

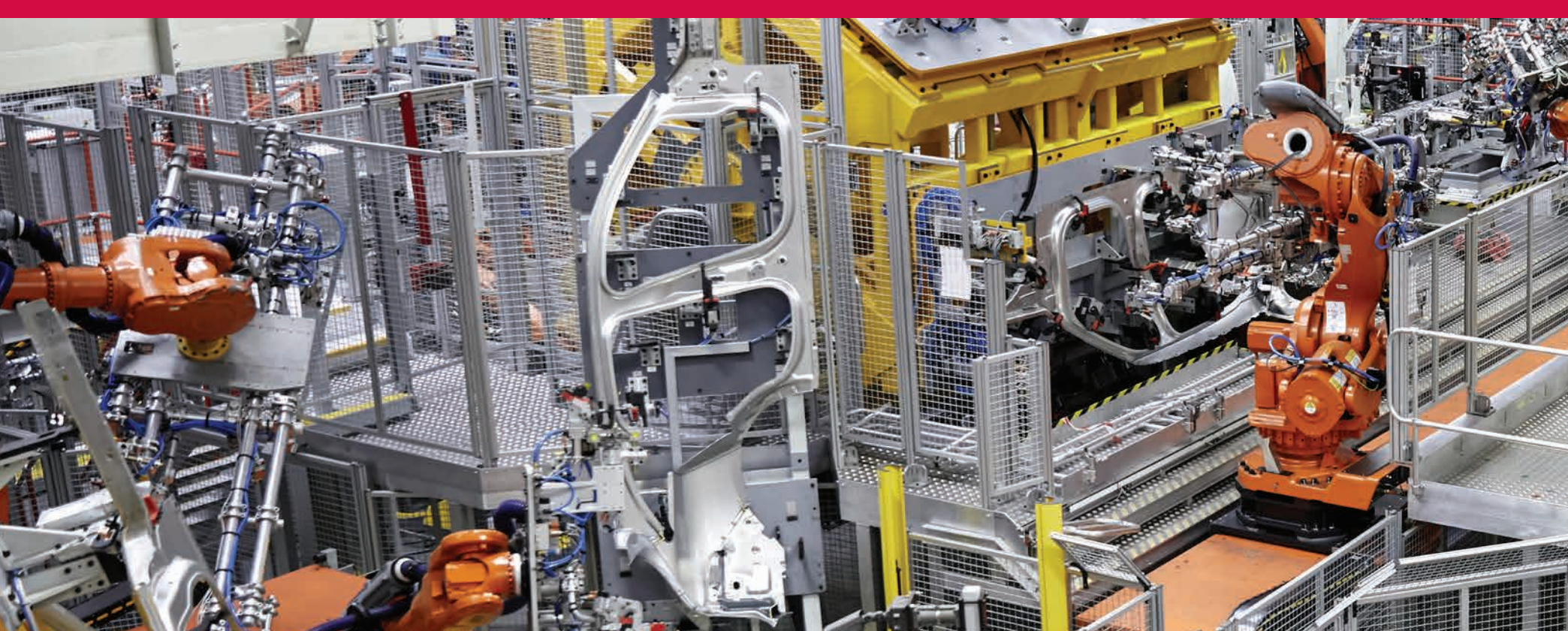


Future-focused capabilities to reduce complexity and power your performance

ASCO™ Fluid Control and AVENTICS™ Pneumatics for Machine Automation

Proven automation solutions and local expertise to help you overcome your toughest challenges.





In a constantly evolving landscape, relationships with solutions-oriented and innovative partners are essential for success.

More complexity and connectivity creates both challenges and opportunities

Manufacturing is experiencing its fourth revolution, with digitization at the forefront. Across the manufacturing industries we see customers faced with amplified pressure to keep up with the ever-increasing pace of innovation. This leads to a need for more bespoke machines that anticipate the experience of the future. More than ever before, each decision made on individual products used has long-term effects on the ability of a manufacturer to react to his specific and evolving landscape, it is clear that better technologies, deeper expertise and a stronger commitment to value-creating solutions guarantee future viability.

As the drumbeat for digitization grows louder, manufacturers must develop new strategies for IoT technology investment. For many manufacturers, what was once a clear path to success is now fraught with uncertainty.
– PWC Industrial manufacturing trends 2018 – 2019



Nearly 60 percent of manufacturing companies pointed to a lack of qualified workers as a barrier to business growth.
– Advanced manufacturing org – 2017



To mitigate their risks – OEMs cannot simply turn to their traditional toolbox. They need to review and adjust their strategic priorities, deploy the appropriate investments and resources, and develop new skills.
– Mckinsey. What's driving the global automotive industry



Turn to Emerson for deep industry expertise and applied solutions

Emerson's strengthened fluid control & pneumatics portfolio is uniquely positioned to address the performance and flexibility needs required for the automation of current and future generations of machines. Working with our brands ASCO™, AVENTIC™, TESCO™ and TopWorx™ means you can expect durable products configured for your application and connected to your information chain, as well as global service for unequalled distribution and support.



