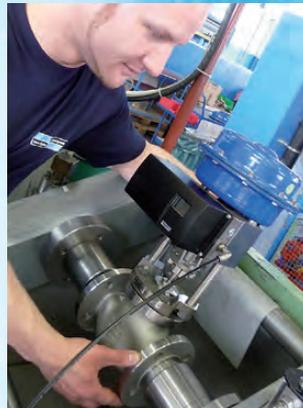


# ARCA GROUP



**Reliability in Control Valves, Pumps & Cryogenics**





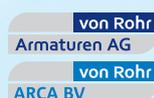
## Dynamic Expansion and Success in the Market

ARCA dates back to 1917, when Ragnar Carlstedt files his first patent for the nozzle-flapper system in Sweden. One year later, ARCA Regler AG is founded there, with Berlin to follow in 1922. In 1949, after the war, the company is refounded in Tönisvorst by Dr. Ing. Ludwig Kaspers and Adolf Paulsen and operates under the name ARCA Regler GmbH. Characterized by dynamic expansion, ARCA has no plans of slowing down in the future.

In 1970, the company expands by adding a second production facility in the Eifel region. In 1979, Dr. Ing. Rüdiger Kaspers, MBA, is appointed as the managing director of ARCA and in the 1990s, Heinz M. Nägel advances the innovative development program of the ARCA Flow Group as technical officer.

The international activities of ARCA start in the mid-1980s, when ARCA Controls Ltd. is founded in India as part of a joint venture with Forbes Marshall. In 1987, the company embarks on a successful collaborative venture with SAM YANG Valve Co. Ltd. in South Korea. In 1994, a cooperative agreement is concluded with von Rohr Armaturen AG in Switzerland and with Von Rohr ARCA BV in the Netherlands. In 1995, ARCA enters the Chinese market with its first licensee. Today, the company has its own subsidiary there, which operates as Guangzhou ARCA Valve Ltd.

Growth continues in the 21<sup>st</sup> century when FELUWA Pumpen GmbH joins the ARCA Flow Group in 2000. Swiss-based WEKA AG, a recognized manufacturer of cryogenic valves and level-measuring systems, follows one year later. The latest member of the ARCA Flow Group is ARTES Valve & Service GmbH in Berlin, which rounds off the product portfolio with steam desuperheaters and regulation ball valves.





### ARCA Worldwide!

Go to [www.arca-valve.com](http://www.arca-valve.com) for up-to-date information about our established representative offices and contacts.

#### Our joint venture partners:

■ INDIA

[www.forbesmarshall.com](http://www.forbesmarshall.com)

■ SOUTH KOREA

[www.samyang-arca.co.kr](http://www.samyang-arca.co.kr)

■ CHINA

[www.arca-valve.com.cn](http://www.arca-valve.com.cn)

■ MEXICO

## The ARCA Flow Group: A Global Corporate Group

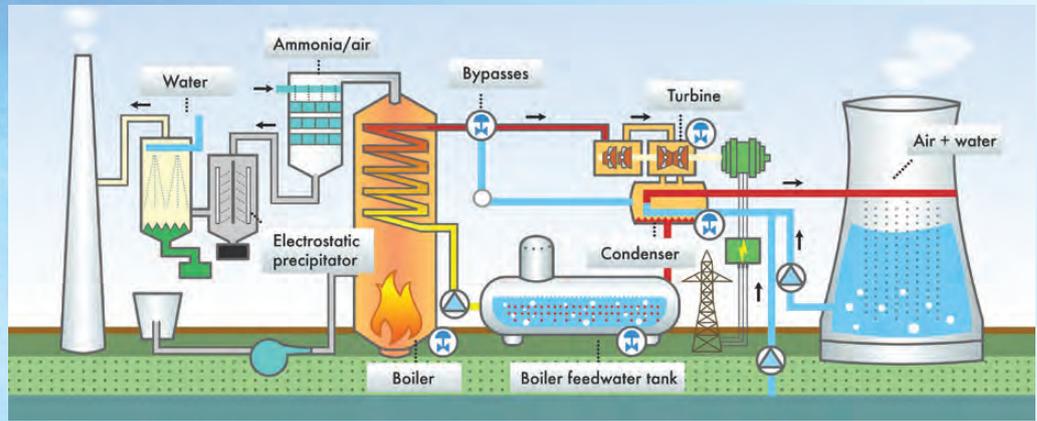
Globally active, the ARCA Flow Group's secret to success is embracing innovations by designing them around customer requirements and advancing their underlying technology to the next level. Promoting new ways of doing things goes back to the early days of ARCA, and many innovations followed to safeguard a competitive advantage for our customers. Still a family and employee-owned enterprise, the ARCA Flow Group prides itself on being close to its customers and practically oriented as a mid-sized company.

Over 500 employees around the world contribute to realizing our corporate vision, which reads as follows:

**«We pursue long-term employment with ARCA, satisfaction in our work, and collaboration with customers so that both sides can be proud of the end result.»**

ARCA develops, manufactures, and markets control valves on an international scale primarily for the chemical, food, power, and oil and natural gas industries. ARCA has also become a globally active corporate group and is well represented not only in Europe, but also in Asia and South America with joint ventures, subsidiaries and collaborative partners in India, South Korea, The People's Republic of China, and Mexico. Adding to this are representatives and sales offices that can be found in all European and many non-European countries. FELUWA Pumpen GmbH and WEKA AG in Switzerland supplement the product line-up with pumps and cryogenics.





## ARCA Technology as Key Components in Power Plants

High-performance control valves from ARCA are capable companions in industrial and large-scale power plants by ensuring safe and reliable operation and can be used in all high and low-pressure steam, oil, gas, water/boiler feedwater, and condensate circuits.

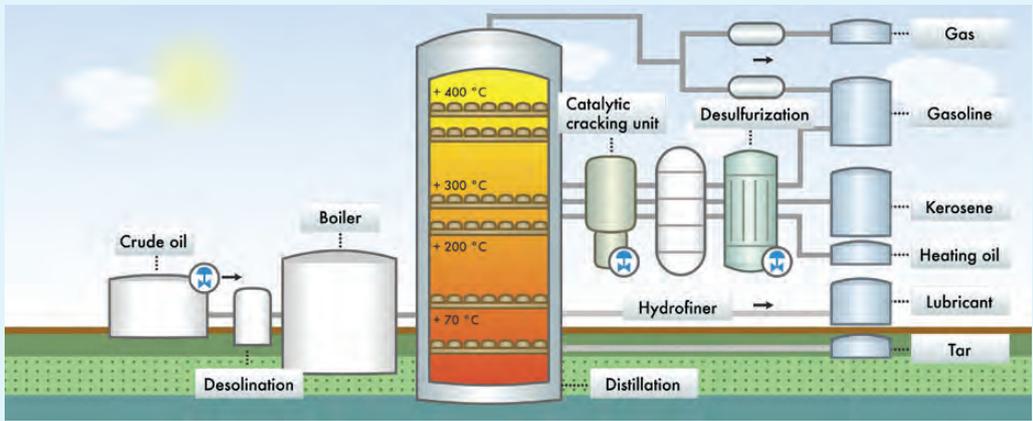
The steam-conditioning stations of the 500 series form the heart of a power plant by functioning as start-up, HP-MP/HP-LP, and bypass stations. They are required during start-up, operation and shut-down, for isolated operation, and can be integrated as safety shut-off valves in accordance with TRD 421 (technical guide-lines for steam conditioning) or as SIL equipment.

Our ECOTROL® valves can assume a variety of control tasks in many processes and are thus ideal for applications involving level, pressure, and temperature regulation. Different trim designs and graduated steps are designed specifically for the process in question.

The steam-conditioning valve, the basic component of a steam-conditioning station, reduces live steam pressure in multiple regulated and unregulated reduction steps, and the modular system offers several possibilities for injecting cooling water to reduce the temperature for the downstream process. The application itself and relevant constraints point to the system and design that are most appropriate, the latter of which is typically angular.

Modular construction of ARCA valves also makes it possible to exchange valve internals without having to remove the entire valve assembly.



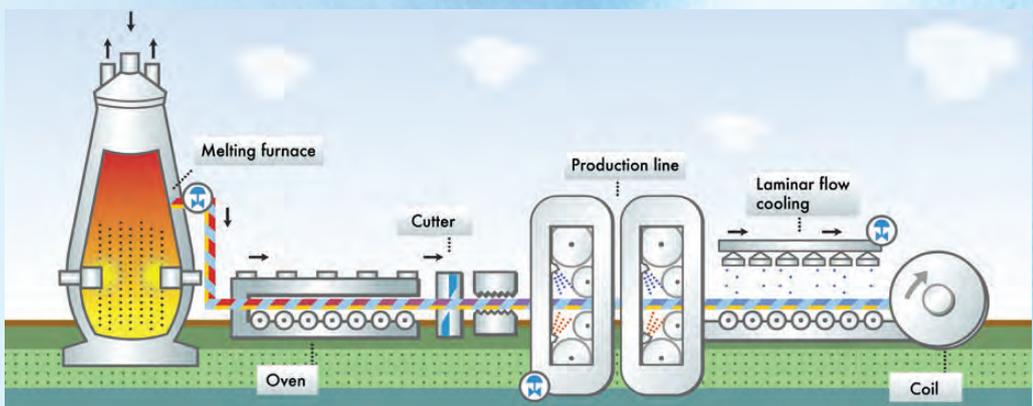


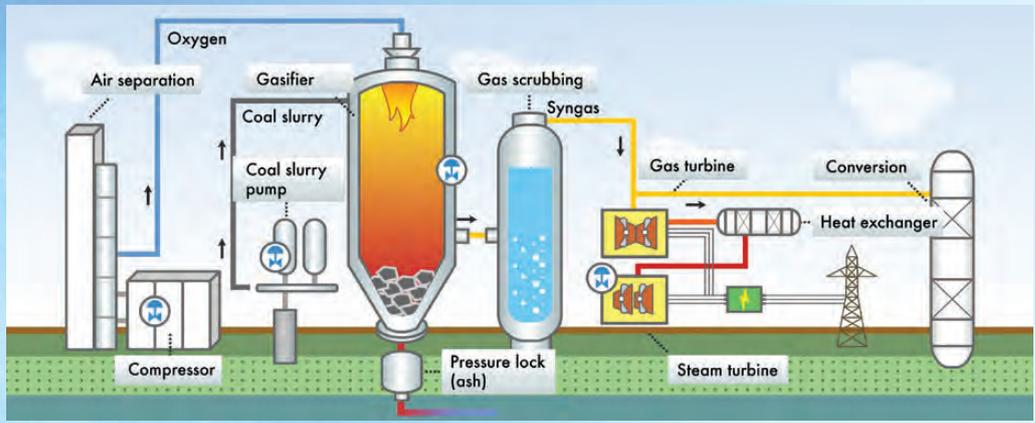
## Petrochemical and Steel Industry

Oil and natural gas are the primary sources of energy driving the global economy. Extraction carried out under extreme offshore conditions and in the icy temperatures of Siberia, the desert heat of Africa and Asia, and tropical climates, combined with storage and processing in refineries, make this market the most demanding when it comes to providing control valves that perform day in and day out. ARCA valves have helped ensure production and process reliability in the oil and natural gas industries for many years, and a wide variety of precision-engineered control valves are available that include DN15 (1/2") to DN600 (24") and PN16 to PN400 (ANSI 150-2500) sizes as well as special-purpose valves for all media handled in these areas.

ARCA valves are also indispensable in steel production. To this end, ARCA has developed control concepts and combined valves with intelligent systems so that the valve selection can be adapted in exact alignment with the production process.

Steel production and processing require valves that offer ultra-high performance and a long service life. In the steel and rolling mill industry, ARCA is a leading international supplier of control valves and systems and impresses with innovative technology, economy, quality, and reliability.





## Coal Gasification Meets Tomorrow's Needs

Programs and projects for manufacturing synthetic fuels are becoming increasingly popular in view of fluctuating oil prices, the importance of securing reliable energy supplies, and the lack of coal and coke.

The ARCA Flow Group, with its expertise in developing and manufacturing control valves for abrasive media and oxygen, steam and water valves for the entire heat recovery circuit, and FELUWA hose diaphragm piston pumps, provides comprehensive solutions for all methods of coal gasification and downstream chemical processes as well as for producing energy from coal gas.

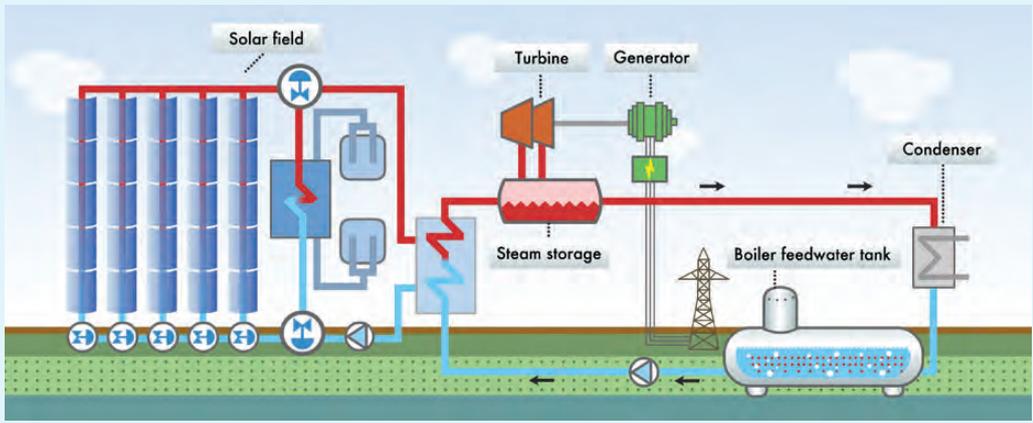


## Safety and Economy: The ARCA Anti-Surge Control Valve for Compressors

Integrated in the bypass section of turbo-compressors, ARCA valves reliably carry out multiple tasks simultaneously by assisting during the start-up and shut-down phases of the compressor. Excess amounts of gas are diverted or blown off at critical points and when the machine must be kept operating at constant speed as consumption fluctuates. The most important function, however, is that of the safety valve as used to provide protection for the pump. Proven ARCA valves reliably prevent pumping action when a stall is encountered or a minimum flow rate is undershot.

ARCA also provides the control valves needed to acquire and process natural gas through to storing it in caverns.





## CSP Power Plants – Technology of the Future

Concentrated **Solar Power** plants convert solar radiation into electrical energy. Systems that use thermal oils as a heat-transfer medium produce temperatures that can reach 400 °C at approximately 40 bar in the solar array. Thermal oils are frequently toxic and highly flammable, however, which is why the outward-facing side of the valves fitted to these systems must be particularly well sealed. Such applications integrate reliable ECOTROL® 6H high-pressure valves, which feature a bellows seal.

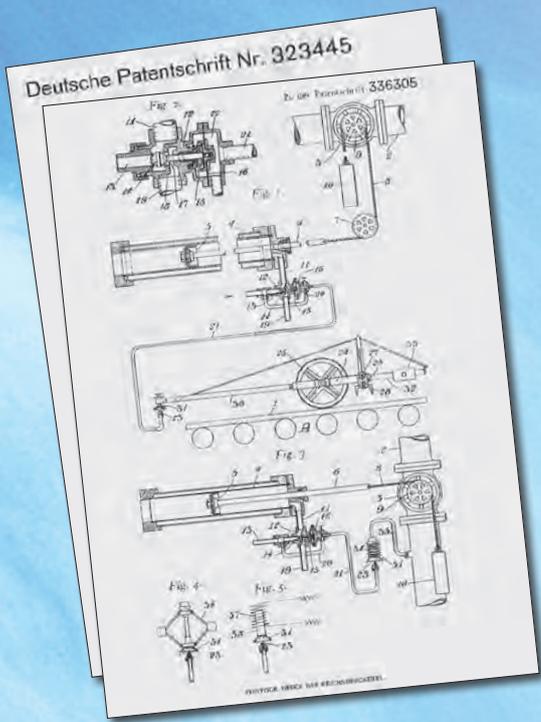
Control valves are especially taxed during the start-up and shut-down procedure as they counteract the fluctuations inherent in the process or system. Since this procedure takes place once a day, the control valves must operate reliably to safeguard the availability and efficiency of the system.



## Responsibility for Products, Operational Reliability, and the Environment in the Chemical and Food Industries

Products from the chemical industry can be found everywhere today and are used in many different environments. Each of these environments places special demands on the control valves used, which range from reliable outward sealing for the highly toxic intermediate products created during plasticizing, to corrosion resistance for processes involving chlorine chemistry, through to absolute sterility in the pharmaceutical and food industries. ARCA delivers by offering bellows seals that meet the strictest air quality requirements as well as a large number of highly corrosive-resistant materials. The BIOVENT® control valve developed for the food industry, for example, is available in many designs and connection layouts and with drives and positioners in stainless steel to cater to all applications.





## Never-Ending Search for a Better Solution

The success of the ARCA Flow Group builds on an innovation that was filed for patent protection long ago and would not have been possible if the founder were not driven to find a better solution. Today, this spirit lives on and has become an inseparable part of our history and corporate culture.

The drive to innovate is therefore just as current now as it was then. Take the ARCASMART, for example. The first actuator with a fully integrated intelligent positioner, it is ideal for challenging applications that involve strict hygienic requirements or extreme ambient conditions.

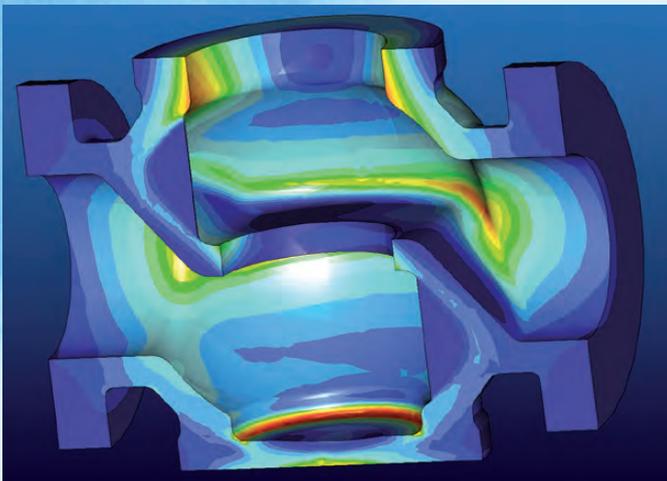
OPOS® Interface is an innovative standard interface that reliably and efficiently connects an intelligent positioner and a pneumatic actuator. Generic in design, the interface does not restrict users to specific products and was developed as part of a strong partnership between ARCA, bar, and Siemens company.

The future is full of change as well, since we plan to continue investing in research and development and leverage our daily interaction with customers to find new ways of doing things, improve existing products, and make quantum leaps in technology.



## Designing with State-of-the-Art Methods

Our technicians and engineers design using state-of-the-art, networked 2D and 3D CAD workstations that simulate all processing steps while taking into account the different materials and respective tooling and machine parameters. NC programs are then written and transferred to the machine tools in the turning and milling stations.



## Economic Success with Optimized Processes

The ARCA Flow Group uses SAP technology to optimize its business processes, which are streamlined from the moment the customer contacts us to the day on which the product is delivered. Working closely with Quality Assurance, shop personnel manufacture the individual components for the valves to the required high level of precision so that the product can be assembled quickly and without complication. A final quality check is then carried out to ensure that the product fulfills all of the customer's requirements in terms of its features and response.

Manufacturing takes place at the main factory in Tönisvorst and in the branch factory in Vulkan Eifel, which focuses on standard parts, entire valve series through to DN 100/PN 40, and pneumatic multi-spring diaphragm actuators. Workers in Tönisvorst, on the other hand, fabricate valves up to a nominal diameter of DN 1200, high pressure valves PN 63 and above, forged and steam-conditioning valves, and all types of pneumatic actuators. Oxygen valves are also machined and assembled under cleanroom conditions in Vulkan Eifel.





## We Minimize Lifecycle Costs

We not only manufacture complex, ultra-high-performance valves, but are also the perfect partner when it comes to maintenance and repair as well as complex instrumentation. ARCA valves are exceptionally durable, and our customer support staff are happy to provide the assistance you need for ongoing care and maintenance work. An experienced team of technicians professionally services your equipment on site and can quickly respond to unforeseen situations, regardless of where you are located. This, in turn, can have a considerable impact on the service life of your valve and the operating reliability of the plant.

Inspections and conversions are carried out quickly and thoroughly by experts, and we can also accommodate valves from other manufacturers thanks to our proven ARCA know-how and decades of experience.



## ARCA Quality Speaks Volumes

Certified to the ISO 9001:2008 standard, our quality management system lays the groundwork for realizing optimally designed products that are reliable and exceptionally durable. We have also achieved compliance with many national quality standards to facilitate business around the world and underscore our know-how and international reputation, and are certified to ISO 14001:2009, the international standard for environmental management systems.

All ARCA valves are subjected to ongoing quality checks that start at the planning and development stages and continue through to manufacturing and final inspection. During this time, the valves are verified for proper performance under established working conditions to ensure absolute dependability.



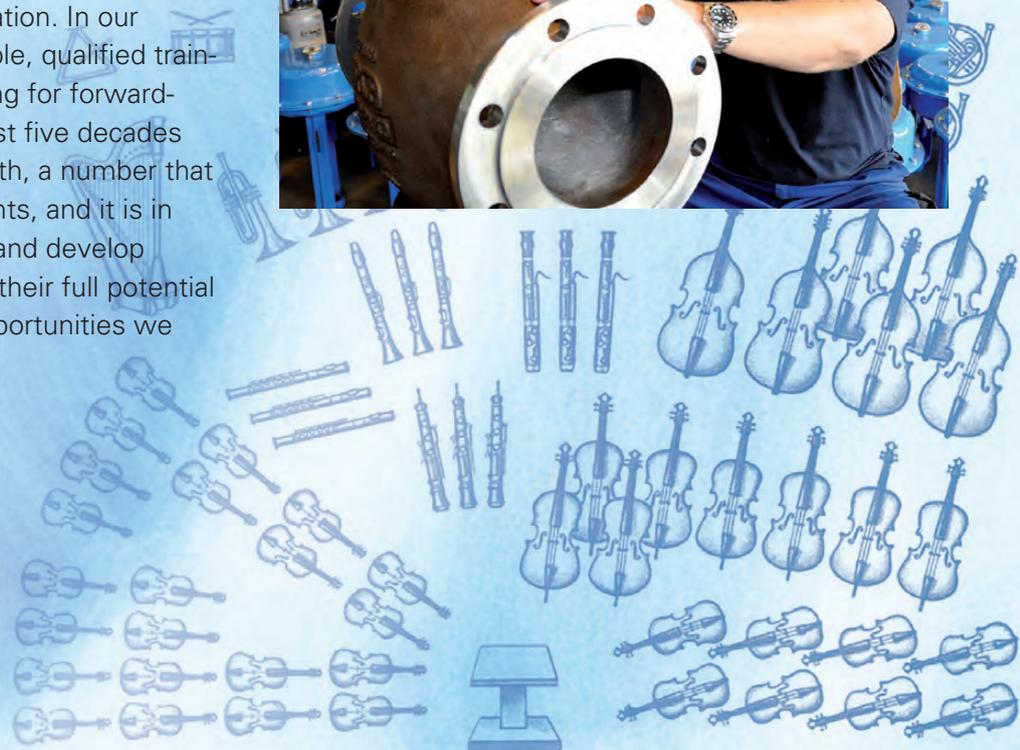
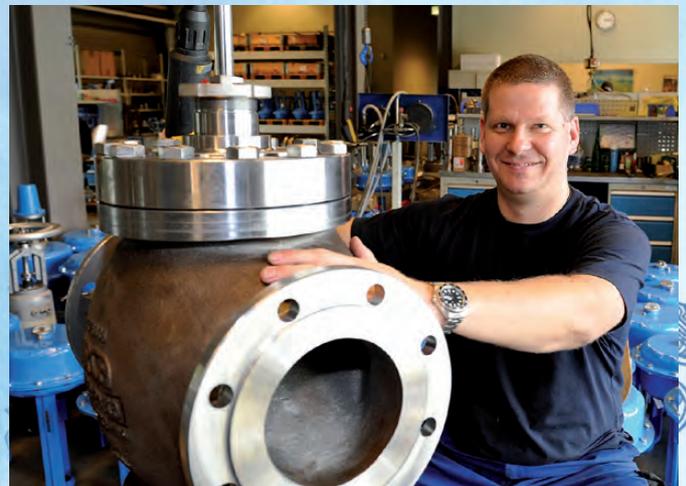
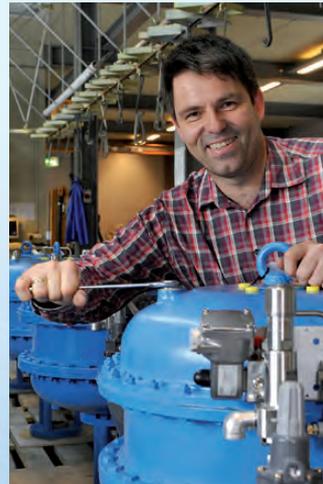
## Our Employees Are Our Main Asset

ARCA has maintained its leading position in the global market for decades primarily because it has adopted a sustainable personnel strategy and has received the «TOP JOB» award for mid-sized companies in recognition of its exemplary HR program. The large number of patents we have filed also testifies to our commitment in furthering the skills and creativity of our employees.

«Pushing and promoting» is the guiding principle behind our personnel strategy. By establishing transparency, fairness, and an open-door policy, we foster the strengths of all individuals so that they can cater to customers' needs while meeting their own professional objectives.

We like to compare ourselves to a world-class orchestra, since a company also has to rely on teamwork to produce exceptional results. While one player is busy trumpeting, another provides the subtle tones required to carry on the background melody. In the end, both are required to bring about the desired effect. For our employees around the world, such balance translates to a corporate culture rooted in teamwork, respect, responsibility, integrity, and innovation.

Our company encourages education. In our apprentice workshop, for example, qualified trainers assist young people preparing for forward-looking careers at ARCA. The last five decades have seen us train over 200 youth, a number that far exceeds our own requirements, and it is in this spirit that we actively seek and develop employees who want to realize their full potential and explore the international opportunities we provide.



## Control Valves and Valve Service

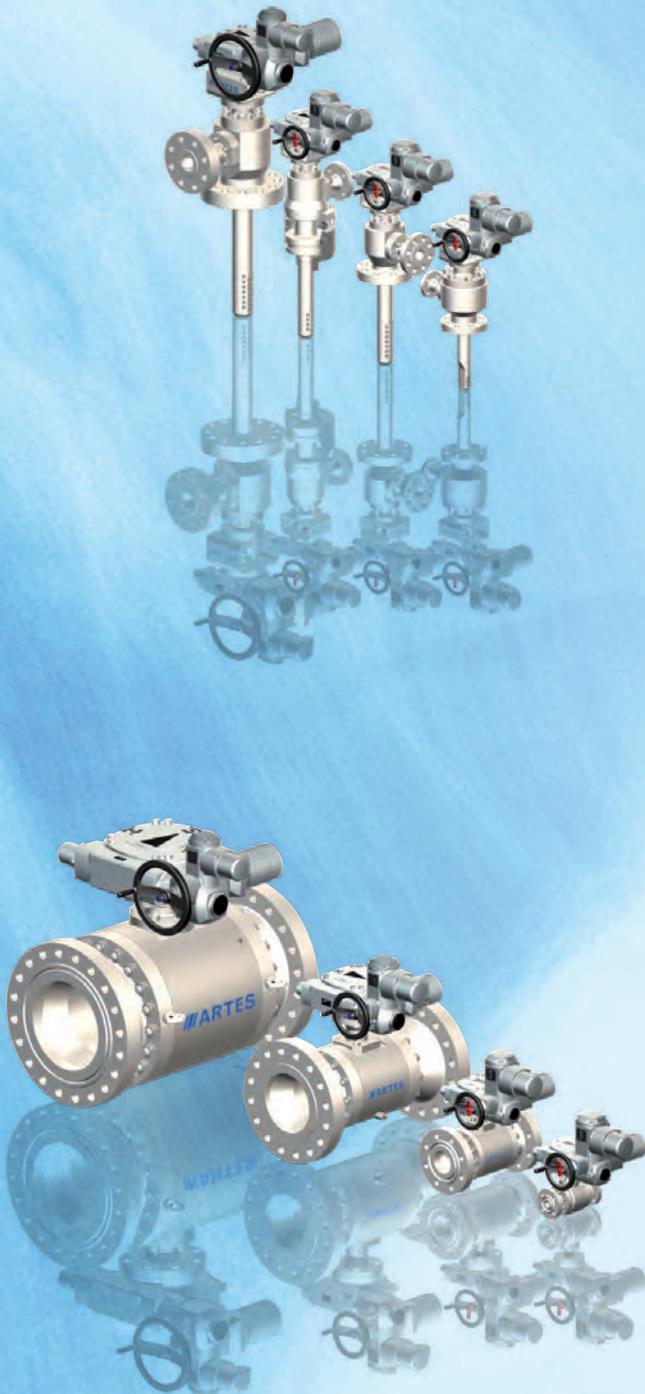
Headquartered in Berlin, ARTES specializes in manufacturing control valves for flow, pressure, and temperature controls and can service valves of all types.

ARTES valves are used in the power, natural gas, and oil industries and in various industrial plants.

Experienced employees enable ARTES to provide comprehensive engineering services, high-quality-valves and reliable valve repair services in this field.

The **ARTES product portfolio** comprises:

- Control ball valves for flowcontrol in water and steam circuits
- Control ball valves for use in flue gas desulfurization plants
- Control ball valves for flow control of natural gas, brine, and petrochemical products
- Desuperheaters and motive steam coolers for steam temperature control
- Steam conversion stations
- Primary differential pressure devices



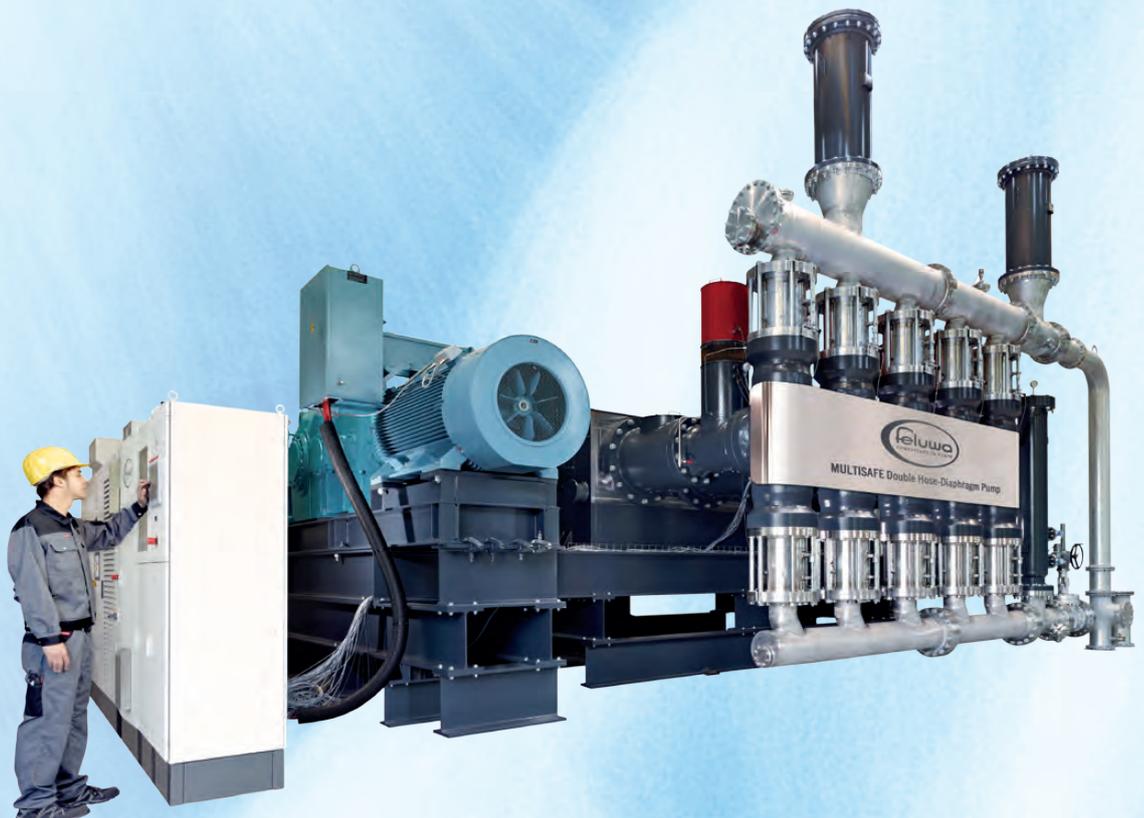


## Competence in Pumps

FELUWA Pumpen GmbH is headquartered in the Vulkaneifel region and has been a member of the ARCA Flow Group since the year 2000. The company is a leading manufacturer of pumping technology and has at its base in excess of 100 years' corporate history. For 50 years plus, FELUWA has been focusing on the development, fabrication, commissioning and after-sales service of pumps for solids-carrying and other challenging products.

At the heart of FELUWA's production is its patented MULTISAFE double hose-diaphragm process pump. It is successfully applied worldwide for the handling of chemically aggressive, mechanically abrasive, fluid and highly viscous media in a great variety of fields, such as power, metallurgical, mining, chemical, petrochemical, pharmaceutical and general process engineering industries or hydrotransport applications.

For extraordinary company and product development, FELUWA has been honoured by multiple awards, such as the Premier of the Grand Prix of Medium-Sized Enterprises and the Holkenbrink Award in 2010.





### Precision by Tradition

The valve line of von Rohr Armaturen AG encompasses the entire range of cost-effective standard valves offered by the ARCA Flow Group and the Swiss tradition of combining such valves with long-term value retention continues in the 8B series. Special customer requirements are also realized in professional and innovative fashion by the qualified team of engineers and technicians.

A specialist for pneumatic and electrically-actuated valves, the «von Rohr» name has been synonymous with precision-milled, high-quality products since 1954. Von Rohr is a member of the ARCA Flow Group and is headquartered in Switzerland and the Netherlands.

### Industries served:

- Chemical, biotechnology and pharmaceutical (sterile equipment) industries
- Food and beverage industry
- Petrochemical and natural gas industry
- Paper and pulp industry
- Energy industry (power plants and district heating)
- Disposal and municipal facility industry

Assembly, commissioning and aftersales services are performed by highly skilled personnel. This not only facilitates proximity to the customer, but also allows the company to resolve control tasks in minimal time and leverage the knowledge gained to develop valves with even higher levels of performance.





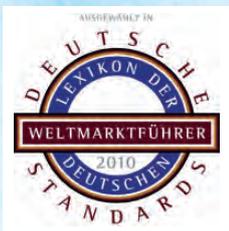
## Innovation in Liquid Level Measuring and Valve Technology

Swiss-based WEKA AG is a member of the ARCA Flow Group since 2001 and offers a wide range of level-measuring instruments, cryogenic components and highly specialised valves. Quick and flexible response to customer requests is a key asset of this medium sized company. WEKA specialises in the development, production and testing of custom made solutions in level measurement using the magnetic float principle. Cutting edge technologies are used for highly specialised valves and other components in the cryogenic field and other extreme operating conditions. The WEKA brand stands for highest quality products worldwide.

Well over 90 percent of WEKA's turnover is generated from the international market. Level instruments are generally distributed over a global network where as the cryogenic components are usually handled directly. WEKA is internationally perfectly placed and one of the market leaders in cryogenic process technologies.



# ARCA GROUP



A range of awards confirms our professional approach to business and motivates us to continue aspiring to new heights!

Visit the following Web sites for up-to-date information about our global network of representative offices and contacts and to learn about innovations and current trade show appearances:

[www.arca-valve.com](http://www.arca-valve.com)

[www.artes-valve.com](http://www.artes-valve.com)

[www.feluwa.com](http://www.feluwa.com)

[www.von-rohr.ch](http://www.von-rohr.ch)

[www.vonrohr-arca.nl](http://www.vonrohr-arca.nl)

[www.weka-ag.ch](http://www.weka-ag.ch)

## Quality made by ARCA Flow Group

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Phone +49 (0)2156-7709-0, Fax +49 (0)2156 7709-55, [sale@arca-valve.com](mailto:sale@arca-valve.com)

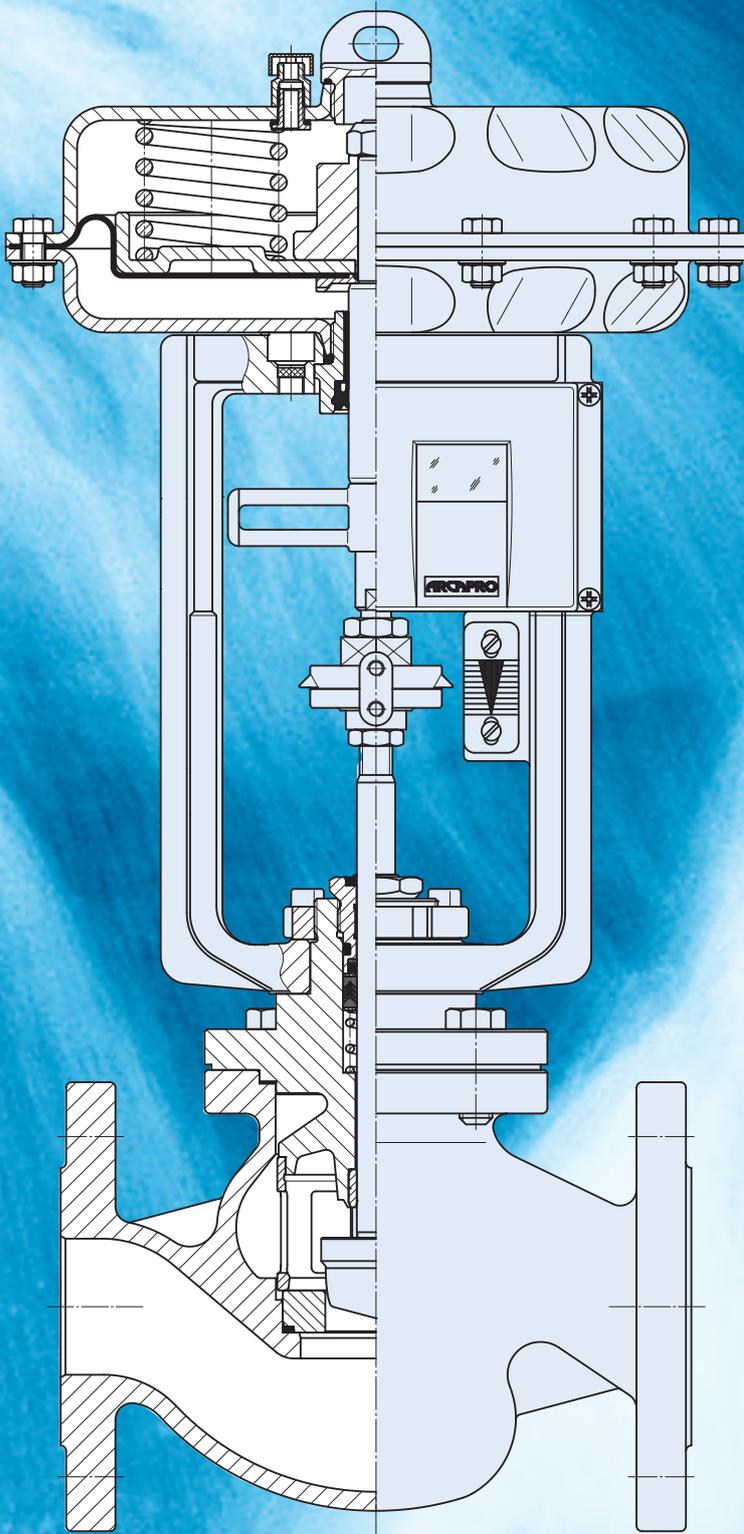
**ECOTROL®**

**control valve**



**ARCA**  
VALVES  
*quality engineered  
control valves*

## ECOTROL® control valve



## Committed to perfection in every detail

### Powerful valve actuator

The pneumatic multi-spring 812 series actuator shown here is deployed in many applications as a standard actuator. Not only is it robust and explosion proof, it also provides short stroking times, a constant seating force, and is cost effective. The actuator is available in different sizes optimized in line with required actuating force. ECOTROL® control valves are also available with optional electric or electrohydraulic actuators. For more details, see the ARCA actuators brochure.

### Multi-functional positioner

The ARCAPRO® digital positioner is a multi-functional interface with the controller or process control system and operates as standard with 4–20 mA. HART, Profibus (PA), and Foundation Fieldbus communication are used to establish a digital interface with bidirectional data exchange (including status messages). It can be parameterized on site or via the communications system. An open mechanical interface concept that we helped elaborate complies with VDI/VDE 3847 and is used for mounting and mechanically connecting the positioner to the actuator. For more details about this and the optional analog positioners, see the ARCA positioners brochure.

### Reliable stem seal

Depending on the process fluid, pressure and temperature, we can advise you on the most suitable stem seal – from the stuffing box to the hermetically-tight bellows sealing – so that your system remains completely leak proof. The stem surfaces, packing material, and design complement each other perfectly, which means that friction, corrosion, and emission limit values are not an issue.

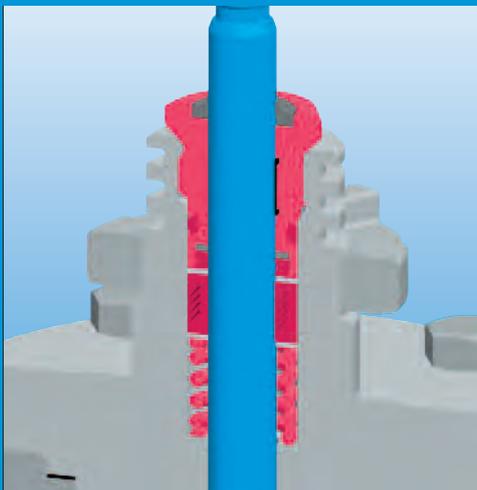
### Fixed-form housing seal

The connection between the valve housing and the bonnet is established in the force bypass. This helps prevent mistakes during assembly and ensures that the housing seal is fully enclosed, thereby preventing it from yielding. This housing/bonnet design also ensures that the valve seat and plug are not subject to any lateral forces, which helps prevent leakage.

### Robust, high-precision inner parts

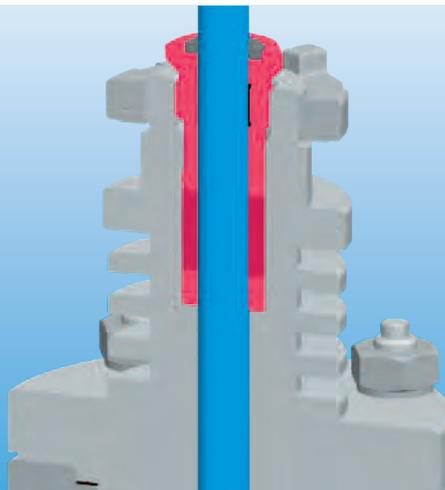
The ECOTROL® control valves are equipped with inner parts specially designed for the prevailing flow conditions in your plant. The shapes of the closure members and valve seats as well as the material from which they are made are optimized in line with your requirements. A key technical feature here is the unique quick-exchange system that enables your service personnel to replace the clamped valve seat without the need for special tools. The metal or compressible seal for the valve seat and the float-mounted seat ring ensures long-life seat tightness. As an option a symmetrical seat ring, which can be used on both sides, is available. This cuts costs dramatically not only with the ceramic version for abrasive media.

## Stem seals



### Maintenance-free PTFE V-ring packing with precision sealing element

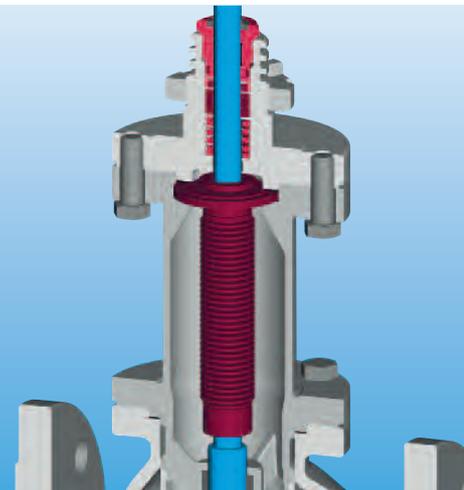
This packing system comprises graphite reinforced and virgin PTFE V-rings, which makes them immune to strongly fluctuating operating temperatures. The corrosion-resistant preload spring located under the packing allows the stem seal to adjust itself automatically and ensures sufficient sealing force even at low pressures. An elastomer precision sealing element seals the device up to the stuffing box, while a wiper ring protects against the ingress of dirt.



### Adjustable stuffing box with packing rings

Different packing materials are available for the adjustable stem seal. The required sealing force can only be ensured over the long term, however, when the individual packing rings or cords are pressed with equal load. Thanks to the patented ARCA-OPTIPRESS® preloading device, the packing rings are all compressed with constant preload, with the result that the sealing effect is properly distributed over the packing length.

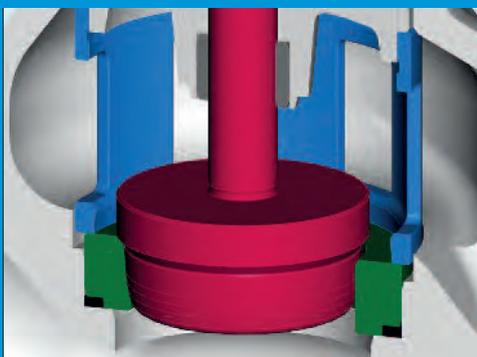
## ECOTROL® control valve



### Bellows seal

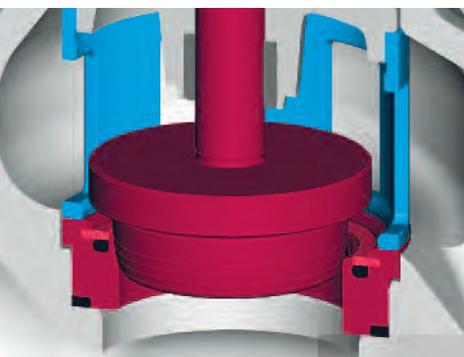
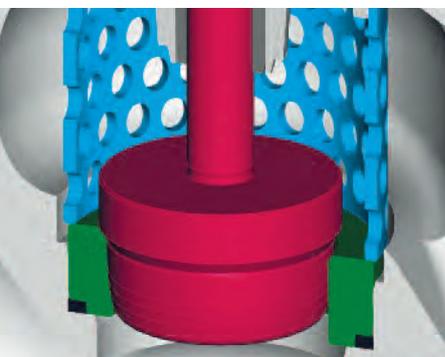
If hermetic sealing is required, our specially developed bellows seal is the perfect solution. The stainless steel bellows is welded on the bottom with the valve stem and on the top with the bellows plate so that it is hermetically tight. For safety reasons, an additional stuffing box with standard life loading packing is provided. An optional control connection for alarm, flushing, or siphoning equipment can also be installed between the metal bellows and safety packing to ensure maximum operational reliability even if the metal bellows fail.

## Valve trims



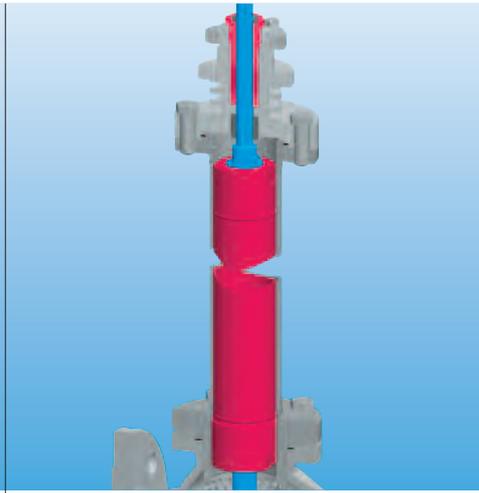
### Standard contoured plug

For a laminar or turbulent flow, the single-stage, dirt-resistant contoured plug is the ideal solution. The characteristic of the contoured plug can be adjusted as required. The standard trim is metal-seated. The seat ring is rotationally symmetric and can be supplied as an option with two seating surfaces. This means that when one of the seat faces has worn, you can simply turn the seat ring around. This can be easily carried out on site and without the need for special tools. To prevent corrosion due to cavitation and high pressures, the (single or multi-stage) contoured plug and the seat ring can also be made from highly wear-resistant ceramic materials. A low-noise perforated cage can help reduce noise.



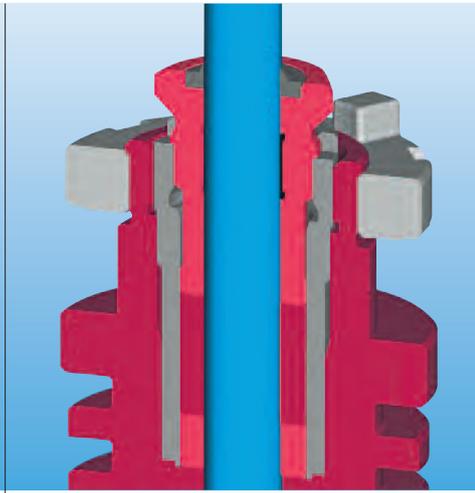
### Soft seat with metal support

To ensure that even with oversized actuators the soft seal remains tight over long periods of operation, we have developed the patented ECOTROL® soft seal with an additional metal seal between the seat and plug. This ensures that the surface pressure of the PTFE soft sealing element remains at a permissible level and protects the PTFE sealing element against «cold flow». The defined pretension of the sealing element is achieved by means of an O-ring spring suspension. With over 1 million operating cycles, this soft seal design has proved to be highly reliable.



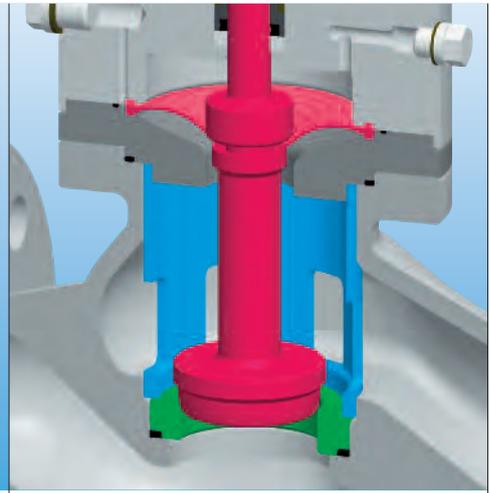
**Low temperature extension**

At low temperatures, sufficient distance must be maintained between the valve actuator and the valve itself. To provide protection against these icy conditions, we offer a special stem extension housed in a thin-walled insulation column. The stem extension is filled with an insulator, which minimizes loss caused by thermal conduction and radiation. The length of the extension can be adapted in line with your specific plant requirements.



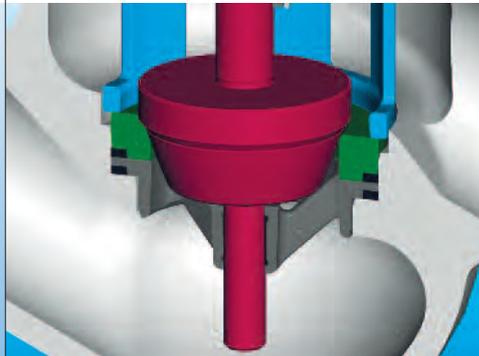
**Cooling fins for high temperatures**

At operating temperatures of above 250 °C, multiple cooling fin sets can be used in conjunction with graphite packing. These allow heat to escape, thereby ensuring that the packing does not overheat. At operating temperature of above 450 °C, the customized design of the cooling fin set ensures that, in a worst case scenario, the temperature within the packing does not exceed 450 °C.



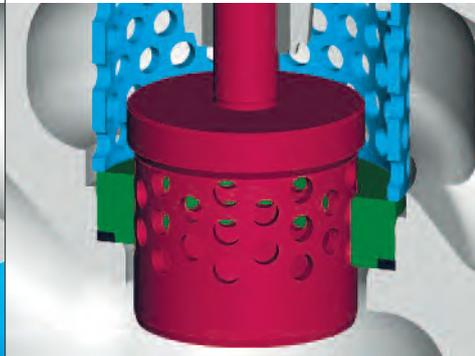
**OPTISEAL® diaphragm seal for hazardous media**

The OPTISEAL® diaphragm seal with additional safety stuffing box prevents hazardous media from escaping. This is the ideal solution if metal bellows can potentially be destroyed in critical applications by particles which become lodged in the bellows winding. OPTISEAL® fixes a hydraulically-supported diaphragm between the valve housing and bonnet, and between the stem and plug. Thanks to the hydraulic support, the diaphragm can withstand operating pressures of up to 100 bar.



