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GEA VARITOP® HYGIENIC TANK SAFETY SYSTEMS

Legal notice
Publication date: May 2023

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Hygienic Valve Technology

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

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

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

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

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

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

Hygienic Components – for Special Process Functions

Special components, free of dead spaces, for your process
Every process operator who processes valuable or sensitive liquids benefits from our hygienic, 100 % drainable components for important special functions in the process. All components were developed on the basis of the groundbreaking and proven GEA VARIVENT® design and guarantee extraordinary reliability and functionality for trouble-free, efficient processes.

GEA VARINLINE® Process Connections
The trademark VARINLINE® includes control and measuring instruments that meet the requirement of being CIP/SIP-able, thus enabling cleaning and sterilization without the need for dismantling. The instruments can be cleaned and sterilized without any residue in automatic cleaning and sterilizing process cycles. The core piece of the in-line control and measurement technology is the process connection fitting, the VARINLINE® housing. It is mainly an in-line housing with double vertical ports with two process connections.

The process connections in the VARINLINE® housing allow up to two control / measuring instruments, e.g. a sight glass with opposite illumination unit or different measuring mountings. They are available for all pipe sizes, with the VARIVENT® process connection designed for the nominal width of the respective components to be installed. VARINLINE® housings are self draining – also in the horizontal installation orientation – and thus permit instrumentation free of dead zones. VARINLINE® housings are 3A approved, according to the DGRL and are EHEDG-certified.

GEA VARICOMP® Expansion Compensators
VARICOMP® expansion compensators compensate for expansions and tensions in pipeline systems that result from temperature differences. Due to the dead-zone free design, they are able to be used in hygienic and aseptic processes.

GEA VARITOP® Tank Safety Systems
The VARITOP® tank safety system consists of a modular system and thereby forms a functional unit designed individually according to the customer's requests.

The diverse applications of the VARITOP® system range from tank cleaning to protecting tanks against high and low pressures to gassing and degassing of tanks.

GEA VARICOVER® Product Recovery Systems
VARICOVER® product recovery systems are designed for use in fully automatic operations with maximum cleaning demands. They are used to recover valuable products from pipelines – an important consideration to optimize the economic efficiency of a process system. Pigging pushes the product from the pipes and returns it to the production cycle.

A VARICOVER® product recovery system usually comprises of a pig cleaning station, a pig catching station with propellant medium valves and a pig.

Technical Characteristics

Available nominal widths of cross pieces

Nominal width	DN	100	125	
	OD			6"
Cross piece type				
VARITOP® tank safety system		•	•	•

Pipe classes

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 according to IPS schedule 5
100	104.0 × 2.00	6"	168.2 × 2.77
125	129.0 × 2.00		

Surfaces
The standard for surfaces in contact with the product depends on the particular nominal width standard:
- Metric: $R_a \leq 0.8$ µm
- Inch, IPS: $R_a \leq 1.2$ µm

Higher-quality surfaces are an available option.

Surfaces not in contact with the product are matte 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 use 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 product wetted parts can be supplied with a test report 2.2 or an inspection certificate 3.1 according 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) and FKM. NBR material is used for seals not in contact with the product.

The mixing constituents of our seal materials conform to the USP class VI and are contained in the FDA White List. In this the sealings fulfill 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.

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

Technical Characteristics

Ambient conditions

Ambient temperatures	
Tanktop (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 tanktop can also be used outdoors. However, in these application areas they must be protected against icing, or else de-iced before switching. 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 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

Proximity switch holder (INA)

Proximity switches of size M12 × 1 can indicate the positions “open” and/or “closed”.

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

Components for special process applications in the GEA Hygienic Valve Technology portfolio 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 components 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 and other additional certificates are available on request for many components in the GEA Hygienic Valve Technology portfolio.

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

* Standard material for components not in contact with the product

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

Seal material properties

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

Other applications on request

* Depending on the installation situation

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

\+ = Good resistance

O = Reduced service life

– = Not resistant

Selection Matrix

Catalogs
Hygienic Valve Technology

Catalogs
Hygienic Pump Technology

Catalogs
Aseptic Valve Technology

Catalogs
Cleaning Technology

GEA VARIVENT®
seat valves

GEA butterfly valves

GEA VARIVENT®
special application valves

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

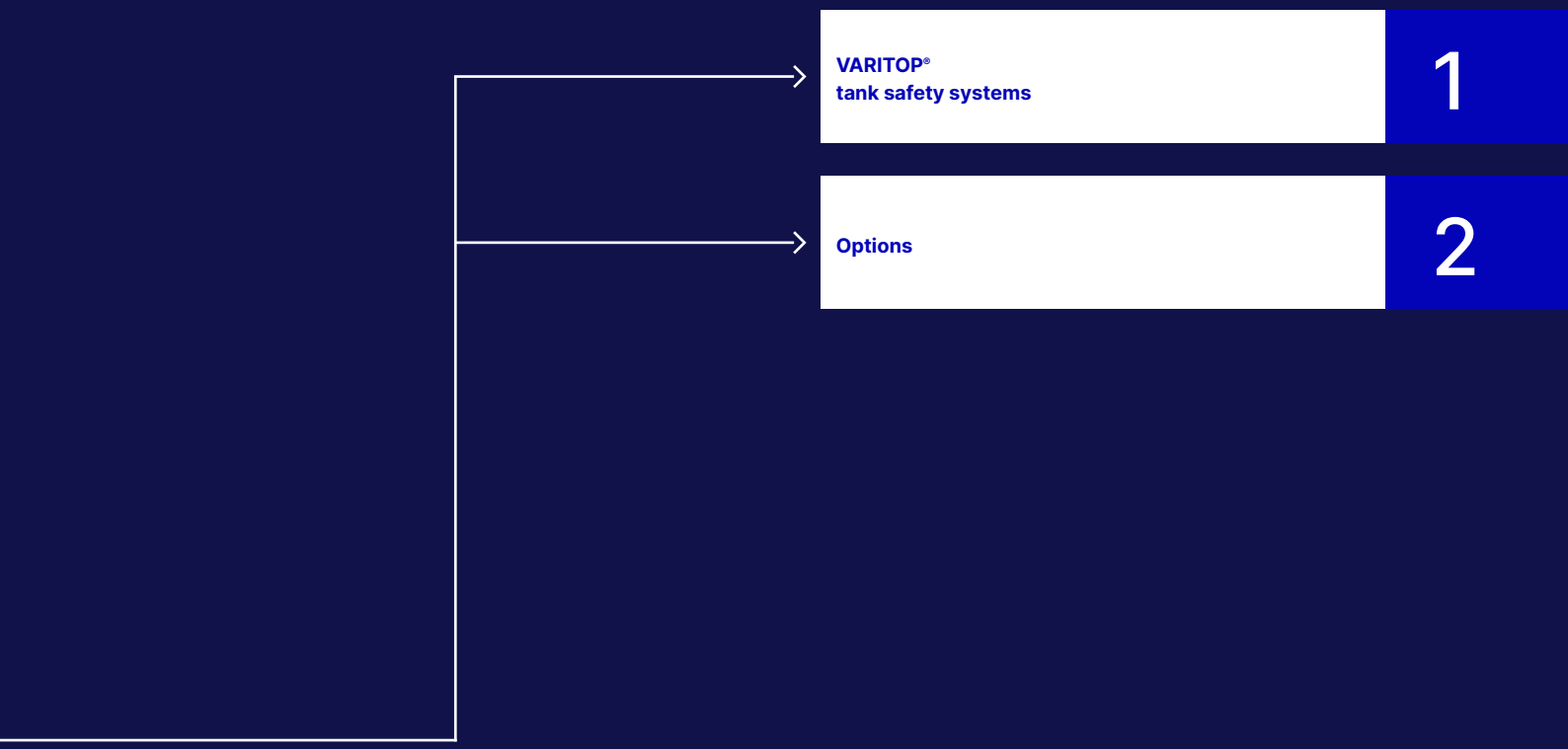
GEA VARITOP®
tank safety systems

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

GEA VARICOVER®
product recovery systems

GEA Service
for hygienic valve technology

GEA valve automation
control and feedback systems


VARITOP®
tank safety systems
1
Options
2

1 VARITOP® TANK SAFETY SYSTEMS

Overview

VARITOP®

The tank safety system VARITOP® is a modular system on the basis of standardized basic components. VARITOP® is used for tank cleaning, to secure against inadmissible excessive and negative pressure and for gassing and degassing of tanks. Each customer may select the respective desired function units. Apart from this, the setup can be structured individually. The result is a functional unit adapted to customer desires.

Special features
Flexibility because of modular principle
Reliability in fully automated processes
Reproducible cleaning result
Securing against excess pressure
Securing against negative pressure

Overview

Function of the system
The tank is secured against excess pressure with springloaded safety relief valves. VARIVENT® vacuum valves secure against negative pressure. For more detailed information about and the configuration of these valves please see catalog GEA VARIVENT® Hygienic Special Application Valves.

