



**Innovative and Future-Proof.  
Our Program for Efficient  
Pneumatics Solutions.**

**AVENTICS™ Pneumatics Solutions**  
Actuators, Valves and Valve Systems, Air Supply Management



# A pneumatics program that opens up a world of opportunities.

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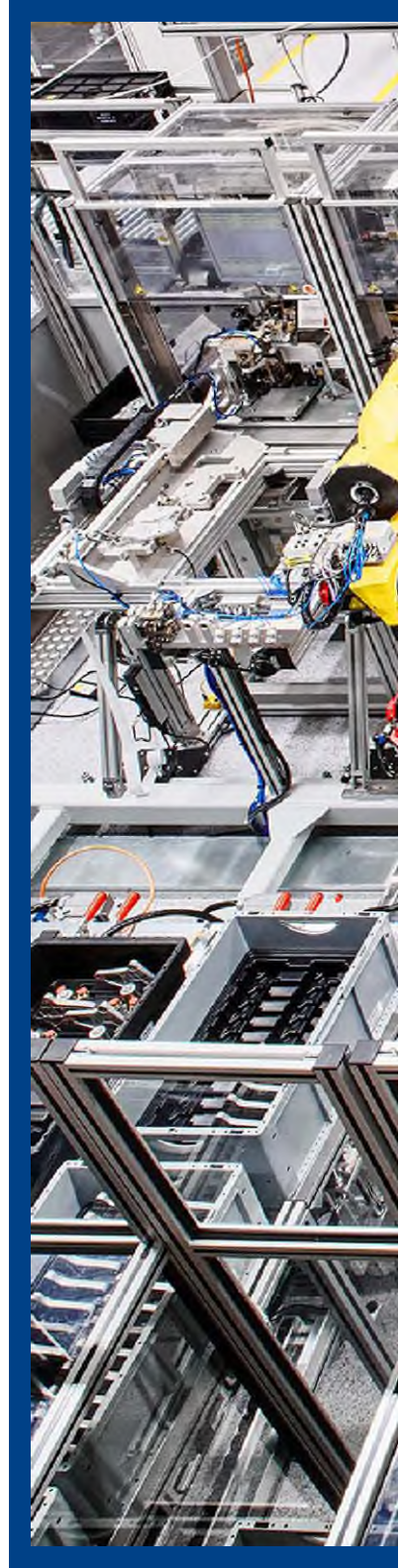
## Our package leaves no gaps in the system.

In good hands right from the start: superior product quality, an extensive product portfolio, solution expertise and target-oriented, long-term support — as an Emerson customer, you can take advantage of everything you need for a future-proof pneumatic solution.

### What we offer:

- Best-in-class products and components
- Expertise in pneumatics: systems know-how and experience in the industry
- Comprehensive automation solutions with pneumatics

Successful collaboration with you is a major building block for our innovation. Each new project and daily practical experience add to our industry expertise and provide crucial inspiration. Functional integration, component reduction, and alternative material management are just some of the current trends on the path to optimized productivity. Thanks to the targeted use of new technologies and materials, as well as the integration of electronic elements, we continually optimize the function and features of our products and solutions. All for your benefit — you can be sure of that.







The products in our portfolio play a major role in automation technology and have been well-received in virtually all industries. We would like to make your automation tasks more efficient with our program.



## With everything you need — all perfectly matched



At Emerson, we know that in the end it's all about your satisfaction. About solutions that work safely and efficiently for your needs and reliably accomplish your automation tasks. Long-lasting and maintenance-free. Our products, components and systems are designed for just that. And that's what we work towards every day.

### **Pneumatic solutions tailored to the application**

It's the perfect interaction of products and components that makes an application successful. Of course, using individual AVENTICS products and components also ensures proven quality for your machines and systems.

But our mission doesn't stop there. We know that maximum efficiency requires all elements of a system to work together in perfect harmony. This is why we offer you solutions, not just products; efficiency, not just functionality. Let's talk about it — take advantage of our expertise in pneumatics for your application tasks!

Emerson across the line: a pneumatic application generally consists of compressed air supply, compressed air control and actuators. For all areas, Emerson offers a comprehensive range of equally innovative and proven products that optimally complement each other in line with our product philosophy. Everything works together perfectly — down to the last fitting.



# Pneumatics Overview

## Actuators

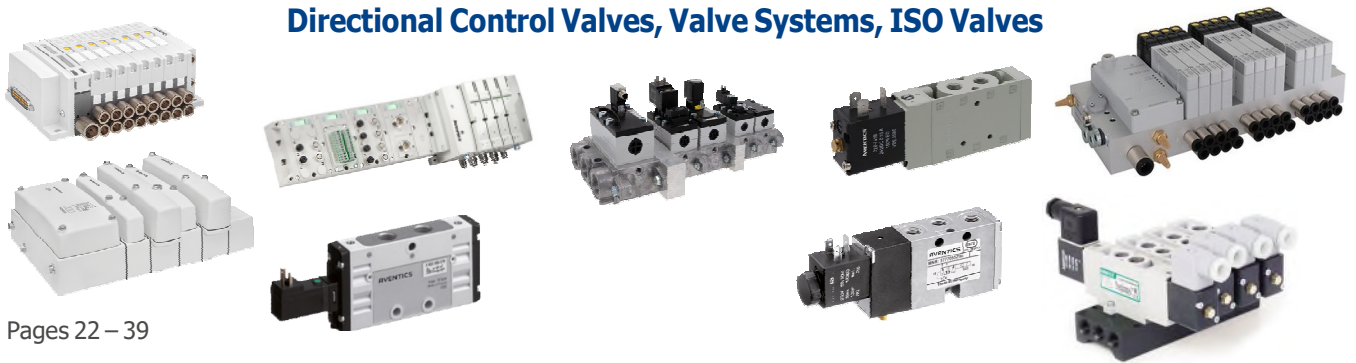
### Cylinders, Slides, Grippers, Accessories



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## Valves and Valve Systems

### Directional Control Valves, Valve Systems, ISO Valves



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## Proportional Technology

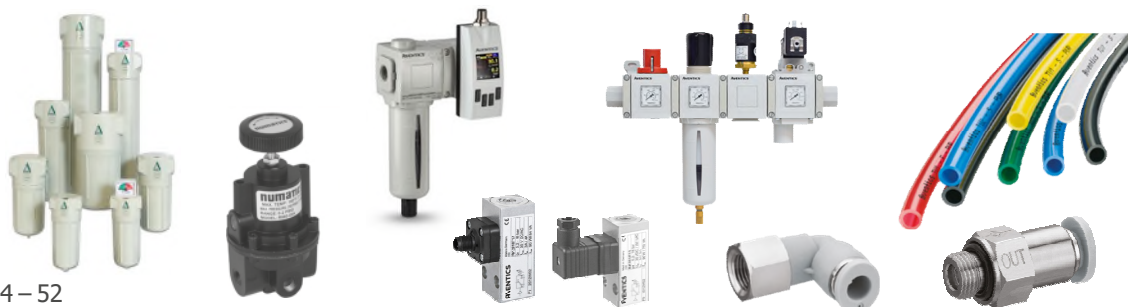
### Proportional Pressure Control Valves



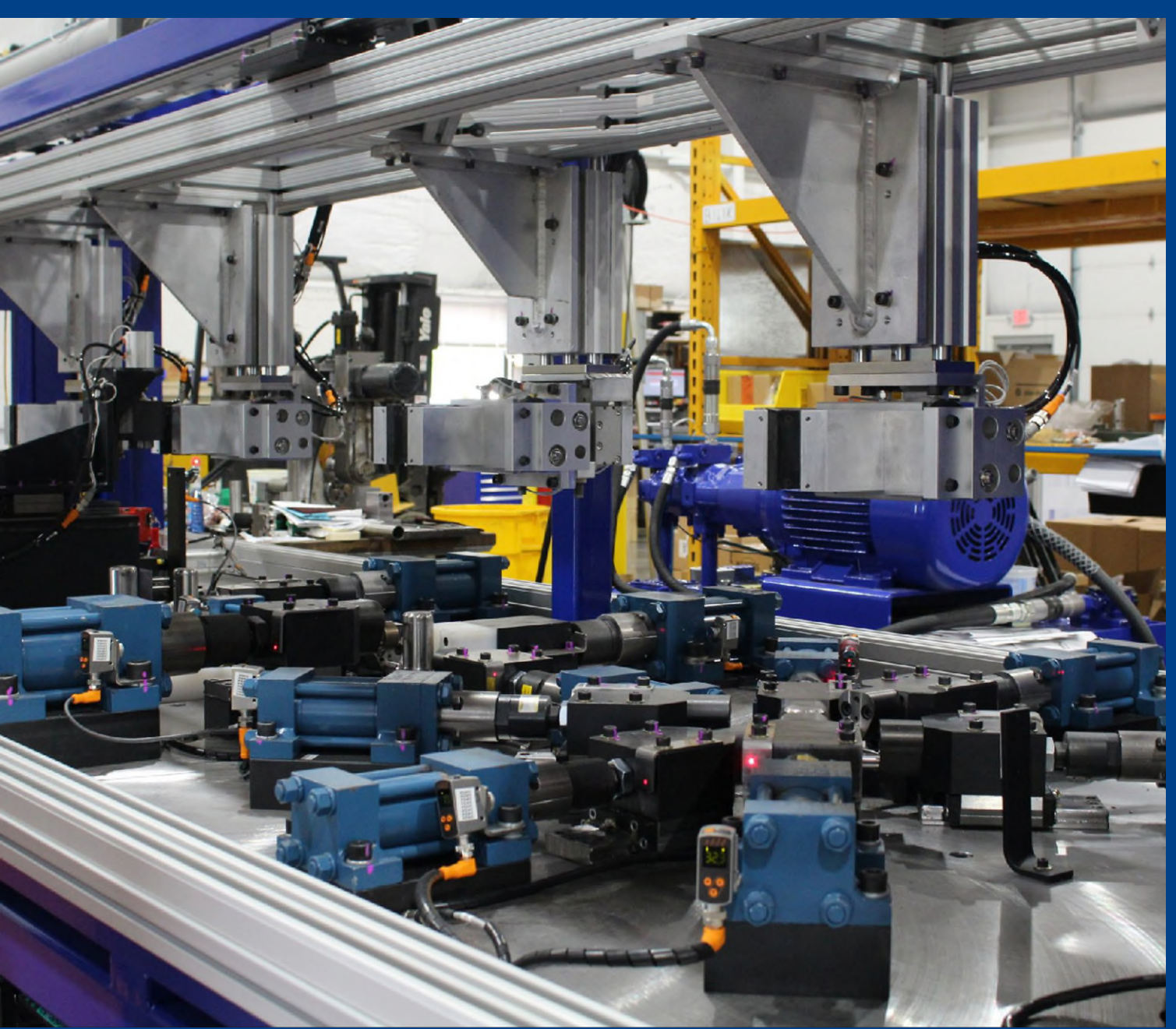
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## Air Supply Management

### Air Preparation Units, Pressure Sensors, Pneumatic Connection Technology



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## **Actuators: movements with precision and power — cylinders and drives for every application**

Whether in extremely tight spaces, in especially tough conditions, or tasks with high hygienic demands — when it comes to our cylinders and drives, there are no unsuitable or unusual environments. Our products have mastered their roles and perform well in every application, whether for fast cycles and sensitive movements, the heaviest of loads or finely metered forces.

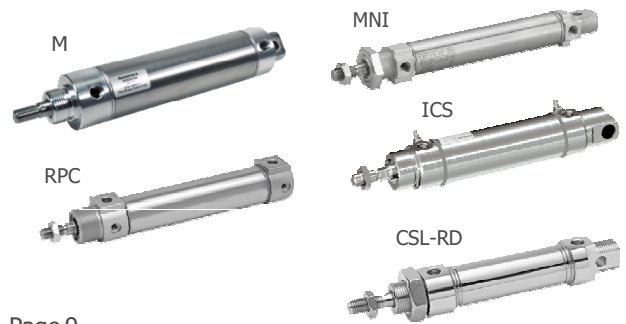


## NFPA Cylinders



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## Mini and Round Cylinders



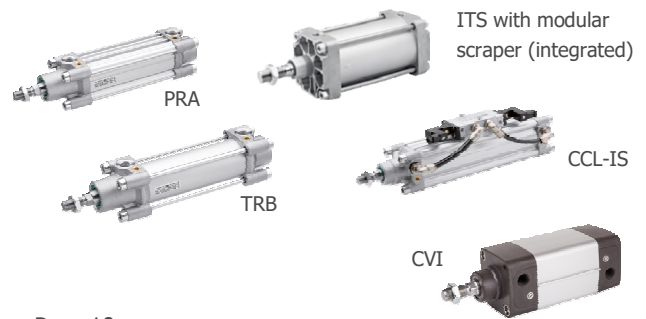
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## Short-stroke and Compact Cylinders



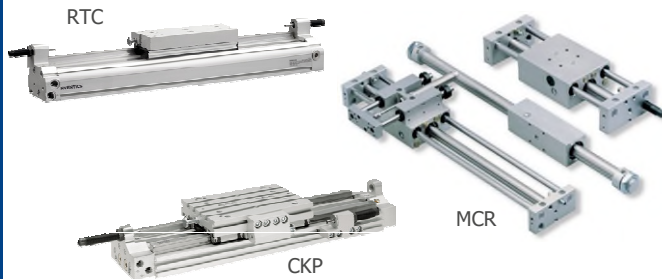
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## Profile and Tie Rod Cylinders



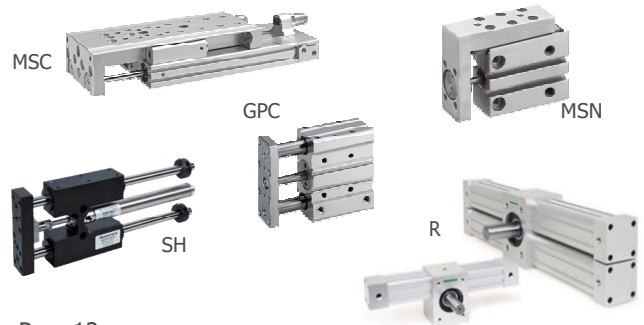
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## Rodless Cylinders



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## Slides, Guided Cylinders & Rotary Actuators



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## Grippers, & Bellows



Page 13

## Special Cylinders & Accessories



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## NFPA Cylinders

### Series PPT, PHT, HHT

PPT, PHT and HHT cylinders are highly customizable and easily adaptable due to the wide range of options and mounting styles. They feature a tie rod design with heavy-duty steel construction for air and hydraulic service.



PPT, PHT, HHT

### Series TM5

TM5 cylinders are versatile due to profile and tie rod versions and feature a rugged yet lightweight aluminum construction with an effective cushioning design.