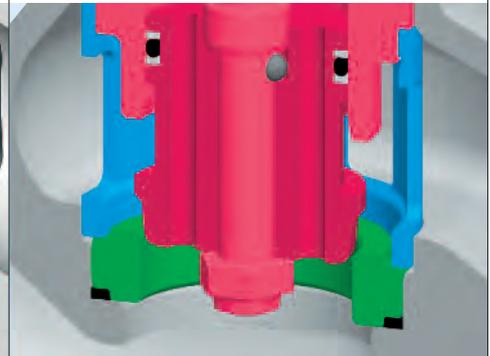
**Double guided contoured plug**

Due to the Bernoulli Effect, liquids with a high differential pressure can cause the valve plug to vibrate. This can be counteracted, however, by means of an integrated bottom guide. This innovative design ensures that there is no additional sealing area on the outside. The bottom guide is open and, therefore, completely dirt resistant. Thanks to the ECOTROL® quick-exchange system, this component is also retrofitted to each standard valve.



**Perforated plug and cage**

For liquid and compressible media, perforated plugs and cages have proved to be the ideal solution for preventing noise and cavitation damage. Cavitation downstream of the perforation caused by gas bubbles imploding occurs in the center of the perforated plug without damaging the trim or housing. This increases the service life and, in turn, the cost-effectiveness of control valves which are designed for high differential pressures and subject to harsh conditions. This also results in lower noise emissions, which can be reduced even further by means of a low-noise perforated cage.



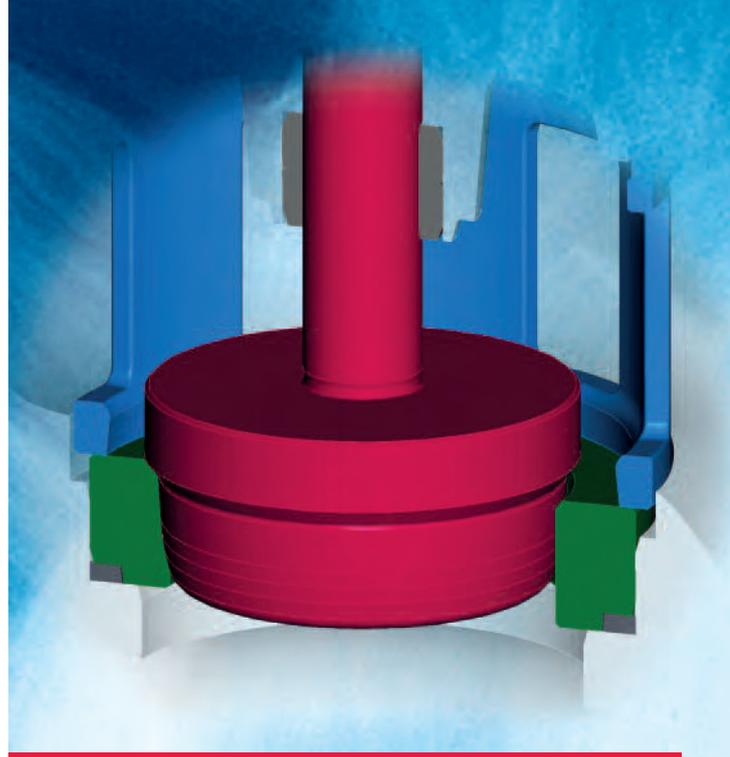
**Pressure-balanced valve plug**

Pressure-balanced valve trims are optimized for minimal actuating forces. The plug surface facing away from the valve seat is under the same pressure as the surface facing the valve seat. This is achieved by bores in the plug and dynamic piston sealing. An ECOTROL® control valve with a pressure-relieved plug can be operated even by very small actuators. Depending on the process conditions, the plug relief device is sealed by metal piston or elastomer rings.

## Ensuring precision and efficiency

ARCA ECOTROL® offers a wide range of innovative solutions designed to fulfill all your control task requirements. Whether housing, inner valves, valve seats, stem seals, actuators, or positioners, every detail benefits from the know-how of expert engineers with many years' experience in a wide range of applications. Factors such as efficiency, control precision, price/performance ratio, weight, and lifecycle costs are optimized to suit your requirements. Our commitment to innovation in valve technology ensures that you benefit from high control precision and lower operating costs. Why not see for yourself!

## ECOTROL® control valve



### Our innovations

- 1 Patented valve seat with PTFE soft seal and metal secondary seal
- 2 Seat rings made from a wide variety of materials
- 3 PTFE V-ring packing with additional precision sealing element
- 4 Quick exchange system for seat rings and plugs
- 5 Wide variety of valve trims optimized for all applications
- 6 Stainless steel stuffing box area
- 7 Flow-optimized valve housing
- 8 Compact, robust design

### How you benefit

- ✓ Absolute seat tightness
- ✓ Defined preload
- ✓ Long service life
- ✓ Reproducible seat tightness due to self-centering
- ✓ Low wear and tear minimizes cost of spare parts
- ✓ Safety and hermetic sealing
- ✓ Low maintenance
- ✓ Maintenance without special tools
- ✓ Maximum process flexibility with high control quality
- ✓ Low noise emissions
- ✓ No galvanic corrosion
- ✓ High flow coefficients
- ✓ Low noise emission
- ✓ Minimum mounting space required
- ✓ Low weight

# ECOTROL® control valve

## ECOTROL® general specifications

Series	8C	6N	6H	
DN	15–100 / ½"–4"	150–600 / 6"–24"	15–400 / 1"–16"	
PN / ANSI class	10–40 / class 150–300	10–40 / class 150–300	63–250 / class 600–2500	
Body material	<b>EN</b>	<b>for temperatures</b>	<b>ASTM</b>	<b>for temperatures</b>
	1.0619 GP240GH	–10 °C to 400 °C	A 216 WCB	–29 °C to 425 °C
	1.4408 GX5CrNiMo19-11-2	–29 °C to 400 °C	A 351 CF8M	–196 °C to 400 °C
	1.4581 GX5CrNiMoNb19-11-2	–10 °C to 400 °C	–	–
	1.6220 G20Mn5	–50 °C to 345 °C	A 352 LCC	–50 °C to 345 °C
	1.6982 GX3CrNi13-4	–120 °C to 400 °C	–	–
1.7357 G17CrMo5-5	–10 °C to 530 °C	A 217 WC6	–29 °C to 530 °C	
Bonnet Material	≤ DN 65 made of 1.4408 (A351CF8M) ≥ DN 80 made from the same material as the housing but with a stuffing box sleeve made of 1.4571 (ANSI TP316TI)			
Plug characteristic	Standard: equal percentage or linear Optional: modified linear			
Rangeability	50 : 1			
Double guide	Optional: integrated bottom guide for sizes DN 40 – DN 600, Kvs > 25			
Seat leakage	Metal sealing: leakage rate class IV (<0.01 % Kvs); optional leakage rate class V Soft sealing: leakage rate class VI			
Bellows seal	Double walled, made of 1.4571 or (optional) Hastelloy® (for ANSI 150 and ANSI 300, other rated pressures available on request)			
Heating jacket	Connections DN 15 or DN 25 PN 40 (½" or 1" ANSI 300) screwed joints or flanges			

## ECOTROL® standard inner valves

Material no.	Contoured plug P1	Contoured plug P1 with integrated bottom guide*	Perforated plug L1	Seat	Seat seal	max. permissible medium temperature
1	1.4571	1.4571	–	1.4571	Metal	In acc. with stem seal
2	–	–	1.4571	1.4571 nitrited	Metal	In acc. with stem seal
3	1.4112 hardened	1.4112 hardened	1.4112 hardened	1.4112 hardened	Metal	In acc. with stem seal
4	1.4571	–	–	1.4571	PTFE/FKM	–20 °C ~ 180 °C
5	1.4571	–	–	1.4571	PTFE/EPDM	–29 °C ~ 140 °C
6	1.4571	–	–	1.4571	PTFE	–196 °C ~ 180 °C

\* only as of ≥ 40 (1 ½") KVs ≥ 25 (Cvs ≥ 29)

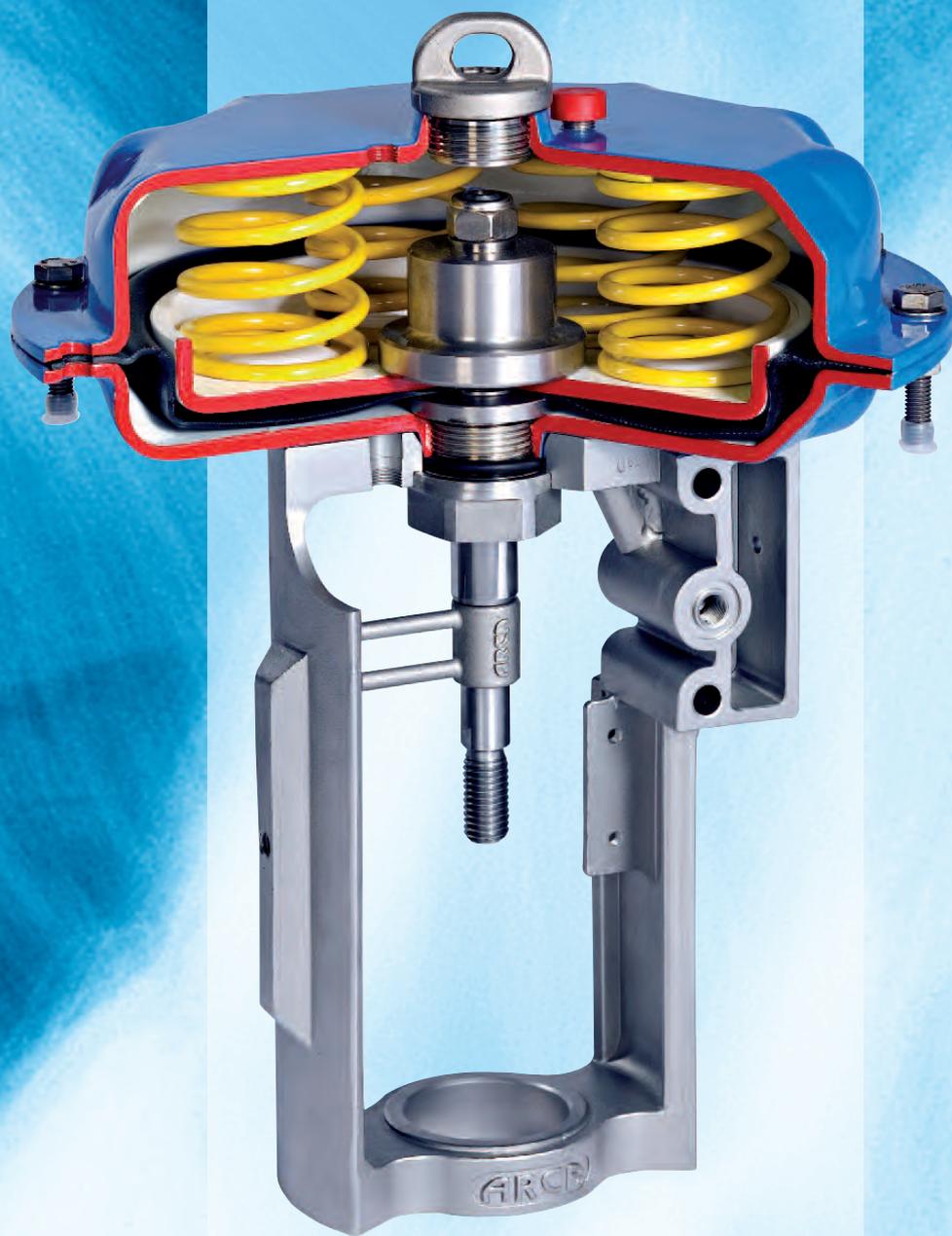
### ARCA Regler GmbH

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ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



# Diaphragm Actuators



**ARCA**  
VALVES  
*quality engineered  
control valves*

# Diaphragm Actuators

## Favorable Variety

Whether rotary or linear – with pneumatic, electric, and hydraulic valve actuators from ARCA Regler GmbH, you always have the right solution at hand. ARCA's comprehensive product portfolio offers a choice of valve actuators ranging from low to very high actuating forces and torques. If requested, we can also develop and manufacture actuators that are optimized for safety-oriented applications or have extremely short actuating times. Low lifecycle costs are a feature shared by all our actuators.

### Pneumatic Diaphragm Actuators

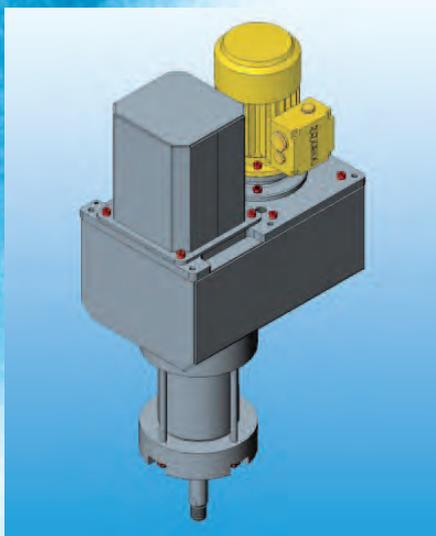
The simple design of our pneumatic diaphragm actuators with a robust rolling diaphragm makes them universal in application while ensuring hysteresis-free control across the entire actuating range. These pneumatic valve actuators can be opened or closed using spring force or control air – an option that is field-reversible, making the devices very versatile and providing security for your investments. The integrated compression springs ensure that the pneumatic control actuator always adopts a defined fail position. This is accomplished with very short actuating times meaning that alongside their control tasks, ARCA diaphragm actuators also play a key role in safeguarding the plant. Explosion protection is not an issue when configuring pneumatic diaphragm actuators. If required, a manual emergency override can be adapted.

### Electric Actuators

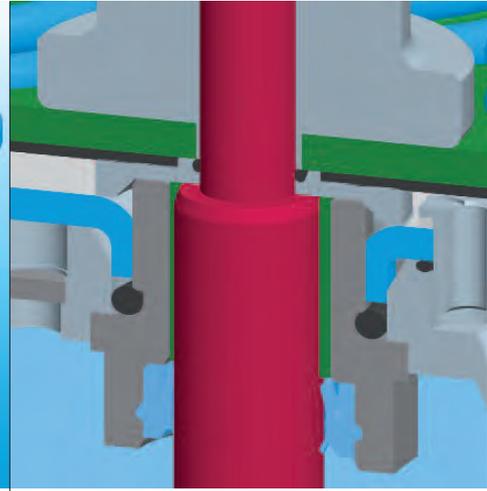
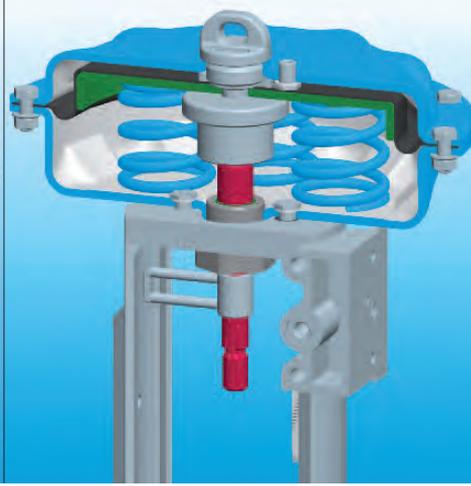
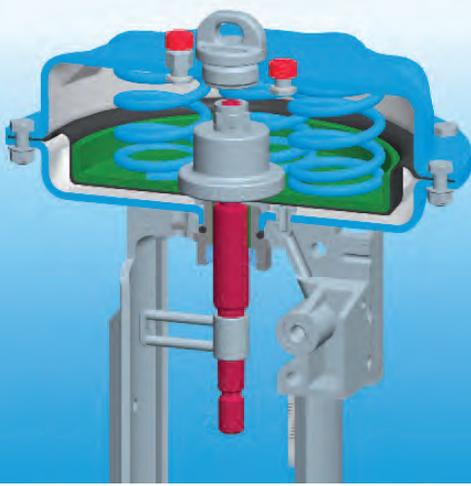
Actuating and control forces are transferred to the valve using geared motors to ensure that the forces are always available on demand. Suitable gear reductions guarantee that even extremely high actuating forces are transferred safely and reliably. Electric actuators are normally equipped with a handwheel. End positions are adjusted via configurable torque or travel limit switches. Explosion protection and an emergency control function can be realized as an option. A standardized interface allows the actuators to be used for all common applications.

### Hydraulic Actuators

These are characterized by their high actuating forces and speeds. Because of the double piping for the inflow and outflow of media, hydraulic actuators are only specified for high-end technical applications. In conjunction with leading manufacturers, we can offer you the correct make to suit your specific requirements.



## Pneumatic Multi-Spring Actuator Type 812



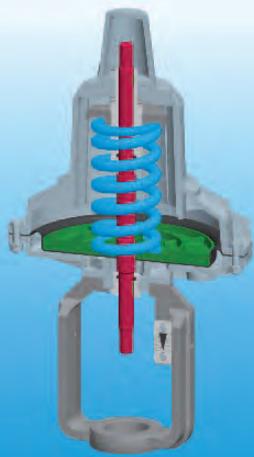
### The Benefits of Our Standard Version

This pneumatic actuator is identical as regards the «air to open» (Fig. 1) and «air to close» (Fig. 2) functions, which allows you to reverse the actuator on site, as installed, with minimal manual intervention and without opening the actuator housing. This design prevents internal parts from being lost and the powder-coated actuator shells are not damaged at the contact points with the bolts and nuts. With this the rolling diaphragm, which has proven itself thousands of times over, is also protected from damage. Special plugs for aerating and bleeding ensure the highest possible protection against spray water and other environmental influences. The multi-spring design enables very compact dimensions. A stainless steel variant is available for demanding process conditions as encountered in the food industry.

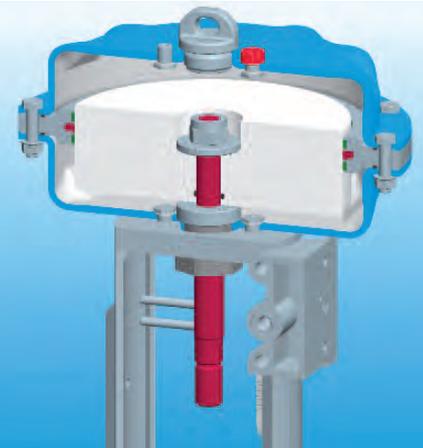
### Special Protection for the Actuator Stem

The stem lead-through is designed to be maintenance-free, even when used in harsh, dusty environments. Dirt particles are reliably deflected upstream of the guide and sealing element to prevent damage from occurring in these areas near the super finished and finish-rolled stems for ultra-high operating reliability.

## Universal Diaphragm Actuator Type 811



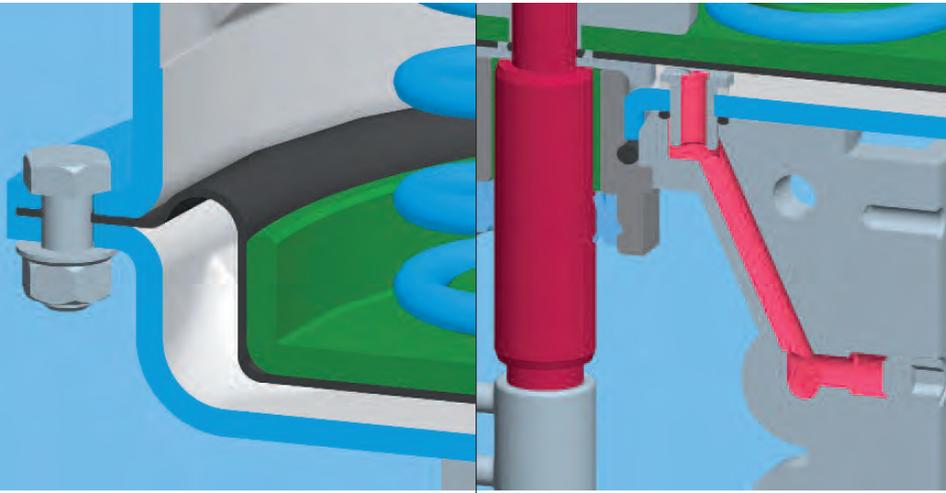
## Double-Acting Piston Actuator



The universal diaphragm actuator, type UMA 811, is a product line comprising four sizes of actuator. The stem features a twin design and both interfaces for adapting to the valve are identical to facilitate toggling between the two directions. Instrumentation can be added by way of standardized NAMUR ribbing. An emergency override facility is available as an option.

A tensioning screw as commonly used in pneumatic regulation is used to adapt the spring preload to the actuating forces required with pinpoint accuracy. This, in conjunction with different-sized centric springs, enables a very broad range of actuating forces to be optimally set. High accuracy is achieved by making adjustments at the outward-facing side, in the installed state, with further fine-tuning possible during operation.

Internal development of the double-acting piston actuator, type 812.MFI-DWK, allows us to accommodate the special requirements associated with large driving forces in both directions as well as very short actuating times for extremely high switching frequency. The basis for this is proven control actuator technology and the combination of compact design, long service life, and high availability. The interfaces have also been retained so that the integrated positioner assembly can be used with the integrated air ducting as has the valve interface, allowing accessories to be retrofitted at any time.



## Diaphragm and Diaphragm Clamping with Enclosure

The rolling diaphragm used by ARCA is maintenance-free thanks to a super finished housing and diaphragm plate. The diaphragm clamping system has proven to be crucial in terms of service life, however. Our diaphragm clamping system with force bypass further extends the service life of the diaphragm significantly. The force bypass design prevents the maximum permissible surface pressure from being exceeded which, in turn, prevents the diaphragm from being installed incorrectly as is otherwise evidenced in seepage at the actuator shells.

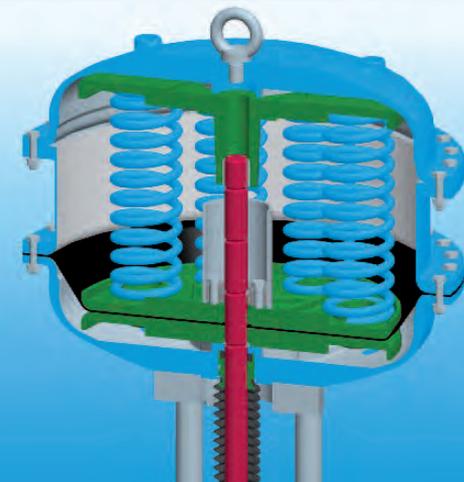
## Integrated Air Ducting

ARCA is known for its integrated air ducting and backlash-free stroke feedback. This makes it possible to easily integrate accessories such as positioners or solenoid valves with the actuator. The actuating pressure can thus be channeled from the positioner through the actuator yoke to the actuator without the need for additional piping. Elaborate, vulnerable external piping is therefore not required, which rules out leakage and provides for very high operating reliability and exceptional serviceability.

## Manual Emergency Override (Option)

The pneumatic diaphragm actuator can be easily equipped or retrofitted with an emergency override so that the actuator stem can be moved to the desired position against the spring force. The enclosed design meets all common safety requirements.

## Diaphragm Actuator MA



This line not only includes a single-acting model that «opens» or «closes» with air pressure increase, but a double-acting variant as well, whereby air pressure is effective in both directions onto the same double side coated diaphragm. The latter can thus be used for control and on/off applications. Instrument air is a common control medium. Clean water can also be used, however, as arranged. The housing shells are made from coated sheet steel, coated cast shells, or stainless steel. Adjustable limiters and emergency overrides are optional.

## ARCAtorque 840 Rotary Actuator



The ARCAtorque 840 targets rotary actuators designed quarter-turn movements. Four sizes are available, each of which has a double-sided connecting flange compliant with DIN/ISO requirements. The «spring to open» and «spring to close» safety functions are easy to realize with this rotary actuator. Instrumentation can be added using the same DIN/ISO connection flange.



The ARCA-specific diaphragm enclosure and integrated air ducting have been integrated as a design feature. Characteristic for this pneumatic rotary actuator is the rolling diaphragm, which operates very uniformly with hysteresis-free torque output throughout the entire range. An emergency override can also be ordered or retrofitted.

# Ultra-High-Precision Regulation

The pneumatically activated multi-spring diaphragm actuator Series 812 can perform key control tasks in almost all industrial areas. Not only have all current guidelines on occupational safety been considered; ARCA has also focused on environmental compatibility, durability, and impact on human health.

The unique possibility of installing the positioner with integrated air ducting and optional spring chamber purge means that your plant never needs to be maintained. Instrument air is used to operate the actuator and subsequently fill its spring chamber. This protects your control actuator from aggressive and corrosive ambient or sea air and allows us to offer actuators with above-average durability while keeping costs as low as possible.

## Diaphragm Actuators



### Our innovations

- 1 Reliable rolling diaphragm
- 2 Reversible actuator
- 3 Integrated air supply
- 4 Compact design
- 5 Low dead volume
- 6 Special ventilation system
- 7 Extensive choice of materials

### How you benefit

- ✓ High level of availability
  - ✓ Broad range of actuating force
  - ✓ Short actuating times
  - ✓ No hysteresis
- 
- ✓ Easy to maintain
  - ✓ One version for several applications
- 
- ✓ Ultra-high operational reliability
  - ✓ Compact design
  - ✓ Clear, easy-to-read instrumentation
- 
- ✓ Minimal space required
  - ✓ Compliant with accident prevention regulations
- 
- ✓ Quick response
- 
- ✓ Splash-proof in every installation position
- 
- ✓ Wide range of applications

# Diaphragm Actuators

## Pneumatic Actuators

### General Data

Air supply, max.	6 bar
Ambient temperature	-20 to +80 °C (-40 to +90 °C)

### Actuator Series 812

Size	MF I		MF III	
Stroke, max.	20 mm	30 mm	30 mm	60 mm
Diaphragm effective area	320 cm <sup>2</sup>	320 cm <sup>2</sup>	720 cm <sup>2</sup>	720 cm <sup>2</sup>
No. of springs	6 (7)	6	12	12
Actuating force, spring return, max.	6.4 (7.4) kN	4.8 kN	16 kN	14 kN
Actuating force, air, max.	14.4 kN	14.4 kN	32.4 kN	32.4 kN

### Actuator Series 811

Size	UMA 0	UMA I	UMA III	UMA V
Stroke, max.	20 mm	30 mm	60 mm	120 mm
Diaphragm effective area	210 cm <sup>2</sup>	320 cm <sup>2</sup>	720 cm <sup>2</sup>	1440 cm <sup>2</sup>
No. of springs	1	1	1	1
Actuating force, spring return, max.	4.5 kN	7.7 kN	17.3 kN	33.1 kN
Actuating force, air, max.	11.6 kN	17.8 kN	39.5 kN	81.2 kN

### Actuator Series MA

Size	16	21	31	41	60
Stroke, max.	20 mm	35 mm	59 mm	118 mm	136 mm
Diaphragm effective area	85–110 cm <sup>2</sup>	150–240 cm <sup>2</sup>	355–550 cm <sup>2</sup>	600–1135 cm <sup>2</sup>	1500–2185 cm <sup>2</sup>
No. of springs	7	7	7	14	16
Actuating force, spring return, max.	2.6 kN	4.3 kN	8.4 kN	25.2 kN	45 kN
Actuating force, air, max.	4.6 kN	8.5 kN	22.4 kN	40.5 kN	87 kN

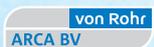
### Quarter-turn actuator Series 840

Size	841	842	843	844
Valve opening angle	0–60° / 0–90° / 30–90°			
Diaphragm effective area	104 cm <sup>2</sup>	360 cm <sup>2</sup>	470 cm <sup>2</sup>	780 cm <sup>2</sup>
No. of springs	1	1	1	1
Actuating torque, spring return, max.	46 Nm	253 Nm	715 Nm	1630 Nm
Actuating torque, air, max.	87 Nm	460 Nm	1345 Nm	2295 Nm

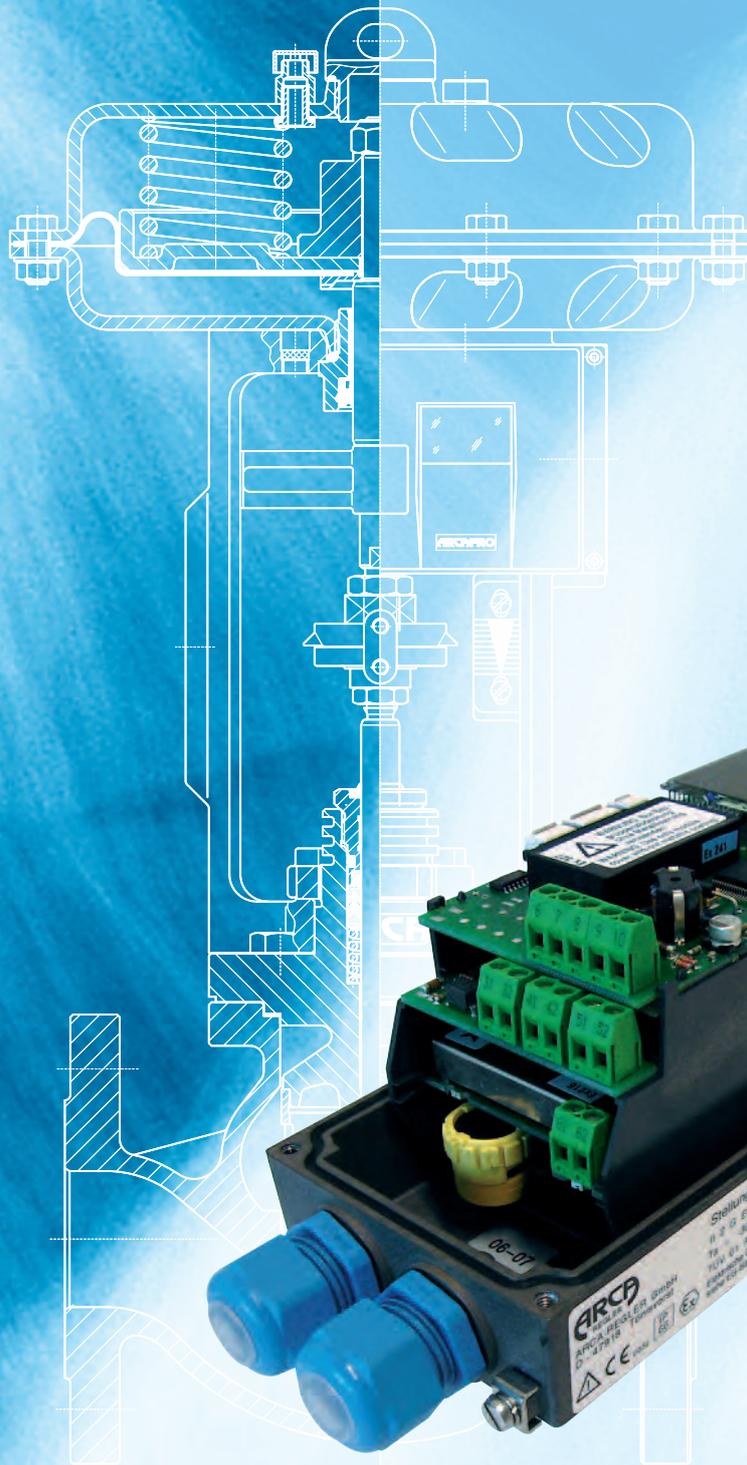
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ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics

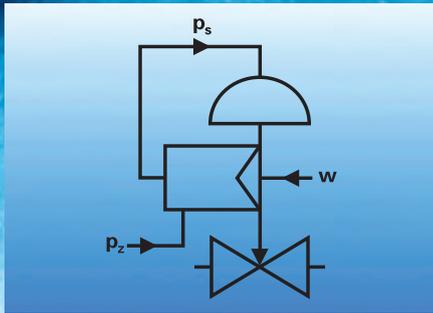


# ARCAPRO<sup>®</sup> positioner



**ARCA**  
VALVES  
*quality engineered  
control valves*

# ARCAPRO® positioner



## Positioner customized for specific tasks

A linear function between the input signal and stroke is the best way to ensure maximum control precision. Control valves with pneumatic actuators, however, are subject to friction, media pressure, and high flow forces, which means that this linearity is not intrinsic in the system. Only a positioner can eliminate positioning errors. To do so, it compares the input signal (reference variable  $w$ ) with the actual stroke (control variable  $x$ ). Depending on the control deviation ( $x_w$ ), the positioner uses the intake air pressure ( $p_z$ ) to yield the actuating pressure ( $p_s$ ) for the actuator (actuating variable  $y$ ). Either 0.2...1 bar, 4...20 mA or digital signals can be used as input signals.

### 1 Positioner mounting to IEC 534 (NAMUR)

The standard mounting method to IEC 534 is based on manufacturer-neutral mechanical interfaces with the actuator yoke and stem. A bracket is normally used to secure the positioner, while the feedback lever comprises a lever with a spring element. The inlet air is connected to the positioner, while the pneumatic connection with the actuator is realized by means of a pipe or hose.

### 2 Direct integrated mounting

The positioner can be easily mounted on the actuator yoke by means of two screws to ensure that it is robust and protected against vibrations. The feedback lever is located within the yoke, which offers better protection than the NAMUR mounting method. The actuating pressure is channeled from the positioner through the actuator yoke to the actuator without the need for additional piping, thereby preventing any leakage. The inlet air is connected directly to the positioner.

### 3 Integrated mounting to VDI/VDE 3847

As with the NAMUR mounting method, this method uses standardized mechanical interfaces with the actuator yoke and stem. The actuator interface, however, is also a pneumatic interface, which means that, as with the direct mounting method, the actuating pressure is channeled to the actuator through the actuator yoke. In addition, the rear of the yoke is equipped with an interface for a solenoid valve, which is pneumatically connected between the positioner and actuator, thereby enabling a safety shutdown of the unit. The inlet air is connected directly to the yoke, which means that no work needs to be carried out on the piping if the positioner is replaced.

### 4 ARCAPLUG® stroke pick-up

The patented ARCAPLUG® stroke pick-up connects the valve stem and the stroke scanning lever. The tapered roller, which is made of wear-resistant plastic, grips between two pins on the stem. The spring mechanism for the tapered roller is self-adjusting, which means that the stroke is always detected without any zero backlash and without hysteresis. Even strong vibrations or heavy impacts do not cause any wear and tear, and the spacing tolerances of the pins are optimal equalized.

## The classic design: analog positioner type 824

### Functional principle

Positioner type 824 functions according to the tried-and-tested force-balance principle. The pneumatic setpoint standardized signal issued by a pneumatic controller or I/p converter module generates a force on the diaphragm that is balanced with the spring force on the feedback shaft. The resulting difference in force moves the gate valve, which connects the actuator with the intake air or atmosphere, thereby controlling the movement of the valve.

### Modular design

Pneumatic positioner type 824 is modular in design and can be expanded with a range of additional modules, thereby allowing it to be easily customized for specific tasks.

### I/p converter module

The I/p converter module converts electrical 0/4...20 mA input signals to pneumatic standardized signals with 0.2...1 bar for controlling the positioner.

### Limit switch module

Two adjustable inductive switches enable checkback signals for limit positions to be sent to the control system (e. g. as NAMUR signal).

### Feedback potentiometer

The feedback potentiometer generates a message containing the actual position for evaluation in the control system.

## The intelligent design: ARCAPRO® digital positioner type 827A

### Functional principle

ARCAPRO® is an intelligent, second-generation positioner. It not only offers a wider range of functions and higher level of reliability, but also features an advanced online diagnostics system and optional maintenance display. The position of the stem is sent to a potentiometer whose output signal is then compared with the setpoint by the microprocessor. Using a special control algorithm, the controller activates the two piezo valves, which connect the actuator with the inlet air or atmosphere.

The ARCAPRO® positioner can be operated locally or from the control room.

### Optimized operating modes

The ARCAPRO® positioner supports the following operating modes:

- Automatic or manual mode
- Initialization
- Parameterization
- Diagnostics

### Modular design

The ARCAPRO® positioner is compact and modular.

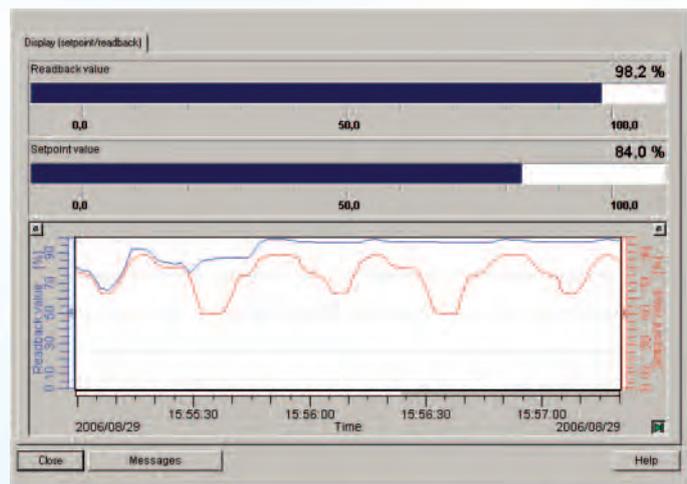
Additional modules increase your range of options:

- **Analog module:** Position transmitter for signaling the actual position as a current signal of 4...20 mA
- **Binary module:** Two adjustable software limit switches, fault signaling switch, binary input
- **Slot initiator module:** Two variable inductive limit switches, fault signaling switch
- **Contact module:** Two adjustable mechanical limit switches

### Automatic commissioning

The automatic initialization function allows you to commission the positioner quickly and easily. The parameters can be set on the device or by means of HART, PROFIBUS or Foundation Fieldbus communication. The following parameters can be set:

- Setpoint direction, characteristic
- Split-range mode
- Tight closing function
- Function for position and fault signaling outputs and the binary inputs



## Additional modules increase your range of options

### Position transmitter

The position transmitter comprises the feedback potentiometer and an R/I converter. It is used for signaling the actual position as a 0/4...20 mA signal.

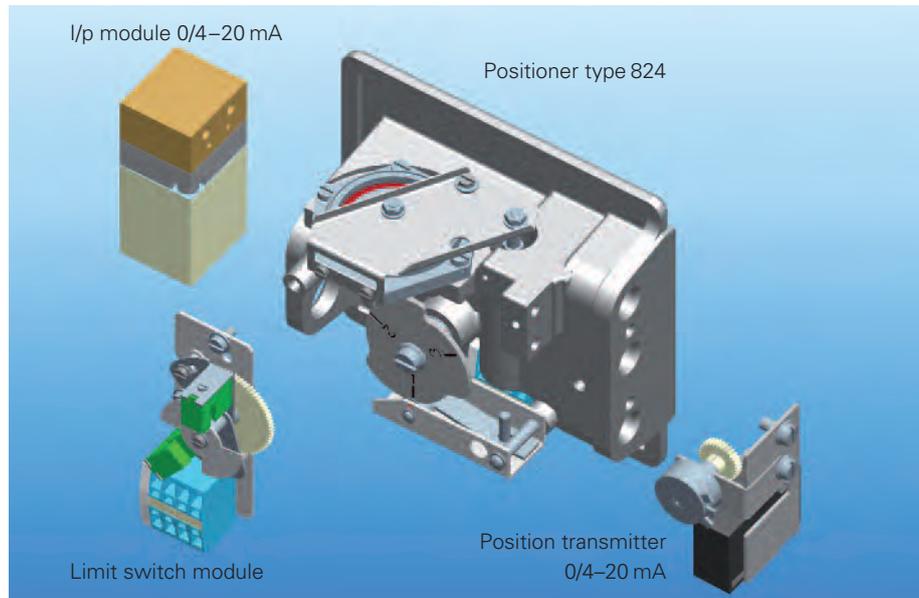
### Gauge group

The gauge group displays the inlet air pressure, setpoint air pressure and actuating pressure. It also allows you to check whether or not the positioner is functioning properly.

### Explosion-protected designs

(for type 827A too)

- Intrinsically safe (EEx ia and EEx ia/ib)
- Explosion-proof (EEx d)
- Non-sparking (EEx n)



### Communication

Depending on the version, the ARCAPRO® positioner enables communication with other field devices or process control systems via:

- HART
- PROFIBUS PA
- Foundation Fieldbus

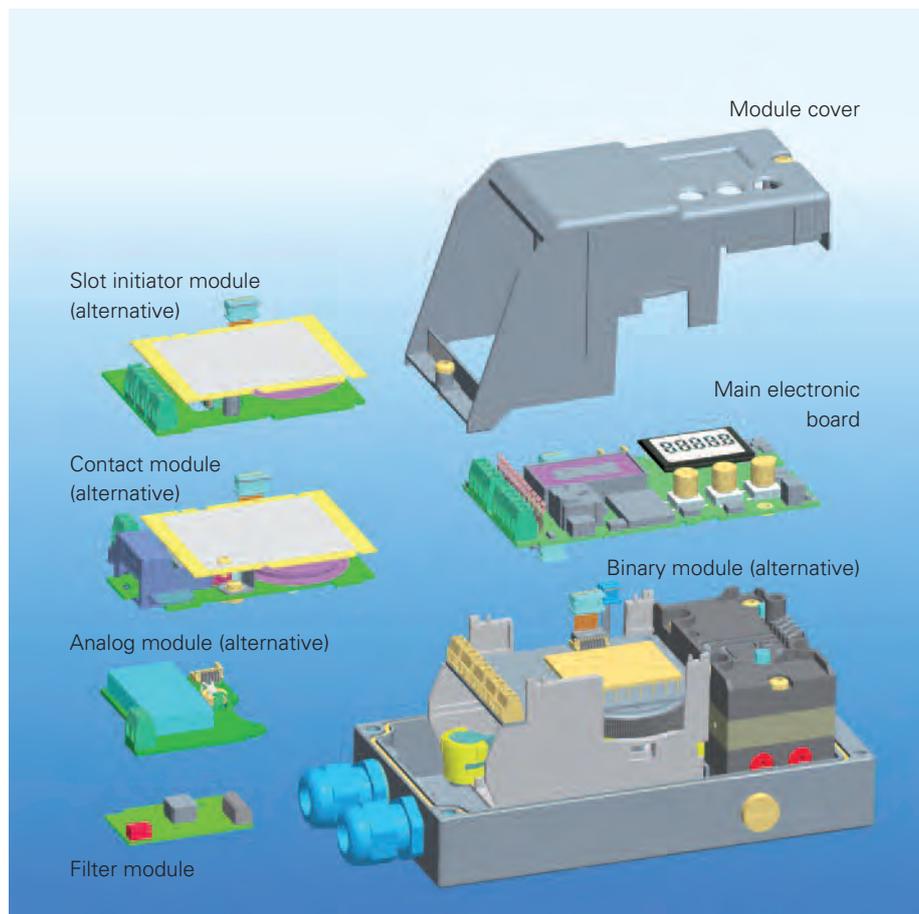
### Advanced online diagnostics to NE 91

The advanced online diagnostics function allows you to evaluate the status of the positioner. The diagnostics values can be displayed locally or queried via the communications cable. A range of additional functions that enable even more accurate status analyses are also available:

- Partial stroke test
- Leak measurement
- Limit temperature monitoring
- Mean position value calculation

### Maintenance data to NE 107

Three-stage limit value signaling to NE 107 can be carried out for the parameters acquired by means of the advanced online diagnostics function.



To enable this, the relevant limit values that trigger the signals must be defined for the following statuses:

- Medium-term need for maintenance
- Urgent need for maintenance
- Failure

The data is displayed on the device and can be sent to higher-level systems via the binary outputs or via HART or bus communication. The data is normally evaluated in the process control system.

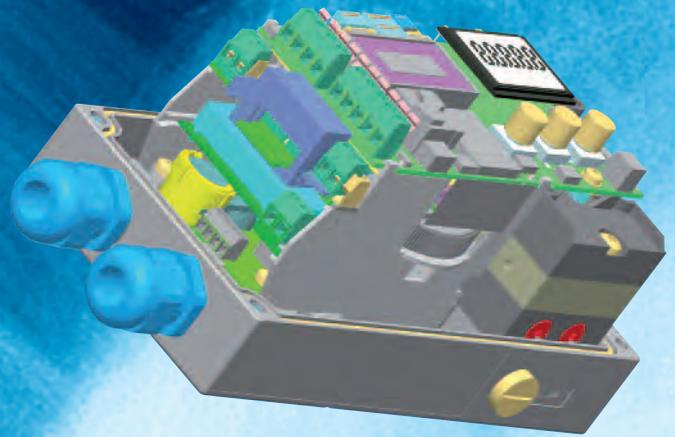
## Analog and digital – precision through innovation

Since 1917 when it released its patented nozzle-flapper system, ARCA has been at the forefront of the industry for control valves with positioners. Our advances over the years have helped make modern positioner technology what it is today – and our state-of-the-art digital positioner ARCAPRO® is just the latest in a long line of innovations.

Thanks to automatic adjustment in line with the control valve and user-friendly parameterization (e. g. direction of action, split range or stroke limitation), the system is easy to commission and operate. In addition, a range of variable diagnostics parameters allow preventive maintenance measures to be specially planned to avoid plant downtime.

Modern communication options (e. g. HART, PROFIBUS, or Foundation Fieldbus) enable function and diagnosis parameters to be sent to process control systems for evaluation.

## ARCAPRO® positioner



### Our innovation

- 1 Classic or intelligent digital positioners tried-and-tested over many years
- 2 Modular, retrofittable accessory and option modules
- 3 Integrated, pipe-free mounting
- 4 Patented ARCAPLUG feedback lever
- 5 Minimal air consumption
- 6 Universal communication
- 7 Advanced online diagnostics

### How you benefit

- ✓ Long service life
- ✓ Low lifecycle costs
- ✓ Optimal adaption to specific applications and control systems
- ✓ Compact design
- ✓ High mechanical resistance
- ✓ No sensitive piping
- ✓ Self-adjusting
- ✓ No hysteresis
- ✓ Minimal wear and tear
- ✓ Low operating costs
- ✓ Easy adjustment in line with existing plant communication systems
- ✓ All diagnostics data can be read on the device or in the control room
- ✓ Self-monitoring of the complete valve
- ✓ Precise planning of maintenance measures

# ARCAPRO® positioner

## Positioner type 824

<b>General data</b>	Enclosure material	Anodized aluminum / Glass-fiber-reinforced polyester
	Temperature range	-40...+80 °C
	Steady-state deviation	< 0,5 %
	Linearity error	< 2 %
	Hysteresis	< 0,7 %
<b>Explosion protection</b>	without / intrinsically safe / explosion-proof	
<b>Input signal</b>	0,2...1 bar or 0/4...20 mA 2 wire connection	
<b>Option modules</b>	Position transmitter	4...20 mA, passive, 2/3 wire connection (not explosion proof)
	Limit switch	2 NAMUR sensors
<b>Pneumatic data</b>	Inlet air pressure	1.4...6 bar
	Continuous air consumption	< 500 Ndm³/h
<b>Mounting</b>	Linear actuators	ARCA-integrated or to IEC 534; range of stroke 10...120 mm
	Quarter turn actuators	To VDI/VDE 3845; angle of rotation 90°

## ARCAPRO® positioner type 827A

<b>General data</b>	Enclosure material	Anodized aluminum, stainless steel, polycarbonate
	Temperature range	-30...+80 °C
	Steady-state deviation	Typically < 0,3 %
	Linearity error	Typically < 0,5 %
	Dead zone	Self-adjusting (typically 0.3 %) or adjustable (0.1 % to 10 %)
<b>Explosion protection</b>	without / intrinsically safe / non-sparking / explosion-proof	
<b>Communication / input signal</b>	Standard / HART	4...20 mA 2 wire connection, 0/4...20 mA 3/4 wire connection
	Profibus PA	Profibus PA, profile B, version 3.0
	Foundation Fieldbus	H1 communication
<b>Binary inputs</b>	Switching or voltage inputs, parameterizable (e. g. «Move valve to CLOSED»)	
<b>Option modules</b>	Analog module	4...20 mA position transmitter, passive
	Binary module	2 NAMUR limit switches, 1 NAMUR fault switch, 1 binary input
	Slot initiator module	2 inductive NAMUR limit switches, 1 NAMUR fault switch
	Contact module	2 mechanical limit switches
<b>Pneumatic data</b>	Inlet air pressure	1.4...7 bar
	Continuous air consumption	< 36 Ndm³/h
<b>Mounting</b>	Linear actuators	ARCA-integrated, integrated to VDI/VDE 3847 or to IEC 534; range of stroke 3...130 mm
	Quarter turn actuators	Integrated to VDI/VDE 3847 or VDI/VDE 3845; angle of rotation 30...100°

### ARCA Regler GmbH

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ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



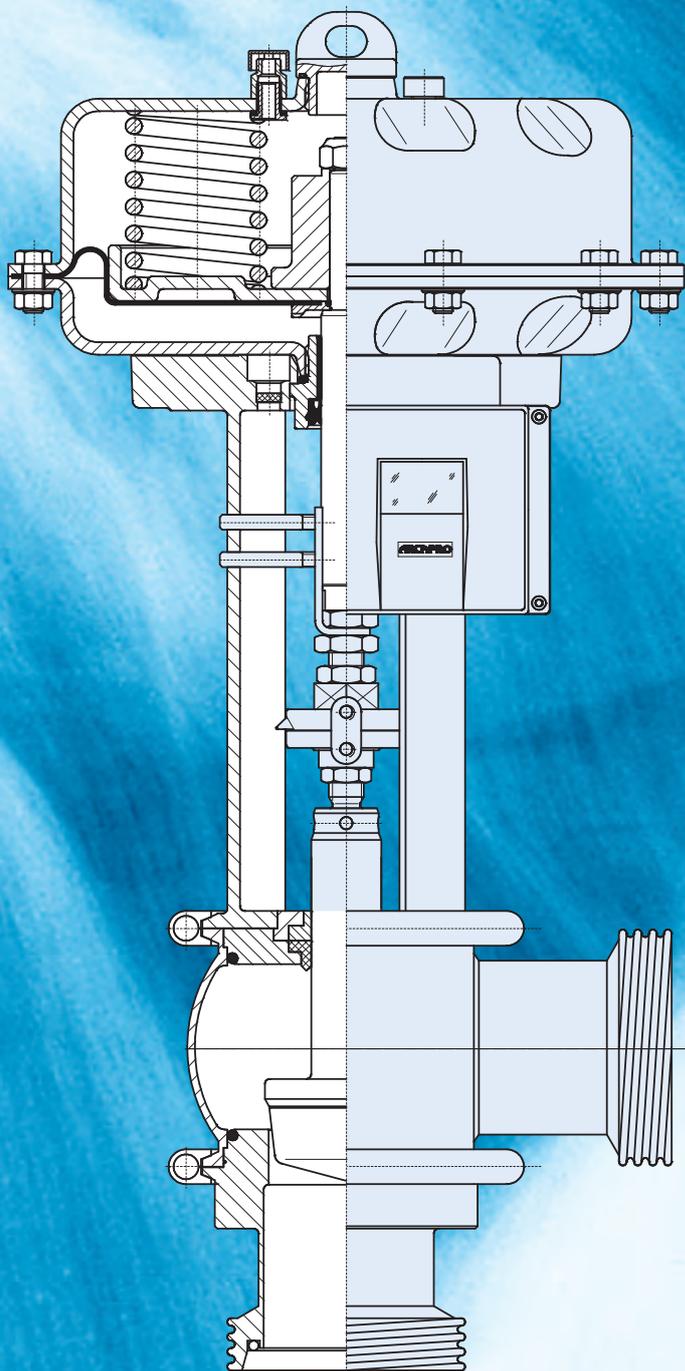
**BIOVENT®**

**Hygienic Valve**



**ARCA**  
VALVES  
*quality engineered  
control valves*

# BIOVENT® Hygienic Valve



## Committed to perfection in every detail

### Powerful valve actuator

BIOVENT® control valves are usually combined with pneumatic multi-spring ARCAPAQ actuator type 813. Not only is it cost effective, robust, and explosion proof, but also provides short stroking times and a constant seating force. The actuator is available in different sizes optimized in line with the required actuating force. BIOVENT® control valves are also available with optional electric actuators. For more details, please see the ARCA actuators brochure.

### Multi-functional positioner

Thanks to the digital ARCAPRO® positioner, BIOVENT® control valves are equipped with a multifunctional interface with the controller or process control system and operate as standard with 4–20 mA. HART, Profibus (PA), and Foundation Fieldbus, for example, are used to establish a digital interface with bidirectional data exchange (including status messages). For more details, please refer to the ARCA positioners brochure.

