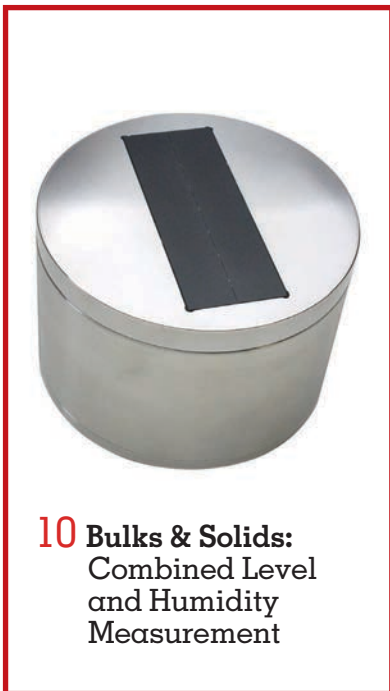


Enabling Accurate Measurement for Custody Transfer in the Hydrogen Industry

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and Humidity
Measurement

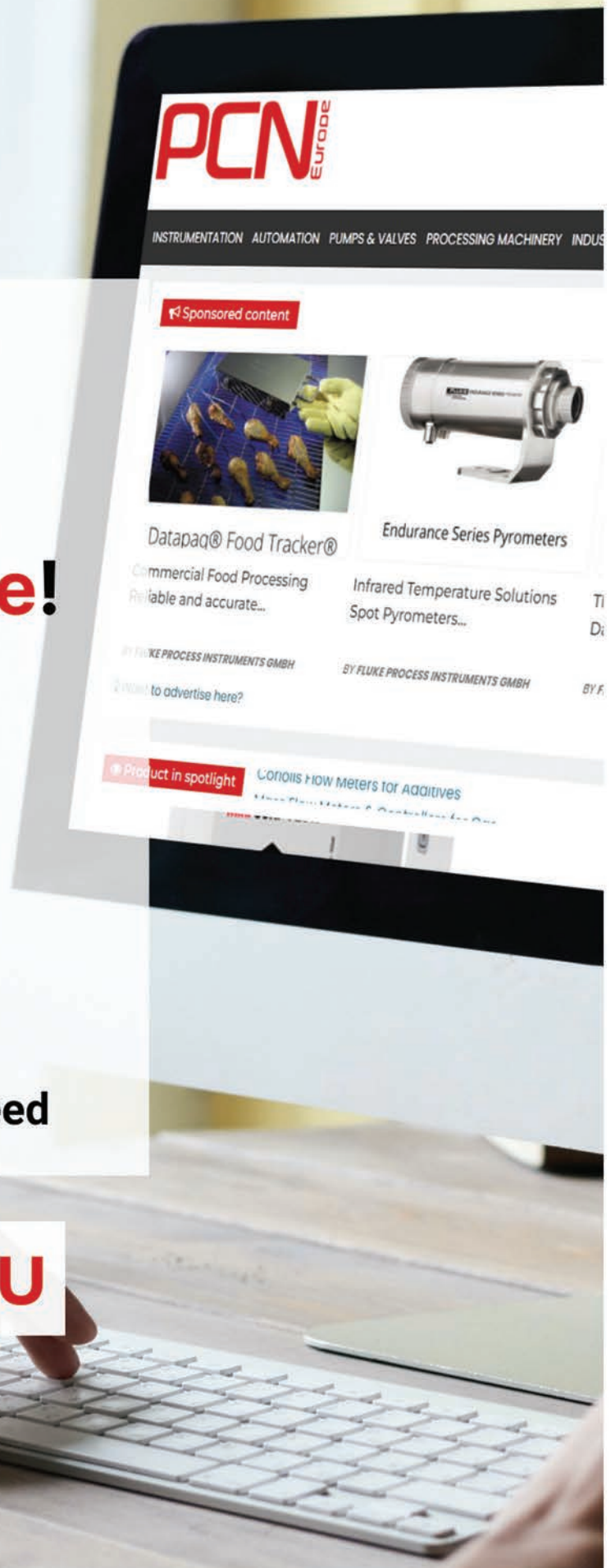
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Dear Reader,

End of August I was visiting ACHEMA in Frankfurt. I was able to see lot of interesting products and solutions and learn interesting things talking to exhibitors, just the old way, non-digital and face to face. But at the fair ground was also demonstrated, where we have to get better. Bright lights shining in areas where they were not needed, air conditioning to the maximum, so when you walked into some of the halls you felt like entering a fridge. From my point of view that example shows that there is a lot of work to be done on our path to efficiency, not only in industry.

In many cases, modularization and digitalization can be the answer for fine-tuning the processes and getting the raw data you need for it out of the processes. How this can work an interesting editorial on page 14 shows, where one of the big players in automation helps Heubach, a manufacturer of pigments and colour solutions, to lift data treasures in their production.

How improvements in measurement can help the editorials on page 8 and 24 show. The first one describes the needs of custody transfer of hydrogen, the second a new technology for a combined monitoring of filling level and moisture content of a product.

I wish you and interesting read.

Editor of PCN Europe



Kay Petermann
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ELECTRIC STEAM BOILER

22
Carbon-neutral steam generation for industrial
and commercial processes helps conserve resources,
reduce emissions and protect the environment.



LEWA Celebrates 70th Company Anniversary

A semi-basement room in Leonberg near Stuttgart, a motorcycle as the company vehicle and DM 3,000 as seed capital – this is how the success story of LEWA GmbH began. Founded in 1952 as an engineering office for water treatment, LEWA developed into a leading manufacturer of metering and process diaphragm pumps, as well as complete metering systems for process engineering within a few decades despite the difficult initial conditions. As an international group, the company now has 14 subsidiaries and 80 representatives worldwide. At present, the company's strategic focus is primarily on sustainable applications. "We see great growth potential here, both in transition technologies such as gas, and in the circular economy or renewable energies such as hydrogen and their storage options," explained Dr. Philipp Trunk, Senior Strategy Manager at LEWA. "The energy efficiency of our pump technology and greater digitalization and also remain concerns and challenges for us." As a group of companies, LEWA has been part of the Atlas Copco Group since March and to take advantage of the opportunities offered by the new markets, is further expanding its Leonberg site.



Mitsubishi Electric on the Board of German Water Partnership e.V.

German Water Partnership e.V. is the network of the internationally oriented German water sector and unites over 300 companies. The course for the future was set at its 18th General Assembly held in July 2022 in Berlin. Alexandra Ervenich, Corporate Account Manager Water at Mitsubishi Electric,



was one of the members elected to sit on the GWP board for the next four years (2022-2026). Due to the reorientation of climate policy, the German water industry is increasingly dealing with the problems of climate change, sustainability, digitalisation and the resulting need for innovation. Alexandra Ervenich: "Topics like reliability of supply, protection of resources and energy efficiency are currently the focus of our attention and are promoted by the GWP. In this, the latest digital technologies will make a significant contribution to climate and water protection." As a global player in the field of automation technology, Mitsubishi Electric has a long history of success in providing energy-efficient and sector-specific solutions for the water industry. In-house AI supports intelligent maintenance concepts, complex data analytics and process monitoring, thus making an important contribution to the achievement of climate targets.

Industrial-Scale Waste-Heat-2-Steam Project

BASF and MAN Energy Solutions have entered into a strategic partnership to pursue the construction of an industrial-scale heat pump at the BASF site in Ludwigshafen. This project is intended to make an important contribution to reducing greenhouse gas emissions, establishing the use of low-CO₂ technologies in chemical production and reducing the site's natural gas consumption. As a first step, the project partners are conducting a feasibility study that is expected to be completed by the end of 2022. The planned large-scale heat pump will enable production of steam using electricity from renewable energy, tapping waste heat from the cooling water system at BASF as a source of thermal energy. The residual heat in the water will be processed using compression to produce steam that will be fed into the site's steam network. By integrating the planned heat pump into the site's production infrastructure, up to 150 metric tons of steam can be produced per hour, equivalent to a thermal output of 120 megawatts. The project could reduce CO₂ emissions at the site by up to 390,000 metric tons per year. At the same time, it would make the cooling water system more efficient and less dependent on climate and weather conditions.



Rudolf Hausladen is the new CEO of the BEUMER Group

Effective 1st of June 2022, there was a change of leadership in the family-run company BEUMER Group, Germany. Rudolf Hausladen is the new CEO and succeeds Dr. Christoph Beumer, who has led BEUMER Group as CEO very successfully since 2000. Dr. Beumer will remain a member of the Management Board until the end of the year and then move to the Advisory Board. "We are very pleased that we were able to gain such an expert for this position," says Dr. Christoph Beumer. "With his hands-on style, he's an ideal match for our company and us." Rudolf Hausladen adds: "The BEUMER Group is a very modern, dynamic and innovative company. I can contribute all my strength and expertise here. I'm very much looking forward to my new role." Rudolf Hausladen (52) has a university degree in Mechanical Engineering as well as an MBA and has held management positions with well-known intralogistics providers, both nationally and internationally before. He has served on the Management Board of BEUMER Group since October 2020. BEUMER Group is an international leader in the manufacture of intralogistics systems for conveying, loading, palletising, packaging, sortation, and distribution. With 4,500 employees worldwide, BEUMER Group has annual sales of about EUR 960 million.



SMART ELECTRIC-PNEUMATIC POSITIONER

Support for control processes in modern plant automation



GEMÜ is expanding their range of positioners and process controllers by adding a controller with two-wire technology for the first time. Above all, this offers advantages when it comes to simplified wiring. The field device is supplied via the signal source and thus requires no further power supply. With the GEMÜ 1441 cPos-X, a passive analogue 4-20 mA feedback signal and digital input and output signals are

available. The positioner is suitable both for single acting and double acting pneumatic process valves with linear and quarter turn actuators. The integrated linear travel sensor has a length of 75 mm. Alternatively, an external mounting is available. The electrical connection can be made via M12 connectors or via cable entries with an inside terminal strip. The new positioner operates using a specially developed app. This is connected to the device via Bluetooth Low Energy. Following self-commissioning with the tried-and-tested SpeedAP function, the basic configuration of the controller can be individually and conveniently adapted to the specific control task. A status display that is also integrated into the positioner displays the most important information about the operating behaviour. The app is available free-of-charge for both iOS and Android operating systems from the respective app stores.