Smarter products engineered for ease of use

- With IIoT-ready products connected to the cloud, alongside a suite of I/O-Link and fieldbus products you can create a flexible pneumatic system architecture, enabling easy configuration and communication
- Concentrate effort by finding solutions for all your diverse and unique applications from one supplier
- Reduce cost of ownership with products that are easy to install and long lasting

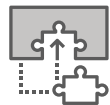
“The new pneumatics system allows us to optimally meet high expectations for this customer-specific coating system. Furthermore, we can standardize the system so that we can find and build a solution more quickly when we receive a special request for machines.”
– Thomas Amrein – Matti Technology AG



Industry experts partnering across design & development

- Work with experts with a deep technical knowledge in pneumatics, fluid control, fieldbus, machine safety and IIoT
- Depend on a company with over 100 years of experience in the application of pneumatic solutions to many diverse customer applications
- Trust in our knowledge of the operation and design of pneumatic systems, from special products to complete solutions

“They provided valuable support with the pneumatic control. It is very important for me to have a personal contact person who can actually look at the machine here in action and support me with their expertise. This lets me concentrate on optimizing the process.”
– Michael Muschiol – FVG Marl

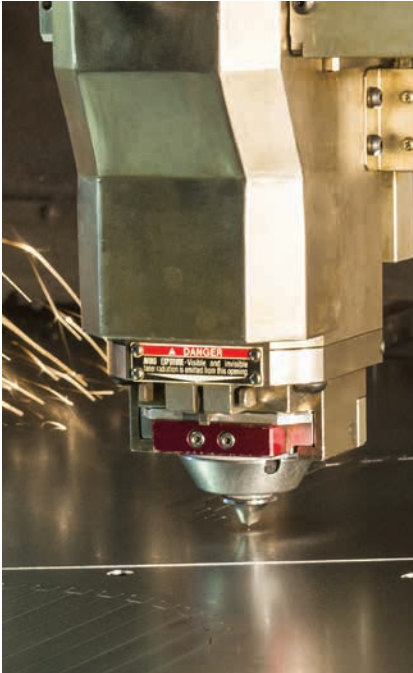


Full suite of valuable services and solutions at your fingertips

- We will help train your employees to master the application of pneumatics and fluid control products. Take advantage of our local and global teams, to support you wherever you are doing business.
- Access live and online support to free up your resources and ensure quick service

“We have achieved improved system performance that also saves energy thanks to much shorter lines”
– Martin Stolte – V+M Systems GmbH

High-quality engineering and applied industry expertise is our promise



Factory Automation

Unmatched fieldbus and I/O capabilities to optimize complete factory systems and innovative products for smart engineering.

Typical applications include:

- Laser cutting and welding
- Conveying and movement
- Robot tooling
- Wood working equipment
- Textile machinery
- Sorting machine
- Assembly and handling



Automotive & Tire

Pneumatic systems designed to reduce complexity, shortening installation and commissioning, and simplifying maintenance and upkeep.

Typical applications include:

- Automotive manufacturing:
 - Press shop handling and gripping
 - Body shop welding
 - Painting
 - Power train assembly
- Tire manufacturing:
 - Tire building machine
 - Tire curing press
 - Rubber preparation

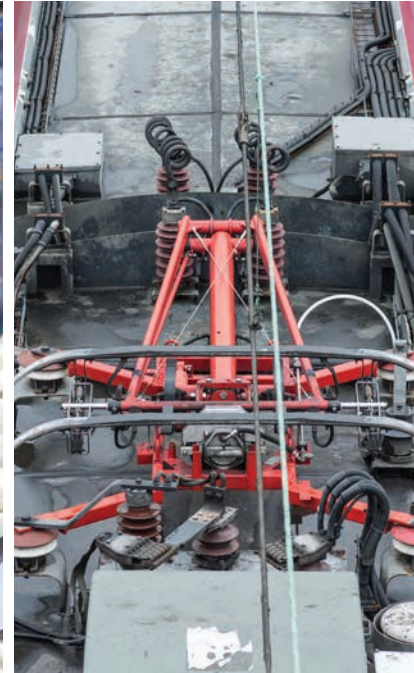


Food, Beverage & Packaging

Modular control solutions that minimize downtime and restart production time, backed by experts in your unique application's design requirements.

Typical applications include:

- Meat processing (all zones)
- Case packers
- Form fill seal
- Bottling
- PET blowing and bottle manufacturing



Rail and Commercial Vehicles

Ultra-reliable products and solutions designed to cope with most challenging environments and reduce total cost of ownership.

