

# PCN Europe

processing & control news

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N° 5 - MAY 2019

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Kay Petermann  
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Dear Reader,

One of the big challenges in the calendar of an editor is done for 2019, the Hannover Industrial Fair. Even as it is not as big for the processing industries as it was in the Interkarma days, there is still a lot to discover, in the area of COMVAC, for compressed air, the Energy area for new



trends in Renewables and more and more hydrogen fuel cells and the still booming trend of digitalization and Industry 4.0 in all shapes and colours of soft- and hardware, as well as new services. One of these we are presenting to you in this issue on page 16, with the new portfolio of smart equipment for the mobile digital worker. This gives a lot of new opportunities in the field and also improves the safety of the individual, a point of fundamental importance in all modern plants.

In the cover story of this issue the question is answered, how the availability of pumps can be optimized with monitoring and maintenance. Surely a field where some potential waits to be raised.

Not only Hannover has a lot of news and interesting trends to show, also the Franconian capital of Nuremberg has. What the international bulk and solids community discussed and presented there at Powtech, we put together in a special, starting page 26.

I hope you will have an interesting read and as usual: please contact me if you have a feedback for me or an idea for a story to share.

Editor of PCN Europe

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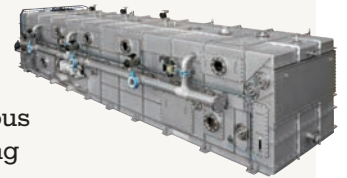
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Without Leaving a Trace. Fly ash transportation,  
quietly and dust-free, through motorways, railways  
and steep rocks



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## RADIOMETRIC LEVEL MEASUREMENT

With radiation interference detection



DuoSeries LB 470 is the radiometric level measurement from **Berthold** in true 2-wire technology, which is now also available with radiation interference detection (RID). The level measurement DuoSeries is characterized by a particularly high accuracy and reproducibility. The level measurement system DuoSeries consists of a Scintillation detector - CrystalSENS point detector or

UniSENS rod detector - as well as a separate transmitter for display and operation. The modern evaluation unit has a 3.5" touch panel, a powerful dual core CPU and various operating options. In addition, advanced functions for self-diagnostics and monitoring ensure the highest functional safety of level measurement during operation. In addition, operators can use the data log functions for detailed process analysis, such as tracking trends and process changes. If you want to continue to measure with impending external radiation, then the "LB470RID" version is required. The measurement continues without interruption, even if external radiation is present. External radiation is detected due to its different energy. The detector then changes to a second measuring channel and continues the measurement without error.

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## HYGIENIC PRESSURE TRANSMITTER

Process Reliability with protection classes up to IP69



The pressure transmitter **JUMO TAROS S46 H** is designed according to hygienic requirements for precision measurement and longevity. The high-level protection type and the fully welded, compact design enable residue-free cleaning

processes and high temperature compatibility for SIP and CIP processes. Its excellent active temperature compensation ensures exact pressure measurements and thereby improved process reliability. It is an ideal partner for the food industry, CIP and SIP applications, sterilizers, and autoclaves as well as for all hygienic pressure measurement applications. The pressure transmitter also ensures maximum operational safety in the pharmaceutical, medical, and biotechnology industries. Protection classes from IP65 to IP69 enable use in all areas. The use of FDA compliant materials and hygienic process connections guarantees safety and good cleanability. The default measuring ranges of the JUMO TAROS S46 H are between 0 and 100 bar. An autoclavable version is available for special applications. The medium temperature can be between -40 and +125 °C. For a maximum of 1 hour per day the medium temperature can even be at 140 °C, which is ideal for CIP and SIP applications. Linearity and long-term stability are both very low at 0.1 %. The total accuracy at 20 °C is at the most 0.25 % of the measuring span.

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## HMI FOR EXTREME ENVIRONMENTS

Enhanced UV resistance and extended temperature range



With an extended operating temperature range of -20°C to +65°C, and protection ratings to IP67F/IP66F, the GOT2507T-WTSD 7" operator terminal from **Mitsubishi Electric** meets the needs of harsh and demanding applications. No additional

protective measures are required for washdown with high pressure water or use in power equipment that is typically located outdoors. As a result, it is a perfect fit for industries such as power, food and beverage and machine building. While standard HMIs typically feature an operating range from 0-55°C, the expanded temperature range means it can be used in harsher environments without the need for heaters in the lowest temperatures or fans and coolers in the highest. This can significantly reduce operating expenses for the likes of food and beverage manufacturers and in power industry applications, as well as offering more flexibility for deployment where extreme temperatures are encountered. Where use in direct sunlight is required, the GOT2507T-WTSD offers enhanced resistance to UV rays, while on-screen clarity even under strong sunlight has been enhanced through the use of a high brightness LCD panel and a special coating to eliminate glare. Furthermore, with its reinforced metal housing, the rugged model can be used in environments that are subject to shock or vibration.

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## LEVEL MEASUREMENT FOR CRYOGENICS

80-GHz radar secures applications down to -196°C



It is not only the extreme temperatures that make life difficult for measuring instruments when they are being used at sea or measuring liquefied gases. Petrochemical products are characterized by their low dielectric constants and are generally difficult to measure.

Because they are temperature decoupled from the process, the 80-GHz radar sensors from **VEGA** are optimized for the extreme process temperatures that prevail in LNG applications: they easily withstand temperatures as low as -196° C. Ice does not form on the housing, nor is there any condensation on the antenna system. In addition to cryogenic applications, the specially protected housing and front-flush antenna cover of PTFE are also suitable for reliable measurement of aggressive media, whether acids, alkalis or abrasive substances. From the top of the housing to the business end of the measuring cell, the sensor is extremely robust and equipped with high-quality components. The key is its highly resistant stainless-steel housing, which thermally decouples the sensitive electronics inside. But it's also their high dynamic range that makes the 80-GHz sensors so unique - they can detect even the tiniest of signals. The sensors can detect virtually all media in the petrochemical industry, from crude oil to cryogenic liquefied gases, with high reliability despite their poor reflective properties.

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## Drone-based Gas Leak Detection

Leaks in gas distribution and transmission pipelines present serious safety risks and result in lost revenue and profits to producers. The ABB Ability mobile gas leak detection system is a digital solution that for the first time, enables drone deployment in the identification of gas leakages. The new solution is being launched at ABB's customer event in Houston to complement the existing range of ABB mobile gas leak detection systems suitable for all facilities. The ABB Ability mobile gas leak detection system benefits from drone deployment as it enables faster identification of leaks, requires less man hours to implement and costs less to operate as it covers wide, hard-to-reach areas. To avoid false readings, it can distinguish between biogenic methane, the source of which is ruminant animals, manure and shallow coal and oil deposits, from thermogenic methane from natural gas. The solution uses patented cavity-enhanced absorption spectroscopy to detect methane and ethane with a sensitivity more than 1000 times higher than conventional leak detection tools.



## Bosch Achieves Sales in the Billions With Industry 4.0

Industry 4.0 has definitely become a part of the factory scene, where it is paying off: over the past four years, Bosch has made more than 1.5 billion euros with Industry 4.0 applications. As early as 2022, Bosch wants to generate annual sales of over a billion euros with Industry 4.0. Bosch recognized the potential early on: the company began connecting manufacturing and logistics in 2012. This strategy improves competitiveness, and Bosch's Industrial Technology business sector is seeing robust growth: according to preliminary figures, last year it grew by 8.9 percent. After adjusting for exchange-rate effects, this growth measured 11 percent. Sales rose to 7.4 billion euros. What use is highly automated manufacturing if the materials don't arrive at the production line on time and in the right quantities? "If you take the idea of the factory of the future to its



logical conclusion, distinctions break down and you see that manufacturing and logistics have to be thought of as one element. This is the only way for Industry 4.0 to succeed in practice," Key elements of the strategy will be Artificial Intelligence as well as the fast implementation of 5G networks.

## Software Alliance on Cloud-based Exploration

Emerson and Repsol announced they have established a strategic alliance to deliver advanced subsurface geophysical technologies to significantly reduce



the time to prospect and produce first oil. To achieve this critical industry goal, Emerson will work collaboratively with Repsol to implement and deploy advanced subsurface imaging technologies, with core technologies developed by Repsol as part of Kaleidoscope, its 10-year innovation project. These advances will be used by a broad range of the geoscience community within Repsol and in all oil and gas companies that choose to license the technologies. The solution combines the latest in high-end visualisation, high-performance computing and cloud delivery. These technologies have contributed to the exploration success ratio of Repsol, with special significance in settings of complex geology in countries like Brazil, Peru and Bolivia. "Emerson is helping the energy industry implement the latest digital technologies to realise significant performance improvements," said Lal Karanbhai, executive president of Emerson's Automation Solutions business.

## GE To Sell Its BioPharma Unit

GE announced plans to sell its BioPharma business to Danaher for approximately \$21.4 billion, including \$21 billion in cash. GE Chairman and CEO H. Lawrence Culp Jr. said the deal was a "pivotal milestone" that "demonstrates that we are executing on our strategy by taking thoughtful and deliberate action to reduce leverage and strengthen our balance sheet." The BioPharma business, which is part of GE Healthcare's Life Sciences division, generated approximately \$3 billion in revenue last year. The deal will establish the business as a stand-alone company within Danaher's existing Life Sciences platform and give it access to additional resources



to grow. The BioPharma unit manufactures equipment and special resins that help pharmaceutical companies to discover and mass produce biopharmaceuticals. GE said GE Healthcare would retain the second key part of GE's Life Sciences business Pharmaceutical Diagnostics, a unit developing contrast media used by radiologists. The unit is a global leader in pharmaceutical diagnostics for medical imaging, used in more than 90 million patient procedures each year.



## An Alliance for the IIoT

At the Hannover Messe 2019 trade fair, seven leading suppliers from mechanical engineering, industrial automation and software announced the foundation of the Open Industry 4.0 Alliance. With this cooperation, the companies want to overcome proprietary solutions and give a decisive boost to the digital transformation of the European industry. Founding members of the alliance are Beckhoff, Endress+Hauser, Hilscher, ifm, KUKA, Multivac and SAP. In principle, the alliance is open to all companies.



Balluff, Gebhardt, Pepperl+Fuchs, Schmidtsche Schack, Samson and WIKA have already joined the alliance as members. All companies are mutually committed to the creation of a standardized and open ecosystem for the operation of highly automated factories and process plants with the integration of logistics and services. "The open architecture of the Open Industry 4.0 Alliance meets all the requirements of the process industry," emphasized Matthias Altendorf, CEO of the Endress+Hauser Group. "It is based on standards, ensures transparency across all business processes and guarantees the integrity of the systems. This enables process plant operators to leverage the potential of digitalization."



## Excellent Growth for Endress+Hauser Group

According to preliminary figures, Endress+Hauser, one of the world's leading providers of process and laboratory instrumentation, automation solutions and services, increased net sales by more than 9 percent to over 2.4 billion euros in 2018. Exchange rate effects prevented even better results. "In local currencies, we grew nearly 13 percent," said Chief Financial Officer Dr Luc Schultheiss (pic.). The family-owned company created new jobs primarily in production, research and development and services. At the end of 2018, Endress+Hauser had 13,928 employees worldwide, 629 more than the year before. "The solid development in sales shows that we have held our ground well in the market," explained CEO Matthias Altendorf. The growth was spurred by innovations from across all fields of activity. "We supported our customers with more than 50 new products, solutions and services. We were able to break new ground through our digitalization strategy, as well as in



the measurement and analysis of quality-relevant parameters," said the Group's CEO. Endress+Hauser is expecting a somewhat weaker market dynamic for the current year. The Group is anticipating growth in the mid single-digit range, with earnings remaining at a healthy level.

