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GEA VARIVENT® HYGIENIC SPECIAL APPLICATION VALVES

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Hygienic Valve Technology

Efficiency delivering perfect results
Hygienic valves from GEA form the core component of matrix-piped process plants. Thanks to a pioneering valve concept that sets standards for its flexibility, as well as the latest control and automation functions, our valves offer manufacturers maximum product safety and process reliability.

All GEA hygienic valves are designed to be efficient and costeffective for their particular applications, leading to sustainable operation and considerable savings potential.

GEA valve technology controls flow processes
Our hygienic valve technology ensures safe, efficient processes wherever sensitive liquid products are manufactured. In food production, the classic application areas range from milk processing (milk, yogurt, cheese ...) to liquid foods (sauces and pastes, instant products, baby food ...) and on to the brewing of beer and production of beverages. Further significant areas are biotechnology and pharmaceuticals, as well as care products and cleaning agents / detergents.

Regardless of the sector, the application or production specifications: Our hygienic valve technology is sure to meet the demands of our users.

Hygienic solutions for every task
Additional components in our portfolio are available to optimize the design of any process plant – from pigging systems for the recovery of valuable products, process connections, and expansion compensators for offsetting thermal stress, to tank safety systems for securing and cleaning tanks and containers.

Supported by our Research and Development Department we regularly launch new, technologically mature products on the markets. Our customers have high standards, which we continuously and systematically meet.

Hygienic Special Application Valves Overview

VARIVENT® control valves
VARIVENT® control valves are used for control of applications where constant parameters are required. With gases, vapors or liquids, the valve series is characterized by reliable control of the process.

With many configuration options available, these control valves offer the best economical solutions for individual process requirements. Based on the proven VARIVENT® sealing and housing technology, maximum hygiene is ensured.

VARIVENT® sampling valves
VARIVENT® sampling valves are designed for many different tasks. Both manual sampling of very small amounts and the incorporation into fully automatic, mix-proof sampling and dosage systems are possible. Thanks to the VARIVENT® modular principle, the sampling valves can be easily integrated into process lines and vessels, while fully complying with hygiene requirements.

VARIVENT® overflow valves
Critical pressures in pipeline system can be secured cost-effectively by overflow valves. They are mostly applied in combination with displacement pumps.

VARIVENT® safety relief valves
VARIVENT® safety relief valves work purely mechanically and offer reliable protection against critical process pressures. The often proven valve contributes to protection from pressure-bearing vessels in various applications. The hygienic design ensures full cleaning capability.

VARIVENT® constant pressure valves
A compact design and high function characterize the VARIVENT® constant pressure valve. It is designed for compensating for process-related pressure fluctuations and to keep production-relevant pressures at a constant level at all times.

VARIVENT® vacuum valves
VARIVENT® vacuum valves offer reliable protection from negative pressures. Small differential pressures and a fail-safe construction mark this valve series. The upside down design of the valve disc prevents sucking in of dirt particles into the vessel and thus into the product.

Hygienic Classes for Valves

Increasing variety of products, longer production cycles and changing market conditions are all factors that make the conception of new installations more complex for producers. Additionally, there are higher expectations from the consumers as well as stricter regulations for producers and products. Therefore, engineers have many things to consider when creating suitable solutions for their customers. Our goal is to equip your installation with components that fit your product and your market. To better assist you, we have set up a guideline for choosing the right hygienic component technology according to the Association of German Food Processing Machinery and Packaging Machinery (VDMA).

The hygienic classes can be described by microbiological, physicochemical as well as the resulting organoleptic properties of the product. An important indicator for the classification is its desired shelf-life. The classification is based on the desired characteristics of the final product. Contamination risks and the ability to detect them are important factors for corresponding component designs.

Soft drink (still)*
MSL: several months
pH-value: > 4.5

Ice tea (still)*
MSL: > 12 months
pH-value: > 4.5

Babyfood / Nutrition*
MSL: several months
pH-value: > 4.5

UHT milk / UHT cream*
MSL: > 3 months
pH-value: > 4.5

Fruite juice*
MSL: several months
pH-value: ≤ 4.5

Ice tea (still)*
MSL: > 6 months
pH-value: ≤ 4.5

Fruit yogurt, heat-treated**
MSL: > 5 weeks
pH-value: ≤ 4.5

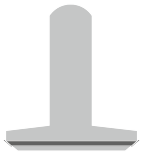
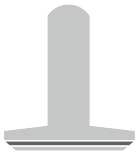
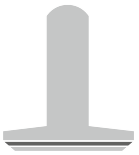
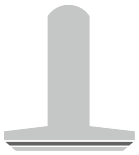
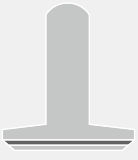
ESL milk**
MSL: 21–45 days
pH-value: > 4.5

Wine*
MSL: > 1 year
pH-value: ≤ 4.5

Beer*
MSL: > 6 months
pH-value: ≤ 4.5

Fruit yogurt / Natural yogurt**
MSL: 2–4 weeks
pH-value: ≤ 4.5

Fresh milk**
MSL: 7–10 days
pH-value: > 4.5

	Storage	Preparation	Preservation	Bottling
Aseptic (V)	 Seat valves	 Seat valves	 Stainless steel bellow	 Stainless steel bellow
UltraClean (IV)	 Seat valves	 Seat valves	 Diaphragm and stem diaphragm	 Diaphragm and stem diaphragm
Hygienic (I-III)	 Butterfly valves	 Seat valves	 Seat valves	 Seat valves

* unchilled
** chilled
MSL: Minimum Shelf Life

THE BENCHMARK.

GEA VARIVENT® Valve Unit

GEA VARIVENT® Valves

The standard for hygienic valve technology
Wherever future-proof product and process security is essential in liquid processes, the modular GEA VARIVENT® valve system is first choice for systems operators and engineers. Uncompromisingly hygienic valve technology, adaptable to any requirement, permits sustainably economic system and process solutions for a wide variety of the most demanding production tasks.

Safely to safe products
As a pioneering standard for premium quality valve technology, the GEA VARIVENT® modular system offers an unrivalled range of ever-reliable, dead-zone free valves – from classic single-seat and mixproof double-seat valves to valves with special process functions. A nearly limitless choice and variety of customization, combination and materials options meet all hygiene, performance and stress requirements of individual customers. Systematically standardized modules with low parts diversity help cut the operating costs for maintenance and spare parts logistics.

Perfectly in tune: The GEA VARIVENT® valve unit
Pioneering mechanical valve technology and equally advanced options for electronic valve control and system communication combine to form a finely tuned valve unit, increasing valve functionality and safety as well as its cost-efficiency in operation.

Made in Germany – renowned worldwide
The invention of the mixproof valve by Otto Tuchenhagen in Büchen, Germany in 1967 set in motion the triumphant march of the modular VARIVENT® valve series shortly thereafter. To this day, GEA develops and manufactures every GEA VARIVENT® valve unit at the original Büchen location in Germany. The experience of GEA's engineers along with the huge installed base of valve units around the world offer the best guarantee of safety and total reliability. Users benefit continuously from international project developments and ground-breaking innovations which are incorporated into the valve design.

Every GEA VARIVENT® valve unit keeps the promise of "The Benchmark" – the bar for hygienic valve technology.

The Sustainable Choice – 4 is the new 6

10 % savings potential on compressor energy costs and reduction of carbon footprint with 4 bar valve actuators
GEA VARIVENT® hygienic process valves are actuated by compressed air in automated systems, connected to the air supply stations via the digital valve control top. In a pioneering effort, GEA has introduced specially designed 4-bar actuators for all relevant valve types and process applications. This allows operators to reduce the compressed air system pressure, resulting in significant energy savings throughout the plant.

Pioneered by GEA to enable pressure-reduced control air systems
Compressed air is essential for operating automated valve systems and other process equipment. But it comes at a significant cost – typically 10 % – 15 % of the total energy consumption in food and beverage plants. Due to the increasing need to save energy, experts now recommend reducing the air system pressure. Historically, 6 bar has been the standard system pressure in many industries, and available valve actuators are mostly still designed for 6 bar, inhibiting plants from implementing lower pressures.

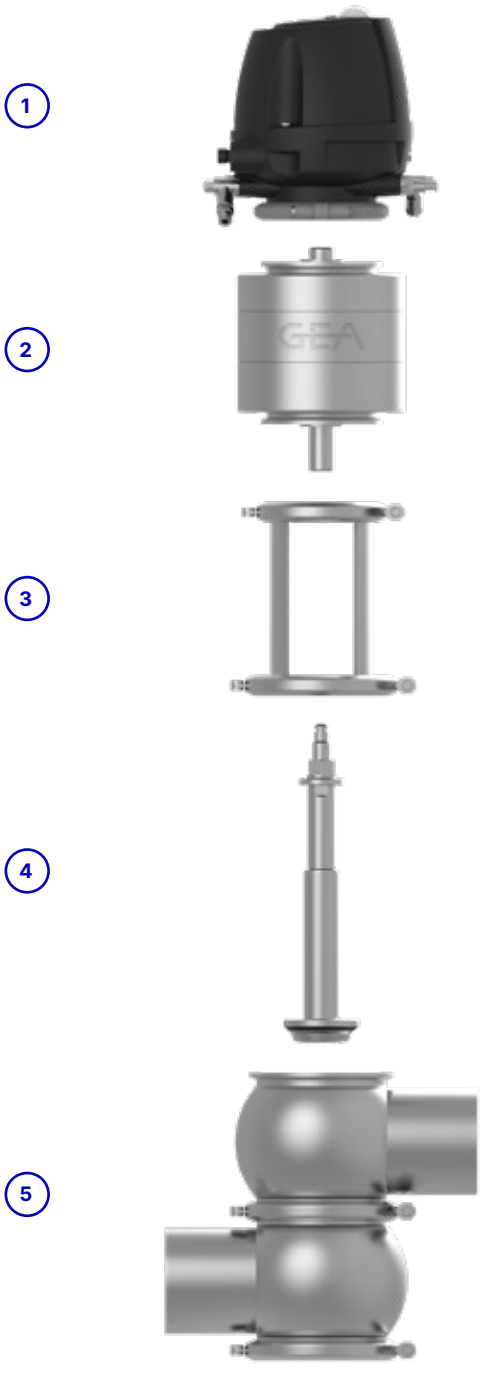
GEA is leading the way to a more sustainable setup, with 4-bar actuators made available for all GEA VARIVENT® seat valves (single-seat and mixproof) and GEA Hygienic butterfly valves. These 4-bar actuators maintain full reliability of functionality and operation. They can be ordered for retrofit or new valve installations.

Awarded the Add Better label
As one of numerous new resource-efficient solutions by GEA, the energy-saving 4-bar valve actuators carry the Add Better label.

GEA VARIVENT® Modular System

The VARIVENT® system is the first – and, to date, the only – valve module to feature a flexible design. Its modular concept offers numerous advantages, such as the standardized forms and connections across all valve types, thereby ensuring that all components can be removed, replaced, combined and expanded without any issues. The result? Cost-efficient system operation, optimized warehousing, economical spare parts and low parts diversity.

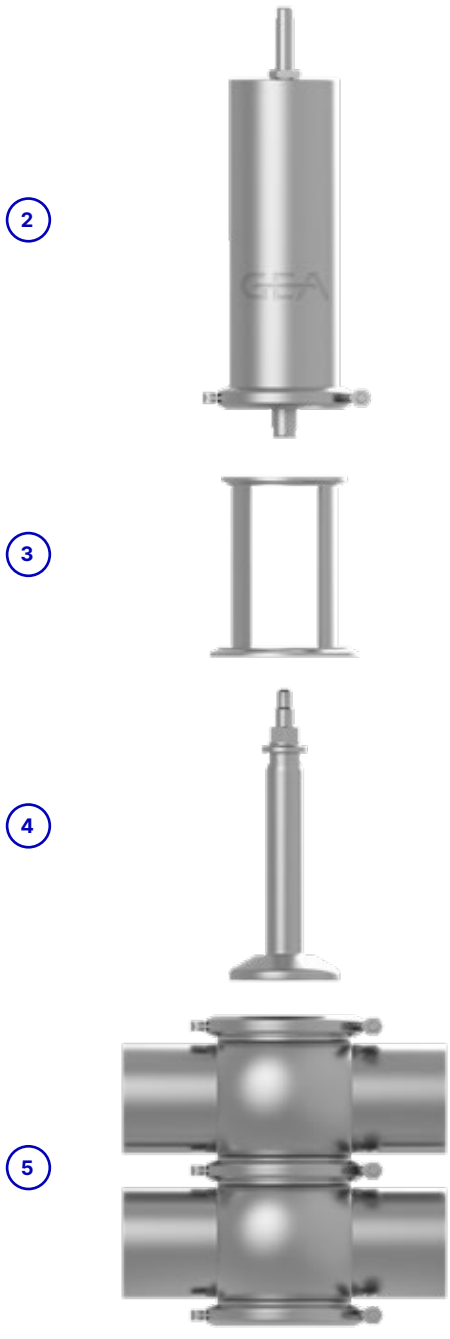
Existing valve systems in process plants can be modified or adjusted without the need to alter the overall system concept. The VARIVENT® system remains the benchmark others seek to emulate.



GEA VARIVENT® Control Valve

1 Control and feedback system
Each control top enables intelligent valve control for easy commissioning and increased safety in the process sequence. Detectable valve positions make a decisive contribution to optimal system operation. All common connection types and control systems are available for technical communication in the plant.

2 Actuator
A process-specific selection of the actuator size according to the installation situation results in low air and energy consumption. Depending on the tasks of the valve, various actuator options are available and can be adapted optimally to customer requirements. All actuators can be used in Ex zones as standard, although the Ex-conformity of the electrical add-on components must be taken into account. Furthermore, the actuator contains an integrated interface for mounting a control and feedback system. The internal air supply reduces the risk of failure with external hoses.



GEA VARIVENT®
Overflow Valve

3 Lantern
The open lantern separates the actuator and product parts. It permits visual inspection of the stem seal, and is also used for indicating any leakages. Furthermore, heat transfer from the valve housing to the actuator is prevented. The VARIVENT® valve series enables the integration of additional valve options in the lantern, for example a limit stop or support of up to two proximity switches.

4 Valve disc
The VARIVENT® system offers an extensive number of different valve types for particular applications in process systems. These are mainly characterized by the different configurations of the valve disc. Mixproof separation of the media is achieved by two mutually independent valve discs, the double disc (upper disc) and the valve disc (lower disc).

5 Valve housing
The height of the dead-zone free housing exactly corresponds to the inside diameter of the connection pipeline. This avoids domes and sumps with their negative effects such as oxidization damage or cleaning problems. The special ball shape of the housing offers the best flow profiles without flow separation. Depending on the valve design, different seat rings are installed between the valve housings. Optionally, numerous housing combinations are available with either clamped or welded seats.

Hygienic Valves and Components Technical Characteristics

Hygienic valves and components are suitable for CIP/SIP, easy to maintain, offer reliable function and represent a significant factor in consistent product quality. Low costs with operation, maintenance and service ensure economical system productivity.

The VARIVENT® system has a modular structure, which means it offers a high level of flexibility. The result is economic efficiency for the system operator, optimized stock keeping and low-cost spare parts production due to the reduced diversity of parts.

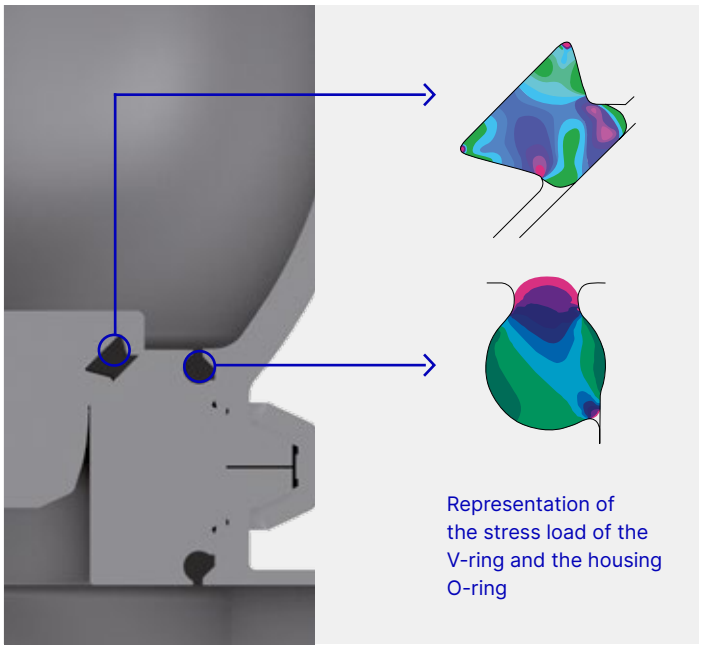
Modular system
Greater flexibility because of the ability to adapt rapidly to process changes
High economic efficiency
Low spare part stocks

Hygienic design
Lower risk of contaminating the end product
Maximum efficiency in cleaning
Lower CIP costs

Sealing acc. to the VARIVENT® principle

The hygienic control valves are characterized by a special seal technology. A metallic stop causes a defined seal deformation. This achieves a longer service life in the process system - which means shorter downtimes and a continuous production.

The special groove form in the valve disc ensures a secure hold of the seal at all times up to a pressure differential of 10 bar during the switching. In order to minimize the danger of cavitation, the pressure loss between the upper and the lower housing should be kept as low as possible. The sealing geometry was optimized by means of FEM calculations.



Representation of the stress load of the V-ring and the housing O-ring

Seals
Long operating time
Vacuum-proof
Selection of FDA-compliant seal materials • EPDM • FKM • HNBR • PTFE

Available nominal widths for valve series

Nominal width	DN	10	15	25	40	50	65	80	100	125	150				
	OD			1"	1 ½"	2"	2 ½"	3"	4"		6"				
	IPS											2"	3"	4"	6"
Valve type															
VARIVENT®															
VARIVENT® control valve type S				•	•	•	•	•	•	•	•	•	•	•	•
VARIVENT® control valve type P				•	•	•	•	•	•	•	•	•	•	•	•
VARIVENT® sampling valve type I		•	•	•	•	•	•	•	•	•	•	•	•	•	•
VARIVENT® sampling valve type TSVN* and TSVU*				•	•	•									
VARIVENT® double-seat sampling valve type T/09**					•	•									
VARIVENT® overflow valve type Q				•	•	•	•	•	•			•	•	•	
VARIVENT® constant pressure valve type DHV				•	•	•	•								
VARIVENT® safety relief valve type 488				•	•	•	•	•	•						
VARIVENT® safety relief valve type 483				•	•										
Spring-loaded safety relief valve type HyCom				•	•	•	•	•							
VARIVENT® vacuum valve type V							•	•	•		•				•

* Suitable for process connection size F or N
** Suitable for process connection size N

Hygienic Valves and Components Technical Characteristics

Pipe classes

Standard VARIVENT® valve housings are supplied with welding ends, although the valves can be delivered with various connection fittings as an option (see section 7).

The dimensions of the welding ends comply with the following standards:

Metric		Inch		
DIN	Outside diameter according to DIN 11866, series A	OD IPS	Outside diameter based on ASME-BPE-a-2004, DIN 11866, series C	Outside diameter according to IPS schedule 5
10	13.0 × 1.50			
15	19.0 × 1.50			
25	29.0 × 1.50	1"	25.4 × 1.65	
40	41.0 × 1.50	1 ½"	38.1 × 1.65	
50	53.0 × 1.50	2"	50.8 × 1.65	60.3 × 2.00
65	70.0 × 2.00	2 ½"	63.5 × 1.65	
80	85.0 × 2.00	3"	76.2 × 1.65	88.9 × 2.30
100	104.0 × 2.00	4"	101.6 × 2.11	114.3 × 2.30
125	129.0 × 2.00			
150	154.0 × 2.00	6"	152.4 × 2.77	168.3 × 2.77

Surfaces

The standard for surfaces in contact with the product is:

- Metric, inch OD, inch IPS: $R_a \leq 0.8$ µm

Higher-quality surfaces are an available option (see section 7).

Surfaces not in contact with the product (housing) are matt blasted or metal ground as standard. Detailed information on surface designs can be taken from the respective sections.

Materials

Components in contact with the product are produced from 1.4404 (AISI 316L), while those not in contact with the product are made from 1.4301 (AISI 304). Other materials, e.g. for use when handling aggressive fluids, are available on request.

For detailed information about the properties of the materials, refer to the material properties table.

Test report and inspection certificate

Optionally, the valve housings and internal components can be supplied with a test report 2.2 or an inspection certificate 3.1 acc. to EN 10204.

If 3.1 inspection certificates are required, please notify us of this when you place the order.

Seal materials

Seals in contact with the product are EPDM (standard), FKM and HNBR. NBR material is used for seals not in contact with the product.

The mixing constituents of our seal materials confirm to the USP class VI and are contained in the FDA White List. In this the sealings are in accordance with FOOD and DRUG (FDA) guidelines 21 CFR Part 177.2600 or 21 CFR 177.1550: “Rubber articles intended for repeated use”.

The resistance of the seal material depends on the type and temperature of the product being transported. The contact time with certain products can negatively affect the service life of seals. The seal material PTFE is available for individual valve types and components as well.

For detailed information about the seal material properties, refer to the seal material properties table.

Material properties

						Main alloy elements in % by mass			
Material number	Short name		Similar materials		PREN***	Cr (Chrome)	Ni (Nickel)	Mo (Molybdenum)	C max. (Carbon)
1.4301*	X5CrNi18-10	AISI 304	BS 304S15	SS2332	18	17.5 – 19.5	8.0 – 10.5	–	0.07
1.4404**	X2 CrNiMo 17-12-2	AISI 316L	BS 316S11	SS2348	25	16.5 – 18.5	10.0 – 13.0	2.0 – 2.5	0.03
1.4435	X2 CrNiMo 18-14-3	AISI 316L	BS 316S11	SS2353	27	17.0 – 19.0	12.5 – 15.0	2.5 – 3.0	0.03
1.4462	X2 CrNiMoN 22-5-3	2205	BS 318S13	SS2377	37	21.0 – 23.0	4.5 – 6.5	2.5 – 3.5	0.03
1.4410	X2 CrNiMoN 25-7-4	SAF 2507®	–	SS2328	39	24.0 – 26.0	6.0 – 8.0	3.0 – 4.5	0.03
1.4529	X1 NiCrMoCuN 25-20-7	AISI 926	–	–	42	19.0 – 21.0	24.0 – 26.0	6.0 – 7.0	0.02
AL-6XN®	–	–	–	–	43	20.0 – 22.0	23.5 – 25.5	6.0 – 7.0	0.03
1.4539	X1 NiCrMoCu 25-20-5	AISI 904L	BS 904S13	SS2562	35	19.0 – 21.0	24.0 – 26.0	4.0 – 5.0	0.02
2.4602	NiCr21Mo14W HASTELLOY C-22	–	–	–	69	20.0 – 22.5	Rest	12.5 – 14.5	0.01
2.4819	NiMo16Cr15W HASTELLOY C-276	N 10276	–	–	75	14.5 – 16.5	Rest	15.0 – 17.0	0.01

* Standard material for components not in contact with the product

** Standard material for components in contact with the product (other materials available on request)

*** Pitting Resistance Equivalent Number = % Cr + 3.3 × (% Mo + 0.5 W) + 20 N

Seal material properties

Seal material			**EPDM**	**FKM**	**HNBR**	**FFKM**	**PTFE**
General application temperature*			−40 to 135 °C −40 to 275 °F	−10 to 200 °C 14 to 392 °F	−25 to 140 °C −13 to 284 °F	−10 to 230 °C 14 to 446 °F	−200 to 260 °C
Medium	Concentration	At permitted operating temperature					
Alkali	≤ 3 %	up to 80 °C	+	o	+	+	+
	≤ 5 %	up to 40 °C	+	o	o	+	+
	≤ 5 %	up to 80 °C	+	–	–	+	+
	> 5 %		o	–	–	+	+
Inorganic acid**	≤ 3 %	up to 80 °C	+	+	+	+	+
	≤ 5 %	up to 80 °C	o	+	o	+	+
	> 5 %	up to 100 °C	–	+	–	+	+
Water		up to 80 °C	+	+	+	+	+
		up to 100 °C	+	+	+	+	+
Steam		up to 135 °C	+	o	o	+	+
Steam, approx. 30 min		up to 150 °C	+	o	–	+	+
Hydrocarbons / fuels			–	+	o	+	+
Products containing grease	≤ 35 %		+	+	+	+	+
	> 35 %		–	+	+	+	+
Oils			–	+	+	+	+

Other applications on request

* The general resistance of the material does not correspond to the maximum possible operating temperature.

** Inorganic acids are, for example, hydrochloric acid, nitric acid, sulphuric acid

\+ = Good resistance

o = Reduced service life

– = Not resistant

Hygienic Valves and Components Technical Characteristics

Housing connections

For valves with the option of combining housings, such as overflow and control valves, the clamped housing connection forms a flexible selection of the port orientation.

Clamped housing connection: Seat ring clamped by clamping connection

Installation

Hygienic valves and components must be installed without stresses. Lateral forces such as expansion of the pipelines due to heat cannot be compensated in the valve, as a result valve damages are possible. In such cases, we recommend taking measures to compensate for the expansion, such as by using the VARICOMP® expansion compensator.

The required clearance for installing and removing a component is specified in the particular technical data and dimensional sheet.

Recommended flow direction

If possible, the valves should close against the flow direction so to avoid water hammer. Exception: Constant pressure valve type DHV, sampling valve type I and vacuum valve type V.

Ambient conditions

Ambient temperatures	
Hygienic valves and components (with connection 0)	0 °C to 45 °C
	32 °F to 113 °F
Proximity switches	−20 °C to 80 °C
	−4 °F to 176 °F

The valves can also be used outdoors. However, in these application areas they must be protected against icing, or else de-iced before switching or lifting. In addition, the particular requirements on the control and feedback system must be taken into account in this case.

The product or operating temperature depends on the seal material and can be seen in the seal material properties table.

Air supply

The valve actuators are configured for operation with min. 4 bar and max. 8 bar air pressure. The standard actuator sizes are configured for an air supply pressure of min. 6 bar (with a product pressure of 5 bar). The quality of the air supply must meet the requirements of ISO 8573-1:2010.

ISO 8573-1:2010	
Solid content	Quality class 6
	Particle size max. 5 µm
	Particle density max. 5 mg/m³
Water content	Quality class 4
	Max. dew point 3 °C
	A correspondingly different dew point is required for applications at high altitude or with low ambient temperatures.
Oil content	Quality class 3
	Max. 1 mg oil per 1 m³ air, preferably oil-free

Feedback

In the control top

See catalog GEA Valve Automation

In the lantern (LAT)

Proximity switches of size M12×1 can detect the positions “open” and/or “closed”. In double-seat valves with lift actuator, it is also possible to detect the upper valve disc stroke in the lantern by means of a proximity switch (see catalog GEA Valve Automation).

For detecting the end positions by proximity switches in these valves, it is recommended to use the proximity switch holder (INA) on the actuator (see catalog GEA Valve Automation).

Certificates

Hygienic valves in the GEA VARIVENT® family, including ECOVENT® variants, have been designed according to the requirements of the European Hygienic Engineering and Design Group (EHEDG) as well as 3-A Sanitary Standards, Inc. (3-A SSI).

Certificates are available for several valve types. Additionally, numerous valves have been demonstrated to offer trouble-free and efficient cleaning ability not only in accordance with the above guidelines, but also in independent and standardized cleaning tests. The GEA VARIVENT® product family hence offers optimal safety and high potential savings.

ATEX certificates, CRN, EAC and other additional certificates are available on request for many GEA VARIVENT® valves and for other hygienic valves and components in the GEA portfolio.

GEA VARIVENT® and ECOVENT® valves comply with the EC Machinery Directive 2006/42/EC and bear the CE mark. They also fulfill the EN ISO 12100:2010 standard for the safety of machinery.

Due to their refined design, the GEA VARIVENT® family, including ECOVENT® variants, also meet the essential health and safety requirements of the EC Pressure Equipment Directive 2014/68/EU.

GEA VARIVENT® and ECOVENT® valves can come into contact with food. Components with the sealing material EPDM or FKM comply with Regulation (EC) No. 1935/2004 of the European Parliament and Council.

Selection Matrix

Catalogs
Hygienic Valve Technology

Catalogs
Hygienic Pump Technology

Catalogs
Aseptic Valve Technology

Catalogs
Cleaning Technology

GEA VARIVENT®
seat valves

GEA Butterfly valves

GEA VARIVENT®
special application valves

GEA VARIVENT®
valves for the U.S. dairy market

GEA VARITOP®
tank safety systems

GEA VARINLINE® / GEA VARICOMP®
process connections and
expansion compensators

GEA VARICOVER®
product recovery systems

GEA Service
for hygienic valve technology

GEA Valve automation
control and feedback systems


Control
VARIVENT® control valves
1
Sampling
VARIVENT® sampling valves
2
Protection against pressure in pipelines
VARIVENT® overflow valves
3
Securing constant pressure
VARIVENT® constant pressure valves
4
Excess pressure protection
VARIVENT® safety relief valves
5
Negative pressure protection
VARIVENT® vacuum valves
6
Options
7

1 VARIVENT® CONTROL VALVES

VARIVENT® Special Application Valves

Overview

To ensure an economical system productivity, it is necessary to keep the operation, maintenance and servicing costs at a minimum. At the same time, increasing cost pressure leads to higher expectations toward technology, quality and service and more comprehensive and stringent statutory provisions.

The VARIVENT® system's modular design makes it possible to individually adjust control valves to specific process requirements. This results in economic efficiency for the system operator, optimized stock keeping, and cost-effective spare parts production due to the low diversity of parts.

The integration of the control valves into the process control technology has a decisive impact on the quality of the control and the product. Preventive maintenance of the control valves ensures the system's high availability.

Special features
Modular design for flexible adaptation to application conditions
Linear and equal percentage control cones
Soft- or metallic-sealing valve discs
Low maintenance and assembly due to detachable clamp connections
Positioner for a large variety of requirements

Overview

Valve function
Control valves serve as actuators in control loops. In this process, the particular control valve works as a throttle device that sets the desired flow rate by changing the pressure loss in a pipeline.

General benefits
Proven sealing geometry
Dead-zone free VARIVENT® housing
Maximum cleaning efficiency
Low spare part stocks
Positioner for a large variety of requirements

Technical design
The linear or equal percentage control cone and the corresponding valve seat are located in the completely cleanable, dead-zone free VARIVENT® housing. The exchangeable seat ring with an associated control cone allows the selection of several Kvs values per nominal width; subsequent adjustments to changes in the operating conditions are possible at any time. All control cones are available in either a soft- or a metallic-sealing version.

The open lantern allows easy detection of potential leakages due to a defective stem seal.

Detachable clamp connections between the individual modules enable the control valve's quick assembly and maintenance. The valves are available in both effective directions, spring-to-close (NC) and spring-to-open (NO).

Positioners determine the valve's stroke with a high level of accuracy; a variety of designs allows for ideal integration into the process control.

Application examples

The need for strict adherence to standards in food production requires that control valves are designed to comply with the food and beverage industry's maximum hygiene demands.

In the manufacture of drugs by the pharmaceutical industry and in chemical process systems or in the technical use of enzymes, cells and microorganisms, any contamination would endanger the process results as well. Therefore, the use of dead-zone free control valves which can be cleaned efficiently and without leaving residue is necessary.

VARIVENT® valves enable low-germ processes. The control valves meet high hygiene requirements and allow the cleaning of pipes according to the efficient CIP or SIP procedure.

Control valves are used for pressure regulation, flow control, or for the mixing of liquids. Typical applications include: Temperature control in heat exchangers, tank pressure control, wort aeration, or dosing of various media. Different control valves adapted to various control tasks are available.

Control valve with a soft-sealing valve disc

VARIVENT® control valves

The VARIVENT® system's modular design offers numerous optional implementations for the valve's optimal adaptation to the process. The portfolio comprises two different valve types. Type S has a diaphragm actuator and a positioner, whereas the type P control valve is equipped with a VARIVENT® air/spring actuator and a T.VIS® P-15 positioner.

VARIVENT® control valve type S

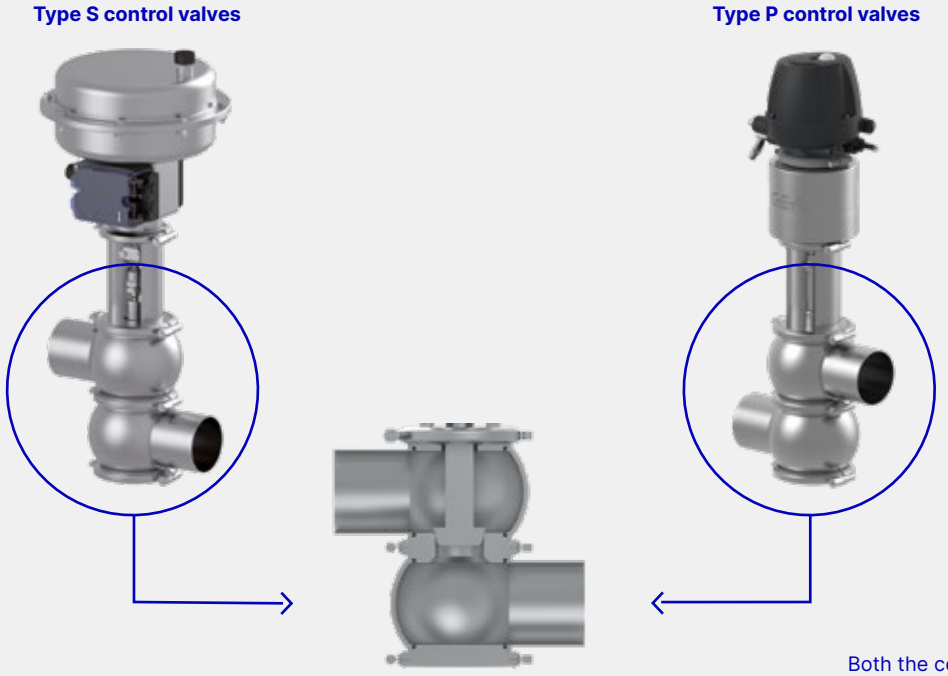
VARIVENT® control valve type P

Overview

Distinguishing features of VARIVENT® control valves

VARIVENT® control valves are available in two designs. While type S uses a diaphragm actuator in combination with a positioner, type P is equipped with a VARIVENT® air/spring actuator and the T.VIS® P-15 positioner. Both variants differ exclusively in the actuator's design.

All components are based on the VARIVENT® modular system principle. This provides the option to convert either the type S or the type P control valve to the particular other valve type at a later time.



Both the components in contact with the product as well as the strokes are identical in type S and type P control valves

The type S control valve is designed for fast, high-precision process controls. Due to a different operating principle, the type P control valve works at a slightly slower speed. As the control quality must always be considered individually in conjunction with the superordinate process control, a differentiation of the two types based on the level of difficulty of the control tasks or based on applications is not possible.

However, both series can be differentiated based on their options. Process-related requirements toward the valve can have a decisive effect on the selection.

	Type S	Type P
Actuator type	Diaphragm actuator	VARIVENT® air/ spring actuator
Positioner	Samson positioner	T.VIS® P-15
Manometer for air pressure	•	–
Emergency handwheel	•	–
Protection class	IP 66	IP 66 / IP 67 / IP 69K
	NEMA 4X	–
ATEX approvals	•	–
Pneumatic command variable	•	–
BUS / HART communication	•	–
Position transmitter 4... 20 mA	Optional	Standard
Troubleshooting functions	•	–
Split range	•	–

Control characteristic
The characteristic of a control valve is defined as the Kv value's dependence on the stroke, specified by the control cone's shape. Linear or equal percentage control cones are available.

In a valve with a linear characteristic, the Kv value changes linearly in relation to the stroke, whereas the equal percentage characteristic leads to a percentage change of the free flow area identical to the change in stroke.

A control valve with a linear characteristic is used for controls in which the valve causes more than 30 % of the overall pressure loss in the line system, e.g., in a level control. For all other applications the use of an equal percentage control cone is recommended. This is the case for approx. 90 % of all applications.

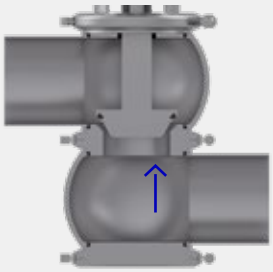
A Kvs value is the flow in m^3/h of water at a temperature of 5–30 °C that flows through the fully opened valve at a pressure loss of 1 bar.

It is common to select a Kvs value of the valve that is approx. 30 % higher than the maximum Kv value calculated for the particular operating conditions. Thus, a reserve is generated that offsets fluctuations or changes of the design data to a certain extent.

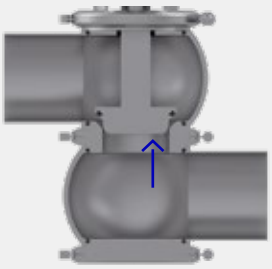
The three-way control valves can be provided as flow mixers or flow dividers. They are only available with linear control cones in the metallic-sealing design.

The control valves with a 3-stage seat have a linear control characteristic. The metallic-sealing valves are used to control large pressure differentials in order to counter-act cavitation.

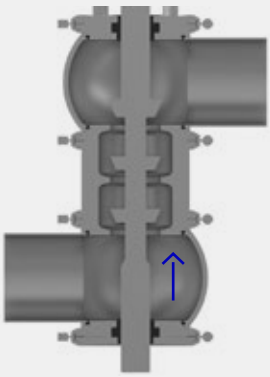
Recommended flow direction
In order to fulfill a reliable modulating function, and to prevent water hammers when closing the valve during the product flow, it is recommended to direct the flow through VARIVENT® control valves counter to the control cone's fail-safe position.



Control valve with linear control cone



Control valve with equal-percentage control cone



Control valve with 3-stage seat for control of high differential pressures

Overview

Housing combinations

VARIVENT® control valves are available with different housing combinations.