▶▶ 62649 at www.pcne.eu

IP67 ETHERCAT I/O SERIES

Decentralized acquisition of intrinsically safe signals



With the new EPX module series, **Beckhoff** now offers a compact option for Ex i signal acquisition from zones 0/20 and 1/21 as an addition to the wide range of EtherCAT Box modules. With robust IP67 protection, they enable direct

and decentralized installation in machines and systems, even in harsh environments. This results in numerous advantages in areas with explosion protection requirements, both in processing plants and in discrete manufacturing applications. As a robust alternative to IP20 solutions with their elaborate housing protections, the EPX with IP67 protection rating enable reliable data collection, even in hazardous areas where no control cabinet or terminal box can or should be installed. Three modules with four or eight input channels are available. The EPX1058 is designed for direct connection of up to eight intrinsically safe NAMUR field devices and records their signals pursuant to IEC 60947-5-6. EPX3158 supplies a maximum of eight measuring transducers located in the field and transmits their analog 4...20 mA measuring signals, electrically isolated, to the automation device. Appropriate 2-wire and 3-wire sensors can be connected. EPX3184 for connection of up to four intrinsically safe HART-capable field devices provides information on the state of HART communication via LEDs and signals any errors there.

▶▶ 62570 at www.pcne.eu

PARTIAL STROKE TEST WITH HART 7

Improved safety and uptime in hazardous applications



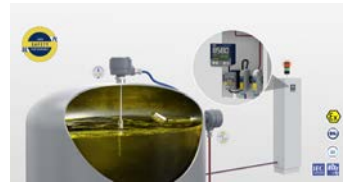
Emerson introduces the TopWorx™ DX PST with HART® 7. Units provide valuable valve data and diagnostic information, enabling the digital transformation of process applications. It integrates seamlessly with existing valves and control

systems, giving operators access to critical valve data, trends, and diagnostics that can be used to predict and schedule maintenance. The DX PST's partial stroke test ensures the system's reliable function without shutting down the process. A safety feature that confirms the valve will fully close and stop the process if an emergency is detected, and the test is activated by simply pressing the local PST button — no additional equipment is required. To prevent critical failure in upset conditions, the unit will override testing to perform an emergency shutdown (ESD). Certified for operation in harsh and hazardous applications, the adaptive DX PST is designed to ensure the integrity of valves, improving overall safety and facility uptime in oil and gas, refinery, chemical, industrial energy and mining applications. The HART® protocol, the specifications of which are owned by the FieldComm Group, builds another layer of information that ensures data, trends and diagnostics are monitored and tied into the Industrial Internet of Things. This information can be used to effectively predict and schedule maintenance.

▶▶ 62490 at www.pcne.eu

SAFETY-CRITICAL LEVEL MEASUREMENT

Highest standards in monitoring filling levels



Using the name JSP (JUMO Safety Performance), **JUMO** has already been bundling the company's expertise in the SIL (Safety Integrity Level) and PL (Performance Level) fields for

years. Now the JSP portfolio is being expanded to include another important measurand — it enables the reliable detection and measurement of process-critical point levels and filling levels for liquids. JUMO offers solutions for the measuring point up to SIL 2 according to IEC 61508. This is a system solution based on the products of the JUMO NESOS series that is available in various expansion stages to suit the customer's requirements. Flexible options are available including the SIL-qualified sensor with all required safety-related characteristic values, SIL-certified sensors, and the certified measuring point. Qualification and certification were carried out by an independent test facility so that a solid basis has been laid for safety-critical applications. The JSP complete solution in the "filling level" field can also reliably detect line faults, such as short circuits and cable breaks, ranging from the sensor to the actuator. Solutions can also be implemented in combination with applications in explosion-protected areas (intrinsically safe [Ex i] and flameproof enclosure [Ex d]). As a result, possible applications include the field of liquid gas and hydrogen, steam boilers, bioreactors, or solvent purification plants.

▶▶ 62632 at www.pcne.eu



IO-LINK CONDITION MONITORING SENSOR

For continuous humidity and temperature recording



Turck's CMTH combined humidity and temperature sensor is now available in a compact variant with improved IIoT integration for smart condition monitoring applications. With a length of only 57 mm and an operating temperature range from -40 to +100 °C, the IP67 sensor in an M12 housing can even be used in challenging environments. The interface provided also supports easy integration: The standard IO-Link Smart Sensor Profile (version 4.1.2.) with 64 bits on two channels simplifies the vendor-neutral configuration of networked systems. The CMTH is particularly suitable for monitoring the climatic conditions in production and warehouse buildings for all sectors handling goods that are sensitive to humidity and temperature. In simple I/O mode (SIO) the sensor outputs a switching signal for temperature and one for humidity. This mode is particularly suitable for retrofitting climatic data in existing applications where digital interfaces like IO-Link are rarely available. IO-Link mode offers benefits in modern plants or machines as the CMTH smart sensor can not only output continuous process values but can for example also calculate the local dew point. Users requiring long-term analyses will appreciate the pre-configured histogram function.

▶▶ 62619 at www.pcne.eu

SENSOR FOR PH AND ORP MEASUREMENT

For demanding monitoring and control applications



With the SE555X/°-AMSN sensor, Knick presents a solution for the combined measurement of pH and ORP in demanding applications. Bringing pH and ORP measurements together in a

single sensor provides the user with greater flexibility. At the same time, the sensor requires little maintenance and is also suitable for inline measurements in tough environments. The SE555X/°-AMSN unites Knick's SE555 pH and SE565 ORP sensors in one measurement sequence. The combination saves space in the production environment and also reduces the amount of additional equipment required. The combined pH and ORP sensor is based on the SE555 pH sensor, in which an additional platinum disk embedded in the side of the glass shaft enables measurement of ORP. ORP sensors are used to detect the presence of redox-active reactants. Platinum is recommended as an electrode material for this purpose, since precious metals do not interfere with the redox process themselves and platinum is also strongly resistant to aggressive media. The SE555X/°-AMSN was developed for the demanding requirements in the chemical industry, the food sector, and for hygienic applications. This results in a wide range of potential applications. The sensor can be used as required - the user can use both the pH and the ORP values for process monitoring and control, or just one of these measuring parameters can be used for this purpose.

▶▶ 62662 at www.pcne.eu



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OPC UA-BASED DATA EXCHANGE SOLUTION

For management of complex IT/OT system architectures



Data exchange plays a particularly important role in the integration of production and management levels up to edge and cloud applications. Already with a small number of servers and clients, the architecture becomes very complex. With the new edgeAggregator, Softing provides a central data integration layer that reduces complexity while addressing the large number of variables as well as managing access rights and special security requirements. The edgeAggregator has three key functions: As an OPC UA aggregation server, it handles the aggregation of up to 100 OPC UA servers and supports up to 25 OPC UA server endpoints. As an IIoT cloud gateway, it handles bidirectional data transmission with cloud applications via MQTT Publisher/Subscriber functionality. As Security Supervisor, it is responsible for the central management of the security parameters of the OPC UA and MQTT connections, such as users and certificates, and acts as an "OPC UA Firewall" for protection against attacks. As a Docker container, edgeAggregator can be easily configured and deployed as an edge solution or with central cloud platforms. The interface abstraction of edgeAggregator allows continuous adaptation and scaling of IIoT solutions based on OPC UA and MQTT throughout the entire lifecycle. Users thus gain a high degree of flexibility while significantly reducing integration and configuration costs.

▶▶ 62692 at www.pcne.eu

VERSATILE MASS FLOW CONTROLLERS

Covering a wide flow range with high precision



Sensirion is expanding its product range with two additional mass flow controllers from the successful SFC5500 series and four new mass flow meters in the SFM5500 series. The new mass flow controllers and meters are ideally suited for analytical, medical and industrial applications. The high-performance mass flow controllers and meters are

calibrated for multiple gases and come with push-in fittings, which can be easily swapped out by the user from the list of compatible parts. Thanks to the ultra-wide range, each device can cover several of the flow ranges found in conventional devices. The versatile SFC5500 mass flow controller is now available in ranges from 50 sccm to 200 slm. In addition, a new mass flow meter series - the SFM5500 - is being launched; it is a valveless sibling of the SFC5500, featuring the same excellent performance. These pressure-resistant mass flow meters are now available in the following four flow ranges: 50 sccm, 0.5 slm, 2 slm and 10 slm. The SFC5500/SFM5500 series sensor is based on the microthermal measurement principle and makes use of Sensirion's proven CMOSens® MEMS Technology. This allows us to build radical mass flow controllers and meters with high performance and excellent reliability, which do not drift and do not require in-service re-calibration.

▶▶ 62600 at www.pcne.eu

Enabling Accurate Measurement for Custody Transfer in the Hydrogen Industry

The decarbonization of energy systems has seen greater interest in the production, distribution and use of hydrogen. To ensure it can become a viable business, custody transfer for hydrogen is essential and this is now being made possible using the latest generation of measurement technologies, as Ricardo Mendes, Global Product Line Manager, ABB explains.

Although traditionally associated with the oil and gas industry, custody transfer of hydrogen is now becoming increasingly common as this alternative energy source becomes a viable substitute for a wide range of energy sectors, including natural gas. Hydrogen custody transfer presents its own unique challenges that must be addressed. A hydrogen economy can only grow if we ensure that transferring ownership of hydrogen can be done safely, effectively and with a high degree of accuracy. As a new industry, hydrogen is well placed to embrace new technologies and ensure custody transfer procedures are based on best practices from the start.

Hydrogen's flexibility makes it a very attractive option as both an energy source and as a feedstock in the chemicals industry. Able to be combusted producing water as its main residue, hydrogen also wins because it can be produced through electrolysis processes



Building a true hydrogen economy will require the development of infrastructure and processes designed to transport, store, and trade hydrogen as a resource. This means that achieving accurate process measurement is crucial for custody transfer purposes.