Typical applications include:

- On-vehicle controls for engine clutch and transmission
- Commercial vehicle ancillary systems:
 - Doors controls
 - Pantographs
 - Sanitary systems



Marine

Broadest suite of products and solutions suitable across the whole manufacturing process, supporting the highest productivity.

Typical applications include:

- Engine controls
- Remote control systems
- Alarms and monitoring
- Joysticks



Pneumatic Systems

Optimized pneumatic products and capabilities at your disposal so your performance is driven by the advice of pneumatic experts. [Learn more.](#) ▶ p6

Proportional Control

Proportional valves and regulators offering the appropriate technology to deliver the precise level of control that your application demands. [Learn more.](#) ▶ p10

Machine Safety

Expertise and products to meet a wide range of safety architecture and performance level requirements on your machines and equipment. [Learn more.](#) ▶ p8

Industrial Internet of Things

Smart pneumatic products that enable you to implement a practical and flexible approach to increasing your operational uptime and energy efficiency. [Learn more.](#) ▶ p12

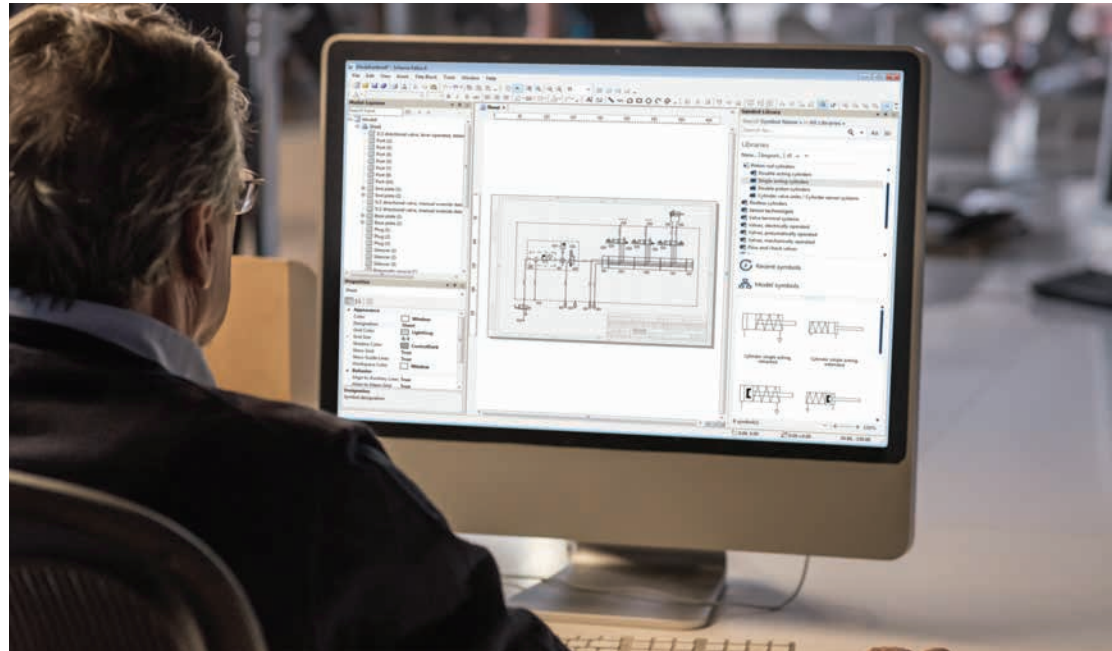
Pneumatic Systems

The performance of your business comes down to the people you employ, the products you purchase and the systems you design to bring your operations to life. Emerson is renowned for forward-thinking pneumatic system products and our technical experts are capable of performing solution development, design, documentation, procurement and assembly.



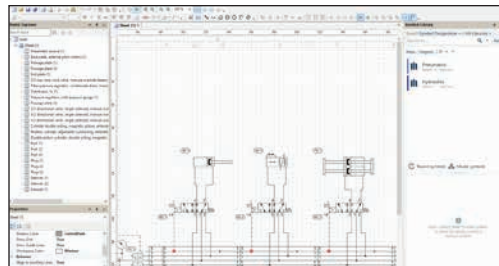
What's your opportunity?

- As more than a pneumatic systems supplier, Emerson is uniquely placed to offer a full fluid control and pneumatic system solution. This enables easier integration, improved flexibility and greater interoperability
- Our deep industry and application expertise enables you to work with a supplier that truly understands your needs. Our partnering approach means we are with you throughout your journey enabling an optimized solution delivering on your business goals



Take advantage of our tools, experts, and extensive experience.

Emerson is investing in technologies and people to make pneumatic system design easier, such as tools you can use in your office to have more control in your hands or providing fast access to experts who will take on the responsibility of your system design.