## Yokogawa Establishes Subsidiary to Expand Business in Norway

Yokogawa announced that it has established a subsidiary in Norway to engage in the sale of control products and provision of related services. The subsidiary, Yokogawa Norge, was established in February. Renewable energy, pharmaceuticals, and foods are targeted under Yokogawa's Transformation 2020 mid-term business plan, and each of these industries enjoys good prospects for growth in Norway. The country has played a leading role in Europe's transition to a low-carbon economy and is diversifying its economy to lessen its dependence on natural resources. In the Norwegian market, Yokogawa has relied to date on distributors and a representative office to provide and promote control systems, field devices, and related services to the oil & gas industry's upstream and downstream sectors, including refining and LNG. In July 2017, Yokogawa acquired TechInvent2 AS, a Norwegian company with advanced chemical injection technology that helps to prevent blockages and corrosion in oil wells and pipelines, and renamed it Yokogawa TechInvent. Through the establishment of Yokogawa Norge and the creation of synergy with Yokogawa operations in Aberdeen, Scotland, Yokogawa will be able to solidify its sales and service organization in Norway and accelerate growth not only in existing markets but also in the renewable energy, pharmaceutical, and food industries.



## Fokus on Process Automation

About two months before the opening, the preparations are well underway for the SENSOR+TEST from 25 to 27 June 2019. At the Annual Press Conference of the AMA Association for Sensors and Measurement in Nuremberg, the organizer, Holger Bödeker, had a very positive outlook on this year's edition of the international trade fair for sensor, measuring, and testing technology. According to Holger Bödeker, managing director of the organizing AMA Service GmbH, the SENSOR+TEST 2019 is fully on target: "This year we do not expect quite as many exhibitors as last year because of the parallel etc - European Test and Telemetry Conference in 2018. It will be held jointly with the SENSOR+TEST as per schedule again in 2020. Moreover, our new trade-fair dates in the last week of June are still not fully planned by all exhibitors. Nevertheless, we are currently counting with about 530 exhibitors from Germany and abroad. Many enterprises and institutes from 30 countries have announced a plethora of innovations." This year's special topic - Sensor and Measuring Technology for Process Automation - will be in great demand not only at the lectures. The Special Forum is already almost booked out. In great demand as well is the government-funded community stand "Innovation Made in Germany" for young, innovative enterprises.



# SupraMotion: Contact-free, Quiet and Clean

## New contactless movement concepts with superconductivity

The requirements placed on the cleaning of production facilities and their purity are increasing – particularly in future-oriented fields such as medical technology, laboratory automation or biotechnology. Thanks to superconductor technology, these demands could easily be fulfilled in future. With the SupraMultitool, an innovative concept developed by Festo several functions can be carried out with only one superconductor element; and SupraDrive 2.0 demonstrates smooth, linear transport of objects – with precise positioning.

In the future, many manufactured products

will move quietly and cleanly through the production shops, with low energy consumption and without contact. Contact-free, frictionless handling beyond walls and in any spatial orientation, which will become possible thanks to superconductor technology, will yield entirely new solutions – especially in highly pure environments. Medical technology, laboratory automation, biotechnology and food production are decisive future fields of automation, which are showing great potential for growth over the coming decades. Reliable cleaning is essential for hygienically safe production in these applications.

### CONTACT-FREE PRODUCTION OF THE FUTURE

The spatial separation of a product from its handling equipment in a vacuum, in a clean room, in gases or liquids ensures protected transport to meet the highest demands. “The special characteristics of superconductors open up great potential wherever contact-free storage or handling is required. Automation can thus make inroads into areas of application that until now have been regarded as not or only hardly accessible to automation,” said Georg Berner, Head of Strategic Corporate Development, Group Holding Festo and Project Coordinator for the SupraMotion concepts.

“Our customers, and their customers in turn, benefit from this paradigm shift in automation.

Festo has therefore been investigating and developing this technology for more than ten years. We are currently working together with customers on trendsetting pilot projects.”

### WHAT ARE SUPERCONDUCTORS?

Superconductors are materials which below a certain temperature can store the field of a permanent magnet at a predefined distance. This effect enables objects to be held in position and manoeuvred without contact.

The levitation gap remains stable even beyond walls. Thanks to their restoring forces, the superconductive magnetic bearing components autonomously return to their memorised position even after one of them is temporarily removed - entirely without external control engineering.



*With superconductor technology, objects can be stored and moved without contact – as with the SupraDrive 2.0 exhibit.*

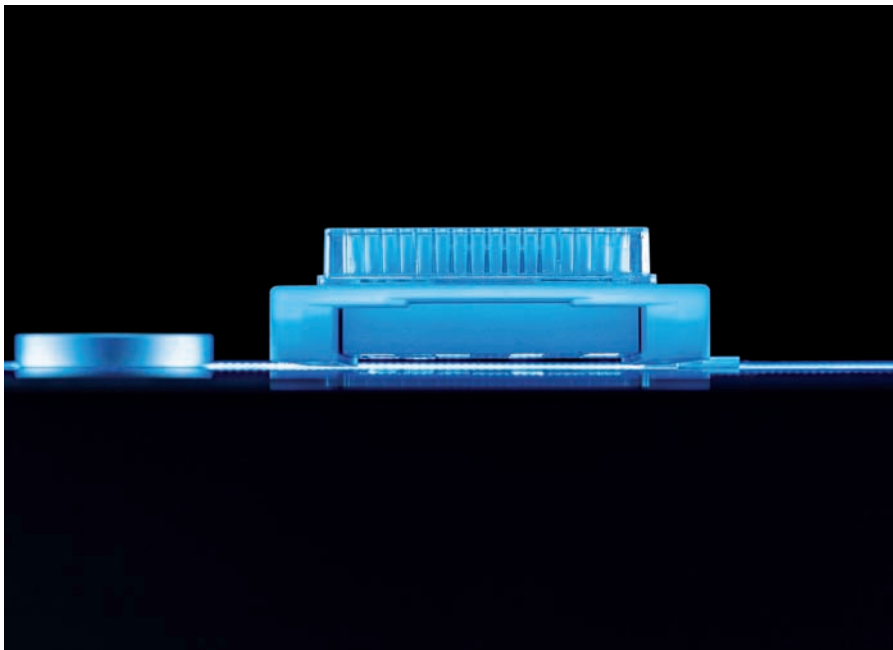




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## SUPRAMULTITOOL: PERFORMING SEVERAL FUNCTIONS SIMULTANEOUSLY WITH ONLY ONE CRYOSTAT

The SupraMultitool demonstrates how different automation tasks can be simultaneously carried out flexibly and without contact, using only one system.

On display are the stable, linear transport and secure, contact-free rotation of a workpiece carrier. This configuration clearly shows the advantages of superconductive storage in terms of stability and reliability as compared with electromagnetic solutions. At the SupraMultitool exhibit, a handling system positions a workpiece carrier on two different magnets in turn to demonstrate the flexible possibilities for application.

## SUPRADRIVE 2.0: SMOOTH LINEAR TRANSPORT

Based on the SupraDrive exhibit presented in 2017, SupraDrive 2.0 is fitted with two integral 1.5-metre cryostats with superconductors, which make for particularly smooth and at the same time dynamic movement of the transport sledge. The cryostats are tilted at an angle to each other. By this means, they additionally centre and stabilise the transport sledge from both sides. With SupraDrive 2.0, the movement and precise positioning are likewise affected by the drive unit from the Multi-Carrier-System MCS. Like all SupraMotion exhibits, these two SupraDrive concepts can be used for example in applications that require the equipment to be cleaned frequently or during regular operation.

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# Custom SWIR Optics for Material Sorting and Inspection

An interview with Mark Pontin, Managing Director of Resolve Optics about the decisions that have to be made for the best optical inspection results

**PCN Europe: Can you describe your optical design and manufacture capabilities to our readers in short?**

**Pontin:** Resolve Optics has over 30 years' experience in the design and manufacture of application-optimised, custom optical systems covering the complete spectrum from the UV to Infrared wavelengths and beyond. We use Zemax Optic Studio for our optical design and Solidworks professional for our mechanical designs. We are internationally renowned for our ability to design compact, high performance zoom lenses and our expertise in producing the highest quality, radiation resistant optical systems in particular.

**PCN Europe: Why is the SWIR wavelength so useful for inspection tasks and in which industries it is often used?**

**Pontin:** In contrast to Mid-Wave Infrared (MWIR) and Long-Wave Infrared (LWIR) light, which is emitted from an object, Short-Wave Infrared (SWIR) is similar to visible light in that photons are reflected or absorbed by an object. Consequently, SWIR provides the strong contrast needed for high resolution imaging. For applications from 1 to 2.5 microns, best results are achieved by using a lens that is designed, optimized, and coated for this SWIR wavelength range. Using a lens designed for the visible spectrum will result in lower resolution images and more significant optical aberrations. Many applications that are difficult or impossible to perform using visible light are possible at SWIR wavelengths. For instance, colours that appear almost identical in the visible may be routinely differentiated using SWIR making it a great QC/QA (Quality Control/Quality Assurance) tool.



*Mark Pontin, Resolve Optics' managing director*

**PCN Europe: Why is the need for custom lenses growing and what are the most common optical challenges you must overcome, especially for SWIR lenses?**

**Pontin:** Typically, off-the-shelf lenses are manufactured for the mass market where unit cost is the dominant driving force. However, when it comes to an application that optically requires something a little more demanding such as high performance, high-resolution, compactness or a large format image, using an off-the-shelf lens will force you to accept a compromise in one or more

aspects of optical performance. The result of this compromise can be a reduction in optical performance, a bulkier less attractive product, shorter product life and loss of competitive advantage - all of which ultimately lead to lower profitability. As a result, demand for custom lens designs for that meet the exact needs of the customer application are rising dramatically.

InGaAs sensors (Indium gallium arsenide) are a favoured detector for the SWIR region. Like all sensors, there is a move for higher and higher resolution InGaAs detectors. This





Focus Corrected SWIR Lens

trend is the major driving force to provide lenses that meet the demands of these new generation sensors. Many off-the-shelf SWIR lenses are in fact standard visible designs with AR coating designed for the SWIR band. These lenses do not account for the way the glass transmits in the SWIR region and as such the final image quality can often be compromised. This problem is particularly apparent with the higher resolution SWIR sensors.

**PCN Europe: Are there any trends you expect to grow over the next years for inspection tasks in (processing) industries? Are there special challenges, that lenses can help to solve?**

**Pontin:** In many process industries it is the desire to measure or identify something more accurately, at a lower level or even



*Lenses in ruggedized design provide long life and best results in difficult environments*

just faster that is driving why more operators want a custom lens design that meets or exceeds their application need without compromise. Our optimised custom designs enable process customers to get the maximum performance from their instrument or sensor without the lens being a bottleneck. We also endeavour to design the lenses to be as future proof as the budget will allow.

**PCN Europe: How important is a rugged lens design in a process industry customer's projects?**

**Pontin:** This really dependent on the process application. If a process creates vibration then the measurement lens may need to have its elements bonded in position to avoid failure after prolonged exposure to these vibrations. In processes subject to higher levels of humidity or moisture an appropriate measurement lens should be IP66 rated. Likewise processes that take place at higher temperatures and pressures place critical demands on the robustness of a lens design.

**PCN Europe: What is the typical information you need from a potential customer to classify their problems and offer an appropriate optical solution?**

**Pontin:** Before we undertake a custom design, our experienced team of optical designers look to quickly gain an understanding of the basic physics of the technology associated with each customer's product enabling us to propose novel solutions. Our aim is to provide a fast and flexible optical and me-

chanical design assessment on all projects. A project engineer is assigned to closely liaise with customers at all points of a development to ensure complete satisfaction with the final product. To answer your question, we require as much information as we can get. We will sign NDA's to enable our customer to feel comfortable with providing what can be extremely sensitive commercial information. This all helps to ensure the customer receives the optimised optical solution they need.

**PCN Europe: When you are contacted to find a solution development time is probably a factor in most of the cases. What is a typical time frame for a project from start to final product?**

**Pontin:** Lenses are often the last piece of the product development jigsaw for many instrument, sensor and camera manufacturers. Typically, driven by cost considerations, many product developers first try to find a lens from the off the shelf market. For more demanding applications, by the time developers realise that the lens they need is not available and a custom lens is required, they are running short on time. For a fixed focus lens the typical time period from design to manufacture is 4 to 6 months.

