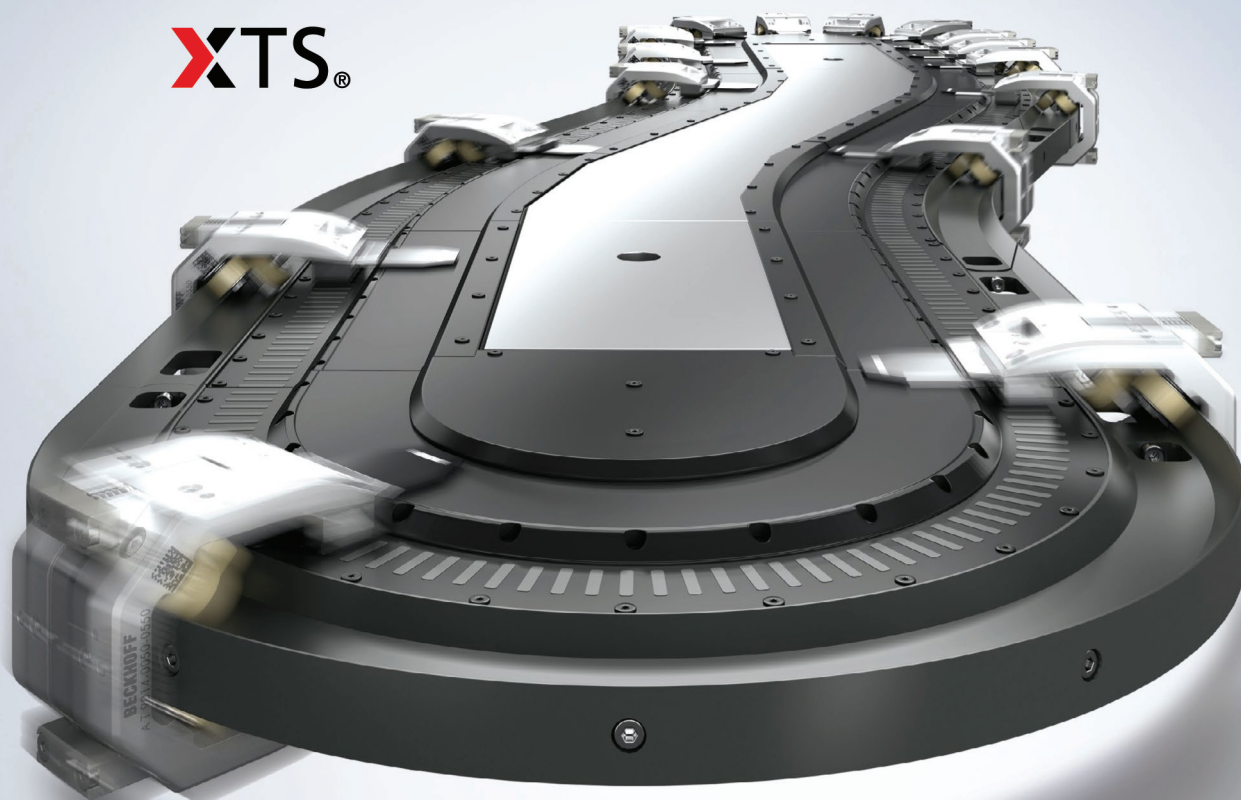


What's New in

PROCESSING

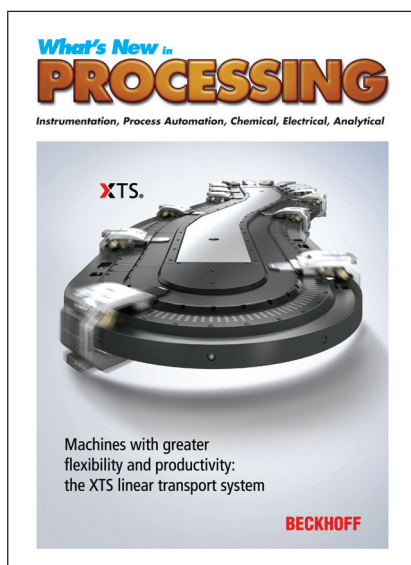
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Machines with greater
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What's New in Publishing
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On the cover ...

XTS Increases Flexibility in The ***Quickly And Easily From Blister To Carton Packagin***



Elos Medtech from Gørløse, Denmark builds its own machines for the production and packaging of dental components and aims at standardizing automation throughout.

An XTS-based blister packaging machine from 2018 demonstrates the advantages of the platform concept. After expanding the XTS linear transport system, Elos was able to easily add new machine modules for cartoning the blisters.

Elos Medtech is one of Europe's largest and leading manufacturers in the field of orthopaedic and dental implants, headquartered in Sweden.

The company employs 570 people in Sweden, China, the U.S. and Denmark and is part of the listed Elos Group. The factory in Gørløse, Denmark, specializes in the development and manufacture of dental components.

In 2018, Elos Medtech was the first company in Denmark to develop a new packaging machine based on the XTS from Beckhoff. Leveraging the flexibility of the modular transport system with the individually controllable movers, Elos was able to automate the previously manual packaging of dental components in blisters.

In day-to-day operations, the fast changeover capabilities of XTS help to increase productivity and reduce resource consumption.

"We need to run many different, small-volume batches every day, so the flexibility of the machine and its quick changeover capability is crucial for us. It only takes 10 to 30 min to adjust the packaging machine's setup," says Rune Callesen, head of the automation department at Elos Medtech.

"This packaging machine is fully validated against the strict requirements applicable in the medical industry for a clean and dust-free environment, high precision, reliability, quality control and testing for complete traceability."

Simple machine expansion with XTS

For Elos Medtech as a machine builder, the goal is to standardize the automation of its machines across the board.

According to Rune Callesen, the recently expanded packaging machine is a good example of this: "We are very far along in standardizing

Packaging Of Dental Components

g

our automation, not least compared to the larger machine automation vendors, where this is an extensive and lengthy process.

“With ‘Elos Medtech Modulized Automation Standard’ we have created a uniform platform that includes hardware, software and networking.

“This means we can easily move modules and add hardware, and all cable or network connections and software interfaces are standardized.

“With this packaging machine, we fully applied our standard, which benefited us when we added extra modules.”

With the new modules, the machine will be able to package components in both loose blisters and blisters with cardboard outer packaging and printed labels in the future.

This requires an additional paper cutter in the machine, a magazine module for the carton blanks and a new printer module.

Carton packaging will be fully introduced in the summer of 2023, and until then, packaging will continue in loose blisters.

Elos has also added two vision modules that check the items being packaged as well as the placement and content of the labels. Previously, the machine contained two robots installed in the machine bed.

After the expansion, the robots are mounted on rails on the ceiling of the machine cell and can move freely back and forth to free up space and to handle more tasks.

Maximum flexibility and integration capability

Rune Callesen says it inspires great confidence that the technologies on which the 2018 machine is based are so well thought out to enable long-term use.

Everything is modular and reusable; everything is open and easy to use, he explains. This allowed Elos to simply add machine modules without any hassle, instead of building a whole new machine, which ensures both sustainability and investment protection.

“The open platform from Beckhoff supports our way of thinking. We can tie everything together and even integrate third-party hardware seamlessly. In doing so, we don’t have to work with multiple types of automation software. That’s a big advantage for us.

“For example, our vision cameras and the servo equipment for the robots come from two other suppliers. It would have been more difficult for us to integrate these with automation technology from any other supplier than Beckhoff,” says Rune Callesen.

He also points out that third-party software can also run on the Industrial PC without additional effort. One example is the printer, which uses specific software, yet can be installed directly.



Product insertion into a blister transported by a XTS mover

The alternative would have been to develop a complicated solution involving the transmission of print commands via the network or to use an separate PC for printer control.

The network structure is also easy to work with because the EtherCAT Coupler from Beckhoff with Fast Hot Connect ports takes care of identifying the modules in the network topology if they are moved.

This technology makes it easy to quickly create the correct configuration for all connected components, according to Callesen.

“The technologies just work – for us there is no real alternative to Beckhoff. In my opinion, the solutions from other suppliers don’t integrate as well,” says Rune Callesen, continuing.

“The support is also top-notch. We have two programmers in the Danish branch and have to ensure 24-hour operation. Beckhoff always steps in quickly when needed and is also happy to share know-how and even Gray code that we can adapt ourselves.

“We see working with Beckhoff as a true partnership, and the many benefits for us as a company reinforce our decision to choose Beckhoff as a supplier.”

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All Eyes On The Type 2000 Valve

The type 2000 2/2-way angle seat valve CLASSIC consists of a pneumatically activated piston actuator and a streamlined gunmetal valve body or one made of precision cast stainless steel.

The self-adjusting spindle seal with integrated wiper provides optimal protection for the spindle and actuator against aggressive media and dirt.

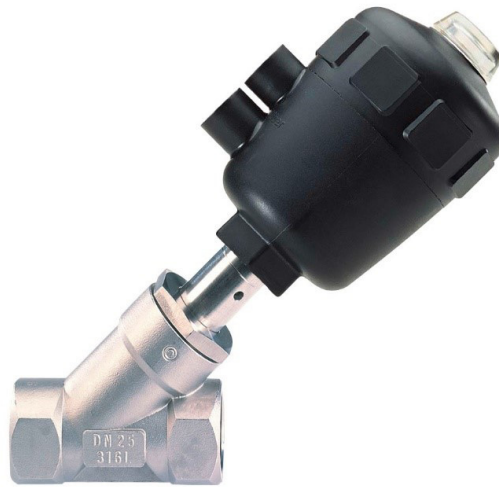
This enables low-maintenance operation and ensures a long service life even with high switching cycles. Only components made from tested materials are used in manufacturing.

The Type 2000 is particularly renowned for its robust actuator and prominent level of reliability.

What role will it play in your process?

Depending on the process and customer requirements, the valve can be individually adjusted – e.g. the flow rate, the process connection or the actuator and housing material can be selected.

The Type 2000 is available up to the extraordinary nominal diameter DN80.



Where will the 2/2-way angle seat valve be used?

For decades, the type 2000 angle seat valve has been used worldwide to shut off gaseous and liquid media in various applications.

The Type 2000 is created in very efficient and quality-assured work processes.

Application areas of the Type 2000:

- steam applications, e.g. sterilisation of food items and CIP cleaning
- water and wastewater treatment
- bottling of drinks and food items
- in the pharmaceutical industry as

well as in medical applications

- in machines in the textile industry, e.g. in the manufacture of clothing
- in the washing and cleaning industry and many other areas.

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EtherCAT Bus High Performance PLC



The VC5 series PLC is a new generation of bus high-performance PLC developed by Veichi. Using its dual-core architecture technology, it has powerful motion control capabilities, the fastest communication cycle is 250µs, and the synchronization time accuracy is ±80ns.

EtherCAT bus motion control of up to 32 real axes can be realized. It can meet the requirements of belt shaft capacity and strict cost control requirements, reducing the pressure on manufacturing.

The VC5 supports advanced industrial Ethernet support, distributed operation of master and slave stations, convenient installation, and shortened information transmission cycle.

The communication speed is fast, and the synchronization time is short. The operation control modes such as straight line, arc, and cam are supported.

The VC5 supports EtherCAT, Ethernet (Modbus-TCP, TCP/IP), CANopen, RS485 (Modbus, free protocol), RS232, and Type-C. The units support the N:N protocol independently developed by VEICHI.

Multi-level network communication can be realized. In the occasions where there is information interaction with servo, vision, robot, code scanning gun, MES, etc., it brings all-around efficiency improvement for manufacturing.

The CPU module provides multiple serial communication ports, with a bit rate of up to 115.2k.

The Veichi VC5 supports multiple programming languages making programming easier and supports function block programming. LD, SFC, FB function block instructions and other programming methods are also supported while subroutines are automatically generated and executed. The VC5 series also supports oscilloscope function debugging.

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Measuring The Level of Tower Bottoms

The level measurement in the bottom of any distillation column is a critical measurement task in refineries.

Tower internals damage due to the failure of level control technologies for residual bottoms is one of the most common issues in refineries.

However, this is not the only way that reliable bottoms level measurements can save costs and increase efficiency in the refining process.

In the atmospheric distillation process as well as in vacuum distillation, crude oil is separated into fractions by temperature. The least volatile components descend to the bottom of the column, where it is important to measure the liquid level in order to avoid excessive height or falling too low.

If the level is too high, this could lead to tray damage and decrease the quality of the products with large impacts downstream in other units. If the level is too low, this could potentially damage pump seals or even the pumps themselves.

With the radiometric level systems from Berthold the bottoms can be reliably measured in a non-invasive and non-intrusive manner, regardless of process conditions changes or environmental changes.

Often, the level measurement on tower bottoms is carried out using differential pressure probes. Such devices require calibrations and often face issues with the plugging of pressure ports.

Berthold offers a radiometric measurement solution, which does not have these issues and can easily be installed on existing columns without any process downtime.

Typically an arrangement with a point source and a rod detector is applied here.

In case of measurement ranges over 2 meters, the TowerSENS solution can be used to cover the entire span with just one set of wiring.

Measuring principle

In simple terms, a radiometric measurement is a system consisting of a source that emits radiation and a detector that can detect that radiation.

Gamma radiation is attenuated as it passes through the vessel and its contents.



The amount of attenuation depends on the fill level: the higher the fill level, the less radiation reaches the detector.

The measurement is not influenced by pressure, temperature, viscosity, colour or chemical properties of the product to be measured.

This results in a high level of reliability combined with freedom from maintenance, even under harsh operating and environmental conditions.

As the source and detector are non-intrusive and non-invasive, they do not make contact with tarry tower bottoms, and are therefore not negatively impacted by the process buildups.