It is vital to ensure that measurements are as accurate as possible, as even a small error could potentially have a huge financial impact.

using green renewable electricity, producing little or no carbon emissions. With more renewable energy sources such as wind and solar coming on stream, the more opportunities there are to both reduce emissions and create a green hydrogen economy, helping to further accelerate efforts to decarbonize society.

HUGE CROSS-SECTOR POTENTIAL

As well as its use as a clean combustion fuel, hydrogen can also be used in a wide range of industrial processes, such as metal production, the manufacture of semiconductors and fuel cells, and many others. Hydrogen is also making inroads into transport, being increasingly seen as a viable, more ecofriendly

alternative for road vehicles, as well as for shipping and even for aircraft propulsion. Blending it with natural gas in existing distribution networks is considered a possible first step to contribute to the decarbonization of natural gas systems.

Building a true hydrogen economy will require the development of infrastructure and processes designed to transport, store, and trade hydrogen as a resource. This means that achieving accurate process measurement is crucial for custody transfer purposes. The challenge is that precision can be hard to maintain when measurement devices are operating in harsh field conditions. Even mi-



nor errors in readings can accumulate into a major error over time, running the risk that people lose confidence in the entire custody transfer process. For a growing industry like hydrogen, this risk must be avoided.

THE FUNDAMENTAL CHALLENGES OF HANDLING HYDROGEN

Hydrogen's physical form presents challenges in both storage and measurement. It is usable in the gas or liquid states and its low density means it is often pressurized for storage. Its low density compared to natural gas also requires metering to be both highly accurate and able to handle high flow rates. With hydrogen being nature's smallest molecule, storage vessels are highly prone to leakage. As hydrogen is odorless and a very light gas, these can be difficult to detect. For these reasons, accurate measurements of hydrogen using traditional technologies poses a major challenge.

To make the adoption of hydrogen a success, there must be regulations in force that ensure standardization across countries and markets. With different regulations in play in different jurisdictions, custody transfer across borders can be a particular challenge. Yet it is one that must be solved, as collaboration between countries, regions and organizations is vital to allow the hydrogen industry to develop and thrive.

COMPLEXITY OF CUSTODY TRANSFER ARRANGEMENTS

The problem here is that "normal conditions" rarely occur, as for custody transfer purposes, hydrogen is often mixed with other gases. Adding nitrogen or natural gas adds more complexity. This means that, as well as using the calculations set out in the standard, operators also need to understand what is happening inside the pipe to gain a "true" picture of hydrogen quantities.

It is vital to ensure that measurements are as accurate as possible, as even a small error could potentially have a huge financial impact. This means that investing in advanced measurement equipment now will reduce the error rate as time goes on. It is also critical that customers have confidence in the measurement system. Inaccurate reports can have potentially significant effects on the market, influencing commodity prices.

A wide range of factors can lead to measurement errors. These include human error,



equipment that has been incorrectly calibrated, measurement equipment that is faulty or of inappropriate design, flow computers with incorrect algorithms, and drifting analog inputs. Other sources of error can include inadequate maintenance procedures or infrequent or intermittent maintenance intervention. Just one instance of an error can negatively impact and create inaccuracy to the entire custody transfer system, so it is critical to ensure that measurement is as accurate as it can be.

NEW AND EMERGING HYDROGEN MEASUREMENT TECHNOLOGIES

One method is to use a process gas chromatograph such as ABB's PGC1000 to measure the amount of hydrogen gas present in a measured gas flow. Using hydrogen produced from low carbon energy sources can help to significantly reduce greenhouse gas emissions. When measuring for the presence of hydrogen, it is important to use a device that can account for variations in compositions and concentrations that can occur due to specific design conditions and individual country authority regulations.

While research suggests that a concentration of up to 10 percent (potentially up to 20%) of hydrogen can be safely added to the grid and does not imply a major upgrade of the existing infrastructure, it can affect the accuracy of conventional gas meters due to the

reduced energy content of the natural gas stream. Consequently, for custody transfer applications, analyzers will need to be capable of measuring all components of the gas stream, including hydrogen, to be able to calculate the properties and parameters needed to meet gas sales requirements.

The ability of on-line process gas chromatographs like the PGC1000 to measure the full composition of natural gas streams enables them to provide a highly accurate measurement solution for custody transfer applications. The analyzer can accurately measure up to 20% hydrogen, together with a traditional C6+ natural gas analysis, with no need for a second carrier or additional analytical modules.

IN SUMMARY

Using hydrogen as the basis of a new, cleaner economy is gaining increasing interest across industry and society in general. If this hydrogen economy is to be a success, companies selling and exchanging hydrogen must be confident in the accuracy of the process measurement techniques used. Modern techniques, such as the measurement of hydrogen concentration in natural gas, will give the industry confidence that hydrogen can be transferred accurately, allowing us to build a viable hydrogen future.

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N° 9 - SEPTEMBER 2022

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The Right Dosage

Goods and products manufactured with industrial processes often contain water in various concentrations. To date, laboratory instruments have been the most common tools for measuring moisture. While the processes are highly precise, they also have disadvantages. Endress+Hauser is enhancing an existing level measurement technology so that it's also capable of determining material characteristics, radar-based sensors supply real-time information regarding material moisture.

There are numerous reasons for using moisture measurement instruments. Because the water content in products can be a decisive factor for product quality and process reliability, it's important to draw conclusions regarding moisture in the materials. This can range from extremely small amounts of water in dry products in the food industry to very high levels such as in drilling mud in the mining industry. In other words, it all boils down to the exact dosage of water in the process. Think of it in terms of baking a cake. The success of a recipe rides on adding the precise amount of each ingredient. Laboratory instruments are typically employed for drawing conclusions regarding water content. To do that, dry and wet samples are weighed and compared. The results can then be used to draw conclusions about the water

content. Although this method is precise and simple to use, it has several disadvantages. One of these is that the process sample is merely a representative snapshot. Drying can take from 30 minutes to 24 hours depending on the moisture content and the quantity and type of the sample. Meanwhile, the process continues to run and by the time the measurement result is available, it's already outdated. In addition, manual sampling is laborious and costly.



The Solitrend family of products comprises several versions. In this picture is the MMP40 for measuring moisture in conductive bulk solids and slurry.

SUBSTITUTE FOR TIME-CONSUMING RANDOM SAMPLING

With the Solitrend family of products, Endress+Hauser has created a solution for continuous, process-based moisture measurements. The sensors, which are based on TDR technology, precisely determine the water content in bulk solids based on the runtime of a radar impulse across a ceramic measurement cell, using the physical effect of the increasing dielectric constant as it relates to increased water content.

The moisture sensors are installed directly in the bulk solid stream with the help of a bracket to ensure fast and reliable measurements. In the primaries industry, for example, material is often conveyed out in the open. In these environments, sensors are mounted directly under silo hatches, under the conveyer heads, where they can measure in free fall or from above where they are installed on the conveyers. This ensures that the sensor has a proper flow around it and can maintain direct contact with the material. The measurement values can be read out with an optional display or a control system (SPS). It's also possible to enter threshold values into the control system and trigger alarms when they are



The water content in products can be critical for product quality and process reliability.





Solitrend ensures fast and reliable measurement of moisture directly in bulk solid flows.

reached. This allows the water dosage to be controlled during the process.

MINIMAL WEAR, NO CALIBRATION

Compared to other measurement methods, TDR enables a high degree of accuracy and

deep penetration of the material, and it is not impacted by the grain size or contaminants. Thanks to their robust construction and the use of high-quality materials, the sensors are characterized by resistance to wear and thus a long service life. To measure highly abra-

sive materials, such as coarse bulk solids, a hard metal version is available. The high-temperature version of the sensor is suitable for process temperatures of up to 120 degrees Celsius and can thus be employed directly behind the dryer. Because calibration curves for a variety of aggregate materials (sand, gravel, crushed stone) are delivered with the sensor, commissioning of the instrument is straightforward. Once the instrument has been initially commissioned, regular recalibration in production is not necessary.

FLEXIBLE AND RELIABLE USE FOR ANY APPLICATION

Solitrend sensors are available in different versions for various bulk densities, including low density (animal feed, grains, plastic granulate), very low density and low water content (sawdust, pellets) or even conductive bulk goods and slurry (fresh cement, sewage sludge). All versions feature simple installation and operation, even in demanding applications, plus an integrated transmitter for streamlined plant integration. Solitrend instruments eliminate the need for manual sampling and laboratory analysis, thus allowing plant operators to optimize process costs, improve product quality and reduce energy needs.

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THE TDR MEASUREMENT PRINCIPLE

Guided radar (TDR measurement principle) propagates at nearly the speed of light. The sensor measures layer for layer in the form of slices, perpendicular to the surface of the sensor, similar to how computer tomography works. That means the sensor has a precisely defined measurement field and can perform error-free measurements, even when there are fluctuating fines or varying grain sizes.

Since the measurement is traverse to the surface of the sensor, the mechanical condition of the sensor surface is not a disturbance variable. That means recurring and unavoidable wear of the sensor does not lead to falsification of the measurement value. The defined measurement field furthermore enables precise measurements with applications in which the material coverage is low or fluctuates. This provides a high degree of flexibility in mechanically integrating the sensor into the application.