**PCN Europe: Thank you, Mr. Pontin, for these interesting insights.**

*Kay Petermann*

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# Smart Approaches to Safe Pump Operation and Lower Maintenance Costs

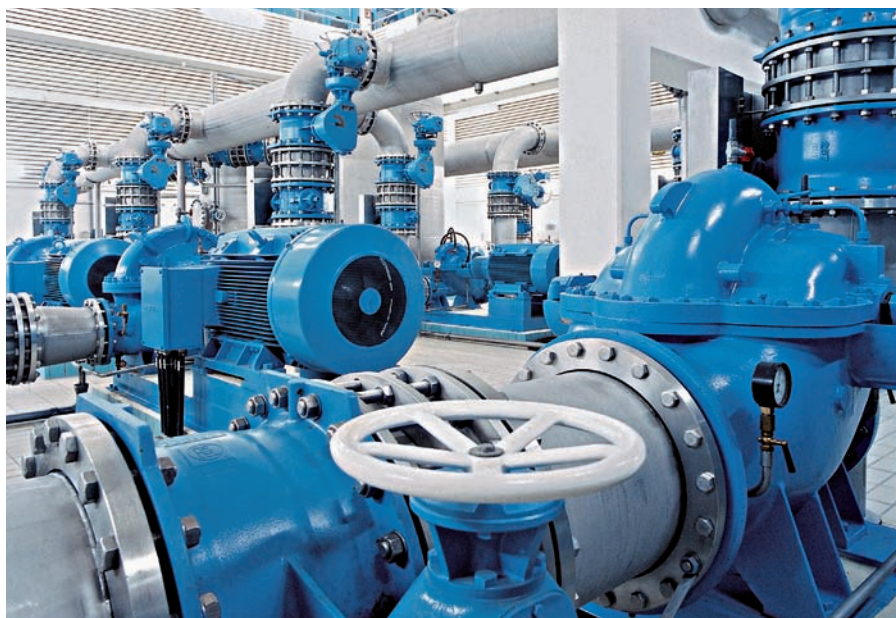
Current products in the field of industrial controls have additional functions for increasing the availability of pumps. For their development, Siemens obtained the assistance of experts in various industries

Pumps are used for transporting and pumping liquids in the widest range of applications. Since many pump motors - irrespective of the industry - are started by contactor/circuit breaker combinations, compact motor starters or soft starters, Siemens, as one of the world's leading manufacturers of industrial controls, has set itself the task in recent years to use these products to develop solutions to the specific challenges encountered in pump applications. To this end, the company collaborates with experts from research and practice.

Dry running is a typical problem encountered in pump operation in all industries: If insufficient liquid is transported, the pump may be irreparably damaged. Therefore the liquid level is usually monitored by sensors. Alternatively, the condition of the pump can be assessed by measuring the active power and detecting dry running at an early stage. For some time now, Siemens has been offering for this purpose special current and voltage measuring modules of the Simocode pro motor management for measuring and reporting the corresponding values, and switching the pump off automatically when necessary. The advantage: Sensors and their regular, time-consuming maintenance are eliminated.

## MORE SAFETY IN ACCORDANCE WITH SIL REQUIREMENTS

Centrifugal pumps running dry is especially critical in hazardous areas if, for example, overheating of the pump could ignite highly flammable materials. However, products have to be certified for use in such areas. Siemens therefore had the principles and practical applicability of this technology investigated in



*In collaboration with experts from both research and practice, Siemens has developed innovative solutions to meet typical challenges encountered during pump operation*

a research project held in collaboration with the Physikalisch-Technische Bundesanstalt (National Metrology Institute of Germany) so that the Simocode pro motor management system could be certified as an ignition source monitoring device corresponding to a type b1 ignition protection system according to ATEX and IEC Ex. Thanks to this certification, it is now possible to detect centrifugal pumps that are running dry and stop them safely in accordance with SIL1 safety requirements (IEC 61508).

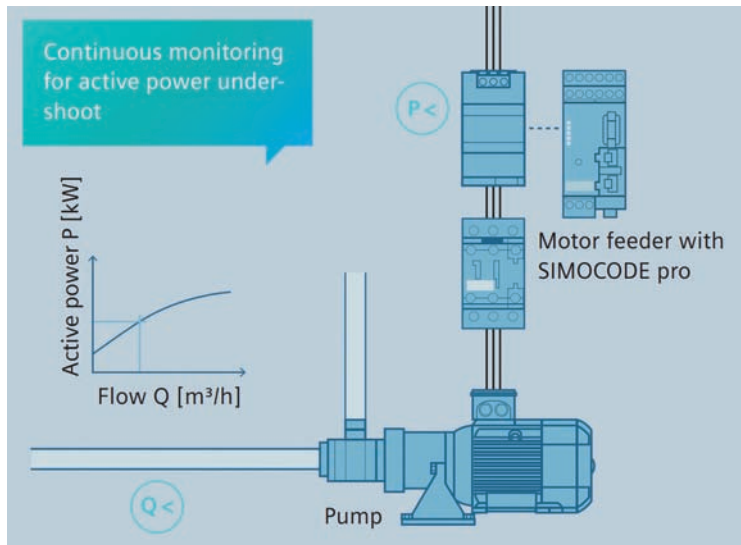
Blocked pumps are another widespread problem, encountered most frequently in waste water disposal. Such blockages are caused by wet wipes and other sanitary articles not

suitable for disposal in waste water. In most case, clogging is caused by waste materials clumping together so that they collect even more readily in the pump. The resulting stoppages of operation may not only damage the system, but also incur considerable maintenance costs. Here again, Siemens has been able to find an innovative solution with the Simocode pro motor management system as a result of cooperation with the Water Innovation Network, founded by Anglian Water, a British water utility, and the Allia Future Business Center.

Simocode pro monitors current levels and the power factor on the motor to determine the condition of the pump. Apart from the



The dry-running protection based on the active power provided by the Simocode pro motor management system offers a low-cost alternative to using sensors in hazardous areas



Simocode basic device, this monitoring only requires an additional current/voltage measuring module. If a predefined threshold is exceeded, Simocode pro automatically reverses the direction of rotation of the pump with the aid of a configurable internal logic. The pump alternates between forward and backward operation to dislodge contamination from the impeller. The sharp edges of the impellers cut through pieces of the clogging. The procedure is repeated until the pump is once again running within its rated load range. The advantage: Cleaning takes place completely automatically, so it does not require any software instruction or further training of employees.

#### SOFT START AND STOP FUNCTIONALITY

With the Sirius 3RW55 soft starter, Siemens has been offering this pump cleaning function for several months, as well as in another product group. During the cleaning operation, the pump alternates between forward and reverse operation at rated speed or at reduced speed but with maximum possible torque. The 3RW55 provides not only intelligent motor monitoring, but also the option of starting the motor softly, that is with a slowly increasing speed. Starting the motor softly reduces the peaks in the power supply network and also places considerably less stress on the mechanical mechanisms.

The Sirius 3RW55 soft starter also has another



With the new generation of Sirius 3RW5 devices, Siemens is offering the right soft starter for every application

er function that prevents the very common phenomenon of water hammer. Stopping pumps that convey large volumes of water or other liquids is a difficult challenge. The pump stops immediately, so the water in the pipes also stops immediately, but the kinetic energy still present in the water is transmitted to the pipes, couplings, valves, and seals. This results in damage, and may even cause a breakage in the pipe system.

Therefore, pumps should always stop as softly as possible. The Soft Torque pump run-down function of the Sirius 3RW5 soft starter not only reduces torque peaks shortly before the rated speed is reached, but also supports the pump run-down and stops the motor gently. This avoids water hammer and the associated mechanical stresses on the system. That means lower maintenance costs and a longer plant life.

All in all, Siemens offers not only specific solutions for pump applications, but also increasingly equips its products for starting motors with functions such as recording measured values, communication links and integrated safety, which render additional hardware superfluous and permit condition monitoring and predictive maintenance. Innovative solutions will continue to be produced in future by collaborating with experts from research and practice.



Pump blockage and water hammer reduce plant availability in the water industry. Integrated device functions, such as pump cleaning with Simocode pro and the Sirius 3RW55 soft starter, and pump run-down with the Sirius 3RW5 soft starter prevent typical pump problems from occurring

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## VOLUMETRIC/MASS GAS FLOW CONTROLLER

Reliable control for 90 gases and multi-gas mixes



**Aalborg Instruments'** DPC series precision digital mass flow controllers provide accurate and stable control of mass flow rates, of process gases. With simultaneous display of Mass Flow, Volumetric Flow, Pressure and Temperature parameters it is used in a variety of industries, including scientific and analytical applications, bioreactors and surface depositions, gas sampling, manufactu-

ring and metrology activities. DPC differential pressure mass flow controllers feature totalizers with batch processing mode (0.5% RD + 0.2%FS) standard accuracy, 200:1 turn-down ratio and less than 150 ms response time. With the Multi-Gas functionality control for 90 different gases and gas mixes is supported.

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## REDUNDANT I/O-LINK MASTER

Profinet S2 System Redundancy made available



**Turck** is presenting the TBEN-L5-8IOL as the first fieldbus module with Profinet S2 system redundancy. The IO-Link master with IP67 protection is the only device of its kind at present to support the Profinet redundancy concept relevant for process automation. Through the upgrade, the block I/O module is able to

establish via a single connection communication relations to two controllers - the primary controller and its backup. In this way, the master module integrates the host of existing IO-Link devices, such as position indicators, valve blocks, I/O hubs and sensors in the world of high availability systems.

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## CAPACITIVE SENSORS WITH IO-LINK

Delivering more than just a switching signal



Looking for a way to detect metallic and non-metallic objects or levels in direct media contact? Then the compact capacitive sensors from **Balluff** with IP 67 protection are the right choice. The shielded versions for flush mounting are ideal for object detection and the non-flush versions for detecting levels. The new M12

generation in the rugged VA-1.4404 housing and PEEK sensing surface stands out with its optimized technical properties. All sensors include an operating-, status- and switching function display. You can set parameters from a central location and enable simple diagnostics by monitoring the process values. Bottom line: greater application security.

►► 57156 at [www.pcne.eu](http://www.pcne.eu)

## NON-RETURN VALVE

Different sizes with integrated inspection flaps



The new Q-Flap RX non-return valve is a joint development between **REMBE** and the Swiss company RICO. The Q-Flap RX is available in nominal pipe sizes of DN 140 to DN 1250. The strict requirements of EN 16447 are mainly achieved through the very high strengths and flexible instal-

lation distances. The product range consists of three different design versions, each adapted to the application areas of the product. The small sizes (up to DN 400) are designed for decentralised aspiration systems, e.g. in the chemical and pharmaceutical industries. With their small overall dimensions and integrated inspection flap they are also easy to install and maintain.

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## COMPACT GAS CHROMATOGRAPH

Multi trace impurity detection in one chassis



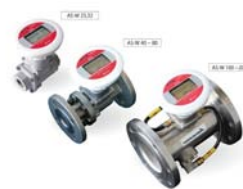
**Michell Instruments** is now internationally selling and supporting a range of GC impurity analyzers manufactured by sister company LDetek. The MultiDetek2 is flexible enough to incorporate different detection technologies. Its

additional upstream sampling capabilities using gas sampling techniques for the combined detection of a broader range of impurities. H<sub>2</sub>-CO-CH<sub>4</sub>-CO<sub>2</sub> impurity detection can be performed below 1ppbV in multiple gas backgrounds for semiconductor gas applications. For applications such as air separation, semiconductor manufacture, purging, chemical plants, steel industries, welding among others, the MultiDetek 2 validates traces of H<sub>2</sub>-CO-CH<sub>4</sub>-CO<sub>2</sub> as well as NMHC in Argon to sub ppbV levels.