### Flexible hygienic housing

The stainless steel spherical housing with zero dead space offers the ideal flow conditions. The internal height of the housing matches the internal diameter of the connection pipe. The hygiene-committed design of BIOVENT® control valves is CIP capable and ensures that any residue is drained. This makes the valves easy to clean and prevents damage caused by oxidation as well as media from settling. The housing components are connected by means of stainless steel clamping rings, which facilitates maintenance and allows different housing and connection types to be used.

### Hygienic housing and stem seals

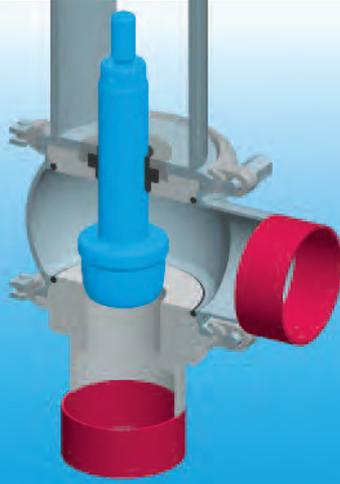
EPDM O-rings, which are shaped to a defined size in a form-fit installation space, are used as standard to ensure that the housing components are sealed in line with FDA requirements. The O-ring is pre-tensioned so that it is flush with the wall of the housing and secures the seals. Optimum CIP conditions are ensured. A special combination sealing element with wiper ring is used on the dynamic seal of the valve stems. Purge liquid and/or particles are removed upstream of the sealing element and bearing, thereby preventing them from settling or being crushed between the stem and bearing.

### High-precision valve trims

The BIOVENT® control valves are equipped with valve trims specially designed for the prevailing flow conditions in your plant. The shapes of the closure members and valve seats as well as the material from which they are made (1.4571 superfinished, roller burnished, 1.4404) are optimized in line with your requirements. The replaceable plug and clamped valve seat allow the system to be easily adapted to different operating conditions. Various Kvs values can be selected for each nominal diameter, which means that the valve can be optimized to meet the actual service conditions.

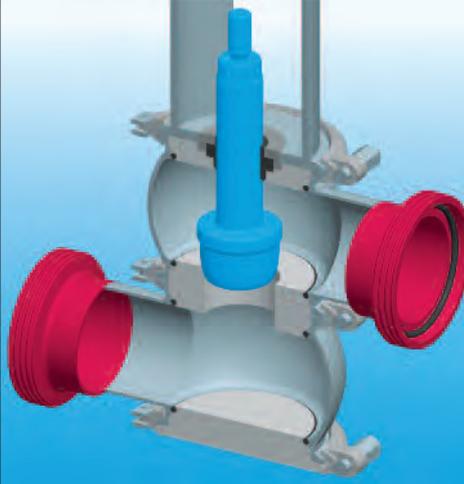
## Housing styles/connections

## BIOVENT® Hygienic Valve



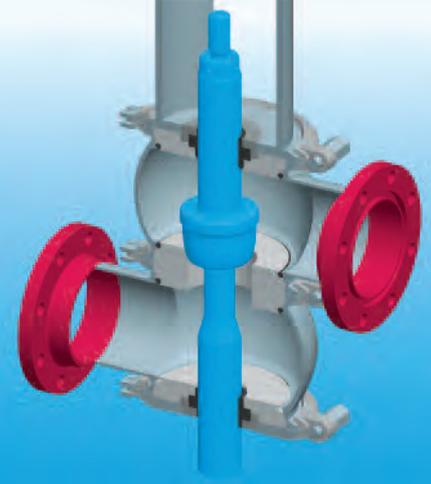
### Angular valve with welding stubs (type 391-P1-L)

This design is a cost-effective standard version of the BIOVENT® hygiene valve. It comprises a spherical housing with a pipe connection and a vertical valve inlet with an integrated valve seat. The flow direction is always against the direction closing of the plug.



### Straight-way valve with knuckle thread (type 391-P1-BO)

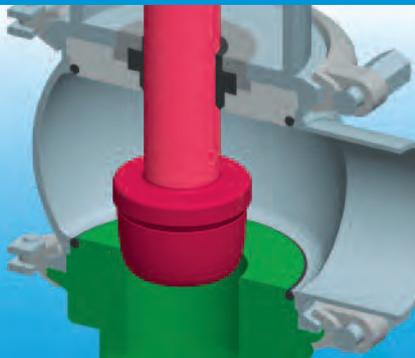
This design comprises two spherical housings, each with one connection. The valve seat is secured as a separate component between the two halves of the housing, which means that it can be quickly and easily replaced. The clamping ring connections allow the two pipe connections to be aligned as required. The knuckle threads are manufactured in accordance with DIN 11851.



### Straight-way valve with flanged connection (type 391-P1-BM)

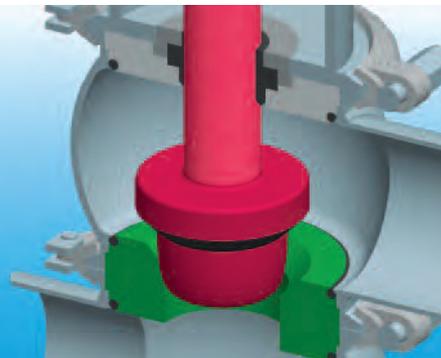
This design also comprises two spherical housings, each with one connection and with a clamped and easily exchangeable seat ring. With larger nominal diameters or Kvs values, a second, lower guide for the plug is recommended to prevent vibrations of the stem.

## Valve trims



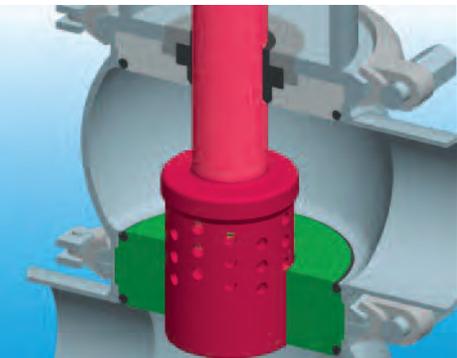
### Standard parabolic plug with metal seal

The single-step parabolic plug is the ideal solution for laminar or turbulent flows. This version is suitable for handling high viscosity fluids or media containing fruit. The linear or equal-percentage plug is located in the spherical housing, which is designed in such a way that it can be cleaned thoroughly. The valve has a metal sealing and a one-piece plug.



### Parabolic plug with V-ring soft seal

If the hygienic valve is also used as a shut-off device, maximum tightness can be ensured by means of an EPDM or FPM V-ring soft seal. The seating thrusts are absorbed by the metal support. The stress-relieved installation of the seal increases the service life. The secure fixing of the soft seal allows the system to be used in vacuums or in applications with high flow velocity.



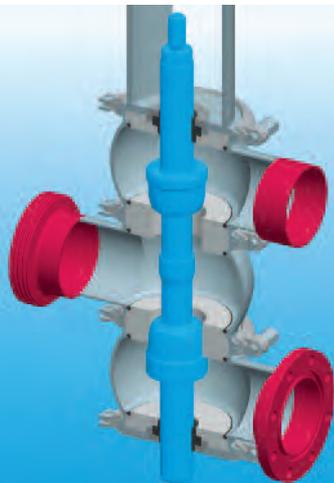
### Perforated plug

A special perforated plug can be used in applications with critical pressures. The bores in the perforated plug divide the flow into numerous small flows which are less critical concerning cavitation and erosion. This not only protects the trim and housing but also reduces the noise level.



**Three-way valve as a flow mixer (type 391-M-WM)**

This valve design comprises three identical spherical housings, each with a pipe connection. Both valve seats are secured between the housing components. This valve can be used as a flow mixer or flow divider. In the picture a valve with Tri-Clamp® connections is shown.



**Three-way valve as a flow divider (type 391-T-WM)**

This three-way valve is dimensioned for both plugs with the maximum Kvs value and a linear characteristic. Reduced Kvs values are also available as an option. This valve is ideal as a flow divider.



**Multi-step valve (type 391-P3-BM)**

This multi-step valve combines two spherical housings (each with one connection) and a specially-shaped valve seat, which is secured between the two housing components by means of clamping rings. The control unit is ideal for pressure reducing of liquids at high differential pressure, thereby preventing the serious consequences of cavitation.



**Stem seal with combination sealing element**

A specially-developed combination sealing element with wiper ring seals the polished and roller burnished valve stem. The wiper ring protects the sealing element and bearing against the ingress of purge liquid and particles, thereby preventing media from settling or abrasive particles from being crushed or ground down between the stem and bearing.



**Stem seal with sterile lock**

The sterile lock, which can be applied with steam or other sterilizing media, protects the product space against the environmental air. The medium is applied to the sterile lock at the discharge end in such a way that it always remains on the «sterilized» side.



**OPTISEAL® hermetic stem seal**

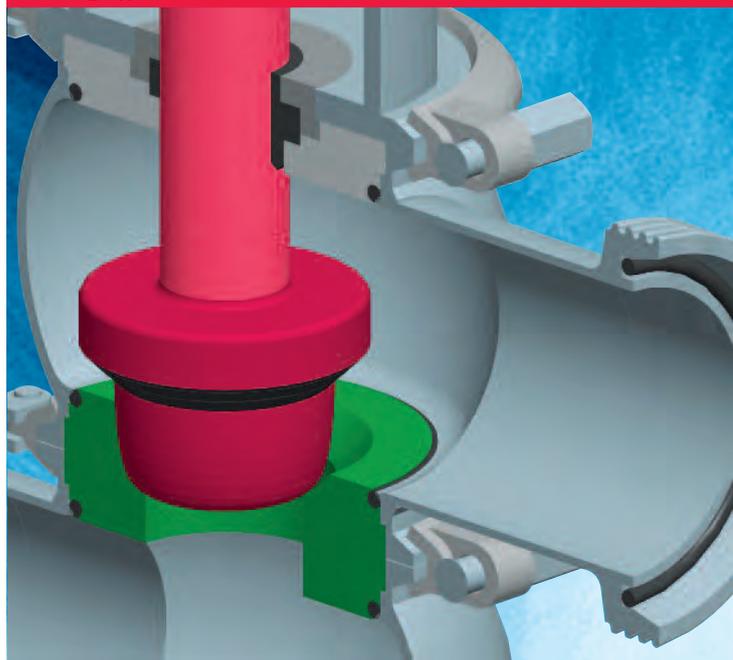
The specially-developed OPTISEAL® diaphragm seal ensures that the stem is hermetically sealed. A twin-diaphragm seal with an additional safety stuffing box, and optional hydraulic support, and a diaphragm breakage monitor provides triple stem seal protection and offers major benefits particularly in sterile processes.

## Ensuring precision and efficiency

The ARCA BIOVENT® hygiene valve features zero dead space and is designed to ensure that it can be thoroughly cleaned. The modular design of the valve housing, connections, stem seals, valve trims, actuator, and positioner enables it to be optimized in line with your requirements. The hygiene-oriented design, efficiency, control precision, price/performance ratio, and maintenance outlay of the ARCA BIOVENT® hygiene valve are carefully harmonized to minimize the total cost of ownership. Our commitment to innovation in valve technology ensures that you benefit from maximum control precision for your application. Why not see for yourself!



## BIOVENT® Hygienic Valve



### Our innovations

### How you benefit

<p><b>1</b> Flow-optimized valve housing</p>	<ul style="list-style-type: none"> <li>✓ Zero dead space</li> <li>✓ GMP compatible</li> <li>✓ FDA compliant</li> <li>✓ 3A sanitary standard (optional)</li> <li>✓ Low noise emission</li> </ul>
<p><b>2</b> Nominal diameter identical to internal diameter of piping</p>	<ul style="list-style-type: none"> <li>✓ Optimum CIP conditions</li> <li>✓ No sources of infection</li> </ul>
<p><b>3</b> Compact module connection by means of clamping rings</p>	<ul style="list-style-type: none"> <li>✓ Maintenance without special tools</li> <li>✓ Quick and easy disassembly</li> </ul>
<p><b>4</b> Valve plug and seat can be replaced separately</p>	<ul style="list-style-type: none"> <li>✓ Cost-effective plug replacement</li> <li>✓ Flexible valve adjustment</li> <li>✓ Minimal spare parts required</li> </ul>
<p><b>5</b> Stem seal with special sealing element and additional wiper ring</p>	<ul style="list-style-type: none"> <li>✓ Long-term safety</li> <li>✓ Maintenance free</li> </ul>
<p><b>6</b> Modular system</p>	<ul style="list-style-type: none"> <li>✓ A wide range of connection and housing types</li> <li>✓ Quick adjustment to process changes</li> <li>✓ Highly cost effective</li> </ul>
<p><b>7</b> Customized sealing solutions</p>	<ul style="list-style-type: none"> <li>✓ EPDM seals from <math>-40\text{ }^{\circ}\text{C}</math> to <math>+135\text{ }^{\circ}\text{C}</math> (up to <math>+150\text{ }^{\circ}\text{C}</math> over short periods)</li> <li>✓ FPM seals from <math>-10\text{ }^{\circ}\text{C}</math> to <math>+200\text{ }^{\circ}\text{C}</math> (optional)</li> </ul>
<p><b>8</b> Triple-sealed, hermetic stem seal OPTISEAL®</p>	<ul style="list-style-type: none"> <li>✓ Hermetic twin-diaphragm seal</li> <li>✓ Additional safety stuffing box</li> <li>✓ Hydraulic support for diaphragm (optional)</li> <li>✓ Diaphragm breakage monitor</li> </ul>

# BIOVENT® Hygienic Valve

## General specifications

<b>Series</b>	391		
<b>DN</b>	15 – 150		
<b>PN</b>	10 – 25		
<b>Housing types</b>	Angular	L	Parabolic plug
	Straight way	BO	Parabolic plug
	Straight way	BM	Parabolic plug (double guided)
	3 step	BM	3-step plug (P3)
	3 way	M-WM	Flow mixer
	3 way	T-WM	Flow divider
<b>Material</b>	1.4404 (316L) St. Steel (all housing components blasted and post-treated)		
	Thread connection 1.4301 (304) St. Steel		
<b>Housing connections</b>	Thread connections, welded ends, flanged connections, clamp connections, aseptic flanged connections Other connection types available on request		
<b>Piping classes</b>	Metric in accordance with DIN 11850		
	Imperial OD in accordance with ISO 2037/BS 4825 Part 1		
	Imperial IPS in accordance with Schedule 5		
<b>Surfaces</b>	Surfaces that come into contact with product: Ra ≤ 0.8 µm; fine-blasted surface		
<b>Plug characteristic</b>	Standard: equal percentage or linear		
<b>Rangeability</b>	40:1		
<b>Seat leakage</b>	Metal sealing: class IV (0.01% of kvs)		
	Soft sealing: class VI		
<b>Plug</b>	1.4571 (316Ti) St. Steel (superfinished; guiding surfaces roller burnished)		
<b>Seat</b>	1.4404 (316L) St. Steel		
<b>Stem seal</b>	EPDM sealing rings; temperature range: -30 to +135 °C; FDA compliant		
	Resistance: 2 to 5% resistance to alkaline solutions and acids up to +85 °C		
	Other materials (FPM, HNBR etc.) available on request		
<b>Options</b>	Sterile lock, diaphragm seal		
<b>Material certificates</b>	Inspection certificate in accordance with EN 10204 / 3.1		
	Material certificate EN 10204 / 2.2		

### ARCA Regler GmbH

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# Control valves

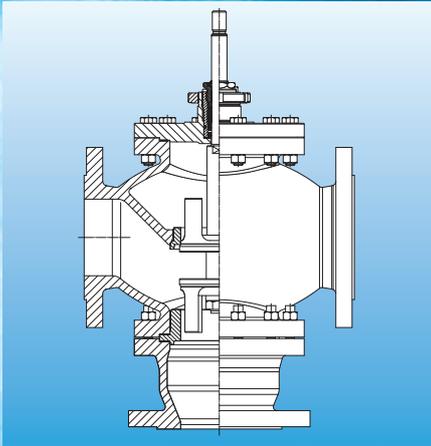


**ARCA**  
VALVES  
*quality engineered  
control valves*

# Control valves from the ARCA modular parts system

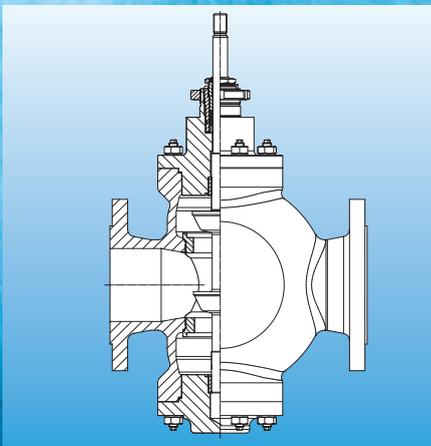
### Three-way control valves

The ARCA three-way control valve is designed to be used as a three-way or mixing valve, depending on the application. As a three-way valve, the incoming medium is split into two individual flows. This split can be 1:1 or a different ratio can be used. As a mixing valve, two media are mixed in the valve housing and exit the three-way valve in the desired new state.



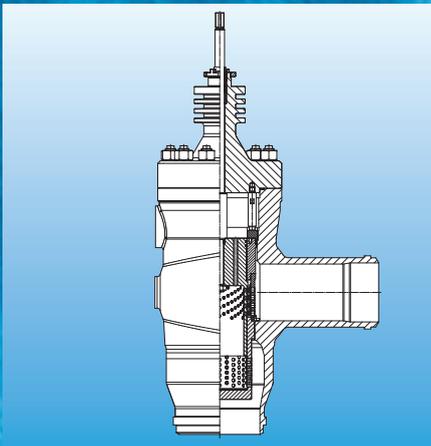
### Double-seat control valves

The ARCA double-seat control valve is characterized by its simple and robust design, featuring a double guided trim, and is used for larger volumetric flows. The flow is controlled at two ports, whereby both plug diameters are coordinated such that the medium exerts an opening force on the one plug and a closing force on the other and the actuating forces almost compensate each other out as a result. The plugs can take a variety of shapes to meet application requirements.



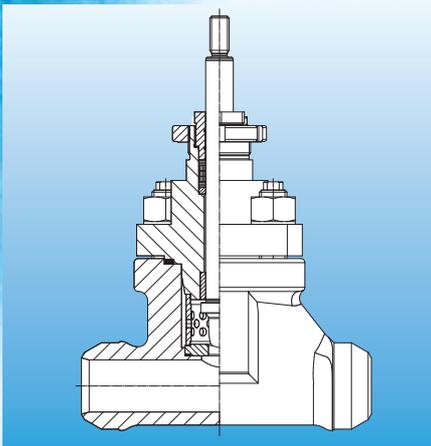
### Angle valves

The ARCA angle valve is used in very specific plant applications. The ARCA modular parts system therefore integrates housings made from different cast and forged materials so that a wide variety of requirements can be met. The internals, however, always follow the same basic clamped principle of the ECOTROL® series. The process fluid flows into the angle-control valve from the side or the bottom and exits after just one deflection.



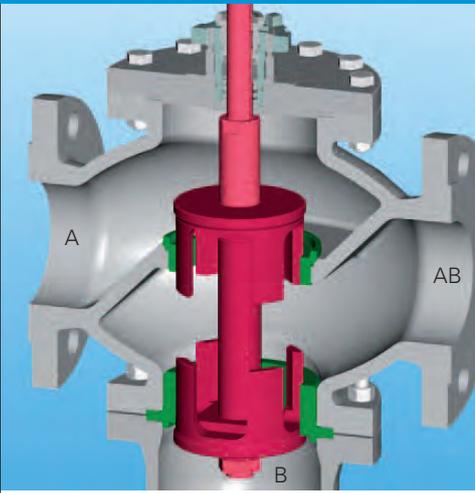
### Forged valves

ARCA forged valves are made from a forged block or a dye-forged housing. Defining characteristics is the large selection of housing materials and the resulting increase in structural safety. Forged control valves are especially used in conjunction with welded ends, since they can be connected directly to the piping here. The internals also follow the basic clamped principle of the ECOTROL® series.



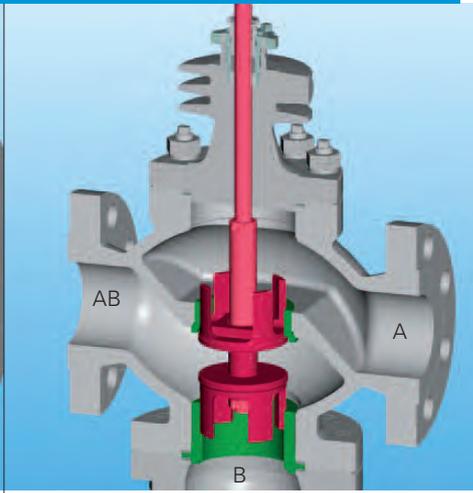
A wide variety of pneumatic and electric actuators, such as the series 812 pneumatic actuator, is available to precisely operate all control valves listed here.

## Three-way control valves: 200 and 220 series



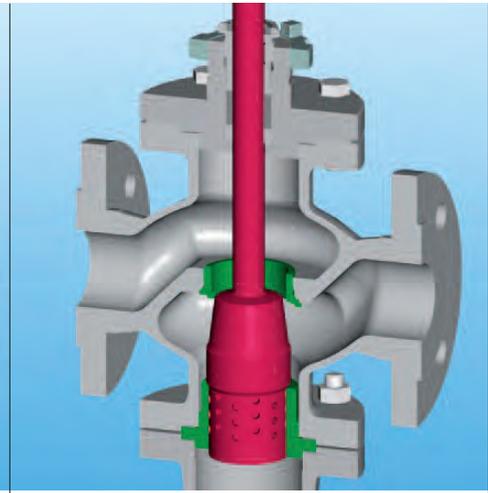
### Flow divider

The fluid enters the valve housing laterally (AB), where it splits into a downward (A) and a straight-through (B) flow. Both opposed plugs have the same seat diameter and are thus pressure equalized on the static side. The ARCA design always features a double guide to also accommodate more demanding applications. The actuator then only needs to be dimensioned for the forces resulting from the differential pressure, dead weight, and packing friction.



### Flow mixer

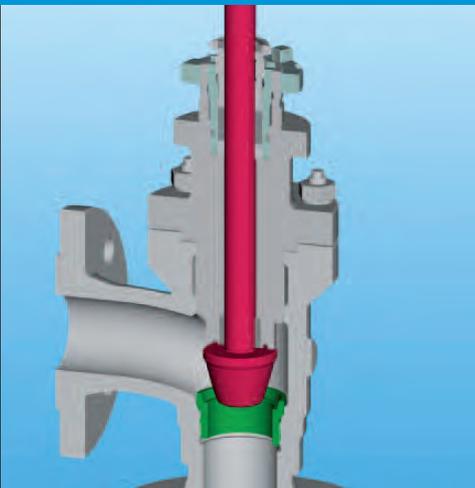
The fluid enters the valve housing laterally (A) and from the bottom (B) and mixes in the valve housing before it exits the body of the valve (AB) at the side. This is a typical application for temperature controllers. The ARCA modular parts system covers temperature applications to 530 °C for the three-way control valve, meets nominal pressure requirements of up to 250 bar (PN 250), and features cooling fins in the bonnet area. The inner construction corresponds to the modular design of the flow divider and is identical from an actuator perspective.



### Further applications

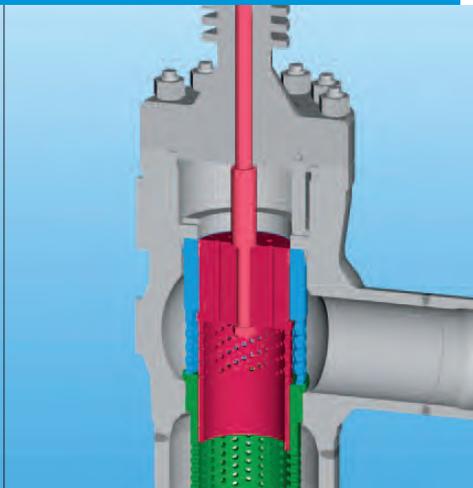
The ARCA modular parts system offers a wide variety of combination options for temperature, pressure, and flow. In the example shown, the incoming process fluid flows through in a straight line under low differential pressure and is regulated to the bottom outlet under high differential pressure. The perforated plug can respond to different flow coefficients with the right perforated pattern and safeguards bottom guidance. Many applications are possible. Contact us for more information!

## Angle-control valves: 350 and 380 series



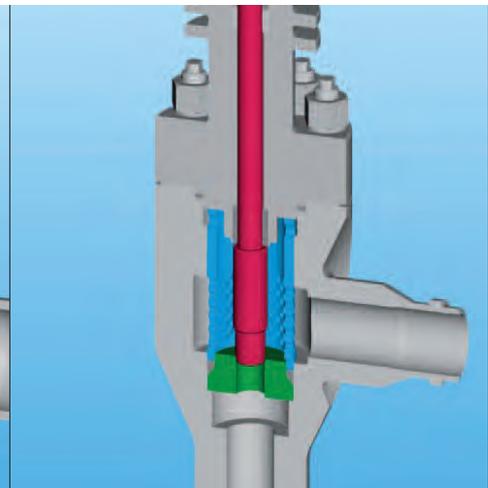
### Angle-control valve

The ARCA modular parts system includes a cast model as a basic version. This cast housing series meets the requirements of basic applications. The plug used is a single-step parabolic plug. Stem sealing can be realized with cooling fins or bellows in addition to the standard bonnet, whereby the packing is selected based on the application. Further options such as a heating jacket can be added.



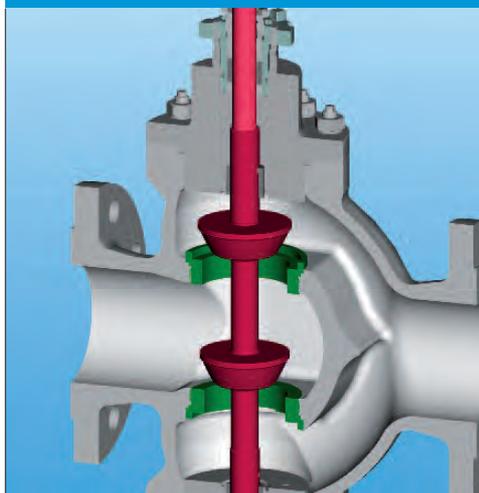
### Angle-control valve

ARCA not only offers angle-control valves in low-pressure design, but also ones rated to a nominal pressure of 250 bar (PN 250). Several cast models are available for different materials and can withstand temperatures up to 600 °C. The base design integrates butt-welded ends to allow the housings to be adapted for individual application requirements. Different valve trims are available, all of which feature the proven clamped seating design. Bonnet seals include all common versions through to a self-sealing pinch cap from Bretttschneider.



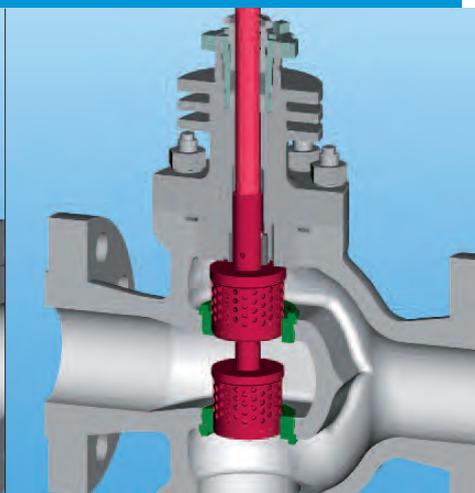
### Angle-control valve

ARCA cast models cannot always serve all of your applications, which is why several forged housings have been designed around proven, standardized valve trims and bonnets. Your specific material, pressure, and temperature requirements are met, thanks to a nominal pressure rating of more than 250 bar (PN 250) and a temperature range beyond 600 °C. Such performance allows ARCA to provide the optimal solution for all applications involving angle-control valves.



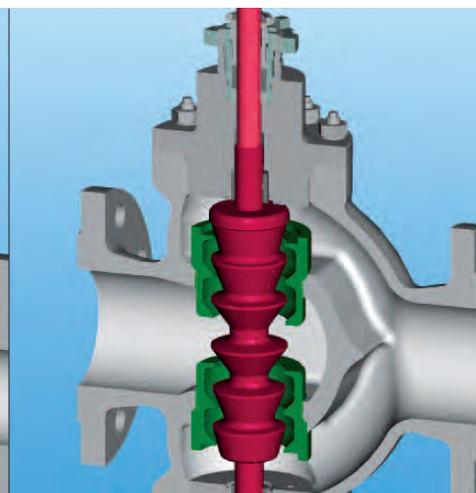
**Double seat with parabolic plug**

This double-seat control valve divides and controls the process fluid using two parabolic plugs. The proven double-guided parabolic plug design is frequently used for applications involving water and impresses with its robust and simple construction. The exterior dimensions of the parabolic plugs are virtually identical by design, making them almost pressure equalized. The full cone diameter does not need to be considered in dimensioning the actuating force, but only the resulting ring gap, allowing use of smaller actuators.



**Double seat with perforated plug**

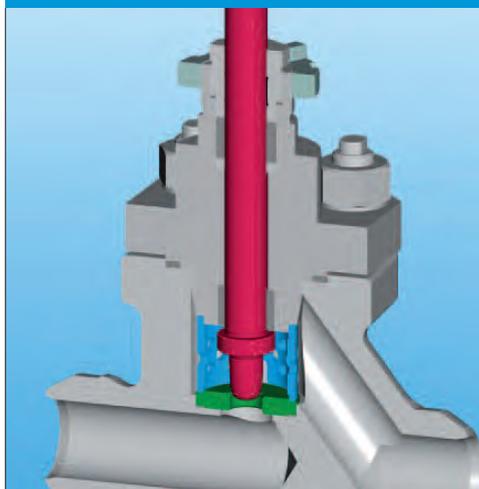
As with all ARCA series, the modular double-seat control valve is available in many versions, meets nominal pressure requirements up to a nominal pressure of 160 bar (PN 160), and is compatible with temperatures to 530 °C. This valve is a high-pressure double-seat control valve that has cooling fins in the bonnet so that the stuffing box remains outside the hot area. Fluid control takes place via perforated plugs, which are used in place of traditional parabolic plugs to reduce noise. Small actuators are also specified for this model so that high differential pressures can be regulated.



**Graduated double seat**

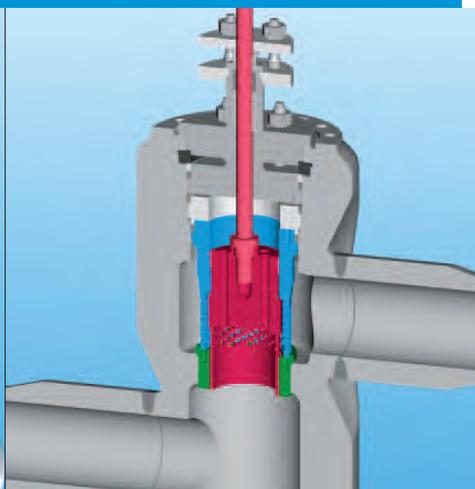
The ARCA modular parts system facilitates a multi-stage pressure drop to accommodate higher differential pressures and applications for which the purity of the medium cannot always be ensured. This version allows you to depressurize the medium without cavitation, for example. The design of the double-seat control valve eliminates the need for a pressure-relief facility and shall be preferred if the process fluid is slightly contaminated. Small actuators are of course used for the double-seat control valves.

Forged valves: 180 series



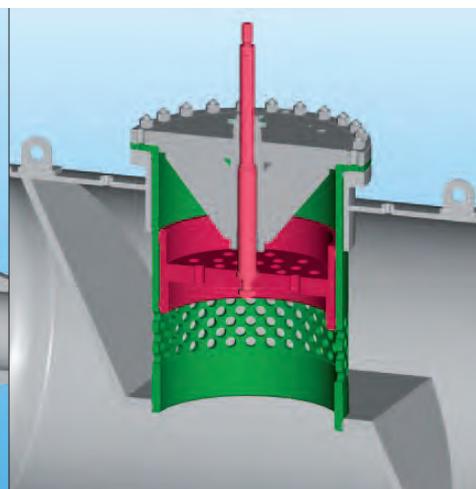
**With parabolic plug**

The control valves for the basic version are available in different nominal sizes and designed in accordance with the ECOTROL® principle. Proven, standardized, and diverse valve trims ensure that internal leakage between the seat and housing are a thing of the past. The forged valve housings can be ordered with butt-weld ends or conventional flanges. The bonnet affixed in the force bypass can be used to install all ARCA actuators.



**Multistage perforated plugs**

The globe style control valve is available in the classic straight or Z configuration, depending on the pipe layout. Here, too, ARCA can offer a coherent concept. The forged housing is designed and adapted to specific conditions and requirements based on the proven valve trim and wide variety of designs and bonnets.



**With perforated plug**

ARCA can also assist with its standardized design concept when it comes to large valves. The dimensions of this design are largely unrestricted. You specify the nominal width and version needed by your application. The design concept is pursued and implemented far beyond control requirements, whereby the conditions for transport and on-site commissioning are taken into account and ensured during the design stage.

## Master of variety

ARCA rounds off its valve program with these control valves and offers three-way, double-seat, angle, and forged valves in addition to the classic valve line. This variety is what makes us the ideal partner for complete control valve packages.

While ARCA uses a design principle to standardize these valves, it also ensures that each series offers its own, unique benefits and variety for your process – from materials and piping system connections to numerous valve trims that regulate your medium in line with the application.

ARCA's complete selection of actuators and controllers is available to meet your control requirements.

## Control valves



### Our Innovations

- 1** Modular parts system with standardized components
- 2** Flow-optimized housings
- 3** Optimized valve trim comprising cone and seat for all application areas
- 4** Standardized interface to valve actuator
- 5** Valve trims can be completely removed
- 6** Always the right package
- 7** Valve plug and stem can be replaced separately

### How You Benefit

- ✓ All nominal diameters
- ✓ Fewer components
- ✓ Only one special tool required
- ✓ Low levels of noise emission
- ✓ Optimized flow coefficients for all nominal diameters
- ✓ Adaptable to any requirements
- ✓ High control accuracy
- ✓ Wide control range
- ✓ Low levels of noise emission
- ✓ All types of actuator can be used – pneumatic, electric and hydraulic
- ✓ Can be easily reconfigured later on
- ✓ Maintenance work is fast and simple
- ✓ All internal parts can be removed
- ✓ No special machines required
- ✓ All interior components are clamped or screwed (no welding)
- ✓ Safety and hermetic sealing
- ✓ Maintenance free
- ✓ Reduced storage
- ✓ Cost-effective plug replacement

# Control valves

## Additional valves – Technical data

Design	Three-way		Double-seat		Forged		Angular	
Type	200	220	250	280	180		350	380
DN (housing)	25–600	25–300	50–350	40–250	15–100	150–1200	15–300	25–400
PN	10–40	63–160	10–40	63–160	10–250	10–40	10–250	10–400
Housing type/design	Three-way		Straight-way		Straight-way		Angle	
Housing material	Cast		Cast		Forged		Cast	Forged

## Materials

	EN	for temperatures	ASTM	for temperatures
<b>Housing – cast</b>	1.0619 GP240GH	up to 450 °C	A 216 WCB	up to 450 °C
	1.7357 G17CrMo5-5	up to 530 °C	A 217 WC6	up to 530 °C
	1.4581 GX5CrNiMoNb19-11-2	up to 550 °C	–	–
	1.7379 G17CrMo9-10	up to 580 °C	–	–
	1.4931 GX23CrMoV12-1	up to 600 °C	–	–
	2.1050 G CuSn10	–196 up to 300 °C	–	–
<b>Housing – forged</b>	1.0460 P250GH	up to 450 °C	A 105	up to 450 °C
	1.0425 P256GH	up to 450 °C	–	–
	1.5415 16Mo3	up to 530 °C	–	–
	1.7335 13CrMo4-5	up to 570 °C	A 182 F12 Cl.2	up to 570 °C
	1.7383 11CrMo9-10	up to 600 °C	A 182 F22 Cl.3	up to 600 °C
	1.4903 X10CrMoVNb91	up to 620 °C	A 182F91 - P91	up to 620 °C
<b>Valve trims</b>	1.4021 X20Cr13			
	1.4122 X39CrMo17-1			
	1.4571 X6CrNiMoTi17122			
	1.4922 X20CrMoV1 21			
	2.0966 / 2.0550			
<b>Bonnet</b>	Standard			
	With cooling fins			
	Self-sealing pinch cap			
	With stuffing box control/sealing fluid connection			
	With bellows			
<b>Plug characteristic</b>	Standard: linear or equal percentage			
	Optional: linear, modified			
<b>Rangeability</b>	25:1 / 50:1			
<b>Seat leakage</b>	Metal sealing: leakage rate Class IV (0.01% of flow coefficient)			
	Metal sealing: double-seat, type 250 Class III (0.1% of flow coefficient)			
	Soft sealing: Class VI			
<b>Options</b>	Double guide, heating jacket, ANSI classes, additional materials			

### ARCA Regler GmbH

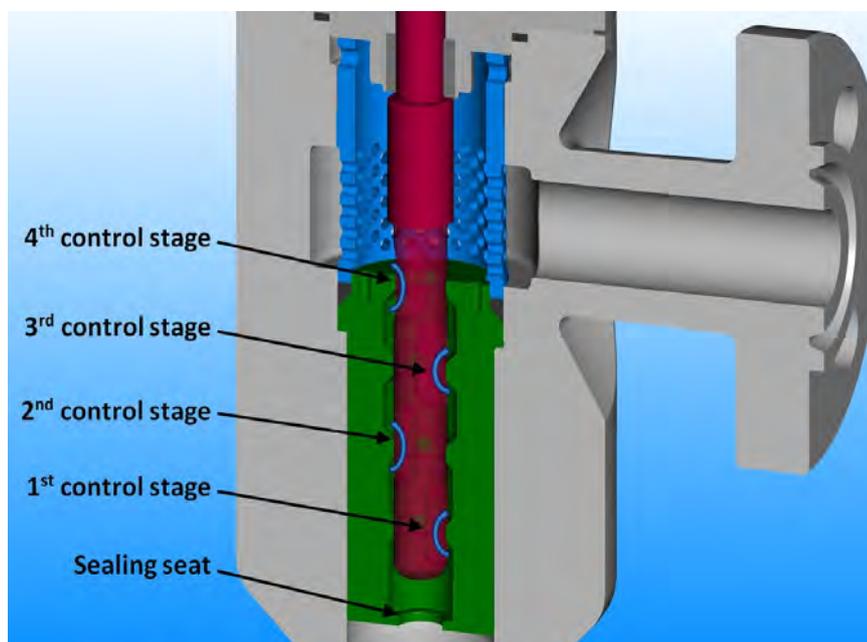
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ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



# MS4 Multi-Stage Trim for Blowdown of Fluids containing Solid Matters

Processes based on the reaction of a process fluid under high pressure and at a high reaction temperature (possibly with the addition of a catalyst), are of major significance in the chemical and petrochemical process industry. If these are continuous processes, they are quite often in conjunction with a pressure or level control and therefore also equipped with the associated control valves, which transfer the process fluid from the reaction container to the downstream process.



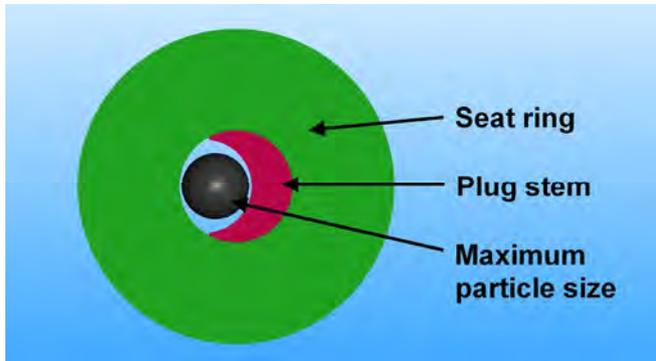
Due to the high pressure drop at these control valves, multi-stage valves are essential for this use; but as soon as particles (e.g. catalysts) are present in the process fluid, not only the normal design (number of individual throttle stages and their respective flow coefficient), but also the grain size distribution of the solids need to be taken into consideration - the cross-section of each individual flow channel in the valve must be dimensioned and designed in such a way that a maximum-sized grain can pass through this flow channel. As the overall cross-section of the flow channels of each throttle stage is defined by the KV, only the parameters “Number of flow channels” (optimal =1) and “Form of the individual flow channel” (a cross-section as circular as possible is optimal here) remain for optimisation.

The MS4 set, in which a flow channel with a CNC controlled characteristic curve in the form of a ball segment is cut into a multiple guided cylindrical rod for each stage, corresponds to a great extent with this optimal solution.

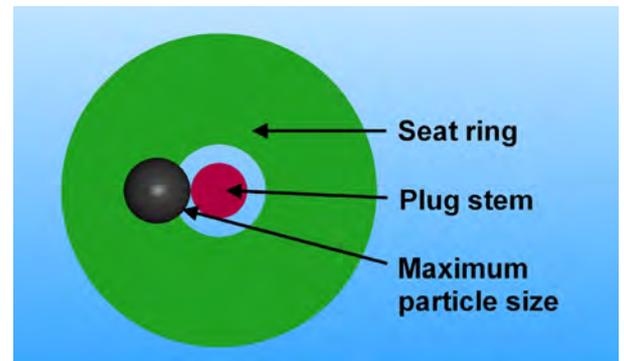
A further special feature of this set is the protection of the sealing edge, which is sensitive to solids, by the overtravel of the valve. This way, the actual control is only enabled when a low pressure drop only occurs at the sealing edge, thus resulting in a slower flow velocity.

# MS4 Multi-Stage Trim for Blowdown of Fluids containing Solid Matters

Comparison of MS-Trim cross-section with the double-guided parabolic cone (same KV):

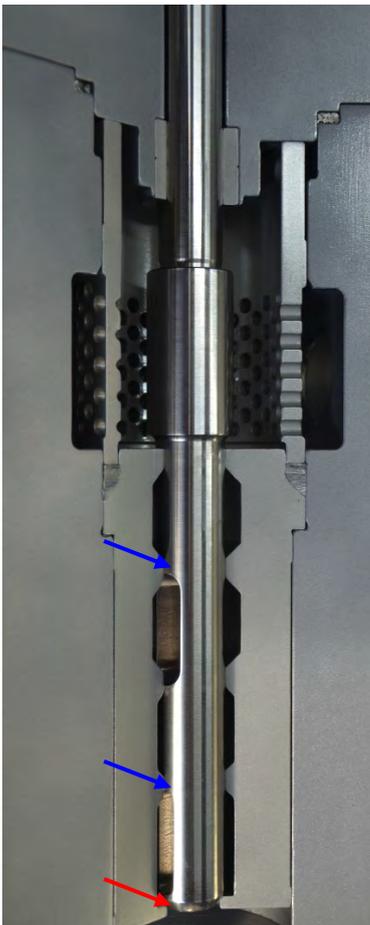


**MS Trim**



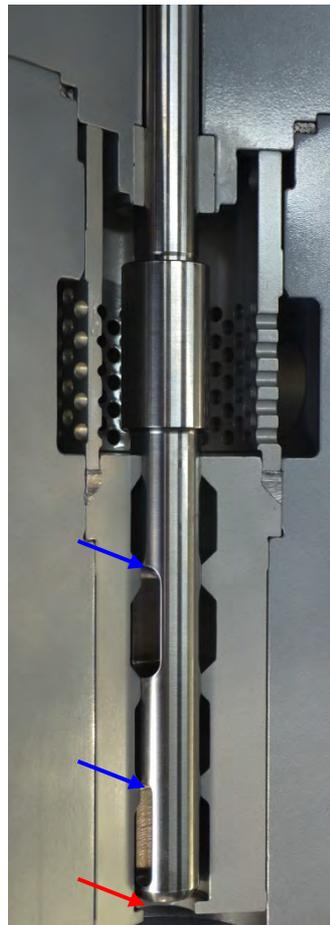
**Parabolic cone**

Protection of the sealing edges by overtravel:



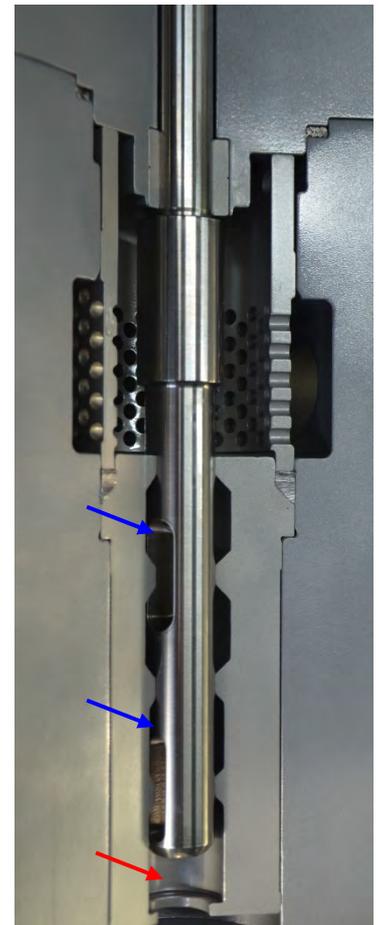
**Valve closed**

- ▶ Sealing edges in contact
- ▶ Control openings closed



**End of overtravel**

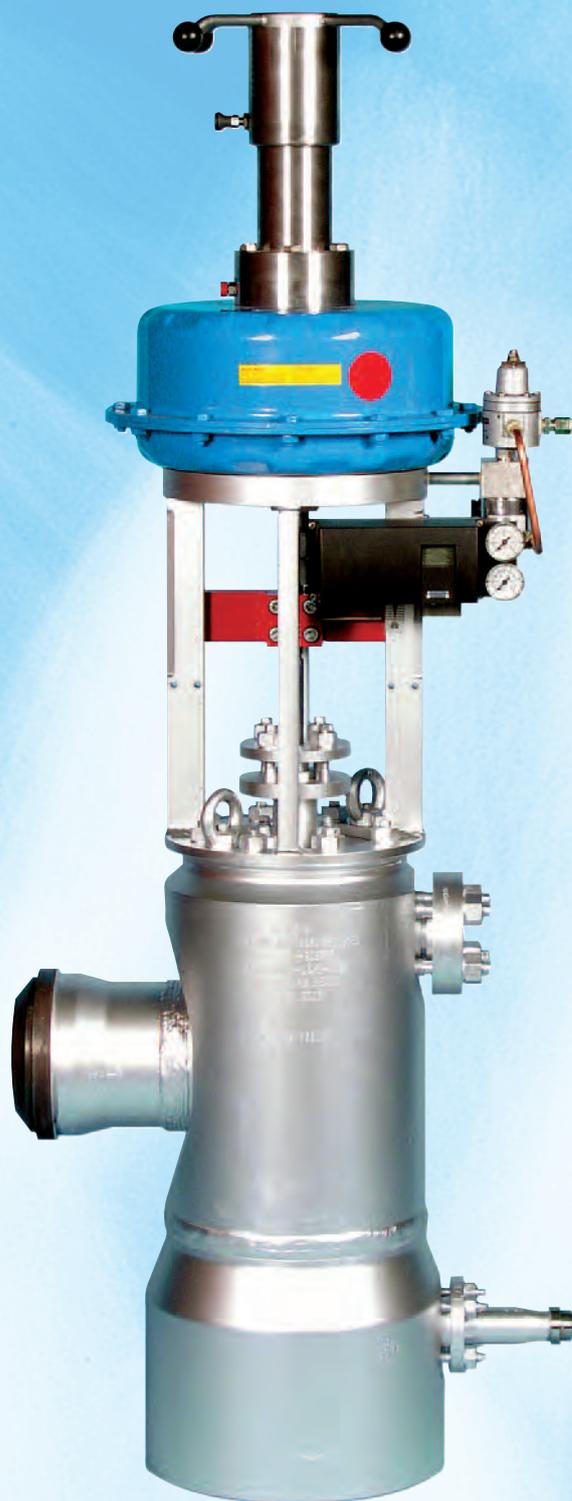
- ▶ Seat/cone partial opening
- ▶ Control openings start to open



**Valve opened**

- ▶ Seat/cone full opening
- ▶ Control openings completely opened

# Steam-Conditioning Valve



**ARCA**  
VALVES  
*quality engineered  
control valves*

## Steam-Conditioning Valve

## Components Tailored to Meet Any Requirement

### Powerful actuator

Whether you want to use it for control or safety applications, the actuator for ARCA's steam-conditioning valves is designed with your plant in mind. This is made possible by our wide range of pneumatic, electric, and hydraulic actuators such as the series 812 pneumatic actuator (pictured). The valve-closing force and stroking time of all actuators is sized according to your requirements.

### Multi-functional positioner

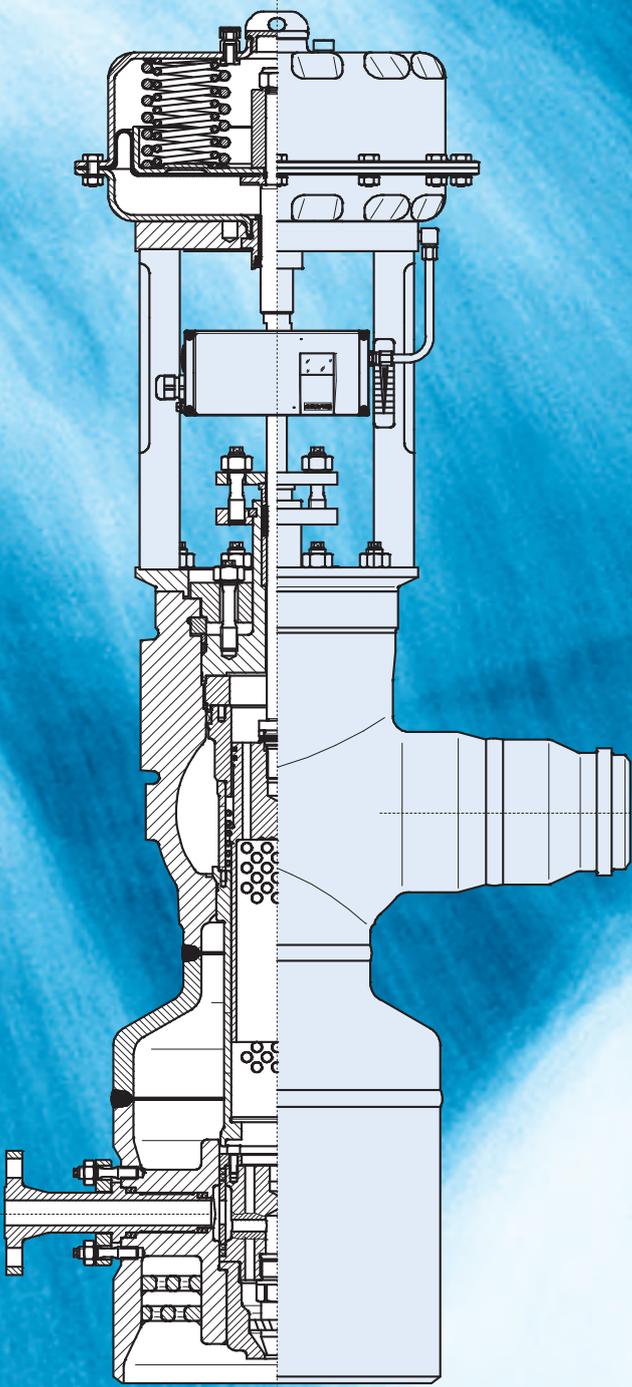
The digital ARCAPRO® positioner allows the steam-conditioning valve to communicate with the controller or process control system via a multi-functional interface. The positioner is connected to the actuator either directly or using the NAMUR mounting method and ensures that the stroke feedback is always free from backlash for maximum precision control. The standard input is the standardized 4 to 20 mA analogue signal. HART®, Profibus®, and Foundation® fieldbus standards can also be used to establish a digital interface with bidirectional data exchange (including status messages). This means that the positioner can be parameterized in the field as well as remotely via the communication system. Optional accessories such as boosters, limit switches, and solenoid valves are available to customize the valve to suit your individual requirements.

### Optimized static and dynamics sealing

We have engineered a dynamic stem seal and static bonnet seal in the force bypass that are optimized in line with the pressure and temperature range of your application. The surface finish of the stem and the packing material are also taken into account here. The force bypass design used for the bonnet seal prevents assembly problems during service and maintenance. A self-sealing bonnet is used for high-pressure applications to ensure that the valve remains tight regardless of the torque applied to the bonnet screws. These design features also ensure that the valve seat and plug are not subjected to any lateral forces, thereby also minimizing internal leakage.

