



Top Design

Progema Engineering Automates Cheese Handling with
AVENTICS Pneumatics

Expert Interview

Matthias Damm, OPC Foundation
Member of the Board

At the press of a button

Batch Size 1 in just seconds

Pneumatics
It's that easy

A woman with dark hair tied back, wearing a dark blue top, is pointing her right index finger towards a large, glowing orange circular logo with a white 'A' inside. The background is a dark grey gradient.

AVENTICS^A

PNEUMATICS IT'S THAT EASY

Achieve your goals with just a few clicks – AVENTICS simplifies your order process, even for demanding pneumatic products.

Benefit from easy configuration at the click of a mouse, quick conversion to AVENTICS products, and the one-of-a-kind CylinderFinder. Our Engineering Tools take you directly to the most economical solution for your needs.

Visit us at

**Hannover Messe, April 23–27, 2018
hall 23, stand C39**



"AVENTICS is your global partner and we are wherever you may need us."

Paul Cleaver
CEO AVENTICS



Dear Readers,

To stay competitive in global markets, monitoring efficiency is becoming increasingly important – and we are well aware that this also applies to you as an AVENTICS customer. This is why we concentrate on ensuring fast delivery times, meeting customer-specific requirements and supplying the quality you expect of us. We support end users, machine manufacturers and system integrators, in mastering the challenge of boosting efficiency with a simple promise: "Our ambition is to become known as the smart pneumatic engineering company that is easy to do business with." Our products and services, our experience and lean processes save time, effort and costs along the customer's entire journey.

Efficiency also means simplifying machinery without overcomplicating control and operation, especially when it comes to machine-to-machine communication and interfaces to IT systems. Experience from IT, electronics and automation show again and again that networking requires manufacturer-independent standards. The best example is our AES Advanced Electronics System with its multi-interface to all established protocols and fieldbuses: a single hardware that covers all options. This makes it easy to fulfil customer specifications while reducing complexity in logistics, commissioning and spare parts stocking. AVENTICS goes one step further and already applies OPC UA today – the communication standard for the Internet of Things. Learn more about this powerful standard inside this magazine and the possibilities it provides for increasing availability of pneumatics.

AVENTICS is your global partner and we are everywhere you may need us. In recent years, we have continually expanded our sales network and established new partnerships, most recently

in Brazil and Argentina, for example. At the same time, we have systematically expanded our existing sales channels, whether in Australia, the US or Asia. Our regional country units and sales partners are at your side with their unique experience in pneumatics. We frequently assist in configuring complete automation solutions – one more example of how easy pneumatics can be with AVENTICS.

We assemble valves, cylinders, modules and control cabinets at your premises all over the world, increasing local added value and we are able to respond quickly to your requirements. In this A Mag, read how a wide range of customers have found their success here: whether in the production of Parmesan cheese, setup times reduced to virtually zero in woodworking or reliable low-wear power supply in railway technology. You can look forward to these applications and more.

Maybe I will see you at one of the largest industry trade shows, the Integrated Automation, Motion & Drives (IAMD) as part of the Hanover Fair in April 2018. We cordially invite you to discuss your new ideas and our new products. Feel free to contact us in advance by phone or e-mail.

Yours,

A handwritten signature in dark ink, appearing to read 'P. Cleaver'. The signature is fluid and cursive, written on a light background.

Paul Cleaver
CEO AVENTICS

CONTENTS



06 | KALEIDOSCOPE

AVENTICS news

From a new COO, to a Lego winner, to the IAS Industrial Automation Show in Shanghai – news from the AVENTICS world



10 | EXPERT INTERVIEW

Matthias Damm, OPC Foundation

Opportunities and future developments for machine manufacturers and end users



24 | PRODUCTS IN APPLICATION

Progema Engineering

AVENTICS cylinders and valves play a key role in handling Parmesan

03 | Editorial

09 | New product

Pneumatics and IoT

Intelligently networked pneumatics from AVENTICS

13 | New product

The universal genius

The new UPG gripper series from AVENTICS offers a standard solution for automated handling

14 | Products in application

Batch size 1 at the press of a button

Schröder GmbH develops with AVENTICS automated pin table

18 | Products in application

Additive manufacturing

Machine manufacturer Solukon equips cleaning booths with AVENTICS pneumatics

20 | Products in application

Water theater

The 5D motion seats from Attraktion! are equipped with AVENTICS pneumatic components

22 | Products in application

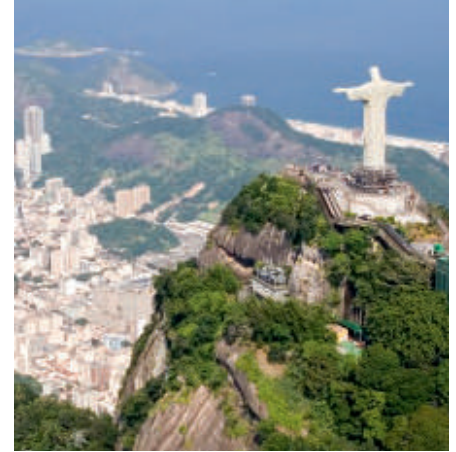
Reaching high speeds with pantographs

Temperature-resistant pneumatics for Swiss pantographs

28 | International

AVENTICS Australia

How the industry and sales of AVENTICS products have changed



32 |

PRODUCTS IN APPLICATION

Relaxed luxury

AVENTICS Marine Technology makes controlling and maneuvering the new Sunseeker 76 luxury yacht a breeze

36 |

INTERNATIONAL

AVENTICS in Argentina & Brazil

New distribution partners on site

- 30 |** **Products in application**
Weber Schraubautomaten
Flow drill screw systems with AVENTICS valve technology

- 34 |** **Products in application**
Lapmaster Wolters Group
Valve technology, pressure regulators, and cylinders from AVENTICS in ultra-precise twin fine-grinding machines with rotary table

- 38 |** **New product**
AV valve system
New BP (Bottom Ported) version with outlets on the bottom simplifies assembly

- 39 |** **International**
News from Hungary
Fiftieth anniversary of the AVENTICS plant in Hungary and first-ever pneumatic laboratory at the University of Debrecen in Hungary

- 40 |** **Digital transformation**
Interview
Digitalization
Why AVENTICS sees its future in e-business.

- 42 |** **Preview of trade shows**
Presenting AVENTICS
Meet AVENTICS at select trade shows in 2018


KALEIDOSCOPE

A TOTAL SUCCESS



"Touch of Time"
lights up
Amsterdam

From November 20, 2017, to January 21, 2018, visitors once again enjoyed the beautiful installations and works of art in downtown Amsterdam, including a piece by artist Lambert Kamps.

AVENTICS supported the festival as a sponsoring partner and is pleased with the event's success. 

► www.amsterdamlightfestival.com/en

THE LUCK OF THE DRAW

In our last issue of A Mag, our readers had the chance to participate in a contest. The lucky winner of the LEGO Technic Mercedes-Benz Arocs 3245 is Svenja Stenner. By the way, 2753 elements make the vehicle the largest LEGO Technic model ever produced – we wish Svenja lots of fun and patience putting it together. 




Svenja Stenner



SEEHAUSEN REPRESENTS THE INTERESTS OF FLUID TECHNOLOGY

Frank Seehausen, Vice President Group Technical Director at AVENTICS, was elected to the board of the Fluid Power Association, part of the German Mechanical Engineering Industry Association (VDMA) by the general assembly. "Pneumatics has a highly promising future, especially in networked concepts like the Internet of Things," states Frank Seehausen.

The electrical engineer has worked for AVENTICS for over three decades and has played a crucial role in driving the integration of electronic functions in the product range in various management positions. Since 2014, he has been in charge of global engineering, including customer-specific applications. 



Frank Seehausen, Vice President Group Technical Director at AVENTICS




OSTERMANN V. ROTH – NEW COO AT AVENTICS

Andreas Ostermann v. Roth joined AVENTICS executive board as Chief Operating Officer (COO) in early 2018, succeeding Dr. Thomas Brückner, who retired in mid-2017. In his new role, Ostermann v. Roth will be in charge of the AVENTICS plants in Laatzen (Germany), Bonneville (France), Eger (Hungary), Lexington (USA), and Changzhou (China), as well as the areas of procurement, logistics, and quality management.

Ostermann v. Roth has many years of experience in the areas of procurement and logistics. . Most recently, he was Senior Vice President Operations at KUKA Roboter GmbH, where he was responsible for the entire supply chain, as well as procurement, planning, and logistics. 


AVENTICS IN SHANGHAI

The IAS Industrial Automation Show took place November 7-11, 2017, in Shanghai. With over 120,000 visitors, the international trade show for industrial automation technology was a major success. AVENTICS welcomed many visitors at its booth and was a major attraction in the hall thanks to its pneumatically controlled interactive game featuring a prize. 



AVENTICS ONCE AGAIN “PREFERRED SUPPLIER” TO ROBERT BOSCH GMBH

For the third time in a row, Bosch has awarded AVENTICS with Preferred Supplier Status in the material field of “Standardized Pneumatic Devices”. The award was presented in early October 2017 at the Bosch plant in the German town of Bamberg. Here, AVENTICS equipped a new production line with pneumatic solutions.


Bosch grants the Preferred Supplier Status to suppliers that the company intends to cooperate with most intensely. AVENTICS has delivered an exceptionally competitive level of performance in the production and supply of products or services in a specific material field over an extended period. 



RAFFAELE CREMONA APPOINTED GENERAL MANAGER OF AVENTICS ITALY

There's a new man in charge at AVENTICS in Italy: Raffaele Cremona, an experienced player in the automation industry. After taking over the reigns September 1, 2017, the Italian aims to sustain growth for the company while achieving a market share in Italy equivalent to that in other parts of the world. “I was immediately able to identify with the AVENTICS values – passion, agile, and focused,” emphasizes the 49-year-old. Raffaele Cremona has many years of experience in sales, most recently as Sales Director at Habasit Italiana SpA, a global leader in the production of drive and conveyor sys-



tems. Before that, he filled various positions in the export and distribution sectors. Cremona studied politics and economics at the University of Milan. 



PNEUMATICS AND IOT: IT'S THAT EASY

The Internet of Things is complicated and should be left to IT specialists? Quite wrong, according to AVENTICS. With its Smart Pneumatics Monitor, the company has demonstrated how easy it is to intelligently network pneumatics and benefit from added value.


It doesn't take much: AV series compact valves, AES valve electronics, and the Smart Pneumatics Monitor (SPM), a small electronic device for decentralized assembly. The SPM captures data with existing sensors, such as limit switches or pressure and flow sensors, processes it, and transfers derived information to parent systems at the same time for control. AVENTICS uses the OPC UA manufacturer-independent protocol, the world's current standard for machine-to-machine communication in the Internet of Things.