Benefits

- Reliable prevention of pump cavitation
- Increased efficiency of distillation process
- Safe prevention of foam or liquid entering the upper fractions
- Unaffected by foaming, plugging, build-ups or changes in temperature or pressure
- Easy to install on existing columns without process downtime

Technical Features

- Continuous level measurement, typically 2 ... 4 m measuring range
- Installed on the cylindrical bottom of the column, mounted below all trays and packing
- Redundancy can easily be provided
- Typical arrangement: Cs-137 point sources and rod detectors
- On small diameter columns Co-60 rod sources achieve best measurement results
- As the source and detector are non-intrusive and non-invasive, they do not make contact with tarry tower bottoms, and are therefore not negatively impacted by the process buildups
- SIL2 / SIL3 certified detectors available.

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Revolutionizing Hydrogen Measurement ... Gold-Plated Pressure Sensors for Unparalleled Stability and Innovation



Keller manufactures isolated piezoresistive pressure sensors for the type of pressure measurements invented by Keller founder Hannes W. Keller. The great advantage of the piezoresistive measuring principle is its high stability. The chip that measures the pressure is installed in an oil-filled cylinder and sealed by a steel diaphragm. This ensures the best possible isolation.

The piezoresistive pressure sensors is also considered one of the most stable for hydrogen applications. Without additional actions, however, an oil-filled sensor can also have a disadvantage.

Under certain circumstances, hydrogen molecules can split into two hydrogen atoms at higher temperatures. These atoms are smaller than the pores of the steel membrane. This allows the atoms to penetrate through the membrane into the oil chamber of the pressure sensor.

In the oil chamber, they fuse again to form a hydrogen gas molecule (H_2), which leads to offset errors due to the expansion.

The offset is called the signal deviation of the target value. After all, it must be considered that the medium is gas. The phenomenon described is called "permeation".

For this reason, Keller uses gold-plated steel membranes for hydrogen pressure sensors.

Gold has much smaller pores than stainless steel. The hydrogen can hardly penetrate the gold layer. This defusing action, together with fully welded sensors without internal seals, confirms Keller's competence and strength in the pressure sensor market, including for hydrogen applications.

The typical pressure ranges for applications with hydrogen are from 0...2 bar to 0...1000 bar. Keller offers exactly the suitable sensors for these applications. In addition, the hydrogen pressure sensors are compatible with the EC79 standard for automotive applications.

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Waterproof Temperature Data Loggers



From storage to shipping, it's important to monitor the temperature of your products to ensure that they are being stored in optimal conditions.

Quick to setup, simple to use, the HI148 is a datalogger that is ideal for monitoring and recording temperature in applications such as food processing, transportation, museums, and horticulture.

- Available with one or two channels, and internal and/or external sensors
- Multicolor LEDs for logging status
- Customizable programming using the included software
- Thin rugged compact design
- Housed in a rugged waterproof ABS casing
- IP67 rating
- Large clear LCD display with a wide viewing angle
- Multiple Sensor Options
- Data retrieval and analysis

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PC-based Control in Filling Lines for Liquid, Viscous and Powder and More Efficient



If there is one innovation that is inextricably linked with the Italian filling equipment manufacturer Weightpack, it is the electronically controlled net weight rotary filler, which founder Carlo Corniani first introduced in 1979.

The principle behind it is still implemented in a wide variety of filling machines today, with Weightpack Technical Manager Paolo Marogna relying on PC-based control from Beckhoff for the company's automation needs.

Based in Goito in the Italian province of Mantua, Weightpack has always been characterized by its innovative spirit. Indeed, this is reflected in the sheer volume of different filling lines it offers for liquid, viscous, and powder products.

Real Chimica is one of many companies that rely on these solutions. In fact, this leading brand manufacturer of detergents, fabric softeners, laundry soaps, and degreasing agents relies exclusively on Weightpack machines at its production site in Sant'Agata Bolognese.

With regard to automation technology, Paolo Marogna has been won over by the innovation potential afforded by PC-based control: "Our mission as an industry leader is to continuously improve our machines and create real benefits for our customers in the process."

In contrast to conventional weight-based filling solutions

that use a tank with constant pressure, Carlo Corniani had a novel idea for his net weight filling systems: in his patented design, he replaced the large tank containing the product to be dispensed with a distributor equipped with filling valves, which is continuously fed with the product by a positive displacement pump.

Precise and fast drive control ensures that the pressure in the distributor remains constant. This ensures that the product flow fed to the individual filling valves contains the exact quantity of product to be filled – provided that the pressure in the distributor is precisely controlled by the pump drive in real time.

Another essential consideration is that the sophisticated motion sequence of the bottle holders and other sub-functions must be controlled in sync with the filling process.

This quickly adds up to over 50 axes in one machine, which calls for an advanced, flexible automation solution: PC-based control.

Paolo Marogna states, "The powerful, flexible and scalable architecture of Beckhoff technology, the high-performance products, and the comprehensive technical support are the key elements that allow us to meet our customers' challenges in terms of innovation and efficiency."

Products - Automation Makes Metering Faster, More Precise

PC-based control technology replaces PLC

Weightpack originally adopted a more traditional approach to automating its plants, using a PLC and separate control panel. It wasn't until 2012 that Paolo Marogna replaced the control unit with a panel PC, which also took over the initial secondary functions.

After these positive early experiences, the company began to run tests with a view to equipping the most delicate elements of the Weightpack systems with Beckhoff controllers, namely the pressure regulation for the filling distributor and the associated control of the product pump.

Today, a C6030 ultra-compact Industrial PC or a CX5130 Embedded PC, supplemented with a CP3918 multi-touch Control Panel, manages the core functions and all filling line processes depending on the system version.

This includes the weighing system, motion control for all axes in the filling station, and all other machine parts, such as the sealing machine and the ejection system for faulty packaging.

TwinCAT automation software can monitor the filling distributor in real time, and even control each individual valve and the product pump as required to modulate the product feed depending on the feedback on the pressure measured in the distributor.

This solution offers significant advantages, as it reduces the volume in the filling process to a minimum.

This increases the efficiency and environmental friendliness of production, as cleaning requires less detergent, energy, and time when products are changed.

It also cuts costs for materials and production downtime.

Modular plants benefit from scalable architecture

PC-based control and industrial PCs from Beckhoff provide the scalability required in terms of computing power.

"They combine the world of automation with the typical process and IT infrastructure for our machines' production environment into one simple standard architecture," Paolo Marogna says, stating an equally important factor for Weightpack.

Controlling all machine functions with a single controller is a huge advantage, he adds, which hugely reduces project planning and programming work while simultaneously guaranteeing optimized performance at system level.

"We see TwinCAT as a complete technological solution that not only enables automation and control applications, but also integrates them with the typical technology of the IT world - a domain that, although related to automation, remains purely IT-based," emphasizes Paolo Marogna.

EtherCAT also plays an important role in Weightpack's automation concept.

This communication system is not only fast and robust, it also supports a wide variety of topologies and provides enough bandwidth to integrate safety and TCP/IP communication as well: "All these features make EtherCAT a versatile and universal communication platform," explains Paolo Marogna.

... continues overleaf ...



Weightpack also controls all secondary processes, such as capping the bottles, with PC-based control.



CX5130 Embedded PCs (shown here) or C6030 ultra-compact Industrial PCs are used depending on the system configuration.



Fast control of the pressure pump – via the AX5000 servo drive and AM8000 servomotor – is crucial for precise filling.

... continues from previous page ...

The EtherCAT protocol, currently the fastest industrial Ethernet technology, offers a huge advantage in that applications can be controlled in real time without overloading the processor of the industrial PC.

This allows Weightpack to position or move applications with more than 50 axes that need to be moved synchronously with an error of less than 0.05%.

"This precision is essential to prevent bottlenecks or jamming at the high speeds at which our customers want to – and indeed can – fill and seal their products," points out Paolo Marogna.

Crises bring communities together

For Weightpack, the COVID-19 pandemic presented a huge challenge, but also set the seal on Weightpack and Beckhoff's close partnership.

"The demand for explosion-proof equipment for filling products containing alcohol and for corrosion-resistant machines for handling aggressive media was extremely high. Beckhoff provided us with crucial support during this difficult phase," recalls Paolo Marogna.

During the pandemic, Beckhoff prioritized all requests from companies manufacturing equipment for medical products and hygiene articles, like Weightpack.

The large number of different components, along with the easy scalability of the TwinCAT applications, enabled Weightpack to cover the great demand for individual specific components with other solutions.

"The line of communication to sales was always open, and the technical support from the Beckhoff engineers was second to none – even in the most critical phases," says Paolo Marogna.

Thanks to this consistency, Weightpack was able to adapt the control architecture to the available components.

"At Weightpack, we know that focusing on a structured but fully standardized solution is the best option," says Paolo Marogna. Weightpack is thus aiming to equip all of its machines entirely with Beckhoff architecture.

Two pilot projects for integrating TwinSAFE and TwinCAT Vision have been launched recently. Another project aims to extract structured information from the mass of machine data with the help of TwinCAT Machine Learning.

Intended benefits of this approach include the ability to optimize energy consumption, minimize downtime through predictive maintenance, and suggest the best machine settings for optimal performance (Golden Batch).

"We are in no doubt that Beckhoff is the right partner for us when it comes to implementing these ideas and achieving our goal of working with high-performance machines that meet our needs," concludes Paolo Marogna.

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Firmware Upgrade Brings Extra



Fluke's ii910 precision acoustic imager with Firmware 5.0 enables early identification of potential mechanical problems.

This minimises unplanned downtime, cuts repair costs and energy savings are achieved with reduced faults and early repairs.

To help users identify and localise 'mechanical areas of interest' within short timeframes, Comtest has added a unique new feature to the ii910 precision acoustic imagers.

The Firmware 5.0 update brings a MecQ facility to the ii910, which helps minimise unplanned downtime and cut repair costs by enabling early identification of potential mechanical problems. Energy savings are also achieved by carrying out repairs early and reducing faults.

The update was developed following extensive research involving Fluke customers worldwide.

Maintenance specialists and technicians said their crucial focus was identifying issues on the potential failure curve as early as possible.

Looking at various types of conveyor systems, the research showed that non-driven bearings are often the root cause of many mechanical faults.

Because these systems are integral to the overall production process, lengthy downtime could significantly impact the factory and cause significant issues along the supply chain.

This applies in food and beverage production as much as it does in the logistics, electronics, automotive and mining/raw materials sectors.

Never inspected

Despite a line going down representing a huge concern (and costing anything up to R2,430,000 an hour), Fluke found that around 59% of conveyor belt systems are never inspected. In comparison, another 11% are checked manually.

The research showed that human sensing was the least effective way of detecting a problem, followed by contact temperature and thermography.

Testing using contact vibration or airborne ultrasound also represented a challenge – with ease of use being a significant issue with the latter – but acoustic imaging offered the most effective method.

Not only did customers say that the ability to localise issues was vital if substantial cost savings were to be achieved, but

From Layer of Detection to Precision Acoustic Imagers



Maintenance teams will love the ease of use of Fluke ii910 with MecQ's intuitive interface and seamless integration.

they also needed a scalable solution that could help those with lengthy conveyor systems (a significant warehouse could operate up to 80km of conveyor belts) or where accessibility was an issue (perhaps because of conveyor guards).

Using the Fluke ii910 acoustic imager with MecQ, the process of carrying out non-contact inspection on conveyor systems is simplified considerably, with the unit immediately identifying the locality of a mechanical area of interest through sound pattern comparison.

Once the issue is displayed on-screen, the maintenance professional can note it, share it with their team and address it on their maintenance schedule.

User-selectable frequencies

MecQ was developed to bring an extra layer of detection to the ii910 in addition to taking a picture, taking a video, carrying out leak detection with LeakQ, and detecting partial discharge in PDQ mode.

Although the most common frequency for ultrasound instruments is 30kHz, the ii910 with MecQ now offers user-selectable frequencies from 2kHz to 100kHz and fixed multi-mode frequency bands of 15kHz, 20kHz, 30kHz, 40kHz and 60kHz to check various stages of bearing deterioration.

The user can choose whether to turn these pre-set frequency bands on or off, depending on the environment.

Tako Feron of Fluke says: "Any member of a maintenance team will love the ease-of-use the new MecQ facility provides with its intuitive interface and seamless integration with existing leak and partial discharge detection tools.

They will also appreciate the ability to boost efficiency, maximise uptime (by reducing meantime-to-repair) and lower costs while ensuring high safety levels through contactless inspection and eliminating hazardous situations.

Thanks to MecQ, the ii910 now enables maintenance engineers to locate a problem, annotate a screenshot, share that with the team and then schedule repairs during planned downtime.



Fluke ii910 with MecQ is designed to offer a first-line scanning solution that identifies an area of interest at scale for a follow-up inspection.

Having all these workflow enablement solutions built into a single tool is unique to Fluke.

The Firmware 5.0 upgrade has also simplified what could ordinarily be a highly complex and time-consuming inspection and maintenance operation."

Feron adds: "It is important to remember that the ii910 with MecQ is designed to offer a first-line scanning solution that identifies an area of interest at scale for a follow-up inspection."

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All In One Solution for Maintaining Proper Nutrient Levels

The HI981413 GroLine Nutrient Dosing System is a complete solution with advanced process controller and a built in chemical dosing pump. Engineered to be an inexpensive solution for the hydroponic or greenhouse grower to maintain the ideal nutrient solution concentration level in the reservoir tank.



Multi-colour LCD

The HI981413 features a multi-colored LCD to show the status of the pool controller. The display is green during normal operation, yellow if the control is not enabled, or flashes red when an alarm is triggered.

Intuitive LCD

Both conductivity or TDS and temperature are displayed with status icons that show when the pump is dosing and the control mode status.

Programmable Alarm System

Hanna controllers allow users to enable or disable the low and high-level alarms for EC/TDS. When an alarm is activated, all dosing will stop.

For added safety, the alarm system also offers overdosing protection in that if the set point value is not corrected within a programmed time interval then the meter will go into alarm status.



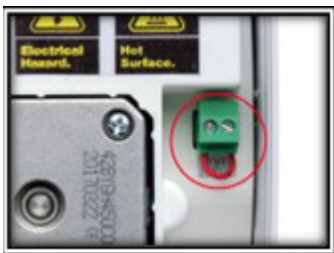
Adjustable Flow Rate

The flow rate from the dosing pumps is adjustable from 0.5 to 3.5L/h. Larger bodies of water require more chemical to be dosed than smaller ones in per unit of time.

