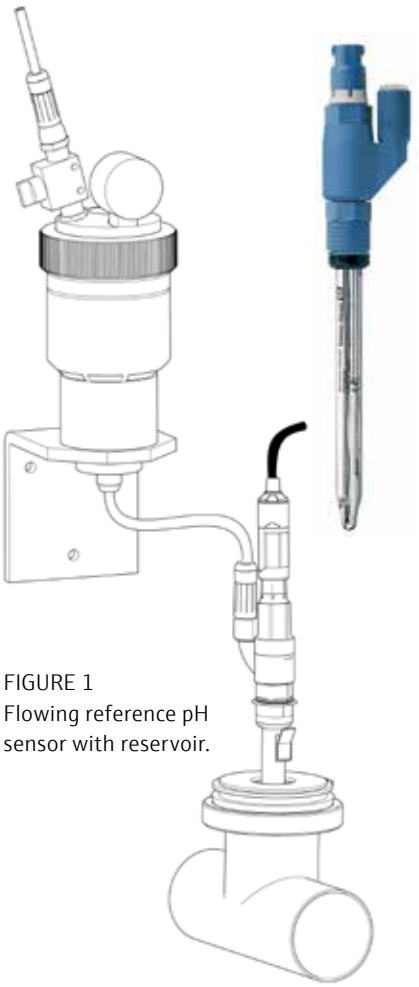


FIGURE 1
Flowing reference pH sensor with reservoir.

Electrical Considerations

Cables for pH sensors must be kept as short as possible, less than 10 feet if not using any type of preamplification or signal conversion. Furthermore, sensors should employ gold connections and O-ring sealed connectors, or use a digital inductively-coupled sensor-to-cable connection to avoid EMI/RFI intrusions and moisture/corrosion problems.

Endress+Hauser Memosens pH sensors (Figure 4) convert the pH signal from an analog to a digital value at the sensor, and send this digital signal up to 300 feet from the sensor to the transmitter. These digital pH sensors are available from several vendors, and most are not affected by moisture or contamination of connectors.

$$mV = 0.1985 [(°C + 273) \times (7 - pH)]$$

Temperature has no effect on the electrode at 7 pH

pH	mV (0° C)	mV (25° C)	mV (50° C)
0	379	414	449
1	325	355	385
2	271	296	321
3	217	237	256
4	163	177	192
5	108	118	128
6	54	59	64
7	0	0	0
8	-54	-59	-64
9	-108	-118	-128
10	-163	-177	-192
11	-217	-237	-256
12	-271	-296	-321
13	-325	-355	-385
14	-379	-414	-449

FIGURE 2 Temperature as it relates to pH.

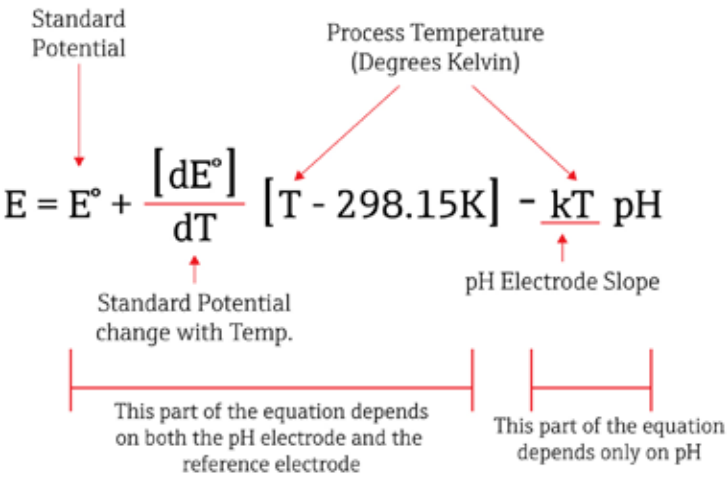


FIGURE 3 Nernst equation showing breakout of potentials and slope.

