SAMSON
Expertise in control valve engineering
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Global presence with a local touch

Worldwide operation
SAMSON has enjoyed a successful history of growth for nearly one century since its foundation in 1907. Right at the beginning, the German company established partnerships with renowned business houses in several European countries to efficiently market its products abroad. The formation of the Technical Sales Department in 1949 laid the foundations for the expansion of SAMSON’s international sales and service network recognized for its expertise and efficiency.

Your partner for success
Today, SAMSON is a worldwide leading manufacturer of expertly engineered control valves and accessories for all industrial processes. Prominent manufacturers of special valves, such as Pfeiffer, VETEC, STARLINE, and AIR TORQUE, belong to the successful SAMSON Group. Pfeiffer produces lined control valves for special applications. VETEC is noted for its rotary plug valves and special valves. STARLINE specializes in ball valves and AIR TORQUE in compact rotary actuators.
Local customer service

With 42 mostly independent subsidiaries and over 100 representatives or sales offices, SAMSON is on hand to provide local customer service all over the world. Each year, new offices are established to further strengthen SAMSON’s local presence and to ensure faster service. Owing to the close collaboration with other well-known manufacturers, such as Welland & Tuxhorn – a company specializing in sophisticated valves for power plant applications, special valves have been added to SAMSON’s comprehensive product line.
Optimally engineered products

Economically viable

SAMSON’s expertise in control valve engineering covers all processes in industrial plants. Extensive experience gained over the past years from the design, development, and manufacture of custom-engineered solutions serves as the basis for mastering new challenges. The wide range of products proven in practice can be customized in close cooperation with the customer to provide a commercially acceptable solution to meet the requirements of even the most complex applications.
Flexible product range

Thanks to their modular design, SAMSON control valves in globe, angle and three-way body styles are available with short delivery times for all common pressure ratings and in all common materials.

They are designed to conform with ANSI, DIN, and JIS standards and can be combined with various flange styles and butt-weld ends.
The right actuator design

Pneumatic actuators with a rolling diaphragm and springs evenly arranged in the actuator case are made to precisely fit on valves over robust yokes, completing the compact design of SAMSON control valves.

The fail-safe action of SAMSON actuators is field reversible, requiring no additional parts. A simple connector mechanism to fasten the actuator to the valve stem facilitates the pretensioning of the actuator springs.

Small to medium-sized actuators are designed for integral positioner attachment, eliminating the need for external piping. The NAMUR design provides easy, safe attachment of all other valve accessories.

Actuators with manual overrides ensure that the process can keep running, even in the event of a control signal or power supply failure.
Custom engineered

SAMSON control valves can be customized to individual applications and meet even the most challenging demands in often harsh conditions. Materials, dimensions, and flange styles conform with the major international standards, ensuring that SAMSON’s products can be used worldwide. Practical valve accessories such as positioners with integral attachment contribute to plant safety.
Handling gases

Theoretical insight

In pressure reducing applications involving gases and vapors, the medium expands as it passes through the control valve, and its velocity increases rapidly even at small pressure drops, creating turbulence with high pressure fluctuations at the valve exit. As the pressure difference rises, the flow velocity increases, exceeding the speed of sound, while the turbulence is overlapped by shock waves. This phenomenon exposes the valve components to extreme stress and leads to vibration and noise emission exceeding 100 dB(A).
Applied empirical data

SAMSON has carried out extensive tests on valve test rigs operated by air and steam to investigate exactly how noise develops in control valves and to find ways of optimizing the noise behavior patterns. The ultimate aim to obtain a low-noise pressure letdown is achieved by restricting the velocity at the valve outlet to 0.3 Mach. Secondary noise sources are avoided in this way, while the SAMSON flow divider keeps the turbulent zone directly downstream of the valve restriction under control, which reduces the noise level by as much as 30 dB(A).
Accurate noise prediction

SAMSON bases its noise emission predictions on the internal sound power, which can be calculated accurately using a theoretical formula and acoustical efficiency factors determined with the aid of empirical data. This prediction method can precisely calculate noise transmission loss, the effect of insulation, noise emission at a certain distance or on venting to the atmosphere. With the objective of improving existing standards and meeting customer requirements, SAMSON is constantly investing in its high-performance test rigs.
Effective solutions

A control valve can be adapted to an existing pipeline by installing a silencer downstream of the valve, which helps to restrict the differential pressure across the valve at full load. At the same time, it expands the outlet to achieve an outlet velocity at the valve which does not exceed 0.3 Mach.

