



## Preventing Emergencies with Reliable Systems

Pneumatics ensures machine safety

### The Path Towards the Industrial Internet of Things

Interview with Peter-Michael Synek of the VDMA

### Smooth Sailing with AVENTICS

Marex ship control in 42-meter sailing yacht

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# WELCOME TO EMERSON



## Dear readers,

In July AVENTICS became part of the Emerson family. The integration into Emerson is the right step to ensure a prosperous and sustainable future for AVENTICS. Together the combined businesses offer new opportunities for development and interesting projects with customers, suppliers and other partners.

AVENTICS has a great market reputation, state of the art products, a solid and loyal customer base and sound manufacturing principles and capabilities. With our expertise in smart pneumatics, we are a strong match with Emerson – and together we will enhance our position on the global Fluid & Motion Control market.

WE ARE PROUD TO BECOME PART OF  
ONEEMERSON

**Paul Cleaver,**  
CEO AVENTICS  
Emerson Automation Solutions



## Dear readers,

WE ARE DELIGHTED TO HAVE AVENTICS AS A  
PART OF THE EMERSON FAMILY. WE ARE  
BROADER.BETTER.TOGETHER.

Combined with the existing Emerson portfolio of products, we are now able to offer solutions for our customers toughest challenges. In order to efficiently service our customers globally, it is our intent to continually invest in people, products, and infrastructure.

The industry is filled with exciting new opportunities and we will partner with our customers to work towards the next era of innovation in automation technologies.

**Manish Bhandari,**  
Group President,  
Fluid & Motion Control  
Emerson Automation Solutions



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From left to right: Orsolya Fiser, Director Human Resources Hungary at AVENTICS, András Pfeiffer Ph. D., Deputy Director of the Hungarian Academy of Sciences, Institute for Computer Science and Control, and Gábor Bányai, Director IT Central & Eastern Europe at AVENTICS.

## AVENTICS HUNGARY NAMED “FACTORY OF THE YEAR” FOR ITS IIOT CAPABILITIES

The AVENTICS plant in Eger is the plant best equipped for the IIOT in Hungary according to the jury of the “Factory of the Year” competition. “We are extremely pleased with this award,” says István Gödri, CEO of AVENTICS Hungary. “We only integrate solutions that increase efficiency, are profitable, and help us to better face market challenges.” Owing to growing digitalization, PPH Média presented the competition category of “Hungary’s System Best Equipped to the IIOT” in 2017. In Hungary, AVENTICS began digitalizing its Eger plant in 2008, which was no longer able to cope with ever-increasing complexity using the standard tools. 




## EMERSON COMPLETES AVENTICS ACQUISITION



Townhall Meeting

Emerson (NYSE: EMR) announced the completion of its acquisition of AVENTICS on July 17. The acquisition will significantly expand the company’s reach in the growing \$13 billion fluid automation market and solidify Emerson’s automation technology presence in Europe.


AVENTICS is a strong complement to Emerson’s capabilities and solutions in key discrete and hybrid automation markets, and creates one of the

broadest portfolios of fluid control and pneumatic devices that incorporate sensing and monitoring capabilities to improve system uptime and performance, enhance safety, and optimize energy usage. 

## IIOT ON THE ROAD



How can I introduce IIoT in my company without making it unnecessarily complicated? That's a question asked by many users. With the Smart Pneumatics Analyzer (SPA), pneumatics specialist AVENTICS offers its customers a mobile, easy-to-integrate solution. "Everyone is talking about the Industrial Internet of Things, or IIoT – lots of companies are looking to take advantage of it," reports Andreas Kliewe, Manager Application & Specification at AVENTICS. But when

it comes to realizing this potential, many companies are just getting started. "This is exactly where we come in," says Kliewe. Users can simply connect the SPA to the compressed air supply on an existing machine, providing them with instant analysis options for key machine characteristics, such as compressed air consumption and possible leakages. 

## DIRECT DIALOG WITH CUSTOMERS




The Hannover Messe team was pleased with its successful week.

In 2018, AVENTICS could be found at more than just Hannover Messe – the pneumatic specialists also scored big at other international trade fairs. "At the Elmia in Sweden, for example, the former "World's Strongest Man Champion," Magnus Samuelsson, appeared as our guest," states Christian Sjöberg, Nordic Marketing Manager at AVENTICS. But AVENTICS employees Italy and

Switzerland also had nothing but positive experiences to report at the SPS and Sindex, respectively. "Many customers still highly value direct dialog – and they also enjoy trying out our exhibits out for themselves," says Sabine André, Director Marketing at AVENTICS. "We look forward to other upcoming trade fairs this year." 

## "SMART INDUSTRY EVENTS" IN SPAIN

In collaboration with other industrial companies, AVENTICS Spain has launched a new event series, inviting customers to a technical lecture held at a special location. "With our series titled 'Smart Industry Events,' we aim to improve contact with customers while discussing topics such as the Industrial Internet of Things," explains Michele Burla, General Manager Sales Spain. 

Successful get-together with AVENTICS customers





# THE FLOATING TAXI

AVENTICS Outfits Mudflat Taxi with  
Marex OS III Control System

**What does deteriorating medical care on the German Islands of the North Sea have to do with a ship control? A great deal: the Liinsand mudflat taxi makes it easier for residents on the coast of the North Sea to reach often faraway doctors.**

"We take you where you want to go, when you want to go there," promises the Liinsand crew. The ship is no ferry, with the number of passengers and length of travel determining the fare per person. From Wittdün on Amrum to Wyk on Föhr or from Dagebüll to Pellworm.