Housing combination with two housings

Housing combination with one housing and housing connection

Valve seat version

The use of clamped housing connections during the valve's installation achieves a high degree of flexibility. The valve seat is installed between the housings by means of a clamp connection. This makes it possible to adjust the valve's port orientation to the particular orientation of the pipeline system.

The interchangeability of the seat ring and the associated valve disc enables the subsequent adjustment of the required Kvs value.

The following table shows an overview of all available Kvs values per nominal width:

Kvs values

Nominal width	0.1*	0.16*	0.25*	0.4*	0.63*	1*	1.6	2.5	4	6.3	10	16	25	35	40	60	80	100	160	200	260	360
DN 25	•	•	•	•	•	•	•	•	•	•	•											
DN 40										•	•	•	•									
DN 50											•	•	•	•	•							
DN 65													•	•	•	•						
DN 80														•	•	•	•					
DN 100																•	•	•	•			
DN 125																		•	•	•	•	
DN 150																				•	•	•
OD 1"	•	•	•	•	•	•	•	•	•	•	•											
OD 1 ½"										•	•	•	•									
OD 2"											•	•	•	•	•							
OD 2 ½"													•	•	•	•						
OD 3"														•	•	•	•					
OD 4"																•	•	•	•			
OD 6"																				•	•	•
IPS 2"											•	•	•	•	•							
IPS 3"														•	•	•	•					
IPS 4"																•	•	•	•			
IPS 6"																				•	•	•

* For gas applications

Sealing acc. to the VARIVENT® principle
The hygienic control valves are characterized by a special sealing technology. A metallic stop results in a defined deformation of the seal.

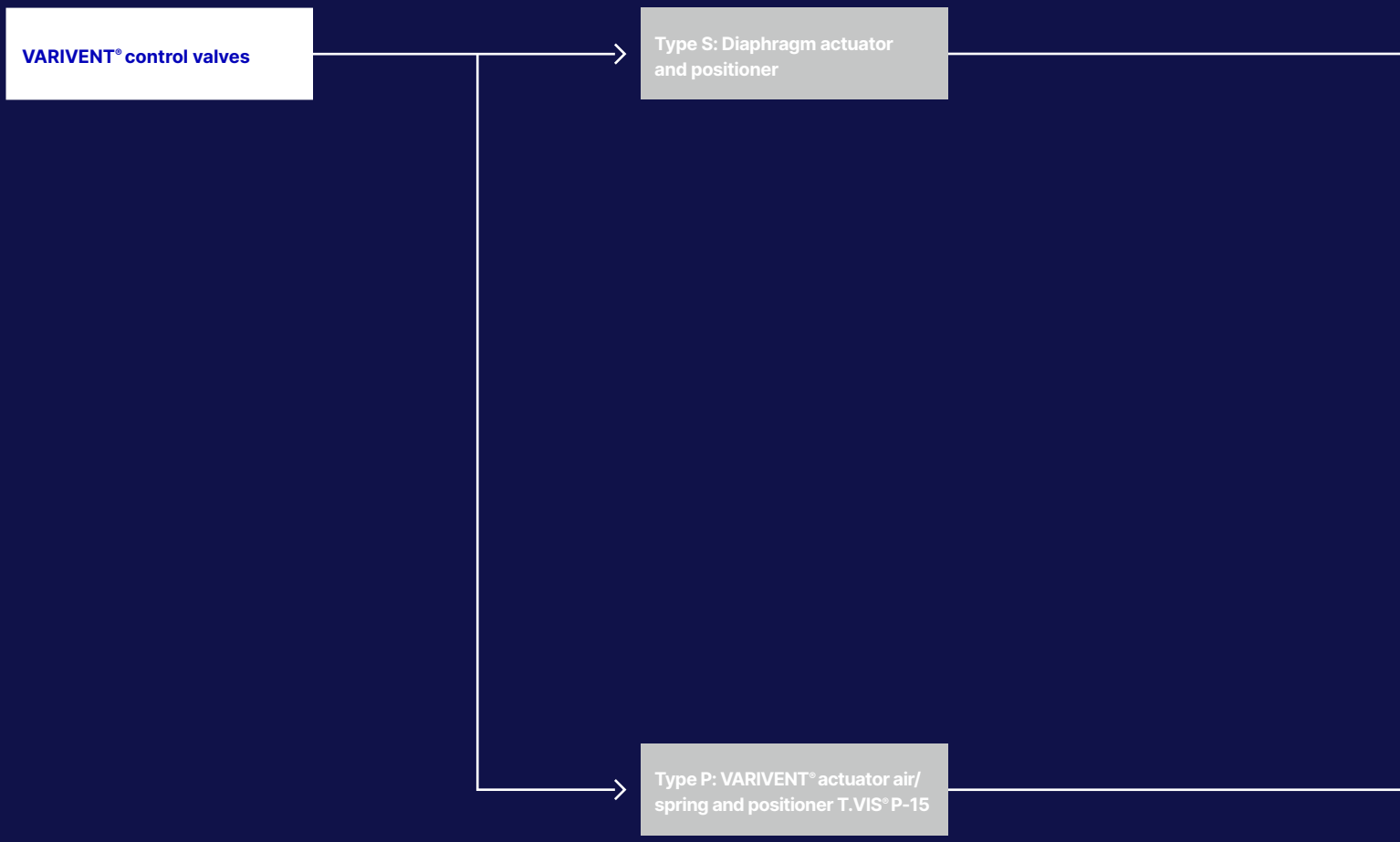
If the control valve does not also have to act as a shut-off valve, or if a higher leakage rate of the seat seal is tolerable, it is also possible to use control valves with a metallic seat design. These valves offer the advantage of even lower maintenance requirements.

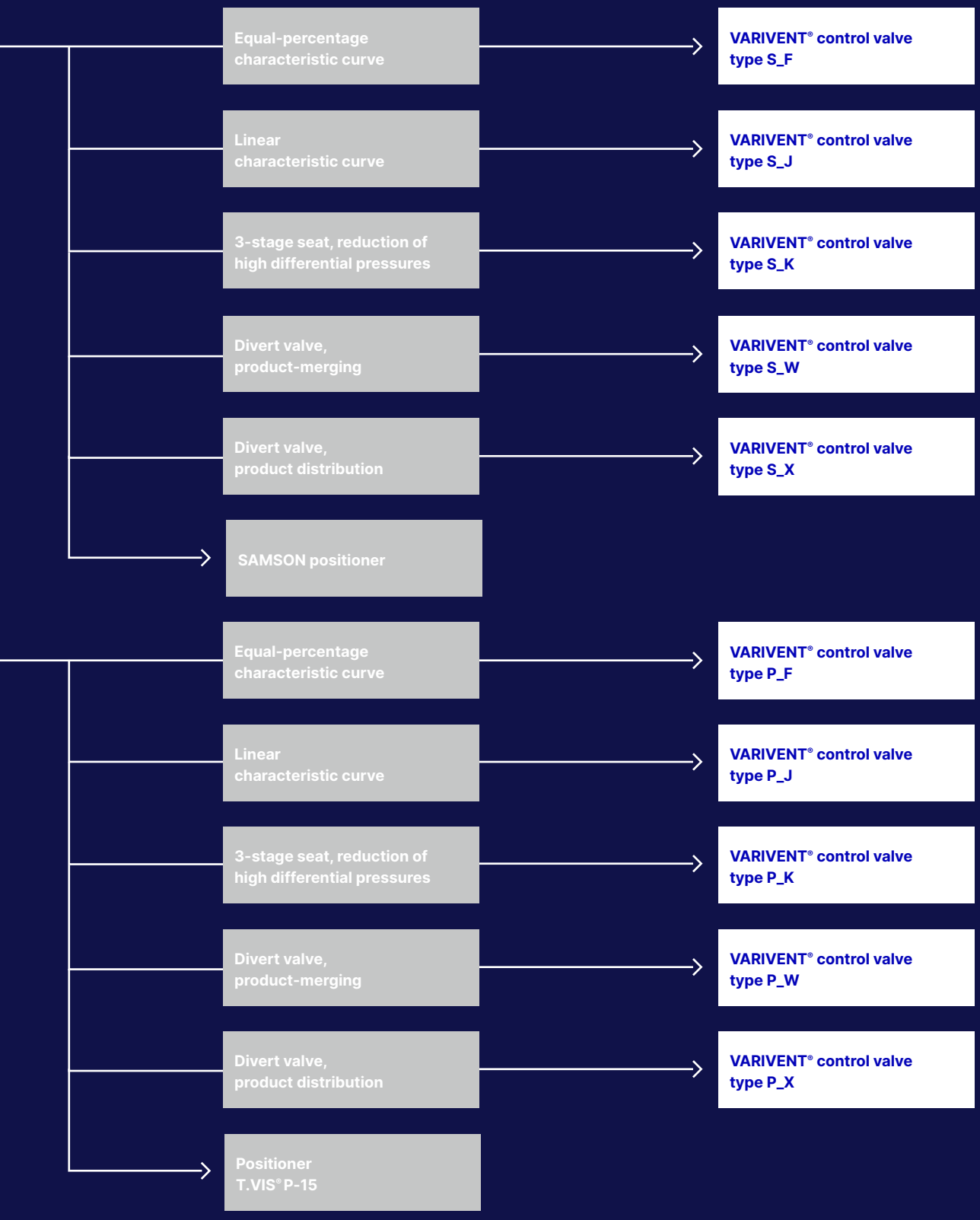
Seals
High operating time
Vacuum-proof
Selection of FDA-compliant sealing materials • EPDM • FKM • HNBR

Control valve with
V-ring, Soft-sealing (W)

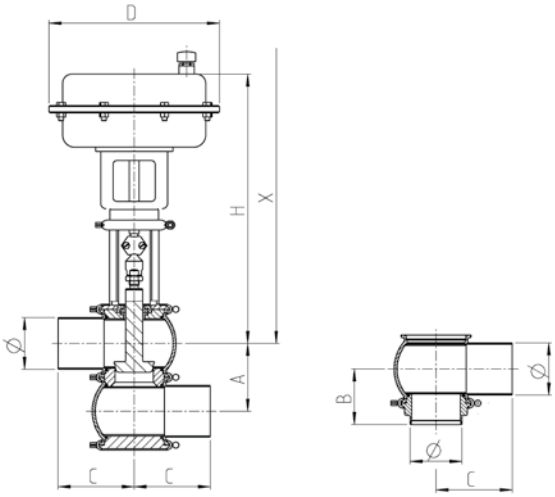
Control valve without
V-Ring, Metallic (M)

Selection Matrix




Equal-percentage characteristic curve
VARIVENT® control valve type S_F
Linear characteristic curve
VARIVENT® control valve type S_J
3-stage seat, reduction of high differential pressures
VARIVENT® control valve type S_K
Divert valve, product-merging
VARIVENT® control valve type S_W
Divert valve, product distribution
VARIVENT® control valve type S_X
SAMSON positioner
Equal-percentage characteristic curve
VARIVENT® control valve type P_F
Linear characteristic curve
VARIVENT® control valve type P_J
3-stage seat, reduction of high differential pressures
VARIVENT® control valve type P_K
Divert valve, product-merging
VARIVENT® control valve type P_W
Divert valve, product distribution
VARIVENT® control valve type P_X
Positioner T.VIS® P-15

VARIVENT®
Control Valve Type S_F
Equal-Percentage Characteristic Curve



	Dimension
Diaphragm actuator	D [mm]
175 cm²	215
350 cm²	280
750 cm²	390

Technical data of the standard version

Control characteristics	Equal-percentage
Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	4–6 bar (58–87 PSI)
Product pressure	DN 25 – 65, OD 1" – 2½", IPS 2": 0–16 bar* (0–232 psi)
	DN 80 – 150, OD 3" – 6", IPS 3"–6": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Positioner	I/P positioner; type 3725
Actuator type	Diaphragm actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

* We recommend the metallic seat design at a differential pressure of more than 10 bar.

	Pipe	Housing			Dimension				Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58.0	90.0	370	–	–	408	15	14.5
DN 40	41.0 × 1.50	62.0	64.0	90.0	376	380	–	430	15	16.0
DN 50	53.0 × 1.50	74.0	70.0	90.0	382	386	–	448	15	21.5
DN 65	70.0 × 2.00	96.0	83.0	125.0	393	397	–	478	15	26.0
DN 80	85.0 × 2.00	111.0	90.5	125.0	401	405	–	501	15	26.5
DN 100	104.0 × 2.00	130.0	100.0	125.0	–	414	471	586	15/30*	57.0
DN 125	129.0 × 2.00	155.0	112.5	150.0	–	–	484	624	30	68.5
DN 150	154.0 × 2.00	180.0	125.0	150.0	–	–	496	661	30	75.0
OD 1"	25.4 × 1.65	46.0	56.0	90.0	368	–	–	406	15	14.5
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	375	379	–	431	15	16.0
OD 2"	50.8 × 1.65	71.5	69.0	90.0	381	385	–	450	15	21.5
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	390	394	–	482	15	26.0
OD 3"	76.2 × 1.65	103.0	86.5	125.0	397	401	–	504	15	26.5
OD 4"	101.6 × 2.11	127.5	99.0	125.0	–	413	469	588	15/30*	58.0
OD 6"	152.4 × 2.77	177.0	123.0	150.0	–	–	495	660	30	75.0
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	386	390	–	445	15	21.5
IPS 3"	88.9 × 2.30	115.0	92.5	152.5	403	407	–	499	15	27.5
IPS 4"	114.3 × 2.30	140.0	105.0	152.5	–	419	476	581	15/30*	58.0
IPS 6"	168.2 × 2.77	192.0	131.0	152.5	–	–	502	655	30	76.0

* 30 mm stroke from KVS 100

Position	Description of the order code for the standard version			
1	**Valve type**			
	S	VARIVENT® control valve		
2	**Housing combinations**			
	A	B	C	E	L	T
						
3	**Supplement to the valve type**			
	F	Equal-percentage characteristic curve		
4/5	**Nominal width (upper housing/lower housing)**			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"	IPS 2"	
	DN 65	OD 2 ½"		
	DN 80	OD 3"	IPS 3"	
	DN 100	OD 4"	IPS 4"	
	DN 125			
	DN 150	OD 6"	IPS 6"	
6	**Non-actuated position**			
	Z	Spring-to-close (NC)		
	A	Spring-to-open (NO)		
7	**Control cone seal**			
	M	Metallic, without V-ring		
	W	Soft-sealing, with V-ring		
8	**Kvs value**			
	0.1	DN 25, OD 1"	16	DN 40 – 50, OD 1 ½" – 2", IPS 2"
	0.16	DN 25, OD 1"	25	DN 40 – 65, OD 1 ½" – 2 ½", IPS 2"
	0.25	DN 25, OD 1"	35	DN 50 – 80, OD 2" – 3", IPS 2" – 3"
	0.4	DN 25, OD 1"	40	DN 50 – 80, OD 2" – 3", IPS 2" – 3"
	0.63	DN 25, OD 1"	60	DN 65 – 100, OD 2 ½" – 4", IPS 3" – 4"
	1	DN 25, OD 1"	80	DN 80 – 100, OD 3" – 4", IPS 3" – 4"
	1.6	DN 25, OD 1"	100	DN 100 – 125, OD 4", IPS 4"
	2.5	DN 25, OD 1"	160	DN 100 – 125, OD 4", IPS 4"
	4	DN 25, OD 1"	200	DN 125 – 150, OD 6", IPS 6"
	6.3	DN 25 – 40, OD 1" – 1 ½"	260	DN 125 – 150, OD 6", IPS 6"
	10	DN 25 – 50, OD 1" – 2", IPS 2"	360*	DN 150, OD 6", IPS 6"
9	**Actuator****			
10	**Actuation pressure****			
11	**Actuator material**			
	S	Stainless Steel		
	P	Steel sheet, powder-coated		
12	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA; to DN 100, OD 4")		
13	**Surface quality of the housing**			
	2	Inside R_a ≤ 0.8 µm, outside matt blasted		
14	**Connection fittings**			
	N	Welding end		
15	**Options (See acc. to valve types)**			
+				
16	**Positioner**			
	0-------	Order code for positioners, see at the end of the section Control Valves		

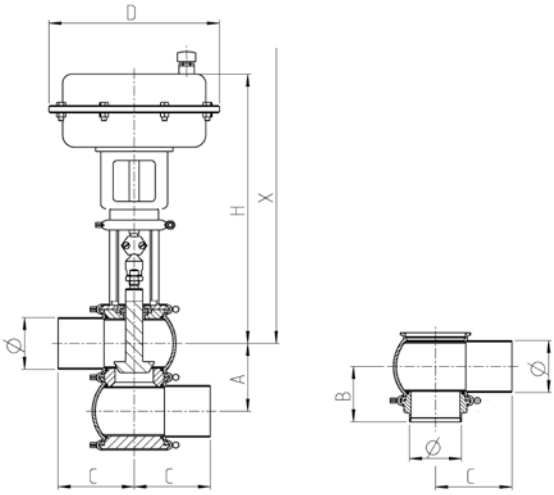
* Maximum product pressure is 7.5 bar.
** The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		F	-	/	-				-			-		-		2	N		+	0-------

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Control Valve Type S_J
Linear Characteristic Curve



	Dimension	
Diaphragm actuator	D [mm]	H [mm]
175 cm²	215	H1
350 cm²	280	H2
750 cm²	390	H3

Technical data of the standard version

Control characteristics	Linear
Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	4–6 bar (58–87 PSI)
Product pressure	DN 25 – 65, OD 1" – 2 ½", IPS 2": 0–16 bar* (0–232 psi)
	DN 80 – 150, OD 3" – 6", IPS 3"–6": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Positioner	I/P positioner; type 3725
Actuator type	Diaphragm actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

* We recommend the metallic seat design at a differential pressure of more than 10 bar.

	Pipe	Housing			Dimension				Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58.0	90.0	370	–	–	408	15	14.5
DN 40	41.0 × 1.50	62.0	64.0	90.0	376	380	–	430	15	16.0
DN 50	53.0 × 1.50	74.0	70.0	90.0	382	386	–	448	15	21.5
DN 65	70.0 × 2.00	96.0	83.0	125.0	393	397	–	478	15	26.0
DN 80	85.0 × 2.00	111.0	90.5	125.0	401	405	–	501	15	26.5
DN 100	104.0 × 2.00	130.0	100.0	125.0	–	414	471	586	15/30*	57.0
DN 125	129.0 × 2.00	155.0	112.5	150.0	–	–	484	624	30	68.5
DN 150	154.0 × 2.00	180.0	125.0	150.0	–	–	496	661	30	75.0
OD 1"	25.4 × 1.65	46.0	56.0	90.0	368	–	–	406	15	14.5
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	375	379	–	431	15	16.0
OD 2"	50.8 × 1.65	71.5	69.0	90.0	381	385	–	450	15	21.5
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	390	394	–	482	15	26.0
OD 3"	76.2 × 1.65	103.0	86.5	125.0	397	401	–	504	15	26.5
OD 4"	101.6 × 2.11	127.5	99.0	125.0	–	413	469	588	15/30*	58.0
OD 6"	152.4 × 2.77	177.0	123.0	150.0	–	–	495	660	30	75.0
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	386	390	–	445	15	21.5
IPS 3"	88.9 × 2.30	115.0	92.5	152.5	403	407	–	499	15	27.5
IPS 4"	114.3 × 2.30	140.0	105.0	152.5	–	419	476	581	15/30*	58.0
IPS 6"	168.2 × 2.77	192.0	131.0	152.5	–	–	502	655	30	76.0

* 30 mm stroke from KVS 100

Position	Description of the order code for the standard version			
1	**Valve type**			
	S	VARIVENT® control valve		
2	**Housing combinations**			
	A	B	C	E	L	T
						
3	**Supplement to the valve type**			
	J	Linear characteristic curve		
4/5	**Nominal width (upper housing/lower housing)**			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"	IPS 2"	
	DN 65	OD 2 ½"		
	DN 80	OD 3"	IPS 3"	
	DN 100	OD 4"	IPS 4"	
	DN 125			
	DN 150	OD 6"	IPS 6"	
6	**Non-actuated position**			
	Z	Spring-to-close (NC)		
	A	Spring-to-open (NO)		
7	**Control cone seal**			
	M	Metallic, without V-ring		
	W	Soft-sealing, with V-ring		
8	**Kvs value**			
	0.1	DN 25, OD 1"	16	DN 40 – 50, OD 1 ½" – 2", IPS 2"
	0.16	DN 25, OD 1"	25	DN 40 – 65, OD 1 ½" – 2 ½", IPS 2"
	0.25	DN 25, OD 1"	35	DN 50 – 80, OD 2" – 3", IPS 2" – 3"
	0.4	DN 25, OD 1"	40	DN 50 – 80, OD 2" – 3", IPS 2" – 3"
	0.63	DN 25, OD 1"	60	DN 65 – 100, OD 2 ½" – 4", IPS 3" – 4"
	1	DN 25, OD 1"	80	DN 80 – 100, OD 3" – 4", IPS 3" – 4"
	1.6	DN 25, OD 1"	100	DN 100 – 125, OD 4", IPS 4"
	2.5	DN 25, OD 1"	160	DN 100 – 125, OD 4", IPS 4"
	4	DN 25, OD 1"	200	DN 125 – 150, OD 6", IPS 6"
	6.3	DN 25 – 40, OD 1" – 1 ½"	260	DN 125 – 150, OD 6", IPS 6"
	10	DN 25 – 50, OD 1" – 2", IPS 2"	360*	DN 150, OD 6", IPS 6"
9	**Actuator****			
10	**Actuation pressure****			
11	**Actuator material**			
	S	Stainless Steel		
	P	Steel sheet, powder-coated		
12	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA; to DN 100, OD 4")		
13	**Surface quality of the housing**			
	2	Inside R_a ≤ 0.8 µm, outside matt blasted		
14	**Connection fittings**			
	N	Welding end		
15	**Options (See acc. to valve types)**			
+				
16	**Positioner**			
	0-------	Order code for positioners, see at the end of the section Control Valves		

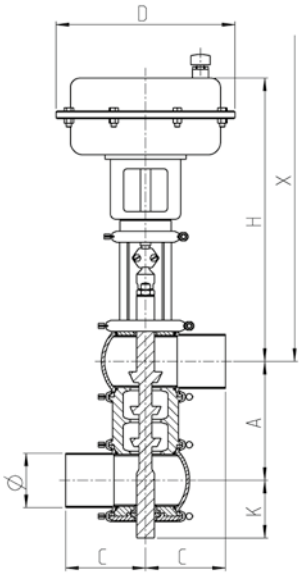
* Maximum product pressure is 7.5 bar.
** The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		J	-	/	-				-			-		-		2	N		+	0-------

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Control Valve Type S_K
3-Stage Seat



	Dimension	
Diaphragm actuator	D [mm]	H [mm]
175 cm²	215	H1
350 cm²	280	H2
750 cm²	390	H3

Technical data of the standard version

Control characteristics	Linear
Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	4–6 bar (58–87 PSI)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Positioner	I/P positioner; type 3725
Actuator type	Diaphragm actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe	Housing			Dimension			Valve	
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	77.5	90.0	75.0	370	–	–	548	15	15.0
DN 40	41.0 × 1.50	112.5	90.0	81.0	376	–	–	601	15	17.5
DN 50	53.0 × 1.50	124.5	90.0	87.0	–	386	–	635	15	23.0
DN 65	70.0 × 2.00	170.5	125.0	105.0	–	–	454	778	15	55.5
DN 80	85.0 × 2.00	185.5	125.0	114.0	–	–	462	817	15	55.5
DN 100	104.0 × 2.00	214.5	125.0	120.0	–	–	471	871	15	61.0
OD 1"	25.4 × 1.65	73.5	90.0	75.0	–	372	–	546	15	15.0
OD 1 ½"	38.1 × 1.65	109.5	90.0	81.0	–	382	–	602	15	17.5
OD 2"	50.8 × 1.65	122.0	90.0	87.0	–	388	–	637	15	23.0
OD 2 ½"	63.5 × 1.65	164.5	125.0	105.0	–	401	451	782	15	55.5
OD 3"	76.2 × 1.65	177.5	125.0	114.0	–	–	465	820	15	55.5
OD 4"	101.6 × 2.11	212.0	125.0	120.0	–	–	473	873	15	62.0

Position	Description of the order code for the standard version	
1	**Valve type**	
	S	VARIVENT® control valve
2	**Housing combinations**	
	A B C E 	
3	**Supplement to the valve type**	
	K	3-stage seat, linear characteristic curve
4/5	**Nominal width (upper housing/lower housing)**	
	DN 25	OD 1"
	DN 40	OD 1 ½"
	DN 50	OD 2"
	DN 65	OD 2 ½"
	DN 80	OD 3"
	DN 100	OD 4"
6	**Non-actuated position**	
	Z	Spring-to-close (NC)
	A	Spring-to-open (NO)
7	**Control cone seal**	
	M	Metallic, without V-ring
8	**Kvs value**	
	2.3	DN 25, OD 1"
	5.8	DN 40, OD 1 ½"
	9.2	DN 50, OD 2"
	14.4	DN 65, OD 2 ½"
	23.1	DN 80, OD 3"
	34.6	DN 100, OD 4"
9	**Actuator***	
10	**Actuation pressure***	
11	**Actuator material**	
	S	Stainless Steel
	P	Steel sheet, powder-coated
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA)
13	**Surface quality of the housing**	
	2	Inside R_a ≤ 0.8 µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options (See acc. to valve types)**	
	/2F	Double stem guidance
+		
16	**Positioner**	
	0-------	Order code for positioners, see at the end of the section Control Valves

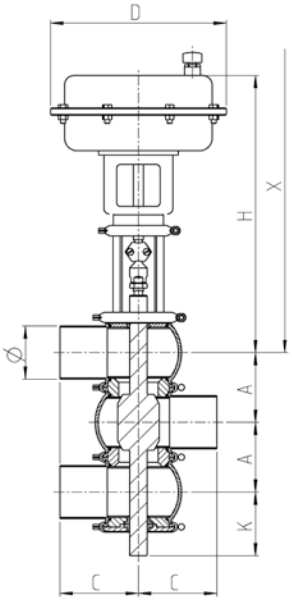
* The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		K	-	/	-		M		-			-		-		2	N	/2F	+	0-------

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Control Valve Type S_W
Divert Valve Product-Merging

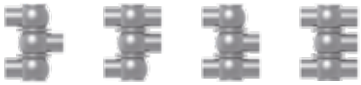


	Dimension	
Diaphragm actuator	D [mm]	H [mm]
175 cm²	215	H1
350 cm²	280	H2
750 cm²	390	H3

Technical data of the standard version

Control characteristics	Linear
Recommended flow direction	Product merging
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	4–6 bar (58–87 PSI)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Positioner	I/P positioner; type 3725
Actuator type	Diaphragm actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe	Housing			Dimension			Valve	
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90.0	73.5	370	374	–	573	15	15.5
DN 40	41.0 × 1.50	62.0	90.0	80.0	376	380	–	615	15	17.5
DN 50	53.0 × 1.50	74.0	90.0	85.5	–	386	–	657	15	18.5
DN 65	70.0 × 2.00	96.0	125.0	101.5	–	397	–	739	15	31.0
DN 80	85.0 × 2.00	111.0	125.0	110.0	–	405	–	793	15	32.0
DN 100	104.0 × 2.00	130.0	125.0	133.5	–	414	471	930	15	65.0
OD 1"	25.4 × 1.65	46.0	90.0	71.5	368	–	–	571	15	15.5
OD 1 ½"	38.1 × 1.65	59.0	90.0	78.5	378	382	–	616	15	17.5
OD 2"	50.8 × 1.65	71.5	90.0	84.5	–	385	–	659	15	18.5
OD 2 ½"	63.5 × 1.65	90.0	125.0	98.5	–	401	–	743	15	31.0
OD 3"	76.2 × 1.65	103.0	125.0	105.0	–	408	–	796	15	32.0
OD 4"	101.6 × 2.11	127.5	125.0	132.5	–	416	473	932	15	66.0

Position	Description of the order code for the standard version	
1	**Valve type**	
	S	VARIVENT® control valve
2	**Housing combinations**	
	W U Y M 	
3	**Supplement to the valve type**	
	W	Divert valve, product-merging, linear characteristic curve
4/5	**Nominal width (upper housing/lower housing)**	
	DN 25	OD 1"
	DN 40	OD 1 ½"
	DN 50	OD 2"
	DN 65	OD 2 ½"
	DN 80	OD 3"
	DN 100	OD 4"
	DN 125	
	DN 150	
6	**Non-actuated position**	
	Z	Spring-to-close (NC)
	A	Spring-to-open (NO)
7	**Control cone seal**	
	M	Metallic, without V-ring
8	**Kvs value**	
	6.3	DN 25, OD 1"
	16	DN 40, OD 1 ½"
	25	DN 50, OD 2"
	35	DN 65, OD 2 ½"
	60	DN 80, OD 3"
	100	DN 100, OD 4"
9	**Actuator***	
10	**Actuation pressure***	
11	**Actuator material**	
	S	Stainless Steel
	P	Steel sheet, powder-coated
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA)
13	**Surface quality of the housing**	
	2	Inside R_a ≤ 0.8 µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options (See acc. to valve types)**	
	/2F	Double stem guidance
+		
16	**Positioner**	
	0-------	Order code for positioners, see at the end of the section Control Valves

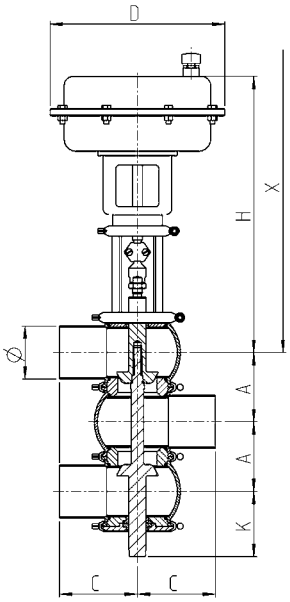
* The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		W	-	/	-		M		-			-		-		2	N	/2F	+	0-------

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Control Valve Type S_X
Divert Valve Product Distribution



	Dimension	
Diaphragm actuator	D [mm]	H [mm]
175 cm²	215	H1
350 cm²	280	H2
750 cm²	390	H3

Technical data of the standard version

Control characteristics	Linear
Recommended flow direction	Product distribution
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	4–6 bar (58–87 PSI)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Positioner	I/P positioner; type 3725
Actuator type	Diaphragm actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe	Housing			Dimension				Valve	
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90.0	73.5	370	374	–	573	15	15.5
DN 40	41.0 × 1.50	62.0	90.0	80.0	376	380	–	615	15	17.5
DN 50	53.0 × 1.50	74.0	90.0	85.5	–	386	–	657	15	18.5
DN 65	70.0 × 2.00	96.0	125.0	101.5	–	397	–	739	15	31.0
DN 80	85.0 × 2.00	111.0	125.0	110.0	–	405	–	793	15	32.0
DN 100	104.0 × 2.00	130.0	125.0	133.5	–	414	471	930	15	65.0
OD 1"	25.4 × 1.65	46.0	90.0	71.5	368	–	–	571	15	15.5
OD 1 ½"	38.1 × 1.65	59.0	90.0	78.5	378	382	–	616	15	17.5
OD 2"	50.8 × 1.65	71.5	90.0	84.5	–	385	–	659	15	18.5
OD 2 ½"	63.5 × 1.65	90.0	125.0	98.5	–	401	–	743	15	31.0
OD 3"	76.2 × 1.65	103.0	125.0	105.0	–	408	–	796	15	32.0
OD 4"	101.6 × 2.11	127.5	125.0	132.5	–	416	473	932	15	66.0

Position	Description of the order code for the standard version	
1	**Valve type**	
	S	VARIVENT® control valve
2	**Housing combinations**	
	W U Y M 	
3	**Supplement to the valve type**	
	X	Divert valve, product distribution, linear characteristic curve
4/5	**Nominal width (upper housing/lower housing)**	
	DN 25	OD 1"
	DN 40	OD 1 ½"
	DN 50	OD 2"
	DN 65	OD 2 ½"
	DN 80	OD 3"
	DN 100	OD 4"
6	**Non-actuated position**	
	Z	Spring-to-close (NC)
	A	Spring-to-open (NO)
7	**Control cone seal**	
	M	Metallic, without V-ring
8	**Kvs value**	
	6.3	DN 25, OD 1"
	16	DN 40, OD 1 ½"
	25	DN 50, OD 2"
	35	DN 65, OD 2 ½"
	60	DN 80, OD 3"
	100	DN 100, OD 4"
9	**Actuator***	
10	**Actuation pressure***	
11	**Actuator material**	
	S	Stainless Steel
	P	Steel sheet, powder-coated
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA)
13	**Surface quality of the housing**	
	2	Inside R_a ≤ 0.8 µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options (See acc. to valve types)**	
	/2F	Double stem guidance
+		
16	**Positioner**	
	0-------	Order code for positioners, see at the end of the section Control Valves

* The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		X	-	/	-		M		-			-		-		2	N	/2F	+	0-------

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Control Valve Type S
Positioner

Function of the positioner
Positioners convert an electrical input signal into a corresponding output signal (set position).

Description
Positioners compare the set value from a superordinate controller (PLC) to the stroke of the control valve and convert it into a pneumatic actuator pressure that is sent to the diaphragm actuator. A mechanical return of the current position of the actuator stroke can balance out changes regarding operating pressure and actuation energy automatically. This improves the accuracy and reduces the actuation time. Interferences such as friction or flow influences are balanced out by the positioner itself. The positioners can be used in the normal and split range operation.

The positioners are directly assembled to the diaphragm actuator of the control valve, which means the pneumatic connections are realized without additional tubes or hoses.

Special features of digital positioners
Simple operation
Display with switchable reading direction
Automatical setup of the neutral point and the range during the initialization process
Independent recognition of errors in the actuator
Movement direction independent of the installation orientation
Continuous monitoring of the zero point
Minimized air consumption
Fail-safe storage of all parameters

Type of signal

Electro-pneumatic (i/p) positioners

For the electro-pneumatic positioners, the input is an analog direct current signal of 4 to 20 mA or a digital signal (PROFIBUS®, FOUNDATION™ Fieldbus). The input signal is converted into the corresponding required pressure with an integrated circuit. The output signal is an actuation pressure with up to 6 bar (90 psi).

Type 3725

Type (TROVIS) 3730

VARIVENT®
Control Valve Type S
Positioner

The respective positioners can be equipped with further accessoiries. The positioners of type TROVIS 3730-3 additionally permit HART®-communication between field and process control level. The positioners type 3730-4 and type 3730-5 integrate control valves into fieldbus systems via PROFIBUS® PA or FOUNDATION™ fieldbus.

Type	**3725**	**3730-5**	**3730-4**	**TROVIS 3730-1**	**TROVIS 3730-3**
Input/output signal	i/p	i/p	i/p	i/p	i/p
Communication		FOUNDATION™	PROFIBUS®		HART
Diagnosis		EXPERTplus	EXPERTplus		EXPERTplus
Guide size	4 to 20 mA	–	–	4 to 20 mA	4 to 20 mA
Split range	•	•	•	•	•
Supply air pressure	4 to 6 bar	4 to 6 bar	4 to 6 bar	4 to 6 bar	4 to 6 bar
Options					
Position feedback, 4 – 20 mA				•	•
Forced venting 24V					•
Pressure gauge component	•	•	•	•	•
AS-Interface module type 6150	•				
Open/close position feedback					
2 proximity switches (software)				•	•
2 Inductive limit switches					•
Approval acc. to ATEX					
II 2G Ex ia IIC T4 Gb	•				
II 2G Ex ia IIC T6 Gb / II 2D Ex ia IIIC T80°C Db			•		
II 2G Ex ia IIC T4/T6 Gb / II 2D Ex ia IIIC T85°C Db				•	•
IECEx			•	•	•
Class I, II, Div.1, Groups A,B,C,D,E,F,G				•	
Operating elements					
Display	•	•	•	•	•
Volume throttle	•	•	•		
Buttons	3	1	1		1
Dial switch/push button		•	•	•	•
Slider		•	•		•
Ambient temperature	–20 to 80 °C	–45 to 80 °C	–45 to 80 °C	–20 to 80 °C	–20 to 80 °C
Index of protection class	IP66	IP66	IP66	IP66	IP66
Option in the order code	1	6	7	10	11

Not all options listed can be combined

Position	Description of the order code for the standard version	
1	**Positioner type**	
	0	Without positioner
	1	Type 3725 i/p
	6	Type 3730-5 i/p (FOUNDATION™ fieldbus)
	7	Type 3730-4 i/p PROFIBUS®
	10	Type TROVIS 3730-1 i/p
	11	Type TROVIS 3730-3 i/p HART
2	**Open/close position feedback**	
	–	Without information
	S	2 proximity switches (software)
	J	2 inductive limit switches
3	**Position feedback**	
	–	Without position feedback
	2	With position feedback 4 – 20 mA
4	**Forced venting 24 V**	
	–	Without
	1	With
5	**Ex-design**	
	–	Without Ex-protection certificate
	E	With Ex-protection certificate*
	U	With Ex-protection certificate acc. to FM/CSA
6	**Pressure gauge component**	
	–	Without pressure gauge assembly
	1	With pressure gauge assembly
7	**Air connection**	
	M	Metric for air hose Ø 6/4 mm
	Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)
8	**ASI module**	
	–	Without ASI module
	A	With ASI module

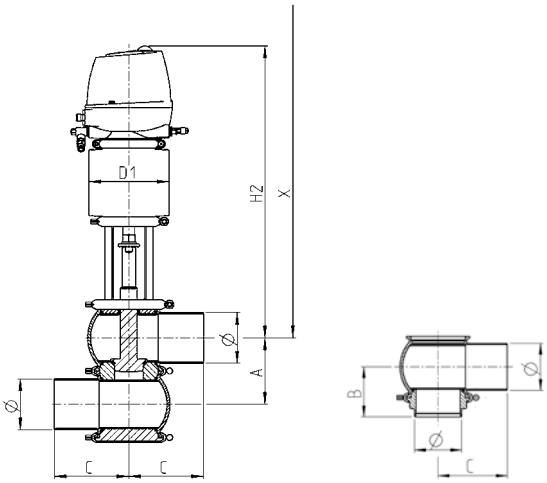
* For the available ATEX approvals please see table “further options”.

