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# PROCESSING

Instrumentation, Process Automation, Chemical, Electrical, Analytical



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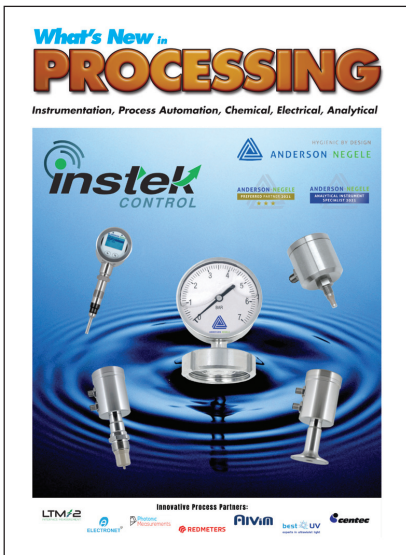
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Innovative Process Partners:





**Editor:**

**Debbie Scott**



**Tel. +27 83 788 5145**

**Marketing:**

**Roelien Fraser**



**Tel. +27 78 079 2296**



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## High-Precision Pressure Gauge - Durable Accuracy For High Process Reliability In Food Applications

Highly accurate monitoring of process pressure and robustness against recurring pressure surges are essential in many food applications. The long-life technology of the EL pressure gauges noticeably increases measuring sensitivity and durability:

The wear-free mechanical system ensures a measuring accuracy of  $\pm 0.5\%$  of the end value over many years.

The optional hydro-mechanical damping provides efficient and reliable protection against damage even under pronounced mechanical loads such as vibrations and pressure hammers.

The diaphragm is specially mechanically equipped for a long service life, for example through the supreme material quality and an in-house production process optimised over decades.

The extended service life, which is often several times longer than that of other pressure gauges, leads not only to increased process reliability but also to a favourable cost of ownership.

A particular feature for fast and reliable detection is the display with the maximum possible diameter related to the device size.

Other factors for long-term practical suitability include the robust construction, the process and CIP/SIP temperature resistance up to 149 °C, and the all-round hygienic and easy-to-clean one-piece design with protection class IP66.

### Technical specifications at a glance

- High-precision pressure gauge, measuring accuracy  $\pm 0,5\%$  of the end value
- Huge display diameter 90 mm
- Pressure range -1...+40 bar, measuring range selectable in PSI, BAR or Dual
- Optional hydro-mechanical damping
- Extremely robust one-piece design and Long Life Technology for easy cleaning and lasting process reliability.



**Raymond Karsten**  
Instek Control  
Tel. +27 12 998 6326  
raymond@instek.co.za  
www.instek.co.za

## Professional Help for Personal Care

Of the many processes involved in finalising a consumer product, the final step can often be the most intricate. For this Omron customer, the last step in production is to fasten the cover holding screw, closing the unit—in this case, an electric shaver.

Traditionally, the full process was completed manually, with an electric screwdriver in a multi-step process. This repetitive task is an ideal application for the help of an Omron cobot.

When a leading global manufacturer of personal care equipment needed a production solution that combined cost reduction with quality improvement, they came to Omron, a trusted partner they had worked with many times. For this particular line, they needed something that would help with a very specific task, right at the end of production.

### Meeting the challenge

The task at hand? Tightening the final screw into a personal grooming device—simple enough you might think. But the intricate process is something that takes great care, accuracy, and attention to detail, and involves differing form factors and models, with differing placements of screws per model, which is why it's generally finalised by hand.

### Professional solutions

"The customer approached us to see if it was possible to bring a collaborative robot in to help the operator," Barry Oorbeek, Key Account Manager Industry Solutions at Omron Benelux explains. The solution design phase involved a thorough audit of needs: "Omron Safety Services Europe (OSSE) first conducted a machine risk analysis, then a Sistema calculation, to define the requirement specifications for the system integrator," says Barry. "From here we were able to prioritise and plan for the commissioning phase of the project."

### Selection & setup

"In the setup phase, we used the intuitive plug & play software to establish virtual 'safety fences' prior to installation. This set clear boundaries around the cobot, to limit its range of movement to its specific area of operation." This ensured complete predictability, so that the operator had a confident understanding of where the cobot would be, and what it would be doing, at all times.

### Safety first

For the customer, the key criterion was of course safety, since the cobot would be working in close proximity with a human operator. From the various options suited for the task, they chose the OMRON TM5-700, a unit built for quick start-ups, rapid changeovers and of course, inherent safety, as Barry explains. "From the points highlighted in the machine risk analysis, OSSE then conducted extensive force- and pressure-testing, going through each potential risk point, establishing



the maximum permissible pressure, and confirming that the cobot was able to instantly and accurately sense the results of its actions."

This testing covered all the delicate movements involved in screwing the unit cover into place, so the cobot detected when the screw was firmly in place, without overtightening. And since everything is programmable, once

the actions are performed perfectly once, they are fixed in memory, for right first time—every time—action.

### Rapid start-up, intuitive operation

An intuitive human-machine interface within the machine controller gives full overview and control of the cobot, which is designed for ease of use. Operators need only 5 minutes' instruction before starting to work with the system, which was engineered to keep pace with the speed of the manual production line.

### Ideal human/cobot mix

"This system goes a long way to solve a very common problem in production lines," says Barry Oorbeek. "Repetitive tasks done by hand can suffer from quality variation over time. With this solution, the customer has the ideal combination—the flexibility of an operator to handle the high diversity of components, with the accuracy and sensitivity of the Omron cobot to perform the repetitive screw-fastening process."

### So why not fully automate?

The customer in this case already has a large installed base of Omron robots in place, with some automated screwdriving in automated lines. But this particular workstation is used for a variety of form factors and end-products, so it was decided to bring a cobot on board, since there may be multiple changes per day of the product that's being finalised. "Omron cobots are designed to be supremely flexible, both in the way they are simple to program, and in the way that they can be used. Here for instance, the customer can achieve single-minute exchange of dies (SMED), moving from one product type to another extremely quickly."

### The end result?

"Their process quality has improved, and they have an integrated solution that was quickly verified and validated." This customer is currently investigating the use of Omron cobots in other areas of its production facilities.

Laetitia de Jager  
Omron Electronics (Pty) Ltd  
Tel. +27 11 579 2600  
info\_sa@omron.com  
www.industrial.omron.co.za

## Mobile Robots Streamline The Transport Of Medical Vials In A Cleanroom Environment



Established in 1937, Madrid-based company, Normon, has been manufacturing high-quality medicines for over 80 years, serving customers in the pharmaceutical and healthcare sectors throughout Europe and in the US. The company prides itself in its advanced technology and innovation, and its ability to produce affordable medicines in a sustainable way.

### A solution for clean room environments

Normon was using automated guide vehicles (AGVs) within the production process. However, following a change in the environment in which the robots needed to be deployed, the company discovered that the AGVs were too large to be used in certain clean rooms. Robots used in this environment must meet stringent requirements to prevent them from acting as a source of contamination.

A different type of robot would be required for the clean room application, as without robots, highly trained and qualified operators would have to transport the products within the clean rooms, instead of focusing on their own tasks.

Normon's Head Engineer, Jose María Urdillo, comments: "We were looking at the different solutions in the market and particularly interested in autonomous mobile robots (AMRs), but these were not able to meet our criteria. However, we then came across an impressive AMR produced by OMRON, which was suitable for work in clean rooms.

The OMRON LD mobile robot could be personalised to meet Normon's specific needs and was very easy to install in the plant. The whole implementation process took just three days and was carried out by Mipelsa, an integrator that specialises in the implementation and maintenance of electronic products, including those involved in industrial automation. OMRON worked closely with the system integrator throughout the whole process.

The installation and start up in the Normon factory, was extremely fast, previously tested in the Mipelsa laboratory after building a similar work area, and it was here where a fine tuning to fulfil all the performance and safety requirements was done, highlighting that was very easy from the Normon point of view to make the commissioning in just one week working in production mode.

Normon was pleased with the help and advice provided by both OMRON and Mipelsa, including a redesign of a tray holder to include a slight bend in one of the tubes holding the structure, which resulted in a more robust construction, this being the most relevant in the application to reduce the presence of humans in an "A class" working area as specified by the FDA in their requirements.

No modifications in the environment were needed when integrating the robots, which were ready for trials within a week.

### Improved productivity

OMRON's Project Manager, Miguel Ángel Esteban, says: "Since the first implementations of OMRON mobile robots in 2018 and 2019, Normon now operates one of the first and largest mobile robot fleets in Europe, with 18 mobile robots in service.

According to Normon, the project was a huge success when the robots have demonstratively boosted production after one month in operation."

This proved to be the case: productivity improved significantly, as 111,000 vials could be transported in 40% less time than before, reducing the length of stay in the plant's "A class" area. This means that the production process that previously took one and a half shifts can now be completed in less than a shift. The FDA regulations require no people to be present in an "A class" area, and this has been made possible thanks to OMRON's mobile robots.

Following the introduction of the robots, employees can perform more specialised tasks and functions within the Clean Room, adding more value to their work and ultimately the company.

What is noteworthy about this specific project is that not one employee has been re-deployed or made redundant by the introduction of the Cobots in the "A Class" area of Normon.

As the OMRON robots have exceeded Normon's expectations, additional future implementations are being planned. Miguel Ángel Esteban concludes: "Intralogistics solutions such as this are key to meeting the needs of our pharmaceutical customers, especially in clean room environments.

With the newest additions to our mobile robot fleet, including mobile robots capable of transporting heavy loads, we can offer a solution to a wide range of applications."

**Laetitia de Jager**  
**Omron Electronics (Pty) Ltd**  
**Tel. +27 11 579 2600**  
**info\_sa@omron.com**  
**www.industrial.omron.co.za**

## Electronic Transformer For Special Requirements



The Jumo IPC 300 electronic transformer with amplitude control in the performance range of up to 40 kW was developed for the control of heating loads that previously required an additional transformer for power control.

With the integrated amplitude control, the mains current and the mains voltage of the Jumo IPC 300 are proportional to the required power of the heating element. The acquisition of additional compensation equipment is therefore no longer necessary.

In addition, the power converter reduces malfunctions such as flicker or harmonics so that it contributes to higher plant availability

Consistent energy demand decreases reactive power and reduces current peaks. In this way, energy costs are reduced.

The integrated resistance limitation protects against overheating in the upper temperature range and extends the service life of molybdenum disilicide heating elements.

Low maintenance requirements combined with longer operating times reduce the operating costs.

An external current sensor monitors residual currents and detects housing shorts in the heating elements. Heating elements with large temperature coefficients change their heat output very strongly relative to their operating temperature.

The power controller of the IPC 300 detects this and compensates for the error.

Other strong advantages of the Jumo IPC 300 include easy operation, configuration and start-up.

The compact device has a plain text display and keypad. By using the USB interface, the parameters can be easily transferred via the setup program. A voltage supply is not required.

As a result, the transformer is the right solution for mechanical and plant engineering, the process industry and furnace construction.

**Anastas Schnippenkotter**  
**ASSTech Process Electronics & Instrumentation CC**  
 Tel. +27 11 708 9200  
 info@asstech.co.za  
 www.asstech.co.za



Tel: 010 595 1824  
 sales@comtest.co.za  
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### Quickly, easily and confidently monitor your equipments' partial discharge.

Partial discharge is a very serious issue that you would like to be able to monitor quickly and easily. Whether you are inspecting insulators, transformers, switch gears or high voltage power-lines, you need to be sure that you spot a problem quickly and early. Partial discharge that goes unchecked can cause blackouts, fires, explosions, or death from arc flashes. In addition, there's a significant monetary risk of downtime.

#### Fluke ii910 Precision Acoustic Imager

Key areas to scan for partial discharge

- Transformers
- High voltage power-lines or coils
- Switch gears
- Arrestors
- Busbars
- Breakers
- Capacitors



Learn More

## Electronic Engineers Help Wine Growers To Vintage Success



English wine is taking off, with more and more people recognising its award winning quality and production growing by the year. A generation ago it was wise to steer clear of 'British wine', blends of cheap wine from generally unnamed sources.

But since then, a warming climate and improvements in viticulture has seen a whole new industry blossom. Commercial vines are now grown throughout the UK, predominantly in the south of England about also in Wales and even Scotland.

Viniculturalists all over the world know that without treatment, large portions of any vine crop will routinely be lost to fungi, bacteria, and – the blight of the industry - mildew. The English growers also realise that like all developing industries, as production grows so the need for efficiency increases.

Oxfordshire's Heli-Lift Services has been pioneering the use of helicopters for spray treating grapevines, using technologies developed by neighbours Sensor Technology - represented in SA by Instrotech.

Starting in the historical vineyards of Douro Valley, Portugal, where with little room for tractors, Heli-Lift soon realised that aerial spraying was very much more efficient and cost effective than traditional manual methods.

It is now promoting its capabilities to English vine growers, who are all keen to innovate and advance their industry further onto the world stage.