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Enable a direct connection to the IT world with OPC UA integration/information modeling making data sharing seamless

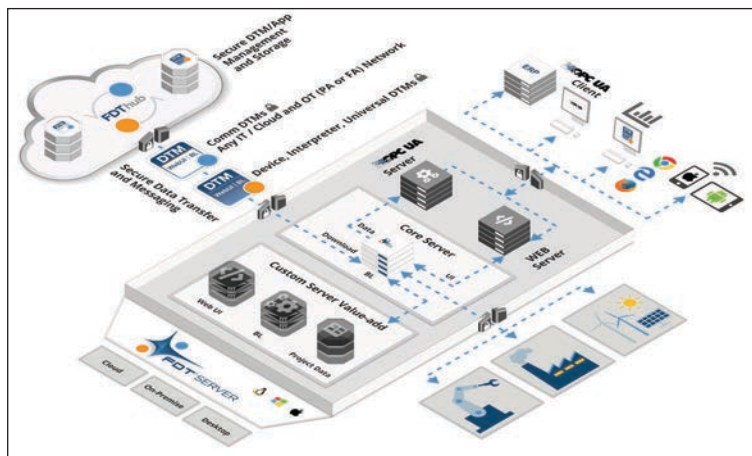
FDT Group's IEC 62543 field-to-cloud integration standard has a well-established, global installed base in the user community. Companies recognize the business benefits and specify FDT-enabled devices (DTMs) and systems (hosts) to provide a single, consistent and easy-to-use method for the design, configuration, and management of any device, across any hierarchy of networks. The embedded nature of FDT allows

users the freedom to choose devices that best fit their control applications. The industry takes for granted the true openness FDT enables, as there are millions of FDT 1.2/2.x device DTM's in field operation today.

Although FDT Group has existed for 20-plus years, we find the organization at a transition point that matches the industry's transformation to end-to-end data-rich device intelligence and communication enabling IIoT applications.

In 2020, FDT Group launched the FDT 3.0 specification and developer tools simplifying migration to service-oriented device management solutions that take full advantage of FDT's foundational features at the request of the end-user community. With complete interoperability and device management that is now standardized based on NAMUR (NE107), the FDT 3.0 standard enables a direct connection to the IT world with OPC UA integration/information modeling making data sharing seamless.

With a great deal of collaborative support from



other standards organizations and subject-matter experts that poured manhours into creating FDT 3.0, the FDT Group now offers the only standardized integration and data management solution making IT/OT convergence a reality out of the box. This is possible because of the main components of the spec; an enhanced device DTM which now includes a WebUI with separate business logic, an FDT Server creating an IIoT data hub with distributed control, and the FDT Hub providing a single point of access to all certified DTMs – no more searching through websites for device drivers. The new standard creates a unified environment offering a modernized approach to device integration, management, and monitoring of control system devices.

Although FDT 3.0 focuses on extending data interoperability and access, the platform inherently supports its base of FDT 1.2 and 2.0 DTM's. The hosting upgrade allows a simplified migration path for customers when they have the business need to take advantage of the new benefits that FDT 3.0 device DTM's can provide.

Users currently using an FDT-enabled desktop hosting environment can migrate to an FDT Server environment providing a seamless connection to their IT business unit with the inclusion of a native and pre-wired OPC UA server. This allows any authenticated ERP, MES, or higher-level system application access to the FDT 3.0 server IIoT data hub. This opens a new world of device data connectivity to the entire enterprise with a tight con-

nection to the IT infrastructure.

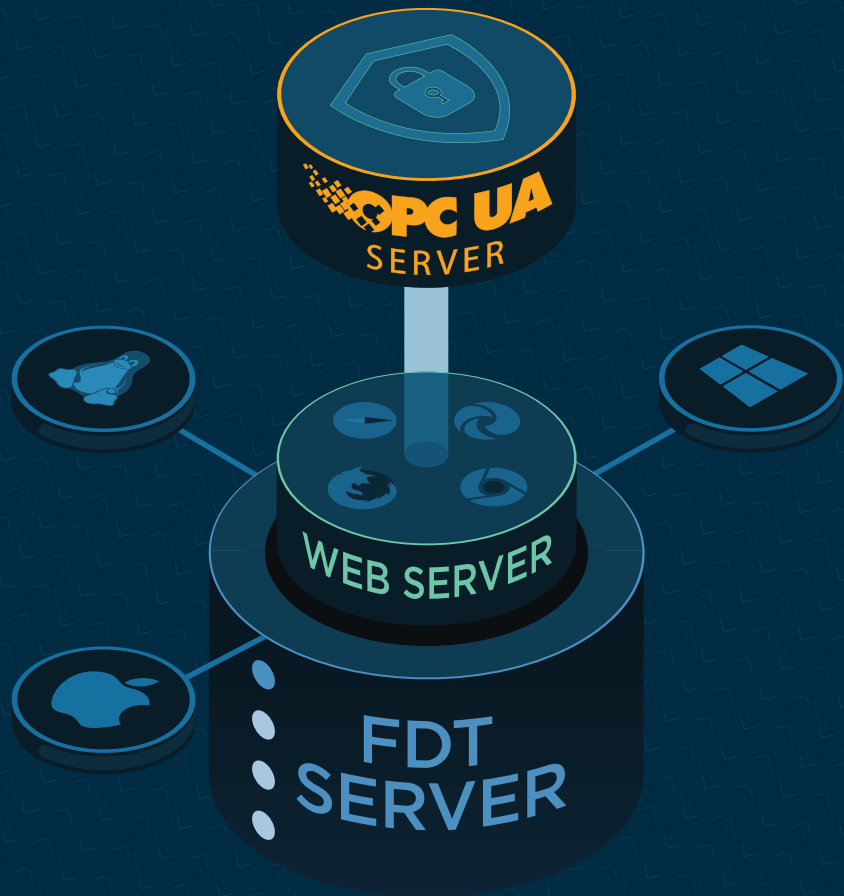
Although the FDT 3.0 spec is new and provides continued support for the current installed base of DTM's, the connection with OPC UA is a breakthrough for the industry. System vendors ready to answer the demands from end users can immediately embed the FDT Server in their asset management offerings allowing controllers and IT systems access to critical control device data – for configuration, control, and collection of data to be used in applications as asset management systems.

Many organizations are trying to create what FDT 3.0 can enable today – a seamless connection to devices for the reasons mentioned above. FDT 3.0 provides the Unified Environment you are familiar with, and it's here today. If you need IT/OT integration today, ask your vendors for FDT (3.0) UE!

*Steve Biegacki,
FDT Group Managing Director*

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FDT UE Makes IT/OT Data Integration a Reality—Today!

- Open Interoperable IIoT Architectures
- Secure, Scalable, and Adaptable Platforms
- Comprehensive Control and Configuration
- Standardized Universal Device Integration

fdtgroup.org/innovation



Artificial Intelligence Helps Lifting Data Treasures

Every day, sensors in production plants collect huge amounts of data. However, companies seldom realise how valuable the correct evaluation of large amounts of data is. This creates data graves whose potential remains undiscovered. The Heubach Group had a similar experience. However, with Festo AX artificial intelligence, it was proven that benefits for maintenance, engineering and productivity can be achieved from central PID data.

Heubach used to collect data from PID controllers in a central PIMS (production information management system) database. According to industry insiders, many chemical and pharmaceutical manufacturers accumulate such data, but it then usually remains unused on servers. Production data is often stored in condensed form – in the case of PID controllers with sampling rates of two seconds.

OPTIMISING LOCATIONS WORLDWIDE

Full-fledged controller optimisation is probably not possible with such data. Nevertheless, experts from Heubach and Festo wondered whether the centrally accessible data could be put to good use. After all, PIMS databases have an invaluable advantage: they contain the data of all controllers from different systems, different manufacturers and from all connected production sites. Michael Pelz, Automation & Digitisation Manager at Heubach, says "Our goal would be a central controller monitoring system. In order to achieve this, we would have to succeed in meaningfully evaluating the data in context and making it usable, thus creating a uniform instrument with which we can analyse the controllers of all connected locations worldwide." Based on the results obtained, controllers could then be specifically analysed and optimised, for example with optimisation software in the Scada system used and with experts on site. As part of the solution, it became apparent



The right coatings for a wide field of applications.

for Heubach to use the Festo Automation Experience (Festo AX) software. "It helps our customers to make decisions based on facts," emphasises digitalisation expert Eberhard Klotz from Festo. Festo AX is a flexible and easy-to-use solution that enables users to extract maximum value from machine and plant data through artificial intelligence (AI) and machine learning.

AI EVALUATES SOURCE DATA

In the first step, Festo AX's AI – as a pragmatic approach – evaluated several months of baseline data and cleaned it if necessary. Experts from Heubach's Maintenance, Process Engineering (Quality) and Operations Improvement Management departments accompanied this step and evaluated the

initial results from the historical offline data.

In the second step, the specialist departments reported back regarding the variable batch processes, which sensitivity should be possible for the controllers, depending on their physical functions. For example, it was assessed whether the temperature factor was less critical than the flow factor or the pressure factor. Subsequently, it was determined how the different error deviations should be prioritised. An additional trend line of the anomaly scores should also help the departments to identify

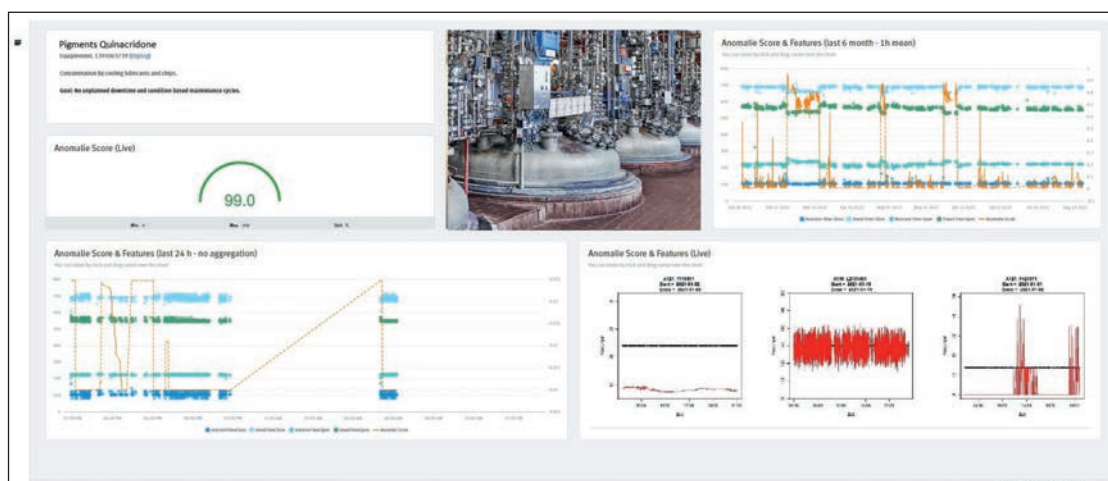
the deviations per batch accurately, early and, above all, easily.