Tools offered...

- The AVENTICS Scheme Editor 6 software enables you to intuitively design circuit diagrams and identify the products you need
- The wide array of cylinder types can make selection difficult. The AVENTICS Cylinder finder allows you to describe your application to discover the best-fit product

Featured Cylinders

AVENTICS RTC Rodless Cylinders



Rodless cylinders offering optimized stroke length in a compact size, saving space and facilitating better machine or pneumatic system design.

- Oval piston enables higher loads and torques which makes them ideal when space is at a premium.
- Minimal leakage and a wide range of speeds enable a longer lifetime and greater flexibility
- One-piece slide and piston increasing stability which can improve positional accuracy and speed up cycle times

AVENTICS PRA ISO Cylinders



ISO cylinders offering a classic solution for a myriad of applications across all industries, available worldwide.

- Considerably more lightweight, efficient, and feature superior cushioning design
- Reduces vibration, noise, and cycle times which means your system will last longer and run faster in the long term

Featured Air Preparation

AVENTICS Series 651 Air Preparation



Complete range of easy-to-assemble and modular air preparation products. An extensive selection of accessories and a variety of bowl types and drains makes it highly flexible and suitable for many applications.

- Key lockable and tamperproof options on regulators and filter/regulators ensures improved machine safety
- Polycarbonate and aluminum bowls with a selection of sight gauge materials to suit any application

Featured Valve Systems

AVENTICS AV Valve Systems

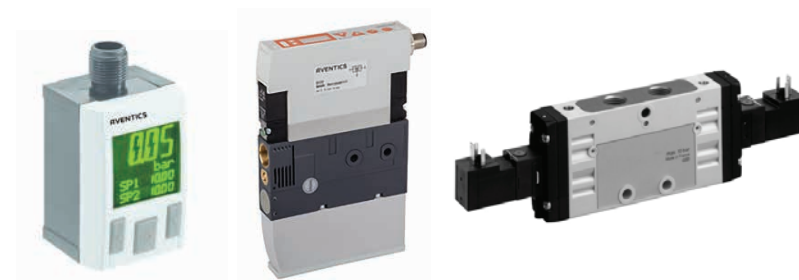


With a unique design, significantly reduced weight, and extremely compact size, as well as an increased function density, the AV is a complete automation solution that can adapt to your unique application requirements.

- Saves up to 45% space and 40% lighter than competitive products for the same flow rate, enabling a more compact machine design
- Consumes up to 20% less compressed air thanks to shorter distances from the actuator to the valve, reducing operating costs
- Performance and energy efficiency with pressure regulator integration: single station regulator, pressure zone control

Featured Pneumatic Products

AVENTICS ECD Vacuum Ejectors, PE5 Electronic Pressure Sensors and TC Spool Valves



A broad offering of products components ensures all your needs are met from one supplier and smooth integration is assured.

- A broad range enables all products to be purchased from one supplier on one purchase order, reducing your supplier base
- Designed with long service life in mind, AVENTICS products help assure machine reliability and extend the life between service intervals



Visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS) to learn more about designing pneumatic cylinders into your system.

Machine Safety

In the fast-paced manufacturing world, any accident that happens on one of your machines is one too many. Emerson prioritizes creating pneumatic system products that improve machine safety and make it easier to implement. Our experts advise on all matters of machine safety related to your pneumatic systems, in accordance with the safety standard ISO 13849. We offer a comprehensive service to help you achieve a sound safety concept.



What's your opportunity?

- Emerson is the expert in pneumatic system design, able to advise on the optimal requirements for the pneumatic safety circuits to provide the right balance between ease of implementation and achieving your safety goals
- Discover products that have some of the highest $B_{10}/MTTF$ values in the industry, enabling a longer period between maintenance cycles, while not compromising on safety
- Maximize control and uptime and simplify your safety concept through Emerson's Zoned Safety approach to pneumatic safety circuit design



Special understanding of safety applied to your business.

Emerson is more than a fluid control and pneumatic supplier. Based on years of experience in pneumatic safety applications and our wide range of safety-oriented products we work alongside your engineers or safety system consultants to ensure a fully optimized pneumatic safety concept providing an adequate level of safety for your specific application.

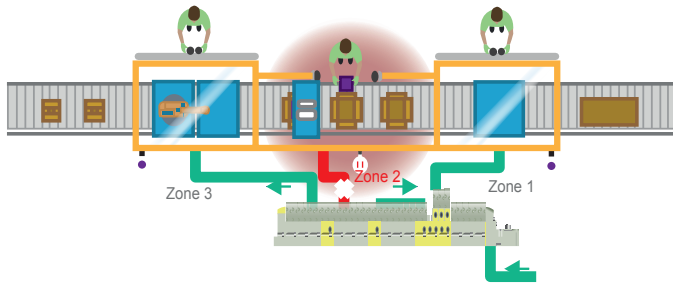


Services offered...