Heli-Lift Services' spraying rig is designed so that its nozzles release perfectly weighted droplets evenly and swiftly over the crop. The company has also developed a hydraulically stabilised Heli-Deck for easy refilling on rough or sloping ground.

To ensure even spray coverage, the pilots use a sophisticated GPS mapping device called HeliNav LoadMaster coupled with an intelligent LoadSense weight sensor that monitors spray usage to plot and record progress in precision detail.

Both HeliNav and LoadSense were developed by Sensor Technology Ltd. LoadSense is based on the company's wireless torque sensor which the industrial world is very fond of.

Helicopter operators took to it because, being wireless, there is no need to drill cable holes through the aircrafts' body panels – which would mean getting recertified for airworthiness.

The pilots asked if Sensor Technology could link the load information with accurate GPS positioning, to automated flight

planning for optimised spray patterns, and HeliNav LoadMaster was born. The load sensing and position monitoring technology developed by Sensor Technology is essentially simple, yet is accurate to very fine tolerances.

LoadSense combines Sensor Technology's wireless signalling with a strain gauge Load Sensor.

It has the capability of wirelessly transmitting its data to a readout where it both displays live readings and records them to build up an exact profile of each operation. Its inbuilt 32MBit memory can hold up to 280 hours of data which can then be downloaded to a PC via its USB cable.

The load sensor transmits using the worldwide license free frequency of 2.4GHz using two built in antennae. The cockpit mounted readouts provide the pilot with precise real time information in an easy to understand graphical format. The sensor can also send signals direct to handheld readouts so that assistants on the ground have the same live information.

HeliNav LoadMaster provides position information through an on-board GPS (global positioning system), inclinometer and accelerometer and helps pilots plot and follow flight paths, monitor flight times, fuel requirements, etc.

As such it makes even the most complex spraying jobs simple and efficient. It also logs the weight of the load and the distance travelled, so that the helicopter operating company can provide the client with accurate work reports and precise billing as well as schedule timely maintenance.

Sensor Technology and other British companies lead the world in advancing electronic sensing and data handling systems and it works hand-in-hand with the English wine industry, which is equally innovative and successful

There are now over 500 vineyards in Britain, the most northerly being on the Shetland island of Unst, 1400 miles north of Bordeaux and just 400 miles south of the Arctic Circle.

They produce 5,000,000 bottles of world-class wine that competes with the best that Europe and the New World have to offer.

These numbers are growing rapidly: 1,000,000 new vines were planted in 2016, which will eventually produce about 2,000,000 bottles of wine and people are clamouring to join the industry or increase their existing investments.

Norfolk's Winbirri Bacchus has been voted world's best white wine, sparkling Nyetimber from Sussex is similarly acclaimed.

*Information supplied by Instrotech on behalf of Sensor Technology*

**Instrotech**

**Tel. + 27 10 595 1831**

**sales@instrotech.co.za**

**www.instrotech.co.za**

**Facebook: [www.bit.ly/3rj1SWY](http://www.bit.ly/3rj1SWY)**

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**#Instrotech #SensorTechnologies #Torque**

## Logic, Motion, Robotics, HMI, Vision, Sensing, Safety And 3D Simulation Are All Integrated Within A Single Platform

Omron's updated Sysmac Studio 3D Simulation Integrated Development Environment (IDE) with 3D simulation integrates and verifies the movements of robots and peripheral devices. It can digitally reproduce the entire facility to verify the operation to the same accuracy as that of an actual machine. This helps companies to introduce new efficiencies to their processes and production capacity.

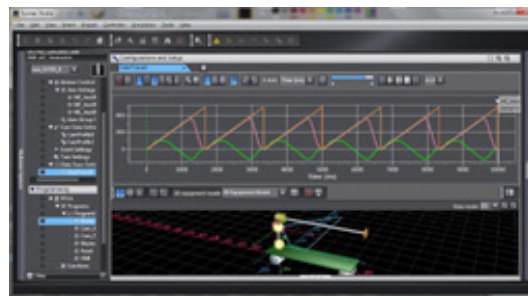
The IDE facilitates design through advance verification. It uses simulations that meet the need for rapid changes in production sites; shorter delivery times for equipment development; high-precision assembly; and simultaneous start-up of production lines at multiple sites.

The new Sysmac Studio 3D Simulation can be purchased by simply adding optional licenses for simulation functions to the Sysmac Studio programming software of Omron's flagship NJ/NX Series automation controllers.

"Conventional simulators use dedicated software, which is expensive and requires specialist expertise.

If the software is different from the controller, it's difficult to match the simulation results with the actual machine operation", comments Josep Lario, Omron's EMEA Product Marketing Manager for Software, IPC and Visualization.

He concludes: "This is the first IDE in the industry to control and verify robots and other peripheral



equipment in a single operation. This enhances the efficiency of facility design and shortens the time needed to confirm the production capacity of the equipment, start-up and modifications."

### Main Features:

- Single software for motion, logic sequencing, safety, drives, vision and HMI
- Fully compliant with open standard IEC 61131-3
- Supports ladder, structured text and in-line ST programming with a rich instruction set
- CAM editor for easy programming of complex motion profiles
- One simulation tool for sequence and motion in a 3D environment
- Advanced security function, with 32-digit security password

**Laetitia de Jager**  
**Omron Electronics (Pty) Ltd**  
 Tel. +27 11 579 2600  
 info\_sa@omron.com  
 www.industrial.omron.co.za

## Super Ion Air Knives

The Gen4 Super Ion Air Knives are like the Super Air Knives with the added benefit of static elimination. They produce a wide, laminar sheet of static eliminating airflow to remove static charge on plastics, webs, sheet stock, and other conductive material. It removes static cling between parts, reducing jams, tears, and shocks to workers.

### Super Ion Air Knife Eliminates Static on Label Prior to Application

Customer fills and labels various types of liquid soap bottles. The label being applied has a pressure sensitive adhesive on its back side. Static would form as the labels were unrolled and peeled from their backing.

As the bottles go by, the label is forced to the bottle, but the static charge would cause the label to repel from the bottle

and a wrinkle would form in the label, rendering it a non-conforming part. In colder weather, the problem would become even worse. Customer chose a Model 111206 6" (152mm) Super Ion Air Knife Kit to eliminate static on the label just prior to application. Labelling rejects were dramatically reduced.

**Terri Carlson**  
**ETEST**  
 Tel. +27 31 702 8302  
 terri@etest.co.za  
 www.etest.co.za

## New 1D/2D Code Scanners Simplify Industrial Decoding

Wenglor Sensoric has released 19 new models of the C5PC series of 1D/2D code scanners to expand its portfolio with more powerful and easy-to-operate devices.

The simple installation via Plug & Play in particular, as well as the intuitive, browser-based WebLink user interface or the uniform interface concept across all scanners, open up a large number of new application solutions. The WebLink user interface pre-installed in each scanner guides the users to install and set-up the scanners, even without any programming knowledge.

The decoding of the codes can be started directly after the IP address has been entered. The scanners can easily be integrated into systems with the available interfaces such as digital IOs, RS232, Ethernet TCP/IP, PROFINET and EtherNet/IP.

The C5PC series is now available in variants with static focus or auto-focus, with resolutions of 0.3, 1.2 or 5 megapixels and with optics in SD, HD or LR. There are seven different focal distance3s between 50 and 1,200 mm.

With these hardware combinations, 1D and 2D codes can be read and decoded reliably, even if they have been printed, needle punched or lasered directly onto the object (also called DPM (Direct Part Marking)).

This new scanner portfolio means Wenglor can offer a suitable product for every customer requirement from simple static applications with high contrasts, simple and complex codes to dynamic applications with high object speeds and very small, complex and sometimes incomplete or damaged codes. Any task can be taken care of with 25 percent higher reading performance than before.

All common standards for determining code quality are met with these scanners: IOS/IEC TR 29158 and EN 15415/6 and EN 16022. With CodeScan 360, up to eight scanners can be connected via daisy chain, providing 360° visual field.



This means that several scanners can be arranged in a circle around an object and connected together, for example. The code on the object is safely decoded by one of the scanners in the system, regardless of its position.

The scanners can also be password-protected. Different user roles and levels are available in WebLink. The new Multishot

Configuration Database is also located in WebLink. Here, users can select different configurations stored in the integrated database for the scanner to automatically perform fast, multiple scans at different positions as well as different heights and brightness levels.

The devices process these and evaluates then simultaneously. Users save manual programming effort and a lot of time.

### Highlights at a glance

- Browser-based interface WebLink
- Easy installation with Plug & Play
- Consistent interface concept
- 360° decoding with CodeScan 360
- 19 new models available
- 25% higher read performance
- Compliance with standards to determine code quality
- Protection against manipulation

**Anastas Schnippenkotter**  
**ASSTech Process Electronics & Instrumentation CC**  
 Tel. +27 11 708 9200  
 info@asstech.co.za  
 www.asstech.co.za

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## Portable Humidity Generator Delivers Fast, Accurate Multi-Point Calibration Of Humidity Probes And Loggers



The Fluke 5128A RHapid-Cal Humidity Generator is a portable, versatile humidity generator for calibrating a large workload of probes and loggers in the field or laboratory.

The 5128A is ideal for corporate and independent calibration labs where humidity measurement is critical to prevent spoilage

of products, including pharmaceuticals, medical devices, semiconductors, chemicals, and food production.

The 5128A is lightweight and compact so technicians can easily take it to the field for thorough, reliable multi-point calibration of humidity probes and loggers.

In the lab, the 5128A reduces calibration time by at least 33 percent compared to traditional two-pressure humidity generators, which are slower to respond to humidity and temperature set point changes.

The 5128A delivers:

- **Best-in-class system accuracy of  $\pm 1.0\%$  RH** for dependable humidity probe calibration
- **Rapid humidity and temperature stabilization time** for high calibration throughput
- Rate of change for temperature increase is typically  $10\text{ }^{\circ}\text{C}/\text{minute}$ ; for temperature decrease  $1.5\text{ }^{\circ}\text{C}/\text{minute}$ .
- Rate of change for humidity increase is typically  $10\%$  RH/minute; for decrease  $5\%$  RH/minute.
- A six-point calibration can be done in two hours.

### Easy maintenance

- A front-loading desiccant cartridge can be easily changed by removing the front cap and sliding in a new one.
- Only clean distilled water is needed to operate the 5128A.

The 5128A RHapid-Cal comes standard with an ISO 17025 accredited system calibration and is backed by Fluke Calibration's world-class metrology and support.

### Comtest

Tel. + 27 10 595 1821

sales@comtest.co.za

www.comtest.co.za

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SCAN ME

## Choosing Pulse Valves That Improve Dust Collector Performance

*Michael Russo, Product Marketing Manager, Dust Collector Systems at Emerson*

**P**ulse valves with high peak pressure and quick valve response time can boost overall dust collector system efficiency, which is critical for effectively removing dusty particles from process environments.

Dusty particles are found in nearly all process facilities, either as products, such as seasoning or medical formulations, or byproducts, such as limestone dust. Whether in the food and beverage, pharmaceutical or aggregate industry, they move through a plant during production, where they can enter the surrounding environment and coat equipment, collect on the floor or hover in the air. When hard-to-contain dusty particles accumulate in this way, they can contaminate or damage equipment or lead to slip and fall injuries, inhalation exposure and even explosions if the material is combustible. To prevent safety risks and equipment damage, many processing facilities rely on dust collector systems to remove particles from the working environment.

In order to effectively remove a full range of particulates, from sugars to rocks, dust collector systems must operate efficiently. Like any other machine on the plant floor, dust collector efficiency is determined by the performance of the components that comprise it, and certain components make a bigger impact than others. One critical component that directly affects dust collector performance is the pulse valve.

### The role of the pulse valve

To understand exactly what a pulse valve does, it's helpful to consider how reverse pulse jet dust collectors work. When a dust collector is in operation, it draws dusty particles onto its filters. As particulates accumulate, they compress into cakes. When cakes become thick and dense, they block filters, reducing the dust collector's efficiency. In order to continue removing dust particles from filters, a line of pulse valves, in turn, periodically emit a blast of compressed air that sends a shockwave through the filters. When the shockwave hits dust cakes, it causes them to crumble off filters and collect in the hopper.

Pulse valves, then, are the critical components that deliver the blasts of compressed air that continually clear filters and free them up to collect more particulates.

Some dust collector systems may have a few pulse valves, while others may have more than 50; the number depends on the size of the collector, and the frequency of compressed air activation depends on the needs of the application.



*The ASCO™ Series 353 Pulse Valve has a one-piece diaphragm design and patented quick-mount clamp connection.*



*The ASCO™ Series 335B Tank System is designed for use in dust collector applications requiring highest peak pressure and more effective filter cleaning.*

### Peak pressure and valve response time determine efficiency

While the number of pulse valves and frequency of activation can certainly affect dust collector efficiency, it's *how* pulse valves deliver that blast of air that really matters. This is determined by a pulse valve's peak pressure and valve response time. Peak pressure is the force that affects the air blast's speed and power.