This should make algorithms and error scores adaptable within the AI evaluation, taking into account the experience of experts and conditions on site. It was also important to implement a simple visualisation of the results, with the aim of being able to use aggregated dashboards in the future. In the third step, the project should be portable (on premise) and be able to lead to an online query including visualisation within existing systems, which greatly simplifies the implementation from a data security point of view.

OPTIMAL ADAPTATION OF THE ALGORITHM

"The results were already amazingly good after the first step of the AI analysis: it was





To gain insights from data you have to find the right approach to use it.

very easy to see which controllers, for example, exhibited a strong fluctuation in the manipulated variable and thus caused the actuators to wear out more quickly,” explains digitisation expert Pelz. In addition to many well-adjusted and inconspicuous controllers, the AI also found controllers that constantly failed to reach the setpoints, overshoot strongly, oscillated or were subject to manual intervention. With some controllers, however, the results were not always

immediately comprehensible due to the different areas of application. “In a close exchange between controller and data science experts, the AI algorithm could be adapted to other special features in (batch) production. For the pragmatic and quick exchange of results, only classic office tools were actually sufficient in this phase,” adds Pelz. Since we have different process control systems in use, a controller analysis was previously only ever possible at plant level and

with different tools. “But with this solution we have two outstanding advantages: Firstly, it is cross-manufacturer and can be used globally on a central system, so that we can use the algorithm for all systems and controllers. Secondly, the Festo solution is so flexible on the IT side that it can be used and further developed from a pragmatic of-line pilot project to an on-premise solution within our own IT systems to a cloud-based implementation,” says the Automation & Digitisation Manager from Heubach.



Taking a look into Heubach's pigment production.

MASTERING CURRENT AND FUTURE CHALLENGES MORE EFFECTIVELY THANKS TO AI

“Especially in the current times, it is important to be able to optimise production processes as effectively as possible in terms of energy consumption, quantity and quality and to monitor them in the long term. In the future, the central controller monitoring system can be an important building block here, especially in the context of the advancing optimisation of the CO₂ footprint in production,” says digitalisation expert Pelz.

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N° 9 - SEPTEMBER 2022

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Smart Box for Valve Management

Digital platform for intelligent valve management opens new opportunities for monitoring and documentation.

Industrial valves are analogue components that play an important role in many different system processes. EBRO ARMATUREN is adopting an innovative approach to the digitalisation of valves and, with its new module EBRO Smart Box Unit SBU IO-Link, offers extensive monitoring and documentation functions. The module can be integrated seamlessly into existing digital and analogue system and process controllers via IO-Link, Bluetooth or other standardised interfaces. The benefits for customers are obvious: they have an overview of the relevant parameters at all times, can record operating states digitally and thus detect problems at an early stage thanks to automation. This allows failures to be prevented and processes reliability increased.

MEETING CUSTOMER REQUIREMENTS

Even by itself, EBRO SBU IO-Link meets all the demands that customers from all manner of different industries place on the digital and automated monitoring of shut-off and check valves. When combined with EBRO valves, actuators and sensor systems, the result is a perfectly coordinated overall package that guarantees customers an extremely high level of operational safety by monitoring faults. However, EBRO SBU IO-Link offers much more than that: the IO-Link technology makes it easy to integrate into an existing network and installation follows the "plug and play" principle, meaning that control and feedback are especially straightforward to handle. EBRO SBU IO-Link boasts comprehensive documentation capabilities, enabling events to be followed up at any time. The features of the SBU

The EBRO Smart Box Unit SBU IO-Link boasts extensive monitoring and documentation functions.



IO-Link reduce the total cost of ownership significantly. The fact that system maintenance and repairs can be planned cuts direct costs and ensures shorter downtimes and fewer failures.

INTELLIGENT MONITORING MODULE WITH IO-LINK

The SBU IO-Link can be used both on manually operated valves (hand levers or worm gears) and on pneumatic actuators. Instead of just looking at a valve, the SBU IO-Link allows the operator to peek inside. It uses integrated sensors to record the valve's most important parameters, which can be documented and monitored continuously. This includes a reliable Hall sensor for monitoring the end position, whose own end position and sensitivity can be adjusted

electronically. Events such as pressure surges, system vibrations and faults can also be logged. Another integrated sensor checks the ambient and equipment temperature. The SBU IO-Link has eleven predefined messages at its disposal for signalling deviations from the preset values, ranging from equipment faults and equipment temperatures that are too low or too high through to opening times that are too long or too short, limits for switching cycle counters and the activation of the Bluetooth module. In combination with the "EBRO Connect" app, the Bluetooth interface provides access to detailed information on status monitoring and parameterisation even during operation.

Besides the integrated sensors, the electronic system also has two analogue and two digital process inputs, which the customer can use to connect various external sensors (e.g. fill level, flow rate, pressure) to the module and call up these values via IO-Link. This does away with the need for wiring and PLC signal inputs.

How the various operating states are signalled visually has also been optimised. For instance, the new SBU IO-Link comes with clearly visible LEDs on the top as well as



the familiar position indicator. Various operating states can be assigned to the colours of these LEDs. Meanwhile, the sturdy aluminium case, which meets the requirements of protection classes IP65/67/68, protects the electronics during transport, installation and operation.



The EBRO SBU IO-Link is supplied as a 100% turnkey solution, with no additional assembly or installation work required on site.



Besides the integrated sensors, the EBRO SBU IO-Link also has two analogue and two digital process inputs.

PLUG AND PLAY

The SBU IO-Link is supplied as a 100% turnkey solution, with no additional assembly or installation work required on site. Commissioning and configuration can be done by means of programming via IO-Link or via Bluetooth using the EBRO Connect app. Customised preconfigurations are also possible.

FUTURE-PROOF COMMUNICATION

The SBU IO-Link is IIoT-ready. It uses future-proof communication interfaces in the form of IO-Link, Bluetooth LE and secure data transfer via standard protocols. An IO-Link master enables data links to any number of higher-level field buses such as Profinet, EthernetIP, CAN and Devicenet, making it extremely easy to integrate the model into system and process controllers. Current values and analyses can be presented in chart form in the automation system with the

help of monitoring software, meaning that faults and deviations from default values can be spotted quickly.

COORDINATED OVERALL CONCEPT

With the SBU IO-Link, EBRO ARMATUREN is leading the way towards digitalising shut-off and control valves, including their actuation and management technology. Matthias Jortzik, Director of Valve Automation, says: "The EBRO SBU IO-Link is the first step towards digital valve management. It opens the door to comprehensive data logging right at the valve itself and allows data to be transferred to all kinds of different interfaces. The parameters that it captures will underpin all the other steps, such as process automation and valve diagnostics and analysis."

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A Step Towards Smart Oil Platforms

For smart devices, use in the oil industry, for example on an offshore oil platform, represents a real endurance test. The Pepperl+Fuchs brand ECOM Instruments subjected the Visor-Ex® 01, the first system consisting of smart glasses and smartphone certified for use in hazardous areas, to this endurance test during its development phase. The practical test reveals great potential for rollout in future applications.

Inhospitable environmental conditions, confined spaces and limited WLAN connectivity – the offshore oil and gas industry with its remote drilling rigs is not the easiest place for digitalization. The stringent requirements for hazardous areas further restrict the choice of smart devices that can be used. This is a reason why, up to now, the staff on oil platforms often works with pen and paper. For example, to provisionally document inspection results before manually transferring the data to digital files at a computer desk. For mobile workers, this practice is associated with traversing long distances along the multilevel oil platforms. So, there is great efficiency potential waiting to be tapped in the oil and gas industry, particularly in the area of knowledge management.

SMART DEVICES FOR EXTREME CONDITIONS

Another special feature of drilling rigs is that the hazardous areas can change depending on current conditions. So the highest level of protection is essential for the equipment used. Since crews on an oil platform should be kept to a minimum for safety, cost and time reasons, remote support solutions for maintenance and repair are becoming increasingly attractive. Currently, oil and gas industry is looking for suitable digitization solutions to ensure real-time knowledge transfer for employees and to accelerate the first-time fix. With up to 10,000 maintenance activities per month on the oil platform, streamlined processes are a significant factor to ensure efficiency.

That's why a company in the oil and gas value chain started its search for suitable smart devices to help digitize processes. In addition to remote support, the most important application scenarios included data harvesting, for example during inspections or for the upcoming general storage system overhaul. Potential devices had to meet a number of requirements in order to make it on the shortlist. Wearables were of interest because they allow hands-free work – this is essential, since mobile workers must be able to safely navigate long distances along steep staircases. Global certifications such as ATEX or IECEx are mandatory to enable safe use. In addition, the devices had to be comfortable to wear, i.e. not too heavy or bulky.

An obvious application scenario for the smart glasses Visor-Ex® 01 from ECOM Instruments is remote support during inspection and maintenance. (Image: ECOM Instruments)





VISOR-EX® 01 SMART GLASSES IN A PRACTICAL TEST

The company also subjected the explosion-proof Visor-Ex® 01 smart glasses from the Pepperl+Fuchs brand ECOM Instruments to an extensive practical test on a drilling rig. The lightweight wearable (180 g) combines high camera quality and reliable communication features in an ergonomic design. Coupled with the intrinsically safe smartphone ECOM Smart-Ex® 02 as computing unit with reliable LTE connectivity and a pocket device with replaceable battery for power supply, the smart glasses become part of an intelligent ecosystem. A total of three integrated and suitably positioned cameras transform the Visor-Ex® 01 smart glasses into a bionic eye, with the help of which remote support workers can observe the situation from a natural perspective and an unrestricted field of vision. All these features help to implement remote support scenarios without unnecessary complication, even under chal-

lenging environmental conditions. During the field test, the company was in close contact with the development team at ECOM Instruments, and the feedback contributed the smart glasses development.