TM5

### Series A

Series A cylinders are highly customizable and easily adaptable due to the wide range of options and mounting styles. They feature a tie rod design with aluminum construction.



A

### GO and Stroke-To-GO

TopWorx inductive proximity switches are the preferred choice for NFPA cylinders. Featuring a stainless steel construction and a leverless switch design, these switches set the standard for reliability and durability in cylinder position sensing.



GO Switch

### Rod Lock

Designed for static application and to fit on NFPA series cylinders, these units provide precision holding and high accuracy in demanding applications. These spring-engaged, air-released units have very low backlash. Large clamping surface ensures high clamping/holding force with minimal rod wear. The rod locks are sealed and IP67 and NEMA 4X rated.



Rod Lock



## Mini and Round Cylinders

### Series MNI (ISO 6432)

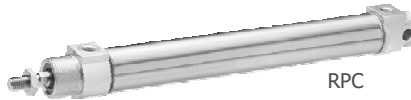
MNI cylinders are ideal for general automation applications. Available in many variants, this cylinder series is characterized by extreme durability and long service life.



MNI

### Series RPC

The Series RPC is the big brother to the MNI and also offers a short variant. The cylinders are easy to clean and are suitable for packaging applications in the food industry thanks to food-grade lubricants.



RPC

### Series CSL-RD (ISO 6432)

The stainless steel Series CSL-RD is available in an ISO version, a short version, and in hygienic design. The cylinders do not have any gaps, feature a low surface roughness, and work with food-grade lubricants and seals. Also available with cushioning adjusted at the factory.



CSL-RD

### Series M

Series M cylinders are built to excel in light-duty cylinder applications. The series offers a multitude of value-added features such as 12 bore sizes, 27 mounting styles, stainless steel piston rods as standard, and it can be easily customized for specific applications. ACCU M variant features an LRT sensor allowing for continuous positioning sensing anywhere along the stroke.



M

### Series ICS-D2

Cylinder series in hygienic design. Stainless steel, smooth surfaces, form-fit seals, and cushioning screws ensure optimal cleaning conditions.



ICS-D2

## Short-stroke and Compact Cylinders

### Series CCI (ISO 21287)

The Series CCI is ideal for increased cycle time and moving mass requirements. It has a compact, easy-to-clean design with integrated sensor slots on all sides, and offers a wide range of variants and equipment details, e.g., an ATEX version or US version with NPTF port threads.



CCI,  
non-rotating

### Series C

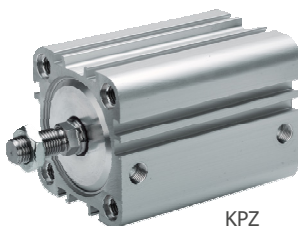
The Series C, available with NPTF ports, has a robust high strength aluminum alloy tube, cast bronze rod bushing and solid aluminum alloy piston, ensuring that this cylinder series will perform in demanding applications in a reduced footprint for tight spaces.



C

### Series KPZ (NFE 49 004)

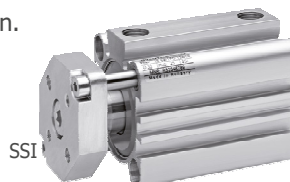
Series KPZ compact cylinders can be used for a wide range of applications thanks to their dimensions based on the established standard NFE 49 004. Also available in an ATEX version.



KPZ

### Series SSI (ISO 15524)

SSI short-stroke cylinders feature a particularly short design and are up to 30% lighter than comparable cylinders thanks to material and component optimization. The 4 and 6 mm slots on all sides provide maximum flexibility for sensor installation.



SSI

### Series KHZ

Series KHZ cylinders feature an extremely compact design and are available from a piston diameter of 8 mm. They are ideal for installation in even the tightest of spaces and can be assembled anywhere, easily and securely.



KHZ

## Profile and Tie Rod Cylinders

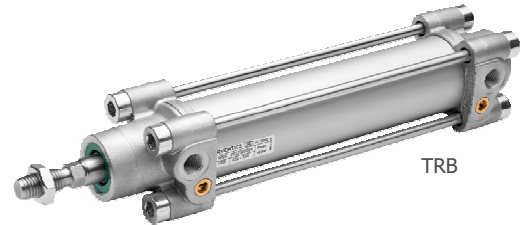
### Series PRA (ISO 15552)

PRA cylinders are based on a compact aluminum profile with integrated 4 and 6 mm sensor slots for simple, space-saving installation of sensor technology.



### Series TRB (ISO 15552)

TRB cylinders with a classic design featuring smooth tubing and tie rods offer an impressive load capacity and adaptability to existing processes.



### Series ITS (ISO 15552)

ITS cylinders are used for moving masses up to several tons. As standard, they are equipped with a configurable scraper module from the modular sealing system.



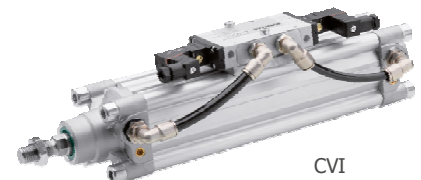
### Series CCL-IS (ISO 15552)

This cylinder in clean design is produced specifically for packaging applications in the food industry. It is characterized by practical sensor mountings and its hygienic design that combines simple cleaning with low maintenance.



### Series CVI (ISO 15552)

Cylinder valve units can also be configured online with the ISO cylinder series PRA and TRB, and five freely combinable valve series.



## SPRA Electric Rod Style Actuator (ISO 15552)

Simply SPRA electric rod style linear actuator is a cost-effective high-performance solution offering enhanced load capacity, accuracy, and reliability. In addition to providing outstanding precision and repeatability, the Series SPRA is also extremely versatile and flexible with a choice of lead, ball, or roller screw technologies that allow implementation within a wide range of applications and can meet exacting application requirements.

- Size: 32 / 40 / 63 / 100mm
- Stroke: up to 2000mm
- Max dynamic load capacity: 106kN (23830 lb-f)
- Max linear speed: 1m/s
- Max acceleration: 12 m/s<sup>2</sup>
- Configurable with Emerson and third-party motors
- Easily customize solution with interconnected online tools and configurator

SPRA Home Page

[\(click here\)](#)

Sizing Tool

[\(click here\)](#)

Configurator Tool

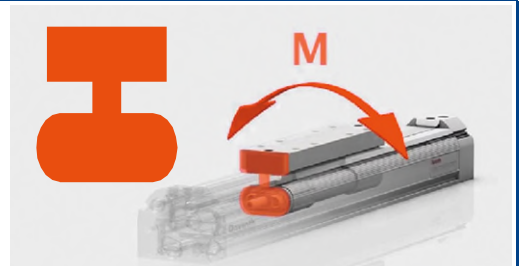
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## Rodless Cylinders and Guided Slide Units

The unique oval piston shape and one-piece slide/piston unit enables higher loads and torques, and highly compact designs. Users achieve the same performance with far more compact cylinders, which cuts down on weight and costs.



### Series RTC

RTC offers multiple design variants with different strengths for movement and positioning as well as a wide range of speeds. They are available as a basic version and slide bearing, compact guide, and heavy-duty versions for large loads. The unique oval piston shape and one-piece slide/piston unit enables higher loads and torques, and highly compact designs. Users achieve the same performance with far more compact cylinders, which cuts down on weight and costs.



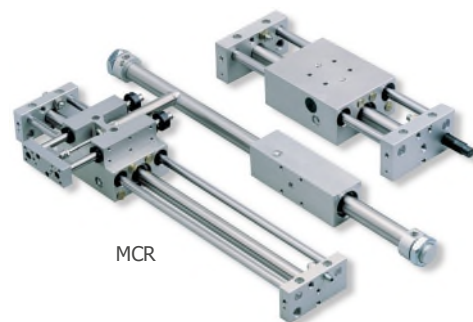
### Series CKP

CKP is particularly suitable for applications requiring the movement of heavy loads. It provides sturdy, ultra-precise guiding with excellent repeatability.



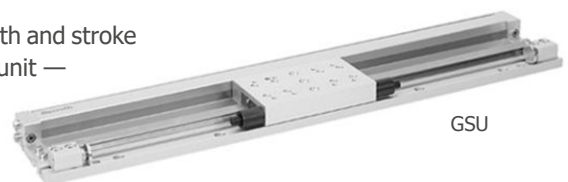
### Series MCR

MCR cylinders are designed with a piston and cartridge that are coupled using rare earth magnets. When the cylinder is pressurized from one end, the piston will travel the length of the tube, which in turn moves the carriage.



### Series GSU

GSU cylinders are the ideal basis for many handling systems. Stroke length and stroke position can be set variably along the entire length of the guided slide unit — individually from both sides, underscoring the great flexibility during installation. Their very low height and the option of ventilation from one side improve their integration capacity.



For further information on these or any other AVENTICS product, visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)

# Slides, Guided Cylinders and Rotary Actuators

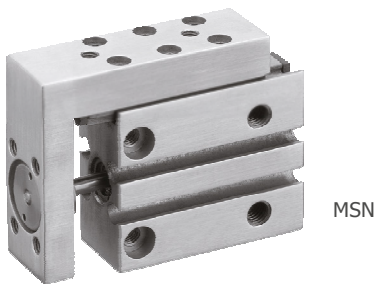
## Series SH, LCX and LC

Series SH, LCX and LC slides provide guided linear motion and ensure greater resistance to side loads, non-rotating effect and optimal alignment. Available in a multitude of bearing designs, the SH Series offers a robust solution for applications requiring large loads and high precision whereas Series LCX and LC offer reduced space but lower load capacities.



## Series MSN

MSN offers precise guidance without play in a slim package. A wide variety of attachment and air supply and exhaust options allows for application in virtually any position and location.



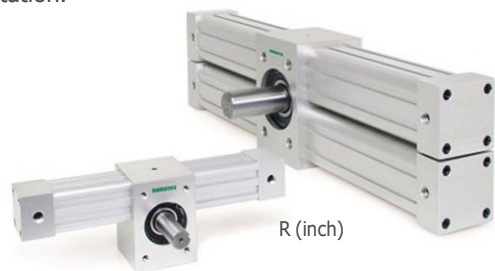
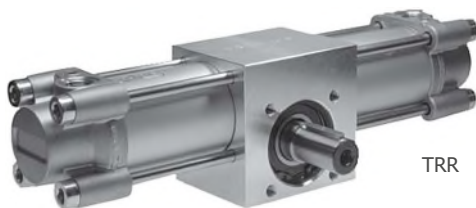
## Series CGT and GPC

The robust design is particularly reliable and absorbs high torques and transverse forces. Several mounting options make this ideal for minimum space requirements.



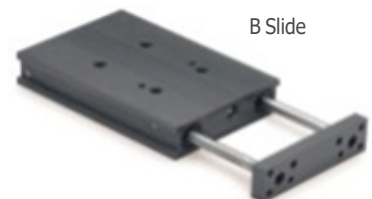
## Series R and TRR

Rack and pinion type rotary actuators provide high torque for a wide range of applications; customizable for inch or metric connections with a variety of angles of rotation.



## MSC, B Slide and TJ Gripper

Series MSC mini slides, B Slides and TJ jaw grippers combine a compact design, flexibility and reliability for automation and pick-and-place applications.





## Special Cylinders

### Series KG

KG cylinders provide a versatile method to automate knife gate valves and are designed to withstand harsh applications in water and wastewater treatment facilities, power plants, pulp and paper mills and mining operations.



### Series 412

Series 412 power clamps are available in both NAAMS and International mounts with flexible options for arm type, material and position. The rugged, lightweight clamp body with fully enclosed design allows for use in weld splatter applications without damaging the piston rod or seals.



## Bellows Actuators

### Series BCP, BCC, BRB and BCR

Bellows actuators are suitable for angular movements and axial displacements, virtually wear and maintenance-free due to frictionless movement and capable of handling high forces in the tightest spaces. Available in many sizes and in different variants (single, double, or triple bellows), our offering covers a wide range of applications.



BCC



BCR



BRB



For further information on these or any other AVENTICS product, visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)



## Modular Scraper System

The modular scraper system enables individual adaptation to the requirements of the respective application. This means maximum flexibility, optimal scraping, higher performance and lower costs for maintenance and downtime. Standard for the Series ITS cylinder and optional for PRA/TRB and CCL-IS cylinders.

Each of the cylinder series features five scraper modules. They are available separately with fully installed seals, bushings and metal scrapers, and can be exchanged at any time, quickly and easily, without dismantling the cylinder.

### Mounting Accessories

#### Series CM1 Cylinder Mountings



CM1

#### Series CM2 Piston Rod Mountings



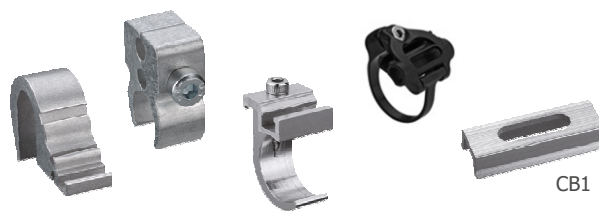
CM2

#### Series CG1 Guide Units



CG1

#### Series CB1 Sensor Mountings



CB1



## Locking Units

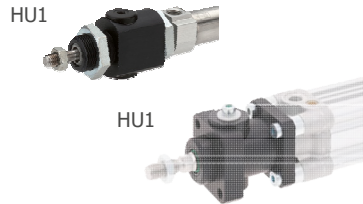
### NFPA Rod Locks

Powered by a spring locking mechanism, these rod locks provide reliable clamping forces and are available with pneumatic or hydraulic release based on the selection of the actuator and application requirements.



### Series HU1 Holding Unit

The Series HU1 holds piston rods using spring force. A corresponding adapter is used for attachment to the cylinder. Holding cartridges can be exchanged in case of wear.



### Series LU6 Locking Unit

The LU6 is a mechanical holding unit/dynamic brake for piston rods in pneumatic cylinders according to ISO 15552 or comparable round bars. This unit is certified to be used in accordance with ISO 13849.



LU6  
Dynamic brake

## Cylinder Sensors

### Position Detection

Broad range of space saving detection options including reed switches and electronic versions. Series ST4, ST4-2P, ST6 and 494.



### Series SM6/SM6-AL

Series SM6 and SM6-AL sensors enable high-resolution, permanent distance measurement and are ideal for continual detection of piston movements in pneumatic cylinders within the maximum measurement range of 1,007 mm. Thanks to an intuitive teach pad, a 4-color LED display and IO-Link communication, the SM6-AL is also easy to start up in next to no time.



### Other Sensors

TopWorx inductive proximity switches are the preferred choice for NFPA cylinders. Featuring a stainless steel construction and a leverless switch design, these switches set the standard for reliability and durability in cylinder position sensing.