The adjustable flow rate, like the proportional band, allows for better control in maintaining a desired set point.

Acid Tank Level/Flow Switch Input

The BL100 allows for a connection to an optional level controller or flow switch. This input can be used to disable the dosing pump when there is no chemical left in the reservoir tank or there is no flow due to the pump being turned off.



Built-in Dosing Pump

The HI981413 features a peristaltic dosing pump that is superior to diaphragm versions due to the ability to self-prime when there is no liquid in the uptake line.

Brushless Motor

The brushless motor does not have any gears or brushes that can wear out. A brushless design provides for a long life and little maintenance.

The compact stepper motor allows for very precision control over the dosing of the chemical.

Long-life Peristaltic Tubing

The industrial grade peristaltic tubing is chemical resistant and provides for a relatively long-life. As tubing stretches over time it can be easily replaced. No special tools required.



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Same Viscosity, Different Performance: How to Choose The Best Grease



Not all greases are created equal. But beyond just making sure they choose the right type of grease for an application; how can maintenance teams know which grease will perform best and last as long as possible?

Lubrication Engineers (LE) South Africa use a brute force mechanical test tool called the “rat trap” to assess how two lubricants compare.

LE National Marketing Manager Gavin Ford explains that the rat trap test can show how two greases with the same viscosity react differently to the same force or pressure over time.

Each lubricant is applied to a plate on the apparatus and then the spring-loaded clapper is released.

“When we release it, it hits both plates with the same speed and force. We then compare how the two lubricants have reacted.

“We can snap the device several times to simulate what would happen over time or with continuous use,” explains Ford.

Picking the correct grease

However, the rat trap tool is only one element for determining if the selected grease is the right one for the intended application.

“People often think a grease is a grease is a grease,” says Ford.

“However, greases are used for such a wide range of applications, their viscosity and properties vary significantly. You can get greases that are the consistency of peanut butter, toffee or honey.

“Obviously, each of these lubricants will behave differently,” he adds.

To measure grease consistency, the National Grease Lubricating Institute (NLGI) has created a standardised scale. It grades grease consistency from 000 to 6.

The penetration test measures how deep a standard cone falls into a grease sample in the tenths of millimeters. Each NLGI grade corresponds to a specific worked penetration value range.

Equipment manufacturers use this scale to recommend the grade of lubricant required for their equipment components, and it’s essential to adhere to this recommendation to optimise the effectiveness and longevity of equipment. “If an equipment manufacturer specifies NLGI 001 and you’re using NLGI 2, you’re going to run into problems, because the grease penetration is different,” says Ford.

The power of additives

In its greases, LE uses proprietary additives, Almasol, Quinplex and Monolec.

Almasol is a solid wear-reducing additive that is able to withstand extremely heavy loads, harsh chemicals and temperatures up to 1,038 degrees Celsius. It is attracted to metal surfaces, forming a microscopic layer, but does not build up or affect clearance.

Almasol minimises metal-to-metal contact and the resulting friction, heat and wear.

Monolec is a wear-reducing additive that creates a singular molecular lubricating film and Quinplex is an impact-resistant additive that contributes towards outstanding water resistance.

When used as a comparative product in the rat trap test, a grease without Quinplex inevitably disperses from the plate where it’s been applied much quicker than one that contains this additive.

“The non-Quinplex grease loses its tackiness and heats up far more quickly,” says Ford.

“Each of our unique, proprietary additives has been designed to yield specific benefits. This is a tangible way we can show our customers just how much of a difference our unique additives can make in protecting their equipment.”

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Signal Conditioning Is the Protective Armour Between Plant And Field

Automation for Industry 4.0, process control, data acquisition and alarm processing all rely on the conversion of physical signals to a standardised, usable format, that engineered systems can reliably use to manage industrial processes.

At its simplest, signal conditioning is the process by which physical properties such as temperature, humidity, pressure, vibration, frequency, presence or absence, relay logic, and flow are converted by transducers into usable electrical signals, suitable for measurement and control systems.

Any electronic device that detects and quantifies a physical property like this is referred to in industry as a transducer.

We can think of signal conditioning as an interface between the plant and the field.

Control and monitoring systems are sensitive and need to be protected from harsh environments.

Voltage spikes, high temperatures and electrical noise are all potentially damaging, and signal conditioning provides protection to mitigate these harsh field conditions, typically using electrical isolation (galvanic or optical), noise immunity and surge protection mechanisms.

Field devices or transducers on a process are normally wired back individually from the process to marshalling panels, where the signal conditioning system again converts the signal to the industry standard range of 4-20 mA. From there, multiple signals are run together in multi core cables to control systems.

4-20 mA is used for a number of reasons. 4 mA = 0 per cent, minimum value, and 20 mA = 100 per cent or maximum value. This can be interpreted by the measurement and control system and expressed in SI units. The signal conditioner also allows the field signal to be amplified and zoom in on a portion of the transducer's range.

This standard exists because a voltage output would result in a volt drop on the cable, introducing an error in measurement, whereas the current output over a long distance can be actively compensated in the system circuitry with voltage manipulation. Additionally, using four mA as a 'live zero' makes it very easy to detect a system fault, for example a cable break, as the current will fall to true zero.



Challenges of signal conditioning

Electromagnetic interference (EMI) is one of the biggest challenges involved with signal conditioning in industrial environments: any factors that jeopardise the accurate transmission of signals to the control system must be dealt with.

To resolve this, the signal conditioning system is electrically isolated from the plant at an industry standard of 1,500 VAC, meaning this is the maximum difference between input and output that the signal conditioner can handle without breaking down.

Signal amplification and attenuation are also issues that require attention. If signals have to travel long distances, tens or even hundreds of metres, they can attenuate because of wire resistance, meaning an inaccurate signal reaches the control system.

Similarly, amplification of low-level voltage signals is complex, as any interference or non-linearities can be amplified along with the desired signal.

All of these challenges are mitigated by the 4-20 mA current range. Current signals naturally withstand EMI better than voltage signals, particularly over long distances. Other control devices can share the current loop as part of the control system.

Signal conditioning is an essential mechanism for industrial plants to collect information about, and monitor, their processes, and only through precise design can plant engineers ensure reliable incoming data flow.

Technical issues like signal attenuation, EMI and process safety are all important to consider, but industry standard ranges for signal current and electrical isolation keep things running smoothly.

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Versatile, High-Performance Gas Detection With Easy Deployment



There are many prerequisites when it comes to gas detection, not least maximum flexibility, increased performance and minimal installation costs. Add in modern expectations such as smart features and the ability to detect explosive, toxic or asphyxiant gases, and the list of potential solutions soon shortens.

Prominent among the choices, however, is the proven and increasingly popular iTrans 2 fixed gas detector from Teledyne Gas & Flame Detection.

Offering smart sensor capabilities that support an intelligent electronics platform, the iTrans 2 provides one or two points of detection from a single head for maximum flexibility, with both readings shown on the standard-issue, LED and display.

Gas sensors are mountable directly to the transmitter, or remotely. For the detection of explosive and toxic gas, or oxygen, the iTrans 2 accepts infrared, catalytic bead or electrochemical sensors.

Specifically, in addition to the LEL (lower explosive limit) sensor range, the iTrans 2 is configurable with a 0-100% volume methane infrared sensor for bio-gas applications and CO₂ infrared sensors ranging from 0.5% to 100% volume.

All are pre-calibrated using smart technology to enable automatic sensor recognition and data transfer. The device displays sensor life data automatically after each calibration.

Offering cable-saving and time-saving installation, the iTrans 2 is suitable for almost any application via common configurations that include 3-wire (4-20mA) and 4-wire (digital ModBus) models.

Both allow for full utilisation of the gas detector's features and options, and use with all iTrans 2 sensors.

iTrans 2 offers analogue 4-20mA and digital RS-485 Modbus (9600 baud) outputs.

The HART communication protocol is optional, enabling remote communication across the 4-20mA signal for diagnostics, commissioning and calibration.

A simple magnetic wand further aids ease of use by allowing full transmitter configuration and calibration without opening the explosion-proof housing.

The housing comes as standard in epoxy-coated aluminium, with an optional 316 stainless steel version available for corrosive environments.

Operating temperature is -40°C to +75°C. Although this robust specification is ideal for many heavy industry applications, the iTrans 2 is equally at home in smaller systems and boiler rooms, for example.

Indeed, this tried and tested gas detector is suitable for sectors that extend from oil and gas, offshore drilling, utilities and petrochemical, through to water and wastewater treatment, and food and beverage production.

Certifications include CSA, ATEX, IECEx, INMETRO, CCC and China Ex.

Notably, the microprocessor-controlled transmitters are capable of plug and play, stand-alone operation or multi-point system configuration.

The monitor's stand-alone operational ability arrives courtesy of optional on board relays that can activate alarms, horns or fans, and can also shut down a system without the need for return wiring to a central control panel.

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Have you seen our Know-How videos?

Stay up to date with the latest industry innovations, technology and products!

New Pilot Operated Relief Valve for Enhanced Storage Tank Reliability And Protection



The Fisher safety valve portfolio now includes a 2-inch model, enabling closer-to-setpoint control, easier installation, and simplified maintenance for smaller tanks.

Emerson has introduced the Fisher™ 63EGLP-16 Pilot Operated Relief Valve for installation on pressurized bullet tanks used to store liquid propane and anhydrous ammonia.

This type of pressure relief valve (PRV) is typically installed on tanks fabricated by original equipment manufacturers (OEMs), that provide them to end users, engineering firms, or contractor customers.

The new valve is certified under UL132 and American Society of Mechanical Engineers (ASME) Section VIII.

With a pre-installed national pipe tapered (NPT) thread standard 2-inch male hex nipple, this new product serves the need for a solution with a 2-inch connection that provides the

same benefit as traditional multi-ported valves, but with simplified installation and maintenance.

For this application, the PRV must be connected directly to the tank, with no isolation valve between the tank and the PRV. This National Fire Protection Association (NFPA) 58 code requirement presents challenges when testing the PRV while the tank is pressurized and in operation.

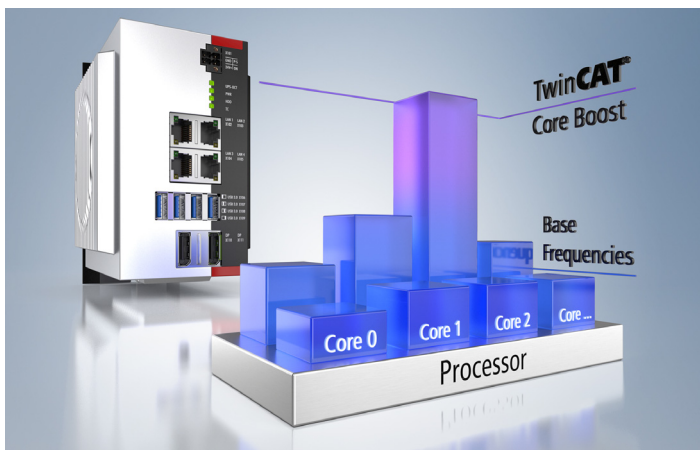
The Fisher 63EGLP Pilot Operated Relief Valve addresses this and other issues because it is the only pilot-operated relief valve on the market designed specifically for this type of service.

Operation is implemented with a dual pilot array, providing redundancy, and allowing for removal of one pilot for testing while the other is operational.

Because this is a critical safety-related application, reliable operation over a long lifecycle is needed. This requirement is met by the 2-inch PRV because it is similar in design to the Fisher 63EGLP 4-inch CL300 model, which has been proven in use over the past 10 years.

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Enormous Leap in Performance Thanks to Processor Cores in Turbo Mode



TwinCAT 3 consistently supports modern multicore processor technology. The multi-thread capability enables the application to be distributed across several cores.

Supplemented by TwinCAT Core Boost, the computing performance of individual real-time or user-mode cores can now be increased by up to 50% in order to get the maximum performance out of the system and adapt it optimally to the respective requirements.

With TwinCAT Core Boost, the clock frequency of the processor cores can be configured individually and as required, so they no longer all have to be clocked at the same rate. The clock rate per core can be defined for real-time transmission and user-mode applications.

It is also possible to operate individual cores permanently and in real-time in a so-called turbo mode.

This results in the following application benefits: – up to 50% more computing power for one or more processor cores, – possibility of using more cost-effective CPUs.

The permitted power consumption and temperature of each processor core (and of the overall system) is monitored by TwinCAT Core Boost, so that reliable operation is ensured even when turbo mode is used.

TwinCAT Core Boost can be used with all Industrial PCs with Intel® Core™ I processors from the 11th generation onwards.

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Inline Concentration Measurement of Acids And Bases With A S

A precise and accurate concentration measurement is essential for many processes in the chemical, metal, pharma and semiconductor industry.

Laboratory measurements are in most cases the first choice for monitoring the parameters but are often time consuming, cost intensive and are only a spot view in a continuous process.

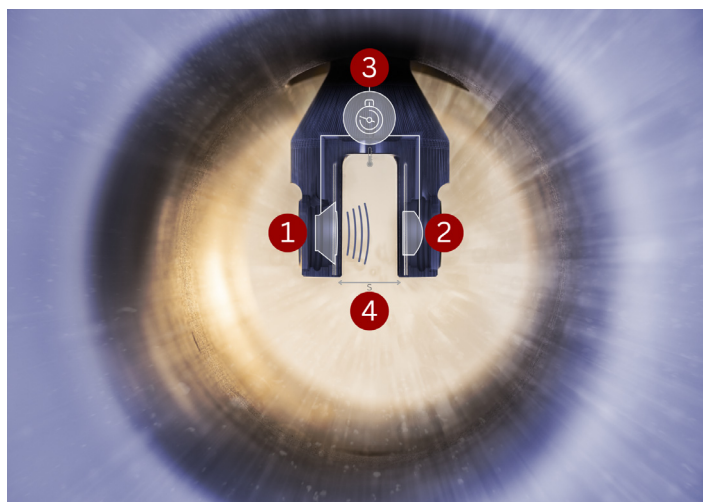
With the inline concentration meter L-Sonic 5100 from Anton Paar, a reliable 24/7 observation is possible, resulting in an immediate response to any concentration change within seconds.