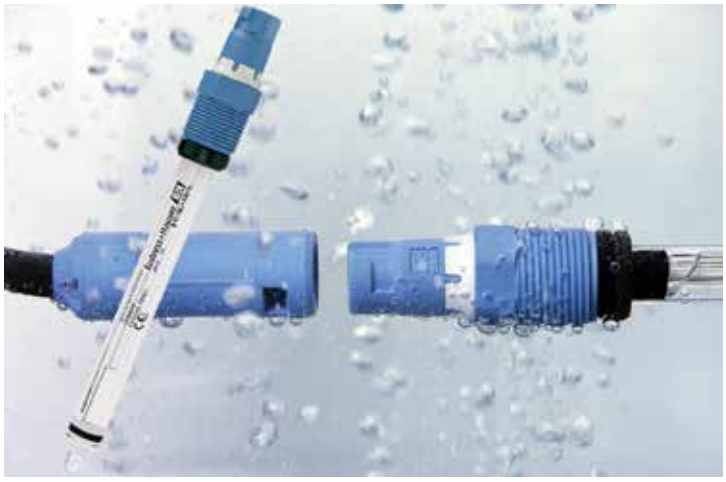


FIGURE 4 Memosens pH sensors convert the pH signal to digital and transfer it inductively to the transmitter, eliminating common cabling problems.

When using analog-type pH sensors, a common problem may develop called a ground loop. A ground loop is a difference in the ground potential that the pH sensor sees versus the ground potential of the pH transmitter. Ground loops can be a constant or varying offset of voltage to the pH reading (leading to an inaccurate pH value), or can be an on/off type signal that falsely increases or decreases the pH signal to the transmitter when an electrical device using the same ground is either turned on or off.

Ground loops can be hard to find and tougher still to eliminate, but the use of inductively-coupled digital pH sensors eliminates ground loop problems.

Calibration

Calibrations of pH sensors should be conducted on a regular basis. This can be done during a process shutdown, or by simply replacing the sensor with a calibrated unit.

The use of the proper buffer solutions are a must as calibrations need to be made in pH 7 and 4 buffers, never pH 10. Also, proper rinsing and drying of the sensor between buffer immersions are critical for accuracy. It's also important to ensure the glassware and other equipment interfacing with the buffer and sensor are clean and free of contamination. Calibrations should be made in accordance with the manufacturer's recommendations, and proper care should be taken when cleaning the pH sensor.

If large step changes in buffer readings occur from the previous calibration, the sensor is suspect and has either been damaged or contaminated. Proper cleaning should be employed to get the calibration closer to the last values. Large shifts in calibration values are not normal in ultrapure water chemistries.

Digital pH sensors allow calibration in the laboratory or shop with either a separate transmitter, an alternate channel on a multi-channel instrument, or hardware/software that allows hardware to directly connect to a PC. With digital pH sensors, spare pre-calibrated sensors can be employed to rotate in and out of the process as needed.

Calibration in this manner allows for longer and more accurate aging of the sensors in the calibration buffers. Also, a technician is not under pressure to have calibrations done onsite while the system is down awaiting calibration

FIGURE 5
pH sensor installation in pre-fabricated panel.

completion and re-installation of the sensor. This scenario is not possible with analog-type pH sensors, yet another advantage of digital pH sensors.

Calibrated pH sensors not in use should be stored in a 7 pH buffer or 3 molar KCl solution. A pH sensor should not be allowed to go dry, either in the process or during storage. If left to become dehydrated, the glass electrode will show higher electrical impedance from the norm, and will react much slower to pH changes. It may take from a few minutes to hours or even days for the sensor to regain its original operational performance, if ever.

Repeated cycles of hydration and dehydration significantly shorten the pH sensor's useful life. The reference electrode is also affected by dehydration. If left dry, salt from the internal KCl fill solution will form salt crystals and cake the outer surface of the junction, and ultimately the junction may siphon out all its fill solution 2.

pH sensors should be pre-mounted and plumbed in stainless steel flow loops (Figure 5) easily accessible for service/maintenance, and where flow rates can be easily controlled.