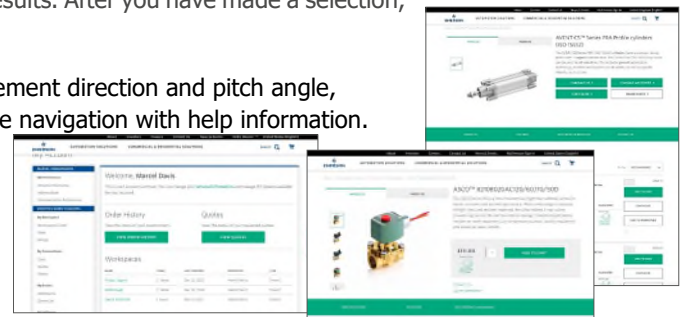


GO Switch 75 and  
Stroke-to-GO

## How to find the perfect cylinder for your application










Simply enter the key performance parameters for your new application to get an overview of all possible cylinders. Additional filters and comparison analyses narrow down your results. After you have made a selection, you are forwarded to the directly linked configuration program.

- Application data input: stroke, mass load, time, load movement direction and pitch angle, cycles per hour, optional additional detailed data – intuitive navigation with help information.
- As a result, all possible cylinder series are listed with the Key basic data and additional comparison values – weight, speed, air consumption, etc.
- The selection can be refined according to the desired specifications via the comprehensive filter menu.









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## NFPA, Profile and Tie-Rod Cylinders







Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
PPT (NFPA) 		1 1/2 – 14 in	Steel	<ul style="list-style-type: none"> <li>- Designed and built to last in the most demanding applications</li> <li>- Encompasses many value-added features including heavy-duty steel construction, extra long bronze rod bearing and Exact-a-just™ cushioning</li> <li>- Extensive range of options and highly customizable</li> <li>- Series PPT/PHT is rated for pressures up to 250 psi (air) and 1,500 psi (hydraulic)</li> <li>- Series HHT is rated for pressures up to 3,000 psi (nominal) and 5,000 psi (non-shock)</li> </ul>
PHT (NFPA) 		1 1/2 – 14 in	Steel	
HHT (NFPA) 		1 1/2 – 14 in	Steel	
TM5 (NFPA) 		1 1/2 – 14 in	Aluminum	<ul style="list-style-type: none"> <li>- Designed and built to perform in demanding applications</li> <li>- Ideal cushioning design for high energy actuation with lower cycle time and vibration without sacrificing longevity</li> </ul>
A (NFPA) 		1 1/2 – 14 in	Aluminum	<ul style="list-style-type: none"> <li>- Designed and built to excel in many applications</li> <li>- Encompasses many value-added features including an extra long graphite-filled cast iron rod bushing and a large piston wear band</li> <li>- Extensive range of options and highly customizable</li> </ul>
S (NFPA) 		1 1/2 – 8 in	Stainless Steel	<ul style="list-style-type: none"> <li>- Designed and built to perform in the toughest “wash down” applications</li> <li>- Stainless steel construction provides outstanding corrosion resistance while including a multitude of favorable design features</li> </ul>
F (NFPA)		1 1/2 – 4 in	Aluminum	<ul style="list-style-type: none"> <li>- Designed for applications where piston rotation is not acceptable</li> <li>- Innovative dual rod design provides precision positioning and linear movement</li> </ul>
PRA  ISO 15552		32 – 125 mm	Aluminum	<ul style="list-style-type: none"> <li>- Compact aluminum profile with integrated 4 and 6 mm sensor slots for simple, space-saving installation of sensor technology</li> <li>- Ideal cushioning design and wide range of variants and accessories</li> </ul>
TRB  ISO 15552		32 – 125 mm	Aluminum	<ul style="list-style-type: none"> <li>- Classic aluminum tie rod design featuring smooth tubing and offering an impressive load capacity and adaptability</li> <li>- Ideal cushioning design and wide range of variants and accessories</li> </ul>
ITS ISO 15552		160 – 320 mm	Aluminum	<ul style="list-style-type: none"> <li>- Heavy-duty applications; up to five tons can be moved by a single cylinder</li> <li>- Allows the simple and cost-effective automation of extremely powerful applications</li> </ul>
CCL-IS  ISO 15552		25 – 125 mm	Aluminum	<ul style="list-style-type: none"> <li>- Clean design is produced specifically for packaging applications in the food industry</li> <li>- Lubricants (NSF-H1) are approved for food applications</li> </ul>
CVI ISO 15552		32 – 125 mm	Aluminum	<ul style="list-style-type: none"> <li>- Ready-to-install cylinder valve unit with PRA/TRB cylinder and one of five different spool valves</li> <li>- Typical applications: open/close functions such as flap controls and spool applications</li> </ul>




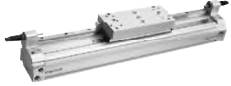


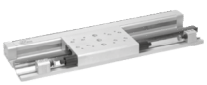
## Round and Mini Cylinders

Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
MNI ISO 6432		10 – 25 mm	Stainless Steel Aluminum	<ul style="list-style-type: none"> <li>- Robust and space-saving design</li> <li>- Characterized by extreme durability and a long service life</li> </ul>
M and ACCU M		5/16 – 3 in	Stainless Steel Aluminum	<ul style="list-style-type: none"> <li>- Competitive non-repairable round cylinder, ideal for light-duty applications</li> <li>- Highly customizable and with an extensive range of options and mounting styles available</li> <li>- Stainless steel options available</li> <li>- ACCU M variant allows for continuous position sensing anywhere along the stroke (1 1/16 – 3 in bores)</li> </ul>
RPC		32 – 63 mm	Stainless Steel Aluminum	<ul style="list-style-type: none"> <li>- Compact and space-saving design (short variant without bottom thread for even more compact requirements)</li> <li>- Corrosion-resistant materials: tube and piston rod made of stainless steel and covers made of anodized aluminum</li> </ul>
CSL-RD ISO 6432		16 – 25 mm	Stainless Steel	<ul style="list-style-type: none"> <li>- Stainless steel cylinder with a hygienic design</li> <li>- Certified according to Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food</li> <li>- Ideally suited for the F&amp;B splash zone</li> </ul>
ICS ISO 6431		32 – 100 mm	Stainless Steel	<ul style="list-style-type: none"> <li>- Fully stainless-steel cylinder for harsh environments</li> <li>- Hygienic design intended for environments with direct contact with food</li> </ul>
ICM ISO 6432		8 – 32 mm	Stainless Steel POM	<ul style="list-style-type: none"> <li>- Lightweight design</li> <li>- Food- and beverage-compatible materials (NSF-H1 grease, stainless steel, water-repellent POM covers)</li> </ul>



## Short-stroke and Compact Cylinders

Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
SSI ISO 15524		12 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Optimized for length and weight compared to other compact cylinders</li> <li>- Non-rotate, spring-retract, optional magnet, double rod and sensor intergration options</li> </ul>
CCI ISO 21287		16 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Simple sensor assembly along the complete cylinder length thanks to a continuous aluminum profile</li> <li>- Excellent flexibility thanks to hollow piston rod, multi-position, tandem, integrated holding or braking unit</li> </ul>
C		3/4 – 4 in	Aluminum	<ul style="list-style-type: none"> <li>- Robust compact and low profile cylinder, designed to fit tight space requirements</li> </ul>
KPZ NFE 49004		16 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Excellent flexibility thanks to hollow piston rod, multi-position, integrated holding unit</li> <li>- Simple sensor assembly along the complete cylinder length thanks to a continuous aluminum profile</li> </ul>
KHZ		8 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Clean profile</li> <li>- For applications requiring a very short/narrow cylinder</li> </ul>
CCL-IC ISO 21287		16 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Compact clean design with anodized surfaces</li> <li>- Lubricants (NSF-H1) are approved for food applications</li> </ul>

## Rodless Cylinders













Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
RTC 		16 – 80 mm	Aluminum	<ul style="list-style-type: none"> <li>- Comprehensive range with many variants and options enables configurations that are individually tailored to the application</li> <li>- Oval piston, ideal cushioning and Easy-2-Combine interface</li> <li>- Bore sizes per variant: RTC-BV = 16 – 80 mm, RTC-SB = 25 – 50 mm, RTC-CG = 16 – 40 mm, RTC-HD = 16 – 63 mm</li> </ul>
MCR		12 – 40 mm	Aluminum	<ul style="list-style-type: none"> <li>- Magnetically coupled rodless cylinders</li> <li>- Guided series end plate design allows easy shock absorber installation for optimum load deceleration</li> </ul>
CKP		16 – 32 mm	Aluminum	<ul style="list-style-type: none"> <li>- High load capacity with two linear guides, clearance-free</li> <li>- Provides sturdy, ultra-precise guiding with excellent repeatability</li> <li>- Easy-2-Combine interface</li> </ul>
GSU		16 – 25 mm	Aluminum	<ul style="list-style-type: none"> <li>- High load capacity with optimized height</li> <li>- Stroke length and position can be variably adjusted over the entire length — individually from both sides</li> <li>- Easy-2-Combine interface</li> </ul>

## Slides, Guided Cylinders and Rotary Actuators

Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
SH 		5/16 – 3 in	Aluminum	<ul style="list-style-type: none"> <li>- Robust linear slide for heavy loads and moderately long stroke applications</li> <li>- Wide range of bearing, mounting and shock absorber options. Durable polyurethane bumpers as standard.</li> </ul>
LCX		3/4 – 1 1/2 in	Aluminum	<ul style="list-style-type: none"> <li>- Economical linear slide with high load capability</li> <li>- Tool plate motion guided by two hardened linear rods supported by polymer plastic bushings</li> </ul>
PST		8 – 25 mm	Aluminum	<ul style="list-style-type: none"> <li>- Precision slide with dual square rails for high load capacity and precise linear motion</li> </ul>
MSC		8 – 25 mm	Aluminum	<ul style="list-style-type: none"> <li>- Mini slide with one-piece slide table for maximum stability and reliable precision</li> <li>- High torque and load absorption with maximum stability</li> </ul>
PBS		3/4 – 1 1/4 in	Aluminum	<ul style="list-style-type: none"> <li>- Power block slide</li> <li>- Features low friction U-cup seals and ball bearings</li> </ul>
B Slide		7/16 – 7/8 in	Aluminum	<ul style="list-style-type: none"> <li>- Compact linear slide</li> <li>- Strokes up to 4 in</li> </ul>



**Slides, Guided Cylinders and Rotary Actuators** (continued)

Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
CGT 		16 – 50 mm	Aluminum	- Compact guide slide with slide and ball bearing versions available
GPC		10 – 100 mm	Aluminum	- Guided precision cylinder with two guide rods for high side load capacity and high precision - Easy-2-Combine interface - Slide and ball bearing versions available
SPS		1/2 – 3/4 in	Aluminum	- Small power slide with heavy cross section T-slot for superior load bearing capabilities
GS		3/4 – 2 in	Aluminum	- Gantry slide with carriage moving between two fixed tool bars
MSN		6 – 16 mm	Aluminum	- Mini slide offering precise guidance in a very narrow package - High torque and load absorption with maximum stability
TWC		6 – 32 mm	Aluminum	- Compact twin rod slide providing high force with low space requirements - Available with end position lock feature with pressure drop
TRR		32 – 100 mm	Aluminum	- Rack-and-pinion design with metric connections, magnetic piston and adjustable pneumatic cushioning - Angle of rotation (90, 180 and 360)
R 		1 – 3 1/4 in	Aluminum	- Rack and pinion design with Imperial connections - Angle of rotation (45, 90, 180, 270 and 360), flexible port location - Double rack option available
RCM		6 – 25 mm	Aluminum	- Low profile rotary with two independent pistons, angle of rotation (90 and 180)
RAK		0.15 – 10 mm	Aluminum	- Compact double acting rotary wing drive Two different sizes with either one or two wings

## Grippers

Series	Picture	Type	Body Material / End Covers	Features and Benefits
WBG		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- Utilizes large jaw support shafts and four independent pistons to handle large objects</li> <li>- Non-synchronous operation option available</li> </ul>
NRG		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- One-piece body construction for maximum rigidity</li> <li>- Synchronizing mechanism housed internally and protected from external contamination</li> </ul>
RPG		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- Low profile with true parallel motion that is generated by a pinion mechanism powered by a double acting piston</li> </ul>
WG		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- Guided wedge gripper</li> <li>- Achieves synchronous motion with a double acting piston attached via the piston shaft to a double side wedge</li> </ul>
MPG5		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- Designed for pick and place of small objects</li> <li>- Unique design with dual-purpose purge port</li> </ul>
PG		Parallel	Aluminum	<ul style="list-style-type: none"> <li>- Low profile gripper</li> <li>- True parallel motion generated by a pinion mechanism powered by a double acting piston</li> </ul>
GR		Angular	Aluminum	<ul style="list-style-type: none"> <li>- Unique double toggle link mechanism design</li> <li>- 180 degrees of jaw motion</li> </ul>
AG		Angular	Aluminum	<ul style="list-style-type: none"> <li>- Unique cartridge style design offers the greatest grip force to size ratio over other conventional designs</li> </ul>
PG6J80		Jaw	Aluminum	<ul style="list-style-type: none"> <li>- Utilizes six jaws in synchronized parallel motion</li> <li>- Ejectors operate independent of the gripper jaws</li> </ul>



## Bellows and Special Cylinders

Series	Picture	Bore Size	Body Material / End Covers	Features and Benefits
Bellows  (imperial and metric)		60 – 950 mm	Rubber	<ul style="list-style-type: none"> <li>- Available in single, double and triple convolutions with multiple options and elastomers</li> <li>- Multiple designs to choose from including crimped connecting plates, removable mounting plates or with bead-rings</li> </ul>
KG		1 1/2 – 24 in	Steel	<ul style="list-style-type: none"> <li>- Knife gate cylinder designed to automate valve operation</li> <li>- Wide range of options</li> <li>- Max. pressure: 150 psi</li> </ul>
RDC		52.5 – 115 mm	Steel	<ul style="list-style-type: none"> <li>- Diaphragm actuator, power transducer and pressure intensifier</li> <li>- Extraordinary low friction for precise force control</li> </ul>
SC		25 – 63 mm	Aluminum	<ul style="list-style-type: none"> <li>- Swing clamp actuator</li> <li>- Combines linear and rotary motions</li> </ul>
412 Power Clamps 		25 – 80 mm	Aluminum	<ul style="list-style-type: none"> <li>- Competitive interchangeability with pneumatic clamps and NAAMS Standard clamps</li> <li>- Internal sensor for positive feedback of actuation</li> <li>- Fully adjustable opening angle from 0 – 135 degrees</li> </ul>
SWN		6 – 16 mm	Brass	<ul style="list-style-type: none"> <li>- Miniature single-acting cylinder</li> <li>- Simple mounting by using the continuous thread</li> </ul>
SPRA 		32 – 100 mm	Aluminum	<ul style="list-style-type: none"> <li>- Electric Rod Style Actuator</li> <li>- Max acceleration: 12m/s<sup>2</sup></li> <li>- Max dynamic load: 106kN (23830 lb-f)</li> </ul>



## Valve technology: precise drive and control

Valves and valve systems play a key role in pneumatic solutions. And that's why no compromises are made here — only the best for our customers. Innovation and quality from Emerson. With precise commands, our valves and valve systems control the pneumatic components in all automation processes. We have the right program for you — best in class.