### Versatile valve trims

These are the most crucial functional elements for controlling pressure and temperature. The perforated valve plug and seat ring are designed and manufactured to suit the prevailing flow conditions and the rangeability required. The type of water-injection selected is suited to the steam and cooling water temperature. For safety applications, a dirt strainer is inserted at the opening of the steam inlet. This prevents the ingress of contaminants and protects against defects. The patented retained seat ensures that maintenance is fast, simple, and cost-effective and does not require special tools.

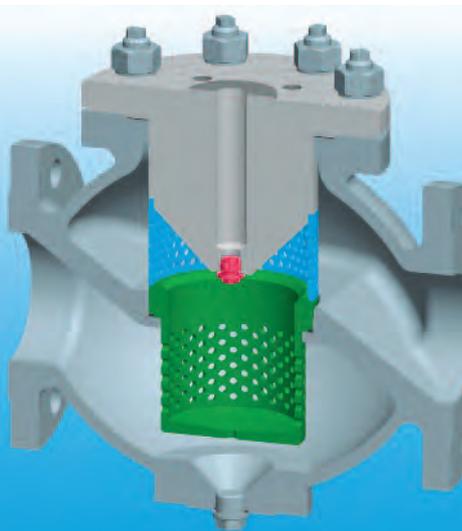


## Injection systems



### Single-phase nozzle (type 596)

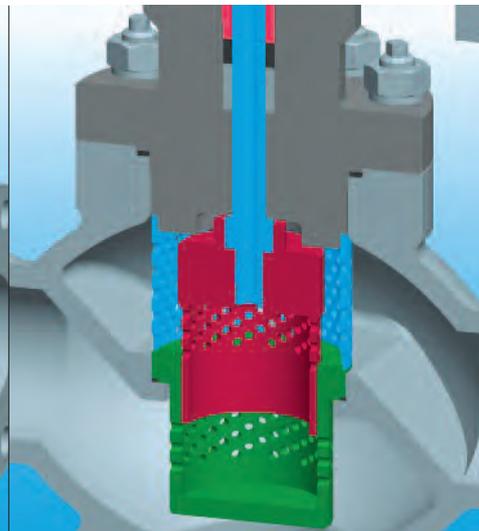
This nozzle is used as a simple means to cool overheated steam in applications that involve high-pressure water injection and a continuous supply of steam. The cooling water is regulated via the interaction between the nozzle and the cooling water control valve (in this case, an ECOTROL® valve), both of which are compatible with each other. System control ratio: up to 1 : 3.



### Mini cooler (type 595)

The mini cooler, which is based on the single-phase nozzle, is used in steam-conditioning stations that process very small quantities of injected water. Once the pressure has been reduced, the water is injected into a perforated valve seat orifice to ensure ultra-high turbulence for optimal vaporization conditions. The orifice also protects the valve housing (which can also be fitted with a condensate drain connection) from coming into direct contact with the injected water.

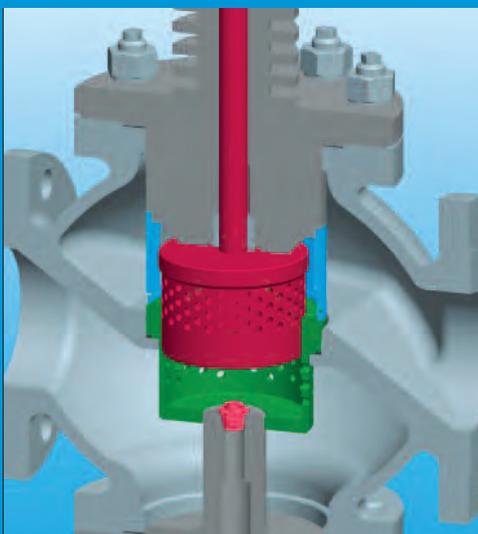
## Steam-Conditioning Valve



### Injection through valve stem

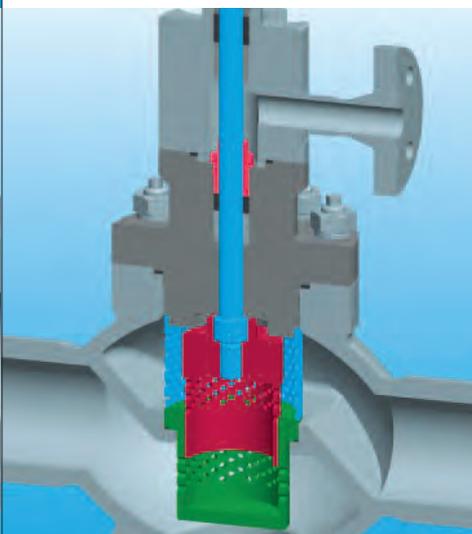
This valve features a hollow stem that uncovers a hole pattern used to inject a controlled amount of water directly into the intermediate pressure-reduction chamber (perforated plug-seat). Turbulence is at its greatest here, where cross-sectional flow areas are restricted in accordance with the quantity of steam required. This ensures optimal vaporization of the injected water and prevents the valve housing from becoming directly exposed to the medium.

## Designs



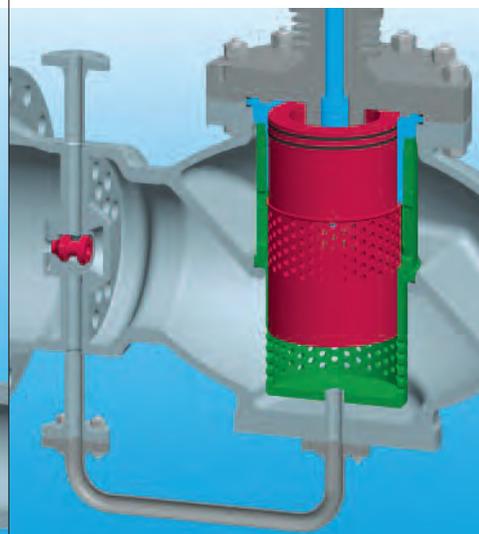
### Globe-style design with flanges (type 52...)

This cast globe-style housing from the basic line (shown here with flange) is optimized for low-pressure applications with minimal differential pressure. Pressure is reduced in the perforated plug-seat while cooling water is injected.



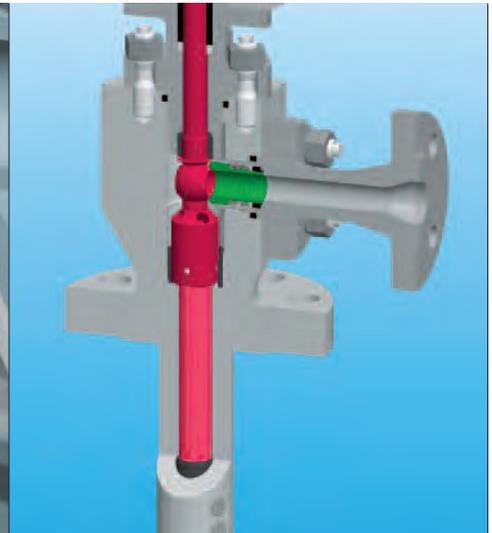
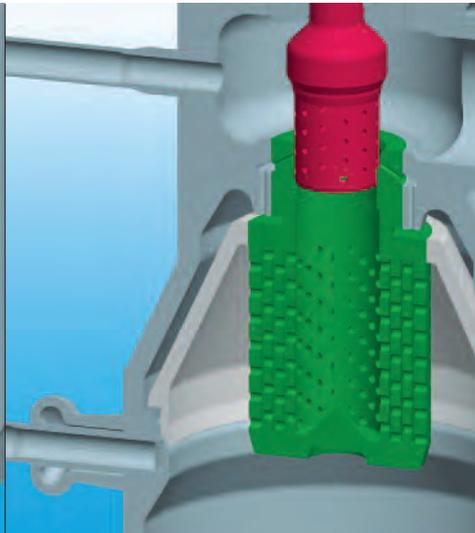
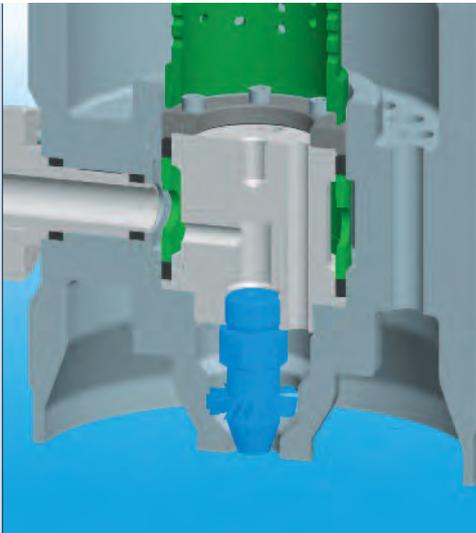
### Globe-style design with welded ends and extension (type 51...)

Steam-conditioning stations are typically welded for applications with reasonable steam pressures. Higher differential pressures must be relieved in graduated steps to reduce sound pressure. This can be accomplished using a three-stage perforated trim, for example (shown). The cast standard valve housing can also be combined with an outlet extension to accommodate expanding steam.



### Globe-style design with steam-assisted nozzle

Part of the steam is siphoned off as motive steam and transferred directly into the two-component nozzle via the auxiliary passage at an intermediate control stage of the perforated plug. The globe valve with the downstream steam-assisted nozzle replaces the additional motive steam valve otherwise required.



**Steam-assisted nozzle (type 598)**

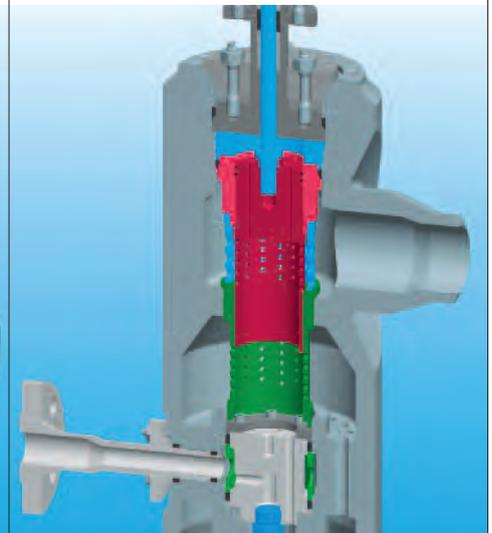
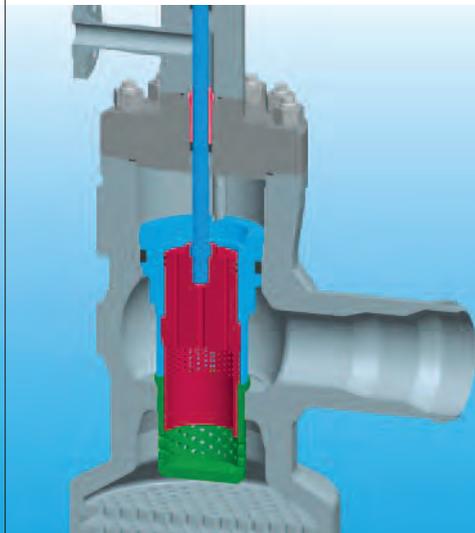
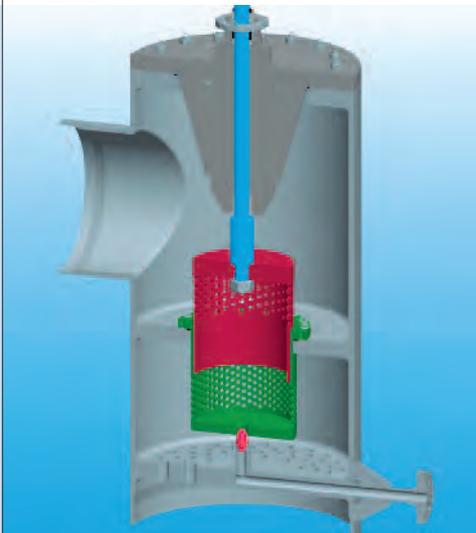
The steam-assisted spray nozzle is an optimal solution for applications in which the temperature difference ( $\Delta T$ ) between the injected water and live steam is exceptionally large, water is injected at low pressure, or minimal loads must be regulated. The nozzle extracts and atomizes the water from the live steam in accordance with the injector principle so that low-pressure vaporization paths can also be realized without turbulence via perforated plug-seats.

**Ring nozzle**

The ring nozzle is ideal for use in applications that require very large quantities of live steam and injected water. Its functional principles are similar to those of the steam-assisted spray-nozzle, although the ring nozzle siphons off the motive steam directly from the live steam at the control plug and transfers it along internal veins to the ring chamber. The steam then collides with the injected spray water (regulated by the cooling water valve) at its outer edge and atomizes it.

**Injection-desuperheater valve**

Injection-desuperheater valves are installed as a series of single-phase nozzles that sequentially activate in accordance with water-injection requirements. During operation, the differential pressure required at each nozzle remains almost entirely constant to ensure an optimal spray pattern. An additional pressure control can also be integrated for ultra-high injection pressures.



**Angle-style valve for low-pressure applications**

Low-pressure steam is reduced in the vicinity of the condensers. Angular valves made from piping component are used in applications where pressures are typically very low but large quantities of steam are generated. The temperature can be reduced via an integrated single-phase nozzle on the outlet side.

**With welded ends and extension (type 55...)**

These angle-style control valves are optimized for the flow characteristics and sound pressure levels associated with high-pressure applications. All ARCA cast angle-style housings with welded ends can be extended on the outlet side to meet individual requirements. The bonnet is available as a bolted design or as a self-sealing pinch cap from Bretschneider (optional). The cooling water chamber is constructed as shown here.

**Forged angle-style valve with steam-assisted nozzle (type 58...)**

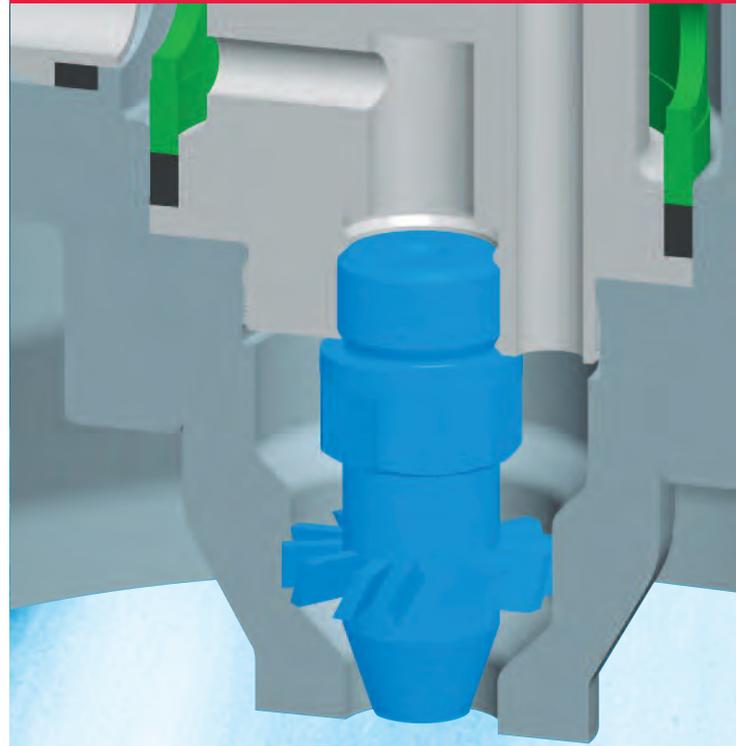
The ever-increasing demands of operating conditions can necessitate the use of fittings made from forged materials. In the design shown here, a fraction of the live steam is siphoned off at an intermediate control stage and used as motive steam by the steam assisted spray nozzle. This allows the temperature control to be maintained by one spray water control valve only; the steam valve previously required to generate the motive steam is no longer needed.

## Full control in steam conditioning

ARCA steam-conditioning valves are customized in line with your specific operating conditions. A wide range of designs and materials – from cast globe-style housings to forged angle-style valves – are available to meet all pressure and temperature requirements.

ARCA control valves optimize efficiency and enable cost-effective operation in small plants and large-scale power-generation facilities. ARCA steam-conditioning valves integrate sound-reduction measures such as perforated plugs and seat rings with graduated control to minimize the impact of sound emissions on humans and the environment. We can even dimension a silencer system that encompasses the condenser of your plant.

## Steam-Conditioning Valve



### Our innovation

- 1** Modular system with standardized components
- 2** Flow-optimized housings
- 3** Optimized trim comprising plug and seat for all application areas
- 4** Standardized interface to valve actuator
- 5** Value trims can be completely removed

### How you benefit

- ✓ All nominal diameters
- ✓ Fewer components
- ✓ Only one special tool required
- ✓ Low noise emission
- ✓ Optimized KV values for all nominal diameters
- ✓ Adaptable to any requirements
- ✓ High control accuracy
- ✓ Wide control range
- ✓ Low noise emission
- ✓ All types of actuator can be used – pneumatic, electric, and hydraulic
- ✓ Can be easily reconfigured later on
- ✓ Maintenance work is fast and simple
- ✓ All internal parts can be removed
- ✓ No special machines required
- ✓ All interior components are clamped or screwed (no welding)

# Steam-Conditioning Valve

## General specifications

Series	51... & 52...	55... & 56...	57... & 58...	59...
<b>DN (Housing)</b>	50–600 / 2"–24"	80–200 / 3"–8"	25–250 / 1"–10"	25–100 / 1"–4"
<b>PN/ANSI</b>	16–250 / 150–1500	16–250 / 150–1500	16–400 / 150–2500	16–400 / 150–2500
<b>Housing types</b>	Straight way	Angular	Angular	Angular
<b>Body style</b>	Cast	Cast	Forged	Forged
<b>Materials</b>	<b>EN</b>	<b>for temperatures</b>	<b>ASTM</b>	<b>for temperatures</b>
<b>Cast Housing</b>	1.0619 GP240GH	up to 450 °C	A 216 WCB	up to 450 °C
	1.7357 G17CrMo5-5	up to 530 °C	A 217 WC6	up to 530 °C
	1.4581 GX5CrNiMoNb19-11-2	up to 550 °C	–	–
	1.7379 G17CrMo9-10	up to 580 °C	–	–
	1.4931 GX23CrMoV12-1	up to 600 °C	–	–
<b>Forged Housing</b>	1.0460 P250GH	up to 450 °C	A 105	up to 450 °C
	1.0425 P256GH	up to 450 °C	–	–
	1.5415 16Mo3	up to 530 °C	–	–
	1.7335 13CrMo4-5	up to 570 °C	A 182 F12 Cl.2	up to 570 °C
	1.7383 11CrMo9-10	up to 600 °C	A 182 F22 Cl.3	up to 600 °C
	1.4903 X10CrMoVNb91	up to 620 °C	A 182F91 - P91	up to 620 °C
<b>Valve trims</b>	1.4021 X20Cr13			
	1.4122 X39CrMo17-1			
	1.4571 X6CrNiMoTi17122			
	1.4922 X20CrMoV1 21			
<b>Bonnet</b>	Standard, with cooling fins, self-sealing bonnet, with cooling-water injection			
<b>Plug characteristic</b>	Standard: linear			
	Optional: linear modified			
<b>Rangeability</b>	25 : 1			
<b>Seat leakage</b>	Metal sealing: class IV (0.01% of kvs)			
	Pressure balanced < 0,05 % of KV-value			

### ARCA Regler GmbH

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**ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics**



# Controllers and Instrumentation



**ARCA**  
VALVES  
*quality engineered  
control valves*

# Controllers and Instrumentation

## The Optimal Solution for Every Task

### Local Pneumatic Control Circuits

Inexpensive local control circuits are often used for simple control tasks such as those related to pressure, differential pressure or temperature. They comprise a valve, pneumatic actuator and a pneumatic measuring element that determines the measurement variable, evaluates the control deviation, and integrates an I or D component in addition to the P-response to form the signal used to control the actuator.

ARCA Regler offers a line of pneumatic controllers that meets basic to advanced requirements. Be it P-controllers with a fixed setpoint value and direct actuator control or for ultra-precise control, PID or two-point controllers, available with external setpoint value configuration and support for displaying setpoint/actual values, and actuating pressure, as well as manual-automatic transition with actuator control via pneumatic positioner 824P (see ARCA brochure on the ARCAPRO positioner), ARCA's product offering has the device you're looking for to meet your control needs.

### Instrumentation Accessories

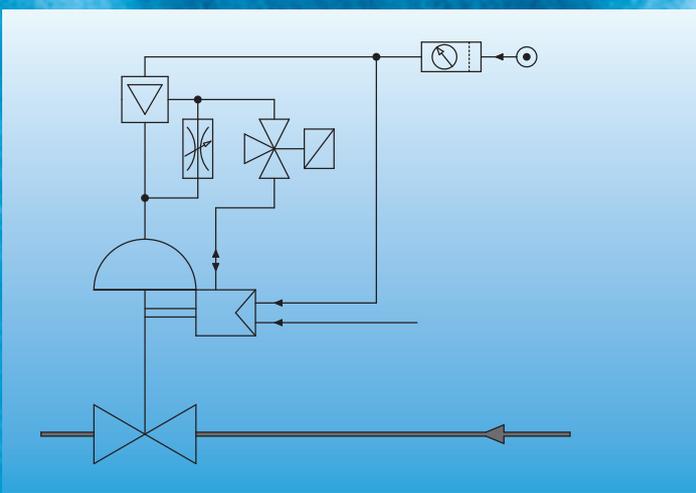
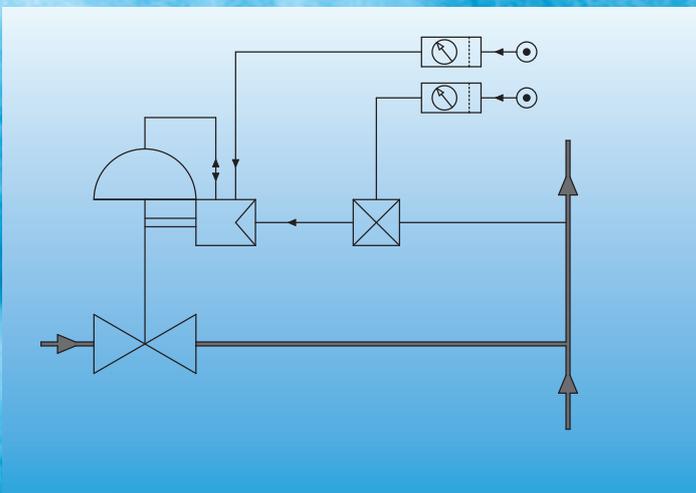
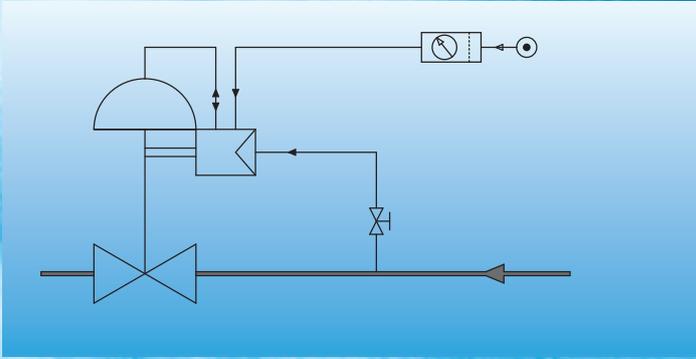
Functions in addition to the ones used for actuating and controlling are often required to ensure that valves are used effectively in plants.

Regardless of whether the application calls for limit position signalling via inductive or mechanical switches, safety-relevant and redundant valve deactivation (if needed) via solenoid and blocking valves, longer actuating times or conditioning of instrument air – ARCA Regler can always provide an appropriate, proven solution.

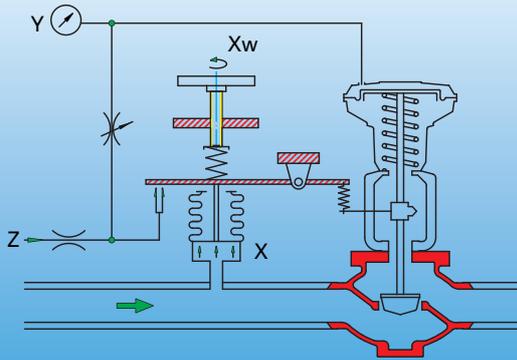
### Minimized Actuating Time

Control valves with large, pneumatic actuators typically have actuating times in excess of 30 seconds. Such responses are too slow for many applications, however. Special applications involving turbine bypass stations or anti-surge control valves on compressors, for example require actuating times of 2 seconds or less to prevent damage to machines and plants.

ARCA Regler has the know-how it takes to master these challenges too. Integration of boosters, throttle and solenoid valves, and filter-reduction stations in the assembly process allows us to offer actuation control circuits that are robust, free of vibrations and extremely fast for demanding situations.

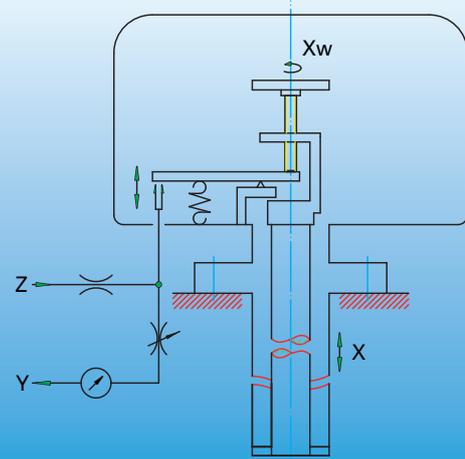


## Pneumatic Controllers



### Type 902 Pressure Controller «Roboter»

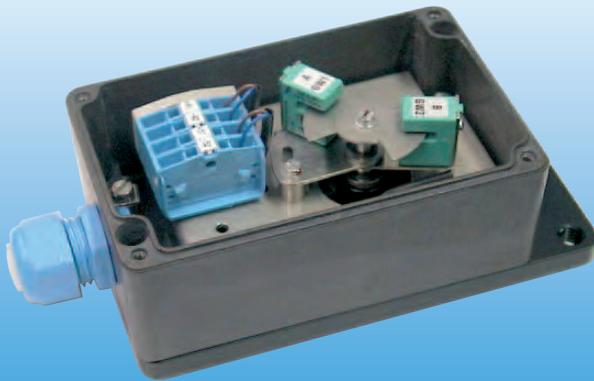
The type 902 pressure controller is a compact measuring element controller that measures pressure and differential pressure and is mounted directly on a pneumatic actuator. The pressure to be controlled generates a force via the measuring system (bellows or diaphragm). This force is then compared to the force of an adjustable spring and used to create the actuating pressure by way of a nozzle/flapper system. A return facility from the drive spindle balances control. The «Roboter» pressure controller can be used to regulate the flow of gas, steam, or fluid pressure in industrial plants.



### Type 910 Temperature Controller

The type 910 temperature controller is an extremely robust measuring element controller for controlling temperature. It is installed directly at the measuring point and generates the actuating pressure required for the actuator via an expansion stick and a nozzle/flapper system. A calibrated scale enables the setpoint value to be configured. The pneumatic actuator with valve can also be located further away from the measuring point. The type 910 temperature controller is used to regulate the temperature of central refrigerant circuits, among other applications.

## Instrumentation Accessories



### Type 827S Signal Box

The type 827S signal box is suitable for signalling intermediate or limit positions. It is mounted at the actuator bracket acc. to NAMUR or ARCA standards and taps the valve stroke using the patented, zero-backlash ARCAPLUG® position feedback. Up to three inductive slot initiators are actuated by adjustable switch discs to indicate the current position of the valve.

### Proximity Switches

Intermediate or limit positions can be detected by external inductive proximity sensors mounted to the NAMUR rib of the actuator bracket. A contact plate on the actuator spindle triggers the sensor signal.



### Mechanical Switches

Mechanical switches with dry contacts can also be attached to ARCA actuators for signalling intermediate or limit positions. The roller-type or plunger switches are mounted to the actuator bracket acc. to NAMUR standards and triggered by a contact plate.

### Solenoid and Blocking Valves

Solenoid valves can be used to actuate on-off valves or implement safety-relevant deactivation for control valves. Pneumatic blocking valves allow the actuating pressure of the actuator to be blocked when the supply air pressure drops below a set threshold value so that the valve remains in its current position.



### Type 920 and 921 Measuring Element Controllers

The measuring element controllers for pressure (type 920) and temperature (type 921) are easy-to-use, highly-precise pneumatic uniform controllers that can be mounted in a cabinet or on a wall. They can function as P, PI, PD, PID, or two-state controllers, with configurable parameters, depending on the type of control needed. The devices indicate setpoint/actual values and the actuating pressure, allow the setpoint value to be changed and provide for a smooth transition from manual to automatic mode.



### Type 931 Pressure Transmitter (1:1)

The type 931 pressure transmitter (1:1) can convert the pressure exerted by liquid, highly viscous, or aggressive media into a pneumatic, air signal and transmit this to a pneumatic measuring element controller, for example. The pressure transmitter has a very simple, robust design and requires no maintenance. It is used in any application that requires the pressure of aggressive, very hot, or highly viscous media as well as media containing solids to be measured.



### Filter-Reducing Stations

For providing supply air with the required pressure and quality filter-reducing stations are used. ARCA Regler offers a wide range of materials, temperature ranges and filter porosities for your specific application.

### Throttle and Throttle Check Valves

Throttle valves are installed in the control-air line to increase the actuating time of pneumatic actuators. Throttle check valves can be used if the actuating time must differ for each direction.



### Accessories for Optimizing Actuating Times

Actuating times of up to 30 seconds are typical for large pneumatic actuators during normal control operation with positioners or open-close operation. Such responses are too slow for many applications, however, because the valves must open and close much more quickly to prevent damage to the plant and high follow-up costs.

The experts at ARCA Regler can provide you with boosters, throttle valves, quick-bleed valves, and appropriately dimensioned filter-reduction stations to ensure consistent, vibration-free closed-loop control or on-off operation actuation times down to 2 seconds, also for large actuators and high levels of valve friction.

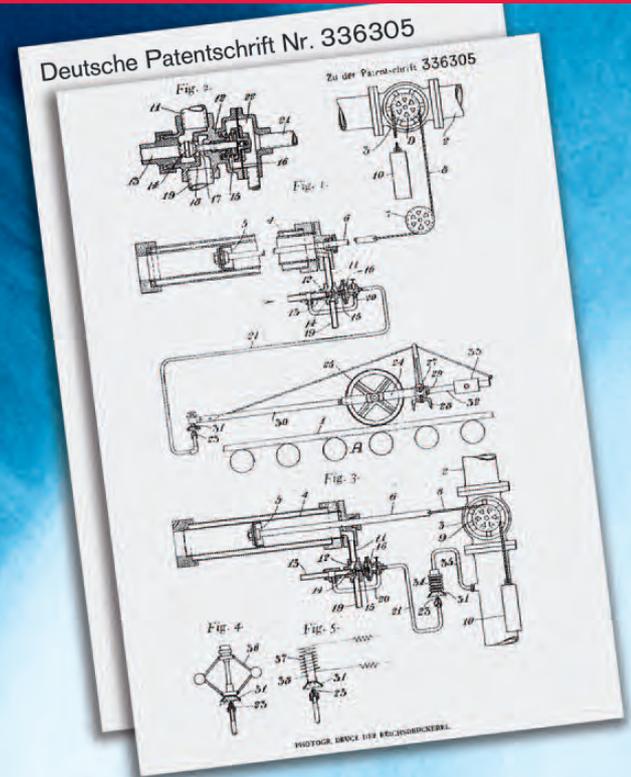
## Proven Nozzle/Flapper System

The nozzle/flapper system was filed for patent protection in 1917 by the founder of ARCA Regler, Ragnar Carlstedt from Sweden. It continues to be the foundation of pneumatic automation technology and gave rise to a world of new possibilities for regulating equipment locally and remotely.

The system is rooted in the principle of controlling pressure by opening and closing a nozzle by means of a flapper and using the signal generated by this to control a pneumatic actuator. This allows the movement of the flapper to be regulated by a force, pressure or temperature signal that is converted into a distance or angle. Simple, low-cost pressure and temperature controllers or highly-precise measuring element controllers can be designed on this basis.

ARCA offers a comprehensive range of pneumatic controllers, for pressure and temperature, combining proven technology and quality and tailored to meet your specific requirements.

## Controllers and Instrumentation



### Our Innovations

- 1 Time-tested, classic pressure and temperature controllers with pneumatic output
- 2 Wide range of instrumentation accessories
- 3 Accessories with all common degrees of protection, including SIL classification
- 4 Broad temperature range
- 5 Actuating times of 2 seconds, even for large actuators
- 6 Safety-relevant deactivation via solenoid valve
- 7 Blocking in the event of an auxiliary power failure

### Your Benefits

- ✓ Long service life
- ✓ Simple, robust design
- ✓ No external signal cables required
- ✓ Low life-cycle costs
- ✓ Optimal adaptation to a specific application
- ✓ Can be integrated in any plant concept
- ✓ Also suitable for applications in tropical or arctic environments
- ✓ Special applications possible, e.g. for turbine bypass stations and antisurge control valves on compressors
- ✓ Integration with different safety concepts possible
- ✓ Easy shut-down of plants when damage occurs

# Controllers and Instrumentation

## Pneumatic Controllers

Supply air pressure	1,4 bar
Actuating air pressure	0,2...1 bar
<b>Type 902 pressure controller «Roboter»</b>	Measuring range -1,0...-0,01 bar to 1,5...80 bar
<b>Type 910 temperature controller</b>	Measuring range 0...100 °C to 150...250 °C
<b>Type 920 measuring element controller for pressure</b>	Measuring range -1...1 bar to 0...650 bar
<b>Type 921 measuring element controller for temperature</b>	Measuring range -40...50 °C to 200...600 °C
<b>Type 931 pressure transmitter (1:1)</b>	Measuring range 0...4 bar

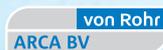
## Instrumentation Accessories

<b>Type 827S signal box</b>	Up to 3 slot initiators: SC3,5-N0-B-BU / SJ3,5-SN / SB3,5-E2
Ignition protection	None
<b>External proximity switches</b>	Up to 2 inductive proximity sensors: NJ5-18GK-N / NJ5-18GK-SN / NJ5-18GM50-E2
Ignition protection	None / intrinsically safe
<b>External mechanical switches</b>	ENM2-SU1Z Ex / GC-UV1Z-AH / 07-2511-3330/04
Switching capacity	To 400 V, 10 A AC / 250 V, 0.5 A DC, depending on the type
Ignition protection	None / flameproof
<b>Solenoid valves</b>	G1/4 / G1/2 / 1/4" NPT / 1/2" NPT
Type	2/2-, 3/2-, 5/2- or 5/3-way valves
Rated voltage	24 V, 50 Hz / 230 V, 50 Hz / 24 V DC
Ignition protection	None / flameproof / encapsulated / intrinsically safe
<b>Blocking valves</b>	G1/4
Type	2/2-, 3/2- or 4/2-way valves
<b>Filter-reduction stations</b>	G1/4 / G1/2 / 1/4" NPT / 1/2" NPT
Supply pressure range	Up to 31 bar, depending on the type
Downstream pressure adjustment range	0...6 bar to 0.3...10 bar, depending on the type
Filter porosity	5...40 µm, depending on the type
<b>Quick-bleed valves / boosters / throttle valves</b>	G1/4 / G1/2 / G 3/4 / G 1 / 1/4" NPT / 1/2" NPT / 3/4" NPT / 1" NPT

### ARCA Regler GmbH

Kempener Strasse 18, D-47918 Tönisvorst  
 Phone +49 (0)2156-7709-0, Fax +49 (0)2156 7709-55  
[www.arca-valve.com](http://www.arca-valve.com), [sale@arca-valve.com](mailto:sale@arca-valve.com)

ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



# Repair & Maintenance



**ARCA**  
VALVES  
*quality engineered  
control valves*

## Repair & Maintenance

We not only manufacture complex, ultra-high-performance industrial valves, but are also your partner when it comes to maintenance & repair as well as complex instrumentation. ARCA valves are exceptionally durable and our customer support staff are happy to provide the assistance you need for ongoing care and maintenance work, which can have a considerable impact on the service life of your valve and the operational reliability of the plant.

Inspections and conversions are carried out quickly and thoroughly by experts. We can also accommodate valves from other manufacturers, thanks to our proven ARCA know-how and decades of experience. Quality and reliability are not simply words on paper – they are evident in everything we do. Put us to the test!

**Our services – with fast results you can count on!**



### Repair

- Advice on planning for downtime/inspections
- Assessment of defects
- Substantiated assessment with cost estimate in 5 business days
- Inspection of wear parts for wear or damage
- Economical cost estimate
- Complete disassembly and cleaning/sandblasting of all valve components
- Replacement of original gaskets and packings
- Reconditioning of sealing surfaces
- Replacement of wear parts (e. g. seat and cone) if required
- Deposit welding as required
- Assembly of valves using original wear and replacement parts
- Hydrostatic and leakage testing
- Application of anti-corrosion coatings
- Installation and adjustment of instrumentation
- All work is carried out in line with defined quality assurance guidelines.

### Conversions

- Consultation with regard to design and application
- Strength and design calculations
- Verification of material combinations
- Economical cost estimate
- Complete rework as specified for repairs

## Your benefits

### Inspection Management

Feel free to consult with the trained experts at ARCA for planning and carrying out technical inspections and revisions. First we collect and assess all relevant data regarding your plant, then use this as a basis for making suggestions on how to best plan your inspection cycles, carry out inspections, and procure and stock replacement parts for fittings. Corresponding documentation is also included in the service package.

### Repair Service

Your fittings are fully reconditioned and renewed in our workshop in direct collaboration with inspection management. All wear and replacement parts as well as seals and packings are at your disposal. The entire range of machining facilities and equipment at ARCA can be accessed to perform any rework required for seat and control faces. Qualified specialist personnel from all departments are available to machine the complete fitting and ensure that it passes final inspection for efficient, thorough processing.

### On-Site Service

The highly qualified service team at ARCA can provide on-site service as well.

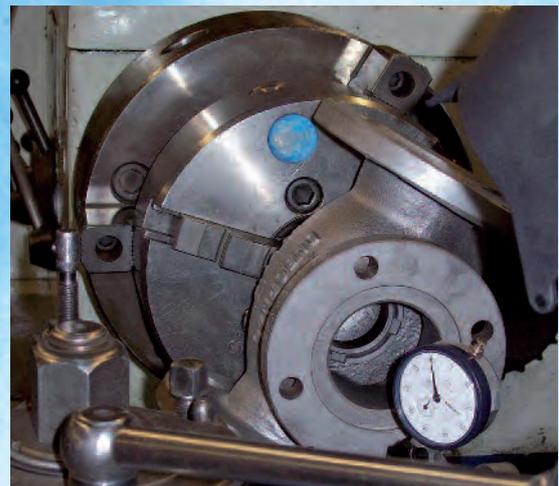
### Machining Facilities and Equipment

- Blasting machines for various materials
- Lathes (wide range)
- CNC machines
- Milling machines
- Drilling machines
- Paint shop
- Clean room (for assembling oxygen valves)

### Special Tools and Testing Equipment

- Pneumatic wrenches
- Hydraulic wrenches
- Calibrators
- Positive Material Identification (PMI)
- Surface measurement
- Coating thickness measurement
- Non-destructive testing
- Hardness testing

**We offer a 12-month guarantee on our services.**



# Repair & Maintenance

## Certificate of Endorsement

Please send this form, completed, together with your repair order.

Company stamp

Order no.

Contact

Phone

Fax

E-Mail

### Scope

App. / Serial no.

Device type

Valve

Actuator

Positioner

Instrumentation

### Description of problem

### Declaration of endorsement (parts in contact with medium)

The inspection takes place in line with safety guidelines and while wearing protective clothing, protective footwear, working gloves, safety goggles, and breathing/mouth protection.

Process fluid

poisonous

caustic

combustible

harmful to the environment

harmless

hazardous to health

The device was cleaned

uncleaned

using water

high-pressure water

solvent

other cleaning agents

blasted

We hereby confirm that the devices provided are not hazardous and do not contain any toxins.

The above safety precautions are also sufficient should the devices contain small residual deposits.

Date:

Signature:

### ARCA Regler GmbH

Kempener Strasse 18, D-47918 Tönisvorst

Phone +49 (0)2156-7709-0, Fax +49 (0)2156 7709-55

www.arca-valve.com, sale@arca-valve.com

ARCA Flow Group worldwide: Competence in valves, pumps & cryogenics



# Certificate



DNV GL Business Assurance herewith certifies, that the company

## ARCA-Regler GmbH

Kempener Straße 18, D-47918 Tönisvorst

the location: ARCA-Regler GmbH, Hontheimer Straße 50, D-54552 Strotzbüsch

has established and maintains a Management System relevant for

**Development, design,  
manufacture and sale of control valves.**

DNV GL Business Assurance confirms that the Management System of the above mentioned company has been assessed and found to be in accordance with the requirements of the following standard:

## ISO 14001:2009

The validity of this certificate is subject to the company applying and maintaining its Management System in accordance with the standard indicated. This will be monitored by DNV GL Business Assurance.

The certificate is valid from 24.03.2014 until 23.03.2017

Hamburg, 24.03.2014

DNV GL Business Assurance Germany

A handwritten signature in blue ink, appearing to read 'N. Kim', is written over a large, faint background watermark of a globe.

Nikolaus Kim  
Manager

Certificate No. **EM-6979HH**



# MANAGEMENT SYSTEM CERTIFICATE

Certificate No.:  
170546-2014-AE-GER-DAKKS

Initial date:  
20.03.2012

Valid:  
18.03.2015 - 17.03.2018

This is to certify that the management system of

## **ARCA-Regler GmbH**

Kempener Str. 18, 47918 Tönisvorst - Germany  
and the sites as mentioned in the Appendix accompanying this Certificate

has been found to conform to management system standard:

## **ISO 9001:2008**

This certificate is valid for the following Scope:

**Development, design, manufacture and sale of control valves**

Place and date:  
**Essen, 23.02.2015**



For the Issuing Office:  
**DNV GL Business Assurance Zertifizierung  
und Umweltgutachter GmbH**

**Thomas Beck**  
Technical Manager

Certificate No.: 170546-2014-AE-GER-DAkKS  
Place and date: Essen, 18.03.2015

## Appendix to Certificate

### ARCA-Regler GmbH

Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
ARTES VALVE & SERVICE GmbH 170546CC1-2014-AE-GER-DAkKS	Lessing Str. 79 13158 Berlin - Germany	Development, design, manufacture and sale of control valves service of valves
ARCA-Regler GmbH 170546CC2-2014-AE-GER-DAkKS	Hontheimer Str. 50 54552 Strotzbüsch - Germany	Development, design, manufacture and sale of control valves
Von Rohr Armaturen AG 170546CC3-2014-AE-GER-DAkKS	4132 Muttenz - Switzerland	Manufacture and sale of control valves
Von Rohr ARCA B.V. 170546CC4-2014-AE-GER-DAkKS	CW Eerbeek 6961 Eerbeek - Netherlands	Sale of control valves
WEKA AG 170546CC5-2014-AE-GER-DAkKS	Schürlistr. 8 8344 Bäretswil - Switzerland	Development, Production and Distribution of Visual Level Indicators, Tank Level Indicators, Cryogenic Components and Stainless Steel Valves



**Bescheinigung des Herstellers  
zur Nichtrelevanz der ATEX 94/9/EG**

***Declaration of Manufacturer  
regarding ATEX 94/9/EC being non-relevant***

für Regelventile Baureihe/ *for valves series*  
8C, 6N, 6H, 100, 110, 120, 130, 140, 160, 170, 180, 200, 220, 230,  
250, 280, 340, 350, 380, 390, 440, 510, 520, 540, 550

Die oben bezeichneten Ventile wurden einem Konformitätsbewertungsverfahren nach der Richtlinie 94/9/EG mit folgendem Ergebnis unterzogen:

*The valves specified above have been inspected concerning conformity according to rule 94/9/EG with the following result:*

- Die Ventile besitzen keine potenzielle Zündquelle.  
*The valves have no potential ignition source.*

Die Ventile fallen somit nicht in den Anwendungsbereich der ATEX 94/9/EG.  
*So the rule ATEX 94/9/EC becomes not applicable.*

- Die Ventile dürfen im Ex-Bereich der Zone 1 und 2 eingesetzt werden.  
*The valves are allowed to be used in Ex-range zone 1 and 2.*

**Ergänzender Hinweis / Supplementary note:**

- Elektrische/mechanische Stellungsregler und Zubehörgeräte müssen einer eigenen Konformitätsbewertung nach ATEX unterzogen werden.  
*Electrical/mechanical positioners and accessories have to be inspected separately with regard to ATEX conformity.*

Angewendete harmonisierte Normen oder Regelwerke, insbesondere:  
*Applicable harmonised standards and rules, in particular:*

- AD Regelwerke 2000 / *AD 2000 rules and regulations*
- DIN EN 1127 Teil 1 / *Part 1*
- DIN EN 13463

Tönisvorst, 21.05.2014



L. Grutesen  
Product Manager



J. Buchholz  
Quality Assurance Manager

## Bescheinigung des Herstellers zur Nichtrelevanz der ATEX 94/9/EG

### *Declaration of Manufacturer regarding ATEX 94/9/EC being non-relevant*

für pneum. Stellantriebe Baureihe 811, 812, 813, 840 und MA60  
*for pneum. actuators series 811, 812, 813, 840 and MA60*

Die oben bezeichneten Stellantriebe wurden einem Konformitätsbewertungsverfahren nach der Richtlinie 94/9/EG mit folgendem Ergebnis unterzogen:

*The actuators specified above have been inspected concerning conformity according to rule 94/9/EG with the following result:*

- Die Stellantriebe besitzen keine potenzielle Zündquelle.  
*The actuators have no potential ignition source.*

Die Stellantriebe fallen somit nicht in den Anwendungsbereich der ATEX 94/9/EG.  
*So the rule ATEX 94/9/EC becomes not applicable.*

- Die Stellantriebe dürfen im Ex-Bereich der Zone 1 und 2 eingesetzt werden.  
*The actuators are allowed to be used in Ex-range zone 1 and 2.*

#### Ergänzender Hinweis / Supplementary note:

- Elektrische/mechanische Stellungsregler und Zubehörgeräte müssen einer eigenen Konformitätsbewertung nach ATEX unterzogen werden.  
*Electrical/mechanical positioners and accessories have to be inspected separately with regard to ATEX conformity.*

Angewendete harmonisierte Normen oder Regelwerke, insbesondere:  
*Applicable harmonised standards and rules, in particular:*

- AD Regelwerke 2000 / *AD 2000 rules and regulations*
- DIN EN 1127 Teil 1 / *Part 1*
- DIN EN 13463

Tönisvorst, 21.05.2014

  
L. Grutesen  
Product Manager

  
J. Buchholz  
Quality Assurance Manager

# EC Assessment Report



for the EC Assessment of the Quality Assurance System according to the Directive 97/23/EC of the European Parliament and of the Council of 29 May 1997 on the Approximation of the Laws of the Member States concerning Pressure Equipment, in its valid Version.

Certificate No.: **88 477 - 14 HH**  
Authorized Representative: ---  
Manufacturer: ARCA-Regler GmbH with the works in:  
- Kempener Str. 18, D-47918 Tönisvorst  
- Hontheimer Str. 50, D-54552 Strotzbüsch  
- von Rohr Armaturen AG, Fichtenhagstr. 4, CH-4132 Muttenz

## Pressure Equipment

Manufacturers Designation: ECOTROL®, BIOVENT®, Steam Conditioning Valves, etc.  
Description: Pressure Accessories  
Category: III IV  
Applied Module: H (Full Quality Assurance) H1 (Full Quality Assurance with design examination and special surveillance of the final assessment)  
Applied Standard: ---  
Marking: CE 0098

Basis:  
Basis for Assessment was the EC Directive 97/23/EC.

Results:  
The Quality Assurance System is in accordance with the relevant essential safety requirements of the EC Directive 97/23/EC (Report No. 944/14 and 022/02).

Accompanying Documents/ Enclosures: EC Design-Examination Certificate for Category IV Pressure Accessories

EC Assessment Report valid until: 2017-06-16

Hamburg, 2014-06-17

**DNV GL**  
**Notified Body for the Certification of Pressure Equipment**  
**Identification No. 0098**

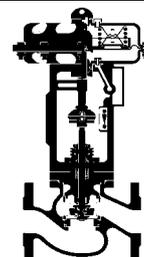
  
Thomas Woehler

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The latest edition of our 'General Terms and Conditions' is applicable.

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Form 11 / 2005-10-06

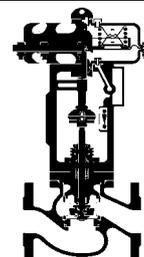
# Product Range ARCA Regler GmbH



## Valves

Production line	Design	Series	Nominal diameter	Application area	
				Nominal pressure	Temperature
Control Valves	2-way valves single seated	ECOTROL® 8C	DN15 - DN100	PN10 - PN40	-196°C...530°C
			DN1/2" - DN4"	ANSI150 - ANSI300	-196°C...530°C
		ECOTROL® 6N	DN125 - DN800	PN10 - PN40	-196°C...530°C
			DN5" - DN32"	ANSI150 - ANSI300	-196°C...530°C
		ECOTROL® 6H	DN15 - DN400	PN63 - PN250	-196°C...530°C
			DN1/2" - DN16"	ANSI600 - ANSI2500	-196°C...530°C
	2-way valves double-seated	250	DN50 - DN350	PN10 - PN40	-10°C...530°C
		280	DN40 - DN250	PN63 - PN160	-10°C...530°C
	3-way valves	200	DN25 - DN600	PN10 - PN40	-10°C...400°C
		220	DN25 - DN300	PN63 - PN160	-10°C...530°C
	Angle type valves	350	DN15 - DN300	PN10 - PN160	-10°C...530°C
			DN100/150 - DN150/300	PN63 - PN250	-10°C...600°C
		380	DN25 - DN400	PN10 - PN400	-10°C...600°C
	Hygienic valves	BIOVENT® 391-BO	DN15 - DN150	PN10 - PN25	-30°C...135°C
		BIOVENT® 391-BM			
		BIOVENT® 391-M-WM	DN15 - DN150	PN10 - PN25	-30°C...135°C
BIOVENT® 391-T-WM					
BIOVENT® 391-L		DN15 - DN150	PN10 - PN25	-30°C...135°C	
Steam conditioning valves	Globe type	510	DN50 - DN600	PN16 - PN250	up to 450°C
			DN2" - DN24"	ANSI150 - ANSI1500	up to 450°C
		520	DN50 - DN600	PN16 - PN250	up to 450°C
			DN2" - DN24"	ANSI150 - ANSI1500	up to 450°C
	Angle type	550	DN80 - DN200	PN16 - PN250	up to 450°C
			DN3" - DN8"	ANSI150 - ANSI1500	up to 450°C
		560	DN80 - DN200	PN16 - PN250	up to 600°C
			DN3" - DN8"	ANSI150 - ANSI1500	up to 530°C
		570	DN25 - DN250	PN16 - PN400	up to 450°C
			DN1" - DN10"	ANSI150 - ANSI2500	up to 450°C
		580	DN25 - DN250	PN16 - PN400	up to 620°C
			DN1" - DN10"	ANSI150 - ANSI2500	up to 620°C
590	DN25 - DN100	PN16 - PN400	up to 620°C		
	DN1" - DN4"	ANSI150 - ANSI2500	up to 620°C		

# Product Range ARCA Regler GmbH



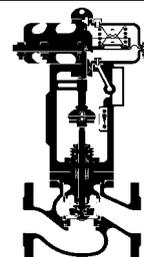
## Actuators

Production line	Series	Temperature range	Stroke/Rotary angle	Max. actuating force/moment	
				Spring	Air
Linear actuators	<b>811 (UMA)</b>	-20°C...+80°C	20mm - 120mm	4,5kN - 33,1kN	11,6kN - 81,2kN
	<b>812/813 (MF)</b>	-20°C...+80°C	20mm - 60mm	4,8kN - 16kN	14,4kN - 32,4kN
	<b>MA</b>	-20°C...+80°C	20mm - 136mm	2,6kN - 45kN	4,6kN - 87kN
Rotary actuators	<b>840</b>	-20°C...+80°C	0° - 90°	46Nm - 1630Nm	87Nm- 2295Nm

## Positioners

Production line	Series	Air supply	Type of explosion-proof	Communication	Options	Temperature range	Residual control deviation	Linearity failure
E/P-Positioner	827A	1,4bar - 7bar	w/o intrinsically safe non-sparking flame-proof	w/o HART Profibus Foundation Fieldbus	analogue module binary module slot initiator module contact module	-30°C...+80°C	< 0,3%	< 0,5%
P-Positioner	824.P	1,4bar - 6bar	w/o	w/o	I/P converter limit switch	-40°C...+80°C	< 0,5%	< 2%
E/P-Positioner	824.E	1,4bar - 6bar	intrinsically safe flame-proof	w/o	I/P converter limit switch	-40°C...+80°C	< 0,5%	< 2%

# Product Range ARCA Regler GmbH



## Accessories

Production line	Series	Application area	Measuring range	Diam. of bellows
Pressure controller	Roboter 902	Over pressure	0,02bar - 80,0bar	15mm-160mm
		Low pressure	0,01bar - 1,0bar	60mm
		Differential pressure	0,03bar - 5,0bar	50mm - 100mm

Production line	Series	Measuring range	Feeler length
Temperature-P-controller	910 (05075 / 05076)	0°C - 250°C	300mm / 500mm

Production line	Series	Application area	Measuring range
Pneumatic controller	920 (00400) P. PI. PID	Pressure	-1bar - 350bar
		Differential pressure	0 - 40bar

Production line	Series	Application area	Measuring range
Pneumatic controller for temperature	921 (00400)	Temperature	-40°C - 600°C

Production line	Series	p max.	T min/max
Pneumatic pressure transformer	931	4 bar	-50°C / 200°C

Production line	Series	Adjusting range	T min/max	Filter size
Air set	961	0 bar - 6 bar	0°C - 50°C	40µm

## Sound level guarantee conditions for control valves with guaranteed sound level calculated acc. to VDMA 24422

Sound emission values as stated and guaranteed by us, measured as Sound Pressure Level (SPL) in dB(A) in 1 m distance, are based on the following conditions with respect to the location of the installed valve, valve manifold, piping arrangement and method(s) of measurement:

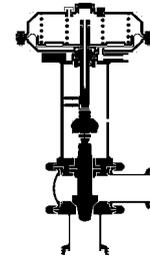
1. The pipe shall be straight and even 10 x DN upstreamside 15 x DN downstreamside the control valve. Within the length of 25 x DN downstreamside rectangular pipe inlets/outlets are not allowed.
2. Within a length of at least 15 x DN the thickness of the pipewall has to be executed acc. to the Nominal Pressure rating (PN) of the control valve respectively acc. to the thickness of pipewall "S" applied in our calculation of the sound level.
3. The method of measurement of sound level guaranteed has to be followed acc. to DIN 45635 part 50, i.e. that the requirements of enveloping-surface and interference noise level distance have to be considered.
4. Guarantee measurements are to be carried out under operating conditions for which the valve has been designed. In case that the operating data exceed the values for which the valve has been designed, the guarantee shall be null and void. In case of smaller deviations from design-conditions, corrective calculations acc. to VDMA 24422 are allowed.
5. The valve manufacturer reserves the right to approve the control valve manifold and piping arrangement.
6. Guarantee measurements exceeding the guaranteed value by up to 5% are admissible and no subject to complain.
7. In case of that a thermal insulation is considered on a control valve for which at the same time a sound level guarantee has been given, this valve and pipe must have a special thermal- and noise-insulation. This special insulation has to be applied on a minimum length of 10 x DN upstreamside and 20 x DN downstreamside of the valve.

