



ADVANCED VALVE SYSTEM FLEXIBLE, INTELLIGENT AND FUTURE-ORIENTED

Pneumatics
It's that easy





The AV family: success through advancement

Sophisticated thanks to use in a wide variety of practical applications, driven forward through constant development: The Advanced Valves (AV) have made quite an impression since entering the market. The AV family continues to grow – finding modern answers to current requirements in industrial automation.

Our Advanced Valve system has proven successful in a broad spectrum of applications. The recipe for success: Long-term research in the area of valve technology, continuous further development of the materials used, as well as fast implementation of innovative ideas to expand our modular concept.

The AV systems provide a reliable basis for both compact handling systems and complex automation solutions. In the area of machine safety in particular, the AV family offers intelligent solutions that significantly reduce your effort in creating a safe design.

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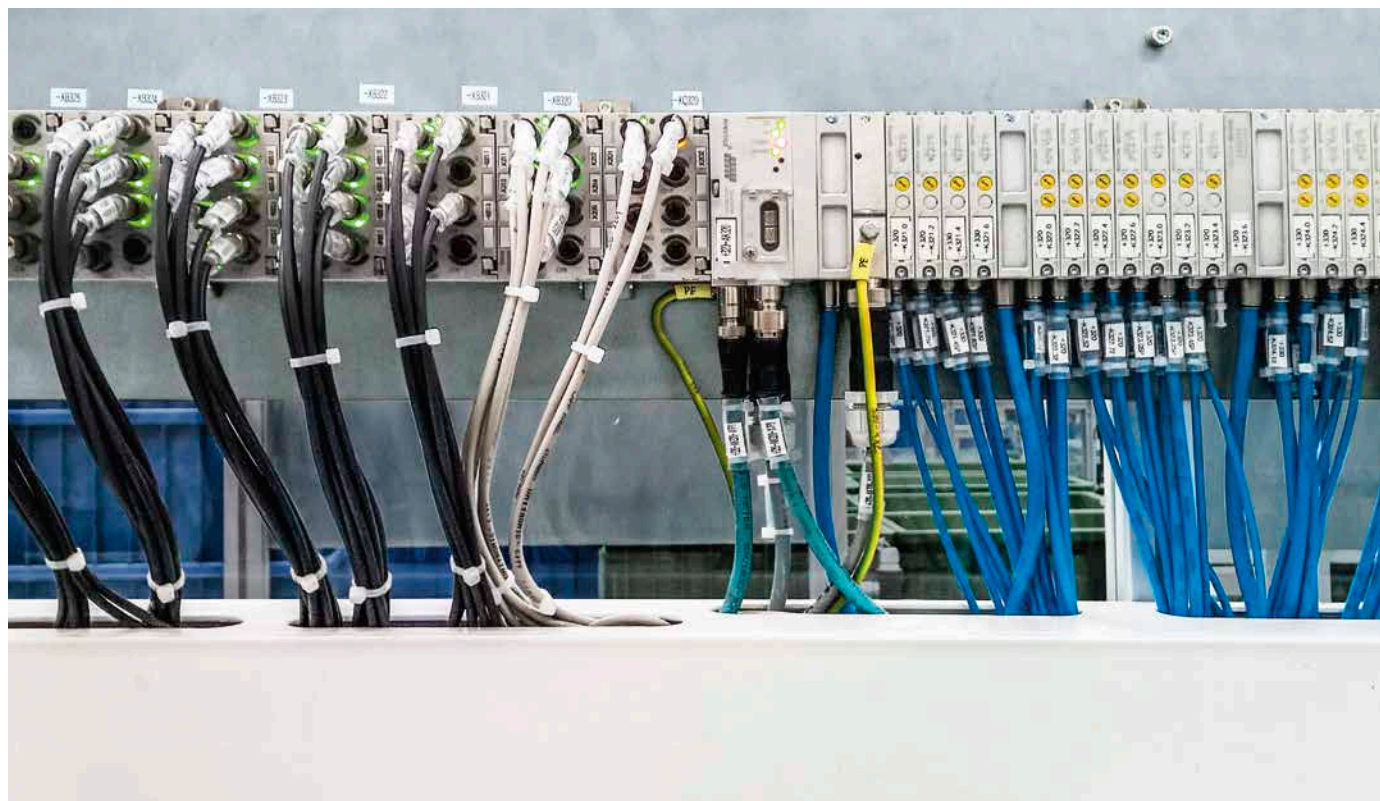
One solution for many automation requirements: the AV family at a glance

Important performance data reveals just how much an innovative material selection and sophisticated pilot valve technology pay off in practice: With a weight reduced by up to 70% and current consumption cut by 80%, the AV system makes a major contribution to your energy-efficient automation solution.