EXPERIENCE AND FUTURE APPLICATION SCENARIOS

Visor-Ex® 01 was able to demonstrate its strengths during the field test, particularly in the area of data harvesting. With the help of cameras and image processing, QR codes from devices and machines can be read to gain access to sensor data such as pump pressure. This opens up a wide range of possible IoT application scenarios. But smart glasses are already scoring points because they improve the documentation of incidents not only quantitatively, but also qualitatively. Mobile workers can not only note down the causes of malfunctions, but also enrich the information with photos or video recordings. The digitized information can then also be

shared with external support experts or employees on other rigs or at the company's headquarters – for comprehensive, up-to-date knowledge management. They also don't have to rush from the scene back to the computer or decipher handwritten notes.

The freedom of movement and vision that mobile workers gain from using smart glasses proved to be one of the other advantages. Because their hands are free, employees can move safely and freely up and down the stairs of the multilevel rig while fully concentrating on their task. Furthermore, they can make all the configurations they need on the associated smartphone and use the smart glasses as an optional augmented reality layer. When not in use, users can conveniently fold the OLED display of the Visor-Ex® 01 out of their field of vision and gain an unobstructed view of analogue reality.

Overall, the testing company attests the Visor-Ex® 01's versatility and good usability, even at the prototype stage; the intuitive operation was particularly emphasized. In the short term, the most obvious use scenario for the smart glasses is remote support during inspection and maintenance.

The stable LTE connectivity of the ECOM devices facilitates communication with external experts. This point is particularly worth emphasizing, since WLAN cannot be relied upon in every area of a drilling rig. In the medium term, the augmented reality functions could also significantly facilitate the onboarding of new specialists on the drilling rig. During a tour of the most important areas, for example, the relevant information or efficient routes could be shown on the OLED display of the

Visor-Ex® 01 – or a connected expert could communicate via the integrated loudspeaker and describe what to look out for in certain areas. The ability to retrieve data quickly and easily from various sources (data harvesting) lays the foundation for sophisticated application scenarios for smart glasses.

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3D Format Parts for In-House Printing in Consistently High Quality

With PARTBOX, Schubert Additive Solutions, part of the German Schubert Group, had already created a digital platform from which customers could call up certified print jobs in their own production and produce 3D parts themselves using a standard filament printer. Now this process has become even more reliable and quality-driven, as the company has developed an entirely new 3D printer for its customers.

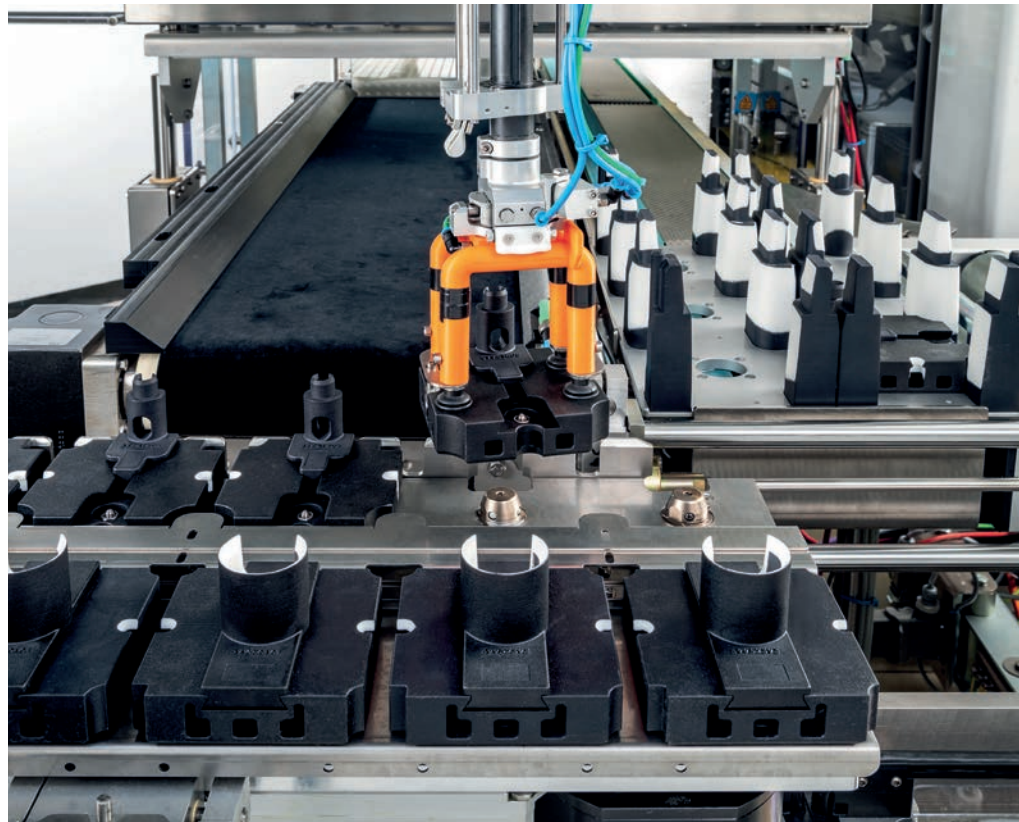
Printing 3D parts for the packaging process in-house offers manufacturers many advantages: ideally adapted robotic tools for all conceivable products, greatly reduced environmentally damaging and lengthy transport of new format parts, quick replacement in the event of defective tools and the possibility of simply producing new format sets for changed products themselves. "We believe that components should be produced when and where they are needed," explains Conrad Zanzinger, CTO at Schubert Additive Solutions. The objective is to ensure 3D printing of technical components at the customer's site in a reliable, safe and high-quality process. To implement this, the Schubert subsidiary decided to develop its own 3D printer to meet these requirements.

CONSISTENTLY HIGH PRINT QUALITY

It was important to the developers to design a very simple solution that could be used by anyone without much previous know-how. The new PARTBOX printer delivers consistently high print quality, which significantly improves process reliability within the packaging machines and therefore efficiency in the packaging process for customers. The print head is positioned precisely through the use of high-precision components such as a milled aluminium frame, ball screws and a unique guiding technique. Schubert ensures the exact dosage of the filament by means of an extruder with direct extrusion. A 'hood' over the unit eliminates environmental influences such as heat or dirt.

PERFECTLY MATCHED PLASTIC MATERIAL

Moreover, Schubert Additive Solutions sup-



plies the right printing material in the form of PARTBOX Black plastic. The difference versus commercially available filaments lies in a polyamide optimised for the FDM (Fused Deposition Modelling) printing process. The material is food-grade and detectable with a metal detector. PARTBOX Black also features excellent mechanical properties and high temperature resistance. This allows very smooth surfaces to be achieved in the printing process. Hardware, software and material are therefore perfectly aligned.

The new printer is easily connected to the Internet via the LTE standard. With its own streaming platform and printer, Schubert's PARTBOX is now a complete system that enables manufacturers to produce components directly in their own operations – with the fastest possible availability. The digital process saves customers processing, shipping and warehousing costs.

▶▶ 62431 at www.pcne.eu



IEC-ADAPTER SOLUTION FOR MIXERS

Higher reliability & lower maintenance for agitator drives



NORD has developed the SAFOMI-IEC adapter (SAFOMI = Sealless Adapter For Mixers) specifically for agitators. It has a compact and simple design, as well as an integrated oil expansion volume. Oil tanks and hoses as well as the radial shaft seal that is subject to leakage and wear between gear unit and IEC cylinder are not required. The SAFOMI-IEC adapter replaces a standard IEC adapter on the agitator drive, resulting in increased operational reliability

and reduced maintenance. Compared to the standard application, not only is the required oil volume lower, but the installation space is also reduced thanks to the absence of attached components. **NORD** offers the SAFOMI for MAXXDRIVE® parallel gear units in the sizes 7 to 11 and thus for maximum output torques from 25 to 75 kNm. The compact combination of SAFOMI-IEC adapter, MAXXDRIVE® industrial gear unit and a drive motor is the ideal choice for mixer and agitator applications and largely eliminates the need for wear-prone and attached components. They offer high output torques from 15 to 250 kNm and ensure smooth operation even under demanding operating conditions.

▶▶ 62634 at www.pcne.eu

COMPACT INDUSTRIAL MIXING SOLUTIONS

Reliable mixing processes for smaller batch sizes



In different industrie sectors customers rely on **Gericke's** expertise in the complex process step of mixing. With the new GMS Compact and the GBM Mini Batch Blender the technology can now also be used for smaller mixing volumes. The GMS Compact Mixer brings the superb mixing quality

of the GMS family to the laboratory, R&D and pilot plant batch sizes, with useable volumes from 1 to 20 l. It uses the same superimposed mixing tools as the bigger GMS mixers. This allows for accurate process and recipe development, but with its fully industrial design it can also be used for pre-mixes or other direct process related process steps. The GMS compact empties completely after a batch and is therefore the perfect choice for frequent recipe changes. The Gericke Mini Batch Blender is a semi-continuous inline approach to make continuous manufacturing suitable for low dosage, low volume, highly potent products. It combines advantages of the traditional batch and true continuous manufacturing processes to generate a simplified system. With minimal batch sizes below 1 kg and the simple control strategy related to a batch mixing process it combines many advantages of batch and continuous processes.

▶▶ 62484 at www.pcne.eu



FREE DIGITAL SUBSCRIPTION

ENERGY-SAVING MIXING FOR SOLIDS

Innovative shovel design supports efficiency in mixing



Lödige Process Technology will present at Powtech the High Efficiency Shovel (HES), a special shovel for mixing solids in horizontal Ploughshare mixers. It is designed to require less drive power than a standard shovel. The innovative shovel concept of the HES for short, immediately draws the eye. Unlike standard shovels, this in-house development by

Lödige has an opening in the shovel blade. This corresponds to 85 percent of the surface area. The advantage of this design: Depending on the product, it permits a reduction of the start-up torque by up to 20 percent and reduces the reactive power. This makes it possible to design a mixer with a lower motor rating. The unique efficiency of this shovel also becomes apparent in its Ploughshare mixer application: The design reduces torque by approximately ten percent to save even more energy. The HES is perfect for industries that process dry, free-flowing solids with small particle sizes. The shovel design combines high efficiency with the qualities of a standard Lödige shovel: The HES is just as easy to maintain and achieves a comparably high mixing quality.

