

# EFFECTIVE CONTROL WITH AIR

## AN OVERVIEW OF PNEUMATIC VALVES AND VALVE SYSTEMS

**Rexroth**  
Pneumatics





**Everything you need, inside and out**

Functions, an innovative and compact housing design, as well as comprehensive connection options – going above and beyond precision and reliability. Valves and valve systems from AVENTICS meet the demands of today's control technology like no other.

# Capable and well thought-out – application-oriented valve technology from AVENTICS

The result of decades of work in application-oriented development for our key industries, single valves and valve systems from AVENTICS set the tone in today's pneumatics. Simply put, AVENTICS is unrivalled when it comes to the entire spectrum of valve technology instruments. And that doesn't only sound good – it's a solid argument for efficient pneumatic solutions.

## Perfection is our standard

With a valve solution to match any application and work environment, our comprehensive program of perfected valve technology fulfills all of the requirements placed on cutting-edge, efficient pneumatic control technology. And as you've come to expect from our products, each component has the best quality and design.

- Wide range of functions
- Modular construction
- Quality and design

As well as meeting all environmental requirements, our products are extremely durable and offer a wide range of functions. As a result, this is demonstrated by a quick system layout and adaptation to specific tasks thanks to the modular design. Further quality features of our valves include low leakage and power consumption. And with short delivery times thanks to local production, our products get to where they need to be quickly, to do what they do best – work for you!



- ✓ Systems expertise
- ✓ Long-term product strategy
- ✓ Industry management
- ✓ International know-how
- ✓ Best-in-class components
- ✓ Global presence

# A valve solution to match any application – coordinated perfectly

## Get some insight, an overview, a preview

Use this brochure to help you select the products you need. It also provides information on key properties and application areas for the valves and valve systems. A summary of the program at the end of the brochure serves as an introduction to our detailed catalog.

### Directional control valves


- Valve systems using the base plate principle
- Valve systems for ISO standard valves
- Valve systems using the plate principle with single system valves
- Straight single valves

### Control valves

- Electropneumatic pressure regulator valves

## A comprehensive program with a straightforward platform strategy

Our range of products is just as diverse as our customers' tasks. The spectrum covers everything from mechanically, pneumatically, or electrically operated single valves with nominal flows of 50 to 15,000 l/min. to highly complex, modular valve systems fitted with a complete range of functions and state-of-the-art bus technology. Let the application dictate the requirements – we will supply the right technology. Aside from technology based on conventional directional control valves, we also provide optimal solutions featuring electro-pneumatic pressure regulator technology. Get acquainted with the complete range of our program in the following pages:

Product group	With base plate						Without base plate	
Series	AV03	AV05	HF04	HF03	HF02	CL03	TC08/15	589
Valve systems								
Single valves, electrically operated								
Single valves, pneumatically operated								
Single valves, mechanically operated								