We met up with Sven Jürgensen, CEO of Watten Fährlinien GmbH, who has backed the Wattentaxi mudflat taxi project together with owner Dirk Lehmann right from the start. Jürgensen has a great deal of experience in seafaring, and is a ship operations technician among other things.

## **From Wittdün to Wyk or from Dagebüll to Pellworm**

"Liinsand hails from Husum, once again making the North Frisian district capital the starting point for regular trips to destinations in the mudflats," he explains. Measuring 18.70 meters in length and 7.2 meters in width and







With the Marex control, the ship crew can optimally maneuver the mudflat taxi.



The Wattertaxi is a low-emission hybrid ship.



The 5.7 inch display is easy to read even in sunlight.

outfitted with a hybrid gearbox, the ship indicates the emissions released during the trip within the cabin. "At the port, the ultra-quiet 'Liinsand' is operated emission-free with battery power, with modern, filtered diesel engines propelling the mudflat taxi with minimal emissions at sea", says Jürgensen. "While other ships are only used seasonally, we run all year with two crews," the CEO reports. With a low draft of 1.35 meters, the mudflat taxi can be used no matter the tide, the only exceptions being very strong winds or ice drift.

Liinsand can also be used for medical care purposes. "Here on the coast, we are facing a slump in local doctors and midwives. In some cases, residents have traveled over two hours to see a doctor, something set to change with the mudflat taxi," Jürgensen rejoices.

After the decision was made to make Liinsand a low-emission hybrid ship, Jürgensen looked for a shipyard able to implement the plans as desired. In this case, Loça Mühendislik in Turkey presented the ideal partner. The importance of emissions released by seafaring ships will certainly grow with increasing ship traffic. This is why Lehmann and Jürgensen want to set an example, showing that other options are available. As with hybrid vehicles, the diesel engine and electric motor provide each other support.

### Origin of the mudflat taxi

No easy feat: a catamaran-type ship outfitted with a hybrid gearbox and emission control for the diesel engine as well as space for up to a "busload" of up to 50 passengers. AVENTICS products were the obvious choice: "You know you're getting quality," states Jürgensen.

The new mudflat taxi features two redundant hybrid diesel propulsion systems with two propellers, two helms, and two battery systems each with a good 50 kilowatt hours. With the Marex OS III, Jürgensen and his crew relied on the proven marine products in the AVENTICS offering. The hardware of only a few modular units that are extremely powerful thanks to their bus connection. The electrical remote control uses a control device on the propulsion engine speed governor, while the gearbox is controlled mechanically. Consisting of a control signal generator and MPC, the components are connected via CAN bus data lines. The CAN bus protocol ensures reliable control. Designed for applications in diesel drive engines, this type of Marex OS III control can be found on passenger ships and utility vessels, freight carriers, as well as on motor and sailing yachts of all kinds and sizes to safely and efficiently operate controllable pitch propellers and jet propulsions.

### Under way since February 2018

Now up and running, the ship has been well received by passengers. Tickets can be booked either online or on the phone. Passengers can view planned tours, the current position, and availability of the mudflat taxi using the trip calendar on the website. The only time the crew was unable to disembark was during the heavy frost in late February, when the ship was stuck between countless ice floes.

By the way: Did you know what first low-emission vehicle was that ship owner Lehmann launched? Electric trolley "Elli". 🚲



# KEEPING THINGS RUNNING

Reliable Pneumatics  
Ensure Safe Machines



**Digitalization of industrial automation is progressing steadily. Machines are capable of mastering tasks faster and faster, and can even communicate. But machines are only left to their own devices in the rarest of cases. And when people are interacting with machines, machine safety is key.**

Setup operation for a new packaging size: Peter Schmidt\* holds the packaging in the machine with his left hand, and seals it by moving the axle with the other. All it takes is a single second of distraction and his hand is caught in the axle. Now, speed is crucial: "With standardized safety technology, I will walk away without even a bruise. But without safety technology, my hand would be seriously injured," explains Andreas Blume, Global Account Management at AVENTICS.

Now, things get dangerous for Peter Schmidt: In pain, he is unable to free himself, colleagues rush to assist and press the emergency OFF switch for the entire machine, but the axle is still stuck. They have to turn the power to the axle back on to retract it. Keep in mind – Peter's hand is still caught. "In case of major injuries, the machine has to remain shut down until it has been approved by experts of the trade association or other regulatory bodies in many countries," Blume adds. "This can cause prolonged production downtime of entire lines." And in this case, Peter Schmidt would require lengthy medical treatment and would be unable to work for weeks.

\*Name changed by editorial team

*"There are no easy answers  
to defining a security concept."*

Andreas Blume,  
Global Account Management at AVENTICS  
andreas.blume@aventics.com



#### **Machinery Directive provides guidelines**

In 2014, nearly 3.2 million non-fatal occupational accidents causing downtimes of at least four calendar days and 3,739 fatal accidents were recorded in the European Union. These figures reveal how important it is for machines not to present hazards to people when operated properly. In Europe, the Machinery Directive (2006/42/EC) sets specifications for the safety technology of all types of machines and systems. At the same time, it sets an example across the globe: The regulation serves as the foundation for other regional standards, such as Brazil's NR 12. ISO 13849 plays an important role in the implementation of the machinery directive for the assessment of technical safety measures.