A central connection is used to switch gas and CIP paths. The CIP/gas management takes place either via an automatic switch-over module (no power supply required) or via a butterfly valve combination. The cleaning media enters the cleaning lance or the rotating jet cleaner and then the tank through the CIP line in the module. If no cleaning process takes place, gassing and degassing is ensured by a gas bypass at the cross piece and via the switch-over module.

The tank safety system VARITOP® can be placed on a central connection or a tank dome cover. The interface is always the proven VARIVENT® flange connection on the cross piece.

Application example
In practice, VARITOP® tank safety systems are often used in the brewery industry. A typical application is in the securing of tanks in the fermentation and storage cellar areas. During fermentation and storage, VARITOP® can be used to adjust the pressure in the head space of the tank. At the same time, the VARITOP® system protects the tanks from over- or underpressure when filling or emptying.

The option of heating the vacuum valve and the safety relief valve permits using the VARITOP® tank safety system outdoors. However, there is the prerequisite that protective measures must be taken, e.g. for adequate protection from weather influences (enclosure).

Filling and emptying

Tank dome cover connection

Tank dome cover connection

Features of the tank dome cover
More compact design
Sight glass with and without illumination
Optional: GEA level-probe type TNS
Optional: VARIVENT® flange connection

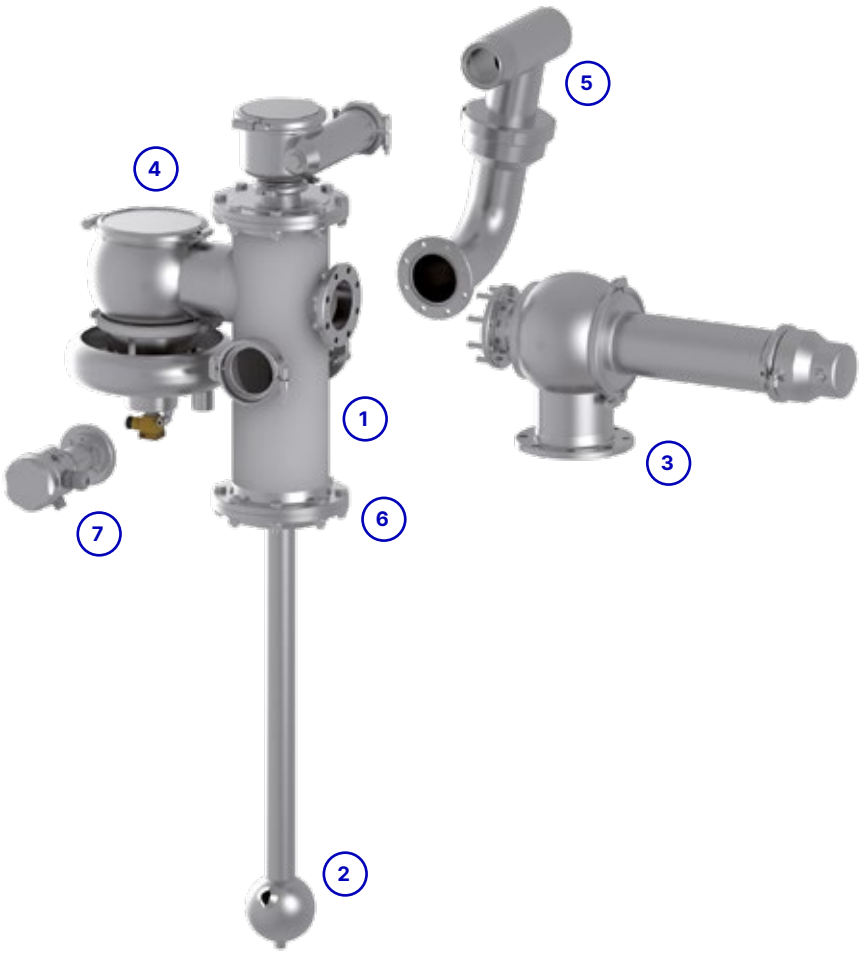
Central connection

Central connection

Features of the central connection
Reduced to one connection to the tank
Identical function ensured
More cost-effective version
VARIVENT® flange connection

Overview

Design of the central connection



1 Cross piece
The cross piece is the central connection point of the containers. All essential components are installed at the cross piece. The special construction ensures complete cleaning of all connected components.

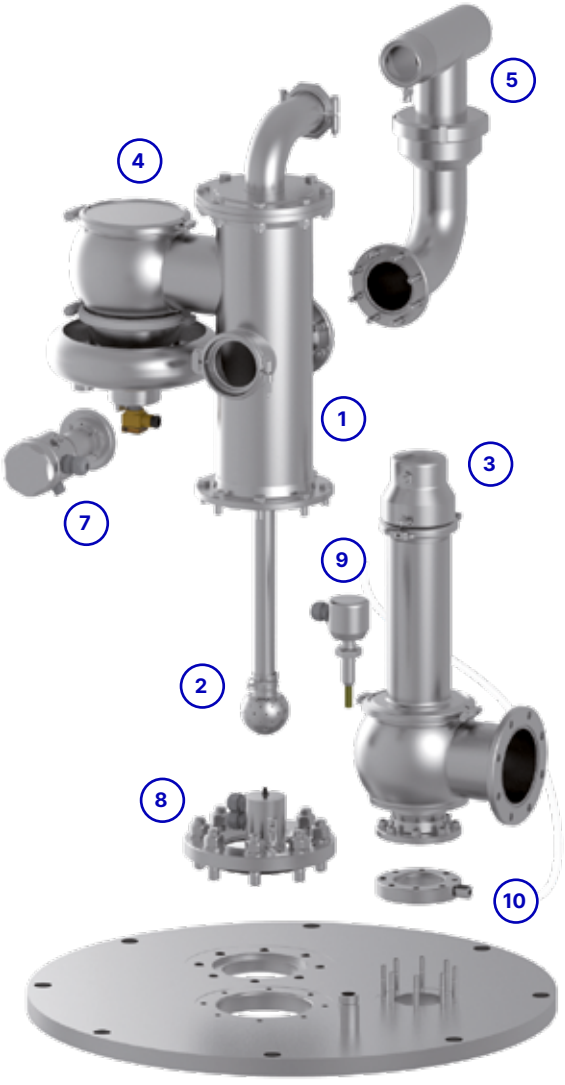
2 Cleaning lance or rotating jet cleaner
The cleaning lance or the rotating jet cleaner is connected to the CIP/gas management and leads to the tank through the cross piece. Special nozzles additionally clean the cross piece from the inside and the connected components.

3 Safety relief valve
The safety relief valve of type 488 or HyCom secures the tanks reliably against excess pressures. For more detailed information and notes on design, see the catalog GEA VARIVENT® Hygienic Special Application Valves.

4 Vacuum valve
VARIVENT® vacuum valves secure the tank against a minimum negative pressure of –2.5 $mbar_g$. The construction of the valve ensures fast reaction times when a vacuum occurs. For more detailed information and notes on design, see the catalog GEA VARIVENT® Hygienic Special Application Valves.

5 Switch-over module of the CIP/Gas management
For more detailed information, see the next pages.

Design of the tank dome cover connection



6 Central connection
For the central connection, the connection to the container takes place via the tried and tested VARIVENT® flange connection. The grooved flange is always provided for at the cross piece.

7 Pressure transmitter
The optional pressure transmitter records the pressure in the head space of the tank above the product. The process connection type VARINLINE® N 50/40 is always present even if no pressure transmitter is provided.

8 Sight glass valve (with illumination)
The sight glass is available as a selection option for the tank dome cover. Additionally, the sight glass can be equipped with illumination. This is attached on the sight glass.

9 GEA level probe type TNS
The GEA level probe is used as overfill protection at vessel filling. It is fitted right on the tank dome cover.

10 Cleaning module
The cleaning module serves the hygienic cleaning of the entrance side of an upright safety relief valve. A cleaning connection at the CIP-pipeline is used to spray cleaning media into the seat area of the valve.

Overview

CIP/GAS Management

Automatic switch-over module
Way I: Open
Way II: Open

In the idle position, the switch-over module keeps the path for gassing and degassing of the tank open (path II). The path to the cleaning device is always opened (path I).

During the supply of cleaning media to the cleaning lance, the switch-over module automatically switches at a flow rate of 10 m^3/h um and closes path II. The exception is with the use of a rotating jet cleaner where the switch-over module closes at 8 m^3/h. The path to gassing and degassing is closed after switching.

Please note the following with the design of the VARITOP®! The gas capacity is pressure dependent and the maximum is 92 m^3/h CO_2 at an operating pressure of 2 bar_g. This can also be converted to other process parameters.