# Comprehensive electrical connection options

### The right contact for any situation

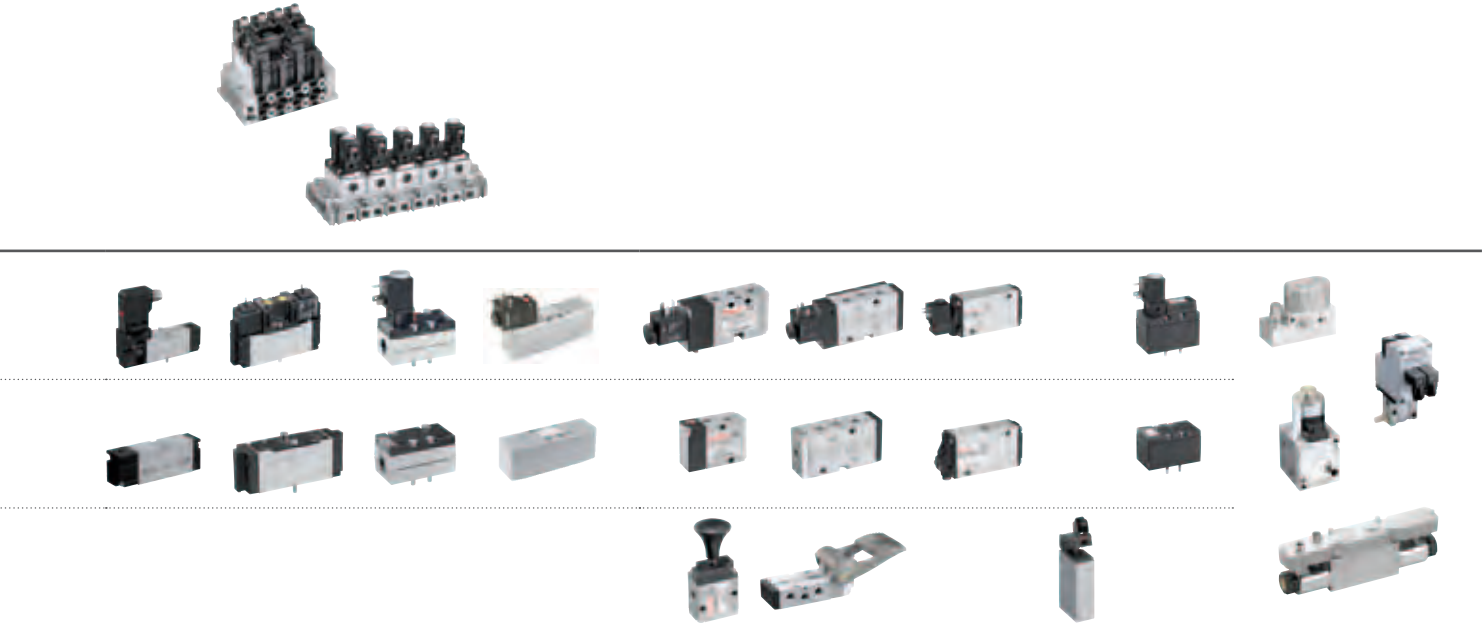
Electronic control and connection technology for valves and valve systems is developing at a rapid pace. Along with single wiring via standardized plug connections and easy valve system connection with multipole plugs, open and integrated field bus solutions now set the standard. Having participated in each stage of electric connection technology development, we used this experience to identify the right options for each application in the program, such as valves with application-specific individual connections, as well as systems with integrated bus technology for all current field bus protocols.

- Standard plug
- Multipole plug
- Field bus connection



Pages 16 – 17

ISO standard				Sturdy single valves					E/P
CD02	CD01	581	CERAM	CD04	CD07	CD12	AP	560	ED



Pages 10 – 11

Pages 12 – 13

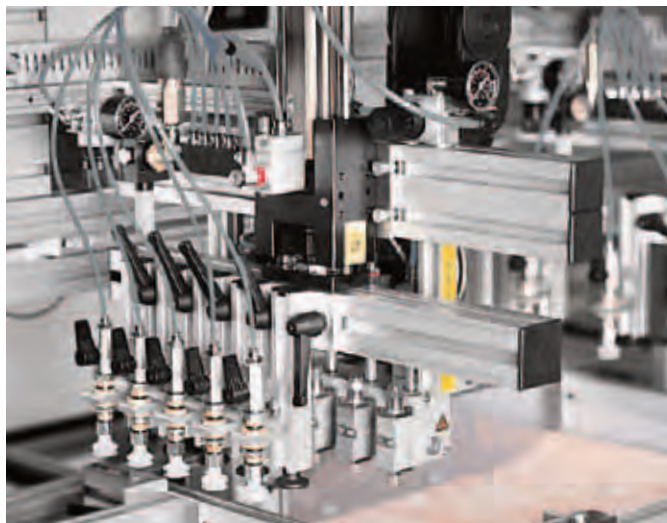
Pages 14 – 15

# Flexible to the core: Modular solutions from AVENTICS

All valve systems in this group were designed in line with the base plate principle, offering the highest flexibility and functionality. Highly modular in construction, they easily integrate into tight spaces and the most demanding work environments without sacrificing functional reliability.

## Expandable for future needs

Thanks to their modularity, you can expand valve solutions any time you need to and adapt them perfectly to changing machine environments. Exchanging valves on the base plate is simple and inexpensive – and doesn't involve machine modifications. Another advantage of these valve systems is their comprehensive range of accessories, allowing for highly customized designs and equipment.



Typical application areas are: automation technology, process control in machine construction, and general material handling including vacuum technology, all in a wide variety of industries. Concepts differ according to how multiple valve systems are networked.



