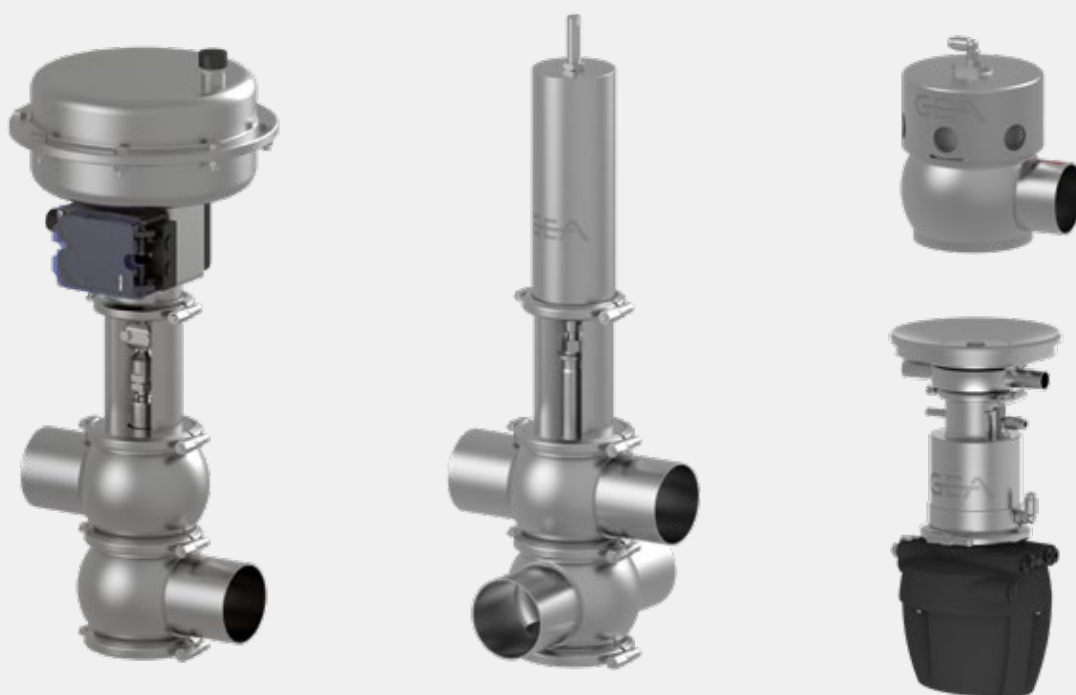


GEA VARIVENT[®] HYGIENIC SPECIAL APPLICATION VALVES



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GEA VARIVENT®
Hygienic
seat valves



GEA
Hygienic
butterfly valves



GEA VARIVENT®
Hygienic special
application valves



GEA VARICOMP®
Hygienic expansion
compensators



GEA VARITOP®
Hygienic tank
safety systems



GEA VARINLINE®
Hygienic process
connections



GEA VARICOVER®
Hygienic product
recovery systems



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

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 cost-effective 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



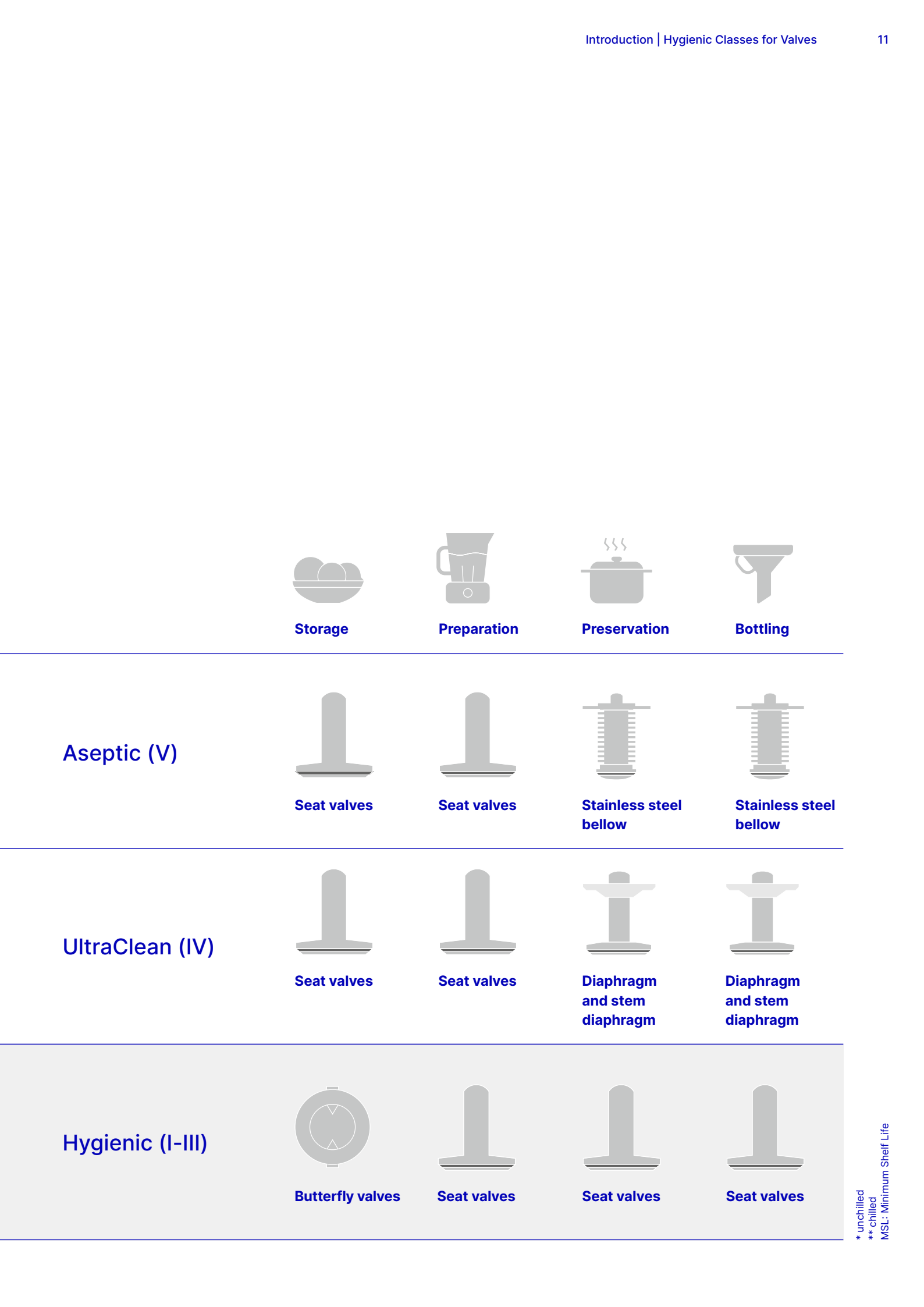
Fruit yogurt / Natural yogurt**

MSL: 2–4 weeks
pH-value: ≤ 4.5



Fresh milk**

MSL: 7–10 days
pH-value: > 4.5



* 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, pocket-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 Tuchenhausen in Büchen 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. 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

16 % 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, estimating an 8 % savings in compressor energy for every 1-bar reduction. 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.



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.

1

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GEA VARIVENT® Overflow Valve

3 Lantern

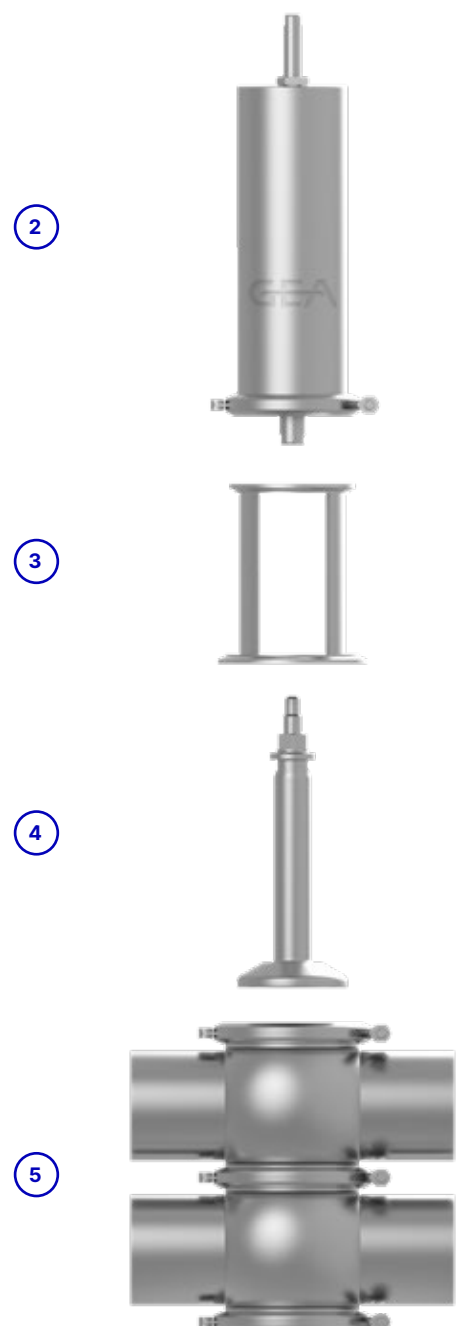
The open lantern separates the actuator and product parts. It permits visual inspection of the stem seal, and is also used for indicating any leakages. Furthermore, heat transfer from the valve housing to the actuator is prevented. The VARIVENT® valve series enables the integration of additional valve 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. Mix-proof 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

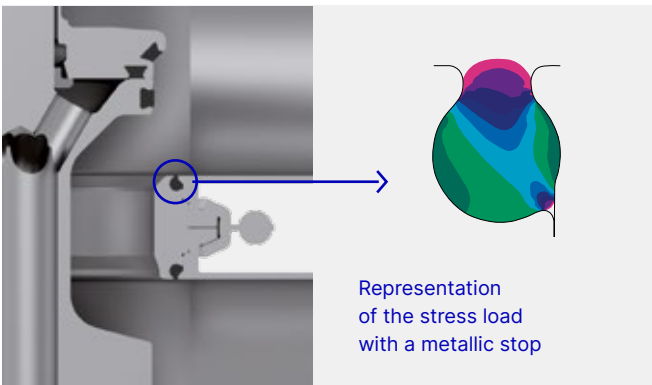
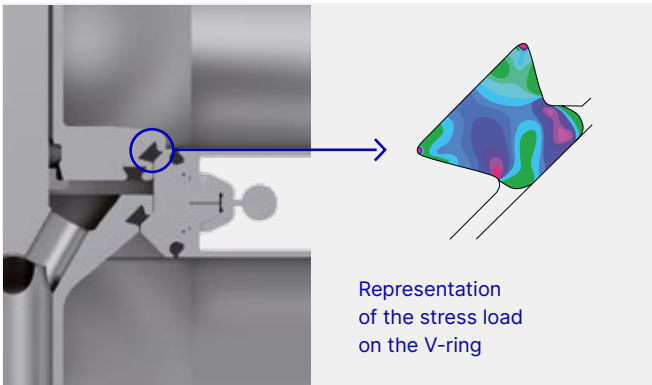
- Greater flexibility because of the ability to adapt rapidly to process changes
- High economic efficiency
- Low spare part stocks

Hygienic design

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

Sealing according to the VARIVENT® principle

The hygienic valves and components 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 with the process system, thereby allowing for continuous production and shorter downtimes. The special groove shape in the valve disc makes sure the seal has a secure hold at all times up to a pressure differential of 10 bar during switching. The seal geometry was optimized using FEM calculations.



Seals

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

Available nominal widths for valve series

	DN	10	15	25	40	50	65	80	100	125	150	162					
Nominal width	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							•	•	•		•					•	

* Adaptable 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: $R_a \leq 0.8 \mu\text{m}$

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), HNBR, FKM and FFKM (on request; not available for all components). 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	VMQ (pig)
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	–50 to 200 °C
Medium	Concentration	At permitted operating temperature						
Alkali	≤ 3 %	up to 80 °C	+	○	+	+	+	○
	≤ 5 %	up to 40 °C	+	○	○	+	+	○
	≤ 5 %	up to 80 °C	+	–	–	+	+	○
	> 5 %		○	–	–	+	+	○
Inorganic acid**	≤ 3 %	up to 80 °C	+	+	+	+	+	○
	≤ 5 %	up to 80 °C	○	+	○	+	+	○
	> 5 %	up to 100 °C	–	+	–	+	+	○
Water		up to 80 °C	+	+	+	+	+	+
		up to 100 °C	+	+	+	+	+	○
Steam		up to 135 °C	+	○	○	+	+	○
Steam, approx. 30 min		up to 150 °C	+	○	–	+	+	○
Hydrocarbons / fuels			–	+	○	+	+	–
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

○ = Reduced service life

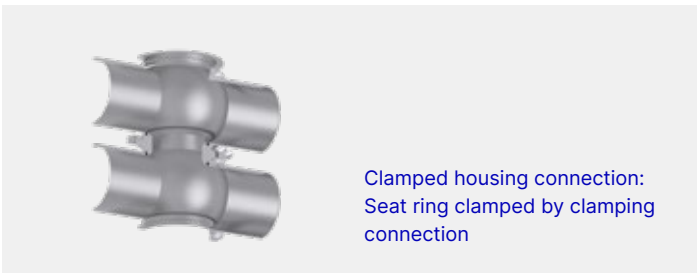
– = Not resistant

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.



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, meet the requirements of the European Hygienic Engineering and Design Group (EHEDG) as well as those of 3-A Sanitary Standards, Inc. (3-A SSI).

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.

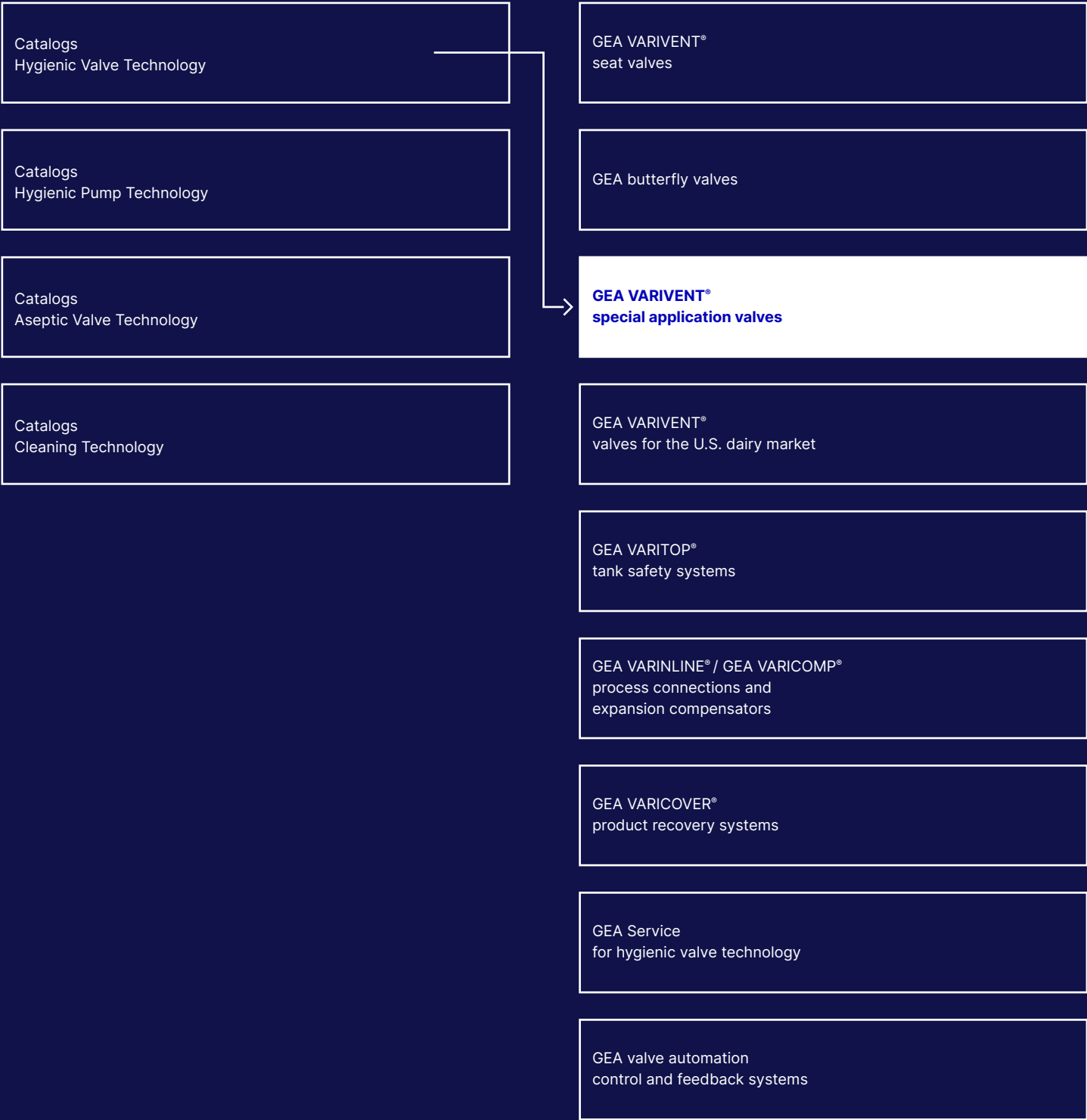
ATEX certificates, CRN, EAC and other additional certificates are available on request for many GEA VARIVENT® valves and for other hygienic valves and components in the GEA portfolio.

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, VARIVENT® valves 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. They comply with Regulation (EC) No. 1935/2004 of the European Parliament and Council.

Selection Matrix





1

VARIVENT® CONTROL VALVES

VARIVENT® Special Application Valves



1

2

3

4

5

6

7

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

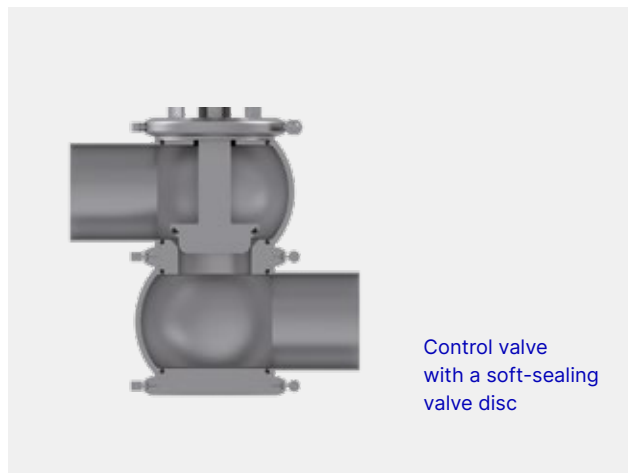
The need for strict adherence to standards in food production requires that control valves be designed to comply with the food and beverage industry's maximum hygiene demands.

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 application of dead zone-free control valves is required, which can be cleaned efficiently and without leaving residue.

VARIVENT® valves enable germ-free 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 the dosing of a variety of different media. A number of different control valves is available that are adjusted to various control tasks.



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.



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Overview

Housing combinations

VARIVENT® control valves are available with different housing combinations.



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

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Control characteristic

The characteristic of a control valve denotes the Kv value's dependence on the stroke, as specified by the control cone's shape. Here, linear or equal percentage control cones are available.

In a valve with a linear characteristic, the Kv value changes in a linear fashion in relation to the stroke, while 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 m³/h of water at a temperature of 5–30 °C that flows through the fully opened valve at a pressure loss of 1 bar.

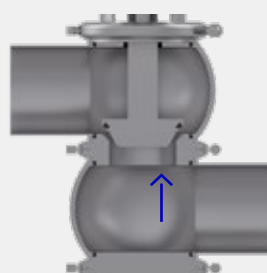
It is customary to select a Kvs value for the valve that is approx. 30 % higher than the maximum Kv value calculated for the particular operating conditions. Thus, a reserve is generated that offsets fluctuations or changes of the design data to a certain extent.

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.

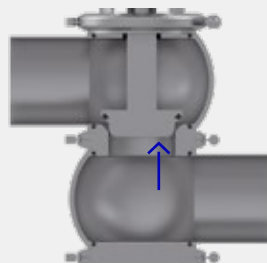
The control valves with a 3-stage seat have a linear control characteristic. The metallic-sealing valves are used to control large pressure differentials in order to counter-act cavitation.

Recommended flow direction

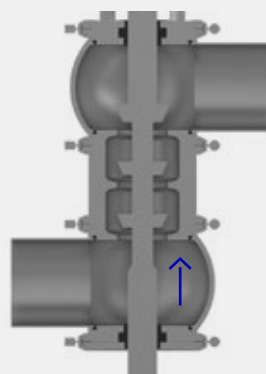
In order to fulfill a reliable modulating function, and to prevent water hammers when closing the valve during the product flow, it is recommended to direct the flow through VARIVENT® control valves counter to the control cone's fail-safe position.



Control valve with linear control cone



Control valve with equal-percentage control cone



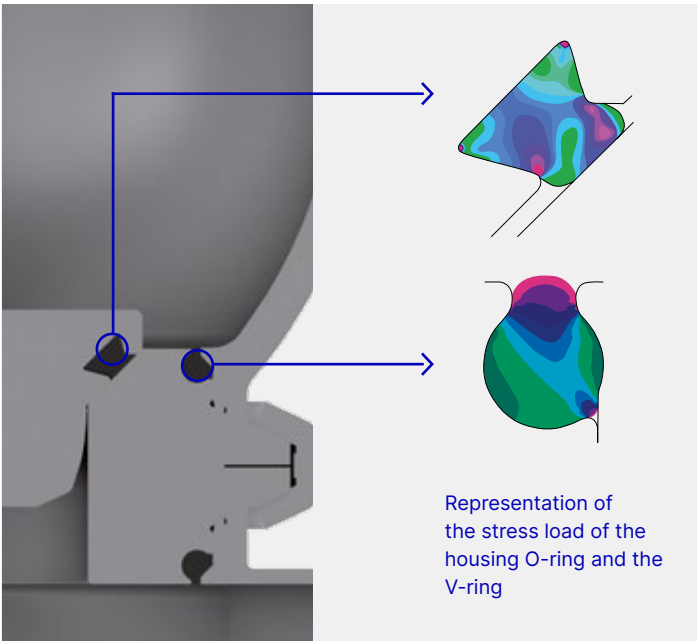
Control valve with 3-stage seat, reduction of high differential pressures

Overview

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.