A cut down of laboratory measurements and a simultaneous improvement of product quality and output are the consequence.

The advantages of Anton Paar's L-Sonic 5100 series are obvious:

- 24/7 concentration monitoring
- Low CAPEX and OPEX
- Flexible pipeline or tank installation without limits
- Quick integration into existing plant infrastructure
- No bypass, pumps or valves needed for operation
- Wetted parts resistant for aggressive chemicals
- Flexible fork lengths and flange types
- In-house formula development
- Excellent worldwide Anton Paar service network
- Direct and fast Anton Paar customer support

Sound velocity to concentration



The L-Sonic 5100 concentration meter works according to the velocity/ time/ distance principle. The illustration shows the sound fork immersed in a fluid filled pipeline.

During measurement, the transmitter piezo (1) sends out sound waves which travel through the fluid to the receiver piezo (2).

During that time, an internal "watch" (3) measures the propagation time that each sound wave needs in order to pass the distance (4) in the fluid.

Based on the measured propagation time of each sound wave, the sound velocity is calculated by the sensor. This sound velocity is, together with the actual measured temperature, the input variable for the respective concentration formula.

The L-Sonic 5100 can sample every second and therefore display any concentration change immediately.

Acid and base applications

There are numerous different acid and bases application available. In the following the most important ones are listed and described in more detail:

Sulfuric Acid, H₂SO₄ (80 % - 100 %)

With more than 280 million tons, sulfuric acid is one of the most produced base chemicals in the world.

With wetted parts of Hastelloy, Gold or Rhodium and an outstanding accuracy of up to +/- 0.016 % the L-Sonic 5100 from Anton Paar is the unbeatable industry standard for a precise and reliable inline concentration measurement of H₂SO₄.

The sound velocity is within a concentration range of 80 % to 100 % the only physical parameter that can provide such a reliable accuracy (Figure 2)

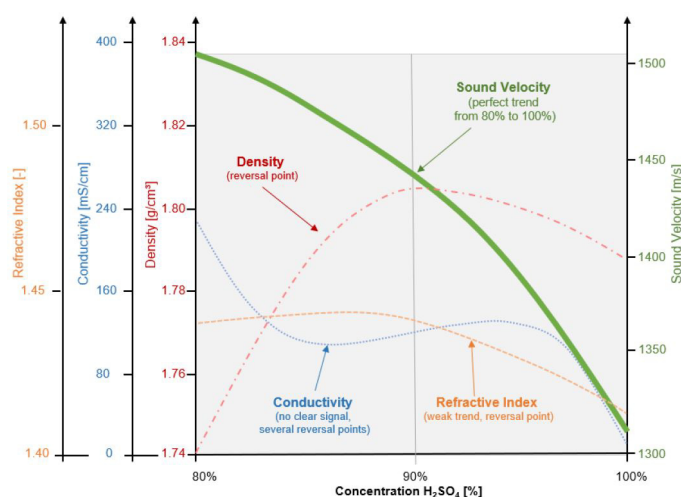


Figure 2: Concentration measurement H₂SO₄ (80% - 100%)

Hydrochloric Acid, HCl (0 % - 12 % and 20 % - 40 %)

Similar to sulfuric acid, HCl is also one of the most important base industrial chemicals. Especially for the use in pickling baths, in metallurgical processes and in the food and pharma industry, HCl is essential.

By the use of the L-Sonic 5100 version Hastelloy or Gold, Anton Paar offers an absolute resistant and 100 % durable sensor for a very precise concentration measurement.

Acetic Acid, C₂H₄O₂ (40% - 100 %)

Acetic acid is a carboxylic acid and an important industrial chemical for the production of polymers and synthetic fibers. The acid is also used as a solvent in the cosmetics and pharmaceutical industry as well as an additive for food processing.

With the proven sound velocity meter L-Sonic 5100 and wetted parts made of Hastelloy, a 24/7 inline process monitoring and quality control can be realized.

Sound Velocity Sensor

Potassium hydroxide, KOH (0 % to 55 %)

Potassium hydroxide is an essential base and used for glass etching processes, as an electrolyte for the production of H₂ as well as for the production of batteries, dyestuffs and for various food and cosmetics products.

With the L-Sonic 5100 version MON (Monel), Anton Paar reaches an outstanding accuracy of 0.05 % for the inline concentration measurement of KOH.

Further L-Sonic 5100 acid/ base applications:

- Oleum, H₂SO₇
- Sodium Hydroxide, NaOH
- Sulfamic acid, H₂NSO₃H
- Phosphoric acid, H₃PO₄
- Customer specific solutions (measurement of customer samples in our in-house lab)
- Hydrogen Peroxide, H₂O₂
- Citric acid, C₆H₈O₇
- Nitric acid, HNO₃

The unbeatable sensor: L-Sonic 5100

Anton Paar has more than 35 years of experience in concentration measurement by sound velocity. Our own developed L-Sonic 5100 is an absolute precise and durable sensor. The combination of high-tech wetted parts with the sensor-integrated Pico 3000 evaluation platform sets the industry standard - without compromise.

The sensor is available in both, Ex and non-Ex versions and has proven its perfection in hundreds of applications and installations - worldwide.



L-Sonic 5100 Non-Ex and Ex Version

- Robust, durable and industry proven
- Sensor-integrated evaluation unit Pico 3000
- Low CAPEX, low OPEX
- Maintenance-free and insensitive to bubbles
- For integration, no pumps or bypass needed
- Wetted parts for the toughest applications
- 24/7 sampling = 24/7 product control
- Excellent worldwide service network

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SCAN ME

Economical And Reliable Safety Gate Guarding



The safety locking device PSENmlock mini is used for efficient protection of safeguards such as flaps, covers or swing gates and sliding gates, for example.

With its compact design of just 30 x 30 x 159 mm, there's always space for the safety switch, even in space-critical applications.

This small safety locking device has a holding force FZH of 1950 N (F1max: 3900 N), enabling safe guard locking for personnel protection applications up to PL d, Cat. 3 of EN ISO 13849-1.

The safety locking device PSENmlock mini offers you an economical solution for safety gate guarding.

Designed to be extra compact, the safety locking device is ideal for integrating into your machine and saves valuable space.

The PSENmlock mini also offers a high level of flexibility for installation, as the actuator can be attached from the right, left and front. As a result, there is much greater flexibility for designing machines.

PSENmlock mini can be connected in series up to PL d, Category 3, minimising wiring and simplifying commissioning – saving you time and costs.

The bistable guard locking principle guarantees a high level of safety. In the event of a power failure, the last state is maintained and so the gate is either closed and locked, or open.

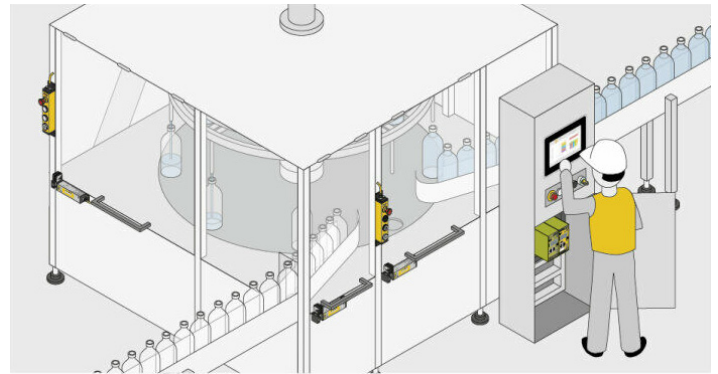
This principle reduces energy consumption, as the guard locking device only needs to have power applied whenever the gate is locked or released.

High level of safety through dual-channel operation of the solenoid; in the event of an error, the OSSDs are switched off but guard locking is retained.

This can then be released through a targeted, one-off deactivation.

Installed quickly – time saved

- The PSENmlock mini can be quickly and easily secured with just two screws
- Flexible actuator can be installed inside and outside the safeguard and can be attached from the right, left and front.



Compact design – space saved

- With its compact design, the PSENmlock mini is 60% smaller than the PSENmlock and is ideal for space-critical applications.
- Can also be used for gates with a minimal gate radius from 200 mm

Strong in use – productivity increased

- Safe holding force FZH up to 1950 N
- High level of safety up to PL d, Category 3, through dual-channel operation of the solenoid
- High degree of manipulation protection; coding freely selectable

Safety locking device PSENmlock mini in detail

- Safe guard locking for personnel protection up to PL d, Cat. 3 (EN ISO 13849-1)
- Robust in use due to safe holding force FZH up to 1950 N, integrated latching force 11 N
- RFID safety switch with high level of manipulation protection thanks to a coded actuator
- Protection type IP67
- Simple to operate via the power-to-unlock guard locking principle:
- Bistable guard locking principle ensures safe operation and reduces energy consumption; in the event of a power failure, the OSSDs are switched off and the safeguard remains locked
- Safe series connection minimises wiring and simplifies commissioning
- Integrated auxiliary release on two sides
- Simple installation: M12 plug-in connector, 8 or 12-pin

Even on plants containing several protective devices, the PSENmlock mini provides efficient safeguarding through safe series connection up to PL d, Cat. 3.

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Rotational Viscometer: Compact and 25% Faster

The Brabender ViscoQuick viscometer is compact, reliable, and delivers results 25% faster than comparable devices.

It is specialized in measurement for larger sample quantities (5 g to 15 g / 100 mL to 110 mL) that require higher torques (0.25 Nm).

The integrated PC, touchscreen, and temperature control system (Peltier) optimize lab space and reduce costs for periphery.

Heating and cooling rates of +20 °C / -15 °C per minute ensure short measuring times (e.g., starch gelatinization below 10 minutes). The MetaBridge software allows access and data export from any device.

ViscoQuick enables real-time dosing of substances and rapid rheological determination at temperatures below 20 °C. Its comprehensive database supports a wide range of applications while delivering a user-friendly, automated experience.

All of this makes the ViscoQuick an intuitive solution for quick quality checks and formulation development of, for example, starch and flour.

It's ready-to-use right out of the box and doesn't require a comprehensive installation process.

Flour and starch measurement instruments lead the way

- Communicate in the established flour and starch measurement language, Brabender Units (BU), or a universal unit such as cP and mPas



MetaBridge: Streamlined data access

- Access your measurements from any device and location via web browser
- Export and send data to colleagues and third-party systems such as LIMS and ERP, or even send results by email

Reliable results below 20 °C

- Unlike conventional devices that can only cool to 50 °C, ViscoQuick can reach temperatures lower than 20 °C in a very short time
- Cool down to the temperature at which food will be consumed or processed

Real-time dosing for added substance insight

- Dose during the process and get immediate insights into the effects of added substances Monitor and adjust your process in real time

No periphery: Save cost and lab space

- Compact design with integrated tempering system, PC, and touchscreen
- Precise Peltier temperature control system with direct heating and cooling minimizing temperature gradients.

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Next Level of Valve Stability, Accuracy and Speed Control



When there is the need to reduce or eliminate harmful shock or excessive motion, or when a valve application requires accurate and repeatable closing or opening times, Kinetrol Steadylane provides the next level of valve stability, accuracy, and speed control.

The Kinetrol Steadylane series are precision valve actuators with built-in damping devices providing smooth resistance to actuator/valve shaft rotation (the resistance increases with angular velocity).

The Kinetrol Steadylane product smooths out the actuator's standard travel, dampens any pipeline flow-induced valve disc oscillations, and allows the user to specify a minimum amount of travel time upon power failure.

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<https://bit.ly/3trNq4g>

Finding Energy Waste with Power Quality Management



Saving energy and minimising energy waste are two of the most critical aspects of energy use. No matter what industry you work in, looking for energy savings means looking at your power consumption rates and developing a power quality management energy-saving plan.

Benchmarking electrical energy consumption

The first step in developing a power quality management program is benchmarking your current electrical energy consumption across the facility.

Through that initial survey, you can look for quick and easy solutions to start with, like areas that are typically closed on the weekends and can be shut down.

Track areas that contribute to your energy usage outside significant assets, like supplementary electrical heating, lighting being left on, and computers not being switched off.

Once you've identified and implemented those quick wins, continue with more detailed studies throughout the building or campus.

Run load studies on assets throughout the area using the Fluke 1777 Three-Phase Power Quality Analyser.

These measurements can show where you could see significant energy-saving opportunities from switching some systems off during the night on non-operating times.

Advanced power quality considerations

As current flows, some generated energy will inevitably become wasted as heat. The next step in reducing energy consumption is to look at where energy waste arises. One area to focus on is losses in conductors.

As current flows through conductors, some energy generated will turn into wasted energy as heat. Figuring out how to level this issue returns to the fundamental I^2R equation indicating the power delivered.

But this leaves two possible solutions: reduce the current flow (I) so there is less kW or reduce the resistance (R). Both leave you with a problem:

- Lower current (I) and the load will not operate correctly
- Reduced resistance (R) can cost more because it requires the installation of copper or aluminium conductors

So, what is the best solution?

Consider the conductor sizing. Following the National Electric Code (NFPA 70 or NEC 100) gives a lot of guidance toward the size of a conductor, describing the ideal conductor size for almost any circumstance.

The primary consideration for conductor sizing is ensuring the safe operation of the conductors with the most appropriate insulation.

This depends on the length, cross-sectional area, and anticipated current rating required.

This can provide minimised energy losses, typically 2% or less, and an acceptable voltage drop in the conductor.

Some additional possibilities would be installing higher efficiency loads and considering checking to see if motors might be oversized for the current application.

Wasted power

These codes and guidelines are great when you're putting in new work, but it doesn't always work out ideally once the cabling installation is completed and the loads are installed.

Over time, the equipment may change with additions or adjustments; moves and age can significantly affect waste energy.