"Engineers constantly have to ask themselves what happens when there is a power failure or an operator presses the emergency OFF switch on a machine. "In these cases, we need an external mechanism to safely cut off power to pneumatic cylinders, for example, so that they do not present a hazard," explains Duško Marković, expert for machine safety at AVENTICS. In the example involving Peter Schmidt, the AV series exhaust module could have provided assistance. It exhausts the cylinder

chambers without requiring additional energy. This means a cylinder can be moved to correct workpieces since the cylinder chambers that were under pressure are now exhausted. If a person is trapped and the cylinder cannot be moved due to power failure, the exhaust module enables the cylinder to be switched without power. The module offers full functional integration with simple connection to the actuator. It reduces the installation space required by the cylinder significantly, lowering costs by up to 20%.

AVENTICS offers the right pneumatic and electronic solutions for all major safety functions – available across the globe: from SV07 and SV09 double valves to ISO valves with position inquiry and maintenance units for safe exhaust to the new AV valve generation with safety-oriented electronic and mechanical components. "As new products for machine safety, we offer the AS3-SV exhaust valve and the SV01, SV03, and SV05 redundant dual solenoid valves," explains Wolf Gerecke, Director Strategic Product Management at AVENTICS. Users can integrate the AS3-SV modularly into AS series maintenance units or position it flexibly as a stand-alone product.

#### **Reliability determining factor for performance level**

Engineers have to define a required performance level (PL) in a risk assessment, depending on the probability of occurrence and frequency of risks, as well as the severity of possible injuries. This PL must be achieved by means of technical safety precautions. Safe pneumatic switching processes and the reliability of the safety-relevant components contribute to these efforts. The engineer calculates and documents the PL with reliability values, such as the B10 value. In valves, this value indicates how many switching cycles it takes for 10% of components to likely exceed defined limits, such as switching times, leaks, or switching pressure under specific conditions. AVENTICS sets benchmarks in the area: The SV07 and SV09 exhaust valves achieve 10 million, and AV valves even perform up to 75 million.

And it is crucial to remember that AVENTICS determines these values in line with ISO 19973, which gives engineers the certainty they need, as they are responsible for calculations. AVENTICS uploads the B10 values for all safety-relevant components as a library in the cross-manufacturer Sistema database.






*"Safety starts in the design  
and selection of components,"*

Duško Marković,  
Technical Support Applications at AVENTICS  
[dusko.markovic@aventics.com](mailto:dusko.markovic@aventics.com)

Electronics plays a major role in the process. With galvanic isolation between the UL and UA, the AES valve electronics for the new AV valve generations meet proven safety principles. They have two independent signal paths for safety-related tasks and other tasks. They are safeguarded against manipulation because they do not have a switch for configuration and can feature any valve to safety-zone ratio.

AVENTICS has created a comprehensive catalog with safe switching examples. The examples were given a positive rating by the IFA, the Institute for Occupational Safety and Health of the German Social Accident Insurance. AVENTICS supplements this catalog with a safety brochure and detailed information on pneumatics and machine safety online. Trained sales staff is available to provide technical support. "There are no easy

answers to defining a security concept. Each case is different, and tailored solutions need to be found for each customer's special requirements," summarizes Blume. "AVENTICS offers customers more than general machine safety training. We aim to work out solution approaches directly on site." 

► More information at:  
[www.aventics.com/machinesafety](http://www.aventics.com/machinesafety)

# RELIABLE PROTECTION FOR BOTH MAN AND MACHINE

# AS3-SV



Thanks to the redundant structure and two-channel signal processing with self-monitoring, with the new AS3-SV safety valve, users can achieve category 4 safety-relevant control while meeting the maximum performance level “e” (PLe) according to ISO 13849-1. It also meets category 4 and PLe requirements as a stand-alone component. The corresponding BG and CE certifications have been issued.


The valve assumes safety functions including redundant exhaust and protection against unexpected pressurization. It only activates compressed air supply when all conditions for a safe system start-up have been met. Protection against unexpected pressurization prevents the cylinder from being actuated unintentionally. In the event of a fault or emergency OFF, the valve exhausts the operating lines, ensuring a de-energized and thus safe state. In addition, the soft-start function gently moves the actuators into their initial position and then switches through to full working pressure. Here, the technician uses an adjustment screw to adapt the time for switching to full pressure. Full pressure is switched at a value of around 50 percent of the input pressure. Using the adjustment screw, the operator can also override slow pressurization.

Safe inputs, outputs, and controls are already integrated. As a result, machine manufacturers and system integrators can implement the safety electronics in hardware and software without any additional effort. Internal monitoring includes detailed troubleshooting and

a status indication. The B10 value in accordance with ISO 13849 is 10 million.

The safety valve functions starting at pressures of 2.5 bar. Users can integrate it modularly into AS series maintenance units from AVENTICS or position it flexibly as a stand-alone product.

The front of the valve features a G1/4 air connection for a pressure sensor or pressure gauge, for example with an adjustable working range indicator to visualize the target pressure for quick, reliable readings. Installed as standard, the flat silencers make the valve especially compact.

The AS3-SV is suitable for use in door switches, light barriers, as a reliable output for a control, or as a safety module for emergency OFF applications. 