Sensors send signals to pH transmitters, which present the information to the control system. The transmitter should be easy to use; for example, just a few keypad manipulations should be sufficient to perform calibrations without having to revert to the instruction manual each time a calibration is performed. The transmitter should also be capable of providing sensor diagnostics to alert the user to the sensor state, and deploy alarms or warnings should the sensor start to deviate from configured parameters.

Modern transmitters can have virtually any desired output from 4-20 mA to relay/alarm contacts to multiple digital communication outputs such as HART, Foundation Fieldbus, Profibus PA or EtherNet/IP. An integrated web server is a feature provided with many pH transmitters, allowing remote users to access the transmitter from any web browser.

Conclusion

Work with the manufacturer to select the best pH sensor for your specific application. If possible, look for the latest in technology for both the sensor style (junction and glass formulation), as well as the sensor's signal transmission methodology—i.e. analog vs. digital.

Usually, no two sensors within a single manufacturer's portfolio can realistically serve the same application. There can be big differences in sensor design/construction for a sensor that is used in 10 µS/cm service as compared to a sensor designed for 1.0 to 2.0 µS/cm service.

Make sure pH sensor cables and connectors are specified correctly for the distances involved and the environment in which they will be used, and keep them free of moisture and corrosion.

Pay attention to the materials used to mount the pH sensor and to the importance of stability in the flow rates past the sensor. Make sure the sensor is easily accessible for calibration and general maintenance. Make sure trained resources are available to maintain the pH sensors (cleaning and calibration) at the manufacturer's suggested intervals.

If these steps are followed, accurate and repeatable pH measurements can be made in ultrapure water, leading to improved operations, reduced maintenance and increased uptime.

REFERENCES

1. Osmonics, *Pure Water Handbook*, 2nd Edition, 1997, p 12.
2. Frederick J. Kohlmann, *Understanding pH in Practical Terms*, 2008, p 10.

Endress+Hauser Celebrates 25 years in Canada

For a quarter century, Endress+Hauser Canada Ltd. has been creating a legacy of product quality, service and customer success. The company marked its 25th anniversary in the Canadian market on July 3, 2015.

As the Canadian arm of one of the world's most successful family-owned industrial firms and a leader in measurement and automation equipment, Endress+Hauser Canada Ltd. was incorporated May 1, 1990. The new company opened for business two months later, with offices in Burlington, Ont. and Montreal.

"We had 13 employees on that first day," remembers Richard Lewandowski, general manager of Endress+Hauser Canada. "Our initial focus was on Ontario and Quebec markets, specifically on water and wastewater, food and beverage, and mining customers."

Today, the Canadian operation employs more than 150 people, with additional offices in Calgary and Edmonton. As well representative companies handle sales in Atlantic Canada, Northern Ontario, Manitoba, Saskatchewan and British Columbia. The company also extended its services into other industries such as oil and gas, and power.

"Initially, we provided our customers with measurement products, product repair and product field service," explains Mr. Lewandowski. "Today, we start working with customers at the engineering stage, assisting with selection of process measurement solutions, provide project management, start-up and commissioning services during the build phase and maintenance and calibration services during the operations phase.

"Also the measurement product offering has increased over the last 25 years to include flow, level, pressure, temperature and analytical. We are able to provide customers with a complete solution for their measurement and automation needs, not just a measuring device."

The growth and development of Endress+Hauser Canada reflects the story of its parent company in many ways. The Endress+Hauser Group, began in Germany in 1953 with the formal partnership of Swiss engineer Georg H. Endress and German banker Ludwig Hauser. One brought to the partnership an incredible technical understanding of level measurement technology. The other provided a careful, responsible approach to business development. Together, they created a corporate culture of reliable service and continual innovation that has served thousands of companies around the world. Today, the company specializes in automation processes for oil and gas, food and beverage, mining and metals, chemicals and life sciences industries, and more.