Series	AV	HF	CL
Functionality	++	+	○
Compactness	++	+	–
Weight	++	+	○
Modularity	++	++	+
Simple installation	++	++	+
Protected	+	+	++

++ Highly recommended + Recommended ○ Suitable – Less suitable

# Compact and modular – valve systems offering all options



## AV series – Advanced Valve

With its unique design, significantly reduced weight, and extremely compact size, as well as an increased function density make sure that you stay a step ahead in production. AV is a complete automation solution that continuously adapts to application requirements. An optimum interaction of the valves with the AES fieldbus connection and the wide variety of components is a crucial benefit. Compared with existing products, the AV:

- up to 45 % less space thanks to its diagonal design
- up to 40 % lighter thanks to low-weight, high-performance polymers
- up to 20 % less compressed air consumption thanks to shorter distances from the actuator to the valve

## HF series – High Flow

The HF valve system offers flexible installation and quick, secure valve exchanges. HF means high flow and high functionality with extensive equipment options.

## CL series – Clean Line

The Clean Line series features a hygienic design with a high protection class. The synthetic material is resistant to cleaning agents and aggressive chemicals, enabling applications in wet areas, even under harsh conditions. The valve system can be expanded modularly to include up to 16 valves and offers outstanding flexibility with the possibility to generate up to 32 different pressure stages in a single system.



AV03/AV05



AV03



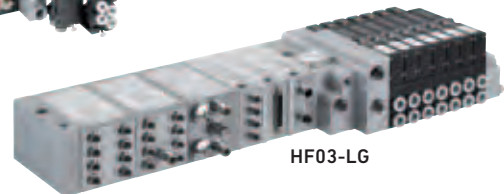
AV05



HF04



HF02-LG



HF03-LG



CL03



CL03-XL

# Compact solutions based on a plate principle

The choice is up to you. Using single valves and modular valve systems from the same series makes a lot of things easier, safer, and more cost-efficient. This multi-purpose family helps you implement extremely compact solutions tailored to the machine environment, which are both efficient and cost-effective.

## Optimized in terms of time

If you want to implement optimal, machine-specific configurations, valve concepts based on a plate principle offer all the options you need. Their low installation volume make them easy to integrate anywhere, and since they are so lightweight, you can install them directly onto moving machine parts. Deliberately reducing the equipment to the specifically required features also translates into substantial cost advantages, both in terms of investment and operation.

These valve solutions are often used in automation, as well as process control and assembly technology, especially in small handling, machine tool construction, and the electronics industry.



Series	589	TC08	TC15
Functionality	+	++	++
Compactness	+	++	++
Weight	++	++	++
Modularity	○	+	+
Simple installation	++	+	+
Protected	++	+	+

++ Highly recommended + Recommended ○ Suitable – Less suitable



# Single or in a system? However you like it

## Streamlined solutions designed for flexibility

AVENTICS developed this flexible program with the motto "just the necessary components, but premium quality throughout" in mind. Covering flow rates from 50 to 1500 l/min., the program is adaptable for pneumatic operation.

### 589 series

The 589 series presents users with a cost-optimized 3/2 and 5/2-way valve solution featuring poppet valve technology. Easy to stack, these valves have a convincing range of integrated functions.



589



### TC series

The TC series is available in two sizes with 800 and 1500 l/min. flow rates. They are the perfect choice for applications calling for lightweight valves packing a lot of power in a small space. The TC product concept is also incredibly flexible when it comes to designing valve solutions. With valves operated either pneumatically or electrically, the valve system can be modularly expanded by up to 12 valves.



TC08



Valves can be exchanged without dismantling the valve block. Only the tie rods have to be loosened slightly. Our TC single valves are also easy to install. Thanks to their through holes, they can easily be mounted on any level surface.



TC15



# The best quality, globally available – daily at AVENTICS

The same size, the same performance, the same connections. Standards are standards. AVENTICS excels at producing the very best within this framework. Our program – a complete assortment of perfected ISO valves with exemplary features and pivotal additional benefits – is several steps ahead of the pack.

## With future standards in mind

Designed to withstand the test of time, our ISO valve systems can be upgraded in any direction. These systems help reduce the vast array of components by standardizing interfaces to reduce storage and procurement costs. Another plus: Less chances of installation mistakes thanks to preassembled cabling that's easy to plug in, reflecting the rise of uniform M12 connection technology.