**Recommendation:** Insulating material with a density of 100 kg/m<sup>3</sup> - thickness of insulation 100 mm - covered with galvanised metal-sheet of approx. 1.5 mm thickness, innerside coated with antinoise-compound.

**Attention !!** There shall be no sound bridges by metal to metal contact on the installation of the control valve and the matching pipeline. A clear decoupling between valve, pipeline and the support fixing system is essential to optimise sound reduction and insulation.

# Technical Data Sheet

## BIOVENT® Hygienic Control Valve



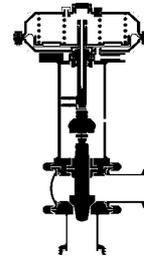
TD\_391

### General data

<b>Series</b>	391		
<b>Nominal diameter (DN)</b>	15 – 150		
<b>Nominal pressure (PN)</b>	10 – 25		
<b>Housing designs</b>	Angle type	L	Parabolic plug
	Globe style	BO	Parabolic plug
	Globe style	BM	Parabolic plug, double guiding
	3-step	BM	3-step plug (P3)
	3-way	M-WM	Flow mixer
	3-way	T-WM	Flow divider
<b>Body material</b>	Material no. 1.4404 (all body components blasted and post-treated) Thread connection 1.4301		
<b>Body connections</b>	Thread connections, welded ends, flanged connections, clamp connections, aseptic flange connections (other connections available on request)		
<b>Piping classes</b>	Metric in accordance with DIN 11850 Inch OD in accordance with ISO2037/BS 4825 Part 1 Inch IPS in accordance with Schedule 5		
<b>Surfaces</b>	Wetted Surfaces Ra ≤ 0.8 µm; matt-blasted outer surface		
<b>Plug characteristic</b>	Standard: equal percentage or linear		
<b>Rangeability</b>	40:1		
<b>Seat leakage</b>	Metal sealing: class IV (0.01% of kvs) Soft sealing: class VI		
<b>Plug</b>	Material no. 1.4571 (superfinished; guide surfaces also finish rolled)		
<b>Seat</b>	Material no. 1.4404		
<b>Stem seal</b>	EPDM sealing rings; temperature range: -30 to +135°C; FDA compliant Resistance: 2 to 5% resistance to alkaline solutions and acids up to +85°C Other materials (FPM, HNBR etc.) available on request.		
<b>Options</b>	Sterile lock, diaphragm seal Optimum CIP conditions		
<b>Material certificates</b>	Manufacturers final test certificate in accordance with EN 10204-3.1, factory certificate in accordance with EN 10204-2.2		

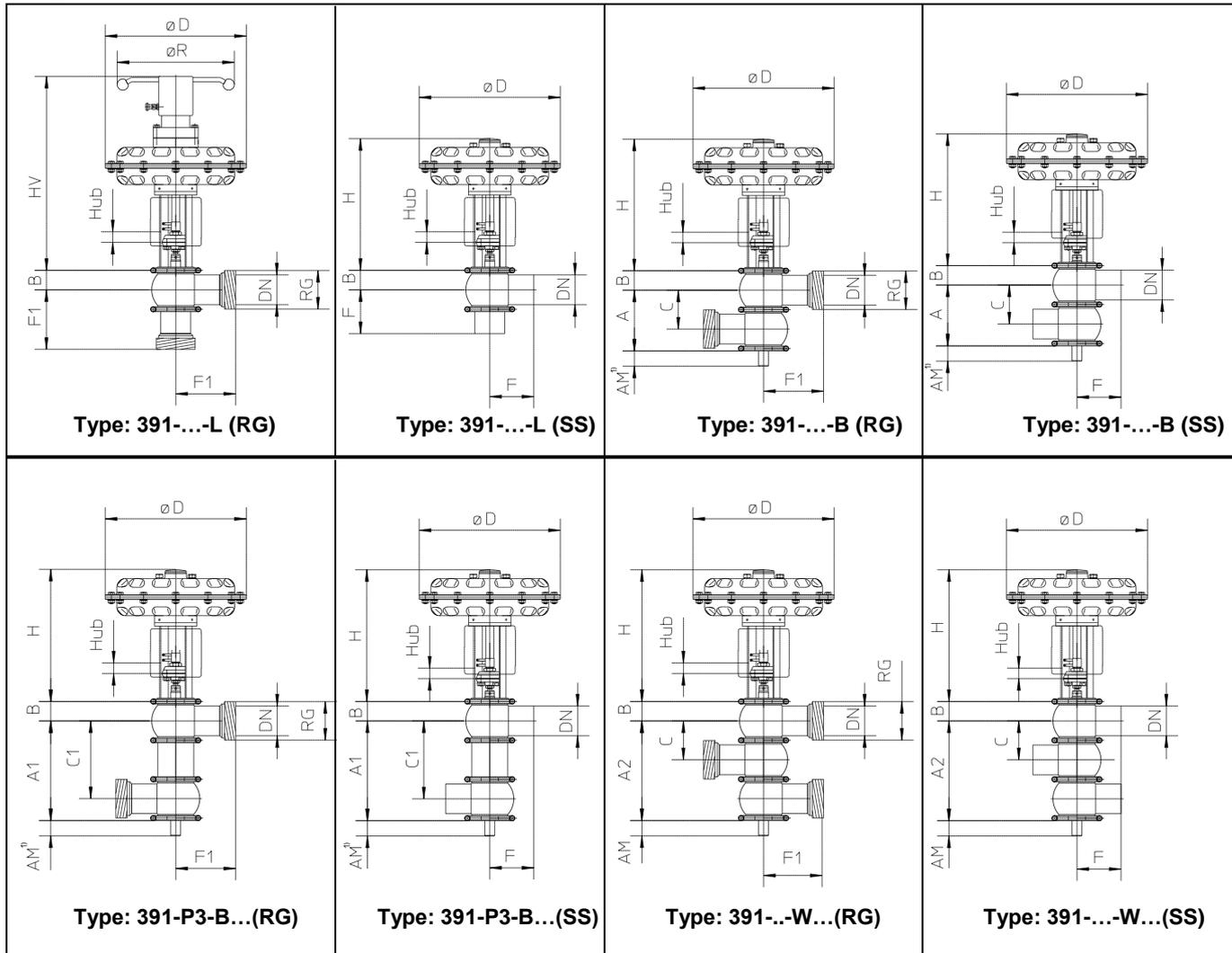
# Technical Data Sheet

## BIOVENT® Hygienic Control Valve



TD\_391

### Weight and dimensions



SS = welded ends for piping compliant to DIN 11850 / RG = round thread connections compliant to DIN 11851

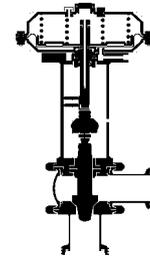
With integrated ARCA positioners type 824 and 827 (standard); other positioners available on request.

DN	Actuator	Stroke	ØD	H	HV	R	B	F	F1	F2	F3	A	A1	A2	AM <sub>1</sub>	C	C1	Weight
25	MFI-20	20	270	325	530	270	25	90	119	58	87	87	102	137	30	50	65	13.5
40	MFI-20	20	270	325	530	270	31	90	123	64	97	109	157	171	30	62	114	23.0
50	MFI-20	20	270	325	530	270	37	90	125	70	105	126	186	200	30	74	134	23.0
65	MFI-30 MFIII-30	30	270 400	355 387	573 651	270 400	48	125	165	83	123	154	234	250	40	96	171	23.0 38.0
80	MFI-30 MFIII-30	30	270 400	355 387	573 651	270 400	55.5	125	170	90.5	135.5	175	251	286	40	111	186	24.0 39.0
100	MFI-30 MFIII-30	30	270 400	355 387	573 651	270 400	65	125	179	100	154	205	295	335	40	130	215	27.0 42.0
125	MFIII-60	60	400	510	888	400	77.5	150	--	112.5	---	245	415	400	70	155	325	61.0

1) Dimension AM with double guide only.

2) Weights refer to 391-P1-L angle valves with round thread connections (excluding DN 125 with welded ends) and actuator without positioner.

# Technical Data Sheet BIOVENT® Hygienic Control Valve



TD\_391

Maximum permissible differential pressures  $\Delta$  (delta) p (bar), flow against the closing direction of the plug.

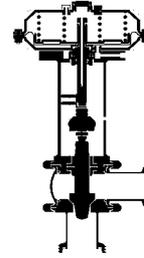
DN						25	32	40	50	65	80	100		125		150		
Function: air to open / spring to close	25 to 50	MFI-20	2.0	3	2.4	25		23.5	16.9									
			3.5	6	4.8	25												
	65 to 100	MFI-30	2.7	3	2.4				20	16.9	9.1	4.7	3					
			4.9	6	4.8					20		12.6	8.7					
65 to 100	MFIII-30	2.0	3	5				20			13.3	9.2						
		3.5	6	10					20									
		4.2	9	13					20									
125 to 150	MFIII-60	2.0	3	5								9.2	5.6	4.5	3	2		
		3.5	6	10									10		7.8	5.5		
		4.1	9	12									10		9.8	6.9		
			4.8	12	14							10				8.2		
Function: air to close / spring to open	25 to 50	MFI-20	3.5	3	4.8	25												
			4.5		9.6	25												
			6.0		14.4	25												
	65 to 100	MFI-30	3.0	3	4.8				20		12.6	8.7						
			4.5		9.6				20									
			6.0		14.4				20									
	65 to 100	MFIII-30	3.0	3	10.8				20									
			4.5		21.6				20									
			6.0		32.4				20									
	125 to 150	MFIII-60	3.0	3	10.8								10		8.6	6		
			4.5		21.6							10						
			6.0		32.4							10						

The differential pressures listed do not apply to valves with V-ring sealing element.

The maximum permissible operating pressure is 10 bar (standard). The maximum permissible operating pressure can be higher, however, depending on the nominal diameter of the piping connection:

DN 25 to DN 50 = 25 bar  
 DN 65 to DN 100 = 20 bar  
 DN 125 to DN 150 = 10 bar

# Technical Data Sheet BIOVENT® Hygienic Control Valve



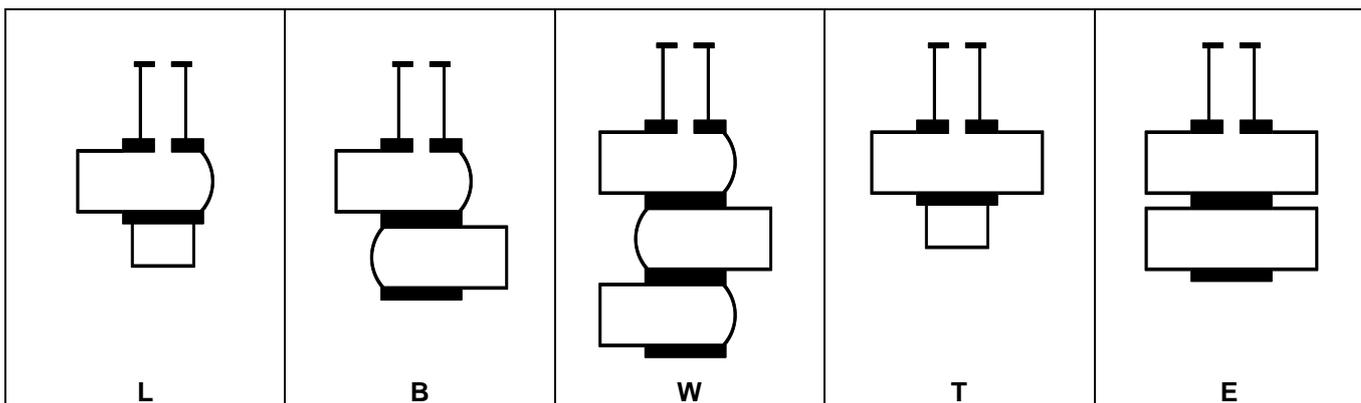
TD\_391

## Type codes

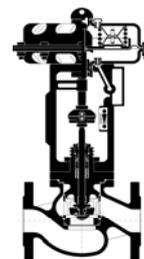
39	1	-P L M T	1 3	-L B W T E	M O
----	---	-------------------	--------	------------------------	--------

<b>Series</b>	
1 = hygienic design	
P = parabolic plug	
L = perforated plug	
M = mixer	
T = divider	
1 = 1-stage	
3 = 3-stage	
Does not apply to mixer and divider	
Housing design	L
Housing design	B
Housing design	W
Housing design	T
Housing design	E
M = removable floor panel with guide	
O = removable floor panel without guide	

## Possible housing designs



# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve



TD\_6H

## General Data

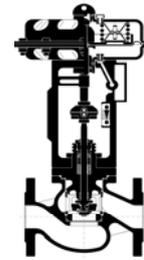
<b>Series</b>	6H
<b>Nominal Size DN / NPS</b>	(15) 25-200 / (1/2") 1"-8"
<b>Nominal Pressure PN / ANSI</b>	63-250 / Class 600-1500
<b>Characteristic Rangeability</b>	equal perc. or linear 40:1
<b>Plug guide</b>	stem guided, option: double guided (retrofit able)
<b>Seat leakage</b>	metal sealing: IEC 50534-4 leakage class IV (0,01% kVs-value); option leakage class V soft sealing (IEC 50534-4 leakage class VI soft sealing on request)
<b>Bellow sealing (option)</b>	seamless, multiple layers, made of 1.4571, option: Hastelloy and other materials
<b>Heating jacket (option)</b>	Connections DN 15 PN 40 (1/2" ANSI 300) flanges
<b>Low temperature design (option)</b>	Down to -196°C

## Materials

	EN	Temperature range	ASTM	Temperature range	
<b>Body materials</b>	1.0619 GP240GH*	-10 to 400°C	A 216 WCB*	-29°C to 400°C	
	1.4408 G-X 5 CrNiMo 19 11 2	-196 to 400°C	A 351 CF8M*	-196°C to 400°C	
	1.4581 GX5CrNiMoNb 19-11-2*	-10 to 450°C	-	-	
	1.6220 G20Mn5	-40 to 400°C	A 352 LCB	-50°C to 400°C	
	1.6982 GX3CrNi13-4	-120 to 400°C	-	-	
	1.7357 G17CrMo5-5	-10 to 530°C	A 217 WC6	-29°C to 530°C	
<b>Bonnet materials</b>	Same material as body, stuffing box sleeve made of 1.4571 (AISI 316TI)				
<b>Trim material</b>					
Material No.	Parabolic Plug	Perforated plug L1	Seat	Seat sealing	Max. fluid temperature
1	1.4122*	1.4122 nitrided	1.4021*	metallic	same as stem sealing
2	1.4571*	1.4571 nitrided	1.4571*	metallic	same as stem sealing
3	1.4112 hardened	1.4112 hardened	1.4112 hardened	metallic	same as stem sealing

\* Standard

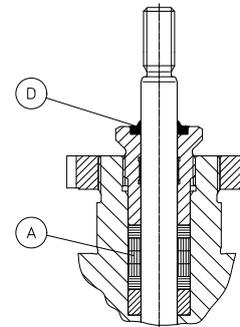
# Technical Data Sheet ECOTROL® Control Valve



TD\_6H

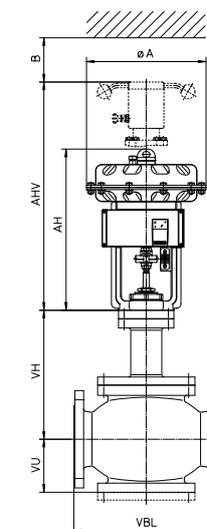
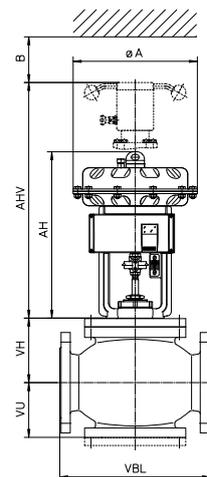
## Temperature range for stem sealings

Sealing type	Packing ring (Item A)	Wiper ring (Item D)	Temp. range	Top flange design	Remarks
adjustable	reinforced Graphite/ Inconel	NBR (FKM)	-29 ~ 400°C	Standard/ cooling fins	Standard operation
adjustable	Pure Graphite	VITON	-29 ~ 530°C	Standard/ cooling fins	High temperature
adjustable	Braided Graphite/PTFE	NBR	-196 ~ 200°C	Extended bonnet	Low temperature
Bellow sealing c/w double safety sealing	PTFE V-Ring bellow (1.4571 or Hastelloy C)	NBR (FKM)	-100 ~ 200°C	Bellow sealing	preloaded c/w stainless steel spring



## Weights and dimensions

Dimensions (in mm) for valve c/w flanges acc. to DIN EN 1092-1 or ANSI Class 600/900/1500 RF/RTJ										
Valve Series 6H	DN	15**	25	40	50	80	100	150	200	
	ANSI NPS	½"	1"	1 ½"	2"	3"	4"	6"	8"	
	VBL PN63/100/160		230	260	300	380	430	550	700	
	VBL PN250		260	300	350	450	520	700	800	
	VBL Class 600 RF		216	241	292	356	432	559	660	
	VBL Class 600 RTJ		216	241	295	359	435	562	664	
	VBL Class 900 RF		254	305	368	381	457	610	737	
	VBL Class 900 RTJ		254	305	372	384	460	613	740	
	VBL Class 1500 RF		254	305	368	470	546	705	832	
	VBL Class 1500 RTJ		254	305	372	473	549	711	842	
	VH	DEK1		135	160	190	250	275	335	410
		DEK2		170	240	270	315	355	490	480
		DEK3		170	240	270	315	355	490	480
		DEK4	on request							
DEK5		on request								
DEK7						250	285	335	410	
VU	3-Flansch		70	105	115	155	180	230	275	
	4-Flansch				175	235	265	315	410	
Actuator Type 812/811/MA	ØA	MFI	270							
		MFIII						400		
		UV						530		
	AH	MA.60						596		
		MFI	361							
		MFIII				489		625		
	AHV	UV						1006		
		MA.60						840		
		MFI	508							
	B	MFIII				657		888		
		UV						1323		
			130		150			200		
	Weight* ca. kg	MFI		34	42	72	101	136		
		MFIII		60	68	98	127	210	430	607
UV								475	645	
MA.60								550	750	

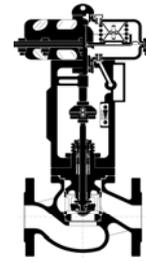


\*) Weight: Valve c/w actuator w/o hand wheel  
\*\*) on request



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# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve

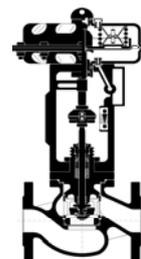


TD\_6H

## Standard kVs/ Cvs and seat diameters of series 6H (not balanced)

DN/NPS	Seat-Ø (mm)	Characteristics	kVs [m <sup>3</sup> /h]		Cvs [gal/min]	
			Parabolic plug	Perforated plug	Parabolic plug	Perforated plug
25 1"	16	= %	4	-	4,7	-
		linear		-		-
	19	= %	7	4	8,2	4,7
		linear		4		4,7
	24	= %	11	7	12,9	8,2
		linear		10		11,7
40 1 1/2"	24	= %	11	7	12,9	8,2
		linear		10		11,7
	32	= %	18	13	21,1	15,2
		linear		18		21,1
	37	= %	26	16	30,4	18,7
		linear		26		30,4
50 2"	32	= %	18	16	21,1	18,7
		linear		23		26,9
	37	= %	26	21	30,4	24,6
		linear		26		30,4
	48	= %	43	35	50,3	41
		linear		43		50,3
80 3"	48	= %	43	38	50,3	44,5
		linear		55		64,4
	62	= %	68	43	79,6	50,3
		linear		60		70,2
	73	= %	100	55	117	64,4
		linear		80		93,6
100 4"	62	= %	68	43	79,6	50,3
		linear		60		70,2
	73	= %	100	55	117	64,4
		linear		80		93,6
	90	= %	150	68	175,5	79,6
		linear		110		128,7
150 6"	90	= %	150	125	175,5	146,3
		linear		170		198,9
	113	= %	260	150	304,2	175,5
		linear		260		304,2
	143	= %	380	210	444,6	245,7
		linear		380		444,6
200 8"	113	= %	260	150	304,2	175,5
		linear		260		304,2
	143	= %	380	210	444,6	245,7
		linear		380		444,6
	172	= %	650	260	760,5	304,2
		linear		450		526,5

# Technical Data Sheet ECOTROL® Control Valve



TD\_6H

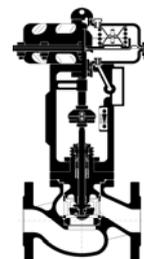
Max. shut off differential pressure (valve closed)  
(Standard packing, leakage class IV, w/o balancing<sup>1)</sup>, flow-to open)

Actuator series 812 (multi-spring actuator)			Air to open / spring to close				Air to close / spring to open				
			No. of springs				No. of springs				
DN	Actuator size	Seat-Ø (mm)	3	6	9	12	3	3	3	6	6
			p instrument air min. [bar]								
bar											
25 1"	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	24	27,0	80,1			80,1	160,0	160,0	80,1	160,0
		19	45,9	130,6			130,6	160,0	160,0	130,6	160,0
		16	67,1	160,0			160,0	160,0	160,0	160,0	160,0
40 1 1/2"	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	37	9,5	31,8			31,8	76,4	121,1	31,8	76,4
		32	13,6	43,5			43,5	103,2	160,0	43,5	103,2
		24	27,0	80,1			80,1	160,0	160,0	80,1	160,0
50 2"	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	48	4,7	17,9			17,9	44,5	71,0	17,9	44,5
		37	9,5	31,8			31,8	76,5	121,1	31,8	76,4
		32	13,6	43,5			43,5	103,2	160,0	43,5	103,2
	MFIII-30 720 cm <sup>2</sup> 111 in <sup>2</sup>	48	19,1	46,7	63,3	79,9	51,1	110,8	160,0	51,1	110,8
		37	33,7	80,2	108,1	136,0	87,6	160,0	160,0	87,6	160,0
		32	46,0	108,2	145,5	160,0	118,2	160,0	160,0	118,2	160,0
80 3"	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	73	1,1	6,8			6,8	18,3	29,8	6,8	18,3
		62	2,1	10,0			10,0	25,9	41,8	10,0	25,9
		48	4,7	17,9			17,9	44,5	71,0	17,9	44,5
	MFIII-30 720 cm <sup>2</sup> 111 in <sup>2</sup>	73	7,3	19,3	26,4	33,6	21,2	47,0	72,8	21,2	47,0
		62	10,7	27,3	37,2	47,1	29,9	65,7	101,5	29,9	65,7
		48	19,1	46,7	63,3	79,9	51,1	110,8	160,0	51,1	110,8
100 4"	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	90	0,3	4,1			4,1	11,6	19,2	4,1	11,6
		73	1,1	6,8			6,8	18,3	29,8	6,8	18,3
		62	2,1	10,0			10,0	25,9	41,8	10,0	25,9
	MFIII-30 720 cm <sup>2</sup> 111 in <sup>2</sup>	90	4,4	12,2	17,0	21,7	13,5	30,5	47,5	13,5	30,5
		73	7,3	19,3	26,4	33,6	21,2	47,0	72,8	21,2	47,0
		62	10,7	27,3	37,2	47,1	29,9	65,7	101,5	29,9	65,7
150 6"	MFIII-60 720 cm <sup>2</sup> 111 in <sup>2</sup>	143	1,2	4,3	6,2	8,1	4,8	11,6	18,3	4,8	11,6
		113	2,4	7,4	10,4	13,4	8,2	19,0	29,8	8,2	19,0
		90	4,4	12,2	17,0	21,7	13,5	30,5	47,5	13,5	30,5
200 8"	MFIII-60 720 cm <sup>2</sup> 111 in <sup>2</sup>	172	0,6	2,8	4,1	5,4	3,1	7,8	12,4	3,1	7,8
		143	1,2	4,3	6,2	8,1	4,8	11,6	18,3	4,8	11,6
		113	2,4	7,4	10,4	13,4	8,2	19,0	29,8	8,2	19,0

Actuator series 811 (single-spring actuator, adjustable)			Air to open -spring to close				Air to close - spring to open				
			spring		spring		spring				
DN	Actuator size	Seat-Ø (mm)	standard		reinforced		Min.		Max.		
			Min.	Max.	Min.	Max.	p instrument air min. [bar]				
bar											
150 6"	UV-60 1440 cm <sup>2</sup> 223 in <sup>2</sup>	143	-	6,9	-	13,5	18,5	32,0	45,6	22,3	35,8
		113	-	11,5	-	22,1	30,2	51,7	73,5	36,2	57,8
		90	-	18,7	-	35,4	48,1	82,1	116,4	57,7	91,7
200 8"	UV-60 1440 cm <sup>2</sup> 223 in <sup>2</sup>	172	-	4,6	-	9,1	12,6	21,9	31,3	15,2	24,5
		143	-	6,9	-	13,5	18,5	32,0	45,6	22,3	35,8
		113	-	11,5	-	22,1	30,2	51,7	73,5	36,2	57,8

<sup>1)</sup> For higher differential pressures, balanced trim is required. Please contact us.

# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve

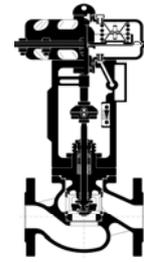


TD\_6H

Actuator series MA60 (multi-spring actuator)			Air to open / spring to close No. of springs				Air to close / spring to open No. of springs				
			2	4	6	8	2	2	2	4	4
DN	Actuator size	Seat-Ø (mm)	bar				p instrument air min. [bar]				
							3,0	4,5	6,0	4,5	6,0
150 6"	MA3.60A 2185 cm <sup>2</sup> 339 in <sup>2</sup>	143	4,3	10,6	16,8	23,0	29,3	41,7	54,2	-	-
		113	7,4	17,4	27,4	37,3	47,3	67,3	87,2	-	-
		90	12,2	28,0	43,7	59,4	75,2	106,6	138,1	-	-
200 8"	MA3.60A 2185 cm <sup>2</sup> 339 in <sup>2</sup>	172	2,8	7,1	11,4	15,7	20,0	28,6	37,2	-	-
		143	4,3	10,6	16,8	23,0	29,3	41,7	54,2	-	-
		113	7,4	17,4	27,4	37,3	47,3	67,3	87,2	-	-

For higher differential pressures, balanced trim is required. Please contact us.

# Technical Data Sheet ECOTROL® Control Valve



TD\_6H

## ECOTROL® 6H type code

0. Operating Conditions		7. Body materials (cont.)		16. Seat/ plug seal <sup>1)</sup>	
Fluid:		6	A216WCB	0	Leakage class IV (metal to metal)
Temp.:	°C	7	A351CF8M	1	Leakage class V (metal, super finished)
Press. P <sub>1</sub> :	bar abs	8	A217WC6	2*	Soft sealed (PTFE/EPDM)
Press. P <sub>2</sub> :	bar abs	9	other (in acc. with order)	3*	Soft sealed (PTFE/FKM)
<b>1. Series</b>		<b>8. Guiding <sup>1)</sup></b>		<b>4*</b> Soft sealed (PTFE/ trapezoidal)	
6H		0	Stem guided (standard)	9	other (in acc. with order)
<b>2. Bonnet</b>		1	Bottom guided	<b>17. Cage Retainer <sup>1)</sup></b>	
1	Standard	9	other (in acc. with order)	0	Standard
2	Double stuffing box	<b>9. kVs</b>		1	LN (Low Noise), not controlled
3	Cooling fins	xxx	in acc. with order	2	LN controlled
4	Bellows	<b>10. Characteristics</b>		9	other (in acc. with order)
5	Extension (insulating column)	l	Linear	<b>18. Low noise cage <sup>1)</sup></b>	
7	Standard balanced	g	=%	1	LK1
8	Cooling fins balanced	m	modified	2	LK2
9	Special design in acc. with order	s	On/ Off	3	LK3
<b>3. Plug design</b>		<b>11. Plug materials <sup>1)</sup></b>		4	LK4
P1-P3-P5	Parabolic plug (1-3-5 step)	1	1.4571	5	SLK1
L1-L2-L3	Perforated plug (1-2-3 step)	3	1.4112	6	SLK2
S	On/ Off plug	4	1.4122	9	other (in acc. with order)
<b>4. Nominal diameter (DN) – DIN/ ANSI</b>		9	other (in acc. with order)	<b>19. Stem sealing <sup>1)</sup></b>	
25	DN 25 / ANSI 1"	<b>12. Plug wear/ tear protection <sup>1)</sup></b>		1	-
40	DN 40 / ANSI 1 1/2"	0	Standard (w/o)	2	-
50	DN 50 / ANSI 2"	1	nitrided	3	Latty 6118/ETF Inconel
80	DN 80 / ANSI 3"	2	hardened	4	Graphite 0901
100	DN 100 / ANSI 4"	3	Plug face stellite	5	Graphite/PTFE 6226/6232
150	DN 150 / ANSI 6"	4	Completely stellite	9	other (in acc. with order)
200	DN 200 / ANSI 8"	5	Colsterised	<b>20. special design</b>	
<b>5. Nominal pressure (PN)</b>		9	other (in acc. with order)	0	Standard
63	PN 63	<b>13. Balancing <sup>1)</sup></b>		1	AD2000
100	PN 100	1	Piston rings	2	NACE
160	PN 160	2	EPDM- quad ring	3	Oxygen design
250	PN 250	3	FKM- quad ring	9	other (in acc. with order)
600	Class 600 acc. to ANSI B16.10	5	PTFE spring loaded	<b>21. Material inspection (pressure retaining parts)</b>	
900	Class 900 acc. to ANSI B16.10	9	other (in acc. with order)	0	w/o
1500	Class 1500 acc. to ANSI B16.10	<b>14. Seat materials</b>		1	EN 10204-2.1
<b>6. Connections</b>		1	1.4571	2	EN 10204-3.1
0	Flanges c/w sealing strip RF SF	3	1.4112	3	EN 10204-3.2
1	Flanges c/w groove	4	1.4122	9	other (in acc. with order))
2	Flanges c/w tongue	9	other (in acc. with order)	<b>22. Final inspection</b>	
3	Flanges c/w projection/ recess	<b>15. Seat wear/ tear protection <sup>1)</sup></b>		0	w/o
4	Butt weld ends	0	standard (w/o)	1	EN 10204-2.1
5	Butt weld ends c/w spool pieces	1	nitrided	2	EN 10204-2.2
7	RTJ	2	hardened	3	EN 10204-3.1
9	other (in acc. with order)	3	Seat face stellite	4	EN 10204-3.2
<b>7. Body materials <sup>1)</sup></b>		4	Completely stellite	9	other (in acc. with order)
2	1.0619	5	Colsterised		
3	1.4581	9	other (in acc. with order)		
4	1.7357				
5	1.6620				

<sup>1)</sup> in accordance with customer's specification, or selected by manufacturer in accordance with customer's specification (fluid, pressure, etc.)

### Example:

**6H - 1 - P1 - 150 - 40 - 0 - 2**      *Position 1-7 / basic data*

Series 6H – c/w standard bonnet – c/w parabolic plug - DN150 – PN40 – flanges acc. to EN1092 B1 – body 1.0619

**0 - 260 - g - 1 - 0 - 0 - 1 - 0 - 0 - 0 - 0 - 1**      *Position 8-19 / trim*

Single stem guiding – kVs 260 – equal percentage – plug made of 1.4571 – w/o wear/tear protection – w/o balancing – seat made of 1.4571 – w/o wear/ tear protection – leakage class IV – cage retainer standard – w/o low noise cage – stem sealing PTFE-V-Ring/EPDM quad ring

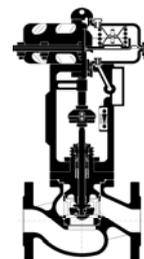
**0 - 1 - 1**      *position 20-22 / Design/ inspections*

Standard design – Material inspection acc. to EN 10204 3.1 - Final inspection acc. to EN 10204 3.1



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# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve



TD\_6N

## General Data

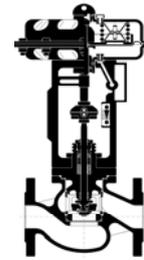
<b>Series</b>	<b>6N</b>
<b>Nominal Size DN /NPS</b>	<b>150-500 / 6" – 20"</b>
<b>Nominal Pressure PN / ANSI</b>	<b>10-40 / Class 150-300</b>
<b>Characteristics</b>	equal percentage or linear
<b>Rangeability</b>	40:1
<b>Plug guide</b>	stem guided, option: double guiding (retrofit able)
<b>Seat leakage</b>	metal sealing: IEC 50534-4 leakage class IV (0,01% kVs- value); option: leakage class V soft sealing: IEC 50534-4 leakage class VI
<b>Bellow sealing (option)</b>	seamless, double walled, made of 1.4571, option: Hastelloy and other materials
<b>Heating jacket (option)</b>	Connections DN 15 PN 40 (1/2" ANSI 300) flanges
<b>Low temperature design (option)</b>	Down to -196°C

## Materials

Body Materials	EN	Temperature range	ASTM	Temperature range	
	1.0619 GP240GH*	-10 to 400°C	A 216 WCB*	-29°C to 400°C	
	1.4408 G-X 5 CrNiMo 19 11 2	-196 to 400°C	A 351 CF8M*	-196°C to 400°C	
	1.4581 GX5CrNiMoNb 19-11-2*	-10 to 450°C	-	-	
	1.6220 G20Mn5	-40 to 400°C	A 352 LCB	-50°C to 400°C	
	1.6982 GX3CrNi13-4	-120 to 400°C	-	-	
	1.7357 G17CrMo5-5	-10 to 530°C	A 217 WC6	-29°C to 530°C	
<b>Bonnet Materials</b>	Same material as body, stuffing box sleeve made of 1.4571 (AISI 316TI)				
<b>Trim material</b>					
Material No.	Parabolic Plug	Perforated plug L1	Seat	Seat sealing	Max. fluid temperature
1	1.4122*	1.4122 nitrided	1.4021*	metallic	same as stem sealing
2	1.4571*	1.4571 nitrided	1.4571*	metallic	same as stem sealing
3	1.4112 hardened	1.4112 hardened	1.4112 hardened	metallic	same as stem sealing
4	1.4122*	1.4122 nitrided	1.4021*	PTFE/FKM	-50 ~ 160°C
5	1.4571*	1.4571 nitrided	1.4571*	PTFE/FKM	-50 ~ 160°C
6	1.4112 hardened	1.4112 hardened	1.4112 hardened	PTFE/FKM	-50 ~ 160°C
7	1.4122*	1.4122 nitrided	1.4021*	PTFE/EPDM	-50 ~ 140°C
8	1.4571*	1.4571 nitriert	1.4571*	PTFE/EPDM	-50 ~ 140°C
9	1.4112 hardened	1.4112 hardened	1.4112 hardened	PTFE/EPDM	-50 ~ 140°C
10	1.4122*	1.4122 nitrided	1.4021*	PTFE	-196 ~ 180°C
11	1.4571*	1.4571 nitrided	1.4571*	PTFE	-196 ~ 180°C
12	1.4112 hardened	1.4112 hardened	1.4112 hardened	PTFE	-196 ~ 180°C

\* Standard

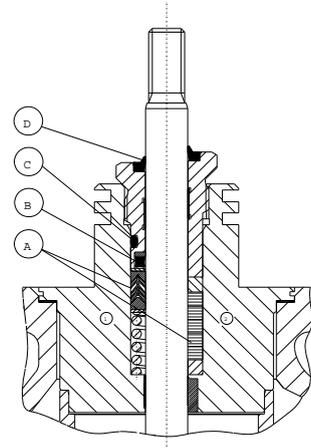
# Technical Data Sheet ECOTROL® Control Valve



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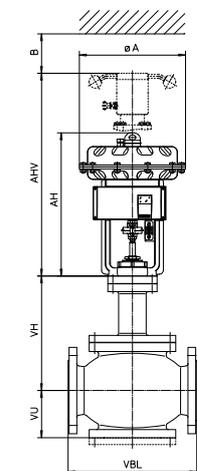
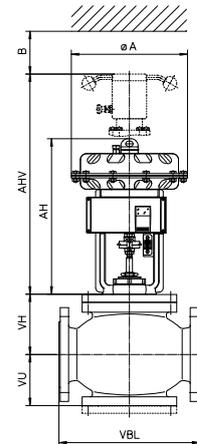
## Temperature range for stem sealings

Sealing type	Packing Ring (Item A)	Micro sealing (Item B)	O-Ring (Item C)	Wiper ring (Item D)	Temp. range	Top flange design	Remarks
Maintenance free double sealing	PTFE V-Ring	EPDM (FKM)	EPDM	NBR	-25 ~ 180 (200)°C	Standard	preloaded c/w stainless steel spring
adjustable	reinforced Graphite/ Inconel	-	-	NBR (FKM)	-29 ~ 400°C	Standard/ Cooling fins	Standard operation
adjustable	Pure Graphite	-	-	VITON	-29 ~ 530°C	Standard/ Cooling fins	high temperature
adjustable	Braided Graphite/ PTFE	-	-	NBR	-196 ~ 200°C	Extended bonnet	low temperature
Bellow sealing c/w double safety sealing	PTFE V-Ring/ bellow (1.4571 or Hastelloy C)	EPDM (FKM)	EPDM	NBR (FKM)	-100 ~ 200°C	Bellow sealing	preloaded c/w stainless steel spring



## Weights and dimensions

Dimensions (mm) of valves c/w flanges acc. to DIN EN 1092-1 or ANSI Class 150/300 RF/RTJ									
Valve Series 6N	DN	150	200	250	300	350	400	500	
	ANSI NPS	6"	8"	10"	12"	14"	16"	20"	
	VBL PN10-PN40	480	600	730	850	980	1100	1250	
	VBL Class 150 RF	450,8	542,9	673,1	736,6	889	1016	1250	
	VBL Class 150 RTJ	463,5	555,7	-	-	-	-	-	
	VBL Class 300 RF	472,9	568,3	708	774,7	927,1	1057,3	1250	
	VBL Class 300 RTJ	488,9	584,1	-	-	-	-	-	
	VH	DEK1	260	295	360	395	465	520	600
		DEK2	355	410	510	545	615	670	1)
		DEK3	355	410	510	545	615	670	1)
DEK4		575	605	850	850	880	1)	1)	
DEK5		on request							
DEK7		260	295	360	395	465	520	600	
VU	DEK8	355	410	510	545	615	670	1)	
	VU	190	240	305	335	395	445	540	
Actuator <sup>2)</sup> Type 812/811/MA	ØA	MFIII	400						
		UV	530						
		MA.60	596						
	AH	MFIII	625						
		UV	1006		1135				
		MA.60	840		1010				
	AHV	MFIII	888						
		UV	1323		1452				
		B	200		340				
	weight* ca. kg	MFIII	247	332					
		UV	250	350	535	830	1160	1460	
		MA.60	330	390	600	1000	1300	1770	2500

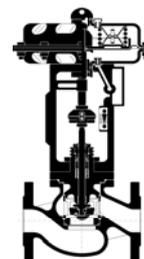


1) On request

2) Actuator type for DN500/ 20" on request

\*) valve c/w actuator w/o hand wheel

# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve

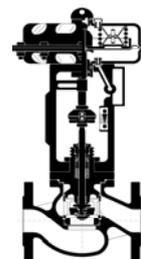


TD\_6N

## Standard kVs/ Cvs and seat diameters of series 6N (not balanced)

DN/ NPS	Seat-Ø (mm)	Characteristics	kVs [m³/h]		Cvs [gal/min]	
			Parabolic Plug	Perforated Plug	Parabolic Plug	Perforated Plug
150 6"	90	= %	150	125	157	146
		linear		170		199
	113	= %	260	150	304	175
		linear		260		304
	143	= %	380	210	445	246
		linear		380		445
200 8"	113	= %	260	150	304	175
		linear		260		304
	143	= %	380	210	445	246
		linear		380		445
	172	= %	650	260	761	304
		linear		450		523
250 10"	143	= %	380	210	445	246
		linear		380		445
	172	= %	650	260	761	304
		linear		450		526
	220	= %	900	520	1053	608
		linear		900		1053
300 12"	172	= %	650	260	761	304
		linear		450		526
	220	= %	900	520	1053	608
		linear		900		1053
	282	= %	1300	720	1521	842
		linear		1300		1521
350 14"	220	= %	900	520	1053	608
		linear		900		1053
	282	= %	1300	720	1521	842
		linear		1300		1521
	313	= %	1800	850	2106	995
		linear		1800		2106
400 16"	282	= %	1300	720	1521	842
		linear		1300		1521
	313	= %	1800	850	2106	995
		linear		1800		2106
	400	= %	2500	1250	2925	1462
		linear		2500		2925
500 20"	400	= %	2500	1250	2925	1462
		linear		2500		2925
	500	= %	4000	-	4680	-
		linear		4000		4680

# Technical Data Sheet ECOTROL® Control Valve



TD\_6N

Max. shut off differential pressures (valve closed)  
(PTFE packing (V-Ring), leakage class IV, w/o balancing, <sup>1)</sup> flow-to-open)

Actuator series 812 Type MFIII - 60 (multi-spring actuator)		Air to open / Spring to close No. of springs				Air to close / spring to open No. of springs				
		3	6	9	12	3	3	3	6	6
DN/ NPS	Seat-Ø (mm)	bar				p <sub>instrument air, min</sub> [bar]				
						3,0	4,5	6,0	4,5	6,0
150 6"	90	4,9	12,7	17,4	22,2	14,0	31,0	47,9	14,0	31,0
	113	2,7	7,7	10,7	13,7	8,5	19,3	30,1	8,5	19,3
	143	1,4	4,5	6,4	8,3	5,0	11,7	18,5	5,0	11,7
200 8"	113	2,7	7,7	10,7	13,7	8,5	19,3	30,1	8,5	19,3
	143	1,4	7,7	6,4	8,3	5,0	11,7	18,5	5,0	11,7
	172	0,8	2,9	4,2	5,5	3,3	7,9	12,6	3,3	7,9

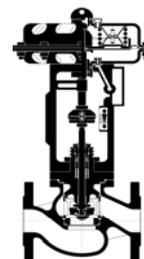
Actuator series 811 Type UV-60 (single-spring actuator)		Air to open / Spring to close spring				Air to close / spring to open spring				
		standard		reinforced		standard			reinforced	
DN/ NPS	Seat-Ø (mm)	Min.	Max.	Min.	Max.	p <sub>instrument air, min</sub> [bar]				
		bar	bar	bar	bar	3,0	4,5	6,0	4,5	6,0
150 6"	90		19,2		35,8	48,6	50,0	50,0	50,0	50,0
	113		11,8		22,4	30,5	50,0	50,0	36,5	50,0
	143		7,1		13,7	18,7	32,2	45,8	22,5	36,0
200 8"	113		11,8		22,4	30,5	50,0	50,0	36,5	50,0
	143		7,1		13,7	18,7	32,2	45,8	22,5	36,0
	172		4,7		9,3	12,7	22,0	31,4	15,4	24,7

Actuator series 811 Type UV-100 (single-spring actuator)		Air to open / Spring to close spring				Air to close / spring to open spring				
		standard		reinforced		standard			reinforced	
DN/ NPS	Seat-Ø (mm)	Min.	Max.	Min.	Max.	p <sub>instrument air, min</sub> [bar]				
		bar	bar	bar	bar	3,0	4,5	6,0	4,5	6,0
250 10"	143		3,3		6,8	17,3	30,7	44,2	22,3	35,7
	172		2,1		4,5	11,8	21,1	30,4	15,2	24,5
	220		1,1		2,6	7,0	12,7	18,4	9,1	14,8
300 12"	172		2,1		4,5	11,8	21,1	30,4	15,2	24,5
	220		1,1		2,6	7,0	12,7	18,4	9,1	14,8
	282		0,5		1,4	4,1	7,6	10,0	5,4	8,8
350 14"	220		1,1		2,6	7,0	12,7	18,4	9,1	14,8
	282		0,5		1,4	4,1	7,6	10,0	5,4	8,8
	313		0,3		1,1	3,3	6,1	8,9	4,3	7,1

Actuator series 811 Type UV-120 (single-spring actuator)		Air to open / Spring to close spring				Air to close / spring to open spring				
		standard		reinforced		standard			reinforced	
DN/ NPS	Seat-Ø (mm)	Min.	Max.	Min.	Max.	p <sub>instrument air, min</sub> [bar]				
		bar	bar	bar	bar	3,0	4,5	6,0	4,5	6,0
400 16"	282	-	-	-	0,5	4,1	7,6	11,0	5,4	8,8
	313	-	-	-	0,3	3,3	6,1	8,9	4,3	7,1
	400	-	-	-	-	1,9	3,6	5,3	2,5	4,2

<sup>1)</sup> For higher differential pressures, balanced trim is required. Please contact ARCA!

# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve

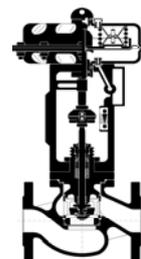


TD\_6N

Max. shut off differential pressures (valve closed)  
(PTFE packing (V-Ring), leakage class IV, w/o balancing, <sup>1)</sup> flow-to-open)

Actuator series MA60.D (multi-spring actuator)		Air to open / Spring to close No. of springs				Air to close / spring to open No. of springs				
		2	4	6	8	2	2	2	4	4
DN/ NPS	Seat-Ø (mm)	bar				p instrument air, min [bar]				
		3,0	4,5	6,0	4,5	6,0				
150 6"	90	12,7	28,4	44,2	50,0	50,0	50,0	50,0	-	-
	113	7,7	17,7	27,7	37,6	47,6	50,0	50,0	-	-
	143	4,5	10,7	17,0	23,2	29,4	41,9	50,0	-	-
200 8"	113	7,7	17,7	27,7	37,6	47,6	50,0	50,0	-	-
	143	4,5	10,7	17,0	23,2	29,4	41,9	50,0	-	-
	172	2,9	7,2	11,5	15,8	20,2	28,8	37,4	-	-
250 10"	143	4,5	10,7	17,0	23,2	29,4	41,9	50,0	-	-
	172	2,9	7,2	11,5	15,8	20,2	28,8	37,4	-	-
	220	1,4	3,9	6,4	8,7	11,8	18,6	25,4	-	-
300 12"	172	2,9	7,2	11,5	15,8	20,2	28,8	37,4	-	-
	220	1,4	3,9	6,4	8,7	11,8	18,6	25,4	-	-
	282	0,7	2,2	3,7	5,2	7,0	11,2	15,3	-	-
350 14"	220	1,4	3,9	6,4	8,7	11,8	18,6	25,4	-	-
	282	0,7	2,2	3,7	5,2	7,0	11,2	15,3	-	-
	313	0,5	1,7	2,9	4,1	5,6	9,0	12,4	-	-
400 16"	282	0,7	2,2	3,7	5,2	7,0	11,2	15,3	-	-
	313	0,5	1,7	2,9	4,1	5,6	9,0	12,4	-	-
	400	-	0,4	0,9	1,3	3,3	5,4	7,5	-	-

# Technical Data Sheet ECOTROL® Control Valve



TD\_6N

## ECOTROL® 6N type code

0. Operating Conditions		7. Body materials (cont.)		16. Seat/ plug seal <sup>1)</sup>	
Fluid:		6	A216WCB	0	Leakage class IV (metal to metal)
Temp.:	°C	7	A351CF8M	1	Leakage class V (metal, super finished)
Press. P <sub>1</sub> :	bar abs	8	A217WC6	2	Soft sealed (PTFE/EPDM)
Press. P <sub>2</sub> :	bar abs	9	other (in acc. with order)	3	Soft sealed (PTFE/FKM)
<b>1. Series</b>		<b>8. Guiding <sup>1)</sup></b>		<b>4</b>	
6N		0 Stem guided (standard)		9 other (in acc. with order)	
<b>2. Bonnet</b>		1 Bottom guided		<b>17. Cage Retainer <sup>1)</sup></b>	
1 Standard		9 other (in acc. with order)		0 Standard	
2 Double stuffing box		<b>9. kVs</b>		1 LN (Low Noise), not controlled	
3 Cooling fins		xxx in acc. with order		2 LN controlled	
4 Bellows		<b>10. Characteristics</b>		9 other (in acc. with order)	
5 Extension (insulating column)		l Linear		<b>18. Low noise cage <sup>1)</sup></b>	
7 Standard balanced		g =%		1 LK1	
8 Cooling fins balanced		m modified		2 LK2	
9 Special design in acc. with order		s On/ Off		3 LK3	
<b>3. Plug design</b>		<b>11. Plug materials <sup>1)</sup></b>		4 LK4	
P1-P3-P5 Parabolic plug (1-3-5 step)		1 1.4571		5 SLK1	
L1-L2-L3 Perforated plug (1-2-3 step)		3 1.4112		6 SLK2	
S On/ Off plug		4 1.4122		9 other (in acc. with order)	
<b>4. Nominal diameter (DN) – DIN/ ANSI</b>		9 other (in acc. with order)		<b>19. Stem sealing <sup>1)</sup></b>	
150	DN 150 / ANSI 6"	<b>12. Plug wear/ tear protection <sup>1)</sup></b>		1 PTFE/V-Ring/EPDM quad ring	
200	DN 200 / ANSI 8"	0 Standard (w/o)		2 PTFE/V-Ring/VITON quad ring	
250	DN 250 / ANSI 10"	1 nitrided		3 Latty 6118/ETF Inconel	
300	DN 300 / ANSI 12"	2 hardened		4 Graphite 0901	
350	DN 350 / ANSI 14"	3 Plug face stellite		5 Graphite/PTFE 6226/6232	
400	DN 400 / ANSI 16"	4 Completely stellite		9 other (in acc. with order)	
500	DN 500 / ANSI 20"	5 Colsterised		<b>20. special design</b>	
<b>5. Nominal pressure (PN)</b>		9 other (in acc. with order)		0 Standard	
10	PN 10	<b>13. Balancing <sup>1)</sup></b>		1 AD2000	
16	PN 16	1 Piston rings		2 NACE	
40	PN 40	2 EPDM- quad ring		3 Oxygen design	
150	Class 150 acc. to ANSI B16.10	3 FKM- quad ring		9 other (in acc. with order)	
300	Class 300 acc. to ANSI B16.10	5 PTFE spring loaded		<b>21. Material inspection (pressure retaining parts)</b>	
<b>6. Connections</b>		9 other (in acc. with order)		0 w/o	
0	Flanges c/w sealing strip RF SF	<b>14. Seat materials</b>		1 EN 10204-2.1	
1	Flanges c/w groove	1 1.4571		2 EN 10204-3.1	
2	Flanges c/w tongue	3 1.4112		3 EN 10204-3.2	
3	Flanges c/w projection/ recess	4 1.4122		9 other (in acc. with order))	
4	Butt weld ends	9 other (in acc. with order)		<b>22. Final inspection</b>	
5	Butt weld ends c/w spool pieces	<b>15. Seat wear/ tear protection <sup>1)</sup></b>		0 w/o	
7	RTJ	0 standard (w/o)		1 EN 10204-2.1	
9	other (in acc. with order)	1 nitrided		2 EN 10204-2.2	
<b>7. Body materials <sup>1)</sup></b>		2 hardened		3 EN 10204-3.1	
2	1.0619	3 Seat face stellite		4 EN 10204-3.2	
3	1.4581	4 Completely stellite		9 other (in acc. with order)	
4	1.7357	5 Colsterised			
5	1.6620	9 other (in acc. with order)			

<sup>1)</sup> in accordance with customer's specification, or selected by manufacturer in accordance with customer's specification (fluid, pressure, etc.)