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## FUEL GAS FLOW METER

Maintenance-free ultrasonic measurement



The ATZTA AS-W Series from **Aichi Tokei** are Ultrasonic Flow Meters for Fuel Gas. They are covering a wider range from small to large flow rates than roots meters and turbine meters, contributing to accurate measurement, cost saving and conveni-

ent facility management. The structure of measurement portion is very simple with only 2 ultrasonic sensors. Measurement without mechanical moving part has various advantaged features as high durability against oil, mist and dust and high accuracy without changes over a long period of time. The measurement method makes the series maintenance-free. The 1: 400 wide rangeability enables the devices to adapt to various users' applications under wide changes in flow volume.

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## NEW SEALING COMPOUND

FKM material meets the demands of oil and gas sector



With the newly developed FKM compound Vi 900 C. **Otto Gehrc-kens** presents a high-performance product innovation for use in the petrochemical industry. The material has proved its suitability as a dependable elastomer seal

even under the most demanding conditions, complying with Norsok test standard M-710 and also passing the hardness test with the best possible rating of 4x '0000', without showing any damage whatsoever. Vi 900 is therefore ideally suited for use in production sectors which, as a result of the danger of explosive decompression, impose especially high demands on the seals used. The special feature of this new product development is its outstanding stability under low temperatures. With a TR-10 value of -40°C, Vi 900 is suitable for the coldest applications, right down to -50°C and, as well as complying with the Norsok standard. According to the manufacturer, combined with an extraordinarily good cold compression set this high-performance material sets new standards in relation to AED (anti-explosive decompression) and RGD (rapid gas decompression) seal materials. A further advantage of the new FKM compound is its excellent resistance to a wide range of specific media and chemicals, from mineral oils to aliphatic, aromatic or even chlorinated hydrocarbons and also to acids in various concentrations.

►► 57150 at [www.pcne.eu](http://www.pcne.eu)

## SMALL SENSOR TRANSMITTER

Suitable for different liquid measurands



The Liquiline Compact CM82 from **Endress+Hauser** is the right transmitter where space is restricted in production. Its housing is so slender, that it fits, together with the sensor, into

almost every assembly. Although it is so small, it is packed full of the latest transmitter technology and can be operated via Bluetooth from any iOS or Android device. Using the app, you can see all the measuring points within the Bluetooth range of your tablet and smartphone. Configuration and diagnosis can also be performed conveniently using the SmartBlue app. Incidentally, the Bluetooth connection is uniquely secure against unauthorized access by third parties, as confirmed by the German Fraunhofer Institute for Applied and Integrated Security (AISEC). The Liquiline Compact CM82 is compatible with all the transmitters, analyzers and samplers from the Liquiline platform. This means that you can use sensors of the same type at all measuring points: all pH, ORP, conductivity and oxygen sensors with the blue Memosens plug-in head can be connected. This allows you to make use of the numerous benefits that Memosens technology has to offer, including 100% reliable data transmission and true plug and play with pre-calibrated sensors. As a loop-powered two-wire device, the CM82 can be connected directly to a programmable logic controller (PLC), which also serves as the power supply.

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## BATCH MIXERS WITH NEW FUNCTIONALITIES

Available in sizes from 140 litres up to 5.000 litres



**GERICKE's** double shaft GMS mixer is now available with new options and functionalities in sizes from 140 litres up to 5'000 litres. The series offer short mixing time while maintaining high mixing efficiency. Homo-

genous mixing of microingredients (down to <0.001%) has never been easier and faster and effectively substitutes the need of expensive premixes. The design of the GMS mixer and the high mixing dynamics with the fluidised zone do not only allow for mixing of powders but also for the efficient addition of liquid ingredients. The new optional cutters (patent pending) can be added in the front door to disperse agglomerates. With its large diameter and optimal location in the mixer process chamber it works highly efficiently. For cleaning the front door swivels open, thus the cutter is highly accessible for cleaning. With this new feature the GMS becomes even more flexible to meet additional process requirements. The series also comes with inflated double shell housing, which allows to control the temperature and safeguard the product quality. The active cooling or heating is achieved by the means of efficient heat transfer from the jacket to the mixer. Typical application for controlled heat transfer are mixing of synthetic products that are sensitive to high temperatures and the addition of liquids that tend to crystallize on the cold mixer housing.

►► 56977 at [www.pcne.eu](http://www.pcne.eu)

## EXTERNAL SENSOR FOR POSITIONER

Space saving solution for small valves



Small control valves are often used in research facilities. Typically, the available installation space is limited in such systems and the dimensions of commercially available positioners are often not suitable for mounting on micro flow valves. For this reason, Schneider Electric developed an external sensor for the

new positioner SRD998. This sensor allows for an ideal connection to the **Badger Meter** small control valves. The existing, patented mounting kit from Badger Meter could be incorporated. Due to the decoupled and self-adjusting coupling, a spring preload of the tap can be dispensed with. As a result, no lateral forces are introduced into the valve guiding. To prevent differences in electrical potential, the connection to the valve system is conductive. The valve and stroke sensor unit are therefore combined and electrically grounded. The sensor is supplied with a pre-assembled cable. The connection to the positioner is made with a screwed plug. This connection avoids exchanging terminals and can be intrinsically safe. The longer pneumatic connection from the positioner to the valve drive is not a factor that needs to be considered. With the normal dimensioning of this compound, the pressure-bearing total volume increases only slightly.

►► 57154 at [www.pcne.eu](http://www.pcne.eu)

## The Digital Mobile Worker

Newly developed smartphone, digital services platform, and new peripherals for use in explosion protected areas

The Pepperl+Fuchs brand ecom has presented the next generation of its ATEX Zone 1/21 and Div. 1 certified, intrinsically safe Smart-Ex 4G/LTE Android smartphone at Hannover Messe 2019 (April 1 to 5). The Smart-Ex 02 is a completely new development that is tailored to the market's requirements. Complemented by innovative, new peripherals such as the intrinsically safe CUBE 800 thermal image video camera and the explosion-proof Smart-Ex watch, the Smart-Ex 02 accompanies mobile workers in a wide range of tasks and provides future-proof solutions. In addition, ecom is presenting its new Digital Products and Services platform, which offers a comprehensive solution for staging, mobile device management, and device analytics.

### INTRINSICALLY SAFE SMARTPHONES FOR ZONE 1/21 AND DIV. 1

With a large 12.7 cm (5 inch) display, powerful features, an ergonomic design, and optimized

accessories, the newly developed Smart-Ex 02 is the most advanced intrinsically safe smartphone for Zone 1/21 and Div. 1. In addition, global Ex certifications enable worldwide use and global rollouts. The Smart-Ex 02 supports 21 different LTE frequency bands. It is delivered unlocked and without a SIM card. With the latest Android 9 operating system, the smartphone is fast, secure, and efficient. The Smart-Ex 02 will also be the first Zone 1/21 and Div. 1 certified device to meet Google's demanding Android Enterprise Recommended (AER) validation. The AER validation ensures consistent, easy deployment and management of mobile solutions through hardware, OS support, and regular security patches. Worldwide support from Pepperl+Fuchs also ensures safe operations. Short distances to the service technicians enable quick support and troubleshooting. Users also benefit from collaboration with ecom's own system engineers and development teams, who can

advise and support with changing software requirements. Depending on requirements, the Smart-Ex 02 can be supplemented with numerous coordinated and optimized peripheral devices from ecom, such as headsets, microphones, video cameras, scanners, Bluetooth beacons, and smartwatches.

### NEW DIGITAL PRODUCTS AND SERVICES PLATFORM EXPANDS MOBILE WORKER CONCEPT

With its new Digital Products and Services platform, ecom is offering a solution that combines automated staging, mobile device management, and device analytics. It can be used as a full-fledged enterprise mobility management system, if desired. The Smart-Ex 02 and all other mobile devices from ecom can leave production at the customer's request with the necessary configuration secured in a container—including security settings, applications, and wireless setup. This



Tablet, smartphones and peripherals with ATEX certification







*New opportunities for collaboration, services and worker safety in ex-zones: combination of smartphone and -watch in operation*

can be used to establish correlations and causalities, for example between software errors, geographical data, and WiFi coverage.

#### PERIPHERALS ENABLE NEW SAFETY STANDARDS

For hands-free operation in potentially hazardous areas, the Smart-Ex 02 can be extended by the CUBE 800 Ex camera, available via cooperation between Librestream and ecom. This intrinsically safe thermal image video camera is certified for use in Zone 1 / Div. 1 Ex environments. It can be easily attached to a helmet or stick/monopod, and settings such as lighting or zoom can be remotely controlled. Upon request, pictures and documents can be available live in a digital workspace. The CUBE 800 enables simultaneous streaming of HD and infrared video. A powerful integrated light ring and a laser target pointer ensure high image quality, even in poor lighting conditions. In combination with Librestream Onsite Connect software, experts in the control room can support technicians live on site. This enables remote diagnostics and repairs of critical areas. For a new form of hands-free cooperation and better employee protection in hazardous areas, the Smart-Ex 02 can also be synchronized with the ecom Smart-Ex watch (based on the Samsung Galaxy smartwatch). Integrated GPS, motion, and heart rate sensors enable monitoring of the current status of critical values possible and ensure quick localization in case of an emergency. Hands-free navigation simplifies operation, and a rotatable bezel allows quick and easy scrolling through apps and commands, even with gloves. Hands-free workflows and operator communication support enterprise-wide solutions. The Smart-Ex watch is fully B2B-capable, offering up to five days of performance and up to 28.5 hours of GPS time.

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allows the devices to be used by mobile workers immediately after delivery without error-prone manual configuration.

On request, device diagnostics and device analytics can collect real-time operating data and error analysis of the mobile devices, continuously monitoring their condition and remedying malfunctions preventively or directly. The devices can be managed via the ecom online platform and updated at any time during operation (over-the-air), without having to be

sent to the local IT department or even to the head office. Cloud servers hosted in Germany meet the highest data protection standards, enabling high data availability and security. One-time staging or enrolling can also be done internally via ecom's own production servers, if required. Additionally, the platform enables critical software events or software installations and other security-critical processes to be detected via analysis of historical data. Statistical accumulation of events



## Are you FMD-ready?

### Easy to operate offline solution for packaging serialisation for pharmaceuticals

Pharmaceutical manufacturers must now comply with the Falsified Medicines Directive (FMD) which is aimed at reducing the number of falsified medicines infiltrating the European pharmaceutical supply chain. Richard Pether, Director of coding and marking specialist Rotech, outlines the impact of the FMD across the pharmaceutical supply chain, and the simple changes SMEs can make to ensure compliance. Rather like Brexit, the FMD has hung over the industry for a number of years. Delays and amendments have meant that previous deadlines have come and gone, lulling some manufacturers into a false sense of security. However, the final implementation date is here.

#### LIVING IT LARGE

The pharmaceutical supply chain is vast, and can be divided into three main sub-groups: large multinationals, parallel importers and

SMEs. The FMD affects each of them differently. As you might expect, the large multinationals are well-prepared for the FMD. Cushioned by the luxury of a healthy cash flow, most invested early in the necessary infrastructure to bring their operations into line with the compliance requirements. Having left nothing to chance, the deadline passes them by without a hitch.

#### GOODBYE TO PI?

The future is far less bright for parallel importers (PIs). Traditionally, these low profile European firms have operated under the radar, re-labelling and sometimes rebranding EU medicines to sell to the UK market. The FMD significantly hinders this business model. Buying tablets in Portugal, for example, re-issuing them with an English label and distributing them in the UK will cause alarm bells to ring. Under the FMD, the original manufacturer will

have already registered those tablets in Portugal with a unique serial number. Changing the label alters this registration and pharmacists will be unable to re-dispense the drugs. For PIs to remain compliant, they must re-certify each medicine for the new country it will be dispensed in; providing the original manufacturer allows this. The cost and hassle involved may prove prohibitive and could force many PIs out of the market altogether.