All are advantages that see our ISO valves used not only in the automotive industry, but in the packaging, woodworking, printing and paper industries, as well as heavy industries around the world. ISO valves from AVENTICS are at home everywhere. Global availability is essential for standardized valves.



Series	CD01-PA	CD02-AL	581	CERAM
Functionality	++	+	++	+
Compactness	+	○	+	○
Weight	+	○	○	○
Modularity	+	○	+	○
Simple installation	+	+	+	+
Protected	+	+	+	++

++ Highly recommended + Recommended ○ Suitable – Less suitable

# Valves and valve systems complying with ISO standards

## ISO valve technology from a single source

The right valve for every standard. As the leading supplier in this field, we offer valve series with perfect options to combine and expand. Series are available in accordance with ISO 15407 and ISO 5599.

### CD01-PA, CD02-AL series

For ISO standard 15407, the range includes single valves and valve systems in the sizes 18 mm (CD02 series) and 26 mm (CD01 series). The CD01 can be electrically and pneumatically controlled and also offers comprehensive functions in terms of electrics. Versions are available in aluminum (AL) and polyamide (PA). The CD02-AL version features very short switching times, low control pressures, and low-friction seal elements.

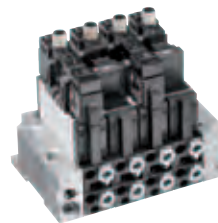
### 581 series

The 581 series is available in all sizes 1 – 4 and offers the complete range of valve functions with comprehensive accessories as well as integrated flow control valves. It can be equipped with various pilot valves.

### CERAM series

CERAM series valves are equipped for exceptionally harsh operating conditions. Thanks to the special material concept, they offer reliable functions and a long service life, even under extreme ambient conditions. The valve plates are made of a particularly hard ceramic material that is resistance to dust, chippings, oils and other sources of contamination.

## ISO-Norm 15407-1

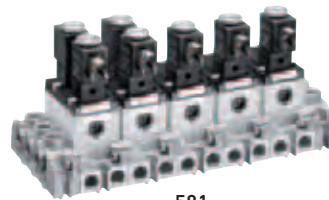


CD01-PA



CD02-AL

## ISO-Norm 5599-1



581



CERAM

# Sturdy and strong – single valves for harsh environments

Sometimes it is inner strength that really matters. When safe and extremely reliable pneumatic solutions for harsh environments are required, these sturdy single valves are perfect. Full of power, they are impervious even to aggressive media.

## Made to hold up under any task

Thanks to a unique design and the use of proven materials, these specialized single valves are equally resistant to mechanical influences, as well as extreme fluctuations in temperature or electric voltage. These properties make the valves ideal for applications in the paper, woodworking, metal processing, and heavy industries, as well as in material handling and printing systems.



▲ Sturdy valves from AVENTICS withstand the most demanding work environments.

## Reliable time after time

Whether it is inside or outside, subject to extreme heat and cold, in damp or dusty environments, our single valve program for demanding applications matches the right valve solution to the task at hand. Flow rates range from 150 to 4100 l/min.



Series	CD	AP	560
Functionality	++	+	+
Compactness	○	+	○
Weight	+	+	○
Modularity	+	○	+
Simple installation	+	+	+
Protected	+	+	+

++ Highly recommended + Recommended ○ Suitable – Less suitable



# Electrically, pneumatically, or mechanically operated single valves

## CD series

The CD series has a broad range of applications featuring three basic sizes and electrically, pneumatically, and mechanically operated versions. These valves have been designed and approved for use in hazardous areas. What's more, they guarantee the best functionality and a high degree of flexibility.

- Sturdy metal housing
- Large temperature ranges
- High voltage tolerances

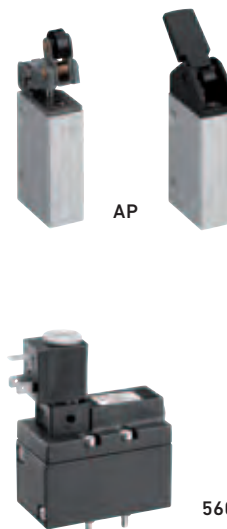


## AP series

The AP series provides a comprehensive range of mechanically operated single valves. With a wide variety of sizes, flow rates, and detail features, the valves are suitable for universal use. Whether you require manual operation via levers or pedals, or automated operation via rollers, special buttons, or plungers – the AP series has the perfect solution for your automation task.