Key areas where energy waste may occur are related to your power quality: voltage regulation, harmonics, power factor and unbalanced loads.

Voltage regulation

Voltage regulation works to reduce energy consumption in voltage-dependent loads. It reduces or controls the voltage levels within the equipment manufacturer's specifications to return energy savings. As more efficient loads are installed at a transformer, the voltage in the system may rise or be incorrectly controlled.

To catch voltage regulation issues, use a Fluke 1777 Power Quality Analyser to look for transient voltages and voltage imbalance.

Both issues can lead to failure, unplanned downtime, and expensive repairs.

Harmonics

Harmonics distort the voltage and current so that the ideal sine wave for voltage is not maintained. One of the most recognised effects of harmonics in electrical systems is the excess heat they create in the conductors carrying them.

This results in overheating in phase and neutral conductors, known as “triplen harmonics.”

The additional heat causes cable runs, motor windings, and transformer issues. The overheating can cause significant damage or complete failure, either of which could lead to unplanned downtime and expensive repairs.

To measure and diagnose harmonics, use a Fluke 1770 Series Three-Phase Power Quality Analyser.

Unbalanced load

The additional heat causes cable runs, motor windings, and transformer issues. The overheating can cause significant damage or complete failure, either of which could lead to unplanned downtime and expensive repairs.

To measure and diagnose harmonics, use a Fluke 1770 Series Three-Phase Power Quality Analyser.

Benefits of Power Quality Studies

Once power quality studies reveal areas where energy is being wasted, you can take steps to fix the issues:

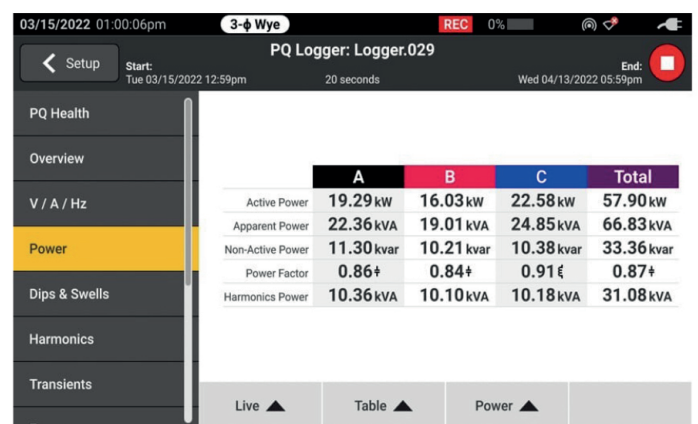
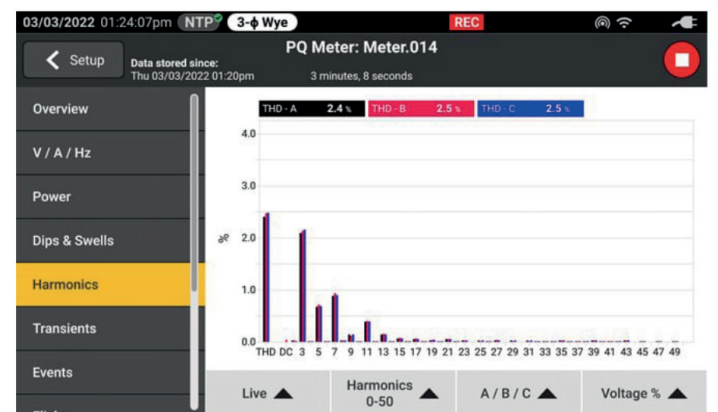
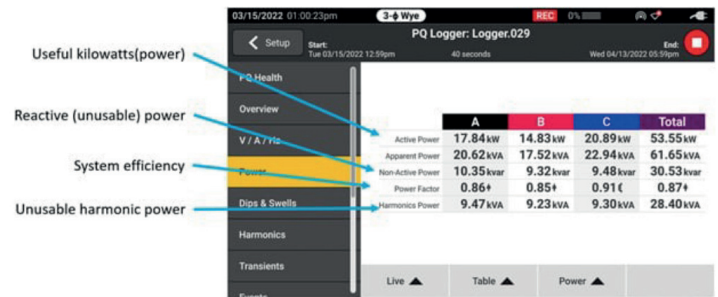
1. Set up a preventive maintenance routine so you can continue to measure against your benchmark and catch issues as they arise
2. Install harmonic filters on loads that add to your facility's harmonic distortion.
3. Address the sources of unbalance. This may mean setting up a repair or replacement schedule for large motors with mechanical unbalance issues.
4. Mitigate unbalanced load issues. In some cases, this may mean adjusting single-phase loads to be more equally distributed across the phases.
5. Replace blown fuses where necessary. A blown fuse on a bank of three-phase power factor improvement capacitors could also cause the problem; simply replacing the fuse can resolve a major unbalance.

Power quality studies highlight much of what can be done to save energy, reduce energy losses due to issues throughout a facility, and lower energy costs.

Power quality monitoring can show where the issues you're experiencing are coming from and how to fix them.

Beyond the energy savings, power quality studies have been shown to lead to some additional benefits:

- Discovering potential failure points in assets that can cause major disruption
- Came across improperly installed breakers prone to accidental tripping.



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Measure Pump Performance Using A Portable Ultrasonic Flowmeter



Measure your pumps flow rate, totalised flow, flow over a period of time and the velocity, non-intrusively, with the TUF2000P ultrasonic flowmeter. Print out the results on the built-in printer or data log to the SD card, for later print out in a .txt format.

- For use on carbon steel, HDPE, concrete, copper and plastic pipes.
- Measure clean water flow on pipes from DN25 -DN6000 (sensor dependent)
- 12 hour battery run time

- Option to add a 4-20mA Output
- 1% accuracy
- -30 to 160°C (with high temperature sensors)
- Rugged metal enclosure

All kits include:

Aluminium carry case containing ultrasonic flowmeter, chosen sensor set (-30 to 90°C) (3 different sensor sets to choose from), SD card and card reader (if datalogging is required) 5m of cabling, ultrasonic gel, strapping, tape measure, 2 paper rolls and manual.

Optional Extras:

High temperature sensors (-30 to 160°C), mounting brackets, ultrasonic thickness gauge, local verification certificate.

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New High-Flow Solenoid Valve Increases Plant Reliability and Operating Efficiency

Emerson has introduced the new ASCO™ Series 327C solenoid valve, which features a direct-acting, high-flow design that provides superior flow-to-power ratio compared to similar valves.

The Series 327C design features a balanced poppet construction that permits high flows at minimum power levels, making it ideal for use in power plants, refineries and chemical processing facilities.

Facilities like these can have hundreds, even thousands, of valves installed throughout their processes and systems. Even one malfunctioning valve can disrupt critical gas and fluid flows, impacting process quality and forcing unscheduled downtime and extra maintenance.

The ASCO Series 327C incorporates features that combine reliability and durability to increase operational efficiency and improve process certainty.

The valve features a unique, two-layer dynamic seal technology that provides low friction and excellent stiction resistance, helping ensure reliable valve operation in environments with temperatures ranging from -60 to 90 degrees Celsius.

In addition, the valve is SIL (Safety Integrity Level) 3 Capable, demonstrating a high level of performance integrity



and a very low risk of failure over the valve's projected lifecycle.

"Facilities such as power plants and refineries have demanding, high-flow gas and fluid delivery processes and need valves that are efficient, reliable and easy to maintain across thousands of hours of operation," said Anne Sophie Kedad, director of marketing with Emerson's discrete automation group.

"The ASCO Series 327C solenoid valve provides the reliable performance these facilities require, helping improve operational efficiency by minimizing unnecessary maintenance trips and

extending the intervals between proof tests."

The ASCO Series 327C valve can help streamline supply chains and simplify specification complexities for global industrial users by providing a single, globally approved solution for high-flow solenoid valve applications.

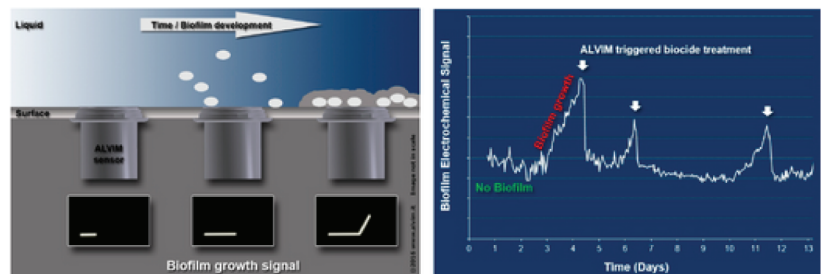
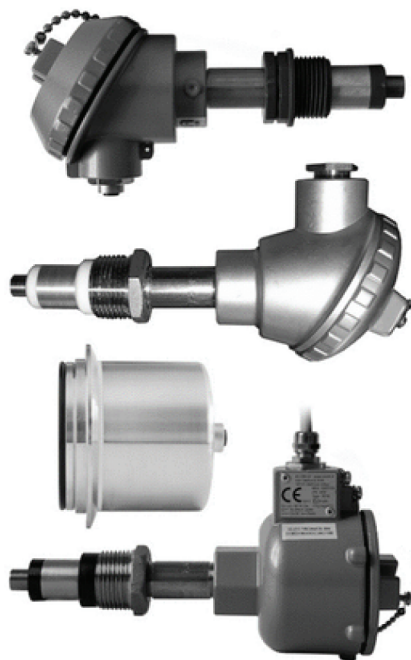
The valve also offers a unique electrical test connection to minimize field commissioning time and prevent moisture ingress in storage.

Emerson Automation Solutions

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ALVIM Biofilm Sensors detect early stage biofouling with highly satisfactory results in Industrial fields such as; Cooling Water Systems, Water Treatment, Desalination, Food Processing, Paper Mills and Petro-Chemical.

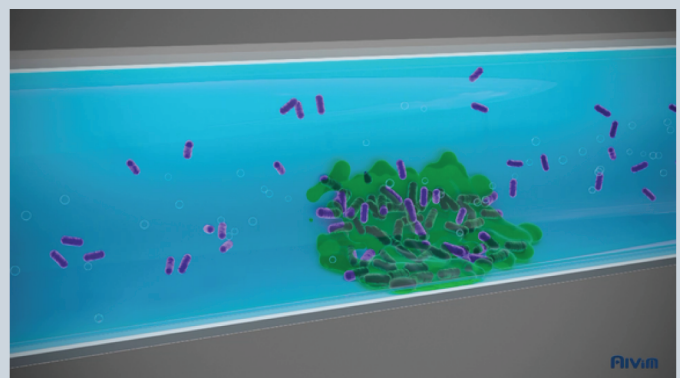


This technology allows for a simple and flexible biofilm monitoring approach, considering different applications such as:

- analysis and characterization of biofilm growth, in civil and industrial piping systems;
- assessment and comparative evaluation of different chemical biocides or sanitation treatments;
- real-time continuous monitoring of water treatment systems;
- automatic and/or remote control and optimization of sanitation treatment;
- preventative detection of pathogens such as, Legionella, Listeria and Staphylococcus in different fields (cooling towers, food production, drinking water, hospitals, etc.)

Some advantages of the ALVIM technology:

- early detection of bacterial biofilm growing in pipelines, tanks, heat exchangers, RO membranes, ...
- while other fouling sensors detect "generic deposit", ALVIM detect bacterial biofilm
- optimization of cleaning and sanitation treatments (biocides, disinfectants, ...)
- easy to install, easy to operate, virtually maintenance-free probe, real-time, continuous biofilm monitoring



Pressure Monitoring for Mobile Tanks in Pharmaceutical Processes

Pressure monitoring in mobile tanks is an important measuring task in the pharmaceutical industry.

Among other things, it enables users to check whether the containers are leaktight during transport. In the case of active ingredients, this is an absolute necessity.

Active pharmaceutical ingredients are high-value products.

Pharmaceutical companies therefore do everything they can to avoid any losses.

This also applies to the route between the various manufacturing stations of such "active pharmaceutical ingredients" (APIs) and their subsequent further processing.

Transport is carried out using mobile tanks. To protect the valuable contents, the remaining empty space in the containers is blanketed with inert gas.

Falling pressure in the mobile tank is an indication of a leak

Pressure monitoring for mobile tanks during transport extends to this zone. The pressure in it must be constant. However, if the pressure falls, this is an indication of a leak in, for example, a valve or a seal. Active ingredients can either escape or become contaminated through this leakage.

If the corresponding pressure is indicated, users can react immediately to prevent major economic damage or to prevent a possible danger to the environment due to escaping medium.

Which instrumentation is recommended for pressure monitoring in mobile tanks?

Pressure gauges are usually used for this task. They work purely mechanically and do not require any external energy to measure and indicate pressure. The user, therefore, always receives a reliable measured value.

However, the instruments must be designed to meet the task.

Diaphragm pressure gauges for a wide range of applications and high safety requirements

A wide range of applications can be covered with two diaphragm pressure gauges from WIKA's PG43SA series. The general advantage of diaphragm pressure gauges, in addition to the high overload safety, is the "dry" operation of the measuring cell, which poses no risk of contamination for the medium.

In addition, the PG43SA instruments have a hygienic design with a diaphragm element welded flush to the front. They are suitable for CIP/SIP cleaning processes and are also autoclavable.



Integrated diaphragm element monitoring

WIKA has developed the model PG43SA-D for particularly high safety requirements. The instrument has an additional integrated diaphragm element monitor with red/white indicator.

Should the otherwise robust measuring element tear as a result of a particularly aggressive medium, the user immediately receives an indication (red) of the damage.

A second barrier in the instrument keeps the pressure gauge sealed until the damage has been repaired.

The model PG43SA-C is suitable for small tanks with a capacity of up to 20 litres. With this compact instrument, the process connection is integrated into the case to save space. Due to the patented design, the pressure gauge is also suitable for containers from which no instrumentation may protrude due to the risk of it being torn off.

Highly accurate pressure monitoring for mobile tanks with complete documentation

However, if the focus of the measuring task is on accuracy and/or there is a need for documentation for transport, a diaphragm seal system with the model CPG1500 precision digital pressure gauge and a hygienic process connection is the first choice.