The code is composed as following, depending on the chosen configuration:

Position	1	2	3	4	5	6	7	8
Code								

The code to describe the positioner is attached to the order code of the control valve.

VARIVENT®
Control Valve Type P_F
Equal-Percentage Characteristic Curve



Technical data of the standard version

Control characteristics	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	5–8 bar (73–116 psi)
Product pressure	DN 25 – 65, OD 1" – 2 ½", IPS 2": 0–16 bar* (0–232 psi)
	DN 80 – 150, OD 3" – 6": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and Feedback System	Positioner T.VIS® P-15
Actuator type	Air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

* We recommend the metallic seat design at a differential pressure of more than 10 bar.

	Pipe			Housing	Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58	90.0	99	423.0	473	15	7.5
DN 40	41.0 × 1.50	62.0	64	90.0	110	464.0	534	15	10.0
DN 50	53.0 × 1.50	74.0	70	90.0	110	470.0	552	15	10.5
DN 65	70.0 × 2.00	96.0	83	125.0	135	481.0	582	15	17.0
DN 80	85.0 × 2.00	111.0	90	125.0	170	519.0	635	15	17.5
DN 100	104.0 × 2.00	130.0	100	125.0	210	528.0	663	15/30*	25.0
DN 125	129.0 × 2.00	155.0	112	150.0	260	684.0	859	30	55.0
DN 150	154.0 × 2.00	180.0	125	150.0	260	708.0	908	30	63.5
OD 1"	25.4 × 1.65	46.0	56	90.0	99	421.0	471	15	7.5
OD 1 ½"	38.1 × 1.65	59.0	62	90.0	110	466.0	535	15	10.0
OD 2"	50.8 × 1.65	71.5	69	90.0	110	472.0	554	15	10.5
OD 2 ½"	63.5 × 1.65	90.0	80	125.0	135	485.0	586	15	17.0
OD 3"	76.2 × 1.65	103.0	86	125.0	170	522.0	638	15	17.5
OD 4"	101.6 × 2.11	127.5	99	125.0	210	529.0	665	15/30*	25.0
OD 6"	152.4 × 2.77	177.0	123	150.0	260	707.0	907	30	63.5
IPS 2"	60.3 × 2.00	81.0	73	114.3	110	467.0	549	15	10.5
IPS 3"	88.9 × 2.30	115.0	92	152.5	135	487.0	633	15	17.5
IPS 4"	114.3 × 2.30	140.0	105	152.5	135	493.0	658	15/30*	25.0
IPS 6"	168.2 × 2.77	192.0	131	152.5	260	702.0	902	30	63.5

* 30 mm stroke from KVS 100

Position	Description of the order code for the standard version					
1	**Valve type**					
	P	VARIVENT® control valve				
2	**Housing combinations**					
	A	B	C	E	L	T
						
3	**Supplement to the valve type**					
	F	Equal-percentage characteristic curve				
4/5	**Nominal width (upper housing/lower housing)**					
	DN 25	OD 1"		DN 80	OD 3"	IPS 3"
	DN 40	OD 1 ½"		DN 100	OD 4"	IPS 4"
	DN 50	OD 2"	IPS 2"	DN 125		
	DN 65	OD 2 ½"		DN 150	OD 6"	IPS 6"
6	**Actuator type**					
	S	Air / spring				
7	**Non-actuated position**					
	Z	Spring-to-close (NC)		A	Spring-to-open (NO)	
8	**Control cone seal**					
	M	Metallic, without V-ring		W	Soft-sealing, with V-ring	
9	**Kvs value**					
	0.1	DN 25, OD 1"		16	DN 40 – 50, OD 1 ½" – 2", IPS 2"	
	0.16	DN 25, OD 1"		25	DN 40 – 65, OD 1 ½" – 2 ½", IPS 2"	
	0.25	DN 25, OD 1"		35	DN 50 – 80, OD 2" – 3", IPS 2" – 3"	
	0.4	DN 25, OD 1"		40	DN 50 – 80, OD 2" – 3", IPS 2" – 3"	
	0.63	DN 25, OD 1"		60	DN 65 – 100, OD 2 ½" – 4", IPS 3" – 4"	
	1	DN 25, OD 1"		80	DN 80 – 100, OD 3" – 4", IPS 3" – 4"	
	1.6	DN 25, OD 1"		100	DN 100 – 125, OD 4", IPS 4"	
	2.5	DN 25, OD 1"		160	DN 100 – 125, OD 4", IPS 4"	
	4	DN 25, OD 1"		200	DN 125 – 150, OD 6", IPS 6"	
	6.3	DN 25 – 40, OD 1" – 1 ½"		260	DN 125 – 150, OD 6", IPS 6"	
	10	DN 25 – 50, OD 1" – 2", IPS 2"		360	DN 150, OD 6", IPS 6"	
10	**Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)**					

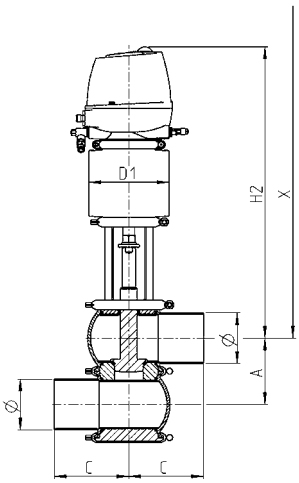
Nominal width	Actuator (Spring-to-close)													Actuator (Spring-to-open)											
Kvs value	<4	6.3	10	16	25	35	40	60	80	100	160	200	260	360	<4	6.3	10	16	25	35	40	60	80	100	160	200	260	360
DN 25, OD 1"	AA														AA													
DN 40, OD 1 ½"		AA			BB											AA			BA									
DN 50, OD 2", IPS 2"			AA		BB												AA		BA									
DN 65, OD 2 ½"					BB			CD											BA									
DN 80, OD 3", IPS 3"						BB		CD	DF													BA	CA					
DN 100, OD 4", IPS 4"								CD	DF		E6											BA	CA	DB				
DN 125										DF	EG6Z	SH6Z												CA	DB	EF6A		
DN 150, OD 6", IPS 6"												SH6Z														EF6A		

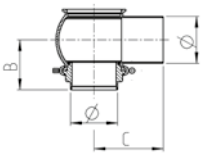
11	**Valve seat version**	
	L0	Clamped seat ring / clamp connection
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA; to DN 100, OD 4")
13	**Surface quality of the housing**	
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options**	
	/52	Adhesive ID tag
+		
16 – 21	**Control and feedback system**	
	TP15XXX	Order code for positioner T.VIS® P-15

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7		8	9		10	11		12	13	14	15		16 to 21				
Code	P		F	-	/	-	S		-			-		L0	-		2	N	/52	+	TP15	I		P	A

VARIVENT®
Control Valve Type P_J
Linear Characteristic Curve





Technical data of the standard version

Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	5–8 bar (73–116 psi)
Product pressure	DN 25 – 65, OD 1" – 2 ½", IPS 2": 0–16 bar* (0–232 psi)
	DN 80 – 150, OD 3" – 6": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and Feedback System	Positioner T.VIS® P-15
Actuator type	Air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

* We recommend the metallic seat design at a differential pressure of more than 10 bar.

	Pipe			Housing	Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58	90.0	99	423.0	473	15	7.5
DN 40	41.0 × 1.50	62.0	64	90.0	110	464.0	534	15	10.0
DN 50	53.0 × 1.50	74.0	70	90.0	110	470.0	552	15	10.5
DN 65	70.0 × 2.00	96.0	83	125.0	135	481.0	582	15	17.0
DN 80	85.0 × 2.00	111.0	90	125.0	170	519.0	635	15	17.5
DN 100	104.0 × 2.00	130.0	100	125.0	210	528.0	663	15/30*	25.0
DN 125	129.0 × 2.00	155.0	112	150.0	260	684.0	859	30	55.0
DN 150	154.0 × 2.00	180.0	125	150.0	260	708.0	908	30	63.5
OD 1"	25.4 × 1.65	46.0	56	90.0	99	421.0	471	15	7.5
OD 1 ½"	38.1 × 1.65	59.0	62	90.0	110	466.0	535	15	10.0
OD 2"	50.8 × 1.65	71.5	69	90.0	110	472.0	554	15	10.5
OD 2 ½"	63.5 × 1.65	90.0	80	125.0	135	485.0	586	15	17.0
OD 3"	76.2 × 1.65	103.0	86	125.0	170	522.0	638	15	17.5
OD 4"	101.6 × 2.11	127.5	99	125.0	210	529.0	665	15/30*	25.0
OD 6"	152.4 × 2.77	177.0	123	150.0	260	707.0	907	30	63.5
IPS 2"	60.3 × 2.00	81.0	73	114.3	110	467.0	549	15	10.5
IPS 3"	88.9 × 2.30	115.0	92	152.5	135	487.0	633	15	17.5
IPS 4"	114.3 × 2.30	140.0	105	152.5	135	493.0	658	15/30*	25.0
IPS 6"	168.2 × 2.77	192.0	131	152.5	260	702.0	902	30	63.5

* 30 mm stroke from KVS 100

Position	Description of the order code for the standard version					
1	**Valve type**					
	P	VARIVENT® control valve				
2	**Housing combinations**					
	A	B	C	E	L	T
						
3	**Supplement to the valve type**					
	J	Linear characteristic curve				
4/5	**Nominal width (upper housing/lower housing)**					
	DN 25	OD 1"		DN 80	OD 3"	IPS 3"
	DN 40	OD 1 ½"		DN 100	OD 4"	IPS 4"
	DN 50	OD 2"	IPS 2"	DN 125		
	DN 65	OD 2 ½"		DN 150	OD 6"	IPS 6"
6	**Actuator type**					
	S	Air / spring				
7	**Non-actuated position**					
	Z	Spring-to-close (NC)		A	Spring-to-open (NO)	
8	**Control cone seal**					
	M	Metallic, without V-ring		W	Soft-sealing, with V-ring	
9	**Kvs value**					
	0.1	DN 25, OD 1"		16	DN 40 – 50, OD 1 ½" – 2", IPS 2"	
	0.16	DN 25, OD 1"		25	DN 40 – 65, OD 1 ½" – 2 ½", IPS 2"	
	0.25	DN 25, OD 1"		35	DN 50 – 80, OD 2" – 3", IPS 2" – 3"	
	0.4	DN 25, OD 1"		40	DN 50 – 80, OD 2" – 3", IPS 2" – 3"	
	0.63	DN 25, OD 1"		60	DN 65 – 100, OD 2 ½" – 4", IPS 3" – 4"	
	1	DN 25, OD 1"		80	DN 80 – 100, OD 3" – 4", IPS 3" – 4"	
	1.6	DN 25, OD 1"		100	DN 100 – 125, OD 4", IPS 4"	
	2.5	DN 25, OD 1"		160	DN 100 – 125, OD 4", IPS 4"	
	4	DN 25, OD 1"		200	DN 125 – 150, OD 6", IPS 6"	
	6.3	DN 25 – 40, OD 1" – 1 ½"		260	DN 125 – 150, OD 6", IPS 6"	
	10	DN 25 – 50, OD 1" – 2", IPS 2"		360	DN 150, OD 6", IPS 6"	
10	**Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)**					

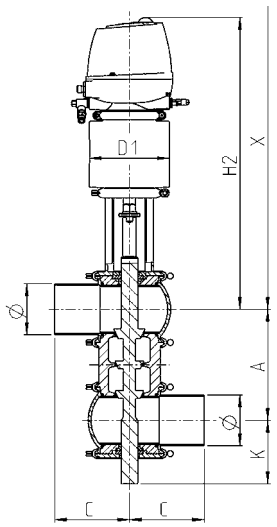
Nominal width	Actuator (Spring-to-close)													Actuator (Spring-to-open)											
Kvs value	<4	6.3	10	16	25	35	40	60	80	100	160	200	260	360	<4	6.3	10	16	25	35	40	60	80	100	160	200	260	360
DN 25, OD 1"	AA														AA													
DN 40, OD 1 ½"		AA			BB											AA			BA									
DN 50, OD 2", IPS 2"			AA		BB												AA		BA									
DN 65, OD 2 ½"					BB			CD											BA									
DN 80, OD 3", IPS 3"						BB		CD	DF													BA	CA					
DN 100, OD 4", IPS 4"								CD	DF		E6											BA	CA	DB				
DN 125										DF	EG6	SH6Z												CA	DB	EF6A		
DN 150, OD 6", IPS 6"												SH6Z														EF6A		

11	**Valve seat version**	
	L0	Clamped seat ring / clamp connection
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA; to DN 100, OD 4")
13	**Surface quality of the housing**	
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options**	
	/52	Adhesive ID tag
+		
16 – 21	**Control and feedback system**	
	TP15XXX	Order code for positioner T.VIS® P-15

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7		8	9		10	11		12	13	14	15		16 to 21				
Code	P		J	-	/	-	S		-			-		L0	-		2	N	/52	+	TP15	I		P	A

VARIVENT®
Control Valve Type P_K
3-Stage Seat



Technical data of the standard version

Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	5–8 bar (73–116 psi)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and Feedback System	Positioner T.VIS® P-15
Actuator type	Air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	Clearance X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	77.5	90	75	99	423	613	15	9.5
DN 40	41.0 × 1.50	112.5	90	81	99	429	666	15	12.0
DN 50	53.0 × 1.50	124.5	90	87	110	470	739	15	12.5
DN 65	70.0 × 2.00	170.5	125	105	110	481	825	15	21.0
DN 80	85.0 × 2.00	185.5	125	114	135	489	864	15	21.5
DN 100	104.0 × 2.00	214.5	125	120	170	528	933	30	32.0
OD 1"	25.4 × 1.65	73.5	90	75	99	421	611	15	9.5
OD 1 ½"	38.1 × 1.65	109.5	90	81	99	431	667	15	12.0
OD 2"	50.8 × 1.65	122.0	90	87	110	472	741	15	12.5
OD 2 ½"	63.5 × 1.65	164.5	125	105	110	485	829	15	21.0
OD 3"	76.2 × 1.65	177.5	125	114	135	492	867	15	21.5
OD 4"	101.6 × 2.11	212.0	125	120	170	529	935	30	32.0

Position	Description of the order code for the standard version			
1	**Valve type**			
	P	VARIVENT® control valve		
2	**Housing combinations**			
	A	B	C	E
				
3	**Supplement to the valve type**			
	K	3-stage seat, reduction of high differential pressures, linear characteristic curve		
4/5	**Nominal width (upper housing/lower housing)**			
	DN 25	OD 1"	DN 80	OD 3"
	DN 40	OD 1 ½"	DN 100	OD 4"
	DN 50	OD 2"		
	DN 65	OD 2 ½"		
6	**Actuator type**			
	S	Air / spring		
7	**Non-actuated position**			
	Z	Spring-to-close (NC)	A	Spring-to-open (NO)
8	**Control cone seal**			
	M	Metallic, without V-ring		
9	**Kvs value**			
	2.3	DN 25, OD 1"		
	5.8	DN 40, OD 1 ½"		
	9.2	DN 50, OD 2"		
	14.4	DN 65, OD 2 ½"		
	23.1	DN 80, OD 3"		
	57.7	DN 100, OD 4"		

10 **Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)**

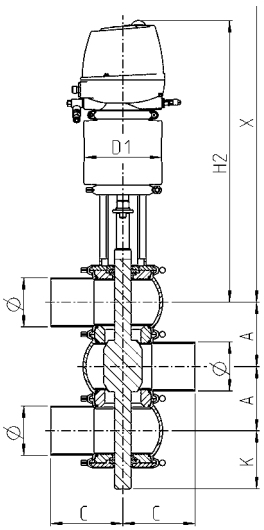
Nominal width	Actuator (Spring-to-close)						Actuator (Spring-to-open)					
Kvs value	2.3	5.8	9.2	14.4	23.1	57.7	2.3	5.8	9.2	14.4	23.1	57.7
DN 25, OD 1"	AA						AA					
DN 40, OD 1 ½"		AA						AA				
DN 50, OD 2"			BB						BA			
DN 65, OD 2 ½"				BB						BA		
DN 80, OD 3"					CD						BA	
DN 100, OD 4"						DF						CA

11	**Valve seat version**	
	L0	Clamped seat ring / clamp connection
12	**Seal material in contact with the product**	
	1	EPDM (FDA)
	2	FKM (FDA)
	3	HNBR (FDA)
13	**Surface quality of the housing**	
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted
14	**Connection fittings**	
	N	Welding end
15	**Options**	
	/52	Adhesive ID tag
+		
16–21	**Control and feedback system**	
	TP15XXX	Order code for positioner T.VIS® P-15

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7		8	9		10	11		12	13	14	15		16 to 21					
Code	P		K	-	/	-	S		-	M		-		L0	-		2	N	/52	+	TP15	I		P	A	

VARIVENT®
Control Valve Type P_W
Divert Valve Product-Merging



Technical data of the standard version

Recommended flow direction	Product merging
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	5–8 bar (73–116 psi)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and Feedback System	Positioner T.VIS® P-15
Actuator type	Air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	Clearance X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90	73.5	110	458	667	15	11.0
DN 40	41.0 × 1.50	62.0	90	80.0	110	464	719	15	12.5
DN 50	53.0 × 1.50	74.0	90	85.5	135	470	761	15	13.5
DN 65	70.0 × 2.00	96.0	125	101.5	135	481	843	15	22.5
DN 80	85.0 × 2.00	111.0	125	110.0	170	519	927	15	23.5
DN 100	104.0 × 2.00	130.0	125	133.5	210	528	1,007	15	39.5
OD 1"	25.4 × 1.65	46.0	90	71.5	110	456	675	15	11.0
OD 1 ½"	38.1 × 1.65	59.0	90	78.5	110	466	720	15	12.5
OD 2"	50.8 × 1.65	71.5	90	84.5	135	472	763	15	13.5
OD 2 ½"	63.5 × 1.65	90.0	125	98.5	135	485	847	15	22.5
OD 3"	76.2 × 1.65	103.0	125	105.0	170	522	930	15	23.5
OD 4"	101.6 × 2.11	127.5	125	132.5	210	529	1,009	15	39.5

Position	Description of the order code for the standard version			
1	**Valve type**			
	P	VARIVENT® control valve		
2	**Housing combinations**			
	W	U	Y	M
				
3	**Supplement to the valve type**			
	W	Divert valve, product-merging, linear characteristic curve		
4/5	**Nominal width (upper housing/lower housing)**			
	DN 25	OD 1"	DN 80	OD 3"
	DN 40	OD 1 ½"	DN 100	OD 4"
	DN 50	OD 2"		
	DN 65	OD 2 ½"		
6	**Actuator type**			
	S	Air / spring		
7	**Non-actuated position**			
	Z	Spring-to-close (NC)	A	Spring-to-open (NO)
8	**Control cone seal**			
	M	Metallic, without V-ring		
9	**Kvs value**			
	6.3	DN 25, OD 1"		
	16	DN 40, OD 1 ½"		
	25	DN 50, OD 2"		
	35	DN 65, OD 2 ½"		
	60	DN 80, OD 3"		
	100	DN 100, OD 4"		
10	**Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)**			

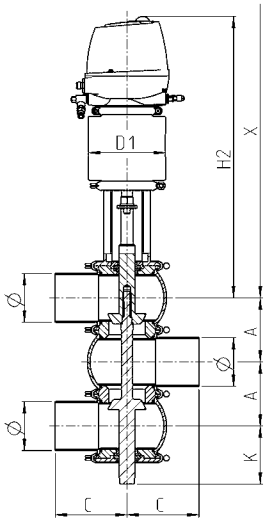
Nominal width	**Actuator (spring-to-close + spring-to-open)**					
Kvs value	6.3	16	25	35	60	100
DN 25, OD 1"	BA					
DN 40, OD 1 ½"		BA				
DN 50, OD 2"			CB			
DN 65, OD 2 ½"				CB		
DN 80, OD 3"					DD	
DN 100, OD 4"						EF5

11	**Valve seat version**		
	L0	Clamped seat ring / clamp connection	
12	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
13	**Surface quality of the housing**		
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted	
14	**Connection fittings**		
	N	Welding end	
15	**Options**		
	/52	Adhesive ID tag	
+			
16–21	**Control and feedback system**		
	TP15XXX	Order code for positioner T.VIS® P-15	

The code is composed as following, depending on the chosen configuration:

Position	**1**	**2**	**3**		**4/5**		**6**	**7**		**8**	**9**		**10**	**11**		**12**	**13**	**14**	**15**		**16 to 21**				
Code	P		W	-	/	-	S		-	M		-		L0	-		2	N	/52	+	TP15	I		P	A

VARIVENT®
Control Valve Type P_X
Divert Valve Product Distribution



Technical data of the standard version

Recommended flow direction	Product distribution
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	5–8 bar (73–116 psi)
Product pressure	DN 25 – 65, OD 1" – 2 ½": 0–16 bar (0–232 psi)
	DN 80 – 100, OD 3" – 4": 0–10 bar (0–145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and Feedback System	Positioner T.VIS® P-15
Actuator type	Air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	Clearance X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90	73.5	110	458	667	15	11.0
DN 40	41.0 × 1.50	62.0	90	80.0	110	464	719	15	12.5
DN 50	53.0 × 1.50	74.0	90	85.5	135	470	761	15	13.5
DN 65	70.0 × 2.00	96.0	125	101.5	135	481	843	15	22.5
DN 80	85.0 × 2.00	111.0	125	110.0	170	519	927	15	23.5
DN 100	104.0 × 2.00	130.0	125	133.5	210	528	1,007	15	39.5
OD 1"	25.4 × 1.65	46.0	90	71.5	110	456	675	15	11.0
OD 1 ½"	38.1 × 1.65	59.0	90	78.5	110	466	720	15	12.5
OD 2"	50.8 × 1.65	71.5	90	84.5	135	472	763	15	13.5
OD 2 ½"	63.5 × 1.65	90.0	125	98.5	135	485	847	15	22.5
OD 3"	76.2 × 1.65	103.0	125	105.0	170	522	930	15	23.5
OD 4"	101.6 × 2.11	127.5	125	132.5	210	529	1,009	15	39.5

Position	Description of the order code for the standard version			
1	**Valve type**			
	P	VARIVENT® control valve		
2	**Housing combinations**			
	W	U	Y	M
				
3	**Supplement to the valve type**			
	X	Divert valve, product distribution, linear characteristic curve		
4/5	**Nominal width (upper housing/lower housing)**			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"		
	DN 65	OD 2 ½"		
	DN 80	OD 3"		
	DN 100	OD 4"		
6	**Actuator type**			
	S	Air / spring		
7	**Non-actuated position**			
	Z	Spring-to-close (NC)	A	Spring-to-open (NO)
8	**Control cone seal**			
	M	Metallic, without V-ring		
9	**Kvs value**			
	6.3	DN 25, OD 1"		
	16	DN 40, OD 1 ½"		
	25	DN 50, OD 2"		
	35	DN 65, OD 2 ½"		
	60	DN 80, OD 3"		
	100	DN 100, OD 4"		
10	**Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)**			

Nominal width	**Actuator (spring-to-close + spring-to-open)**					
Kvs value	6.3	16	25	35	60	100
DN 25, OD 1"	BA					
DN 40, OD 1 ½"		BA				
DN 50, OD 2"			CB			
DN 65, OD 2 ½"				CB		
DN 80, OD 3"					DD	
DN 100, OD 4"						EF5

11	**Valve seat version**		
	L0	Clamped seat ring / clamp connection	
12	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
13	**Surface quality of the housing**		
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted	
14	**Connection fittings**		
	N	Welding end	
15	**Options**		
	/52	Adhesive ID tag	
+			
16–21	**Control and feedback system**		
	TP15XXX	Order code for positioner T.VIS® P-15	

The code is composed as following, depending on the chosen configuration:

Position	**1**	**2**	**3**		**4/5**		**6**	**7**		**8**	**9**		**10**	**11**		**12**	**13**	**14**	**15**		**16 to 21**				
Code	P		X	-	/	-	S		-	M		-		L0	-		2	N	/52	+	TP15	I		P	A

VARIVENT®
Control Valve Type P
Positioner T.VIS® P-15

Concept
The positioner T.VIS® P-15 represents a low-cost alternative to proven positioners. The controller is equipped with a highly precise path measuring system and can move to any valve position between the taught open/close positions in combination with an air-spring actuator.

The T.VIS® P-15 is characterized not only by its performance but also by its ease of operation and outstanding price/performance ratio.

Structure
The T.VIS® P-15 is equipped with a precise path measuring system for detecting its position.

The necessary wiring for control and feedback is configured using M12 plug connections that can be accessed externally.

The control top can be opened for this.

Operation and configuration of the T.VIS® P-15 takes place either by the two push buttons mounted on the cap or, with the cap removed, via the buttons below. The push buttons are secured electronically against inadvertent or incorrect operation, while in operating mode.

The T.VIS® P-15 is equipped with adjustable supply and exhaust air throttles as standard, through which the control quality can be adjusted individually.

Features
Automatic initialization
Simple and safe operation
Manual operation of the process valve
Valve status display by LED
Open/close position feedback (optional)
Selectable dead band (control hysteresis)
High-quality pneumatic fittings
High potential for cost reduction
Standard protection class IP66

Position control
The T.VIS® P-15 position controller works with an integrated microprocessor which contains the software for operation, visualization as well as intelligent position detection and evaluation. When a nominal value is specified (4 – 20 mA), e.g. by the PLC, the process valve can be set to any required position. The push buttons on the cap also make it possible to specify a nominal value manually, in order to set the process valve to the required position. The position is detected using a position transducer and is automatically controlled using two integrated solenoid valves. The position of the cone can also be permanently evaluated using the analog actual value output, as well as, three binary outputs in the PLC.

Setting
Automatic – following unlocking, simply pressing the two buttons on the cap of the T.VIS® P-15 starts the initialization process which runs fully automatically. There is no need to open the position controller for this purpose, resulting in particularly quick, easy and safe commissioning of the position controller (on average < 1 minute).

Directly following the set-up, the open/close position tolerances, the control hysteresis and control characteristics can be set in the parameter menu.

Visualization
LED display:
- Green: valve in non-actuated position
- Green flashing: valve moving towards non actuated position
- Yellow: valve in end position
- Yellow flashing: valve moving towards end position
- Red: in programming mode or fault
- Blue: valve adjusted
- Blue flashing: valve not adjusted

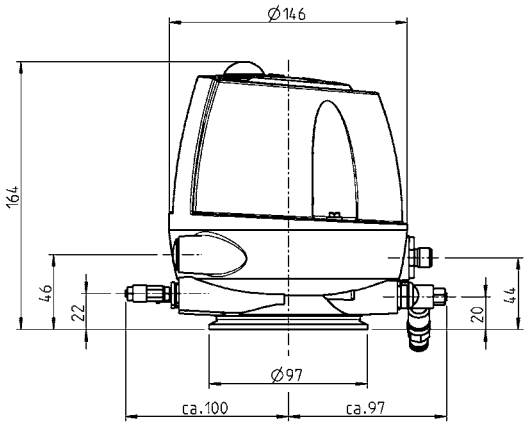
Feedback
- Standard: valve position 0 – 100 %, opening amount (4 – 20 mA)
- Option: additionally 24 V DC feedback signals for open/close position and error output

Service mode
Activation of the main stroke, which may be required in VARIVENT® Control Valves Type P with closed (non-actuated) position for valve maintenance, is performed using the service mode that can be activated by the buttons. At the same time, all feedbacks are stopped (warning to the system control). Furthermore, input signals from the control room are not implemented by the T.VIS®, in order to protect the employee.

Flow control
The T.VIS® P-15 position controller offers not only linear position signal transformation, but also the possibility of equal percentage position signal transformation. This permits significantly more precise position control of the valve disc in positions close to the non-actuated position.

Air guidance
The control air for actuating the valve is fed directly from the control top into the actuator via internal air duct.

VARIVENT®
Control Valve Type P
Positioner T.VIS® P-15



Technical data of the standard version		
Position detection		Path measuring system
Housing material		PA 12/L
Ambient temperature		−20 to +55 °C
Air supply	Pressure range	2 to 8 bar
	Standard	acc. to ISO 8573-1:2010
	Solid content	Quality class 6
	Water content	Quality class 4
	Oil content	Quality class 3
Dimensions of air connections		Metric 6/4 mm, inch 6.35/4.31 mm (¼")
Protection class		IP66 (powerful water jet)
Sound pressure level via exhaust air throttle		Max. 72 dB
Visualization		LED (green, yellow, red, blue)

Type of interface	24 V DC programmable
Supply	
Supply voltage U_V	24 V DC (+20%, −12.5%)
No-load current	≤ 20 mA
Maximum current consumption	∑ I = (IT.VIS + IPV + IRM) = 260 mA ±10%
Maximum residual ripple	5 %
Inputs	
Control voltage max. 28.8 V DC	High = ≥ 13 V DC; low = ≤ 6 V DC
Pilot current	≤ 10 mA
Outputs	
Output voltage	High = UV − ≤ 5%; low = ≤ 5 V
Max. current	(∑ IRM) 200 mA short circuit-proof
Switching frequency	(ohmic + inductive loads ≤ 25 mH) 2 Hz
Operating current	Internal solenoid valve (IPV) 35 ... 45 mA
Analog input	Setpoint 4 – 20 mA/0 – 100 % stroke
Analog output	Actual value 4 – 20 mA/0 – 100 % stroke
Load	Max. 600 Ω

Position	Description of the order code	
14	**Feedback location**	
	TP15	Control top T.VIS® P-15
15	**Control top type**	
	I	2 solenoid valves
16	**Feedback**	
	4	T.VIS® P-15 (with analog module)
	5	T.VIS® P-15 (with analog module + 2 feedbacks / error output)
17	**Type of interface**	
	P	24 V DC programmable
18	**Solenoid valve**	
	A	24 V DC, 0.85 W
19	**Screw connection (with analog module)**	
	J	Metric air connection, 5-pin M12 plug, A-coded With feedback code 5: additional M12 plug B-coded inclusive
	P	Inch air connection, 5-pin M12 plug, A-coded With feedback code 5: additional M12 plug B-coded inclusive
	IMPORTANT: Please also order the appropriate connection sockets as well.	

	Options (multiple selection possible)	
	/22	5-pin connection socket for screw connection A-coded (article no. 508-963) 5-pin connection socket for screw connection B-coded (article no. 508-964)
	/67	Protection class IP67 (temporary immersion)
	/69k	Protection class IP69k (high pressure spray down)
	/UC	Certification UL / CSA

The code is composed as following, depending on the chosen configuration:

Position	14	15	16	17	18	19	Options			
Code	TP15	I		P	A					

Options
VARIVENT® Actuator Air / Spring

Typical application and description
As one of the basic elements of the VARIVENT® modular system, the actuator air/spring is used for performing the valve movement in all VARIVENT® valves.

The air supply is connected to the particular control and feedback system and led via the internal air channel under the piston surface of the actuator. Simply by reversing the actuator, it is possible to convert the fail-safe position of the valve (in single-seat valves) from spring-to-close (NC) to spring-to-open (NO). In these cases, or if the product or air supply pressure differs from the standard, check the definition of the actuator size based on the selection sheets.

Available nominal widths

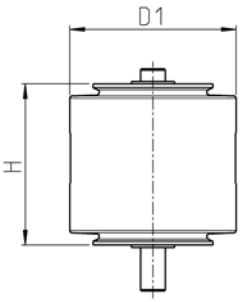
Metric	DN	25 – 150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

VARIVENT® control valve	P

Technical data

Material	1.4301
Outside surface	Turned, $R_a \leq 1.6$ µm



Type	Dimensions		
No. 10 in the order code	D1 [mm]	H [mm]	Weight [kg]
AA	99	95	3.2
BA	110	130	4.3
BB	110	130	4.5
BD	110	130	5.1
CA	135	130	5.7
CB	135	130	5.8
CD	135	130	6.2
CF	135	130	7.0
DB	170	160	8.0
DD	170	160	8.7
DF	170	160	9.6
DG	170	160	10.8
DH	170	160	11.4
ED	210	160	11.2
EF	210	160	12.1
EG	210	160	13.2
EH	210	160	13.8

Type	Dimensions		
No. 10 in the order code	D1 [mm]	H [mm]	Weight [kg]
BD5	140	140	5.1
DD5	160	160	9.0
DF5	170	170	10.4
DG5	170	170	11.1
ED5	160	160	12.3
EF5	170	170	12.9
EG5	170	170	13.5
EH5	170	170	14.1
DF6	170	199	13.5
EF6	210	246	20.5
EG6	210	246	21.7
EH6	210	246	24.2
EK6	210	246	25.5
SG6	260	246	26.0
SH6	260	246	28.4
SK6	260	246	29.8
SM6	260	246	33.4
SN6	260	246	35.8

Incorporation of the option in the order code and example

Position		Description of the order code for options
6		Actuator type
	S	Air / Spring
10		Actuator
	...	Acc. to actuator selection scheme (e.g. CD)

Position	1	2	3		4/5		6	7		8	9		10	11	12	13	14	15		16	17	18	19	20	21
Code	P		J	-	DN 80/80	-	S	Z	-	M	60	-	CD	L0	1	2	N	/52	+	TP15	I		P	A	

Options
VARIVENT® Manual Actuator

Typical application and description
For manual operation of VARIVENT® valves.

The manual actuator is designed as a handwheel up to the nominal width DN 100 or 4". With larger nominal widths, the manual actuator is designed as a crank. The manual actuator can be locked in any position using a lock nut.

One full turn of the manual actuator results in a valve stroke of 11 mm, irrespective of the nominal width.

Available nominal widths

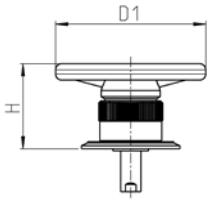
Metric	DN	25 – 150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

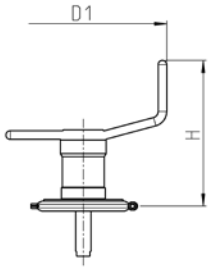
VARIVENT® control valve	P

Technical data

Material	1.4301
Outside surface	Turned, $R_a \leq 1.6$ µm



G1 and G2



G6

	Type	Dimensions		
Nominal width	No. 10 in the order code	D1 [mm]	H [mm]	Weight [kg]
DN 25 – DN 50 1" – 2"	G1	148	107	2.7
DN 65 – DN 100 2 ½" – 4"	G2	198	113	3.1
DN 125 – DN 150 6"	G6	532	239	5.8

Incorporation of the option in the order code and example

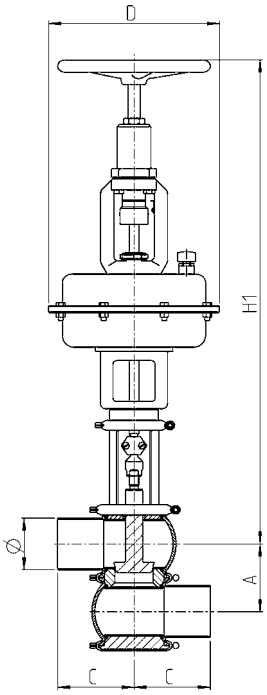
Position		Description of the order code for options
6		Actuator type
	G	Manual actuator
10		Actuator
	...	Acc. to size (e.g. G2)

Position	1	2	3		4/5		6	7		8	9		10	11	12	13	14	15		16	17	18	19	20	21
Code	P		J	-	DN 80/80	-	G	Z	-	M	60	-	G2	L0	1	2	N	/52	+	0	0	0	0	0	0

Options
VARIVENT® Additional Handwheel

Typical application and description
Optionally, the diaphragm actuators can be equipped with an additional manual adjustment. This is attached on the upper actuator lid. The handwheel can be used to manually adjust the stroke of the valve disc against the spring force of the actuator.

Available valve types	
VARIVENT® control valve	S



Type	Dimensions			
Diaphragm surface [cm²]	D [mm]	H1 [mm]	H2 [mm]	Weight [kg]
175	180	234	279	4
350	250	237	282	5
750*	315	355	403	5

* additional handwheel is not for all 750 actuators available

Incorporation of the option in the order code and example

Position	Description of the order code for options
15	Accessories
	/5 Additional handwheel

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S	B	F	-	DN 80/80	-	Z	M	80	-	350	8	-	S	-	1	2	N	/5	+	0-------

Options
VARIVENT® Limit Stop

Typical application and description
Mechanically adjustable limit on the stroke.

The maximum stroke can be reduced by using a mechanically adjustable limit stop. The limit stop limits either the opening or the closing stroke of the valve. The minimum stroke is 5 mm.

It is not possible to install a proximity switch as a feedback function in the lantern!

NOTE: The limit stop can not be used simultaneously with a sterile lock.