#### REQUIREMENTS FOR SMES

Which brings us to the final sub-group – small and medium-sized pharmaceutical manufacturers. A core requirement of the FMD legislation is the serialisation of individual pharmaceutical packs, via unique codes encrypted in machine-readable 2D datamatrix codes. Besides a randomised unique serial number, the datamatrix codes is required to carry a manufacturer product code, expiry date and batch number.

Some firms have re-engineered their entire production lines to comply with this. While larger companies may be able to afford to do so, not every SME can commit to this kind of investment; hence why the continued delays and amendments to the legislation have prompted so many to kick any proposed operational overhaul into the long grass.

#### TAKING IT OFFLINE

Over the last few months, we've seen an uplift in enquiries for our RF Compliance coder from such firms. As an alternative to expensive production line upgrades, the RF Compliance can pre-code packaging prior to filling. Unlike some of the expensive and complex online solutions better suited to

*A core requirement of the FMD legislation is the serialisation of individual pharmaceutical packs, via unique codes encrypted in machine-readable 2D datamatrix codes*



big pharma, this is an affordable, easy-to-operate, stand-alone system that doesn't interfere with production or compromise line efficiency.

Particularly suited to smaller and even manual packaging lines, the RF Compliance generates a unique code for each pack and transmits it to the printer on a carton-by-carton basis. An integrated camera automatically inspects the datamatrix code, text and pharmacode, ensuring each pack is fully FMD-compliant.

**SIMPLE AND SWIFT**

By taking the process offline, cartons are brought to the line ready-printed and inspected, eliminating any delays due to coding issues. And unlike online coders, which traditionally use continuous inkjet (CIJ) printing



*All-in-one: code generation, printing and inspection*

technology, the RF Compliance uses thermal inkjet (TIJ). CIJ coders have been shown to struggle to consistently produce high quality 2D codes, whereas TIJ is known for its superior print quality and simple, no-mess operation.

The message to SME pharma manufacturers is clear: you must comply, just keep it simple and act fast.

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# Utilizing egg Yolk Powder Effectively Thanks to Continuous Filtration and Drying

An internationally operating pharmaceutical company extracts phospholipids from egg yolk and further processes the by-product into an additive for animal feed. Thanks to technological solutions from BHS-Sonthofen and AVA, the company succeeded in optimizing its processes

Egg yolk is an excellent source of phospholipids. In order to extract these lipids, the user suspends egg yolk powder in ethanol. This suspension is filtered and washed several times. The phospholipids thus obtained are used, for instance, as an emulsifier in the chemical industry or in baby food. The filter cake from the filtration can be further processed into animal feed.

Previously, the egg yolk powder was resuspended in a series of containers and washed out by means of dilution washing. The user

replaced this complex batch process with a continuous process. BHS-Sonthofen analyzed the existing processes and tested alternatives in the laboratory. Ultimately, BHS recommended the use of a belt filter as the most suitable solution.

#### BF BELT FILTER FROM BHS INCREASES YIELD OF PHOSPHOLIPIDS

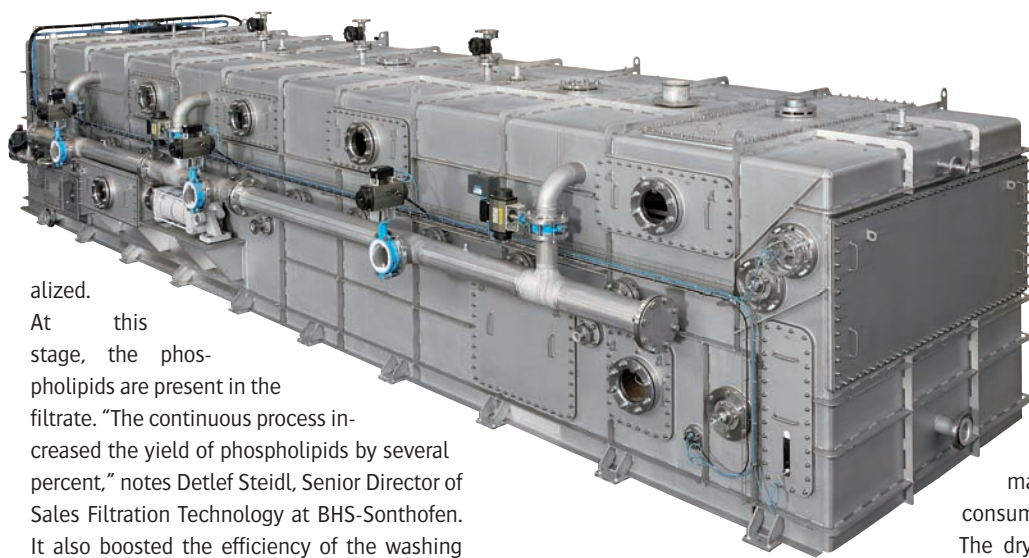
The indexing belt filter used is a continuously operating, horizontal vacuum filter that makes it possible to separate sedimentation solids

gently and reliably. An indexing belt filter of type BF 050-045 B operated with a vacuum pump was installed at the user's premises. The suspension of egg yolk powder and ethanol is continuously fed into the filtration system. The filter medium is a circulating belt that is indexed. The filtrate is drained at each stage individually. As the extraction of phospholipids is a relative fast process, even short active time allows for high yields. By using a multi-stage parallel cake wash system in the filter, a highly efficient positive displacement wash can be re-



AVA installed an HTK-T continuous dryer for drying egg yolk powder





alized.

At this stage, the phospholipids are present in the filtrate. "The continuous process increased the yield of phospholipids by several percent," notes Detlef Steidl, Senior Director of Sales Filtration Technology at BHS-Sontheofen. It also boosted the efficiency of the washing process: The supplied filter is equipped with three nozzle wash systems on the filter. "Compared to the previous process using several containers, washing the filtrate in the belt filter requires significantly less solvent and energy," Steidl adds. The customer is completely satisfied with the filter's performance, and the system has also been validated for the production of pharmaceutical substances.

#### HTK-T CONTINUOUS DRYER DRIES EGG YOLK POWDER TO A RESIDUAL MOISTURE OF 10 PERCENT

The user dries the filter cake to egg yolk powder with a residual moisture content of ten percent after filtration. AVA developed a suitable continuous drying process and supplied the required 1,700-liter HTK-T con-

*BHS-Sontheofen installed a continuously operating indexing belt filter (BF) at an international pharmaceutical company to help them extract phospholipids*

tinuous dryer. The egg yolk powder that has a moisture content of 60 to 65 percent is conveyed from the belt filter to the dryer. Optimized transfer moisture in the integrated filtration and drying system enables maximum efficiency regarding energy consumption, process time and machine size. The dryer delivers a throughput capacity of 485 kg/h.

The filter cake is placed in direct contact with the shaft and the double jacket of the horizontal dryer. Both the shaft and the double jacket are heated with steam. The double jacket is divided into two heating zones in order to ensure gentle heating of the product. The target temperature is between 70 and 80 degrees. A vapor filter passes the evaporated ethanol on to the condensation system. There, the ethanol is collected so it can be used again in the process.

"The rotating mixer continuously feeds the egg yolk powder through the dryer, so it is discharged with less residual moisture than the 10 percent required by the customer," explains Martin Specht, Sales Manager at AVA. "The blades are arranged in such a way that homogeneous mixing takes place and no dead pockets are created." The dried product is finally discharged into a shaft via a manually adjustable weir. There the powder is crushed and then pneumatically conveyed to a double cooling screw, where it is cooled down to 25 degrees. The final product is then filled into bulk containers for further processing before it is sold as a nutrient-rich basic component for the animal feed industry.

## COMPANY INFOS

### BHS-Sontheofen GmbH

BHS-Sontheofen is an owner-operated group of companies in the field of machinery and plant engineering based in Sontheofen, Germany. The company offers technical solutions and consulting services in the field of mechanical process technology, with a focus on mixing, crushing, recycling, and filtration. BHS-Sontheofen has a global presence with more than 400 employees and several subsidiaries.

### AVA GmbH & Co. KG

AVA GmbH & Co. KG, based in Herrsching am Ammersee, provides machines and system solutions for mixing, drying, and reaction processes. The product range of the company, which was founded in 1991, comprises both horizontal and vertical technologies. The in-depth process technology expertise held by a creative and highly experienced team, the outstanding quality of the technical implementation, as well as comprehensive service and consulting have ensured a leading position in the relevant markets for decades. Process technologies from AVA are used in numerous industrial applications. AVA became a member of the BHS-Sontheofen Group in 2018.

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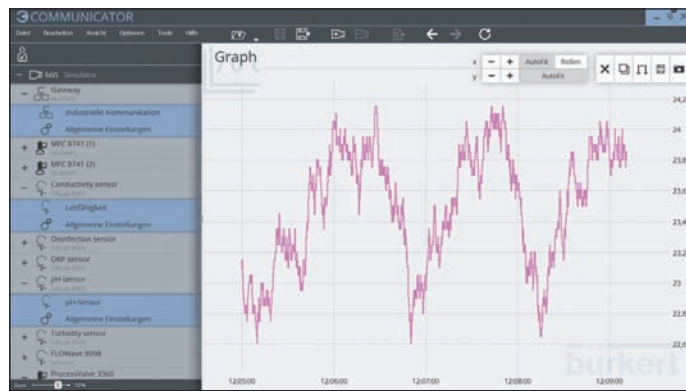
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## More Flexibility for Fluid Control Systems

### Communications platform as a gateway to Industry 4.0

Only when different valve functions and sensors are linked together does a plant also perform a function. This is traditionally done using a PLC. However, the connection of sensors leads to a significant increase in the number of signals. It then becomes more difficult to actually exploit all the possibilities arising from this. That is because every change, no matter how insignificant, requires intervention in the PLC program. The Efficient Device Integration Platform (EDIP) from Bürkert offers a new solution to this problem.

The EDIP clears the path to digital networking for all intelligent Bürkert devices and offers hands-on operating and parametrisation options. For example, it can be used to interlink online analysis systems, flow meters (FLOWave) and mass flow controllers (MFC) very quickly, simply and flexibly. The user can program logic and adapt it to changing processes and operating conditions. The EDIP-enabled devices communicate via an



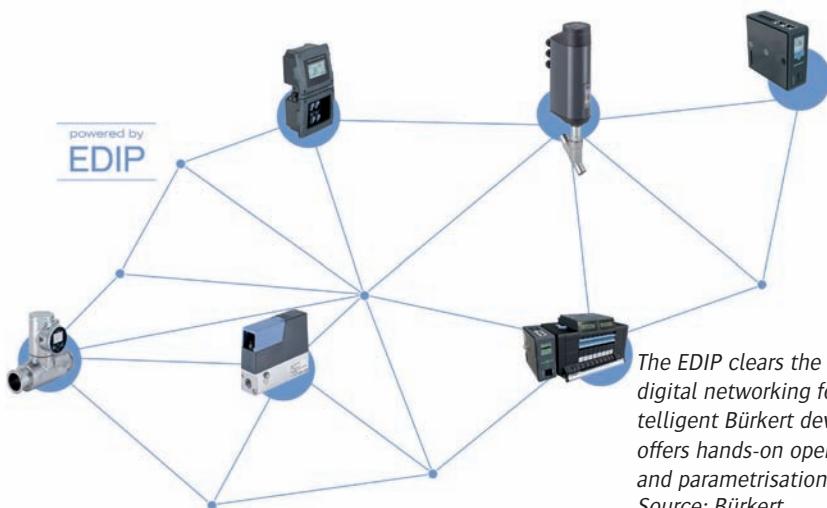
The Windows-based program *Communicator* is used to configure and parametrise all “intelligent” Bürkert products with electrical components and can be downloaded free of charge from the company website. (Image: Bürkert)

interface based on the CANopen industry standard, which was expanded with additional features. This means, for example, that no master is required and the subscribers are automatically addressed. This autonomous sub-system is integrated into the existing network or in the higher-level fieldbus at precisely one location. This simplifies project planning and minimises interfaces.