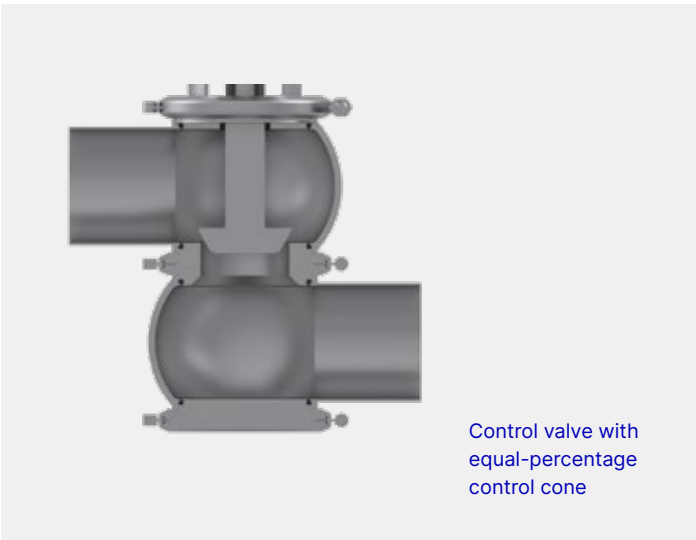
The special groove form in the valve disc ensures a secure hold of the seal at all times up to a pressure differential of 10 bar during the switching. In order to minimize the danger of cavitation, the pressure loss between the upper and the lower housing should be kept as low as possible. The sealing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



Seals

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

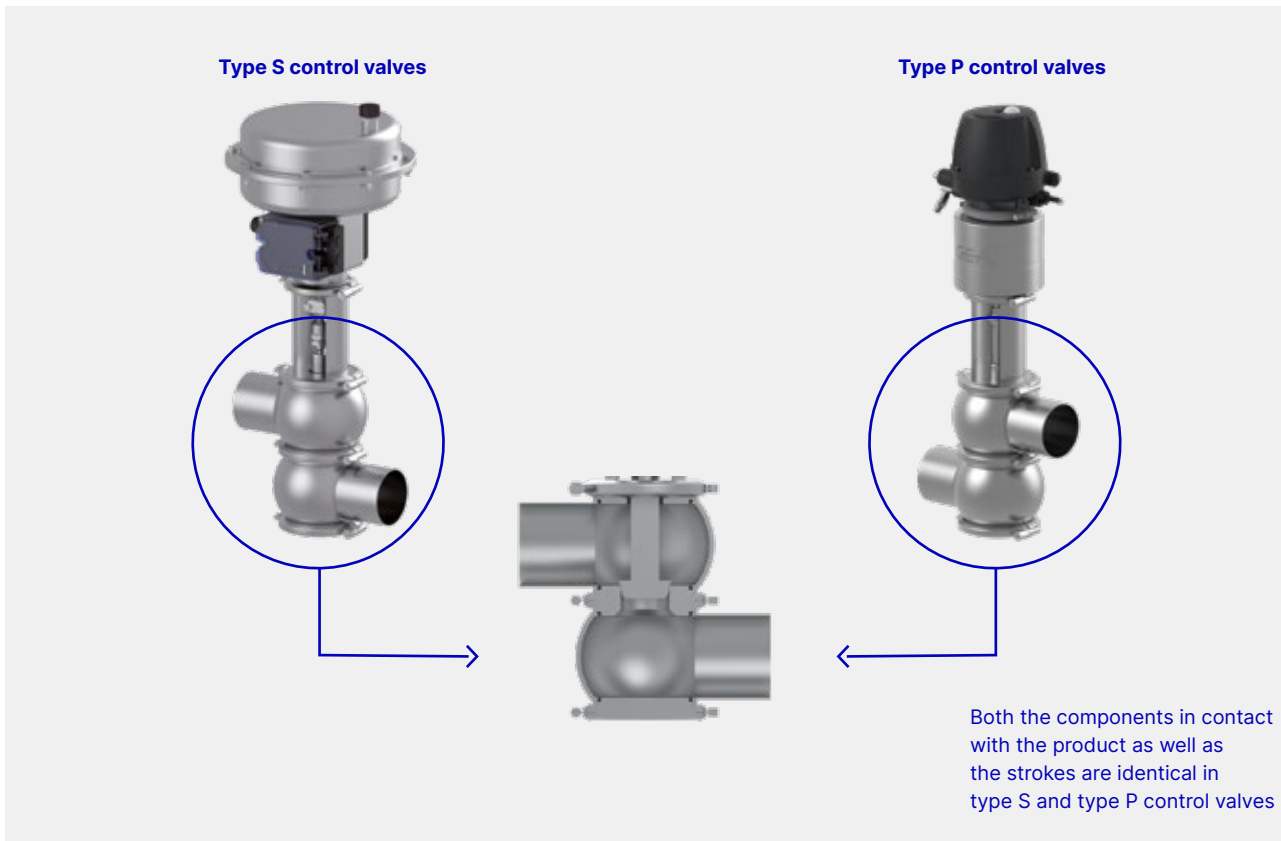
If the applied control valves do not need to assume an additional shut-off function, or if a higher leakage rate of the seat seal is tolerable, it is also possible to use control valves with a metallic seat design. These valves offer the advantage of even lower maintenance requirements.



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.

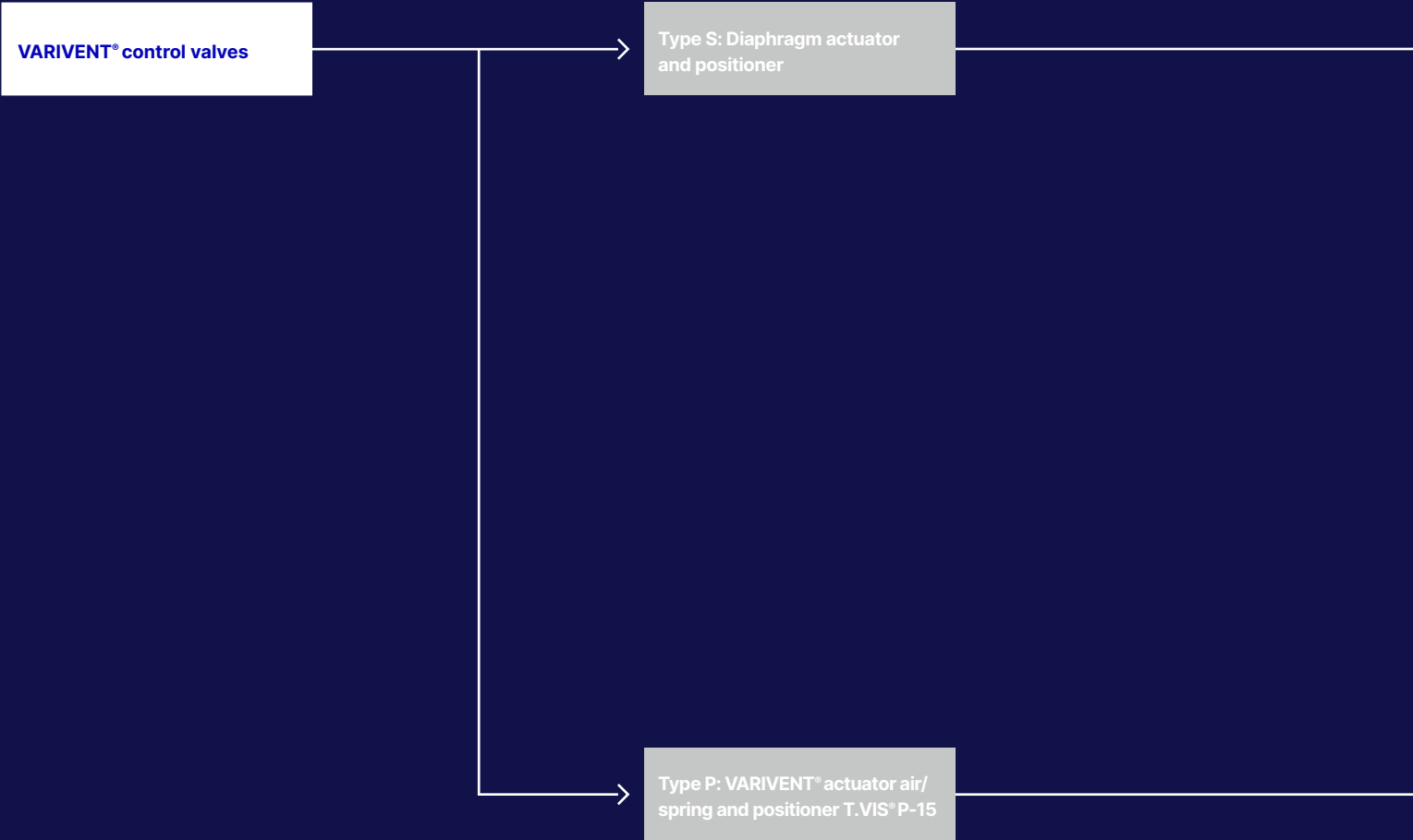


The type S control valve was designed for fast, high-precision process controls. Due to a different operating principle, the type P control valve works at a slightly slower speed. It is not possible to offer a delimitation according to simple or difficult control tasks or applications, since the control quality must always be considered individually in connection with the superordinate process control.

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 NEMA 4X	IP 66 / IP 67 / IP 69K –
ATEX approvals	•	–
Pneumatic command variable	•	–
BUS / HART communication	•	–
Position transmitter 4... 20 mA	Optional	Standard
Troubleshooting functions	•	–
Split range	•	–

Selection Matrix



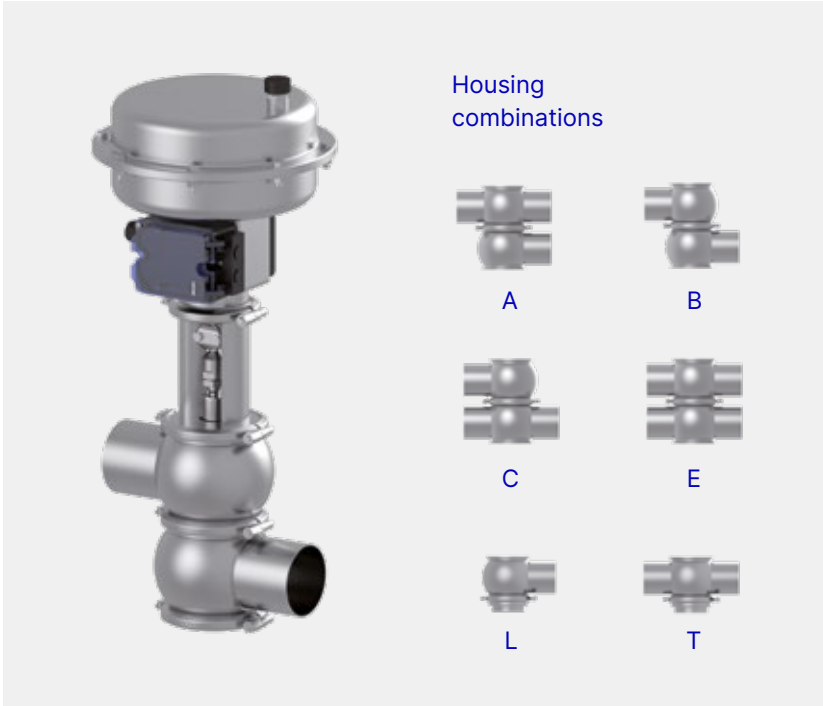


VARIVENT®

Control Valve Type S

Equal-Percentage

Characteristic Curve



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 3"–6", IPS 3"–6"	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	DN, OD IPS	$R_a \leq 0.8 \mu\text{m}$
		$R_a \leq 1.2 \mu\text{m}$
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 CERTIFIED 1 CHEDG TYPE EL-C14311 FDA	

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

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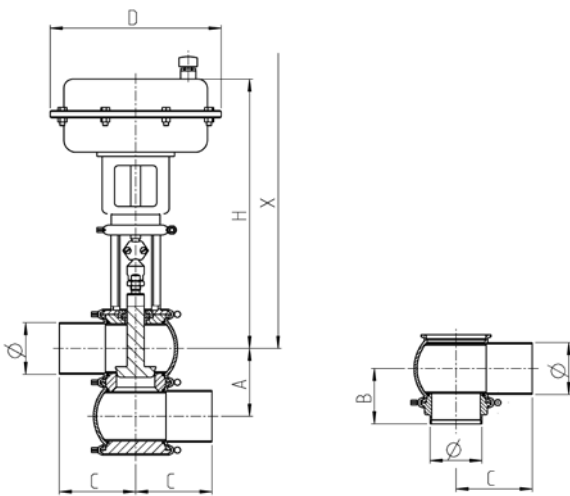
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	Pipe	Housing			Diaphragm surface 175 cm ²		Diaphragm surface 350 cm ²		Diaphragm surface 750 cm ²		Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D [mm]	H [mm]	D [mm]	H [mm]	D [mm]	H [mm]	X [mm]
DN 25	29.0 × 1.50	50.0	58.0	90.0	215	370	–	–	–	–	393
DN 40	41.0 × 1.50	62.0	64.0	90.0	215	376	280	380	–	–	415
DN 50	53.0 × 1.50	74.0	70.0	90.0	215	382	280	386	–	–	433
DN 65	70.0 × 2.00	96.0	83.0	125.0	215	393	280	397	–	–	466
DN 80	85.0 × 2.00	111.0	90.5	125.0	215	401	280	405	–	–	489
DN 100	104.0 × 2.00	130.0	100.0	125.0	–	–	280	414	390	471	574
DN 125	129.0 × 2.00	155.0	112.5	150.0	–	–	–	–	390	484	612
DN 150	154.0 × 2.00	180.0	125.0	150.0	–	–	–	–	390	496	718
OD 1"	25.4 × 1.65	46.0	56.0	90.0	215	368	–	–	–	–	391
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	215	375	280	379	–	–	414
OD 2"	50.8 × 1.65	71.5	69.0	90.0	215	381	280	385	–	–	432
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	215	390	280	394	–	–	464
OD 3"	76.2 × 1.65	103.0	86.5	125.0	–	397	280	401	–	–	541
OD 4"	101.6 × 2.11	127.5	99.0	125.0	–	–	280	413	390	469	573
OD 6"	152.4 × 2.77	177.0	123.0	150.0	–	–	–	–	390	495	714
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	215	386	280	390	–	–	437
IPS 3"	88.9 × 2.30	115.0	92.5	152.5	215	403	280	407	–	–	491
IPS 4"	114.3 × 2.30	140.0	105.0	152.5	–	–	280	419	390	476	579
IPS 6"	168.2 × 2.77	192.0	131.0	152.5	–	–	–	–	390	502	724

VARIVENT®

Control Valve Type S

Equal-Percentage Characteristic Curve

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, no V-ring			
	W		Soft-sealing, with V-ring			
8	Kvs value					
	0.1		DN 25, OD 1"			
	0.16		DN 25, OD 1"			
	0.25		DN 25, OD 1"			
	0.4		DN 25, OD 1"			
	0.63		DN 25, OD 1"			
	1		DN 25, OD 1"			
	1.6		DN 25, OD 1"			
	2.5		DN 25, OD 1"			
	4		DN 25, OD 1"			
	6.3		DN 25–40, OD 1"–1 ½"			
	10		DN 25–50, OD 1"–2", IPS 2"			
	16		DN 40–50, OD 1 ½"–2", IPS 2"			
	25		DN 40–65, OD 1 ½"–2 ½", IPS 2"			
	35		DN 50–80, OD 2"–3", IPS 2"–3"			
	40		DN 50–80, OD 2"–3", IPS 2"–3"			
	60		DN 65–100, OD 2 ½"–4", IPS 3"–4"			
	80		DN 80–100, OD 3"–4", IPS 3"–4"			
	100		DN 100–125, OD 4", IPS 4"			
	160		DN 100–125, OD 4", IPS 4"			
	200		DN 125–150, OD 6", IPS 6"			
	260		DN 125–150, OD 6", IPS 6"			
	360*		DN 150, OD 6", IPS 6"			

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9	Actuator**	
	175	Diaphragm surface 175 cm²
	350	Diaphragm surface 350 cm²
	750	Diaphragm surface 750 cm²
10	Actuation pressure**	
	1	0.4–2.0 bar
	2	0.8–2.4 bar
	3	1.0–3.0 bar
	4	1.65–2.65 bar
	6	2.1–3.3 bar
	7	2.2–3.4 bar
	8	2.3–4.2 bar
	9	2.4–3.6 bar
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	
	1	Inside R _a ≤ 1.2 µm, outside matt blasted (IPS)
	2	Inside R _a ≤ 0.8 µm, outside matt blasted (DN, OD)
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:

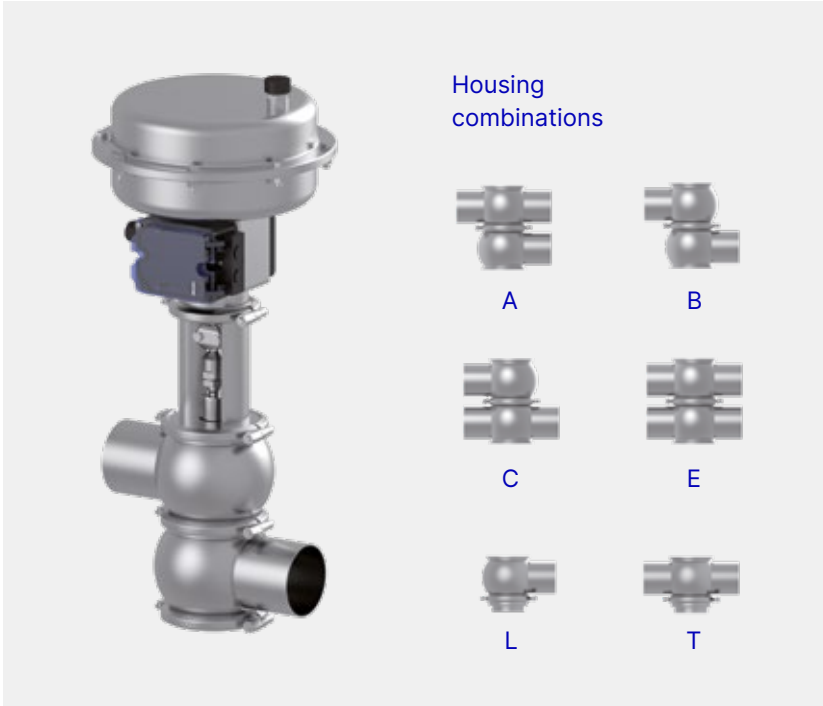
Position	1	2	3		4/5		6	7	8		9	10		11		12	13	14	15		16
Code	S		F	-	/	-				-			-		-			N		-	0-----

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

VARIVENT®

Control Valve Type S

Linear Characteristic Curve



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	DN, OD	R _a ≤ 0.8 µm
	IPS	R _a ≤ 1.2 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 CERTIFIED 1 ehedg TYPE EL - CLASS I FDA	

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

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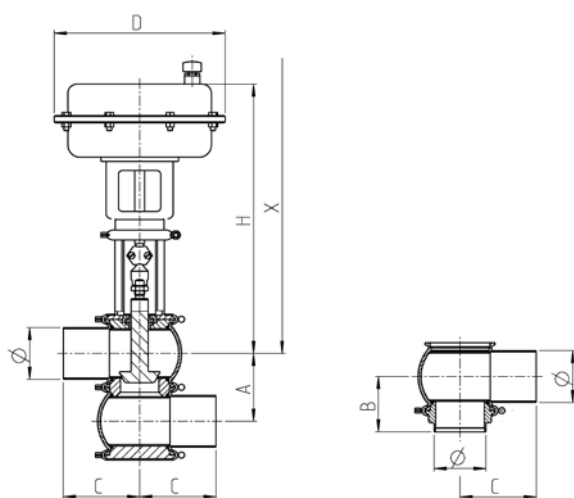
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	Pipe	Housing			Diaphragm surface 175 cm ²		Diaphragm surface 350 cm ²		Diaphragm surface 750 cm ²		Valve
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]	D [mm]	H [mm]	D [mm]	H [mm]	D [mm]	H [mm]	X [mm]
DN 25	29.0 × 1.50	50.0	58.0	90.0	215	370	–	–	–	–	393
DN 40	41.0 × 1.50	62.0	64.0	90.0	215	376	280	380	–	–	415
DN 50	53.0 × 1.50	74.0	70.0	90.0	215	382	280	386	–	–	433
DN 65	70.0 × 2.00	96.0	83.0	125.0	215	393	280	397	–	–	466
DN 80	85.0 × 2.00	111.0	90.5	125.0	215	401	280	405	–	–	489
DN 100	104.0 × 2.00	130.0	100.0	125.0	–	–	280	414	390	471	574
DN 125	129.0 × 2.00	155.0	112.5	150.0	–	–	–	–	390	479	612
DN 150	154.0 × 2.00	180.0	125.0	150.0	–	–	–	–	390	560	718
OD 1"	25.4 × 1.65	46.0	56.0	90.0	215	368	–	–	–	–	391
OD 1 ½"	38.1 × 1.65	59.0	62.5	90.0	215	378	280	382	–	–	414
OD 2"	50.8 × 1.65	71.5	69.0	90.0	215	381	280	385	–	–	432
OD 2 ½"	63.5 × 1.65	90.0	80.0	125.0	215	397	280	401	–	–	464
OD 3"	76.2 × 1.65	103.0	86.5	125.0	–	–	280	408	–	–	541
OD 4"	101.6 × 2.11	127.5	99.0	125.0	–	–	280	416	390	537	573
OD 6"	152.4 × 2.77	177.0	123.0	150.0	–	–	–	–	390	559	714
IPS 2"	60.3 × 2.00	81.0	73.5	114.3	215	379	280	383	–	–	437
IPS 3"	88.9 × 2.30	115.0	92.5	152.5	215	399	280	403	–	–	491
IPS 4"	114.3 × 2.30	140.0	105.0	152.5	–	–	280	409	390	439	579
IPS 6"	168.2 × 2.77	192.0	131.0	152.5	–	–	–	–	390	555	724

VARIVENT®

Control Valve Type S

Linear Characteristic Curve

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, no V-ring			
	W		Soft-sealing, with V-ring			
8	Kvs value					
	0.1		DN 25, OD 1"			
	0.16		DN 25, OD 1"			
	0.25		DN 25, OD 1"			
	0.4		DN 25, OD 1"			
	0.63		DN 25, OD 1"			
	1		DN 25, OD 1"			
	1.6		DN 25, OD 1"			
	2.5		DN 25, OD 1"			
	4		DN 25, OD 1"			
	6.3		DN 25–40, OD 1"–1 ½"			
	10		DN 25–50, OD 1"–2", IPS 2"			
	16		DN 40–50, OD 1 ½"–2", IPS 2"			
	25		DN 40–65, OD 1 ½"–2 ½", IPS 2"			
	35		DN 50–80, OD 2"–3", IPS 2"–3"			
	40		DN 50–80, OD 2"–3", IPS 2"–3"			
	60		DN 65–100, OD 2 ½"–4", IPS 3"–4"			
	80		DN 80–100, OD 3"–4", IPS 3"–4"			
	100		DN 100–125, OD 4", IPS 4"			
	160		DN 100–125, OD 4", IPS 4"			
	200		DN 125–150, OD 6", IPS 6"			
	260		DN 125–150, OD 6", IPS 6"			
	360*		DN 150, OD 6", IPS 6"			

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9	Actuator**	
	175	Diaphragm surface 175 cm²
	350	Diaphragm surface 350 cm²
	750	Diaphragm surface 750 cm²
10	Actuation pressure**	
	1	0.4–2.0 bar
	2	0.8–2.4 bar
	3	1.0–3.0 bar
	4	1.65–2.65 bar
	6	2.1–3.3 bar
	7	2.2–3.4 bar
	8	2.3–4.2 bar
	9	2.4–3.6 bar
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	
	1	Inside R _a ≤ 1.2 µm, outside matt blasted (IPS)
	2	Inside R _a ≤ 0.8 µm, outside matt blasted (DN, OD)
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.

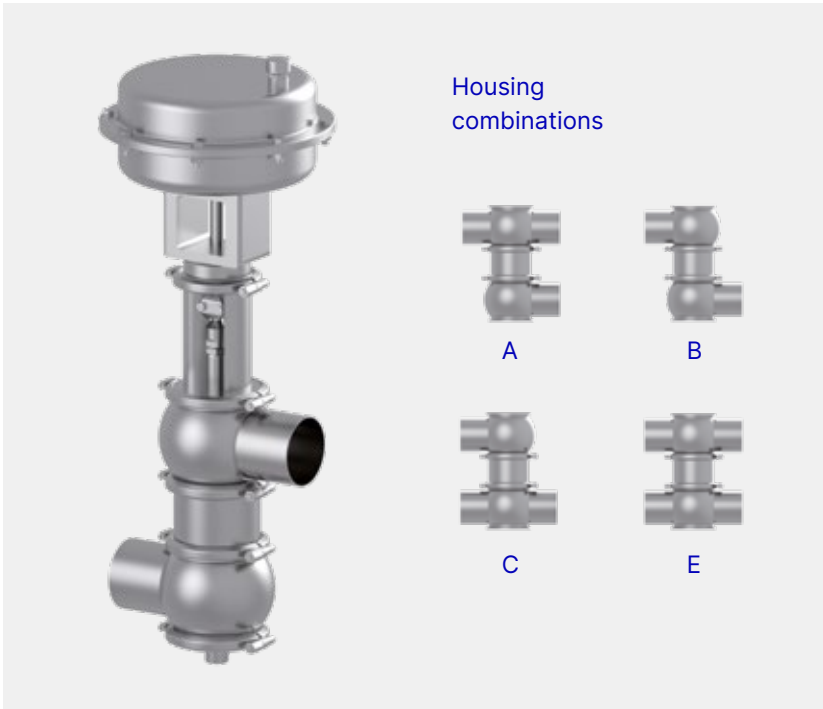
** The actuator size and the actuation pressure are calculated depending on the nominal size, Kvs value and product pressure.