## Directional Control Valves



TC08/15



490/579/589



L1/L2



Mark 3/8/15/55



CL03-EV



CD04/07/12



L01



740/840



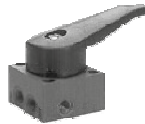
AP



563/565/567



ST



Rotair Block



LS04

Pages 24 – 28

## Valve Systems



TC08/15



HF02-LG



XV03/XV05



AV03/AV05



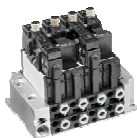
501/502/503



CL03

Pages 29 – 31

## ISO Valves



CD01-PA  
(ISO15407-1)



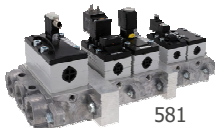
CD02-AL  
(ISO15407-1)



511/512/513  
(ISO5599-2)



CERAM Valve  
(ISO5599-1)



581  
(ISO5599-1)



502/503  
(ISO15407-2)



Pages 32 – 35

## Fieldbus and IO Solutions



AES



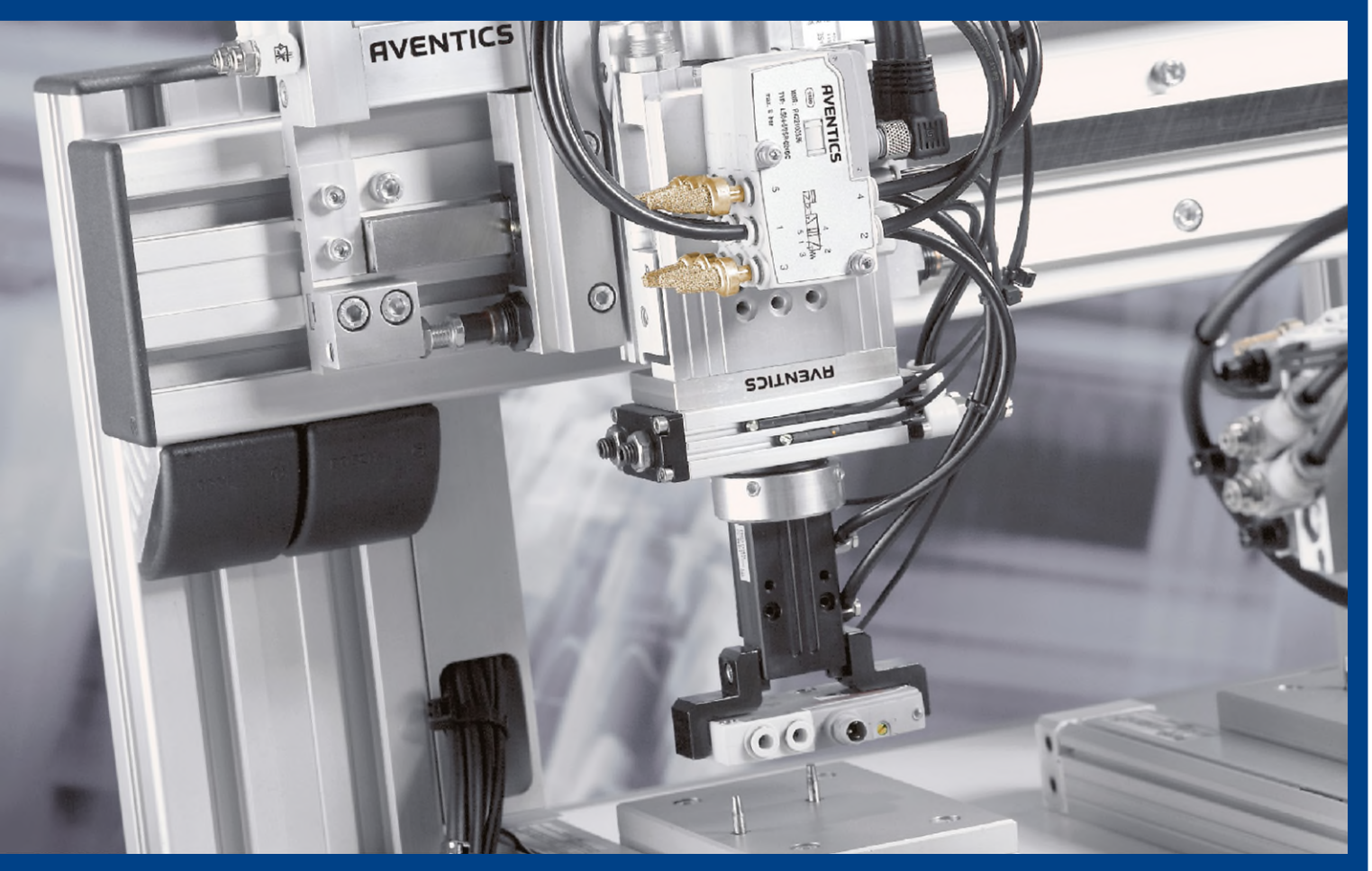
580



G3

Pages 36 – 39





## Directional control valves for different tasks — as single valves or valve system assemblies

### Ideal for decentralized applications

For applications indoors or outdoors, in extreme cold or heat, for delicate work or tasks demanding enormous power — our range of directional valves has the right valve solutions for every situation. From the Clean Line valve for wash-down applications in the food industry, to the special valve for use in furnaces in the aluminum industry — the single valves with flow rate performances from a minimum of 0.05 to a tremendous 13.62  $C_v$  are tailored to a broad spectrum of applications with their specific characteristics.

# Directional Control Valves

## Series L01/L1/L2

The Series L01 direct solenoid actuated and L1/L2 spool-and-sleeve valves offer high speed and high flow capacity from 0.2 C<sub>v</sub> (L01) and 1.0 to 1.7 C<sub>v</sub> (L1/L2) in a compact design. They are available either with solenoid pilot, air pilot, or hand lever actuation for inline mounting or on manifolds from 2 to 12 stations.



L Series

## Series TC

The Series TC08/TC15 includes a wide range of spool valves with housings made of high-performance polymers with robust and flexible metal inserts. They are designed for flow rate performances from 0.8 to 1.5 C<sub>v</sub>. These directional valves are easy to assemble, making them ideal for applications requiring the highest efficiency in limited spaces.



TC15

TC08

## Series CD

The Series CD is available in three sizes from 0.9 to 4.1 C<sub>v</sub> as electrically, pneumatically, and mechanically and manually operated valves. They consist of various spool valves with an extremely durable die-cast zinc housing. Their electrical, pneumatic or mechanical actuating controls (roller, lever, pedal or plunger) make the Series CD ideal for applications in harsh environments.



CD07

## Series Mark 3/8/15/55

The rugged spool and sleeve design makes this a top choice in the harshest environments offering flows from 0.18 to 5.4 C<sub>v</sub>. They are available with direct solenoid, air pilot or solenoid pilot depending on series. These valves can be base or manifold mounted with sandwich speed controls and regulators.



Mark 3

Mark 8

Mark 15

Mark 55

## Series LS04

The Series LS04 are lightweight spool valves and save space with their polyamide housing. The valves are suitable for direct mounting onto moving machines and system parts.



LS04-XS

LS04-AF

## Series 490/579/589

The Series 490/579/589 featuring poppet valve technology have a robust polymer housing that can be mounted individually or as a block. They cover a large range of voltages and feature fast connections for pneumatic tubing.

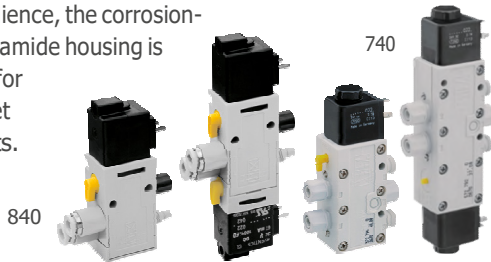


579

## Directional Control Valves

### Series 740/840

The Series 740/840 feature directional control with soft, abrasion-free diaphragm technology. The simple, reliable and robust design is suitable for all air qualities and ensures high repeatability and unsurpassed service life. Due to its excellent resilience, the corrosion-resistant polyamide housing is also suitable for dusty and wet environments.



### Series CL03-EV

CL03 is resistant to cleaning agents and aggressive chemicals and is ideal for wash-down applications, even under harsh conditions. The series complies with protection class IP69K, is suitable for class NSF-H1 lubricants and designed for intensive applications in the food and beverage industry.



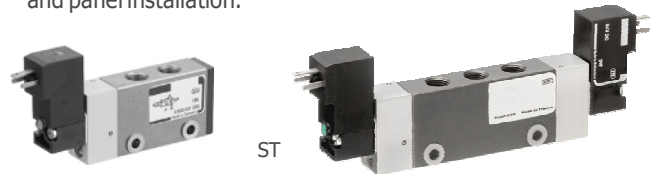
### Series AP

The Series AP offers a wide range of poppet valves with aluminum housing. With many actuation control versions available (roller, lever, pedal, push-button or plunger) the Series AP is the universal solution for automation systems and panel installation.



### Series ST

The Series ST offers a comprehensive range of spool valves with hardened stainless steel housing. The metal sealing system ensures their extended service life independent of the air quality. Their electrical, pneumatic or mechanical actuating controls (roller, lever, push-button or plunger) make the Series ST ideal for demanding industry applications and panel installation.



### Series 563/565/567

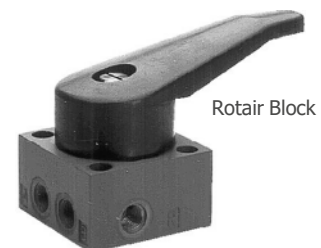
The Series 563/565/567 have an aluminum housing and are suited for assembly on single or manifold subbases and offer flow rate performances of up to 13.62 C<sub>v</sub> with a working pressure of up to 435 psi.



563/565/567

### Series Rotair Block

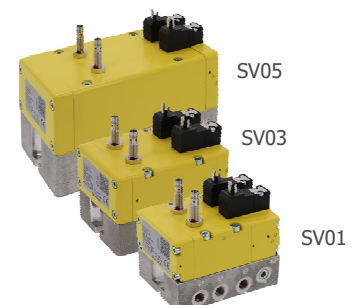
The Series Rotair Block are manually operated poppet valves with a flow rate up to 1.2 C<sub>v</sub>. With their simple and robust design they are always ready for applications and easy to operate even with work gloves.



Rotair Block

### Series SV01/SV03/SV05

The Series SV01/03/05 double valves are redundant 3/2 and 5/2 valves for external monitoring. They are designed to meet the needs and requirements of safe air supply and exhaust 3/2 valve and safe cylinder return 5/2 valve applications for machinery with pneumatic controls according to the requirements of ISO 13849-1-2 for safety functions.














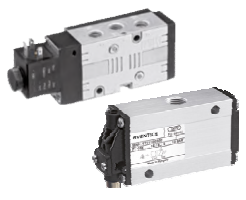












SV05

SV03

SV01



## Directional Control Valves

Series	Picture	Max. Flow	Piloting	Benefits
L01 		0.2 C <sub>v</sub>	Electric	Direct solenoid, robust, base plates
L1  L2 		1.0 C <sub>v</sub> 1.7 C <sub>v</sub>	Pneumatic, electric, solenoid pilot	Spool-and-sleeve, robust, base plates, accessories
TC08  TC15 		0.8 C <sub>v</sub> 1.5 C <sub>v</sub>	Pneumatic, electric	Small size, 2x3/2, valve system version
CD04  CD07  CD12 		0.9 C <sub>v</sub> 1.2 C <sub>v</sub> 4.1 C <sub>v</sub>	Mechanic, manual, pneumatic, electric	Robust, reliable, ATEX (CD07)
Mark 3  Mark 8  Mark 15  Mark 55 		0.18 – 0.35 C <sub>v</sub> 0.79 – 0.99 C <sub>v</sub> 1.38 – 1.48 C <sub>v</sub> 3.94 – 5.42 C <sub>v</sub>	Pneumatic, electric, solenoid pilot	Spool-and-sleeve, robust, base plates, full accessories
140 		16.5 C <sub>v</sub>	Individual plug, pneumatic	High-flow capacity, lapped spool-and-sleeve, suitable for harsh environments
LS04-AF 		0.2 C <sub>v</sub>	Electric	Very small size, 2x3/2 version
579  589 		0.75 C <sub>v</sub>	Pneumatic, electric	Cost-efficient, common supply with joinable version

## Directional Control Valves

Series	Picture	Max. Flow	Piloting	Benefits
740 		1.1 C <sub>v</sub>	Pneumatic, electric	Robust, inline or base plate assembly, throttles
840 		0.2 C <sub>v</sub>	Pneumatic, electric	Robust, inline or base plate assembly, throttles
CL03-EV 		0.7 C <sub>v</sub>	Electric	Hygienic design, IP69K, single valve
ST 		0.28 C <sub>v</sub>	Pneumatic, electric	Stainless steel, metal sealed
AP 		0.55 C <sub>v</sub>	Mechanic, manual	Large portfolio
Rotair Block 		1.1 C <sub>v</sub>	Manual	Simple and robust, manually operated poppet valves
563 565 567 		1.35 C <sub>v</sub> 4.24 C <sub>v</sub> 13.62 C <sub>v</sub>	Pneumatic, electric	Robust aluminium housing, suitable for high flow rate and high working pressure
SV01 SV03 SV05 		0.71 C <sub>v</sub> (1 to 2) 1.4 C <sub>v</sub> (2 to 3) 1.05 C <sub>v</sub> (1 to 2) 2.65 C <sub>v</sub> (2 to 3) 2.4 C <sub>v</sub> (1 to 2) 7.0 C <sub>v</sub> (2 to 3)	Electric	Safety redundant 3/2 and 5/2 valves, Category 4 performance level "e"

## Series XV03/XV05

The Series XV03/XV05 Compact provides a reliable basis for both compact handling systems and complex automation solutions. It comprises a wide range of valve functions and accessories as well as the required electrical connectivity for all requirements in factory automation and other industries.

Our one-of-a-kind online configurator makes it easy to configure the complete valve system, including accessories, so that it is perfectly tailored to your application needs.



XV03

## Series 501/502/503

The Series 500 valve platform, with advanced connectivity in addition to the multipole up to G3 or 580, is a state-of-the-art electronic system with integrated graphic display and IO module capability. Series 501 (11 mm) offers highflow of  $0.4 C_v$  and a panel mount solution for cabinet mounting as well as zone safety or ATEX option.