Available nominal widths

Metric	DN	25 – 150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

VARIVENT® control valve	P

Technical data

Material	1.4301
Setting possibility	Limitation of the stroke in closing or opening direction

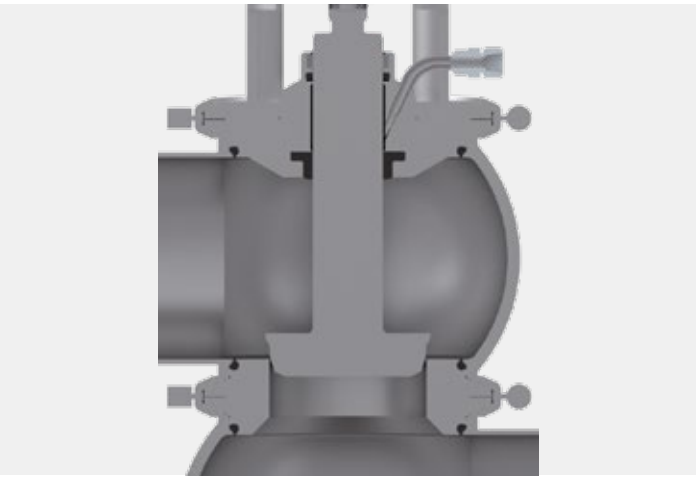
			Type	Dimensions
Nominal width				Weight [kg]
DN 25	OD 1"		N 25 – 50	0.4
DN 40	OD 1 ½"		N 25 – 50	0.4
DN 50	OD 2"	IPS 2"	N 25 – 50	0.4
DN 65	OD 2 ½"		N 65 – 100	0.7
DN 80	OD 3"	IPS 3"	N 65 – 100	0.7
DN 100	OD 4"	IPS 4"	N 65 – 100	0.7
DN 125			N 125 – 6" IPS	1.1
DN 150	OD 6"	IPS 6"	N 125 – 6" IPS	1.1

Incorporation of the option in the order code and example

Position		Description of the order code for options
15		Accessories
	/20	Limit stop, opening
	/21	Limit stop, closing

Position	1	2	3		4/5		6	7		8	9		10	11	12	13	14	15			16	17	18	19	20	21
Code	P		J	-	DN 80/80	-	S	Z	-	M	60	-	CD	L0	1	2	N	/20	/52	+	TP15	I		P	A	

Options
Sterile Lock



Typical application and description
The sterile lock is used for reliable separation between the surface of the valve disc in contact with the product and the atmosphere.

Applying sterilizing media to the sterile lock prevents contamination of the product from atmosphere due to the switching movement of the valve stem (“elevator effect”).

If the media has a tendency towards crystallization, this effect can be avoided by pressurizing the sterile lock with a liquid and securing the shaft seal against damage.

If this option is selected with valves with double stem guide, both the upper and the lower stem feedthrough will be equipped with a sterile lock.

Available nominal widths

Metric	DN	25 – 150
Inch OD	OD	1" – 6"

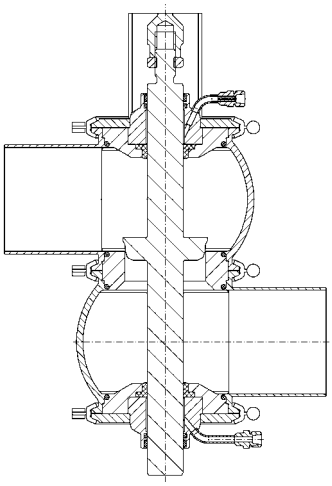
Available valve types

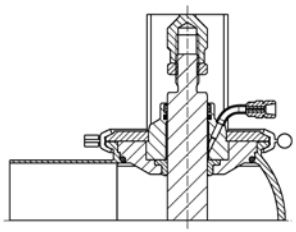
VARIVENT® control valve	S

Technical data

Material	1.4301
Barrier fluid	e.g. sterile water, condensate, steam

IMPORTANT: The sterile lock is not suitable for permanent vapor application. Brief actuation is recommended after or before the switching procedure.





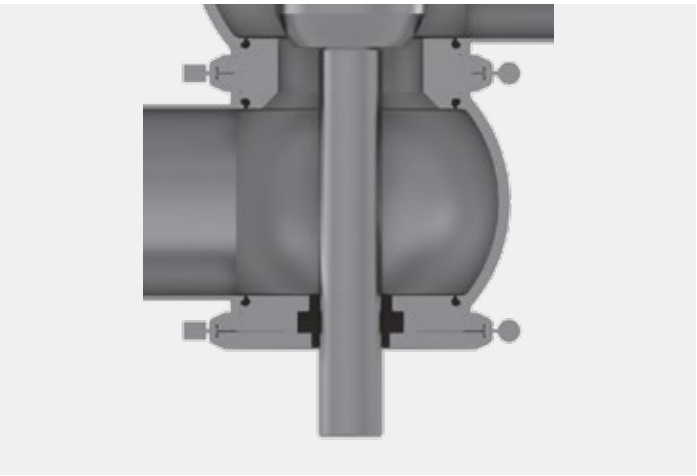
		Dimensions	
Nominal width		Connection [mm]	Weight [kg]
DN 25	OD 1"	6 / 4	0.4
DN 40	OD 1 ½"	6 / 4	0.8
DN 50	OD 2"	6 / 4	0.8
DN 65	OD 2 ½"	6 / 4	1.5
DN 80	OD 3"	6 / 4	1.5
DN 100	OD 4"	6 / 4	2.6
DN 125		6 / 4	5.9
DN 150	OD 6"	6 / 4	7.2

Incorporation of the option in the order code and example

Position	Description of the order code for options
15	Accessories
	/24 Sterile lock complete

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S	B	F	-	DN 80/80	-	Z	M	80	-	350	8	-	S	-	1	2	N	/24	+	0-------

Options
Double Stem Guidance

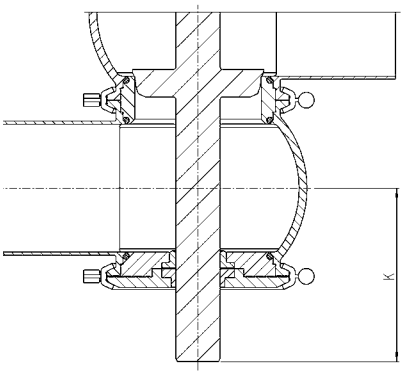


Typical application and description

The double guidance of the valve stem is recommened to avoid vibrations that may result from the flow dynamics within the valve body. The additional bearing of the stem in the lower housing is available for valves with Kvs 100 and onwards. Modulating control valves with 3-stage seat* and divert valves* are equipped as standard with double stem guide.

Available valve types	
VARIVENT® control valve	S, P

* Dimensions for 3-stage Seat Control Valves or Divert valves can be found on the particular valve pages.



VARIVENT® control valve type S and P with equal percentage and linear characteristic

Nominal width	Kvs	K [mm]
DN 100	100–160	134.0
DN 125	100–260	147.5
DN 150	200–360	166.0
OD 4"	100–160	134.0
OD 6"	200–360	166.0
IPS 4"	100–160	134.0
IPS 6"	200–360	166.0

Incorporation of the option in the order code and example

Position		Description of the order code for options
15		Accessories
	/2F	Double stem guidance

Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S	B	F	-	DN 80/80	-	Z	M	80	-	350	8	-	S	-	1	2	N	/2F	+	0-------

Options
Transport Device

Typical application and description
For transporting VARIVENT® and ECOVENT® valves with pneumatic actuator for assembly and maintenance purposes.

The transport device is screwed into the piston stem of the actuator after removal of the control and feedback system and thus permits secure transport with available lifting equipment. The transport device must be removed before commissioning.

Available nominal widths

Metric	DN	25 – 150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

VARIVENT® control valve	P

Technical data

Material	1.4301
Connection size	M14
Article number	221-104.98

Options
VARIVENT® Manual Emergency Actuator

Typical application and description
For manual actuation of pneumatic VARIVENT® valves if there is a power failure as well as for actuation during maintenance and assembly work.

The emergency manual actuator attachment NOH is used for manual activation of all pneumatically operated VARIVENT® valves as well as for maintenance and assembly work on all valve types. Radial sealing valves with lifting actuator represent an exception to this. The manual emergency actuator cannot be used in these valves.

Available nominal widths

Metric	DN	25 – 150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

VARIVENT® control valve	P

Technical data

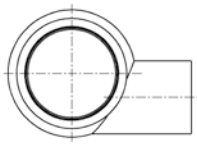
Material	1.4301
Article number	221-310.74

Options
Tangential Valve Housings

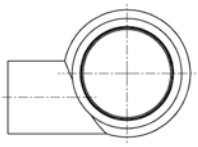
Typical application and description
Horizontal tank valves or horizontally installed valves are configured so the connection piping can be completely drained.

Tangential valve housings are provided with eccentrically welded-on vertical ports, as a result, no fluid remains in the housing sphere of the horizontal installation.

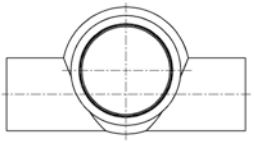
Various nominal widths are available. If required, please contact GEA Tuchenhagen to ask about the dimensions and feasibility.



Tangential right
(view from the direction of the actuator)



Tangential left
(view from the direction of the actuator)



Tangential straight
(view from the direction of the actuator)

Available nominal widths
On request

Available valve types	
VARIVENT® control valve	S, P

Technical data	
Material	1.4404 (AISI 316L)
Product pressure	10 bar
Valve seat version	Clamped or welded housing connection

Incorporation of the option in the order code and example

Position	Description of the order code for options	
15	Accessories	
	/ TR	Tangential right
	/ TL	Tangential left
	/ TT	Tangential straight

Position	1	2	3		4/5		6	7		8	9		10	11	12	13	14	15			16	17	18	19	20	21
Code	P		J	-	DN 80/80	-	S	Z	-	M	60	-	CD	L0	1	2	N	/52	/TT	+	TP15	I		P	A	

Sizing

Formula symbols used

Q	Flow rate (liquid)	[m³/h]
Q_N	Flow rate (gas) at the standard condition	[m³/h]
p_1	Pressure upstream of the valve	[bar abs.]
p_2	Pressure downstream of the valve	[bar abs.]
Δp	Differential pressure	[bar]
ρ	Density (liquid)	[kg/m³]
ρN	Density (gas) at the standard condition	[kg/m³]
η	Dynamic viscosity	[mPas]
T_1	273+t1	[Kelvin]
t1	Operating temperature	[°C]

1. Kv value calculation:
Kv-value = Valve-stroke-dependent flow volume Q in m³/h referring to water at t = 5 to 30 at a differential pressure of $\Delta p = p_1 - p_2 = 1$ bar in the control valve.

For low-viscous liquids:

$$Kv = \frac{Q}{31.6}\sqrt{\frac{\rho}{\Delta p}}\left[\frac{m^3}{h}\right]$$

For gases:

Subcritical pressure reduction at $\Delta p < 0.5\ p_1$ or $p_2 > 0.5\ p_1$

$$Kv = \frac{Q_N}{514}\sqrt{\frac{\rho_N \times T_1}{\Delta p \times p_2}}\left[\frac{m^3}{h}\right]$$

Over-critical pressure reduction at $\Delta p < 0.5\ p_1$ or $p_2 < 0.5\ p_1$

$$Kv = \frac{Q_N}{257 \times p_1}\sqrt{\rho_N \times T_1}\left[\frac{m^3}{h}\right]$$

Over-critical pressure reduction = strong noise development

Example 1: low-viscous liquid
Q = 30 m³/h, = 1000 kg/m³, Δp = 0.5 bar, p_1 = 7 bar

$$Kv = \frac{30}{31.6}\sqrt{\frac{1000}{0.5}} \approx 42.46\left[\frac{m^3}{h}\right]$$

At different operating conditions: Highest throughput and lowest differential pressure.

For high-viscous liquids:

$$Kv_T = \frac{Q}{31.6}\sqrt{\frac{\rho}{\Delta p}}\left[\frac{m^3}{h}\right]$$

$$Kv_L = \frac{1}{1.05}\left(\frac{Q \times \eta}{216 \times \Delta p}\right)^{\frac{2}{3}}\left[\frac{m^3}{h}\right]$$

$$\frac{Kv_T}{Kv_L} < 0.46 \Rightarrow Kv_L = Kv \qquad \frac{Kv_T}{Kv_L} > 20 \Rightarrow Kv_T = Kv$$

$$0.46 < \frac{Kv_T}{Kv_L} < 20 \Rightarrow$$ Calculation as below

$\frac{Kv_T}{Kv_L}$	0.46	0.52	0.59	0.68	0.8	1.00	1.35	1.9	3.0	4.9	9.5	20
F_R	0.46	0.50	0.54	0.58	0.62	0.68	0.74	0.80	0.86	0.90	0.94	0.98

$$Kv = \frac{Q}{F_R \times 31.6}\sqrt{\frac{\rho}{\Delta p}}$$

2. Determination of the Kvs value and the valve size
The chosen Kvs value must be above the calculated Kv value. This ensures that the control valve works even at deviating operating data (Reserve).

There are two cases for this:

Linear control cone

$$\text{Kv req.} = \frac{\text{Kv value calculated}}{\approx 0.7}$$

Equal-percentage control cones

$$\text{Kv req.} = \frac{\text{Kv value calculated}}{\approx 0.6}$$

3. Determination of the control cone
The characteristic curve of the control valve is defined as the dependence of the Kv value on the stroke. Control valves are performed either with an equal-percentage or a linear characteristic curve. The equal-percentage characteristic curve is characterized by stroke changes leading to same percentage changes of the particular Kv value. For a linear characteristic curve, same stroke changes cause changes to the Kv value.

The selection of the control cone depends on the ratio of the pressure reduction $\Delta p = p_1 - p_2$ in the control valve at maximum flow to the pressure reduction Δp_{ges} in the entire system.

- Linear control cones are used if more than 30 % of the total pressure drop is caused in the line system of the control valve. Level control is a typical example for this.
- Equal-percentage control cones are used if less than 30 % of the total pressure drop is caused in the line system of the control valve; these are approx. 90 % of the applications of the control valves.

Example:
Kv = 42.5 m³/h, equal-percentage control characteristics

$$\text{Kv req.} = \frac{42.5}{0.6} = 70.8$$

According to the data sheet, a Kvs value of 80 m³/h must be chosen, i.e. management of the control task set requires a valve of DN 80.

4. Determination of the nominal width and actuator size of the valve
Calculation of the actuator forces is the basis for the actuator selection scheme. The diaphragm actuator to be chosen acc. to the required closing force is determined depending on the selected Kvs value of the valve and the maximum product pressure. This information must be specified in the order.

Example:
Chosen Kvs = 80, p_1 = 7 bar, (Q = 30 m³/h)

A valve nominal width of DN 80 is chosen from the data sheet. An actuator of size 350 results. Based on the flow volume, a flow speed of 1.6 m/s through the valve results.

Questionnaire

Customer			
Company name / customer number			
Project			
Contact			
Phone			
Email			

Product			
	Case I (e.g. product at full load)	Case II (e.g. product at partial load)	Case III (e.g. CIP)
Type of medium	☐ Liquid ☐ Gas / gaseous ☐ Saturated steam	☐ Liquid ☐ Gas / gaseous ☐ Saturated steam	☐ Liquid ☐ Gas / gaseous ☐ Saturated steam
Name of medium	_____	_____	_____
Density ρ	_____ ☐ kg/m³ ☐ lb/gal [US] ☐ lb/gal [UK]	_____ ☐ kg/m³ ☐ lb/gal [US] ☐ lb/gal [UK]	_____ ☐ kg/m³ ☐ lb/gal [US] ☐ lb/gal [UK]
Compressibility factor Z (for gas)	_____	_____	_____
Isentropic exponent γ (gases and steams)	_____	_____	_____

Process			
Unit for pressure	☐ bar-g ☐ mbar-g ☐ MPa-g ☐ lb/ft²-g ☐ psi-g	☐ bar-g ☐ mbar-g ☐ MPa-g ☐ lb/ft²-g ☐ psi-g	☐ bar-g ☐ mbar-g ☐ MPa-g ☐ lb/ft²-g ☐ psi-g
Input pressure p_1	_____	_____	_____
Output pressure p_2	_____	_____	_____
Differential pressure (optional)	_____	_____	_____
Application temperature	_____ ☐ K ☐ °F ☐ °C	_____ ☐ K ☐ °F ☐ °C	_____ ☐ K ☐ °F ☐ °C
Flow	_____ ☐ l/h ☐ m³/h ☐ mn³/h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm	_____ ☐ l/h ☐ m³/h ☐ mn³/h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm	_____ ☐ l/h ☐ m³/h ☐ mn³/h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm

Basic data	
Valve type	☐ Type S ☐ Type P
Housing combination	☐ A ☐ B ☐ C ☐ E ☐ L ☐ T ☐ W ☐ U ☐ Y ☐ M
Nominal size standard	☐ DN ☐ OD ☐ IPS
Control characteristics	☐ Equal-percentage ☐ Linear
Options for the control valve	☐ 3-stage seat ☐ Divert valve type W ☐ Divert valve type X
Seat seal	☐ Metallic ☐ Soft-sealing
Seal material	☐ EPDM ☐ FKM ☐ HNBR ☐ FFKM (on request)
Positioner basic type S	☐ 3730-4 PROFIBUS® ☐ TROVIS 3730-1 ☐ 3730-5 Foundation™ Fieldbus ☐ 3725 ☐ TROVIS 3730-3 HART
Options for the positioner	☐ Inductive limit switches ☐ Pressure gauge ☐ Position feedback (4...20 mA)
Options for the control valve	☐ Double stem guide ☐ Additional manual adjustment ☐ Sterile lock
Certificates	☐ 3A ☐ ATEX ☐ FDA ☐ 3.1 Certificate

Comments

2 VARIVENT® SAMPLING VALVES

VARIVENT® Special Application Valves

Overview

VARIVENT®/VARINLINE® valves are characterized by their ease of operation and flexibility. The modular design of the VARIVENT® modular system offers the user a wide range of options. The variable system of VARIVENT®/VARINLINE® products permits adjustable use of the valves.

Special features
Certified hygienic design
Flexibility because of the modular principle
Simple connection options

Function of the valve
The sampling valves can be installed either by the process connection options of the VARINLINE® housing or through direct connection in the process. The valve is manually or pneumatically opened for sampling. The valve position can be reported to the PLC via proximity switches. An integrated metallic stop in the actuator prevents excess pressure on the seals.

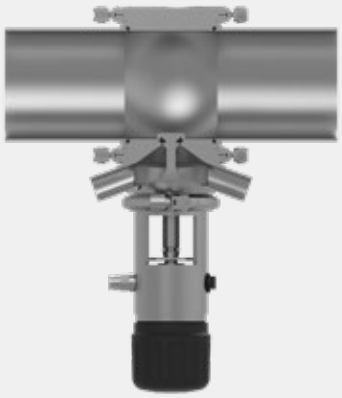
Application examples
Sampling valves can be employed in a variety of situations. In practice, these valves are often integrated into the processes of the dairy, brewing or beverage industries. A typical example is on fermentation tanks of breweries.

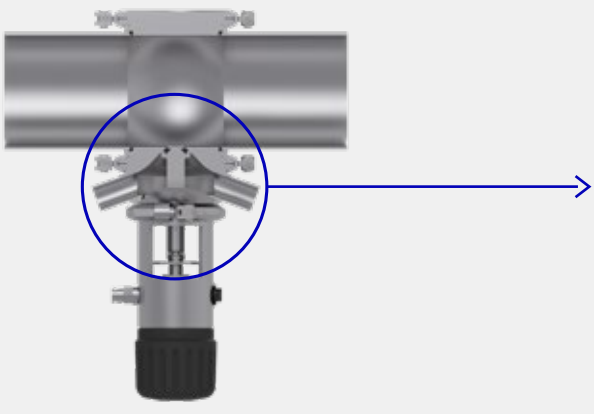
Overview

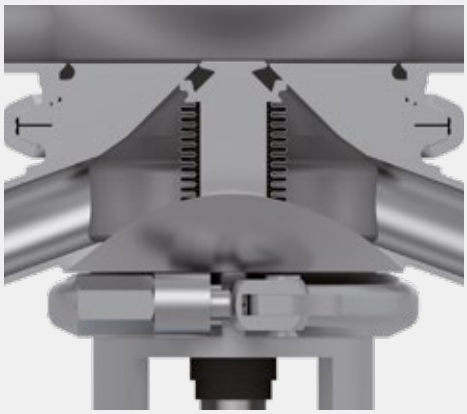
Sampling valve VARIVENT® type I
The sampling valve VARIVENT® type I is installed into the process system upright. The actuator is dually configured so that the valve can be actuated pneumatically or manually. Due to the conical contour of the valve disc, smaller sample volumes can be tapped as well. The VARIVENT® type I valve can be expanded with various individual components. Using up to two proximity switches permits detection of the closed and/or open valve positions.

Sampling valve VARINLINE® type TSVN and TSVU

The sampling valve VARINLINE® type TSV in the versions N and U can be installed into the process system vertically or horizontally. The VARIVENT® modular system makes the valve compatible with the VARINLINE® product family. The connection sockets of the sampling housing permit integration of the valve into a sampling system or alternatively connecting the second port to the CIP supply. The illustrated model shows version N. In version U, the valve disc closes from the product side and therefore additionally protects against product loss in water hammers. The valve type TSV is also available as an aseptic sampling valve with stainless steel bellows.







Overview

Sampling valve VARIVENT® type T/09
The mixproof sampling valve type T/09 of series VARIVENT® is used as a fully automatic sampling and dosing valve. The sampling line can be cleaned or sterilized immediately after sampling via connected CIP-/SIP-loop. The design as a mix-proof double-seat valve ensures that the process can be executed safely in the connected tank during cleaning or sterilization.

Fully automated sampling
The double-seat valve can be fitted on the tank simply with the connection through a tank flange. The VARIVENT® interface permits installation of all common T.VIS® control tops so that the valve can be used for fully automated sampling. The mixproof design as double-seat valve offers the option of cleaning and sterilizing the sampling line independently of the tank.

Simple dosage
The compact double-seat valve is very suitable for the dosage of smaller liquid volumes into larger process lines. The inline connection provided as standard permits easy insertion of the valve into the common VARINLINE® housings (process connection N) and seals flush with the pipe – free of dead zones.

The advantages
Permits fully automated sampling
Completely drainable even in the horizontal installation
Small, compact and light-weight
Level shut-off free of dead zones

Special features
Mixproof
VARIVENT® sealing principle
Both valve discs can be cleaned via lifting function
VARINLINE® connection flange
Equipment with common feedback systems possible

Sampling
The sampling valve is available with single or double horizontal ports in the sampling line. The sampling line is always size DN 15. The process connection N as standard connects the valve directly to the tank via tank flanges.

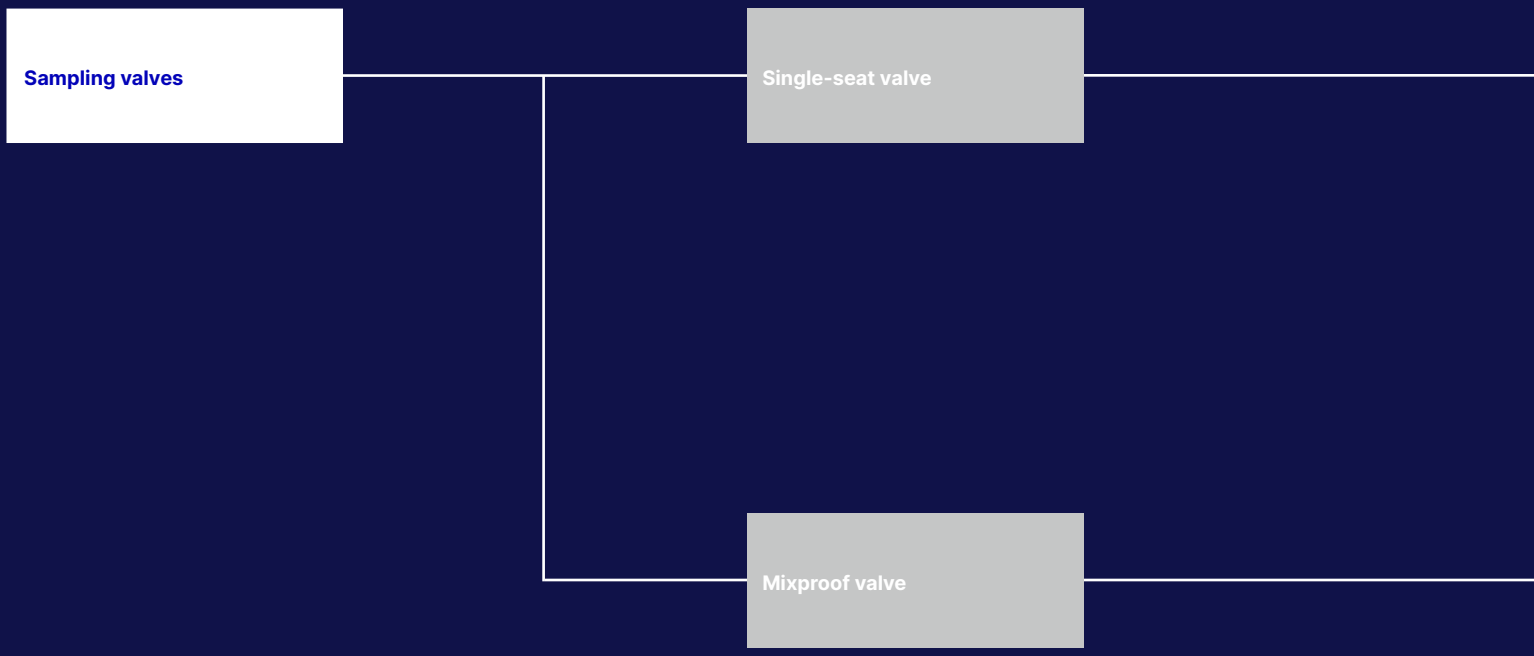
Cleaning the leakage chamber
The leakage chamber can be cleaned during tank cleaning or pipe cleaning thanks to the lift function of the two valve discs which allows separate lifting of each valve disc. During pipe cleaning, the upper disc is lifted, cleaning medium from the pipe flows into the leakage chamber, cleans the seal of the upper disc, and flows unpressurized through the leakage outlet into the periphery. The V-ring of the lower disc seals off the cleaning medium against percolation into the tank as the lower disc is in closed position.

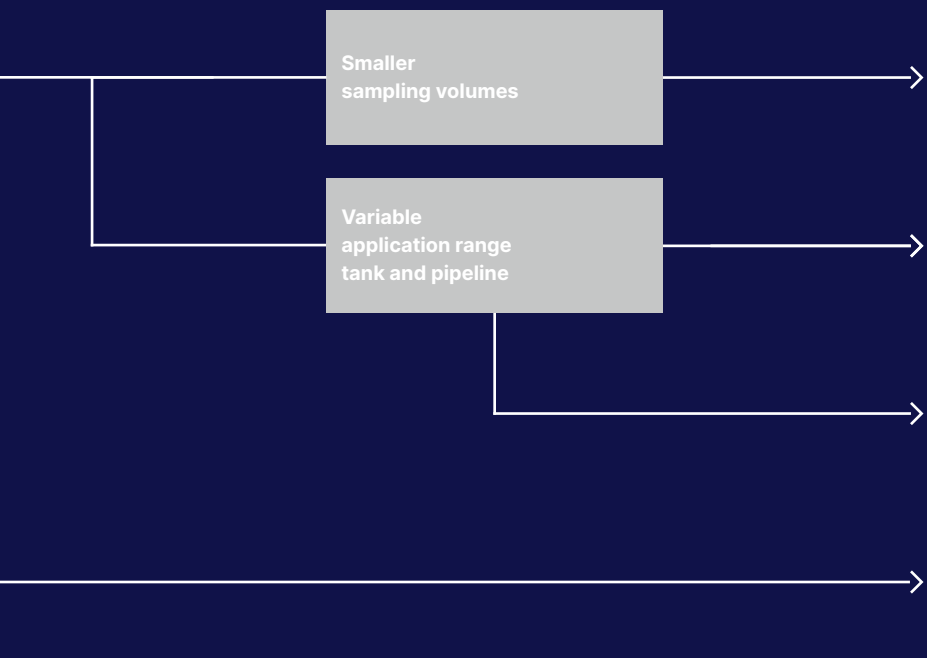
During tank cleaning, it is the other way around: The lower valve disc is lifted into the tank, cleaning medium flows from the tank into the leakage chamber, cleans the seal of the lower disc and flows unpressurized through the leakage outlet into the periphery. The V-ring of the upper disc seals off the cleaning medium against percolation into the sampling chamber as the upper disc is in closed position.

Leakage chamber cleaning during pipe cleaning (double disc activated)

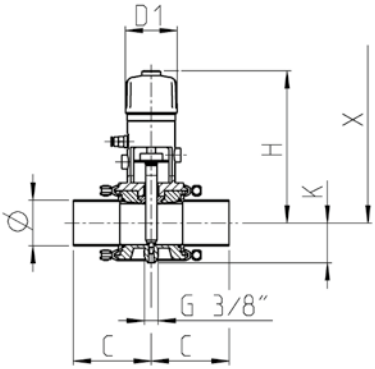
Leakage chamber cleaning during tank cleaning (valve disc activated)

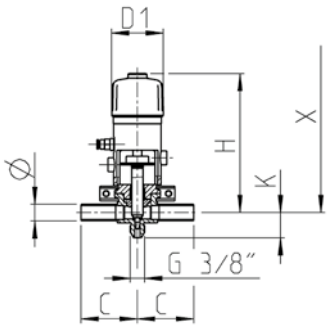
Selection Matrix




Smaller
sampling volumes
Variable
application range
tank and pipeline
VARIVENT® type I
VARINLINE® type TSVN
VARINLINE® type TSVU
VARIVENT® type T/09

VARIVENT®
Sampling Valve Type I
Single-seat Valve





Technical data of the standard version

Material in contact with the product	1.4404 (AISI 316L), 1.4460
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 60 °C
Air supply pressure	Min. 4 bar (58 psi)
Product pressure	Max. 10 bar (145 psi)
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Pneumatic actuator air/spring
Connection fittings	Welding end with additional connection fittings
Identification	Adhesive ID tag
Marking / Certificates	CE FDA

	Pipe		Housing	Actuator	Dimensions		Valve	
Nominal width	Ø [mm]	C [mm]	K [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 10	13.0 × 1.50	65.0	26.0	60	156.0	193	5.5	1.5
DN 15	19.0 × 1.50	65.0	29.0	60	159.0	202	8.0	1.6
DN 25	29.0 × 1.50	90.0	34.0	60	162.0	210	8.0	2.2
DN 40	41.0 × 1.50	90.0	40.0	60	168.0	222	8.0	3.0
DN 50	53.0 × 1.50	90.0	46.0	60	174.0	234	8.0	3.2
DN 65	70.0 × 2.00	125.0	54.0	60	182.0	250	8.0	3.8
DN 80	85.0 × 2.00	125.0	61.5	60	189.5	265	8.0	4.0
DN 100	104.0 × 2.00	125.0	71.0	60	199.0	284	8.0	4.4
DN 125	129.0 × 2.00	125.0	83.5	60	211.5	310	8.0	4.7
DN 150	159.0 × 2.00	150.0	96.0	60	224.0	323	8.0	9.1
OD 1"	25.4 × 1.65	90.0	32.0	60	160.0	206	8.0	2.1
OD 1 ½"	38.1 × 1.65	90.0	38.5	60	166.5	219	8.0	3.0
OD 2"	50.8 × 1.65	90.0	44.7	60	173.0	232	8.0	3.1
OD 2 ½"	63.5 × 1.65	125.0	51.0	60	179.0	244	8.0	3.6
OD 3"	76.2 × 1.65	125.0	57.5	60	185.5	257	8.0	3.8
OD 4"	101.6 × 2.11	125.0	69.7	60	198.0	282	8.0	4.3
OD 6"	152.4 × 2.77	150.0	92.7	60	221.0	346	8.0	9.5
IPS 2"	60.3 × 2.00	114.3	49.5	60	177.5	241	8.0	3.6
IPS 3"	88.9 × 2.30	152.5	63.4	60	191.5	269	8.0	4.2
IPS 4"	114.3 × 2.30	152.5	76.0	60	204.0	294	8.0	5.2
IPS 6"	168.2 × 2.77	152.5	102.0	60	230.0	346	8.0	10.3

Position	Description of the order code for the standard version			
1	**Valve type**			
	I	VARIVENT® sampling valve		
2	**Housing combinations**			
	L* 	T 		
3	**Nominal width (housing)**			
	DN 10			
	DN 15			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"	IPS 2"	
	DN 65	OD 2 ½"		
	DN 80	OD 3"	IPS 3"	
	DN 100	OD 4"	IPS 4"	
	DN 125			
	DN 150	OD 6"	IPS 6"	
4	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA)		
5	**Surface quality of the housing**			
	2	Inside R_a ≤ 0.8 µm, outside matt		
6	**Connection fittings**			
	N	Welding end		
7	**Type of outlet**		**Connection sleeve (optionally for outlet type threaded connection)**	
	/0	Threaded connection (standard)	–	Without connection sleeve
	/S	Schütt connection	/A	Hose nozzle
	/L	LUER connection	/B	Flammable nozzle straight
	/M	LUER connection 90°	/C	Flammable nozzles 90°
	/K	Keofitt connection M4	/D	Spiral-type flammable nozzle
	/A	AL / Clip-On		
	/W	Keofitt connection W9		
	/C	Clamp DN6**		
8	**Accessories**			
	/52	Adhesive ID tag		
+				
9–14	**Air connection/control and feedback system**			
	LAT.0000M	Metric for air hose Ø 6/4 mm		
	LAT.0000Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)		
	XXXXX	Order code for different control and feedback systems see catalog GEA Valve Automation		

* The housing combination "L" can only be selected for size DN50/OD2"/IPS2".
** From size DN 40 / OD 1 ½"

The code is composed as following, depending on the chosen configuration:

Position	1	2		3		4	5	6	7	8		9 to 14					
Code	I		-		-		2	N		/52	+						

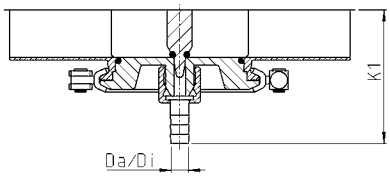
For order codes differing from the standard version, please refer to section 7.

Accessories
Connection Sleeves

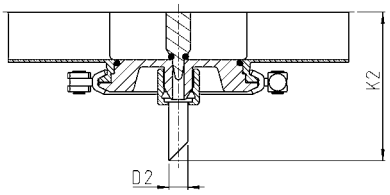
Outlets deviating from the standard
The threaded connection in G⅜" presents the standard connection of the outlets. Deviating from the standard connection sleeves, outlet types are available. Please see next page.

Typical application and description
Various types of connection flanges are available for a reliable and no-loss discharge of the sample volume. The threaded connection as a basis permits easy installation of the connection sleeves. The following sleeves are available for the sampling valve type I.

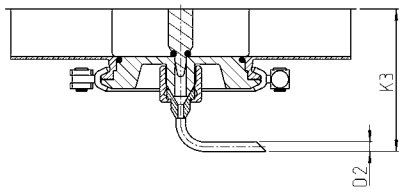
Hose nozzle
The connection type “Hose nozzle” offers the option of targeted discharge of the sample through a hose.



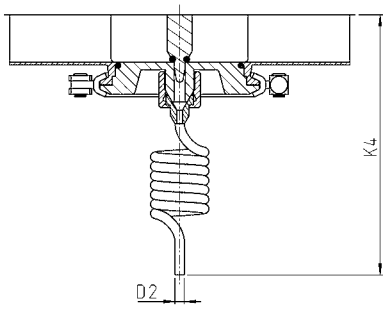
Flammable nozzle straight
The connection type “Flammable nozzle straight” is designed for the horizontal installation orientation. The burner can be used to sterilize the flammable nozzle.



Flammable nozzles 90°
The connection type “Flammable nozzle 90°” is designed for vertical sampling or installation orientation. A burner is recommended to sterilize the nozzle.



Spiral-type flammable nozzle
The connection type “Spiral-type flammable nozzle” is used in CO_2-containing and foaming liquids. The flammable nozzle can be sterilized with a burner.



	Dimensions					
Nominal width	K1 [mm]	K2 [mm]	K3 [mm]	K4 [mm]	Da [mm]	Di [mm]
DN 10	48	61	51	115	10	7
DN 15	51	64	54	118	10	7
DN 25	56	69	59	123	10	7
DN 40	62	75	65	129	10	7
DN 50	68	81	71	135	10	7
DN 65	76	89	79	143	10	7
DN 80	83	97	87	150	10	7
DN 100	93	106	96	160	10	7
DN 125	106	119	109	172	10	7
DN 150	117	132	122	185	10	7
OD 1"	54	67	57	121	10	7
OD 1 ½"	60	74	64	127	10	7
OD 2"	66	80	70	134	10	7
OD 2 ½"	73	86	77	140	10	7
OD 3"	79	93	83	146	10	7
OD 4"	92	105	95	159	10	7
OD 6"	115	130	120	183	10	7
IPS 2"	71	85	75	138	10	7
IPS 3"	85	99	89	152	10	7
IPS 4"	98	111	101	165	10	7
IPS 6"	123	138	128	191	10	7

Accessories
Outlet Types

Outlet KEOFITT M4
The outlet KEOFITT is used for aseptic sampling systems with quick couplings.

Outlet Clamp DN 6
The outlet Clamp DN6 is a standard connection acc. to DIN32676.

Outlet SCHÜTT
The outlet SCHÜTT can be connected with a clamping connection to a sampling vessel.

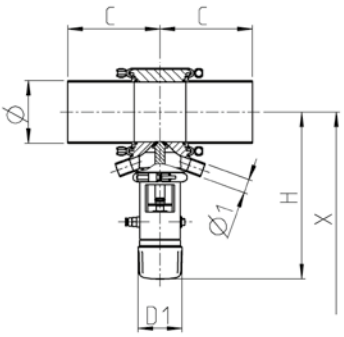
Outlet AL clip-on
This outlet is connected to a corresponing sampling valve. It addtionally can be used to connect pipes or a sealing cap.

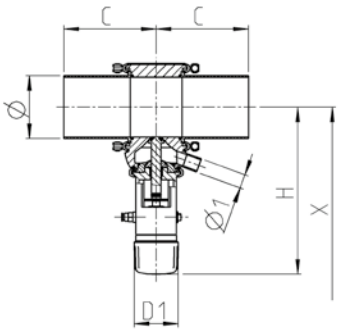
Outlet LUER
The LUER outlet connection is designed for cannulas or hoses with an inner diameter of 4 mm. It is sealed via the conical design of the outlet, the LUER cone.

