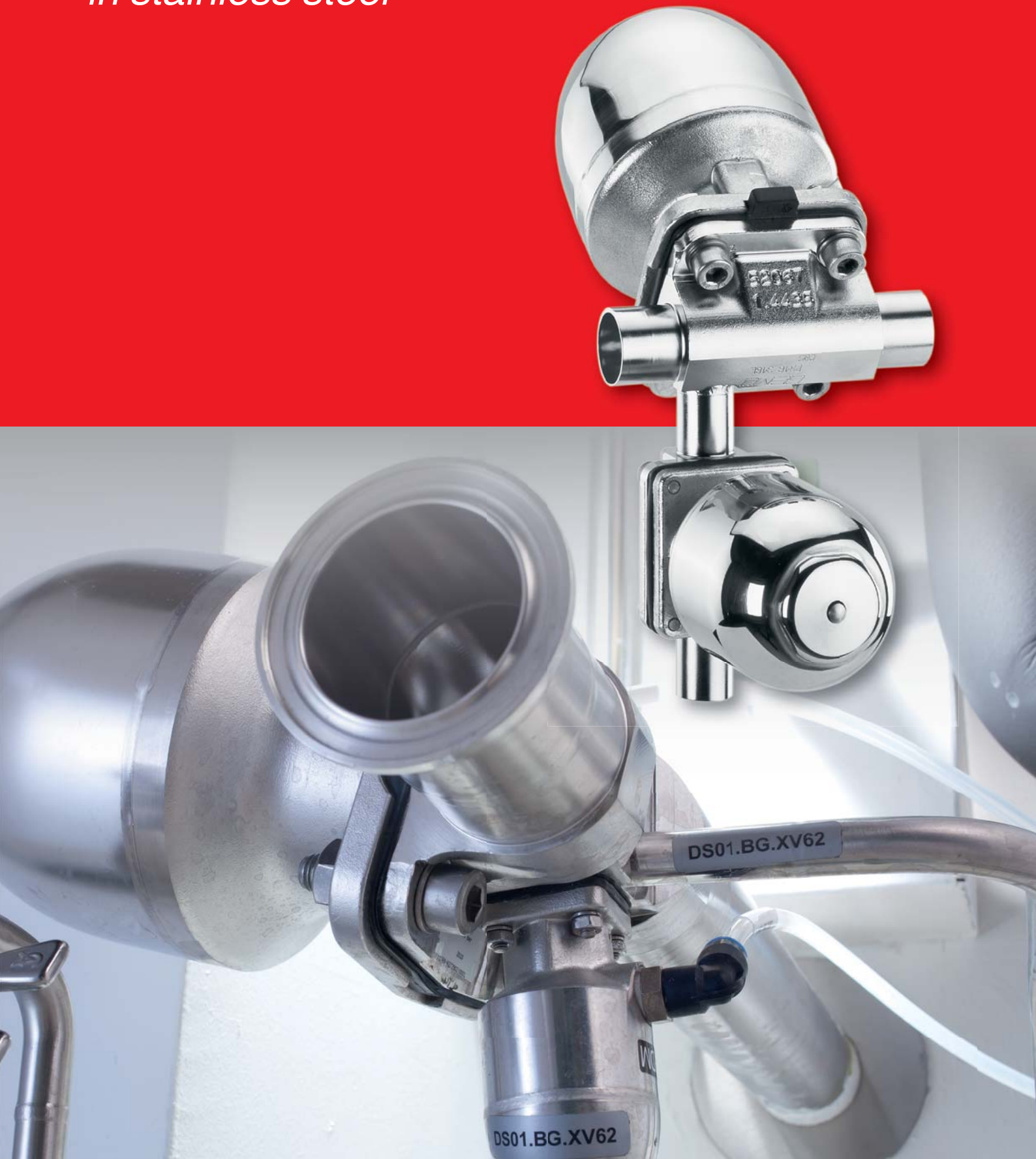
GEMÜ®

VALVES, MEASUREMENT AND CONTROL SYSTEMS

W600 Valve Configurations
in stainless steel



Leading the world in pharmaceutical and biotechnology industry sterilisation processes

GEMÜ is one of the leading manufacturers of valves, measurement and control systems for sterile applications in the pharmaceutical and biotechnology industries. This position is based on GEMÜ's comprehensive investments in application-oriented research & development, amounting to more than 5% of the company's turnover. The versatile product range is supplemented with a wide range of advisory services provided by industry specialists and application experts.