Series 502 (18 mm) and 503 (26 mm) can be used on ISO15407-2 base plates but also offer a flow up to  $1.4 C_v$  in combination with a flow-optimized base plate. All products in this range offer a large number of sandwich accessories such as speed controls, sandwich shut-offs or pressure regulators.



503 with G3

501 with panelmount

## Series AV03/AV05

The Series AV03/AV05 provide a reliable basis for both compact handling systems and complex automation solutions. The Series AV03/AV05 offer intelligent solutions for machine safety that significantly reduce the effort required for creating a safe design. With the integration of the fieldbus and I/O-modules of the Series AES, all requirements for decentralized control are also available. The Series AV03/ AV05 is easy to configure, easy to use, and easy to extend as well as future-proof thanks to the option of IIoT integration.



AV03

AV03/AV05

AV05

## Series TC08/TC15

The Series TC08/TC15 includes a wide range of spool valves with housings made of high-performance polymers with robust and flexible metal inserts. They are designed for flow rate performances from  $0.8$  to  $1.5 C_v$ . These directional valves are easy to assemble, making them ideal for applications requiring the highest efficiency in limited spaces.

TC15



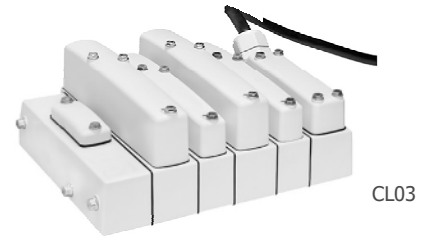
TC08





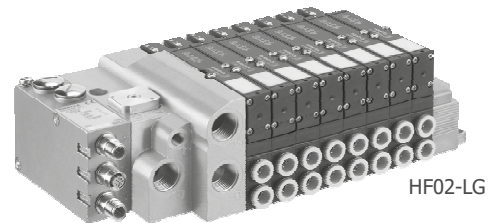
## Series CL03

The clean line Series CL03 is the ideal valve system for pneumatic solutions in the food industry — clean design, utmost configuration flexibility, module extension possible at any time, and the highest protection from water. The synthetic material is resistant to cleaning agents and aggressive chemicals, enabling applications in wet areas, even under harsh conditions. The valve system offers outstanding flexibility with the option to generate up to 32 different pressure stages in a single system.



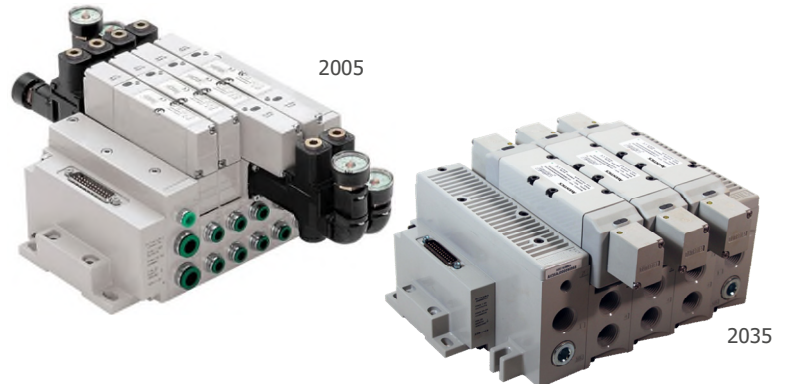
## Series HF02-LG

HF02-LG offers a compact design with high flow of up to 1.4 Cv. Individual base plates offer flexibility as well as the connectivity with multipole, fieldbus or adaptation to AV05.































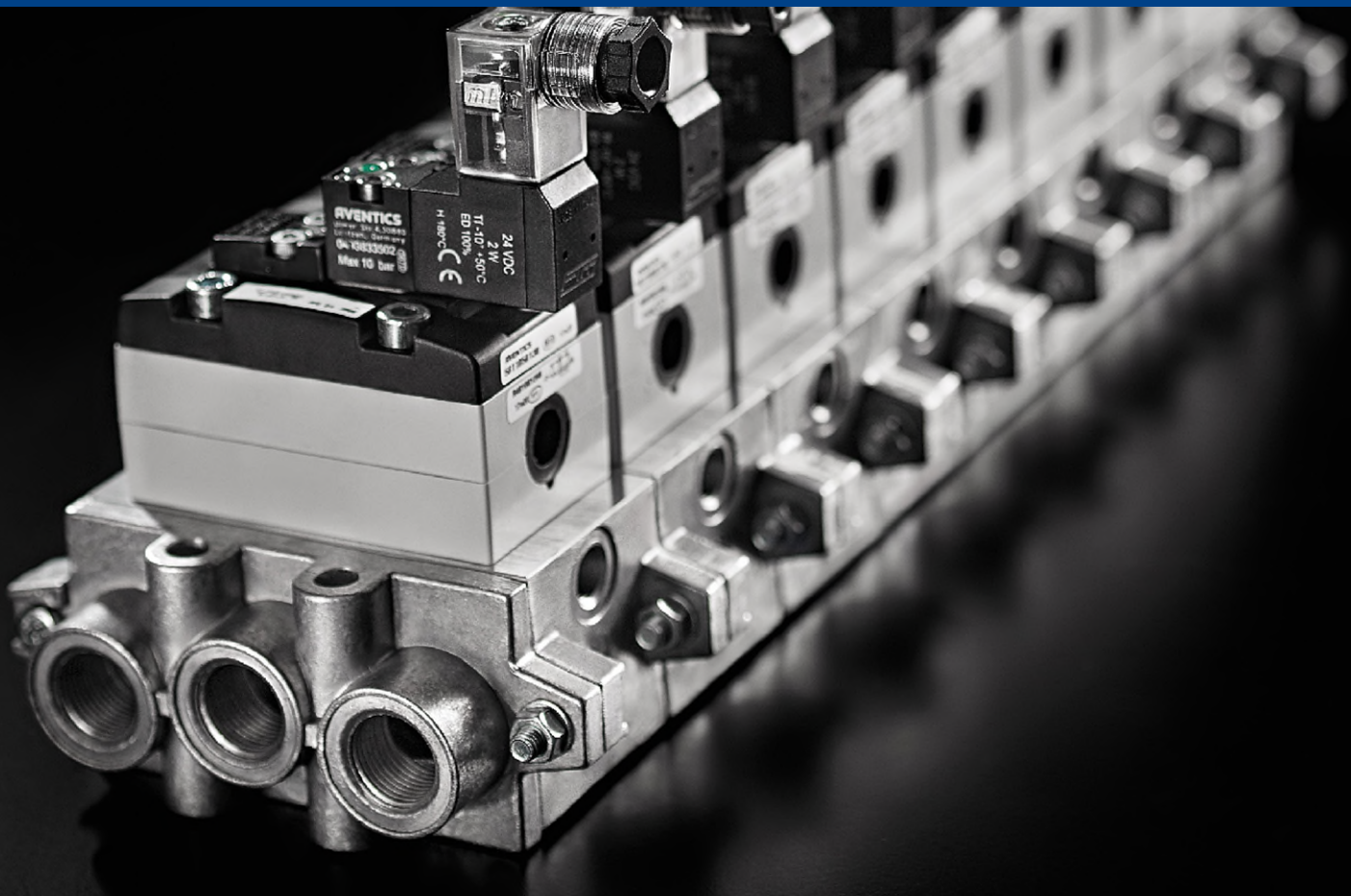
## Series 2002/2005/2012/2035

The Series 2000 is a line of modular directional control valves. Designed with plug-together flexibility, the valves eliminate internal wiring and are easily configured. Highly energy efficient and supports various electronic interface/bus protocols connectivity options with flows up to 3.5 Cv.



## Valve Systems

Series	Picture	Max. Flow	Versions	Benefits
XV03-  Compact		0.35 C <sub>v</sub>	Multipole, fieldbus, cabinet mounting	Aluminum extruded baseplate, Optimized Flow-to-Volume ratio for most compact valve system, Customer Value-Add design, Cost optimized
XV05-  Compact		0.88 C <sub>v</sub>	Multipole, fieldbus, cabinet mounting	
501 		0.4 C <sub>v</sub>	Multipole, fieldbus, cabinet mounting	Metal body and base plate, ATEX option, and panel mount
502 		0.65 C <sub>v</sub>	Multipole, fieldbus, single wire M12x1	Metal body and base plate, ISO and high-flow base plate, spool-and- sleeve, ATEX option
503 		1.4 C <sub>v</sub>	Multipole, fieldbus, single wire M12x1	Metal body and base plate, ISO and high- flow base plate, spool-and-sleeve
AV03 		0.3 C <sub>v</sub>	Multipole, fieldbus, single wire, bottom ported	IIoT ready, small, lightweight, optimized for safety- related circuits
AV05 		0.7 C <sub>v</sub>	Multipole, fieldbus, single wire, bottom ported	IIoT ready, small, lightweight, optimized for safety- related circuits
TC08 		0.8 C <sub>v</sub>	Pneumatic, electric, single wire, inline valve	Compact valve system, inline version
TC15 		1.5 C <sub>v</sub>	Pneumatic, electric, single wire, inline valve	Compact valve system, inline version
CL03 		0.7 C <sub>v</sub> 1.1 C <sub>v</sub>	Multipole, fieldbus, inline valve	IP69k, hygienic design, high flow, up to 32 pressure zones
HF02-LG 		1.4 C <sub>v</sub>	Multipole, fieldbus	High flow, 2x3/2 version, can be combined with AV
2002  2005  2012 		0.25 C <sub>v</sub> 0.56 C <sub>v</sub> 1.2 C <sub>v</sub>	Multipole, G3 fieldbus, individual plug	Interchangeable cartridge fittings, spool-and-sleeve, rubber pack (2002)
2035 		3.5 C <sub>v</sub>	Multipole, G3 fieldbus	High flow, spool-and- sleeve



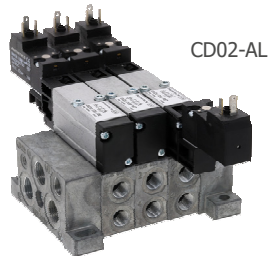
## Directional control valves complying with ISO standards for universal applications

Our ISO-standardized valve solutions have long been important pneumatic components in the automotive industry and for machine builders. They ensure reliability, speed and efficiency — all reasons why they are also used in the timber, printing and paper industries, as well as heavy industry.



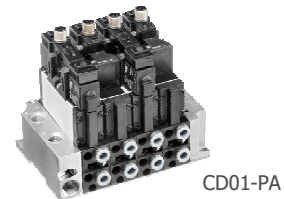
## Series CD02-AL

Series CD02-AL complies with the ISO standard 15407-1 with a size of 18 mm and flow up to 0.45 C<sub>v</sub>. The robust valve series offers the full range of valve functions as well as various control voltage and connection types. The joinable base plate system can be combined with 26 mm base plates.



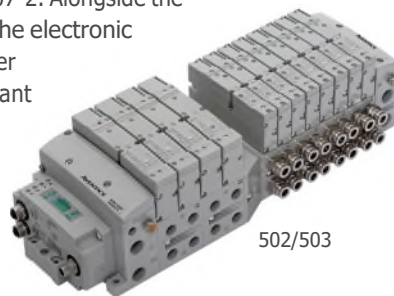
## Series CD01-PA

Series CD01-PA complies with the ISO standard 15407-1 with a size of 26 mm and flow up to 1.01 C<sub>v</sub>. The robust valve series offers the full range of valve functions as well as various control voltage and connection types. Sixteen bar versions are also available. The valve can be easily inverted to an ISO plug-in valve with contact bridges. The joinable base plate system can be combined with 18 mm base plates.



## Series 502/503

In addition to the broad product range of Series 502 and 503, this valve family offers a plug-in base plate system that complies with ISO 15407-2. Alongside the pneumatic portfolio, the electronic Series G3 and 580 offer connectivity to all relevant fieldbus protocols, IO functionality and distributed flexibility.



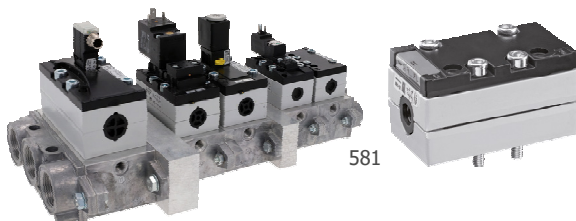
## CERAM

The Series CERAM valve with ceramic lapped plates — a non-stick design which features a shearing action to keep the valve debris-free — complies with ISO 5599-1. Available in sizes 1–4, it is an ideal valve for locations subject to airborne contamination.



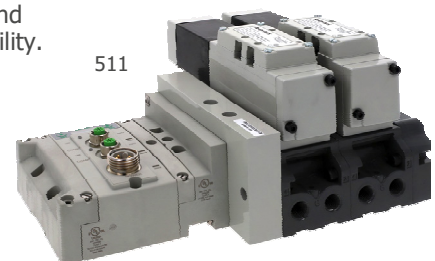
## Series 581

The Series 581 single valves according to ISO 5599-1 are available in sizes 1–4. The extensive range of valve functions, electrical connectivity and pneumatically controlled versions meet the demands of many different applications. With its small dimensions and reliable robust sleeve design together with a wide range of accessories, the Series 581 is the all-in-one solution for standardized demands.



## Series 511/512/513

ISO 5599-2 Series 511/512/513 allow the control of a flow up to 5.2 C<sub>v</sub>. The robust spool-and-sleeve technology makes for sturdy products even in rough environments. Together with the option of direct action pilot, constant and fast shifting times are benchmark. Alongside the pneumatic portfolio, the electronic Series G3 offers connectivity to all relevant fieldbus protocols, IO functionality with integrated graphic display and distributed flexibility.