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	-	/	-				-			-		-			N		-	0-----

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

VARIVENT®
Control Valve Type S
3-Stage Seat



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	DN, OD	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		



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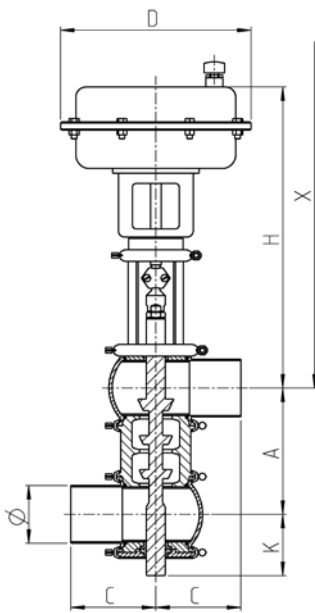
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	Pipe	Housing			Diaphragm surface 350 cm ²		Diaphragm surface 750 cm ²		Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D [mm]	H [mm]	D [mm]	H [mm]	X [mm]
DN 25	29.0 × 1.50	77.5	90.0	75.0	280	370	–	–	393
DN 40	41.0 × 1.50	112.5	90.0	81.0	280	380	–	–	415
DN 50	53.0 × 1.50	124.5	90.0	87.0	280	386	–	–	433
DN 65	70.0 × 2.00	170.5	125.0	105.0	–	–	390	454	466
DN 80	85.0 × 2.00	185.5	125.0	114.0	–	–	390	462	489
DN 100	104.0 × 2.00	214.5	125.0	120.0	–	–	390	471	574
OD 1"	25.4 × 1.65	73.5	90.0	75.0	280	372	–	–	391
OD 1 ½"	38.1 × 1.65	109.5	90.0	81.0	280	382	–	–	414
OD 2"	50.8 × 1.65	122.0	90.0	87.0	280	388	–	–	432
OD 2 ½"	63.5 × 1.65	164.5	125.0	105.0	280	401	390	451	464
OD 3"	76.2 × 1.65	177.5	125.0	114.0	–	–	390	465	541
OD 4"	101.6 × 2.11	212.0	125.0	120.0	–	–	390	473	573

VARIVENT®

Control Valve Type S

3-Stage Seat

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, no 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*			
	350	Diaphragm surface 350 cm²		
	750	Diaphragm surface 750 cm²		

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10	Actuation pressure*	
	1	0.4–2.0 bar
	2	0.8–2.4 bar
	3	1.0–3.0 bar
	9	2.4–3.6 bar
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 $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)
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:

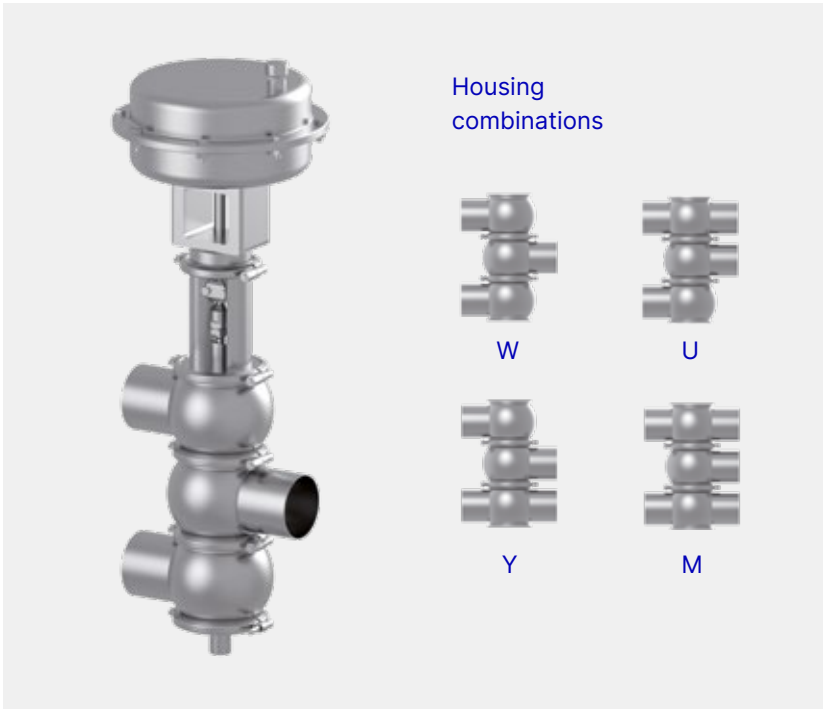
Position	1	2	3		4/5		6	7	8	9	10		11		12	13	14	15		16
Code	S		K	-	/	-		M		-		-		-		2	N	/2F	-	0-----

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

VARIVENT®

Control Valve Type S

Divert Valve Product-Merging



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	DN, OD	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		







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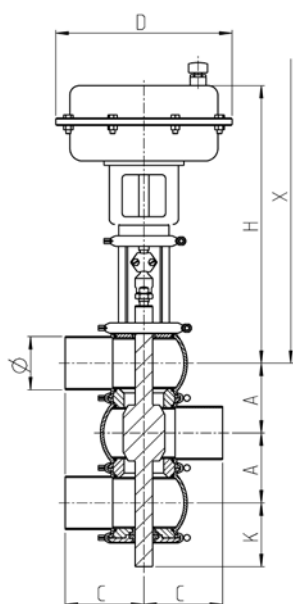
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Nominal width	Pipe	Housing			Diaphragm surface 175 cm ²		Diaphragm surface 350 cm ²		Diaphragm surface 750 cm ²		Valve
	Ø [mm]	A [mm]	C [mm]	K [mm]	D [mm]	H [mm]	D [mm]	H [mm]	D [mm]	H [mm]	X [mm]
DN 25	29.0 × 1.50	50.0	90.0	73.5	215	370	280	347	–	–	393
DN 40	41.0 × 1.50	62.0	90.0	80.0	215	376	280	380	–	–	415
DN 50	53.0 × 1.50	74.0	90.0	85.5	–	–	280	386	–	–	433
DN 65	70.0 × 2.00	96.0	125.0	101.5	–	–	280	397	–	–	466
DN 80	85.0 × 2.00	111.0	125.0	110.0	–	–	280	405	–	–	489
DN 100	104.0 × 2.00	130.0	125.0	133.5	–	–	280	414	390	471	574
OD 1"	25.4 × 1.65	46.0	90.0	71.5	215	368	–	–	–	–	391
OD 1 ½"	38.1 × 1.65	59.0	90.0	78.5	215	378	280	382	–	–	414
OD 2"	50.8 × 1.65	71.5	90.0	84.5	–	–	280	385	–	–	432
OD 2 ½"	63.5 × 1.65	90.0	125.0	98.5	–	–	280	401	–	–	464
OD 3"	76.2 × 1.65	103.0	125.0	105.0	–	–	280	408	–	–	541
OD 4"	101.6 × 2.11	127.5	125.0	132.5	–	–	280	416	390	473	573

VARIVENT®

Control Valve Type S

Divert Valve Product-Merging

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"		
6	Non-actuated position			
	Z	Spring-to-close (NC)		
	A	Spring-to-open (NO)		
7	Control cone seal			
	M	Metallic, no 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*			
	175	Diaphragm surface 175 cm²		
	350	Diaphragm surface 350 cm²		
	750	Diaphragm surface 750 cm²		

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10	Actuation pressure*	
	1	0.4–2.0 bar
	2	0.8–2.4 bar
	3	1.0–3.0 bar
	4	1.65–2.65 bar
	6	2.1–3.3 bar
	7	2.2–3.4 bar
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 $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)
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:

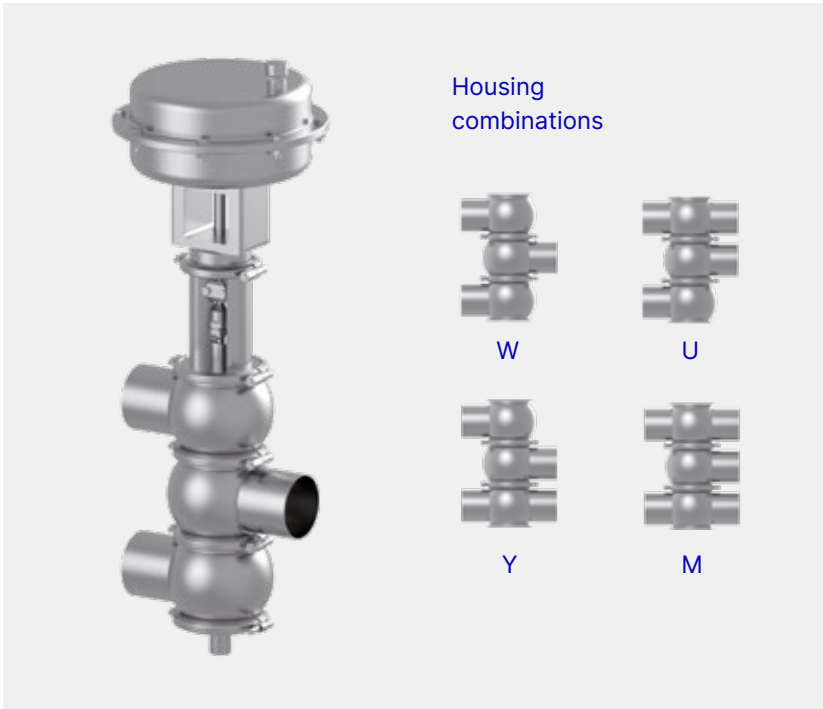
Position	1	2	3		4/5		6	7	8	9	10		11		12	13	14	15		16
Code	S		W	-	/	-		M		-		-		-		2	N	/2F	-	0-----

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

VARIVENT®

Control Valve Type S

Divert Valve Product Distribution



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	DN, OD	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		

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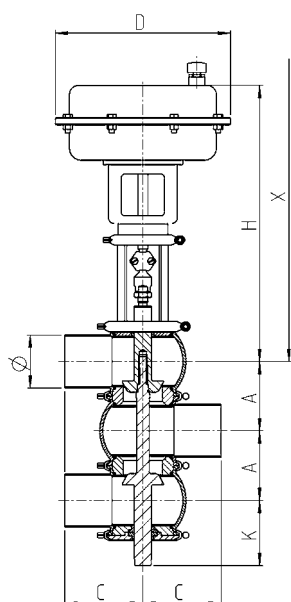
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Nominal width	Pipe	Housing			Diaphragm surface 175 cm ²		Diaphragm surface 350 cm ²		Diaphragm surface 750 cm ²		Valve
	Ø [mm]	A [mm]	C [mm]	K [mm]	D [mm]	H [mm]	D [mm]	H [mm]	D [mm]	H [mm]	X [mm]
DN 25	29.0 × 1.50	50.0	90.0	73.5	215	370	280	347	–	–	393
DN 40	41.0 × 1.50	62.0	90.0	80.0	215	376	280	380	–	–	415
DN 50	53.0 × 1.50	74.0	90.0	85.5	–	–	280	386	–	–	433
DN 65	70.0 × 2.00	96.0	125.0	101.5	–	–	280	397	–	–	466
DN 80	85.0 × 2.00	111.0	125.0	110.0	–	–	280	405	–	–	489
DN 100	104.0 × 2.00	130.0	125.0	133.5	–	–	280	414	390	471	574
OD 1"	25.4 × 1.65	46.0	90.0	71.5	215	368	–	–	–	–	391
OD 1 ½"	38.1 × 1.65	59.0	90.0	78.5	215	378	280	382	–	–	414
OD 2"	50.8 × 1.65	71.5	90.0	84.5	–	–	280	385	–	–	432
OD 2 ½"	63.5 × 1.65	90.0	125.0	98.5	–	–	280	401	–	–	464
OD 3"	76.2 × 1.65	103.0	125.0	105.0	–	–	280	408	–	–	541
OD 4"	101.6 × 2.11	127.5	125.0	132.5	–	–	280	416	390	473	573

VARIVENT®

Control Valve Type S

Divert Valve Product-Merging

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, no 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*			
	175	Diaphragm surface 175 cm²		
	350	Diaphragm surface 350 cm²		
	750	Diaphragm surface 750 cm²		

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10	Actuation pressure*	
	1	0.4–2.0 bar
	2	0.8–2.4 bar
	3	1.0–3.0 bar
	4	1.65–2.65 bar
	6	2.1–3.3 bar
	7	2.2–3.4 bar
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 $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)
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 or pneumatic 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 (except type 3730-0)
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



1

Differentiation acc. to type of signalPneumatic/electro-pneumatic positioner

A difference is made acc. to the input signal between pneumatic (p/p) and electro-pneumatic (i/p) positioners.

Pneumatic (p/p) positioners

For pneumatic devices, the input value is a mechanical signal with a pressure of 0.2 to 1 bar (3 to 15 psi) and the output value is an actuator pressure up to 6 bar (90 psi) at most.

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Type 3766

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).

6

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Type 3725



Type 3730



Type 3767

VARIVENT® Control Valve Type S Positioner

The respective positioners can be equipped with further accessories. The positioners of type 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.

The optionally available 3/2 way solenoid valve for the positioner type 3720-2, 3720-3, 3730-4 and 3767 converts binary control signals into pneumatic control signals, which opens or closes the associated diaphragm actuator.

Type	3725	3730-0	3730-1	3730-2
Input/output signal	i/p	i/p	i/p	i/p
Communication				
Diagnosis				EXPERTplus
Guide size	4 to 20 mA	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

Options

Position indicator, 4–20 mA				•
With 3/2 directional solenoid valve				•
Pressure gage component	•	•	•	•
AS-Interface module type 6150	•	•	•	•

Open/close position feedback

2 proximity switches (software)			•	•
1 inductive + 1 software proximity switch				•
2 proximity switches				

Approval acc. to ATEX

II 2G Ex ia IIC T4	•			
II 2G Ex ia IIC T6 / II 2D Ex tb IIIC T80 °C				•
II 2G Ex ia IIC T6				
IECEx			•	•

Operating elements

Display	•		•	•
Volume throttle	•	•	•	•
Buttons	3			1
Dial switch/push button			•	•
Slider				•
Potentiometer		•		
DIP switch		•		
Setting screws				
Ambient temperature	–20 to 80 °C	–20 to 80 °C	–20 to 80 °C	–20 to 80 °C
Index of protection class	IP66	IP66	IP66	IP66
Option in the order code	1	2	3	4

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3730-3	3730-4	3730-5	3766	3767
i/p	i/p	i/p	p/p can be converted to i/p	i/p can be converted to p/p
HART	PROFIBUS®	FOUNDATION™		
EXPERTplus	EXPERTplus	EXPERTplus		
4 to 20 mA	–	–	0.2 to 1 bar (4 to 20 mA)	0 to 20 mA (0.2 to 1 bar)
•	•	•	•	•
4 to 6 bar	4 to 6 bar	4 to 6 bar	4 to 6 bar	4 to 6 bar

Options

				•
•	•	•	•	•
				•

Open/close position feedback

•				
•	•			
			•	•

Approval acc. to ATEX

•	•			
				•
•	•		•	•

Operating elements

•	•	•		
•	•	•	•	•
1	1	1		
•	•	•		
•	•	•		
–20 to 80 °C	–45 to 80 °C	–45 to 80 °C	–20 to 80 °C	–20 to 80 °C
IP66	IP66	IP66	IP54	IP54
5	6	7	8	9

VARIVENT®

Control Valve Type S

Positioner

Position	Description of the order code for the standard version	
1	Positioner type	
	0	Without positioner
	1	Type 3725 i/p
	2	Type 3730-1 i/p
	3	Type 3730-0 i/p
	4	Type 3730-2 i/p
	5	Type 3730-3 i/p HART
	6	Type 3730-5 i/p (FOUNDATION™ fieldbus)
	7	Type 3730-4 i/p PROFIBUS®
	8	Type 3766 p/p
	9	Type 3767 i/p
2	Solenoid valve	
	–	Without
	1	With 3/2 directional solenoid valve 24 V DC
3	Open/close position feedback	
	–	Without information
	S	2 proximity switches (software)
	I	1 proximity switch
	F	2 proximity switches
4	Position feedback	
	–	Without position feedback
	2	With position feedback 4–20 mA
5	Ex-design	
	–	Without Ex-protection certificate
	E	With Ex-protection certificate*
6	Pressure gage component	
	–	Without pressure gage assembly
	1	With pressure gage 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.

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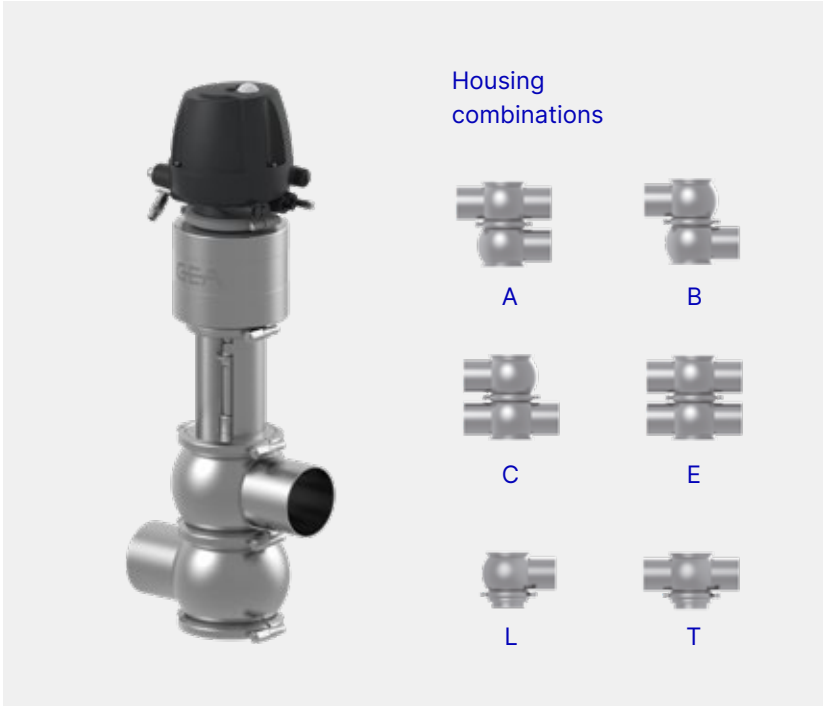
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VARIVENT®

Control Valve Type P

Equal-Percentage 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", IPS 3"–6"	0–10 bar (0–145 psi)
Surface in contact with the product	DN, OD	R _a ≤ 0.8 µm
	IPS	R _a ≤ 1.2 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		CEFDA

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

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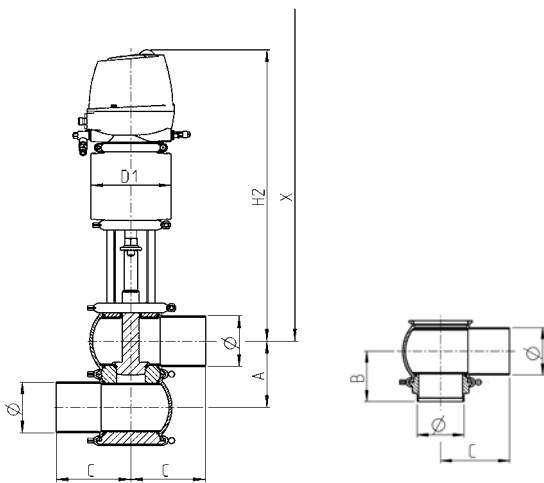
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	Pipe		Housing			Actuator	Dimension		Valve	
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]		D1 [mm]	H [mm]	X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58	90.0		99	423.0	508	15	6
DN 40	41.0 × 1.50	62.0	64	90.0		110	464.0	514	15	7
DN 50	53.0 × 1.50	74.0	70	90.0		110	470.0	520	15	7
DN 65	70.0 × 2.00	96.0	83	125.0		135	481.0	626	15	11
DN 80	85.0 × 2.00	111.0	90	125.0		170	519.0	634	15	11
DN 100	104.0 × 2.00	130.0	100	125.0		210	528.0	643	15	16
DN 125	129.0 × 2.00	155.0	112	150.0		260	784.0	884	30	39
DN 150	154.0 × 2.00	180.0	125	150.0		260	708.0	908	30	50
OD 1"	25.4 × 1.65	46.0	56	90.0		99	421.0	506	15	6
OD 1 ½"	38.1 × 1.65	59.0	62	90.0		110	466.0	516	15	7
OD 2"	50.8 × 1.65	71.5	69	90.0		110	472.0	522	15	7
OD 2 ½"	63.5 × 1.65	90.0	80	125.0		135	485.0	630	15	11
OD 3"	76.2 × 1.65	103.0	86	125.0		170	522.0	637	15	11
OD 4"	101.6 × 2.11	127.5	99	125.0		210	529.0	645	15	17
OD 6"	152.4 × 2.77	177.0	123	150.0		260	706.5	907	30	50
IPS 2"	60.3 × 2.00	81.0	73	114.3		110	467.0	517	15	7
IPS 3"	88.9 × 2.30	115.0	92	152.5		135	487.0	632	15	11
IPS 4"	114.3 × 2.30	140.0	105	152.5		135	493.0	638	15	17
IPS 6"	168.2 × 2.77	192.0	131	152.5		260	702.0	902	30	50

VARIVENT®

Control Valve Type P

Equal-Percentage Characteristic Curve

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 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)			
	A		Spring-to-open (NO)			
8	Control cone seal					
	M		Metallic, no V-ring			
	W		Soft-sealing, with V-ring			
9	Kvs value					
	0.1		DN 25, OD 1"			
	0.16		DN 25, OD 1"			
	0.25		DN 25, OD 1"			
	0.4		DN 25, OD 1"			
	0.63		DN 25, OD 1"			
	1		DN 25, OD 1"			
	1.6		DN 25, OD 1"			
	2.5		DN 25, OD 1"			
	4		DN 25, OD 1"			
	6.3		DN 25–40, OD 1"–1 ½"			
	10		DN 25–50, OD 1"–2", IPS 2"			
	16		DN 40–50, OD 1 ½"–2", IPS 2"			
	25		DN 40–65, OD 1 ½"–2 ½", IPS 2"			
	35		DN 50–80, OD 2"–3", IPS 2"–3"			
	40		DN 50–80, OD 2"–3", IPS 2"–3"			
	60		DN 65–100, OD 2 ½"–4", IPS 2"–4"			
	80		DN 80–100, OD 3"–4", IPS 3"–4"			
	100		DN 100–125, OD 4", IPS 4"			
	160		DN 100–125, OD 4", IPS 4"			
	200		DN 125–150, OD 6", IPS 6"			
	260		DN 125–150, OD 6", IPS 6"			
	360		DN 150, OD 6", IPS 6"			

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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
	DN 40, OD 1 ½"	AA BB
	DN 50, OD 2", IPS 2"	AA BB
	DN 65, OD 2 ½"	BB CD
	DN 80, OD 3", IPS 3"	BB CD DF
	DN 100, OD 4", IPS 4"	CD DF E6
	DN 125	DF EG6Z SH6Z
	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	
	1	Inside R _a ≤ 1.2 µm, outside matt blasted (IPS)
	2	Inside R _a ≤ 0.8 µm, outside matt blasted (DN, OD)
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