Combined with the SAMSON flow divider in the valve, the silencer attains an excellent noise performance and reduces the dynamic load on the valve plug.
Throttling service with liquids

Collapsing bubbles

Handling liquids at moderate pressure drops does not pose any difficulties for control valves made of suitable anti-corrosive material. However, problems emerge when cavitation occurs, accompanied by its numerous damaging side effects, such as surface erosion, unacceptably high noise emission, and unsteady flows. This will almost certainly result in critical interruptions in plant operation, costly repairs or even require the replacement of control valves and consequential changes in pipeline layout.
The perfect solution

The cavitation factor $x_{Fz}$ introduced by SAMSON in 1973 is the basis for international noise prediction standards and specifies at which pressure ratio cavitation starts. As a result of a series of elaborate tests and calculations performed at SAMSON, the standard valves have been optimized to prevent cavitation by developing special plug designs and anti-cavitation trims with high $x_{Fz}$ values to keep the valves free of vibration and cavitation over the entire load range.
Throttling service with liquids

For example, a seat-guided and shape-optimized parabolic plug with a small hydraulic radius and special flow contours in conjunction with a raised seat yields the lowest possible pressure recovery. The $X_{Fz}$ value can be raised further at high valve load to prevent cavitation by integrating attenuation plates into the valve. Applications involving high pressure drops benefit, in particular, from a multi-stage plug. The double-guided plug is sized to achieve the same differential pressure ratio at every stage over the entire load range.
Getting cavitation under control

In cases where cavitation cannot be prevented using the primary countermeasures at hand, the sizing of the valve can still contribute to ensuring that the valve withstands the adverse effects of cavitation. The solution can be configured from the SAMSON valve range with coefficients determined over the entire travel range on in-house test stands and using a valve sizing software, which also takes into account the control loop behavior in all operating situations.
Handling multi-phase flows

Flow know-how

As there is no suitable calculation standard, a high level of expertise is required to size valves intended to control a multi-phase flow, such as a gas-liquid mixture. Special consideration must be given to the increase in volume and velocity of the mixture during its expansion and the fact that the mixture has a lower sound velocity than its individual components. Thanks to this know-how, SAMSON offers ideally sized valves that produce non-choked, steady flows which do not cause any mechanical stress.
Eliminating effects of erosion

Multi-phase flows containing a large amount of gas and solid particles, such as coal or minerals, have a highly erosive effect even at low flow velocities. Angle valves featuring a flow-to-close design, a ceramic or carbide trim, and a downstream anti-wear sleeve eliminate the effects of erosion and are therefore ideal for controlling such flows.
Handling multi-phase flows

Valves are easier to size in cases where the two-phase flow does not occur until the flow medium evaporates in the valve body (flashing). In such cases, the equations provided by the IEC 60534 standard to determine the indispensable flow coefficient are applicable. This standard, however, does not include any information on the sizing of the valve outlet and downstream pipe diameters. And it is precisely the correct sizing of these diameters that ensures trouble-free operation and a non-choked, steady downstream flow.

For this purpose, SAMSON set up a high-performance test rig to examine valves under operating conditions. Together with the Technical University of Hamburg-Harburg, SAMSON successfully worked on solutions for correct sizing and found valves equipped with multi-stage trims to be unsuitable. The optimum valve design both for two-phase flow and flashing service proved to be a one-stage valve with a greatly reduced seat bore and a seat-guided plug, which provides sufficient space for the expansion of the gas or vapor and ensures...
continuous, non-erosive downstream flow. Such a valve design is easily and conveniently configured from SAMSON’s modular valve components. One of the most essential components is the seat-guided V-port plug. Owing to its rugged guiding and its asymmetrical ports, the plug prevents mechanical vibrations and resonance oscillations. Last but not least, it ensures safe operation especially under critical operating conditions such as flashing.
High-capacity control valves

Well sized

An essential factor for the economical operation of processing plants involves handling large flow rates at low pressure drops and a low energy consumption. In addition to large-sized globe valves, the best-suited and most cost-effective option for this type of application is provided by control valves with a high flow capacity and low coefficient of friction, such as rotary plug valves, butterfly valves, and ball valves which can be equipped with powerful, low-friction rotary actuators.

Tight shutoff

Depending on the application involved, key features required of these control valves, apart from a high flow capacity and low noise emissions, include tight shutoff, low fugitive emissions, excellent control quality, and reliable fire-safe performance. Rotary valves achieve tight shutoff requirements over a wide range of operating conditions by using a combination of a floating or flexible seat as well as an angle seat design or an offset shaft and eccentric closure element arrangement.
The heavy-duty valve series from SAMSON, available in nominal sizes up to 20”, keeps large flow volumes under control even at high pressures and temperatures.
High-capacity control valves

All-round talent

An excellent rangeability and fine control characteristic is achieved, for example by the SAMSON segmented ball valve, which has a V-shaped port incorporated in the ball. The single-offset or double-offset disc design of the butterfly valves guarantees a low initial breakaway torque and accurate control performance even at very small opening angles. The ball valves featuring a floating ball provide an effective tight seal, whereas a trunnion-mounted ball achieves improved control properties.