## FUNCTIONAL STARTING WITH 2.5 bars



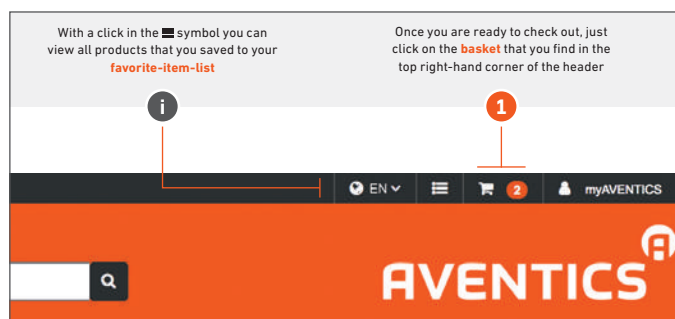
# SUCCESSFUL LAUNCH

Purchasing AVENTICS Products Even Easier with the Pneumatics Shop

Purchasing pneumatics solutions is as easy as buying a book at home. AVENTICS has now launched its new Pneumatics Shop, available virtually across the globe. "We are very pleased with the launch of our shop," summarizes Andreas Hart, Director Digital Business at AVENTICS. "Of course, we faced several challenges in this project, but we worked them all out by roll-out. The feedback from our customers has been very positive."

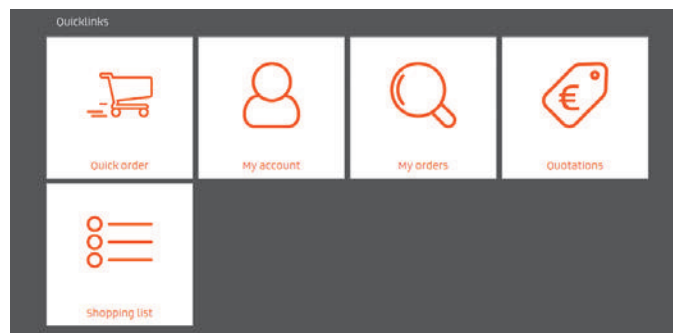
## Making B2B shopping easy

A Mag will give everyone who has yet to use the new shop a quick preview.



Shopping list available at any time

"In the Pneumatics Shop, the cart is anonymous, for example," explains Hart. "Every user can add products to the cart."



Browse the categories, where the material numbers are sorted by chapters.

Changes have also been made to registration and login: For example, registered users can save their cart as a shopping list. Once customers have an account, they also have access to the myAVENTICS Portal.

Here, they can track their delivery or manage their user and SAP account. 

► The Pneumatics Shop is available at:  
[www.pneumatics-shop.com](http://www.pneumatics-shop.com)






## WIRELESS CONTROL FOR LEISURE BOATS **MAREX ECS**

**Owners of small leisure and work boats with fixed pitch propellers can now dock and undock even easier. The AVENTICS Marex ECS is supported by remote control company Yacht Controller resulting in a solution that can be connected via plug and play. Even mechanically actuated motors can be controlled wirelessly.**

It holds nicely in your hands and can be used from anywhere on the deck: the control panel that forwards commands to Marex ECS via radio waves. "We want to make it even easier for our customers to maneuver their boats – and not just on

large yachts," states Christian Lader, Product Manager Ship Controls Marine at AVENTICS. Another advantage: Previously, boat owners with mechanically actuated motors could not retrofit a remote control. The experts from AVENTICS and Yacht Controller have now closed this gap. The Dual Band plus remote control from Yacht Controller provides users with a simple, intuitive control for engines, bow thruster, stern thruster, and two anchor winches that can easily be retrofitted. 




## DESIGNED FOR HARSH OPERATING CONDITIONS **ED05-RAIL**

**The optimal pressure for every application, ultra-precise and highly dynamic: Precisely set, dynamically adjusted pressure forms the basis for optimized, energy-efficient processes. ED05 series pressure regulators combine control electronics, pressure sensor, and direct drive via a proportional solenoid in a single closed unit. AVENTICS now offers a version of the valve for railway customers.**

"With sturdy components made of die-cast aluminum and special steel alloys, the ED05-Rail optimally meets the requirements and standards applicable in railway technology," says Thomas Alm, Director Railway at AVENTICS.

The ED valves process pressure regulation tasks in a decentralized manner without additional parameter adjustment based on the set points of the superordinate train control. They control highly dynamic and precise

movements and force, or pressure, without additional control settings. ED05-Rail also offers high repeatability combined with a small hysteresis, as well as an integrated diagnostic function and a variety of pressure ranges. With an operating temperature range of -40 to +70°C, the valves are suitable for worldwide application in all climatic zones.

"The intelligent actuators communicate with the superordinate train control either directly via an analog interface or via a bus module. This significantly reduces the construction, assembly, and commissioning requirements for the pneumatically controlled functions of the railway vehicle," says Alm. The expert cites dynamic brake control for gentle braking, height adjustment on the platform for optimum boarding and disembarking, or contact pressure control for the safe functioning of pantographs as possible areas of application. 