Systematic success – modern advancement

With their diagonal spool, the AV family valves – AV03 and AV05 – have set benchmarks in both sizes. They feature an excellent volume-to-flow ratio as well as a record-breaking energy balance.

With the serial Advanced Electronic system (AES) interface, the AV valve system effortlessly communicates with modern control systems via all standard fieldbus systems. The modular electronics form the basis for high networking, flawless data transmission, and integration into Internet of Things concepts.



▲ AES and AV as complete solution for the integration of electronics and pneumatics.

Fully integrated or as a stand-alone solution: AV-EP

Available in a range of variants, electropneumatic pressure regulators supplement the AV family. Our many years of experience in electropneumatic pressure regulator technology are reflected in our AV-EP, which can be integrated into the valve system achieving both functional and visual perfection – with minimum effort required for installation, parameterization, and commissioning, and maximum control behavior performance.

Convenience by design and configuration

The selection of materials and design make the AV valve system the ideal solution for use under demanding conditions. AV systems also cover the requirements of global automation technology, even under UL specifications and in ATEX areas.

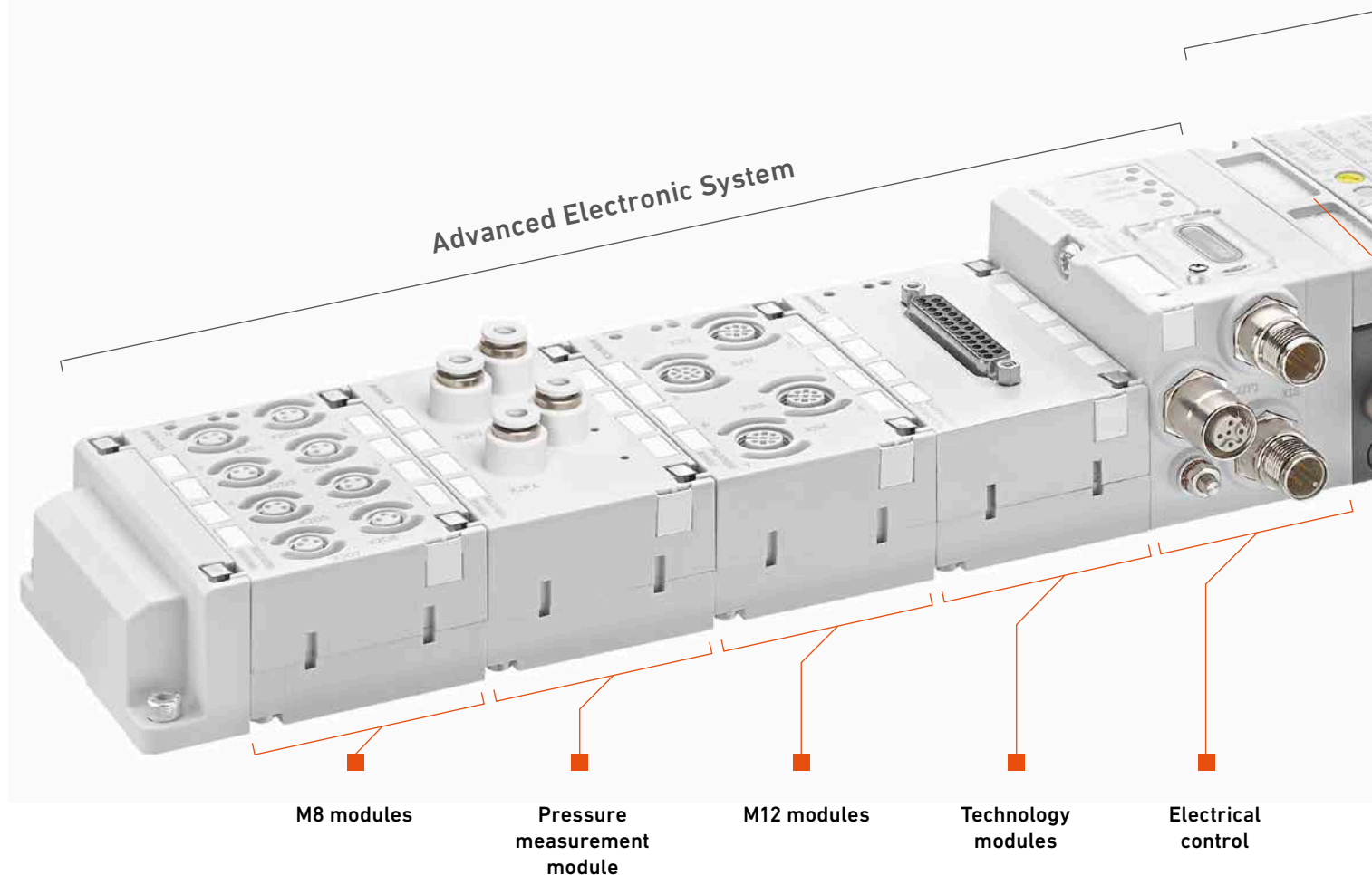
The online configurator helps during system layout, providing useful information and documentation for spare part and system documentation in the design phase, speeding up your machine development. The QR code also grants you direct access to all configuration and spare part data – including on your mobile device.