## 560 series

Hot, cold, severe temperature fluctuations, harsh ambient conditions, or high working pressures of up to 30 bar – this is where the 560 valves work best. Sturdy and strong, with nominal flows of up to 13,600 l/min.

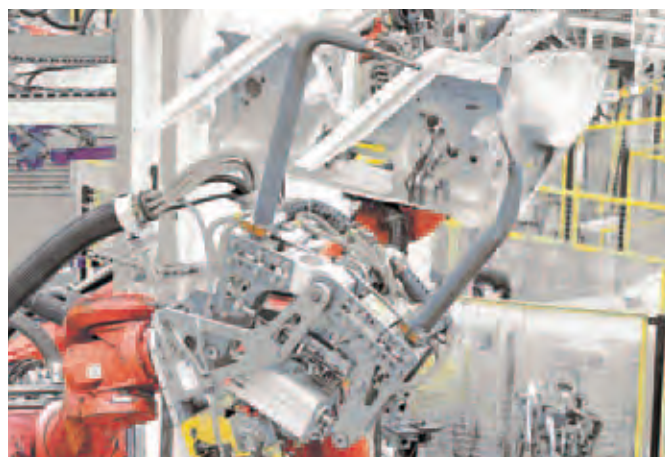


# Sensitive and highly dynamic – electropneumatic pressure regulation

Speed and precision are crucial to controlling dynamic processes reliably. State-of-the-art control valve technology from AVENTICS meets these requirements like no other. No matter if it is pressure, quantity, speed, or weight – each one is precisely controlled.

## Electropneumatic pressure regulator technology for every industry

Sophisticated systems with E/P valves frequently replace other pneumatic solutions or simply take over due to their clear advantages over non-pneumatic control technology. Classical applications include precise positioning of parts and components, variable control of welding tips, weight-independent balancer technology in assembly, and exact controlling and metering in cutting-edge painting systems.



Making the best use of any E/P-type valve depends on the kind of application and the actual tasks involved. AVENTICS is the technological leader in every aspect of electropneumatic pressure control and offers a rounded-out program of products for all required nominal widths.

Series	ED02	ED05	ED07/12	EV04/07
Dynamics	++	+	++	–
Precision	+	+	++	+
Sturdiness	++	++	++	+
Protection class	++	++	++	–
Flexibility	+	○	+	–
Electric connection	+	++	++	+

++ Highly recommended + Recommended ○ Suitable – Less suitable

# The entire E/P range from AVENTICS



## Different models for different tasks

As electropneumatic pressure regulator technology develops, three different control principles have emerged.

- Pilot control
- Direct control
- Highly dynamic

### ED02 – the smallest

The extremely compact yet powerful ED02 offers perfect control solutions in a variety of applications. Reliable, dynamic, and cost-effective. ED02 is stackable without base plate.



ED02



ED05

### ED05 – the all-rounder

The principle of direct control with a proportional solenoid enables highly precise control while remaining extremely dynamic. This also minimizes inertia and hysteresis in mechanical transfer elements.

### ED07/ED12 – highly dynamic

As well as enabling higher air flow rates, another advantage of this arrangement is its highly dynamic behavior.



ED07/ED12



EV04/EV07

### EV04/EV07 – pilot-controlled

Perfect for static requirements, the EV series works according to the indirect control principle. A key feature of the series is its extremely low energy consumption – yet it still guarantees pressure control during a power loss.

# Perfect connections on every level – structured bus technology

The integrated field bus systems match the right solution to every application and control environment. And thanks to our refined concept that works with all current field bus protocols, you are guaranteed extremely flexible and open planning.

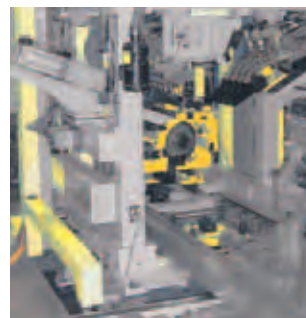
## It all depends on the application

As control complexity increases, the more profitable it is to use field bus systems. Each application calls for a tailored solution which promises maximum benefit. Our advanced field bus systems minimize wiring efforts, reduce possible sources of errors thanks to efficient diagnostic technology, and ensure quick and safe data transfers.