#### INCREASING PLANT EFFICIENCY

A key module of EDIP is the “Communicator” PC software, which is available to all customers free of charge. The program is used to configure or parametrise “intelligent” Bürkert devices. The graphic programming interface in particular offers numerous practical advantages because it can be used to implement virtually unlimited functions and control application-specific processes, such as controlled mixing of gases, status monitoring or fault monitoring. Custom adaptation and optimisation of sub-processes no longer requires intervention in the control system, thereby increasing system efficiency and saving you time and money. The approach based on decentralised intelligence is not intended to replace the conventional process control system in the majority of cases, but is certainly a useful part of an overall system. In addition to applications in sub-systems, it is possible to create autonomous decentralised systems to implement customised solutions quickly, easily and economically.

➔ 57148 at [www.pcne.eu](http://www.pcne.eu)



The EDIP clears the path to digital networking for all intelligent Bürkert devices and offers hands-on operating and parametrisation options. Source: Bürkert





## DUCTLESS FUME HOOD

User protection with high performance level



The Purair Basic from **Air Science** has been updated to create one of the world's most energy efficient ductless fume hoods. Eco-friendly, advanced carbon filtration technology used in the Purair Basic offers a safe, high performance alternative to conventional ducted fume hoods designed to protect the user and the environment from hazardous vapors generated on the work surface and creates a safe work environment over the widest

range of applications in the industry. Different improvements were made for energy efficiency. The high efficiency ebm-papst EC blower promotes long life and dependable performance while minimizing cost of ownership. Internal testing using primary filters during normal operation documented energy consumption of 22-50 watts. The fume hoods have energy-saving LED lighting that provides comfortable illumination to the work surface without significant heat output. The filters are easy to change, with the leakproof filter clamps it can be performed without the need for tools. Purair Basic products are available in 3 standard widths, 2 depth options, in metal or polypropylene construction, totaling 12 standard models.

►► 56788 at [www.pcne.eu](http://www.pcne.eu)

## ROBUST FLOWMETER PLATFORM

Protection from overvoltage line faults up to  $\pm 60V$



**VPInstruments** announced that the VPFlowScope electronics platform has been upgraded providing more robust protection against static discharges and short-circuiting.

We implemented a new, ultra-robust Modbus transceiver circuit, which can hold up to  $\pm 60V$  on A and B lines. It can also allow a larger common mode range of  $\pm 24$  Volts, which makes biasing of your RS485 network less critical. This transceiver was already in use in the VPFlowScope M and has now been integrated into the complete product line, including the VPFlowScope Probe, DP, and In-line. In many industrial devices, for example, compressor controllers and sensors, RS485 transceivers are easily blown by static discharges, especially when connecting wires for the first time without any protection. Therefore, static protection is very important. We also experienced that one of the most common wiring errors is to reverse data and power lines. Connecting the 24V power supply across the data lines of any traditional RS485 port will result in the transceiver chip going up in smoke, which means the end of your device. All your VPFlowScope products are now protected with the new integrated overvoltage protection. The new transceiver will protect against incorrect connection and the data lines will withstand connection to 24V power indefinitely. The protection is rated for a maximum of  $\pm 60V$ .

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FREE DIGITAL SUBSCRIPTION

## HIGHLY ACCURATE CO<sub>2</sub> PROBE

Heated Sensing Module for improved measurements



**E+E Elektronik's** new probe measures CO<sub>2</sub> concentration up to 5 % (50000 ppm) and features active pressure and temperature compensation with on-board sensors. The heated, replaceable CO<sub>2</sub> sensing module and the

long-term stable dual wavelength NDIR operation principle lead to outstanding measurement performance even under harsh and condensing conditions. With its temperature range -40...60°C (-40...140°F), the EE872 is appropriate for most CO<sub>2</sub> monitoring applications. The multi-point CO<sub>2</sub> and temperature adjustment ensures best accuracy over the entire working range. The probe incorporates the E+E dual-wavelength NDIR CO<sub>2</sub> sensor, which is highly insensitive to pollution. Due to auto-calibration, the sensor also shows excellent long-term stability. On-board sensors compensate the effect of temperature, altitude or weather changes on the CO<sub>2</sub> measurement. This leads to highly accurate CO<sub>2</sub> reading independently of the environmental conditions. The heating prevents condensation inside the sensing head. Thus, the EE872 is appropriate for use in high humidity and condensing environment. The modular design facilitates the replacement of the interchangeable, pluggable sensing module. The robust IP65 stainless steel or plastic enclosure and the replaceable PTFE filter cap provide optimum protection against contamination.

►► 57171 at [www.pcne.eu](http://www.pcne.eu)



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# Full Traceability for Formulated Milk Products

Meeting tight deadlines implementing a new software system was a main concern when Kendal Nutricare was searching for a partner

An IT solution from CSB-System, devised and installed within a very tight deadline, is providing full production control and monitoring along with comprehensive traceability at Kendal Nutricare, a leading pharmaceutical research company and supplier of an extensive range of products including infant formulas and cereals, adult formulas, pharma grade allergen-free and lactose-free powders and complete meals.

The Kendal Nutricare factory in Kendal, UK was acquired by food scientist and entrepreneur Ross McMahon from Heinz in June 2015. While the factory had an existing SAP system, the licensing agreement was expensive, and a new solution had to be sourced and running by the beginning of December. CSB was able to react very quickly to the initial enquiry, providing a proposal that outlined how the new system could be installed and implemented to meet these tight deadlines.

“Selecting CSB-System was one of the best decisions we made,” says Ross McMahon. “Any ERP system can be modified to give you exactly what you want – but you have to create it all yourself from scratch. This can be time-consuming to deliver. “With the CSB-System the right modules, processes and tables for food manufacturing are already in place and this makes it much faster to set up, which was particularly important for us. We were able to be up and running extremely quickly and the system then gave us the flexibility to adapt it as we moved forward.”

Kendal Nutricare employs advanced quality manufacturing processes, along with high-speed filling lines that are able to pack in metal and composite cans, bag-in-box and sachets. The CSB solution provides full



*Providing full control and monitoring at every stage of the operation with comprehensive traceability*

control and monitoring throughout these processes, with comprehensive traceability at every stage of the operation. This is critical to guarantee the quality of every product that leaves the factory and an essential part of the highest standards and accreditations that Kendal Nutricare implements. All ingredients are ordered and then receipted into the factory through the system. Stock management allows the production team to plan each run, calling off the ingredients as required.

As product moves through each stage of production, this is recorded in the CSB-System using hand held terminals. Equally important, the system is able to interface with

other equipment, for example during the blending operation. Finished goods are then recorded back into warehouse storage, with scanners on the forklift trucks to help monitor goods in and out, before being called off for delivery. Stringent quality control and testing are also linked to the CSB-System so that each test batch can be traced back to its particular production run.

“Ultimately, for every pack we produce, we know exactly what it contains, when it was produced and from where the ingredients were sourced, and this provides the high level of safety and traceability that is essential for these types of products,” explains Ross. CSB’s commitment to ensuring the project







*Filling lines are able to pack formulated milk in metal and composite cans, bag-in-box and sachets*

was completed on time meant the team was on hand throughout, with key personnel on site during the critical stages to ensure as smooth a transition as possible. "There was huge knowledge within the CSB team," confirms Kendal Nutricare's IT Manager Sarah Woodhams, "and even if not on site, the relevant person was always easily available at the end of a phone to give us help and advice. "What was particularly beneficial about the CSB approach was that there were specialists for every part of the system, including the hand-held devices, production, finance or sales, so not even the smallest of details were missed."

"The phrase 'hitting the ground running' is probably overused but it does exactly sum up the challenge we faced, with just six months to get this new system in place and operational," concludes Ross McMahon. "That we achieved such a massive project in this short space of time is a tribute to the dedication of the staff here and to the professionalism and commitment of CSB-System. It was truly a team effort and it has made a vital contribution to the business, in particular in supporting our unflinching commitment to the highest quality standards."

►► 57149 at [www.pcne.eu](http://www.pcne.eu)

## Upgraded Generation of Data Logger With Remote Data Transmission Unit

**For years, KELLER's GSM-2 has provided a simple way of remotely tracking pressure, fill and water levels, and monitoring limits. Now, this proven device has been upgraded and given a new name: ARC-1, the Autonomous Remote Data Collector**

In the interests of compatibility, the ARC-1 incorporates the same functions as the GSM-2 but also includes some new features, as the 3G mobile network, or 4G if required. The new radio modules also allow the device to be located via the mobile network. The data logger can also be supplied with an e-SIM upon request. The system status information, including battery status and signal strength, has been supplemented by a moisture sensor. A real-time clock (RTC) now has been integrated into the data logger. Existing GSM-2 data loggers can also be upgraded easily to ARC-1 data loggers if the existing 2G network at the measuring point is no longer available.

### PRESERVING PROVEN FEATURES

The new generation has not changed in appearance. At just 48 mm in diameter, the cylindrical design of the ARC-1 can simply be placed into the top of a two-inch-wide sounding tube standard in the groundwater measuring industry. The housing is designed to withstand condensation and temporary flooding. The sealed antenna is covered by a lockable protective cap made of robust plastic. This protects the data logger against theft and damage. Complete with energy-efficient electronics and a premium-quality lithium battery (3,9 V/32 Ah), the logger can transmit the results of 24 measurements every day by e-mail, SMS or FTP for up to ten years. Its fastest measure-

ment rate is 1 measurement per minute. With two input voltages (0...5 V), two digital inputs, one bus interface (RS485) to operate up to five level sensors and an optional SDI12 interface for water analysis devices, the ARC-1 data logger is a universal data collection module for wide area measurement networks. A flexible, easy-to-use, open-source "DataManager" software covers the key functions of a monitoring, collection, control, and organisational unit for the ARC-1. The DataManager collects the measurement data, assigns it, puts it in charts, reports any limits that have been exceeded, and stores it in an open-source MySQL database.

►► 57170 at [www.pcne.eu](http://www.pcne.eu)



# Ensuring Explosion Safety in Bucket Elevators

How you can convey combustible bulk materials safely.

By Jim Vingerhoets, Global Product Manager Explosion Protection, Fike

Bucket elevators are widely used to transport agricultural bulk materials such as grains, seeds or pellets from ground level to the top of storage silos. Buckets are attached to a vertical belt, rotating around a drive pulley in the head section and a free pulley in the boot section. Metal casings are built around the belts and pulleys to prevent spillage. High rotation speeds maintain the transport capacity.

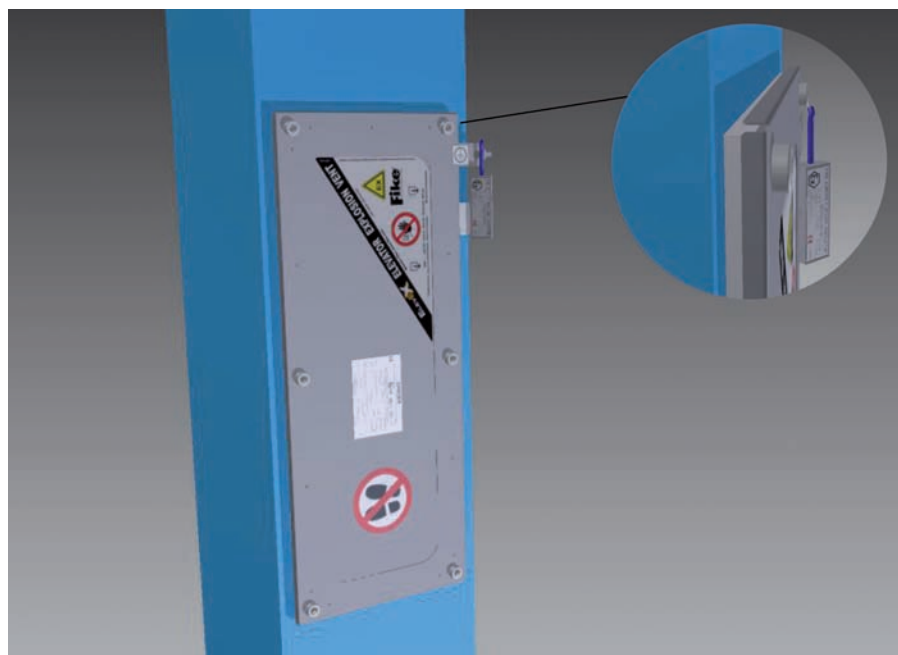
History shows a high number of dust explosions originate in bucket elevators and spread into adjacent galleries and silos. The construction and operation of bucket elevators is such that combustible dust clouds and potential ignition sources are omnipresent. In the grain handling industry, the bucket elevator is

considered among the most dangerous pieces of equipment. Although the increased application of good housekeeping practices and explosion prevention strategies have reduced the number of explosions, elevator explosions continue to be reported, causing considerable property losses, human suffering and sometimes, loss of life. The October 2011 devastating explosion at the Bartlett Grain Company near Atchison, Kansas claimed six lives and injured several others.