Outlet KEOFITT W9
The outlet KEOFITT is used for aseptic sampling systems with quick couplings.

Outlet LUER 90°
In the LUER 90° connection, the sampling process takes place in accordance with the outlet type of LUER. The outlet LUER 90° is used for vertical pipeline routing. The sampling valve is installed horizontally.

VARINLINE®
Sampling Valve Type TSVN
Single-seat Valve





Technical data of the standard version

Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 60 °C
Air supply pressure	Min. 6 bar (87 psi)
Product pressure	Max. 10 bar (145 psi) With stainless steel bellows max. 5 bar (73 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Pneumatic actuator air / spring
Connection fittings	Welding end
Marking / Certificates	CE FDA

		Pipe		Housing	Actuator		Dimensions		Valve
Nominal width	Process Connection	Ø [mm]	Ø1 [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	F	29.0 × 1.50	13 × 1.5	90.0	60	193.0	205.0	8	3.0
DN 40	N	41.0 × 1.50	19 × 1.5	90.0	60	199.0	212.0	8	3.9
DN 50	N	53.0 × 1.50	19 × 1.5	90.0	60	205.0	218.0	8	4.0
DN 65	N	70.0 × 2.00	19 × 1.5	125.0	60	213.0	226.0	8	4.6
DN 80	N	85.0 × 2.00	19 × 1.5	125.0	60	220.5	233.5	8	4.8
DN 100	N	104.0 × 2.00	19 × 1.5	125.0	60	230.0	243.0	8	5.2
DN 125	N	129.0 × 2.00	19 × 1.5	125.0	60	242.5	255.5	8	5.5
DN 150	N	154.0 × 2.00	19 × 1.5	150.0	60	255.0	268.0	8	9.9
OD 1"	F	25.4 × 1.65	13 × 1.5	90.0	60	191.0	204.0	8	2.9
OD 1 ½"	N	38.1 × 1.65	19 × 1.5	90.0	60	197.5	210.5	8	3.8
OD 2"	N	50.8 × 1.65	19 × 1.5	90.0	60	203.8	216.8	8	4.0
OD 2 ½"	N	63.5 × 1.65	19 × 1.5	125.0	60	210.0	223.0	8	4.4
OD 3"	N	76.2 × 1.65	19 × 1.5	125.0	60	216.5	229.5	8	4.6
OD 4"	N	101.6 × 2.11	19 × 1.5	125.0	60	228.8	241.8	8	5.1
OD 6"	N	152.4 × 2.77	19 × 1.5	150.0	60	258.0	272.0	8	10.5
IPS 2"	N	60.3 × 2.00	19 × 1.5	114.3	60	208.5	221.5	8	4.4
IPS 3"	N	88.9 × 2.30	19 × 1.5	152.4	60	222.5	235.5	8	5.0
IPS 4"	N	114.3 × 2.30	19 × 1.5	152.4	60	235.0	248.0	8	6.0
IPS 6"	N	168.3 × 2.77	19 × 1.5	152.4	60	261.0	274.0	8	11.0

Position	Description of the order code for the standard version			
1	**Valve type**			
	TSV	VARINLINE® sampling valve		
2	**Type**			
	N	Fail-safe position against the flow direction		
3	**Process connection**			
	Housing DN 25, OD 1"			
	Housing DN 40–125, OD 1 ½"– 6", IPS 2"– 6"			
4	**Sampling housing**			
	1 	2 		
5	**Aseptic**			
	K	Without metal bellow	M	With metal bellow
6	**Feedback**			
	0	Without feedback*		
	1	1 feedback		
	2	2 feedbacks		
	6	Prep. for one magnetic-inductive proximity sensors M12×1*		
	7	Prep. for two magnetic-inductive proximity sensors M12×1*		
7	**Magnetic-inductive proximity sensors M12×1**			
	0	Without	E	NAMUR / ATEX, 2-wire, terminal chamber
	B	24 V DC, 3-wire, PNP, terminal chamber	S	24 V DC, 3-wire, PNP, plug connector
	F	25 V DC, 2-wire, PNP, terminal chamber	W	24 V DC, 4-wire, NPN, plug connector
8	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA)		
9	**Installation type VARINLINE® fitting***			
	–	Without		
	T**	VARINLINE® housing (Process connection N)		
	TU	VARINLINE® housing connection flange, type U (Process connection N)		
	TT	VARINLINE® housing connection flange, type T (Process connection N)		
	TU-S	VARINLINE® housing connection flange, type U-S (Process connection N)		
	TT-S	VARINLINE® housing connection flange, type T-S (Process connection N)		
10**	**Nominal width VARINLINE® housing**			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"		
	DN 65	OD 2 ½"		
	DN 80	OD 3"		
	DN 100	OD 4"		
	DN 125			
	DN 150	OD 6"		
11**	**Blanking plates**			
	0	Without blanking plate		
	1	With blanking plate 1.4404 (AISI 316L)		
12**	**Surface quality of the VARINLINE® housing**			
	2	Inside R_a ≤ 0.8 µm, outside matt blasted		
13	**Accessories**			
	–	Without		
	/52	Adhesive ID tag		

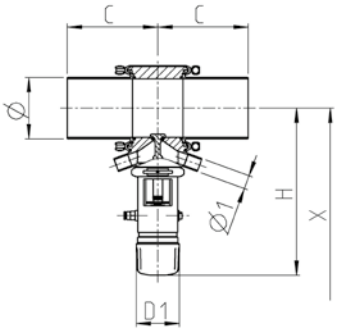
* In that case, position 7 must be without proximity sensors
** Positions 10, 11, 12 apply only for installation type T, VARINLINE®-housing

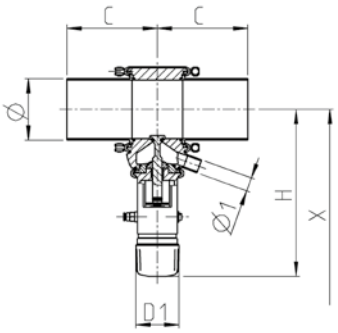
The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4	5	6	7	8		9	10	11	12	13
Code	TSV	N		-						/				2	

For order codes differing from the standard version, please refer to section 7.

VARINLINE®
Sampling Valve Type TSVU
Single-seat Valve





Technical data of the standard version

Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 60 °C
Air supply pressure	Min. 6 bar (87 psi)
Product pressure	Max. 10 bar (145 psi) With stainless steel bellows max. 5 bar (73 psi)
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Pneumatic actuator air / spring
Connection fittings	Welding end
Marking / Certificates	CE FDA

		Pipe		Housing	Actuator	Dimensions			Valve
Nominal width	Process Connection	Ø [mm]	Ø1 [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	F	29.0 × 1.50	13 × 1.5	90.0	60	193.0	209.0	8	3.0
DN 40	N	41.0 × 1.50	19 × 1.5	90.0	60	199.0	216.0	8	3.9
DN 50	N	53.0 × 1.50	19 × 1.5	90.0	60	205.0	222.0	8	4.0
DN 65	N	70.0 × 2.00	19 × 1.5	125.0	60	213.0	230.0	8	4.6
DN 80	N	85.0 × 2.00	19 × 1.5	125.0	60	220.5	237.5	8	4.8
DN 100	N	104.0 × 2.00	19 × 1.5	125.0	60	230.0	247.0	8	5.2
DN 125	N	129.0 × 2.00	19 × 1.5	125.0	60	242.5	259.5	8	5.5
DN 150	N	154.0 × 2.00	19 × 1.5	150.0	60	255.0	272.0	8	9.9
OD 1"	F	25.4 × 1.65	13 × 1.5	90.0	60	191.0	208.0	8	2.9
OD 1 ½"	N	38.1 × 1.65	19 × 1.5	90.0	60	197.5	214.5	8	3.8
OD 2"	N	50.8 × 1.65	19 × 1.5	90.0	60	203.8	220.8	8	4.0
OD 2 ½"	N	63.5 × 1.65	19 × 1.5	125.0	60	210.0	227.0	8	4.4
OD 3"	N	76.2 × 1.65	19 × 1.5	125.0	60	216.5	223.5	8	4.6
OD 4"	N	101.6 × 2.11	19 × 1.5	125.0	60	228.8	245.8	8	5.1
OD 6"	N	152.4 × 2.77	19 × 1.5	150.0	60	258.0	272.0	8	10.5
IPS 2"	N	60.3 × 2.00	19 × 1.5	114.3	60	208.5	225.5	8	4.4
IPS 3"	N	88.9 × 2.30	19 × 1.5	152.4	60	222.5	239.5	8	5.0
IPS 4"	N	114.3 × 2.30	19 × 1.5	152.4	60	235.0	252.0	8	6.0
IPS 6"	N	168.3 × 2.77	19 × 1.5	152.4	60	261.0	279.0	8	11.0

Position	Description of the order code for the standard version			
1	**Valve type**			
	TSV	VARINLINE® sampling valve		
2	**Type**			
	U	Fail-safe position with the flow direction		
3	**Process connection**			
	Housing DN 25, OD 1"			
	Housing DN 40–125, OD 1 ½"– 6", IPS 2"– 6"			
4	**Sampling housing**			
	1 	2 		
5	**Aseptic**			
	K	Without metal bellow	M	With metal bellow
6	**Feedback**			
	0	Without feedback*		
	1	1 feedback		
	2	2 feedbacks		
	6	Prep. for one magnetic-inductive proximity sensors M12×1*		
	7	Prep. for two magnetic-inductive proximity sensors M12×1*		
7	**Magnetic-inductive proximity sensors M12×1**			
	0	Without	E	NAMUR / ATEX, 2-wire, terminal chamber
	B	24 V DC, 3-wire, PNP, terminal chamber	S	24 V DC, 3-wire, PNP, plug connector
	F	25 V DC, 2-wire, PNP, terminal chamber	W	24 V DC, 4-wire, NPN, plug connector
8	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA)		
9	**Installation type VARINLINE® fitting***			
	–	Without		
	T**	VARINLINE® housing (Process connection N)		
	TU	VARINLINE® housing connection flange, type U (Process connection N)		
	TT	VARINLINE® housing connection flange, type T (Process connection N)		
	TU-S	VARINLINE® housing connection flange, type U-S (Process connection N)		
	TT-S	VARINLINE® housing connection flange, type T-S (Process connection N)		
10**	**Nominal width VARINLINE® housing**			
	DN 25	OD 1"		
	DN 40	OD 1 ½"		
	DN 50	OD 2"		
	DN 65	OD 2 ½"		
	DN 80	OD 3"		
	DN 100	OD 4"		
	DN 125			
	DN 150	OD 6"		
11**	**Blanking plates**			
	0	Without blanking plate		
	1	With blanking plate 1.4404 (AISI 316L)		
12**	**Surface quality of the VARINLINE® housing**			
	2	Inside R_a ≤ 0.8 µm, outside matt blasted		
13	**Accessories**			
	–	Without		
	/52	Adhesive ID tag		

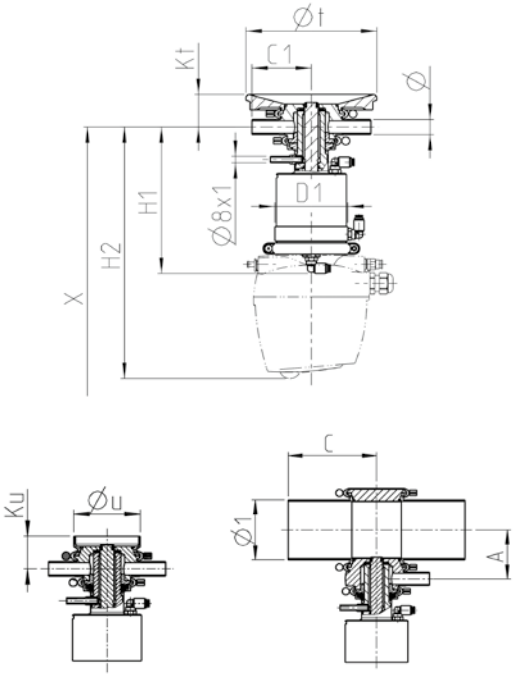
* In that case, position 7 must be without proximity sensors
** Positions 10, 11, 12 apply only for installation type T, VARINLINE®-housing

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4	5	6	7	8		9	10	11	12	13
Code	TSV	U		-						/				2	

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Mixproof Sampling Valve
Type T/09



Technical data of the standard version	
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM
Ambient temperature	0 to 45 °C
Air supply pressure	6 to 8 bar (87 to 116 psi)
Product pressure	Max. 10 bar (145 psi)
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Pneumatic actuator air / spring
Connection fittings	Welding end
Marking / Certificates	CE FDA

With housing connection

		Pipe		Actuator			Dimensions		Valve
Nominal width	Ø [mm]	Ø1 [mm]	Øu [mm]	D1 [mm]	C1 [mm]	H2 [mm]	Kt [mm]	Ku [mm]	Stroke [mm]
DN 15	19.0 × 1.50	165	85 × 2	93	75	317.5	41	41.5	15

With in-line housing

		Pipe		Actuator					Dimensions		Valve
Nominal width	Process connection	Ø [mm]	Ø1 [mm]	D1 [mm]	A [mm]	C [mm]	H1 [mm]	H2 [mm]	Clearance X [mm]	Stroke [mm]	Weight [kg]
DN 15/DN 40	N	19 × 1.5	41.0 × 1.50	93	47.5	90.0	204	317.5	368	15	7.9
DN 15/DN 50	N	19 × 1.5	53.0 × 1.50	93	53.5	90.0	204	317.5	368	15	8.1
DN 15/DN 65	N	19 × 1.5	70.0 × 2.00	93	61.5	125.0	204	317.5	368	15	8.7
DN 15/DN 80	N	19 × 1.5	85.0 × 2.00	93	69.0	125.0	204	317.5	368	15	8.9
DN 15/DN 100	N	19 × 1.5	104.0 × 2.00	93	78.5	125.0	204	317.5	368	15	9.2
DN 15/DN 125	N	19 × 1.5	129.0 × 2.00	93	91.0	125.0	204	317.5	368	15	9.6
DN 15/DN 150	N	19 × 1.5	154.0 × 2.00	93	103.5	150.0	204	317.5	368	15	14.0
DN 15/OD 1 ½"	N	19 × 1.5	38.1 × 1.65	93	46.0	90.0	204	317.5	368	15	7.9
DN 15/OD 2"	N	19 × 1.5	50.8 × 1.65	93	52.0	90.0	204	317.5	368	15	8.0
DN 15/OD 2 ½"	N	19 × 1.5	63.5 × 1.65	93	58.5	125.0	204	317.5	368	15	8.5
DN 15/OD 3"	N	19 × 1.5	76.2 × 1.65	93	65.0	125.0	204	317.5	368	15	8.6
DN 15/OD 4"	N	19 × 1.5	101.6 × 2.11	93	77.0	125.0	204	317.5	368	15	9.2
DN 15/OD 6"	N	19 × 1.5	152.4 × 2.77	93	92.7	150.0	204	317.5	368	15	9.2
DN 15/IPS 2"	N	19 × 1.5	60.3 × 2.00	93	57.0	114.3	204	317.5	368	15	8.5
DN 15/IPS 3"	N	19 × 1.5	88.9 × 2.30	93	71.0	152.4	204	317.5	368	15	9.1
DN 15/IPS 4"	N	19 × 1.5	114.3 × 2.30	93	83.0	152.4	204	317.5	368	15	10.0
DN 15/IPS 6"	N	19 × 1.5	168.3 × 2.77	93	110.0	152.4	204	317.5	368	15	15.1

Position	Description of the order code for the standard version					
1	**Valve type**					
	T	Mixproof sampling valve				
2	**Housing combinations**					
	L	T	F	D	C (VARINLINE®)	E (VARINLINE®)
						
3	**Supplement to the valve type**					
	RC	Lifting actuator without spray cleaning				
4	**Nominal width top**					
	DN 15					
5	**Nominal width bottom (optional for the VARINLINE® housing combination)**					
	DN 40	OD 1 ½"				
	DN 50	OD 2"	IPS 2"			
	DN 65	OD 2 ½"				
	DN 80	OD 3"	IPS 3"			
	DN 100	OD 4"	IPS 4"			
	DN 125					
	DN 150	OD 6"	IPS 6"			
6	**Actuator type**					
	S	Air/spring				
7	**Non-actuated position**					
	Z	Spring-to-close (NC)				
8	**Actuator**					
	T/09					
9	**Valve seat version**					
	L0	Clamped seat ring/clamp connection				
10	**Seal material in contact with the product**					
	1	EPDM (FDA)				
	2	FKM (FDA)				
11/12	**Surface quality of the sampling housing**			**/Surface quality of the VARINLINE® housing**		
	3	Inside R_a ≤ 0.8 µm, outside ground		2	Inside R_a ≤ 0.8 µm, outside matt	
				3	Inside R_a ≤ 0.8 µm, outside ground	
13	**Connection fittings**					
	N	Welding end				
14	**Accessories**					
	/52	Adhesive ID tag				
+						
15–20	**Air connection/control and feedback system**					
	LAT.0000M	Metric for air hose Ø 6/4 mm				
	LAT.0000Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)				
	XXXXX	Order code for different control and feedback systems see catalog GEA Valve Automation				

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4		5		6	7		8		9		10	11/12	13	14		15 to 20
Code	T		RC	-	DN 15	/		-	S	Z	-	T/09	-	L0	-		3/	N	/52	+	

For order codes differing from the standard version, please refer to section 7.

3 VARIVENT® OVERFLOW VALVES

VARIVENT® Special Application Valves

Overview

VARIVENT® overflow valves are used to reduce excess pressure or pressure spikes as well as to protect the pipeline system and its installed components.

Special features
Hygienic design
Metallic stop
Flexibility because of the VARIVENT® modular principle
Proven VARIVENT® seal geometry
Availability of three different actuator types
Low investment and maintenance costs
Mix-matched housing combinations available

Overview

Function of the valve

The VARIVENT® overflow valve regulates the respective opening pressure of the valve with a manually adjustable actuator. When the set pressure is exceeded, the valve will open. The special contour of the valve disc and the seat ring effect a controlled diversion of the product flow so that the valve continues to remain open in spite of the pressure relief starting. This way, flutter of the valve is avoided.

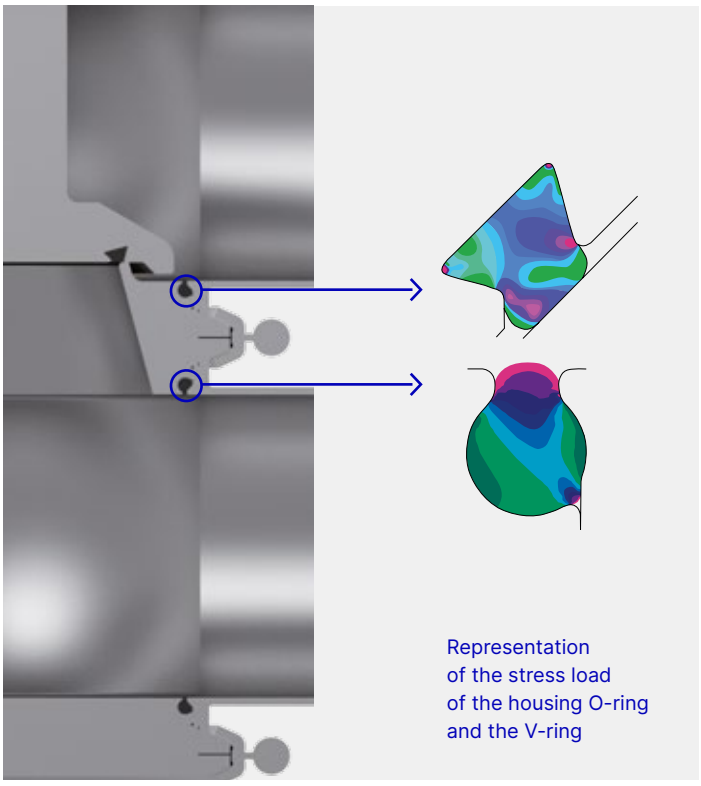
The overflow valves can be equipped additionally with up to two proximity switches in the lantern. This permits feedback of the valve disc position.

Sizes	
Type F	Opening pressure adjustable via a spring
Type M	Opening pressure adjustable via a spring and with pneumatic lifting
Type F-CJ	Opening pressure adjustable via a spring with pneumatic actuator (D-Force)

Available nominal widths	
DN	25 – 100
OD	1" – 4"
IPS	2" – 4"

Application examples

VARIVENT® overflow valves are mainly used for overpressure protection downstream of displacement pumps. The valves are installed in such a way that the respective pump conveys the medium in a circle and the pressure cannot further increase.

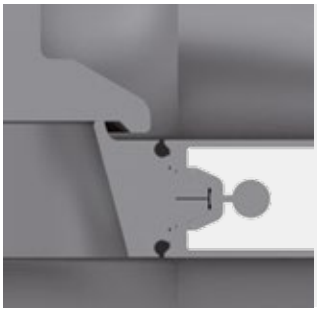


Representation of the stress load of the housing O-ring and the V-ring

Sealing according to the VARIVENT® principle
The VARIVENT® overflow valves are characterized by special seal technology. A metallic stop results in defined seal deformation, ensuring long seal life. This allows for more time to pass between required maintenance services, thereby allowing for continuous production and shorter downtimes.

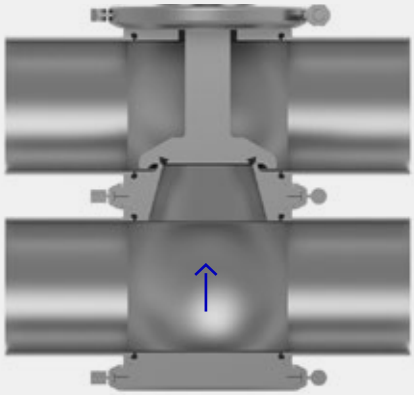
The special, grooved shape in the valve disc ensures the seal has a secure hold at all times, up to a pressure differential of 10 bar during switching. The seal geometry has been optimized by using FEM calculations.

Overflow valves with metallic seat design can be used to secure a pressure difference above 10 bar. When selecting the valve, the permitted maximum pressures of the housings and the possible setting pressures of the actuators must be considered. These valves offer the benefit of lower maintenance requirements.



Metal seat design

Recommended flow direction
In order to ensure the desired safety function of the valve during product flow, the VARIVENT® overflow valves must have a flow contrary to the fail-safe position of the valve disc. An upright installation orientation of the valve is recommended.



Overview

Actuator types of the overflow valves

The spring-to-close actuators (F) available for the overflow valve are to be set to the desired set pressure with a setting screw. Different spring packages are available to permit different pressure ranges, see table adjustable set pressures.

The overflow valves are optionally available with an additionally integrated pneumatic actuator (M). This permits individual lifting of the valve disc during pipe cleaning.

The cleaning medium flows past the seal of the lifted valve disc, cleans the seal surfaces and the seat area and then drains through the upper housing. This ensures hygienic cleaning of all areas in contact with the product.

The D-Force actuator keeps the valve shut against a higher pressure during specific production steps. It is a combination of two actuators: the overflow valve actuator with set screw (F) and an air/air actuator (CJ).

The D-Force actuator combination allows for keeping the valve closed even against higher pressures than set mechanically by using air pressure. This characteristic is in particular required for the production of carbonated beverages as a pressure increase might occur in almost all process steps. There will be gasification of the product and foam formation in the pipeline. This actuator also permits lifting of the valve disc during cleaning.

Adjustable set pressures [bar]

	Actuator type						
Nominal width	F11 M11	F21 M21	F1 M1	F2 M2	F3 M3	F4 M4	M5
DN 25 OD 1"	1.5–4.5	3.0–9.0	8.0–20.0*	–	–	–	–
DN 40 OD 1 ½"	–	1.5–2.0	1.5–5.0	4.0–15.0	14.0–20.0*	–	–
DN 50 OD 2" IPS 2"	–	–	1.5–4.0	3.0–11.0	10.0–20.0*	–	–
DN 65 OD 2 ½"	–	–	–	1.0–4.0	3.0–10.0	9.0–15.0	14,0–20,0*
DN 80 OD 3" IPS 3"	–	–	–	1.0–4.0	3.0–10.0	9.0–15.0**	14,0–20,0**
DN 100 OD 4" IPS 4"	–	–	–	0.5–1.5	0.5–4.0	3.0–7.0	6,0–12,0**
Required air supply pressure for lifting [type M]	3	3	3	4	3	5	6

	Actuator type						
Nominal width			D-Force F1-CJ	D-Force F2-CJ	D-Force F3-CJ	D-Force F4-CJ	
DN 25 OD 1"	–	–	8.0–20.0*	–	–	–	–
DN 40 OD 1 ½"	–	–	1.5–5.0	4.0–15.0	14.0–20.0*	–	–
DN 50 OD 2" IPS 2"	–	–	1.5–4.0	3.0–11.0	10.0–20.0*	–	–
DN 65 OD 2 ½"	–	–	–	1.0–4.0	3.0–10.0	9.0–15.0	–
DN 80 OD 3" IPS 3"	–	–	–	1.0–4.0	3.0–10.0	9.0–15.0**	–
DN 100 OD 4" IPS 4"	–	–	–	0.5–1.5	0.5–4.0	3.0–7.0	–
Required air supply pressure for lifting [type F-CJ]	–	–	3	3	4	6.5	

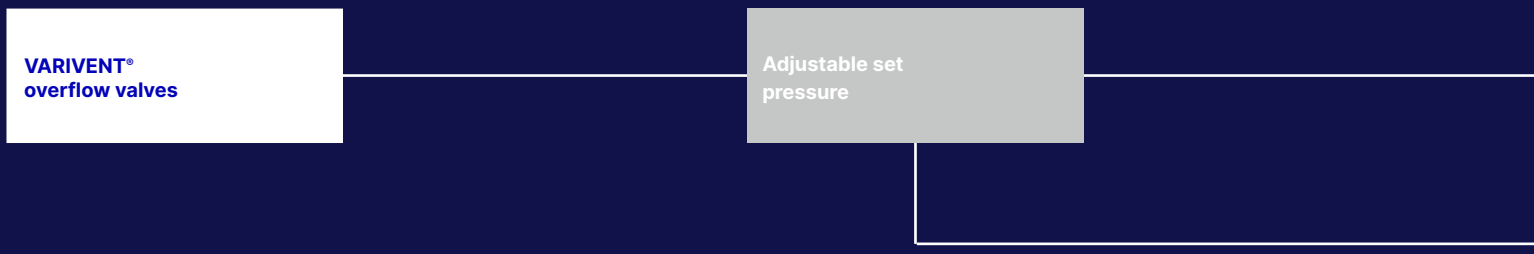
Higher pressures on request.
* Set pressure > 16,0 bar only in combination with the option increased pressure level PS20 (see option /37)
** Set pressure > 10,0 bar only in combination with the option increased pressure level PS20 (see option /37)

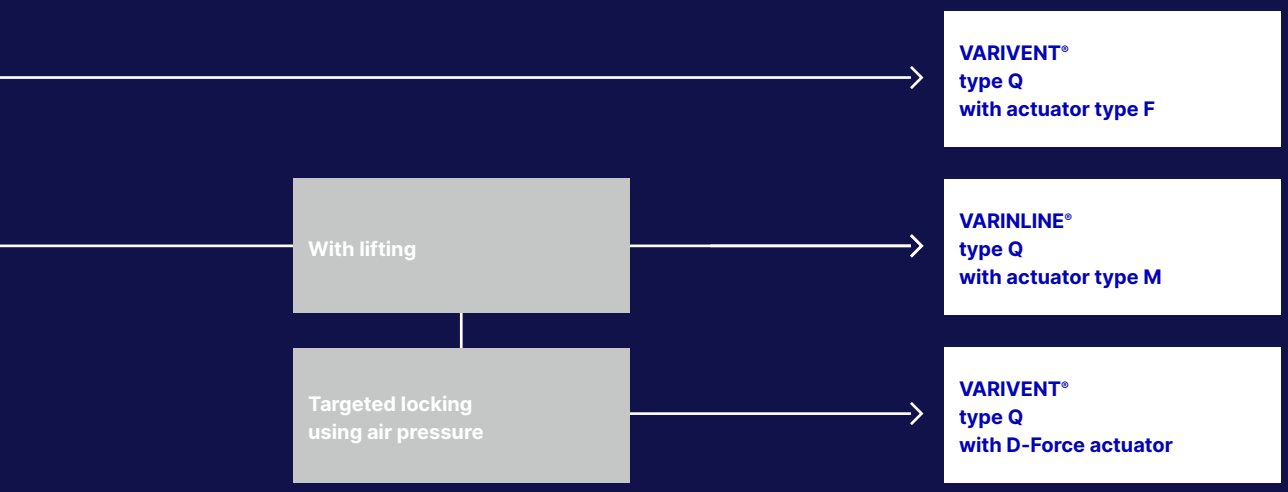
Actuator type F
with set screw
for the set pressure

Actuator type M
with set screw and
pneumatic lifting

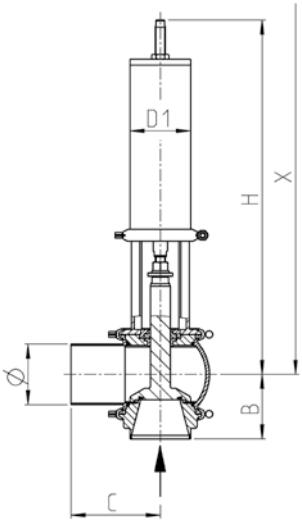
D-Force actuator
with set screw and
air/air actuator

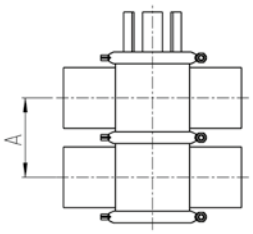
Selection Matrix




VARIVENT®
type Q
with actuator type F
With lifting
VARINLINE®
type Q
with actuator type M
Targeted locking
using air pressure
VARIVENT®
type Q
with D-Force actuator

VARIVENT®
Overflow Valve Type Q
Adjustable Set Pressure





Technical data of the standard version

Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Valve disc sealing	Soft-sealing with V-ring
Ambient temperature	0 to 45 °C
Product pressure	See separate table set pressures
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Adjustable spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimensions			Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58.0	90.0	85	394.0	644.0	10.0	4.6
DN 40	41.0 × 1.50	62.0	64.0	90.0	85	490.0	740.0	15.0	6.6
DN 50	53.0 × 1.50	74.0	70.0	90.0	85	496.0	746.0	27.0	6.8
DN 65	70.0 × 2.00	96.0	83.0	125.0	85	517.0	767.0	30.0	10.8
DN 80	85.0 × 2.00	111.0	90.5	125.0	85	524.5	774.5	30.0	11.0
DN 100	104.0 × 2.00	130.0	100.0	125.0	85	534.0	784.0	30.0	13.9
OD 1"	25.4 × 1.65	46.0	56.0	90.0	85	392.0	642.0	6.0	4.5
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	85	491.5	741.5	15.0	6.5
OD 2"	50.8 × 1.65	71.5	69.0	90.0	85	498.0	748.0	27.5	6.7
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	85	521.0	771.0	31.0	10.7
OD 3"	76.2 × 1.65	103.0	86.5	125.0	85	527.5	777.5	29.0	10.9
OD 4"	101.6 × 2.11	127.5	99.0	125.0	85	536.0	786.0	30.5	13.6
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	85	492.5	742.5	27.0	7.0
IPS 3"	88.9 × 2.30	115.0	92.5	152.4	85	522.5	772.5	30.0	11.1
IPS 4"	114.3 × 2.30	140.0	105.0	152.4	85	529.0	779.0	30.0	14.1

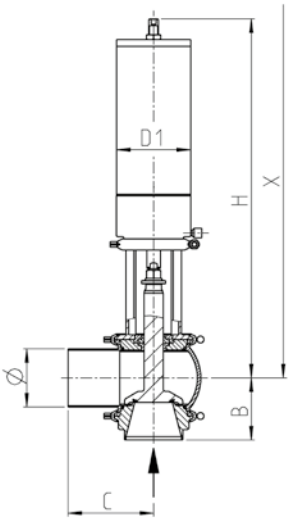
Position	Description of the order code for the standard version		
1	**Valve type**		
	Q	Overflow valve	
2	**Housing combinations**		
	A 	B 	C 
	E 	L 	T 
3	**Valve disc sealing**		
	W	Soft-sealing (with V-ring)	
	M	Metallic (without V-ring)	
4/5	**Nominal width (upper housing/lower housing)**		
	DN 25	OD 1"	
	DN 40	OD 1 ½"	
	DN 50	OD 2"	IPS 2"
	DN 65	OD 2 ½"	
	DN 80	OD 3"	IPS 3"
	DN 100	OD 4"	IPS 4"
6	**Actuator type**		
	F		
7	**Actuator type**		
	F11		
	F21		
	F1		
	F2		
	F3		
	F4		
8	**Valve seat version**		
	L0	Clamped seat ring/clamp connection	
9	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
10	**Surface quality of the housing**		
	2	Inside R_a ≤0.8 µm, outside matt blasted	
11	**Connection fittings**		
	N	Welding end	
12	**Accessories**		
	/52	Adhesive ID tag	
+			
13–18	**Air connection/control and feedback system**		
	00000M	Metric for air hose Ø 6/4 mm	
	00000Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)	
	XXXXX	Order code for different control and feedback systems	

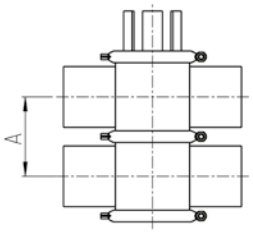
The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q			-	/	-	F		-	L0	-		-	2	N	/52	+						

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Overflow Valve Type Q
Adjustable Set Pressure with Pneumatic Lifting





Technical data of the standard version

Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Valve disc sealing	Soft-sealing with V-ring
Ambient temperature	0 to 45 °C
Air supply pressure	Max. 8 bar (116 psi)
Product pressure	See separate table set pressures
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Adjustable spring with pneumatic lifting
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimensions		Valve	
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58.0	90.0	108	439.0	689.0	10.0	9.5
DN 40	41.0 × 1.50	62.0	64.0	90.0	108	545.0	795.0	15.0	10.3
DN 50	53.0 × 1.50	74.0	70.0	90.0	108	551.0	801.0	27.0	10.5
DN 65	70.0 × 2.00	96.0	83.0	125.0	168	562.0	812.0	30.0	16.8
DN 80	85.0 × 2.00	111.0	90.5	125.0	168	569.5	819.5	30.0	17.0
DN 100	104.0 × 2.00	130.0	100.0	125.0	168	579.0	829.0	30.0	19.9
OD 1"	25.4 × 1.65	46.0	56.0	90.0	108	437.0	687.0	6.0	9.5
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	108	546.5	796.5	15.0	10.2
OD 2"	50.8 × 1.65	71.5	69.0	90.0	108	553.0	803.0	27.5	10.5
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	168	566.0	816.0	31.0	16.7
OD 3"	76.2 × 1.65	103.0	86.5	125.0	168	572.5	822.5	29.0	16.9
OD 4"	101.6 × 2.11	127.5	99.0	125.0	168	581.0	831.0	30.5	19.6
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	108	547.5	797.5	27.0	10.8
IPS 3"	88.9 × 2.30	115.0	92.5	152.4	168	567.5	817.5	30.0	17.2
IPS 4"	114.3 × 2.30	140.0	105.0	152.4	168	574.0	824.0	30.0	20.1

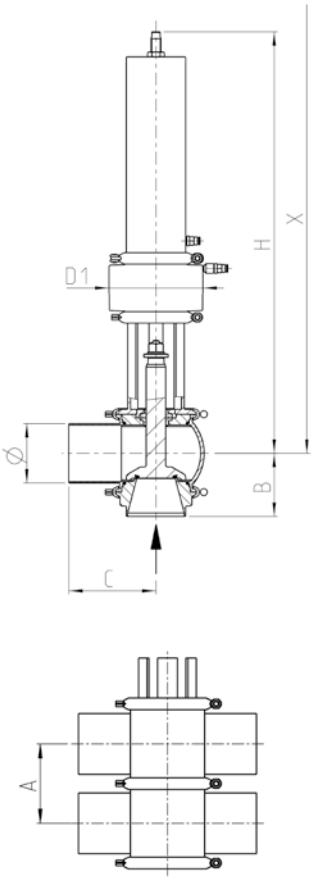
Position	Description of the order code for the standard version		
1	**Valve type**		
	Q	Overflow valve	
2	**Housing combinations**		
	A B C E L T 		
3	**Valve disc sealing**		
	W	Soft-sealing (with V-ring)	
	M	Metallic (without V-ring)	
4/5	**Nominal width (upper housing/lower housing)**		
	DN 25	OD 1"	
	DN 40	OD 1 ½"	
	DN 50	OD 2"	IPS 2"
	DN 65	OD 2 ½"	
	DN 80	OD 3"	IPS 3"
	DN 100	OD 4"	IPS 4"
6	**Actuator type**		
	M	M-actuator with lifting	
7	**Actuator type**		
	M11		
	M21		
	M1		
	M2		
	M3		
	M4		
	M5		
8	**Valve seat version**		
	L0	Clamped seat ring/clamp connection	
9	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
10	**Surface quality of the housing**		
	2	Inside R_a ≤0.8 µm, outside matt blasted	
11	**Connection fittings**		
	N	Welding end	
12	**Accessories**		
	/52	Adhesive ID tag	
+			
13–18	**Air connection/control and feedback system**		
	00000M	Metric for air hose Ø 6/4 mm	
	00000Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)	
	XXXXX	Order code for different control and feedback systems	

The code is composed as following, depending on the chosen configuration:

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q			-	/	-	M		-	L0	-		-	2	N	/52	+						

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Overflow Valve Type Q
D-Force Actuator



Technical data of the standard version

Recommended flow direction	Against closing direction
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Valve disc sealing	Soft-sealing with V-ring
Ambient temperature	0 to 45 °C
Air supply pressure	Max. 8 bar (116 psi)
Product pressure	See separate table set pressures
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Control and feedback system	Connection 0 (without control top)
Actuator type	Adjustable spring with pneumatic guard against higher pressures and lifting
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	CE FDA

	Pipe			Housing	Actuator	Dimensions		Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	Clearance X [mm]	Stroke S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58.0	90.0	135	524.0	774.0	10.0	12.6
DN 40	41.0 × 1.50	62.0	64.0	90.0	135	630.0	880.0	15.0	13.6
DN 50	53.0 × 1.50	74.0	70.0	90.0	135	636.0	886.0	27.0	13.8
DN 65	70.0 × 2.00	96.0	83.0	125.0	135	647.0	897.0	30.0	17.5
DN 80	85.0 × 2.00	111.0	90.5	125.0	135	654.5	904.5	30.0	17.7
DN 100	104.0 × 2.00	130.0	100.0	125.0	135	664.0	914.0	30.0	20.9
OD 1"	25.4 × 1.65	46.0	56.0	90.0	135	522.0	772.0	6.0	12.6
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	135	631.5	881.5	15.0	13.5
OD 2"	50.8 × 1.65	71.5	69.0	90.0	135	638.0	888.0	27.5	13.7
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	135	651.0	901.0	31.0	17.4
OD 3"	76.2 × 1.65	103.0	86.5	125.0	135	657.5	907.5	29.0	17.6
OD 4"	101.6 × 2.11	127.5	99.0	125.0	135	666.0	916.0	30.5	20.7
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	135	632.5	882.5	27.0	14.0
IPS 3"	88.9 × 2.30	115.0	92.5	152.4	135	652.5	902.5	30.0	17.8
IPS 4"	114.3 × 2.30	140.0	105.0	152.4	135	659.0	909.0	30.0	21.1

Position	Description of the order code for the standard version		
1	**Valve type**		
	Q	Overflow valve	
2	**Housing combinations**		
	A B C E L T 		
3	**Valve disc sealing**		
	W	Soft-sealing (with V-ring)	
	M	Metallic (without V-ring)	
4/5	**Nominal width (upper housing/lower housing)**		
	DN 25	OD 1"	
	DN 40	OD 1 ½"	
	DN 50	OD 2"	IPS 2"
	DN 65	OD 2 ½"	
	DN 80	OD 3"	IPS 3"
	DN 100	OD 4"	IPS 4"
6	**Actuator type**		
	D	D-Force	
7	**Actuator type**		
	F1-CJ		
	F2-CJ		
	F3-CJ		
	F4-CJ		
8	**Valve seat version**		
	L0	Clamped seat ring/clamp connection	
9	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
10	**Surface quality of the housing**		
	2	Inside R_a ≤0.8 µm, outside matt blasted	
11	**Connection fittings**		
	N	Welding end	
12	**Accessories**		
	/52	Adhesive ID tag	
+			
13–18	**Air connection/control and feedback system**		
	00000M	Metric for air hose Ø 6/4 mm	
	00000Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)	
	XXXXX	Order code for different control and feedback systems	

The code is composed as following, depending on the chosen configuration:

Position	**1**	**2**	**3**		**4/5**		**6**	**7**		**8**		**9**		**10**	**11**	**12**		**13 to 18**					
Code	Q			-	/	-	D		-	L0	-		-	2	N	/52	+						

For order codes differing from the standard version, please refer to section 7.