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Electric Steam Boiler

Carbon-neutral steam generation for industrial and commercial processes

100 per cent electric and fully carbon neutral with green electricity: Bosch Industrial Boilers presents the new ELSB electric steam boiler for industrial and commercial steam generation, continuing to offer more green technologies which conserve resources, reduce emissions and protect the environment and climate.

With various outputs from 350 to 7500 kilograms of steam per hour, the ELSB electric steam boiler meets the range of demand for industrial and commercial steam processes. An important point is that operation is fully carbon-neutral when using renewable electricity – let's look at an example of a customer in Iceland: As a pilot project, the

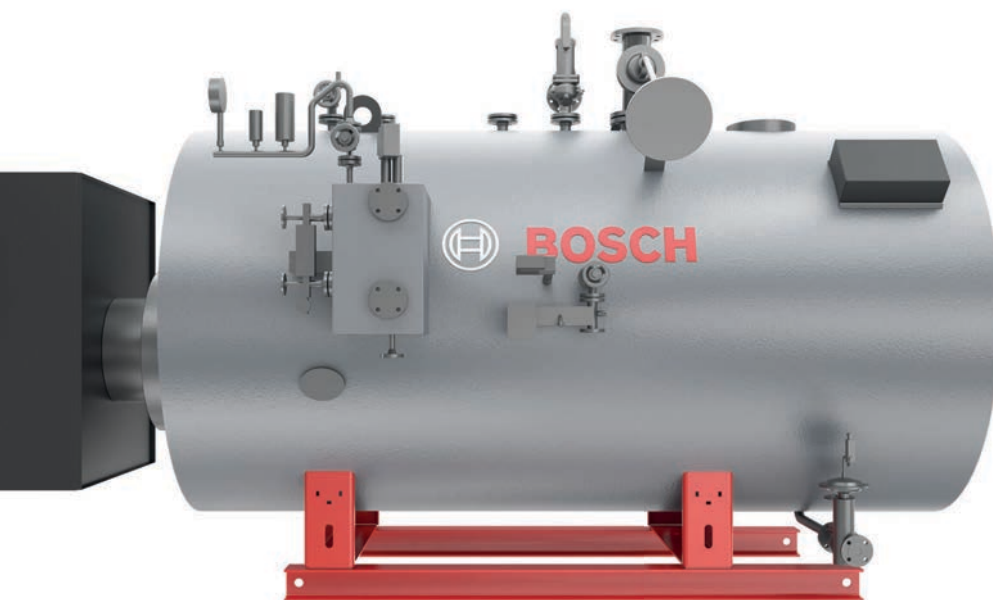
company, which produces sustainable packaging, operates a Bosch ELSB with a steam output of 4000 kilograms per hours. The electricity used is generated from renewable sources with water and wind energy, meaning the steam generation is particularly sustainable and resource-saving. Other ELSB pilot plants have been put into operation in the food industry, for example.

FLEXIBLE AND EFFICIENT STEAM GENERATION

With an over 99 per cent efficiency level, the electrical heating system in the ELSB steam boiler surpasses all combustion systems. Thanks to the infinitely variable out-

put regulation, the electric boiler has the advantage of achieving an extremely high level of flexibility across the entire load range. This ensures consistently high efficiency, as well as automatically adjusting output to suit requirements or available surplus in self-generated electricity. In addition to control systems configured in-house with software, Bosch manufactures a complete steam boiler system tailored to individual requirements, covering water treatment, condensate management and modules for saving energy. Since the ELSB is operated exclusively with electricity in accordance with the power-to-heat principle, there is no need for flue gas components, chimney or fuel supply infrastructure. This saves space and costs – and no flue gas emissions are generated on site. For service-side advice, commissioning and maintenance, operators can contact the team at Bosch Industrial Service.

Not using fossil fuels and reducing CO₂ make the electric steam boiler a solution fit for the future. In addition to the ELSB, Bosch also offers boiler systems for use of 100 per cent hydrogen, biofuels or hybrid solutions. Using a multi-technology approach, Bosch enables companies to model their steam and heat supply in a carbon-neutral way depending on infrastructure and individual requirements. Furthermore, it is also possible to convert existing systems to suit new requirements. This lays the foundations for a carbon-neutral future for industry, making an important contribution to the energy transition.



►► 62663 at www.pcne.eu



EXPLOSION-PROOF LASER SPECTROMETER

Simultaneous gas measurement for combustion control



Yokogawa announced an explosion-proof version of the TDLS8200 probe type tunable diode laser spectrometer as part of its OpreX™ Analyzer family. The TDLS 8200 features low installation cost, high measurement stability, and high reliability,

and is able to simultaneously and directly measure concentrations of two gas types (oxygen plus either carbon monoxide or methane) at high speed. Currently on offer are types that are capable of measuring temperatures up to 600°C and 850°C. Industries as oil & gas, petrochemical, iron and steel, and ceramics plants need to monitor the concentrations of oxygen and carbon monoxide or methane inside furnaces in order to control and thereby ensure an efficient, environmentally friendly, and safe combustion process. However, the use of digital devices in zones where combustible gases reach concentrations that result in the risk of an explosion is limited by regional laws and regulations as they have the potential to ignite such gases. The ex-proof TDLS8200 being released conforms to the IECEx explosion-proof standard of the International Electrotechnical Commission (IEC), the FM explosion-proof standards of the United States and Canada, and EU's ATEX explosion-proof directives, other regions will follow.

▶▶ 62675 at www.pcne.eu

PYROMETER FOR INDUSTRIAL APPLICATIONS

4 temperature ranges for use in demanding environments



Process Sensors Corp. introduces its newest fiber optic two-color pyrometer, Model PSC-GRF11N, for industrial automation and R&D applications. This digital ratio pyrometer series is

designed for lower starting temperature measurements beginning at 300°C (572°F). Four temperature ranges are offered: 300 to 1100°C, 350 to 1300°C, 400 to 1600°C, and 500 to 2300°C. The Model PSC-GRF11N operates in ambient temperatures up to 250°C (482°F) and is immune to high magnetic frequencies encountered in manufacturing facilities. Independent of emissivity and spanning a wide range of demanding industrial applications, the fast 5ms response time is ideal for quick measurement processes. A selection of variable focus fiber optic lenses provides small spot sizes from 0.7mm in diameter. The non-contact infrared temperature sensor uses an integrated laser that provides precision aiming onto the center of the target. The linear temperature output signal of 4 to 20mA simplifies installation into existing measurement and control systems. Each device is equipped with a galvanically isolated RS-485 Modbus RTU interface, allowing the setting of parameters and software evaluation in bus systems as well. PSC-GRF11N's rugged and flexible stainless steel fiber optic cable and lens assembly facilitates operation in the most demanding environmental conditions.

▶▶ 62688 at www.pcne.eu



FREE DIGITAL SUBSCRIPTION

2/2- AND 3/2-WAY VALVES IN COMPACT DESIGN

Solenoid valves for potentially explosive atmospheres



The compact and powerful **Bürkert** solenoid valve types 7011 and 7012 are now available with the circuit function "normally open", the plug form C as well as the approval DVGW EN 161 for fuel gases or as encapsulated variant for the use in potentially explo-

sive atmospheres (ATEX, IECEx). More and more compact and at the same time powerful valves are required in potentially explosive atmospheres or when combustible gases are used. With the help of the AC08 coil technology of type 7011 and type 7012, the performance of the valves is improved thanks to the optimised ratio between the iron circuit and the solenoid coil winding. For example, the 24.5 mm coil with encapsulation is one of the smallest Ex m coils on the market. This allows smaller and compact control cabinets to be realised in the potentially explosive atmosphere. Type 7011 is at the moment one of the smallest gas valves on the market. All versions of type 7011 and type 7012 can be switched reliably at higher switching pressure and increased ambient temperatures of 75°C (55°C for Ex variants). This makes the new variants ideal for use in numerous applications, such as pneumatic conveyors, venting technology in mills, sugar refineries or coal mining, the mineral oil industries and distilleries and more.

▶▶ 62648 at www.pcne.eu

MULTIPHASE LEVEL DETECTORS

For accurate measurement of various layers



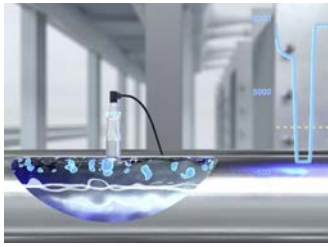
Magnetrol-AMETEK announced the new Genesis™ Multiphase Detector for multiphase detection, measurement, and control. The new Genesis device encompasses several significant engineering accomplishments. It is designed to measure multiple

phases in applications with thick and dynamic emulsion layers and therefore is able to differentiate the following different phases in a tank: vapor, total level (e.g., hydrocarbon liquid), top of emulsion layer, bottom of emulsion layer (e.g., water level, sediment). For measurement the TDR (Time Domain Reflectometry) technology is used. In this pulses of electromagnetic energy measure distances or levels. When a pulse reaches a dielectric discontinuity (created by the surface of a process medium), part of the energy is reflected. The detector has a 24VDC input with four 4-20mA outputs (including HART) for convenient control of total level, top of emulsion, water level, and sediment. The signal is concurrently generated top-down and bottom-up for best measuring results. A 4-button keypad and graphic LCD display allow for viewing of configuration parameters and performance curves, the electronics can be remote mounted up to 30 meters away from the probe. Proactive diagnostics for scheduling maintenance can be used, probe designs are available up to +200°C / 70 bar.