The pressure gauge measures with an accuracy of up to 0.1 percent of span. It also has a high-performance data logger that enables complete information about the pressure profile. The information can also be read out via Bluetooth® and archived for later review by the responsible authorities.

Vibration and shock-resistant

The mechanical design of the CPG1500 also enables it to be used in critical applications. It has comparatively few mechanical components and is therefore very resistant to vibration and shock, which is particularly advantageous when transporting by forklift, truck or plane.

In applications with highly aggressive ingredients or cleaning agents, the wetted parts of the diaphragm seal fitted to the pressure gauge can also be made of special materials, such as Hastelloy®.

Greg Rusznyak

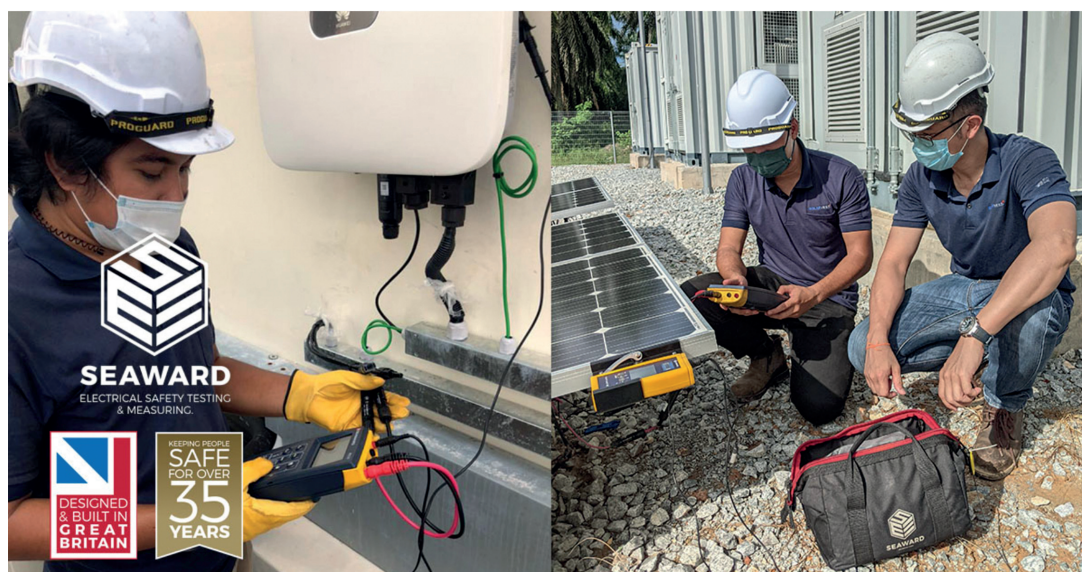
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Testers Power Ahead at Malaysia PV Specialists

One of Asia's leading clean energy specialists, Solarvest Holdings Berhad, uses the latest electrical safety test equipment to ensure the solar photovoltaic (PV) installations it services and maintains operate at peak performance levels.



Solarvest is committed to the vision of creating a world generated by renewable energy. Founded in 2012, the company provides a range of solar PV engineering, procurement, construction and commissioning services for several large-scale solar, residential, commercial and industrial projects in Malaysia.

Through its dedicated operations and maintenance (O&M) subsidiary, PowerTrack, the company actively maintains and monitors over 90 national projects.

The ongoing work it undertakes for customers involves pre-commissioning checking, and testing PV installations, specifically measuring the relationship between module current and voltage with the simultaneous display of irradiance value while analysing the current vs voltage (I-V) curve. Insulation tests without disconnecting the PV module are also undertaken.

To ensure this is carried out quickly, accurately and to the highest technical standards at dozens of installations across Malaysia, Solarvest's regional teams in Selangor, Penang and Johor rely on portable multi-function PV200 solar PV testers from Seaward.

These are used to interrogate the health of individual modules using I-V curve analysis, perform string cable insulation tests, and measure short circuit current (ISC) and open circuit voltage & (VOC) during pre-commissioning tests.

In this way, the accurate visual comparison of curve shapes can be used to immediately identify common problems such as shading, defective cells, or poor electrical connections, helping to rectify any issues quickly.

Using simple push button operation, the PV200 also carries out all the electrical tests required by IEC 62446, including maximum power point voltage, current and power, and insulation resistance.

Solarvest has used the tester frequently on PV string voltage design for its Industrial and Large-Scale Solar projects below

1000V in Malaysia to perform PV module output measurements.

Muhammad Mahadzir Bin Abdul Halim, Operations & Maintenance Engineer at Solarvest, said the PV200 is a highly efficient tester that allows engineers to complete checks regardless of the location of modules.

He added, "We strive to provide our clients with the highest quality and value-added turnkey solar energy solutions. The tester is an essential part of our on-site tool kit to enhance the efficiency of our service.

"With the multifunction PV200 unit eliminating the need for engineers to carry separate meters for different tasks. The ability to take one combined measurement instead of many separate ones greatly improves operator efficiency and accuracy, helping to identify possible faults from the modules and getting them verified and replaced quickly and safely - which is the key requirement of our maintenance work."

The combination of advanced remote monitoring capabilities with the latest in on-site solar PV test instrumentation enables Solarvest to ensure that the expanding infrastructure of PV installations it's responsible for maintaining continues to perform at maximum performance levels.

They form part of a comprehensive range of Seaward solar PV testing equipment.

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LinkedIn: www.bit.ly/3rpTu86

Product: www.bit.ly/3OT7Gn8

Damped Manual Failsafe

Kinetrol is pleased to introduce the new D-line damped lever operated manual fail safe.

Addressing a safety-critical gap in the market and expanding their range of failsafe units, these damped manual failsafe units are fully compliant with the machinery directives and unlike anything else on the market.

The D-line has been specifically designed to slow down the manual handle's movement on the return stroke, ensuring the stored energy in the spring is safely dissipated.

This allows manual operation of Kinetrol springs on sizes not previously possible safely.

The use of Kinetrol's highly reliable, low stress, clock type spring linked to a torque multiplier allows effortless manual operation of a valve in a compact space.

Features and Benefits:

- Manual unit, cannot be left in wrong position
- 180° lever input & 90° spring return
- Locking facility using a padlock (padlock additional adder)
- ATEX approved as standard
- 4 models available (07, 08, 09 & 10)
- Reliable torque delivery for valve reseal
- All units sealed to IP65 to protect from internal corrosion
- Safe and easy manual lever operation using Kinetrol's proven torque multiplier and energy dissipating rotary dashpot.



Application Damped lever operated manual fail-safe units are available in Kinetrol sizes 07 to 10 with torques from 42Nm to 143Nm (375 lbs.ins to 1270 lbf.ins).

D-line units are available for either clockwise or counter clockwise spring action and the direction of the unit is determined by looking from above with the mounting interface on the bottom.

Suffix - M20 = clockwise

Suffix - M30 = counter clockwise.

Materials of construction:

- Spring case 61.75 ... Diecast aluminium alloy - epoxy stove enamel coating
- Clock type spring ... Carbon spring steel
- Torque multiplier ... Diecast aluminium alloy – epoxy stove enamel coating
- Energy dissipating dashpots ... Zinc alloy
- Shafts ... Stainless steel or zinc plated carbon steel
- Locking plate ... Mild steel – epoxy stove and enamel coating
- Manual lever ... Stainless steel
- Operating temperature ... -40°C to 80°C (-40°F to 176°F).

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Enhancing Safety in Winder Operations



Within mining operations, winders are instrumental in vertical transportation, ensuring safe and efficient transport of people and tools in the mine shafts.

Maintaining the hydraulic oil that regulates the winder brakes can pose a challenge. Leaks can lead to a significant loss of oil and jeopardise operations.

Wika provides innovative solutions to such challenges, like their Float Level Switch, which effectively detects oil loss and automatically triggers the shutdown of pumps once a certain threshold is reached.

This technology minimises the risk of losing substantial amounts of hydraulic oil, promoting operational continuity and safety.

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New Benchtop Ionizer for Hands-Free Static Elimination



EXAIR's Varistat Benchtop Ionizer is the latest solution for neutralizing static on charged surfaces in industrial settings.

Utilizing ionizing technology, the Varistat provides a hands-free solution that requires no compressed air and provides a constant stream of particulate-free and static eliminating air.

Easily mounted on benchtops or machines, this static eliminator is manually adjustable and perfect for processes needing comprehensive coverage, like part assembly, web cleaning, printing and more.

The Varistat is the first fan-driven static eliminator to be offered by EXAIR, expanding available solutions while maintaining top-of-the-line performance.

Once plugged in, the Varistat provides rapid static decay capable of reducing 1000V to 100V in .8 seconds.

This product features two replaceable ion emitter points and two 30 PPI foam filters to ensure optimal performance over extended periods, as well as LED lights to signify proper function.

Offering customizable options like selectable voltage, variable fan speed and adjustable polarity, the Varistat is a comprehensive solution for eliminating static and removing dust, debris, and other troublesome particulate.

The Varistat joins an extensive line of static eliminating products from EXAIR that are UL listed and CE compliant.

Terri Carlson

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Compact Valve Position Indicator Engineered for Quick And Easy Commissioning



The new TopWorx™ DVR Switchbox is an entry-level addition to the DV Series of valve position indicators. It combines a durable resin enclosure, compact size and a patented cam design that provides water and wastewater systems, food and beverage production lines and industrial utilities a reliable valve position feedback tool.

The TopWorx DVR Switchbox uses a low-profile indication to provide easy-to-read local position feedback. This is vital real-time data that helps technicians and plant operators keep processes on target.

Engineered for harsh environments, it features stainless-steel components to provide a reliable, corrosion-resistant valve

indication solution to keep customer processes running smoothly.

Clear and highly reliable feedback of valve position helps process industry plants, platforms and pipelines operate with peak efficiency and safety without taking up additional production line footprint.

The TopWorx DVR Switchbox cam design enables swift position configuration for faster, easier installation and maintenance. For many process industry applications, the TopWorx DVR provides a compact and versatile design well suited for confined spaces.

In addition, its enclosure has an ultraviolet (UV) F1 rating, providing UV resistance that ensures the DVR performs reliably over the long term in outdoor conditions.

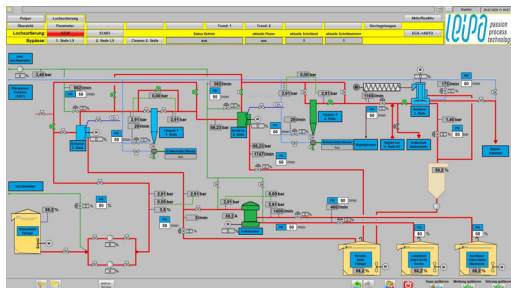
The TopWorx DVR Switchbox is one more offering in the TopWorx valve intelligence and proximity sensing portfolio from Emerson, designed to help process industry plants manage and control operations more intelligently and efficiently under the most demanding conditions.

Emerson Automation Solutions

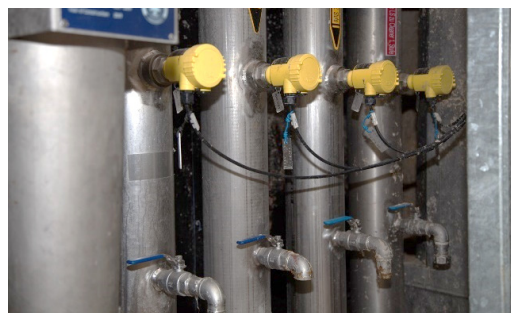
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Stock Preparation for Cartonboard Machine Modernised with Optimal Sensor Technology

The LEIPA GROUP is an independent family business – for over 170 years it has stood for environmentally friendly processes and technologies in the area of paper and packaging based on 100% recycling. The range of business activities in Schrobenhausen, where the company was founded, include the cartonboard and specialty paper segments as well as the LEIPA FlexPack business unit. The latter offers paper-based solutions in the area of flexible packaging.



Plant overview – new stock preparation



Pressure measurement with VEGABAR 82 – cleaning system



Pressure measurement with VEGABAR 82 – hole sorter

Ceramic measuring cell mounted in a M44x1.25 process fitting. The seal is recessed and therefore well protected.



LEIPA multi-ply grey cartonboard is, so to speak, the “classic product” for secure protection of valuable products in boxes and packagings. But it is also a popular standard solution for pallet covers or hardbound books.

The environmentally friendly material with grammages ranging from 300 to an impressive 950 g/m² is extremely resistant and stable and is used in a wide range of applications.

The cartonboard machine at the Schrobenhausen site was previously supplied by three separate stock preparation lines, one for each of the three layers: top, interlining and back.

Because the proportion of foreign matter and dirt in the recycled paper used was continuously increasing, the costs of operating and servicing the threefold system technology were also increasing.

For that reason, the company undertook a comprehensive modernisation project, combining the three stock preparation lines into one and making investments in new plant components and extensive automation technology.

There were four main goals here: increase operational reliability, make production more cost-efficient through new technologies, reduce maintenance costs and improve deinking quality.

A high degree of automation is indispensable in a modern stock preparation system that requires availability around the clock, all year round. This is ensured by a modern control system and the right sensors.

Those responsible for planning and maintenance decided in favour of the VEGABAR 82 pressure transmitter as the standard instrument for level and pressure measurement in the new stock preparation system.

The simple on-site adjustment and the robustness of the instruments were also decisive factors.

Especially in recovered paper processing, the deployed measurement technology is subject to extreme mechanical stresses caused by abrasive residues in the suspension or the vibration of refiners or standpipes of MC pumps, as well as hydraulic shock resulting from quickly closing valves.

Further challenges for every measuring system are: varying stock densities as well as agitators in vats and stock towers. The internal cleaning of equipment components with aggressive chemicals and external cleaning with high pressure cleaners are additional factors that have to be reckoned with.

Sensors have to measure precisely and reliably in spite of these challenging conditions. VEGA understood the advantages of robust ceramic early on and came up with a sophisticated sensor design utilising the dry, capacitive measuring cell CERTEC®.