Valve response time is the time it takes the pulse valve to open and close, which controls the duration of the air blast and influences peak pressure.

If a pulse valve provides inadequate peak pressure and slow valve response time, the force of the compressed air and resulting shockwave will be too weak to completely break up cakes and will leave residue on the filters.

Saturated filters are not as efficient as clear filters, and the dust collector system must work harder to compensate. This inefficiency increases the frequency of filter replacement and can prematurely wear system components, raising maintenance costs and creating downtime.

Yet, if a pulse valve provides too much peak pressure and a slow valve response time, the overpowering strength and duration of the shockwave can destroy more than dust cakes — it can damage filters. This, again, increases filter replacement, downtime and related maintenance costs.

Pulse valves that provide optimal peak pressure and have a quick valve response time issue the precisely controlled burst of compressed air that is required to effectively removes dust cakes, which improves overall dust collector system efficiency, extends component and filter life and lowers maintenance costs.

The design of a pulse valve can affect peak pressure and quick valve response time. While most conventional pulse valves use closing springs, some new pulse valve designs use a one-piece diaphragm.

The single-piece design permits airflow to travel beneath the diaphragm instead of over a wall, allowing it to flow faster and more freely. This new design offers a response time of 8 to 14 milliseconds and provides a 14% increase in peak pressure over legacy pulse valves.

### The additional benefits pulse valves offer

In addition to improving dust collector performance, pulse valves can increase efficiency in other ways, too. One way is by using less compressed air. Compressed air can be quite expensive for processing facilities, and plants that have multiple

## Valves & Actuators ...

dust collector systems may use a lot of it. The length of time the valve is open determines how much compressed air is used. Pulse valves with quick valve response time use less compressed air than pulse valves with slow valve response time.

In a dust collector with 40 pulse valves, the high flow and fast valve response time of single-piece diaphragm designs use about 15% less compressed air than pulse valves with standard designs.

While all processing facilities have the opportunity to minimize compressed air use, the opportunity to see substantial energy savings grows the more pulse valves a plant has. Online valve manufacturer tools or consulting services can help calculate a processing facility's approximate compressed air savings.

Another way the one-piece diaphragm design improves efficiency is by streamlining installation and maintenance. It is in any OEM or plant manager's best interest to keep time required for installation and maintenance as short as possible to minimize downtime and costs.

A valve's connection and part count determine how quickly and easily it can be installed and maintained. Certain connections may require special tools or additional sealing, and high part counts take more time to disassemble and reassemble.

Even if it's planned, downtime can add up quickly in facilities with large dust collector systems and hundreds of pulse valves.

Conventional pulse valves have threaded or dresser connections, which require a wrench for tightening, and a spring-loaded diaphragm that may contain washers, islets and rivets that must be installed and serviced.

Springless, one-piece diaphragm designs have only one part to service and feature a quick-mount clamp connection that quickly, easily and securely connects to pipework, reducing installation time by 60% compared to threaded and dresser connections.

In addition to minimizing *planned* downtime, pulse valves can minimize *unplanned* downtime. For facilities that operate in locations subject to extremely low temperatures, some pulse valves fail when it gets too cold.

Pulse valves with a wide temperature-performance range offer reliable, long-term dust collector operation even during the coldest days. There are now pulse valves with operating ranges from -40 F (-40 C) to 284 F (140 C).

### Selecting pulse valves that make a difference

In processing facilities, dust collector systems must reliably operate to remove particulates before they collect and become safety hazards or damage equipment. Pulse valves are a key component that can improve dust collector system performance and efficiency, as well as that of the plant at large.

By knowing what to look for, OEMs, engineers or purchasing managers can choose pulse valves that improve dust collector system performance, extend component and system life, reduce air consumption and streamline installation and maintenance.

To access these benefits, it's important to work with a supplier who offers a comprehensive range of dust collector solutions, including monitoring and diagnostic options, that meet all approvals, ratings and certifications

Suppliers who offer technical support, quick shipments and short lead times can provide recommendations, troubleshoot issues, answer questions and help OEMs keep processes moving. Through the right partnership, OEMs can provide their customers with greater value, and facilities can enjoy greater efficiency and a cleaner, safer work environment.

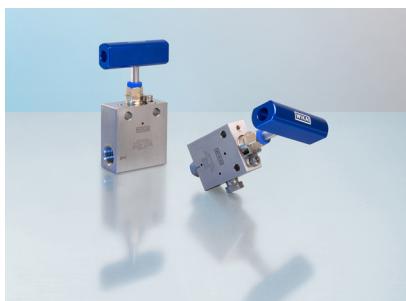
**Giles Wilcox**

**Emerson**

**Tel. +27 73 347 1534**

**[giles.wilcox@emerson.com](mailto:giles.wilcox@emerson.com)**

## Robust needle valve for high-pressure applications



**W**IKA has supplemented its portfolio of shut-off valves with the model HPNV high-pressure needle valve.

The new valve is designed for four pressure ranges: up to 15,000 psi (1,034 bar),

up to 20,000 psi (1,379 bar), up to 30,000 psi (2,068 bar) and up to 60,000 psi (4,136 bar).

The sensitive components - spindle tip and sealing - are made of suitably resistant material.

Furthermore, the model HPNV has the same characteristics as the other WIKA needle valves: low-wear operation due to

the non-rotating spindle tip, smooth handling with low torque and leak tightness tested to BS6755/ISO 5208 leakage rate A.

The high-pressure valve is available in various configurations and materials.

WIKA also offers a customer-specific assembly of valve and measuring instrument. Such an instrument hook-up is delivered ready-to-install and leak tested.

**Greg Rusznyak**

**WIKA Instruments (Pty) Ltd**

**Tel. +27 11 621 0000**

**[sales.za@wika.com](mailto:sales.za@wika.com)**

**[www.wika.co.za](http://www.wika.co.za)**

## Valves & Actuators ...

### Fire Fail-Safe Spring Units



To open or close a valve or damper automatically in case of a fire - this device allows the valve to operate using a fusible link mechanism designed to

yield at a set temperature.

- Reliable torque delivery for valve reseal
- Available to Models 05, 07, 09 and 12 (maximum torque 226 Nm 2300 lbf ins)
- Two Yield Temperature Options
- Clockwise or counter clockwise 90° spring action
- ISO5211 female drive options available
- Spring housing sealed to IP65 to protect from internal corrosion
- ATEX Category 2 approved options available

#### Yield Temperatures

Fire fail-safe fusible links

Solder type (UL approved)

Yield temperature options ... 74°C 100°C

Max normal ambient temperature ... 38°C 66°C

#### ISO/Female Drive Options

All models are available with female drive options for direct mount.

#### Ordering Codes

To order a fire fail-safe spring unit, quote model number, direction of spring followed by product type code:

0074 Fire fail-safe spring unit 74°C

0010 Fire fail-safe spring unit 100°C

1074 ATEX fire-safe spring unit 74°C

1100 ATEX fire fail-safe spring unit 100°C

(Example 054-020-0074)

For reduced torque versions contact Rotatech.

**Zjaan Haarhoff**

**Rotatech**

**Tel. +27 11 708 6455**

**[zjaan@rotatech.co.za](mailto:zjaan@rotatech.co.za)**

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## When it comes to valve actuation, smart electric solutions continue to offer growing flexibility to end users for operating systems.



Demca Actuation Solutions and PS Automation have partnered in South Africa, to support customers in the Process, Mining, HVAC, Refrigeration, Renewables and Steam Industries with the right choice for their applications.

Both companies are family businesses, and with

over three decades of experience in electric actuation, have become experts in their field.

“With over 40 years of experience in the sales and after sales service of electric actuators, Demca’s first priority has always been customer service. From the time we receive the initial request for quotation, to the time of final commissioning and handover, our dedicated team strive to set us apart from other actuation companies” says Ross McAslan, Sales and Business Development manager of Demca.

In PS Automation, Demca have found the perfect partner for smart actuators. The German based manufacturer offers innovative and reliable electric actuation solutions for globe valves, and quarter turn valves like ball valves, plug valves and butterfly valves.

The PS-AMS technology provides features like diagnosis, easy auto-commissioning or fail safe operation which is powered by super capacitors. These store the energy needed for a loss of power so that the actuator can run to a defined position.

Established in 2008, the technology is now running in South Africa, as well as thousands of applications all over the world. The unit is designed for 500,000 fail safe operations and the fail safe position can be parametrized freely.

One of the most challenging applications can be found in steam control processes – where actuated Globe valves are required to provide both precise and as robust operation in order to run the system efficiently.

The flexibility that the PS-AMS offers to adapt the actuator to the application, in terms of speed of operation, input and output signals, as well as the time saving auto-commissioning function are just a few of the reasons why customers all over the world choose to actuate their valves with the PS-Actuator Management System.

**Ross McAslan**

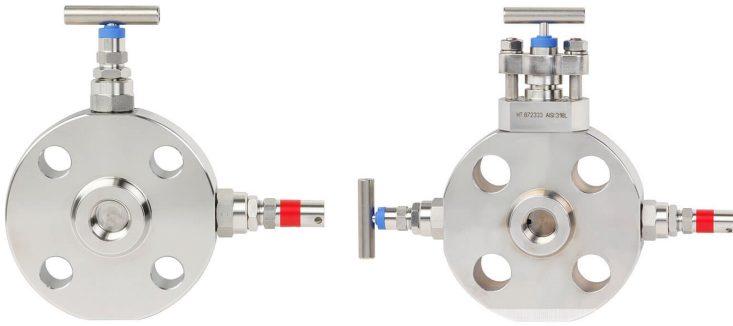
**Demca Actuation Solutions**

**Tel. +27 21 913 1962**

**[rossmcaslan@demca.co.za](mailto:rossmcaslan@demca.co.za)**

## Valves & Actuators ...

### Compact Monoflange Withstands High Pressure



The WIKA Model IVM monoflange can withstand high pressures, thanks to its one-piece design. It ensures a robust and compact mounting of the measuring instrument directly to the process flange.

The use of metal and graphite seals allows working at high temperatures.

In combination with pressure measuring instruments, diaphragm seals or level measuring instruments, the valves are suitable for use in critical applications like refineries or steam generation systems.

The IVM monoflange can be used for “fugitive emissions” in chemical applications or for processes with critical gases.

The bubble-tight leak-tested metal seat makes these valves perfectly suitable for sour gases and natural gas processing or nitrogen production plants.

The super-finished machining of the internal parts of the monoflange, such as spindle and spindle tip, allows a very smooth and precise operation, even at high pressures, and avoids leaks or seizure of the valve.

The OS&Y bonnet has been specifically developed in accordance with the highest international standards for the direct mounting of IVM monoflanges on pipelines or vessels.

**Greg Rusznyak**

**WIKA Instruments (Pty) Ltd**

**Tel. +27 11 621 0000**

**sales.za@wika.com**

**www.wika.co.za**

## TRI-CON TRIPLE OFFSET VALVES

## ZWICK



Zwick Tri-Con valves are successfully used for isolation, on/off, control and ESD applications for industrial and exhaust gases, hydrocarbons, chemicals, liquids and steam with process temperatures up to 815°C. The Tri-Con valve is used extensively in the oil & gas, chemical, petro-chemical and power generation industries.

#### Zwick Tri-Con provides:

- SIL 3 certification
- Sizes from 2" (50mm) to 88" (2250mm)
- Bi-directional operation
- Zero leakage sealing
- Non-rubbing - Self-centering disc
- Metal-to-metal seats
- Fire-safe certified sealing

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## Valves & Actuators ...

### Extended Range Of Locally Available Valves



Allmech has decided to extend the range of Runxin softener and filter valves it stocks to accommodate projects with budget constraints as well as smaller plants that need to minimise installation costs.

“These valves are ideal for residential softeners, smaller boiler softeners, ion exchange systems and for RO pre-treatment softeners,” explains Lynette Morrey, Business Development Administrator at Allmech. “Stocking these items will help us to serve a greater segment of the market. We’re now able to offer products for smaller applications, a cost-effective option for cash-constrained customers, as well as continuing to offer top-spec Runxin products to larger operators.”

#### The new additions to the Runxin line include:

- F65P1 Auto Softener Valve: These can handle a flow rate of up to 2000 litres per hour. Ideal for domestic use. Time setting controls when the softener regenerates.
- F63P3 Auto Softener Valve: An automatic softener valve ideal for industrial use for plants with a flow rate requirement of 4000 litres/hour. Can be set to regenerate based on water volume.
- F71P1 Automatic Filter Valves: With a maximum flow rate of 2000litres/hour. Ideal for domestic applications and smaller sites. Handles a maximum flow rate of 4000 litres/hour.

Morrey says all of these valves are easy to programme and use, with simple, user-friendly displays. “As with all the Runxin valves we stock, Allmech offers reasonably priced repairs and replacement spares,” she adds. “We also choose Runxin because of the valves’ longer service life – some of our valves

have run for more than 10 years with no maintenance required.”