▶▶ 62562 at www.pcne.eu

GAS BUBBLE DETECTION PROTECTS PUMPS

Sensor analyses gas or air contents in liquids



A new type of sensor efficiently protects pumps against dry run and cavitation. With PAD20 **Baumer** presents an intelligent solution for varied applications and industries. The principle is simple: The innovative PAD20 analysis sensor will quickly and

reliably detect even tiniest bubbles of air and gas in fluids. Thanks to the smart sensor principle, it will immediately report any individually adjustable limit for gas inclusions being exceeded. The signal can be used for pump shut down or for reporting an alarm warning. The sensor also signals whether a closed system is free of gas bubbles. The digital IO-Link interface provides valuable secondary data, for example for condition monitoring. Early detection of gas bubbles in fluids is effective pump protection. Bubbles of gas or air in the pumped medium can damage the pump, causing expensive malfunction and high maintenance costs. PAD20 will prevent pumps from harmful gas pockets for extended service life. Thanks to precise detection early on, the sensor also will reduce maintenance effort and downtime. Little matter what's the medium's consistency, the sensor works reliable both in fluids such as milk and in viscous media like oil. The sensor measuring principle is dc-value based detection (dc = dielectric constant) of air and gas bubbles in fluids with a minimum conductivity of $dc > 1.5$.

▶▶ 62572 at www.pcne.eu

INDUSTRIAL GRADE QUANTUM SENSOR

Real-time particle monitoring allows plant optimization



The start-up **Q.ANT**, part of the German **Trumpf** group, presents the world's first industrial-grade quantum sensor as a particle sensor. It can simultaneously measure three parameters in real-time. An artificial intelligence (AI) analyzes the measur-

ed parameters and classifies the particles according to their shape. The sensor generates far more data on the measured particles in different media than currently available measurement methods. This sensor analyzes particles in different gases as well as in liquids or powders. The online integration of the sensor, thus, allows process control in real-time and increases the productivity of the plant as well as the quality of the processed media. With the quantum sensor, continuous processes achieve the flexibility of batch production. Since there is often a risk of explosion during powder processing, Q.ANT is also working on an ATEX version. During the measurement, a quantum-modified laser beam shines through the flowing medium and its particles. As the particle moves through the laser beam, high-frequency scanning generates a characteristic pattern that can be used to simultaneously analyze particle size, position and velocity. The AI then classifies the signals according to the customers' specifications, as for example particle form. The AI must first be trained for the respective use case.

▶▶ 62691 at www.pcne.eu

VERSATILE DEW-POINT HYGROMETER

Precise measurement of moisture and pressure



The new Easidew Advanced Online Dew-Point Hygrometer from **Michell Instruments** measures dew point, moisture content and now also pressure. It features an easy-to-use touch screen interface for set up and operation. Because pressure is such an important variable when measuring the dew point of a gas, the new hygrometer com-

pensates for this with either a live pressure sensor input, or by using a fixed pressure input value. The Easidew Advanced Online can be used for any moisture measurement application, displaying data in °C or °F dew point, ppmv, lb/mmscf or g/m³ from -110 up to +20 °C (-166 up to +68 °F) at pressures up to 450 bar (6627 psi). Additionally, the hygrometer also provides analog, digital and 4 user-configurable alarm outputs. Regular maintenance and recalibration are essential to ensure on-going reliability and customers have two options to achieve this with minimum disruption. The sensor exchange program is designed to eliminate process downtime: customers order a guaranteed, reconditioned sensor and, when this arrives, replace and return their old sensor. Where traceability of calibration is needed, Michell offers a re-calibration service at one of their regional calibration laboratories.

▶▶ 62645 at www.pcne.eu

SENSOR MANAGEMENT SOFTWARE

New release: more features and Android 12 compatibility



With the ArcAir 3.7.6 software release, **Hamilton Bonaduz AG** has launched a new version of its sensor management software which is compatible with android 12 and provides several

additional features and optimizations. The developers have improved the layout and user-friendliness of the integrated Experiment function in particular. The Experiment function is a central tool within the ArcAir software that enables the monitoring and recording of measurement data from up to six Arc sensors. ArcAir enables efficient and safe communication for control, validation and management of all Arc sensors. With the latest version, the display is now clear even on very small screens and an AutoScale function provides additional comfort during operation. In refining the software, Hamilton paid special attention to future innovations in the field of biopharmaceutical applications, so that new arc sensors can be easily integrated. The release is complemented by general improvements to existing functions implemented in response to user requirements, as well as new features. The ArcAir versions are available for mobile devices in the Apple App Store and Google Play Store. The desktop version of the software is available for download from the Hamilton website.

▶▶ 62690 at www.pcne.eu



EFFICIENT MOTOR-DRIVE SET FOR PUMPS

Energy-saving solution for new installations and retrofit



Delta announces the launch of their MPD Series inverter with motor, suitable for pump and fan applications. The new series delivers the benefits of energy efficiency, intelligent water supply and ease of operation by featuring a Delta MSI class IE5 energy efficiency synchronous reluctance motor coupled with a motor-mounted Delta MP300 variable frequency drive. Available in power classes from 0.75 to 22 kW, it features

the IP55 construction that keeps out dust and jetted water from all directions. The fanless drive provides long-term reliability and low maintenance. With support for IEC standard motor flanges, the MPD Series is ideal for both new installations and retrofitting. With energy costs rising, the efficiency of water pumps during operation is of growing importance. Thanks to the use of a high-efficiency motor coupled with the latest variable frequency drive technology, the MPD Series fulfills efficiency class IES2 according to IEC 61800-9-2. The motor-mounted Delta PLC supports 14k steps to implement a range of multi-pump operating modes, such as alternating operation to facilitate maintenance and extend equipment life, constant pressure mode for energy-efficient staging, and redundancy. If desired, the motor drive, MP300, is available separately for use with alternative motors.

▶▶ 62631 at www.pcne.eu

WATERLESS REFLUX CONDENSER

Effectively enabling upscaling of chemical processes



The new CondensSyn MAXI from **Asynt** is ideal for larger scale synthetic chemical reactions and is the latest addition to their popular and well proven laboratory air condenser range. The CondensSyn MAXI enables scientists to scale up their experiments effectively from small benchtop synthesis to large volume jacketed reactor vessels. Made using a unique design and manufacturing

method, the CondensSyn MAXI has a large surface area specifically fabricated for effective condensing of solvent volumes above 1 litre. With options to suit both reflux and distillation applications, the CondensSyn MAXI is a high-performance alternative to traditional water-cooled condensers. Available in two lengths, the CondensSyn MAXI is suitable for use under vacuum as well as standard laboratory and inert atmospheres. It is robust and washable like standard laboratory glassware in a dishwasher or solvent-cleaning bath and has a useful no-roll feature which makes storage easy. Without the need for constant running tap water for cooling, the CondensSyn MAXI also enables laboratories to substantially reduce their environmental impact and their running costs.

▶▶ 62620 at www.pcne.eu



FREE DIGITAL SUBSCRIPTION

IO-LINK VALVE POSITIONERS

Digital positioner makes diagnostic data easily available



Schubert & Salzer Control Systems are now offering the latest generation of their tried and tested 8049 digital positioner for pneumatic control valves with IO-Link. Important diagnostic data from controller and

valve are thus available to plant operating companies. In addition, valve parameters such as dynamics, accuracy and characteristic curve can be simply adapted at any time without physical access. A single cable with an M12 plug bundles the positioning signal, position feedback, data transmission and even the power supply. The integration of the international IO-Link industrial standard in its latest version 1.1.3 facilitates the installation and maintenance of the valves in complex plants. Additional device-specific software or hardware is not required. Incorrect connection is technically impossible due to the coded connecting plug. Even if a replacement should be necessary, this can be done without the need for specialists. The controller adopts the previously used parameterisation automatically by plug & play and is immediately ready for operation after self-calibration. The status data provided non-cyclically via IO-Link significantly increase process reliability and plant uptime. Among other things, they enable the predictive planning of maintenance work through continuous monitoring of field level data.

▶▶ 62615 at www.pcne.eu

SMART & EFFICIENT CHEMICAL PUMPS

Double diaphragm pumps with real-time monitoring



Timmer GmbH presents its new tim®CHEM chemical pump series. The pneumatic double diaphragm pumps are particularly characterised by high process reliability as well as energy-efficient and resource-efficient operation.

Among other things, users benefit from a longer service life, minimal maintenance effort, optimal media flow and intelligent pump monitoring. Different versions are available, in sizes ranging from 1/2 inch to 2 inches. The pump series offer a long service life thanks to a virtually wear-free ceramic spool valve. The bi-stable latching valve ensures high process reliability even in critical operating situations. To meet the increasing requirements in the area of sustainability, Timmer placed a high priority on energy efficiency in the development of the tim®CHEM double diaphragm pumps: Thanks to optimised geometries with minimal dead spaces and start-up pressures under 0.5 bar, the pumps reduce consumption of compressed air to a minimum and thus save costs. In addition, the products are available with emptying of residual quantities. The tim®CHEM series pumps can also be equipped with the intelligent sensor developed by Timmer. In conjunction with the customer's PLC, this sensor opens up many new possibilities for preventative maintenance and process optimisation.

▶▶ 62756 at www.pcne.eu

A	ABB	8		GERICKE	21	
	ASYNT	25		GETRIEBEBAU NORD	21	
B	BAUMER ELECTRIC	24		H	HAMILTON BONADUZ	24
	BECKHOFF AUTOMATION	6			HANS TURCK	7
	BOSCH INDUSTRIEKESSEL	22		J	JUMO	6
	BÜRKERT FLUID CONTROL SYSTEMS	23		K	KNICK ELEKTRONISCHE MESSGERÄTE	7
C	CO.RA	27		M	MAGNETROL	23
D	DELTA	25			MICHELL INSTRUMENTS	24
E	EBRO ARMATUREN	16		P	PROCESS SENSORS	23
	ECOM INSTRUMENTS	18		Q	Q.ANT	24
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	ENDRESS+HAUSER	10			SCHUBERT & SALZER	25
F	FDT	12, 13			SENSIRION	7
	FESTO	14			SOFTING INDUSTRIAL AUTOMATION	7
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	GEMÜ GEBR. MÜLLER APPARATEBAU	6		Y	YOKOGAWA	23
	GERHARD SCHUBERT	20				

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Munich
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Valve World Expo

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