High-purity alumina ceramic (99.9% Al₂O₃), which is second in hardness only to diamond, is used as the diaphragm material. This protects against abrasion, especially in cleaners, and ensures the long service life required for profitable continuous operation.

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Automating Precision Tasks

A new low-cost modular robotics kit from motion plastics manufacturer, igus, makes automation extremely easy and affordable for manufacturing companies in South Africa.

Cost-effective automation is the best possible solution for gripping, turning, pivoting and placing items and returning them to their initial position – especially in the case of simple pick-and-place tasks performed over a long period of time.

Lubrication-free and maintenance-free robolink components can be arranged for a multitude of tasks and are a cost-effective way of ensuring more efficient processes.

igus South Africa's managing director, Ian Hewat, says this also applies to small and medium-sized enterprises that are becoming increasingly exposed to external competitive pressure.

"Our robolink modular robot joint kits give manufacturers easy entry into the world of automation – easily and cost-effectively.

Highly configurable

"Our robolink range of products offer low-cost components made of lubrication-free and maintenance-free plastics. With the modular kit principle of robolink, the user can create a simple automation solution in a very short time.

"In addition, the user can put together systems individually – either with single components such as gearboxes that can then be combined or with completely pre-assembled articulated arms, whose lightweight construction and size make them especially flexible.

"With the possibility of modular combination, the customer receives a system that can be used for a wide variety of robotics tasks. The advantage of robolink is that repetitive and time-consuming tasks that are mostly performed by hand can be automated very easily.

"And all this can be done simply at a fraction of the cost of a classical industrial robot. In this way, better and more efficient use of resources can be made," says Ian.

He explains that the robolink modular kit enables the user to individually assemble a system consisting of joints with



different gearboxes, motors and connecting elements.

The robolink D joints are the moving connecting pieces that are located between the robot arm's individual connecting plates and are operated with a direct drive and a stepper motor.

Made to last

Different joint sizes with worm gears or strain wave gears are available for the user to choose from. In the case of worm gears and strain wave gearing, the motor is located directly on the axis and, depending on the application, can be installed as a waterproof motor – for example, where spray water occurs.

The joints can be operated with motors of other manufacturers, in addition to those obtainable from igus.

As all robolink components are also available as individual joints, they can be combined with each other or special components as well as with highly durable drylin E kits for gantry robots.

For example, a multi-axis articulated arm can move on a lubrication-free drylin E linear axis.

The robolink D connecting elements link the robot arm's individual joints to each other. They include the base with which the robot can be mounted on a surface and the connecting elements for joints.

The robolink joint systems are available as ready-made robot arms with two to five axes. Due to the modularity of the kit, however, they can be extended and adapted as often as required as all components are also available as individual units.

This provides maximum flexibility in the automation process at all times or makes it possible to construct an articulated joint system according to individual needs. Flexible addition of control unit, gripper, suction and other components are also available.

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Biofilm Sensors for Real-Time Measurement of Bacterial Growth

The ALVIM Biofilm Sensor allows for a real-time measurement of bacterial growth, and its possible decrease due to sanitation treatments.

The sensor can be easily connected to any water system (pipelines, tanks, etc.), and requires just one cable for data communication and power supply.

The sensor (composed by a sensitive element and an electronic board) is based on an innovative electrochemical technology, able to detect biofilm coverage since its very first phase.

Besides revealing and monitoring biofilm growth, ALVIM probe is sensitive to oxidizing substances (as many biocides are). This allows for a real-time monitoring of biocide application, providing additional information on the effectiveness of sanitation treatments.



AX03S3 Sensor: ATEX certified, this model is indicated for classified areas and applications where there is a risk of explosion (e.g. Oil&Gas)



AS11S3 Sensor: With hygienic connection to the process, flat surface in contact with the liquid and high resistance to chemical treatments, this model is indicated for applications where hygiene is critical.



A001S3 Sensor: ALVIM standard sensor, suitable for most industrial applications. Given its corrosion resistance, it is particularly indicated for seawater applications.



AS01S3: With hygienic connection to the process, flat surface in contact with the liquid and high resistance to chemical treatments, this model is indicated for applications where hygiene is critical.

Applications

- Open cooling towers
- Once-through cooling systems
- Legionella prevention
- Mineral water bottling
- Water Distribution Networks
- Reverse osmosis desalination
- Biogas upgrading plants
- Cooling towers
- Power plants
- Food production
- Soft drinks
- Industrial reverse osmosis
- Paper mills

For more information, follow these YouTube links:

<https://www.youtube.com/watch?v=ZQMeA39fWjY>

https://www.youtube.com/watch?v=_7BQmGns7I0

<https://www.youtube.com/watch?v=Fw8yWt9Y8CY>

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<https://www.alvimcleantech.com/cms/en/biofilmsensors#datasheets>

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ISO Adaptor - Ultimate Mounting Flexibility



ISO adaptor kits are designed for converting a standard male drive Kinetrol actuator (double or single acting) to a mounting compliant with ISO 5211:2001.

They are available in sizes 02, 03, 05, 07, 08 and 09, and can be fitted to the spring unit of size 02.

Features:

- Low-cost direct mount flange and coupling for mounting to valves with ISO 5211 drive interfaces, available for actuator models 02, 03, 05, 07, 08 and 09.
- Mounting directly to standard Kinetrol double acting actuator thereby reducing stocking requirements
- Multiple mounting hole sets in one part
- International patents. The novel design allows metric mounting screws to face in either direction.

Valve flanges with tapped holes can easily be interfaced for the first time. Nut recesses in flange make for easy installation.

- Robust epoxy coated zinc alloy (02, 03 & 07) and aluminum alloy (05, 08 & 09) adaptor with no threads for maximum corrosion resistance.
- Female drive bi-square (star) coupling is retained by adaptor and made from zinc plated steel (other materials available on request)
- Serrated drive versions also available.

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Linear Drive System Increases Plant Efficiency

EtherCAT and PC-based control has long been used by the Marchesini Group, one of the world's leading manufacturers of packaging machines and filling lines for the pharmaceutical and cosmetics industries.

Nowadays, the Italian machine builder also benefits from Beckhoff's XTS linear transport system. In a monoblock machine for filling and capping bottles containing tablets, capsules, or pills, XTS makes transport more flexible while reducing setup times and energy requirements.

Since it was founded 50 years ago, the Marchesini Group has always paid particular attention to the key components of its systems. This also applies to the machine software, which the company develops entirely in-house.

"Unlike system integrators, our hallmark is that we are an all-round manufacturer: We develop all of our machine technology in-house and therefore know it all inside out," explains Stefano Gualmini, head of Automation R&D at Marchesini.

Fitting entirely with its concept, Marchesini's cooperation with Beckhoff dates back to the 1990s and is based on a precise shared vision with a solid foundation.

From proprietary to open and PC-based architecture

"Since the early 1990s, we have focused our area of interest on standardized and open platforms. We wanted to move away from PLC-based control architectures," recalls Stefano Gualmini. "This was primarily due to the availability and reliability of PC hardware and its excellent price/performance ratio."

In fact, the company implemented EtherCAT back in 2007, soon after it had been launched on the market. "We consider EtherCAT to be the backbone of our automation processes in every respect," states Stefano Gualmini.

He points out that the company's selection criteria were – and still are – based on the platform's open nature, efficiency, and ease of implementation. What's more, it has been using EtherCAT to exploit the potential of functional safety via FSoE since 2013.

At Marchesini, integrating safety functions on the same bus system has resulted in a huge reduction in wiring work – by some 50%. Taking this approach also optimizes the communication between the safety and standard components.

Motion control represents another core area of expertise for suppliers of packaging and filling machines.

After an intensive benchmarking exercise between 2018 and 2019, the company once again decided that Beckhoff was the right choice.

"We knew that we would have to take a quantum leap in terms of motion control and mechatronics to prepare for the challenges we would face in the coming years," notes Stefano Gualmini.



But the Marchesini Group didn't just choose Beckhoff as a partner for motion applications due to their previous partnership – it was also impressed by the quality and diversity of the technologies available.

Although initially classic rotary motion components were used, the XTS linear transport system now also serves as a mechatronic drive solution.

One example of where it can be found is the Compact-24 monoblock machine, designed for counting solid products (tablets, capsules, pills, etc.) and adding them to bottles.

Using XTS to achieve efficient processes

The Compact-24 is a typical example of a linear machine: At the infeed, a mechanical system takes the medication bottles from a stack and places them individually on an XTS mover.

The movers then move to the filling station, where hoppers appropriate for the task fill multiple bottles simultaneously with pills that have already been counted.

The bottles are then transported to the next station, where they are transferred to the rotating capping unit.

After that, XTS is used to move everything back to the unloading station, from which point the containers are sent on for further processing after a series of checks.

According to the Marchesini experts, the Compact-24 breaks the mould through its use of XTS for bottle transport. Each mover moves autonomously and is positioned or grouped according to the desired work sequence.

With this technology, Marchesini machines now boast high linear speeds that minimize the times required for returning the empty movers to the pick-up station and for changing bottles.

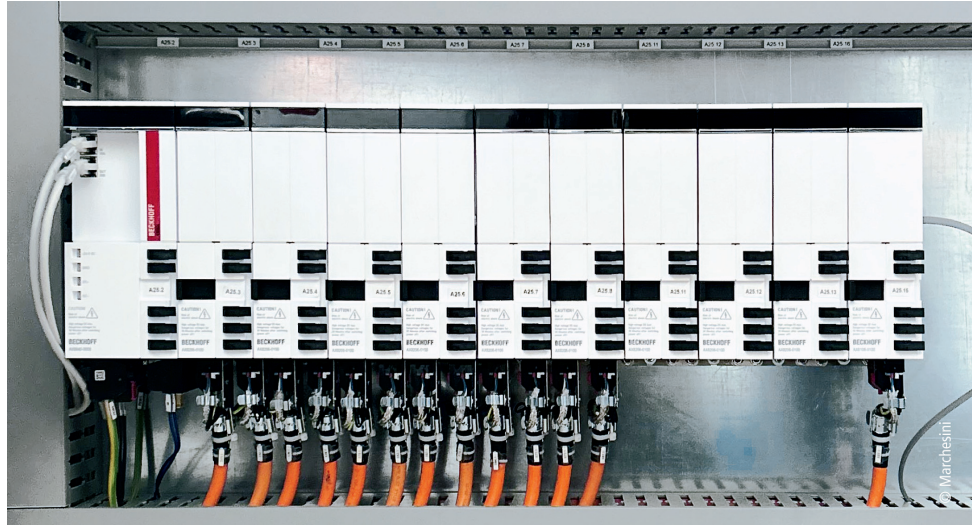
XTS also makes it easier to convert the format. Using the control panel, the movers can be positioned in groups and moved to defined locations for exchanging product-specific adapters.

The Compact-24 offers two special features. For one thing, the in-and-out movements of the bottles at variable intervals can be synchronized.

Furthermore, the software enables the movers to be configured and adapted to the new containers and their properties when the product is changed – for example, the



Marchesini uses a C6930 control cabinet industrial PC to automate the entire Compact-24 filling line.



Using the DC intermediate circuit, the AX8000 multi-axis servo system enables energy savings of up to 20%.

shape and capacity of the bottle and the distance to be maintained between the products.

"XTS enables us to provide flexible and consistently optimized transport," enthuses Stefano Gualmini. Adding pills or tablets to bottles is not quite as simple as it might seem, as these products tend to fall from the feed system hoppers into the bottles at different speeds.

In addition, the filling time for each individual bottle is affected by a visual integrity check and multiple bottles are always filled in parallel. That is why each bottle must be handled individually.

Compared to conventional mechanical solutions, XTS can fully exploit its strengths with the individually controllable movers in the Compact-24.

The XTS technology enables each bottle to be handled individually – an unbeatable advantage when it comes to efficiency.

"Given that the filling station has to count the tablets for each bottle, XTS was the ideal solution for our synchronization problems," explains Stefano Gualmini, an automation expert.

In mechanical terms, the XTS motor modules and guide rails are fully integrated into the machine frame.

From a software perspective, the movers are integrated into the automation project like normal drive axes.

Several dozen axes may be involved, depending on the design, but this does not affect the application in question.

"This offers considerable advantages in terms of flexibility and speed compared to conventional motion solutions," emphasizes Stefano Gualmini.

Machine cycles increased by 25%

Measurable improvements have been achieved. By integrating XTS into its machines, Marchesini has been able to improve accuracy (with respect to tracking errors) in certain applications by up to two orders of magnitude. This has helped to increase the Compact-24 production speed from 120 to 150 bottles per minute.

What's more, using the AX8000 multi-axis servo system with its intermediate voltage circuit (DC bus) has resulted in significant energy savings of up to 20%.

"Beckhoff provides us with a constant incentive to exploit the potential that new technologies can bring in relation to efficiency and innovation. For that reason, I'm positive that our long-standing partnership will be even closer in the future," concludes Stefano Gualmini.

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Improved Regulation and Control of Fluid Flow With Ceramic Core Ball Valves



Automatic and manual ceramic ball valves offer a cost-effective alternative to solenoid valves and provide better wear resistance.

Lynette Morrey, New Business Development Manager of Allmech, says that various innovations mean that these valves are now suitable for a greater number of applications than ever before.

"Ceramic core ball valves are ideal for low torque operation; they're durable and long-lasting and they're resistant to corrosion, abrasion and chemical wear," Morrey says.

"They are a low-maintenance option and we're finding more and more customers choosing them, particularly in humid conditions. They don't need constant monitoring, routine inspections or regular cleaning and re-calibration."

Morrey says common applications include seawater desalination, paper mills, printing and dyeing, electroplating, smelting, energy, medical, chemical, fluid intelligent control, smart card water meters, sewage, water reclaiming, softener and filtration water treatment plants, boreholes and domestic water treatment applications.

Eugene Swart, Managing Member of ZAO Water Systems, has been using Runxin valves since 2009 and partnering with

Allmech since 2017 for the company's valve requirements.