A portrait of a man with light brown hair, wearing a dark suit, white shirt, and an orange patterned tie. He has his arms crossed and is looking towards the camera with a slight smile. The background behind him is a solid orange color.

"With the remarkable AV and AES product range, our customers find a solution for virtually all problems and are ideally prepared for future IoT requirements."

Tomas Kälble,
Strategic Product Management AVENTICS

Impressive range of functions: the AV family system



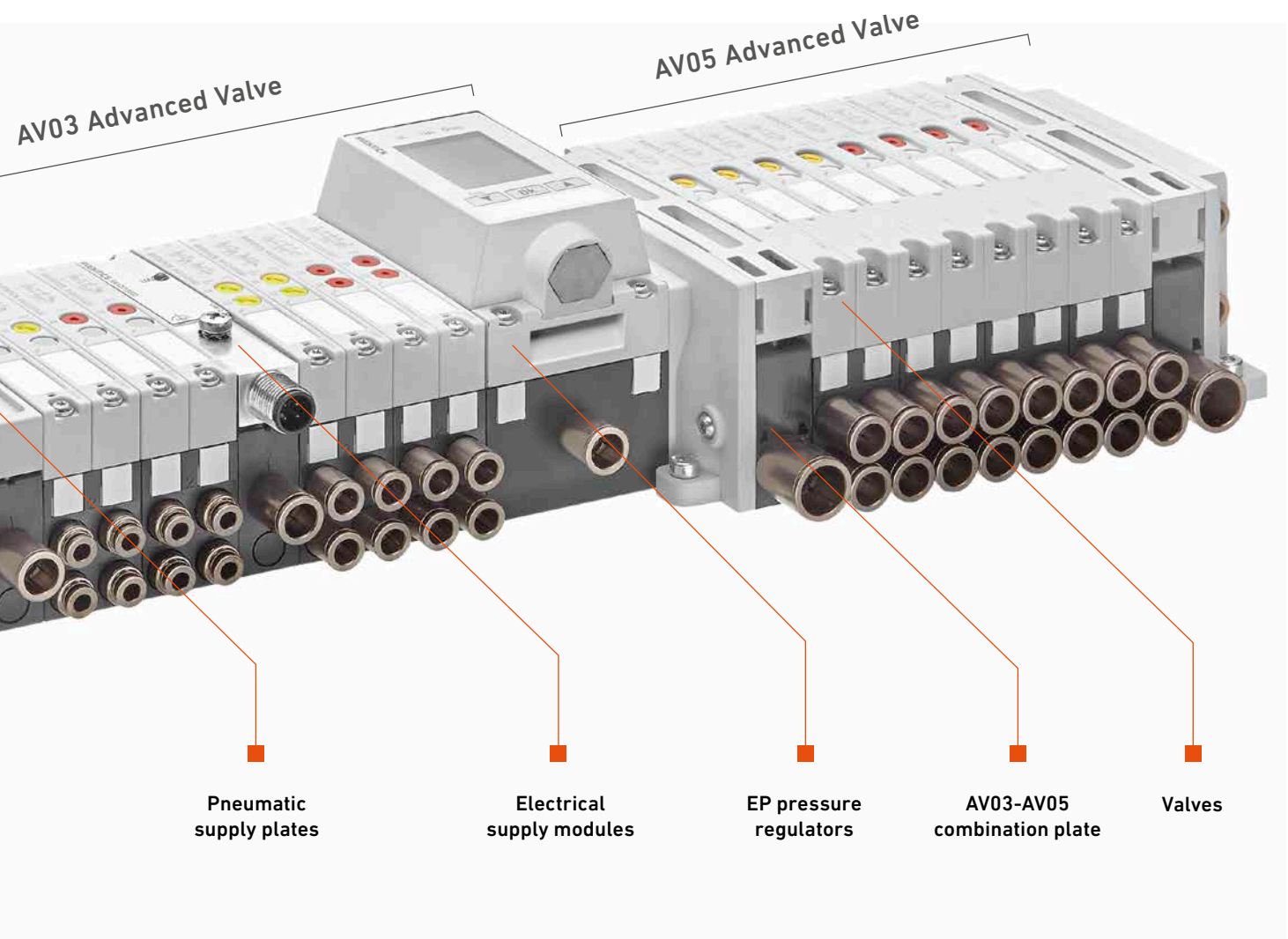
Planning, configuration, commissioning, use, extension, or service.
With the AV family, every phase of your application is easier to manage.