- Pneumatic system safety consultation by an Emerson expert
- Detailed machine safety guides with practical examples to illustrate potential pneumatic system safety designs
- Individualized safety solutions based on our wide product range – tailor made to your specific requirements

Featured Safety Systems

AVENTICS Series 503 Zoned Safety Valve System



Manifolds that simplify the design of a high performance level in pneumatic safety circuits by integrating multiple safety zones on one manifold.

- Enables multiple independent safety circuits to be designed using a single pneumatic valve system
- The zoned approach improves productivity and machine availability as single zones can be isolated, removing the need to de-pressurise the whole system
- Suitable for category 3 systems up to performance level e

AVENTICS AV Valve System with Safety Options



Valve system with a wide range of modular options to integrate safety circuit functionality at a high performance level.

- Integrated voltage monitoring provides a signal to the PLC when the voltage has dropped below an operational level, increasing diagnostic coverage
- Electrical and pneumatic zoning to make safety system implementation easier
- Exhaust modules allow the release of trapped air when performing maintenance
- Electrical separation ensures the safety functions are kept independent from other functions

AVENTICS Series IS12-PD Valve System



Electrically operated 5/2 directional valve with spring return according to ISO 5599-1, sizes 1 & 2

- Provides additional diagnostics for the pneumatic system through spool position detection and electronic proximity sensor technology
- One of the highest B_{10} values in the industry meaning longer intervals between service cycles
- Available as a single or redundant version to provide application flexibility
- Suitable for category 4 safety systems

Featured Safety Cylinder Safety Options

AVENTICS LU6 Series Locking Unit Cylinder



Series of static locking or dynamic braking pneumatic cylinders suitable for use across many safety-related applications. Independently certified by IFA.

- Very high holding forces of up to 12,000 N, and high B_{100} values of 2M cycles for dynamic and 5M for static hold, enable their use in Cat 4, to maximum PL e applications, with the appropriate diagnostic devices
- Robust, clever design allows for excellent holding and braking functions while its hexagonal wrench flattens for easier mounting in limited installation spaces
- Optional sensors directly monitor the signal, increasing diagnostic coverage to 99%
- A safety component in accordance with the machine directive 2006/42/EC

Featured Safety Valve

AVENTICS Series AS3-SV Safe Exhaust Valve



Redundant valve for safe exhaust and prevention of unexpected start-up, with an additional soft-start function.

- The redundant structure and two-channel signal processing with self monitoring enables users to achieve category 4 safety-relevant control while realizing the maximum performance level "e" (PLe) according to ISO 13849-1
- With fully integrated safe electric inputs, pneumatic outputs and safety control, no additional effort is required to implement safety functionality
- No self-test mode required as the device continually checks health. This can reduce the time the machine needs to spend in safe mode, potentially improving cycle times



Visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS) to learn more about our proven valve systems designed with safety in mind.

Proportional Control

Precise control of liquids and gasses enables optimization of machinery and processes, increasing efficiency in terms of greater production throughput and reductions in raw material use and energy consumption. Proportional valve technology quickly and accurately adjusts output pressure or flow in relation to variable operating conditions. This technology provides greater flexibility of system design and operation, which is complemented by Emerson's global engineering services, which design and construct customized solutions to meet the exact requirements of your unique machines.



What's your opportunity?

- High performing proportional valves increase quality and production efficiency
- A broad range of pressure regulation and flow control valves enables the selection of the best technology for your application
- Easy customization of product and settings to meet the needs of any specific application



A superior understanding of proportional control.

Our in-depth understanding of proportional control enables us to truly understand the needs of each application and offer the technology that will bring the biggest benefits, whether that is improved quality, reduced cycle times, faster throughput or a combination of all of these. Typical examples include high speed textile cutting machines, laser cutting, filling equipment and tank pressure control.



Tools offered...

- Free downloadable software for easy application optimization with advanced parameter adjustments
- Customization of standard products to meet the specific needs of any application

Featured Proportional Pressure Control Valves

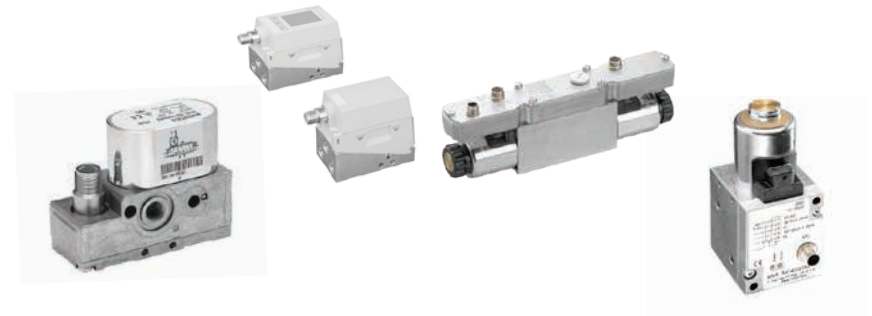
AVENTICS Sentronic D Series 608 and HD Series 616 Proportional Pressure Regulators



Digitally controlled pressure regulators ideally suited for applications where a high degree of accuracy or complicated control parameters are required.