VARIVENT®
Overflow Valve Type Q
T.VIS® Q-15

Concept
Optionally equipped with solenoid valves and as standard proximity switch mounted in the valve lantern, the T.VIS® Q-15 can be used to control and monitor overflow valves of the Q series.

The development focus was to realize the requirements and user requests of the liquid processing industry. In addition to the safe control and monitoring of Q-valve-specific functions in breweries, dairies, fruit juice production plants and in the pharmaceutical industry the T.VIS® Q-15 offers the possibility to mount the control top directly on the Q-valve.

Features
Easy installation directly on the valve
Low energy consumption
Reduction of operating costs
Filter protects solenoid valves
High-quality pneumatic fittings
Exchangeable compressed air connection
Standard protection class IP69

Structure
The T.VIS® Q-15 is equipped with a valve-specific proximity switch for position detection in the lantern. The necessary wiring for control and feedback is carried out via an externally accessible M12 connector. Thanks to the initial initialization carried out at the factory, the only required adjustments for operation are to be made on the proximity switch. The buttons located inside the T.VIS® can be used for reinitialization after a reset. The push buttons are secured electronically against inadvertent or incorrect operation, while in operating mode. The supply air connection is equipped with a replaceable filter to protect the built-in solenoid valves.

Position detection
Inductive proximity switch mounted in the valve lantern.

Setting
Once the proximity switch in the lantern has been adjusted for the specific valve, the valve can be put into operation.

Visualization
LED display
- green: valve in rest position
- yellow flashing: valve disc lifted/deflected
- red: in programming mode
- yellow: D-Force activated

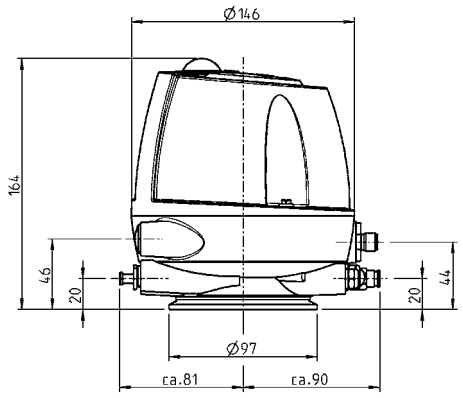
The programmable color change allows the display of colors yellow and green to be swapped over.

T.VIS® Q-15

Lift function
By using an optionally solenoid valve in the control top, the valve disc of the Q valve can be lifted, for example, for cleaning purposes. The proximity switch in the lantern serves as feedback of the valve disc position for processing in the PLC.

D-Force function
By actuating an optional solenoid valve in the control top, the closing force of the spring-loaded actuator can be increased. Two integrated status messages, which can be processed in the PLC, indicate if the D-Force function is active or inactive.

VARIVENT®
Overflow Valve Type Q
T.VIS® Q-15



Technical data of the standard version		
Position detection		Path measuring system
Housing material		PA 12/L
Ambient temperature		−20 to +55 °C
Air supply	Pressure range	2 to 8 bar
	Standard	acc. to ISO 8573-1:2010
	Solid content	Quality class 6
	Water content	Quality class 4
	Oil content	Quality class 3
Dimensions of air connections		Metric 6/4 mm, inch 6.35/4.31 mm (¼")
Protection class		IP69
Sound pressure level via exhaust air throttle		Max. 72 dB
Visualization		LED (green, yellow, red)

Type of interface	24 V DC, 3-Draht, PNP	AS-Interface Bus
Supply		
Operating voltage	24 V DC (+20 % −12.5 %)	26.5 – 31.0 V DC
No-load current	≤ 25 mA	≤ 25 mA
Maximum current consumption	205 mA	105 mA
Polarity reversal protection	Yes	Yes
Specification		AS-i V3.0
Additional information		IO.ID.ID2-Code: 7.A.E
Conformity		AS-i Association
Inputs		
Connection type	24 V DC (PNP)	
Short circuit-proof	Yes	
Overload-proof	Yes	
Maximum current carrying capacity per feedback output	100 mA	
Voltage drop on the outputs	≤ 1 V	
Feedback “D-Force deactivated”	Electronic output	Data bit 0
Feedback “D-Force activated”	Electronic output	Data bit 1
Feedback “valve disc”	Electronic output	Data bit 2
Outputs		
Activation voltage	High = > 13 V; low = < 6 V	
Current consumption per input	< 10 mA	
Activation “PV Y1”	Electronic input	Data bit DO 0
Activation “PV Y2”	Electronic input	Data bit DO 1
Activation “PV Y3”	Electronic input	Data bit DO 2

Position	Description of the order code	
14	**Feedback location**	
	TQ15	Control top T.VIS® Q-15
15	**Control top type**	
	N	Without solenoid valve
	P	1 solenoid valve Y3 (Y3=lift)
	J	2 solenoid valves Y1, Y3 (Y1=D-Force, Y3=lift)
16	**Feedback**	
	9	Max 4 FB incl. 1 ext. Prox.
17	**Type of interface**	
	A	AS-Interface bus
	B	24 V DC, 3-wire, PNP
18	**Solenoid valve**	
	A	24 V DC, 0.85 W
	0	Without
19	**Screw connection**[1)]	
	J	Metric air connection, 5-pin M12 plug (M20×1.5) for AS-Interface
	H	Metric air connection, 8-pin M12 plug (M20×1.5) for 24 V DC
	P	Inch air connection, 5-pin M12 plug (M20×1.5) for AS-Interface
	I	Inch air connection, 8-pin M12 plug (M20×1.5) for 24 V DC

	Options (multiple selection possible)	
	/22	AS-i: 5-pin connection socket for screw connection J, P (article no. 508-963) 24 V DC: 8-pin connection socket for screw fitting H, I (article no. 508-061)
	/50	Metal plate engraved
	/51	Metal plate (US-Version)
	/52	Adhesive label
	/81	AS-i connection box on cable 1 m with 5-pin M12 connection socket (article no. 508-027), IP67
	/82	AS-i connection box on cable 2 m with 5-pin M12 connection socket (article no. 508-028), IP67
	/UC	Certification UL / CSA, only for indoor use and only with interface type A, B, D, and I

[1)] J/H = for air hose Ø 6/4 mm; P/I = for air hose Ø 6.35/4.31 mm

The code is composed as following, depending on the chosen configuration:

Position	14	15	16	17	18	19	Options					
Code	TQ15		9									

4 VARIVENT® CONSTANT PRESSURE VALVES

VARIVENT® Special Application Valves

Overview

The VARIVENT® constant pressure valve is used to set a constant pressure at the input side of the valve. When process-related pressure fluctuations occur, the piston opens and closes automatically and therefore compensates them. The product pressure to be kept in the housing is set by the air supply pressure in the actuator. Due to this, a constant air supply pressure is required.

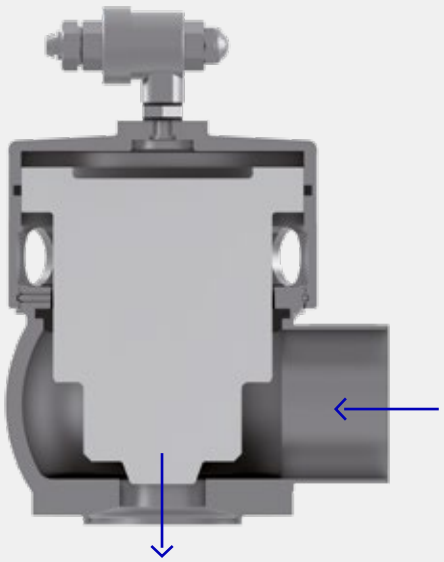
Special features
Mechanically limited open/close position of the valve disc
PTFE-valve disc with low friction
Simple maintenance, only two seals
Good control properties
Kvs values depending on requested flow
Hygienic design
Approval according to 3-A

Overview

Function of the valve
As soon as the product pressure operating on the ring face of the valve disc is higher than the closing force set through the air supply pressure of the piston, the VARIVENT® constant pressure valve opens. If the product pressure decreases, the valve automatically closes and creates a constant pressure in the inlet nozzle.

Additionally, the lower part of the valve disc is equipped with a control cone to optimize the valve characteristics.

The valve disc of the constant pressure valve is made of PTFE, which has a good resistance against aggressive media and only has a low friction during the movement.



The PTFE valve disc
is lifted by the product flow

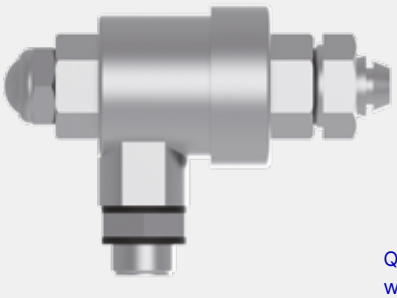
Recommended flow direction
In order to ensure the desired safety function of the valve during product flow, the flow needs to be directed laterally against the valve disc of the VARIVENT® constant pressure valve. An upright installation orientation of the valve is recommended.

Application examples
VARIVENT® constant pressure valves are used to keep the pressure constant at the outlet of a separator. The self-regulating VARIVENT® constant pressure valve offers a cost-efficient alternative to a control valve. Since the valve operates automatically after setting the demanded product pressure, no additional pressure transmitter is necessary.

Furthermore, the VARIVENT® constant pressure valve is used to maintain the demanded pressure in heat exchangers.

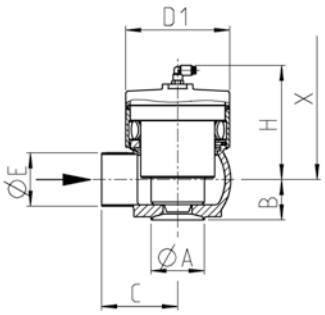
Nominal width				Kvs
DN	40/25	OD	1½"/1"	4
DN	40/40	OD	1½"/1½"	4
DN	40/40	OD	1½"/1½"	10
DN	65/50	OD	2½"/2"	16
DN	65/65	OD	2½"/2½"	25
DN	65/65	OD	2½"/2½"	35
DN	65/65	OD	2½"/2½"	60

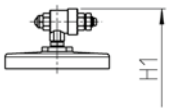
Additional equipment
Optionally, the valve can be equipped with a quick vent or a fine pressure controller. The supply and exhaust quantity permits precise setting of the air supply pressure above the piston surface so that the desired constant product pressure can be regulated on the input side of the valve.



Quick venting valve
with muffler

VARIVENT®
Constant Pressure Valve
Type DHV





Quick vent

Technical data of the standard version	
Recommended flow direction	See arrow in the drawing
Material housing	1.4404 (AISI 316L)
Material valve disc	PTFE (FDA)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	Max. 8 bar (116 psi)
Product pressure	Max. 8 bar (116 psi)
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Connection fittings	Welding end
Identification	Adhesive ID tag
Certificates	FDA

	Housing				Actuator	Dimension			Valve		
Nominal width	ØE [mm]	ØA [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	H1 [mm]	Clearance X [mm]	Stroke [mm]	Kvs [m³/h]	Weight [kg]
DN 40/25	41.0	29.0	39	70	76.5	141	161	169	15	4	2.0
DN 40/40	41.0	41.0	39	70	76.5	141	161	169	15	4	2.0
DN 40/40	41.0	41.0	39	70	76.5	141	161	169	15	10	2.0
DN 65/50	70.0	53.0	53	100	137.0	155	175	203	15	16	7.0
DN 65/65	70.0	70.0	53	100	137.0	155	175	200	15	25	6.9
DN 65/65	70.0	70.0	53	100	137.0	155	175	200	15	35	6.9
DN 65/65	70.0	70.0	53	100	137.0	155	175	203	15	60	6.7
OD 1 ½"/1"	38.1	25.4	39	70	76.5	141	161	169	15	4	2.0
OD 1 ½"/1 ½"	38.1	38.1	39	70	76.5	141	161	169	15	4	2.0
OD 1 ½"/1 ½"	38.1	38.1	39	70	137.0	141	161	169	15	10	2.0
OD 2 ½"/2"	63.5	50.8	53	100	137.0	155	175	203	15	16	7.0
OD 2 ½"/2 ½"	63.5	63.5	53	100	137.0	155	175	200	15	25	6.9
OD 2 ½"/2 ½"	63.5	63.5	53	100	137.0	155	175	200	15	35	6.9
OD 2 ½"/2 ½"	63.5	63.5	53	100	137.0	155	175	203	15	60	6.7

Position	Description of the order code			
1	**Valve type**			
	DHV	VARIVENT® constant pressure valve		
2	**Nominal width inlet**			
	40	DN 40	1.5	OD 1 ½"
	65	DN 65	2.5	OD 2 ½"
3	**Connection fitting inlet**			
	00	Welding end		
4	**Nominal width outlet**			
	25	DN 25	1	OD 1"
	40	DN 40	1.5	OD 1 ½"
	50	DN 50	2	OD 2"
	65	DN 65	2.5	OD 2 ½"
5	**Connection fitting outlet**			
	00	Welding end		
6	**Kvs value**			
	4			
	10			
	16			
	25			
	35			
	60			
7	**Air connection**			
	0	Without		
	M	Metric Ø 6/4 mm		
	Z	Ø G ½"/Ø OD ¼" (standard-US)		
	U	Metric/inch Ø 8/6 (Ø 5/16")		
8	**Pressure control**			
	0	Without		
	1	With quick vent		
	2	With pressure control valve, G ½"*		
9	**Seal material in contact with the product**			
	1	EPDM (FDA)		
	2	FKM (FDA)		
	3	HNBR (FDA)		

* Only available with air connection Z.

The code is composed as following, depending on the chosen configuration:

Position	1		2		3		4		5		6		7	8		9
Code	DHV	-		-	00	/		-	00	-		-			-	

5 VARIVENT® SAFETY RELIEF VALVES

VARIVENT® Special Application Valves

Overview

VARIVENT® safety relief valves have been specifically developed for the requirements of the food, beverage and pharmaceuticals industries and meet the requirements of the relevant rules, such as DIN 11866 or ASME BPE. With a low deadspace inlet area, the unique elastomer bellows and the optional pneumatic lifting, the valves are characterized by very good cleaning ability (CIP/SIP). Many connections permit best adjustment of the valves to different tasks.

Special features
High-quality materials and surface finish
Manual or pneumatic lifting
Insensitive to temperature
Welded housing in CIP-capable design
Dead-space free, self-draining housing shape ensures free drain

Overview

Function of the valve
Due to their sudden opening method, full stroke safety relief valves are used when sudden larger mass flows or very fast pressure increases might occur. The main application is in pressure relief of steams and gases. Since the full stroke safety relief valve performs a full stroke after opening – no matter the pending flow rate – the full flow rate can be discharged even at a low pressure increase.

Normal safety relief valves are ideal pressure relief valves. Their large proportional range leads to a continuous operating method and relief of pressure spikes specifically in liquids. After a longer proportional phase, the valves have a full stroke character and thus achieve a greater mass flow. They are also used as overflow valves in case the smallest design of the full stroke safety relief valve is too large. To ensure hygienic cleaning (CIP) or sterilization (SIP) of all surfaces in the system, the safety relief valves are available with a pneumatic lifting mechanism.

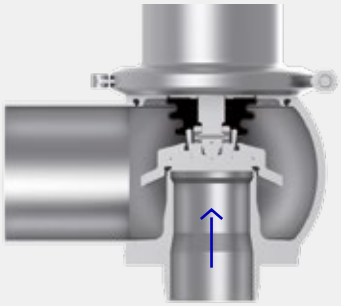
Application examples
Safety relief valves protect from excess pressure, e.g. vessels within a sterilization process or during filling. They secure fermentation tanks in case of unexpected faults.

Safety relief valves are also used for inner pressure relief of vessels and other process equipment for curing media such as chocolate.

Full stroke safety relief valve type 488

The safety relief valves in the series 488 have been developed in close cooperation with system operators and manufacturers. They reliably protect process systems from excess pressure without putting hygienic requirements at risk. The whole series has been configured and officially approved according to international standards (DGR 2014/68/EU, ASME, GOST et al.). A version for steam, gases and liquids of each valve has been type-tested by TÜV in accordance with German regulations. They comply with the EU directive for pressure equipment and bear the CE symbol.

The VARIVENT® safety relief valve type 488 meets the special hygienic and performance requirements of the food, brewery and beverage industries. The valves have been developed for a great performance range and are mostly used in large plants, breweries and the beverage industry.



Safety relief valve
type 488

Special features
Low contamination by bacteria and other contaminations
Minimized dead space in the inlet and flush installation possibility
Gap-free design of the internal assembly
Medium-contacting surface requirements according to DIN 11866 and ASME BPE
Use of FDA compliant elastomers
One-part spindle for higher setting accuracy and less friction
Valve stem and guide protected by EPDM bellows
Approvals worldwide

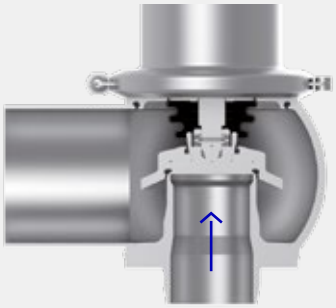
HyTight Assembly

Easy cleanability – this is a requirement for the design of the VARIVENT® safety relief valves type 488. They are equipped with HyTight Assembly and therefore offer the best cleaning opportunities.

HyTight means Hygienic and Tight.

Advantages of the elastomer bellow
Increased tightness by O-ring seal
Elastomer bellows to protect difficult-to-clean components in the guide and spring cap
Fixing elements are placed within the bellows
Gap-free installation parts, exposed, flooded O-rings

Difficult-to-clean components are protected from contact with the product by use of an elastomer bellows. Please keep in mind that an elastomer bellows is not counterpressure-compensating like a stainless steel bellows.



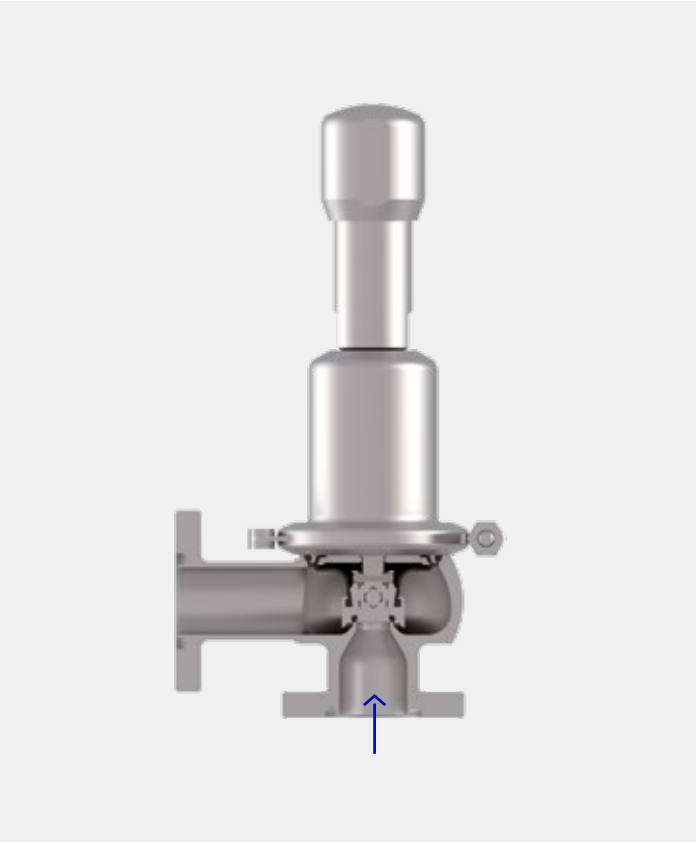
Recommended flow direction

In order to ensure the desired safety function of the valve during product flow, the VARIVENT® safety relief valves must have a flow contrary to the fail-safe position of the valve disc. The installation orientation of the valve, upright or horizontal, is essential for the operating pressure.

Overview

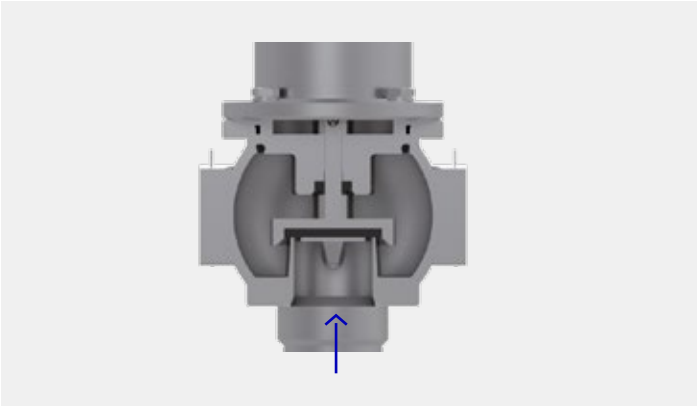
Normal safety relief valve type 483

The safety relief valves of series 483 have been developed for small to medium outputs. This type meets the properties of VARIVENT® safety relief valves type 488 and can be used in all areas of the food and beverage industries. The valves are used in applications such as bottling systems.



Normal safety relief valve type HyCom

HyCom normal safety relief valves have proven to be a cost-effective option for the VARIVENT® safety relief valves series 488. The HyCom series meets the requirements according to European PED 2014/68/EU and AD2000 regulations. The valves are type-test approved by TÜV for non-toxic gases, steams and non-sticky liquids (fluid group 2). The HyCom safety relief valve is available with nominal widths DN 25 to DN 80.



Special features
Standardized design
Manual and pneumatic lifting actuators available
CIP/SIP-able
Design with no dead zones
Seat heating (option)
Set pressure 0.5 to 10 bar

Liftings

The safety relief valves of the series VARIVENT® are equipped with a gas-tight lifting of the valve disc. This design characteristic permits cleaning media (steam or cleaning liquid) to flow through the valve during the cleaning process.

Manual lifting H4

The manual lifting H4 is a unique construction that clearly differs from the conventional lifting. The valves of nominal width DN 25 are equipped with a rotating lifting mechanism in which the safety relief valve opens when the cap turns. The valve remains opened until it is closed again by another turn of the cap. In larger valves, the valve disc can be lifted with a lever lift.

Turning lifting

Lever lifting

Pneumatic lifting H8

The pneumatic lifting H8 permits cleaning (CIP) or sterilizing (SIP) in the system. By pressurization of the lifting with air, the valve disc in the spindle is lifted from its seat and the flushing medium (steam or cleaning media) flows through the safety relief valve.

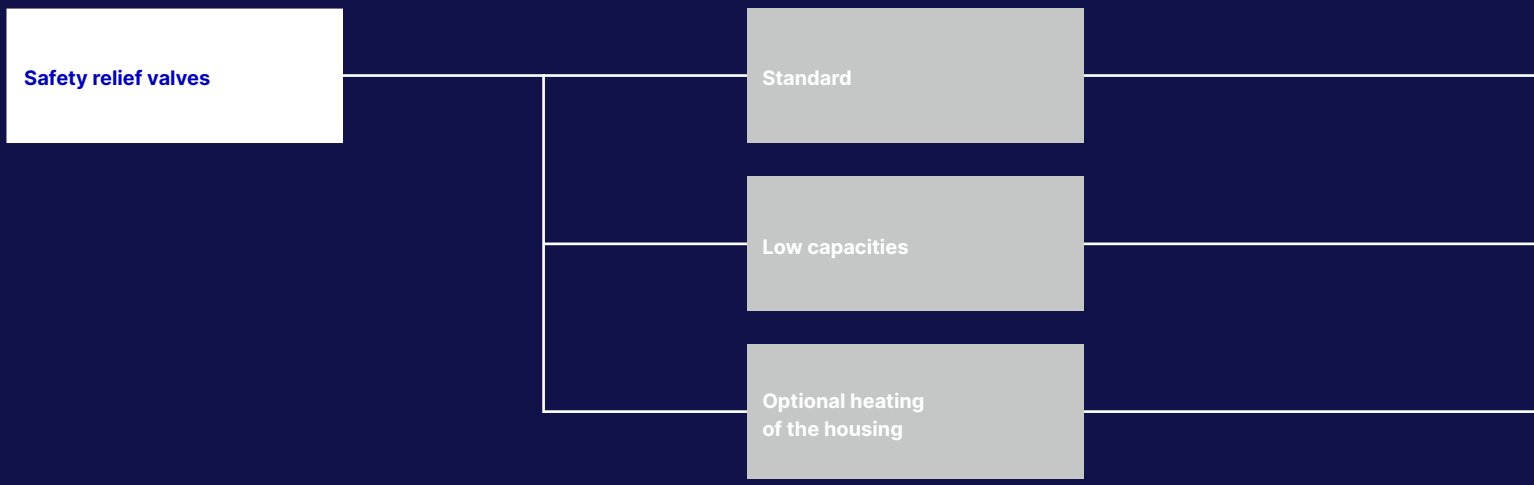
Depending on the setting and lifting pressure (compressed air supply), a double piston version (in exceptions also a triple piston lifting mechanism) can be necessary instead of the single piston design.

Single piston lifting in the VARIVENT® safety valve types 488 and 483

Double piston lifting in the VARIVENT® safety valve types 488 and 483

Pneumatic lifting at the spring-loaded safety relief valve type HyCom

Selection Matrix

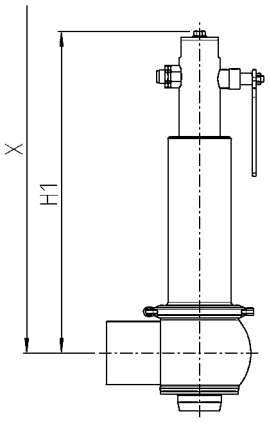


VARIVENT®
spring safety relief valve
type 488

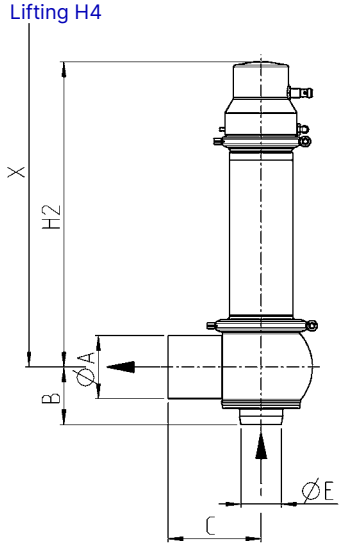
VARIVENT®
spring safety relief valve
type 483

Spring-loaded
safety relief valve
type HyCom

VARIVENT®
Safety Relief Valve Type 488
Full Stroke Safety Relief Valve



Lifting H4



Lifting H8*

Technical data of the standard version	
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4310, 1.4401
Seal material in contact with the product	EPDM
Ambient temperature	2 to 60 °C
Air supply pressure	3.5 to 10 bar
Set pressure	0.2 to 16 bar
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Connection fittings	VARINLINE® grooved flange
Lifting	Manual lifting
Marking / Certificates	CE FDA

		Pipe			Housing				Lifting			Valve	
	ØE	Ø [mm]		ØA	Flow diameter d_0 [mm]	Flow cross section A_0 [mm²]	B [mm]	C [mm]	H1 [mm]	H2 [mm]	Clearance X [mm]	Actuation pressure min. [bar]	Actuation pressure max. [bar]	Weight*** [kg]
DN	25	29.0 × 1.50	DN	40	23	416	53.0	90.0	257	217	342	0.20	16.00	8
DN	40	41.0 × 1.50	DN	65	37	1,075	70.0	125.0	426	395	536	0.20	16.00	14
DN	50	53.0 × 1.50	DN	80	46	1,662	77.5	125.0	434	401	543	0.25	15.00	16
DN	65	70.0 × 2.00	DN	100	60	2,827	87.0	125.0	444	412	593	0.23	10.34	24
DN	80	85.0 × 2.00	DN	125	74	4,301	102.5	150.0	516	517	722	0.26	10.34	39
DN	100	104.0 × 2.00	DN	150	92	6,648	121.0	152.5	534	535	771	0.20	8.20	39
OD	1 ½"**	29.0 × 1.50	OD	2"	23	416	53.0	90.0	257	217	338	0.20	16.00	8
OD	2"**	41.0 × 1.50	OD	3"	37	1,075	70.0	125.0	426	395	536	0.20	16.00	14
OD	2 ½"**	53.0 × 1.50	OD	4"	46	1,662	77.5	125.0	434	401	543	0.25	15.00	16
OD	3"**	70.0 × 2.00	OD	4 ½"	60	2,827	87.0	125.0	444	412	593	0.23	10.34	24
OD	4"**	85.0 × 2.00	OD	5 ½"	74	4,301	102.5	150.0	516	517	722	0.26	10.34	39
OD	4 ½"**	104.0 × 2.00	OD	6.625"	92	6,648	121.0	152.5	534	535	771	0.20	8.20	39

* Illustration and dimensions show valves with single piston design. Depending on the set pressure and air supply pressure a double piston lifting device may be required.
** The nominal widths in inch are only available with clamp connection ISO 2852 (CO), clamp connection ASME BPE (BO) or ASME flange B16.5 CL150RF (FA).
*** Weights refer to the valve without connection fitting

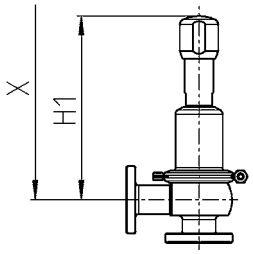
Position	Description of the order code for the standard version			
1	**Valve type**			
	488	VARIVENT® full stroke safety relief valve		
2	**Nominal width inlet**			
	DN 25	OD 1 ½"	DN 65	OD 3"
	DN 40	OD 2"	DN 80	OD 4"
	DN 50	OD 2 ½"	DN 100	OD 4 ½"
3	**Connection type inlet**			
	00	Welding end		
	TN	VARIVENT® grooved flange incl. O-ring and connecting parts		
	CO	Clamp connection ISO 2852 (TRI-Clamp)[1]		
	SO	Clamp connection DIN 32676		
	BO	Clamp connection ASME BPE[2]		
	GO	Male end SC, DIN 11851, incl. seal ring G		
	KO	Liner SD, DIN 11851, incl. nut		
	VG	VARIVENT® process connection F (DN 25)		
	VH	VARIVENT® process connection N (DN 40/50)		
	VC	VARIVENT® process connection (DN 65/80)		
	VD	VARIVENT® process connection G (DN 100)		
	FD	Flange PN16, DIN EN 1092 form B1		
	FA	Flange ASME B16.5 CL 150 RF[1]		
	BS	Aseptic liner with nut DIN11864-1 form A		
	BF	Aseptic plain flange DIN11864-2 form A		
	NF	Aseptic grooved flange DIN11864-2 form A		
	GS	Aseptic union male DIN11864-1 form A		
4	**Connection type outlet**			
	00	Welding end		
	TN	VARIVENT® grooved flange incl. O-ring and connecting parts		
	CO	Clamp connection ISO 2852 (TRI-Clamp)		
	SO	Clamp connection DIN 32676		
	BO	Clamp connection ASME BPE[2]		
	GO	Male end SC, DIN 11851, incl. seal ring G		
	KO	Liner SD, DIN 11851, incl. nut		
	FD	Flange PN16, DIN EN 1092 form B1		
	FA	Flange ASME B16.5 CL 150 RF[1]		
	BS	Aseptic liner with nut DIN11864-1 form A		
	BF	Aseptic plain flange DIN11864-2 form A		
	NF	Aseptic plain flange DIN11864-2 form A		
	GS	Aseptic union male DIN11864-1 form A		
5	**Lifting**			
	H4	Manual lifting	H8	Pneumatic lifting
6	**Certificates**			
	–	No certificates		
	TÜV	Set pressure; TÜV inspection certificate 3.2 according DIN EN 10204		
	A	Delivery specification according ASME Sec.VIII Div. 1[3] – US		
	AA	Delivery specification according ASME Sec.VIII Div. 1 and AD 2000[3] – US		
	R	Approval according to EAC (Eurasian Conformity)[3] – Russia		
	C	Delivery specification according to AQSIQ – China		
	K	Delivery specification according to TSSA – Kanada		
7	**Accessories**			
	/52	Adhesive ID tag	/J41	Double piston lifting
+				
8	**Type of switch**			
	–	Without switch	E	NI 8.2 V DC NAMUR, ATEX M12×1
	B	NI 24 V DC 3-wire PNP M12×1	X	NI 24 V DC 3-wire NPN M12×1, opener
	F	NI 24 V DC 2-wire M12×1		
9	**Proximity switch holder**			
	I	(J38) with proximity switch holder M12×1 (for DN 25, lifting H4+H8)		
	J	(J39) with proximity switch holder M12×1 (for DN 40–100, lifting H4)		
	K	(J40) with proximity switch holder M12×1 (for DN 40–100, lifting H8)		
10	**Documentation**			
	–	Without		
	H03	LESER CGA[4]		
	H01	Material certificate DIN EN 10204 – 3.1 for the housing		
	L30	Material certificate DIN EN 10204 – 3.1 for the spring cover		
	L23	Material certificate DIN EN 10204 – 3.1 for the disc		
	N04	Surface roughness[5]		

The code is composed as following, depending on the chosen configuration:

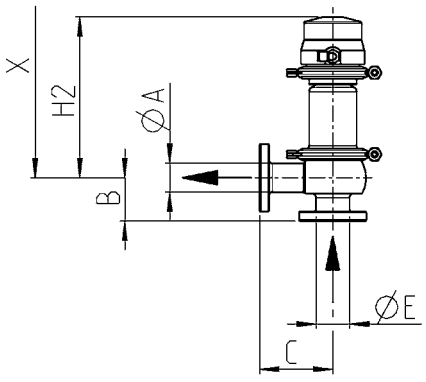
Position	1		2		3		4		5		6	7		8	9	10
Code	488	-		-		/		-		-			+			

[1] Connections in OD-nominal widths / [2] up to nominal width inlet OD 2 ½" / [3] Attention Documentation H01 and H03 required / [4] (Certificate for Global Application); Inspection certificate 3.1 according DIN EN 10204 and confirmation of compliace according to Pressure Equipment Directive DGR 97/23/EC / [5] Test of the surface roughness incl. Inspection certificate 3.1 according DIN EN 10204

VARIVENT®
Safety Relief Valve Type 483
Normal Safety Relief Valve



Lifting H4



Lifting H8*

Technical data of the standard version	
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4310, 1.4401
Seal material in contact with the product	EPDM
Ambient temperature	2 to 60 °C
Air supply pressure	3.5 to 10 bar
Set pressure	0.2 to 16 bar
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Matt blasted
Connection fittings	VARINLINE® grooved flange
Lifting	Manual lifting
Marking / Certificates	CE FDA