If the bucket elevator is conveying a combustible dusty product containing a considerable amount of fines (< 0.5 mm), explosive dust clouds may arise frequently during normal operation. Dust can stick to the inner sur-

faces of the bucket elevator and dust layers can accumulate over time to form an explosive atmosphere if they become dispersed by vibration. Although dust extraction is often used to reduce the dust emissions, it cannot eliminate explosive dust clouds completely. With bucket elevators there is also a high risk of ignition due to fast mechanical movement. The following ignition sources are the most reported upon: Hot surfaces arising from friction, mechanical sparks from loose parts colliding with the casing, electrostatic discharging of belt, buckets or any conductive installation component that is not well earthed, metal or glowing parts that enter the elevator with the bulk product, and finally welding, grinding or cutting works on an uncleaned elevator. In addition to strict cleaning, maintenance and permit to work systems, the correct choice of construction materials, application of clearances, belt slippage and misalignment detectors, bearing temperature detectors and the use of upstream product cleaners, safety grids, magnetic separators and hot particle detectors will reduce to risk on ignition considerable, however, they are almost never sufficient to reduce the explosion hazard to a sufficient low level. Additional explosion mitigation measures are mandatory, unless proved otherwise.

The most used explosion mitigation method is explosion venting. Fike ELEGUARD burst or venting panels are installed at strategic locations along elevator legs and head, rupture at moderate explosion overpressure and prevent that the elevator casing itself is destroyed. The burst pressure, size, number and location of the panels is key to effective protection. Typical leg inter-vent spacing is 3 m, 6 m or



An ELEGUARD mounted on elevator casing





Bucket elevator where the upper part is protected by Active EP and the lower part by Passive EP

12 m, depending on the mechanical strength of the elevator casing and explosion reactivity of the dust. ELEGUARD panels fit on most elevator leg and head geometries, and have integrated bottom and top frame allowing fast and safe installation with a minimal amount of footprint, and without dangerous welding work required.

If the elevator is located indoors or in occupied areas, flameless venting is used to protect people and equipment from freely discharged flames. A Fike ELEQUENCH is a box of flamefilter material installed on top of an ELEGUARD panel, allowing the panel to open within the box and forcing flame to pass through the flamefilter where it is extinguished by cooling. The low weight of ELEQUENCHES and optimal venting efficiency ensure easy installation with minimal footprint.

Venting and flameless venting technologies are relatively inexpensive, have low main-



2011 Barlett Dust Explosion - originated in Bucket Elevator

tenance requirements and can be rapidly installed and replaced. However, they have also several weaknesses: they do not prevent explosion propagation to adjacent feed or receiving systems, they do not prevent post explosion fire damage, they cannot be used with toxic or environmentally harmful materials, and in some cases a lot of devices are needed for low pressure structures.

Superior protection to tackle these weaknesses is achieved by explosion suppression. Then bottles with extinguishing agent are used to stop the combustion process in an early phase. Within milliseconds, the beginning explosion is detected, the bottle valves opened, and an excess of agent discharged into the elevator. Fike HRD suppression bottles are installed on free elevator volumes where the ignition risk is the highest, such as head, boot and possible intermediate chutes. Explosion detection is achieved by pressure and optical detectors. Pressure detectors will not respond until the explosion pressure has risen to a detectable set level and the optical detector will signal within milliseconds once the flame is visible. A combination of both pressure and flame detection will ensure that suppressors activate and keep the explosion overpressure and propagation extension to a minimum. Fike 3" HRD radial suppressor nozzles uses minimal space on the head or boot casing and direct injected suppressant agent into the elevator such that explosion propagation risk out of head or boot is minimized. To

eliminate the risk of explosion propagation to connected areas and equipment completely, additional suppression bottles are installed on the connecting ductwork.

Although the initial investment cost with explosion suppression is higher than with explosion venting and regular specialized maintenance is required, it provides full extinguishment of the fireball, and prevents explosion propagation to feeding or receiving systems, which is often the most critical measure in the hazard reduction.

In addition to offering a full range of dedicated explosion mitigation devices that minimize capital investment and cost of ownership, Fike has over 70 years of experience with designing the most effective elevator protection system. Fike executes its own explosion experiments in representative equipment to get a deeper understanding on the course of elevator explosions and optimize protection schemes. Fike's in house structural strength engineering capabilities and explosion testing laboratory have been used in a multitude of projects for the determination of the explosion pressure shock resistance of the elevator casing and the explosion reactivity of the fines fraction of the bulk product conveyed. Finally Fike provides by default professional help with the application of public elevator protection guidelines such as NFPA 61, NFPA 68, VDI 2263 Part 8 and TR 16829.

►► 57146 at [www.pcne.eu](http://www.pcne.eu)



# Oil-free E-Compressor Family

The successful screw compressor generation Delta Screw from AERZEN gets an addition: With the VM 100 compressor package, the versatile E-Compressor series now comprises seven model variants

The new development of Aerzener Maschinenfabrik was introduced at COMVAC 2019, the leading international trade fair for compressed air and vacuum technology. The new compressor type is designed for a volume flow range from 1500 to 7620 m<sup>3</sup>/h and covers a maximum differential pressure of 3.5 bar. AERZEN is thus responding to specific practical requirements in the low-pressure range and the constantly growing demands for high-performance and efficient technology. All in all, the broad product range of E compressors includes 7 sizes in the volume

flow range from 330 to 7,620 m<sup>3</sup>/h and drive capacities from 30 to 630 kW.

A special feature of the new model type is the already integrated acoustic hood fan. Another new feature is the space-saving horizontal position of the discharge silencer. Like all E-Compressors of the series, the VM 100 has an acoustic hood with internal supply and exhaust air louvers, which favours the compact design. Flow-optimised intake channels minimise pressure loss significantly. A significant improvement in performance can be achieved by supplying cool outside

air directly into the intake filter. Unique is the absolutely oil- and absorbent free compressed air technology of AERZEN. Oil-free operation is certified according to ISO 8573-1/Class 0.

The patented principle of the built-in reflection silencer protects against contamination and ensures process reliability over the entire service life of the system. And the latest addition to the E-Class also impresses with its flexibility. Various equipment options and a comprehensive range of accessories complete the VM 100's operational capability. Efficiency and performance of the Delta Screw E-Compressors are safely controlled by the AERtronic software. The integrated panel reliably and conveniently monitors the intake, discharge and oil pressure as well as the discharge and oil temperature.

According to the manufacturer, all Class E screw compressors score points with a strong energy balance. The technology leader from Aerzen calls the sophisticated concept of performance optimisation and resource utilisation, profitability and flexibility "efficiency plus". With a saving of up to 6 % in energy costs over an operating period of 10 years, the investment volume is almost covered.

The specialisation in application-oriented customer solutions testifies to the competence and experience of the renowned mechanical engineering company. Special solutions, also ATEX-compliant, prove the excellent references from various industries and fields of application. Even under difficult environmental conditions or with special gases, the best possible results can be achieved.



►► 57153 at [www.pcne.eu](http://www.pcne.eu)



# Efficient Filter Dedusting

## Modular filter cleaning system for best results with smallest effort

Optimal cleaning results, individual construction thanks to the modular principle, all components from a single source: This is the new Flex-on filter cleaning system by IMI Buschjost. As the new 85870 series, it completes the range of Flex-on filter cleaning systems and will be available from summer 2019.

When using filter cleaning systems, the trend is clearly towards all-in-one solutions: Users obtain complete systems from a single supplier rather than purchasing individual components from different providers. IMI Precision Engineering focuses on precisely this with its Flex-on series: The "one-stop shop" principle reduces the number of suppliers and is also significantly cheaper than costly tank construction and installation of purchased parts by users themselves. Construction and manufacture of the new Flex-on system are

based on the requirements of the EN 13445 standard, harmonised with the Pressure Equipment Directive 2014/68/EU. This ensures safe usage of the pressure vessel from the initial commissioning onwards; further pressure tests and risk analyses by the user are no longer necessary.

Thanks to its modular construction, the new Flex-on system can be adapted perfectly to the individual requirements of the user. Due to Plug and Play, a particularly easy integra-

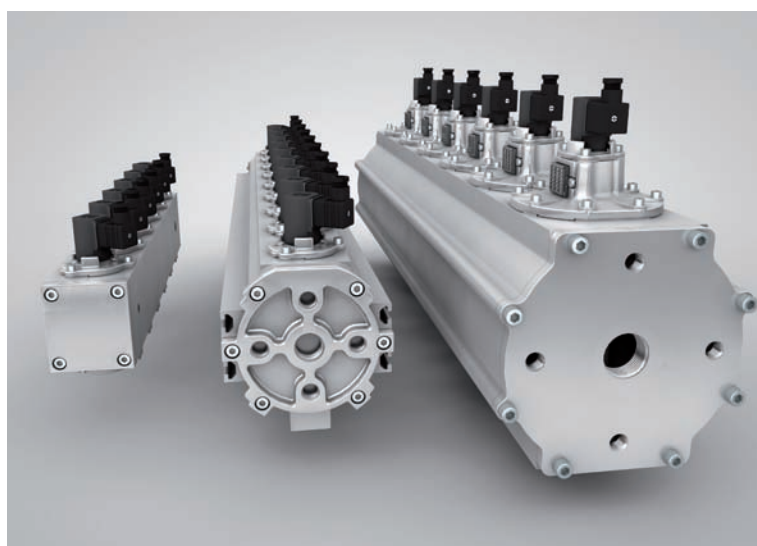
tion into existing units is possible. A tank up to three metres in length with an internal diameter of 220 millimetres forms the basis of the system. It is made of a high-quality aluminium profile that is durable and non-corrosive. Its smooth surface makes the tank especially resistant to dust and

dirt so that the system can also be used in the food industry without any problems. According to the user's requirements, the tank can be fitted with dust collector valves in nominal sizes DN 40 to DN 65; in its maximal length up to 20 valves could be integrated. These offer high pressure peaks, minimal deflection of the coil gas and extremely quick opening and closing times due to the use of high-quality TPE diaphragms. Compressed air consumption and operating costs go down whereas the cleaning of the filter elements is particularly efficient.

The Flex-on series is designed for a maximum pressure drop to 0 bar. The system works without pressure loss or leakages at a media temperature between -20 and +85 °C; the maximum operating pressure is 8 bar. Further components could be added to the system depending on the area of application. IMI Precision Engineering provides the matching accessories here, too, such as valve controllers from IMI Buschjost. These show the degree of contamination of different filter elements reliably and give the signal for cleaning as soon as the threshold is exceeded.