- Very quick response times with high precision and minimal overshoot, enabling superior machine performance and reduced cycle times
- Dual loop control and free software make it easy to adjust control to suit the unique application
- Broad pressure range, various sealing and body material options and the ability to provide customized versions make it extremely flexible to suit any industrial applications, including those in hazardous areas

AVENTICS Series ED02, EV03, ED12 and ED05 Proportional Pressure Regulators



Ultra-precise and highly dynamic, these products provide the optimal level of pressure control for every application.

- Suitable for various applications and with universal connectivity, making it easy to install and configure on your machine
- Whatever your preferred fieldbus option, you can communicate with these valves via the AES software
- Expect an extended service life thanks to the proven in use and robust poppet valve technology

Featured Proportional Flow Control Valves

ASCO Series 290, 298 Pressure Operated or Motorized Valve



A range of robust angle seat valves for use on hot water, steam and other liquid/ vapour applications. Available in pressure operated and motorized versions

- Designed with long service and smooth operation in mind, these valves offer maintenance-free actuators, an anti water hammer design and are resistant to back pressure
- LED indicators for valve status display make system trouble-shooting and maintenance easy
- The numerous options, configurations and accessories, and the different actuation types make these valves highly flexible

ASCO Series 202 Preciflow Valve



Preciflow valves are compact and accurately control the flow rate of gasses.

- Can be easily connected to a valve system I/O making a fluid control circuit simple to implement
- Low hysteresis, excellent repeatability, and high sensitivity for precise flow control
- Compact design, ideally suited for when space is at a premium

ASCO Series 202 Posiflow Valve



Posiflow valves precisely control the flow rate of both liquids and gasses.

- Can be easily connected to a valve system I/O making a fluid control circuit simple to implement.
- The high flow rates and variety of orifice sizes make the valve flexible in use
- Accurate and precise enabling superior machine performance



Visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS) to learn more about our proportional technologies.

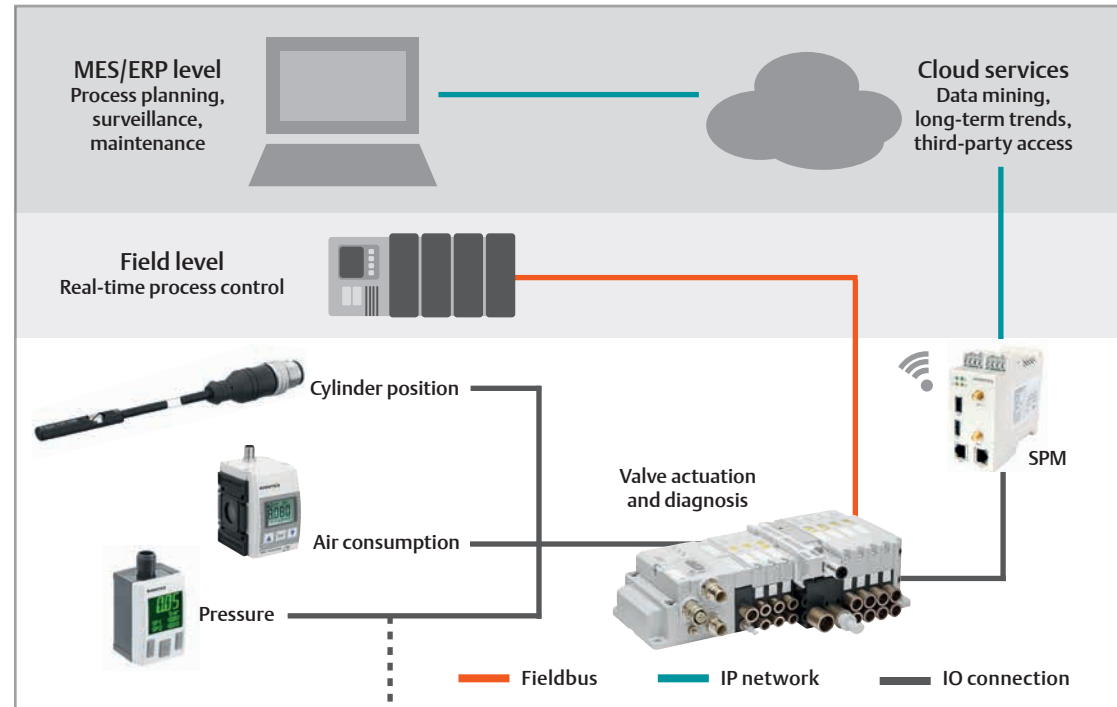
Industrial Internet of Things

Information collected directly within manufacturing processes is becoming a key strategic input to broader business success. Maximum utilization of machine capacities, short maintenance breaks, short cycle times and energy efficiency are essential topics. To prepare your company for these changing demands, Emerson offers solutions that complement and catalyze your IoT strategy.