For further information on these or any other AVENTICS product, visit [Emerson.com/AVENTICS](http://Emerson.com/AVENTICS)





## ISO Valve Systems

Series	Picture	Standard	Max. Flow	Versions	Benefits
CD02-AL 		ISO 15407-1 (18 mm)	0.45 C <sub>v</sub>	Single wire: Form C Single wire: M12x1 pneumatic	2x3/2 function, various voltages
CD01-PA 		ISO 15407-1 (26 mm)	1.05 C <sub>v</sub>	Single wire: Form C Single wire: M12x1 pneumatic	2x3/2 function, various voltages, 16 bar version
502-ISO 		ISO 15407-2 (18 mm)	0.65 C <sub>v</sub>	Multipole, fieldbus, single wire: M12x1	Various fieldbus protocols via G3 and 580
503-ISO 		ISO 15407-2 (26 mm)	1 C <sub>v</sub>	Multipole, fieldbus, single wire: M12x1	Various fieldbus protocols via G3 and 580
CERAM 		ISO 5599-1 Sizes 1–4 (40 mm, 52 mm, 69 mm, 78 mm)	ISO1: 1.1 C <sub>v</sub> ISO2: 2.4 C <sub>v</sub> ISO3: 4.3 C <sub>v</sub> ISO4: 7.5 C <sub>v</sub>	Single wire: Form A Single wire: 3 or 5 pin Mini, pneumatic	Ceramic plates, explosion proof, cURus and intrinsically safe options
581 		ISO 5599-1 Sizes 1–4 (40 mm, 50 mm, 65 mm, 75 mm)	ISO1: 1.4 C <sub>v</sub> ISO2: 2.7 C <sub>v</sub> ISO3: 4.8 C <sub>v</sub> ISO4: 6 C <sub>v</sub>	Pneumatic, electric, single wire: Form A, BI, C, M12x1	Integrated throttles, small dimensions, 16 bar
511 		ISO 5599-2 Sizes 1 (43 mm)	1.28 C <sub>v</sub>	Multipole, fieldbus, via G3	Direct actuation version, spool- and-sleeve
512 		ISO 5599-2 Sizes 2 (56 mm)	2.86 C <sub>v</sub>	Multipole, fieldbus, via G3	Direct actuation version, spool- and-sleeve
513 		ISO 5599-2 Sizes 3 (76 mm)	5.22 C <sub>v</sub>	Multipole, fieldbus, via G3	Direct actuation version, spool- and-sleeve





## Communication is everything!

Using our fieldbus connections, valve systems can be directly integrated into the control structure of your machine. No matter whether the valve system will be controlled only by fieldbus or used as a decentral control center with centralized or distributed IO-functionality, Emerson has a solution for every situation with the AVENTICS electronic portfolio.

Highlights	XVES	G3	AES	580
Number of valve coils	Up to 48	Up to 128	Up to 128	Up to 128
Max. possible I/O modules	-	16	10	-
Protection class	IP65	IP65	IP65	IP65
I/O functionality	-	Digital, analog, temperature	Digital, analog, pneumatic pressure signal	-
Connection options	-	M8x1, M12x1, spring clamp	M8x1, M12x1, D-SUB, spring clamp	-



EtherNet/IP



ETHERNET POWERLINK

DELTA V

CC-Link IE Field



CANopen

DeviceNet

OPC UA

IO-Link



## Series XVES

The Series XVES fieldbus connection ranging from simple direct control via D-SUB or terminal strips to a variety of fieldbus protocols can be integrated into AVENTICS XV03 and XV05 fieldbus-compatible valve systems. XVES features optimized sizing making a compact solution and all XVES modules are interchangeable.

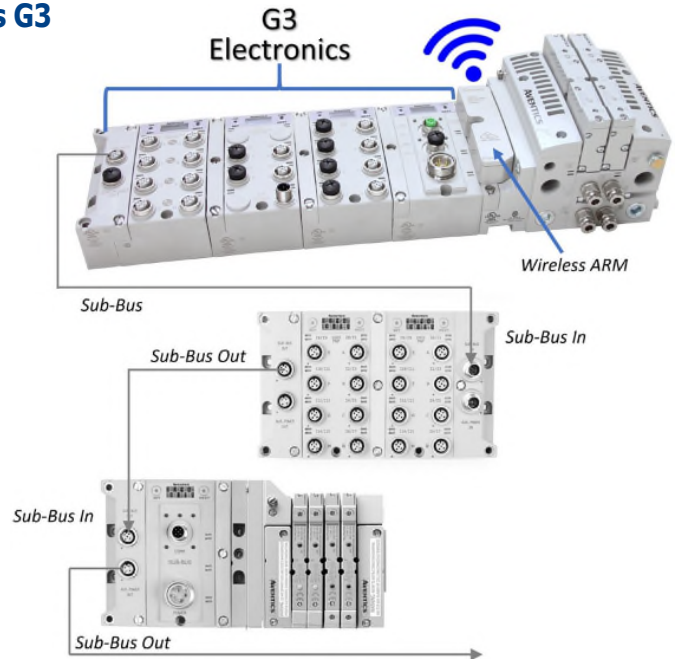


## Series G3

Series G3 are industrial communication fieldbus electronic solutions with a large number of fieldbus protocols and IO module types with integrated graphic display for easy identification, setup and diagnostics. Robust construction with sturdy metal thread.

Series G3 offers easy distribution of additional manifolds and IO through Sub-Bus communication so the complete machine can be covered by one single fieldbus node.

Integration with the Wireless ARM (Auto Recovery Module) protects configuration data during critical failure and allows access to vital valve system diagnostics and health monitoring via WiFi connection.



## Series AES

The Series AES fieldbus connection can be integrated into all AVENTICS fieldbus-compatible valve systems or can also be configured as a stand-alone solution. AES connects your AVENTICS valve system to all relevant fieldbus protocols and offers the integration of I/O-modules and enables optimized decentralized wiring of sensors. The fast internal backplane and integrated IIoT functionality enables a future-proof solution.



## Series 580

Series 580 is a pure industrial communication fieldbus electronic solution with integrated graphic display for easy identification, setup and diagnostics.

The large number of fieldbus protocols as well as IO-Link or Delta V CHARM version make the solution compact, lean and efficient.











For further information on these or any other AVENTICS product, visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)







Fieldbus					
Series	Picture	Protocols	IO functions	Structure	Benefits
XVES 		IO-Link, Profibus, CANopen, Profinet, EtherCAT, Ethernet IP, Powerlink, Modbus TCP, AS-I		Central, direct	Web server, AS-I interface
G3 		Profibus, CANopen, DeviceNet, Profinet, EtherCAT, Ethernet IP, Powerlink, Modbus TCP	Digital IN/OUT, analog IN/OUT, temperature, intrinsically safe IN	Central, distributed	Display, ARM, IO-Link master, wireless web server, parameter handling via web server
AES 		Profibus, CANopen, DeviceNet, Profinet, EtherCAT, Ethernet IP, Powerlink	Digital IN/OUT, analog IN/OUT, pressure sensor, closed loop controller	Central	Small, lightweight, parameter handling via PLC, IIoT integrated, fast backplane
580 		Profibus, CANopen, DeviceNet, Profinet, EtherCAT, Ethernet IP, Powerlink, Modbus TCP, IO-Link, Delta V		Central, direct	Display, web server

Electronic series	XVES	G3	AES	580	CL03-BDC
Valve system series					
XV03/XV05	✓	✓		✓	
501/502/503		✓	✓	✓	
AV03/AV05			✓		
511/512/513		✓			
HF02			✓		
2035		✓		✓	
CL03					✓
Protocols					
Profibus	✓	✓	✓	✓	✓
CANopen	✓	✓	✓	✓	✓
DeviceNet		✓	✓	✓	✓
Profinet IO	✓	✓	✓	✓	✓
EtherCAT	✓	✓	✓	✓	✓
EtherNet IP DLR	✓	✓	✓	✓	✓
Powerlink	✓	✓	✓	✓	
Modbus TCP	✓	✓	✓		
IO-Link	✓	✓	✓	✓	
AS-I	✓				
Delta V CHARM				✓	



## Maximize the efficiency of your machines through precise control of pressure and flow of liquids and gases

### Proportional Pressure Control Valves

AVENTICS' extensive range of proportional pressure control valves provide optimal control of pressure within many machines and processes worldwide. Pilot, directly or indirectly controlled devices enable precise control of highly dynamic pressure variations, with the ability to compensate for variations within the control chain. Digitally operated models offer low energy consumption, short response times and adjustable parameters, ensuring you meet the challenging demands of your application. Choose from a range of options, including Fieldbus and Ethernet TCP/IP connectivity, as well as various connection options that support IIoT applications. Supporting data acquisition software helps streamline your development process by identifying application-specific problems.

### What's Your Opportunity?

- Choose from a wide variety of proportional valve types
- Control atmospheric or absolute vacuum pressure in a wide range of flows
- Select valves that can handle various media and wide temperature ranges
- Identify solutions that can provide extremely precise pressure control in a range of applications
- Take advantage of optional software to customize valve performance during project development
- Work with an application and engineering team with experience in creating custom solutions
- Consider dual loop proportional valves that can modify pressure to control external process variables – e.g., pressure, flow, force, RPM or position

## Proportional Pressure Control Valves

### Sentronic Series

AVENTICS versatile Sentronic valves, including the Series 608/609 Sentronic<sup>D</sup>, Series 614 Sentronic<sup>PLUS</sup>, Series 617 Sentronic<sup>LP</sup> and Series 616 Sentronic<sup>HD</sup>, are available in a wide range of constructions and flow sizes. Control vacuum pressures to 50 bar at various flows from 0.03 to 5.6 C<sub>v</sub>, while dual loop configurations can accept feedback from and directly control process variables, including flow, pressure, force, position and RPM. You can also tune these valves in the field using our free, optional software — guaranteeing optimal performance.

IO-Link communication options are available on Series 614 and 617.



### Series ED02

The extremely compact yet powerful ED02 offers perfect control solutions in a variety of applications. Reliable, dynamic and cost-effective. On top of that, it is easy to stack. ED02 regulates pressure from vacuum up to 10 bar.



ED02

### Series ED07/ED12

ED07 and ED12 are E/P valves for highly dynamic control. They can realize high air flow rates and offer particularly dynamic control characteristics thanks to proportional valves for pressurization and exhaust that can be controlled separately. ED07/ED12 regulate pressure ranges from vacuum up to 20 bar.



ED07

## Proportional Flow Control Valves

### Series 607

Flowtronic D is a digitally operated flow controller up to 2 C<sub>v</sub>. The Flowtronic D consists of a fast, direct-operated 2-port proportional valve that operates independent of the inlet pressure and a control unit that contains all of the control electronics and sensors. The Flowtronic D offers precise flow adjustment and is very responsive to outside influences. The digital control electronics and a USB interface allow the controller to be adapted to different applications. The FlowCom PC software provides easy start-up.



607

## Proportional Valves on AV03 / AV05 Valve System

### Series AV-EP

The AV-EP proportional valve mounts directly on AV03 or AV05 valve systems to reduce plumbing complexity and overall footprint. The valve can be plumbed in two ways. It can be a stand-alone valve with an individual output. It can also be set up as a zone valve to provide proportional pressure to the zone of AV valves immediately adjacent. Consult the AV Valve System online configurator to learn more.




AV-EP



## Proportional Pressure Control Valves

Series	Picture	Flow	Pressure Range, bar	Function	Construction	Dynamic Applications	Precision Applications	Customizations	Explosion-proof
608 609 SentronicD		0.47 – 1.3 C <sub>v</sub>	-1 to 12	3/3	Direct controlled	■	▲	■	No
614 Sentronic PLUS		0.06 – 5.6 C <sub>v</sub>	-1 to 50	3/3	Direct controlled	■	■	■	Yes
616 SentronicHD		1.2 C <sub>v</sub>	-1 to 10	3/3 (2x2/2)	Pilot controlled	▲	■	■	No
617 SentronicLP		0.01 – 5.2 C <sub>v</sub>	0 to 10	3/3 (2x2/2)	Pilot controlled	▲	▲	■	No
ED02		0.12 C <sub>v</sub>	-1 to 10	103/3 (2x2/2)	Direct controlled	■	▲	●	No
ED05		1 C <sub>v</sub>	0 to 10	3/3	Direct controlled	■	▲	●	No
ED07 ED12		1.3 – 2.6 C <sub>v</sub>	-1 to 20	3/3 (2x2/2)	Direct controlled	■	■	●	No
EV03/ AV03-EP		0.6 C <sub>v</sub>	0 to 10	3/3 (2x2/2)	Pilot controlled	▲	▲	▲	No

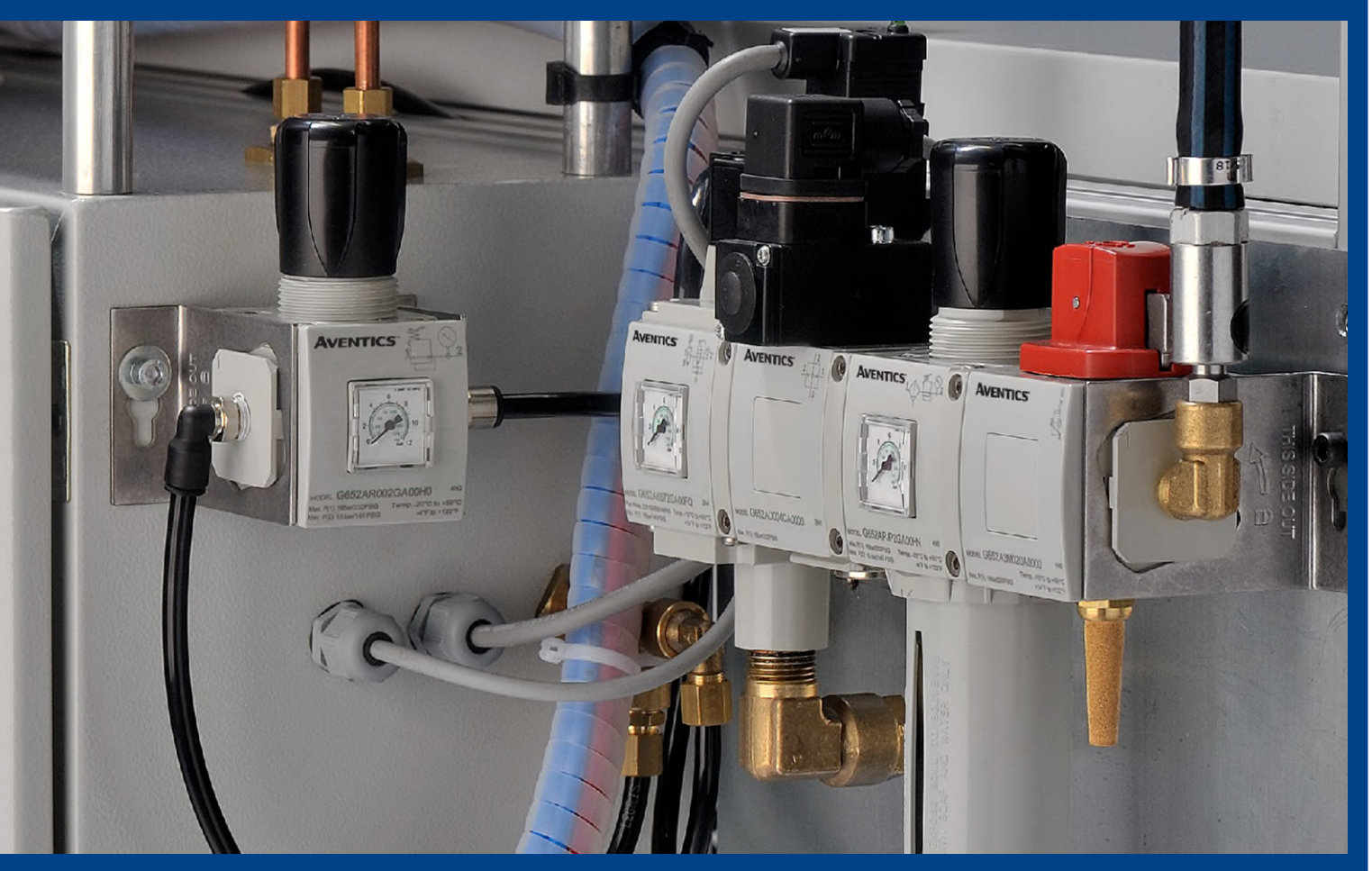
## Proportional Flow Control Valves

Series	Picture	Flow	Function	Medium	Construction	Dynamic Applications	Precision Applications	Customizations
607		0.005 – 2 C <sub>v</sub>	2/2	Neutral gas	Direct controlled	■	■	■

■ Ideal ▲ Suitable ● Requires vendor support







## We provide the power you need — with precisely prepared compressed air available at all times

The demands on our pneumatic solutions are high — there's no room for error. Our air supply management solutions provide the best possible air conditions. Tailored to the application, right on target, finely filtered and well oiled. Our program: from air preparation units to tubing, everything is perfectly matched.