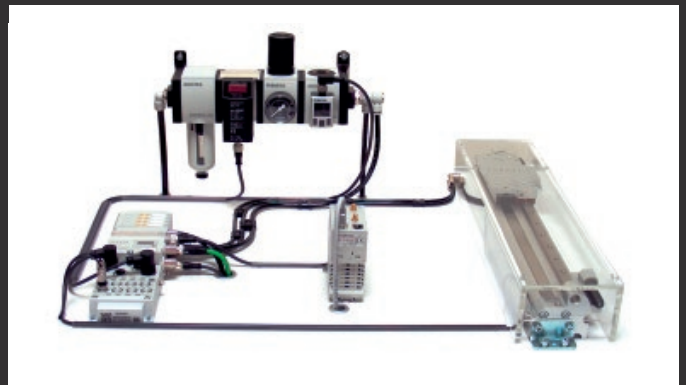
Based on sensor data, the SPM detects wear before it can lead to failure, warning users in good time. Unplanned emergency repairs with high downtime costs are transformed into planned maintenance measures without additional costs. In addition, the data forms the basis for improving energy efficiency of the pneumatics system while detecting leaks very early on. Condition monitoring with predictive maintenance and low energy consumption lowers lifecycle costs for the long term, with minimal effort.

The SPM is incredibly easy to install, requiring just a cable connected to the valve electronics. The device works independently of the machine and system control and can be used universally, with the AES valve electronics covering all standard fieldbus and Ethernet protocols in one hardware. Another advantage – the control doesn't have to process any additional data, which would take computing capacity away from other tasks. The SPM can also be used to subsequently network existing systems.

No control programming

Commissioning requires no knowledge of PLCs. Technicians configure the PLC independently of the control using a graphical user interface with self-explanatory functions. In the process, they can apply pre-installed analysis functions or create their own as needed. The SPM follows the ever more popular edge computing approach, processing data locally. The solution does not transmit any data, but instead sends immediately usable information to local servers or IT systems and cloud-based applications.

While the Internet of Things helps streamline production, the Smart Pneumatics Monitor shows that the means to this end can be simple and efficient. 



“STANDALONE SOLUTIONS DON’T WORK IN A NETWORKED ENVIRONMENT.”

Interview with OPC Foundation Member of the Board Matthias Damm

The Internet of Things is accelerating the OPC Unified Architecture (UA) communications standard in factory automation. Together with BOGE Kompressoren, AVENTICS also relies on the OPC UA as an open standard to seamlessly network pneumatics and improve energy efficiency. A Mag spoke with Matthias Damm, Member of the Board at the globally active OPC Foundation, about opportunities and future developments of this standard for machine manufacturers and end users.

What is OPC UA exactly?

Matthias Damm: OPC is a communications standard that allows devices and machines of different makes to communicate and provide application information to humans. Ongoing development of OPC UA introduced a wide range of new options to integrate devices and machines into all types of IT systems. It's not only machines that communicate with IT systems – sensors in machines can also exchange information with superordinate systems parallel to the control. For example, by analyzing operating time or switch cycle counter data, condition monitoring can calculate the remaining service life.

How complex do applications and technologies have to be for OPC UA to apply?

Matthias Damm: OPC UA is very scalable. This means it is “small enough” for simple applications. On the other hand, the standard can be applied everywhere and at different levels. At the field level, the focus is often on individual data and configuration information of a sensor; the machine level, however, concentrates on complex product-related information relevant to production steps. The range of options as to how OPC UA can write and trans- port data cover these different requirements.



“It makes it easier and more cost-effective to securely network different devices and machines.”

What is OPC's standing in plant automation today?

Matthias Damm: New industry standards generally require 15 years to be implemented across the board. OPC UA has been available for nine years and today, virtually all control manufacturers support it. Thanks to wide availability in core components of industrial automation, OPC UA is now gaining in popularity among end users. It makes it easier and more cost-effective to securely network different devices and machines in their plants, that is, to introduce the Internet of Things. Machine manufacturers that provide external IT communication via OPC UA are also considering the use of OPC UA within machines, for example to standardize interfaces with component suppliers.

How involved are machine manufacturers in the development of the standard?

Matthias Damm: That depends on the industry. Manufacturers of injection molding or tool machines have already established work groups and defined exactly what information OPC UA should transport for their applications. Companies producing cigarette machines, robots, or even image processing systems are also heading in this direction. Generally, machine manufacturers are focusing on defining how OPC UA can be used in their respective machine types for communication in line with the Internet of Things. The VDMA with its 38 trade associations is especially committed to the cause. Today, ten of these associations are already actively working on what is referred to as OPC UA companion specifications, defining how information from a machine is mapped in OPC UA. Additional trade associations in VDMA will follow, meaning machine manufacturers are especially involved in implementing and developing the standard.





*“Security is not a final state.
It will always be a race
between good and evil.”*

The topic of data security and protection against hacker attacks is becoming a major worry within companies. Does OPC UA increase or lower the risks?

Matthias Damm: Unlike any other industrial protocol, OPC UA has been developed with a

focus on a secure IT connection right from the start. We have integrated proven security mechanisms for data security, data integrity, and access permissions in the standard right from the beginning. And there is also external proof: OPC UA is the first industrial communications standard that made it worthwhile for security experts to take a closer look. Following a comprehensive analysis in 2016, the German Federal Office for Information Security confirmed: OPC UA does not contain any systematic security gaps. Of course, regular reviews and threat analyses are still necessary, after all, security is not a final state, and has to be developed and improved continually. It will always be a race between good and evil, and will always involve users. OPC UA offers a tool box and security mechanisms, but operators have to combine these with other security mechanisms into an overall concept.

The OPC Foundation is headquartered in the US. What role do Europe and Asia play?


Matthias Damm: The OPC Foundation was founded in the US as a matter of fact, and global coordination is performed from there. With the development of OPC UA, the focus has somewhat shifted to Europe. Europeans represent over 50% of the members and are currently driving development forward in terms of the Internet of Things. But lots is going on in Asia too. For example, China has defined OPC UA as an official standard as part of the “China 2025” high-tech offensive.

Where will OPC UA be in ten years?

Matthias Damm: In ten years, I assume OPC UA will be in use virtually everywhere in plant automation. But many other industries are also interested. Currently, we are seeing more and more applications in infrastructure, such as railway technology and energy technology, which especially want to apply established, internationally accepted standards. We know that manufacturers of commercial kitchen equipment are standardizing their interfaces to OPC UA, capturing and documenting temperature profiles during cooking, for example.

In the process industry, end users are driving the topic forward. Oil and gas companies have now defined what information underwater handling equipment with pumps and valves should transmit to the process control. The manufacturers of these components and modules can now implement these requirements. In general, end users are playing an ever larger role in the OPC Foundation. They attend joint work groups to get concrete answers to their practical problems.

In one sentence: Why do we need OPC UA?

Matthias Damm: Because we can't ignore the fact that stand-alone solutions don't work in a networked environment. 

Matthias Damm is a longstanding Member of the Board of the global OPC Foundation. In 2003, the electrical engineer joined forces with two partners to form ascolab GmbH, an internationally active service provider for industrial communication with a strong focus on OPC UA. In addition, he is a co-founder of United Automation, which develops libraries and tools for OPC UA as a technology supplier. He is active in various OPC UA work groups.

UNIVERSAL GENIUS

Optimal range of grippers for many standard applications


The new double-acting UPG gripper series from AVENTICS offers a standard solution for automated handling.

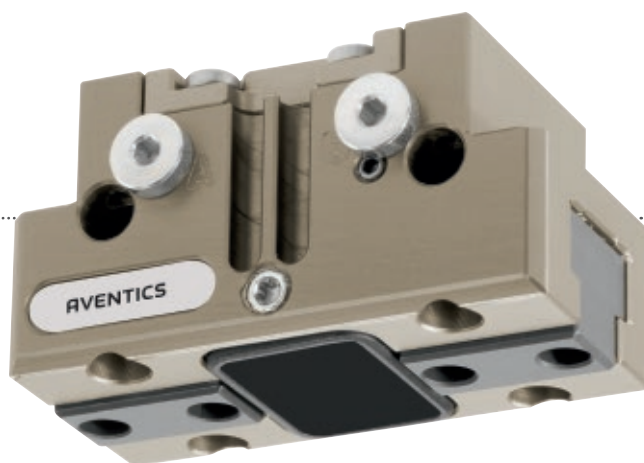
"About half of all pick-and-place tasks in production are performed by vacuum grippers," reports Florent Orget, Strategic Product Management at AVENTICS. "Mechanical grippers take care of the rest. With our new range of grippers, we now offer customers the option to purchase grippers for a majority of applications, in addition to all our other products."

When it comes to tasks requiring a high gripping force, mechanical grippers are key. AVENTICS now offers UPG series pneumatically actuated mechanical grippers. With seven sizes spanning from 40 to 160 millimeters, the series covers performance needs for virtually any standard application in automation technology. Thanks to their robust kinematics and compact design, these grippers can be used anywhere in handling technology and offer a wide range of gripping forces up to 2,000 newtons.

Flexible use

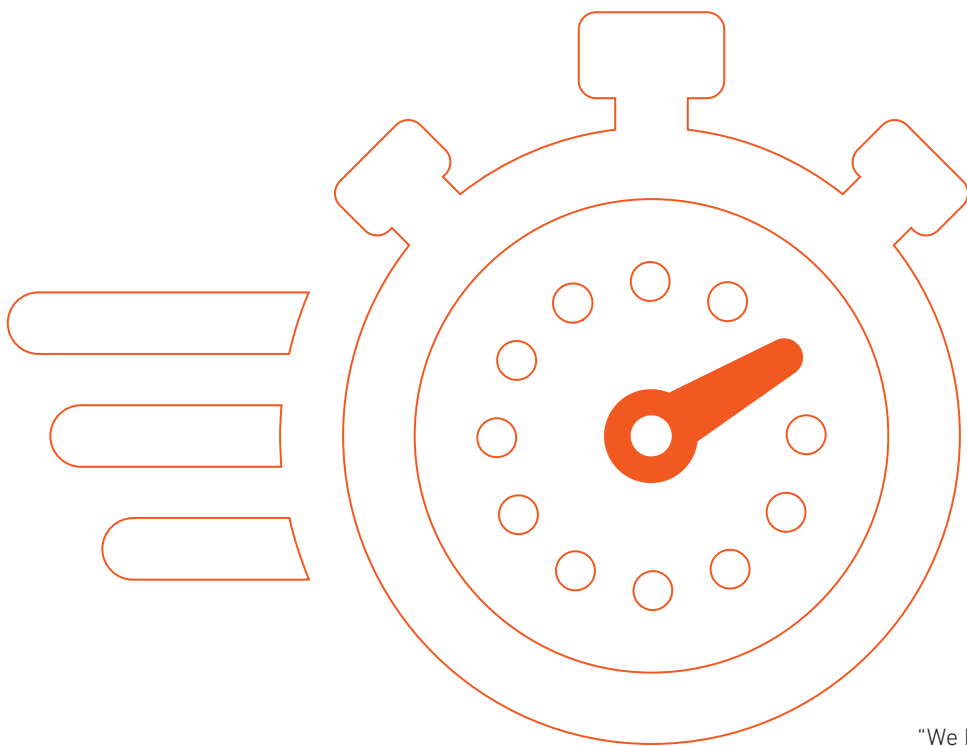
The mechanical grippers are two-finger parallel grippers characterized by their high gripping forces, precision, and exact movement of the clamping jaws. They can be selected based on the application requirements and flexibly equipped with object-specific gripper fingers. AVENTICS offers versions with or without gripping force retention. The series is also suitable for larger finger lengths.