All Runxin valves are made from durable and flame-retardant materials, ensuring they are impact and heat resistant. Their ceramic core components are wear and corrosion resistant, increasing their longevity.

“The ceramic ball valve range is also chemical resistant, which saves on replacement of expensive brass fittings,” says Morrey. “All Runxin valves carry a one-year manufacturer’s warranty, giving you peace of mind. We provide additional technical backup assistance, a repair centre and test facilities from the Allmech premises in Benoni, ensuring you have our full support when installing a Runxin valve.”

#### Other useful features include:

- No power outage worries: The last setting is saved automatically in the valve so that when the power is restored it continues the normal cycle from where it left off. All the user needs to do is reset the time.
- Automatic display lock: If there is no further programming within one minute, the display automatically locks to prevent unintended operation.
- Patented interlocking function: If there are multiple valves in the system, only one valve will stay in rinse or regeneration status while the other is operational.
- Adjustable parameters: All parameters can be adjusted based on your needs during operation according to water quality and usage.

All the Runxin valve manuals are also easily downloaded from the Allmech website for customer convenience.

Lionel Maasdorp

Allmech

Tel. +27 11 849 2731

lionelm@allmech.co.za



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## Valves & Actuators ...

### New Co-Axial Valve Offers 10 X Life Expectancy Compared to Ball Valve Actuator Combo

The recently launched co-axial VIP EVO Valve from Italy-based TOMAL provides the lowest cost of ownership with a life expectancy 10 times that of a ball valve/actuator combination and reduced maintenance costs.

It integrates the valve and actuator into a single compact device, minimises pressure losses and has multi-functional security holes that prevent air supply system damage.

The VIP EVO Valve saves at least 70% of compressed air when compared to an equivalent ball valve with SR pneumatic actuator. Compatible with LPG and LNG gas, oxygen, nitrogen, petroleum, air and water, among others, its easily accessible limit switches are adjustable on both sides.

The EVO Valve allows for different materials for different applications and has a switching time of less than 0.2 seconds for valves up to one inch.

Available in double acting and spring return VIP valves in sizes from 3/8 to 2 inches, it is ideal for use with fire-fighting applications, aviation refuelling systems, gas filling units and PSA generators among other applications.

Fewer mechanical parts translate to reduced friction and therefore less wear, and this is what facilitates the valve's considerable longevity. Reduced downtime and lower production losses combined with energy savings and minimised inventory, means the VIP EVO Valve provides ROI in as little as three months.

Warranted for up to 300 000 cycles (model dependent), VIP EVO can be used in horizontal, vertical or angled mounting. It is available with EPDM, NBR and FKM seals, is ATEX and PED certified and certified up to SIL 3.

It features an integrated slot for the valve position sensor, facilitating easily sensor mounting in both sides

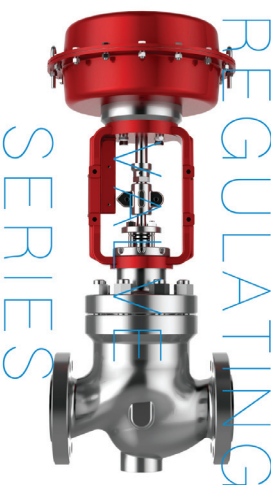
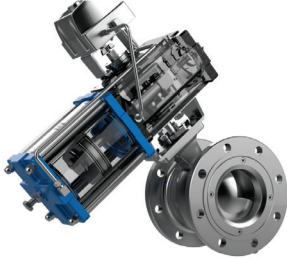
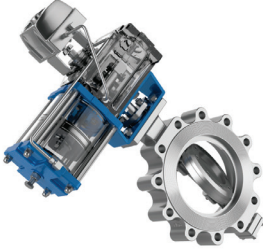
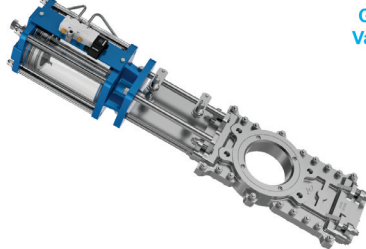
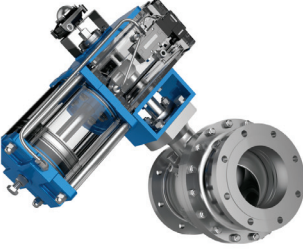

of the valve, minimising space. Risk of injury to personnel is reduced by the omission of any external moving parts on the valve.

**Wade Profitt**  
**Tectra Automation**  
 Tel. +27 11 971 9400  
[wade.profitt@boschrexroth.co.za](mailto:wade.profitt@boschrexroth.co.za)

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## Valves & Actuators ...

### Manual Fail-Safe Spring Units



If you want to operate a valve manually but maintain the advantage of the fail-safe spring's certainty of position when unattended, use this device.

- Manual unit, cannot be left in the wrong position
- Reliable torque delivery for valve reset
- ISO5211 female drive & ATEX Category 2 approved options available for models 02, 03, 05 and 07
- Clockwise or counter clockwise 90° spring action
- Spring housing sealed to IP65 to protect from internal corrosion
- Bi-square (star) and serrated female drive options available

#### Application

Manual fail-safe spring units are available in Kinetrol sizes 02, 03, 05 and 07 with factory adjusted torques from 1.4Nm to 45.5Nm

#### Specification

Spring Case

02, 03, 05, & 07 ATEX ... Die cast zinc alloy epoxy paint finish

07 non-ATEX ... Die cast aluminium alloy epoxy paint finish

Shaft ... Stainless steel or carbon steel zinc plated

Manual lever ... 03 & 05 – Stainless Steel

02 – Aluminium

Working temperature range ... -40°C to +80°C

#### ISO/Female Drive Versions

The 03, 05 and 07 models are available with female drives for direct mount. The model 03 has F03/05 or F04 mounting flanges, the model 05 has F03/05/07 or F04 flanges and the model 07 has a F05/07 flange.

To order female drive versions, replace the '0-' in the product code with 3F'. For example, a model 05 ISO female drive manual fail-safe cw handle with F03/05/07 flanges is coded.

053F020-1006. The F04 flange version is coded 053F020-1006/F4

Female drive versions with the same flange dimensions are available with ANSI threads eg 057F020-1006/F4

Serrated female drive options can also be supplied for models 05 and 07. To order these replace the 'F' in the product code with an 'S'

Female 02 versions are available by use of an ISO adaptor.

**Zjaan Haarhoff**

**Rotatech**

**Tel. +27 11 708 6455**

**[zjaan@rotatech.co.za](mailto:zjaan@rotatech.co.za)**

**[www.rotatech.co.za](http://www.rotatech.co.za)**

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### Valves around the turbine



At the heart of a power station are the steam turbines. They serve as a generator or mechanical drive for pumps and compressors. For its operation a network of valves is built around the turbine.

Steam inlet valves direct the steam flow into the turbine while extraction valves withdraw the steam from the different intermediate stages.

Gland steam and leakage steam control valves provide the labyrinth seals in the hub areas with steam, that seal the turbine shaft towards the turbine housing.

Drain valves drain accruing condensate from the steam pipeline to the condensate collector.

For the project Pingshan ARCA delivered the steam supply control valves, the seal steam control valves and the drain valves of the steam turbine.

The supply control valve in DN 400 controls the steam flow from the reheater into the turbine. Equipped with a hydraulic actuator suitable for a hydraulic pressure of up to 140 bar, it has an actuating time during control operation of 20 seconds and for quick close and open it has a time of 2 seconds and 5 seconds respectively.

The actuator in the picture can provide a maximum actuating force of 44 kN. Silencer disks at the valve outlet ensure a low-noise operation.

Turbine manufacturers world-wide count on the know-how and experience of ARCA for the design and delivery of these valves. Together with customers they develop solutions for efficient turbines with valves suitable for temperatures up to 650°C and nominal pressure up to PN720/Class 4500.

**Valve & Automation**

**Tel. +27 31 579 2593**

**[sales@valve.co.za](mailto:sales@valve.co.za)**

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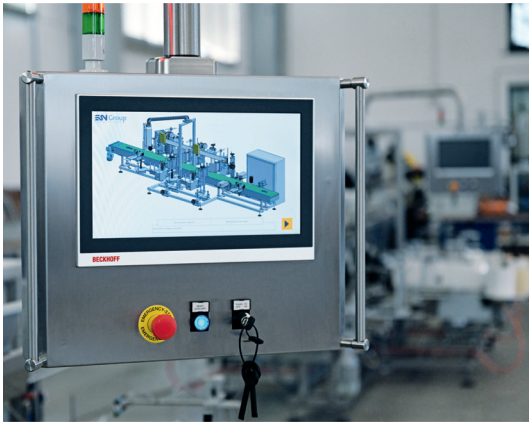
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## Modular And Open Control Technology Increases Efficiency And Flexibility In Machine Development



The Italian ESN Group specializes in integrated solutions for the automation of packaging lines, which involves labeling, packaging, palletizing and handling products within a production plant. The company relies on control and drive technology from Beckhoff at every stage, confident that it is the ideal choice for meeting the requirements of modern modular machine building on account of its openness, flexibility and high-quality standards. It also values the close cooperation that has been established with Beckhoff since the very first project.

The history of the ESN Group is that of a classic startup: Founded only four years ago in Treviglio in northern Italy, ESN (Engineering Service Network) comprises a number of specialized partner companies along with all of their combined expertise and experience.

The result is turnkey, customized end-of-line solutions for packaging processes that notably include machine modules for labeling, primary and secondary packaging, palletizing and handling in sectors including the food, chemical, pharmaceutical, pet food and mineral oil industries.

### Focus on medium and low machine cycles

“Our aim is to serve customers primarily in the medium- and low-speed machine segment,” explains engineer Glauco Cima, co-founder and CEO of ESN. “This market segment offers real scope for innovation and performance improvements with the help of modern automation technology.”

The ESN philosophy is expressed in a particular interpretation of the term ‘end-of-line’: The packaging process is not seen as several machine modules strung together, but rather as a modular and integrated system that is capable of communicating detailed information about its operation through a combination of classic automation systems and modern combined OT/IT architectures.

“Many companies simply combine several individual machines,” explains Glauco Cima, outlining the basic problem. “However, this approach results in valuable information that is crucial to the management and performance of a line being lost to shift and production management.”

The ESN concept of an end-of-line plant includes all of the

aspects that are necessary for the final packaging process:

- labeling and appropriate controls
- product quality controls
- handling
- palletizing
- secondary packaging
- pallet control
- pallet coding and traceability

“The integrated management of each of these process flows in our concept is so important, as it provides end customers with all of the information they need in real time, incorporated into the rest of the production environment,” explains Glauco Cima, highlighting the modular approach. “A variable concept like this requires automation technology that is equally modular, open and flexible. And with that in mind, PC-based control from Beckhoff has proven to be the best solution when it comes to putting this all into practice.”

### Technology supplier and automation partner

“We are familiar with systems from other suppliers, but we were looking for a solution that is reliable, simple and open,” notes Glauco Cima. This ruled out traditional PLCs from the outset. But there was also another aspect to consider: “As a startup, we were looking for a very dynamic kind of support, especially in the beginning,” the ESN managing director says, “and Beckhoff really was – and is – one of the most dynamic companies out there. This is true not only in terms of innovation and market approach, but also in terms of support for companies dealing with special projects and requirements, like ESN.”

According to Glauco Cima, from a technical point of view, Beckhoff automation solutions represent the best on the market for ESN in terms of quality, modularity, compactness and openness.

They are also the perfect fit for the machine builder’s automation philosophy and the motion requirements that are typical in the packaging industry. “I should also point out that our cooperation with Beckhoff has been incredibly close from the start, and this level of trust is so important to us,” enthuses



Partner companies bring their respective expertise to the ESN Group and apply it using Beckhoff technologies and components to create customized, end-of-line solutions that fit seamlessly into modern OT/IT environments.

the ESN managing director. “We only ever use Beckhoff automation technology for our projects, from drives to decentralized I/O and from TwinCAT automation software to operator interface panels.”

### A modular system for modular machines

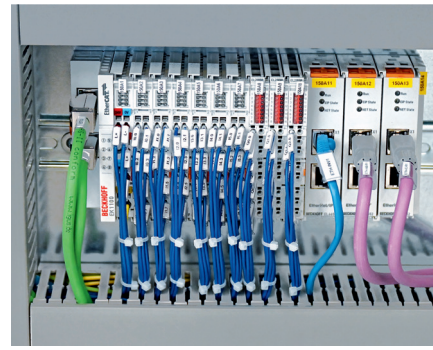
In ESN’s typical end-of-line concept, each module uses a Panel PC as a controller – a CP27xx multi-touch built-in unit or a CP67xx single-touch ‘economy’ version. Glauco Cima explains: “We decided to combine all of our components into a modular system, which means the end of the packaging line resembles a network of compact Panel PCs that communicate closely with each other for maximum performance, traceability and quality control. Without this modular approach, it would have been difficult to achieve this goal cost-effectively and without a considerable amount of effort.”