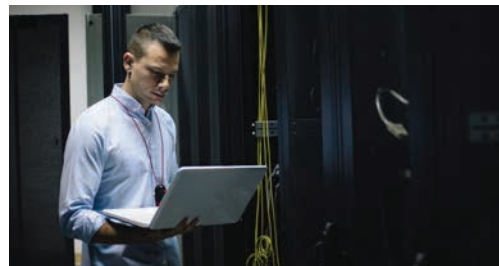
What's your opportunity?

- Every operation and application is different. Work with experts that understand this and look for solutions that drive the required change in your business
- Generate value add information decentralized directly within your pneumatic application, without interfering with your processes
- Improve energy efficiency making energy consumption more transparent and enabling anomalies to be detected earlier



Engage with experts on the industrial internet of things.

Based on our standard product portfolio enhanced by our smart IIoT gateway SPM, we can lower the entry barrier for our customers' first IIoT application or assist in expanding an existing application. Either way, Emerson will support you in finding the right approach for your business.



Services offered...

- Our experts will workshop the value add information potential of your pneumatic application
- Development of the individual combination of hardware, software and connectivity to take the data created and convert to actions

Featured Smart Pneumatics

AVENTICS Smart Pneumatics Monitor



The smart gateway connects your application with your IIoT infrastructure. Data is collected directly from the valve system or from additional sensors and analyzed by the gateway. The gateway sends status messages, minimizing the risk of downtime and lowering operating costs.

- Data collected and analyzed by an algorithm that is unique to the application providing the right information for you to make decisions
- Data analysis and reporting independent of the controller, avoiding complex integration issues
- Support IoT-relevant communication interfaces e.g. MQTT, Cloud Connectors for MS-Azure

AVENTICS Smart Pneumatics Analyzer (SPA)



Portable IIoT unit used to analyze and visualize data from pneumatic installations and systems.

- Enables visualization of live and historical data to assess machine or system performance or the need for maintenance
- By digitizing the pneumatic environment, the SPA provides users with the option to directly experience the benefits of IoT applications on their own machines
- The SPA can be further developed for customers especially according to their applications

Featured products for cloud connectivity

AVENTICS Sentronic IO-Link



High accuracy proportional valve providing data to an IIoT system via IO-Link communications.

- Communications node offers both event based as well as standard I/O mapped diagnostics to an IIoT system, enabling informed decision making on device and machine performance
- Minimal commissioning allowing you get started with IIoT in a simple way
- Can form part of a plant-wide IIoT network enabling greater diagnostic coverage

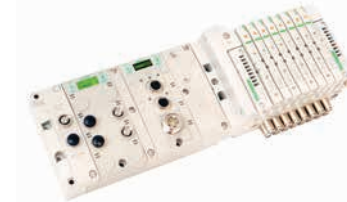
AVENTICS Series AES Fieldbus and I/O



The combination of AV valve system and AES fieldbus system offers best-in-class compact, lightweight and highly modular solutions, as well as providing data to an IIoT system.

- Direct compatibility with SPM IoT gateway, enabling easy access to operational and diagnostic data to make informed decisions
- Pressure sensor module provides additional diagnostics information with minimal set up and integration
- Various I/O modules with M8 and M12 connections are available, enabling flexibility in selection and application

AVENTICS Series G3 and 580 Fieldbus and I/O



Valve systems incorporating an IO-Link master for process applications, easily connected to a process control architecture via Emerson's IIoT CHARMs architecture.

- Installation flexibility due to ATEX certification, panel mount capabilities and I/O on demand.
- Highly distributable products with easy integration to an IIoT system providing greater operational data and further diagnostic coverage
- Unique graphic interface enables trouble-shooting and diagnostic data to be accessed at the device as well as within the IIoT system
- Ethernet and fieldbus connectivity enables diagnostic data to be easily accessed as part of an IIoT system
- Hot swap capabilities enable easy maintenance