The flexible mounting options for gripper fingers and the interface to the Easy-2-Combine modular system make assembling the grippers and exchanging the gripper fingers simple and reproducible. 



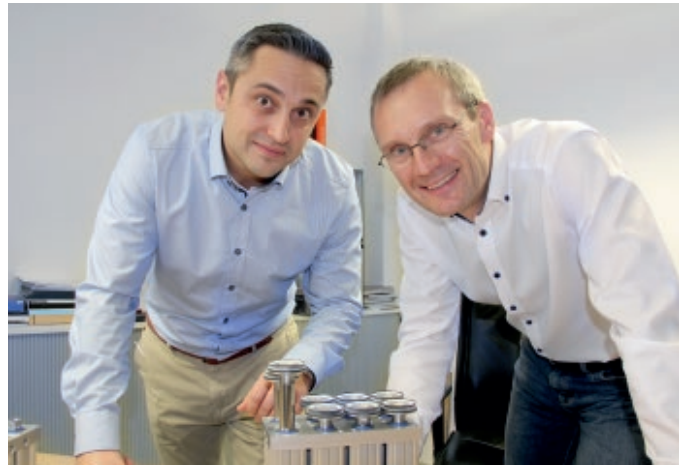
BATCH SIZE 1 IN JUST SECONDS AT THE PRESS OF A BUTTON

Schröder GmbH automates pin table for wood processing with electrically actuated pneumatic cylinders



Today's orders are no minor feat: At least 15 different positions for wood, composite, and aluminum blanks with various geometries on the same machine. No longer a problem at Schröder GmbH – the company has cut down its set-up times significantly thanks to a new and unique pin table. Electronically controlled pneumatic cylinders extend within seconds, forming an inversion to the contours to be manufactured. Integrated vacuum suction cups then hold the plate so machining can begin right away.

"We have been experiencing a shift towards smaller batch sizes for years now," states Jörg Schröder, CEO of Schröder GmbH, describing the challenge. "Quantities in the thousands used to be the norm. Today, we often produce just between 50 and 100 units." And it isn't the NC-controlled processing units on the machinery, but the set-up times that cause a bottleneck – especially when it comes to the work table. Saws, drills, and cutters require extra space below the workpiece to prevent damage to the table. In the industry, it is still common to produce a base with the corresponding recesses and seals and then brace the workpieces to it. "With large batches, this is definitely efficient," says Jörg Schröder. But the smaller the batch, the more effort it takes to produce a single part and templates, register and manage them, then store them properly so they can be used again.



Alexander Minderlen and Jörg Schröder are collaborating on the project.

Based in Beckum in Germany, Schröder GmbH produces series and variant products from wood, composites, and plastic. "As a supplier, we are constantly forced to optimize costs, and unproductive table set-up times are our greatest lever," explains the CEO, summarizing the situation. This is where master carpenter and electromechanical engineer Jörg Schröder's idea came into play: An automatic pin table that flexibly releases the cutting contours under the plates at a software command while holding the plates for precise, secure processing.

Together with AVENTICS, he realized an innovative pin table for a new four-spindle portal machine from MKM International in Bad Oeynhausen. Now, all it takes is a mouse-click and the AVENTICS cylinder valve units move into position within seconds, holding the plate to be machined with its integrated vacuum suction cups. The CNC program is loaded at the same time, and machining can begin.

From LEDs to a fully automatic pneumatic system

This is the development of an idea he implemented with MKM some years ago, when he equipped a manual pin table for plug-in pins with an LED at each position. A software he developed transfers the part's vacuum configuration defined in the CAD system during CNC programming to a separate mini-control, which then actuates the corresponding LEDs. This provides the machine operator with a clear indication of exactly where pins have to be plugged in. "Even so, setting up the machine table can take longer than the production of a small batch. I simply couldn't accept that this process was not automated," recalls Jörg Schröder.

His underlying idea: Replacing the rigid metal pins on the pin table with flexible, compact cylinder valve units. The cylinder valve unit is actuated electrically by a bus system he developed, and can automatically implement the base templates created during programming. Programming itself is mostly automated. The vacuum program is assigned to the CNC program and both are transmitted to the machine together. The integrated vacuum system then secures the workpieces.

Function test one month later

As technology partner, AVENTICS helped the medium-sized company in making its concept a reality. Schröder designed a modular system consisting of four mobile tables, each measuring 1,200 x 800 millimeters and equipped with 48 cylinder valve units with 2x4 cylinders. Two tables each can be synchronized for a larger bracing surface.

"Within a single month, we developed this extraordinary cylinder valve unit to run function and endurance tests," states Alexander Minderlen, the AVENTICS employee responsible for this assembly on the developer side. Eight directional valves and a control board from Schröder are integrated into the assembly base plate to protect them from dust and chips. "We had to meet extremely specific requirements, such as height, width/grid, integrated electronic components, and a vacuum system so that the solution could be retrofitted in already installed work tables," emphasizes the developer. AVENTICS delivers the eight-valve units preassembled and pneumatically tested. At Schröder, the processor board developed and built by CBE was then installed. The assembly is rounded off with an aluminum cover.



50-100 units

BATCH SIZES ARE GETTING
SMALLER AND SMALLER,
PRESENTING THE INDUSTRY WITH
NEW CHALLENGES

Intelligent and energy-efficient

Each of the 384 cylinder valve units on every table are equipped with an input and output, connected to the Schröder control software via a fieldbus. All that is needed to control and monitor an entire table is a four-wire cable. Thanks to the optimally sealed vacuum suction cups, the new pin table achieves better results with a much lower energy consumption. It is also crucial for the workpieces to be level – per table, the evenness of the cylinder end positions lies in the one-hundredth millimeter range. “This is important so that we can precisely mill even the smallest of profiles on the edges of the plates,” explains Jörg Schröder.



Vacuum suction cups hold the workpieces in place.



The automated pin table supports versatile production with virtually no set-up time at all.

Schröder had the first automated pin table produced for a new portal machine from MKM international and now uses it in its own production facilities. The four tables traveling in the y direction can be reached by four independent milling spindles, no matter their location. In addition, two milling spindles are assigned a drilling unit, and the remaining two spindles a swiveling saw unit. With this equipment, tool change times are down to a minimum. "We have reduced our set-up times significantly and our production has become ultra-flexible and lightning-quick," states the tinkerer, summarizing the result.

"Other companies have worked on similar concepts, unable to carry through due to the complexity of the task," Schröder says, smiling. He not only wants to use the automated table himself, but also markets the solution for new and installed machines and systems for the wood and plastic processing sector and other industries. 🤖

"Other companies have worked on similar concepts, unable to carry through due to the complexity of the task."

Jörg Schröder,
CEO of Schröder GmbH





NOTABLE STRUCTURES FROM THE PRINTER

Pneumatics for postprocessing

It's round, a little twisted in some places, looks like it grew organically instead of being planted and built – and it is still incomplete. Sagrada Família in Barcelona is one of the most significant examples of architecture of Antoni Gaudí – and a true nightmare for architects. But additive manufacturing has simplified realization significantly, making the production of complicated components easier, or even possible at all. To transform Gaudí's visions into a reality, architects are examining and analyzing the drafted design using 3D models, encouraging the completion of the building.

Additive manufacturing technology has long established itself in industrial applications. Besides unique design freedom for complex components, more efficient use of materials also plays a crucial role. Despite all advantages, metal printing is also entails risks, as fine metal powders can be harmful and when stirred up, they can sometimes even form an explosive atmosphere. Following the construction process, often large amounts of powder remain in the support structures and interior contours in the component and are very difficult to remove. These residual powders especially can cause significant difficulties and waste time in follow-up processes.

As a German automobile manufacturer approached Augsburg-based machine manufacturer Solukon with the problem two years ago, a timely solution was imperative. "Until then, postprocessing of metal prints had been given little consideration," explains Andreas Hartmann, CEO of Solukon Maschinenbau GmbH. "Our solution was to develop a reliable cleaning booth with an automatic cleaning process. One of the challenges was developing an efficient cleaning device free of ignition sources within a process chamber filled with inert gas. Mainly pneumatic components are used to manage this demanding task. While selecting components, we relied on the expert consulta-

tion of our reliable AVENTICS partner, Michael Lehner Fluidtechnik, right from the start," Hartmann continues. "Quick availability of information and samples, combined with the comprehensive AVENTICS product range, really helped us in developing our system."

Professionalizing the metal printing process

Layered application of material in 3D printing enables the fluid production of components in a single piece. Even components with complex geometries that would be impossible to produce using conventional means can be manufactured relatively easily. Additive manufacturing also gives efficiency a significant boost in terms of material use, but the process is also accompanied by challenges.

Safety thanks to sustainable postprocessing

Production laser melting technique leaves the completed workpiece coated in a thick powder cake. The excess fine powder makes unpacking it from the materials left from production quite difficult. Beside the health risks, stirring ultra-fine particle materials made of aluminum or titanium for example can form explosive atmospheres. To make postprocessing safe, two years ago machine manufacturer Solukon developed a cleaning booth that was then unique to the market. The process chamber with integrated three-dimensional swivel device automatically removes virtually all metal residues in a closed circuit.

The SFM02-AT800 cleaning booth makes it possible to safely and efficiently clean metal components with dimensions of up to 800 x 400 x 500 mm (X/Y/Z incl. build platform). Cleaning is performed within a sealed process chamber flooded with inert gas. In this chamber, the component is swiveled in three dimensions and stimulated with targeted vibrations so that the



The AV05 valve system is used to control the pneumatic components, meaning the block can easily be split into compressed air and inert gas control.