The entire ESN automation concept is based on TwinCAT software, which also supports quality control applications such as vision systems. The openness of TwinCAT means it is also possible to integrate external projects developed in C++ or Python, for example. Depending on the specification, the control architecture can process an almost unlimited number of I/O data points connected via EtherCAT Terminals or box modules. Third-party controllers can also be seamlessly integrated via EK1100 EtherCAT Couplers if required. This system openness enables line expansions without the need for automation equipment changes, which is a vital consideration for ESN projects. The compact drive technology from Beckhoff also continues to be used in the form of EL72xx Servomotor Terminals and AM81xx Servomotors, as well as AX5000 Servo Drives with AM8000 Servomotors. This is where One Cable Technology (OCT) comes into play to minimize both cabling and installation effort.

The high performance of EtherCAT and PC-based control offers a number of further advantages – for example, ESN was able to develop an innovative quick-change system for grippers, which reduces production line downtime by allowing I/O signals to be interrupted briefly during operation.

### Commissioning machines in record time

The extensive features of Beckhoff technology also shorten the development and implementation time of the projects, as Glauco Cima explains: “This is a very important aspect for being able to deliver custom solutions based on a standardized



The wide range of EtherCAT I/O components, including the EK1100 EtherCAT Coupler, HD EtherCAT Terminals, and EL6652 EtherNet/IP master terminals seen here, permits the seamless integration of all required signals – even in heterogeneous systems.

architecture.” This philosophy has been applied to mechanical and electrical plant components alike. As such, the quest for modularity at ESN starts with the design process; it is only at the end that the line is specialized, almost tailored to the process. PC-based control from Beckhoff also makes a crucial contribution to the implementation of this engineering philosophy, as Glauco Cima confirms: “This style of automation fits perfectly with our own concept and offers a suitably modular platform for following precisely this approach in the development of all projects.”

### Intelligent modularity becomes mandatory

For Glauco Cima, there is simply no alternative to this concept: “The packaging industry is changing rapidly – just like all sectors that rely on advanced technology.” He is convinced that the mechanical elements of a machine will become less important in the coming years.

Constraints and ‘architectural barriers’ within companies will increasingly fade away and production will have to be flexibly programmable. The consequence of this is that modularity will become a fundamental feature of a machine. “And in all applications where mechanics hinder an approach like this, electronics and reprogramming will eliminate – or at least circumvent – this shortcoming. The technologies provided by Beckhoff are perfect for this, but they are often still underutilized compared to their full potential,” says Glauco Cima.

With all of this in mind, the future development of the ESN Group is closely linked to Beckhoff’s dynamic approach to innovation. “From the very beginning, our choice was guided by the continuous innovations driven forward by Beckhoff, but fast forward to today and we still have no doubt that Beckhoff is our ideal partner and will certainly remain so for years to come,” asserts Glauco Cima, confirming the Group’s commitment to this strategic partnership.

**Dane Potter**

**Beckhoff Automation**

**Tel. +27 79 493 2288 / +27 11 795 2898**

**danep@beckhoff.co.za**

**www.esngroup.eu/en**

**www.beckhoff.com/packaging**

## Curb Explosive Potential With Intrinsically Safe Tools

For those who work in industries where flammable materials are present—such as petrochemical and pharmaceutical plants, oil platforms, refineries, pipelines, and mining—the potential for an explosion is a daily reality. All it takes is a flammable material coming into contact with air and an ignition source.

As a practical matter, avoiding the ignition source—anything from a spark or electrical arc, to static electricity or a hot surface—is probably your best bet for preventing an explosion.

That is why industries with potentially highly explosive environments are required to abide by a set of intrinsic safety standards that apply to all equipment used in those environments.

Devices that are certified as “intrinsically safe” (IS) are designed so that they are unable to release enough energy to ignite flammable material. Workers are not allowed to carry non-IS-rated tools through an IS classified area even if they aren’t powered up, because the tool could accidentally be activated—creating a safety risk.

### ATEX sets the global standard

The European Union (EU) 94/9/EC Directive, commonly referred to as ATEX (Atmospheres Explosible), is the primary IS standard for electrical and electronic equipment that is to be used in potentially explosive environments in EU countries. Adopted in 2003, ATEX establishes mandatory safety requirements for equipment sold for use in those environments and serves as a model for similar directives adopted around the world. In the United States, the NEC 500 and 505 codes define the requirements. NEC 505 is similar to ATEX in classification and related product markings of products used in hazardous areas.

Third-party accreditation bodies such as Factory Mutual Research or the Canadian Standards Association (CSA) certify that products meet ATEX regulations. To make sure you have the proper level of intrinsically safe tool for your environment, you should be aware of the various aspects of certification.



### Equipment categories

Equipment is categorized for use in classified areas based on its degree of protection:

- **Category I** = A very high level of protection
- **Category II** = A high level of protection
- **Category III** = A normal level of protection

### Zone ratings

Intrinsically safe equipment is rated by zone, which indicates the probability and frequency of flammable gases or vapours being present under normal operating conditions:

- **Zone 0** = An area where gases are known to be present 1,000 or more hours a year. Only Category I equipment can be used in this zone.
- **Zone 1** = Explosive gases are likely to be present between 10 and 100 hours a year. Only Category I and II equipment can be used in this zone.
- **Zone 2** = Explosive gases are not likely to occur in normal operation but may be present for more than 1 hour and less than 10 hours a year. All three categories of equipment can be used in this zone.

Fluke offers a growing number of intrinsically safe tools. They not only dampen the available energy at the output terminals; they do not generate static electricity.

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## Hot Compact IR Camera For Molten Metals

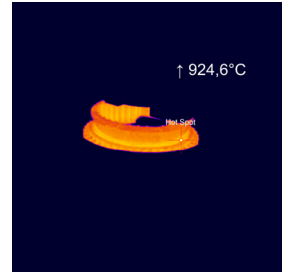
Instrotech is offering the Optris PI 05M compact IR thermal imaging camera. The PI 05M works at a spectral response of 500...540 nm which is ideally suited to all applications with molten metal. Another advantage of this spectral range is the lower dependency on changing emissivities.

In addition, this camera model is dedicated to all laser processing applications through excellent blocking of radiation above 540 nm, which minimises errors due to the uncertainty of emissivity.

The PI 05M has a wide temperature measurement range of 900 °C to 2000 °C without sub-ranges and comes with the same features as the PI 1M, such as fast 1kHz frame rate with a direct output of a selectable region of 8x8 pixels and fast 1kHz line scanning.

### Applications for the PI 05M:

- Iron sand casting of truck axles and automotive parts
- Varying alloys – different emissivities
- Hot spot function + Peak hold
- Melting furnace
- Ring rolling
- Averaging + Peak hold
- Replacement of ratio pyrometers
- Steel tapping
- Steel slabs coming out of a furnace
- Quality inspection in laser welding



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## Position Sensor Detection For Hydraulic Cylinders - A World First!

Siko's SGH wire-actuated encoders measure the cylinder stroke as well as its speed in the hydraulic cylinder with impressive efficiency, flexibility and robustness.

### The technology

SGH sensors use a wire draw mechanism that is integrated directly into the cylinder to measure the stroke. The wire of the wire draw mechanism is secured to the piston head. When the cylinder extends, the wire wound on a wire drum is pulled out.

The resulting rotation of the drum is detected by the contactless sensor system and converted into a linear position. This means that precise and absolute position or speed tracking

of the cylinder is possible at any time. The magnets used to measure the rotation are scanned by the contactless sensor system through the pressure resistant base plate of the SGH sensors. The electronic components are fully encapsulated and located on the non-pressurised side of the system.

The entire measuring system is therefore incorporated into the cylinder and optimally protected against external environmental influences.

Clear advantage: in contrast to measuring systems mounted externally on the cylinder, the sensor system cannot be damaged, negatively affected or even destroyed by environmental conditions.

### Developed for the tough conditions in mobile hydraulic applications

The Siko SGH sensors were designed and developed in line with the strict specifications of renowned hydraulic cylinder manufacturers. Market demands ensured that Siko met their requirements regarding robustness, durability and functionality.

Siko worked closely together with cylinder manufacturers to define and satisfy the specifications regarding service life, shock and vibration resistance, EMC and compatibility with various hydraulic media.

All specifications were tested and confirmed in endurance tests at the facilities of cylinder manufacturers or in external accredited laboratories.

### Intelligent sensors for smart cylinders

The SGH technology transforms hydraulic and telescopic cylinders as well as piston accumulators into smart cylinders and hydraulic systems.

A suitable sensor is available for all applications. With measuring lengths of up to 5,000 mm, a wide selection of interfaces as well as high flexibility for integration of the sensors, the

SGH family offers a wide range of possibilities. Redundant options and sensors for performance levels of up to PLd are available for safety critical applications.

### Reliable position tracking

Smart sensors take mobile hydraulics to a new level of safety and efficiency. "Functional safety" is a term that is being widely discussed. Safety concepts for mobile machinery has been a topic of interest since the implementation of the new Machinery Directive EN 13849. Sensors of the Siko SGH range help implement intelligent safety concepts for mobile machinery and meet the requirements of the specific safety standards for different utility vehicles.

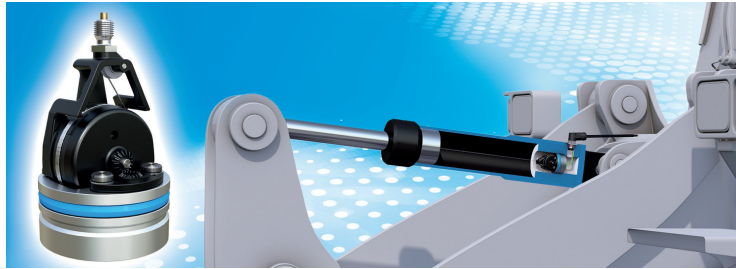
The safety versions of the SGH25 and SGH50 sensors meet the requirements for use in applications up to Performance Level d (PLd). Safe and redundant design in

compliance with CAT3 as well as a safe mechanical design means SIKO products are pre-destined for use in safety-critical applications, also under unusual conditions.

In addition, the sensors supply process data which not only serve to satisfy safety requirements, but also offer an added value for the machine. The process data can therefore provide insight into an impending seal maintenance interval. Flexible support tracking in crane and lifting applications extend the working ranges of the machine. Memory functions in industrial trucks save time and make work safer. All these are examples of how SGH sensors not only make machinery safer, but also more efficient.

### Advantages of the SGH encoder:

- Absolute detection of the cylinder position
- Direct integration into the cylinder
- Measuring range up to 5.000 mm
- Can be used in safety applications up to PLd
- No drilling of the piston required
- Can also be used in telescopic cylinders
- Perfectly protected due to protection category IP69K
- Durable and robust – developed in line with mobile hydraulic requirements
- High EMC



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#Siko #Positionensors #hydraulic

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## Multifunction Timer Sets Timing Parameters Remotely



Machine builders (and end users) now have the option to set timing and counting parameters on their application timers from their smartphone or tablet – without having to power the timer.

The TMM1 NFC, a multifunction, multiscale, multi-voltage electric timer with near field communication

technology and app, facilitates precise programming of a timer quickly and easily.

The multifunction timer is ideal for applications that require serial programming and precise and repeatable settings. An advantage unique to this timer is that, regardless of the timing function selected, a threshold on the number of closings of the relay output can be programmed. When that threshold is reached, the programmed function stops recording.

The counter function can be used for numerous and various applications, like counting the pieces passing under a photocell to commanding the activation of a turnstile with a limited number of accesses.

The electric timer is intuitively, and very quickly, configured using Android or iOS smart devices that support NFC connectivity and have the Lovato TMM1 NFC app installed.

This intuitive programming removes any programming challenges for users, and the graphic interface used on the app shows directly on the screen of the smart device.

This allows users to select a function just by clicking on a diagram – far simpler than referring to a user manual.

“There are an unprecedented 40 settable functions available on the device,” explains Richard Nobbs, ElectroMechanica. “These enhance the timer’s flexibility and adaptability to suit any application.”

Some of the more common functions include on- and off-delay, intermittence (pause-work), pulse generator, step-by-step relay, protection, on-delayed opening or closing of a contact, analogue filter, part counter and hour counter.

Additionally, timing can be paused, reset or restarted just by closing an external contact.

Its multiscale-ability means it accommodates time bases from tenths of a second, to seconds, minutes, hours and days. Even up to 999 days can now be selected.

Device security has been boosted with the introduction of a 4-digit password for peace of mind, and its functionality is extremely fast, saving machine builders and end users’ time. “Once a function has been selected, it can be saved and transferred to an unlimited number of timers. Programming can be copied to other M1 NFC TMs extremely quickly via NFC, without needing to power up the timer.

Once the configuration has been sent to TMM1 NFC, users can check the saved settings simply by re-reading the programming using the Lovato NFC App.