"Allmech has introduced various valves to us. We started experimenting with the different valves and the applications and we realised that we can control quite complex tasks by utilising the different valves and even control the ball valves with the filter valves electronically," Swart says.

"We are still developing other uses for the valves and I think there are many more to discover in future."

Clinton Saunders, Operations Director at Greenchain Group, says the water treatment company looked into importing ceramic ball valves for the business, but ultimately decided to partner with Allmech because of stock availability and technical support.

"Runxin is a brand that we know and trust," Saunders says. "We make use of a lot of the Runxin filter heads too. From a reliability and robustness point of view, those valves are basically bulletproof."

"We primarily use the ceramic ball valves for filtration applications to control and direct fluid flow. Most recently, we've used ceramic ball valves on a seawater desalination system for a cold storage facility."

Morrey says the Runxin ceramic core valves are well-suited to desalination applications because they are corrosion-resistant and relatively waterproof.

"These valves are hard sealing (not sealed by extruding rubber) with a ball core and valve seat made of corundum ceramic," she explains.

"The ball core and seat are ground and paired causing a self-lubricating effect. This in turn makes the manual ball valve easier to open and close due to their low torque."

The automatic ball valves in the range have a self-balancing structure with the ceramic ball opening at an average of 12.5 seconds (far slower than traditional actuated ball valves).

"The valve body and stainless-steel shaft are manufactured to match the ball perfectly, which ensures that the ball is well balanced and has low vibration.

"This reduces water hammering, which may cause damage to pipework, membranes and plant equipment," says Morrey.

Sintered at the ultra-high temperature of 1680°C, the Runxin ceramic ball valve undergoes various grinding processes ensuring that the ball core roundness is accurate to less than 6µm.

"They can handle an operating pressure of 0-16MPa and operate at temperatures between 0-60°C," says Morrey.

"The EPDM seal is also acid- and alkali-resistant. This makes the valves suitable for applications like copper recycling and in metal extraction plants."

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High Precision Data Loggers for Wire And Thermocouple Probes



Senseca, formerly the GHM Group, has launched with enhanced features and a re-design, their PRO 111, PRO 115 handheld meter/data logger for Pt100 4-wire probes as well as their PRO 131/PRO 135 data logger for thermocouple probes.

"Both of these devices now give a higher quality LED screen making the data more visible due to the backlit dot matrix/clear text display, as well as a data logging storage capacity of up to one million data.

"These high-precision instruments are suitable for temperature measurement across all industries. They are robust, reliable and ergonomically designed for both one handed and bench top use" commented Jan Grobler, Managing Director of Senseca South Africa.

PRO 111 / PRO 115

The PRO 111/PRO 115 data loggers are high-class professional handheld meters for 4-wire Pt100 probes. Any four wire Pt 100 standard probe can be connected provided it is equipped with a M12 connector.

It has a high-precision temperature-compensated analog front-end meter that does not add any significant error in the measurement chain which also life chart viewing.

The device incorporates a sophisticated polynomial sensor linearization to ensure best performance and to provide all relevant possibilities for calibration and adjustments.

The LED display offers a HOLD feature which allows freezing of the measurement on display, while the REL feature shows the measurement against the measured value.

The PRO 115 is easily connected via the USB C port for viewing or downloading files stored in the internal memory of the instrument or for connection to the application software Proxware.

PRO 131 / PRO 135

Both models are dual channel professional handheld meters for thermocouple probes. Any K, J, T, N, R, S, B and E standard thermocouple probe can be connected. They offer configurable surface correction factors and can be set for use in combination with Senseca contact probes for enhanced measuring accuracy.

The PRO 135 also has a data logging capability.

They also offer HOLD and REL options in addition if two probes are connected, the instrument will calculate and show the difference between the measurement of the two channels.

Both the four-wire ropes and the thermocouple instruments offer acoustic alarms with high thresholds and optional hysteresis, statistical functions of Min, Avg and Max, IP67 waterproofed with a long battery life, external power via USB along with quick access to most used operations form some of the functional features on the device.

Grobler commented that the redesign of the devices has enabled Senseca to improve functionality, accuracy and reliability while still offering pinpoint precision data loggers that have been manufactured to the highest of European standards.

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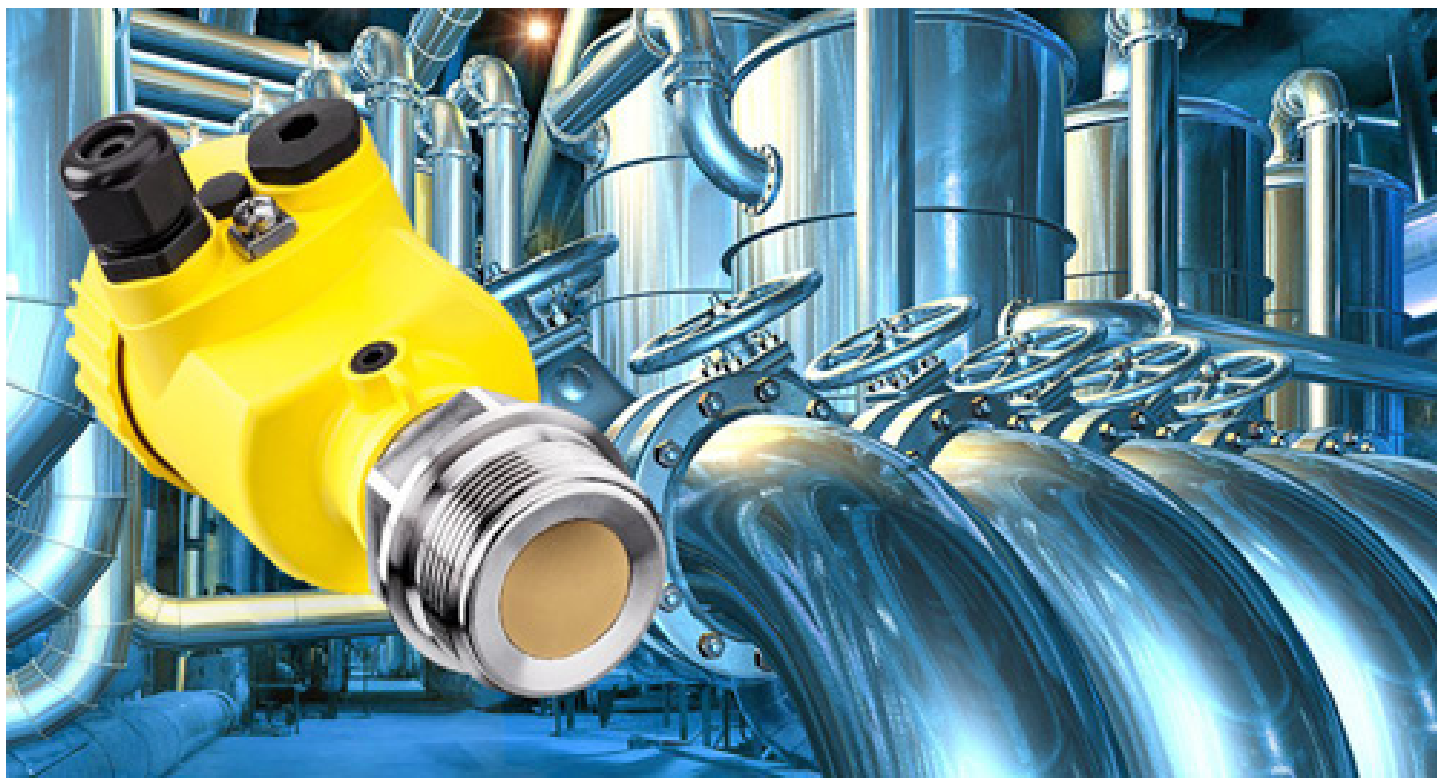
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Seven Good Reasons for Using Pressure Transmitters With Co



Due to its accuracy and high reliability, pressure measurement technology in the process industry is one of the most versatile and robust measuring principles applied for pressure and level.

It demonstrates its capabilities especially when things get difficult: in chemically aggressive media, in hygienic or hazardous areas, in applications with rapid temperature changes, heavy condensation or extreme pressures and temperatures.

Temperature or thermal shock resistance is a recurring issue for many pressure transmitters with ceramic measuring cells, but not for VEGA's CERTEC® measuring cell – its special compensation capability provides an effective antidote to this particular vulnerability.

An additional temperature sensor circuit on the rear of the diaphragm can detect even the slightest change in temperature and has thus solved this problem. This temperature value can even be used as a second output.

But the ceramic-capacitive CERTEC® measuring cell, manufactured from special sapphire ceramic, can do much more: it is one of the most robust and resilient pressure measuring cells ever made.

In short: When the loads are enormous and the demands on the measuring cell are high, there are seven good reasons for using pressure transmitters with ceramic measuring cells.

1. Abrasion resistant

In aggressive process environments, metallic measuring cells can readily fail through a variety of stresses such as abrasion, impacts, friction, corrosion and high temperatures take their toll.

However, it is a different story with measuring cells made with CERTEC® ceramic, which are exceptionally hard and abrasion resistant: 10 times harder than stainless steel.

From demanding production techniques, like slurry containing metallic debris or sand-laden media: whenever superior resistance to chemicals or extreme temperatures or pressures is expected from the deployed measurement technology, CERTEC® ceramic is the only choice, as it handles these conditions with ease.

Even strong cleaning agents or mechanical cleaning with a brush have no effect on the measuring cell.

2. Minimal drift = high long-term stability

Pressure transmitters with ceramic CERTEC® measuring cell deliver reliable measuring results as they are virtually drift-free. When it comes to long-term stability, they far outperform metallic measuring cells.

Drift is a phenomenon that slowly creeps into pressure measuring systems. In pressure transmitters with metallic measuring cells, so-called long-term drift is a common occurrence, due to ageing of the material.

The thin metal diaphragm fatigues after a certain period of use and no longer returns exactly to the original zero point – and starts to 'drift' farther away over time.

The user then has to carry out a drift compensation in the form of a recalibration.

Ceramic CERTEC® measuring cells, on the other hand, operate practically drift free. The hardness and limited but precise flexibility and range of motion of the ceramic material means that they exhibit virtually no material fatigue or drift.

Ceramic Measuring Cells

For that reason, the self-monitoring ceramic measuring cells lengthen the recalibration cycles considerably.

3. Oil free

Ceramic measuring cells are dry measuring cells that operate without oil as a pressure transmitting medium. This distinguishes them from metallic measuring cells, where the pressure reaches the sensor element indirectly, transferred by internal oil.

If oil is involved, there is always a potential danger that it could enter the process unnoticed, for example due to a rupture in a membrane. With corresponding consequences for the end products.

Because the risk of contamination is ever-present in closed, pressurized manufacturing processes, oil-free sensors are being used more and more.

Also, oil-filled measuring systems in combination with high temperatures are less suitable for vacuum applications.

Pressure transmitters with ceramic CERTEC® measuring cell are designed to avoid such risks entirely. Here, pressure acts directly on the sensing diaphragm, so there is no need for transmission oil.

This technology thus fulfils the demand for oil-free processes, and completely eliminates the risk of entire batches getting contaminated.

Also when it comes to zero point shift, users are always on the safe side: where there is no oil, no air can get trapped in the system, which can cause drift.

4. Compatibility for many process media

Two main options are available for measurement applications in highly corrosive processes: special materials, which are often very expensive, or ceramics. Measuring cells made of CERTEC® ceramic resist interaction with the process media very reliably.

In contrast to metallic measuring cells, they exhibit significantly increased chemical resistance to many aggressive liquids and gases.

They are therefore compatible with the majority of process media. Unlike metal, ceramics are ideal for a wide variety of applications: from salt water to highly acidic liquids.

Expensive alternatives, such as measuring cells coated with tantalum, are only needed for really extreme situations.

5. High overload resistance

Ceramic measuring cells easily handle extreme load changes, achieving up to 200 times the overload resistance of metallic cells. This is mainly due to the design of the transmitter.

A typical measuring cell consists of a diaphragm and a ceramic body. If extremely high pressure is applied, the ceramic diaphragm simply stops against the larger base body. The result is an outstanding overload capacity.

6. Small measuring ranges

With ceramic cells, even very small pressure changes of only a few millibars are reliably detected.

In the case of metallic diaphragm cells, a special oil is needed as a transmission medium for the internal sensor to detect pressure changes.

This functional principle is the same whether the measuring ranges are large or small (only a few millibars).

This means that, especially with very small measuring ranges, a correspondingly large diaphragm is needed to reliably detect the minute pressure change.

Ceramic CERTEC® measuring cells do not have this problem: they can easily handle small measuring ranges and since they do not require transmission oil, they are extremely compact and can be mounted with small process fittings.

7. No hydrogen diffusion

Due to its small atomic size, hydrogen can even totally permeate metal. And the thinner the diaphragm, the faster it happens.

If hydrogen diffuses into and through the diaphragm, it reacts with the transmission oil behind the metallic diaphragm.

This results in hydrogen deposits that lead to permanent changes in measurement performance.

The situation is completely different with ceramic measuring cells: even hydrogen cannot diffuse through them and negatively influence their service life.

Their superiority in terms of hydrogen permeability can thus be added to the list of advantages of ceramic measuring cells.

Conclusion

Ever since VEGA has been offering with its versatile and highly capable VEGABAR pressure transmitter a ceramic measuring cell, that withstands thermal shock and has superior overload resistance, the arguments for using metallic measuring cells as standard have become fewer and fewer.

Because even in hygienic applications – normally the domain of flush-mounted, metallic diaphragms – the innovative CERTEC® ceramic has a lot to offer: highly chemically resistant, it withstands extreme temperatures and is so robust that even solid, abrasive particles in liquids cannot harm it.

Ceramic pressure transmitters are made of one of the world's most stable, resistant materials and come with seven convincing arguments for their use: abrasion-resistant, virtually drift-free, no filling oil, compatible with many process media, long-term stability, overload-resistant, suitable for very small measuring ranges and, last but not least, superior in terms of hydrogen permeability.

In any case, they open up countless ideal areas of application for users.

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