# KEEPING AN EYE ON THE MARKET WITH THE INDUSTRIAL INTERNET OF THINGS

Interview with Peter-Michael Synek, Acting CEO of the Fluid Power Association and Acting CEO of the Fluid Power Research Fund with the VDMA

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**Revolution, evolution, or hype? Nearly every company has a different answer to this question. What does the Industrial Internet of Things mean for machine and system engineering as an industry? A Mag discusses this topic and more with Peter-Michael Synek from the VDMA German Mechanical Engineering Industry Association. He is the acting CEO of the Fluid Power Association as well as the acting CEO of the Fluid Power Research Fund. The VDMA provides its members with support and assistance in implementing the Industrial Internet of Things.**

**Mr. Synek, what is the Industrial Internet of Things to you?**

**Peter-Michael Synek:** I associate the Industrial Internet of Things with digitalization, networking, and communication. Machine manufacturers and users focus on these three criteria. However, we have been experiencing a paradigm shift for several years now: The demand for and necessity of digitalization is growing with no end in sight.

**Is the Industrial Internet of Things a topic relevant only in Germany?**

**Peter-Michael Synek:** The original idea behind the Industrial Internet of Things combined with the possibilities it affords definitely comes from Germany. Other

countries soon recognized its significance, quickly embracing the topic. China uses the German terminology, equivalent to "Industry 4.0," while the USA describes it with the term "Industrial Internet of Things" or "IIOT." Implementing the Industrial Internet of Things with all the possibilities it offers is like an initial spark for our globally active industry.

**What role do machine operators play?**

**Peter-Michael Synek:** End users want to boost their productivity and lower their total cost of ownership (TCO). Machine manufacturers have to find new ways to meet these requirements. The Industrial Internet of Things presents an answer. For operators, it's all about increasing and expanding functionalities. How do I achieve this? Steel, aluminum, cast, and iron are now just carriers, while intelligence comes from the IT integrated into the components as well as gained data. Servopneumatics and proportional hydraulics play a leading role.

**What does gathering data do in practice?**

**Peter-Michael Synek:** It is essential not only to gather data, but to analyze it and respond accordingly. One good example is predictive maintenance, which deals with capturing, interpreting, and learning from existing parameters or parameters to be defined. This allows me to prevent the worst case scenario, that is production downtime, by planning maintenance measures ahead of time. Let me draw a parallel: If I create a digital twin for components that corresponds exactly to the real model and capture my control statuses, I can apply this data to the digital twin and directly influence the real machine using software.

**Will we be operating machines using smartphones any time soon?**

**Peter-Michael Synek:** Sometimes, machine and system manufacturers tend to be conservative when it comes to new things. But the smartphone has made its way from the consumer side, establishing itself in the industrial world. Supplier and consumer industries recognized its potential and are pushing its use. Use in stationary and mobile machines has already been mapped out and there's no turning back.

*“Pneumatics is an ultra-efficient technology, as it is both robust and inexpensive. Based on its advantages, pneumatics will continue to be used in many applications.”*

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**“END USERS EXPECT ULTRA-PRODUCTIVE MACHINES WITH A MINIMAL TCO.”**

The VDMA organizes task forces for standardization. What's the status here?

**Peter-Michael Synek:** We support coordinated standardization by bringing together both SMEs and major corporations. Standardization means compromise, and ultimately agreeing to one standard. The German Mechanical Engineering Industry Association agreed on OPC UA as a common communication interface, for example. The VDMA supports the development of use-case-dependent companion specifications in special committees. For me, it is important for the interface and specifications to find international acceptance.

Besides communication, this also involves semantic descriptions. Components and systems have to be able to be identified and addressed via defined characteristics. In this area, we rely on our collaboration with ecl@ass. Once again: As an export-heavy industry, we need standards and data formats accepted worldwide.

Will IT take over engineering?

**Peter-Michael Synek:** Browsing the Hannover Messe today you will notice companies that didn't attend previously, especially IT companies. This is only logical with IT and engineering looking to leverage synergies. But when IT companies come on board, interpretation and data rights become an issue. The result will be new models of collaboration.

In your opinion, what role will pneumatics play in the Industrial Internet of Things?


**Peter-Michael Synek:** End users expect ultra-productive machines with a minimal TCO. Pneumatics is an ultra-efficient technology, as it is both robust and inexpensive. Based on its advantages, pneumatics will continue to be used in many applications, and not be replaced by or substituted with electromechanics. Pneumatics and electromechanics can also complement each other where it makes sense from a process point of view. 





Photo: iStock

# PRESSURE THE KEY TO CHEESE

## The Role of Pneumatics in Cheesemaking

**Cheesemaking is tough work. Liter after liter of milk is processed – ten for one kilogram of hard cheese, in fact. To allow the whey to escape from the cheese, it has to be pressed – at small dairies, this is done manually or mechanically, while in industrial production this process is automated using pneumatic cylinders and valves.**

Cheese lovers have hardship to thank for their favorite product: In ancient times, people used cheesemaking to preserve milk products and bridge gaps in the food supply. Cheese is the result of souring milk and then separating the solid parts from the whey. Today, cheese is not only considered a staple, but also a luxury, with sales growing for years.

“Cheese can be made of cow, goat, or buffalo milk,” explains Gerson Henning, Dairy Expert at AVENTICS. “Those who like it more exotic can find cheese made of reindeer milk, which is produced in Finland, for example.” There is no standard definition, but different types of cheese are differentiated by water and fat content. The water content refers to the fat-free

cheese matter, the fat content in relation to the dry matter. The more dry matter a cheese has, the harder it is. The less dry matter, the more water it contains, making it softer. Cheeses with a dry matter content of at least 60 percent, for example Parmigiano Reggiano or Grana Padano, are considered hard cheese. Soft cheeses are cheeses with a dry matter content of at least 35 percent. Popular soft cheeses include feta or camembert. Other types of cheese include semi-hard cheese, cream cheese, or sour milk cheese.