		Pipe			Housing				Lifting			Valve		
	ØE	Ø [mm]		ØA	Flow diameter d_o [mm]	Flow cross section A_o [mm²]	B** [mm]	C [mm]	H1 (with lifting H4) [mm]	Clearance X [mm]	H2 (with lifting H8*) [mm]	Actuation pressure min. [bar]	Actuation pressure max. [bar]	Weight**** [kg]
DN	25	29.0 × 1.50	DN	40	13	133	45	76	177	159	0.3	16	1.6	8
DN	40	41.0 × 1.50	DN	65	25	491	51	82	258	222	0.1	16	3.7	14
OD	1"***	29.0 × 1.50	OD	1 ½"***	13	133	29	52	177	159	0.3	16	1.6	8
OD	1 ½"***	41.0 × 1.50	OD	2"	25	491	44	60	258	222	0.1	16	3.7	14

* Illustration and dimensions show valves with single piston design.
** The dimensions for metric sizes include VARIVENT® groove flanges (TN) and for inch sizes clamp connections (CO).
*** The nominal widths in inch are only available with clamp connection ISO 2852 (CO).
**** Weights refer to the valve without connection fitting

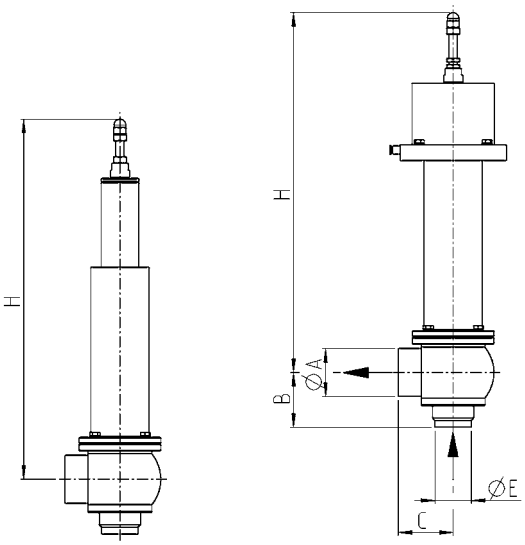
Position	Description of the order code for the standard version			
1	**Valve type**			
	483	VARIVENT® normal safety relief valve		
2	**Nominal width inlet**			
	DN 25	OD 1"	DN 40	OD 1 ½"
3	**Connection type inlet**			
	TN	VARIVENT® grooved flange incl. O-ring and connecting parts		
	CO	Clamp connection ISO 2852 (TRI-Clamp)*		
	SO	Clamp connection DIN 32676		
	GO	Male end SC, DIN 11851, incl. seal ring G		
	KO	Liner SD, DIN 11851, incl. nut		
	VG	VARIVENT® process connection F (DN 25)		
	VH	VARIVENT® process connection N (DN 40/50)		
	BS	Aseptic liner with nut DIN11864-1 form A		
	BF	Aseptic plain flange DIN11864-2 form A		
	NF	Aseptic grooved flange DIN11864-2 form A		
	GS	Aseptic union male DIN11864-1 form A		
4	**Connection type outlet**			
	00	Welding end		
	TN	VARIVENT® grooved flange incl. O-ring and connecting parts		
	CO	Clamp connection ISO 2852 (TRI-Clamp)		
	SO	Clamp connection DIN 32676		
	GO	Male end SC, DIN 11851, incl. seal ring G		
	KO	Liner SD, DIN 11851, incl. grooved nut		
	BS	Aseptic liner with nut DIN11864-1 form A		
	BF	Aseptic plain flange DIN11864-2 form A		
	NF	Aseptic plain flange DIN11864-2 form A		
	GS	Aseptic union male DIN11864-1 form A		
5	**Lifting**			
	H4	Manual lifting	H8	Pneumatic lifting
6	**Certificates**			
	–	No certificates		
	TÜV	Set pressure; TÜV inspection certificate 3.2 according DIN EN 10204		
	A	Delivery specification according ASME Sec.VIII Div. 1** – US		
	AA	Delivery specification according ASME Sec.VIII Div. 1 and AD 2000** – US		
	R	Approval according to EAC (Eurasian Conformity)** – Russia		
	C	Delivery specification according to AQSIQ – China		
	K	Delivery specification according to TSSA – Kanada		
7	**Accessories**			
	/52	Adhesive ID tag	/J41	Double piston lifting
+				
8	**Type of switch**			
	–	Without switch		
	B	NI 24 V DC 3-wire PNP M12×1		
	F	NI 24 V DC 2-wire M12×1		
	E	NI 8.2 V DC NAMUR, ATEX M12×1		
	X	NI 24 V DC 3-wire NPN M12×1, opener		
9	**Proximity switch holder**			
	I	(J38) with proximity switch holder M12×1 (for DN 25, lifting H4+H8)		
	J	(J39) with proximity switch holder M12×1 (for DN 40–100, lifting H4)		
	K	(J40) with proximity switch holder M12×1 (for DN 40–100, lifting H8)		
10	**Documentation**			
	–	Without		
	H03	LESER CGA***		
	H01	Material certificate DIN EN 10204 – 3.1 for the housing		
	L30	Material certificate DIN EN 10204 – 3.1 for the spring cover		
	L23	Material certificate DIN EN 10204 – 3.1 for the disc		
	N04	Surface roughness****		

The code is composed as following, depending on the chosen configuration:

Position	1		2		3		4		5		6	7		8	9	10
Code	483	-		-		/		-		-			+			

* Connections in OD-nominal widths / ** Attention Documentation H01 and H03 required / *** (Certificate for Global Application); Inspection certificate 3.1 according DIN EN 10204 and confirmation of compliace according to Pressure Equipment Directive DGR 97/23/EC / **** Test of the surface roughness incl. Inspection certificate 3.1 according DIN EN 10204

Safety Relief Valve Type HyCom
Spring-loaded Safety Relief Valve



Technical data of the standard version

Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4310 (AISI 304)
Seal material in contact with the product	EPDM
Ambient temperature	−10 to 130 °C
Air supply pressure	6 bar
Set pressure	0.5 to 10 bar
Surface in contact with the product	R_a ≤ 0.8 µm
External housing surface	Electro-polished
Connection fittings	VARINLINE® grooved flange
Marking / Certificates	FDA

		Pipe					Housing		Lifting		Valve			
	ØE	Ø [mm]		ØA	Flow diameter d_0 [mm]	Flow cross section A_0 [mm²]	B [mm]	C [mm]	H (without lifting) [mm]	H (with pneumatic lifting P) [mm]	Actuation pressure min. [bar]	Actuation pressure max. [bar]	Weight without lifting [kg]	Weight with pneumatic lifting [kg]
DN	25	29.0 × 1.50	DN	40	24	452	43.5	59.5	365	365	0.5	10	4.4	9.9
DN	40	41.0 × 1.50	DN	50	36	1,018	48.5	59.5	480	480	0.5	10	7.2	12.7
DN	50	53.0 × 1.50	DN	65	47	1,735	58.5	79.5	525	525	0.6	10	9.1	16.5
DN	65	70.0 × 2.00	DN	80	61	2,922	59.5	89.5	635	635	0.5	10	12.1	20.6
DN	80	85.0 × 2.00	DN	100	75	4,418	72.5	104.5	698	698	0.5	10	20.8	31.3

Position	Description of the order code for the standard version	
1	**Valve type**	
	FHCSV02	Spring-loaded safety relief valve
2	**Nominal width inlet**	
	25	DN 25
	40	DN 40
	50	DN 50
	65	DN 65
	80	DN 80
3	**Connection type inlet**	
	TN	VARIVENT® grooved flange incl. O-ring and connecting parts
	GO	Male end SC, DIN 11851, incl. seal ring G
5	**Lifting**	
	H	Manual lifting
	P	Pneumatic lifting
6	**Options**	
	See following pages	
+		
7	**Feedback**	
	0	Without feedback
	1	One feedback
8	**Type of switch**	
	–	Without switch
	B	NI 24 V DC 3-wire PNP M12×1
	F	NI 24 V DC 2-wire M12×1
	E	NI 8.2 V DC NAMUR, ATEX M12×1

The code is composed as following, depending on the chosen configuration:

Position	1		2		3		4		5		6		7	8
Code	FHCSV02	-		-		/		-		-		+		

Options

Surface quality

Deviating from the quality of the standard surface quality ($R_a \leq 0.8$ µm) a surface quality is available up to a medium roughness for surfaces in contact with the product of $R_a \leq 0.4$ µm. The outer surface of the housings is matte blasted as standard.

One process for improving the surface quality is electrochemical polishing, in which peaks on the surfaces of material are abraded by a galvanic process, resulting in an evened-out elevation profile.

This surface treatment makes it much less likely for contaminating substances and micro-organisms to stick to the surface. In addition, the smooth surface improves corrosion resistance by formation of an inert oxide layer.

Available valve types
Type 488
Type 483

Surface quality of the housing inlet in contact with the product	
$R_a \leq 0.8$ µm	Electro-polished
$R_a \leq 0.4$ µm	Electro-polished

Limit stop

The limit stop permits adjustment of the safety relief valve to the required outlet mass flow to avoid an unstable function behavior of the safety relief valve. This additional equipment limits the stroke of the valve and is therefore suitable for best adjustment of the respective valve size to the required capacity to be discharged.

Available valve types
Type 488

Heating facility

The heating facility is used as a freeze protection of the valve seat so that the safety function of the valve is still ensured even at temperatures below 0 °C. The valve housing is equipped with up to two heating rods. Compensation for a temperature differences of up to 30 °C is possible. Overheating of the valve seat must be avoided!

Available valve types
Type HyCom

Technical data	
Voltage	24 V
Power	30 W per heating rod

Nominal width	Number of heating rods
DN 25	1
DN 40	2
DN 50	2
DN 65	2
DN 80	2

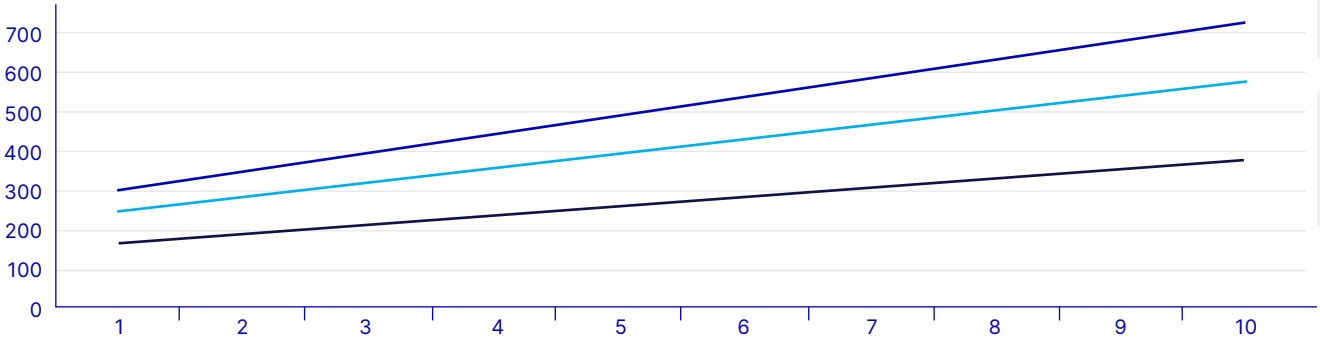
Cleaning module

The cleaning module serves the hygienic cleaning of the entrance side of an upright safety relief valve. A cleaning connection module is used to spray cleaning media into the seat area of the valve. To use the cleaning module, the safety relief valve must be equipped with the connection fitting VARIVENT® grooved flange.

Available valve types
Type 488
Type 483
Type HyCom

Technical data	
Material in contact with the product	1.4404 (AISI 316L)
Connection CIP hose	8/6 mm
Cleaning nozzles	2–4

Flow rate [l/h]



DN 65, DN 80, DN 100 DN 40, DN 50 DN 25

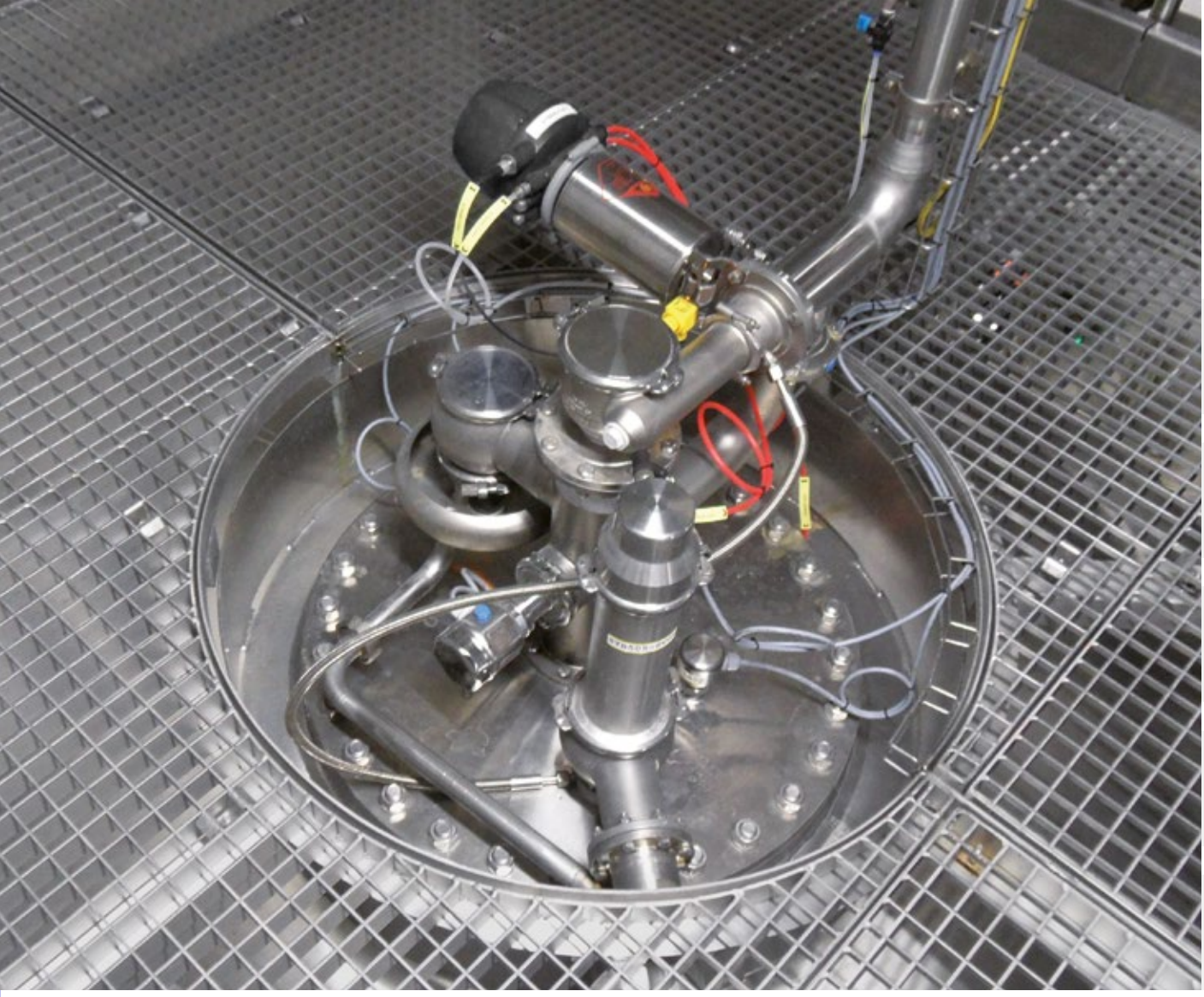
Nominal width	Number of nozzles	For mounting on flange		For mounting on tank cover	
		Material		Material	
		EPDM	FKM	EPDM	FKM
DN 25	2	223-159.13	223-159.19	223-159.01	223-159.07
DN 40	3	223-159.14	223-159.20	223-159.02	223-159.08
DN 50	3	223-159.15	223-159.21	223-159.03	223-159.09
DN 65	4	223-159.16	223-159.22	223-159.04	223-159.10
DN 80	4	223-159.17	223-159.23	223-159.05	223-159.11
DN 100	4	223-159.18	223-159.24	223-159.06	223-159.12

Questionnaire

Customer					
Company name / customer number					
Project					
Contact					
Phone					
Email					
Product					
Type of medium	☐ Liquid	☐ Gas/gaseous	☐ Saturated steam		
Name of medium	_____				
Density ρ	_____	☐ kg/m³	☐ lb/gal [US]	☐ lb/gal [UK]	
Viscosity η (for liquids only)	_____	mPas/cP			
Compressibility factor Z (for gas)	_____				
Isentropic exponent γ (gases and steams)	_____				
Process					
Set pressure p_1	_____				
Back-pressure p_2	_____				
Application temperature	_____	☐ K	☐ °F	☐ °C	
Dischargeable flow	_____	☐ l/h ☐ kg/h	☐ m³/h ☐ lb/h	☐ mn³/h ☐ scfm	☐ gpm
Basic data					
Valve type	☐ Type 488	☐ Type 483	☐ Type HyCom		
Nominal width standard	☐ DN	☐ OD			
Accessories	☐ INI holder ☐ Pneumatic lifting	☐ Manual lifting ☐ Limit stop	☐ Heating		
Certificates	☐ 3.1 Certificate for the housing material ☐ ASME certificate (Canada)		☐ 3.2 Certificate for the setting pressure ☐ ASME certificate (USA)		
Surface quality	☐ ≤ 0.8 µm	☐ ≤ 0.4 µm	☐ Inlet electro-polished		
Connection flanges	☐ TN – VARIVENT® grooved flange ☐ GO – male end SC, DIN 11851		☐ CO – clamp connection ☐ 00 – welding end		
Comments					

6 VARIVENT® VACUUM VALVES

VARIVENT® Special Application Valves



Overview

VARIVENT® vacuum valves are used for hygienic protection of tanks against negative pressure. Protection takes place from –2.5 $mbar_g$. To minimize cleaning and for protection from sticking of the valve disc, the seat ring of the valves has an anti-adhesive coating. The elastomer seals used are FDA-compliant.

VARIVENT® vacuum valves have quick reaction times when vacuum occurs, as well as safe closing functions at excess pressure.

Special features
Best protection from dirt particles being sucked in
Ideal combination with the VARITOP® tank safety system
Quick reaction times
Additional equipment

Overview

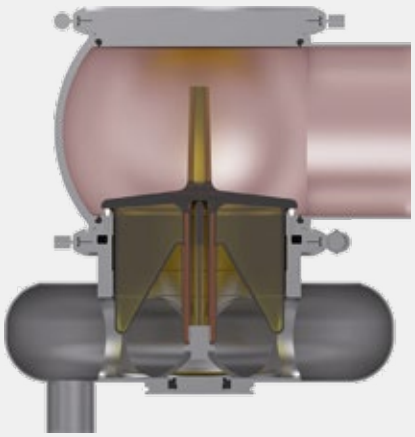
Function of the valve
Hydraulic configuration of GEA Tuchenhagen vacuum valves is always based on prevention of vacuum caused by free emptying of a tank. Prevention of vacuum caused by hot/cold cleaning is not taken into consideration.

If a vacuum occurs in the tank system, the valve disc is lifted by the negative pressure. The inflowing air flows up through the valve from below. This arrangement offers best protection against the percolation of dirt particles into the tank and thus into the product. The valve runs empty.

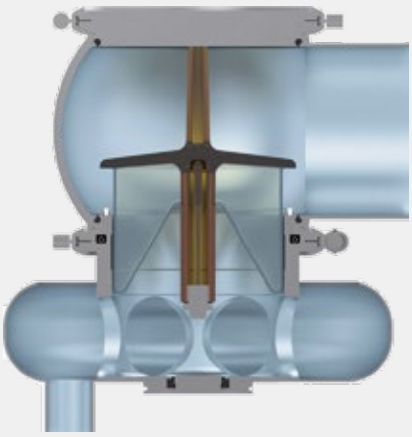
The functions of the VARIVENT® vacuum valve can be optionally expanded with a proximity switch feedback, a pneumatic lifting mechanism and a heating element.

Application examples
The VARIVENT® vacuum valves are mostly used in combination with the VARITOP® tank safety system. Accordingly, the main application is the beer brewing industry.

The optional installation of a heating element ensures full function even at temperatures below freezing. VARIVENT® vacuum valves therefore can also be operated outdoors. Only protection from weather must be provided.

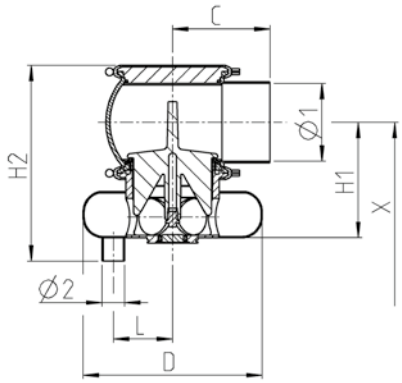


The valve is connected to the housing at the tank system. The valve disc is closed. The coloration in the housing represents the vacuum.



The valve disc is opened by the vacuum; air flows into the system without dirt particles being pulled along.

VARIVENT®
Vacuum Valve Type V



Technical data of the standard version	
Material in contact with the product	1.4404 (AISI 316L)
Material not in contact with the product	1.4301 (AISI 304)
Seal material in contact with the product	EPDM, FKM, HNBR
Ambient temperature	0 to 45 °C
Air supply pressure	Min. 4 bar (58 psi) Max. 8 bar (116 psi)
Product pressure	Max. 6 bar (87 psi)
Surface in contact with the product	$R_a \leq 0.8$ µm
External housing surface	Matt blasted
Actuator type	Pneumatic actuator air/spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Marking / Certificates	FDA

	Pipe			Housing			Dimension	Valve
Nominal width	ØE [mm]	ØA [mm]	C [mm]	H [mm]	H1 [mm]	H2 (mm)	Clearance X [mm]	Kvs [m³/h]	Weight [kg]
DN 65	70.0 × 2.00	29	125.0	68	230	210	260	260	6
DN 80	85.0 × 2.00	29	125.0	68	230	225	268	268	6
DN 100	104.0 × 2.00	29	125.0	76	230	252	295	295	8
DN 150	154.0 × 2.00	36	150.0	102	285	352	420	369	20
OD 2 ½"	63.5 × 1.65	29	125.0	68	230	204	260	260	6
OD 3"	76.2 × 1.65	29	125.0	68	230	217	268	268	6
OD 4"	101.6 × 2.11	29	125.0	76	230	249	295	295	8
IPS 3"	88.9 × 2.30	29	152.5	68	230	229	270	270	7
IPS 4"	114.3 × 2.30	29	152.5	76	230	262	300	300	9
IPS 6"	168.2 × 2.77	29	152.5	102	285	364	430	417	21

Position	Description of the order code		
1	**Valve type**		
	V	VARIVENT® vacuum valve	
2	**Housing combinations**		
	L		
3	**Supplement to the valve type (further information can be found under options on the reserve)**		
	–	Without	
	A	With lifting	
	E	With feedback	
	R	With lifting and feedback	
4	**Nominal width**		
	DN 65	OD 2 ½"	
	DN 80	OD 3"	IPS 3"
	DN 100	OD 4"	IPS 4"
	DN 150		IPS 6"
5	**Valve seat version**		
	L0	Clamped seat ring/clamp connection	
6	**Seal material in contact with the product**		
	1	EPDM (FDA)	
	2	FKM (FDA)	
	3	HNBR (FDA)	
7	**Surface quality of the housing**		
	2	Inside R_a ≤ 0.8 µm, outside matt blasted	
8	**Connection fittings**		
	N	Welding end	
9	**Options**		
	/52	Adhesive ID tag	
+			
10	**Type of the switch (further information can be found under options on the reverse)**		
	0	Without feedback	
	B	NI 24 V DC 3-wire M18×1	
	F	NI 24 V DC 2-wire M18×1	
11	**Air connection (further information can be found under options on the reverse)**		
	0	Without	
	M	Metric for air hose Ø 6/4 mm	
	Z	Inch for air hose Ø OD ¼" (6.35/4.35 mm)	

The code is composed as following, depending on the chosen configuration:

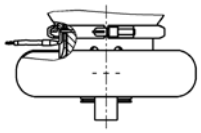
Position	1	2	3		4		5		6	7	8	9		10	11
Code	V	L		-		-	L0	-		2	N	/52	+		

For order codes differing from the standard version, please refer to section 7.

Options

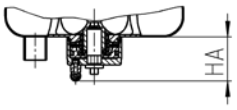
Heating

Heating of the vacuum valve is recommended when ambient temperatures could fall below the freezing point. This ensures that the valve disc does not freeze to the seat.
Voltage: 24 V AC, power: 20 W



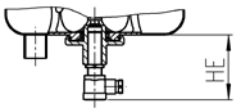
Pneumatic lifting type A

The pneumatic lifting serves control of the valve disc for valve seat cleaning during tank cleaning. This way, the seat and seal surfaces are cleaned in addition to the valve housing. The lifting mechanism can be retrofitted.



Feedback type E

The proximity switch detects the closed valve position. As soon as the valve disc leaves the non-actuated position the switching contact is interrupted.

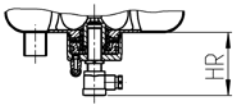


Two types of proximity switches are available:

Proximity switch 24 V DC M18×1 for type E	Article number
2-wire (terminal chamber)	505-036
3-wire (connector M12×1)	505-110

Pneumatic lifting actuator and feedback type R

Type R is a combination of the pneumatic lifting actuator type A and the proximity switch type E. The function method is comparable to type A and E.

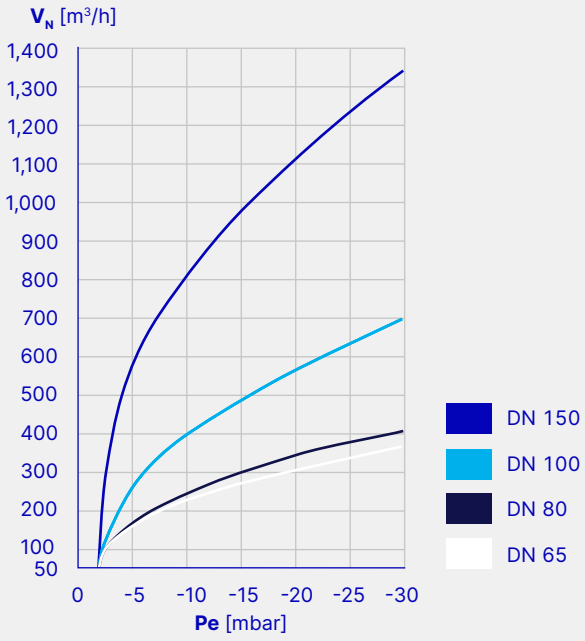


	Dimension		
Nominal width	HA [mm]	HE [mm]	HR [mm]
DN 65	45	77	77
DN 80	45	77	77
DN 100	45	77	77
DN 150	45	77	77
OD 2 ½"	45	77	77
OD 3"	45	77	77
OD 4"	45	77	77
IPS 6"	42	71	73

Questionnaire

Customer	
Company name / customer number	
Project	
Contact	
Phone	
Email	

Process		
Max. fill level of the tank	_____ m	
Max. emptying volume flow	_____ m³/h	
Max. diameter of the outlet opening	_____ mm	
Vacuum-proofness of the tank	_____ mbar-a	
Nominal width standard	☐ DN ☐ OD ☐ IPS	



Accessories	
	☐ INI-holder ☐ Pneumatic lifting ☐ Heating

Surface quality	
	☐ ≤ 0.8 µm ☐ ≤ 0.4 µm

Seal material	
	☐ EPDM ☐ FKM ☐ HNBR

Comments / Miscellaneous

7 OPTIONS

GEA VARIVENT® Hygienic Special Application Valves

Available Options

Options
Housing and Nominal Widths
VARIVENT® Jacketed Valve Housing

Typical application and description
For keeping chocolate or margarine fluid and for cooling ice cream.

For heating or cooling products, a hot or cold medium is passed through the housing jacket in the opposite flow direction.

The product range includes jacketed valve housings with both one and two vertical ports. However, the housings cannot be supplied for valves with mix-matched nominal widths or a welded seat ring.

Available nominal widths

Metric	DN	25–100
Inch OD	OD	1" – 4"

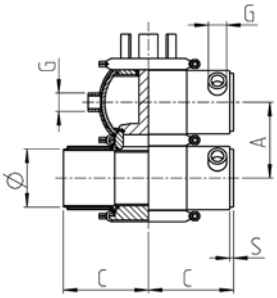
Available valve types

VARIVENT® control valve	S, P
VARIVENT® overflow valve	Q
VARINLINE® housings*	

* Only available for nominal widths DN 25 to DN 50 as well as DN 80 and OD 1" to OD 2"

Technical data

Material		1.4404 (AISI 316L)
Max. product pressure	10 bar	DN 25 – 50, OD 1" – 2"
	6 bar	DN 65 – 100, OD 2 ½" – 4"
Jacket pressure resistance		3.5 bar
Surface in contact with the product		R_a ≤ 0.8 µm
Outside surface		Matt blasted
Valve seat version		Clamped connection



					Dimensions	Weight	
Nominal width	Ø [mm]	C [mm]	A [mm]	S [mm]	G [mm]	single vertical ports [kg]	double vertical ports [kg]
DN 25	29 × 1.5	90	50	5	G ¼"	0.5	0.7
DN 40	41 × 1.5	90	62	5	G ¼"	0.8	1.1
DN 50	53 × 1.5	90	74	5	G ¼"	1.0	1.1
DN 65	70 × 2.0	125	96	5	G ½"	2.5	2.7
DN 80	85 × 2.0	125	111	5	G ½"	3.0	3.2
DN 100	104 × 2.0	125	130	5	G ½"	4.1	4.4
OD 1"	25.4 × 1.65	90	46.0	5	G ¼"	0.5	0.6
OD 1 ½"	38.1 × 1.65	90	59.0	5	G ¼"	0.8	0.9
OD 2"	50.8 × 1.65	90	71.5	5	G ¼"	1.0	1.1
OD 2 ½"	63.5 × 1.65	125	90.0	5	G ½"	2.3	2.5
OD 3"	76.2 × 1.65	125	103.0	5	G ½"	2.7	2.8
OD 4"	101.6 × 2.11	125	127.5	5	G ½"	4.1	4.0

Incorporation of the option in the order code and example

Position		Description of the order code for options
*		Accessoires
	🔍 /25	Jacketed valve housings

Position	1	2	3		4/5		6	7		8		9		10	11	12	13			14 to 19					
Code	D	E		-	DN 80/80	-	S	Z	-	CD	-	L0	-	1	2	N	/25 🔍	/52	+	0	0	0	0	0	M

* According to valve type

Options
Housing and Nominal Widths
VARIVENT® Housing with Increased Pressure Level

Typical application and description

For static use of valves with increased product pressure. For increasing the strength, the half rings on the valve housings are made of cast material and the housings with nominal widths DN 100 / OD 4" are made of a higher-quality material.

IMPORTANT: The differential pressure between the product chambers on both sides of the valve disc is not allowed to exceed 10 bar during switching of the valve. The actuator size of the valve must be selected based on the product data.

Available nominal widths

Metric	DN	25–100
Inch OD	OD	1" – 4"

Available valve types

VARIVENT® control valve	S, P
VARIVENT® overflow valve	Q

Technical data

Material	1.4404 (AISI 316L)	DN 25 – 80, OD 1" – 3"
	1.4462	DN 100, OD 4"
Pressure level	PS 20 bar	TS 0/+150 °C
Pressure level jacketed housing	PS 16 bar	DN 25 – 80, OD 1" – 3" TS 0/+150 °C

Available nominal widths and pressure range

Nominal width	Pressure range (PS)	
	Standard	Option
DN 25	16	20
DN 40	16	20
DN 50	16	20
DN 65	16	20
DN 80	10	20
DN 100	10	20
DN 125	10	–
DN 150	10	–
OD 1"	16	20
OD 1 ½"	16	20
OD 2"	16	20
OD 2 ½"	16	20
OD 3"	10	20
OD 4"	10	20
OD 6"	10	–
IPS 2"	16	20
IPS 3"	10	20
IPS 4"	10	–
IPS 6"	10	–

Dimensions

Nominal width	Ø [mm]	C [mm]	A [mm]
DN 25	29 × 1.5	90	50
DN 40	41 × 1.5	90	62
DN 50	53 × 1.5	90	74
DN 65	70 × 2.0	125	96
DN 80	85 × 2.0	125	111
DN 100	104 × 2.0	125	130
OD 1"	25.4 × 1.65	90	46.0
OD 1 ½"	38.1 × 1.65	90	59.0
OD 2"	50.8 × 1.65	90	71.5
OD 2 ½"	63.5 × 1.65	125	90.0
OD 3"	76.2 × 1.65	125	103.0
OD 4"	101.6 × 2.11	125	127.5

Incorporation of the option in the order code and example

Position		Description of the order code for options	
*		Accessoires	
	🔍	/37	PS 20 bar
		/38	PS 16 bar (jacketed valve housing)

Position	1	2	3		4/5		6	7		8		9		10	11	12	13			14 to 19					
Code	N	E		-	DN 80/80	-	S	Z	-	CD	-	L0	-	1	2	N	/37 🔍	/52	+	0	0	0	0	0	M

* According to valve type

Options
Housing and Nominal Widths
Mix-Matched Housing Combinations

Typical application and description

Many mix-matched housings are already available. For technical reasons, however, a mix-matched combination is not possible for all valve types! If required, please contact GEA Tuchenhagen to ask about the feasibility.

The first mentioned nominal width indicates the upper valve housing, the second one is the nominal width of the lower valve housing. In divert valves, both upper housings are configured with the same nominal width. The larger housing in the mix-matched combination must always be configured as a housing with two vertical ports.

Available nominal widths

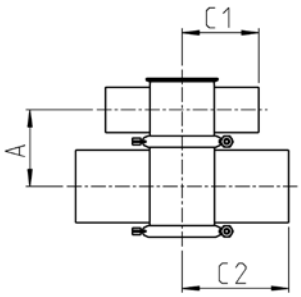
Metric	DN	25–150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Available valve types

VARIVENT® control valve	S, P
VARIVENT® overflow valve	Q

Technical data

Material	1.4404 (AISI 316L)
Product pressure	10 bar
Valve seat version	Clamped

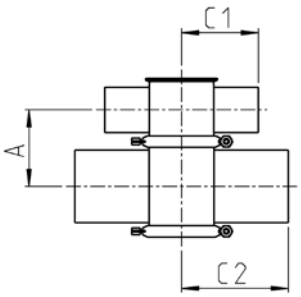


Upper housing	DN 25			DN 40			DN 50			DN 65		
	A	C1	C2	A	C1	C2	A	C1	C2	A	C1	C2
Lower housing												
DN 25	50	90	90	–	–	–	–	–	–	–	–	–
DN 40	56	90	90	62	90	90	68	90	90	–	–	–
DN 50	62	90	90	68	90	90	74	90	90	–	–	–
DN 65	70	90	125	76	90	125	82	90	125	96	125	125
DN 80	77.5	90	125	83.5	90	125	89.5	90	125	103.5	125	125
DN 100	87	90	125	93	90	125	99	90	125	113	125	125
DN 125	–	–	–	105.5	90	125	111.5	90	125	125.5	125	125
DN 150	–	–	–	118	90	150	124	90	150	138	125	150

Upper housing	OD 1"			OD 1 ½"			OD 2"			OD 2 ½"		
	A	C1	C2	A	C1	C2	A	C1	C2	A	C1	C2
Lower housing												
OD 1"	46	90	90	–	–	–	–	–	–	–	–	–
OD 1 ½"	52.5	90	90	59	90	90	65.25	90	90	–	–	–
OD 2"	58.75	90	90	65.25	90	90	71.5	90	90	–	–	–
OD 2 ½"	65	90	125	71.5	90	125	77.75	90	125	90	125	125
OD 3"	71.5	90	125	78	90	125	84.25	90	125	96.5	125	125
OD 4"	83.75	90	125	90.25	90	125	96.5	90	125	108.75	125	125
OD 6"	–	–	–	116.5	90	150	122.75	90	150	133.5	125	150

Upper housing	IPS 2"		
	A	C1	C2
Lower housing			
IPS 2"	58.75	90	90
IPS 3"	65.25	90	90
IPS 4"	71.5	90	90
IPS 6"	77.75	90	125

Options
Housing and Nominal Widths
Mix-Matched Housing Combinations



Upper housing	DN 80			DN 100			DN 125		
	A	C1	C2	A	C1	C2	A	C1	C2
Lower housing									
DN 25	–	–	–	–	–	–	–	–	–
DN 40	–	–	–	–	–	–	–	–	–
DN 50	–	–	–	–	–	–	–	–	–
DN 65	103.5	125	125	–	–	–	–	–	–
DN 80	111	125	125	–	–	–	–	–	–
DN 100	120.5	125	125	130	125	125	–	–	–
DN 125	133	125	125	142.5	125	125	155	125	125
DN 150	145.5	125	150	155	125	150	167.5	125	150

Upper housing	OD 3"			OD 4"		
	A	C1	C2	A	C1	C2
Lower housing						
OD 1"	–	–	–	–	–	–
OD 1 ½"	–	–	–	–	–	–
OD 2"	–	–	–	–	–	–
OD 2 ½"	96.5	125	125	–	–	–
OD 3"	103	125	125	–	–	–
OD 4"	115.25	125	125	127.5	125	125
OD 6"	140	125	150	152.25	125	150

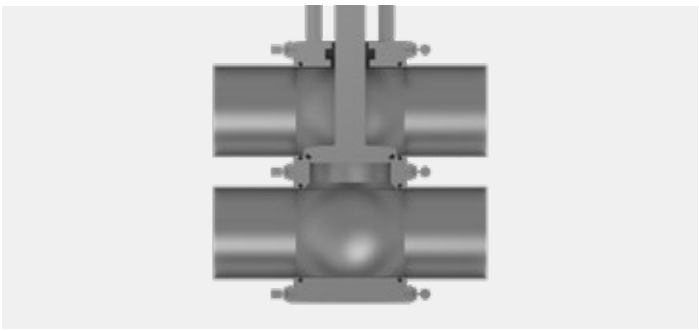
Upper housing	IPS 3"			IPS 4"		
	A	C1	C2	A	C1	C2
Lower housing						
IPS 2"	–	–	–	–	–	–
IPS 3"	115	152.5	152.5	–	–	–
IPS 4"	127.5	152.5	152.5	140	152.5	152.5
IPS 6"	153.5	152.5	152.5	166	152.5	152.5

Incorporation of the option in the order code and example

Position		Description of the order code for options	
4/5		.../...	Nominal width (upper housing/lower housing)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 40/50	-	M	M3	-	L0	-	1	-	2	N	/52	+	0	0	0	0	0	M

Options
Seal Materials
FFKM



Typical application and description

Perfluorinated rubber (FFKM) is an elastomer that is used in areas where particularly high thermal and/or chemical resistance properties are required.