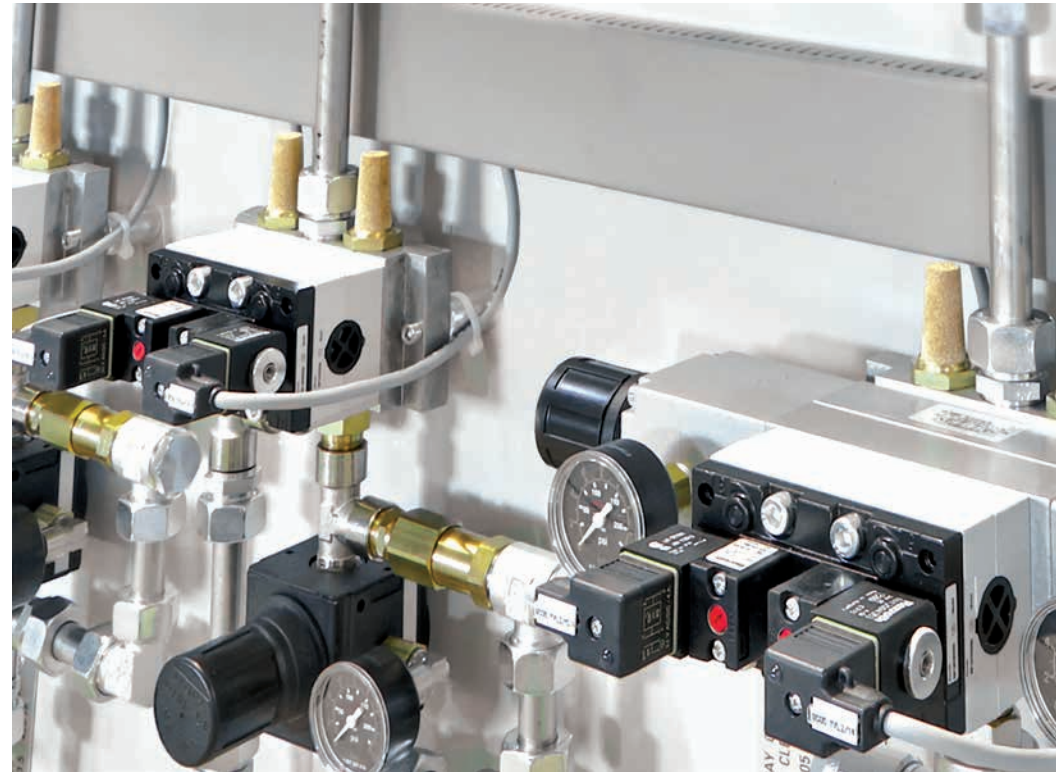
Visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS) to learn more about our IoT technologies.

Cabinets, panels or customized products designed specifically for your application, delivered to site fully certified and ready to go

Emerson's fluid control and pneumatics experts apply industry expertise and clever solutions to your unique business challenges today and tomorrow. We are forward-thinkers – ready to help you with smart technologies, unmatched product reliability, and a proactive, consultative partnership approach, designed to improve your performance.

Our partnership approach means that we do not just supply products. Our speciality is combining our deep application knowledge, with our customer's knowledge of their own business, to create customized solutions that are supplied fully assembled, certified and ready to install.

A customized solution could be as simple as combining two valves on one manifold to perform different functions, a cylinder fully assembled with valves and sensors or a cabinet containing a full pneumatic solution. Purchasing such a solution from Emerson is a more cost-effective alternative, using components from a single manufacturer and saving you valuable engineering time.



Consulting Services

- Application-specific expert consultations
- Design of specific solutions and systems to meet your precise application needs



Project Services

- Procurement and marshalling of all fluid control and pneumatics products needed for your project
- Solution assembly, test and delivery
- On-site service and malfunction analysis of Emerson products and systems or entire processes and machines

A full online world offers easy access to a pneumatics shop and engineering tools



Engineers and technical decision-makers have to tackle complex and time-consuming business processes every day. Emerson's pneumatics online world combines the entire product range, targeted shopping, practical application tools, and comprehensive expertise on one convenient website.

From configuration programs to product information, to the energy savings calculator, many users take advantage of our wide range of practical tools every day. Offering a variety of different functions, our online world is designed for anyone dealing with pneumatic systems and provides you with uninterrupted access to a personalized experience to meet your specific needs. Visit engineering-tools.com



Lifecycle Tools

- Online search, selection and ordering of pneumatics products
- Easy online configuration to select products that meet your unique application needs
- Access to CAD data files for easier system design
- Develop pneumatic circuit diagrams with the online scheme editor
- Cross reference tools to enable easy selection of replacement products



Educational Services

- On-site training tailored to the needs of your staff
- Scheduled training courses to enable your staff develop their skills

Get started



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Emerson delivers time-tested and innovative fluid control & pneumatics solutions designed to help you optimize your business and overcome challenges, today and tomorrow. Contact us now for world-class technologies, and services that can maximize your efficiency. Getting started is easy.
Visit Emerson.com

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