*New filter unit (right) in comparison with other units of the Flex-on range*



►► 57160 at [www.pcne.eu](http://www.pcne.eu)



# Without Leaving a Trace

**In Wallonia, the southern part of Belgium, the BEUMER Group Pipe Conveyor transports fly ash quietly and dust-free, passing through motorways, railways, residential areas and steep rocks**

In the past, a coal-fired power plant was once in operation in the Belgian town of Flémalle. The coal residues are landfilled on a fly ash stockpile. Now, the stockpile is to be entirely emptied and the terrain transformed into a nature park. A BEUMER Group Pipe Conveyor is being used to transport the fly ash to the Maas river for shipment. The system has not only been adapted to operate along the steep mountains, but its enclosed design prevents the volatile material from coming into contact with the environment, while enabling a low-noise transport to the destination. This is important as the Pipe Conveyor passes over public motorways, railways and residential areas. This extraordinary project is characterised by the cooperation of the team with the customer Tractebel Engineering (Group ENGIE). The transport of the fly ash is carried out in strict compliance with safety standards, taking

into consideration environmental protection and the effect noise pollution has on the local residents.

The neighbourhood around the Belgian town of Liège is calm and picturesque with small villages along the Maas. The forests and landscapes are partly untouched and present a unique fauna and flora. Industrialisation started very early in the region of Wallonia, as coal was available in abundance. Even though the mines were closed years ago, there are still residues of slates and stones or bottom ash. For example in Flémalle, less than 20 km away from Liège: for approximately 50 years there are about two million cubic metres of the mentioned materials in a fly ash stockpile within proximity of the once largest coal-fired power plant. The stockpile is indeed surrounded by a wall, but according to a study, in the long run, it will represent a major threat for the lo-

cal residents as it is displaced every year by several millimetres. In addition, the fly ash is an important additive in the manufacture of cement and concrete. It must be prepared to remove foreign substances such as wood or metal and to limit the grain size to 70 millimetres for the cement industry. In a project that is the only one of its kind in Europe, the Belgian power supplier Elektrabel commissioned its subsidiary Tractebel Engineering (ENGIE) to dimension and install a processing plant. The company offers engineering and consulting solutions for the energy and nuclear energy sector as well as for industry and infrastructure. It is planned to dissipate the complete stockpile in the next ten years, and to transform the terrain into a nature park, which will be developed according to the wishes of the local residents and authorities.

## PIPE CONVEYOR: THE ECONOMICAL ALTERNATIVE

Until then, the bulk material has to be transported to the Maas that is approx. two kilometres away (bee-line). However the terrain is very mountainous. The use of trucks would imply driving on public roads for long distances. This would have caused detours, slowed down transport times and raised costs. In addition, the environment would be harmed by exhaust gases, dust and noise. The project lead opted for the BEUMER Group Pipe Conveyor as economical alternative.

“To be able to support companies like Tractebel Engineering with turnkey solutions, we have bundled our comprehensive expertise worldwide spanning various industries and established different Centres of Competence”, says Vincent Ferlay, Managing Director BEUMER



*Demanding assembly work to get the conveyor operational*



BEUMER Group installed a ship loader at the end of the conveyor line. It consists of a fixed boom with an extendable telescopic belt conveyor. Every day, 2,000 tons of fly ash are loaded on a ship

Group France. "It includes also our Pipe Conveyor. This international team bundles the know-how and supports the Sales Department and the Project Management. With Tractebel ENGIE we have developed a solution adapted to the special routing and the ambient conditions", explains Ferlay.

### DUST-FREE CONVEYING

The system supplier provided a conveying system with a centre distance of 1,800 meters. "Due to the system design and the required system capacity, we have designed the Pipe Conveyor with a diameter of 260 mm," explains Ferlay. The conveyor transports 300 tons of fly ash per hour at a speed of 2.3 meters per second. Most importantly though: the enclosed transport of this machine protects the environment from the dry and dusty material. This was an important requirement for the construction of this solution to be approved in the first place. "The project planning absolutely had to guarantee a safe transportation of the material," reports Ferlay. "The fly ash had to be prevented from exiting or falling on the ground, even in the smallest quantities", since the route passes public motorways, railways and residential areas. The noise emission played an important role too. "We had to minimise the noise to an extremely low level," he describes. The team



developed special sound-absorbing elements that were also used to enclose the Pipe Conveyor bridges. "Along certain line sections, the noise level had to be kept under 35 dB(A)," says Ferlay. This is also possible with special sound insulation, idlers and low-noise bearings. The Pipe Conveyor transports fly ash across the open environment, navigates large inclines reliably and can be designed to accommodate tight curve radii. This is why only a few transfer towers are required, depending on the length of the conveyor, the terrain conditions and the curves. BEUMER Group can customise the conveying system to match the individual routing, thus protecting the environment and reducing the costs. The system supports

are up to ten meters high. Durable conveyor belts guaranteeing tensile strength are used. BEUMER Group makes use of own dimensioning programs to determine the ideal belt design, thus enabling to analyse tractive forces but also forces which occur due to acceleration and deceleration – always taking into account the net weight of the belt and the transported material. This method also lets you calculate possible curve radii. "This is particularly important for ascending and descending conveyors," describes Ferlay. For these types of projects, BEUMER Group also offers feasibility studies and profitability calculations. The colour scheme was selected so that the system blends in well with the environment.



This is where the conveying begins. The material is transported from the stockpile onto the Pipe Conveyor

### EFFICIENT SHIP LOADING

The system supplier provided the turnkey system and all of the necessary components such as filters, strippers and dedusting units. The system provider also provided the engineering, automation and the steel structure, as well as loading systems: excavators load the material into hoppers and on vibrating feeders. From there it is transported to the feeding area of the Pipe Conveyor. BEUMER Group installed a ship loader at the end of the conveyor line. It consists of a fixed boom with an extendable telescopic belt conveyor. This way the ships are loaded efficiently. The ship loader is also equipped with a dedusting unit which keeps the process emission-free. Every day, 2,000 tons of fly ash are loaded on a ship and from there transported to a cement plant.

►► 57162 at [www.pcne.eu](http://www.pcne.eu)



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N° 5 - MAY 2019

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## Fast Laser Particle Sizer



**Wide measuring range for analysis in production and quality control, research and development**

Due to the especially wide measuring range of 0.01 - 2100  $\mu\text{m}$ , the Fritsch Analysette 22 NanoTec is a universally applicable Laser Particle Sizer for efficient dry and wet measurement of particle size distributions down into the nano range. It is ideally suited for particle size analysis of powdery samples, of solids in suspensions and of emulsions. Your advantage: extremely simple operation, perfect measurement, short analysis times and consistently reproducible and reliable results. And a convincing combination of price and performance. The dispersion method can be

changed easily and quickly following the need of the customer's measurement. Therefore the device consists of a compact measuring unit that can be quickly and easily combined with different dispersion modules for dry or wet measurement according to on the measuring task. The measuring cells of the different dispersion modules are located in practical cartridges that can be exchanged with a single motion - without changing any hoses or modifying the instrument! Your advantage: This makes you flexible and you can easily modify it at any time.

**PERFECT FULLY AUTOMATIC MEASUREMENT AND EVALUATION**

The ANALYSETTE 22 NanoTec software contains completely predefined SOPs (Standard Operating Procedures) for nearly all typical measurement tasks, making operation especially easy. Via a well-arranged input mask, these SOPs can be completely free and flexible modified to perfectly suit each measurement requirements. For perfect evaluation of the measuring results integrated standard reports are offered. A freely editable report generator allows to organise the measurement reports individually. Graphics as well as all measuring parameters, statistical values or selected measured values can be incorporated in a report.

►► 57159 at [www.pcne.eu](http://www.pcne.eu)

### HYGIENIC FEEDING HOPPER

For use in Ex zones 22 and 2



**AZO's** hygienic design feeding hopper serves to feed bulk solids in powdered and granular form into closed materials handling systems, especially in areas calling for the highest standards in hygiene. Products can be fed from sacks, boxes, barrels or similar receptacles. The feeding hopper is available in two different grades of stainless steel and, depending on the surface finish, has surface roughness of  $< 0.6 \mu\text{m}$  or  $< 0.8 \mu\text{m}$ . The radii on the

inside of the feeding hopper are greater than 50 mm and can be cleaned leaving no residue at all. Wet cleaning is done via an integral spray head. The gasket used for the lid can easily be replaced when needed, as it is not attached with adhesive. It is composed of silicone and is metal detectable. The feeding hopper is suitable for use in areas in zones 22 and 2 where there is a risk of explosion. To avoid dust escaping when sacks are discharged, an aspiration process can be connected that starts when the lid of the feeding hopper is opened. The lid switch complies with safety requirements for applications up to performance level D.

►► 57161 at [www.pcne.eu](http://www.pcne.eu)

### IN-LINE POWDER SAMPLING

Safe and hygienic testing and transportation



The **GEA** auger and vacuum samplers provide a reliable way to accurately take powder samples safely and hygienically while ensuring that the powder isn't contaminated or damaged in the process. The auger sampler uses technology that delivers the most accurately controlled powder sample. It is easy to setup, configure and

control. The auger sampler is recommended for applications in which the sampling point is near the sample destination. By contrast, the vacuum sampler is best used when the sample point is further away from the testing location. The model complies with the latest relevant global requirements and provides either a two-pot, or six-pot diverting head for maximum flexibility. Both models provide improved sampling accuracy compared with a traditional scoop sampler; are easy to operate, maintain and install; and allow samples to be taken in line with a programed schedule to meet operational requirements.

►► 57163 at [www.pcne.eu](http://www.pcne.eu)





# Tomorrow's Technology Today

**Industrie 4.0, or the Internet of Things: the Sigma Air Manager 4.0 (SAM 4.0) makes it all possible, the ability to make predictions far in advance, know today what the future holds, network components and exploit much larger data volumes than ever before, whilst also ensuring significant energy cost savings and delivering a reliable, consistent and efficient compressed air supply**

Presenting the latest generation of SAM 4.0 – the master control system for all your compressed air production and treatment components. It optimises pressure values, automatically adjusts compressor system air delivery to accommodate fluctuating pressure demand and optimises system efficiency based on control losses, switching losses and pressure flexibility. Moreover, the SAM 4.0 enables your compressed air station to take advantage of future services such as Sigma Smart Air, for predictive maintenance. All of these features not only boost operational reliability and efficiency, but also significantly reduce energy costs.

## **BEST POSSIBLE PRESSURE QUALITY, TAILORED TO SPECIFIC NEEDS**

This is in no small part made possible by Kaeser's adaptive 3-Dadvanced Control, which

takes into account additional factors, aside from switching losses (start/stop), that affect compressed air system energy efficiency. These include control and idling losses, frequency converter operation and pressure flexibility (average increase above required pressure). The patented optimisation method predictively calculates the optimum achievable configuration and adjusts the connected components accordingly - all based on the specific pressure required by the user.

## **WHEN MACHINES TALK**

The SAM 4.0 supports operation in 30 languages, while the easy-to-use 12-inch colour touchscreen shows at a glance whether the station is operating in the 'green zone' from an energy management perspective. Operating status, pressure history, free air

delivery, power consumption, as well as maintenance and any error messages can be easily displayed and analysed - both in real-time and retroactively. Using a PC and network connection, this data can be accessed conveniently from anywhere, not just at the machine itself. This not only gives users peace of mind and lays the foundation for digital products in the pipeline, it also enables energy management in accordance with ISO 50001.

## **SIGMA NETWORK**

The far-reaching benefits of the SAM 4.0 are expanded even further when users take advantage of Kaeser's Sigma Network. Based on Ethernet technology, the powerful Sigma Network is a closed and secure network that has been specially developed to support optimal monitoring and coordinated control of compressed air stations.

## **SAM 4.0: FUTURE-READY**

Moreover, the SAM 4.0 is versatile in other ways. An interface for plugin communication modules lends itself to flexible adaptation to accommodate future requirements. The SAM 4.0 is up to date with the latest trends and ensures the reliable, cross-system exchange of data and information.

## **SAM 4.0: UPGRADABLE**

The SAM 4.0 is designed to accommodate potential future compressed air system expansion. A straightforward software upgrade allows for expansion with no need for additional investment in new hardware.

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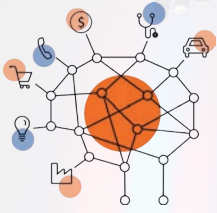
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