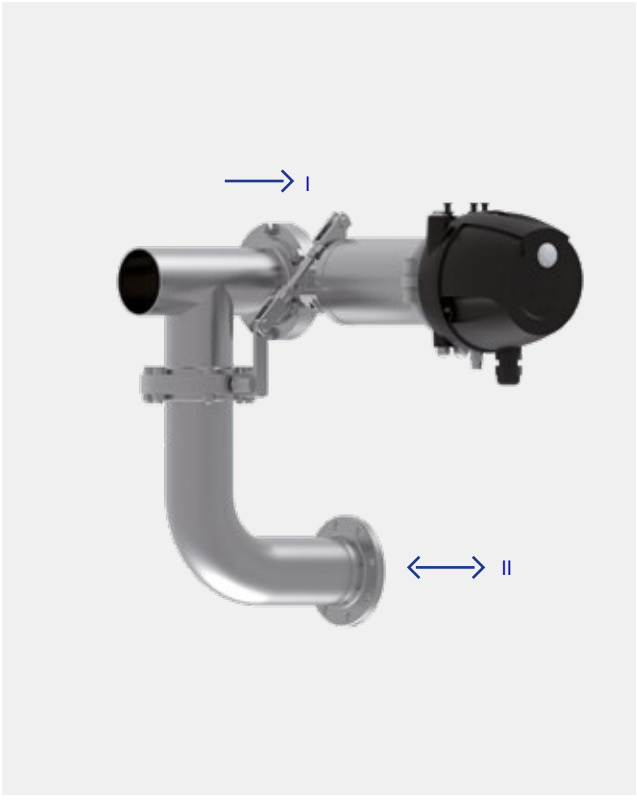
The switch-over module is self-cleaning.

The maximum gas flow into the tank is 145 m^3/h at a maximum pressure drop of 0.01 bar.

Butterfly valve (with power supply)
Way I: Closed
Way II: Open

In the idle position the switch-over module keeps the path for gassing and degassing open. The path to the cleaning device is closed. Pneumatic path switching is provided. After activation the path to the cleaning device is then opened and the gassing and degassing path closed. The switch-over module is designed for higher gas rates.

The butterfly valve combination is optional available with two separate actuators.



Overview

Cleaning Process

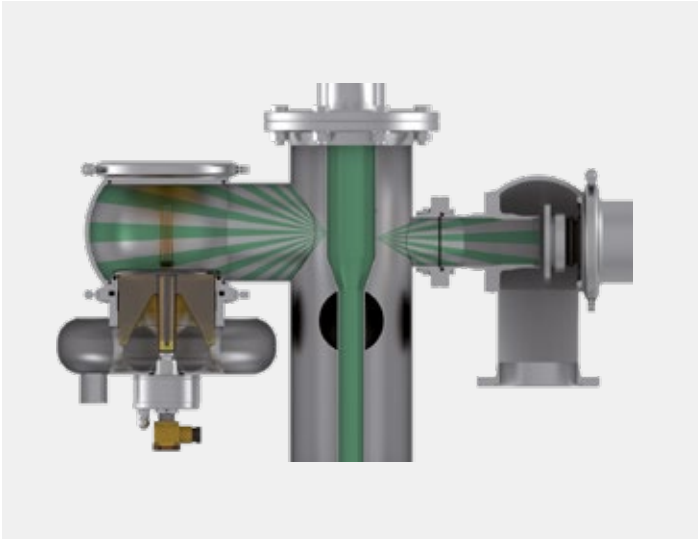
Cleaning of the valves
For the central connection, the safety relief valve and the vacuum valve are cleaned by the cleaning lance or the rotating jet cleaner. The cleaning media is sprayed onto the valve seats through the bores in the lance pipe. To ensure that the valve seats as well as the housings are cleaned, the valve discs can be lifted (optional).

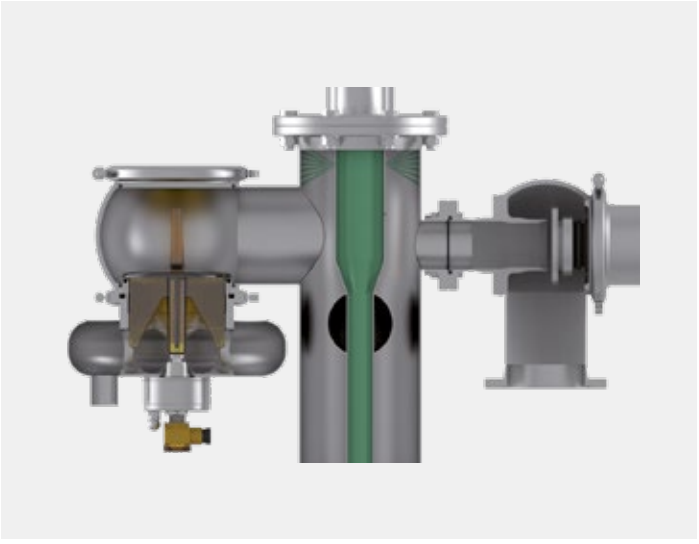
The tank dome cover version has the safety relief valve fitted vertically on the tank dome cover. The valve can be cleaned via a separate cleaning module that is fitted between the tank dome cover and the safety relief valve. For further information refer to the catalog GEA VARIVENT® Hygienic Special Application Valves.

Internal cleaning
The tank can be cleaned with a cleaning lance or a rotating jet cleaner. For the cleaning lance, spray balls, orbital cleaners and rotating cleaners are available cleaning devices.

The cleaning lance or the rotating jet cleaner is fitted on the top of the cross piece and protrudes into the tank through the cross piece. Nozzles in the lance pipe ensure cleaning of the cross piece during tank cleaning.

The automatic switch-over module closes only starting at a corresponding flow rate (see following pages). This volume flow must be reached or exceeded and may be higher than the necessary flow rate for tank cleaning. The divert valve has cleaning openings that ensure cleaning of the connection pipeline to the cross piece when closed.





Cleaning lance and accessories

Many cleaners from the GEA cleaning technology range can be used with the tank safety system VARITOP®. Technical differences from single use can result. Be aware that the maximum permitted working pressure is 10 bar_g.

The cleaning lance is used to adapt the cleaners in the VARITOP® .

For more information on the individual cleaners, see catalog Cleaning Technology.

When using rotating cleaners, we recommend a CIP/Gas management in the form of a butterfly valve combination.

The following cleaners can be used:

Controlled rotating cleaners	Orbital cleaners	Static cleaners
Turbo SSB	Cyclone	Spray ball
	Twister	Recommended operating pressure is between 1.0 and 2.5 bar_g
	Typhoon	
	Tempest	
	Tornado	
	OC200	

For more information on the individual cleaners, see catalog Cleaning Technology.

When using rotating cleaners, we recommend a CIP/Gas management in the form of a butterfly valve combination.

Rotating jet cleaner

The rotating jet cleaner has a proven cleaning concept of slow rotation, combined with powerful and targeted blasting to achieve the best cleaning result.

The following nozzle arrangements are available:

Nozzle placement		
A	C4	E1
B	D1	F2
B1	D2	F3
C1	D3	F5
C2	E	

When using the rotating jet cleaner, we recommend a CIP/Gas management in the form of a butterfly valve combination.

Design

Cleaning Process

Determination of the cleaning volume flow for the overall system
The required flow rate of cleaning media is composed of three different parts. First, the flow rate for the cleaner is determined. Second, the flow rate for the internal cleaning of the systems is determined. If required, a share from using the automatic switch-over module is added. To give an illustrative example, we will present the calculation based on a spray ball type A2 and a cross piece DN 162.

1. Cleaner
Read the flow rate for the cleaner at the desired working pressure; see catalog Cleaning Technology.

Example: Spray ball A2 (1 bar_g): Vcleaner : 21.9 m^3/h

Important: If the spray balls are used at a higher pressure than 1 bar_g, the flow rate changes (see catalog Cleaning Technology).

2. Determination of the flow rate for the internal cleaning in the VARITOP®

Example: Cross piece DN162

$$\dot{V}_{cleaning\ lance} = Kvs\text{-}value \cdot \sqrt{\frac{P}{1}\ \frac{bar_g}{bar_g}}$$

$$\dot{V}_{cleaning\ lance} = 2.3 \cdot \sqrt{\frac{1.0}{1}\ \frac{bar_g}{bar_g}} = 2.3 \frac{m^3}{h}$$

Cleaning flow rate of the internal cleaning

Nominal width of the cross piece	DN 100	DN 125	DN 162
Kvs values [m^3/h]	0.93	1.88	2.30

3. Determination of the overall volume flow
a) For the disc switchover:

For all cleaners:

$$\dot{V}_{total} = \dot{V}_{cleaner} + \dot{V}_{cleaning\ lance}$$

Example: For the spray ball A2 at 1.0 barg in a cross piece DN 162 with disc valve switchover:

$$\dot{V}_{total} = 21.9 \frac{m^3}{h} + 2.3 \frac{m^3}{h} = 24.2 \frac{m^3}{h}$$

b) Exception for automatic switch-over module

The automatic switch-over module consumers the flow rate for self-cleaning: VAuto. Switch-over module This is determined based on the following chart and results from the pressure at the cleaner.

Thus, the overall volume flow is composed as follows:

$$\dot{V}_{total} = \dot{V}_{cleaner} + \dot{V}_{cleaning\ lance} + \dot{V}_{switch\ module}$$

Additionally, the automatic switch-over module requires a minimum volume flow of 10 m^3/h for the divert function independently of the cleaner. Exception: Rotating jet cleaners always close at 8 m^3/h.

Case 1:
- ≤ 8 m³/h for rotating jet cleaners
- ≤ 10 m³/h for all other cleaners

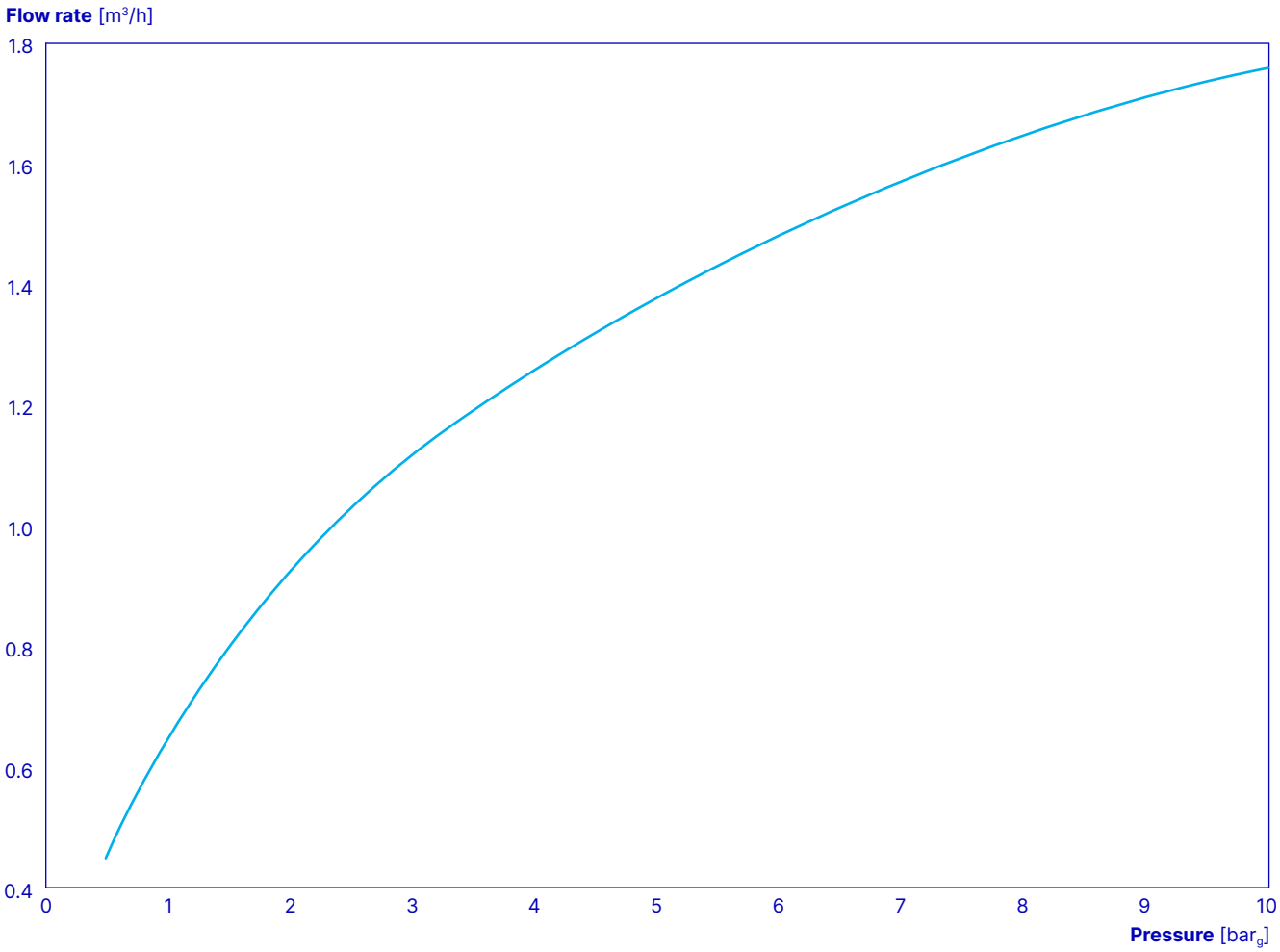
The calculated flow rate is not enough to close the automatic switch-over module.

Case 2:
- > 8 m³/h for rotating jet cleaners
- > 10 m³/h for all other cleaners

The calculated flow rate is enough to close the switch-over module.

Example: For the spray ball A2 at 1.0 barg in a cross piece DN 162 with automatic switch-over module:

$$\dot{V}_{total} = 21.9\frac{m^3}{h} + 2.3\frac{m^3}{h} + 0.65\frac{m^3}{h} = 24.85\frac{m^3}{h}$$



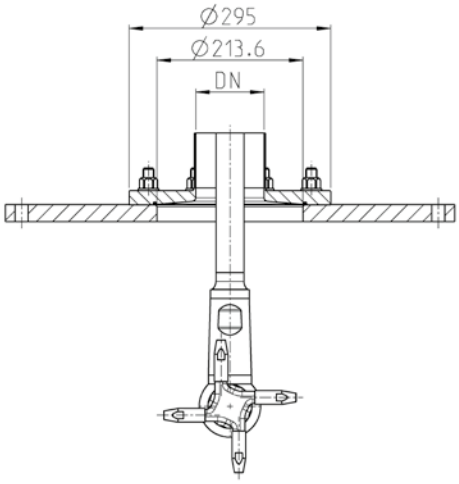
Options

Special Flange

Special flange for cleaners with larger installation opening
The special flange is used for cleaners that require an access opening larger than the nominal width of the cross piece. To permit installation of such cleaners from the outside, an enlarged flange is attached to the cross piece. The cleaner is first fitted to the cross piece and then installed at the tank as one unit. For overproportional cleaners, the special flange is selected automatically.

This version is only possible in combination with the tank dome cover (D).

The special flange is fitted on the tank dome cover. The mounting opening and the outer diameter of the special flange always have the same sizes, as you can see from the dimensional drawing on the left. The connection diameter to the cross piece varies according to the cross piece nominal width.



Nominal width	Diameter of the installation opening
DN 100	213.6 mm
DN 125	213.6 mm
DN 162/IPS 6"	213.6 mm

Pressure transmitter
The pressure transmitter is installed at the cross piece. Gas pressures of 0–4 barg or 0–10 barg can be measured in the head space of the tank. The process connection type is VARINLINE® N 50/40.

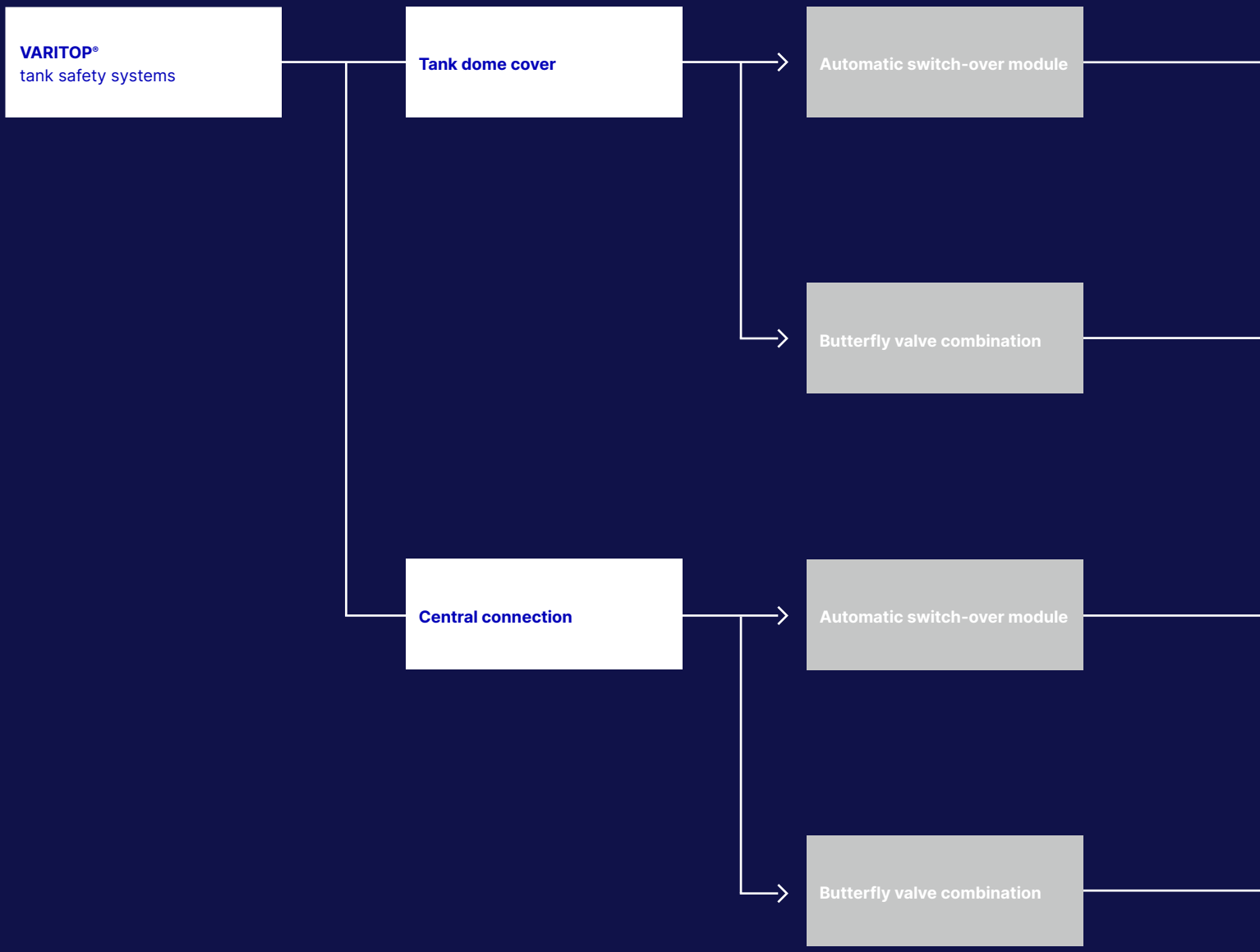
Sight glass
The sight glass is available as a selection option for the tank dome cover. Additionally, the sight glass can be equipped with illumination 50 W.

GEA level probe type TNS
Evaluation of the GEA level probe takes place conductively and can be used for different media. It can be chosen optionally and is fitted into a weld-in adapter on the tank dome cover. For further information refer to the catalog GEA VARIVENT® Hygienic Special Application Valves.

Cleaning module
The cleaning module performs the hygienic cleaning of the entrance side of an upright safety relief valve. It is installed between the tank dome cover and the safety relief valve. A cleaning connection at the CIP pipeline is used to spray cleaning media into the seat area of the valve.

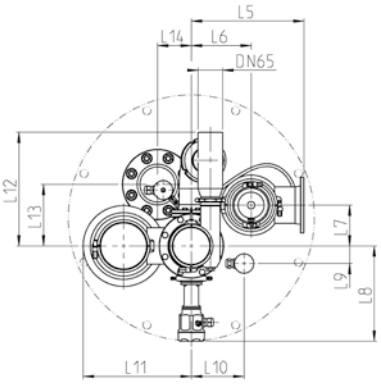
For further information refer to the catalog GEA VARIVENT® Hygienic Special Application Valves.

Selection Matrix

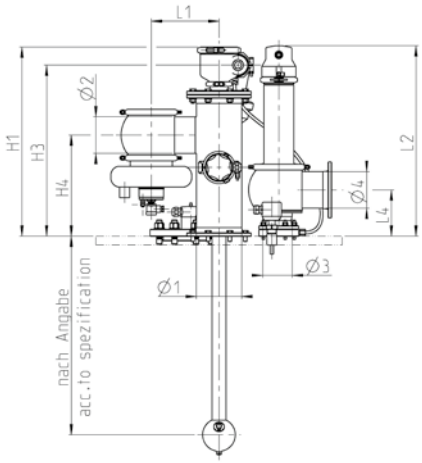



Rotating jet cleaner
VARITOP® TTB 11 D
Cleaning lance
VARITOP® TTB 12 D
Rotating jet cleaner
VARITOP® TTB 41 D
Cleaning lance
VARITOP® TTB 42 D
Rotating jet cleaner
VARITOP® TTB 11 Z
Cleaning lance
VARITOP® TTB 12 Z
Rotating jet cleaner
VARITOP® TTB 41 Z
Cleaning lance
VARITOP® TTB 42 Z

VARITOP®
Type TTB 11 D



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 60 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	R_a ≤ 1.6 µm
CIP/GAS management	Automatic switch-over module
Cleaner	Rotating jet cleaner
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

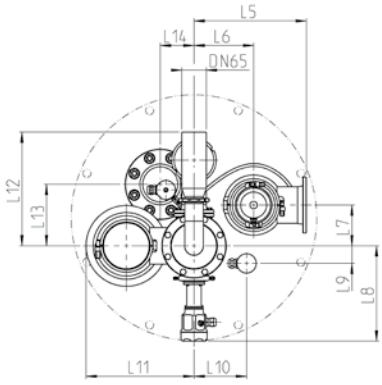
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L6 [mm]	L7 [mm]	L8 [mm]	L9 [mm]	L10 [mm]	L11 [mm]	L12 [mm]	L13 [mm]	L14 [mm]
DN 100	80	514	457	271	180	170	116	288	50	150	295	324	160	96
DN 125	100	545	488	288	193	170	116	301	50	150	308	324	175	96
DN 162	162	649	592	361	243	170	116	323	50	180	386	324	200	96

Maximum values for safety relief valve

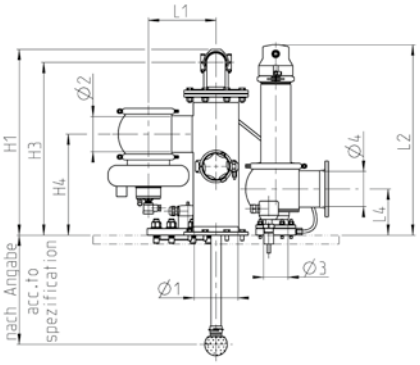
		Safety relief valve type 488			Safety relief valve type HyCom		
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L5 [mm]	L2 [mm]	L4 [mm]	L5 [mm]
25	40	363	98	260	454	89	255
40	65	559	115	295	574	94	255
50	80	574	123	295	629	104	275
65	100	593	132	295	740	105	285
80	125	732	148	320	816	118	300

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 12 D



Top view



Front view

Technical data of the standard version	
Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 60 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	$R_a \leq 1.6$ µm
CIP/GAS management	Automatic switch-over module
Cleaner	Cleaning lance
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

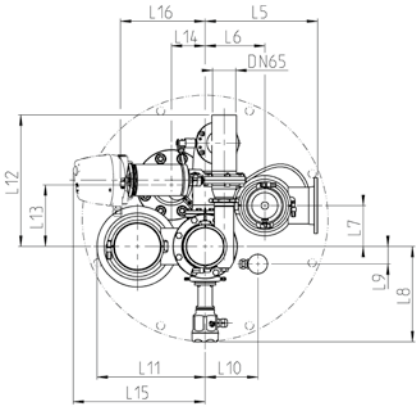
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L6 [mm]	L7 [mm]	L8 [mm]	L9 [mm]	L10 [mm]	L11 [mm]	L12 [mm]	L13 [mm]	L14 [mm]
DN 100	80	502	465	271	180	170	116	288	50	150	295	324	160	96
DN 125	100	529	492	288	193	170	116	301	50	150	308	324	175	96
DN 162	162	637	600	361	243	170	116	323	50	180	386	317	200	96

Maximum values for safety relief valve

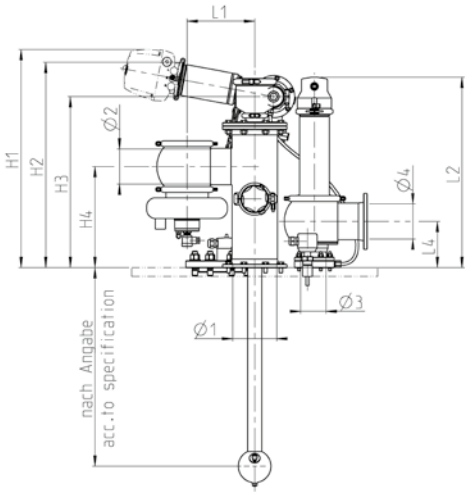
		Safety relief valve type 488			Safety relief valve type HyCom		
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L5 [mm]	L2 [mm]	L4 [mm]	L5 [mm]
25	40	363	98	260	454	89	255
40	65	559	115	295	574	94	255
50	80	574	123	295	629	104	275
65	100	593	132	295	740	105	285
80	125	732	148	320	816	118	300

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 41 D



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 80 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	$R_a \leq 1.6$ µm
CIP/GAS management	Butterfly valve combination
Cleaner	Rotating jet cleaner
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

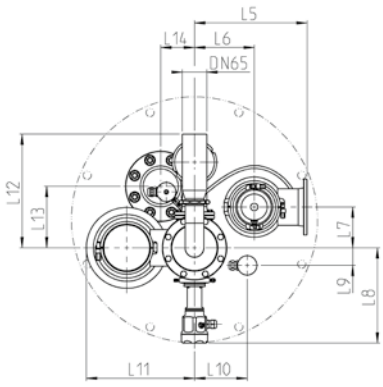
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L6 [mm]	L7 [mm]	L8 [mm]	L9 [mm]	L10 [mm]	L11 [mm]	L12 [mm]	L13 [mm]	L14 [mm]	L15 [mm]	L16 [mm]
DN 100	80	640	575	457	271	180	170	116	288	50	150	295	374	160	96	428	319
DN 125	100	671	606	488	288	193	170	116	301	50	150	308	374	175	96	428	319
DN 162	162	775	710	592	361	243	170	116	323	50	180	386	375	200	96	428	319

Maximum values for safety relief valve

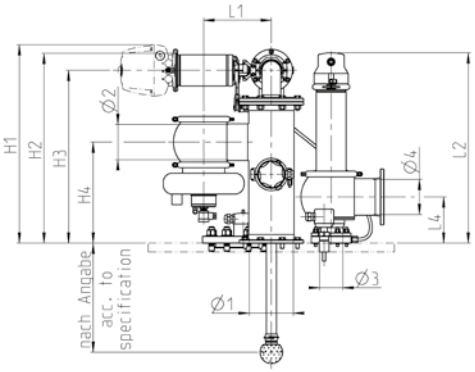
		Safety relief valve type 488			Safety relief valve type HyCom		
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L5 [mm]	L2 [mm]	L4 [mm]	L5 [mm]
25	40	363	98	260	454	89	255
40	65	559	115	295	574	94	255
50	80	574	123	295	629	104	275
65	100	593	132	295	740	105	285
80	125	732	148	320	816	118	300

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 42 D



Top view



Front view

Technical data of the standard version	
Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 80 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	R_a ≤ 1.6 µm
CIP/GAS management	Butterfly valve combination
Cleaner	Cleaning lance
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

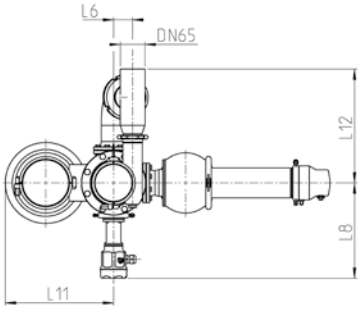
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L6 [mm]	L7 [mm]	L8 [mm]	L9 [mm]	L10 [mm]	L11 [mm]	L12 [mm]	L13 [mm]	L14 [mm]	L15 [mm]	L16 [mm]
DN 100	80	568	526	465	271	180	170	116	288	50	150	295	374	160	96	435	326
DN 125	100	595	553	492	288	193	170	116	301	50	150	308	374	175	96	435	326
DN 162	162	700	658	597	361	243	170	116	323	50	180	386	375	200	96	435	326

Maximum values for safety relief valve

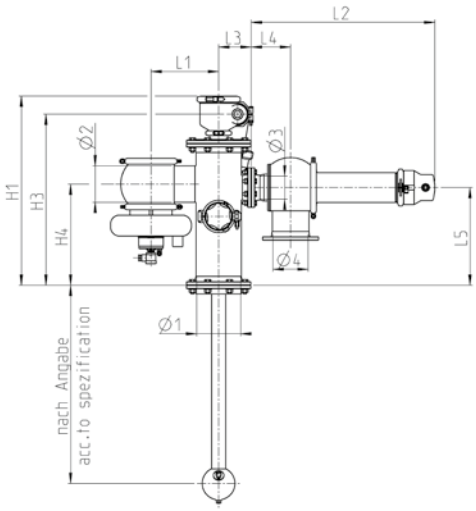
		Safety relief valve type 488			Safety relief valve type HyCom		
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L5 [mm]	L2 [mm]	L4 [mm]	L5 [mm]
25	40	363	98	260	454	89	255
40	65	559	115	295	574	94	255
50	80	574	123	295	629	104	275
65	100	593	132	295	740	105	285
80	125	732	148	320	816	118	300

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 11 Z



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 60 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	$R_a \leq 1.6$ µm
CIP/GAS management	Automatic switch-over module
Cleaner	Rotating jet cleaner
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

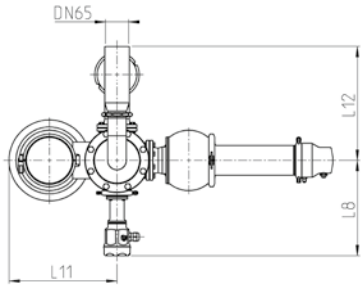
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L5 [mm]	L6 [mm]	L8 [mm]	L11 [mm]	L12 [mm]
DN 100	80	514	457	271	180	276	54	288	295	324
DN 125	100	545	488	288	193	283	54	301	308	324
DN 162	162	649	592	361	243	376	54	323	386	324

Maximum values for safety relief valve

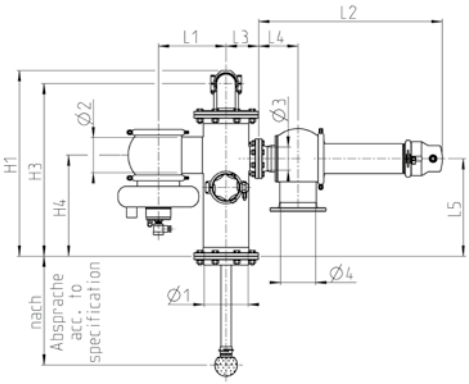
		Safety relief valve type 488		Safety relief valve type HyCom	
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L2 [mm]	L4 [mm]
25	40	343	78	434	69
40	65	539	95	554	74
50	80	554	103	609	84
65	100	573	112	720	85
80	125	712	128	796	98

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 12 Z



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 60 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	$R_a \leq 1.6$ µm
CIP/GAS management	Automatic switch-over module
Cleaner	Cleaning lance
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

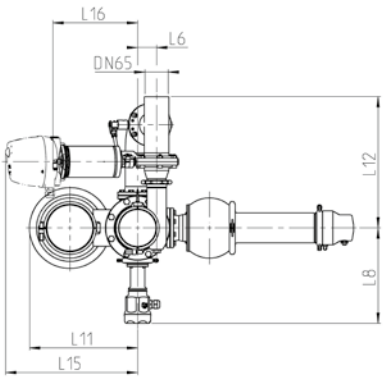
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L5 [mm]	L8 [mm]	L11 [mm]	L12 [mm]
DN 100	80	502	465	271	180	276	288	301	323
DN 125	100	529	492	288	193	283	295	308	386
DN 162	162	637	600	361	243	376	324	324	317

Maximum values for safety relief valve

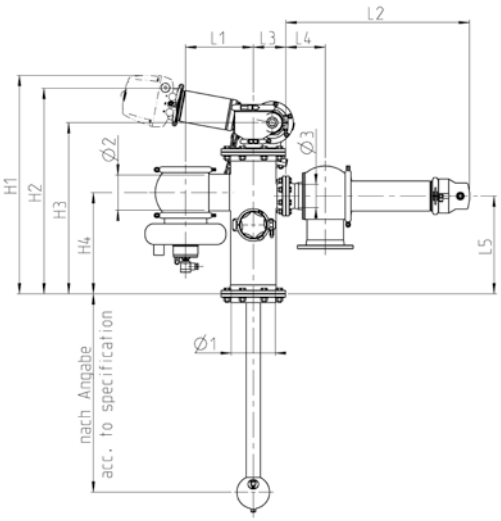
		Safety relief valve type 488		Safety relief valve type HyCom	
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L2 [mm]	L4 [mm]
25	40	343	78	434	69
40	65	539	95	554	74
50	80	554	103	609	84
65	100	573	112	720	85
80	125	712	128	796	98

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 41 Z



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 80 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	$R_a \leq 1.6$ µm
CIP/GAS management	Butterfly valve combination
Cleaner	Rotating jet cleaner
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

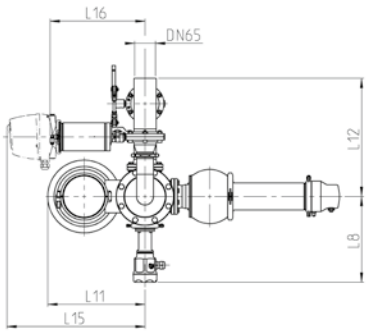
Nominal width Ø1	Ø2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L5 [mm]	L6 [mm]	L8 [mm]	L12 [mm]	L15 [mm]	L16 [mm]
DN 100	80	640	575	457	271	180	276	54	288	374	428	326
DN 125	100	671	606	488	288	193	283	54	301	374	428	326
DN 162	162	775	710	592	361	243	376	54	323	375	428	326

Maximum values for safety relief valve

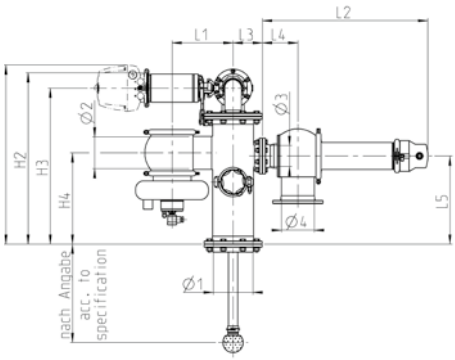
		Safety relief valve type 488		Safety relief valve type HyCom	
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L2 [mm]	L4 [mm]
25	40	343	78	434	69
40	65	539	95	554	74
50	80	554	103	609	84
65	100	573	112	720	85
80	125	712	128	796	98

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

VARITOP®
Type TTB 42 Z



Top view



Front view

Technical data of the standard version

Material in contact with the product	1.4404
Seal material	EPDM
Ambient temperature	0 to 45 °C
Operating temperature	< 80 °C
Air supply pressure	6 bar (87 psi), max. 8 bar (116 psi)
Product pressure	10 bar (145 psi)
Surface in contact with the product	R_a ≤ 1.6 µm
CIP/GAS management	Butterfly valve combination
Cleaner	Cleaning lance
Connection fittings	VARIVENT® flange on the tank side, CIP/GAS connection of the welding end
Identification	Adhesive ID tag

Dimension

Nominal width Ø1	Ø2 [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H4 [mm]	L1 [mm]	L5 [mm]	L8 [mm]	L12 [mm]	L15 [mm]	L16 [mm]
DN 100	80	568	526	465	271	180	276	288	374	435	326
DN 125	100	595	553	492	288	193	283	301	374	435	326
DN 162	162	700	658	597	361	243	376	323	375	435	326

Maximum values for safety relief valve

		Safety relief valve type 488		Safety relief valve type HyCom	
Ø3 [mm]	Ø4 [mm]	L2 [mm]	L4 [mm]	L2 [mm]	L4 [mm]
25	40	343	78	434	69
40	65	539	95	554	74
50	80	554	103	609	84
65	100	573	112	720	85
80	125	712	128	796	98

The description of the options – as well as the configuration of the system designation – can be found at the end of this section.

Selection Scheme

Position	Description of the selection scheme	
1	**CIP/GAS management**	
	1	Automatic switch-over module
	4	Butterfly valve combination
		Selection actuator type butterfly valve combination
		Pneumatic (standard) Pneumatic with control top
		 
2	**Cleaning device**	
	1	Rotating jet cleaner
	2	Central connection
3	**Tank connection**	
	D	Tank dome cover
	Z	Central connection
4	**Installation orientation safety relief valve**	
	L	Horizontal
	S	Upright
5	**Safety relief valve type**	
	L	Safety relief valve type 488
	M	Safety relief valve type HyCom
6	**Connection type cross piece**	
	TN	VARIVENT® grooved flange
	X	Special connection tank side (for cleaner > Ø 162 mm)
7	**CIP/GAS connection**	
	N	Welding end DN 65
	GK	Pipe fitting S complete DN 65 DIN 11851
	TK	VARIVENT® flange connection DN 65
8	**Pressure measurement**	
	–	Without; housing connection N + blanking
	G	Pressure transmitter 0–4 bar
	GB	Pressure transmitter 0–10 bar
9	**Level indicator (optional for tank connection D and DZ)**	
	–	Without
10	**Sight glass (optional for tank connection D and DZ)**	
	–	Without
	G	Sight glass
	GB	Sight glass illuminated 50 W 24 V
11	**Counter flange cross piece (optional for tank connection Z)**	
	–	Without
	TF	VARIVENT® plain flange

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

Position		1	2		3		4		5		6		7		8		9		10		11
Code	TTB			-		-		-		-		-		-		-		-		-	

For order codes differing from the standard version, please refer to section 2.

Questionnaire

Customer	
Company name / customer number	
Project	
Contact	
Phone	
Email	
Basic data	
Installation of the VARITOP®	☐ Central connection ☐ Tank dome cover
Switch-over module	☐ Automatic switch-over module (11/12) ☐ Butterfly valve combination (41/42)
Selection actuator type butterfly valve combination (41/42)	☐ Pneumatically – 1 actuator with switching combination (standard) ☐ Pneumatically with control top T.VIS® M-15 – 1 actuator with switching combination
Safety relief valve	☐ Pneumatic lifting ☐ Monitoring ☐ Heating
Vacuum valve	☐ Pneumatic lifting ☐ Monitoring ☐ Heating
Option	☐ Level probe ☐ 30 mm ☐ 150 mm ☐ 500 mm ☐ 1,000 mm ☐ 1,800 mm ☐ Required length between 30 and 1,800 mm: _____
	☐ Sight glass ☐ Illuminated
	☐ Pressure transmitter ☐ 0–4 bar_g ☐ 0–10 bar_g
Process	
Ø of the tank	_____ m
Tank height	_____ m
Outlet diameter	DN _____
Set pressure safety relief valve	_____ bar_g
Tank vacuum safety	_____ $mbar_g$
Max. fill flow rate	_____ m^3/h
Emptying output	_____ m^3/h

Questionnaire

Product				
Medium*	_____		☐ Configuration for water	
Viscosity [cP]*	_____			
Density [kg/m³]*	_____			
Min. temperature [°C]*	_____			

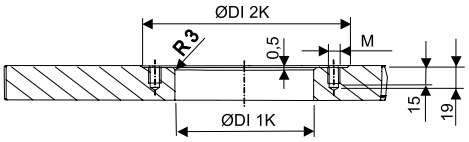
Cleaner				
Type of contamination	☐ Water-soluble	☐ Solvent-soluble	☐ Crusted	
Cleaners	Rotating cleaners	Orbital cleaners	Rotating jet cleaners with nozzle placement	Static cleaners
	☐ Turbo SSB	☐ Cyclone ☐ Twister ☐ Typhoon ☐ Tempest ☐ Tornado ☐ OC200	☐ A ☐ C4 ☐ E1 ☐ B ☐ D1 ☐ F2 ☐ B1 ☐ D2 ☐ F3 ☐ C1 ☐ D3 ☐ F5 ☐ C2 ☐ E ☐ F6	☐ Spray ball
		☐ With monitoring	☐ With monitoring	

Comments

* If any information is missing, the safety relief valve is designed for water.

Dimensions of Tank Dome Cover

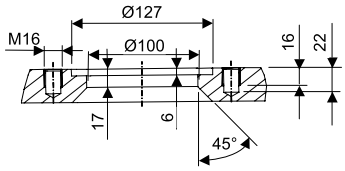
Section A



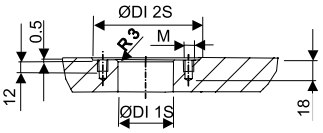
Surface finish of the sealing surfaces $R_a \leq 1.6$ µm, Tolerances according to ISO 2768-mk

⚠ No screws must be on the marked diameter ØK for tank lid attachment, since the proximity switch of the vacuum valve otherwise cannot be removed.

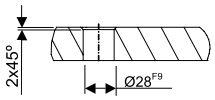
Section B

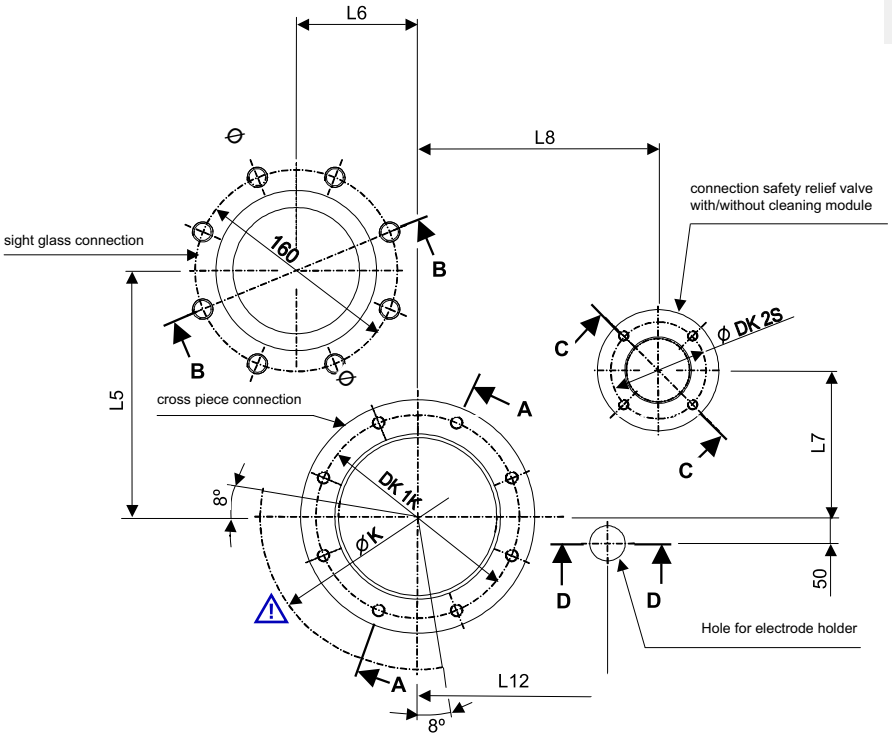


Section C



Section D





Note: The following dimensions are minimum distances. The sight glass and electrode holder are available as options for the respective design.

Coordinates

	L5 [mm]	L6 [mm]	L12 [mm]
VARITOP® TTB DN 100 with vacuum valve DN 80	160	96	150
VARITOP® TTB DN 125 with vacuum valve DN 100	175	96	150
VARITOP® TTB DN 162 with vacuum valve DN 162	200	96	150

Dimensions for cross piece connection (see section A)

Nominal width	No. of threaded bores × M [mm]	ØDK 1K [mm]	ØDI 1K [mm]	ØDI 2K [mm]	ØK [mm]
DN 100	8 × M10	137	100	161	360
DN 125	8 × M10	161	125	185	384
DN 162	8 × M12	202	162	230	485

Dimensions for safety valve connection (see section C)

Nominal width	No. of threaded bores × M [mm]	ØDK 2S [mm]	ØDI 1S [mm]	ØDI 2S [mm]	L7 [mm]	L8 [mm]
DN 25	4 × M8	53	26	72	116	170
DN 40	4 × M8	65	38	84	116	170
DN 50	4 × M8	77	50	96	116	170
DN 65	8 × M8	95	66	115	116	170
DN 80	8 × M8	110	81	130	116	170
DN 100	8 × M10	137	100	161	130	220

2 OPTIONS

VARITOP® Tank Safety Systems

Available Options

Options
Connection Fittings
Overview

Typical application and description
The socket 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.

Connection fittings	
TK	VARIVENT® flange connection, groove flange on housing
TN	VARIVENT® groove flange incl. O-ring and connecting parts
TF	VARIVENT® flange

Options
Connection Fittings
VARIVENT® Flange Connection

Complete connection including bolts and nuts (TK)

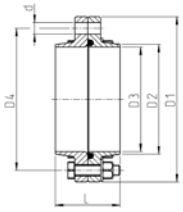
Groove flange (TN), including connecting elements and seal ring

Flange (TF)

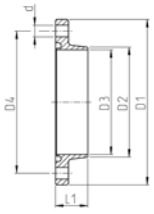
Typical application and description

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

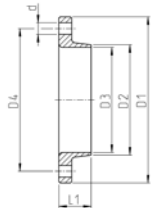
The VARIVENT® flange connection (TK) can be ordered either as a complete connection including bolts and nuts (TK) or a groove flange (TN)/flange (TF) as a connection fitting on a vertical port. If a complete connection is ordered as the connection fitting, the groove flange is welded onto the housing.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



TK = VARIVENT® flange connection



TN = VARIVENT® groove flange



TF = VARIVENT® flange

Available nominal widths

Metric	DN	100–125
Inch IPS	IPS	6"

Technical data

Material	1.4404
Surface in contact with the product	$R_a \leq 0.8$ µm
Certificates	3.1/AD2000W2
Seal materials	EPDM (FDA), FKM (FDA), HNBR (FDA)

							Dimension	**O-Ring**	
Nominal width	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	d [mm]	L [mm]	L1 [mm]	[mm]	PS
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
IPS 6"	227	168.0	162.0	202	8 × Ø 9	50	25	62 × 5.0	10

Options
Additional Options
Test Report and Inspection Certificate

Typical application and description
Optionally, the housings and connection fittings 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).

Options
General
Lubricant

Lubricant	
Tool	**Article number**
Rivolta F.L.G. MD-2 (1,000 g)	413-071
Rivolta F.L.G. MD-2 (100 g)	413-136

GEA Valve Automation – Control and Feedback Systems

Valve automation for increased process reliability, efficiency and flexibility

GEA's 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 VARICOVER® product recovery systems
The T.VIS® M-15 offers an attractively priced basic version of control and feedback technology for GEA VARICOVER® product recovery systems 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.

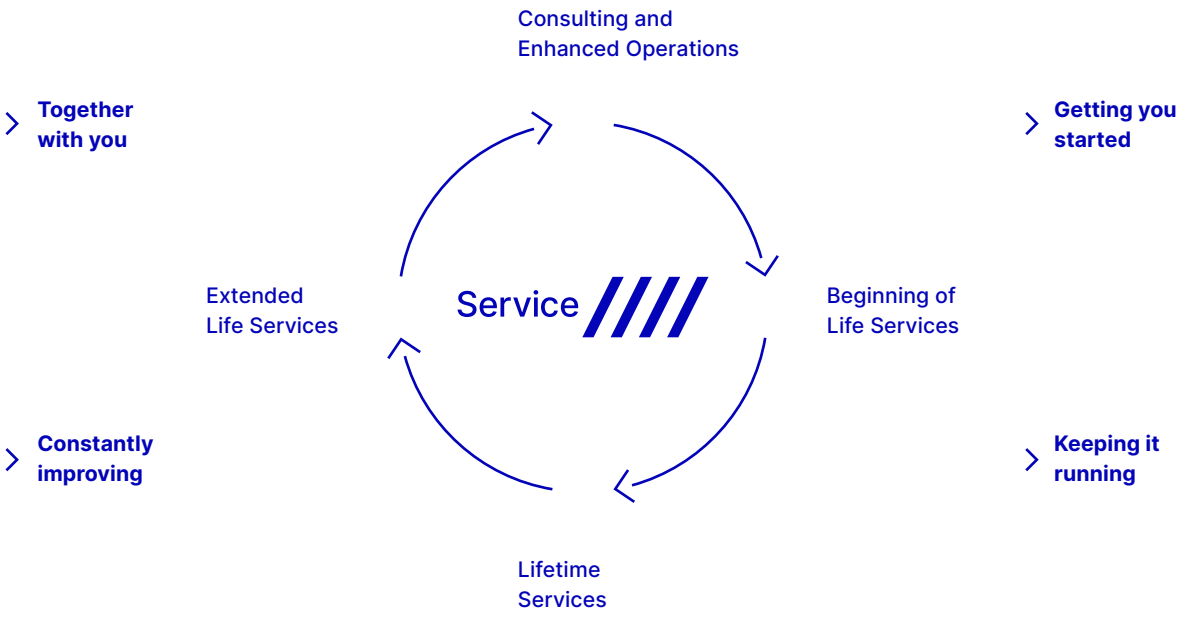
The T.VIS® A-15 offers extended functional scope and greater ease of operation. Besides the established types of communication, this control top also features the groundbreaking IO-Link technology, which allows users to set the parameters for components centrally in the system via digital data exchange 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.

Our service package for dependable valve technology

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

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



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

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

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

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

Description of Certificates

3-A		3-A Sanitary Standards, Inc. (3-A SSI) is an independent, non-profit corporation dedicated to advancing hygienic equipment design for the food, beverage, and pharmaceutical industries.
24/7 PMO VALVE 2.0® NON-STOP PRODUCTION		24/7 PMO VALVE® is a registered trade mark of GEA Tuchenhagen GmbH. It describes double-seat valves that have been authorized for use in PMO-regulated systems for carrying out the seat lift in order to clean the leakage chamber while the other pipeline is carrying product. This grants system operators the possibility of cleaning all valve components in contact with the product in parallel with the production process. In this way, the valves permit uninterrupted production on a 24/7 basis.
AS-i		Actuator Sensor interface. BUS system for the lowest field level.
ATEX		Atmosphères Explosibles. ATEX comprises the directives of the European Union in the area of explosion protection. Complies with the applicable requirements of ATEX directives: 2014/34/EU.
CCCEx		Complies with the applicable requirements of CCCEx directives in China.
cCSAus		Test of a product by CSA according to applicable safety standards in Canada and the USA.
CE		Conformité Européenne. By affixing the CE mark, the manufacturer confirms that the product complies with the European directives 765/2008 applicable to the specific product.
CSA		Canadian Standards Association. A non-governmental Canadian organization which issues standards as well as checking and certifying the safety of products. It is now globally active.
cULus		Test of a product by UL according to applicable safety standards in Canada and the USA.
DeviceNet		BUS system of the ODVA organization for complex communication on various field levels.
EG 1935/2004*		Materials in contact with the product used in valves from GEA Tuchenhagen GmbH are in accordance with EC regulation 1935/2004. This defines a general framework for materials and objects intended to come into contact with foodstuffs.
EHEDG		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 confirmity 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 maximim 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 Mjölk Standard, Scandinavian pipe dimension
SW	Indicates the size of a tool spanner, “Schlüsselweite”
TA-Luft VDI 2440	If a product is certified according to TA Luft it meets the requirements for proof of high grade performance according to TA Luft of 1.0× 10-4 mbar x l / (s x m) at service conditions under the VDI guideline 2440. The product will hence be tested for tightness.
TEFASEP® gold	Brand name for GEA's proprietary valve seat seal (hard sealing)
T.VIS®	GEA Tuchenhagen valve information system, control top system from GEA Tuchenhagen
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 Tuchenhagen
VMQ	High-polymer vinyl methyl polysiloxane, silicone rubber, MVQ = synonym
W	Watt, unit of measurement for power
Y	Control air connection for the working cylinder, designation from pneumatic systems
µ	Micro, one millionth of a unit
Ω	Ohm, the unit of electrical resistance named after Georg Simon Ohm

CAD Files

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

Available drawing formats:

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

General Sales Terms and Condition of Delivery

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

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

VARITOP® Type TTB 11 D
GEA VARITOP®
Hygienic Tank Safety Systems

VARITOP® Type TTB 41 D
GEA VARITOP®
Hygienic Tank Safety Systems

VARITOP® Type TTB 11 Z
GEA VARITOP®
Hygienic Tank Safety Systems

VARITOP® Type TTB 41 Z
GEA VARITOP®
Hygienic Tank Safety Systems

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Engineering for a better world.

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GEA VARITOP® Hygienic Tank Safety Systems/EN-05-2023 Subject to modifications. Printed in Germany.