Pneumatic cylinders play an important role in cheesemaking.



The ICS from AVENTICS performs hard work in a cheese press.

### Transforming milk into a wheel of cheese

Cheesemaking consists of a total of five steps: curdling, heating, shaping, fermentation, and ripening, as well as a final quality inspection. "Cheese is curdled by adding lactic acid bacteria or rennet. Once the milk is solid, the mass is broken into small pieces, referred to as curds, using a cheese harp. When the whey has reached the desired consistency, it is skimmed and forming begins.

But first, the curd has to be pressed. With feta, the cheese's own weight takes care of this. With semi-hard and hard cheeses, a press plate is suspended over the bed of cheese, covering the curd. Depending on the machine, one plate performs this task per wheel, or a large plate applies pressure to multiple wheels. Often, the press plate is perforated allowing the whey to escape. The maximum pressure applied to the curd is around 50 g/cm<sup>2</sup>. "Pneumatics truly shine here: Both the applied pressure and application time can be set with extreme precision," reports Henning.

Pre-pressing is followed by forming: The application speed and pressure are adjusted to the respective cheese variety. The higher the application pressure, the harder the resulting cheese. However, pressure should be applied gradually, as the initial high pressure compresses the surface layer, sealing in moisture.

The pneumatic cylinders, such as the ICS from AVENTICS offering 400 to 800 N, have their work cut out for them. "Large cheese presses are equipped with several hundred of our cylinders and can move plates several meters in size," explains the AVENTICS expert. Other parts of the system also feature pneumatic cylinders, which move the cheese over the course of its ripening, for example.

Valves such as the CL03 from AVENTICS are ideal for controlling the cylinders. The Clean Line (CL) series features a hygienic design with a high protection class of IP69K. The synthetic material is resistant to cleaning agents and aggressive

chemicals, enabling applications in wet areas, even under harsh conditions. The valve system offers flexibility with the possibility to generate up to 32 different pressure stages in a single system. The CL03 single valve can also be used decentrally. The lines are shorter, meaning less dead volume, lower pressure losses, and thus lower air consumption.

### Developing flavor

After forming, most varieties of cheese are then cured in brine, extracting water from the outer layer of the young wheel of cheese and forming the rind. The cheese is then ripened for days, months, or weeks, developing the flavor typical for that variety of cheese, with the exception of cream cheese, which does not have to mature. During ripening, the wheels are turned, waxed, brushed or tossed in herbs either manually or mechanically, landing on shelves following quality inspections.

By the way, did you know that people from France, Finland, and Germany are Europe's largest consumers of cheese, eating around 25 kg cheese per person per year? 🧀

# THE SMALLEST OF ALL


## MSV Series Micro Valves: AVENTICS' Answer to a Wide Range of Applications



It's the smallest valve in the AVENTICS range: The solenoid valve with an eight-millimeter diameter is vacuum-compatible and can be used for both gas and fluids. "The MSV8 series can be used in applications requiring very compact solutions, as well as high performance for controlling actuators or very small devices. It is also suitable for portable devices, such as oxygen concentrators," explains Jean-Marc Gruffat, Product Manager at AVENTICS.

### From life sciences to automotive to industrial automation

Valves of the MSV8 series are responsible for the correct dosage of gases and reactive fluids in medical equipment. The valves, made of stainless steel, can be equipped with chemically-resistant surfaces and still offer a high volumetric flow rate despite their small dimensions. Weighing only 8.5 g, the valves are extremely lights. Additionally, they allow for energy-saving. "Our customers often use the MSV8 in scientific instruments or control applications, such as oxygen supply systems, gas analyses, patient monitors, air calibration equipment, respiratory equipment, blood pressure monitoring, and other flow switching equipment," reports Gruffat.

But this small valve also enables other applications. The MSV8 is used, for example, in industrial automation applications - in vacuum handling and miniature equipment. The valve switches between vacuum and blow-off functions. In case of power failure, the vacuum is maintained at the suction attachment. 





# PURE EXCITEMENT

Pneumobile Once Again  
Draws Large Crowd



**The 11th Pneumobile – the international pneumatics competition held once again this year by AVENTICS in Érsekkert, Eger, offered numerous innovative solutions, lots of excitement, and dramatic moments.**

In early May, 36 teams from 20 universities hailing from nine countries took part in the competition. After a presentation to the jury, the teams competed in distance, arcade, and acceleration races. Hungarian team Jok-Air took home the "Best Pneumobile from AVENTICS" prize, taking first place overall. The many participants in the race were cheered on by loads of spectators.

"As an industrial company, we highly value innovation, which is why we not only enjoy the exciting, often dramatic races, but also the innovation solutions that appear at this event," stated István Gödri, CEO of AVENTICS Hungary Kft. "This year, we notices a lot of exotics: from automotive made of carbon to self-driving automotive that drove independent of a driver and to models that look very much like the legendary Ford Model T." 