AES is the highlight of our bus technology and the logical continuation of the AV family concept.

## Everyday flexibility – verifiable daily

Your requirements for the product or machine have changed? You require an additional sensor in production? Everyday work often requires quick solutions. The modular structure of the AES has proven to be very flexible. Retrofitting new inputs and outputs is easier than ever. And fieldbus connections are realized without tools, by means of spring clamps – with optimized cable routing, of course.



AES bus coupler

◀ AES compared with existing products: Up to 60 % smaller and up to 70 % lighter thanks to fewer parts, an optimized design principle and high-tech polymers



# AES

## Your interface to the superior controller



**AVENTICS Advanced Electronic System (AES)** ensures smooth serial communication between the controller and the AV components and offers quick assembly times, a wide spectrum of variants, as well as increased modularity.

As a fieldbus connection, it ensures perfect communication between actuators and the machine peripherals. In combination with compact AV systems, AES components can be placed very close to pneumatic drives. By contrast, a wide range of communication options are available: each AES fieldbus coupler can control up to ten I/O modules and 64 valves with up to 128 solenoids. This is an impressive figure considering the size of the system.

### AES-highlights

<b>Number of valve coils 128</b>	128
<b>Max. possible I/O modules</b>	10
<b>Protection class</b>	Max. IP65
<b>I/O functionality</b>	Analog/digital
<b>Connection options</b>	M8, M12, D-SUB, spring clamp



# A noticeable difference: end-to-end support

AVENTICS customers are demanding. They expect a great deal – and get even more in return. Expert consultation, future-proof solutions, exemplary service, user-friendly engineering tools and knowing they are a step ahead of the competition.



## Because a standstill is a step backwards

Continuous progress safeguards our economic and technological edge. That is why we are constantly optimizing products, systems, procedures, and technologies. Hearing from our customers every day helps us systematically build on our core competences while bringing practical innovations onto the market.

AVENTICS customers have a vision. Refusing to settle for less, they choose a product concept with built-in progress. Worldwide.

- Task analysis and function definition
- Cross-technology solutions
- Application-specific configuration
- Delivery and installation on time and schedule
- Test runs to optimize functions
- Technological updates
- User-friendly Engineering Tools

- QR code:  
One picture of the QR code on your product using your cell phone or tablet is all it takes, and you are immediately forwarded to your configuration via a wireless connection – from any workstation across the world. For uncomplicated subsequent orders, expansions, or quick connection to our Service department.

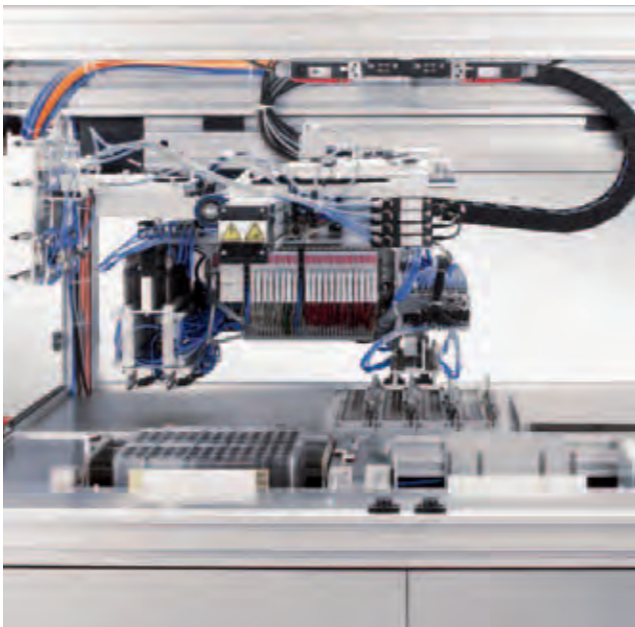


# Precisely tailored to your needs: customized solutions from AVENTICS

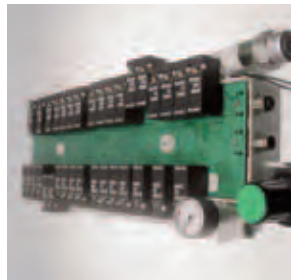
## Valves, valve systems, and components you will find nowhere else

Our offering picks up where the standard stops. You're looking for customized automation solutions to optimize your applications? With this in mind, we have formed 'customized solutions' departments focused on providing one-of-a-kind designs with finely-tuned functions. These could include fully customized valves, as well as slightly but critically modified components from the standard program, or comprehensive working units. Main tasks include adaptation to the specific installation situation, required protection class and system configuration including control panels, cabinets, and correct compressed air preparation.