Before the actuator can be sized effectively for a valve application, a number of factors must be determined, including friction, closing and breakaway torques related to the pressure drop across the valve as well as the dynamic torque additionally related to the valve position, media, and pressure ratio. The valve-specific coefficients are determined and optimized in tests on an in-house test rig. In addition to cost-effective piston actuators, SAMSON offers low-friction rotary actuators with rolling diaphragms for excellent controllability.
The Maxifluss rotary plug valve is ideally designed to control large flow volumes. The straight-through flow path in fully open position is unrestricted, while the controllability remains accurate even at small flow rates. The triple offset configuration of the seat and plug eliminates breakaway torque. The soft seal conforms to leakage class VI. Innovative design details like the rugged splined connection between plug and shaft guarantee the safe operation of the valve.
Stay well informed

Control valve integration into the process automation system has a significant positive effect on control quality as well as plant efficiency and performance. With the aid of smart valve communication, predictive valve maintenance is possible, contributing to increased plant availability. SAMSON smart positioners are used to integrate field devices into process automation. A reliable data exchange is guaranteed by the smart field instruments to ensure the fast detection of any faults and malfunctions.

SAMSON’s innovative, self-calibrating positioners for all common communication protocols feature excellent control characteristics and are easy to operate.
Stay smart

The HART®-capable positioners combine conventional analog 4 to 20 mA technology with digital communication. A substantial amount of time and money can be saved on installing the PROFIBUS positioners as just one cable is needed for both the power supply and data transmission. FOUNDATION Fieldbus positioners rely on state-of-the-art technology as part of a distributed network. They contain function blocks enabling them to act as fully fledged process controllers as well.
Products for valve communication

At the press of a button

The positioners available from SAMSON’s product range are designed to be extremely functional and include a wide variety of innovative details, for example their safe and fast integral attachment, convenient operation over just one rotary pushbutton, automatic start-up and parameter optimization, extensive valve diagnostics, high-resolution travel sensor and, not least of all, the SAMSON-pioneered technology using pilot-controlled solenoid valves or the dynamic flapper-nozzle system.
Explosion-proof enclosure

Even in hazardous areas, the HART®-capable positioner from SAMSON in an explosion-proof enclosure is still easy to operate using just one button. Moreover, there are four selectable initialization modes to automatically commission the control valves. The separate terminal compartment allowing indirect cable entry or connection without spark barriers for cable conduits makes it easier to install and service the device.
Environmental concerns

Keeping the air clean

Environmental protection and the careful use of resources have become key issues in modern society. Regulations such as the Clean Air Act in the United States or its German equivalent TA-Luft aim at restricting emissions produced by industrial plants. Dynamic seals, such as valve packings, pose a challenge: They must be designed to be universally applicable with all media, seal effectively over a wide temperature range with the least possible amount of friction, while proving to have a long, low-maintenance service life.
A matter of packing

SAMSON has developed packings for its valve lines to incorporate all the features required for demanding applications. The maintenance-free, spring-loaded V-ring PTFE and carbon compound packing with a special lubricant is suitable for practically all process media at temperatures ranging from −200 °C to +450 °C. The adjustable, cavity-free packing is designed especially for liquids that crystallize or polymerize by inserting PTFE silk cord rings in front of the V-rings.

Packings for high temperature ranges incorporate rings made of pure graphite and carbon, which are arranged in alternating order.

Optionally, a leak-off connection can be fitted in the space between two packings to detect fugitive emissions.
A groundbreaking invention

The most effective sealing solution is the metal bellows, a groundbreaking invention originally developed by SAMSON. Even today, the engineering expertise that goes into the in-house design and manufacture of the single or multi-layered bellows results in bellows seals recognized for their quality.
Unparalleled sealing quality

The sealing quality of SAMSON bellows remains unsurpassed over its entire life cycle. For special applications, the bellows can be heated or flushed to prevent deposits from clogging it up. Its friction-free sealing ability can last over a valve’s entire service life even in critical applications without the need for any maintenance and still guarantee absolute zero leakage.
Meeting the challenge

With its sophisticated control valves, SAMSON provides the perfect answer to demanding process requirements that cannot be met by standard valve versions. SAMSON has equipped its control valves with special components and accessories to satisfy more challenging requirements and has designed highly specialized valve series for high-performance applications. Last but not least, SAMSON is dedicated to offering valves that are tailored to suit your specific requirements – just as you like it.
**Heating jackets**

Heating jackets ensure optimum condensate draining and allow the control valves to be used even for media with a tendency to crystallize out or congeal.