# WORLD PREMIERE AT HIGH SEA

Hybrid yacht generates energy while sailing

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**The Western Mediterranean, pure sunshine, calm seas, wind strength of 3. With her sails taut, the 42-meter yacht Mirabella III glides on the waves without making a sound. Meanwhile, a world premiere is taking place under water: The screw propeller is rotating silently, generating renewable electrical energy. Entering the next port, the skipper switches to the electrical drive, supplied by the charged batteries. He docks quietly – and free of emissions. The Marex ship control from AVENTICS takes over the regenerative energy management for the entire hybrid yacht, as well as all standard nautical tasks.**

"Maximum comfort, top performance, and a stunning appearance in ever faster and safer boats," This is the demand that the Spanish yacht designer Marcelo Penna Group from Barcelona has pursued since 1984. Always combining elegance with new technical approaches, the company continues to please the most demanding of clientele. As the first ship equipped by Reintjes, it uses wind-power for sailing and to obtain electrical energy that is saved and placed at disposal for the electric engine.

Unlike in previous concepts, the on-board batteries are not charged by the diesel engine, instead using the screw propeller during sailing, similar to hybrid vehicles recovering braking energy. All of this is silent and free of emissions, making for a perfectly natural sailing experience. The technology behind this feat is the product of close collaboration between Marco Penna, drive manufacturer Reintjes, and AVENTICS. The RHS hybrid system from Reintjes consists of a diesel/electric motor, solar modules, generator, frequency converter, and controllable pitch propeller.

## **PTO function charges battery while in motion**

AVENTICS marine specialists tailored the Marex OS-III-CPP 3D Hybrid ship control to the exact requirements of the propulsion systems on board Mirabella III. PTO Management, the newly developed power take-off function, switches the electrical drive into generator mode. Under water, the propeller is powered by the ship's motion and generates electrical energy. The AVENTICS control automatically sets the optimal angle for the controllable pitch

propeller blade to ensure smooth ship operation. During this time, the drive system supplies the current electrical consumers on the ship free from emissions and charges the batteries.

## **Maintaining position silently**

Depending on the task – navigating on heavy seas, maneuvering, or full speed ahead – the skipper chooses either the electrical drive or diesel engine. All information and signals captured and sent by the Marex system are shared via the open Modbus TCP/IP protocol on the yacht's touch screens and main screens. Mirabella III is equipped with a total of four control stations. The Marex 3D joystick simplifies maneuvering, even in critical situations. When the yacht is close to harbor or inside a marina, all it takes is a press of the button to activate and combine the bow and stern thrusters with the main propulsion system.



*"We believe that collaboration between AVENTICS and Reintjes will set benchmarks as an ideal combination of propulsion systems for hybrid vessels."*

Fernando Carrera,  
Sales Engineer at AVENTICS Spain  
fernando.carrera@aventics.com



**Safety no matter the situation**

For years, Marex family ship controls have been called into action on yachts and even mega yachts. With special modes for adverse weather and automatic thruster control, the yacht is guaranteed to stay on course. In addition, AVENTICS also equipped Mirabella III with an emergency system. Thanks to the secondary and redundant equipment

installed in the main bridge station, the skipper can handle the ship with total freedom of movement no matter the conditions, even if unexpected issues occur with main equipment. By the way, Mirabella III is also classified by Bureau Veritas.

This makes Mirabella II not only the world's first yacht with an intelligent

hybrid drive – it is simply elegant and a true beauty. Sustainability has never been so much fun. 



The Marex ship control takes over the regenerative energy management for the entire hybrid yacht, as well as all standard nautical tasks.



Depending on the task, the skipper chooses either the electrical drive or diesel engine.



# BAD ATMOSPHERE IN THE LECTURE HALL? NOT WITH AVENTICS!

Vienna General Hospital is one of the largest hospitals in Europe. Each year, they treat around 110,000 inpatients, with around 1.1 million visits to the outpatient clinic to boot. Their energy consumption reflects this – comparable to that of a medium-sized city. To continually optimize energy efficiency, VAMED-KMB, the technical works manager of Vienna General Hospital, was given the task of energy management.

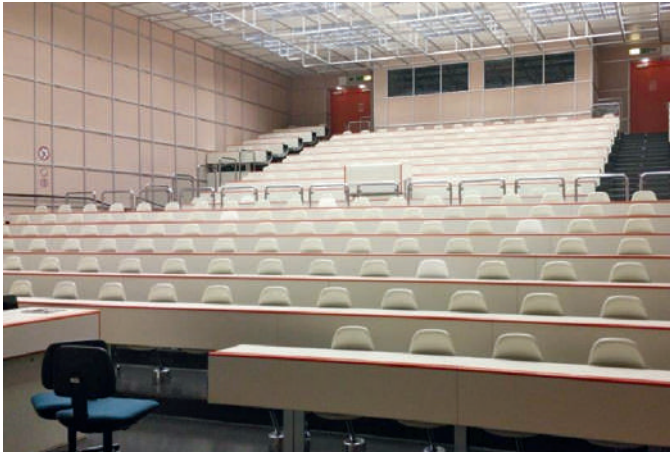
As part of modernization projects, conversion work is continually performed to improve the energy footprint. The auditorium center, including a large lecture hall with 500 seats as well as four additional halls, was supposed to get new air conditioning systems in 2014. VAMED-KMB worked with the technical management of Vienna General Hospital to implement the project. By renewing the ventilation, they hoped to save on energy and costs, as control technology was often designed using pneumatics at the time Vienna General Hospital was founded. Once state-of-the-art, now dated. "We were challenged with updating all controls, from temperature, humidity, to pressure," explains Gerhard Blümel, certified European energy manager at VAMED-KMB. "We had to find a solution that didn't exist on the market in such a form at that point in time. And AVENTICS helped us to develop just the special solution we needed."