- Specific valves
- Configured modules
- Ready-to-install valve systems



- ◀ The separator is more than a combination of an ASi slave, 3/2-way valve with quick exhaust and a cylinder. Integrated electronics preprocess data to ease the burden on serial communication.



- ◀ Valve terminal for the textile industry with CAN bus control and integrated pressure monitoring.



- ◀ Electropneumatic control cabinet to control automation processes during the production and handling of molded stainless steel parts. With pre-installed tubing, pre-wired, and fully protected against external influences.

- ◀ Area gantry with adapted suction head to support 24 SD storage cards on each end.

# In dialog with our customers and partners

## Your homepage for non-stop service

The AVENTICS Internet Portal never sleeps. In the online catalog, you can find additional information covering the entire product range, including all technical details, as well as the use of user-friendly Engineering Tools.



### Online catalog

The fastest point of entry is via our online catalog. Here you can start your search directly by entering a part number or keyword.



### CAD

Your desired object can be issued here directly as a CAD file in various formats, as a PDF file, or for further configuration in your software.



### Configurators

The configurator can be reached by clicking the selected product. After selecting your product, you can begin to adapt it to your own specifications.



### Calculation programs

Here you can specify the dimensions or loadbearing capacity of your components with a wide variety of calculation options. We also provide an air consumption calculator as a special feature.



### Circuit diagram software

With the D&C Scheme Editor, you can quickly and easily create circuit diagrams that are based on your component layout and linked to your catalog selection.



### eShop

The eShop is our online shop that answers your price requests and monitors the whole order process up to delivery.



## Based on proven expertise and a first-class product range

Our understanding of cooperation goes well beyond the boundaries of individual projects. We are constantly in dialog with our customers and are always a competent contact for both technical and economic questions. The know-how contained in our comprehensive pneumatic product range gives us a solid foundation for our work.

- Cylinders and sensor technology
- Valves, valve systems, field bus connections
- Gripper and vacuum technology
- Compressed air preparation, assembly material, accessories

Understanding our customers allows us to respond more quickly and give us a head start in achieving tailor-made solutions. Thus, we always remain close to the action and ensure the technological lead for us and our customers.



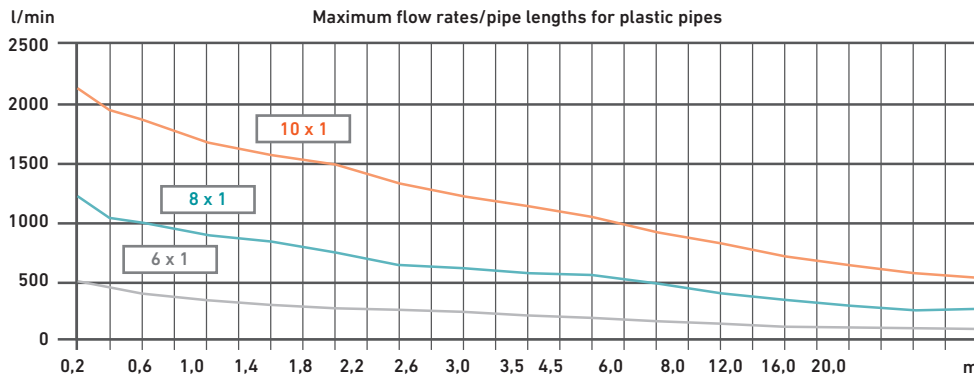


# Which system is right for my application?

Qn l/min	< 400	400 – 800	800 – 1200	1200 – 3000	3000 – 6000
Very compact	AV03	AV05			
Compact		TC08		TC15	
	HF04	HF03		HF02	
Normal		CL03	CD01		581

## Compact design

The dimensions per flow rate are an important factor when it comes to compact valve construction. As machines and systems continue to be optimized, smaller installations are growing in importance. Size, weight, and easy integration into compact machine designs are the deciding factors in many applications.












## Connections

The drive's air consumption, valve connections, and flow controls on the piping side determine valve selection based on the flow rate. Throttling should already be considered in the planning stage.