The protected cleaning booth SFM02-AT800 from Solukon is equipped with AVENTICS pneumatic components. Future booths will feature the AV05 valve series and CCL cylinders.

powder residues come free and gather at the bottom of the chamber. The powder residues are then removed via a funnel. A 3D swivel device continually moves the components including build platform around two axes. Even complex cavities, indentations, and supporting structures can be freed completely from the loose building material. The gentle cleaning process in an inert gas atmosphere prevents explosive atmospheres from forming, also protecting the construction material against oxidation. One clear advantage of these automated processes lies in the many hours of postprocessing saved. Customers in the aviation and aeronautics industries are especially pleased with this new reproducible possibility to clean complex internal structures.

The relevance of pneumatic valves

To prevent any risk of explosion, the process chamber has to be securely flooded with inert gas and totally free of ignition sources. Pneumatic components play a major role in the fully automated cleaning booth. Actuators controlled by compressed air offer the only option to design an efficient and risk-free machine. AV series valve systems are used to control the pneumatic components, meaning the block can easily be split into compressed air and inert gas control. The CCL series pneumatic cylinder is ideal for the process chamber, as it is intended for use in explosive areas. The smooth surface of the CCL also makes cleaning the booth a breeze. "With the Solukon cleaning booth, the challenge was to develop a technology that could meet a wide range of requirements," comments Michael Lehner, longstanding sales partner of AVENTICS. "This is why it was really important to be involved in the design process right from the beginning."

This case shows how areas of additive manufacturing are best advanced by observing processes across companies and incorporating experiences from different areas of automation. Andreas Hartmann confirms that innovations developed in this way offer added value to the entire industry, stating, "thanks to the excellent collaboration, we quickly and easily found a convincing system solution that also benefits our customers in additive manufacturing." 

5D: MOVIES UNDER WATER

Audience members immersed in a flooded theater.
The New 5D Movie Experience.



Going to the movies in a bikini or swim trunks? A flooded theater and you're immersed, so to say? Imagine you're sitting at the seaside. A light breeze blows through your hair. It smells of fresh North Sea air and tideland. You're gazing into the distance, the tide is coming in, and suddenly you are sitting in the water. Reality or illusion?

This could be the new 5D movie experience, made possible by pneumatics. The new form of theater experience involves the audience in the story being shown with powerful illusionistic effects. 5D theaters work with special seats with various integrated effects, featuring smells, air or water jets, just like in a flight simulator. The audience becomes part of the story, with all five senses.

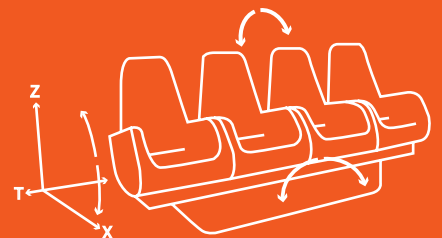
In Europe, 5D theaters have been established for some time. Now, experience theater is being taken to the next level: In Abu Dhabi, the world's first water park

theater opened in spring 2018. This 5D theater not only floods, but also enables movement simulation in the water. For around five years, Austrian company Attraktion! has focused on system integration for multimedia theme parks that are also suitable for water. "We needed a solution that functions precisely with a fixed installation and that scores with a long service life," explains Max Wieland, engineer and head of system planning & engineering at Attraktion!. "We knew that pneumatics were the only solution. The excellent references and constructive consultation convinced us that AVENTICS was the right partner to have at our side," continues Wieland.

Future development: world firsts

The "wet theater" format was developed in collaboration between Markus Beyr and Markus Achleitner from Bad Schallerbach thermal spa in 2009 and the concept has been refined ever since. But to date, only very few 4D-5D theaters with

The 5D motion seats from Attraktion! are equipped with AVENTICS pneumatic components. They feature MU1-RGS series pressure regulators and ED02 series proportional valves.





The ED02 series electronically actuated proportional valves from AVENTICS pneumatically control the MU1-RGS series pressure regulators.



The first water park theater opened in Abu Dhabi.

real water effects have been built, something that is set to change soon. Abu Dhabi's Yas Waterworld water park is home to the first water park theater with flooding and other special effects. A unique movie experience of being right in the middle of a theater that is suddenly flooded with water, where moviegoers are immersed in warm water up to their belly buttons, is becoming a reality. Water rises from below, flooding the theater matching what is happening in the film. Wave machines perfect the illusions, rounded off with waterfalls that flow to the left and right of the screen. The first water park theater opened this spring in Abu Dhabi. Attraktion! GmbH will realize a second project of this type in Guangzhou, China, this fall. Here, pneumatic components from AVENTICS will also be used.

Pneumatics key to the 5D experience

At the heart of the design is the 5D motion seat base, a row of seats consisting of four spaces that move in tact with the movie. Different settings maneuvering the seat back and from, from side to side, and even up and down enable uncountable movement combinations. The theater seat moves according to what is happening in the film, in sync with image and sound.

Pneumatic components play a key role in the technology behind it all. AVENTICS valves control seat movement in sync with the theater controller signals. To deliver this performance, each theater is equipped with a compressed air system consisting of a compressor and air tanks. Compressed air is forwarded to the ED02 series proportional valve system, combined with the MU1-RGS series. This is necessary to control the seats. The electropneumatic proportional valves from AVENTICS control the MU1-RGS series pressure regulators, which supply the pressure to the system. The theater controller sends motion signals (0-10 V) programmed in sync with the film to the ED02 valve, which transforms the modulation into 0 to 6 bars and forwards it to the MU1 valve. There, the resulting system pressure is passed on to the cylinders in the motion seats according to the control signal.

A simple solution for a grandiose theater experience

Thanks to collaboration with AVENTICS, Attraktion! has managed to develop a cost-effective solution that can be implemented for the long term. While an initial technical implementation required three proportional valves and three pressure regulators per row, the current, revised variant has cut material costs significantly since three proportional valves now supply nine pressure regulators. "AVENTICS quickly identified the need for optimizations and assisted us with expert advice. The result: A simple technical solution that is more energy-efficient and cost-efficient. Thanks to the competent consultation from our partner, we will benefit for the long term – even in new projects," explains Max Wieland. "And movie fans can look forward to truly unique theater experiences." 🎬



REACHING HIGH SPEEDS WITH PANTOGRAPHS

Temperature-resistant pneumatics
for Swiss pantographs

"Robust pneumatics and railway technology have been a perfect match for years."

Daniel Boner,
Sales Engineer AVENTICS Switzerland



It's one of those questions children ask that fathers first have to Google: how does the power supply to electric trains work? Tip: give a meaningful look and provide a convincing answer: "That's the work of the pantograph." This may be the right technical term, but Wikipedia will first lead you to believe it is a geometric drawing implement. The simplest solution: This article will provide all the important facts.

To explain this question on power and trains, A Mag interviewed Hanspeter Jutzi, CEO of Swiss company Richard AG Murgenthal. "We have developed and produced pantographs, main switches, insulators, and many other components for modern traction vehicles for 111 years," says Hanspeter Jutzi. And AVENTICS valves, cylinders, and air preparation systems are all on board.


These Swiss pantographs press the wearing strips up onto the live overhead lines. "Unlike with the simple streetcars from decades ago, modern rail cars feature complex control electronics and require a continuous power supply," explains Hanspeter Jutzi, manager of around 80 employees. "The challenge lies in reliably maintaining the contact between the strip and the line but not pressing against the overhead lines too strongly because they will otherwise wear too quickly or even rip."

On the Richard pantograph, this is performed by a mechanically guided rocker, similar to the joint in your knee. The pneumatic solution from AVENTICS consisting of an ISO valve, precision pressure regulator, pneumatic bellows actuator, and air preparation presses the wearing strip against the overhead line with three bars of compressed air. This corresponds to a force of 70 to 85 N. This pneumatic force is enough to maintain the contact with the overhead line, even if the track is uneven.

In Europe, trains can also cross borders without issues. With alternating current, the strip contacts can absorb 25,000 volts with maximum currents of up to 900 amperes and transfer them to the train. Richard pantographs are approved for speeds up to 230 km/h, proof of just how dynamic pneumatic control solutions are.

Components must be robust

"We require an extremely wide operating temperature range of -25°C to +45°C from the pneumatic components, and in some cases even more extreme values for train operators in certain climatic regions," emphasizes Hanspeter Jutzi. The pneumatic solution from AVENTICS is robust not only when it comes to temperatures: compared with other electromechanical solutions, it is virtually wear-free.

AVENTICS supplies the pneumatic assembly for the pantographs and other modules from Richard right to the Swiss family-run company pre-assembled. "We may only be a medium-sized enterprise, but in some cases we have worked with traction vehicle manufacturers and operators for decades," states the CEO. "We know that our customers still expect original spare parts years later, and that's how we choose our suppliers." AVENTICS, also a certified supplier established for decades and involved with numerous operators, meets all of these requirements. 

AUTOMATION MEETS TRADITION

Progema Engineering automates cheese handling
with food-safe pneumatics from AVENTICS



Grana Padano and Parmigiano-Reggiano are well-known Italian cheese varieties that are famous around the world. During the months of their maturation process, the products have to be formed and turned. The Italian company Progema Engineering has now automated this previously back-breaking manual work. AVENTICS cylinders and valves that meet high hygienic standards assume essential functions when handling the famous hard cheese.

Parmesan cheese varieties, such as Grana Padano and Parmigiano-Reggiano, have been produced in their region of origin, the Italian Po plain, for more than 800 years. The traditional production process for these two types of cheese has essentially stayed the same for centuries. Today, however, automation technology is increasingly employed to make this hard task easier, because the famous cheese varieties not only need a great deal of time, but above all meticulous care. Pressing out the whey and turning the resting heavy cheese wheels is back-breaking work. "Often, these tasks are still carried out manually. With the help of our new Forma4 machine, however, producers can automate the process," explains Alberto Boceda, head of mechanical engineering and co-owner of Progema Engineering S.R.L..

The Italian company, located in Borgo Virgilio, in the province of Mantua, has 15 employees and is specialized in innovative dairy equipment. In its "Milk" division, it offers development, design, and manufacturing of special equipment used to automate cheese production. This includes, above all, automatic storage and cleaning systems according to the CIP principle (Cleaning in Place) for process engineering systems in the food industry.



Ing. Alberto Boceda and Ing. Daniele Barbieri from Progema Engineering use Pneumatics manufactured by AVENTICS.



During this maturation period the cheese wheels are meticulously cared for and repeatedly turned, cleaned, and inspected.

During the 25 years since the company was founded, Progema Engineering has gained extensive expertise with dairy applications and knows exactly what really matters. “All components used for our systems have to meet the high standards of the food industry. In addition, we always guarantee that our machines are food-safe, despite customizing them to individual customer’s needs. That’s why we decided to use pneumatic components from AVENTICS when configuring our Forma4 machine for automation,” says Daniele Barbieri, co-owner and head of electrical engineering.