### Example:

**6N - 1 - P1 - 150 - 40 - 0 - 2**      *Position 1-7 / basic data*

Series 6N – c/w standard bonnet – c/w parabolic plug - DN150 – PN40 – flanges acc. to EN1092 B1 – body 1.0619

**0 - 260 - g - 1 - 0 - 0 - 1 - 0 - 0 - 0 - 0 - 1**      *Position 8-19 / trim*

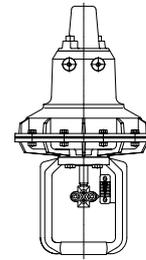
Single stem guiding – kVs 260 – equal percentage – plug made of 1.4571 – w/o wear/tear protection – w/o balancing – seat made of 1.4571 – w/o wear/ tear protection – leakage class IV – cage retainer standard – w/o low noise cage – stem sealing PTFE-V-Ring/EPDM quad ring

**0 - 1 - 1**      *position 20-22 / Design/ inspections*

Standard design – Material inspection acc. to EN 10204 3.1 - Final inspection acc. to EN 10204 3.1

# Technical Data Sheet

## pneum. Diaphragm Actuator



TD\_811

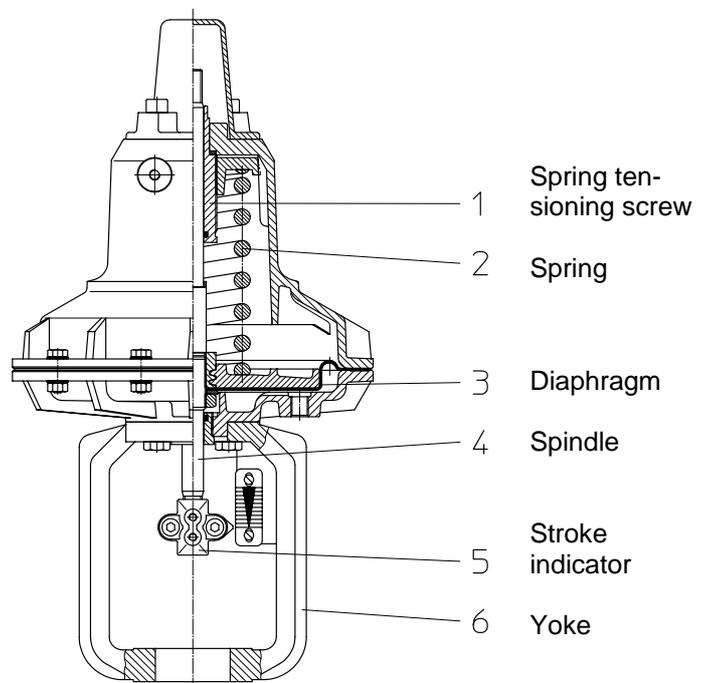
### Technical Data

<b>Series</b>	811
<b>Diaphragm effective area</b>	210 - 1440 cm <sup>2</sup>
<b>Stroke</b>	10 - 120 mm
<b>Control signal</b>	6 bar max.
<b>Materials</b>	Body parts and diaphragm plates: seawater-proof aluminium alloy 3.2581 Spring tensioning screw, spindle bushing: 1.4104 Spindle: 1.4021 Yoke: GG-25 or GGG-40, free of non-ferrous metal Diaphragm: NBR, fabric-reinforced (moulded)
<b>Operating temperature</b>	-20 to +80°C (Option -40 to + 80°C)
<b>Spindle bushing</b>	Straight-through spindle with rolled surface, top and bottom guided in PTFE/Graphite-slot ring bearings. Pressure chamber with O-ring sealing.
<b>Standard spring</b>	Control range = 0,8 bar, for control function: air to open or air to close
<b>Reinforced spring</b>	Control range > 0,8 bar; for max. spring forces with control function: air to open

### Functional description:

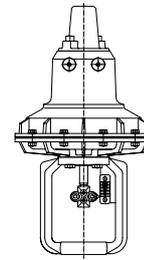
This is a pneumatic diaphragm actuator with spring return (fail safe) and is used to actuate linear valves. The actuator positions the valve plug, which in turn is controlled by a pneumatic or electropneumatic positioner. These actuators can be operated in the "Air to open" function or with the reverse action "Air to close".

- The central spring preload can be adjusted to optimum effect to the required actuating forces using the spring tensioning screw (1).
- A fabric-reinforced diaphragm ensures smooth conversion of the pneumatic application of pressure into the linear motion of the actuator spindle. The power diaphragm (3), supported by the diaphragm disc, is connected to the actuator spindle (4) and divides the actuator housing into pressure and spring chambers. If the force of the compressed air control signal exceeds the opposing spring force (2), the actuator spindle (4) moves and actuates the linear valve.
- The valve yoke (6) connects the actuator to the control valve, while the actuator spindle (4) is connected to the valve spindle via the coupling shown as a stroke indicator (5), securely guided in the slide bearing and sealed with a sealing element.



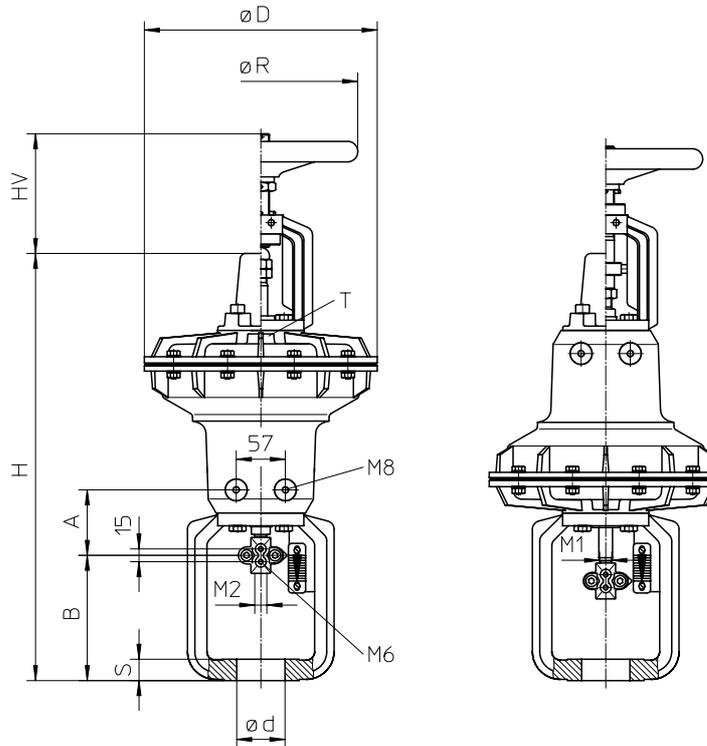
# Technical Data Sheet

## pneum. Diaphragm Actuator



TD\_811

### Dimensions and weights

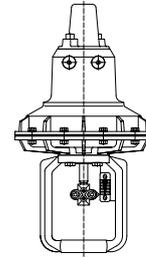


M2=Thread of particular valve spindle

Size	Diaph.-surf. (cm <sup>2</sup> )	Order-No.	Weight (kg) handwheel w/o with		Stroke	ØD	M1 actuator	Ød	S	B	A	H	HV	ØR	T inside				
U0	210	811.11	6,6	8,2	10/20	230	M10	40	15	117	77	430	110	180	G ¼				
		811.13	7,0	8,6								438							
		811.12	7,0	8,6															
		811.14	7,4	9,0															
UI	320	811.21	13,5	16,3	10/20	270	M10	48	20	127	82	495	135	225	G ¼				
		811.23	14,1	16,9															
		811.22	14,2	17,0								20/30							
		811.24	14,6	17,4															
UIII	720	811.31	33,0	42,3	20/30	392	M14	56	25	151	155	722	197	320	G ½				
		811.34	36,2	45,5															
		811.32	33,2	42,5	30							72				30	196	140	752
		811.33	35,0	44,3	45														
		811.35	37,2	46,5	60														
		811.36	39,3	48,6															
UV	1440	811.41	79,0	99,0	30	530	M20x 1,5	72	30	194	147	1006	295	400	2x G½"				
		811.44	85,0	105,0	45					187	154								
					60					194	147								
		811.42	79,5	99,5	60					234	127	1026							
		811.43	78,0	98,0	75														
		811.45	86,0	106,0	100														
811.46	87,0	107,0																	
UV	1440	811.43.1 811.46.1	100	120	100	530	M20x 1,5	100	50	334	138	1134	295	400	2x G½"				
UV	1440	811.47 811.48	105	125	120	530	M20x 1,5	100	50	344	128	1176	300	400	2x G½"				

# Technical Data Sheet

## pneum. Diaphragm Actuator



TD\_811

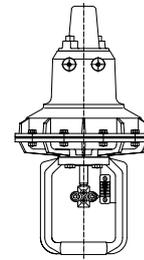
### Control forces and control ranges

Opening function (air to open - spring to close)

Size	Diaphragm surface (cm <sup>2</sup> )	Order-No.	Spring-No.	Stroke (mm)	Control range adjustable (bar)		Control force (kN)
					from	to	
U0	210	811.11	54610	10	0,4-0,8	1,4-1,8	2,8
				20	0,0-0,8	1,0-1,8	2,1
		811.12	54610	10	0,4-0,8	1,4-1,8	2,8
				20	0,0-0,8	1,0-1,8	2,1
		811.13	54611	10	1,0-1,8	2,2-3,0	4,5
				20	0,2-1,8	1,4-3,0	2,8
811.14	54611	10	1,0-1,8	2,2-3,0	4,5		
UI	320	811.21	54620	10	0,55-0,95	1,4-1,8	4,4
				20	0,15-0,95	1,0-1,8	3,1
		811.22	54621	20	0,46-1,0	1,26-1,8	4,0
				30	0,2-1,0	1,0-1,8	3,1
		811.23	54622	10	1,28-1,8	2,48-3,0	7,7
				20	0,75-1,8	1,95-3,0	5,7
811.24	54622	20	0,75-1,8	1,95-3,0	5,7		
UIII	720	811.31	54630	20	0,46-1,0	1,46-2,0	10,3
				30	0,2-1,0	1,2-2,0	8,4
		811.32	54631	30	0,46-1,0	1,26-1,8	8,8
				45	0,2-1,0	1,0-1,8	7,0
		811.33	54632	60	0,2-1,0	0,8-1,6	5,7
		811.34	54633	20	1,36-1,9	2,46-3,0	17,3
				30	1,4-2,2	2,2-3,0	15,5
		811.35	54633	30	1,4-2,2	2,2-3,0	15,5
				45	1,0-2,2	1,8-3,0	12,7
		811.36	54633	60	0,7-2,3	1,4-3,0	9,8
UV	1440	811.41	54650	30	0,5-0,9	1,4-1,8	19,7
				45	0,3-0,9	1,2-1,8	16,9
				60	0,1-0,9	1,0-1,8	14,1
		811.42	54651	60	0,3-0,9	1,0-1,6	14,1
				75	0,1-0,9	0,8-1,6	11,3
		811.43	54652	100	0,1-0,9	0,6-1,4	8,4
		811.44	54658	30	1,0-1,65	2,35-3,0	33,1
				45	0,7-1,65	2,05-3,0	28,9
		811.45	54658	60	0,4-1,65	1,75-3,0	24,7
				75	0,4-2,0	1,4-3,0	19,7
811.46	54658	100	0,4-2,4	1,0-3,0	14,1		
UV	1440	811.47	54652	120	0,15-1,0	0,35-1,2	5,0
		811.48	54658	120	0,25-3,2	0,7-3,2	10,0

# Technical Data Sheet

## pneum. Diaphragm Actuator



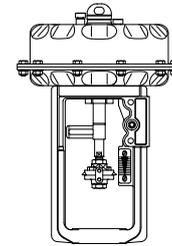
**TD\_811**

**Closing function** (air to close - spring to open)

Size	Diaphragm surface (cm <sup>2</sup> )	Order-No.	Spring-No.	Stroke (mm)	Control range (bar)	Control force kN depending on control pressure (bar)						
						1,4	2,0	2,5	3,0	4,5	6,0	
U0	210	811.11	54610	10	0,4	2,0	3,2	4,3	5,3	8,5	11,6	
				20	0,8	1,1	2,4	3,4	4,5	7,6	10,8	
		811.12		10	0,4	2,0	3,2	4,3	5,3	8,5	11,6	
				20	0,8	1,1	2,4	3,4	4,5	7,6	10,8	
UI	320	811.21	54620	10	0,4	3,1	5,0	6,6	8,2	13,2	17,8	
				20	0,8	1,9	3,8	5,4	7,0	11,8	16,6	
		811.22		54621	20	0,53	2,1	4,0	5,6	7,2	12,0	16,8
					30	0,8	1,3	3,2	4,8	6,4	11,2	16,0
UIII	720	811.31	54630	20	0,53	6,3	10,6	14,2	17,8	28,6	39,4	
				30	0,8	3,7	8,0	11,6	15,2	26,0	36,0	
		811.32		54631	30	0,53	6,4	10,7	14,3	17,9	28,7	39,5
					45	0,8	4,6	8,9	12,5	16,1	26,9	37,7
		811.33		54632	60	0,8	3,8	8,1	11,7	15,3	26,1	36,9
		UV		1440	811.41	54650	30	0,4	14,9	23,6	30,8	38,0
45	0,6		12,3				21,0	28,2	35,4	57,1	78,6	
60	0,8		9,7				18,4	25,6	32,8	54,4	76,2	
811.42	54651		60		0,6		11,8	20,4	27,6	34,8	56,4	78,0
			75		0,8		9,7	18,3	25,5	32,7	54,3	75,9
811.43	54652		100		0,8		7,9	16,5	23,7	30,9	52,5	74,1
UV	1440	811.47	54652	120	1,0	-	-	-	-	-	-	
		811.48	54658	120	2,5	-	-	-	-	21,0	43,0	

# Technical Data Sheet

## pneum. Multi-Spring-Actuator



TD\_812

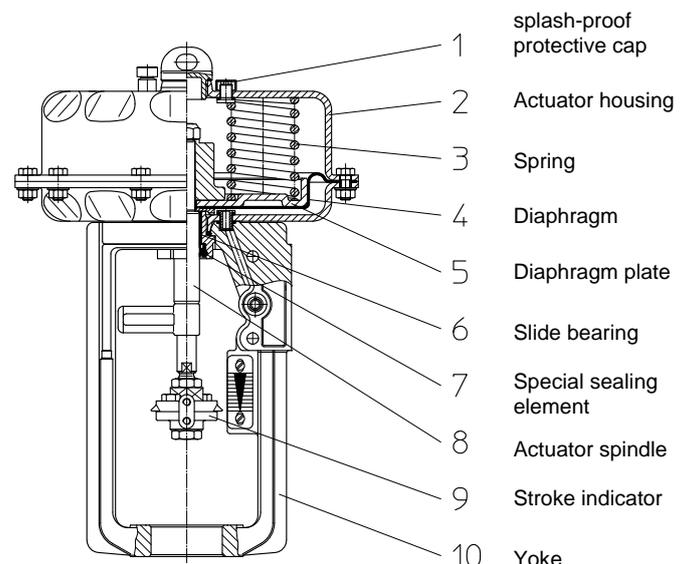
### Technical Data

<b>Series</b>	812
<b>Diaphragm effective area</b>	320 / 720 cm <sup>2</sup>
<b>Stroke</b>	20-60 mm
<b>Control signal</b>	6 bar max.
<b>Materials</b>	Diaphragm- and spring chamber: Steel ST W 22, 1.0332 (Optional: stainless steel 1.4301) Diaphragm plate: St W 22 chromitized Yoke: GGG-40, 0.7040 Spindle: 1.4122 Springs: 1.1230 plastic-covered Diaphragm: NBR, fabric-reinforced (moulded) Gasket: high-quality, special polyurethane
<b>Spring chamber</b>	Optionally with air scavenging
<b>Operating temperature</b>	-20 to +80°C (Option -40 to + 80°C)
<b>No. of springs</b>	3-12
<b>Control force spring max.</b>	4,8 - 16 kN
<b>Control force air max.</b>	14,4 - 32,4 kN

### Functional description

The ARCAPAQ® is a pneumatic multi-spring diaphragm actuator with spring return (fail safe) and is used to actuate linear valves. The actuator positions the valve plug, which in turn is controlled by a pneumatic or electro-pneumatic positioner. These actuators can be operated in the "Air to open" function or with the reverse action "Air to close".

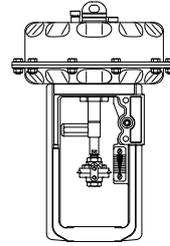
- The actuator has a compact design with a low installed height. Various spring sets with different ranges ensure good adaptation to the relevant operating conditions.
- A fabric-reinforced diaphragm ensures smooth conversion of the pneumatic application of pressure into the linear motion of the actuator spindle. The power diaphragm (4), supported by the diaphragm disc (5), is connected to the actuator spindle (8) and separates the actuator housing (2) into pressure and spring chambers. If the force of the compressed air control signal exceeds the opposing spring force (3), the actuator spindle (8) moves and actuates the linear valve.
- The control signal is carried to the diaphragm chamber via internal channels in the yoke (10). The air supply and venting (ventilation) of the spring chamber is carried out by means of the protective cap (1), which is impermeable to splash water, or the chamber is purged through internal channels with the air from the positioner.
- The yoke (10) connects the actuator to the control valve, while the actuator spindle (8) is connected to the valve spindle via the coupling shown as a stroke indicator (9), securely guided in the slide bearing (6) and sealed with a special sealing element (7) with wiper.



- 1 splash-proof protective cap
- 2 Actuator housing
- 3 Spring
- 4 Diaphragm
- 5 Diaphragm plate
- 6 Slide bearing
- 7 Special sealing element
- 8 Actuator spindle
- 9 Stroke indicator
- 10 Yoke

# Technical Data Sheet

## pneum. Multi-Spring Actuator



**TD\_812**

### Control forces and control ranges

#### Opening function (air to open - spring to close)

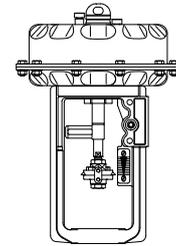
Size	Diaphragm surface (cm <sup>2</sup> )	Type	No. of springs	Stroke (mm)	Control range		Control force (kN)	Force diagram (page 4)
					from (bar)	to (bar)		
MFI-20	320	812-213..	3	20	0,75	1,5	2,4	IA
			6		1,5	3,0	4,8	
812-224..		3	1,0		1,5	3,2	IB	
		6	2,0		3,0	6,4		
7		2,3	3,5		7,4			
		3	0,75		1,5	2,4		II
MFI-30		812-234..	6	30	1,5	3,0	4,8	
			3		0,7	1,5	5	III
812-334..			6		1,5	3,0	10	
			9		1,8	3,7	13	
12			2,2		4,4	16		
			MFI-60		812-346..	3	60	0,7
6	1,4	3,0		10				
9	1,7	3,6		12				
12	2,0	4,3		14				

#### Closing function (air to close - spring to open)

Size	Diaphragm surface (cm <sup>2</sup> )	Type	No. of springs	Stroke (mm)	Control pressure min. bar	Control force (kN) depending on control pressure				
						2,0 bar	3,0 bar	4,0 bar	5,0 bar	6,0 bar
MFI-20	320	812-213..	3	20	1,5	1,6	4,8	8,0	11,2	14,4
			6		3,0	-	-	3,2	6,4	9,6
812-224..		3	1,5		-	4,8	8,0	11,2	14,4	
		6	3,0		-	-	3,2	6,4	9,6	
7		3,5	-		-	1,6	4,8	8,0		
		3	1,5		1,6	4,8	8,0	11,2	14,4	
MFI-30		812-234..	6	30	3,0	-	-	3,2	6,4	9,6
			3		1,5	3,6	10,8	18	25,2	32,4
812-334..			6		3,0	-	-	7,2	14,4	21,6
			9		3,7	-	-	2,2	9,4	16,6
12			4,4		-	-	-	4,3	11,5	
			MFI-60		812-346..	3	60	1,5	3,6	10,8
6	3,0	-		-		7,2		14,4	21,6	
9	3,6	-		-		2,9		10,1	17,3	
12	4,3	-		-		-		5,0	12,2	

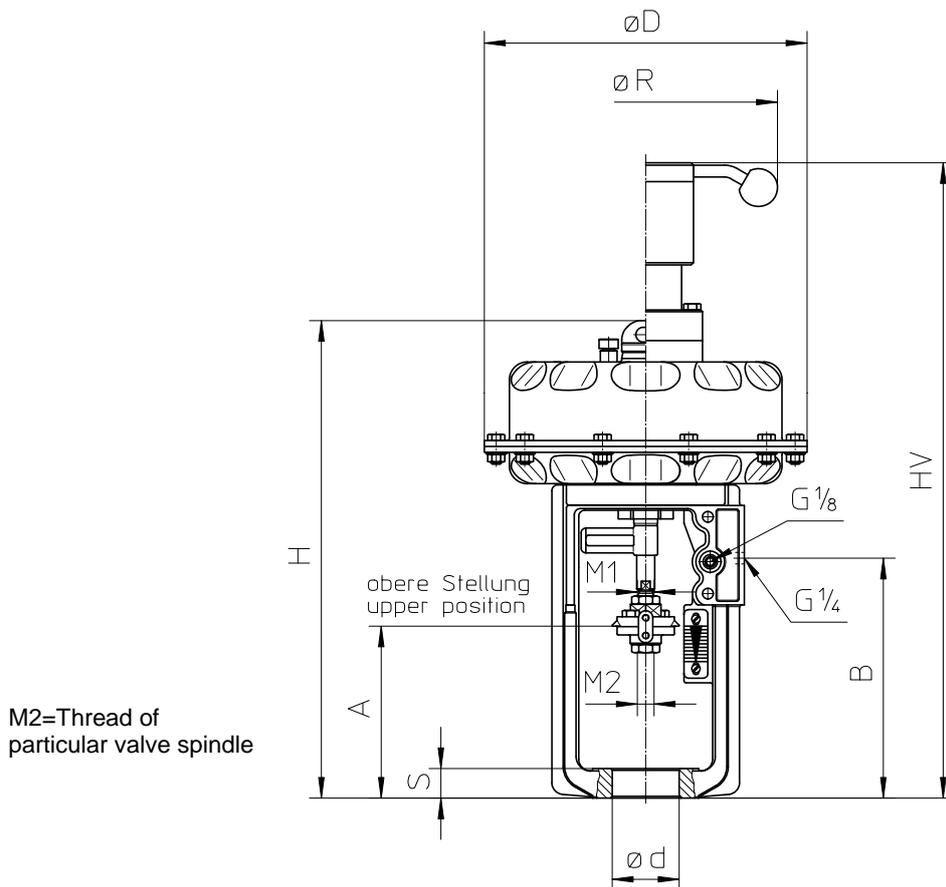
# Technical Data Sheet

## pneum. Multi-Spring Actuator



TD\_812

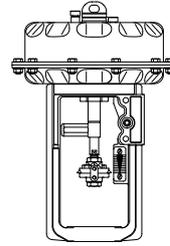
### Dimensions and weights



Size	Diaphragm surface (cm <sup>2</sup> )	Type	Weight	No. of springs	Stroke (mm)	Ø D (mm)	M1 actuator	Ø d (mm)	S (mm)	A (mm)	B (mm)	H (mm)	HV (mm)	Ø R (mm)									
MFI-20	320	812-213..	14	3	20	270	14	40	20	120	180	361	508	220									
				6																			
812-223..		3	20	48	25			142				381	528										
		6																					
MFI-20(v)		812-224..	15	3								20	400		20x1,5	56	30	192	309	404	551	335	
				6																			
MFI-30	812-234..	16	3	30		20x1,5	72		30	192	309	625		489		651							
			6																				
MFIII-30	720	812-334..	40	3	60		20x1,5	72						30		192				309	625		888
				6																			
				9																			
MFIII-60		812-346..	45	3	60		20x1,5	72					30	192	309	625	888						
				6																			
				9																			
			47	12																			

# Technical Data Sheet

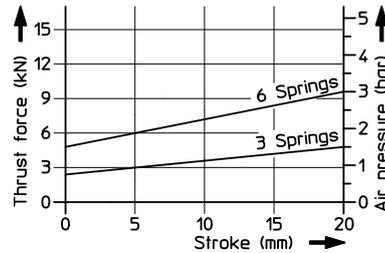
## pneum. Multi-Spring Actuator



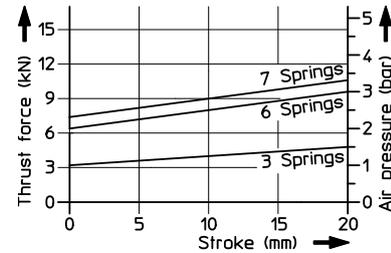
TD\_812

### Force diagram

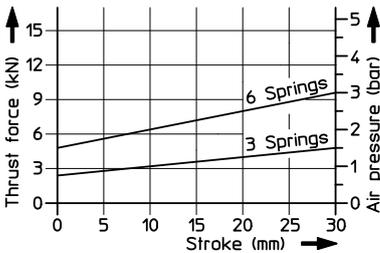
IA MFI-20



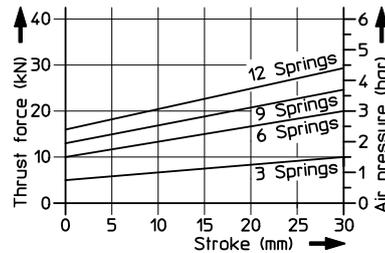
IB MFI-20(v)



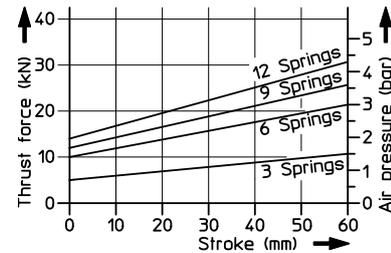
II MFI-30



III MFIII-30



IV MFIII-60



### Type code

812 -2 2 3 3 2- O B 0 -HV

#### Series

#### Actuator size

2 MFI diaphragm surface 320 cm<sup>2</sup>  
3 MFIII diaphragm surface 720 cm<sup>2</sup>

#### Yoke (ø = adapter in mm)

0 1 2 3 4 5 6 9  
w/o ø40 ø48 ø56 ø72 ø40-8C ø48-8C special

#### Stroke

1 2 3 4 5 6  
10 mm 15 mm 20 mm 30 mm 45 mm 60 mm

#### Spring set

3=3 springs 6(7)=6(7) springs 9=9 springs 0=12 springs

#### Material of diaphragm chamber

2 = Steel StW22 3 = Stainless steel

#### Function

O = springs move the spindle downwards (air to open)  
S = springs move the spindle upwards (air to close)

#### Execution

B or E\*

#### Extra equipment

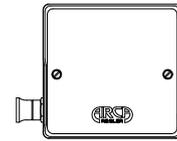
0 1 2 3 4 5  
None Stroke limitation Lifting eye 1+2 Low temperature design Air connection 1/2"

#### Handwheel

\* Exec. B: Reversible, w/o spring chamber purge; Exec. E: Reversible, with integrated spring chamber purge.

# Technical Data Sheet

## Positioner Type 824

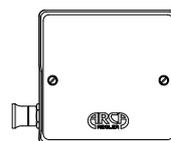


**TD\_824**

### General data

<b>Mounting</b>	On linear actuators	ARCA-integrated or acc. to IEC 534-6 (NAMUR) Range of stroke 10 ... 120 mm
	On quarter-turn actuators	ARCA-integrated or acc. to VDI/VDE 3845 Angle of rotation 90 °
<b>Enclosure material</b>		Aluminium cast / plastic
<b>Degree of protection</b>		IP 54, type 824.D IP 65 acc. to EN 60529
<b>Installation position</b>		Any installation position possible
<b>Climate class</b>	Operation	4K3, but -20 ... +80 °C, low temperature execution -40 ... +80 °C (see electrical data for explosion-protected devices)
	Storage	1K5, but -40 ... +80 °C
	Transport	2K4, but -40 ... +80 °C
<b>Vibration resistance</b>		< 10 g acc. to DIN 89011 Recommended continuous range for complete fittings ≤ 3 g
<b>CE marking</b>		Compliant with EMC Directive 2004/108/EC in accordance with EN 61326 A1 and NAMUR NE21 08.98
<b>Controller data</b>	Gain	max. 100
	Hysteresis	< 0,7 % of the control range
	Response level	< 0,5 % of the control range
	Nonlinearity	< 2 % of the control range
	Supply air influence	< 0,2 % / 0,1 bar, type 824.P < 0,1 % / 0,1 bar
<b>Dimensions</b>		See dimensional drawings figure 1 to 3
<b>Weight</b>	Type 824.P	Approx. 1,8 kg
	Type 824.E and 824.X	Approx. 2,0 kg
	Type 824.D	Approx. 2,8 kg
	Pressure gauge block	Approx. 0,5 kg
<b>Connections</b>	Electric	In dependence of version 0 to 2 cable inlets M20 x 1,5
	Pneumatic with external pipe	(X), Y and Z: collateral G ¼ DIN 45141, special version ¼"NPT, 824.D: behind G ¼ DIN 45141
	Pneumatic with internal pipe	(X), and Z: collateral G ¼ DIN 45141, Y: behind G 1/8 824.D: Z: behind G ¼ DIN 45141, Y: behind G 1/8

# Technical Data Sheet Positioner Type 824



**TD\_824**

## Pneumatic data

<b>Inlet air pressure</b>		1,4...6 barg
<b>Air quality</b>	Solids	ISO 8573-1 Class 2 (particle size $\leq 1 \mu\text{m}$ , particle density $\leq 10 \text{ mg/Nm}^3$ )
	Dew point	ISO 8573-1 Class 2 (- 40 °C, min. 20 K below ambient temperature, low temperature execution < - 50 °C)
	Oil content	ISO 8573-1 Class 2 ( $\leq 0,1 \text{ mg/Nm}^3$ )
<b>Air consumption</b>		< 0,6 Nm <sup>3</sup> /h, type 824.P < 0,5 Nm <sup>3</sup> /h during stationary operation
<b>Flow rate</b>		6 Nm <sup>3</sup> /h at 1,4 barg

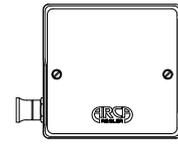
## Explosion protection basic device

<b>Explosion protection</b>	Intrinsically safe zone 1+2 (gas)	II 2 G EEx ia IIC T6 EC type-examination certificate TÜV 99 ATEX 1487X	
	Flame-proof	II 2 G EEx d IIC T4/T5/T6 EC type-examination certificate DMT 02 ATEX E121X	
<b>Internal capacitance</b>		Negligible	
<b>Internal inductance</b>		Negligible	
<b>Valid ambient temperature for connection to circuits with ①</b>	T4	- 55 ... + 80 °C	$U_0 \leq \text{DC } 28 \text{ V}$ , $I_K \leq 120 \text{ mA}$ , $P \leq 3,3 \text{ W}$
	T5	- 55 ... + 70 °C	$U_0 \leq \text{DC } 38,8 \text{ V}$ , $I_K \leq 60 \text{ mA}$ , $P \leq 2,3 \text{ W}$
	T6	- 55 ... + 60 °C	$U_0 \leq \text{DC } 42,5 \text{ V}$ , $I_K \leq 50 \text{ mA}$ , $P \leq 2,1 \text{ W}$

## Electrical / pneumatic data basic device

	Pneumatic	Not explosion-proof	Intrinsically safe	Flame-proof
<b>Electrical connection</b>		Figure 4	Figure 4	Figure 4
<b>Input signal</b>	0,2 ... 1 bar	0 / 4 ... 20 mA	0 / 4 ... 20 mA	0 / 4 ... 20 mA
<b>Split ranges</b>	0,2 ... 0,6 ... 1 bar	0 / 4 ... 10 / 12 ... 20 mA	0 / 4 ... 10 / 12 ... 20 mA	0 / 4 ... 10 / 12 ... 20 mA
<b>Load resistance</b>		170 $\Omega$	170 $\Omega$	260 $\Omega$
<b>Required load voltage</b>		3,4 V	3,4 V	5,2 V

# Technical Data Sheet Positioner Type 824



TD\_824

## Electrical data options – inductive limit switches

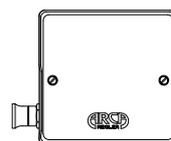
Version	824.P ...	824.E ...	824.X ...	824.D ...
<b>Limit switch N</b>	824 . [ ] [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ] <b>1</b> [ ]			
Normal version	2 wire connection to DIN 19234 (NAMUR), for connected switching amplifier			-
2 slot initiators	Type SJ3,5-N			-
Function	Break contact (NC, normally closed)			-
Hysteresis	≤ 1 %			-
Control loop	See connected switching amplifier			-
Explosion protection zone 1+2 (gas)	-		II 2 G EEx ia IIC T6 ④	-
EC type-examination certificate	-		PTB 99 ATEX 2219 X	-
EMC acc. to	EN 60947-5-2 and DIN 19234			-
Electrical connection	Figure 5	Figure 5	Figure 5	-

<b>Limit switch SN</b>	824 . [ ] [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ] <b>2</b> [ ]			
Safety version	2 wire connection to DIN 19234 (NAMUR) for connected switching amplifier in safety version			-
2 slot initiators	Type SJ3,5-SN			-
Function	Break contact (NC, normally closed)			-
Hysteresis	≤ 1 %			-
Control loop	See connected switching amplifier			-
Explosion protection zone 1+2 (gas)	-		II 2 G EEx ia IIC T6 ④	-
EC type-examination certificate	-		PTB 00 ATEX 2049 X	-
EMC acc. to	EN 60947-5-2 and DIN 19234			-
Electrical connection	Figure 5	Figure 5	Figure 5	-

<b>Limit switch E2</b>	824 . [ ] [ ] [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ] <b>3</b> [ ]			
Direct switching version	3 wire connection with integrated switching amplifier			-
2 slot initiators	Type SB3,5-E2			-
Function	Make contact (NO, normally open)			-
Hysteresis	≤ 1 %			-
Supply voltage	10...30 V DC			-
Max. load current	100 mA			-
Electrical connection	Figure 6	Figure 6		-

# Technical Data Sheet

## Positioner Type 824



TD\_824

### Electrical data options – potentiometer and position feedback

Version	824.P ...	824.E ...	824.X ...	824.D ...
---------	-----------	-----------	-----------	-----------

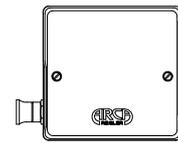
Potentiometer	824	.					-				2	
Resistance	200, 500 or 1000 Ohm ⑤											
Deviation of characteristic	≤ 2 % ⑥											
Internal capacitance C <sub>i</sub>	3,5 pF											
Internal inductance L <sub>i</sub>	10 μH											
Explosion protection						-			EEx i ⑦			
EC type-examination certificate						-			not necessary			
Electrical connection	Figure 7					Figure 7					-	

Position transmitter 3w	824	.					-				3	
3 wire connection	RWG, type 4522											
Supply voltage	15...24 V DC											
Output	4(0) - 20 mA, short-circuit resistant											
Current limitation	at ca. 28 mA											
Load resistance R <sub>i</sub>	0 - 400 Ohm											
Deviation of characteristic.	≤ 2 % ⑥											
Electrical connection	Figure 8					Figure 8					-	

Position transmitter 2w	824	.					-				4	
2 wire connection	RWG, type TMT 136R											
Supply voltage	8,5 ... 36 V DC											
Output	4 - 20 mA, short-circuit resistant											
Current limitation	at ca. 36 mA											
Load resistance R <sub>i</sub>	1300 Ohm at 36 V DC											
Deviation of characteristic.	≤ 2 % ⑥											
Explosion protection						-			-			
EC type-examination certificate						-			-			
Electrical connection	Figure 9					Figure 9					-	

- ① Valid ambient temperature at other loops on request
- ② Special version to - 40° C (dew point < -50°C)
- ③ Special version NPT 1/4"
- ④ Only by connection to valid switching amplifier
- ⑤ Adjustment of zero point and range at receiver terminal
- ⑥ Deviation of characteristic depends on mounting and stroke, max. 5 %
- ⑦ Passive element, therefore an EC type-examination certificate is not required. The valid external inductance and capacitance (L<sub>a</sub> u. C<sub>a</sub>) must be higher then L<sub>i</sub> and C<sub>i</sub> of the potentiometer

# Technical Data Sheet Positioner Type 824



TD\_824

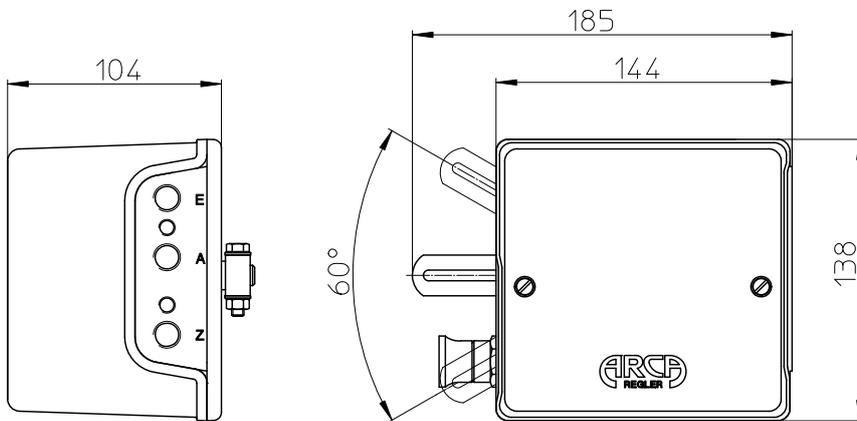


Figure 1 Dimensional drawing basic device type 824.P, 824.E and 824.X

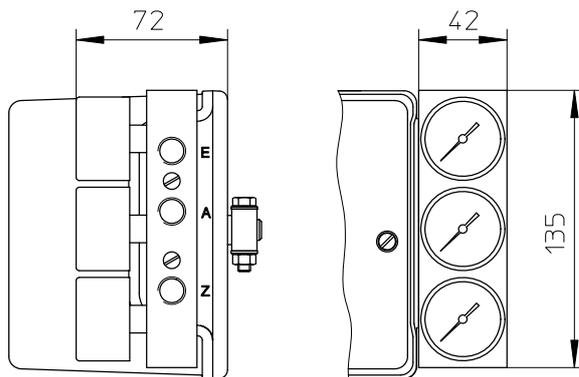


Figure 2 Dimensional drawing pressure gauge block

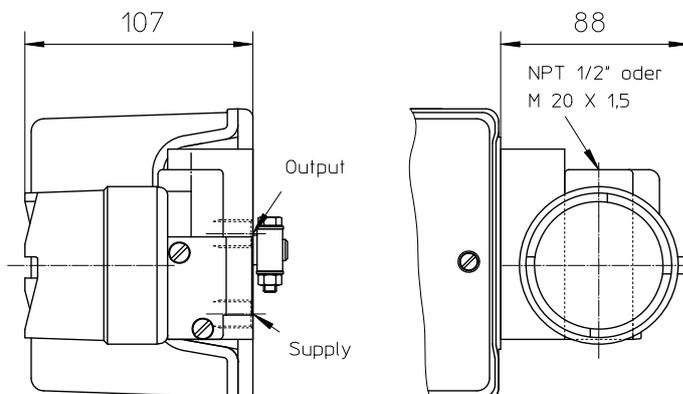
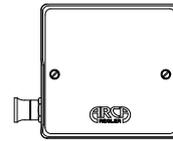
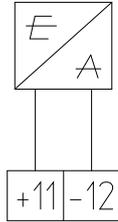


Figure 3 Dimensional drawing flame-proof type 824.D

# Technical Data Sheet Positioner Type 824



**TD\_824**



4 – 20 mA

Figure 4 Electrical connection signal input basic device, type 824.E, 824.X and 824.D

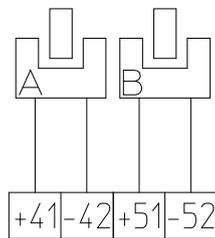


Figure 5 Electrical connection 2 wire limit switch (N and SN)

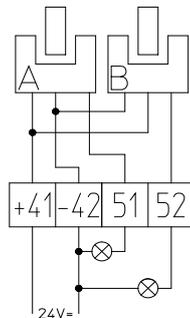


Figure 6 Electrical connection 3 wire limit switch (E2)

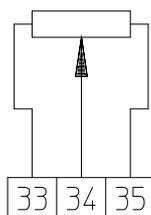
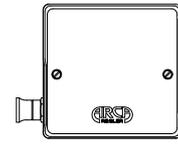


Figure 7 Electrical connection feedback potentiometer

# Technical Data Sheet Positioner Type 824



TD\_824

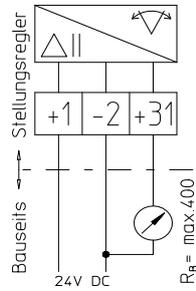


Figure 8 Electrical connection 3 wire position transmitter

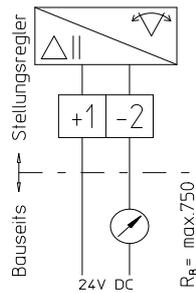
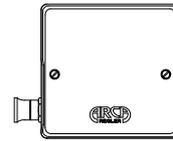


Figure 9 Electrical connection 2 wire position transmitter

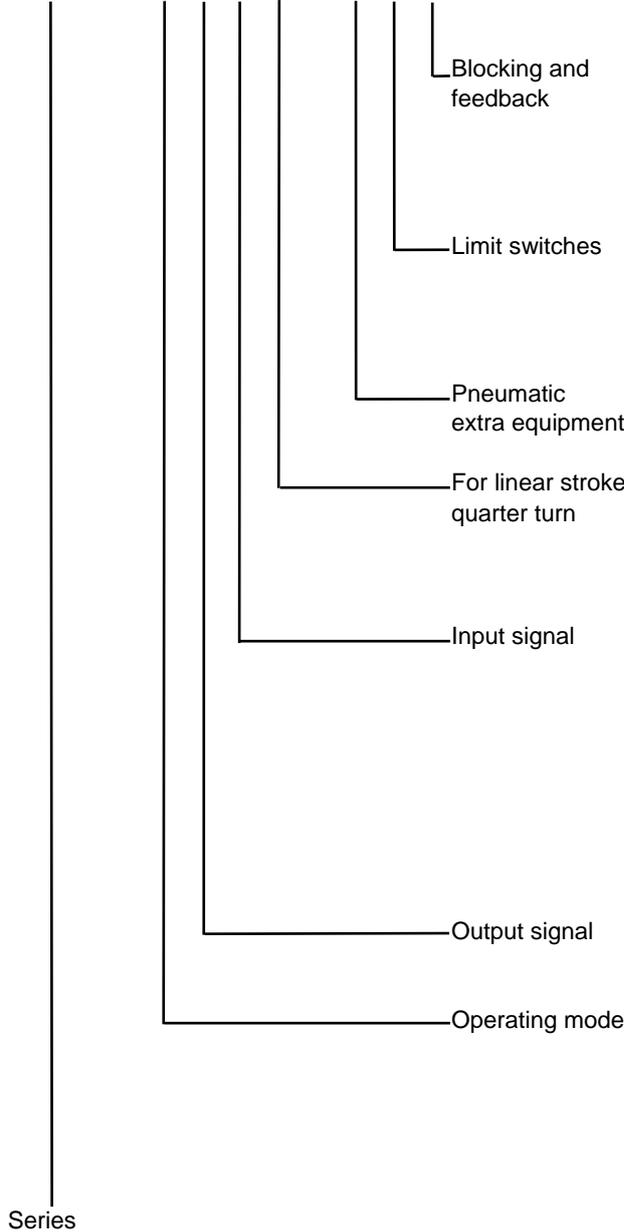
# Technical Data Sheet Positioner Type 824



**TD\_824**

## Order keys

8 2 4 . P 0 0 0 - 0 0 0



- |          |                             |
|----------|-----------------------------|
| <b>0</b> | without                     |
| <b>1</b> | ./.                         |
| <b>2</b> | Potentiometer               |
| <b>3</b> | Position transmitter 3 wire |
| <b>4</b> | Position transmitter 2 wire |
- 
- |          |                                     |
|----------|-------------------------------------|
| <b>0</b> | without                             |
| <b>1</b> | inductive normal version SJ3,5-N    |
| <b>2</b> | inductive safety version SJ3,5-SN   |
| <b>3</b> | inductive direct switching SB3,5-E2 |
- 
- |          |                      |
|----------|----------------------|
| <b>0</b> | without              |
| <b>1</b> | pressure gauge block |
- 
- |          |                       |
|----------|-----------------------|
| <b>0</b> | Stroke $\geq$ 20mm    |
| <b>1</b> | Stroke < 20mm         |
| <b>3</b> | Angle of rotation 90° |
| <b>4</b> | Angle of rotation 60° |
- 
- |          |             |
|----------|-------------|
| <b>0</b> | 0,2-1,0 bar |
| <b>1</b> | 4-20 mA     |
| <b>2</b> | 0-20 mA     |
| <b>3</b> | 0,2-0,6 bar |
| <b>4</b> | 0,6-1,0 bar |
| <b>5</b> | 4-12 mA     |
| <b>6</b> | 12-20 mA    |
| <b>7</b> | 0-10 mA     |
| <b>8</b> | 10-20 mA    |
- 
- |          |               |
|----------|---------------|
| <b>1</b> | single acting |
| <b>2</b> | double acting |
- 
- |          |   |
|----------|---|
| <b>P</b> | pneumatic                                   |
| <b>E</b> | electro-pneumatic, not explosion-proof      |
| <b>X</b> | electro-pneumatic, intrinsically safe EEx i |
| <b>D</b> | electro-pneumatic, flame-proof EEx d        |

# Technical Data Sheet

## ARCAPRO® Positioner Type 827A



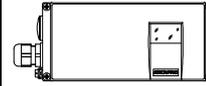
TD\_827A

### General data

<b>Mounting</b>	On linear actuators	ARCA-integrated or to VDI/VDE 3847-1 or IEC 534-6 (NAMUR) Range of stroke: 3 ... 130 mm
	On quarter turn actuators	Integrated to VDI/VDE 3847-2 or VDI/VDE 3845 Angle of rotation: 30 ... 100°
<b>Enclosure material</b>	Metal	Aluminium cast AlSi 12 or austenitic stainless steel 1.4581
	Plastic	Glass-fibre-reinforced polycarbonate
<b>Degree of protection</b>		IP 66 to EN 60529
<b>Installation position</b>		Any installation position possible; pneumatic connections and exhaust opening must not point upwards for wet applications
<b>Climate class</b>	Operation	4K3, but -30 ... +80 °C (Standard) -20...+60 °C (FIP) -40...+80 °C (LT) (see electrical data for explosion-protected devices)
	Storage	1K5, but -40 ... +80 °C
	Transport	2K4, but -40 ... +80 °C
<b>Vibration resistance</b>		98 m/s <sup>2</sup> , 27 ... 300 Hz Recommended continuous range for complete fitting ≤ 30 m/s <sup>2</sup>
<b>Classification according PED97/23/EC</b>		For fluid group 1 gases; fulfils requirements in article 3, paragraph 3 (good engineering practice)
<b>CE marking</b>		Applicable directives and standards see declaration of conformity
<b>Controller unit</b>	Five-point switch	Adaptive
	Dead zone	Adaptive or fixed from 0.1 ... 10 %
	Actuating times	≥1.5 s adjustable
<b>A/D converter</b>	Resolution	≤ 0.5 %
	Sampling time	10 ms
<b>Cycle time</b>	With / without HART communication	20 ms
	With PROFIBUS PA communication	60 ms
	With Fieldbus Foundation communication	60 ms
<b>Dimensions</b>		See dimension drawings 1 to 4
<b>Weight</b>	Metal enclosure, aluminium	Approx. 1.3 kg
	Metal enclosure, stainless steel	Approx. 3.9 kg
	Metal enclosure, flame-proof	Approx. 5.2 kg
	Plastic enclosure	Approx. 0.9 kg
<b>Connections</b>	Electric	Screw terminals 2.5 AWG28-12; cable inlet see order key
	Pneumatic	G 1/4 DIN 45141 or 1/4-18NPT, see order key

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Pneumatic data

<b>Operation</b>	Standard	At failure of electrical or pneumatical energy exhausting
<b>Option</b>	Fail In Place	At failure of electrical or pneumatical energy blocking
<b>Inlet air pressure</b>		1.4 ... 7 bar (Standard) / 3...7 bar (FIP)
<b>Air quality</b>	Solids	ISO 8573-1 Class 2 (particle size ≤ 1 µm, particle density ≤ 1 mg/Nm <sup>3</sup> )
	Dew point	ISO 8573-1 Class 2 (-40 °C, min. 20 K below ambient temperature)
	Oil content	ISO 8573-1 Class 2 (≤ 0.1 mg/Nm <sup>3</sup> )
<b>Air consumption</b>		< 36 Ndm <sup>3</sup> /h during stationary operation
<b>Flow rate (unthrottled)</b>	Air supply valve at Δp	2 bar - 4.1 Nm <sup>3</sup> /h, 4 bar - 7.1 Nm <sup>3</sup> /h, 6 bar - 9.8 Nm <sup>3</sup> /h
	Air exhaust valve at Δp	2 bar - 8.2 Nm <sup>3</sup> /h, 4 bar - 13.7 Nm <sup>3</sup> /h, 6 bar - 19.2 Nm <sup>3</sup> /h 2 bar - 4.3 Nm <sup>3</sup> /h, 4 bar - 7.3 Nm <sup>3</sup> /h, 6 bar - 9.8 Nm <sup>3</sup> /h
<b>Valve leakage</b>		< 0.6 Ndm <sup>3</sup> /h
<b>Throttle ratio</b>		Up to ∞ : 1 adjustable