Mr. Lewandowski stresses the benefits of the company's strong corporate history: "Endress+Hauser remains a family-owned company that is focused only on process measurement and automation products, solutions and services. This enables the company to invest 10 per cent of annual sales in R&D to provide customers with the highest quality and innovation in products and services, supported by very knowledgeable employees."

As its services and offerings expanded in Canada, Endress+Hauser Canada's reputation grew stronger as an industry leader in a competitive marketplace. Endress+Hauser Canada has continually grown in existing industries and expanded into new ones with a customer-centred focus—working to understand a customer's business, helping them achieve their goals and providing unmatched customer service. "It's an approach that has kept customers coming back since the first days in Canada," says Mr. Lewandowski. "We are grateful to our customers for turning to Endress+Hauser Canada for assistance and for the opportunity to contribute to their success. In many ways, their success is our success as well."

While Endress+Hauser Canada looks back over its first 25 years of business in Canada, the company has positioned itself for a bright future. With industry-leading sales and technical service representatives established across the country, an ongoing commitment to product innovation and a deep-rooted desire to exceed customer expectations, Endress+Hauser Canada will set the industry standard in process automation for many, many years to come.

Products Spotlight

Cleanfit CPA875

Hygienic and sterile retractable assembly for pH, ORP, DO

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- Unique seal design ensures safe and sterile online sensor exchange and cleaning
- High-pressure operation with either manual or pneumatic actuation

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- Non-liquid verification and calibration for low range turbidity
- Direct pipe insertion design eliminates product loss
- Single sensor for all turbidity measuring ranges

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Compact, DIN rail mount multi-parameter transmitter system

- Easy plug-and-play setup, commissioning and maintenance with Memosens digital sensors
- Standardized Liquiline modules reduce spare parts and simplify operator training
- DIN rail mount design, 8 channel expandability with optional remote display

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- StronSens Insert for long-term reliability and vibration resistance
- Save time during calibration with the Quickneck release design
- Stainless Steel construction with IP69K Ingress protection for guaranteed performance on wash-down applications

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Memosens

Contactless, digital, innovative

- Inductive metal-free connection for increased signal stability with no corrosion or moisture influences
- Lab calibrations possible with in-sensor data storage (all sensors pre-calibrated at the factory)
- Sensor traceability with automated storage of process and sensor data

www.ca.endress.com/analysis

Smartec CLD18

Compact toroidal conductivity transmitter

- Specially designed for washdown and vibration applications (IP69K)
- Fast response reduces product loss and increases CIP efficiency
- Robust field proven hygienic design reduces unexpected downtime

www.ca.endress.com/CLD18

Prowirl 200

Vortex flowmeter

- HistoROM: secure automated device back up ensures high plant availability
- Heartbeat technology™: continuous self-diagnostics and device verification
- Wet steam alarm for safe and efficient operation of steam systems
- Life-time calibration eliminates errors caused by sensor drift

www.ca.endress.com/vortex

Proline Promag 400

Flowmeter

- HistoROM: secure automated device back-up ensures high plant availability
- Heartbeat Technology™: continuous self-diagnostics and device verification
- Built-in web server for fast and easy device configuration
- Certified corrosion protection for use underground or underwater without modifications

www.ca.endress.com/flow

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Issue 72

Contact

Endress+Hauser
Canada Ltd
1075 Sutton Drive
Burlington, ON L7L 5Z8
Tel: 905 681 9292
1 800 668 3199
Fax: 905 681 9444

Endress+Hauser
Canada Ltée
6800 Côte de Liesse
Suite 100
St-Laurent, QC H4T 2A7
Tél: 514 733 0254
Téléc.: 514 733 2924

Endress+Hauser
Canada Ltd
4th floor, 805 - 10th Avenue SW
Calgary, AB T2R 0B4
Tel: 403 777 2252
1 888 918 5049
Fax: 403 777 2253

Endress+Hauser
Canada Ltd
Edmonton, AB
Tel: 780 486 3222
1 888 918 5049
Fax: 780 486 3466

Vancouver, BC
Tel: 604 925 7600
Fax: 604 925 7601

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