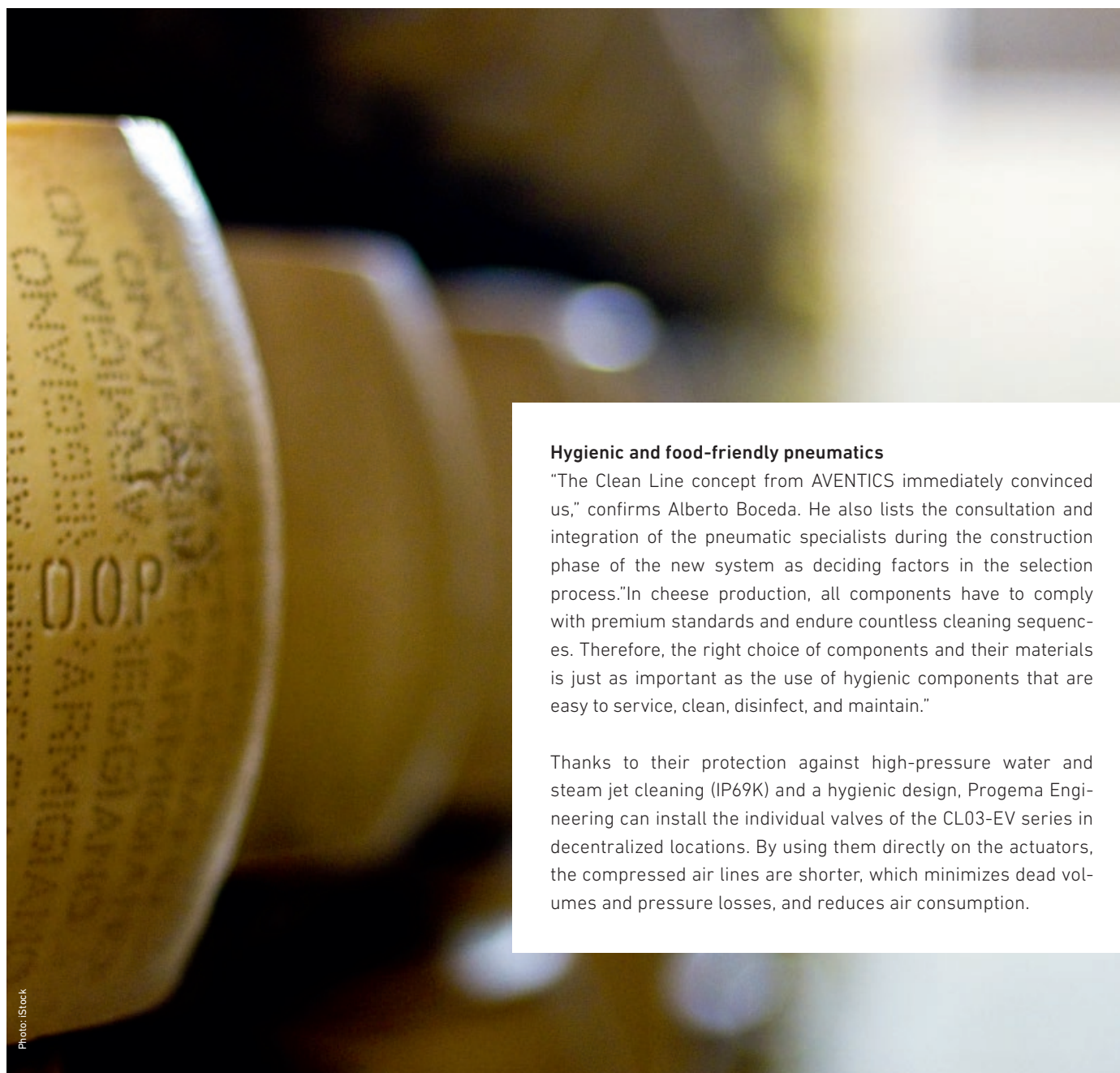
Machine forming and turning

The machine adopts the forming and turning of Grana Padano and Parmigiano-Reggiano cheese wheels. The cheese mixture, obtained through a special method, must first rest for two to three days in round forms called “fascere”. Subsequently, the resulting wheels are repeatedly dipped in brine over the next three weeks and then stored for at least one year in air-conditioned storage rooms until complete maturity. During this maturation period the cheese wheels are meticulously cared for and repeatedly turned, cleaned, and inspected.

Corrosion-resistant, double-acting AVENTICS cylinders from the ISO Clean Line (CCL) series close the round molds and ensure that the whey is pressed out by applying the appropriate pressure. Later on, when the cheese wheels are turned, the cylinders keep the mold under tension. AVENTICS CL03-EV valves regulate cylinder movements and are installed directly on the consumer. The CL03-EV valves are ideal for such applications due to their tailored design and the high protection class of IP69K. AS05 series maintenance units ensure the right compressed air preparation and complete the installed pneumatic system.



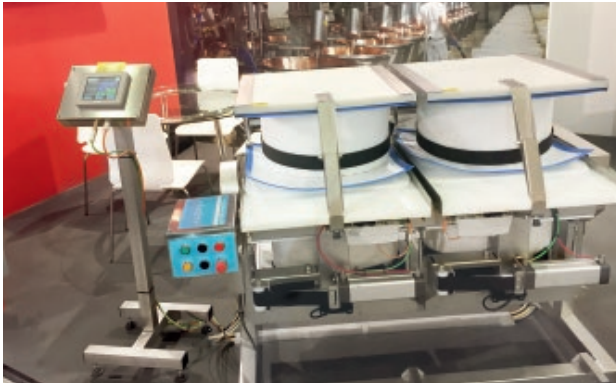
“The regular turning of the approximately 40-kilogram cheese wheels takes on our automatic turning device.”



Hygienic and food-friendly pneumatics

“The Clean Line concept from AVENTICS immediately convinced us,” confirms Alberto Boceda. He also lists the consultation and integration of the pneumatic specialists during the construction phase of the new system as deciding factors in the selection process. “In cheese production, all components have to comply with premium standards and endure countless cleaning sequences. Therefore, the right choice of components and their materials is just as important as the use of hygienic components that are easy to service, clean, disinfect, and maintain.”

Thanks to their protection against high-pressure water and steam jet cleaning (IP69K) and a hygienic design, Progema Engineering can install the individual valves of the CL03-EV series in decentralized locations. By using them directly on the actuators, the compressed air lines are shorter, which minimizes dead volumes and pressure losses, and reduces air consumption.



During the month-long maturation period, the cheese wheels have to be carefully tended to and turned regularly. Progema Engineering developed a sophisticated, fully automatic turning device for just this reason.



AVENTICS CL03-EV valves regulate cylinder movements of the Forma4 machine and are installed directly on the consumer. The CL03-EV valves are ideal for such applications due to their tailored design and the high protection class of IP69K.

Safety through "best-in-class"

AVENTICS long-term expertise in the design of hygienic components plays a key role, demonstrated by the special features of the "best-in-class" components, which have been specially designed for optimal food safety. This means: no indentations or sharp edges, use of food-grade materials and lubricants, as well as high resistance to chemicals and corrosion. The overall design facilitates cleaning, disinfecting, and sterilizing of the machine, thus reliably preventing the risk of microbial contamination.


Progema Engineering uses individual valves in the Forma4. "The modular valve system offers countless possibilities, and this solution corresponds exactly to our requirements in the standard machine. However, depending on the need and specific end-use in a dairy, we can easily expand the CL03," says Daniele Barbieri.

Customized automatic warehouse systems

The mold turning device equipped with AVENTICS pneumatics is one of the components of the automatic warehouse system that Progema Engineering offers its customers. The modern system with several storage levels requires significantly less storage space, facilitates access to the molds, and creates ergonomic workplaces with individual height settings.

As an optional supplement to this modular, expandable concept, customers can use the Forma4 device for further automation. In the production of Grana Padano and Parmigiano-Reggiano, the Forma4 machine is used on the first day to remove the excess whey and form the cheese shapes. In further steps, the cheese is repeatedly immersed in brine for 21 days, followed by seasoning in the last phase.

"The regular turning of the approximately 40-kilogram cheese wheels is not an easy task and can quickly lead to back pain in employees. Instead, our automatic turning device takes over this monotonous, heavy-duty work and completely eliminates that problem," emphasizes Daniele Barbieri.

This makes the Forma4 turning device a sensible investment – especially considering that about 3 million wheels of Parmigiano-Reggiano and about 5 million wheels of Grana Padano cheese are produced in their region of origin each year. 

AUSTRALIA

The number one in growth



Imagine you are founding a new company and one of your most important customer industries simply disappears from your continent entirely. This is precisely what happened to Pneumatic & Automation Equipment Pty Ltd., the authorized AVENTICS dealer in Australia. But founders and executive managers Branislav Mitkovic and Sam Soury rolled up their sleeves and concentrated on new customers and business opportunities, much to their success.

Though Australia may seem to be a bit secluded from the major trade currents, it is one of the most developed countries in the world. Ringing in at over 103, it holds the world record for consecutive quarters of growth, meaning the Australian economy has seen uninterrupted growth without a technical recession for 26 years. The gross national product per capita takes eleventh place worldwide. The continent of Australia is extremely abundant in mineral ores, coal, and other raw materials. But raw material prices

have remained low for some years now. Another hard blow to the manufacturing industry was the closing of all the nation's automobile factories and their suppliers in 2016 and 2017.

As mechanical engineer Branislav Mitkovic and electrical engineer Sam Soury, both longstanding employees of Bosch Rexroth, founded Pneumatic & Automation Equipment Pty Ltd in 2012, they had no way of seeing this coming. But as soon as Ford, General Motors, Holden, Toyota, and Mitsubishi made their plans to close public, Branislav and Sam began a sales offensive. "This enabled us to compensate the losses in the automotive industry and expand our customer base to over 2,000 companies," emphasizes Branislav Mitkovic, Head of Sales of Pneumatic & Automation Equipment. They won over major end customers in the process industry as well as machine manufacturers. Now, end users include some of the largest raw materials miners, as well as material companies producing plasterboard, glued wood, and bricks, aluminum extruders, pharmaceutical companies, the food industry, and manufacturers of special vehicles.

A simple approach: focusing on the customer

"Sales have changed. Not ten years ago, our customers didn't even have high-speed Internet connections, and we performed daily deliveries of catalogs and brochures," recalls Branislav. Now, information is all available online, and customers expect extremely fast response times. "It's easy to do business with us. We have fast delivery times and respond quickly to customer requests. Most matters we can clear up right on the phone, and often we send an e-mail offer within a few minutes, during the call." This offer gives customers all the relevant information they need, such as CAD files and the technical data for all components. For more complex electropneumatic solutions, we aim to respond within one hour.