“This allows a significant reduction in set-up times, the resetting of setting errors and the repeatability of the operation.”

Lovato has taken the intelligent timing aspect a step further with the inclusion of an hour counter function. Typically used to count the operating hours of a machine and signal a request for maintenance when due, the count value is retained in memory – even without power. This enables the counter to start a count from the value stored in memory before the power fails.

A cULus-approved product, the TMM1 NFC is constructed in a single modular container and is suitable for mounting on omega 65 mm profile and for screw fixing.

Power and output are displayed by two signalling LEDs, and a QR code connects to the website to download the technical manual. It can be powered by auxiliary voltage from 12 to 240 V AC/DC and has one output contact.

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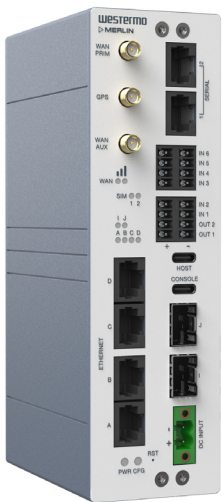
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## Range Of Industrial Cellular Wireless Products To Support IIoT And M2M Applications At Remote Sites



hed a new range of industrial cellular designed to provide resilient data remote sites. The Merlin range of compact, cellular solutions has been specifically t industrial IoT (IIoT) and machine-to-ions in demanding utility, infrastructure plications.

roducts to be released are the 4600 series, gthen Westermo's existing range of rters. These four compact and feature-igh-speed data network connectivity for smart grid, and rail trackside applications. e requirements of IEC 61850-3 Class 1 tation and railway trackside EN 50121-4

The Merlin range has been designed to be easy to install and maintain. When coupled with Westermo's zero touch deployment software Activator, the Merlin devices provide cost-effective, reliable and consistent onboarding within large-scale projects.

To achieve best-in-class cybersecurity, the Merlin 4600 series is equipped with a TPM (trusted platform module) chip that keeps cryptographic keys secure, while Secure Boot ensures that the routers boot using only software signed and trusted by Westermo. A set of cybersecurity tools is available as standard, including virtual private network (VPN) and stateful firewall support for data security and user authentication.

A built-in industrial gateway enables multiple devices, using different protocols, to be accessed via a common interface. For example, in a substation application with IEC-101, Modbus and DNP (distributed network protocol) devices, all three types can be presented via the SCADA system by a single IEC-104 or MMS (multiple messaging service) interface.

The Merlin 4600 series also supports six inputs and two outputs for local monitoring or control. The number of digital and analogue inputs and outputs can be increased using external I/O modules and the status of the internal or external I/O is accessible via the supported industrial communication protocols.

"An increasing desire to implement IIoT and M2M solutions at remote facilities creates a greater reliance on the availability of resilient, reliable and secure data networks," explained Dermot Mannion, Product Manager,, Westermo. "The Merlin range of cellular wireless products will meet this requirement, supporting the most demanding industry applications, while providing the advanced functionality needed to maximise connectivity and reduce installation time without affecting security."

**Bob Petrie**  
**Throughput Technologies**  
 Tel. +27 11 705 2497  
 bob@throughput.co.za

## Compact Ultrasonic Liquid Flow Meter/Controller

The new, compact ES-FLOW™ Ultrasonic Flow Meter/Controller Series ES-113C was designed for the OEM market to measure or dose low volume flows with high precision, high linearity and low pressure drop.

Liquid flows from 2 up to 1500 ml/min can be measured using ultrasound in a small bore tube.

This technology is independent of fluid density, temperature and viscosity. The instrument therefore does not require recalibration when switching fluids.

Thanks to the combination of a straight sensor tube with zero dead volume and transducers positioned at the outer surface, the flow meter is self-draining and easy to clean.

Wetted parts are made of stainless steel, the exterior design is rated to IP66/IP67. The on-board PID controller can be used to drive a control valve or pump.

This enables users to establish a complete, compact control loop.



Moreover, the instrument features various fieldbus options, customizable I/O functions and temperature as secondary output.

Typical applications for the new low-flow liquid flow meters and controllers can be found in Food, Beverage & Pharma (e.g. additives, sterilization), Medical and Chemical (e.g. for dialysis, catalysts, reagents) and many other markets which require precision fluid handling e.g. fuel consumption measurement and dosing of

colorants or lubricants in many industries.

**Henning Springer**  
**Mecosa (Pty) Ltd**  
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## High-Level Pressure Sensors for Complete Systems



Keller's standard product catalogue covers most applications for pressure measurement technology.

However, there are often great benefits to optimising pressure sensors specifically for use and integration into higher-level complete systems.

Keller's modular product design offers great flexibility and allows customer-specific

adaptations to be made without causing soaring costs – even for small production runs.

### Sharing expertise to create the perfect sensor solutions

Keller has 50 years experience in countless challenging projects in the field of piezo-resistive pressure measurement technology.

Applications that at first glance may seem trivial, can actually prove to be highly complex on closer analysis.

By taking the actual usage conditions of the sensor into consideration right from the outset, Keller has achieved major improvements in effectiveness and durability.

Keller has found that a mutual exchange of expertise with customers has been central to their success, and sharing that knowledge is what has enabled Keller to find the best sensor solutions.

### The stages of creating a tailored customer-specific solution

1. Define basic sensor specifications in order to select the appropriate component
2. Assess the environmental conditions to determine the appropriate design for the intended location
3. Design the requested customer-specific solution taking all standards and laws into account
4. Assemble the electronic modules, taking into account application-specific customer requests
5. Configure electrical interfaces and connections
6. Custom product labelling with laser engraving or labels

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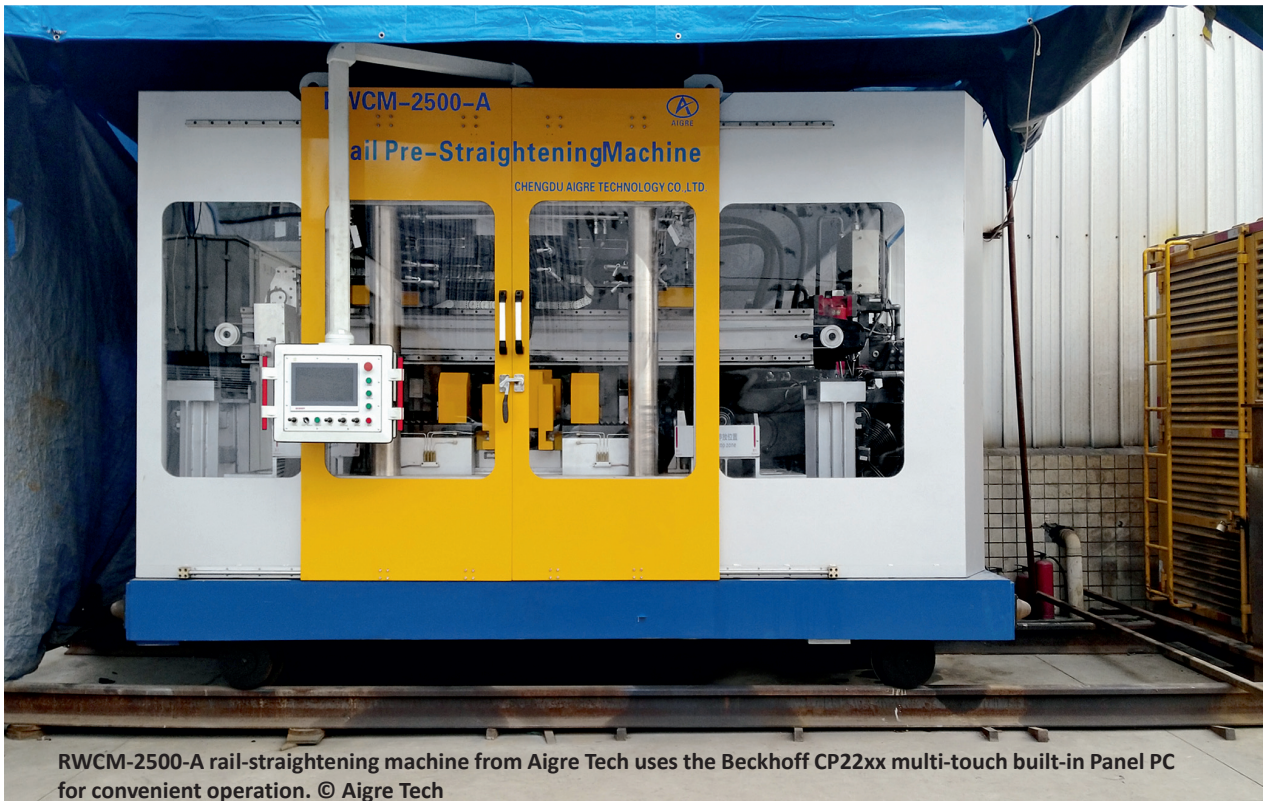
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## Improved Rail And Track Quality With PC-Based Control Technology



When it comes to producing high-quality railroad tracks, two Chinese specialists rely on the performance of PC-based control technology from Beckhoff: Chengdu Aigre Technology Co., Ltd. (Aigre Tech) applies it with a rail-straightening machine to create seamless tracks, as does China Railway Chengdu Group Co., Ltd. with a tandem crane lifting system made up of four overhead cranes.

Founded in 2003, Aigre Tech is a high-tech company that forms part of the SWJTU industrial group located at the Chengdu Modern Industrial Park. The company has developed over 100 machines to date, and these have been used to a large extent for producing seamless tracks in the rail transport sector, e.g., for high-speed trains, heavy-duty trains, inner-city subways and light-rail systems. The key to creating these seamless tracks is in the quality of the welds between rails and the straightness of the rails, all of which has a direct impact on safety, comfort and the service life of the rails.

Due to the difficulties caused by lateral bending of the rails during the welding process, among other things, it is not possible to guarantee straightness. This is where the RWCM-2500-A rail-straightening machine comes in, newly developed by Aigre Tech and equipped with PC-based control technology from Beckhoff. It is primarily aimed at the high-end export market and can detect both horizontal and vertical bending defects in welded joints and straighten these automatically.

For this purpose, the rail is initially scanned horizontally and vertically with a line laser. After the rail has been fixed in place with a clamping and positioning unit, it is corrected several times by four straightening hydraulic cylinders until it meets the quality requirements. An expert system based on fuzzy logic technology (many-valued logic) is used here.

### Straightening machine with integrated control platform

After extensive evaluations, Aigre Tech opted for the integrated control platform from Beckhoff as a complete solution. This was due to its high level of reliability, clear system architecture, simple remote maintenance and use of established programming standards in accordance with IEC 61131-3.

The straightening machine uses the powerful CP22xx multi-touch built-in Panel PC (dual-core Intel® Celeron® processor with 2.2 GHz) to implement all of the control functions. Servo drives from the AX5000 series are used for axis control. An EtherCAT I/O system in a ring network architecture provides fast and reliable data communication. The high computing power of the CP22xx supported development of the user interface directly in the controller using C#. The data is synchronized with the control program and updated via ADS in millisecond intervals.

The system requires high-quality data to control the straightening process correctly. Both the database and set of rules are based on Aigre Tech's practical experience with welded rail connections. The conventional control system used previously had relatively poor data processing and storage capacities.

With TwinCAT Scope View software, Aigre Tech believes that the Beckhoff control platform, on the other hand, provides a powerful and efficient solution that simplifies the recording of rail positions, curvature, force applied, etc., and makes it possible to develop the core database required in a convenient manner.

The powerful Beckhoff hardware and software platform, according to Aigre Tech, increases not just machine availability but also system performance. The first machine equipped with PC-based control in November 2019 successfully passed the comprehensive test for straightening 60 kg/m, UIC 60 and UIC 52 rails, as well as the final approval of the end customer – India's Ministry of Railways.

#### Efficient and precise control of tandem crane lifting system

According to the China Railway Chengdu Group Co., Ltd., the key challenges in controlling tandem crane lifting applications are improving the efficiency when handling long railroad tracks, preventing rails from warping during the lifting process and precise synchronization when lifting or lowering rails.

With PC-based control from Beckhoff, the company successfully achieved these requirements in a lifting system used in southwest China to handle single-piece rails, which are generally 100 m long. China Railway chose their control platform based on the following requirements:

- a powerful CPU as the main controller to coordinate the functions of each sub-crane
- an excellent position-control algorithm to control the driving speed and position of the overhead crane precisely and in real time
- a high-speed communication system to guarantee the timely implementation of various crane instructions, as well as the locking and coordination of the primary and secondary hooks
- an efficient and reliable wireless remote connection

More specifically, CX5120 Embedded PCs (Intel Atom® processor with 1.46 GHz) are used as the main controller for each overhead crane as well as TwinCAT software for the logic functions and NC PTP for precise positioning and synchronization of the overhead cranes.