EASY-2-CONFIGURE

- Can be configured completely online
- User navigation with default specification and plausibility check
- Time-saving creation of technical documents
- Options such as UL and ATEX available
- One material number, no code conversion required, available for order online immediately
- Available in inch or metric versions

EASY-2-USE

- Small, compact dimensions – optimal for use with end-of-arm tooling/moving parts
- All standard fieldbus protocols available
- Configuration code and driver files available for fast commissioning
- Consistent LED diagnosis, ring LED for improved visibility in I/O modules



EASY-2-EXTEND

- Simple subsequent extension of valve positions, pressure regulators, and I/O modules
- Tool-free connection of I/O modules
- Valve assembly with one screw
- Exchangeable fittings
- Extension with function modules
- Minimal PLC configuration adjustment after extension



AV03 and AV05 valve systems for flexible application

Two size options with impressive performance: AV03 with 300 l/min nominal flow, 8 ms switching time, or the AV05 with 700 l/min nominal flow, 13 ms switching time. Benefit from a higher power density in compact dimensions: 45% less space and 40% lower weight

The diagonal spool in the flexible base plate system, the modularity of the power concept: these valve systems are extremely adaptable and intelligent. Up to 64 base plate valves can be positioned variably in the valve system. With electrical and pneumatic supply plates, individual valve and pressure zones can be integrated based on the requirements.

Small valves – high speeds

You can also custom-configure your cylinders with our online Engineering Tools. In combination with the AV valves, you achieve outstanding results: With the AV03 a cylinder with diameter of 32 mm reaches speeds of up to 1 m/s. With AV05, even cylinders with a diameter of 80 mm manage speeds of 0.4 m/s. The variety of components enable a wide range of combination options – thanks to a compact design, the size remains small.

- The diagonal arrangement of the spool reduces the size of the Advanced Valves and optimizes the performance of the supply and exhaust channels.

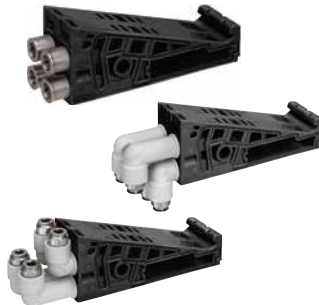


The wide variety of components in the AV family: tailored for flexible application

1



2



3



1 Valves

- 2 × 2/2 directional valves
- 2 × 3/2 directional valves
- 5/2 directional valve
- 5/3 directional valve
- Blanking plate

2 Base plates

- 2x, 3x, 4x
- Straight/angled push-in fitting (metric or inch)

3 Combination plate

AV03 – AV05

4 Pneumatic supply plates

- Int./ext. pilot air
- With/without channel separation
- Exhaust with flat silencer
- Restricted exhaust

5. Electrical supply plate

6 Valve control module

7 Accessories

- a) DIN rail
- b) Fittings (metric or inch)
- c) Flow coupler

8 Function modules

- a) Pressure regulator
- b) Exhaust module
- c) Shut-off module

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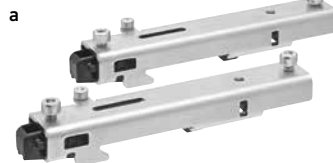
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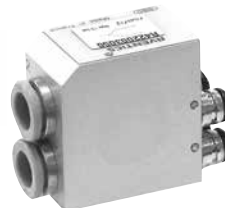
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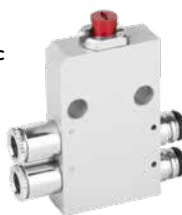
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b



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AES

Your interface to the superior controller

The AES Advanced Electronic system ensure smooth serial communication, connecting the AV system to all relevant controls. In addition, the AES offers a variety of input and output modules enabling easy integration of additional functions in the electronics.