	AV03	HF04	AV05	HF03	CL03	TC08	HF02	CD01	TC15	581
Pressure range regulator		●						●		
Individual valve regulator		●		●				●		●
Vacuum ejectors				●						
Linking diff. sizes	●		●	●			●	●		●
2 pressure ranges	●	●	●	●	●	●	●	●	●	●
3 or more pressure ranges	●	●	●	●			●	●		●
Integrated throttles								●		●
E/P integration	●		●							

## Equipment options

The option of integrating pressure control for individual valves or whole sections, flow controls, vacuum ejectors or pneumatic separation of pressure ranges increases the controller's overall functionality. The possibility to change the type of electrical connection at a later date makes the system convenient and flexible.

Valve systems					
Qn		Series	Functions	Connections	Control
300 l/min		AV03	2 x 3/2, 5/2, 5/3 E/P	Ø 4, Ø 6	Multipole plug, field bus AES
400 l/min		HF04	2 x 3/2, 5/2, 5/3	Ø 6	Multipole plug, field bus BDC, CMS, DDL
700 l/min		AV05	2 x 3/2, 5/2, 5/3 E/P	Ø 4, Ø 6, Ø 8	Multipole plug, field bus AES
700 l/min		CL03	2 x 3/2, 5/2, 5/3	G1/4, Ø 5/16, Ø 3/8	Multipole plug, field bus BDC, DDL
700 l/min		HF03-LG	2 x 3/2, 5/2, 5/3	G1/8, Ø 8, NPTF 1/8	Multipole plug, field bus BDC, CMS, DDL
800 l/min		TC08	5/2, 5/3	G1/8, NPTF 1/8	Single plug, pneumatic
1100 l/min		CD01	2 x 3/2, 5/2, 5/3	G1/8, G1/4, NPTF 1/4, Ø 4, Ø 6, Ø 8, Ø 10	Single plug, multipole plug, pneumatic
1400 l/min		HF02-LG	2 x 3/2, 5/2, 5/3	G1/4, Ø 10	Multipole plug, field bus BDC, CMS, DDL
1500 l/min		TC15	5/2, 5/3	G1/4, NPTF 1/4	Single plug, pneumatic
1400 – 6000 l/min		581	2 x 3/2, 5/2, 5/3	G1/8, G1/4, G3/8, G1/2, G3/4	Single plug, multipole plug, pneumatic

Single valves					
Qn		Series	Functions	Connections	Control
520 – 850 l/min		589	3/2, 5/2	Ø 6 x 1	Electric, pneumatic
800 l/min		TC08	5/2, 5/3	G1/8, NPTF 1/8	Electric, pneumatic
900 l/min		CD04	3/2, 5/2, 5/3	G1/8	Electric, pneumatic, mechanical
900 – 1400 l/min		CD07	3/2, 5/2, 5/3	G1/4, M14 x 1,5	Electric, pneumatic, mechanical
1500 l/min		TC15	5/2, 5/3	G1/4, NPTF 1/4	Electric, pneumatic
3800 – 4100 l/min		CD12	3/2, 5/2, 5/3	G1/2	Electric, pneumatic
1350 – 13620 l/min		560	3/2	G1/4, G1/2, G1	Electric, pneumatic
100 l/min		ED02	3/2	G1/8	Electric
350 l/min		EV04	3/3	G1/8	Electric
800 l/min		EV07	3/3	G1/4	Electric
1000 l/min		ED05	3/3	NPTF, G1/4	Electric
1300 l/min		ED07	3/3	G3/8	Electric
2600 l/min		ED12	3/3	G3/4	Electric
150 – 550 l/min		AP	2/2, 3/2, 4/2	G1/8, NPTF 1/8-27, G1/4, M5	Mechanical, manual
1000 – 7000 l/min		CERAM	5/2, 5/3	G1/8, 1/4, 3/8, 1/2 NPTF 1/4, 3/8, 1/2, 3/4, 1	Electric, pneumatic

**AVENTICS GmbH**  
Ulmer Straße 4  
30880 Laatzen, Germany  
[www.aventics.com](http://www.aventics.com)  
[info@aventics.com](mailto:info@aventics.com)



**Your Contact:**


Further contacts:  
[www.aventics.com/en/contact](http://www.aventics.com/en/contact)

The data specified only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.