**Tandem actuators**

SAMSON’s tandem actuators ensure tight shut-off even at high differential pressures or low supply air pressures.

**Accessories**

Carefully hooked-up accessories, such as supply air reducing stations, boosters, lock-up valves, solenoid valves, and limit switches, provide more functions with the benefits of fast response times and all desired fail-safe actions, for example.
Nothing left to be desired

SAMSON offers a comprehensive product line, including self-operated regulators designed for simple control tasks with a constant reference variable and modular micro-flow valves used for very low flow rates. Its product line is rounded off by top-quality special valves engineered by its partner W&T for power plant applications as well as ball valves and piston actuators designed by its associated companies STARLINE and AIR TORQUE respectively. Moreover, SAMSON builds special application valves made of materials, which are difficult to machine, such as duplex stainless steel or high alloy steel.
Excellent engineering solutions

The VNG valve engineered by VETEC, another member of the SAMSON Group, is an excellent solution for pressure reduction of natural gases that have only been purified preliminarily and still contain dirt particles.

In fact, its throttling system, featuring a patented jet nozzle, is able to handle abrasive liquid and solid particles even at differential pressures of more than 400 bar. In addition, it complies with the strict noise emission regulations, leaving nothing to be desired.
In order to succeed in international competition, companies need to manufacture top-quality products at low cost. An essential prerequisite is a low-maintenance plant with a long service life and little downtime.

Hence, the equipment in a plant is not only selected depending on the purchase price, but also on the cost of the equipment over its life cycle, including the cost of energy, repair, and maintenance.

The price – especially that of high performance control valves designed for critical media – is actually only a fraction of the total cost of ownership.

SAMSON’s control valves feature a modular design providing a large number of valve versions configured from a small number of parts. The Type 3241, for example, allows the plugs for the small nominal sizes to be used up to nominal size 2”.

Top quality for your success

Advantages for you
The bellows and packing are identical up to 3”. In this way, fewer spare parts have to be kept in stock despite the wide variety of $C_v$ coefficients.

The seat design allows the trim to be easily adapted to modified process data – advantages that let you stay competitive in the global market.
Come and compare

It is always worth comparing

Compared with a packing, a metal bellows costs more, but does not leak. Its higher price, however, is worthwhile because the replacement of just one leaky packing involves costly downtime. The same applies to a powerful actuator, which is often more expensive than a solution with pressure balancing, but eliminates the need to continually replace the worn-out gasket. SAMSON solutions help you cut your cost of ownership and increase the competitiveness of your plant.
Meeting your needs

SAMSON offers you a wide product range to meet all your needs, beginning with convenient control valve sizing software and online help.

And when it comes to configuring your accessories and controllers, you can benefit from SAMSON’s cost-effective, time-saving TROVIS-VIEW software.

Finally, EXPERT and EXPERT+ allow for predictive valve diagnostics while the process is running.

Your staff can take advantage of SAMSON’s hands-on training courses to acquire state-of-the-art knowledge essential for the safe, trouble-free operation of your plant.
Due to the long corporate tradition and the group’s constant growth, logistics have always been an important issue at SAMSON. Nevertheless, requirements have increased over the past years. Technology is advancing at an increasingly faster pace. Short innovation cycles demand short-term investment. In order to remain a competent partner even under these changing conditions, SAMSON has built a new logistics center to ensure that the company is able to react quickly, flexibly, and in line with demand on a long-term basis.
Everything under one roof

The new center is the heart of a logistics system to further increase the availability of SAMSON products. The ability to manufacture 5,000 control valves at the Frankfurt headquarters each month is achieved by keeping semi-finished products and castings in stock to meet unscheduled demands. In addition, foresighted production of components and peripheral devices as well as the quick final assembly according to customer specifications take place on short routes under the watchful eye of an ISO 9001 certified quality assurance system.

The last stage that the control valves pass on their way through the logistics center is the sunlit final assembly hall. Here, the painted components are assembled, adjusted, and checked to make sure the final products comply with customer specifications. Modern test equipment, sufficient work space, efficient conveying and stacking systems as well as pleasant offices create a relaxed and friendly environment for the final inspection of SAMSON’s high-quality control valves by the customer.