Branislav Mitkovic and Sam Soury: Founders and General Managers of Pneumatic & Automation Equipment focus on making things easy for customers.

Taking responsibility

"Beside AVENTICS pneumatic products, we also offer a wide range of automation components," states Automation Manager Soury. "We put together complete solutions with all components perfectly matched, including the PLC control, and make sure there aren't any language problems between the different worlds," he says, smiling. "We assume responsibility for the functions and overall performance of our complete system solutions." Logically, Pneumatic & Automation Equipment assembles valve systems as well as pneumatic and electrical circuits to deliver turnkey control cabinets.

Collaboration with far-away wholesalers across the country is coordinated from company headquarters in the state of New South Wales. "On the one hand, we sell standard valves and cylinders, electropneumatic pressure regulators, and rodless cylinders," states Branislav in summary. But Sam also points out the diverse special solutions on offer: "We have products designed for the worst of ambient conditions, for example in underground coal mining." Sam refers to the combined maintenance units for compressed air preparation: As ready-to-install modules, they replace the traditional individual components for filters, regulators, and lubrication. "AVENTICS uses zinc, not aluminum, to produce its AS3 and AS5 models. This is essential because products made of aluminum cannot be used underground. Together with the ATEX certificate for explosion protection, we have an excellent position when it comes to these applications."

Over a million boats

All major cities in Australia are close to the ocean, and there are likely over one million boats, ships, and yachts in private ownership. Pneumatics & Automation Equipment successfully markets MAREX family ship remote controls. Developed specifically for smaller ships, the MAREX Easy Control System (ECS) links state-of-the-art control units from the automotive industry with wireless web servers for fast commissioning and diagnosis. MAREX ECS is compatible with common gas and diesel engines, both for installed and outboard motors. "In addition, we are also responsible for servicing and maintaining MAREX controls on large ships," says Branislav.

Whether in underground mining, food production, or general automation: Pneumatic & Automation Equipment has grown for years despite adverse conditions. In 2017, as the last automotive factory turned off its lights in Australia, the Australian specialist broke its sales record. Just like the entire Australian economy, this company is simply set for permanent growth. 

RELIABLE PROCESSES THANKS TO PNEUMATICS

Weber Schraubautomaten benefits from
AVENTICS valve technology in flow drill
screw systems

Demand for flow drill screws as a cold bonding technique for steel and aluminum is growing, especially in the automotive industry. A developer and one of the most well-known suppliers is Weber Schraubautomaten GmbH in German Wolfratshausen, with over 20 years of experience with flow drill screws in body manufacture. In the latest generation of flow drill screw systems, AVENTICS valve technology lays the perfect foundation for precisely parameterizable tightening processes. The key to collaboration was the pneumatic specialists' comprehensive expertise in proportional control technology.

Absolute process reliability, high flexibility, and zero-defect rates are crucial criteria when it comes to the increasingly popular automated tightening technology. Body manufacture in the automotive industry is leading the way in terms of these technological applications. Materials have to get both lighter and sturdier, yet remain as cost-effective as possible.

Advantageous for vehicles, this mixed construction places extremely strict requirements on connection and bonding technology: Each individual material requires specific designs, which increases the complexity of material joining. The individual parts have to be not only connected securely and permanently, but also easy to disconnect.

As a central element, the body is a key element for the passive safety of vehicles, and is a load-bearing connection for virtually all components. In this challenging segment, Weber Schraubautomaten GmbH is the technological leader. Its advanced tightening processes for state-of-the-art materials and compounds are based on profound expertise. This also applies to its RSF series flow drill screw systems, whose robust and reliable design has convinced renowned automotive manufacturers.

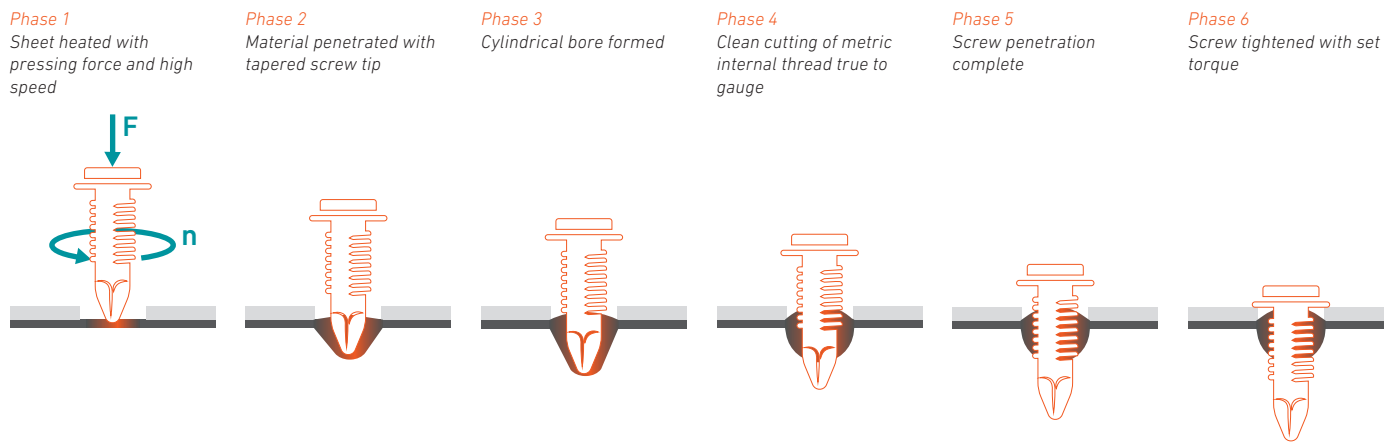
Functional pneumatics for complex processes

"The special characteristics of flow drill screw processes place high demands on the underlying systems, which we can meet with AVENTICS proportional valve technology," stresses Wolfgang Wagenstaller, responsible for mechanical design at Weber Schraubautomaten. The pneumatics control the robot-assisted tightening system. "The process is extremely complex, which has to be reproduced in the process parameters especially. This is why high functionality and modularity are important criteria when selecting a pneumatic system. Components from AVENTICS offer these characteristics, while meeting our wishes for compact sizes and integration of the required I/O modules, including bus system."

Using the advanced flow drill screw systems, workpieces are connected with a single mating surface without predrilled holes. Near the joint, the material is heated and becomes viscous, forming a flow hole. The screw then cuts a metric thread true to gauge, tightening to the defined torque when the head is reached. The pronounced shape of the thread results in an ultra-tight connection. If necessary, a flow drill screw can also be replaced with a standard metric screw later on.

Extremely flexible thanks to exact parameterization

In close collaboration with AVENTICS, the engineers from Weber Schraubautomaten created a new electropneumatic concept, with the innovative AV03 Advanced Valve system as the key element. In combination with electropneumatic pressure regulators, it is characterized by high precision and pressure that can be documented at all times. Furthermore, I/O modules capture the electrical signals from the sensors.




During the process, the EV03 series pressure regulators immediately detect a possible pressure drop or increase in the pneumatic system's circuit. The required pressure change is generated dynamically based on a target/actual value comparison on the output side. Ralf Wiethoff sees this as the foundation for streamlined processes: "Only a tightening process that can be parameterized in just this way offers flexible adjustment options that are absolutely crucial in this type of application."

The AES fieldbus connection allows the valve system to be integrated into the system's control structure, allowing compact, functional, and powerful pneumatics to be installed decentralized right where the actuators are. This enables shorter lines, which reduces dead volumes and pressure losses, and ultimately leads to lower air consumption.

Switching at just the right moment

The details reveal just how flexible the tightening system has to be: The right combination of force and speed is essential for every single screw. Flow drilling requires high forces and torques, while thread-forming requires lower forces since the pitch of the screw determines the penetration velocity. The force applied should only ensure the bit's force application in the screw. In practice, this means a number of flow drill screws located next to each other may require different process curves.

"Our patented depth gradient recognizes changes to depth while the screw penetrates the material. This ensures switching at the right point in time, which only works with agile, fast valve and sensor technology," says technologist Robert Stützer, explaining the joining-specific features. 



The AV03 Advanced Valve system from AVENTICS is the key element in the flow drill screw systems from Weber Schraubautomaten.



RELAXED LUXURY

AVENTICS Marine Technology makes controlling and maneuvering the new Sunseeker 76 Yacht a breeze

In the world of motor boats, luxury has a name: Sunseeker. The manufacturer of luxury yachts has long been known worldwide – not least by appearing in spectacular James Bond scenes. The company stands for style, exceptional craftsmanship and meticulous attention to detail. In line with the exclusive requests of its customers, Sunseeker equips its recently introduced 76 Yacht with Marex remote control and joystick systems from AVENTICS. Having this technology on board makes navigating, docking and departing easier and safer.

The 76 Yacht is a true Sunseeker, setting benchmarks in its class. Lounge seats, cocktail bars, or a mini beach club with BBQ and rainfall shower – this exclusive motor boat is where wishes come true. But it isn't just the spacious three decks with countless options for customization and design that offer pure relaxation at sea. Located in Poole in Southern England, yacht manufacturer Sunseeker makes controlling and maneuvering the luxury yacht an easy-going experience. The Marex 3D joystick system allows captains with different skill levels and experiences to easily maneuver the mega yacht. Even in tight slips, they can dock and depart without fearing an accident.

The yacht can be controlled from various locations on board. AVENTICS system technology permits up to six joysticks. Based on the size of the boat, Sunseeker opted for three joysticks on its latest model, the 76 Yacht, measuring just under 24 meters. The ship can be moved easily and securely from the bridge, flybridge or quarterdeck. Captains can choose which joystick they would like to use according to their personal experience and use of the decks, depending on the current weather or visibility.

Joystick facilitates intuitive operation

The three-axis Marex OS 3D joystick enables intuitive operation without having to coordinate the propulsion elements separately. Based on the specific situation, the captain can choose whether to use the 3D mode, which actuates the main propulsion drives and bow and stern thrusters centrally, or to control only the thruster with the joystick in thruster mode.

This convenient, secure maneuvering at the tap of a finger owes to the proven AVENTICS control concept. The individual components of the Marex OS 3D can be combined based on the application and desired equipment. Starting with the joystick in a modern, ergonomic design through to the preassembled cables to connect modules and the main computer via CAN bus, the Marine Technology experts at AVENTICS have perfectly matched all technical elements to one another.

The heart of the system is vector controlled by means of a marine propulsion controller. The MPC 3D processes the commands received by the joystick, calculating vectors that are required to control the main propulsion and thruster. In combination with an electronic compass, this technology makes maneuvering much easier, even when facing strong side winds or currents: Such adverse environmental conditions are no problem for the system thanks to its automatic heading compensation function, enabling effortless lateral or diagonal movements on the spot using the joystick.