## Combining the old with the new

When Vienna General Hospital was constructed, room thermostats, sensors, and heating, cooling, and ventilation valves were not operated with electrical energy as is standard today, but with compressed air (1.2 bars). To boost energy efficiency and reduce costs, the purely pneumatic solution was supposed to be replaced with an electronic one in 2014. But the

Photo: iStock





Gerhard Blümel, Energy Manager at VAMED-KMB, discusses the lecture hall at Vienna General Hospital, which was equipped with state-of-the-art building bus technology.



The AVENTICS AV-AV05X10-PROFINET IO valve system with network technology ensures continuous control of the pneumatic actuators.

actuators themselves were supposed to remain pneumatic, as they are much more maintenance-friendly than electrical actuators. The hospital also appreciated their longer service life and low proneness to failure.


Updating all pneumatic controls to today's technological standards required an electropneumatic transformer that controls the pneumatic actuator and sends a constant signal. "That was our starting point. After performing intensive research, I noticed AVENTICS at a trade fair in Vienna, a company able to meet our demands and criteria," states Blümel. "AVENTICS provided us with a solution – then, a prototype – for a test phase.

### **Creative pneumatics: custom solution for exact air quality control**

The requirements were high. Most pressure signal devices operate in a range from 0 to 6 bars. The system at Vienna General Hospital had to be restricted to signals ranging from 0 to 1 bar. Furthermore, the system that offered eight actuators up to its modernization was supposed to control up to ten actuators in the future.

In response to the requirements of Vienna General Hospital, AVENTICS developed a custom solution: AV-AV05X10-PROFINET IO. The AVENTICS product designed for constant control of pneumatic actuators converted an electronic control signal into a pneumatic signal in state-of-the-art building bus technology. It uses network technology, allowing for the control of up to ten actuators. For the first time ever, the controllable pneumatic actuators for air volume control are now continuously moved to the required position by a bus-controlled electropneumatic

converter (PROFINET/0-1bar) never before available. This in turn enabled more precise regulation of the air flow. In addition, the system wiring is much simpler in comparison with analog transformers. This is the first solution of its type to be applied in air conditioning technology.

The air conditioner with electropneumatic transformers has been running in five lecture halls for two years now without a single malfunction. "This special solution from AVENTICS was implemented for the first time here, and we are very satisfied with our custom solution," states Gerhard Blümel. 



A portrait of Peter Hubina, a middle-aged man with short brown hair and glasses, wearing a white button-down shirt. He is smiling slightly and looking towards the camera. The background is a blurred office interior with large windows.

# FROM LOCAL TO GLOBAL

An interview with Peter Hubina,  
Managing Director of Eckerle Industrie Ltd.

**AVENTICS has been selected as Preferred Supplier of the Eckerle Group, a globally active industrial company. Collaboration began years ago at the local level in Hungary. Peter Hubina, Managing Director, Eckerle Industrie Ltd., talks about a success story for both companies.**

**Mr. Hubina, why does the Eckerle Group collaborate with AVENTICS?**

**Peter Hubina:** Collaboration between Eckerle and AVENTICS is proof of the advantages of local collaboration. We have worked together for over ten years here in Hungary. The sales employees at AVENTICS are always available to us, providing us with support wherever possible. They come to us for training sessions and keep us up-to-date with the latest information on their products. AVENTICS is a business partner on equal terms that is familiar with our daily challenges.

**And because collaboration in Hungary was going so well, you decided to work together at the global level?**

**Peter Hubina:** Exactly. We are always happy to extend cooperation with good partners. Demand for automation solutions is high all over Europe – machine manufacturers are barely able to meet the requirements of customers and prospects. The market is growing rapidly, and we are pleased to offer proven solutions.


Thanks to excellent collaboration between our Hungarian subsidiaries (Eckerle Industrie and AVENTICS Hungary), the Eckerle Group has selected AVENTICS as a preferred supplier on other European markets. In Germany, where no business relationship existed between Eckerle and AVENTICS previously, the two companies have now joined forces to implement several successful projects.

**Are there any collaborative projects you are especially proud of today?**

**Peter Hubina:** Yes, for example we built assembly lines for the Hungarian plant of a world leading automotive company. Eckerle is also one of the first to use the AV valve systems in Hungary. Our customers are satisfied with the product and recommend it to others.

AVENTICS Hungary not only supplies Eckerle Industrie, but also our valuable customers. We equipped the company's pneumatic system in Eger with several automation solutions – most recently, we installed one of the largest servo presses in Europe.

**How's your outlook for the future?**

**Peter Hubina:** Very positive – I think both we and AVENTICS are optimally positioned. Digitalization is an essential part of our everyday work, and efficiency and transparency are also key factors in B2B purchasing. This is why we began using the AVENTICS Pneumatics Shop right from the start. To take advantage of possibilities afforded by the Industrial Internet of Things, companies – our customers – need more and more data on their processes. Suppliers have to develop products and solutions that support this trend – AVENTICS is well on the way. 

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