No matter the electrical system structure – the Advanced Valve system offers the right interface. In addition to the parallel connection technology via D-Sub plugs, AV systems can also be connected to all standard fieldbus systems via the AES fieldbus coupler. For simple integration and commissioning, we provide driver files and configuration keys.

The AV also equips you well for IoT requirements, providing consistent communication up to the valve, as well as an integrated web server.

Connection magic with compact dimensions

The input and output modules are no higher than the valves, even with mounted plugs. In addition to the typical I/O modules, technology modules are also available that provide further advantages in wiring or application for special requirements.

The data width of the AES with 512 input bits and 512 output bits enables all conceivable combinations as well as the control of 64 double solenoid valves.

Besides the modular AES components for fieldbus applications, the AV system also features a solution for IO-Link. With a direct M12 connection, the majority of all AV functions can be used, with extremely simple implementation in the IO-Link system.

AES highlights

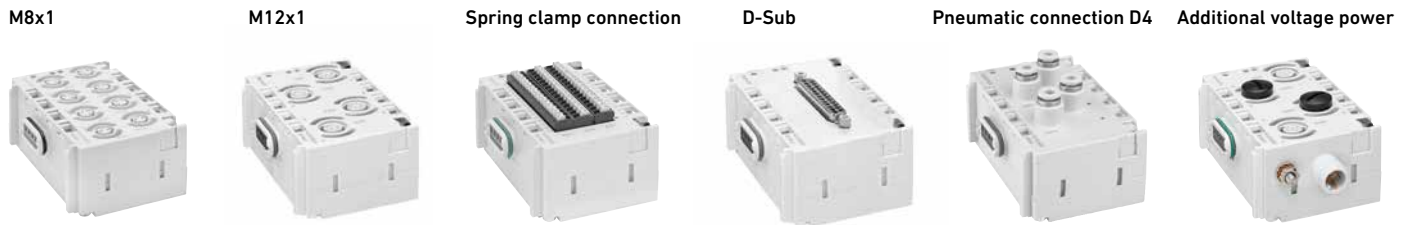
| | |
|-------------------------------|--------------------------|
| I/O data width | 512-bit/512-bit |
| Number of I/O modules | Max. 10 |
| Number of valves/coils | Max. 64 valves/128 coils |
| Internal cycle time | <1ms |

AES facts

| | |
|---------------------------|------------------------------|
| Protection class | Max. IP65 |
| I/O functionality | Analog/digital |
| Connection options | M8, M12, D-Sub, spring clamp |



AES I/O modules – connection variants



| Module variants | M8x1 | M12x1 | Spring clamp connection | D-Sub | D4 | Additional voltage power |
|----------------------------------|------|-------|-------------------------|-------|----|--------------------------|
| Digital input modules | • | • | • | | | |
| Digital output modules* | • | • | • | • | | |
| Digital input and output modules | • | • | | | | |
| Analog input modules | | • | | | | |
| Analog output modules | | • | | | | |
| Analog combination module | | • | | | | • |
| Control module | | • | | | | • |
| Pressure measurement module | | | | | • | |

* optimized for connecting additional valve system via D-Sub connection

Special modules

Analog combination module

Optimized for direct control of up to 2 EP pressure regulators each with one analog input and output signal as well as a 24 V power supply on one plug

Control module

With integrated regulator for the direct control of e.g. up to 2 EP pressure regulators and one external sensor. Suitable for superior control circuits and servo-pneumatic positioning

Pressure measurement module

Simple reading of four pressures with up to 10 bar and transfer to the control via the field bus

Accessories



M8x1, M12x1 plugs and cables



Multipole plugs and cables



Decentralized I/O module

AV-EP – direct integration into the fieldbus, for single pressure or pressure zone control with high performance

AVENTICS stands for the leading electropneumatic pressure control (EP) technology, but we are now taking it one step further. Integration, compact dimensions, and the wide range of variants of our AV03/AV05 EPs supplement the functionality of the AV family.



▲ Regulation, control, monitoring: all in a single system



▲ EV03 pressure regulator as a stand-alone solution

The consistent use of high-tech polymers in the AV-EP also ensures high functional integration and power density. You cut weight by 70% and current consumption by 80% compared with existing products. A major advantage is the direct integration into the AV03 and AV05 valve systems. The display enables direct input of parameters – tailored to the respective application – for example the desired operating pressure level. The AV-EP can be used within the valve system as a single pressure or pressure zone control.

Wide variety: typical AV

AV-EPs are available in a wide range of variants: matching the AV03/AV05 system, fully integrated, as a stand-alone solution or EV03 single station control. A display or control via multipin as well as via fieldbus are further options. The EP pressure regulator features 16-bit resolution and uses 10 bits for the pressure range: as a result, the regulator has a very precise resolution compared with competitor products. The AV-EP is ideal for applications where the set points rarely have to be changed.

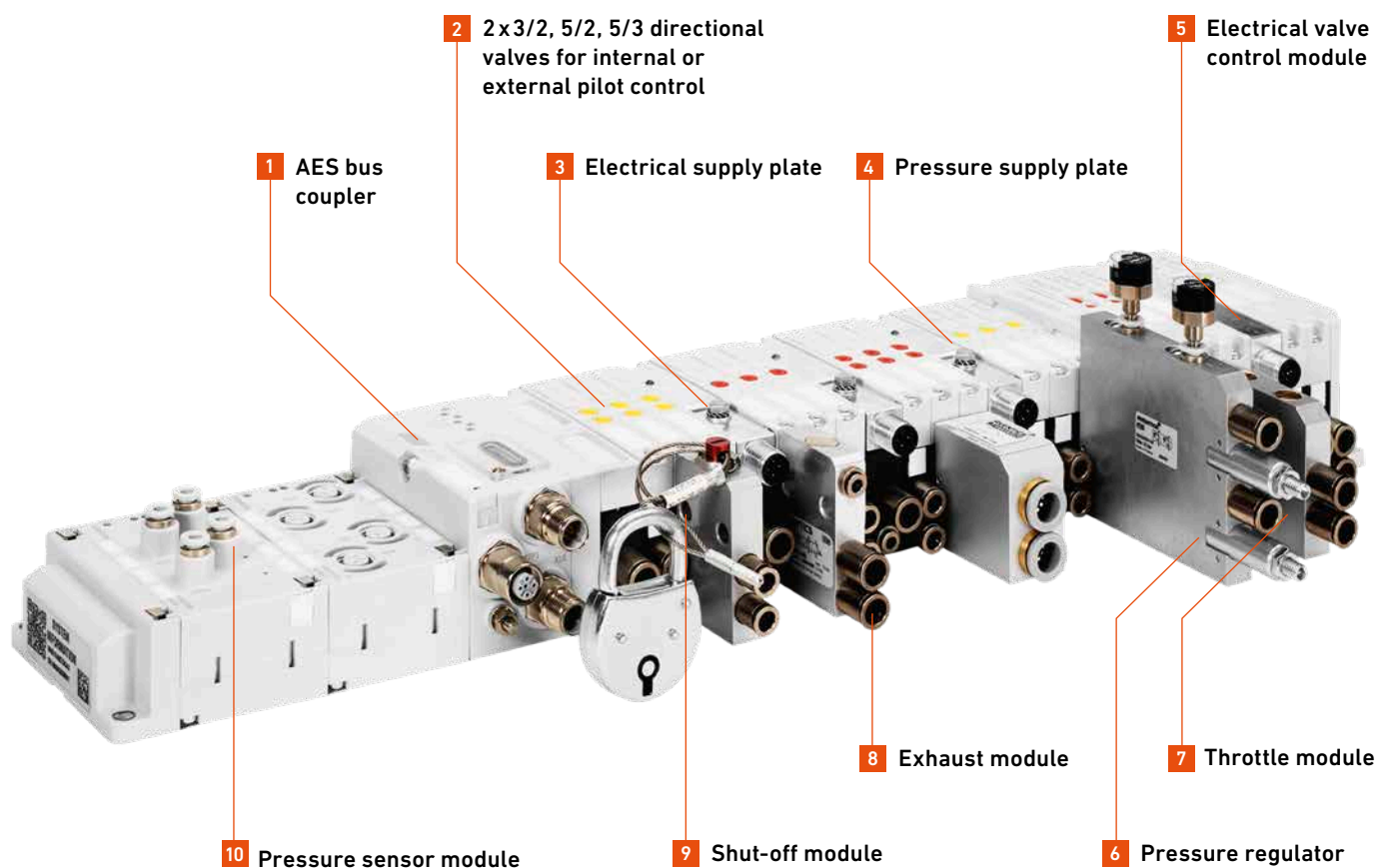
Of course, the AV-EPs feature all advantages of the AV switching valves: push-in fittings for fast operating line switching, visible status LEDs, and a low weight. Furthermore, it is easy to assemble with just two screws.

| Flows* | Single pressure control | Pressure zone control |
|----------------|-------------------------|-----------------------|
| AV03-EP | 600l/min | 800l/min |
| AV05-EP | 900l/min | 1100l/min |
| EV03 | 1060l/min | |

* PV = 7 bar, P1 = 6 bar, P2 = 5 bar

AV valve system with AES fieldbus system – the ideal solution for machine safety

Thanks to its sophisticated modular and functional structure, the AV system can be easily adapted to the requirements of safety-oriented pneumatic controls.





The consistent modular design simplifies your project planning with regard to machine safety, with each module making its own contribution:

- 1 AES bus coupler:** Galvanic isolation between the logic voltage (UL) and actuator voltage (UA) in the bus coupler; this achieves a safe separation of safety-related function from other functions in the application. The entire system features standardized M12 connections.
- 2 AV series valves** have an extremely long service life of over 150 million cycles. Excellent leakage values plus easy maintenance minimizes the risk of failure. Pilot air can be controlled internally or externally; should a problem occur, the valves switch to a defined safe state. The valves comply with basic and proven principles in safety-related controls.
- 3 The electrical supply plate** enables the formation of independent voltage zones with any number of valves. Safety functions thus remain separate from other functions. In addition, the supply plate makes it possible to use separate cables for logic and actuators, thus reducing the potential for error. The supply plate meets the safety principles specified in

ISO 13849-2. MTTF values are also available for all relevant components.

- 4 Pressure supply plates:** Enable mutually independent pressure zones for customized pressure supply to different safety circuits and ensure adequate, rapid system exhaust.
- 5 Electrical valve control module:** For direct actuation of 2 valves in AV03 and AV05 valve systems. The valve control module can be integrated at the right end of D-Sub or fieldbus valve systems. The two following valve positions are controlled via the M12 connection. No electrical connection to the previous base plates exists. It is possible to use multiple valve control plates.
- 6 Pressure regulator:** Reduced working pressure in the operating lines for force limitation in cylinders.
- 7 Throttle module:** With the two-channel pressure module, the flow in both operating lines can be limited, reducing the cylinder traversing speed. Optionally, a cover plate is available to safeguard against manipulation.

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8 Exhaust module: In case of emergency stop, cylinder chambers may remain under pressure. To perform maintenance, release trapped personnel, or achieve correct workpiece positioning, the cylinder chambers must be exhausted to change the cylinder piston position. The solution: targeted system exhaust to disable the cylinder without application of energy.

9 Shut-off module: The shut-off module serves to separate actuators from the pneumatic supply, e.g. for maintenance purposes.

10 Pressure sensor module: Processes four pneumatic inputs (pressure) from a pneumatic control and converts the pneumatic pressure into digital information of the serial transmission system for processing in the machine control. The module provides diagnostic capabilities via LED and supply voltage monitoring. All necessary functions are integrated; the module is also protected against manipulation. It safely monitors system pressures and provides reliable, fast information about the pressure conditions in all relevant modes of operation.

We also provide you with assistance if you have any further questions on machine safety. Feel free to contact us.

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Certified products, for specific requirements

UL

The UL mark is frequently required for products that are to be sold on the North American market. During product certification, a major focus is placed on safety against electric shocks and fire hazards.

According to these requirements, materials and components in the AV system were selected based on UL criteria, enabling simple extension to UL within the system configuration.



ATEX

Pneumatics play an important role in potentially explosive atmospheres and, thanks to their simplicity, often feature major advantages over electrical actuator systems. For this reason, the ATEX option can be selected for AV systems during system configuration.



QR code

Easier, faster, more direct



Just a single picture of the QR code on your product on your cell phone or tablet brings you straight to your configuration, wirelessly, from anywhere in the world. For easy reordering, additions, or fast contact to Service.

Your advantages – small solution, major effect

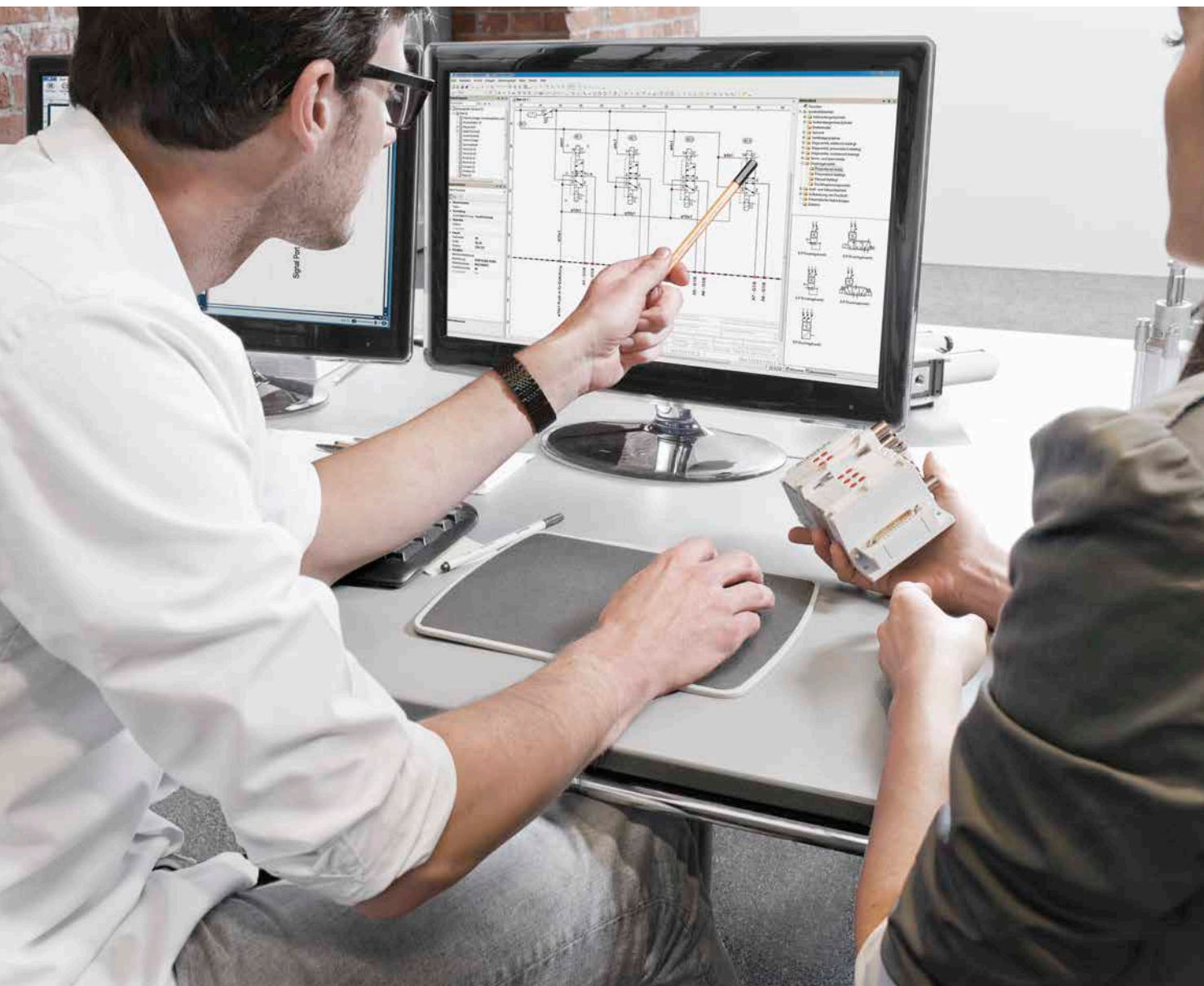
The AV family is not only designed intelligently for highly flexible application – it is also continuously being upgraded. All information and new features can be found at www.aventics.com or www.advanced-valve.com. Always up-to-date.

The QR code below brings you directly to www.advanced-valve.com.



Engineering tools

Excellent service comes with the family



Our AV system products provide key features, with our service offering rounding off the entire package. With the Engineering tools, we provide the complete product range, tools, and expertise for all of your pneumatics-related questions online.

From configuration programs to product information, up to the energy savings calculator, our wide range of practical, time-saving Engineering Tools is already in use by many satisfied customers.

Your homepage for non-stop service

Research tools, design and configuration aids, circuit diagram software, and the eShop are available online at

www.engineering-tools.com – including technical support and detailed documentation. Our tools not only determine the basic configuration for the components, but also provide recommendations for alternative solutions and more energy-efficient accessory parts. This allows you to accelerate your business processes and save all of your steps online so that you can access them again even after the project is finished.



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

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. The configurator provides technical information, CAD data, and the documentation.



Calculation Programs

Here you can specify the dimensions or load-bearing 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.

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