Docking a breeze

"Thanks to the sophisticated control technology, the yacht mirrors the movement of the joystick exactly," emphasises Nick



Lean, Senior Manager at Sunseeker in Poole. "The Marex joystick on the 76 Yacht is an excellent feature that makes docking so much simpler."


Local AVENTICS partner for marine technology, PME Group Limited, delivered and commissioned the Marex OS 3D. The joystick is just one of the components AVENTICS offers for decentralized automation of ship controls. The modular concept includes a range of inter-compatible components, offering open interfaces for motor suppliers. This simplifies system installation and commissioning, enabling a faster time-to-market.

Nick Lean finds this particularly advantageous, and the company not only uses the joystick control in the 76 Yacht, but Sunseeker's motor supplier has also integrated the AVENTICS Marex OS III ship control into its system. "The entire electrical control forms a powerful unit, ensuring all components are perfectly compatible," states the Senior Manager, emphasising that completion of a yacht in time is crucial. Offering both the ship control and the joystick system from a single manufacturer is a major argument in favor of AVENTICS. After all, each year Sunseeker builds around 170 exclusive motor boats ranging from 16 to 47 meters in length with exceptional craftsmanship and meticulous attention to detail.

Proven system technology from a single source

Along with the joystick system, Sunseeker also uses the Marex OS III for the adjustable propeller, jet propulsion and reversing gear. For years it has been used on various mega and super yachts for efficient, safe and simple propulsion system control.

The hardware consists of only a few modular units with software preconfigured at the factory, meaning it can be installed quickly and easily. The control uses a self-monitored CAN bus for each of the maximum five parallel powertrains, increasing the powerful system's reliability significantly. The functions in use have already found success in a wide range of applications. Marex systems have established their place on premium yachts thanks to the controller's modern design combined with the ease of use of the operating elements.

Sunseeker benefits from the fact that the Marex OS III doesn't require any project-based programming. All that is needed to adapt the control to the current yacht conditions is to set a few customer-specific parameters and add required functions using the integrated PLC as necessary. 

FINEST PNEUMATICS

AVENTICS components excel in ultra-precise Peter Wolters twin loader fine-grinding machines with new rotary table

Improved surface finishing and faster loading and unloading times were high priorities in the development of the new Peter Wolters AC microLine® 1000 with twin loaders and robot cell. Thanks to the new concept, the machine offers a greater degree of workpiece flexibility and throughput, and also has a smaller footprint. In addition to the new electrical linear axis, the innovative valve technology from AVENTICS forms the basis, including pressure regulators and cylinders, which are used in the entire AC series and the new rotary table.

The main task of the new twin batch processing machine is ultra-precise machining of workpieces with a maximum diameter of 320 mm and thicknesses up to 100 mm. Thanks to its modular design, the Peter Wolters AC microLine® 1000 is ideal for a wide range of tasks, including fine-grinding, lapping, honing, and polishing of surfaces.

"We use AVENTICS components in all our AC series machines, and have had excellent experiences for years," says Alexander Unger, the engineer responsible for the project at the Lapmaster Wolters plant in Rendsburg. "Tailored to the concept of the latest AC microLine® 1000, we have also developed a new rotary table that offers maximum functionality as well as the compatibility essential for this type of concept. We are able to achieve this by also equipping the twin loader with AVENTICS pneumatics."

Automation shortens process cycles

The new rotary table is part of a high-tech automation concept for future tasks, which Lapmaster Wolters continually advances. The new loading and unloading unit used to insert workpieces in the carriers aim to shorten processing time. All this is made possible thanks to the use of a loading and unloading unit for carrier handling developed in-house.

"Handling is a true highlight," emphasizes the engineer. "The loading and unloading unit is designed for fully automatic operation, allowing users to precisely set both the cycle time and speed. The design also helps reduce the time required to swap carriers."

High-strength GPC series guide cylinders and weight-optimized MNI series standard cylinders are used to handle the carriers. The exact position and required travel time for the MNI mini cylinder are queried by the analog SM6 distance measuring sensor with a precision of ± 0.1 mm. This sensor can also be used to check material supply. The resulting preventive maintenance is another crucial factor speaking for AVENTICS components, as Alexander Unger confirms: "Their special features give machine availability and process reliability a major boost."

A solution saving time, energy, and space

Based on standard components, the sophisticated system is also used in the grinding machine, where the AVENTICS AV03 valve system with Profinet interface plays a main role. The system controls the cylinders and offers integrated pressure zone separation for the required pressures. AV03 also features up to 45% smaller installation dimensions, allowing users to integrate the multi-patented Advanced Valve into existing concepts without any problems at all. At the same time, the system offers major advantages for energy-conscious users.

The innovative valve system is the main component of the pneumatic control cabinet. As Alexander Unger points out, AVENTICS provided Lapmaster Wolters with a plug-and-play solution: "This enables end-to-end standardization, from hardware to handling. The complete assembly is tailored to our customer-specific requirements and is delivered with a test seal." Last but not least, the flexible AES field bus control for the valve system supports all common fieldbus protocols.

Higher machine safety and process reliability

"In addition to the valves crucial to the application, we have also managed to solve all stroke and travel motions with AVENTICS," reports the engineer, pointing out the application-specific selection of cylinders from the comprehensive offering in order to achieve maximum process reliability. On the end of the AC microLine® 1000 fine-grinding machine, the ED02 series electropneumatic pressure regulators from AVENTICS play their




The Peter Wolters AC microLine® 1000 has a modular design and is ideal for fine-grinding, lapping, honing, polishing, and deburring surfaces. Using the new twin loader ensures fast loading and unloading times.

part: They perform a key function in workpiece processing by controlling the contact pressure of the fine-grinding disc.

ED series valves combine control electronics, the pressure sensor, and direct drive via proportional solenoids into a single closed unit. With critical fluctuations in pressure, the pressure regulator shines, with its typical high dynamics: Based on a target-actual value comparison, it immediately generates the necessary pressure change on the outlet side to ensure process stability. "With this control technology, the pressure can always be tailored to the application and dynamically adjusted. The valve's high control precision makes it ideal for optimized, energy-efficient machining processes," confirms Alexander Unger.

Just how versatile AVENTICS components can be seen in the AS series maintenance units, which ensure compliance with the required compressed air quality and cover the preparation processes of filtering, regulating, lubricating, and dehydrating. In its fine-grinding machines, Lapmaster Wolters uses the AS3-FRE filter pressure regulator of this series to control the system pressure.

The pneumatic concept of the AC microLine® 1000 with twin loaders will now be applied to additional fine-grinding machines from the company, allowing users to flexibly integrate them into different production strategies. The grinding machine and twin loaders form a single unit, with excellent production performance thanks to compact dimensions, high flexibility, and a high throughput. Based on the advantages of the rotary table, Lapmaster Wolters wants to use it in its AC 700 and AC 1250 for fine-grinding and flat-honing. The project manager is convinced of the AVENTICS pneumatics in use: "Here, you can clearly see how flexible and future-proof the system is." 

PRECISE SURFACE TECHNOLOGY

Known as a premium manufacturer of tool machines in the areas of lapping, polishing, and grinding, the Lapmaster Wolters Group is focused on continually advancing and improving surface quality. The company employs around 700 associates worldwide, with production sites in Germany, Great Britain, the U.S., China, and India.

Today's Lapmaster Wolters GmbH in Rendsburg was founded in 1804, and was purchased by Lapmaster Group Holdings LLC in 2014. To better market the many product brands in the group, the Lapmaster Wolters Group became the Precision Surfacing Solutions Group in the fall of 2017. The rebranding reflects both internal changes to the brand architecture and the expanded product range.



SOUTHERN STARS

New sales partners in Argentina and Brazil
invest in quality consultation

In the southern hemisphere, the North Star doesn't lead the way. But happily, on his second journey, Amerigo Vespucci discovered the "Southern Cross" constellation as a navigational aid, clearly pointing south in 1501. The Southern Cross is part of the Brazilian flag and gauchos in Argentina traditionally use the constellation as a guide in the vast Pampas region. From an economic point of view, the Southern Cross has been hidden behind black clouds in recent years. But now, the skies are clearing up.

For most countries in South America, the last decade has been rather difficult. But for some time now, more than just a shimmer of hope for an economic rebound seems to be on the horizon. The multinational world bank predicts accelerating growth in Latin America in 2018. The analysis identifies Argentina and Brazil as the main drivers of this recovery. "With new, strong sales partners, AVENTICS is at the right place at the right time to support machine manufacturers and end users with complete pneumatic and automation solutions," stresses Franco Stephan, Director Product Management & Sales Support at AVENTICS USA. Together with Rahul Karanth, Global Business Development Manager, he is responsible for new sales structures in Brazil and Argentina. "We looked for strong companies with proven

success and experience in automation," states Rahul Karanth, explaining their approach. Both countries have a wealth of excellent engineers that expect a partnership based on technical expertise.

Fluipress: Extensive application experience

In Brazil, the largest economy in South America, AVENTICS America carefully examined the pneumatics market and possible sales partner. "The country is huge, and the industrial bases are spread so far apart that a single partner would never be able to cover everything alone." Fluipress Automação Industrial met these conditions, qualifying as a sales partner and coordinating further dealers throughout the country. The company is headquartered in Curitiba, southeast of São Paulo.

"Fluipress has been in the business for over a quarter-century and offers profound expertise in a wide range of applications," highlights Rahul. This also owes to the fact that Fluipress has two business divisions: on the one hand, the trade business, and on the other, the company also produces custom machines, electronically controlled precision presses, and assembly lines itself. Employees from Fluipress are familiar with the requirements for pneumatics in these and many other applications based on first-hand experience.

Before collaboration officially began, Fluipress recruited a number of additional experienced pneumatics specialists to be able to offer top consultation right away. AVENTICS provided support in training the sales staff, but also for technicians responsible for assembling the cylinders and complete pneumatic modules. "Fluipress is a certified partner for cylinder assembly in line with AVENTICS standards," confirms Rahul.

Another topic crucial for the Brazilian machine manufacturer and end users is machine safety. Brazilian standard NR 12 corresponds to the European Machinery Directive in many respects.



"The business potential in South America is huge, and the new AVENTICS sales partners are ready."


AVENTICS has comprehensive experience in implementing compliant solutions with certified safety products.

Fluipress is a seasoned company active in strategically important industries, including automation, food & beverage, energy, steel and aluminum plants, but also for the shoe industry and sugar production. AVENTICS offers ultra-resistant components for the sugar industry. Launched at the end of 2017, the pneumatics division already keeps one in every six Fluipress employees busy.