# Compressed Air Preparation

## Air Preparation Units



Pages 46 – 49

## Pressure Gauges



Page 48

## Sensors



Page 48

## Assembly Material

### Push-in Fittings



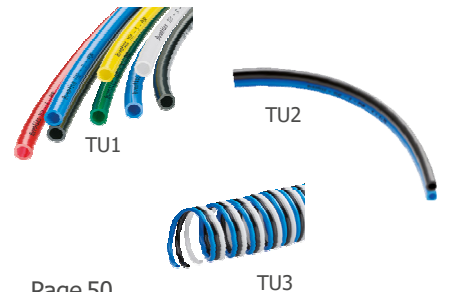
Page 50

### Fittings with Tube Nuts, Couplings, Silencers and Other Products



Page 50

### Plastic Tubing



Page 50

## Flow and Check Valves

### Flow and Check Valves, Throttle Valves, Non-Return Valves and Other Valves

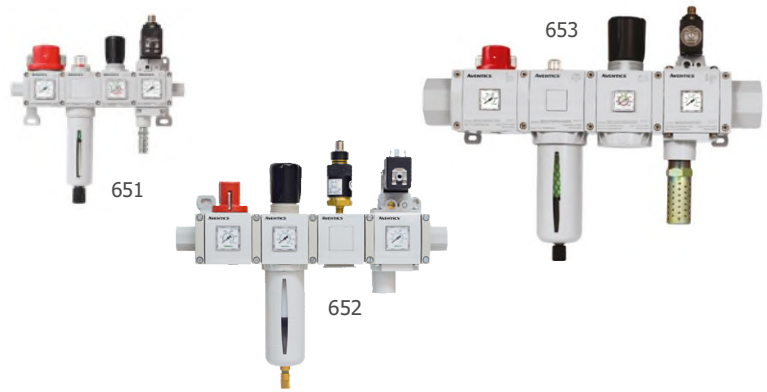


Pages 50 – 51

# Air Preparation Units

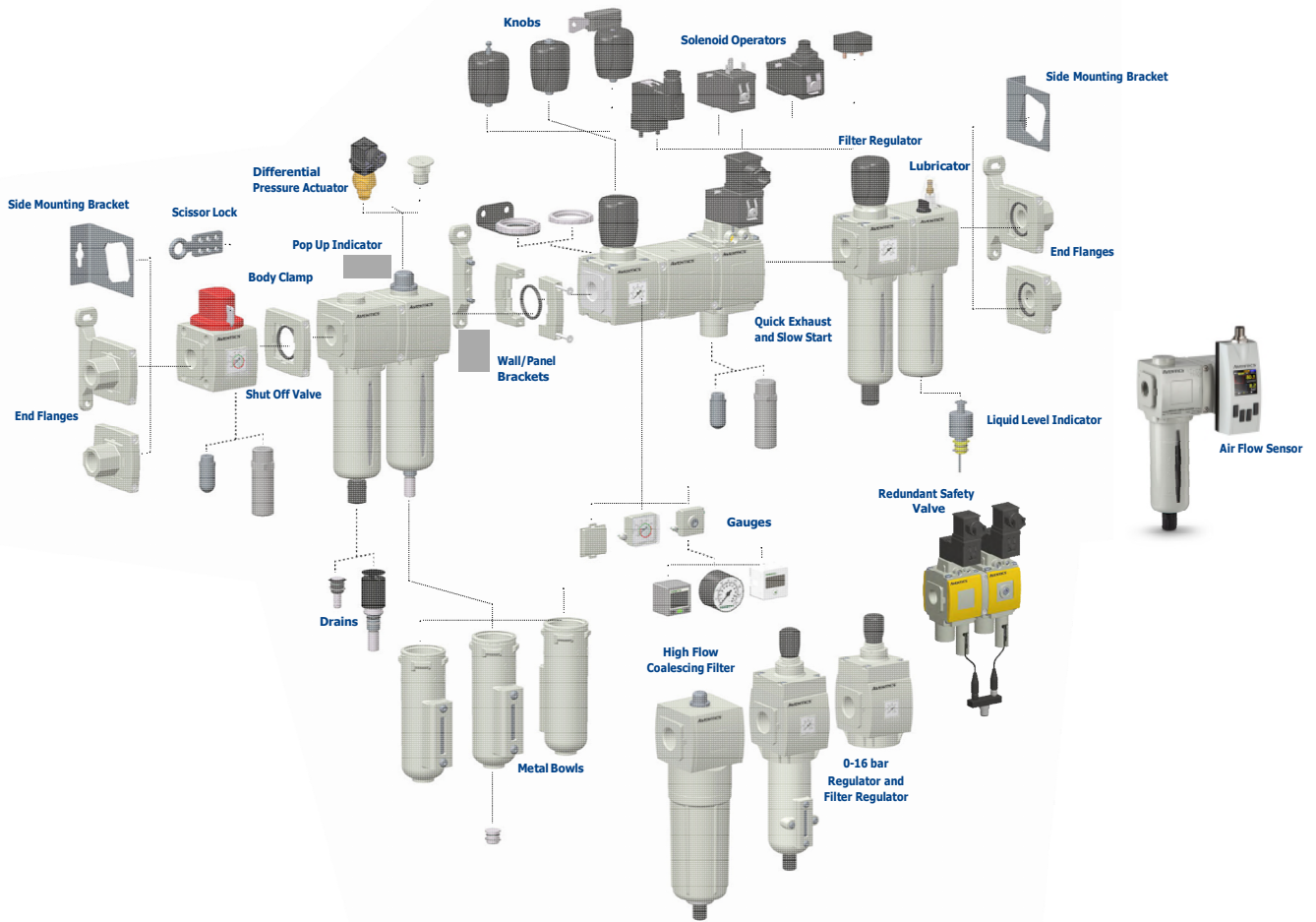
## Series 651, 652, 653 Aluminum Air Preparation, Product Range Overview

This product line offers you complete, customizable compressed air preparation technology. It includes an option to combine every component in the series to achieve the desired function, making it possible to adjust the components precisely to the application requirements.



## Broad Range of Products and Accessories Make Selection Easy

The AVENTICS 651, 652, 653 ranges of air preparation equipment include particulate and coalescing filters, regulators, filter regulators, lubricators (FRL), shut-off valves, and a variety of accessories and assembly kits. The range is one of the most comprehensive offerings of air preparation products available from one supplier.









## Air Preparation Units

### Series 901 Delta Filters

Delta Series includes particulate, coalescing and adsorbing filters and water separators. With port sizes up to 3 inches, these filters are perfect for large flow industrial and process applications and are perfectly suited for compressor applications.



### MU1

MU1 series components are always the perfect choice for applications in tough environments where large dimensions, thread connections or flow rates are required.

The largest connection G2 (2 in) enables a compressed air flow rate of up to 50 C, and provides reliable filtration, regulation and lubrication.

MU1 series components are also designed to meet the demands of harsh environments thanks to very robust construction.



### R88

The precision pressure regulators in the R88 series are ideal for applications that demand fast responses to the slightest fluctuation in compressed air. They can be adjusted precisely and are a good alternative to electronic pressure regulators.

R88 regulators are used to achieve extremely accurate pressure control of the output pressure, independent of the pilot pressure and the flow rate. They offer high performance and absolute flexibility, combined with guaranteed reliability.



## Sensors

### Series 652/653 Flow Sensors

Series 652/653 flow sensors monitor air consumption in pneumatic systems, enabling rapid action to be taken in the event that leaks are detected. They help to optimize energy consumption, prevent machine downtime and cut costs. These flow sensors determine not only the flow but also the current pressure and temperature in the feed line, enabling advanced diagnosis of the system operating parameters. The data is forwarded to the control either via standard switch or analog outputs, or through IO-Link. Data can also be communicated directly via the EtherNET interface using OPC UA or MQTT.



### Series PM1/PE Pressure Sensors

Series PM electromechanical pressure switches are set manually using an adjustment screw. Series PE pressure sensors can be used in virtually all applications and easily integrate into existing compressed air preparation systems.



## Air Preparation Units

Series	Picture	Max. Flow	Housing Material	Connections	Filter Porosity	Optional Certification
651 		2.06 C <sub>v</sub>	Aluminum	1/8–1/4 NPT & G	0.01–40 μm	ATEX CUT-R
652 		7 C <sub>v</sub>	Aluminum	1/4, 3/8, 1/2 NPT & G	0.01–40 μm	ATEX CUT-R
653 		11.5 C <sub>v</sub>	Aluminum	1/2, 3/4, 1 NPT & G	0.01–40 μm	ATEX CUT-R
AS1 AS2 AS3 AS5		1 C <sub>v</sub> 1.7 C <sub>v</sub> 5.2 C <sub>v</sub> 14.5 C <sub>v</sub>	Polyamide	G1/4 G1/4–G3/8 G3/8–G1/2 G3/4–G1	0.01–5 μm 0.01–40 μm 0.01–40 μm 0.01–40 μm	ATEX
901 Delta 		1.47–52.5 C <sub>v</sub>	Aluminum	1/4–3 NPT & G	0.01–3 μm	CRN
14		1 C <sub>v</sub>	Aluminum	1/8–1/4 NPT or G	0.01–40 μm	
50 		1.7–10.5 C <sub>v</sub>	Aluminum	1/4–2 1/2 NPT or G	5 μm	

# Flow and Check Valves

## Series NCPGG Pilot Operated Check Valves

Series NCPGG pilot operated check valves are available in 1/8 – 1/2 in NPTF and operate between 15 and 150 psig. The NPTF threads have pre-applied thread sealant.



## Series SEV Quick Exhaust Valve

Series SEV quick exhaust valves are available in 1/8 – 1 in NPTF or G thread and operate between 3.9 and 145 psig.



## Series CV Check Valves

Series CV check valves prevent return flow in 1/8 – 1/2 in NPT thread sizes. Operating pressure is 3.5 to 213 psig.



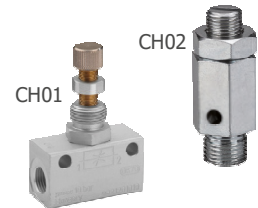
## Series CC Check-Choke Valves

Series CC check-choke valves are designed for nominal flows from 0.06 to 5.6 C<sub>v</sub>. The different versions are available with a push-in fitting or internal thread.



## Series CH Throttle Valves

Series CH throttle valves can be used for nominal flows up to 4.1 C<sub>v</sub>. The series features special versions with integrated silencer and screw-in variants.



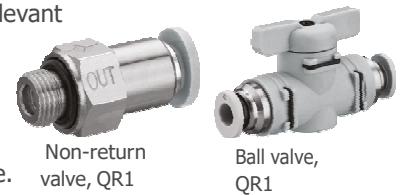
## Series NR Non-Return Valves

Thanks to an array of connection options, the NR non-return valves can be screwed in separately and are also suitable for direct installation in piping.



## Series QR1 Non-Return, Ball and Shut-off Valves

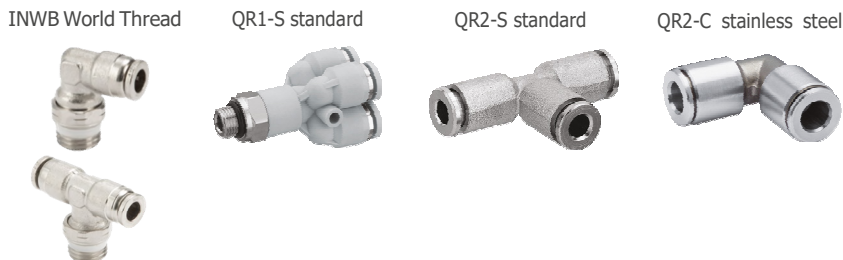
Designed for safety-relevant processes, the valves enable automatic blocking of the air supply to immediately stop the working stroke.



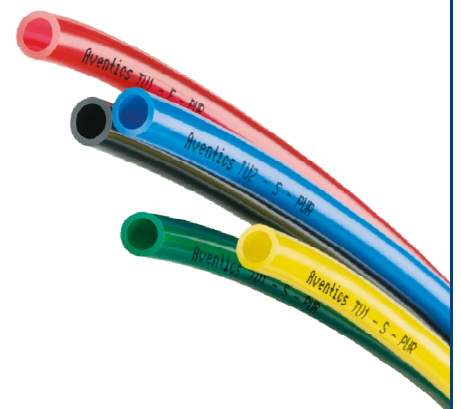
# Pneumatic Connection Technologies, Plastic Tubing

## Series INWB and QR Push-in Fittings

INWB World Thread fittings are compatible with either imperial or metric threads. Available with imperial or metric push-in connections. QR fittings range from 3 to 16 mm tubing and are available in plastic, metal or stainless steel. Our broad fitting selection offers the right solution for every application and industry.


























## Series TU Plastic Tubing












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Flow and Check Valves			
Series	Designation	Picture	Flow
NCPGG 	Pilot operated check valves		0.2 – 1.9 C <sub>v</sub>
CV 	Check valves		1.22 – 3.8 C <sub>v</sub>
CC02 	Check-choke valves		0.5 – 1.96 C <sub>v</sub>
CC04 	Check-choke valves		0.9 – 2.1 C <sub>v</sub>
CC01 	Check-choke valves		0.11 – 8.83 C <sub>v</sub>
CH01 	Throttle valves		0.4 – 2.8 C <sub>v</sub>
CH02 	Throttle valves		0.2 – 4.1 C <sub>v</sub>
NR01 	Non-return valves		0.4 – 7.95 C <sub>v</sub>
NR02 	Non-return valves with release		0.3 – 5.8 C <sub>v</sub>
QR1 	Non-return valves		0.28 – 2 C <sub>v</sub>
QR1 	Ball valve and shut-off valve		0.5 – 2.6 C <sub>v</sub>
SEV 	Quick exhaust valves		0.91 – 14.22 C <sub>v</sub>

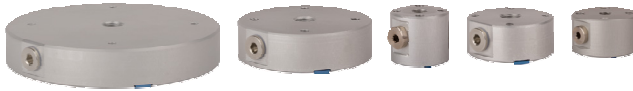
Fittings and Plastic Tubing			
Series	Designation	Picture	Connections
INWB  NWB NB  INB 	World thread fittings Metric fittings Imperial fittings		1/8 – 1/2 WT 1/8 – 1/2 G 1/8 – 1/2 NPT
QR1 	Push-in fittings		Ø 3 – 16 M3 – G1/2
TU1  TU2 	Plastic tubing, polyethylene (T1) or polyurethane (T2)		Ø 3 – 22

## Non-Contact Transport System

### NCT Non-Contact Transport System

The unique, gentle NCT gripper technology is available in two material versions. NCT-AL (aluminum) is suitable for all standard applications. NCT-PK (PEEK) grippers are designed for special requirements in the food, semiconductor, and solar industries and enable direct contact with foods or silicon.

NCT-AL



NCT-PK



## Vacuum Cups and Accessories

### Vacuum Cups

Whether angle joints, flow valves, vacuum filters, spring-loaded plungers, the right fitting or the entire range of vacuum cups — along with vacuum ejectors, our program offers everything required for a vacuum-based pneumatic solution.



## Vacuum Ejectors

### Series EBS

The Series ESB features inline ejectors with axial compressed air and vacuum connections for direct installation in the vacuum line as well as compact ejectors with several integrated functions: vacuum generation, pilot valves, filters, switches and silencers.



## Vacuum Ejectors

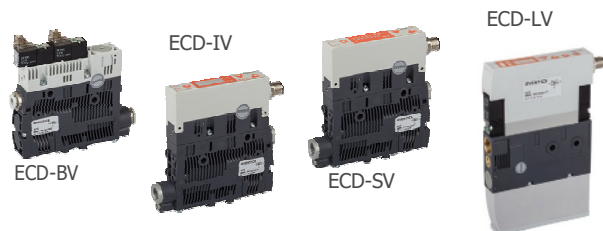
### Series EMS

Enormous suction capacity with maximum efficiency — the multistage ejectors with multiple Venturi nozzles connected in series offer a very high suction capacity, making it possible to handle workpieces with difficult-to-seal surfaces.



### Series ECD

From Basic, Smart, Intelligent, to Large: Series ECD ejectors are available in four modular versions with functions, sizes and features that can be selected as needed.



For further information on these or any other AVENTICS product, visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)

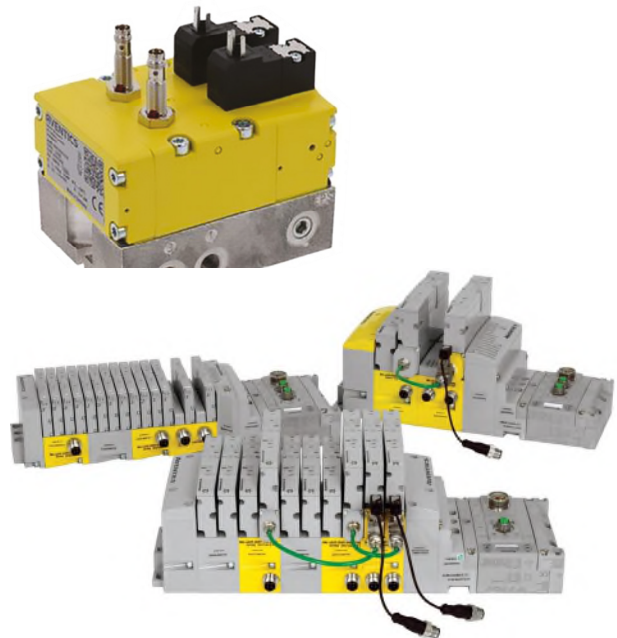


## Stay on the Safe Side with Emerson

Safety first. We advise on all matters of machine safety for pneumatic controls and offer comprehensive service to help you develop and achieve a sound safety concept. We supply the right products and the required documentation.

### Certified Products and Integrated Solutions

- Products include documentation with reliability ratings
- Comprehensive advice on-site
- Pneumatic components in certified quality
- Free access to switching examples
- Compliant machine equipment
- Proven expertise



### Regulations and Specifications Dictate the Design of Safe Machines

The regulations relevant to machine construction set a uniform level of safety for accident prevention as well as safety and health requirements for engineering. Pneumatics offers a wide range of technical safeguards. This includes restricted, secure speeds, reduced pressure and force, de-energizing through exhaust, ensuring secure movement directions, or stopping or blocking a movement.



### Example: Series LU6

- Static locking or dynamic braking
- Prevents dangerous movements
  - Secure hold in upper end position through clamping and one-sided pressurization
  - Stops a dangerous movement (emergency stop/emergency off)



Locking unit, LU6, max. holding force 12,000 N

### Towards Safe Machinery: Risk Assessment

The legal specifications for designing and operating machines require a risk assessment. This process serves to determine the type and quality of protective measures to be taken and safety equipment to be implemented:

#### Risk analysis:

Determine the machine limits, identify and estimate risks

#### Risk evaluation:

Check and estimate design, technical and instructive machine safety measures

#### Risk mitigation:

Realization of all safety functions



# Saving the best for last!

## Tailored entirely to the customer

Looking for something customized to your needs? You've come to the right place. Customer-specific solutions have always been an Emerson specialty. If there's a suitable solution for your task, we'll find it. Not because we're driven by ambition at any price, but out of conviction.

### Engineered Solutions — ready-to-install pneumatic solutions 🔗

Our system engineers mainly focus on the planning, configuration and assembly of control panels, control cabinets or handling systems. They turn your task into an optimized ready-to-install modular solution — including compressed air preparation, valve technology, electrical control and all accessory parts.

- Ready-to-install cylinder valve units
- Modified valve systems and air preparation units
- Configured control cabinets and panels
- Pneumatic handling systems

Save time and costs: from planning, design and documentation, to logistics and assembly, to delivery and reliable commissioning, we do it all for you.

### Specific product development

Our product development experts create specific product adaptations and special solutions just for you. Their tasks range from simple modification of existing products to completely new designs and product solutions for your application.

- Modification of standard components
- Integrating various functions in a single product
- Product development with additional specifications
- Integration of electrical system and pneumatics

From highly complex projects with functional integration to careful, yet effective, adjustments, the tailored components offer clear added benefits for your application.



## IIoT Hardware Solutions: Edge Gateway, SPA and AF2 Air Flow Sensor

The RXi2-LP Edge Gateway is an industrial PC (IPC) edge computer with an IIoT software stack called PACEdge. It delivers compact, rugged, low-power and cost-effective performance computing capabilities to run HMI data recording, historian, analytics and dashboard applications right at the machine, enabling improved real-time operational control and plant-wide systems integration.

- Open architecture — flexibility to adapt to your needs
- Data analysis independent of the controller
- Advanced OPC UA and MQTT support
- Multiple air flow sensors (AF2s) and valve systems that connect from one gateway
- Powerful data visualization to easily turn data into actionable insights



The AVENTICS Smart Pneumatics Analyzer (SPA) monitors pneumatic installations and systems, visualizing the analyzed data. This integrated IIoT edge gateway with PACEdge (RXi2-LP) continuously records data from the integrated sensors of the air preparation unit (AF2), enabling users to improve overall equipment effectiveness (OEE) and optimize machine efficiency and sustainability.

- Local preparation of data (edge computing) and visualization of sensor data
- No additional software (web browser) required
- Measure without overriding PLC-controlled process
- Portable for use on different machines
- Instant data analysis and ROI calculations — ideal for organizations new to IIoT



The AVENTICS Series AF2 Air Flow Sensor monitors air consumption in pneumatic systems, enabling fast action if leaks are detected. This series helps optimize energy consumption, prevent machine downtime, lower costs and reduce your CO2 footprint.

- Large flow measurement range and integrated pressure sensor for a broad spectrum of applications
- Comprehensive communication options via analog, IO-Link, OPC UA and MQTT or Ethernet interface
- High flexibility for system integration
- Integrated analytics to provide actionable insights
- Configurable in air preparation units or as a sensor/filter combination

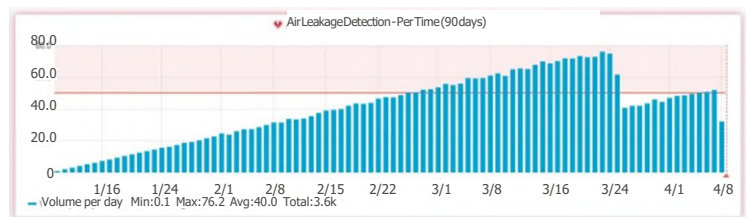
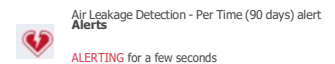


## IIoT Analytics Software

With our wide variety of analytics software solutions, combined with our IIoT hardware, you can:

- Monitor energy consumption and detect air leakages to improve energy efficiency and sustainability
- Monitor valve and cylinder health through predictive maintenance, reducing unplanned downtime and improving OEE

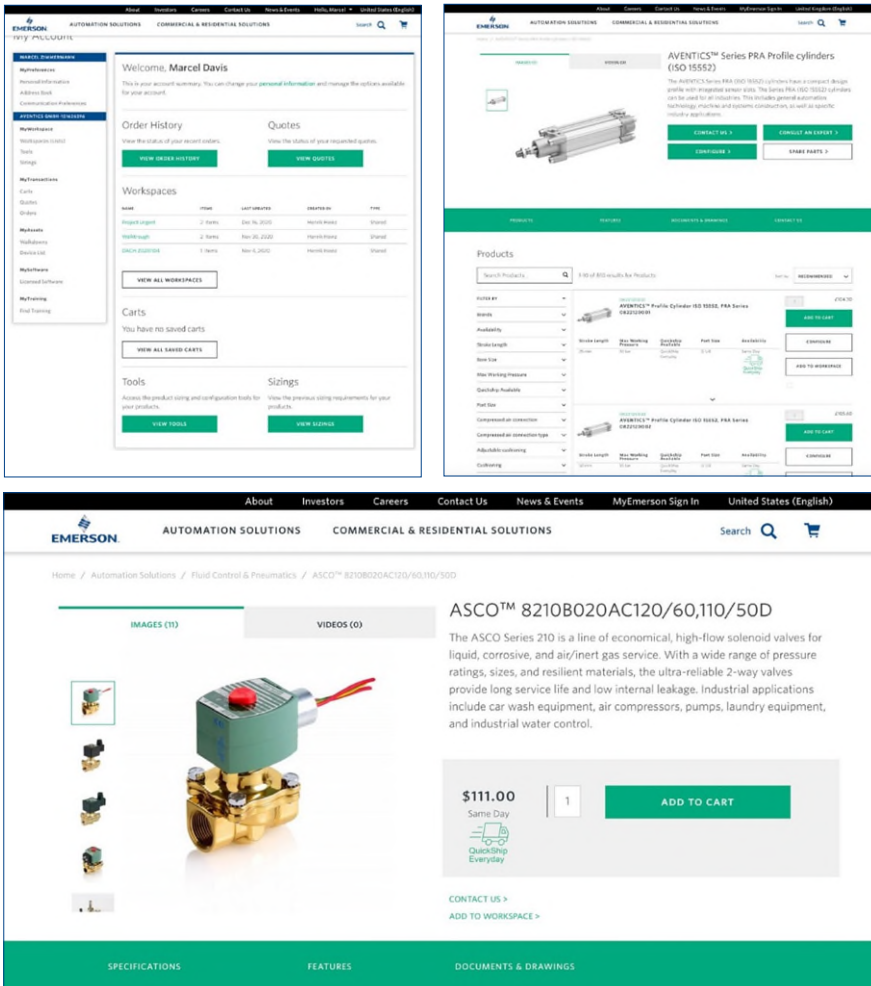
You'll receive notifications when leakages or anomalies are detected during manufacturing and get email alerts when a critical threshold is breached in the manufacturing process.



Valve Monitoring - Cycle Counter Table

Name	Lifetime	Percentage	Current	Status
Valve1	75.000.000	67%	50.001.682	Grey
Valve2	75.000.000	86%	64.321.405	Grey
Valve3	75.000.000	95%	71.432.407	Yellow
Valve4	75.000.000	99%	74.001.611	Yellow
Valve5	75.000.000	101%	76.000.537	Red

# A single online shopping experience to meet your complete fluid control and pneumatics requirements



- Unified product catalog and store for all Emerson products
- Integration of spare parts and accessories
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- Register without an existing customer number
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- Tracking your order and shipment status
- Prices and availability immediately visible
- Discounts and net prices displayed
- Manage multiple ship-to locations and create a shopping list for projects

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To simplify purchasing fluid control and pneumatics products, Emerson provides a single online store for its ASCO and AVENTICS brands. The MyEmerson personalized digital customer experience at Emerson.com offers a range of features and functionality via a single login, including an overview of orders, delivery tracking and easy access to downloadable product documentation. A convenient single-sign-on will facilitate the log-in process while avoiding logins on several platforms like our online configurators. MyEmerson features an overview of orders, delivery tracking and download options for all relevant documents.



## MyEmerson digital customer experience at Emerson.com



The online store and digital customer experience includes the entire pneumatics range and comprehensive expertise and support at one convenient location — [Emerson.com/en-us/automation/fluid-control-pneumatics](https://www.emerson.com/en-us/automation/fluid-control-pneumatics)

### CAD



Objects can be issued here directly as a CAD file in various formats, as a PDF file or for further configuration in our customers' software.

### Configurators



To create customized products matching their individual requirements, customers can set their parameters in the configuration program, which then presents a product tailored to their specifications.

### Calculation Programs



With transparent calculations, our customers can determine the size or durability needed for their products and can even keep an eye on energy consumption.

### Cross Reference Tool



This tool shows our customers the right alternatives to competitor products from within the AVENTICS catalog.

### CylinderFinder



This free online tool helps our customers find the right cylinder for their application with just a few clicks.

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In the new online shop, you can easily, quickly and securely order your fluid control and pneumatics products — simply register with your e-mail address and password, and order directly.

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- Track your orders online
- Transparent pricing

## Efficient pneumatic solutions: actuators and drives, valves and valve systems, air supply management, proportional pressure control valves



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