FFKM seal material combines the chemical properties of PTFE and the mechanical properties of Viton, and is characterized by a wide range of application temperatures, very good resistance to fluids, low-pressure deformation and minimum swelling.

The mixing constituents of our FFKM gasket material comply with US Plastic Class VI and have been tested for acude systemic toxicity, intrataneous reactivity and intramuscular implantation in accordance with USP-NF 87 and 88.

The resistance of the sealing material depends on the type and temperature of the product being transported. The contact time with certain products can negatively effect the service life of the seals.

Detailed information on the properties of the sealing material can be found in the table with the material properties.

Available nominal widths

Metric	DN	10–100
Inch OD	OD	1" – 4"
Inch IPS	IPS	2" – 4"

Available valve types

VARIVENT® control valve	S, P
VARIVENT® overflow valve	Q
VARIVENT® sampling valve	I, N, U
VARINLINE® components	

Technical data

Operating temperature	–10 °C to 230 °C (14 °F to 446 °F)
Properties	See table of seal material properties

Incorporation of the option in the order code and example

Position	Description of the order code for options
*	Seal material in contact with the product
4	FFKM

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	4	-	2	N	/52	+	0	0	0	0	0	M

* According to valve type

Options
Surface Qualities
Inner and Outer Surface of the Housings

Typical application and description

Deviating from the quality of the standard surface quality, different surface qualities are available up to a medium roughness for surfaces in contact with the product of $R_a \leq 0.4$ µm. The outer surface of the housings is matt blasted as standard. Optionally, it can also be supplied ground.

Housings that should comply with the 3-A standard are produced as standard with an inner surface of $R_a \leq 0.8$ µm with ground welds and a blasted outer surface. If a configuration with a ground outer surface is required, it is necessary to select not only option /3-A (position 13) but also the corresponding surface quality 3 (position 11).

Incorporation of the option in the order code and example

Position		Description of the order code for options
*		Surface quality of the housing
	2	Inside $R_a \leq 0.8$ µm, outside matt blasted
	3	Inside $R_a \leq 0.8$ µm, outside ground
	4	Inside $R_a \leq 0.4$ µm, outside matt blasted
	8	Inside $R_a \leq 0.4$ µm, outside ground

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	N	/52	+	0	0	0	0	0	M

* According to valve type

Options
Surface Qualities
Electro-Polishing

Typical application and description

One process for improving the surface quality is electrochemical polishing, in which peaks on the surfaces of material are abraded by a galvanic process, resulting in an evened-out elevation profile.

This surface treatment makes it much less likely for contaminating substances and micro-organisms to stick to the surface. In addition, the smooth surface improves corrosion resistance by formation of an inert oxide layer.

Electropolishing of the housings is only available for housings that are outside grounded (order code position 11).

Incorporation of the option in the order code and example

Position	Description of the order code for options
*	Accessories
/E	Surface finish electrolytically polished

Position	1	2	3		4/5		6	7		8		9		10	11	12			13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	N	/E	/52	+	0	0	0	0	0	M

* According to valve type

Options
Connection Fittings
Overview

Typical application and description
The valve housings can be specified with a welded-on connection fitting. To find which connection fittings are available, please refer to the list on the following pages.

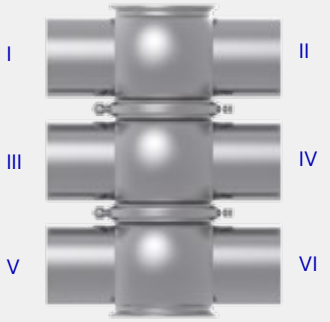
If the vertical ports within a valve do have different configurations, please inform us of the designation for the particular housing port including the required connection fitting (as in the example below). The seal which may be included corresponds to the sealing material of the valve.

Connection fittings

TK	VARIVENT® flange connection, groove flange on housing
TN	VARIVENT® groove flange incl. O-ring and connecting parts
TF	VARIVENT® flange
GK	Pipe fitting, DIN 11851, male end on housing
GO	Male end SC, DIN 11851, incl. seal ring G
KO	Liner SD, DIN 11851, incl. groove nut
ASK	Hygienic flange connection, DIN 11853-2
NFK	Hygienic groove flange, DIN 11853-2
BFK	Hygienic flange, DIN 11853-2
CO	Clamp connection / Tri-Clamp, DIN 32676 (DN) / ISO 2852 (OD; length: 28.5 mm)

Valves with one housing and vertical port

Valves with two housings



Valves with three housings

Example

Housing port	Connection fitting
I	TN
II	TF
III	TK
IV	
V	
VI	
VII	

Incorporation of the option in the order code and example

Position	Description of the order code for options
*	Connection fittings
J	Valve with connection fittings (required connection fitting according to list above, please state separately)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/52	+	0	0	0	0	0	M

* According to valve type

Options
Connection Fittings
VARIVENT® Flange Connection

Complete connection including bolts and nuts (TK)

Groove flange (TN), including connecting elements and seal ring

Flange (TF)

Typical application and description

An O-ring is used for sealing the VARIVENT® flange connection, and is given a defined compression by a metal stop. The O-ring is also protected by the special geometry of the recess from being pulled out at high flow rates.

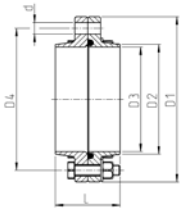
The VARIVENT® flange connection (TK) can be ordered either as a complete connection including bolts and nuts (TK) or a groove flange (TN)/flange (TF) as a connection fitting on a vertical port. If a complete connection is ordered as the connection fitting, the groove flange is welded onto the housing. The groove flange (TN) contains not only the O-ring but also the required connecting elements.

Available nominal widths

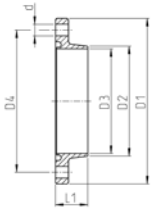
Metric	DN	25–150
Inch OD	OD	1" – 6"
Inch IPS	IPS	2" – 6"

Technical data

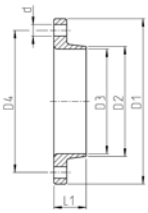
Material	1.4404
Surface in contact with the product	$R_a \leq 0.8$ µm
Certificates	3.1/AD2000W2
Seal materials	EPDM (FDA), FKM (FDA), HNBR (FDA)
Maximum pressure	DN 25–65, OD 1"–2 ½": 16 bar
	DN 80–150, OD 3"–6": 10 bar



TK = VARIVENT® flange connection



TN = VARIVENT® groove flange



TF = VARIVENT® flange

						Dimensions		O-Ring	
Nominal width	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	d [mm]	L [mm]	L1 [mm]	[mm]	PS
DN 25	70	30.0	26.0	53	4 × Ø 9	50	25	25.0 × 5.0	16
DN 40	82	42.0	38.0	65	4 × Ø 9	50	25	36.0 × 5.0	16
DN 50	94	54.0	50.0	77	4 × Ø 9	50	25	47.0 × 5.0	16
DN 65	113	70.0	66.0	95	8 × Ø 9	50	25	62.0 × 5.0	16
DN 80	128	85.0	81,0	110	8 × Ø 9	50	25	75.0 × 5.0	10
DN 100	159	104.0	100.0	137	8 × Ø 11	50	25	95.0 × 5.0	10
DN 125	183	129.0	125.0	161	8 × Ø 11	50	25	115.0 × 5.0	10
DN 150	213	154.0	150.0	188	8 × Ø 14	60	30	134.2 × 5.7	10
OD 1"	66	25.5	22.0	49	4 × Ø 9	50	25	25 × 5.0	16
OD 1 ½"	79	38.5	35.0	62	4 × Ø 9	50	25	36 × 5.0	16
OD 2"	91	51.0	47.5	74	4 × Ø 9	50	25	47 × 5.0	16
OD 2 ½"	106	63.5	60.0	88	8 × Ø 9	50	25	62 × 5.0	16
OD 3"	119	76.5	73.0	101	8 × Ø 9	50	25	75 × 5.0	10
OD 4"	156	102.0	97.5	134	8 × Ø 11	50	25	95 × 5.0	10
OD 6"	211	152.4	146.5	186	8 × Ø 11	50	25	115 × 5.0	10
IPS 2"*	101	60.5	57.0	84	4 × Ø 9	50	25	25 × 5.0	16
IPS 3"*	132	89.0	85.0	114	4 × Ø 9	50	25	36 × 5.0	10
IPS 4"	169	114.0	110.0	147	4 × Ø 9	50	25	47 × 5.0	10
IPS 6"**	227	168.0	162.0	202	8 × Ø 9	50	25	62 × 5.0	10

* only EPDM ** only EPDM and FKM

Incorporation of the option in the order code and example

Position	Description of the order code for options
***	Connection fittings
J	Valve with connection fittings (please state option TK, TN or TF separately with reference to the connection)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/52	+	0	0	0	0	0	M

*** According to valve type

Options
Connection Fittings
Pipe Fitting acc. to DIN 11851

Complete connection (GK)

Male end SC (GO), including seal ring G

Liner SD (KO), including groove nut

Typical application and description

A seal ring G is used for sealing the pipe fitting acc. to DIN 11851. The pipe fitting acc. to DIN 11851 can be ordered either as a complete connection (GK) or male end SC (GO)/liner SD (KO) as a connection fitting on a vertical port. If a complete connection is ordered on a housing port, the male end is welded onto the housing. The groove flange contains the seal ring G. The liner (KO) contains the groove nut.

GK – Complete connection, male end on housing

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Standard	DIN 11851
Seal material	EPDM (FDA), FKM (FDA), HNBR (FDA)
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

GO – Male end SC, including seal ring G

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Standard	DIN 11851
Seal material	EPDM (FDA), FKM (FDA), HNBR (FDA)
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

KO – Liner SD, including groove nut

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Standard	DIN 11851
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

Incorporation of the option in the order code and example

Position		Description of the order code for options
*		Connection fittings
	J	Valve with connection fittings (required connection fitting, please specify separately)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/52	+	0	0	0	0	0	M

* According to valve type

Options
Connection Fittings
Hygienic Flange Connection acc. to DIN 11853-2

Complete hygienic flange connection (ASK)

Hygienic-groove flange (NFK), including connecting elements and seal ring

Hygienic flange (BFK)

Typical application and description

An O-ring is used for sealing the hygienic flange connection acc. to DIN 11853-2, and is given a defined compression by a metal stop. The O-ring is also protected by the special geometry of the recess from being pulled out at high flow rates. Furthermore, the flange connection is centered by the design shape. The sealing geometry of the hygienic flange connection corresponds to the aseptic flange connection acc. to DIN 11864-2.

The hygienic flange connection (ASK) can be ordered either as a complete connection including bolts and nuts (ASK) or a hygienic groove flange (NFK)/hygienic flange (BFK) as a connection fitting on a vertical port. If a complete connection is ordered on a housing port, the groove flange is welded onto the housing. The groove flange (NFK) contains not only the O-Ring but also the required connecting elements.

ASK – Complete hygienic flange connection

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Seal material	EPDM (FDA), FKM (FDA), HNBR (FDA)*
Standard	DIN 11853-2
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

* up to DN 100

NFK – Hygienic groove flange, including connecting elements and seal

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Seal material	EPDM (FDA), FKM (FDA), HNBR (FDA)*
Standard	DIN 11853-2
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

* up to DN 100

BFK – Hygienic flange

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 4"

Technical data

Material	1.4404 (AISI 316L)
Standard	DIN 11853-2
Maximum pressure	DN 10–40, OD 1"–1 ½": 25 bar
	DN 50–100, OD 2"–4": 16 bar
	DN 125–150: 10 bar

Incorporation of the option in the order code and example

Position		Description of the order code for options
*		Connection fittings
	J	Valve with connection fittings (required connection fitting, please specify separately)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/52	+	0	0	0	0	0	M

* According to valve type

Options
Connection Fittings
Clamp Connection (Tri-Clamp)

Clamp connection (CO)

Typical application and description

The clamp connection acc. to DIN 32676 is a widely used connection fitting, in the food, chemical and pharmaceutical industry, especially in North America. The connection uses a symmetrically structured clamp connection with a seal located in between it, and is secured by a clamp. The second clamp connection, the seal and the clamp are not supplied. Clamps with nominal width OD series are compatible to ASME BPE clamps.

Available nominal widths

Metric	DN	10–150
Inch OD	OD	1" – 6"

Technical data

Material	DN	1.4404 (AISI 316L)
	OD	AISI 316L
Standard	DN	DIN 32676
	OD	DIN 32676*; Length 28.5 mm**
Inner diameter	DN	DIN 11866 row A
	OD	DIN 11866 row C
Certificates		3.1
Maximum pressure		DN 10–40, OD 1"–1 ½": 25 bar
		DN 50–65, OD 2"–3": 16 bar
		DN 80–150, OD 4"–6": 10 bar

* Similar to ASME BPE B ** OD 6" referred to DIN 32676

Incorporation of the option in the order code and example

Position	Description of the order code for options
**	Connection fittings
J	Component with connection fittings (required connection fitting, please state separately)

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/52	+	0	0	0	0	0	M

** According to valve type

Options
Additional Options
Test Report and Inspection Certificate

Typical application and description

Optionally, the housings or all parts in contact with the product can be supplied with a test report 2.2 and/or an inspection certificate 3.1 acc. to EN 10204.

IMPORTANT: An inspection certificate for all components in contact with the product can only be produced if notification of this requirement is provided with the order. The inspection certificate 3.1 acc. to EN 10204 can only be issued subsequently for the housings. Unless special requirements are stated, the order code referred to below only covers issuing the inspection certificate 3.1 acc. to EN 10204 for the housings.

European standard EN 10204 in its 2004 edition defines the various types of test certificate that can be issued to the ordering party in accordance with the agreements in the order for delivery of metallic products.

Number	Type of test certificate	Content of the certificate	Confirmation of the certificate by
2.2	Test report	Confirmation of compliance with the order, specifying results of a non-specific test	The manufacturer
3.1	Inspection certificate 3.1*	Confirmation of compliance with the order, specifying results of a specific test	The manufacturer's acceptance officer independent of the production department

* Inspection certificates 3.1 can be selected either for the housing or for product wetted parts, incl. connection fittings or ADW2 (please specify when ordering).

Incorporation of the option in the order code and example

Position		Description of the order code for options	
**		Accessories	
	🔍	/41	Test report 2.2
		/42	Inspection certificate 3.1 according to EN 10204

Position	1	2	3		4/5		6	7		8		9		10	11	12			13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	N	/41 🔍	/52	+	0	0	0	0	0	M

** According to valve type

Options
Additional Options
3-A Symbol

Typical application and description

3-A Sanitary Standards, Inc. is an independent, non-profit corporation dedicated to advancing hygienic equipment design for the food, beverage, and pharmaceutical industries. In particular, it represents the interests of three stakeholder groups in the US dairy industry with a common commitment to promoting food safety and the public health – regulatory sanitarians, equipment fabricators and processors. To achieve this purpose, it has produced guidelines which define various design requirements on components. In the area of seat valves, it is above all the standards 53-07 (compression type valves) that is relevant. Compliance with these design specifications is examined by an independent expert and confirmed by issuing a certificate.

If the 3-A option is selected, compliance with the requirements of the standard is confirmed by means of a sticker on the component. Consequently, if this option is selected, it is necessary to comply with the standard in terms of identification as well.

Furthermore, when this option is selected, the welds of the port connections are ground smooth. The standard does not specify that this is mandatory, but it is in line with customers' preferences in this market. Valves that are intended to meet the 3A requirements are available with butt weld ends or with clamp connections.

IMPORTANT: The standard surface when this option is selected is "inside surface $R_a \leq 0.8$ µm, outside matt". Many customers in this market ask for the alternative surface quality "inside surface $R_a \leq 0.8$ µm, outside ground". If this is required, it must be selected separately in the order code as a non-standard surface.

Incorporation of the option in the order code and example

Position		Description of the order code for options
*		Accessories
	/3A	Adhesive ID tag, configuration of the valve according to 3-A standard

Position	1	2	3		4/5		6	7		8		9		10	11	12			13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	N	/3A	/52	+	0	0	0	0	0	M

* According to valve type

Options
Additional Options
ID Plates, TAG Numbers

Typical application and description

As a standard, the valves are provided with a nameplate for clear identification. All key information required for clear allocation of the valve, as well as technical data, is specified on the nameplate. The plate is glued onto the actuator.

Key data contained	
Valve type	
Serial number	
Materials in contact with the product	Metallic material / seal material
Air supply pressure	Min./Max. [bar/psi]
Product pressure	Housing 1/2/3 [bar/psi]

Option /50 – engraved labeling plate cpl. for system identification number

In addition to the nameplate, the option /50 consists of an engraved labeling plate attached between the actuator and lantern using a key ring on the clamp connection.

Option /51 – metal labeling plate US version cpl.

The engraved labeling plate is attached between the actuator and lantern using a key ring on the clamp connection. Additional information can be recorded as well as the TAG number, customer designation and the valve type. In addition, the valve is identified with a nameplate.

Option /52 – System identification number

In addition to the nameplate sticker the valve can be labelled with a desired system identification number. The TAG number is assigned to the valve by means of a separate sticker on the actuator or control and feedback system.

Incorporation of the option in the order code and example

Position		Description of the order code for options	
*		Accessories	
	/50	Engraved metal plate	
	/51	Metal plate (US version)	
	/52	Adhesive ID tag	

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/50	+	0	0	0	0	0	M

* According to valve type

Options
Additional Options
ATEX

Typical application and description

The ATEX standard of the European Union actually includes two guidelines on the explosion protection subject, the ATEX Product Directive 2014/34/EU and 1999/92/EG. The abbreviation ATEX come from the French term ATmosphères EXplosibles.

VARIVENT® and ECOVENT® valves have been subjected to an ignition hazard assessment and do not have in the interior a potential source of ignition. Thus the directive 2014/34/EU (ATEX) is not applicable for the internal space of the valve.

A risk of ignition or explosion very rarely may occur from the actuator unit in case of an error so that the actuator comes within the scope of Directive 2014/34/EU and is labeled accordingly. The suitability is confirmed by the type-specific Declaration of Conformity of the manufacturer.

Incorporation of the option in the order code and example

Position		Description of the order code for options	
13		Accessories	
	🔍	/EX	Ex-proof design

Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18					
Code	Q	E	W	-	DN 80/80	-	M	M3	-	L0	-	1	-	2	J	/EX 🔍	+	0	0	0	0	0	M

GEA Valve Automation – Control and Feedback Systems

Valve automation for increased process reliability, efficiency and flexibility

GEA's hygienic valve technology sets the standards for reliable, safe and permanently efficient liquid processes. Leading-edge control and automation options enable operators to achieve optimum control and monitoring of the valve – thereby realizing state-of-the-art, highly flexible operating and automation concepts.

The key component is the latest generation of GEA control tops with reliable, ground-breaking control and feedback technology. Mechanical valve components and a control top specified for the particular application together to form a finely tuned valve unit capable of realizing advanced system concepts and enhancing process options.

The control top – integral part of the valve unit

The control top facilitates optimized production and cleaning processes with less expenditure on staff, energy and time. Valve functions can be automatically and continuously monitored, recorded, evaluated and if necessary, corrected. Detectable valve positions make a crucial contribution towards the achievement of optimum system operation. This ensures adherence to a smooth process flow, while also achieving the utmost in product safety.

Special priority is given to sustainability in intelligent valve control: Thanks to the selectable LEFF® function integrated in the T.VIS® A-15, up to 90 percent of cleaning agents can be saved by an optimized and PLC-independent pulsing of the valve discs during the cleaning process. The economical air guidance in the control top and the integrated solenoid valves with low power intake minimize energy consumption as well as the demand for compressed air and the number of hose connections.

In addition, the control top offers the best protection to components against adverse ambient conditions such as moisture, dust, liquids of any kind, vibrations and other mechanical impact.

Modern plant communication at the threshold to industry 4.0
The control tops in the current GEA range can be configured for all common types of connection and control systems to make future-oriented, pioneering automation functions possible. For example, users can ensure early digital integration of their system control setup in Industry 4.0 environments by way of the modern IO-Link technology. Digital exchange of data enables central setting of component parameters and lossless information transfer.

Diagnostic data from the valve can be processed and displayed in central control unit of the plant. The options even extend to networking the system controller with the company's ERP system for optimized resource utilization.

Easy start-up
Thanks to pre-configurable system parameters and a fully automatic SETUP, the installation for digital valve control is easy even also without extensive technical knowledge. Regional requirements, application-specific certificates (UL/CSA/PMO/ATEX) and other individual specifications can be provided as needed.

As a true pioneer with decades of experience in the development of valves and control tops for all processes, GEA offers the perfect symbiosis of mechanical and electronic engineering, largely with standardized components. Extensive tests and countless valve units installed around the world have continuously proved the reliability and cost-effectiveness for the user, always ensuring maximum safety of operation.

Recommended control and feedback systems for GEA VARIVENT® special application valves
The T.VIS® M-15 offers an attractively priced basic version of control and feedback technology with optimum adaptation to process conditions. The T.VIS® M-15 is fitted with manually adjustable sensors and is available for all established types of communication such as 24VDC, As-i and DeviceNet.

The T.VIS® A-15 offers extended functional scope and greater ease of operation. Besides the established types of communication, this control top also features the groundbreaking IO-Link technology, which allows users to set the parameters for components centrally in the system via digital data exchange and transfer all process data loss-free. Thanks to a fully automatic setup, commissioning can be quickly and easily carried out by means of the push buttons fitted on the hood. Additional functions such as the selection of different tolerance bands, signal attenuation and the resource-saving LEFF® function round off the T.VIS® A-15.

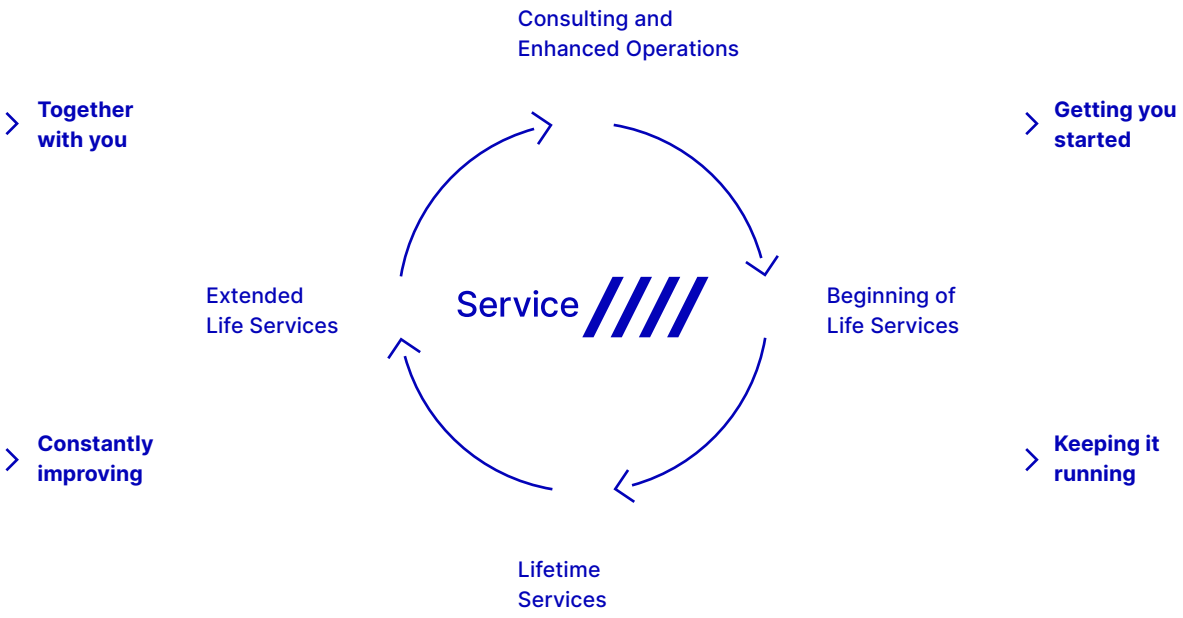
For control applications the T.VIS® P-15 positioner in combination with an air-spring actuator provides a cost-efficient alternative to conventional control valves with diaphragm actuators. The valve can be moved to any position.

Attention must be paid to regional requirements for use in explosive areas. The SES meets the requirements of the European ATEX Directive and can be used in Zones 1 and 20. The T.VIS® A-15 is certified in accordance with the Directive Class 1 / Div. 2 in compliance with the regulations in place for the North American market.

Our service package for dependable valve technology

With a tailored service concept, you can extend the service life of your hygienic valve technology. Professional services and original spare parts from GEA help to ensure maximum system availability and security, smooth operation and precise process execution.

Our service specialists are here to help you in every phase of system utilization – from the initial process concept and throughout the entire performance period to advising on your best strategies for the future.



Beginning of life services
We draw on our decades of experience to support you in configuring your system and providing extensive employee training. Our consultations and training sessions take place in our Competence Centre in Büchen or, upon request, at your premises.

Lifetime services
We optimize your spare parts logistics by using our modular component system and our extensive service network. Preventive maintenance programmes based on comprehensive data, routine troubleshooting and efficient repair logistics keep downtimes to a minimum.

Extended life services
When upgrades are available to enhance your system, you benefit from our continuing advances in hygienic valve technology. We offer extensive advice and consultation.

Consulting and enhanced operations
Working in partnership with you, we support your enduring success and develop service strategies and Service Level Agreements for a profitable future operation.

Description of Certificates

3-A		3-A Sanitary Standards, Inc. (3-A SSI) is an independent, non-profit corporation dedicated to advancing hygienic equipment design for the food, beverage, and pharmaceutical industries.
24 / 7 PMO VALVE 2.0® NON-STOP PRODUCTION		24 / 7 PMO VALVE® is a registered trade mark of GEA Tuchenhagen GmbH. It describes double-seat valves that have been authorized for use in PMO-regulated systems for carrying out the seat lift in order to clean the leakage chamber while the other pipeline is carrying product. This grants system operators the possibility of cleaning all valve components in contact with the product in parallel with the production process. In this way, the valves permit uninterrupted production on a 24/7 basis.
AS-i		Actuator Sensor interface. BUS system for the lowest field level.
ATEX		Atmosphères Explosibles. ATEX comprises the directives of the European Union in the area of explosion protection. Complies with the applicable requirements of ATEX directives: 2014/34/EU.
CCCEx		Complies with the applicable requirements of CCCEx directives in China.
cCSAus		Test of a product by CSA according to applicable safety standards in Canada and the USA.
CE		Conformité Européenne. By affixing the CE mark, the manufacturer confirms that the product complies with the European directives 765/2008 applicable to the specific product.
CSA		Canadian Standards Association. A non-governmental Canadian organization which issues standards as well as checking and certifying the safety of products. It is now globally active.
cULus		Test of a product by UL according to applicable safety standards in Canada and the USA.
DeviceNet		BUS system of the ODVA organization for complex communication on various field levels.
EG 1935/2004*		Materials in contact with the product used in valves from GEA Tuchenhagen GmbH are in accordance with EC regulation 1935/2004. This defines a general framework for materials and objects intended to come into contact with foodstuffs.
EHEDG		The guidelines drawn up by the European Hygienic Engineering and Design Group serve to implement food safety. The aim of the organisation is to improve compliance with the hygienic design of components and technical expertise in the industry. This also includes the ease of cleaning the equipment.
FDA		Food and Drug Administration. US supervisory authority for foodstuffs and pharmaceuticals. This authority issues approvals and certificates for products and materials that are used in the foodstuffs and pharmaceuticals industries.
IECEx		IECEx: International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres. Complies with the applicable requirements according to IECEx directives.
ODVA		ODVA is a worldwide association comprising leading automation companies. It develops network protocols and standards in the joint interests of its members, which are used for the international interoperability of production systems.
TÜV		Technischer Überwachungs-Verein. The German TÜV is a private company which carries out technical safety checks as prescribed in national legislation or regulations.
UKCA		UK Conformity Assessed. By affixing the UKCA marking, the manufacturer confirms that the product complies with the product-specific applicable UK regulations.
UKEx		UKEx includes the guidelines for Great Britain. Complies with applicable requirements acc. UKEx Directive: UKSI 2016: 1107.
UL		Underwriters Laboratories. An organization founded in the USA for checking and certifying products and their safety.

* not possible for HNBR

Abbreviations and Terms

Abbreviation	Explanation
°C	Degrees Celsius, unit of measurement for temperature
°F	Degrees Fahrenheit, unit of measurement for temperature
3-A	Standard of 3-A Sanitary Standards, Incorporated (3-A SSI)
3D	Three-dimensional
A	Ampere, unit of measurement of current intensity or Output, term used in automation
AC	Alternating Current
ADI free	All elastomer compounds are free of animal-derived ingredients
AISI	American Iron and Steel Institute, association of the American steel industry
ANSI	American National Standards Institute, American body for standardizing industrial processes
approx.	approximately
AS-i	Actuator Sensor interface, standard for fieldbus communication
ASME	American Society of Mechanical Engineers, professional association of mechanical engineers in the USA
ASME-BPE	Standard of the ASME's – bioprocessing equipment association
ATEX	Atmosphères Explosibles, synonymous with the directives of the European Union for potentially explosive areas
bar	Unit of measurement for pressure. All pressure values [barg/psig] refer to positive pressure [bar_g / psi_g], unless specifically stated otherwise.
bar_g	Unit of measurement for pressure relative to atmospheric pressure
CAN	Controller Area Network; asynchronous serial bus system
CE	Conformité Européenne, administrative symbol for the free movement of industrial products
CIP	Cleaning In Place, designates a process for cleaning technical process systems.
CRN	The Canadian Registration Number is issued by a Canadian Jurisdiction and covers pressurized components. The authorization is needed to operate these components in Canada.
CSA	Canadian Standards Association, a non-governmental Canadian Standardization organization
dB	Decibel, one tenth of a bel, named after Alexander Graham Bell and used for identifying levels and dimensions
DC	Direct Current
DIN	Deutsches Institut für Normung e. V. Standardization organization in the Federal Republic of Germany, DIN = synonym for standards issued by the organization
DIP	Dual Inline Package, design of a switch
DN	Diameter Nominal, DIN nominal width
Device Net	Network system used in the automation industry to interconnect control devices for data exchange
E	Input, term used in automation
EAC	Certification of technical confirmity from the customs union of Russia/Balarus/Kazakhstan
EG No. 1935/2004	Regulation of the European Parliament which lays down common rules for materials which come, or may come, into contact with food, either directly or indirectly.
EHEDG	European Hygienic Engineering and Design Group. Consortium of equipment manufacturers, food industries, research institutes as well as public health authorities
EN	European standard, rules of the European Committee for Standardization
EPDM	Ethylene propylene diene rubber, acronym acc. to DIN / ISO 1629
Ex	Synonym for ATEX
FB	Feedback
FDA	Food and Drug Administration, official foodstuffs monitoring in the United States
FEM calculation	Finite Element Method; calculation process for simulating solids
FKM	Fluorinated rubber, acronym acc. to DIN / ISO 1629
H	Henry, unit of measurement for inductance
HNBR	Hydrated acrylonitrile butadiene rubber, acronym acc. to DIN / ISO 1629
Hz	Hertz, unit of frequency named after Heinrich Hertz
I	Formula symbol for electrical current
IEC	International Electrotechnical Commission, international standardization organization for electrical and electronic engineering
IP	Ingress Protection / International Protection, index of protection class acc. to IEC 60529
IPS	Iron Pipe Size, American pipe dimension
ISA	International Society of Automation, international US organization of the automation industry

Abbreviations and Terms

Abbreviation	Explanation
ISO	International Organization for Standardization, international organization that produced international standards, ISO = synonym for standards from the organization
kg	Kilogram, unit of measurement for weight
Kv	The Kv value corresponds to the water flow rate through a valve (in m^3 / h) at a pressure differential of 0.98 bar and a water temperature of 5 °C to 30 °C.
Kvs	The Kv values of a valve at nominal stroke (100 % opening) is designated the Kvs value
L	Conductive
LED	Light-Emitting Diode
LEFF®	Function of the T.VIS® valve informations system for cyclical pulsing during the lifting process; Low-Emission Flip Flop
LoTo	Abbreviation for lockout – tagout, is an occupational health and safety procedure in which all energies of systems that could be dangerous for employees are isolated, interlocked and marked
mm	Millimeter, unit of measurement for length
M	Metric, system of units based on the meter or Mega, one million times a unit
m^3/h	Cubic meters per hour, unit of measurement for volumetric flow
max.	Maximum
NAMUR	Standardization working association for measuring and control technology in the chemical industry, synonym for the interface type of the organization, especially for potentially explosive atmospheres
NC	Normally Closed; valve or solenoid valve control which is closed in idle status
NO	Normally Open; valve or solenoid valve control which is open in idle status
NOT-element	Logic element, NOT gate
NPN	Signal transmission against reference potential, current-consuming
NPT	National Pipe Thread, US thread standard for self-sealing pipe fittings
OD	Outside Diameter, pipe dimension
ODVA	Open DeviceNet Vendor Association, global association for network standards
PA 12/L	Polyamide
Pg	Armoured thread
PMO	Pasteurized Milk Ordinance
PN	Nominal pressure for pipeline systems according to EN 1333, rated pressure in bar at room temperature (20 °C)
PNP	Signal transmission against reference potential, current-supplying
Pressure Equipment Directive 2014/68/EU	Directive of the European Parliament and the Council Directive for layout and conformity evaluation for pressure equipment and assemblies with a maximim pressure (PS) of more than 0.5 bars.
PPO	Polyphenylene oxide, thermoplastic material
PS	Maximum permitted operating pressure at which the components can operate safely at maximum allowable temperature (TS)
psi	Unit of measurement for pressure, pound-force per square inch, 1 psi = 6894.75 Pa. All pressure values [bar/psi] refer to positive pressure [bar_g / psi_g], unless specifically stated otherwise.
psi_g	Unit of measurement for pressure relative to atmospheric pressure
PV	Solenoid valve
R_a in µm	Average roughness value, describes the roughness of a technical surface
International Protection-Code IP67, IP66, IP69	Classifies and rates the degree of protection provided against intrusion dust, accidental contact, and water
SET-UP	Self-learning installation, the SET-UP procedure carries out all necessary settings for generating messages during commissioning and maintenance.
SIP	Sterilization in Place, refers to a process for cleaning technical process systems
SMS	Svensk Mjölk Standard, Scandinavian pipe dimension
SW	Indicates the size of a tool spanner, “Schlüsselweite”
TA-Luft VDI 2440	If a product is certified according to TA Luft it meets the requirements for proof of high grade performance according to TA Luft of 1.0× 10-4 mbar x l / (s x m) at service conditions under the VDI guideline 2440. The product will hence be tested for tightness.
TEFASEP® gold	Brand name for GEA's proprietary valve seat seal (hard sealing)
T.VIS®	GEA Tuchenhagen valve information system, control top system from GEA Tuchenhagen

Abbreviation	Explanation
TS	Maximum permitted operating temperature
UL	Underwriters Laboratories, a certification organization established in the USA
USP Class VI	The United States Pharmacopeial Convention (USP) is a scientific nonprofit organization that sets standards to help protecting public health. Class VI administer tests and impacts of material and their substances on animal and human tissues.
UV	Ultraviolet, ultraviolet radiation is a wavelength of light
V	Volt, unit of measurement for voltage
VARICOMP®	Pipe expansion compensator from GEA Tuchenhagen
VMQ	High-polymer vinyl methyl polysiloxane, silicone rubber, MVQ = synonym
W	Watt, unit of measurement for power
Y	Control air connection for the working cylinder, designation from pneumatic systems
µ	Micro, one millionth of a unit
Ω	Ohm, the unit of electrical resistance named after Georg Simon Ohm

CAD Files

Typical application and description
You can receive two-dimensional and/or three-dimensional drawing files of our components for making your piping planning. For this purpose, please send us your specific request, stating the particular order code and the required drawing format. The required files will then be individually prepared for you.

Available drawing formats:

	Format	Name
2D formats	drw	Native Pro / E
	igs (2D)	IGS file
	dxf	AutoCAD drawing exchange
	pdf (2D)	Adobe Acrobat document
	tif	TIFF (plot)
3D formats	asm	Native Pro / E
	igs (3D)	IGS file
	pdf (3D)	Adobe Acrobat document
	stp	STP file
	bmp (3D)	Bitmap image
	jpg (3D)	JPEG image
	tif (3D)	TIFF image
	sat	Standard ACIS

General Sales Terms and Condition of Delivery

Please note
All our sales and/or services are exclusively subject to our valid terms and conditions of sale and/or service applicable in the respective country of business, which can be found on our internet platform: www.gea.com.

If not available or if you otherwise wish to receive such terms and conditions directly from us, please contact us and we of course will send you the applicable version of our terms and conditions for the envisaged business.

Control Valve
GEA VARIVENT®
Hygienic Special Application Valves

Overflow Valve
GEA VARIVENT®
Hygienic Special Application Valves

Constant Pressure Valve
GEA VARIVENT®
Hygienic Special Application Valves

Sampling Valve
GEA VARIVENT®
Hygienic Special Application Valves

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