Racklatina: Complete automation solutions

In Argentina, the second largest market for pneumatics in South America, Racklatina S.A. took over representation at the end of 2017. Headquartered in Moreno, near Buenos Aires City, the company spans the entire country with eight subsidiaries. Racklatina also sells control components from a leading manufacturer, which has helped the company establish an excellent reputation as an automation partner for machine manufacturers and end users. "Racklatina and AVENTICS complement each other perfectly," states Franco confidently. "Customers get complete automation solutions featuring pneumatics, electronics, and control technology." AVENTICS electropneumatic valves use open communication standards, allowing not only Racklatina to easily integrate them into any control solution.

Before the official start date, Racklatina also hired additional pneumatics specialist, investing in comprehensive product training. Today, over 20 experts are available to customers. Racklatina has extensive experience in configuring and assembling customer-specific modules and systems. The company is also certified to assemble AVENTICS cylinders. In addition, control cabinet building is part of everyday work at the Argentinean company.

"Regional assembly increases local added value and helps customers to bring their solutions to market quickly and take full advantage of the current boom," emphasizes Franco. Both sales partners, Fluipress and Racklatina, have set up their own warehouses to ensure fast delivery times. Rahul and Franco are confident: "The business potential in South America is huge, and the new AVENTICS sales partners are ready." 

THE IDEAL CHOICE WHATEVER THE SITUATION: **AV VALVE SYSTEM**

The new BP (bottom ported) version of the AV valve system with outlets on the bottom is the right fit for control cabinets.


"Depending on their requirements, our customers also want to be able to install the AVENTICS AV system in control cabinets," reports Tomas Kälble, product manager for valve systems at AVENTICS. "With outlets on the bottom, the AV system is optimized for just this. And with the help of our transition plate, customers can also take advantage of the benefits of a pneumatic manifold."

The Advanced Valve system has already proven successful in a broad spectrum of applications. If customers want to install it in a control cabinet, the tubing no longer has to be guided out of the cabinet separately, reducing the mounting effort significantly. Both sizes, AV03 and AV05, feature bottom-ported connections, allowing the valve system with up to 32 valves to be mounted directly on the wall of the control cabinet. A foam rubber gasket seals off the system.

Pneumatic manifold capabilities

Alternatively, the customer can use a metal transition plate, which serves as a pneumatic manifold. Quick installation and deinstallation of the valve system no longer require countless push-in fittings to be disassembled and re-mounted. Instead, the valve system can simply be removed from the transition plate and replaced completely. With

this solution, the system also achieves a higher IP protection class – a crucial point in food technology, for example.

"This makes assembly and disassembly of the AV system easier for customers. And if they want a fully pre-installed combination of valve system and control cabinet, the AVENTICS team for system technology is more than happy to assist," summarizes Kälble. 






"In the past century, we have experienced major challenges and turning points and can be proud of our successes."



PNEUMATICS AT THE MALL

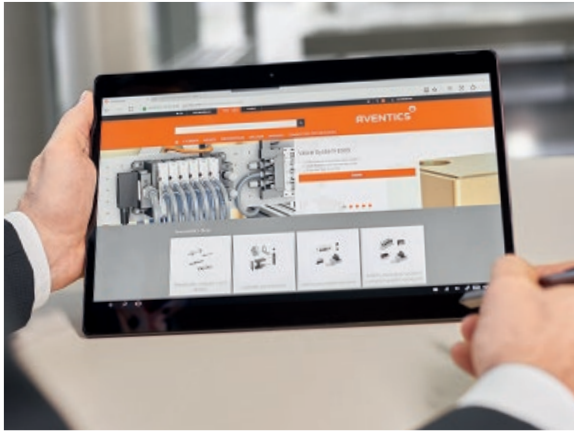
In the fall of 2017, the AVENTICS plant in Hungary celebrated its fiftieth anniversary, celebrating the occasion with a very special exhibit at a mall in Eger. Visitors to Agria Park were surprised by the offer to

test their strength with AVENTICS pneumatics. An AVENTICS race car from the Pneumobile was also available to try out – but only for a virtual test drive. 



LEARNING WITH AVENTICS

Also in the fall of 2017, AVENTICS Hungary inaugurated the first pneumatic laboratory at the University of Debrecen. By setting up a classroom equipped with state-of-the-art pneumatic and control technology, the company is contributing to practice-oriented technical training options in Eger. In addition, engineering students can gather initial experiences with the Internet of Things during their studies. The laboratory features products including ES05, AV03, and MNI cylinders. 



"DIGITALIZATION AFFECTS ALL DISTRIBUTION CHANNELS"

E-commerce plays a significant role in consumer markets. For the past years, sales volume has consistently increased in online commerce. Personalization makes all the difference in the customer journey and shopping experience, therefore simplifying the shopping process for consumers. Amazon and other top e-commerce platforms have set the standard for state-of-the-art customer ease in the B2C context. In the B2B segment, on the other hand, most online shops are still in the early development stages. AVENTICS launched its own brand-new B2B online shop recently – currently, the Pneumatics Shop is accessible for AVENTICS customers in North America, Switzerland, China and Singapore.

To find out more about the current status and the future of e-commerce in the B2B segment, we talked with Andreas Hart, Director Digital Business at AVENTICS.

Mr. Hart, you are Director Digital Business at AVENTICS and responsible for the e-commerce activities of your company. What would you like the AVENTICS online shop to be in order to meet your customers' needs?

For the past years, we have been working intensively on developing the best future sales setup for a classical B2B company such as AVENTICS. Our objective is to support our established sales and customer service channels with digital ones. Based on a detailed analysis and on discussions with several types of customers, we have developed a whole new and innovative approach to online.

Why don't you just transfer the success criteria of B2C shops to the B2B segment?

Consumers want to be informed about general product specifications, shipping details and the final price. By contrast, distributors need much more detailed information about specific product attributes. B2B customers in particular want to be informed about things, such as the quotation process, net price and tax. And this is only one of many differences between B2B and B2C consumers. Therefore, we looked for a solution that incorporates the different needs. Our new Pneumatics Shop offers a simple search function, ease of use, and an easy ordering process, just like on Amazon.

Now, what are the main differences in B2B and B2C e-commerce?

Next to the before mentioned complexity of product information management, the ordering process itself contains multilayered structures. The decision-making level is often complex and usually includes many different contacts with differing competences from various departments, such as developers, process or quality managers, and purchasers. And as the release processes of B2B customers differ significantly from company to company, it is difficult to standardize this function for all types of clients we want to serve with an online shop. Of course such a shop has to work seamlessly with a company's own ERP system. This leads to extensive technical requirements and complex structures to build a state-of-the-art B2B online shop.

But why should a company initiate an online shop at all, if the conception is so complicated?

We see digitalization as a great opportunity to create additional value for our partners and customers. In particular we want to address the individual needs of small and mid-size companies. These tend to look for quick, state-of-the-art technology and sometimes even highly-customized solutions. They will benefit from improved product information management and additional service functions in future online shops.

"Our new Pneumatics Shop offers a simple search function, ease of use, and an easy ordering process, just like on Amazon."

Andreas Hart,
Director Digital Business AVENTICS




AVENTICS invests in digital commerce because we consider this to be a unique opportunity to define future customer service standards and thus differentiate us as a market leader. We want to offer our customers the easiest access to the best technological solution. A cutting edge online shop that is outstanding in terms of service, as well as product information management is the best way to achieve this.

What does an optimized shop look like?

At AVENTICS we will offer a one-stop-shop, covering all relevant applications in the future. We want to avoid an information overload and streamline processes instead. An advanced state-of-the-art search function will ease the shopping experience and guarantee a simplification of the inquiries. The customer will have access to their personalized self-service area "myAVENTICS". I am convinced that there is a tendency towards a kind of consumerization – from surfing habits to usability aspects. Consumers expect to receive the same kind of information from B2B platforms as they do from B2C platforms, according to the approach "one portal fits all." Not only can they manage their order history, they also have the opportunity to give feedback on the products they have purchased. To ensure trust in digital transformation, it is possible to cooperate with providers, such as Trusted Shops, that offer feedback and evaluation tools. In the B2C segment, consumers are already used to this type of personalization. In B2B it was basically a utopian thought until now.

And in future? Which opportunities will open up in the B2B segment thanks to e-commerce?

The objective has to be to match product information with very individual requests. A reseller has other requirements and expectations of an online shop than an engineer does. Through an implementation of different multilayer levels, you can create vari-

ous profiles, which could be used for further communication activities, for example, personalized email marketing. We have not yet exhausted all possibilities. But with our new shop solution at AVENTICS, we are taking important steps that will differentiate us by offering easy and professional solutions for customers and enabling them to save time and money, while also focusing on growing their business. 

PREVIEW OF TRADE SHOWS IN 2018

Presenting AVENTICS

Trade shows: Europe

2) Elmia Automation, Jönköping (Sweden)

May 16–18, 2018
Industrial automation

3) SPS Italia, Parma (Italy)

May 22–24, 2018
Automation

4) Sindex, Bern (Switzerland)

August 28–30, 2018
Automation

6) Automatik, Copenhagen (Denmark)

September 11–13, 2018
Industrial automation

9) WOTS, Utrecht (Netherlands)

October 2–5, 2018
Automation, drive technology

Trade shows: Germany

1) Hannover Messe, Hanover

April 23–27, 2018
Automation

5) SMM, Hamburg

September 4–7, 2018
Marine

7) InnoTrans, Berlin

September 18–21, 2018
Railway technology

10) Motek, Stuttgart

October 8–11, 2018
Assembly, automation

12) Compamed, Düsseldorf

November 12–15, 2018
Medical engineering

Trade shows: Asia

8) Automation & Robotics Expo, Pune (India)

September 22–24, 2018
Automation

11) CBB (China Brew China Beverage), Shanghai (China)

October 23–26, 2018
Food technology

SUBSCRIPTION

You would like to receive the A Mag customer magazine regularly by mail? We would be happy to supply you with the latest issue. Please send an e-mail with your address to **amag@aventics.com**.

IMPRINT

Publisher: AVENTICS GmbH
Ulmer Straße 4, 30880 Laatzen, Germany

Responsible according to the press law: Dr. Peter Saffe
Editor in chief: Sabine André
Tel +49 511 2136-137
Tel +49 511 2136-168
sabine.andre@aventics.com

Deputy & editorial staff: Christiane Bischoff
Tel +49 511 2136-870
christiane.bischoff@aventics.com

Editorial staff: Torsten Kirchmann

Photos: If not labeled: AVENTICS archive;
title: iStock

Layout: Windrich & Sörgel,
Agentur für Markenkommunikation

Print: Druckhaus Pinkvoss

Suggestions, praise, and criticism:
amag@aventics.com



AVENTICS GmbH
Ulmer Straße 4
30880 Laatzen, Germany
www.aventics.com
info@aventics.com



Follow us:

