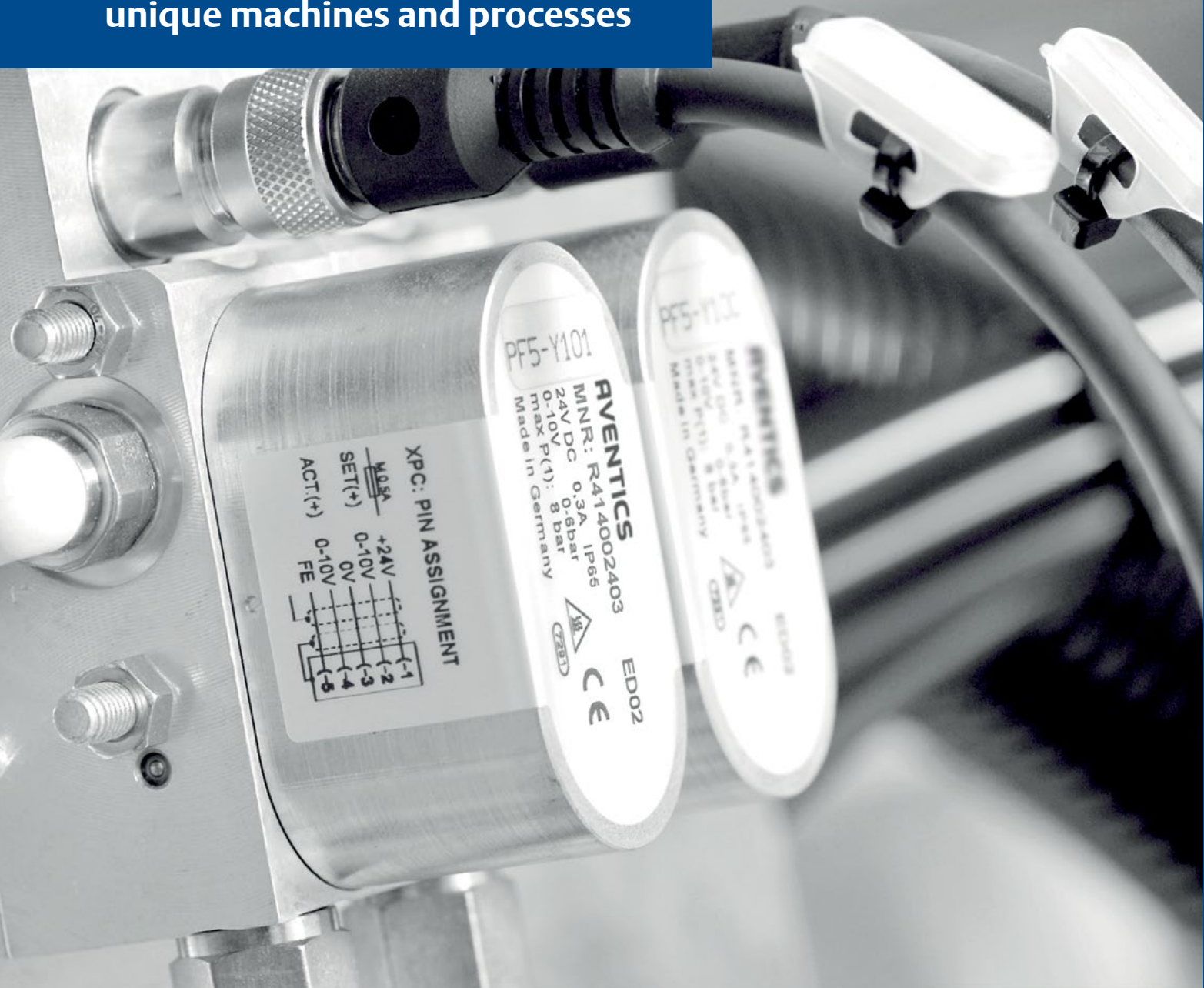


Increase the efficiency of your  
unique machines and processes



## ASCO™ and AVENTICS™ Proportional Technology

Maximize production throughput as a result of precise control of pressure and flow of liquids and gases.



## You need to continually develop machines that offer manufacturers a lower total cost of ownership.

To maintain profit margins while keeping prices down, your customers are continually looking for ways to optimize their manufacturing operations to enable them to be competitive in global markets. Your machines and processes therefore need to help them be more efficient in terms of greater throughput, reduced energy consumption, lower raw material use and even a smaller equipment footprint. The need for innovative solutions to make these gains creates challenges when sourcing devices that meet your specific and unique machinery application requirements.

“Companies lose 20 to 30 percent in revenue every year due to inefficiencies.”

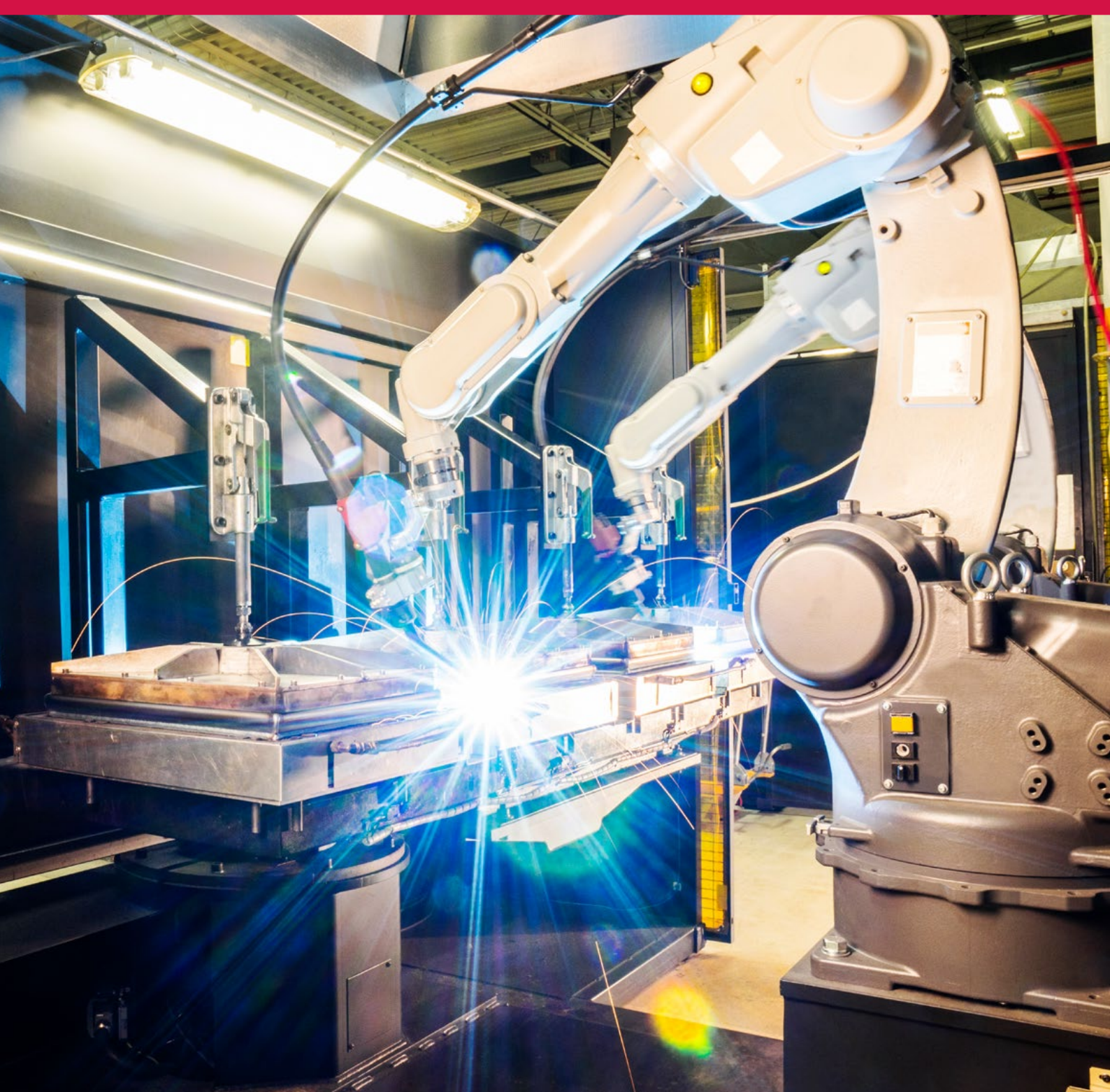
– IDC Market Research



“Knowledge-based customization is key to enhancing the performance of OEM products and to ensuring that this value is realized earlier.”

– Ashwin W. Joshi, OEM Implementation of Supplier Developed Component Innovations, Journal of the Academy of Marketing Science





Instead of developing machines inhibited by the limitations of the available devices, what if you could source customized flow control solutions that not only exceed your machinery specifications, but contribute towards genuine manufacturing efficiency improvements for your customers?

## Advanced proportional technology delivers precise pressure and flow control for greater production efficiency.



ASCO and AVENTICS proportional valve technology quickly and accurately adjusts output pressure or flow in relation to variable operating conditions. Precise control of liquids and gases enables optimization of machinery and processes, increasing efficiency in terms of greater production throughput and reductions in raw material use and energy consumption. Replacing the need for multiple solenoid valves to support large pressure and flow turndowns reduces overall machinery footprint. The greater flexibility of system design and operation is complemented by Emerson's global engineering services, which design and construct customized solutions to meet the exact requirements of unique machines.

**ASCO™ AVENTICS™**



“Precision is crucial to controlling dynamic process reliability. The proportional valves from Emerson meet these requirements, no matter the application.”  
– Engineering Manager, Global Automotive Manufacturing company

## Enable your machines to increase production efficiency.

A manufacturer of ultrasonic welders required control of actuator pressure responsible for quickly and smoothly positioning the ultrasonic horn and adjusting the weld force. The flexibility provided by an AVENTICS Sentronic Plus proportional valve enabled standardization across multiple welding applications, reducing costs and footprint, while high repeatability and precise control produced high dynamic performance, resulting in greater yield.

Efficiency ► p6

## Don't compromise on machinery performance.

An engine manufacturer required very accurate and stable control of air pressure to ensure all engines are tested to the same criteria. Emerson developed a proportional valve with a special mechanical design to regulate pressure. The accompanying software interface enabled customized parameters to be created for different engine sizes, allowing a single testbench to be used for all engines.

Customization ► p8



## Build machines that increase production efficiency.

Your customers demand more efficient machines and processes that help them to remain competitive in global markets. Emerson's proportional valve technology provides precise control of flow and pressure, enabling machines to provide increased performance, ensured safety and manufacturing processes to be optimized. Final products can be produced to tighter specifications, reducing raw material usage and ensuring higher quality and less rejects. Energy efficient solutions reduce power consumption. Digital communications and diagnostic functionality support preventative maintenance strategies that increase uptime and production throughput. Versatile, compact designs save considerable space compared with traditional on/off switching valves, reducing machinery footprints. By implementing Emerson's proportional valve technology and leveraging these benefits, you can design and build machines that support your customers' objectives.

### What's your challenge?



"Companies lose 20 to 30 percent in revenue every year due to inefficiencies."  
– IDC Market Research

### What's your opportunity?



A major snack food manufacturer wanted better regulation of the amount of water in its products. An ASCO Series 290 proportional valve applied to a biscuit and cracker dough mixer provided precise and variable water input across a multi-product production schedule, enabled faster recipe changes and reduced operational costs.

## Greater production throughput



Extremely short response times provide precise control of the process enabling greater product throughput. ► p11



Rugged and durable product with advanced diagnostics reduces downtime leading to increased availability and throughput. ► p11

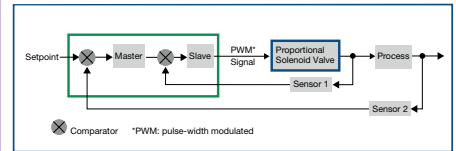
## Improved control



Precise control, enabling products to be manufactured closer to optimum specification reducing raw material usage. ► p11

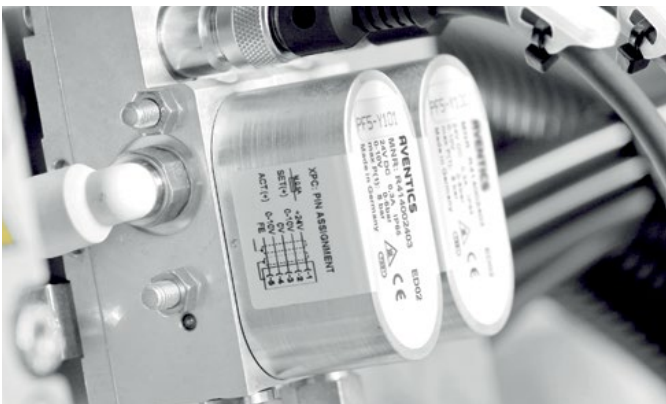


Low power devices enable battery powered applications, and reduce the amount of heat transferred to the media. ► p15



Cascade control enables compensation for disturbances in control chain, improving quality of final products and reducing rejects. ► p15

## Smaller equipment footprint



Proportional technology replaces on/off control devices that require larger manifolds. ► p11



Compact modular lightweight designs further reduce flow/pressure control footprint. ► p11



For further information, visit [Emerson.com/AVENTICS](http://Emerson.com/AVENTICS)





## Develop innovative solutions without compromises.

To develop innovative machines or processes that meet or exceed customer requirements and contribute towards operational efficiency improvements, you require flow and pressure control solutions that elevate the performance of your solutions. However, procuring proportional technology for low volume and/or unique machines and processes that adhere to exacting specifications can be time-consuming and often frustrating. Emerson's extensive range of class-leading proportional valve technology is complimented by a global engineering support network that designs, engineers and delivers cost-effective, high performance customized solutions that fulfil your requirements and ensure your machines meet the toughest industry performance, quality and safety standards.

### What's your challenge?



"Knowledge-based customization is key to enhancing the performance of OEM products and to ensuring that this value is realized earlier. This has the strongest total effect on innovation implementation."  
– Ashwin W. Joshi, OEM Implementation of Supplier Developed Component Innovations, Journal of the Academy of Marketing Science

### What's your opportunity?



A medical device manufacturer implemented a customized manifold of ASCO Preciflow proportional valves to regulate pressure and control the flow of CO<sub>2</sub> within an insufflator for colonoscopy. The ability to provide constant pressure and temperature and fast, instantaneous and progressive release of over pressure has contributed towards creating a class-leading machine.



## Optimize the performance of your machines



Customized flow and pressure solutions help to optimize manufacturing processes and bring added value.



Remove machinery design limitations caused by unavailability of flow and pressure control technology. ► p16



Ensure that the most appropriate technology is implemented. ► p19

## Reduce the cost of final solution

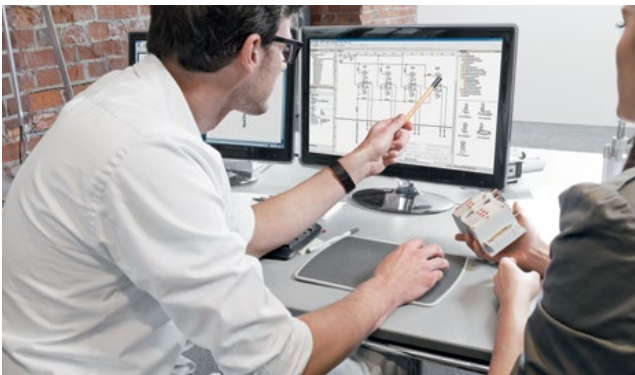


Single-supplier offering a comprehensive range of flow and pressure control solutions helps to reduce overall procurement time and cost. ► p14



Increase speed to market for your machine by streamlining your procurement. ► p19

## Reduced project risk



Reliable industry-proven standard and customized solutions ensure that your machine delivers the performance your customers require. ► p19



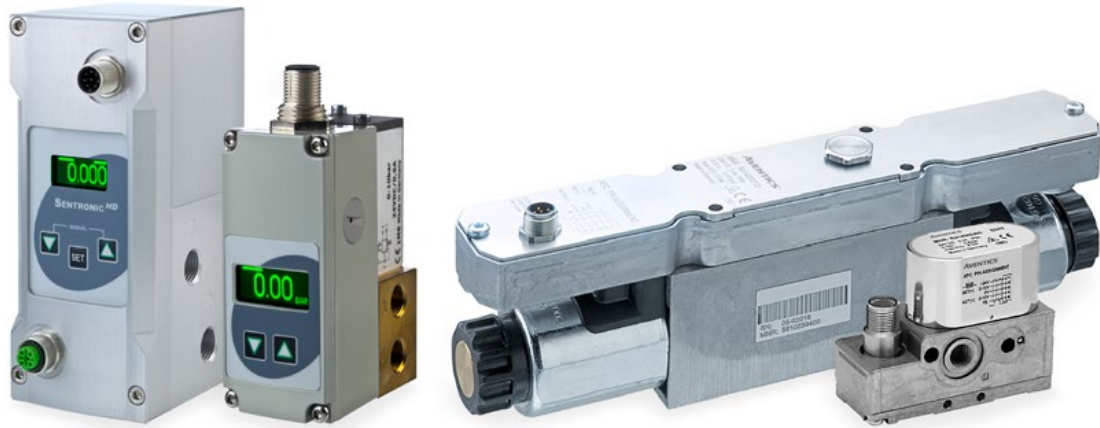
Global engineering support from a network of local offices ensures you receive the correct advice and assistance in a timely fashion. ► p19



For further information, visit [Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)



## AVENTICS proportional pressure control valves: increasing the efficiency of unique machines













### AVENTICS proportional pressure control valves: overview

Emerson's extensive range of AVENTICS proportional pressure control valves provide optimal control of pressure within many machines and processes worldwide. Pilot, directly or indirectly controlled devices provide precise control of highly dynamic pressure variations, with the ability to compensate for variations within the control chain. With over 30 years of experience with proportional technology, Emerson's digitally operated devices offer low energy consumption, short response times and adjustable parameters to ensure the challenging demands of your specific application are met. Small footprints, fieldbus and Ethernet TCP/IP connectivity and a broad range of connection options support IIoT applications and easy installation into your machine or process design. Supporting data acquisition software helps streamline your development process by identifying application-specific problems earlier.

[Emerson.com/AVENTICS](https://www.emerson.com/AVENTICS)

## Pressure control valves comparison

					
Series	Series 608/609 Sentronic D	Series 614 Sentronic PLUS	Series 615 Servotronic Digital	Series 616 Sentronic HD	Series 617 Sentronic LP
Flow (SCFM)	17 - 46	2 - 198	60	42	0.5 - 184
Pressure range PSI	-14.5 to 174	-14.5 to 725	-14.5 to 725	-14.5 to 150	0 to 150
Function	3/3	3/3	3/3	3/3 (2x 2/2)	3/3 (2x 2/2)
Construction	Direct controlled	Direct controlled	Direct controlled	Pilot controlled	Pilot controlled
Dynamic applications	■	■	■	▲	▲
Precision applications	▲	■	▲	■	▲
Customization	■	■	■	■	■
Explosion proof		Yes			
					
Series	Series ED02	Series ED05	Series ED07/ED12	Series EV03 / AV03-EP	Series EV12/18
Flow (SCFM)	4	35	46 - 92	11 - 21	230 - 583
Pressure range PSI	-14.5 to 145	0 to 145	-14.5 to 290	0 to 145	0 to 145
Function	3/3 (2x 2/2)	3/3	3/3 (2x 2/2)	3/3 (2x 2/2)	3/3 (2x 2/2)
Construction	Direct controlled	Direct controlled	Direct controlled	Pilot controlled	Pilot controlled
Dynamic applications	■	■	■	▲	▲
Precision applications	■	▲	■	▲	▲
Customization	●	●	●	▲	▲

■ Ideal ▲ Suitable ● Requires vendor support

## ASCO proportional flow control valves: optimizing process quality and efficiency









### ASCO proportional flow control valves: overview

Emerson's ASCO proportional flow control valves and digital controllers provide precise regulation of variable flow of air, neutral gases, steam or aggressive fluids. By delivering responsive and precise flow control, that compensates for changes or disturbances in the control chain, your process can be optimized, increasing quality and production efficiency. To meet the specific needs of challenging and unique applications, a broad range of valves are available with digital control electronics and simple to use interfaces to allow the customization of parameters. Analytical and medical application requirements are met by compact, lightweight constructions and stainless-steel bodies offering diameters down to 0.2mm. Low power consumption, small footprints and long service lives support lower total cost of ownership.

[Emerson.com/ASCO](https://www.emerson.com/ASCO)

## Flow control valves comparison

			
Series	Series 202 Preciflow	Series 202 Posiflow	Series 630
Flow (SCFM)	0.003 - 7	0 - 78	0.003 - 0.004
Function	2/2	2/2	2/2
Medium	Neutral gas	Neutral gas/Water/Oil	Neutral gas
Construction	Direct controlled	Direct or Pilot controlled	Direct controlled
Dynamic applications	■	▲	■
Precision applications	■	▲	■
Customization	■	▲	●
			
Series	Series E290	Series E290 Motor	Series 607
Flow (SCFM)	0 - 2825	0 - 229	0.2 - 71
Function	2/2	2/2	2/2
Medium	Neutral gas/Water/Steam	Neutral gas/Water/Steam	Neutral gas
Construction	Pilot controlled	Motorized	Direct controlled
Dynamic applications	▲	▲	▲
Precision applications	▲	▲	▲
Customization	■	●	■

■ Ideal ▲ Suitable ● Requires vendor support

## AVENTICS Sentronic valves overview



Emerson's range of AVENTICS Sentronic valves deliver optimized performance and enduring operation. Engineered to exacting standards that match the requirements of your application, they can be applied to a broad range of specialist machinery applications, such as paint coating for spray pattern adjustment and turbine and paint volume control. Within laser cutting applications, gas pressure is rapidly adjusted in accordance with material and its thickness. For filling applications, irrespective of fluid levels in storage tanks, by maintaining constant pressure using the AVENTICS proportional valves, filling volumes remain constant. For glue dosing applications, the system pressure level is maintained as the glue level in the container decreases. For applications with unique requirements, Emerson's engineering service can customize products or manifolds to ensure optimal performance and reliability.

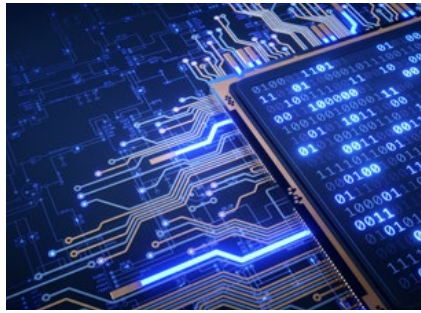
## Reduced lifecycle costs

### Low power consumption



Low power consumption and no heating effect on coil, ensures no accuracy drift and reduced energy usage.

### Advanced diagnostics



Advanced diagnostics help maintain reliable control of the process.

- Inlet pressure control
- Setpoint signal
- Pressure switch

### Operating costs



- Reliable, sturdy and durable constructions
- Valves suitable for a long service lives of up to a billion cycles

## Simplified implementation

### Digital connectivity



- IO-Link interface supports communications using a point-to-point connection between the valve and the master, preventing conflicts
- IIoT-ready using integrated web servers and Ethernet TCP/IP connection. This enables parameters to be set and adjusted over the network

### Small footprint



- Compact and lightweight space-saving designs that reduce installation costs
- Manifold options that produce less heat and offer easy and fast maintenance and single pressure supply

### Easy commissioning



- Ready-to-use flow control valves that are simple to mount with fast electrical connections, auto-adjustment and auto-initialization
- Manual setting with push button for easy commissioning
- Easy parameter setting using the Data Acquisition Software (DaS), to adapt the parameters to the needs of your application

## Meets specific application requirements

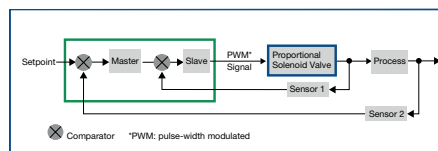
### Customization



FlowCom/DaS software interfaces allow customization of valve control parameters.

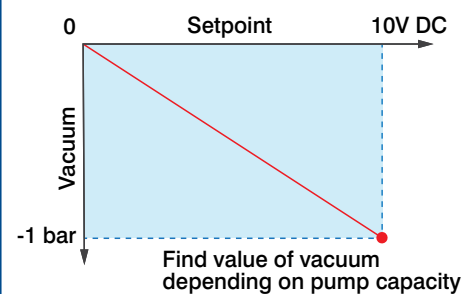
- Create customer protected parameters
- Password protected
- Flow rate/pressure window adjustment

### Cascade control



Cascade control helps to significantly increase process quality, by compensating for all the influencing factors and disturbances in the control chain. The valve manages any physical variable that can be influenced by air or an actuator.

### Vacuum control



Suitable for pressure and vacuum control applications such as testing piping strength or car brake amplifiers.

## AVENTICS Series ED/EV valves overview



Emerson's AVENTICS Series ED/EV proportional pressure control valves provide manufacturers of original equipment with the speed and precision required to reliably control their unique machines and processes. An extensive portfolio of state-of-the-art regulators, supported by customization options, ensures optimal control for almost every industry. For example, AVENTICS pressure control tensioning devices prevent lengths of fabric from tearing/tangling to ensure optimal material flow. By controlling air flow pressure, pneumatic motors and turbines maintain an even and easily adjustable rpm. AVENTICS valves are suitable for materials-testing applications, metering fluids and solids, counter-balancing, speed control, variable control of welding tips, precise positioning of parts or maintaining constant surface pressure of tools to provide uniform surface processing results.



## Application flexibility

### Valve options



- Different models available for different tasks and application requirements
- Suitable for high flow rates, up to 583 SCFM.
- Suitable for dry compressed air and neutral gases. Control of lubricated air, reactive, aggressive or liquid materials using media converter

### Control principle options



- Directly controlled, highly dynamic control and externally piloted options suitable for static requirements
- Ventilation and exhaust can be controlled separately

## Simplified installation

### Connectivity



- Standard analog and fieldbus communications
- Broad range of universal port threads

### Small footprint



- Extremely compact and light-weight
- Reliable dynamic and cost-effective. Stackable without a base plate
- Can be assembled into blocks of 9 devices without additional supply

## Optimized operation

### Low operating costs



Low energy consumption with energy supplied on demand.

### Reliability



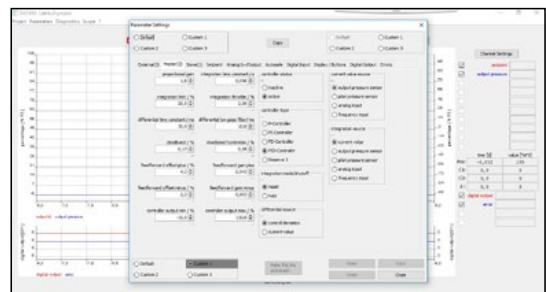
- Wear-free adjustment of valve seat maximizes life within applications with changing processes
- Pressure remains stable during a power loss

## Innovative Data Acquisition Software: Parameter visualization, diagnostics and control



With increasingly shorter development and production phases, faster start-up and reliable, controllable production processes are more important than ever. Using Emerson's DaS, DaS HD and FlowCom Data Acquisition software, Emerson's Sentronic proportional valves can be quickly and securely configured, controlled and maintained directly via a PC. Control parameters for individual Sentronic valves can be adjusted if required and the software also supports routine maintenance work and fault diagnosis, leading to increased production reliability.

- Visualization of setpoint signal, outlet pressure, internal control parameters and pressure switch signal
- Parameter setting including setpoint setting, zero offset, control range limitation, ramp function and factory or customized setup
- Valve diagnostics including pressure switch output, auto-safe function, overvoltage monitoring
- Control optimization
- Proportional valve control



## Engineering Services: Streamline procurement and optimize operational performance



To simplify the design, configuration and procurement of proportional valves for your unique application, Emerson offers a range of engineering services and tools. Global support from local experts helps you to select the appropriate valves to maximize the performance and reliability of your application. We offer a broad portfolio of proportional valves, but our engineering team is also available to develop customized products and manifolds that meet unique requirements. We also have a range of online services and tools that help to streamline the procurement process, deliver faster start-ups and ensure optimized operational performance.



### Online tools

- Configurator – set parameters in the AVENTICS configuration program.
- CAD files in various formats are made readily available via secure access.
- Calculation programs – determine the size and durability of devices needed and calculate energy consumption.
- Circuit diagram software - quickly create circuit diagrams based on the selected components.
- Cross reference and finder tools – online tools that help identify the appropriate valve, including suggestions of alternatives to competitor products.
- Online Shop – easily, quickly and securely order and track delivery of your proportional valves, spare parts and accessories.

Develop machines offering increased throughput and lower total cost of ownership.



**ASCO™ AVENTICS™**

Precise pressure and flow control provided by Emerson's proportional control technology enables your machines to offer a lower total cost of ownership and increased production throughput demanded by your customers.

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