### Electrical data for basic device

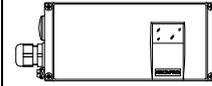
<b>Explosion protection</b>	Intrinsic safety "ia"	II2G Ex ia IIC T6/T4 Gb <sup>1)</sup> , Zone 1, II2D Ex ia IIIC 110°C Db, Zone 2 <sup>2)</sup>
	Intrinsic safety "ic"	II3G Ex ic IIC T6/T4 Gc <sup>1)</sup> , Zone 2 <sup>2)</sup>
	Non-sparking, "nA"	II3G Ex nA IIC T6/T4 Gc <sup>1)</sup> , Zone 2 <sup>2)</sup>
	Dust, protection by enclosure "t"	II3D Ex tb IIIC T100°C Dc, Zone 22 <sup>2)</sup>
	Flameproof "d"	II2G Ex d IIC T6/T4, Zone 1 <sup>2)</sup>
<b>Permissible ambient temperature</b>	"ia", "ic", "nA" with / without HART	T4 / T6 - 30 ... + 80 °C / - 30 ... + 50 °C (Standard) T4 / T6 - 20 ... + 60 °C / - 20 ... + 50 °C (FIP)
	"t" with / without HART	- 30 ... + 80 °C (Standard) - 20 ... + 60 °C (FIP)
	"ia", "ic", "nA" with PROFIBUS PA and Found.Fieldbus	T4 / T6 - 20 ... + 75 °C / - 20 ... + 50 °C
	"t" with PROFIBUS PA and Found.Fieldbus	- 20 ... + 75 °C
	"d"	T4 / T6 - 30 ... + 80 °C / - 30 ... + 50 °C

<sup>1)</sup> With analogue module T4 only

<sup>2)</sup> On request

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



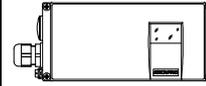
TD\_827A

### Electrical data for basic device with / without HART 2 wire connection

<b>Explosion protection</b>	without, "d"	„ia“	„ic“	“nA”, “t”
<b>Electrical connection</b>	See Figures 5 and 6	See Figures 5 and 6	See Figures 5 and 6	See Figures 5 and 6
<b>Communication</b>	HART version 7			
<b>Input signal <math>I_w</math></b>	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA
<b>Current to maintain the power supply</b>	$\geq 3.6$ mA	$\geq 3.6$ mA	$\geq 3.6$ mA	$\geq 3.6$ mA
<b>Required load voltage without HART 2 wire device</b>	6.5 V	8.3 V	8.3 V	8.3 V
<b>Required load voltage without HART 2/3/4 wire device</b>	8.4 V	-	-	-
<b>Required load voltage with HART 2 wire device</b>	6.7 V	-	-	-
<b>Required load voltage with HART 2/3/4 wire device</b>	-	8.8 V	8.8 V	8.8 V
<b>Static destruction limit</b>	$\pm 40$ mA	-	-	$\pm 40$ mA
<b>For connection to</b>	-	certified intrinsically safe circuits with max. $U_i = 30$ V $I_i = 100$ mA $P_i = 1$ W	intrinsically safe circuits with max $U_i = 30$ V $I_i = 100$ mA	circuits with max. $U_n = 30$ V $I_n = 100$ mA
<b>Internal capacitance</b>	-	11 nF	11 nF	-
<b>Internal inductance</b>	-	207 $\mu$ H without HART 310 $\mu$ H with HART	207 $\mu$ H without HART 310 $\mu$ H with HART	-
<b>Binary input BE1</b>	Suitable for dry contact, max. contact load $\leq 5$ $\mu$ A at 3 V			
<b>Electrical isolation</b>	$I_w$ and BE1 electrically connected	$I_w$ and BE1 electrically connected	$I_w$ and BE1 electrically connected	$I_w$ and BE1 electrically connected

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Electrical data for basic device with / without HART 3/4 wire connection

<b>Explosion protection</b>	without, "d"	„ia“	“ic”	“nA”, “t”
<b>Electrical connection</b>	See Figure 7	See Figure 7	See Figure 7	See Figure 7
<b>Communication</b>	HART version 7			
<b>Input signal I<sub>w</sub></b>	0/4 ... 20 mA	0/4 ... 20 mA	0/4 ... 20 mA	0/4 ... 20 mA
<b>Required load voltage</b>	0.2 V	1.0 V	1.0 V	1.0 V
<b>Power supply U<sub>H</sub></b>	DC 18 ... 35 V	DC 18 ... 30 V	DC 18 .. 30 V	DC 18 ... 30 V
<b>For connection to</b>	-	certified intrinsically safe circuits with max. U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA P <sub>i</sub> = 1 W	intrinsically safe circuits with max U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA	circuits with max. U <sub>n</sub> = 30 V I <sub>n</sub> = 100 mA
<b>Internal capacitance</b>	-	22 nF	22 nF	-
<b>Internal inductance</b>	-	0.12 mH	0.12 mH	-
<b>Binary input BE1</b>	Suitable for dry contact, max. contact load ≤ 5 µA at 3 V			
<b>Electrical isolation</b>	U <sub>H</sub> and I <sub>w</sub> electrically isolated, I <sub>w</sub> and BE1 electrically connected	U <sub>H</sub> and I <sub>w</sub> electrically isolated, I <sub>w</sub> and BE1 electrically connected	U <sub>H</sub> and I <sub>w</sub> electrically isolated, I <sub>w</sub> and BE1 electrically connected	U <sub>H</sub> and I <sub>w</sub> electrically isolated, I <sub>w</sub> and BE1 electrically connected

### Electrical data for basic device PROFIBUS PA

<b>Electrical connection</b>	See Figure 8
<b>Communication</b>	Layers 1 + 2 to PROFIBUS PA, transmission technique to IEC 1158-2, slave function layer 7 to PROFIBUS DP to EN 50170 with extended PROFIBUS functionality
<b>Device profile</b>	PROFIBUS PA profile B, version 3.0, over 150 objects
<b>Response time for a master telegram</b>	typically 10 ms
<b>Device address</b>	126 in the as-delivered condition

### Electrical data for basic device Foundation Fieldbus

<b>Electrical connection</b>	See Figure 9
<b>Communication</b>	H1 communication to specification of the Fieldbus Foundation, group 3, class 31 PS (Publisher/Subscriber) 1 resource block (RB2), 1 analogue output function block (AO), 1 PID function block (PID), 1 transducer block (standard advanced positioner valve)
<b>Physical layer profile</b>	123, 511
<b>Block execution times</b>	Analogue output function block 60 ms; PID function block 80 ms

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Electrical data for basic device PROFIBUS PA / Foundation Fieldbus

Explosion protection	without, "d"	„ia“	“ic”	“nA”, “t”
Power supply	Bus-powered	Bus-powered	Bus-powered	Bus-powered
Bus voltage	DC 9 ... 32 V	DC 9 ... 24 V	DC 9 ... 32 V	DC 9 ... 30 V
Current consumption	10.5 mA ± 10 %	10.5 mA ± 10 %	10.5 mA ± 10 %	10.5 mA ± 10 %
Fault current	0	0	0	0
For connection to	-	circuits with certified FISCO power supply with max. U <sub>i</sub> = 17,5 V I <sub>i</sub> = 380 mA P <sub>i</sub> = 5,32 W	circuits with FISCO power supply with max U <sub>i</sub> = 17,5 V I <sub>i</sub> = 570 mA	circuits with max. U <sub>n</sub> = 30 V I <sub>n</sub> = 100 mA
	-	circuits with certified barrier with max. U <sub>i</sub> = 17,5 V I <sub>i</sub> = 380 mA P <sub>i</sub> = 5,32 W	circuits with barrier with max U <sub>i</sub> = 17,5 V I <sub>i</sub> = 570 mA	
Internal capacitance	-	Negligible small	Negligible small	-
Internal inductance	-	8 µH	8 µH	-
Safety shutdown				
Input resistance	> 20 kΩ	> 20 kΩ	> 20 kΩ	> 20 kΩ
Signal status 0: active	DC 0 ... 4.5 V	DC 0 ... 4.5 V	DC 0 ... 4.5 V	DC 0 ... 4.5 V
Signal status 1: inactive	DC 13 ... 30 V	DC 13 ... 30 V	DC 13 ... 30 V	DC 13 ... 30 V
For connection to	-	certified intrinsically safe circuits with max. U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA P <sub>i</sub> = 1 W	intrinsically safe circuits with max U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA	circuits with max. U <sub>n</sub> = 30 V I <sub>n</sub> = 100 mA
Internal capacitance	-	Negligible small	Negligible small	-
Internal inductance	-	Negligible small	Negligible small	-
Binary input BE1	Suitable for dry contact, max. contact load ≤ 5 µA at 3 V			
Electrical isolation	Bus connection and safety shutdown electrically isolated, Bus connection and BE1 electrically connected	Bus connection and safety shutdown electrically isolated, Bus connection and BE1 electrically connected	Bus connection and safety shutdown electrically isolated, Bus connection and BE1 electrically connected	Bus connection and safety shutdown electrically isolated, Bus connection and BE1 electrically connected

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Electrical data for option modules – analogue module

Explosion protection	without, "d"	„ia“	“ic”	“nA”, “t”
Electrical connection	See Figure 10	See Figure 10	See Figure 10	See Figure 10
Nominal signal range	4...20 mA, short circuit resistant	4...20 mA, short circuit resistant	4...20 mA, short circuit resistant	4...20 mA, short circuit resistant
Dynamic range	3.6...20.5 mA	3.6...20.5 mA	3.6...20.5 mA	3.6...20.5 mA
Auxiliary voltage U <sub>H</sub>	+12...+35 V	+12...+30 V	+12...+30 V	+12...+30 V
External load R <sub>B</sub> [kΩ]	(U <sub>H</sub> [V] – 12)/I [mA]	(U <sub>H</sub> [V] – 12)/I [mA]	(U <sub>H</sub> [V] – 12)/I [mA]	(U <sub>H</sub> [V] – 12)/I [mA]
For connection to	-	certified intrinsically safe circuits with max. U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA P <sub>i</sub> = 1 W	intrinsically safe circuits with max U <sub>i</sub> = 30 V I <sub>i</sub> = 100 mA	circuits with max. U <sub>n</sub> = 30 V I <sub>n</sub> = 100 mA P <sub>n</sub> = 1 W
Internal capacitance	-	11 nF	11 nF	-
Internal inductance	-	Negligible small	Negligible small	-
Electrical isolation	Disconnected from basic device	Disconnected from basic device	Disconnected from basic device	Disconnected from basic device

### Electrical data for option modules – binary module

Explosion protection	without, "d"	„ia“	“ic”	“nA”, “t”
Electrical connection	See Figure 11	See Figure 11	See Figure 11	See Figure 11
Binary outputs A1, A2, fault				
Signal status “High” (not responded)	Conductive, R = 1 kΩ <sup>1)</sup>	≥ 2.1 mA <sup>2)</sup>	≥ 2.1 mA <sup>2)</sup>	≥ 2.1 mA <sup>2)</sup>
Signal status “Low” (responded)	Blocked, I <sub>R</sub> < 60 μA	≤ 1.2 mA <sup>2)</sup>	≤ 1.2 mA <sup>2)</sup>	≤ 1.2 mA <sup>2)</sup>
For connection to	-	certified intrinsically safe circuits with max. U <sub>i</sub> = 15 V I <sub>i</sub> = 25 mA P <sub>i</sub> = 64 mW	intrinsically safe circuits with max U <sub>i</sub> = 15 V I <sub>i</sub> = 25 mA	circuits with max. U <sub>n</sub> = 15 V I <sub>n</sub> = 25 mA
Internal capacitance	-	5,2 nF	5,2 nF	-
Internal inductance	-	Negligible small	Negligible small	Negligible small

<sup>1)</sup> – Current must be restricted to 10 mA per output if operated in flame-proof housing.

<sup>2)</sup> – Switching thresholds for supply to EN 60947-5-6: U<sub>H</sub> = 8.2 V, R<sub>i</sub> = 1 kΩ

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



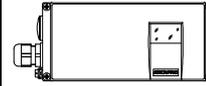
TD\_827A

### Electrical data for option modules – binary module (continuation)

Explosion protection	without, "d"	„ia“	“ic”	“nA”, “t”
Binary input BE2 Terminals 11/12			-	-
Auxiliary voltage U <sub>H</sub>	≤ DC 35 V ≤ 20 mA	-	-	-
Signal status 0:	≤ DC 4.5 V or open			
Signal status 1:	≥ DC 13 V			
Input resistance	> 25 kΩ	> 25 kΩ	> 25 kΩ	> 25 kΩ
Static destruction limit	± 35 V	-	-	-
For connection to	-	certified intrinsically safe circuits with max. U <sub>i</sub> = 25,2 V	intrinsically safe circuits with max U <sub>i</sub> = 25,2 V	circuits with max. U <sub>n</sub> = 25,2 V
Internal capacitance	-	Negligible small	Negligible small	-
Internal inductance	-	Negligible small	Negligible small	-
Binary input BE2 Terminals 21/22				
Signal state 0:	Dry contact, open	Dry contact, open	Dry contact, open	Dry contact, open
Signal state 1:	Dry contact, closed	Dry contact, closed	Dry contact, closed	Dry contact, closed
Contact load	3 V, 5 μA			
Electrical isolation	Binary outputs A1, A2, fault, binary input BE2 terminals 11/12 disconnected from basic device; binary input BE2 terminals 21/22 connected to basic device	Binary outputs A1, A2, fault, binary input BE2 terminals 11/12 disconnected from basic device, binary input BE2 terminals 21/22 connected to basic device	Binary outputs A1, A2, fault, binary input BE2 terminals 11/12 disconnected from basic device; binary input BE2 terminals 21/22 connected to basic device	Binary outputs A1, A2, fault, binary input BE2 terminals 11/12 disconnected from basic device; binary input BE2 terminals 21/22 connected to basic device

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Electrical data for option modules – slot initiator module

Explosion protection	without, "d"	„ia“	“ic”	“nA”, “t”
Electrical connection	See Figure 12	See Figure 12	See Figure 12	See Figure 12
Binary outputs A1, A2	Slotted initiators SJ2-SN to EN 60947-5-6 (NAMUR) for connecting to switching amplifier, NC (normally closed) function			
Signal state “High” (not responded)	$\geq 3 \text{ mA}$ at $U_{nom} = 8 \text{ V}$	$\geq 2.1 \text{ mA}^{1)}$	$\geq 2.1 \text{ mA}^{1)}$	$\geq 2.1 \text{ mA}^{1)}$
Signal state “Low” (responded)	$\leq 1 \text{ mA}$ at $U_{nom} = 8 \text{ V}$	$\leq 1.2 \text{ mA}^{1)}$	$\leq 1.2 \text{ mA}^{1)}$	$\leq 1.2 \text{ mA}^{1)}$
For connection to	$U_{nom} = 8 \text{ V}$	certified intrinsically safe circuits with max. $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	intrinsically safe circuits with max $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$	circuits with max. $U_n = 15 \text{ V}$ $I_n = 25 \text{ mA}$
Internal capacitance	-	41 nF	41 nF	-
Internal inductance	-	100 $\mu\text{H}$	100 $\mu\text{H}$	-
Binary output fault				
Signal status “High” (not addressed)	$R = 1,1 \text{ k}\Omega$	$\geq 2.1 \text{ mA}^{1)}$	$\geq 2.1 \text{ mA}^{1)}$	$\geq 2.1 \text{ mA}^{1)}$
Signal status “Low” (addressed)	$R = 10 \text{ k}\Omega$	$\leq 1.2 \text{ mA}^{1)}$	$\leq 1.2 \text{ mA}^{1)}$	$\leq 1.2 \text{ mA}^{1)}$
For connection to	$U_H \leq 35 \text{ V}$ $I \leq 20 \text{ mA}$	certified intrinsically safe circuits with max. $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	intrinsically safe circuits with max $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$	circuits with max. $U_n = 15 \text{ V}$ $I_n = 25 \text{ mA}$
Internal capacitance	-	5.2 nF	5.2 nF	-
Internal inductance	-	Negligible small	Negligible small	-
Electrical isolation	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device

<sup>1)</sup> – Switching thresholds for supply to EN 60947-5-6:  $U_H = 8.2 \text{ V}$ ,  $R_i = 1 \text{ k}\Omega$

# Technical Data Sheet

## ARCAPRO® Positioner Type 827A



TD\_827A

### Electrical data for option modules – contact module

<b>Explosion protection</b>	without, "d"	„ia“	“ic”	“t”
<b>Electrical connection</b>	See Figure 13	See Figure 13	See Figure 13	See Figure 13
<b>Binary outputs A1, A2</b>	dry contacts			
<b>Max. switching current</b>	4 A AC / DC	-	-	-
<b>Max. switching voltage</b>	250 V AC, 24 V DC	-	-	-
<b>For connection to</b>	-	certified intrinsically safe circuits with max. $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 750 \text{ mW}$	intrinsically safe circuits with max $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$	circuits with max. $U_n = 30 \text{ V}$ $I_n = 100 \text{ mA}$
<b>Internal capacitance</b>	-	Negligible small	Negligible small	-
<b>Internal inductance</b>	-	Negligible small	Negligible small	-
<b>Binary output fault</b>				
<b>Signal status “High” (not responded)</b>	$R = 1,1 \text{ k}\Omega$	$\geq 2.1 \text{ mA}^1)$	$\geq 2.1 \text{ mA}^1)$	$\geq 2.1 \text{ mA}^1)$
<b>Signal status “Low” (responded)</b>	$R = 10 \text{ k}\Omega$	$\leq 1.2 \text{ mA}^1)$	$\leq 1.2 \text{ mA}^1)$	$\leq 1.2 \text{ mA}^1)$
<b>For connection to</b>	$U_H \leq 35 \text{ V}$ $I \leq 20 \text{ mA}$	certified intrinsically safe circuits with max. $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	intrinsically safe circuits with max $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$	circuits with max. $U_n = 15 \text{ V}$ $I_n = 25 \text{ mA}$
<b>Internal capacitance</b>	-	5.2 nF	5.2 nF	-
<b>Internal inductance</b>	-	Negligible small	Negligible small	-
<b>Electrical isolation</b>	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device	Binary outputs A1, A2, fault disconnected from basic device

<sup>1)</sup> – Switching thresholds for supply to EN 60947-5-6:  $U_H = 8.2 \text{ V}$ ,  $R_i = 1 \text{ k}\Omega$

# Technical Data Sheet ARCAPRO® Positioner Type 827A



TD\_827A

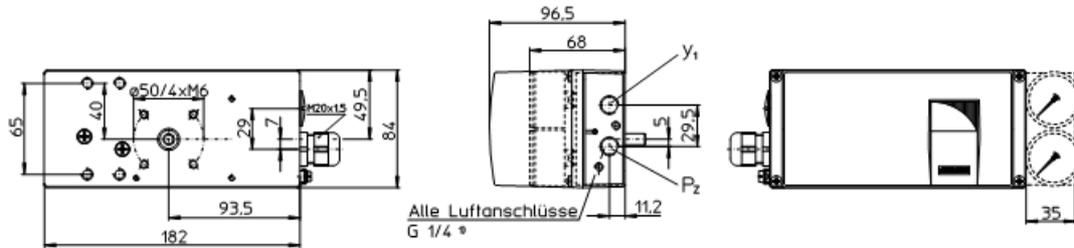


Figure 1 Metal enclosure, standard

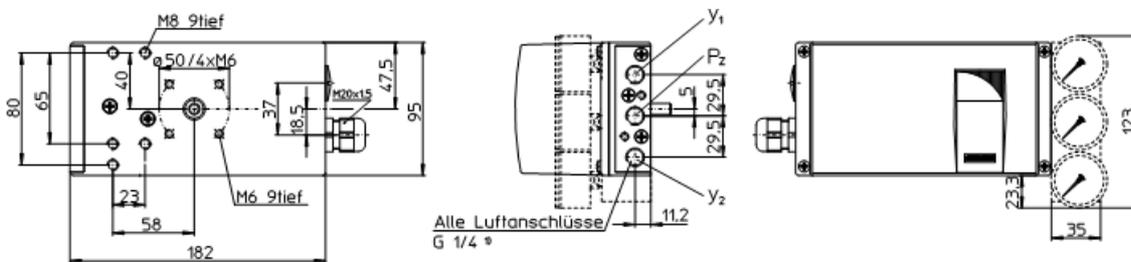


Figure 2 Plastic enclosure

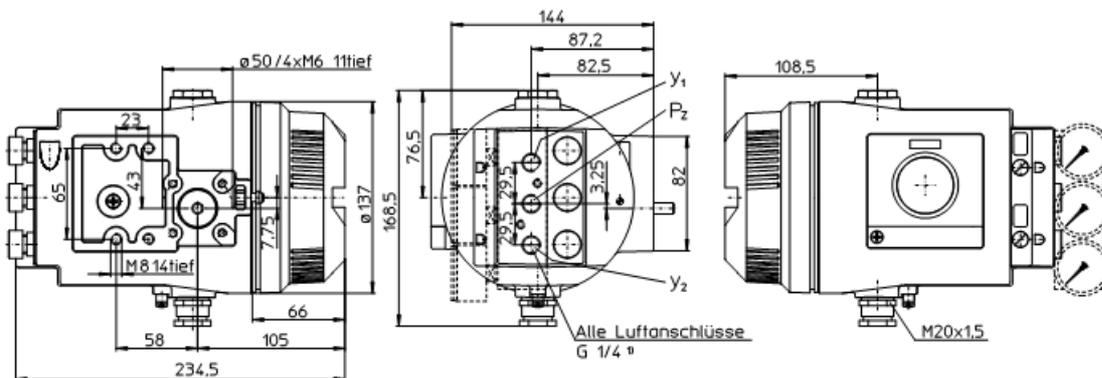


Figure 3 Metal enclosure, flame-proof

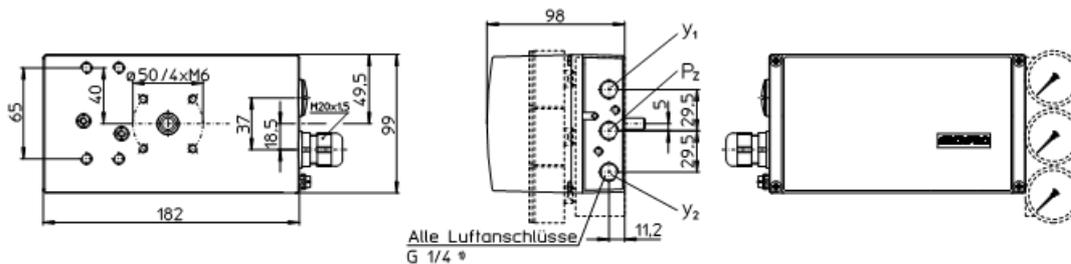


Figure 4 Metal enclosure, stainless steel

# Technical Data Sheet ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

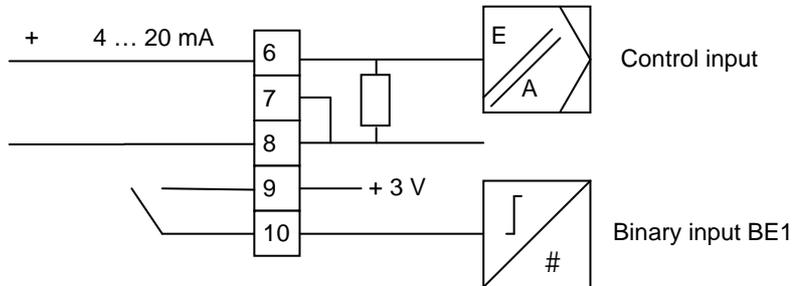


Figure 5 Electrical connection of 2 wire basic device

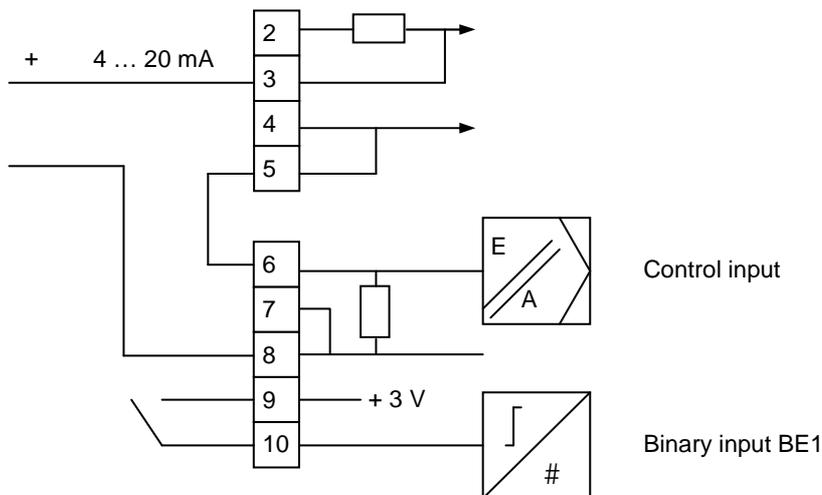


Figure 6 Electrical connection of 2/3/4 wire base device, 2 wire connection

# Technical Data Sheet ARCAPRO® Positioner Type 827A



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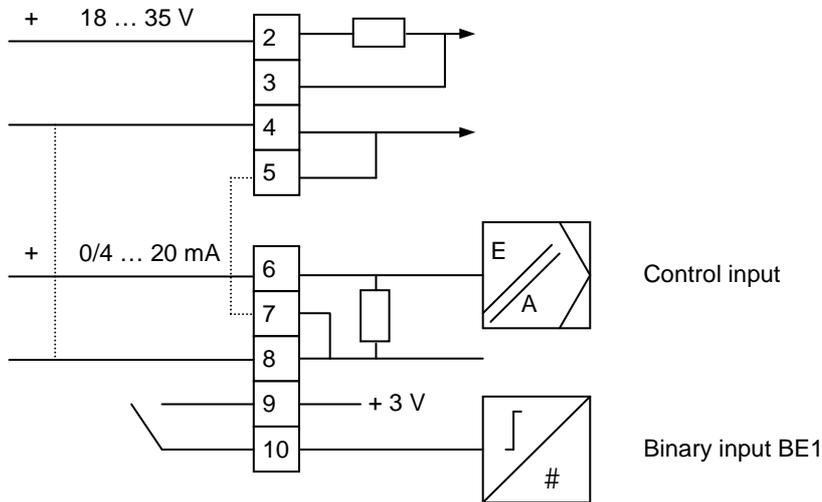


Figure 7 Electrical connection of 2/3/4 wire base device, 3/4 wire connection

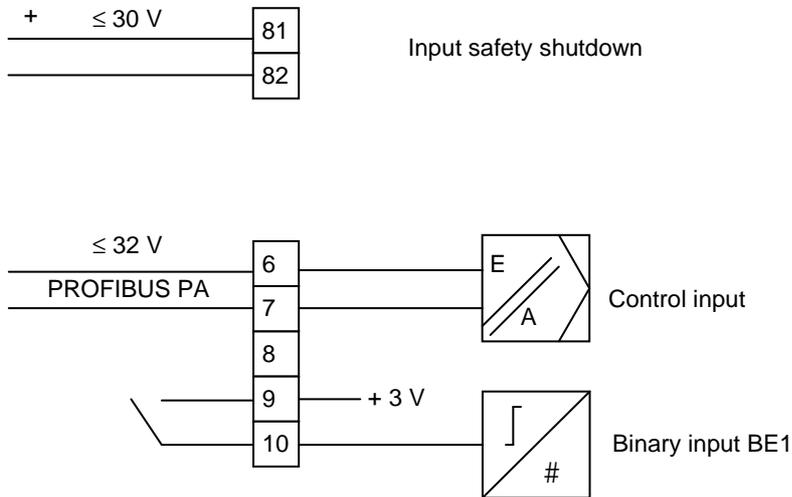


Figure 8 Electrical connection of base device, PROFIBUS PA

# Technical Data Sheet ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

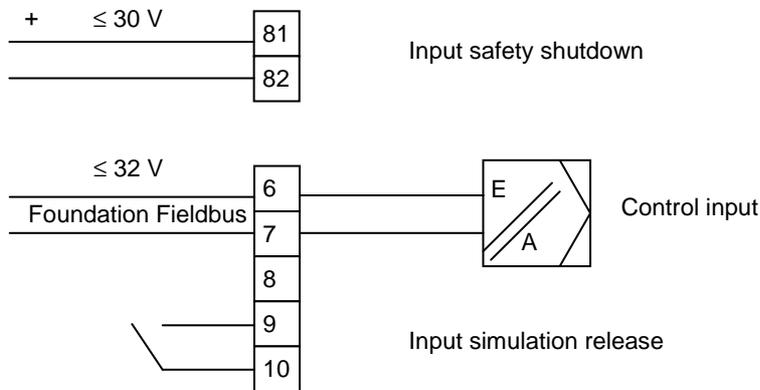


Figure 9 Electrical connection of base device, Fieldbus Foundation

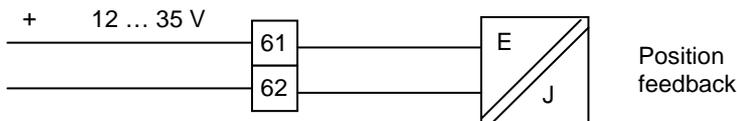


Figure 10 Electrical connection of analogue module

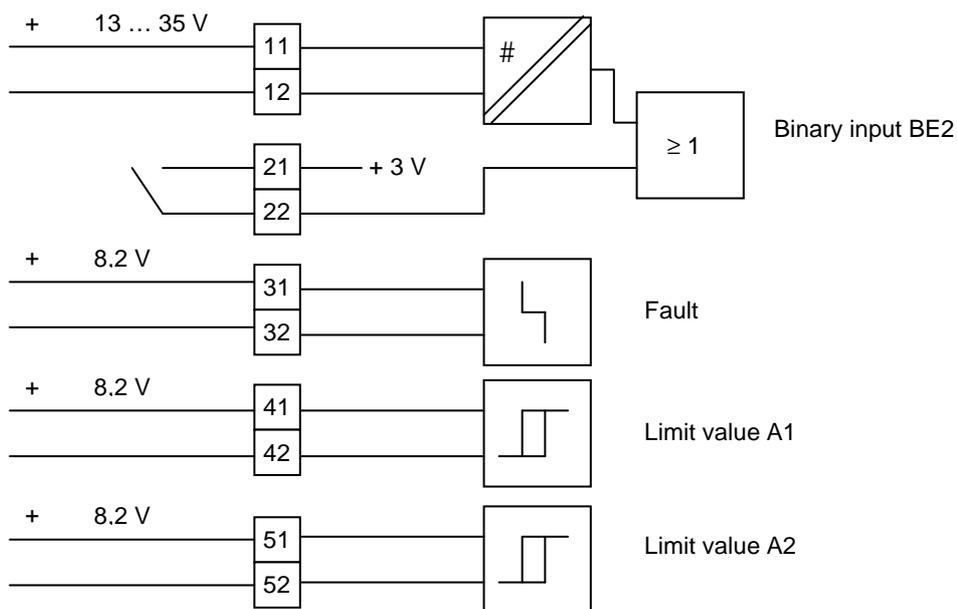


Figure 11 Electrical connection of binary module

# Technical Data Sheet ARCAPRO® Positioner Type 827A



TD\_827A

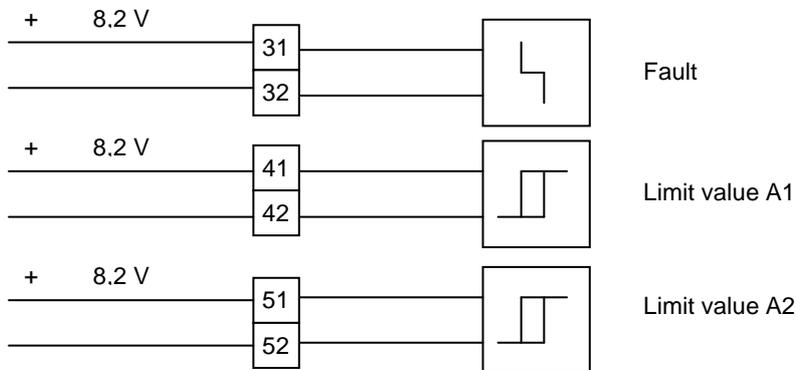


Figure 12 Electrical connection of slot initiator module

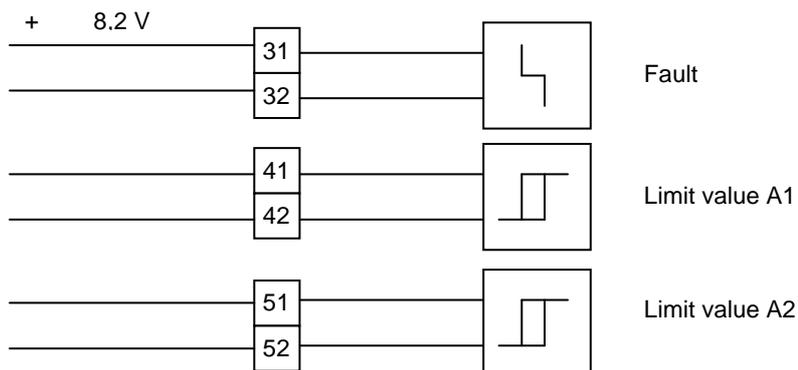


Figure 13 Electrical connection of contact module

# Technical Data Sheet

## ARCAPRO<sup>®</sup> Positioner Type 827A



TD\_827A

### Order keys for ARCAPRO<sup>®</sup> type 827A

1. Series		7. Enclosure material	
827A		M	Aluminium (single-acting only)
2. Explosion protection <sup>1)</sup>			Plastic <sup>6), 7)</sup>
E	Without	E	Stainless steel <sup>6)</sup>
X	Explosion-proof "ia" II2G <sup>2)</sup>	8. Pneumatics	
	Explosion-proof "ia" II2D, "ic" <sup>2), 3), 7)</sup>	1	Single-acting
	Explosion-proof "nA", "n" <sup>2), 4), 7)</sup>	2	Double-acting (aluminium housing excluded)
	Explosion-proof "d" <sup>7)</sup>		
3. Connection of base device		9. Mechanical actuation	
2	2 wire	0	Standard
4	2/3/4 wire <sup>5)</sup>	2	None (for external potentiometer)
4. Analogue output		10. Connection thread, electric / pneumatic	
0	Without analogue output	G	M20x1.5 / G 1/4
A	Analogue module	N	1/2" NPT / 1/4" NPT
5. Binary output		M	M20x1.5 / 1/4" NPT
0	Without binary output	P	1/2" NPT / G 1/4
B	Binary module	Q	M25x1.5 / 1/4" NPT (EEx d only)
S	Slot initiator module <sup>6)</sup>	R	PROFIBUS connector M12 / G 1/4
K	Contact module <sup>6)</sup>	S	PROFIBUS connector M12 / 1/4" NPT
6. Communication		11. Options	
0	Without communication	FIP	Fail In Place <sup>7)</sup>
H	HART	LT	- 40 °C <sup>7)</sup>
P	PROFIBUS PA		
F	Fieldbus Foundation		

<sup>1)</sup> ATEX approval, other approvals on request

<sup>2)</sup> With HART communication 2/3/4 wire only

<sup>3)</sup> Stainless steel housing excluded

<sup>4)</sup> Without inspection window

<sup>5)</sup> PROFIBUS PA and Foundation Fieldbus excluded

<sup>6)</sup> Not for flameproof devices

<sup>7)</sup> On request

### Example:

<b>827A.E2-A0H-</b>	<i>Positions 1 - 6</i>
---------------------	------------------------

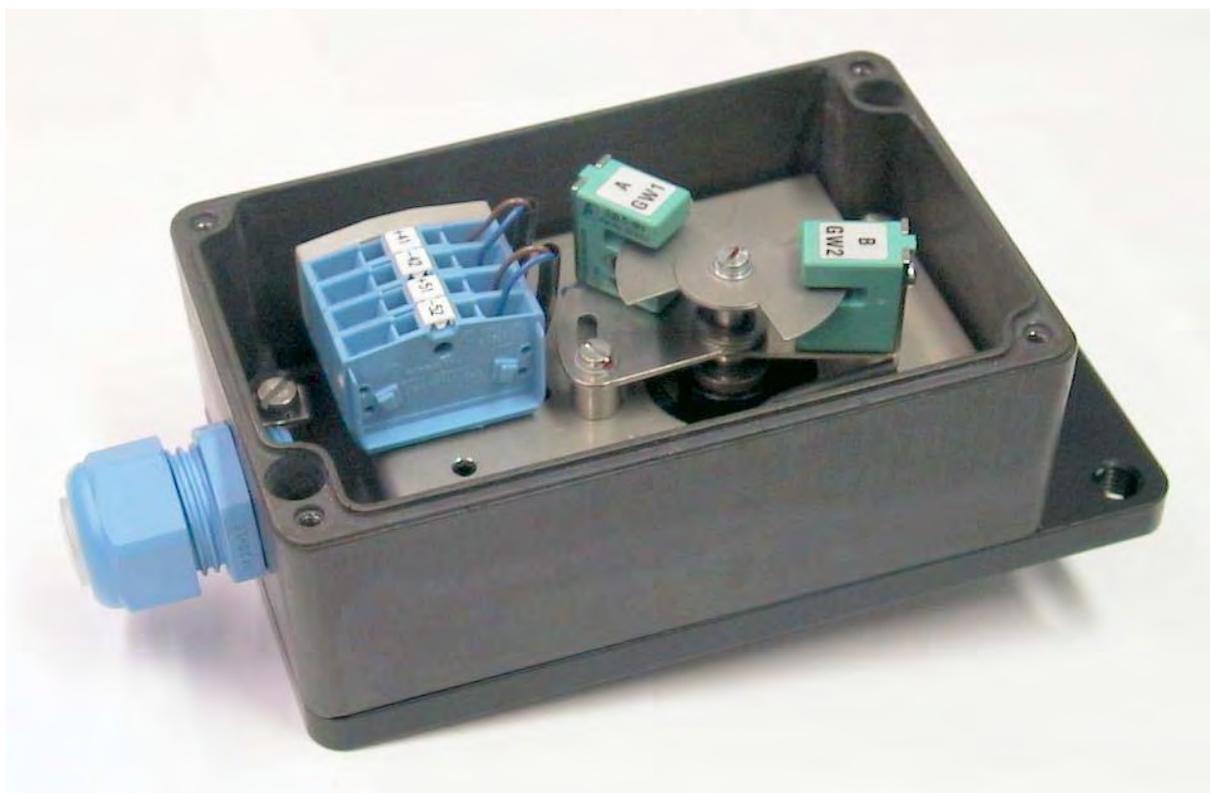
Positioner 827A – not explosion-proof – 2 wire connection – analogue module – without binary output – HART communication

<b>M10-G-LT</b>	<i>Positions 7 - 11</i>
-----------------	-------------------------

Aluminium enclosure – single-acting – mechanical actuation (standard) – connection thread electric M20x1.5 / pneumatic G 1/4 / - 40 °C

### Accessories

<b>Mounting kits</b>	For integrated mounting ARCA linear actuators type 812
	For integrated mounting ARCA linear actuators type 813
	For integrated mounting on linear actuators acc. to VDI/VDE 3847-1
	For mounting on linear actuators acc. to IEC 534 (NAMUR)
	For integrated mounting ARCA quarter turn actuators type 840
	For mounting on quarter turn actuators acc. to VDI/VDE 3845
<b>Pressure gauge blocks</b>	Pressure gauge block for single-acting or double-acting positioner
<b>Extern. position detection</b>	External rotary potentiometer for strokes to 130 mm
	External linear potentiometer



## Signal Box 827.S

**Inductive proximity switches (slot initiators)  
for linear and part-turn actuators**

# Technical Data Sheet



## Technical Data

### 1. Basic Instrument

<b>Signal box</b>	<b>827S.</b> . . .
<b>Angular range</b>	60° for linear valves (10 - 120 mm) and 90° for part-turn valves
<b>Ambient temperature</b>	- 40 to +80°C
<b>Connections</b>	
cable gland	1 x M20 x 1,5
cable terminals	suitable for max. 2,5 mm <sup>2</sup>
<b>Protection class</b>	IP 66
climate class	ZQF acc. to DIN 40040
<b>Weights</b>	0,8 kg

### 2. Inductive limit-value transmitter

<b>Execution</b>	<b>827S.</b> 0 . 1
<b>Standard</b>	2-core system acc. to DIN 19234 (NAMUR), for secondary switching amplifier
slotted switch initiator	type SC 3,5 N0-BU (spare for SJ3,5-N)
function	NC, normally closed
switching difference	≤ 1 %
control current circuit	see secondary switching amplifier
EMV conformance	EN 60947-5-2 and DIN 19234

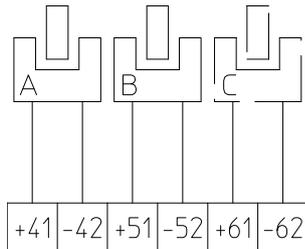
<b>Execution</b>	<b>827S.</b> 0 . 2
<b>Safety Function</b>	2-core system acc. to DIN 19234 (NAMUR) for switch amplifier in safety function (to be supplied by user)
slotted switch initiator	Type SJ 3,5 SN
function	NC, normally closed
switching difference	≤ 1 %
control current circuit	see secondary switching amplifier
EMV conformance	EN 60947-5-2 and DIN 19234

<b>Execution</b>	<b>827S.</b> E . 3
<b>Direct switching execution</b>	3-core system with integrated switching for direct switching
slotted switch initiator	Type SB 3,5 E2
function	NO, normally open
switching difference	≤ 1 %
operating voltage	10...30 V DC
max. output current load	100 mA

## 3. Description of function

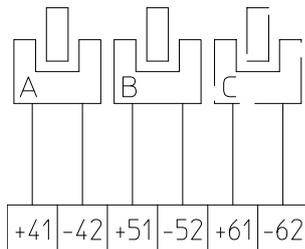
### 3.1 Standard execution (2-wire, N)

The proximity switches acc. to DIN 19234 or acc. to NAMUR respectively, are simple DC-switches in 2-core execution. The signals of the switches can be transmitted by means of a separate switch amplifier (to be supplied by customer). The values of current and voltage are so low that these proximity switches can be used - in combination with suitable switching amplifiers - in explosion hazardous zones. (protection class „intrinsically safe“). Generally, the switches have opening (NC) function.



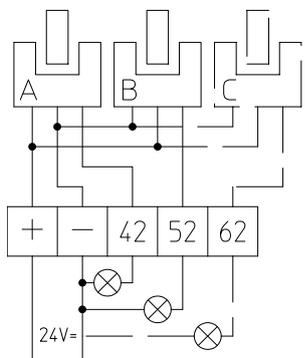
### 3.2 Safety system (2-wire, SN)

These proximity switches correspond to the standard execution, but with an additional function: In case of an error report of proximity switch, amplifier, or connecting cable, the output signal goes automatically into the safe „Out“- position (=logical „0“). Generally, the switches have opening (NC) function.



### 3.3 Direct switching execution (3-wire, E2)

The proximity switches of this type are provided with an integrated amplifier and have separate connections for current supply and load. This type must not be used in explosion hazardous zones. The switches have generally closing (NO), plus-switching (E2) function.

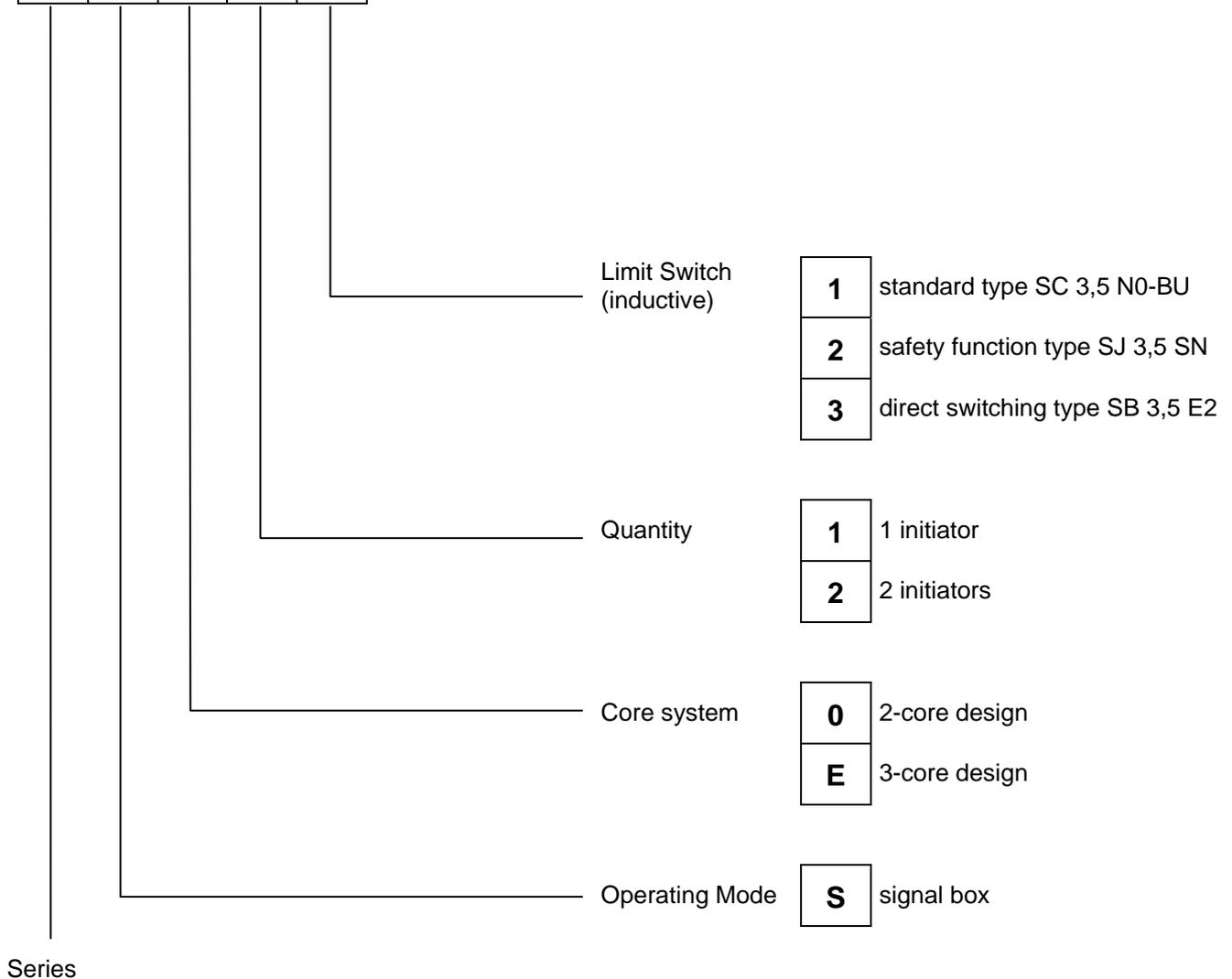


# Technical Data Sheet



## 4. Type Code

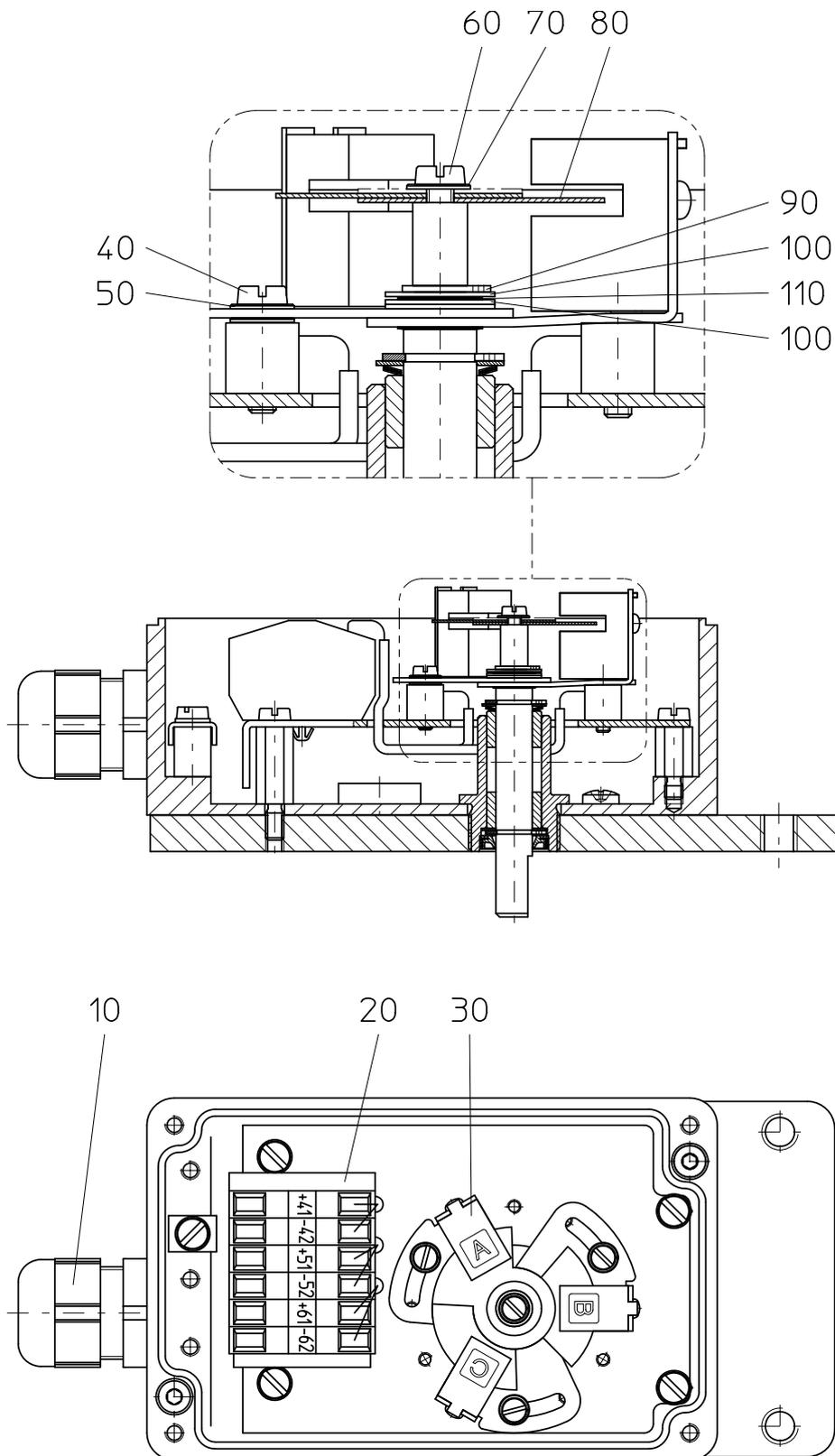
827	S.			
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# Technical Data Sheet



## 5. Design

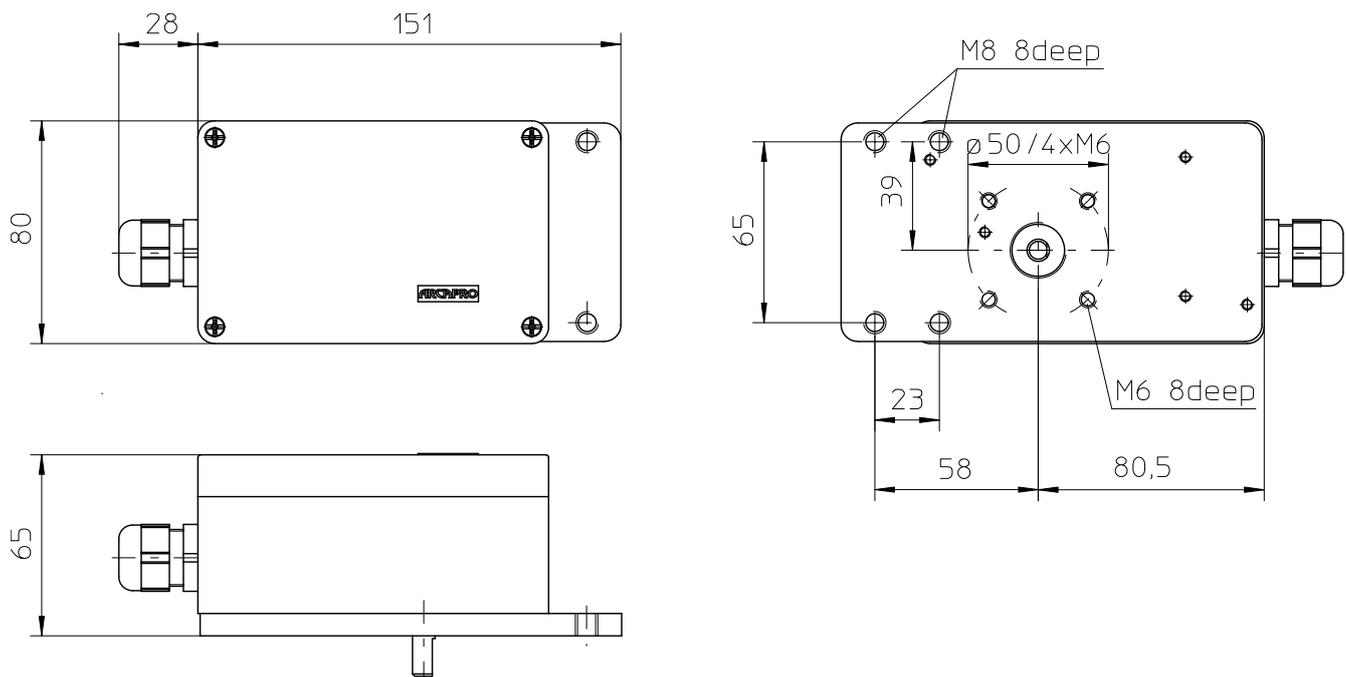


# Technical Data Sheet



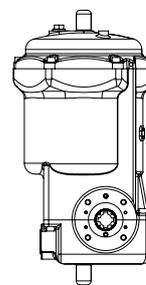
Pos.	Description
10	cable union
20	terminal block
30	proximity initiator
40	screw
50	washer
60	screw
70	washer
80	switch actuating disk
90	snap ring
100	washer
110	spring washer

## 6. Dimensions



# Technical Data Sheet

## Rotary Actuator



**TD\_840**

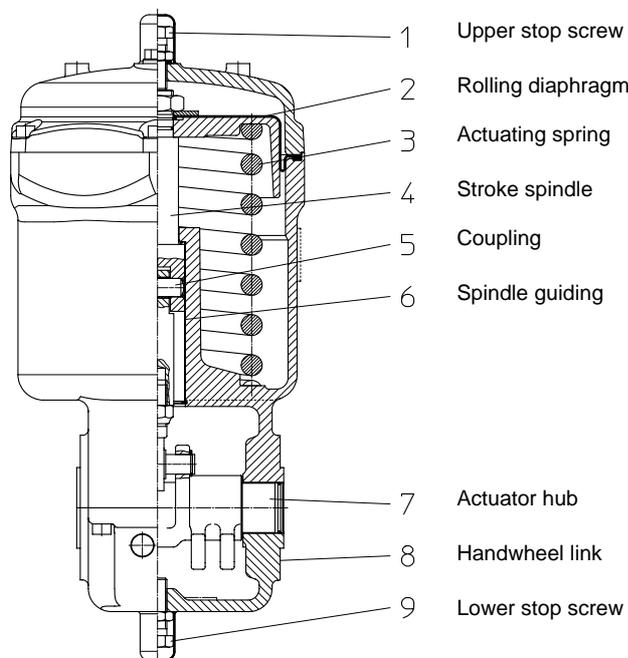
### Technical data

<b>Series</b>	840
<b>Diaphragm effective area</b>	104 - 780 cm <sup>2</sup>
<b>Rotary angle</b>	0-90° / 0-60° / 30-90°
<b>Control signal</b>	6 bar max.
<b>Materials</b>	Body: 3.2341/3.2371.61 Hub: 0.7040/0.7033 Rolling diaphragm: NBR, fabric-reinforced Bearing + guiding: PTFE/Graphite
<b>Spring chamber</b>	Optionally with air scavenging
<b>Operating pressure</b>	max. 7 bar ü
<b>Operating temperature</b>	-20 to +100°C (Option: -50 to +100°C)
<b>Internal piping</b>	-20 to +100°C (Option: -35 to +100°C)
<b>No. of springs</b>	1
<b>Control force spring max.</b>	46 - 1630 Nm
<b>Control force air max.</b>	87 - 2295 Nm

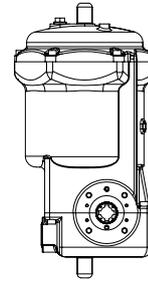
### Functional description

The ARCATORQUE® is a pneumatic diaphragm actuator with spring return (fail safe) and is used to actuate rotary valves. The actuator positions the valve plug, which in turn is controlled by a pneumatic or electropneumatic positioner. These actuators can be operated in the "Air to open" function or with the reverse action "Air to close".

- A fabric-reinforced power diaphragm ensures smooth conversion of the pneumatic application of pressure into the linear motion of the actuator spindle. The power diaphragm (2), supported by the diaphragm disc, is connected to the linear spindle (4) and divides the actuator housing into pressure and spring chambers. If the force of the compressed air control signal exceeds the opposing spring force (3), the linear spindle (4) moves and actuates the rotary valve via a reversing lever.
- The spindle guide, and the pivot and hub bearings are made of maintenance-free PTFE composite materials and ensure a high level of adjusting accuracy when switching from a linear to a rotary motion.
- The control signal is carried to the diaphragm chamber via internal channels in the actuator housing. The air supply and venting (ventilation) of the spring chamber is carried out by means of the protective cap, which is impermeable to splash water, or the chamber is purged with the air from the positioner.
- The actuators are flange-mounted to the rotary valve directly or via an intermediate yoke. Force is transmitted to the shaft of the rotary valve via a positive-fit connection using a key or adjusting washer.



# Technical Data Sheet Rotary Actuator



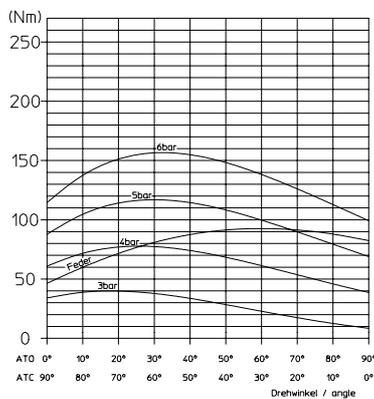
**TD\_840**

## Control force and control ranges

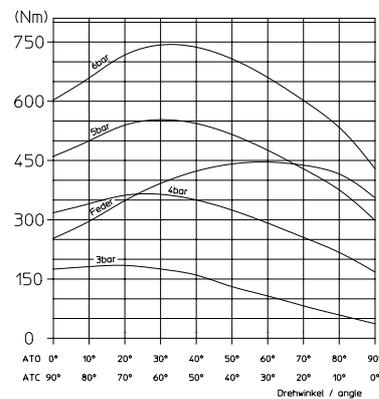
Actuator size		841	842	843	844
Spring 0% stroke	(Nm)	46	253	714.2	1629
	(bar)	1.75	1.75	1.75	2.0
Spring 100% stroke	(Nm)	82	355	1183	2612
	(bar)	2.75	2.75	2.75	3.8
Air 0% Stroke	(Nm)	87	460	1345	2295
	(bar)	5.0	5.0	5.0	5.0
Air 100% Stroke	(Nm)	68	298	855	872
	(bar)	5.0	5.0	5.0	5.0
Rolling diaphragm	(mm <sup>2</sup> )	10387	36217	47120	77892
Cylinder Ø	(mm)	120	220	250	320
Stroke volume	(dm <sup>3</sup> )	0.6	2.9	8.6	15.6
Max. coupling-Ø	(mm)	22	25	40	50
Mounting standard DIN/ISO5211		F07	F10	F12	F14
Air connection		G1/4	G1/2	G1/2	G1/2
Weight	(kg)	8	30	52	140
Handwheel	(kg)	1.5	2.5	3.5	15

## Torque moment

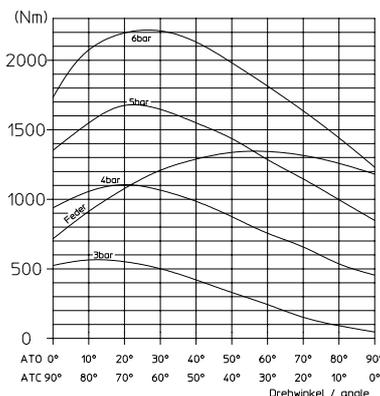
Torque moment (Nm) 841



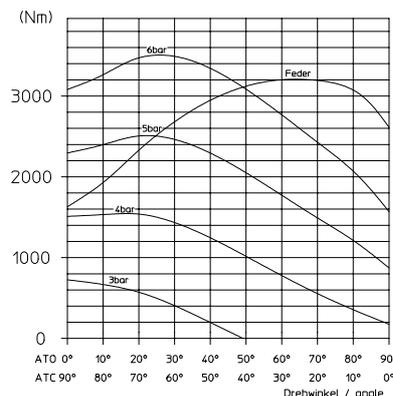
Torque moment (Nm) 842



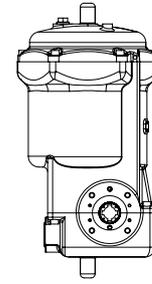
Torque moment (Nm) 843



Torque moment (Nm) 844

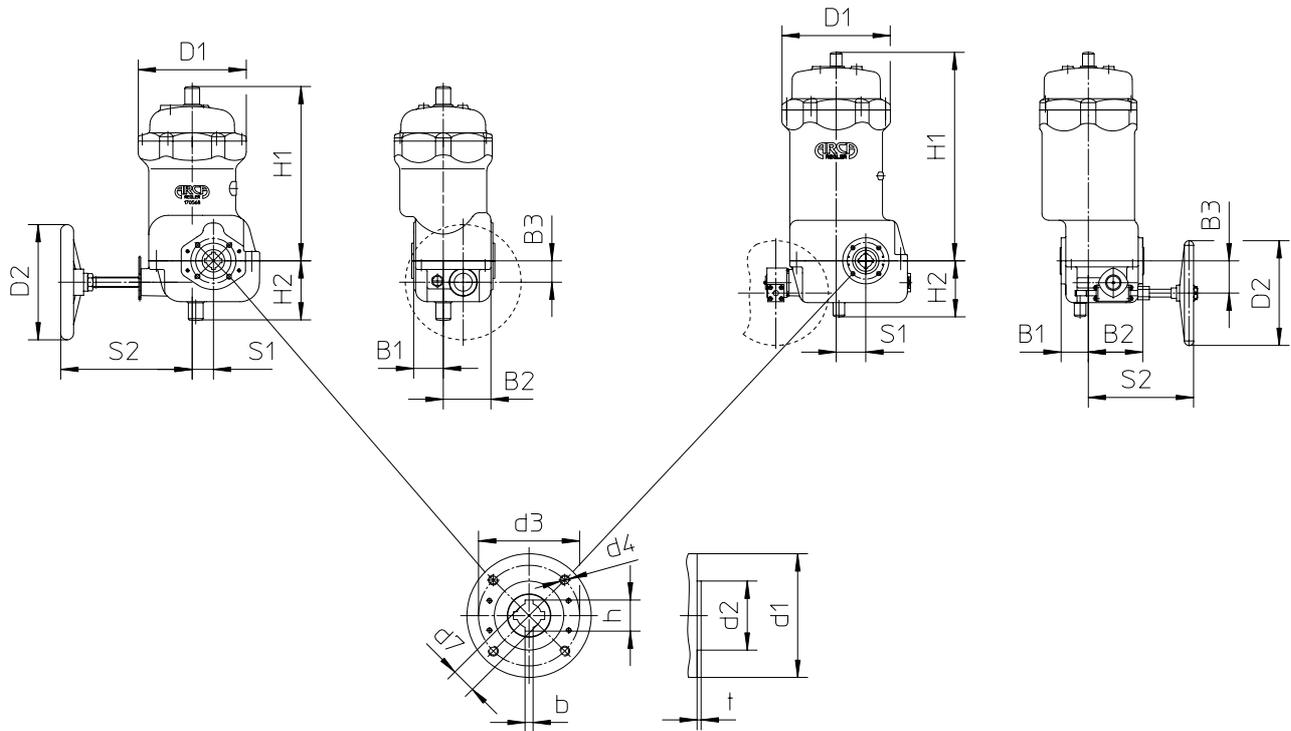


# Technical Data Sheet Rotary Actuator



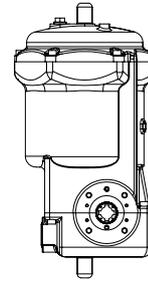
**TD\_840**

## Dimensions and weights



Type	Actuator									Mounting group	DIN/ISO 5211 DIN 3337-F__S							
	D1	D2	H1	H2	B1	B2	B3	S1	S2		d1	d2 <sub>f8</sub>	d3	d4	t	d7	h	b <sup>JS9</sup>
841	168	180	273	93	46	77	33.5	33	125.5	F07	90	55	70	4xM8	3	15	19.4	5
															20	25.6	6	
															22	27.6	6	
842	284	225	429	132.5	66.5	105.5	44.5	44.5	177	F10	125	70	102	4xM10	3	15	19.4	5
															20	25.6	6	
															22	27.6	6	
															25	31.6	8	
843	320	320	609	192	79	142	86	88	245	F12	150	85	125	4xM12	3	22	27.6	6
															25	31.6	8	
															30	36.6	10	
															35	41.6	10	
															40	46.6	12	
844	412	400	796	214	103	207	135.5	112.5	305	F14	175	100	140	4xM16	3	35	41.6	10
															40	46.6	12	
															50	57.6	14	

# Technical Data Sheet Rotary Actuator

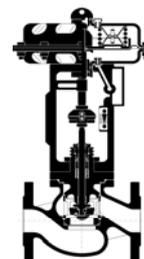


**TD\_840**

## Type code

	841	-22	-09	-0	-1	-1	-0	-0	-0	-0
<b>Series</b>	841	diaphragm surface		103,87 cm <sup>2</sup>						
<b>Size of actuator</b>	842	diaphragm surface		362,17 cm <sup>2</sup>						
	843	diaphragm surface		471,20 cm <sup>2</sup>						
	844	diaphragm surface		778,92 cm <sup>2</sup>						
<b>*Hub diameter (mm)</b>	841	15/20/22								
	842	15/20/22/25								
	843	22/25/30/35/40								
	844	35/40/50								
<b>Rotary angle</b>	09	06	39							
	0-90°	0-60°	30-90°							
<b>Standard spring</b>	0	1								
	yes	no								
<b>Internal piping</b>	0	1	2							
	no	yes	only aeration							
<b>Handwheel</b>	0	1								
	no	yes								
<b>Position indication</b>	0	1								
	no	yES								
<b>Special options</b>	0	1								
	w/o	big screwing								
<b>Painting</b>	0	1	2							
	standard	special	hard-coated							
<b>Execution</b>	0	E	T							
	standard	hub diameter in inch	low temperature design							

# Technical Data Sheet ECOTROL<sup>®</sup> Control Valve



TD\_8C

## General Data

<b>Series</b>	<b>8C</b>
<b>Nominal size DN /NPS</b>	<b>15-100 / ½" – 4"</b>
<b>Nominal pressure PN / ANSI</b>	<b>16-40 / Class 150-300</b>
<b>Characteristic</b>	equal percentage or linear
<b>Rangeability</b>	50:1
<b>Plug guide</b>	stem guided option: integrated double guiding (retrofitable) for DN40 - DN100 (½" - 4")
<b>Seat leakage</b>	metal sealing: IEC 50534-4 leakage rate IV (0.01% Kvs value); option: leakage rate V as well as soft sealing: IEC 50534-4 leakage rate VI
<b>Bellows seal (optional)</b>	seamless, double walled, made of 1.4571; option: Hastelloy and other materials
<b>Heating jacket (optional)</b>	connections DN 15 PN 40 (1/2" ANSI 300) flanges
<b>Low-temperature version (optional)</b>	down to -196°C, with cover flange if required

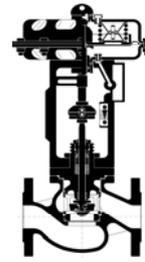
## Materials

	EN	for temperatures	ASTM	for temperatures
<b>Body material</b>	1.0619 GP240GH	-10 to 400°C	A 216 WCB	-29°C to 425°C
	1.4408 G-X 5 CrNiMo 19 11 2	-29 to 400°C	A 351 CF8M	-29°C to 400°C
	1.4408 G-X 5 CrNiMo 19 11 2	-196 to 400°C	A 351 CF8M	-196°C to 400°C
	1.6220 G20Mn5	-50 to 345°C	A 352 LCC	-50°C to 345°C
	1.7357 G17CrMo5-5	-10 to 530°C	A 217 WC6	-10°C to 530°C
<b>Bonnet material</b>	≤ DN 65: 1.4408 (A 351 CF8M)			
	≥ DN 80: same material as body, but for body materials 1.0619/ A216WCB, 1.6220/ A352LCC and 1.7357/ A217WC6 c/w stuffing box sleeve made of 1.4571 (AISI 316TI)			

Valve trim materials						
Material no.	Parabolic plug	Double-guided parabolic plug P1 <sup>1)</sup>	Perforated plug L1	Seat	Seat seal	Max. medium temperature
1	1.4571	1.4571	-	1.4571	Metal	same as stem seal
2	-	-	1.4571	1.4571 nitrided	Metal	same as stem seal
3	1.4112 hardened	1.4112 hardened	1.4112 hardened	1.4112 hardened	Metal	same as stem seal
4	1.4571	-	-	1.4571	PTFE/FKM	-20 ~ 180°C
5	1.4571	-	-	1.4571	PTFE/EPDM	-29 ~ 140°C
6	1.4571	-	-	1.4571	PTFE	-196 ~ 180°C

1) only as of DN ≥ DN40 (1 ½") with KVs ≥ 25 (Cvs ≥ 29)

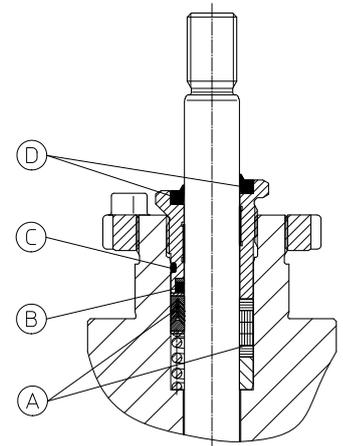
# Technical Data Sheet ECOTROL® Control Valve



TD\_8C

## Temperature range for stem sealing

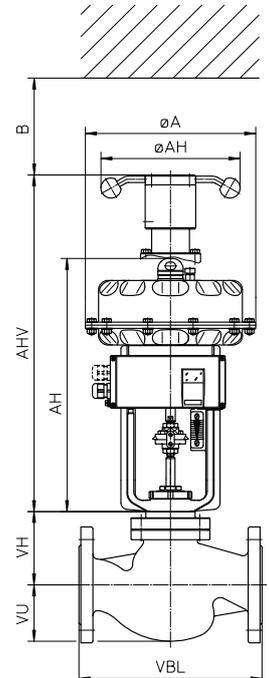
Seal type	Seal (pos. A)	Profile ring (pos. B)	O-ring (pos. C)	Wiper ring (pos. D)	Medium temperature	Bonnet flange	Comments
maintenance-free double seal	PTFE V-ring	EPDM	EPDM	NBR	-29°C~180°C	standard	preloaded with stainless steel spring
maintenance-free double seal	PTFE V-ring	FKM	FKM	NBR	-20°C~200°C	standard	preloaded with stainless steel spring
adjustable	reinforced graphite / Inconel	-	-	NBR	-29°C~400°C	standard/ cooling fins	adjustable
adjustable	pure graphite	-	-	NBR	-29°C~530°C	standard/ cooling fins	adjustable
adjustable	braided graphite / PTFE	-	-	NBR	-196°C~200°C	insulating column	low temperature
Bellow sealing made of 1.4571 or Hastelloy C	PTFE V-ring	EPDM (FKM)	EPDM (FKM)	NBR	-100°C~200°C	bellows	preloaded with stainless steel spring



## Weight and dimensions

### ECOTROL® globe valve with multi-spring actuator type 812 ARCAPAQ

		Dimensions (in mm) of valves with flanges to DIN EN 1092-1 or ANSI class 150/300 RF/RTJ										
		DN	15	20	25	32	40	50	65	80	100	
ANSI NPS		1/2"	-	1"	-	1 1/2"	2"	-	3"	4"		
VBL PN16-PN40		130	150	160	180	200	230	290	310	350		
VBL Class 150 RF		178	-	184	-	222	254	-	298	352		
VBL Class 150 RTJ		-	-	197	-	235	267	-	311	365		
VBL Class 300 RF		190	-	197	-	235	267	-	317	368		
VBL Class 300 RTJ		202	-	210	-	248	282	-	333	384		
Valve Type 8C	VH	DEK1	114				105			156	181	
		DEK3	170				167			248	267	
		DEK4	228				233			365	389	
		DEK5	on request									
		DEK7								196	221	
		DEK8								261	286	
		VU	48	59	62	70	78	83	93	106	136	
Actuator Type 812	ØA	MFI	270						270			
		MFIII							400			
	AH	MFI	346						404			
		MFIII							489			
	AHV	MFI	493						551			
		MFIII							651			
	Weight * approx. kg	MFI	20.5	22.5	23	24	31	33	41,5	70	93	
		MFIII								96	119	
B		150										

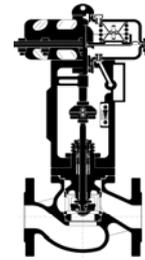


\* Weight: valve (DEK1) + actuator without manual operation



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# Technical Data Sheet ECOTROL® Control Valve



TD\_8C

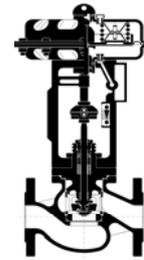
Max. shut off differential pressure in bar (closed position)

ECOTROL® 8C PN16 - PN40 / ANSI Class 150 / ANSI Class 300										Air to open/ Spring to close No. of springs				Air to close/ Spring to open No. of springs				
Valves w/o balancing c/w PTFE-packing / V-Rings, leakage class IV										3				3				
Flow to open (FTO)										6				9				
Actuator series 812										12				6				
DN	Stroke (mm)	Actuator size	P1		L1 lin		L1 =%		Seat-Ø (mm)	bar	bar	bar	bar	P Instrument Air, min (bar)				
			Kv	Cv	Kv	Cv	Kv	Cv						3.0	4.5	6.0	4.5	6.0
15 1/2"	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
20	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
25 1"	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	10	11.6	10	11.6	8,5	9,9	25	30,3	50.0			50.0	50.0	50.0	50.0	50.0
			4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
32	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			10	11.6	10	11.6	8,5	9,9	25	30,3	50.0			50.0	50.0	50.0	50.0	50.0
			4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
40 1 1/2"	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			10	11.6	10	11.6	8,5	9,9	25	30,3	50.0			50.0	50.0	50.0	50.0	50.0
50 2"	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
65	20	MFI-20 320 cm <sup>2</sup> 50 in <sup>2</sup>	10	11.6	10	11.6	8,5	9,9	25	30,3	50.0			50.0	50.0	50.0	50.0	50.0
			4.0	4.6	4.0	4.6	4.0	4.6	16	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			1.6	1.9	-	-	-	-	10	50.0	50.0			50.0	50.0	50.0	50.0	50.0
80 3"	30	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	0.63	0.73	-	-	-	-	5	50.0	50.0			50.0	50.0	50.0	50.0	50.0
			100	116	100	116	75	87	80	1,0	5,6			6,1	28,9	25,2	6,1	15,6
			63	73	63	73	55	64	62	2,7	10,2			11,0	46,1	45,9	11,9	28,9
100 4"	30	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	40	46	40	46	20	23	48	5,7	18,3			19,6	39,5	50	19,6	46,1
			100	116	100	116	75	87	80	6,0	15,4	21,1	26,8	18,0	50,0	50,0	18,0	39,5
			63	73	63	73	55	64	62	10,9	26,6	36,0	45,5	30,9	50,0	50,0	30,9	50,0
100 4"	30	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	40	46	40	46	20	23	48	19,3	45,6	50,0	50,0	50,0	9,6	50,0	50,0	50,0
			160	186	140	162	80	93	100	0,3	3,2			3,5	15,6	15,7	3,5	9,6
			100	116	100	116	75	87	80	1,0	5,6			6,1	28,9	25,2	6,1	15,6
100 4"	30	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	63	73	63	73	55	64	62	2,7	10,2			11,0	46,1	45,9	11,9	28,9
			40	46	40	46	20	23	48	5,7	18,3			19,6	2,9	50	19,6	46,1
			160	186	140	162	80	93	100	3,4	9,5	13,1	16,7	11,1	39,5	38,6	11,1	24,9
100 4"	30	MFI-30 320 cm <sup>2</sup> 50 in <sup>2</sup>	100	116	100	116	75	87	80	6,0	15,4	21,1	26,8	18,0	50,0	50,0	18,0	39,5
			63	73	63	73	55	64	62	10,9	26,6	36,0	45,5	30,9	50,0	50,0	30,9	50,0
			40	46	40	46	20	23	48	19,3	45,6	50,0	50,0	50,0		50,0	50,0	50,0

Please pay attention to the Pressure/ Temperature rating of the valve body!

For a list of other valve/packing versions, see sizing data sheet AD\_8C\_gb.

# Technical Data Sheet ECOTROL® Control Valve



TD\_8C

## ECOTROL® 8C model code

0. Operating Conditions		7. Body materials (cont.)		15. Seat wear/ tear protection (cont.)	
Medium:		4	1.7357	5	Colsterised
Temp.:	°C	5	1.6620	9	Acc. to spec.
Press. P <sub>1</sub> :	bar abs.	6	A216WCB	<b>16. Seat/ Plug seal <sup>1)</sup></b>	
Press. P <sub>2</sub> :	bar abs.	7	A351CF8M	0	Leakage Class IV metal to metal
P Design	bar g	8	A217WC6	1	Leakage Class V (metal to metal)
T Design	°C	9	Acc. to spec.	2	Leakage Class VI soft sealing PTFE/EPDM
<b>1. Series</b>		<b>8. Guide <sup>1)</sup></b>		3	
8C	Single Seat Globe Control Valve ECOTROL® 8C	0	Stem guided (Standard)	Leakage Class VI soft sealing PTFE/FKM	
<b>2. Top Flange</b>		1	Double guided	Leakage Class VI soft sealing PTFE/Trapezium	
1	Standard	9	Acc. to spec	9	Acc. to spec.
3	Cooling fins	<b>9. KVs Value</b>		<b>17. Cage retainer <sup>1)</sup></b>	
4	Bellow Sealing	xxx	Acc. to spec.	0	Standard
5	Extended Bonnet (Insulating Column)		KVs values acc. to table	1	LN (Low Noise) not controlled
7	Standard c/w Balancing	<b>10. Performance Curve Characteristics</b>		2	
8	Cooling fins c/w Balancing	g	=%	LN (Low Noise) controlled	
9	Special design acc. to spec.	l	Linear	9	Acc. to spec
<b>3. Plug Design</b>		m	Modified	<b>18. Seat retainer <sup>1)</sup></b>	
P1, P3	Parabolic Plug (1-step resp. 3-steps)	<b>11. Plug Materials <sup>1)</sup></b>		0	Without
L1-L2-L3	Perorated Plug (1-2-3 steps)	1	1.4571	1	LK1
<b>4. Nominal Diameter (DN) - DIN/ ANSI</b>		3	1.4112	2	LK2
15	DN 15 / ANSI ½"	9	Acc. to spec.	5	SLK1
20	DN 20 (only acc. to DIN)	<b>12. Plug wear/ tear protection <sup>1)</sup></b>		6	SLK2
25	DN 25 / ANSI 1"	0	Standard (w/o)	<b>19. Stem seal <sup>1)</sup></b>	
32	DN 32 (only acc. to DIN)	1	Nitrided	1	PTFE/V-Ring/EPDM quad ring
40	DN 40 / ANSI 1½"	2	Hardened	2	PTFE/V-Ring/VITON quad ring
50	DN 50 / ANSI 2"	3	Plug face stellite	3	Latty 6118/ETF Inconel
65	DN 65 (only acc. to DIN)	4	Completely stellite	4	Graphite 0901
80	DN 80 / ANSI 3"	5	Colsterised	5	Graphite/PTFE 6226/6232
100	DN 100 / ANSI 4"	9	Others (acc. to spec.)	9	Special design acc. to spec.
<b>5. Pressure Ratings (PN)</b>		<b>13. Balancing <sup>1)</sup></b>		<b>20. Special Designs</b>	
16	PN 16	0	Standard (w/o)	0	Standard
40	PN 40	1	Piston Rings	1	AD2000
150	Class 150 acc. to ANSI B16.10	2	EPDM-Quadring	2	NACE
300	Class 300 acc. to ANSI B16.10	3	FKM-Quadring	3	Oxygen version
<b>6. Connections</b>		5	PTFE spring loaded	9	Others acc. to spec.
0	RF flanges (Standard)	9	Acc. to spec.	<b>21. Material Inspections (pressure retaining parts)</b>	
1	Flanges c/w groove	<b>14. Seat Materials <sup>1)</sup></b>		0	w/o
2	Flanges c/w tongue	1	1.4571	1	EN 10204-2.1
3	Flanges c/w projection/ recess	3	1.4112	2	EN 10204-3.1
4	Butt weld ends	9	Acc. to spec.	3	EN 10204-3.2
5	Butt weld ends c/w spool pieces	<b>15. Seat wear/ tear protection <sup>1)</sup></b>		9	Others on request
7	RTJ	0	Standard (w/o)	<b>22. Final Inspections</b>	
9	Acc. to spec.	1	Nitrided	0	None
<b>7. Body materials <sup>1)</sup></b>		2	Hardened	1	EN 10204-2.1
2	1.0619	3	Seat Face stellite	2	EN 10204-2.2
3	1.4408	4	Completely stellite	3	EN 10204-3.1
				4	EN 10204-3.2
				9	Others on request

1) In accordance with customer specifications, or selected by the manufacturer in accordance with customer specifications (medium, pressure, temperature, etc.).

Blue letters: Standard design, at most 3 pieces, available within one week.

### Example:

8C - 1 - P1 - 15 - 40 - 0 - 2	Position 1-7 / basic data
Series 8C - with standard bonnet – one-step parabolic plug - DN15 – PN40 – flange EN1092 B1 – body 1.0619	
0 - 4,0 - g - 1 - 0 - 0 - 1 - 0 - 0 - 0 - 0 - 1	Position 8-19 / valve trims
Single stem guide – KVs 4.0 – equal percentage – plug made of 1.4571 – no wear/tear protection – not balanced – seat made of 1.4571 – no wear/tear protection – leakage class IV – standard cage retainer – no low-noise cage – stem seal PTFE V-ring / EPDM quad ring	
0 - 1 - 1	Position 20-22 / version/inspections

Standard version – material inspection EN 10204 3.1 – final specification EN 10204 3.1



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# Technical Data Sheet

## Filter and reducing station Type 961



**TD\_961**

### Technical Data

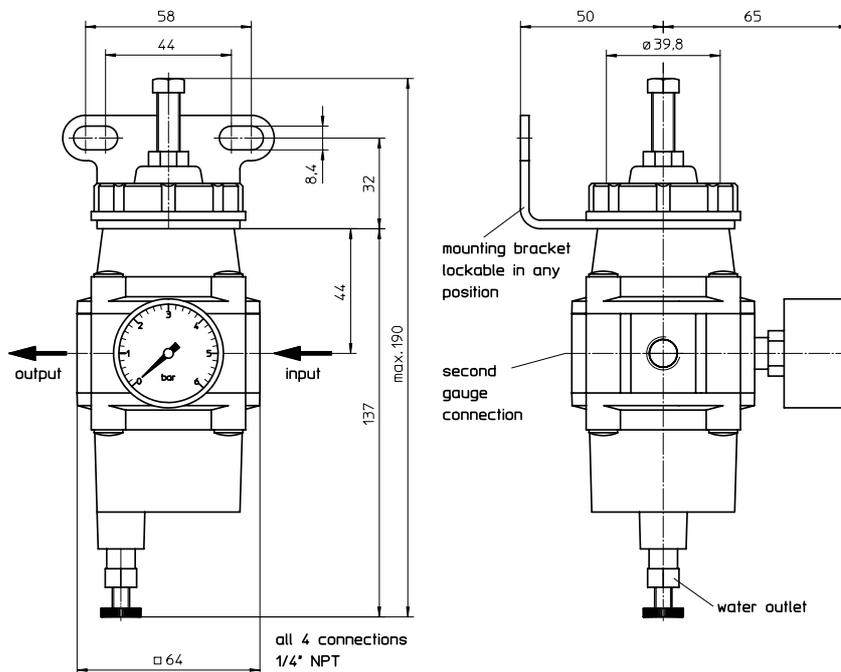
<b>Body material</b>	Aluminium
<b>Mounting position</b>	Vertically, water outlet on bottom
<b>Temperature range</b>	Type 961 0...50 °C
	Type 961-LT -30...60 °C
<b>Adjustment range</b>	0...6 bar
<b>Filter</b>	Made of Nylon / filter size 40 µm
<b>Adjustment accuracy</b>	2 mbar
<b>Sensitivity</b>	< 0,5 mbar
<b>Flow capacity</b>	Venting : 34 m <sup>3</sup> /h in standard condition at p <sub>1</sub> = 7 bar und p <sub>2</sub> = 1,4 bar
	Aerating : 0,85 m <sup>3</sup> /h in standard condition at p <sub>1</sub> = 1,75 bar und p <sub>2</sub> = 1,4 bar
<b>Upstream pressure</b>	18 bar
<b>Proper air consumption</b>	≤ 8 dm <sup>3</sup> /h in standard condition at p <sub>2</sub> = 1,4 bar
<b>Connections</b>	1/4" NPT
<b>Dimensions</b>	Please refer to the dimensional drawing
<b>Weight</b>	App. 0,6 kg

# Technical Data Sheet

## Filter and reducing station Type 961

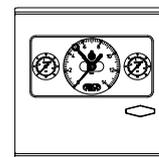


TD\_961



# Technical Data Sheet

## Pneumatic Controller Type 920

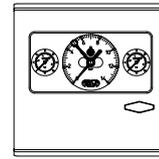


**TD\_920**

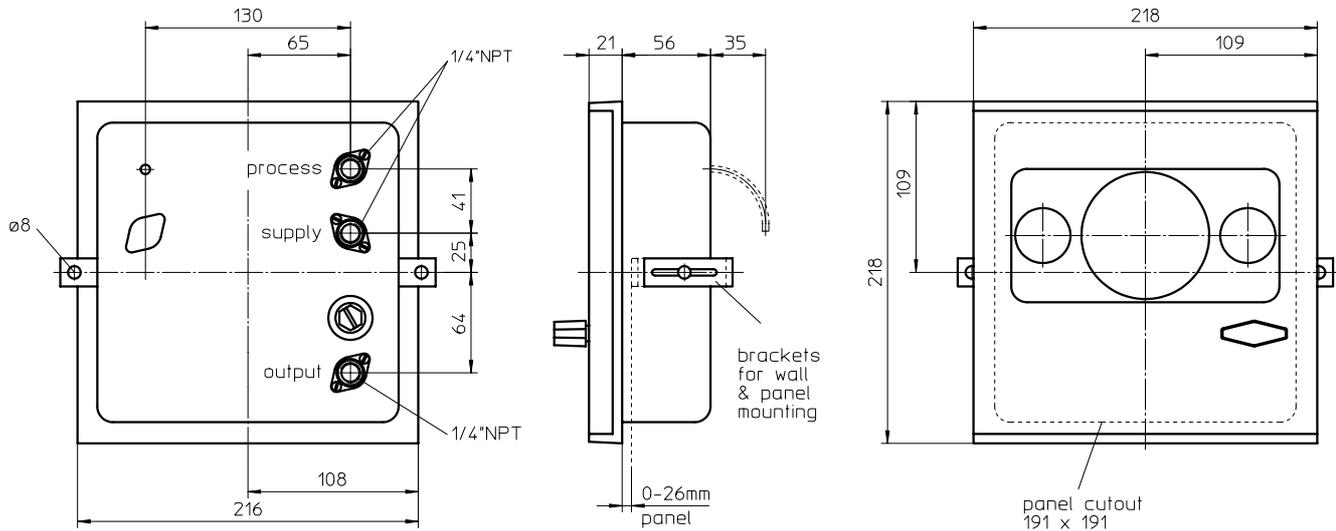
### Technical Data

<b>Mounting</b>	Wall mounting or front panel mounting	
<b>Body material</b>	Aluminium / Steel	
<b>Mounting position</b>	Vertically acc. to screen	
<b>Temperature range</b>	-50...90 °C	
<b>Measuring range</b>	[bar(g)]	Measuring element
<b>Over pressure</b>	(0...0,25; 0...0,5; 0...0,7) 0,2...1	Metal diaphragm
	0...1; 0...2	Bourdon tube made of Bronze
	0...4; 0...7; 0...10; 0...14; 0...20	Bourdon tube made of Bronze or SS
	0...28; 0...40; 0...70; 0...140	Bourdon tube made of SS
<b>Control algorithm</b>	P-, PI-, PD-, PID- or 2-state-controller	
<b>P-Range <math>K_p</math></b>	1...100 % adjustable	
<b>Sensitivity</b>	0,1 % of final value of adjustment range at $K_p = 100$ %	
<b>Accuracy</b>	1%	
<b>Flow capacity</b>	3 Sl/min. at 0,6 bar outlet pressure	
<b>Air supply pressure <math>p_z</math></b>	1,4 (2,4) bar	
<b>Control pressure <math>y</math></b>	0,2...1 bar (0,4...2,0 bar)	
<b>Air consumption</b>	0,84 Sm <sup>3</sup> /h	
<b>Connections</b>	1/4" NPT	
<b>Dimensions</b>	Please refer to the dimensional drawing	
<b>Weight</b>	App. 2,5 kg	

# Technical Data Sheet Pneumatic Controller Type 920



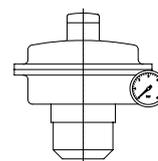
**TD\_920**



# Technical Data Sheet

## Pressure Controller

### „Roboter“ Type 902

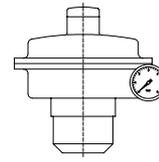


**TD\_902**

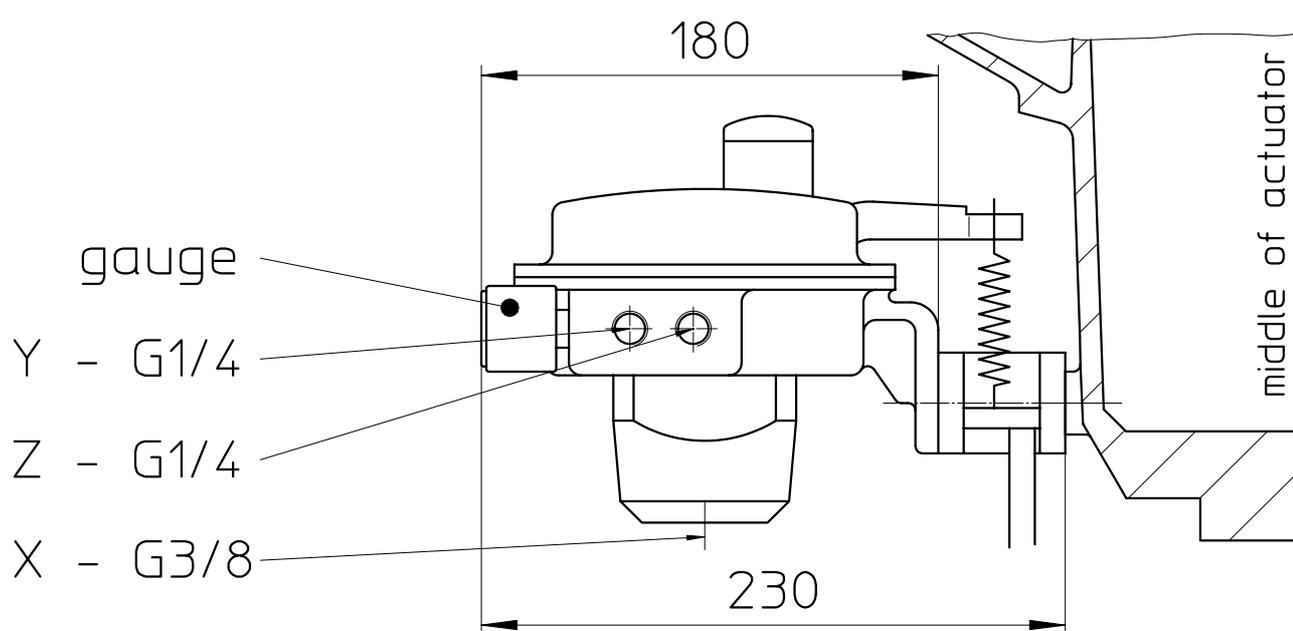
#### Technical Data

<b>Mounting</b>	Assembled to diaphragm actuator type 811		
<b>Body material</b>	Standard: Aluminium / Steel / Stainless Steel - Special: Hastelloy, ...		
<b>Mounting position</b>	Measuring unit (bellows) vertically to the top, impulse line connection at the bottom		
<b>Temperature range</b>	-20 to +120°C or on request		
<b>Adjustment range</b>	[bar(g)]	Measuring element	Overload Capacity [bar(g)] Bronze / Stainless Steel
<b>Vacuum</b>	-1...-0,01	bellows Ø 60 mm	9 / - (only SS)
<b>Over pressure</b>	0,02...0,4	diaphragm Ø 160 mm	4
	0,08...1,8	bellows Ø 60 mm	9 / - (only SS)
	0,15...3	bellows Ø 50 mm	7 / 14
	0,25...7	bellows Ø 36 mm	9 / 15
	0,5...15	bellows Ø 28 mm	18 / 25
	0,7...18	bellows Ø 22 mm	22 / 22
	1...30	bellows Ø 19 mm	40 / 40
	1,5...80	bellows Ø 15 mm	90 / 105 (only SS)
<b>Differential pressure</b>	0,25...5	bellows Ø 50 mm	12 / 25
<b>Control algorithm</b>	P-Controller		
<b>Sensitivity</b>	< 0,02 % of medium adjustment range		
<b>Hysteresis</b>	< 1 % of medium adjustment range		
<b>Air supply influence</b>	< 0,4 % per 0,1 bar air supply change		
<b>Flow capacity</b>	460 SI/h at Y = 0,6 Z = 1,4 nozzle 2/1,9 / 650 SI/h at Y = 0,6 Z = 1,4 nozzle 3/1,8		
	1200 SI/h at Y = 0,6 Z = 1,4 nozzle 3/1,7		
<b>Air supply pressure p<sub>z</sub></b>	1,4 (2,5) bar		
<b>Control pressure y</b>	0,2...1 bar (0,2 ...2,0 bar)		
<b>Air consumption</b>	≤ 300 Sdm <sup>3</sup> /h at p <sub>z</sub> = 1,4 bar		
<b>Connections</b>	x G 3/8, y and p <sub>z</sub> G ¼		
<b>Dimensions</b>	Please refer to the dimensional drawing		
<b>Weight</b>	App. 4,5 kg		

**Technical Data Sheet  
Pressure Controller  
„Roboter“ Type 902**

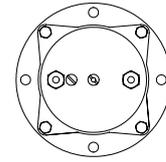


**TD\_902**



# Technical Data Sheet

## Pneum. Pressure Transformer 1:1 Type 931

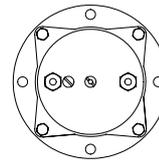


TD\_931

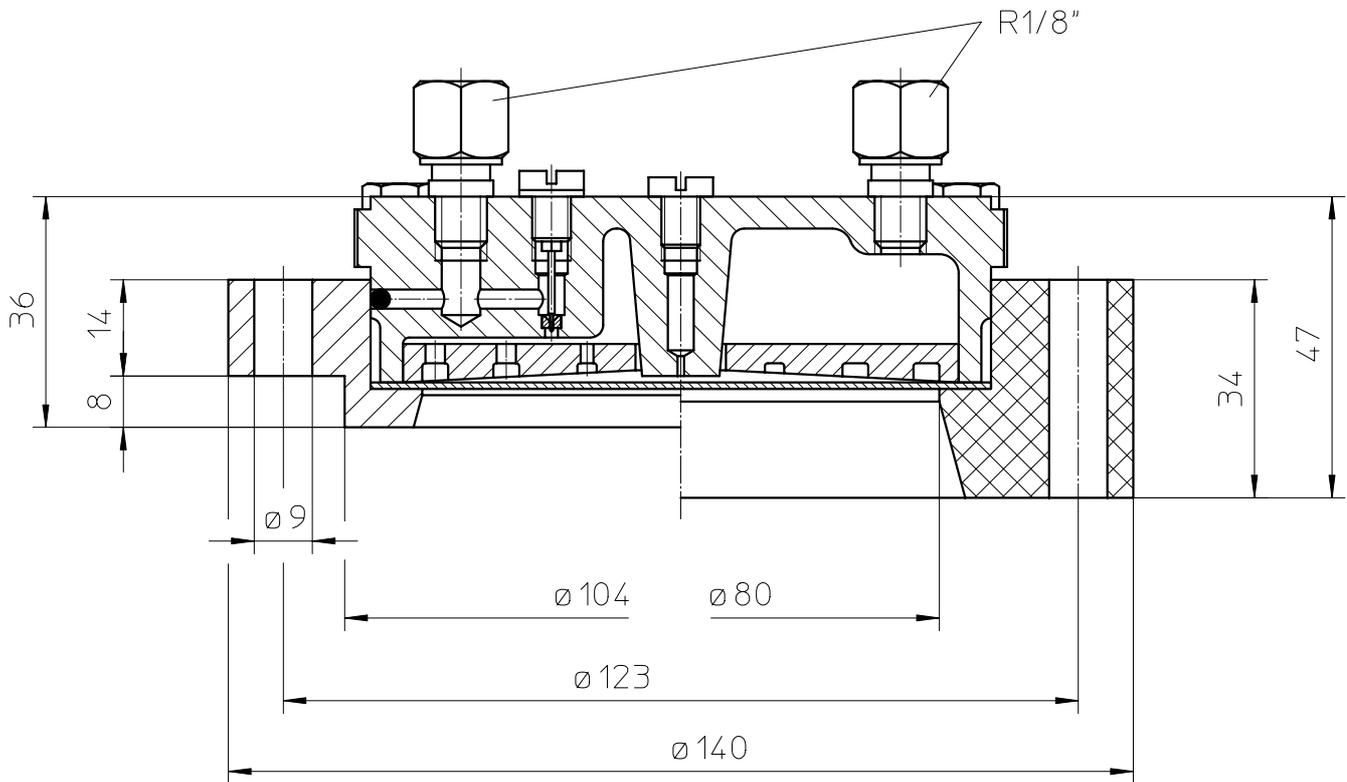
### Technical Data

<b>Mounting</b>	With flange $\varnothing$ 140 mm or flange DN 80 PN 16 acc. to EN 1092-1		
<b>Material</b>	Body brass, flange stainless steel 1.4571 or PVC or PTFE diaphragm PTFE glass-fibre reinforced or Viton, reinforced with polyester		
<b>Mounting position</b>	Anyone		
<b>Temperature range</b>	Flange stainless steel, diaphragm PTFE -50...200 °C		
	Flange stainless steel, diaphragm Viton -20...150 °C		
<b>Measuring range</b>	[bar(g)]	Diaphragm	Overload capacity [bar(g)]
	0...4	PTFE	6,0
	0...0,25	Viton	3,8
<b>Measuring failure</b>	$\leq 0,2$ % of measuring value		
<b>Sensitivity</b>	$\leq 0,2$ mbar		
<b>Hysteresis</b>	$\leq 1$ mbar for Teflon-diaphragm		
	$\leq 0,2$ mbar for FKM-diaphragm		
<b>Air supply pressure <math>p_z</math></b>	1,2 x of final value of adjustment range, minimum 1,4 bar		
<b>Air consumption</b>	$\leq 80$ Sdm <sup>3</sup> /h.		
<b>Connections</b>	G 1/8		
<b>Dimensions</b>	Please refer to the dimensional drawing		
<b>Weight</b>	App. 1,3 kg w/o flange / app. 2,5 kg with flange		

**Technical Data Sheet**  
**Pneum. Pressure Transformer 1:1**  
**Type 931**



**TD\_931**



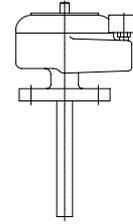
Execution with flanges

made of stainless steel

made of PVC or PTFE

# Technical Data Sheet

## Temperature Controller Type 910

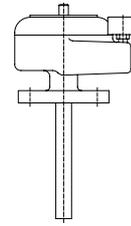


**TD\_910**

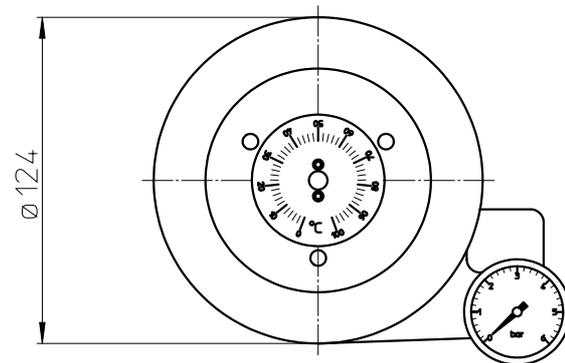
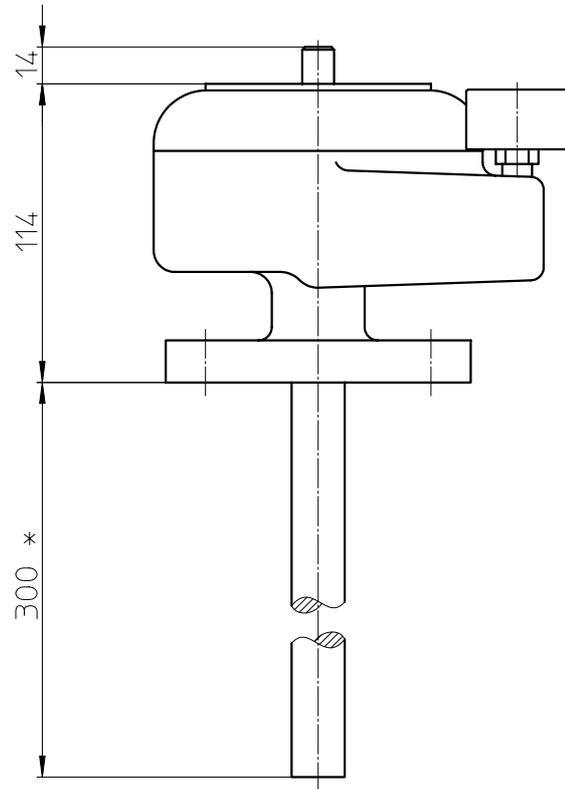
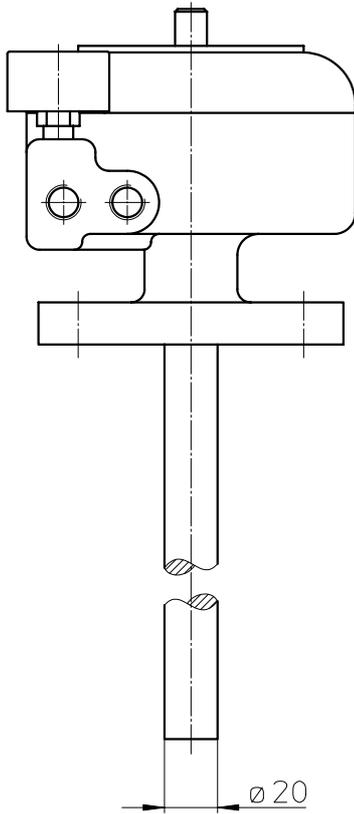
### Technical Data

<b>Mounting</b>	By means of flanges DN 25 PN 6 up to PN16 or DN 25 PN 40 acc. to EN 1092-1 Form B1
<b>Body material</b>	Flanges up to PN 16 Aluminium, flanges PN 40 stainless steel
<b>Material of heat sensor</b>	Stainless steel + CU-sensor
<b>Mounting position</b>	Anyone
<b>Temperature range</b>	Depending on measuring range
<b>Adjustment range</b>	0...100 °C (start increasable from 0...150°C)
<b>Control algorithm</b>	P-Controller
<b>P-Range</b>	3 K, adjustable over the complete measuring range
<b>Signal (input/output)</b>	Increasing / increasing or increasing / decreasing
<b>Flow capacity</b>	Max. 500 Sdm <sup>3</sup> /h
<b>Air supply pressure p<sub>z</sub></b>	1,4 bar
<b>Control pressure y</b>	0,2...1 bar
<b>Air consumption</b>	≤ 400 Sdm <sup>3</sup> /h at p <sub>z</sub> = 1,4 bar and y = 0,6 bar
<b>Pneumatic connections</b>	G 1/4"
<b>Dimensions</b>	Please refer to the dimensional drawing
<b>Weight</b>	App. 2,5 kg

# Technical Data Sheet Temperature Controller Type 910



**TD\_910**



\*optional 500/800