The CX5120 records the external position signal and the data from the laser distance sensor used to move the crane and hook and to raise/lower the hook via the EL5001 SSI encoder interface terminal. Functions such as position control and collision avoidance were implemented via standard TwinCAT NC function blocks. The 1 ms control cycle time implemented here resulted in a significantly increased system response speed, according to China Railway.

The sensor signals distributed across the entire overhead crane structure (e.g., position switch, limit switch, load signal) are controlled via decentralized substations – with the EK1100 EtherCAT Coupler and EL1809, EL2809 and EL3154 EtherCAT Terminals, among others.

These substations and the individual modules are connected via EtherCAT, which is what a spokesman for



Tandem crane lifting systems from China Railway handle 100 m railroad tracks, among other things. © China Railway

China Railway believes ensures the quick and reliable transmission of all signals: “The real-time properties of EtherCAT exceed those of traditional bus systems by far. According to the crane operators, the control sensitivity of the overhead cranes has also improved considerably.”

As the distance between several overhead cranes can be up to 25 m, the visual observations of the operators are of particular importance. Therefore, in addition to the strict safety precautions that ensure normal operation of the system, numerous pieces of data are to be recorded and monitored, including the driving speed, distance between overhead cranes, their positions and the rail lifting height.

It is therefore important to have a user-friendly HMI which – according to a spokesman for China Railway – can be supplied with data efficiently and flexibly via ADS and, as a result, is very easy to implement with a wide range of development software packages. What's more, TwinCAT Scope View allows users to record, monitor, manage and analyze operating states, the degree of efficiency or any faults and their causes easily and reliably.

China Railway summarizes it as follows: “We have been able to significantly improve the efficiency of the lifting system with PC-based control from Beckhoff. The control system has exceeded our expectations and is very much appreciated by our engineers.”

**Dane Potter**

**Beckhoff Automation**

**Tel. +27 79 493 2288 / +27 11 795 2898**

**danep@beckhoff.co.za**

**www.aigretech.com**

**www.cd-rail.cn**

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## When Every Centimetre Counts - VEGABAR 82 As A Safety Device At A Reservoir



The Schlegeis reservoir is part of the “green battery” that provides balance and control energy and also contributes to flood protection in Zillertal. A pressure transmitter from VEGA now measures the water level exactly to the centimetre and is thus, together with a level scale, an important component of the safety system of the dam.

For many tourists, Schlegeis reservoir is an idyllic recreation area in the mountains. For Michael Sporer and his colleagues the lake is an important part of the safe, clean and affordable power supply. “Schlegeis is one of the green batteries of the Alps,” explains Michael Sporer, who, together with his team, is responsible for the control technology in the Zillertal power station group of the Austrian power company VERBUND.

The high-capacity storage power station group Zillertal consists of eight power stations, seven reservoirs and numerous stream channelling systems. The Schlegeis reservoir, located at an altitude of 1782 meters, can accommodate up to 126.5 million cubic meters of water and, with its imposing 313-meter high and 725-meter long dam, is a sight to behold.

To get a better idea of the immense volume of the storage lake: The volume corresponds to a three-meter wide and one-meter deep ditch around the entire Earth at the equator. The lakes work like batteries.

“When the demand for electricity is low, the pumped-storage power station Roßhag and Häusling pump water from the Stillupp reservoir to the higher Schlegeis and Zillergründl reservoirs. But when electricity is needed, for example at peak demand times, we can route the water from the reservoirs to the power stations within minutes via hydroelectric tunnels,” continues Sporer.

### VERBUND - Austria’s leading power company

All the power stations belong to VERBUND, Austria’s leading power company and one of the largest producers of hydropower in Europe. Every year, VERBUND generates around 30 billion kilowatt hours of electricity from renewable sources. In addition to supplying power, the reservoirs play an important

role in flood protection. The large Schlegeis reservoir holds back snowmelt and storm water run-off, thus contributing to flood protection in Zillertal.

All of the facilities, whether it be power stations, reservoirs or stream channels, are interconnected via tunnels, which often run for kilometres through the mountains. The water masses are controlled by a complex interplay of turbines, pumps and valves.

All systems are automated, but also centrally monitored and operated from the central control room in Mayrhofen, where Sporer and his colleagues work.

Sporer says that he’s been working together with VEGA for roughly 30 years already. Sensors for solids detection, differential pressure measurement as well as level and pressure are used at many different locations in the power station network – in the various valve chambers and stream channels, for example, but also in the Roßhag generating station with its enormous turbines.

“I estimate that over 80 measuring points are equipped with VEGA sensors. Especially in the past six to eight years we have expanded our sensor inventory enormously.”

### Exact level

One of the measuring points is responsible for a particularly important task. Not only for economic reasons is it crucial to know the exact level of the water in the reservoir, but also for safety reasons.

“Considering the large surface area of the lake, every centimetre of additional height translates into an enormous amount of water,” explains Sporer. “Although it hasn’t happened yet, a reservoir can, theoretically, overflow in severe weather conditions, such as prolonged heavy rain or thunderstorms. In order to avoid such an event, we have implemented a comprehensive package of security measures, e.g. the rerouting of streams. Exact information on the water level is thus absolutely necessary.”

To ensure that the high accuracy requirements are met, level scales are prescribed by the regulatory authorities. These devices measure the level of the reservoir over the entire height, i.e. 120 meters, with centimetre precision. The authorities also require a redundant measurement.

Level scales meet the accuracy requirements but are also very cost-intensive. For that reason the power company looked for a less expensive solution. Up to that point, VERBUND had been using a pressure measuring system for the redundant measurement. It basically fulfilled the accuracy requirements, but the measured value output had a relatively high hysteresis.

Although the company had managed to live with the pressure measuring system for some time, it was decided that a better solution had to be found for the long term. “From our experience we knew that VEGABAR 82 could easily handle the task. The only problem was the measurement data output, as the analogue resolution was no better than 7 to 8 centimetres”.

# Temperature & Pressure Measurement ...



*VEGABAR 82 takes on the task of redundant measurement, determining the water level in the reservoir with centimetre accuracy.*

The universally applicable pressure transmitter VEGABAR 82 has an abrasion-resistant ceramic measuring cell and is characterized by maximum operational reliability and safety. Its sensing element is the CERTEC® measuring cell with robust ceramic diaphragm.

The process pressure deflects the ceramic diaphragm, thus effecting a change in capacitance in the measuring cell. This is converted into an electrical signal and outputted as a measured value via the output signal.

But a resolution of 1 centimetre was required! So in order to get a resolution in the millibar range, a VEGABAR 82 of the highest accuracy class, with a measuring range of 0 to 10 bar, was chosen.

The problem of measurement data output was solved by means of a HART signal, which was forwarded through a Wago module and converted to a protocol according to IEC 60870-5-104. Now, the operators in the central control room also get the redundant water level with centimetre precision.

“It is quite impressive that a pressure transmitter can compete with a measuring system that is 10 times more expensive,” says Sporer about the measurement, which has now been working flawlessly for two years.

Installation and setup were simple and straightforward. “Basically we had two measuring systems we could use to monitor the level value: the level scale and the previous redundant measurement. Since we were already familiar with VEGA sensors, installation and setup went as planned. The sensor was simply mounted on the old mounting socket,” recalls Sporer.

### Double and triple security

To be on the safe side, the measurements are checked again manually. There are special measuring points in the entire dam that are regularly checked during building inspections. There are also other measuring points – just in the 131-meter-high dam of the Schlegeis reservoir alone there are around 1,000 hidden measuring points, some of which transmit their measuring results electrically to the central control room in real time.



*There are numerous sensors from VEGA not only in the dam itself, but also in the Roßhag power station. Compared to this huge shut-off valve, the two sensors are tiny.*

In addition, a team of qualified technicians performs regular visual inspections, does additional measurements and records and evaluates the measured values.

Outlook: At the moment, pumped-storage power stations are the only noteworthy technical method for efficient, large-scale storage of electrical energy. Within minutes, water can be sent to the lower-lying power stations to cover peak power demands.

Despite decades of experience with the technology (the first pumped-storage facilities were built in the 1920s), the challenges have changed appreciably with the expanded use of renewable energy in the course of the energy revolution.

“The more alternative energy is generated, the more difficult it is to predict how much electricity is actually needed throughout the day,” says Sporer. “We’re accustomed to handling peak periods and working very flexibly, but predicting when and exactly how much electricity is needed has now become much more difficult.” The focus is now on controlling energy flows; there’s no time for non-essential maintenance work.

So for the process control team, it’s all the more important that the sensors work flawlessly and deliver reliable measured values, and that repair and servicing are simple and straightforward if malfunctions do occur.

*Author: Dipl.-Ing. Sabine Mühlenkamp, specialized journalist for the chemical industry and general technology*

**Leandi Hendrikse**  
**Vega Controls SA**  
**Tel. +27 11 795 3249**  
**Leandi.hendrikse@vega.com**  
**www.vega.com/en-za**

# Temperature & Pressure Measurement ...

## A New Class Of Temperature Measurement



The new TS series of temperature sensors manufactured by Anderson-Negele are robust in design with higher accuracy, resilience, and exceptional reliability.

The two versions available, the TSB (compact version) & TSM (mini version) with IO-Link distinguishes these sensors in temperature measurement.

- Process temperature range: -58...482 °F (-50...250 °C)
- Higher ranges on request
- Improved measuring accuracy: <math>< \pm 0.1 \text{ }^\circ\text{K}</math>
- Higher ambient temperature resistance: 185 °F (85°C)
- One-piece design completely in stainless steel: lasting stability and application reliability

### IO-Link & 4...20 mA with Flex-Hybrid

The Flex Hybrid technology with IO-Link and 4...20 mA is multifaceted: Data can be transmitted from the sensor in digital or analogue mode.

- Flexible communication with plug & play is economic and efficient during installation and commissioning
  - Simple individual programming with IO-Link master, e.g., changing the measuring range or two-point adjustment using offset and reach.
  - Sensor replacement is easier than ever before thanks to the "Smart Replace Design" with automatic sensor identification, configuration, and parameterisation via IO-Link
- The modular design allows for configuration of individually desired sensors. The new TS generation offers a suitable solution for every application:
- For new equipment, the modular design together with the Flex-Hybrid technology offers maximum flexibility and innovation
  - For retrofitting, TSB can replace any TS sensor in existing systems - with all the additional advantages
  - For the replacement of third-party devices, a suitable model is always possible due to the large selection of process adaptations and maximum flexibility in configuration.

**Ian Morton**

**Morton Controls**

**Tel. 0861 000 393**

**sales@mortoncontrols.co.za**

**www.mortoncontrols.co.za**

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## A True All-Rounder: Precision Pressure Transmitter

Jumo Taros S47 P is used for acquiring relative and absolute pressures in liquid and gaseous media. Its excellent active temperature compensation ensures precise pressure measurements and therefore increased process reliability over a wide temperature range.

The robust construction enables protection types up to IP69 allowing use in all areas, regardless of the environmental influences. Default measuring ranges for the Jumo Taros lie between 0 to 100 bar relative pressure and 0 to 40 bar absolute pressure.

The medium temperature can be between -40 and +125 °C. It can even be 140 °C for a maximum of one hour per day. Linearity and long-term stability are both very low at 0.1%. The overall accuracy at 20 °C is at most 0.25% of the measuring span.

The zero point correction can easily be carried out with a magnet. This way, the pressure transmitter delivers reliable measured values over a long time.



A wide range of process connections are available for the compact design of the Taros. Cable fittings M12 x 1 round plugs, line sockets, or terminal cases are available as electrical connections.

One area in which the precision transmitter is used is mechanical and plant engineering. It is also suitable for pumps and sterilizers.

Test equipment construction, calibration technology, and laboratories are also area in which the Jumo Taros S47 P has application.

**Anastas Schnippenkotter**

**ASSTech Process Electronics & Instrumentation**

**Tel. +27 11 708 9200**

**info@asstech.co.za**

**www.asstech.co.za**

# Temperature & Pressure Measurement ...

## Electronic Differential Pressure Transmitter In Primary And Secondary Circuits

In the process industry, differential pressure measurement using primary and secondary circuits has several advantages over conventional differential pressure methods.

With WIKA's new Model DPT-EL differential pressure transmitter, the measuring locations, which are usually several metres apart, are connected via a flexible and easily routed cable. This eliminates the need for capillaries, which are complex to install and susceptible to temperature changes.

### Flexible configuration

Two identical or two different instruments can be combined. The prerequisite is that one of the instruments is used as the primary instrument. This processes the measured values supplied by both individual instruments.

An internal calculation determines the pressure difference and relays it to the controller via the current loop or the bus system. The secondary instrument only supplies the measured values to the primary instrument via a bus line.

The possibilities for combination and the flexible connection often enable a configuration in which diaphragm seals are no longer needed for process separation.



For example, a flush system can be used at the bottom of the vessel, while an open process connection in the upper part of the tank poses no problem for measurement in the superimposed gas.

### Insensitive to temperature fluctuations

Especially with vessels that are often outdoors, it is problematic when the sun shines on the capillaries. An increase in pressure due to the effects of temperature often falsifies the measuring result.

The cable used for electronic differential pressure measurement has almost no influence on the measuring result when heated.

**Greg Rusznyak**  
**WIKA Instruments (Pty) Ltd**  
 Tel +27 11 621 0000  
 sales.za@wika.com  
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 & beverage, dairy, brewery, pharma and life sciences industry.

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# Temperature & Pressure Measurement ...

## Pressure And Level Transmitter



The Anderson-Negele "3 in 1" L3 Pressure and Level Transmitter has been designed to measure **process pressure or volumetric and mass level** in all hygienic process applications such as brewing, dairy, food, beverage, and pharma processing applications.

The exceptional accuracy is thanks to temperature compensation that reduces errors associated with process temperature changes and improved zero stability. The user interface makes set-up easy and configuration simple and can be done via HART interface too.

### Key benefits & features:

- Progressive temperature compensation allows temperature resistant pressure, level, and volume measurement
- Pressure measurement in pipes and vessels up to 110 °C (230 °F)

- CIP-/SIP-cleaning up to 135 °C (275 °F) for 60 minutes max
- Various ranges from 0 – 35 bar with Turndown 1:10
- Precise level measurement in small and large vessels with rapidly changing process temperatures
- Modular design for individual configuration, with Smart Replace Design (easy component exchange in the field)
- Remote version available
- Integrated tank linearisation by vessel geometry (dimensions) or a custom input of up to 10 points
- Density compensation for high-precision output of volume or mass (kg, litres, percent...)
- Easy adjustment of zero and span
- 3 different process applications in one sensor.

Ian Morton

Morton Controls

Tel. 0861 000 393

[sales@mortoncontrols.co.za](mailto:sales@mortoncontrols.co.za)

[www.mortoncontrols.co.za](http://www.mortoncontrols.co.za)

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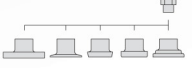
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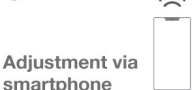
Compact design



Hygienic  
adapter system



**IO-Link**



Adjustment via  
smartphone

## Temperature & Pressure Measurement ...

### Extended Life Pressure Gauge With Longer Service Life And Higher Accuracy

The Bangalore Urban, Rural & Ramanagara District Co-Operative Milk Producers societies Union Ltd. (BAMUL) was established 1975, and it is the second largest Dairy Co-Operative in the country.

In south India, it stands first in terms of procurement as well as sales. The Bangalore Dairy has become one of the most sophisticated dairies in India by adopting Computer Controlled State of the Art Technology.

#### The Requirements

Bamul Bangalore Plant Deputy Manager Maintenance was facing a critical issue in their milk separation process.

They experienced frequent diaphragm ruptures in the installed pressure gauges caused by sudden fluctuations in pressure.

This problem led to repeated plant downtime, and they had to maintain a large inventory because of frequent failures.

On top of that, accurate pressure measurement was a critical requirement to ensure a constant milk fat ratio.

To solve these problems, the manager was looking for a high quality pressure gauge that can sustain such fluctuations and help avoid any downtime, which leads to production loss.

#### The Anderson-Negele Solution

Anderson-Negele India offered the EL Pressure Gauge, first on a trial basis.

The hygienic EL "Extended Life" pressure gauges are designed to resist repeated process and environmental stress like vibration, pulsation, harsh cleaning chemicals and wide temperature and humidity fluctuations.

With over 30 years of experience, they've identified and addressed all of the key causes of premature failure in food, dairy, and beverage processing applications.

After getting the positive test results, BAMUL regularized their milk separation process with the EL pressure gauge. From the first trial more than 5 years ago, all of the installed EL pressure gauges are running successfully with the highest customer satisfaction.

#### Application advantages

- No failures and zero downtime
- High accuracy and performance in the harshest environment
- Maintenance free and faster return on investment
- Higher resistance to pressure fluctuations in the milk separation process.



*EL for process control installed in a pipe*



*EL for pressure control installed in a tank*



#### Advantages

- Long-life technology with wear-free mechanical system
- Extended Life Pressure gauge designed for longest durability
- Resistance to vibration, pulsation, harsh cleaning chemicals, and humidity
- Re-zero option for calibration
- Wide process temperature range from -29 °C to 149 °C
- Huge display with 90 mm housing
- Complete device is certified by 3-A-SSI

**Raymond Karsten**  
**Instek Control**  
 Tel. +27 12 998 6326  
 raymond@instek.co.za  
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## Top Four Tactics For DNS Infrastructure Defense

For something so important, we take a lot of the services provided by **Domain Name System (DNS)** for granted. But DNS availability is critical for anyone providing services or content across the internet, and there have been a number of high-profile, high-impact attacks against DNS over the years.

For example, the 2016 Mirai attacks against DNS service provider DYN impacted millions of users of services such as Netflix.

There are several types of common DNS attacks. The Mirai attackers used a distributed denial-of-service (DDoS) attack to make DNS unavailable.

Using a technique known as Water Torture, the attackers used a botnet to generate DNS queries for millions of random hosts, putting a huge load on the DNS infrastructure and rendering it unavailable for genuine user queries.

Bad actors can also leverage DNS to attack third-party targets by using reflection or amplification attacks to generate large-scale volumetric attacks.

A DNS reflection/amplification attack uses a botnet to generate DNS queries using the source IP address of the intended DDoS victim.

The DNS servers innocently send their large volume of responses back to the victim, creating traffic volume as much as 10 to 100 times higher than that generated by the original botnet.

Once the limits on bandwidth for the network, server, or application are reached, the circuit becomes unavailable.

We recommend the following tactics to build a holistic defense strategy for defending against DNS DDoS attacks:

### Current threat intelligence

Threat intelligence is a crucial tool for DDoS detection and mitigation. Security personnel and DNS administrators must not only be aware of the latest DNS exploits but also understand how the exploit works, and what it does to fully understand the impact on DNS infrastructure.

### Regular audits

Proper maintenance is critical. Organizations must include DNS infrastructure in periodic, realistic tests of the organization's DDoS mitigation plan, as well as regularly audit and properly configure DNS servers.



### Network visibility

Companies must be able to quickly detect abnormal DNS traffic, including both application-layer and volumetric reflection/amplification DNS vector attacks. To accomplish this, you will need visibility and fast detection at Layer-3/4 and Layer-7 of the network.

### Orchestrated mitigation

Companies can orchestrate multiple methods of mitigation, including their own network infrastructure, dedicated DDoS mitigation products, and for network operators, information sharing with other operators. By implementing such an orchestrated mitigation strategy, companies can strategically assign different methods of mitigation to different attack vectors.

#### Comtest

Tel. +27 10 595 1821

sales@comtest.co.za

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## Thermal Cameras With Leading-Edge Technology



**F**luke Ti401 and TiX501 PRO thermal cameras capture and display smaller temperature differences to easily visualize and diagnose issues - making it easier for technicians, engineers and electricians

to get to the root cause of problems faster.

When diagnosing problems, capturing and displaying small temperature variances makes all the difference. Comtest is offering Fluke's Ti401 and TiX501 PRO series thermal cameras, recently fine-tuned to make it easier for technicians, engineers, and electricians to get to the problem's root cause faster by identifying hot spots, cold spots, and apparent surface temperature differentials with a higher degree of confidence.

These IR cameras have increased thermal sensitivity to capture minute differences and the latest Fluke technology for on-screen clarity to make it easy to visualize issues in the field.

The Fluke PRO series cameras introduce a leading-edge visual infrared experience with the smartest, most intuitive user interface available to market. The units feature increased thermal sensitivity that captures the smallest measurement differences, the latest technology for on-screen clarity, and lens compatibility to capture targets - from tiny to large.

The Ti401 PRO thermal camera gives "in-focus" images in a matter of seconds. LaserSharp™ Auto Focus uses a built-in laser distance meter that calculates and displays the distance from the designated target and immediately adjusts the focus.

- Users see small details in the image and can discover anomalies faster with 640 x 480 resolution thermal images
- The level of infrared and visible light can be adjusted (on camera) with patented IR-Fusion™ technology
- Manage data, capture multiple measurements (mechanical, electrical and thermal) and organize them with Fluke Connect™ software
- Top quality optics to transmit energy and produce high quality infrared images. Fluke thermal cameras use only 100% diamond-turned germanium lenses with specialty coatings.

The **TiX501 PRO Hi-Res thermal camera** allows for near as well as distant images. Interchangeable smart lenses require no calibration of the thermal camera and give users the versatility and image quality needed to conduct inspections in almost any environment. Advanced thermal sensitivity helps find subtle temperature differences easily.

**Comtest**  
**Tel. +27 10 595 1821**  
**sales@comtest.co.za**  
**www.comtest.co.za.**  
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## Monitoring Compressed Air in a Few Steps - Without Separation

**T**he SL870020 sensor monitors compressed air consumption with high measuring accuracy. In addition, it is possible to retrofit the sensor into existing systems during operation and for device maintenance during operation.

At a suitable measuring location, with dry air and under consideration of the inlet/outlet section, only a flange with a G½" ball valve (retrofitted if necessary) is required. Then the sensor is screwed onto the ball valve, which is opened then.

The system does not lose air at this point. Afterwards, only the clamping sleeve has to be loosened and the measuring head has to be pushed in until it is placed in the middle of the pipeline with the help of a scale.

Finally, the clamping sleeve is tightened again, which completes the installation. Now only the measuring results are missing. A Modbus RTU interface, a pulse output for counting or a 4-20mA analogue output are available for this purpose.

Thus, the entire information on air consumption can be easily processed in-house, so that you never lose track of the costs.



The solution portfolio is rounded off by a local consumption measurement system that reliably performs its service even in confined spaces.

The sensors listed below have an internal flow straightener. Therefore they require no or in exceptional cases only a very short inlet and outlet distance.

- SL890021 DN 8 G 1/4
- SL900021 DN 15 G 1/2
- SL910021 DN 20 G 3/4
- SL920021 DN 25 G 1
- SL930021 DN 32 G1 1/4
- SL940021 DN 40 G1 1/2
- SL950021 DN 50 G 2

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## Universal And Precise Conductivity Sensor With Maximum Chemical Resistance To Highly Oxidizing Media



The SE 656N toroidal conductivity sensor is a sturdy and corrosion-resistant sensor that, thanks to its high chemical resistance and durability when exposed to aggressive media, is particularly suitable for applications in the chemical industry.

A combination of a large sensor opening and dirt-repellent material prevents blockages and deposits in media with a high pollution degree.

The inductive measuring principle enables full galvanic isolation of the measurement from the medium.

The sensor is an all-rounder, suitable for a multitude of applications with a range covering six decades.

Equipped with Memosens protocol as a digital version, it offers considerable process and data security, and ensures reliable data recording.

### Applications

Concentration measurement, in particular of highly oxidizing acids and bases, online quality monitoring of chemical products in tanks and pipes, phase separation of product mixtures, paper manufacturing (high fiber concentration), heavily soiled media and wastewater, fouling media.

### Facts and Features

- Process-wetted material: PFA
- Sturdy design
- Resistant to contamination and fouling
- Range of six decades
- Inductive measuring principle, full galvanic isolation of sensor coils from process medium
- Digital with Memosens protocol.

**Henning Springer - Mecosa (Pty) Ltd**  
 Tel. +27 11 257-6100  
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## Wirelessly Uncomplicating Your Application

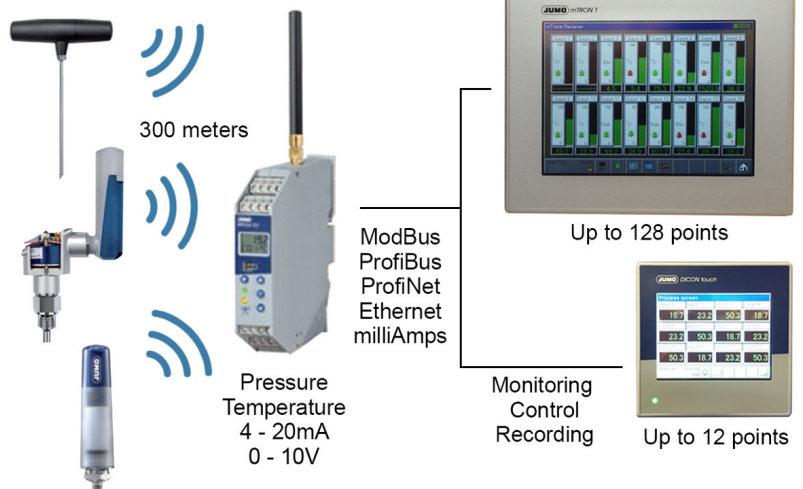


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**Beckhoff Automation (Pty) Ltd**  
Randburg 2169, South Africa  
Phone: + 27 (0)11 795 2898  
[info@beckhoff.co.za](mailto:info@beckhoff.co.za)