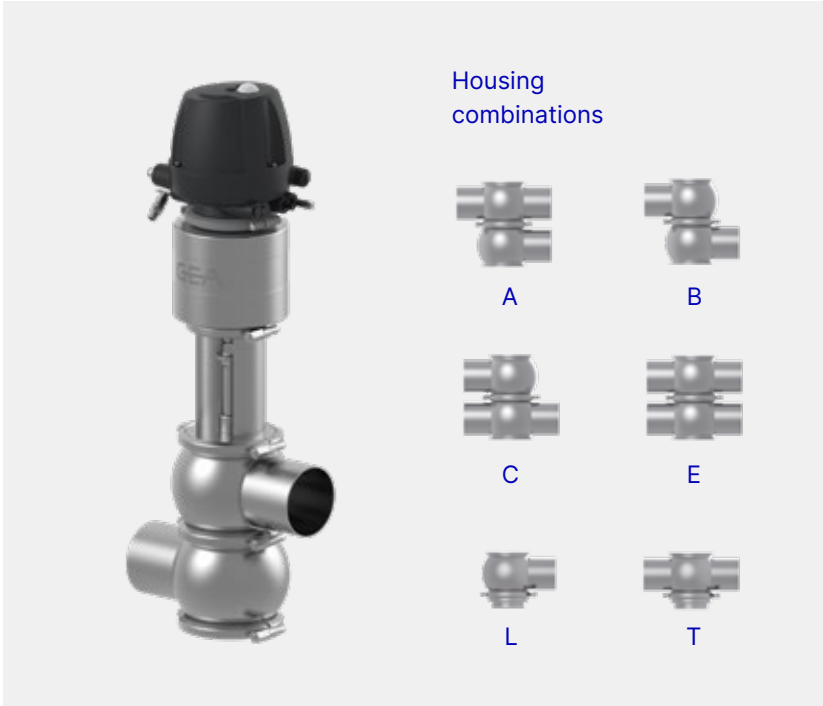
The code is composed as following, depending on the chosen configuration:

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

VARIVENT®

Control Valve Type P

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", IPS 3"–6"	0–10 bar (0–145 psi)
Surface in contact with the product	DN, OD	R _a ≤ 0.8 µm
	IPS	R _a ≤ 1.2 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		CEFDA

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

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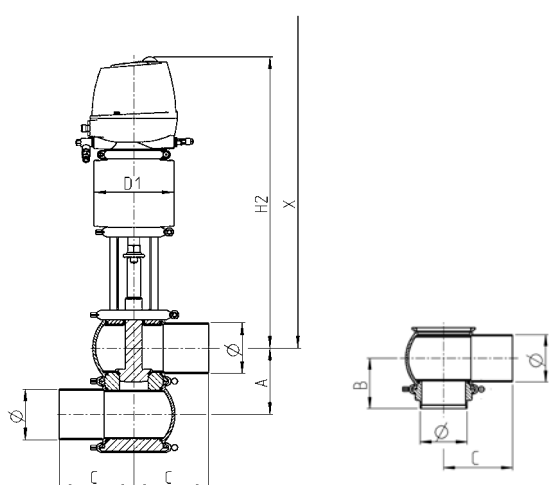
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	Pipe		Housing			Actuator	Dimension		Valve	
Nominal width	Ø [mm]	A [mm]	B [mm]	C [mm]		D1 [mm]	H [mm]	X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	58	90.0		99	423.0	508	15	6
DN 40	41.0 × 1.50	62.0	64	90.0		110	464.0	514	15	7
DN 50	53.0 × 1.50	74.0	70	90.0		110	470.0	520	15	7
DN 65	70.0 × 2.00	96.0	83	125.0		135	481.0	626	15	11
DN 80	85.0 × 2.00	111.0	90	125.0		170	519.0	634	15	11
DN 100	104.0 × 2.00	130.0	100	125.0		210	528.0	643	15	16
DN 125	129.0 × 2.00	155.0	112	150.0		260	784.0	884	30	39
DN 150	154.0 × 2.00	180.0	125	150.0		260	708.0	908	30	50

OD 1"	25.4 × 1.65	46.0	56	90.0		99	421.0	506	15	6
OD 1 ½"	38.1 × 1.65	59.0	62	90.0		110	466.0	516	15	7
OD 2"	50.8 × 1.65	71.5	69	90.0		110	472.0	522	15	7
OD 2 ½"	63.5 × 1.65	90.0	80	125.0		135	485.0	630	15	11
OD 3"	76.2 × 1.65	103.0	86	125.0		170	522.0	637	15	11
OD 4"	101.6 × 2.11	127.5	99	125.0		210	529.0	645	15	17
OD 6"	152.4 × 2.77	177.0	123	150.0		260	706.5	907	30	50

IPS 2"	60.3 × 2.00	81.0	73	114.3		110	467.0	517	15	7
IPS 3"	88.9 × 2.30	115.0	92	152.5		135	487.0	632	15	11
IPS 4"	114.3 × 2.30	140.0	105	152.5		135	493.0	638	15	17
IPS 6"	168.2 × 2.77	192.0	131	152.5		260	702.0	902	30	50

VARIVENT®

Control Valve Type P

Linear Characteristic Curve

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 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)			
	A		Spring-to-open (NO)			
8	Control cone seal					
	M		Metallic, no V-ring			
	W		Soft-sealing, with V-ring			
9	Kvs value					
	0.1		DN 25, OD 1"			
	0.16		DN 25, OD 1"			
	0.25		DN 25, OD 1"			
	0.4		DN 25, OD 1"			
	0.63		DN 25, OD 1"			
	1		DN 25, OD 1"			
	1.6		DN 25, OD 1"			
	2.5		DN 25, OD 1"			
	4		DN 25, OD 1"			
	6.3		DN 25–40, OD 1"–1 ½"			
	10		DN 25–50, OD 1"–2", IPS 2"			
	16		DN 40–50, OD 1 ½"–2", IPS 2"			
	25		DN 40–65, OD 1 ½"–2 ½", IPS 2"			
	35		DN 50–80, OD 2"–3", IPS 2"–3"			
	40		DN 50–80, OD 2"–3", IPS 2"–3"			
	60		DN 65–100, OD 2 ½"–4", IPS 2"–4"			
	80		DN 80–100, OD 3"–4", IPS 3"–4"			
	100		DN 100–125, OD 4", IPS 4"			
	160		DN 100–125, OD 4", IPS 4"			
	200		DN 125–150, OD 6", IPS 6"			
	260		DN 125–150, OD 6", IPS 6"			
	360		DN 150, OD 6", IPS 6"			

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10	Standard configuration with 5 bar air supply pressure for 5 bar product pressure (higher pressures on request)	
	Nominal width	Actuator (Spring-to-close) Kvs value <46.310162535406080100160200260360 Actuator (Spring-to-open) <46.310162535406080100160200260360
	DN 25, OD 1"	AA
	DN 40, OD 1 ½"	AA BB
	DN 50, OD 2", IPS 2"	AA BB
	DN 65, OD 2 ½"	BB CD
	DN 80, OD 3", IPS 3"	BB CD DF
	DN 100, OD 4", IPS 4"	CD DF E6
	DN 125	DF EG6 SH6Z
	DN 150, OD 6", IPS 6"	SH6Z
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	
	1	Inside $R_a \leq 1.2 \mu\text{m}$, outside matt blasted (IPS)
	2	Inside $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)
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

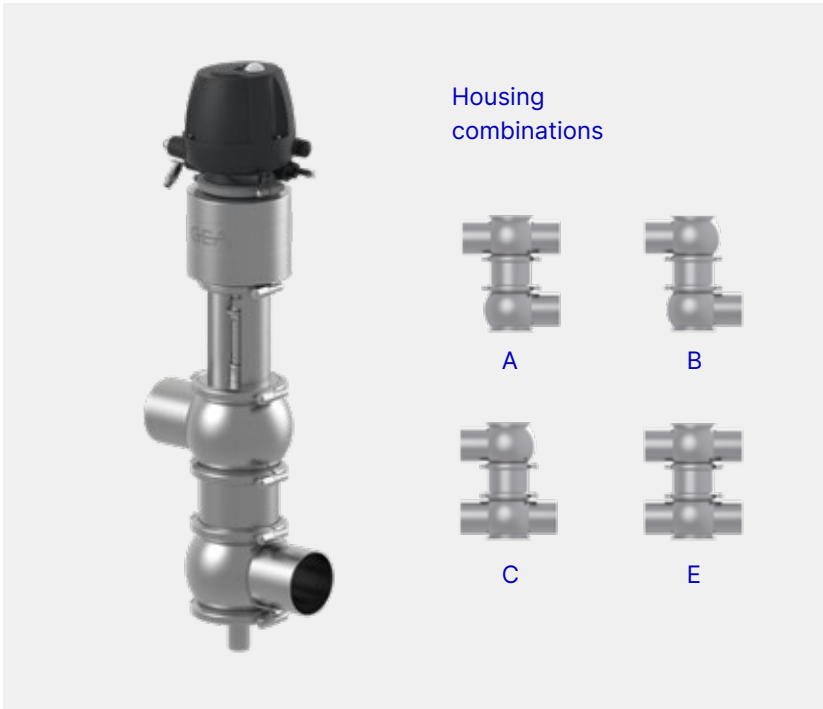
The code is composed as following, depending on the chosen configuration:

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

VARIVENT®

Control Valve Type P

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	DN, OD	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	

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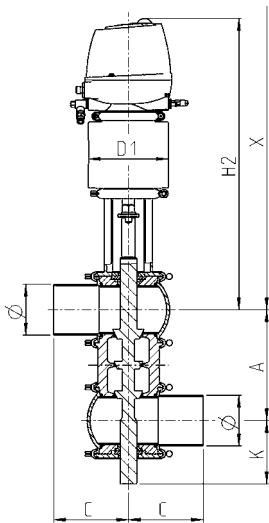
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Pipe		Housing			Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	77.5	90	75	99	423	611	15	6
DN 40	41.0 × 1.50	112.5	90	81	99	429	646	15	9
DN 50	53.0 × 1.50	124.5	90	87	110	470	693	15	9
DN 65	70.0 × 2.00	170.5	125	105	110	481	806	15	15
DN 80	85.0 × 2.00	185.5	125	114	135	489	823	15	17
DN 100	104.0 × 2.00	214.5	125	120	170	528	878	30	24
OD 1"	25.4 × 1.65	73.5	90	75	99	421	609	15	6
OD 1 ½"	38.1 × 1.65	109.5	90	81	99	431	648	15	9
OD 2"	50.8 × 1.65	122.0	90	87	110	472	695	15	9
OD 2 ½"	63.5 × 1.65	164.5	125	105	110	485	810	15	15
OD 3"	76.2 × 1.65	177.5	125	114	135	492	826	15	17
OD 4"	101.6 × 2.11	212.0	125	120	170	529	880	30	25

VARIVENT®

Control Valve Type P

3-Stage Seat

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 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, no 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"		

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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													
	1	Inside R _a ≤ 1.2 µm, outside matt blasted (IPS)												
	2	Inside R _a ≤ 0.8 µm, outside matt blasted (DN, OD)												
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												

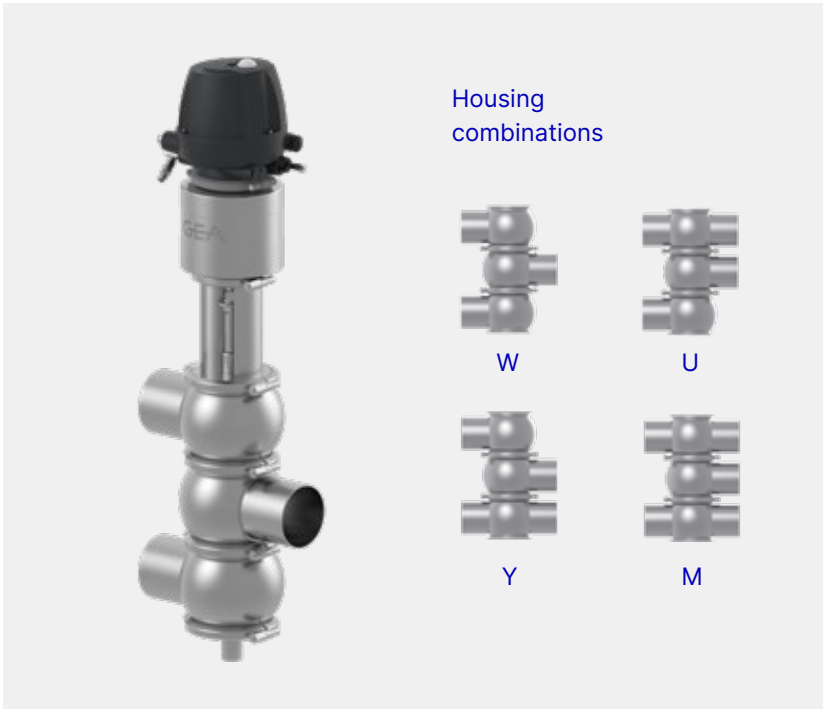
The code is composed as following, depending on the chosen configuration:

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

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	DN, OD	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	

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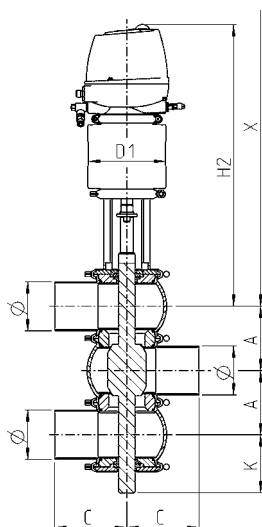
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	Pipe	Housing			Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90	73.5	110	458	692	15	9
DN 40	41.0 × 1.50	62.0	90	80.0	110	464	704	15	10
DN 50	53.0 × 1.50	74.0	90	85.5	110	470	716	15	11
DN 65	70.0 × 2.00	96.0	125	101.5	135	481	868	15	23
DN 80	85.0 × 2.00	111.0	125	110.0	170	519	914	15	22
DN 100	104.0 × 2.00	130.0	125	133.5	170	528	957	15	33
OD 1"	25.4 × 1.65	46.0	90	71.5	110	456	688	15	9
OD 1 ½"	38.1 × 1.65	59.0	90	78.5	110	466	705	15	10
OD 2"	50.8 × 1.65	71.5	90	84.5	110	472	717	15	11
OD 2 ½"	63.5 × 1.65	90.0	125	98.5	135	485	869	15	23
OD 3"	76.2 × 1.65	103.0	125	105.0	170	522	912	15	21
OD 4"	101.6 × 2.11	127.5	125	132.5	170	529	958	15	32

VARIVENT®

Control Valve Type P

Divert Valve Product-Merging

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 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, no 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"

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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"							EFS

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 housing2 Inside $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)**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

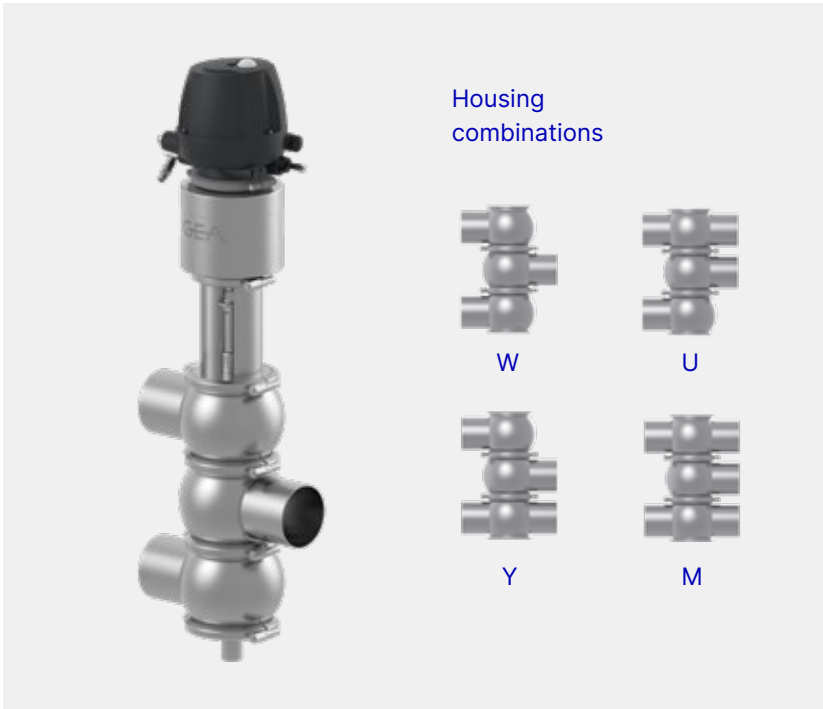
The code is composed as following, depending on the chosen configuration:

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

VARIVENT®

Control Valve Type P

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	DN, OD	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		CEFDA

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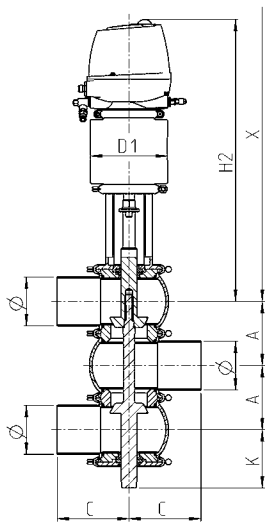
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Pipe		Housing			Actuator	Dimension			Valve
Nominal width	Ø [mm]	A [mm]	C [mm]	K [mm]	D1 [mm]	H2 [mm]	X [mm]	Hub S [mm]	Weight [kg]
DN 25	29.0 × 1.50	50.0	90	73.5	110	458	692	15	9
DN 40	41.0 × 1.50	62.0	90	80.0	110	464	704	15	10
DN 50	53.0 × 1.50	74.0	90	85.5	110	470	716	15	11
DN 65	70.0 × 2.00	96.0	125	101.5	135	481	868	15	23
DN 80	85.0 × 2.00	111.0	125	110.0	170	519	914	15	22
DN 100	104.0 × 2.00	130.0	125	133.5	170	528	957	15	33
OD 1"	25.4 × 1.65	46.0	90	71.5	110	456	688	15	9
OD 1 ½"	38.1 × 1.65	59.0	90	78.5	110	466	705	15	10
OD 2"	50.8 × 1.65	71.5	90	84.5	110	472	717	15	11
OD 2 ½"	63.5 × 1.65	90.0	125	98.5	135	485	869	15	23
OD 3"	76.2 × 1.65	103.0	125	105.0	170	522	912	15	21
OD 4"	101.6 × 2.11	127.5	125	132.5	170	529	958	15	32

VARIVENT®

Control Valve Type P

Divert Valve Product Distribution

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"
	DN 125	
	DN 150	OD 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, no 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"

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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"						EFS	
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 ≤ 0.8 µm, outside matt blasted (DN, OD)						
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 variant

- | | | | |
|---|-----------------------|----|----------------------|
| 1 | Pneumatic block | 6 | 2 push buttons |
| 2 | Control unit | 7 | Exchangeable filter |
| 3 | Path measuring system | 8 | M12 plug connection |
| 4 | Solenoid valves | 9 | Supply air throttle |
| 5 | LED lighting | 10 | Exhaust air throttle |



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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).

Immediately after the setup, end position tolerances, control hysteresis and control settings can be set.

Visualization

LED display:

- Green
- Yellow
- Red
- Blue
- Blue flashing

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.

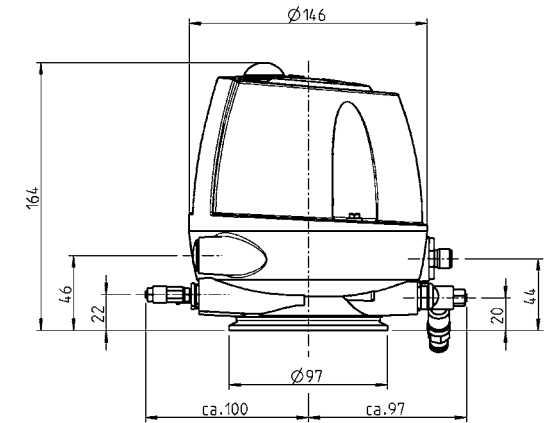
Field of application

In addition to use on VARIVENT® control valves of type P, the T.VIS® P-15 can also be used on VARIVENT® and ECOVENT® seat valves and T-smart disc valves to control the valve disc position. Opening the valves to specific intermediate positions makes it possible to influence the hydraulic characteristics of the system.

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	Σ 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	(Σ 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

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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

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 Tuchenhausen to ask about the dimensions and feasibility.

Available nominal widths

On request

Available valve types

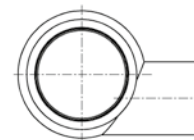
VARIVENT® control valve P

Technical data

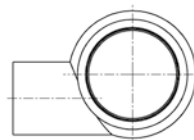
Material	1.4404 (AISI 316L)
Product pressure	10 bar
Valve seat version	Clamped or welded housing connection

Incorporation of the option in the order code and example

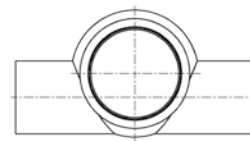
Position	Description of the order code for options
15	Accessories
	/TR Tangential right
	/TL Tangential left
	/TT Tangential straight



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)

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	

Options

VARIVENT® Actuator Air / Spring



Typical application and description

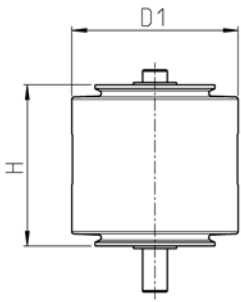
As one of the basic elements of the VARIVENT® modular system, the actuator air/spring is used for performing the valve movement in all VARIVENT® valves.

The air supply is connected to the particular control and feed-back 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 ≤ 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 ≤ 1.6 µm

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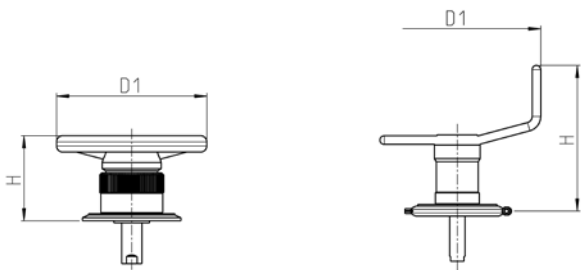
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G1 and G2

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	-		Z	-	M	60	-		G2	L0	1	2	N	/52	+	0	0	0	0	0	0

Options

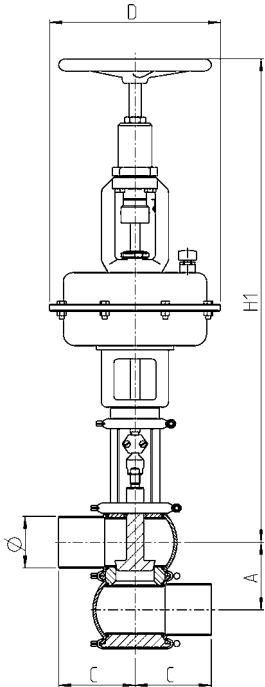
VARIVENT® Additional Handwheel



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



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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

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

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			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

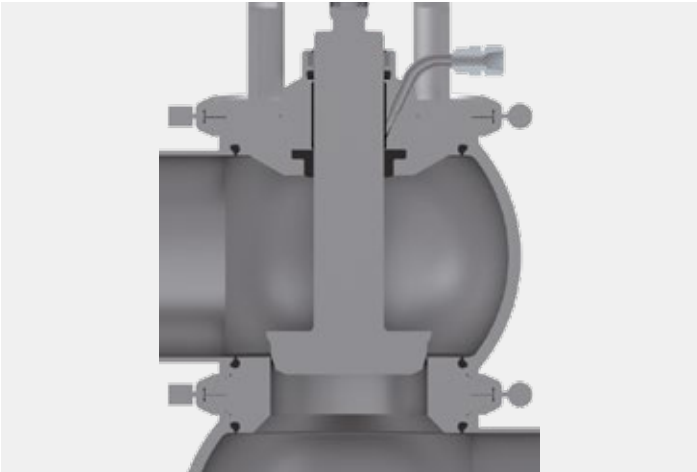
Incorporation of the option in the order code and example

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
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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.

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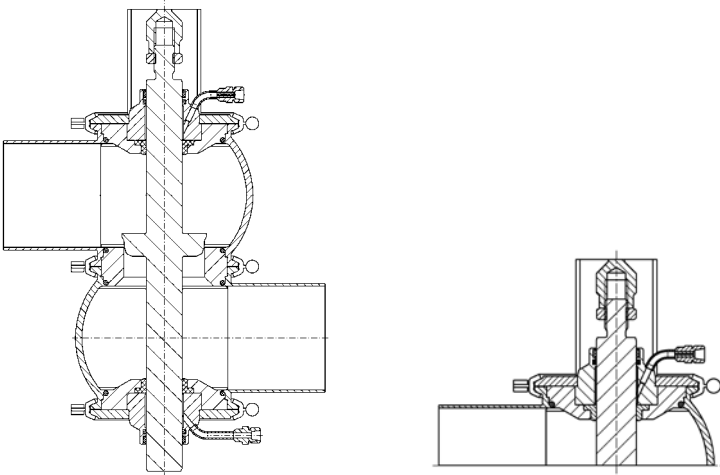
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			Dimensions	
Nominal width		Connection [mm]	Weight [kg]	
DN 25	OD 1"	6/4	0.4	
DN 40	OD 1 ½"	6/4	0.8	
DN 50	OD 2"	6/4	0.8	
DN 65	OD 2 ½"	6/4	1.5	
DN 80	OD 3"	6/4	1.5	
DN 100	OD 4"	6/4	2.6	
DN 125		6/4	5.9	
DN 150	OD 6"	6/4	7.2	

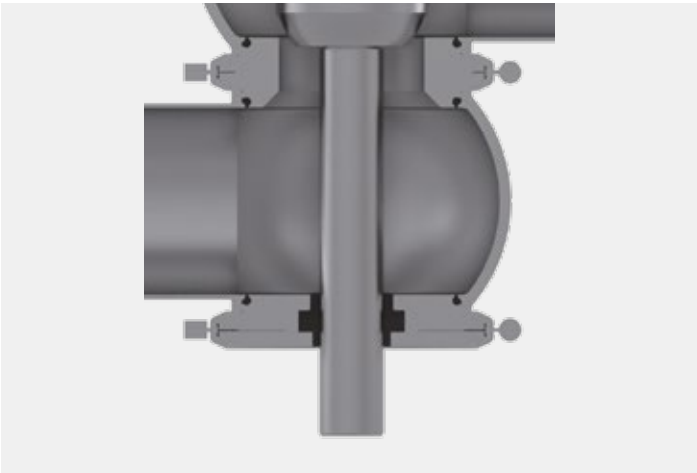
Incorporation of the option in the order code and example

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

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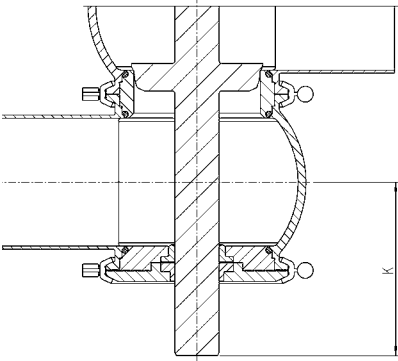
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VARIVENT® control valve type S and P with equal percentage and linear characteristic

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

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Options Design

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]
ρ _N	Density (gas) at the standard condition	[kg/m³]
η	Dynamic viscosity	[mPas]
T ₁	273+t ₁	[Kelvin]
t ₁	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 Δp = p₁ - p₂ = 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 Δp < 0.5 p₁ or p₂ > 0.5 p₁

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

Over-critical pressure reduction at Δp < 0.5 p₁ or p₂ < 0.5 p₁

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

Over-critical pressure reduction = strong noise development

Example 1: low-viscous liquid

Q = 30 m³/h, = 1000 kg/m³, Δp = 0.5 bar, p₁ = 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:

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

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

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

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

$\frac{Kv_T}{Kv_L}$	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

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

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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

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

Equal-percentage control cones

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

3. Determination of the control cone

The characteristic curve of the control valve is defined as the dependence of the Kv value from 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:

$Kv = 42.5 \text{ m}^3/\text{h}$, equal-percentage control characteristics

$$Kv_{req.} = \frac{42.5}{0.6} = 70.8$$

According to the data sheet, a Kvs value of $80 \text{ m}^3/\text{h}$ 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, $p_1 = 7 \text{ bar}$, ($Q = 30 \text{ m}^3/\text{h}$)

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.

Options

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/m ³ ☐ lb/gal [US] ☐ lb/gal [UK]	☐ kg/m ³ ☐ lb/gal [US] ☐ lb/gal [UK]	☐ kg/m ³ ☐ 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/ft ² -g ☐ psi-g	☐ bar-g ☐ mbar-g ☐ MPa-g ☐ lb/ft ² -g ☐ psi-g	☐ bar-g ☐ mbar-g ☐ MPa-g ☐ lb/ft ² -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 ☐ m ³ /h ☐ mn ³ /h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm	☐ l/h ☐ m ³ /h ☐ mn ³ /h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm	☐ l/h ☐ m ³ /h ☐ mn ³ /h ☐ gpm ☐ kg/h ☐ lb/h ☐ scfm

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VARIVENT® SAMPLING VALVES

VARIVENT® Special Application Valves



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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





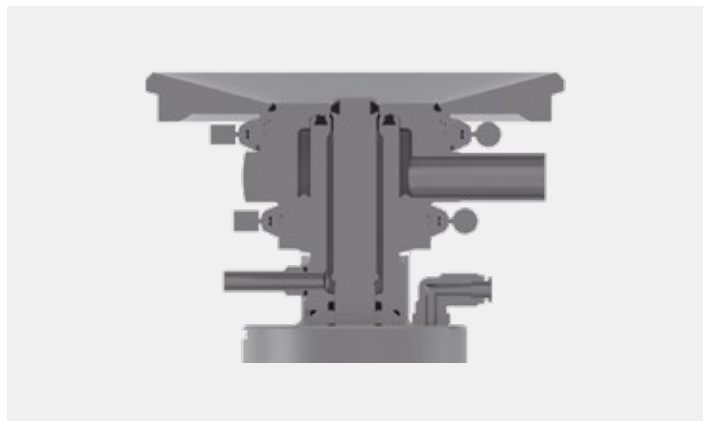
Overview

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. An example of a typical application is in the fermentation tanks of breweries.



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Sampling valve VARIVENT® type I

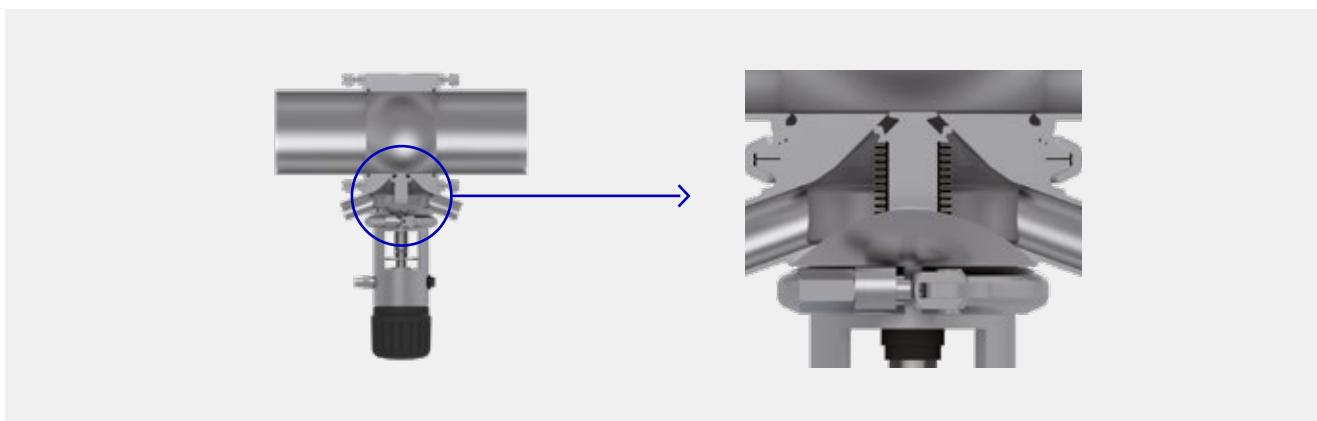
The sampling valve VARIVENT® type I is installed into the process system upright. The actuator is dually configured so that the valve can be actuated pneumatically or manually. Due to the conical contour of the valve disc, smaller sample volumes can be tapped as well. The VARIVENT® type I valve can be 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 for 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 mixproof 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.

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.

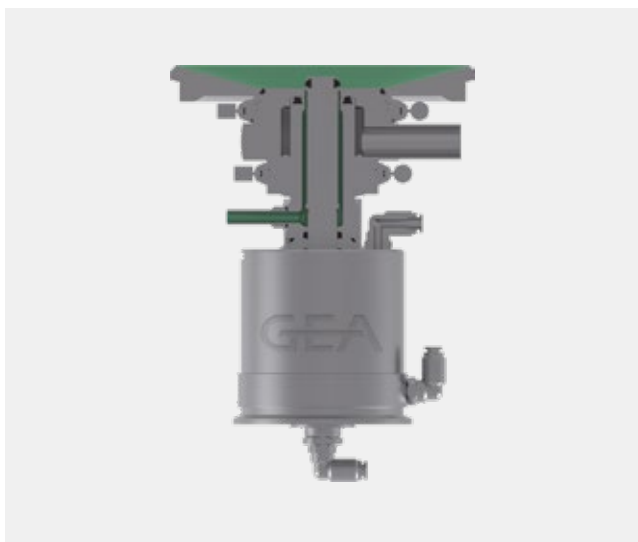


Cleaning the leakage chamber

Cleaning the leakage chamber takes place via the lift functions of the two valve discs during the pipeline or tank cleaning phases. This function ensures an individual lifting of the individual valve discs independently of each other.



For tank or pipe cleaning, the valve disc is lifted and the cleaning media flow into the leakage chamber. This cleans the seal of the valve disc and discharges the cleaning media through the periphery. The V-ring of the double disc seals off the cleaning medium against percolation into the sampling chamber.



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

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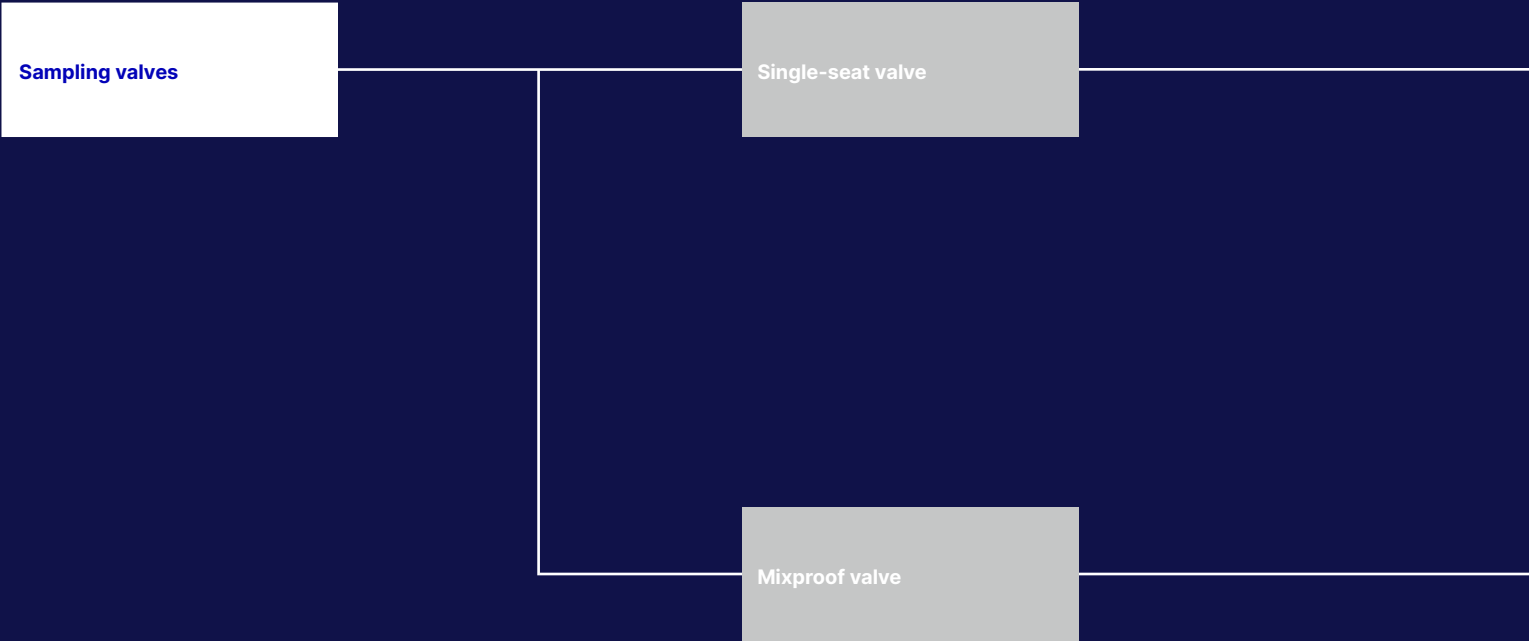
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Selection Matrix

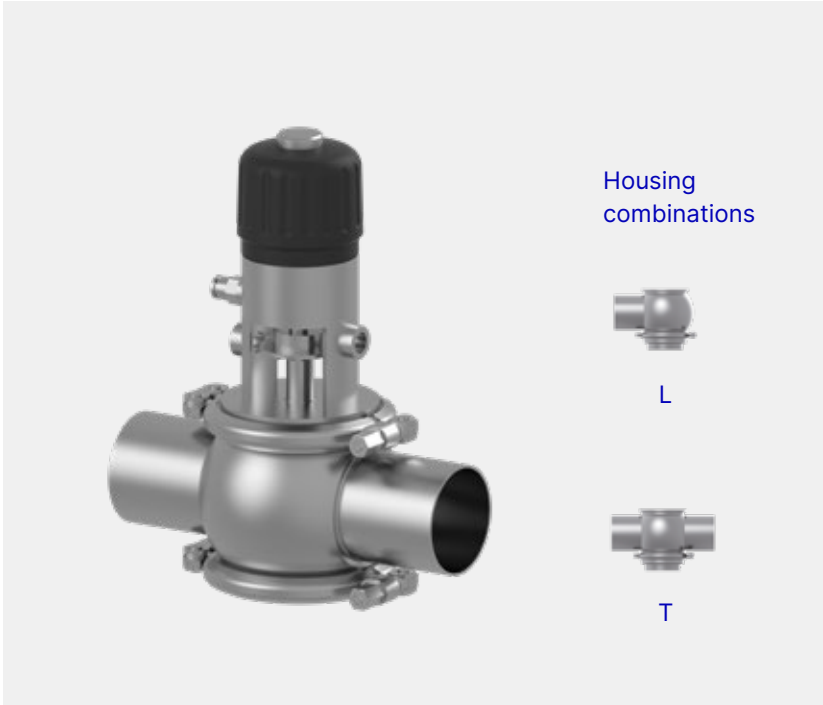




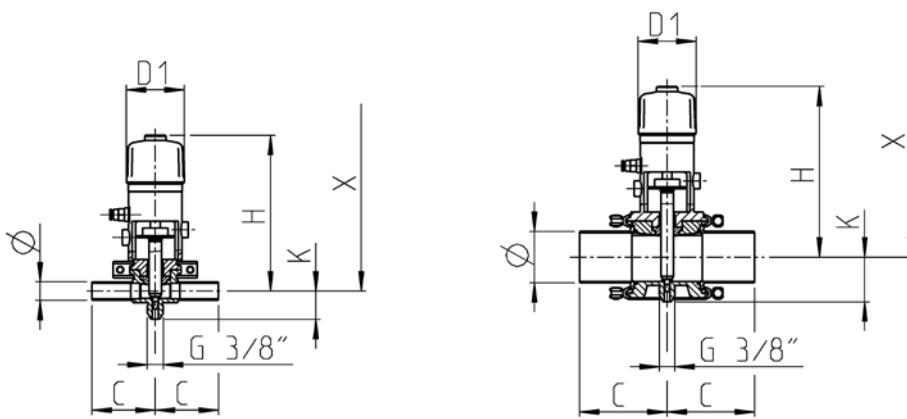
VARIVENT®

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	DN, OD	R _a ≤ 0.8 µm
	IPS	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 with additional connection fittings	
Identification	Adhesive ID tag	
Marking / Certificates		



	Pipe	Housing		Actuator	Dimensions		Valve	
Nominal width	Ø [mm]	C [mm]	K [mm]	D1 [mm]	H [mm]	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

VARIVENT®

Sampling Valve Type I

Single-seat Valve

Position	Description of the order code for the standard version			
1	Valve type			
	I	VARIVENT® sampling valve		
2	Housing combinations			
	L			
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			
	1	Inside R _a ≤ 1.2 µm, outside matt (standard with IPS)		
	2	Inside R _a ≤ 0.8 µm, outside matt (standard with DN and OD)		
6	Connection fittings			
	N	Welding end		
7	Type of outlet		Connection sleeve (optionally for outlet type threaded connection)	
	/O	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	/D	Spiral-type flammable nozzle
	/A	AL / Clip-On		
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 code is composed as following, depending on the chosen configuration:

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

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

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Accessories

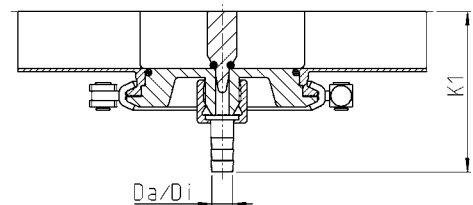
Connection Sleeves

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 present for the sampling valve type I.

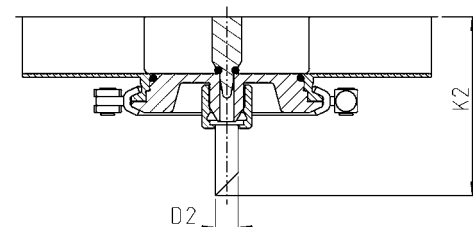
Hose nozzle

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



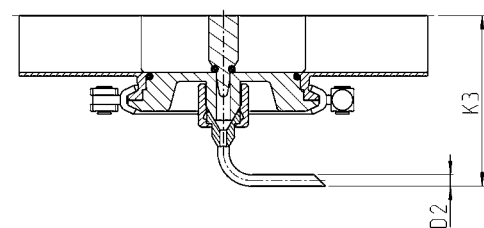
Flammable nozzle straight

The connection type “Flammable nozzle straight” has been constructed for the vertical installation orientation. The burner can be used to sterilize the flammable nozzle.



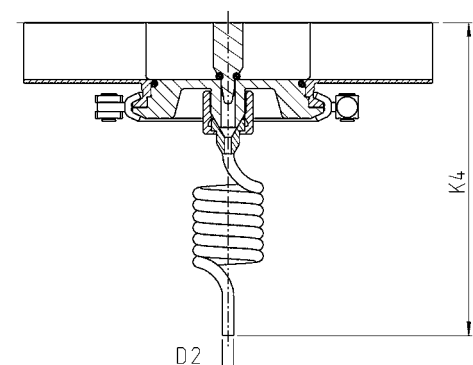
Flammable nozzles 90°

The connection type “Flammable nozzle 90°” has been constructed for horizontal 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 CO₂-containing and foaming liquids. The flammable nozzle can be sterilized with a burner.



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	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

Outlets deviating from the standard

The threaded connection in G3/8" presents the standard connection of the outlets. Deviating from the standard connection, alternative outlets are available for the flammable nozzle.



Outlet KEOFITT

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



Outlet SCHÜTT

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



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Outlet AL clip-on

This outlet is connected to a corresponding sampling valve. It additionally 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 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	

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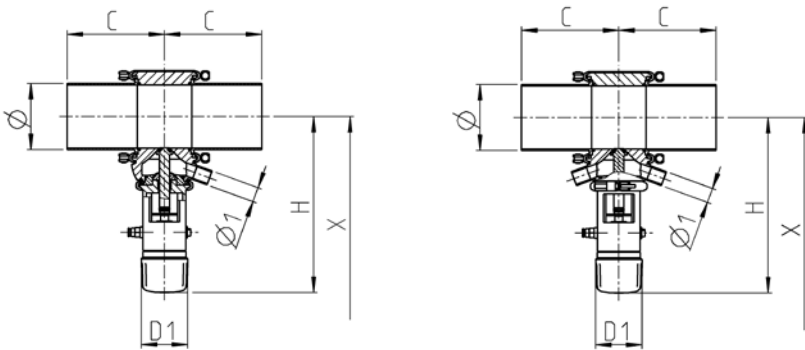
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		Pipe	Housing		Actuator	Dimensions		Valve	
Nominal width	Process Connection	Ø [mm]	Ø1 [mm]	C [mm]	D1 [mm]	H [mm]	X [mm]	Stroke S [mm]	Weight [kg]
DN 25	F	29.0 × 1.50	13 × 1.5	90.0	60	193.0	205.0	8	3.0
DN 40	N	41.0 × 1.50	19 × 1.5	90.0	60	199.0	212.0	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

VARINLINE®

Sampling Valve Type TSVN

Single-seat Valve

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 bellows	
	M	With metal bellows	
6	Feedback		
	0	Without feedback*	
	1	1 feedback	
	2	2 feedbacks	
	3	3 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	
	B	24 V DC, 3-wire, PNP, terminal chamber	
	F	25 V DC, 2-wire, PNP, terminal chamber	
	E	NAMUR / ATEX, 2-wire, terminal chamber	
	S	24 V DC, 3-wire, PNP, plug connector	
	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	Language operating instruction		
	D	German	
	E	English	
10	Number of pieces of dokumentation		
	1	4	7
	2	5	8
	3	6	9

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11	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)
12**	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	
13**	DN 150	OD 6"
	Blanking plates	
	0	Without blanking plate
14**	1	With one blanking plate 1.4404 (AISI 316L)
	Surface quality of the VARINLINE® housing	
15	2	Inside R _a ≤ 0.8 µm, outside matt blasted
	Accessories	
	–	Without
	/52	Adhesive ID tag

* In that case, position 7 must be without proximity sensors

** Positions 12, 13, 14 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	14	15
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 ≤ 0.8 µm
External housing surface	Matt blasted
Actuator type	Pneumatic actuator air / spring
Connection fittings	Welding end
Marking / Certificates	

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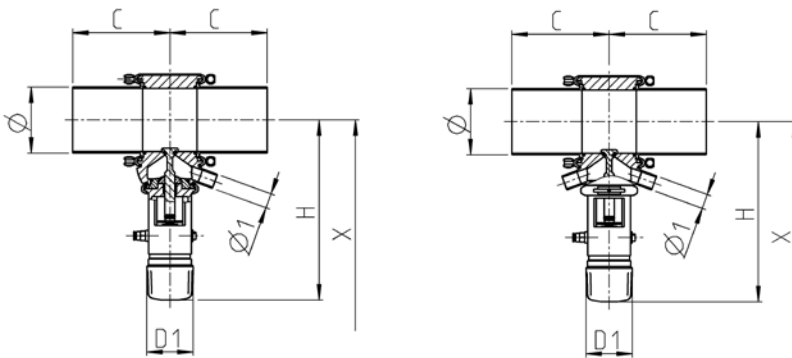
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		Pipe		Housing	Actuator		Dimensions		Valve
Nominal width	Process Connection	Ø [mm]	Ø1 [mm]	C [mm]	D1 [mm]	H [mm]	X [mm]	Stroke S [mm]	Weight [kg]
DN 25	F	29.0 × 1.50	13 × 1.5	90.0	60	193.0	209.0	8	3.0
DN 40	N	41.0 × 1.50	19 × 1.5	90.0	60	199.0	216.0	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

VARINLINE®

Sampling Valve Type TSVU

Single-seat Valve

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 bellows	
	M	With metal bellows	
6	Feedback		
	0	Without feedback*	
	1	1 feedback	
	2	2 feedbacks	
	3	3 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	
	B	24 V DC, 3-wire, PNP, terminal chamber	
	F	25 V DC, 2-wire, PNP, terminal chamber	
	E	NAMUR / ATEX, 2-wire, terminal chamber	
	S	24 V DC, 3-wire, PNP, plug connector	
	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	Language operating instruction		
	D	German	
	E	English	
10	Number of pieces of dokumentation		
	1	4	7
	2	5	8
	3	6	9

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11	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)
12**	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	
13**	DN 150	OD 6"
	Blanking plates	
	0	Without blanking plate
14**	1	With one blanking plate 1.4404 (AISI 316L)
	Surface quality of the VARINLINE® housing	
15	2	Inside R _a ≤ 0.8 µm, outside matt blasted
	Accessories	
	–	Without
	/52	Adhesive ID tag

* In that case, position 7 must be without proximity sensors

** Positions 12, 13, 14 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	14	15
Code	TSV	U	-								/			2	

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

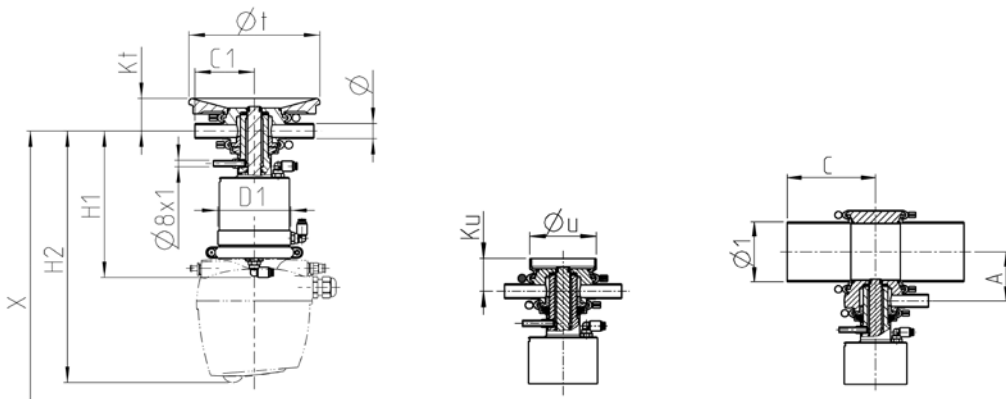
VARIVENT®

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	



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	13.0 × 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]	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

VARIVENT®

Mixproof Sampling Valve

Type T/09

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								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.

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VARIVENT® OVERFLOW VALVES

VARIVENT® Special Application Valves



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Overview

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

Special features

Hygienic design

Metallic stop

Flexibility because of the VARIVENT® modular principle

Proven VARIVENT® seal geometry

Availability of the three different actuator types

Low investment and maintenance costs

Mismatched 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

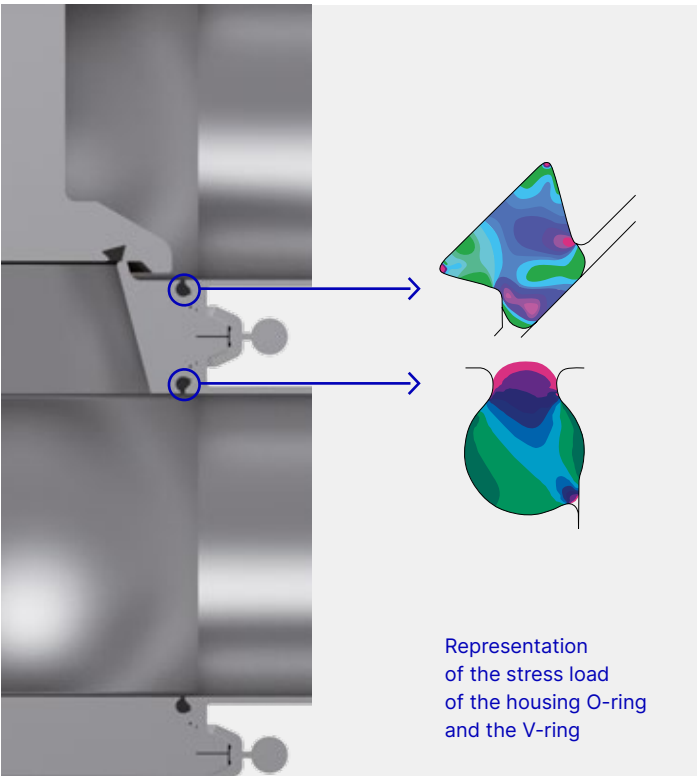
Type F	Opening pressure adjustable via a spring
Type M	Opening pressure adjustable via a spring and with pneumatic lifting
Type F-CJ	Opening pressure adjustable via a spring with pneumatic actuator (D-Force)

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 so that the respective pump will convey the medium in a circle and the pressure cannot increase further.





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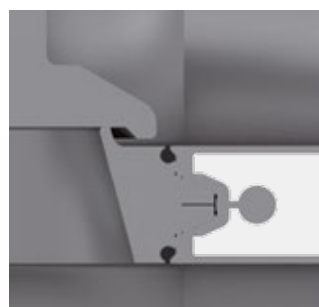
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Sealing according to the VARIVENT® principle

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.

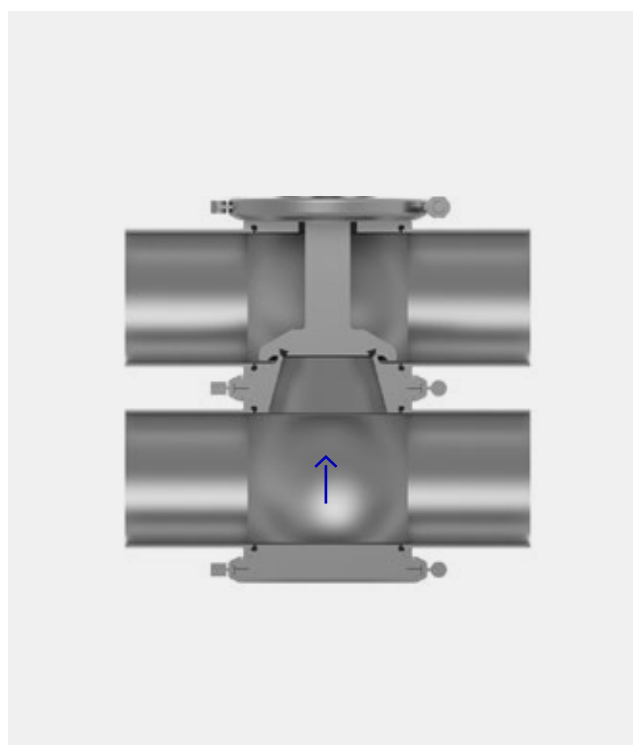
Overflow valves with metallic seat design can be used to secure a pressure difference above 10 bar. When selecting the valve, the permitted maximum pressures of the housings and the possible setting pressures of the actuators must be considered. These valves offer the benefit of lower maintenance requirements.



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 available for the overflow valve (F) are to be set to the desired set pressure with a setting screw. Different spring packages are available to permit different pressure ranges. Take them from the 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 media 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 permits holding shut of the valve against a higher pressure during specific production steps. This 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 by air pressure allows deliberate keeping shut of the valve against higher pressures than the mechanically set pressure. This properly is required specifically for the production of carbonated beverages, since a pressure increase may result in nearly any process step here. 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
DN 25	OD 1"		1.5–4.5	3.0–9.0	8.0–16.0	–	–	–
DN 40	OD 1 ½"		–	1.5–2.0	1.5–5.0	4.0–15.0	14.0–16.0	–
DN 50	OD 2"	IPS 2"	–	–	1.5–4.0	3.0–11.0	10.0–16.0	–
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	9.0–10.0
DN 100	OD 4"	IPS 4"	–	–	–	1.0–1.5	0.5–4.0	3.0–7.0
Required air supply pressure for lifting [type M]			3	3	3	4	3	5

			Actuator type					
Nominal width					D-Force F1-CJ	D-Force F2-CJ	D-Force F3-CJ	D-Force F4-CJ
DN 25	OD 1"		–	–	8.0–16.0	–	–	–
DN 40	OD 1 ½"		–	–	1.5–5.0	4.0–15.0	14.0–16.0	–
DN 50	OD 2"	IPS 2"	–	–	1.5–4.0	3.0–11.0	10.0–16.0	–
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	9.0–10.0
DN 100	OD 4"	IPS 4"	–	–	–	0.5–1.5	0.5–4.0	3.0–7.0
Required air supply pressure [type F-CJ]			–	–	3	3	4	6.5

Higher pressures on request.

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Actuator type F
with set screw
for the set pressure

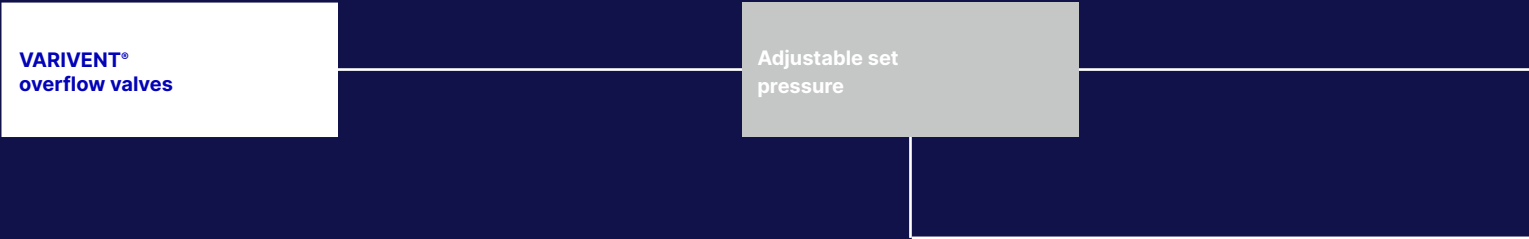


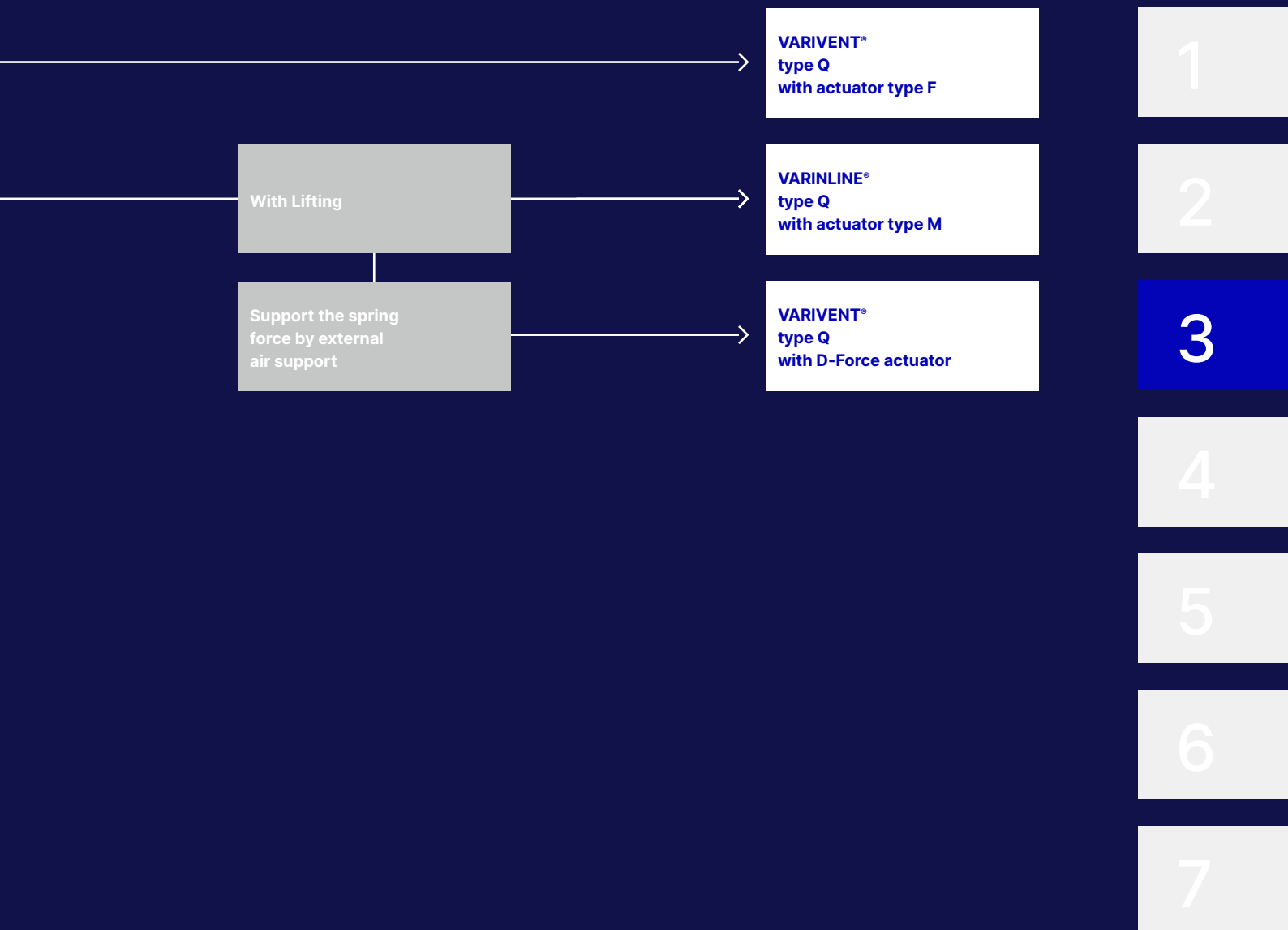
Actuator type M
with set screw and
pneumatic lifting



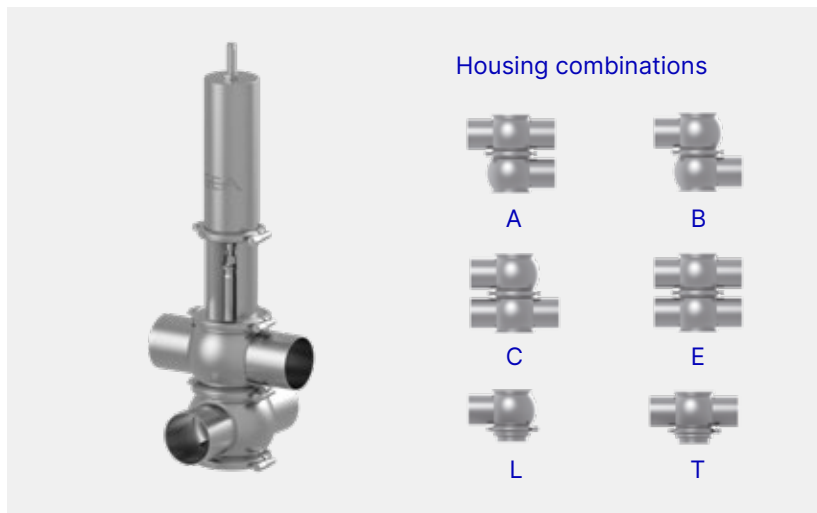
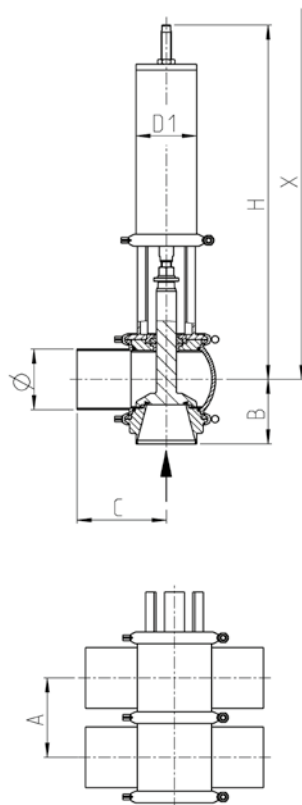
D-Force actuator
with set screw and
air/air actuator

Selection Matrix





VARIVENT® 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	$R_a \leq 0.8 \mu\text{m}$
External housing surface	Matt blasted
Actuator type	Adjustable spring
Connection fittings	Welding end
Identification	Adhesive ID tag
Valve seat version	Clamped seat ring
Marking / Certificates	 

Nominal width	Pipe		Housing		Actuator	Dimensions		Valve	
	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	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

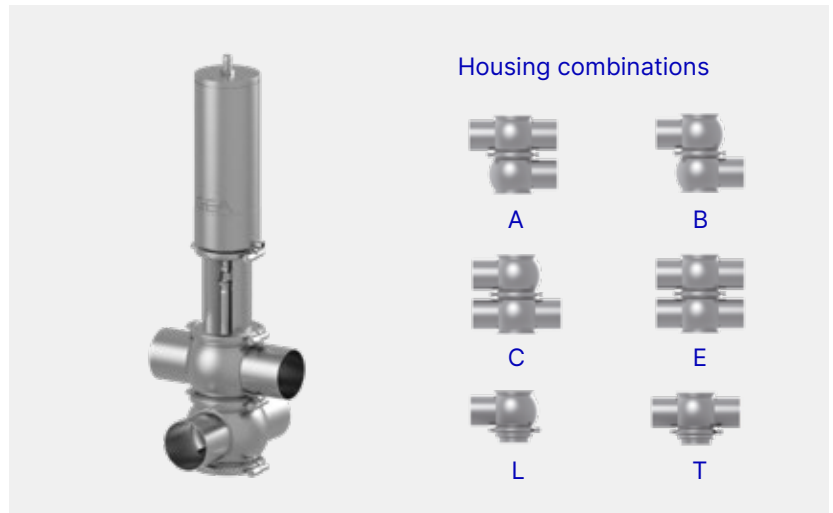
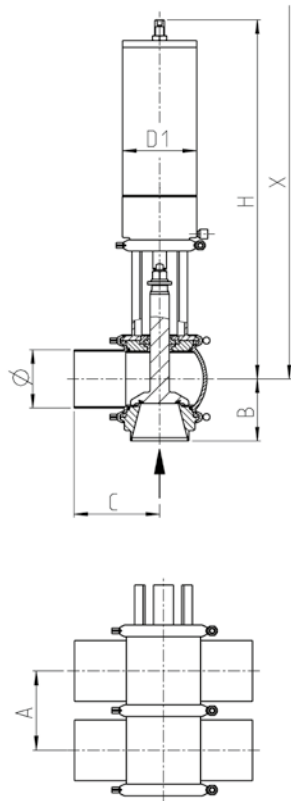
Position	Description of the order code for the standard version															
1	Valve type															
	Q		Overflow valve													
2	Housing combinations															
	A	B	C	E	L	T										
3	Valve disc sealing															
	W		Soft-sealing (with V-ring)													
	M		Metallic (no V-ring)													
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 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 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	$R_a \leq 0.8 \mu\text{m}$
External housing surface	Matt blasted
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]	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

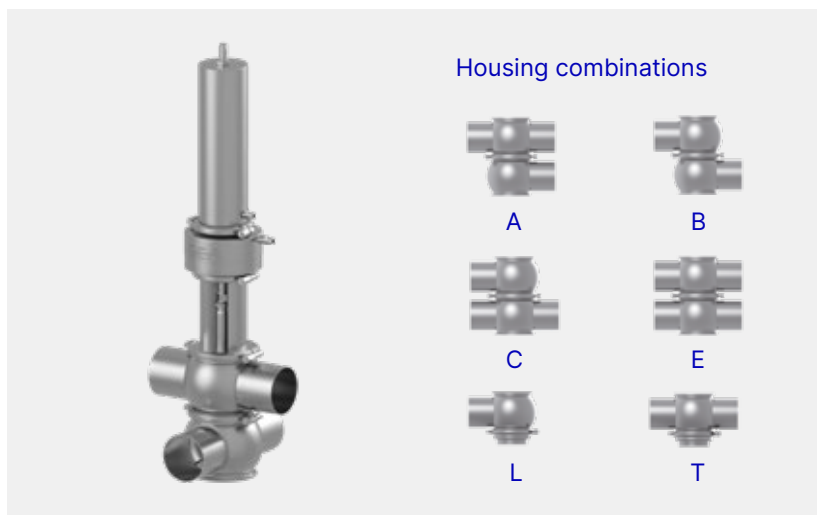
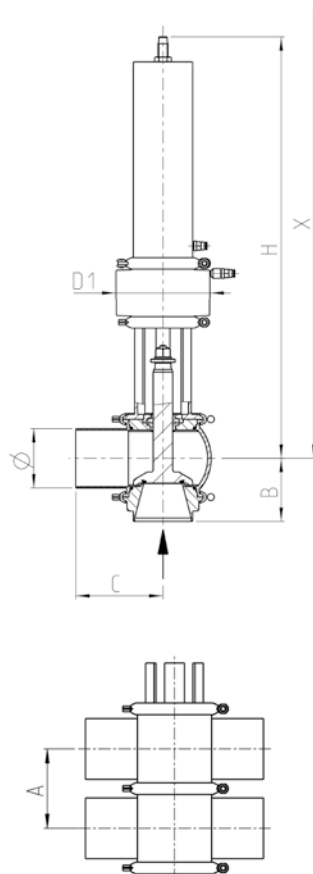
Position	Description of the order code for the standard version									
1	Valve type									
	Q	Overflow valve								
2	Housing combinations									
	A	B	C	E	L	T				
3	Valve disc sealing									
	W	Soft-sealing (with V-ring)								
	M	Metallic (no V-ring)								
4/5	Nominal width (upper housing/lower 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									
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 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 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	$R_a \leq 0.8 \mu\text{m}$
External housing surface	Matt blasted
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

Nominal width	Pipe		Housing		Actuator	Dimensions		Valve	
	Ø [mm]	A [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	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 (no 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 see catalog GEA Valve Automation													

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

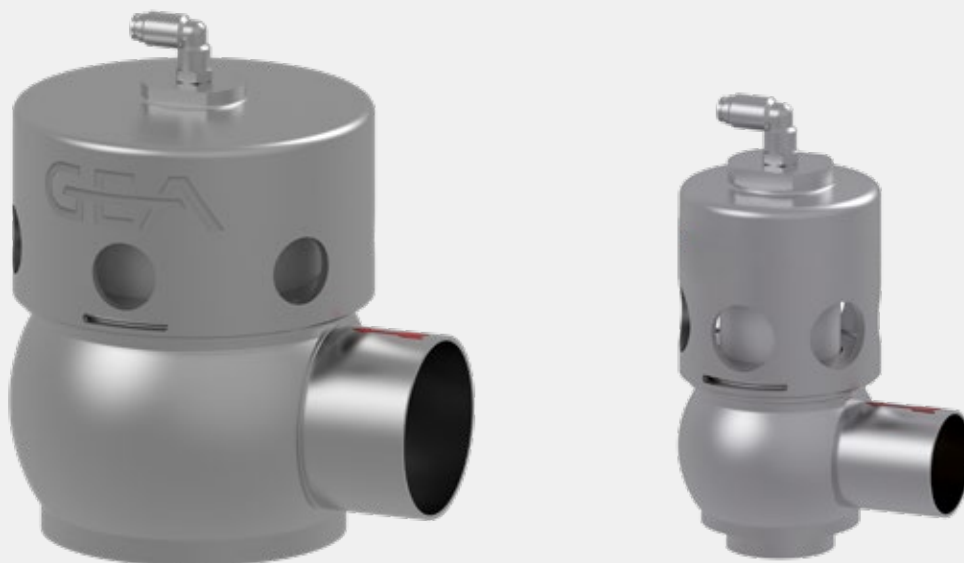
Position	1	2	3		4/5		6	7		8		9		10	11	12		13 to 18							
Code	Q			-	/	-	D		-	L0	-		-	2	N	/52	+								

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

4

VARIVENT® CONSTANT PRESSURE VALVES

VARIVENT® Special Application Valves



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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 will open or close automatically so to compensate for them. The product pressure to be maintained 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

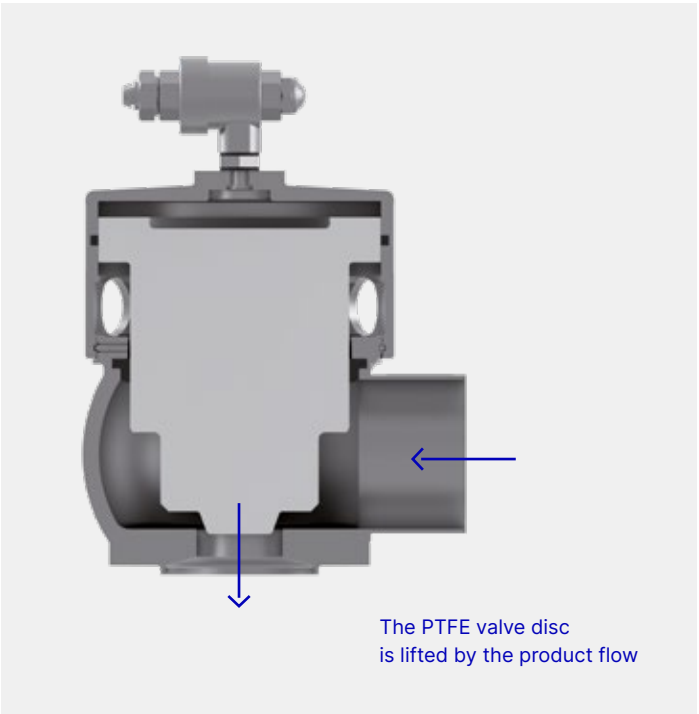
Overview

Function of the valve

In the VARIVENT® constant pressure valve, the exit opening opens when the pressure acting on the ring face of the valve disc is larger than the holding force of the piston set via the air pressure. If the product pressure drops, the valve will close automatically in order to maintain a constant pressure in the inlet socket.

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

The valve disc of the constant pressure valve is made of PTFE with very good resilience against corrosive fluids and only low friction during the lifting movement.



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

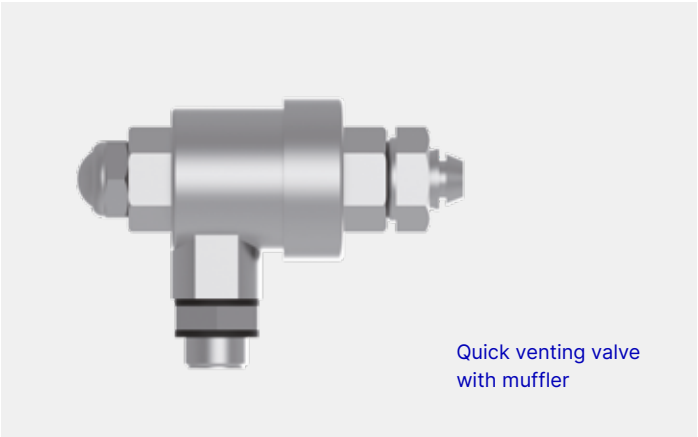
VARIVENT® constant pressure valves are used to keep the pressure constant at the output of a separator. The self-adjusting VARIVENT® constant pressure valve offers a cost-efficient alternative to a control valve. No additional pressure transmitter is required since the valve will work independently after setting the product pressure.

Furthermore, the VARIVENT® constant pressure valve is used to maintain the required pressure at 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 content product pressure can be regulated on the input side of the valve.



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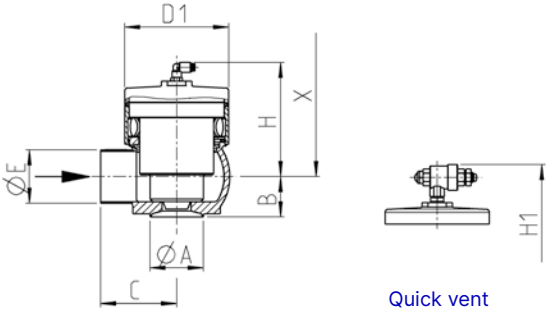
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VARIVENT®

Constant Pressure Valve

Type DHV



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. 10 bar (145 psi)
Surface in contact with the product	R _a ≤ 0.8 µm
External housing surface	Matt blasted
Connection fittings	Welding end
Identification	Adhesive ID tag
Certificates	

	Housing				Actuator	Dimension			Valve		
Nominal width	ØE [mm]	ØA [mm]	B [mm]	C [mm]	D1 [mm]	H [mm]	H1 [mm]	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	-		-				-	

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VARIVENT® SAFETY RELIEF VALVES

VARIVENT® Special Application Valves



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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. Due to the inlet area free from dead zones, 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-able design

Self-draining housing shape free of dead zones ensures free drain

Overview

Function of the valve

Full stroke safety relief valves are used in areas where surge flows or very fast pressure increases occur, due to their quick opening response. 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 slight 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. The valves have a full stroke charge after an expanded proportional phase and thus reach a higher flow rate. They are

also used as overflow valves and are used when the smallest design of the full stroke safety relief valve is too large already. 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. for 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.

HyTight Assembly

Ease of cleaning – 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 observe 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.

Full stroke safety relief valve type 488

The safety relief valves in the series 488 has 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 more than 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

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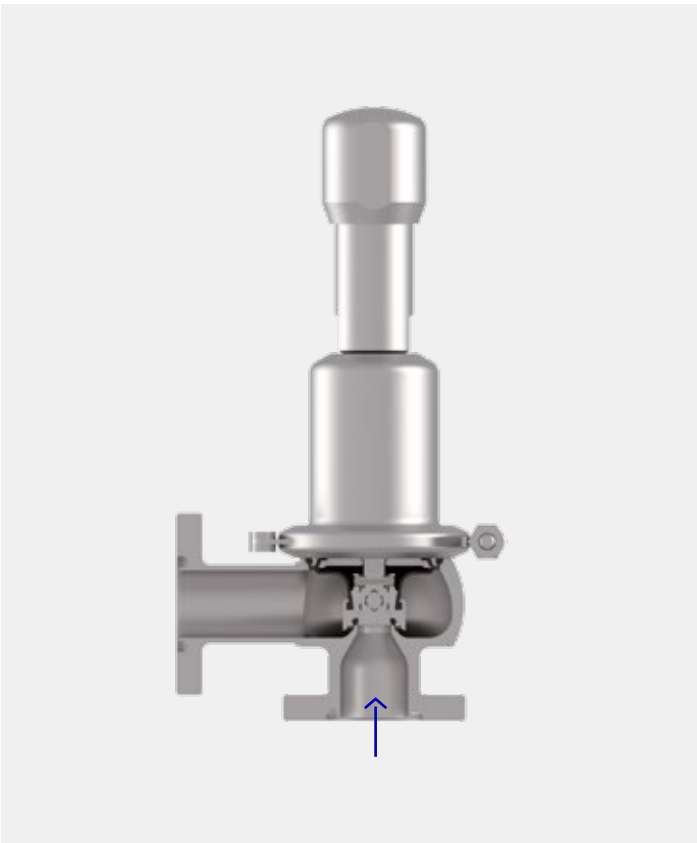
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Overview

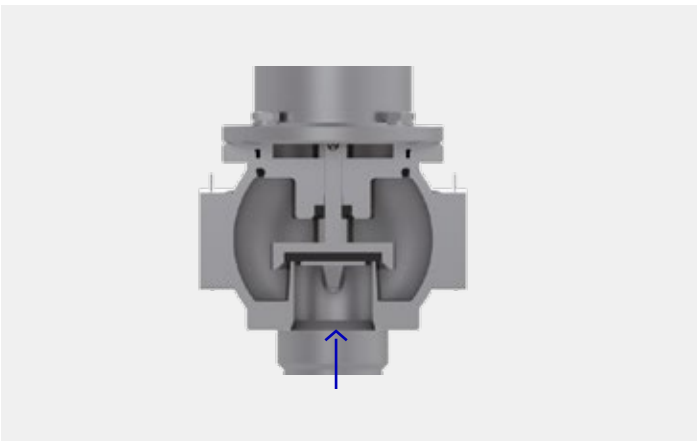
Normal safety relief valve type 483

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 required 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

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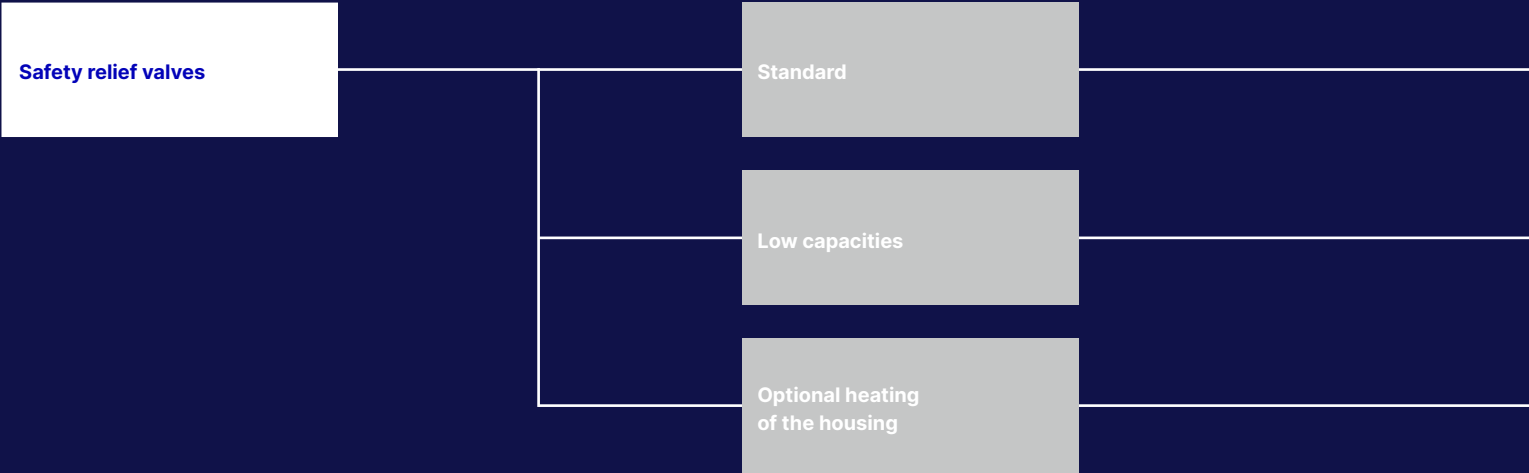
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Selection Matrix



	VARIVENT® spring safety relief valve type 488	1
	VARIVENT® spring safety relief valve type 483	2
	Spring-loaded safety relief valve type HyCom	3
		4
		5
		6
		7

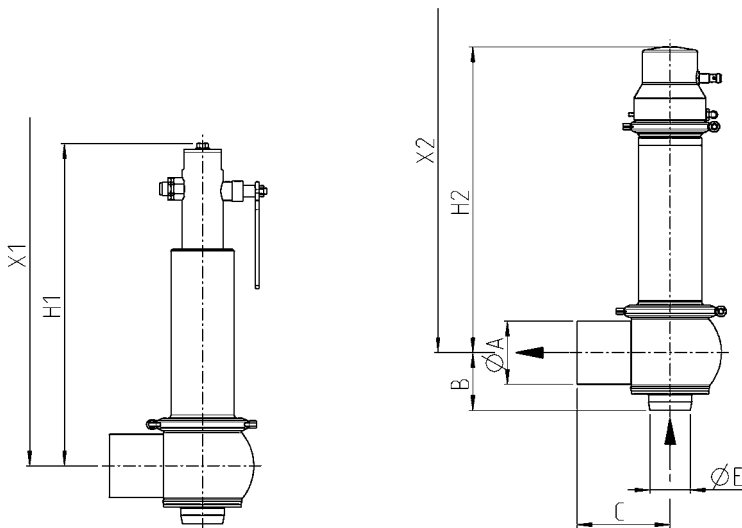
VARIVENT®

Safety Relief Valve Type 488

Full Stroke 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, 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



Lifting H4

Lifting H8*

		Pipe		Housing				Lifting				Valve		
	ØE	Ø [mm]	ØA	Flow diameter d ₀ [mm]	Flow cross section A ₀ [mm ²]	B [mm]	C [mm]	H1 (with lifting H4) [mm]	X1 [mm]	H2 (with lifting H8*) [mm]	X2 [mm]	Actuation pressure min. [bar]	Actuation pressure max. [bar]	Weight*** [kg]
DN 25	25	29.0 × 1.50	DN 40	23	416	53.0	90.0	257	342	217	338	0.20	16.00	8
DN 40	40	41.0 × 1.50	DN 65	37	1,075	70.0	125.0	426	521	395	536	0.20	16.00	14
DN 50	50	53.0 × 1.50	DN 80	46	1,662	77.5	125.0	434	529	401	543	0.25	15.00	16
DN 65	65	70.0 × 2.00	DN 100	60	2,827	87.0	125.0	444	579	412	593	0.23	10.34	24
DN 80	80	85.0 × 2.00	DN 125	74	4,301	102.5	150.0	516	669	517	722	0.26	10.34	39
DN 100	100	104.0 × 2.00	DN 150	92	6,648	121.0	152.5	534	719	535	771	0.20	8.20	39
OD 1 ½"	1 ½"	29.0 × 1.50	OD 2"	23	416	53.0	90.0	257	342	217	338	0.20	16.00	8
OD 2"	2"	41.0 × 1.50	OD 3"	37	1,075	70.0	125.0	426	521	395	536	0.20	16.00	14
OD 2 ½"	2 ½"	53.0 × 1.50	OD 4"	46	1,662	77.5	125.0	434	529	401	543	0.25	15.00	16
OD 3"	3"	70.0 × 2.00	OD 4 ½"	60	2,827	87.0	125.0	444	579	412	593	0.23	10.34	24
OD 4"	4"	85.0 × 2.00	OD 5 ½"	74	4,301	102.5	150.0	516	669	517	722	0.26	10.34	39
OD 4 ½"	4 ½"	104.0 × 2.00	OD 6.625"	92	6,648	121.0	152.5	534	719	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) or ASME flange B16.5 CL150RF (FA).

*** Weights refer to the valve without connection fitting

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VARIVENT®

Safety Relief Valve Type 488

Full Stroke Safety Relief Valve

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 40	OD 2"
	DN 50	OD 2 ½"
	DN 65	OD 3"
	DN 80	OD 4"
	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)*
	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)
	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*
	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. nut
	FD	Flange PN16, DIN EN 1092 form B1
	FA	Flange ASME B16.5 CL 150 RF*
	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
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****

* 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 compliance according to Pressure Equipment Directive DGR 97/23/EC

**** Test of the surface roughness incl. Inspection certificate 3.1 according DIN EN 10204

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

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

VARIVENT®

Safety Relief Valve Type 483

Normal 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, 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

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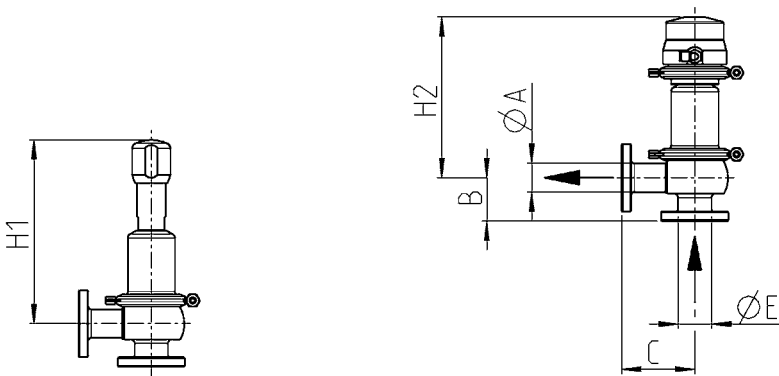
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Lifting H4

Lifting H8*

		Pipe		Housing					Lifting			Valve		
		Ø			Flow diameter d ₀	Flow cross section A ₀	B**	C	H1 (with lifting H4)	X1	H2 (with lifting H8*)	Actuation pressure min.	Actuation pressure max.	Weight****
	ØE	[mm]	ØA		[mm]	[mm²]	[mm]	[mm]	[mm]	[mm]	[mm]	[bar]	[bar]	[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

VARIVENT®

Safety Relief Valve Type 483

Normal Safety Relief Valve

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
7	K	Delivery specification according to TSSA – Canada
	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****

* 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 compliance according to Pressure Equipment Directive DGR 97/23/EC

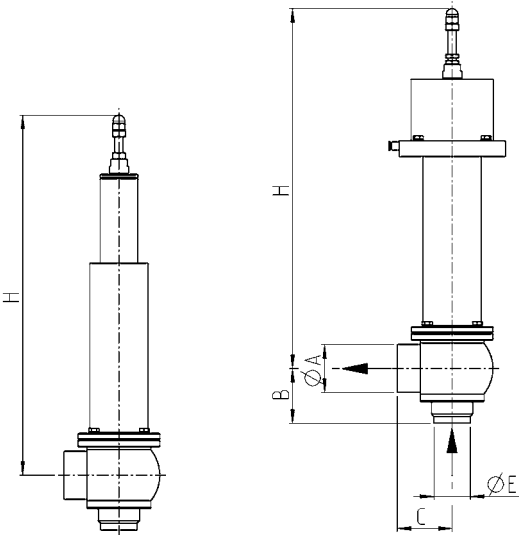
**** Test of the surface roughness incl. Inspection certificate 3.1 according DIN EN 10204

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

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

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	

		Pipe		Housing				Lifting		Valve			
		Ø		Flow diameter d ₀	Flow cross section A ₀	B	C	H (without lifting)	H (with pneumatic lifting P)	Actuation pressure min.	Actuation pressure max.	Weight without lifting	Weight with pneumatic lifting
ØE	[mm]	ØA	[mm]	[mm ²]	[mm]	[mm]	[mm]	[mm]	[mm]	[bar]	[bar]	[kg]	[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	

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

One process for improving the surface quality is electro-chemical 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

$R_a \leq 0.8 \mu\text{m}$	Electro-polished
$R_a \leq 0.4 \mu\text{m}$	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

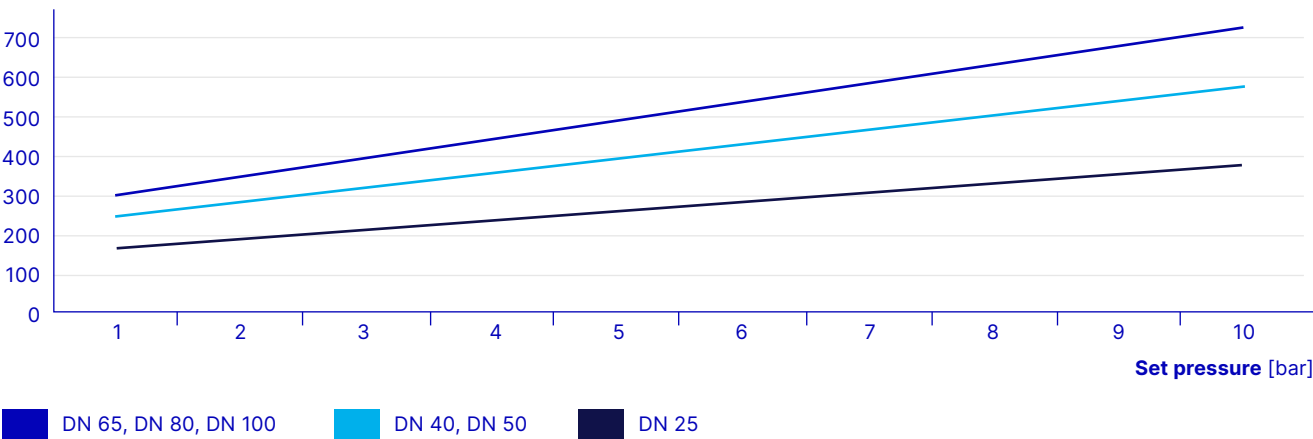
- Type 488
- Type 483
- Type HyCom

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

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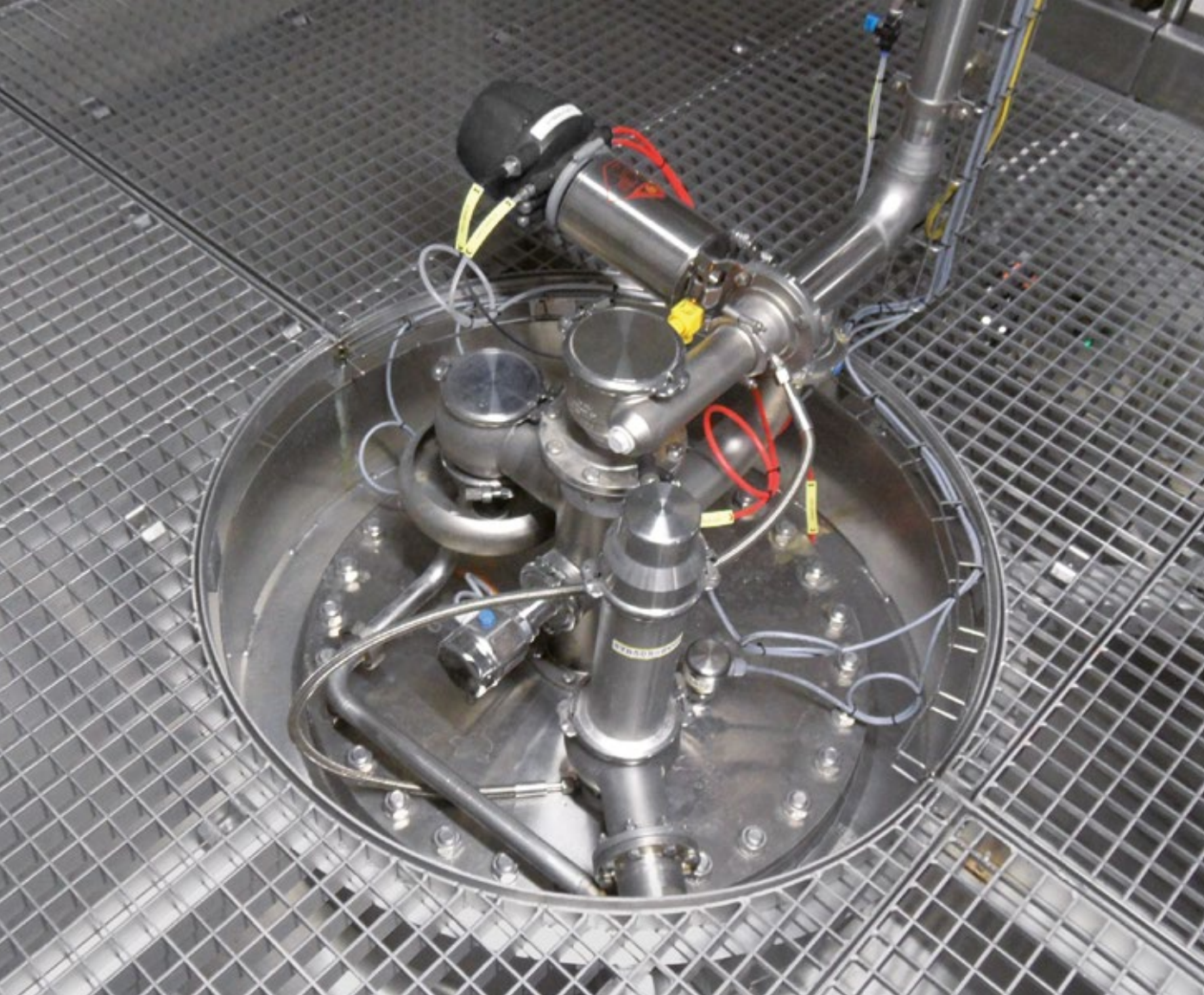
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VARIVENT® VACUUM VALVES

VARIVENT® Special Application Valves



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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 Tuchenhausen 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.

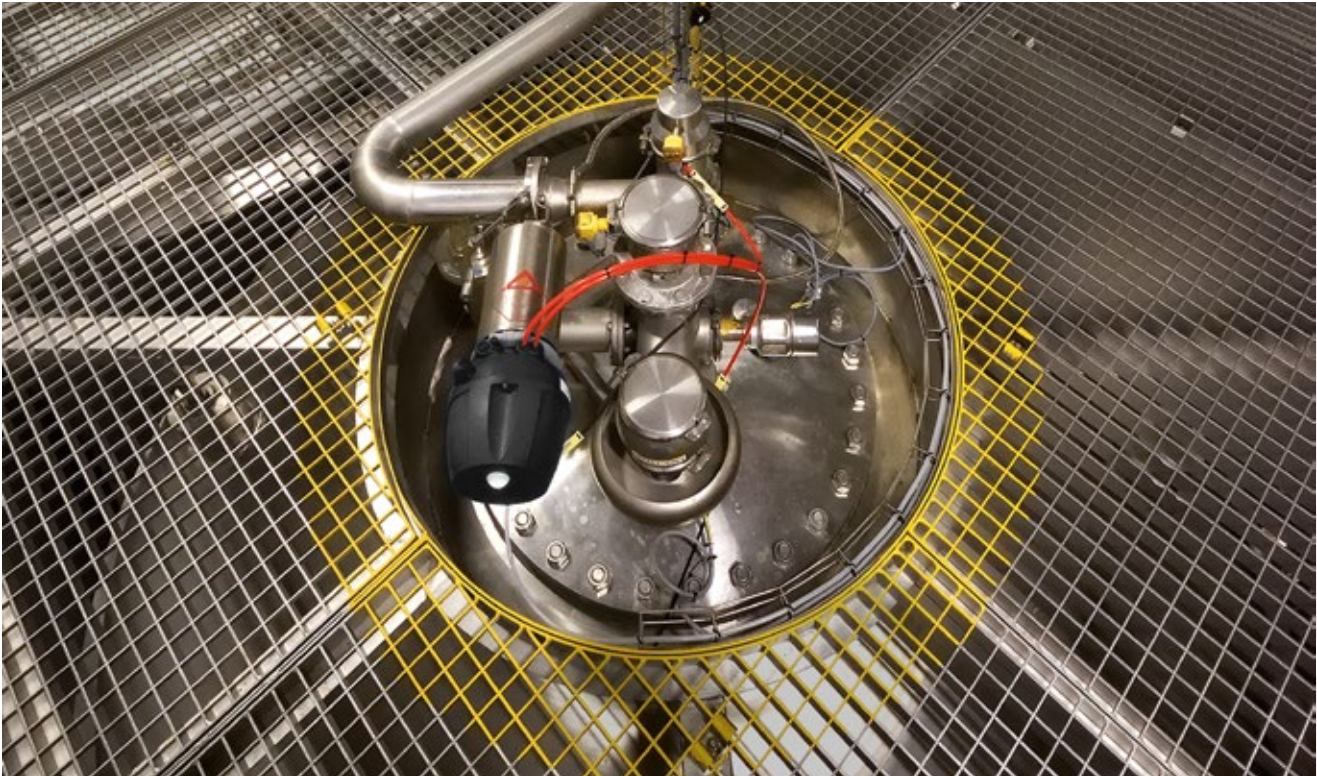
If a vacuum occurs in the tank system, the valve disc is lifted by the negative pressure. The inflowing air flows up through the valve from below. This arrangement offers best protection against the percolation of dirt particles into the tank and thus into the product. The valve runs empty.

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.

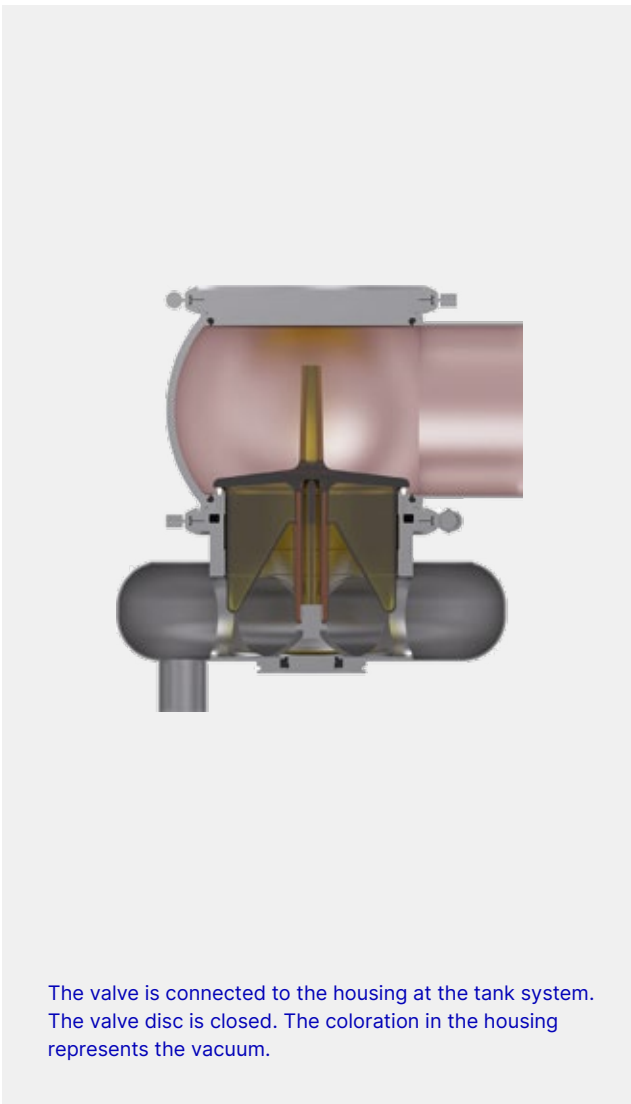


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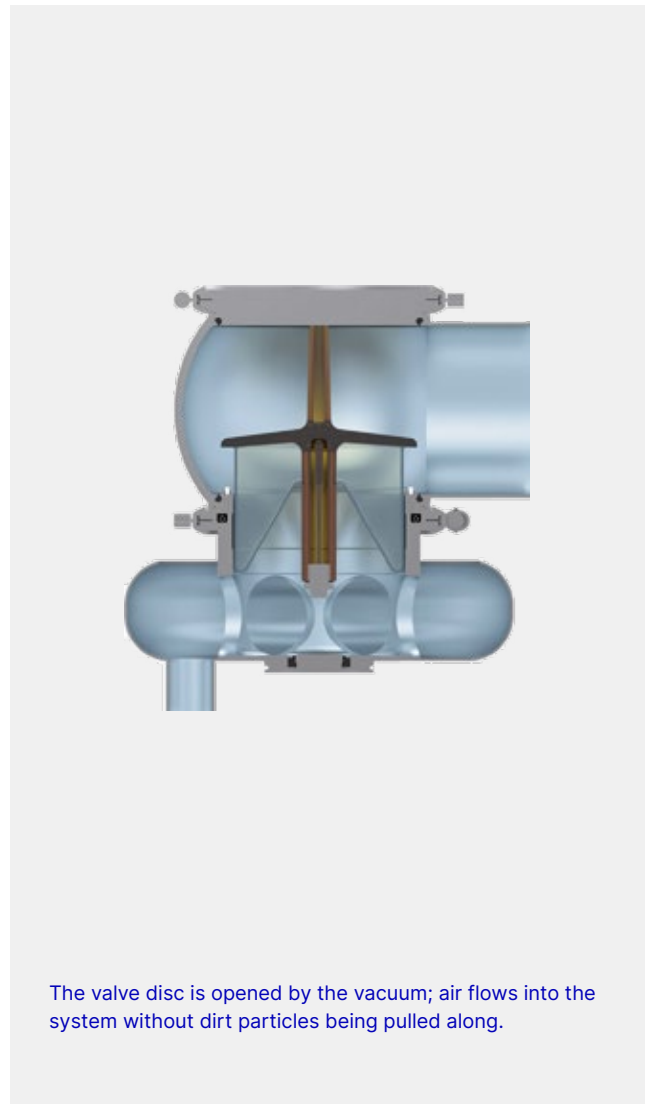
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The valve is connected to the housing at the tank system. The valve disc is closed. The coloration in the housing represents the vacuum.



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

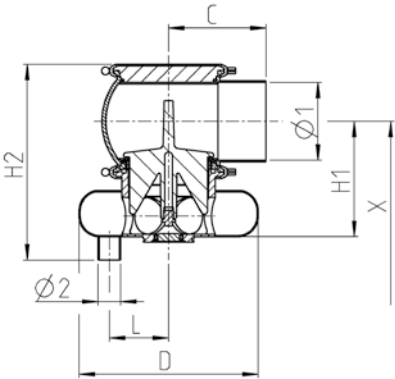
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VARIVENT®

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	DN, OD	R _a ≤ 0.8 µm
	IPS	R _a ≤ 1.2 µm
External housing surface		Matt blasted
Actuator type		Pneumatic actuator air/spring
Connection fittings		Welding end
Identification		Adhesive ID tag

Pipe			Housing			Dimension			Valve
Nominal width	ØE [mm]	ØA [mm]	C [mm]	H [mm]	H1 [mm]	X [mm]	Stroke (mm)	Kvs [m³/h]	Weight [kg]
DN 65	70.0 × 2.00	29	125.0	68	230	126	210	260	6
DN 80	85.0 × 2.00	29	125.0	68	230	133	225	268	6
DN 100	104.0 × 2.00	29	125.0	76	230	152	252	295	8
DN 150	154.0 × 2.00	36	150.0	102	285	225	352	369	20
OD 2 ½"	63.5 × 1.65	29	125.0	68	230	123	204	260	6
OD 3"	76.2 × 1.65	29	125.0	68	230	129	217	268	6
OD 4"	101.6 × 2.11	29	125.0	76	230	150	249	295	8
IPS 3"	88.9 × 2.30	29	152.5	68	230	135	229	270	7
IPS 4"	114.3 × 2.30	29	152.5	76	230	156	262	300	9
IPS 6"	168.2 × 2.77	29	152.5	102	285	231	364	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	
	1	Inside $R_a \leq 1.2 \mu\text{m}$, outside matt blasted (IPS)
	2	Inside $R_a \leq 0.8 \mu\text{m}$, outside matt blasted (DN, OD)
8	Connection fittings	
	N	Welding end
9	Options	
	1	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	-		N	/52	+	

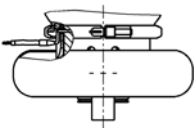
For order codes differing from the standard version, please refer to section 7.

Options

Heating

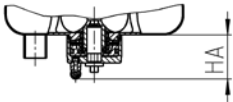
Heating of the vacuum valve is recommended when ambient temperatures could fall below the freezing point. This ensures that the valve disc does not freeze to the seat.

Voltage: 24 V AC, power: 20 W



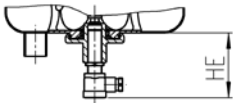
Pneumatic lifting type A

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.

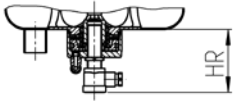


Two types of proximity switches are available:

Proximity switch 24 V DC M18×1 for type E	Article number
2-wire (terminal chamber)	505-036
3-wire (terminal chamber)	505-083

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
OD 2 ½"	45	77	77
OD 3"	45	77	77
OD 4"	45	77	77
IPS 6"	42	71	73

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OPTIONS

GEA VARIVENT® Hygienic Special Application Valves

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Available Options

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Options

Housing and Nominal Widths

VARIVENT® Jacketed Valve Housing



Typical application and description

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

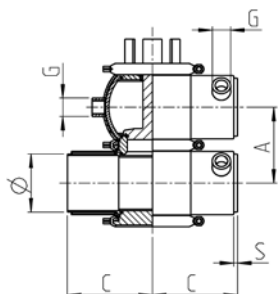
For heating or cooling products, a hot or cold medium is passed through the housing jacket in the opposite flow direction.

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	$R_a \leq 0.8 \mu\text{m}$
Outside surface	Matt blasted
Valve seat version	Clamped connection



Nominal width	Dimensions					Weight	
	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	¼"	0.5	0.7
DN 40	41 × 1.5	90	62	5	¼"	0.8	1.1
DN 50	53 × 1.5	90	74	5	¼"	1.0	1.1
DN 65	70 × 2.0	125	96	5	½"	2.5	2.7
DN 80	85 × 2.0	125	111	5	½"	3.0	3.2
DN 100	104 × 2.0	125	130	5	½"	4.1	4.4
OD 1"	25.4 × 1.65	90	46.0	5	¼"	0.5	0.6
OD 1 ½"	38.1 × 1.65	90	59.0	5	¼"	0.8	0.9
OD 2"	50.8 × 1.65	90	71.5	5	¼"	1.0	1.1
OD 2 ½"	63.5 × 1.65	125	90.0	5	½"	2.3	2.5
OD 3"	76.2 × 1.65	125	103.0	5	½"	2.7	2.8
OD 4"	101.6 × 2.11	125	127.5	5	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	
Pressure level jacketed housing	PS 16 bar	DN 25–80, OD 1"–3"

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			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

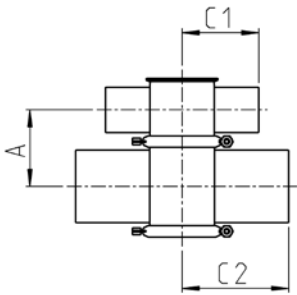
Many mix-matched housings are already available. [For technical reasons, however, a mix-matched combination is not possible for all valve types!](#) If required, please contact [GEA Tuchenhausen](#) to ask about the feasibility.

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

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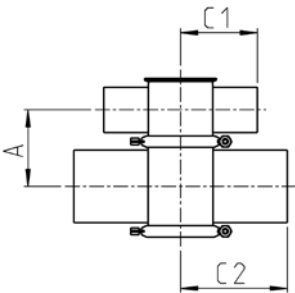
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Options

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			

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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 (FDA)

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.

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 (FDA)

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	-	LO	-	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 $R_a \leq 0.4 \mu\text{m}$. 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 $R_a \leq 0.8 \mu\text{m}$ 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																	
	1***	Inside $R_a \leq 1.2 \mu\text{m}$, outside matt blasted																
	2**	Inside $R_a \leq 0.8 \mu\text{m}$, outside matt blasted																
	3	Inside $R_a \leq 0.8 \mu\text{m}$, outside ground																
	4	Inside $R_a \leq 0.4 \mu\text{m}$, outside matt blasted																
	6	Inside $R_a \leq 0.5 \mu\text{m}$, outside matt blasted																
	7	Inside $R_a \leq 0.5 \mu\text{m}$, outside ground																
	8	Inside $R_a \leq 0.4 \mu\text{m}$, 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 ** DN/OD corresponding to $R_a \leq 0.8 \mu\text{m}$ *** IPS corresponding to $R_a \leq 1.2 \mu\text{m}$

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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.

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	0	M

* According to valve type

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Options

Connection Fittings

Overview

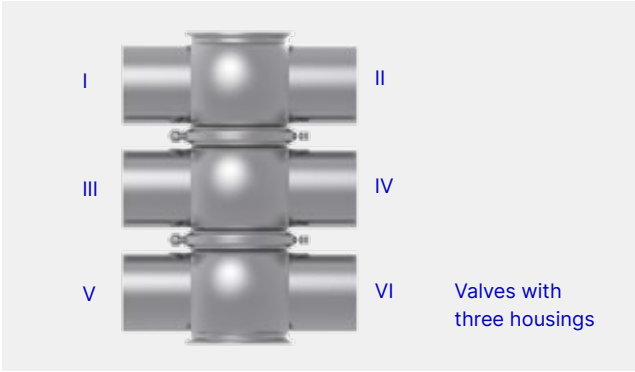
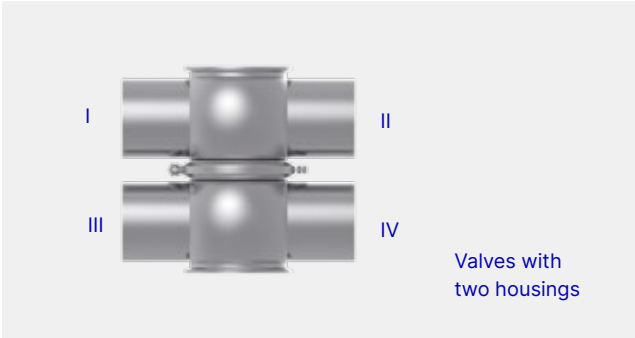
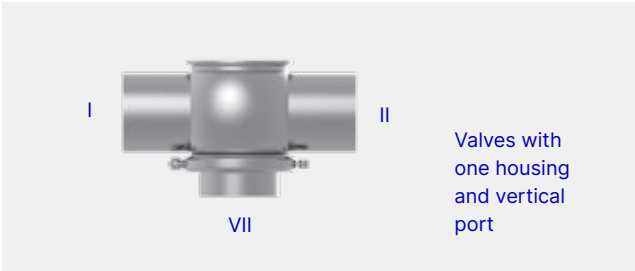
Typical application and description

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)



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																	
	Valve with connection fittings (required connection fitting according to list above, please state <u>separately</u>)																	
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

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Options

Connection Fittings

VARIVENT® Flange Connection



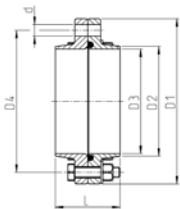
Typical application and description

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.

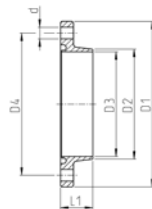
The VARIVENT® flange connection (TK) can be ordered either as a complete connection including bolts and nuts (TK) or a groove flange (TN)/flange (TF) as a connection fitting on a vertical port. If a complete connection is ordered as the connection fitting, the groove flange is welded onto the housing. 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"

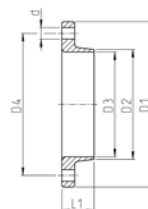
Technical data	
Material	1.4404
Surface in contact with the product	R _a ≤ 0.8 µm
Certificates	3.1/AD2000W2
Seal materials	EPDM (FDA), FKM (FDA), HNBR (FDA)



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
	 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

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

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

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 <u>separately</u>)

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	-	LO	-	1	-	2	J 	/52	+	0	0	0	0	0	M

* According to valve type

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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	

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	

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	

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	-	LO	-	1	-	2	J 	/52	+	0	0	0	0	0	M

* According to valve type

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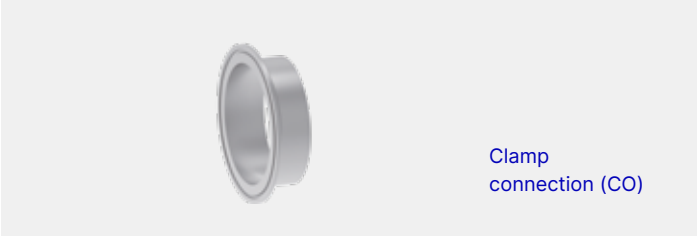
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Options

Connection Fittings

Clamp Connection (Tri-Clamp)



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	25–150
Inch OD	OD	1"–4"

Technical data

Material	DN	1.4404 (AISI 316L)
	OD	AISI 316L
Standard	DN	DIN 32676
	OD	DIN 32676
Inner diameter	DN	DIN 11866 row A
	OD	DIN 11866 row C
Installation length	DN	DIN 32676 KK
	OD	OD 28.5 mm*
Certificates	3.1	

*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 <u>separately</u>)															

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

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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	-	LO	-	1	-	2	N	/41 	/52	+	0	0	0	0	0	M

** According to valve type

Options

Additional Options

ID Plates, TAG Numbers



Typical application and description

If no alternative identification option is selected, the valves are always provided with a nameplate for clear identification (option /52). 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. If the required identification number is specified, this is allocated to the valve by means of a separate sticker on the actuator or control and feedback system.

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.

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	-	LO	-	1	-	2	J	/50 	+	0	0	0	0	0	M

* According to valve type

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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. 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.

IMPORTANT: The standard surface when this option is selected is “inside surface $R_a \leq 0.8 \mu\text{m}$, outside matt”. Many customers in this market ask for the alternative surface quality “inside surface $R_a \leq 0.8 \mu\text{m}$, 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	-	LO	-	1	-	2	N	/3A 	/52	+	0	0	0	0	0	M

* According to valve type

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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.

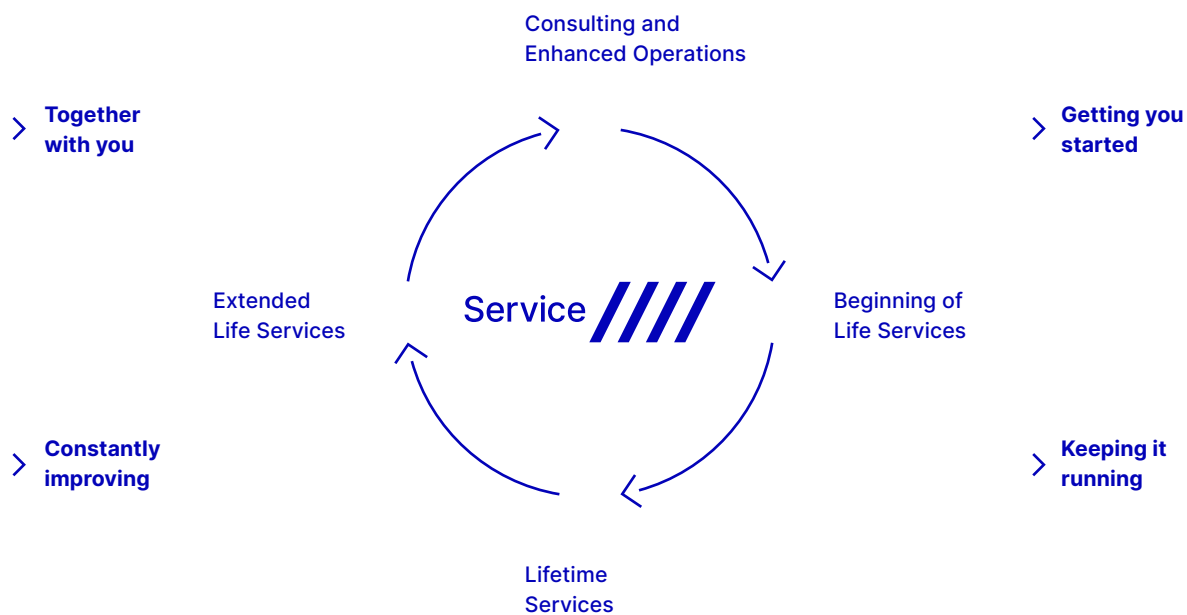
For control applications the T.VIS® P-15 positioner in combination with an air-spring actuator provides a cost-efficient alternative to conventional control valves with diaphragm actuators. The valve can be moved to any position.

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 Tuchenhausen 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 Tuchenhausen 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		European Hygienic Engineering & Design Group. European 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.
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 conformity from the customs union of Russia/Balarus/Kazakhstan
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 maximum pressure (PS) of more than 0.5 bars.
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
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
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
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
RM	Feedback
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 Mjöl 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 Tuchenhausen valve information system, control top system from GEA Tuchenhausen
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

Abbreviation	Explanation
V	Volt, unit of measurement for voltage
VARICOMP®	Pipe expansion compensator from GEA Tuchenhausen
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.