Customised solutions for your project business

GEMÜ provides the optimal solution from a single source. As a system supplier of isolation, actuator and control technology, we can respond very flexibly to your individual project-specific needs.

Our worldwide sales network provides fast reaction times, customer oriented service and a committed project management team.

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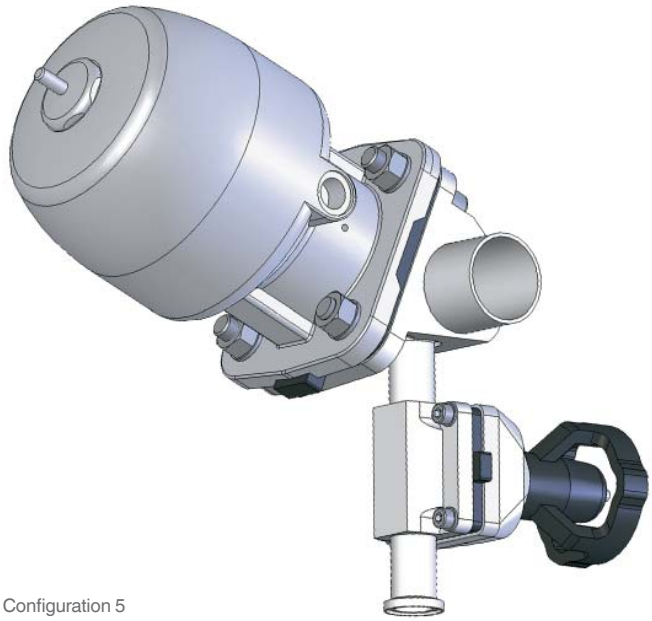
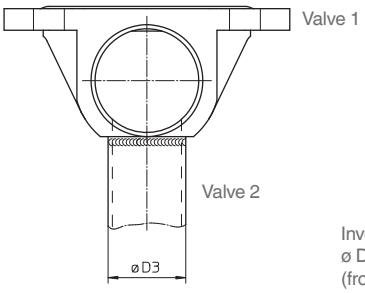
W600 welding configurations

Configuration 2



Configuration 5

The arrangement of two valves welded together to suit the respective application provides maximum functionality in a restricted space. The assembly does without a T piece and thus the dead space between the valves is essentially reduced and two welds are no longer necessary. If more compact designs are required, we recommend using GEMÜ i-bodies and multi-port valve blocks from the GEMÜ M600 series which are machined from a single block.They also have a lower hold-up volume and only a minimum of welds.

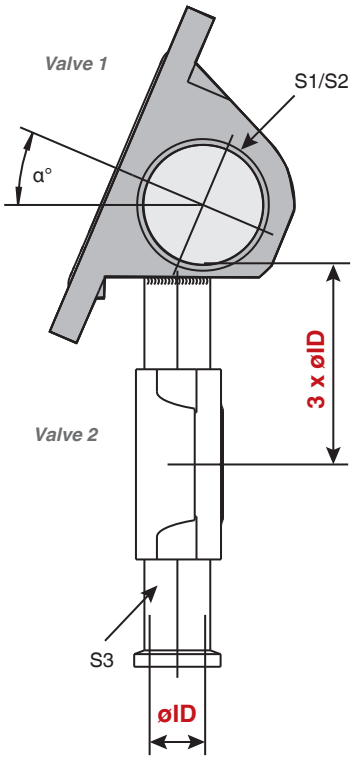


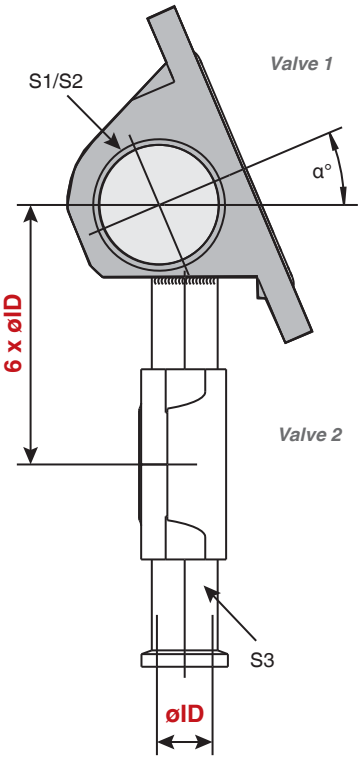
Investment cast body (code 34):
ø D3 max. = 13.5 mm
(from diaphragm size 10 to 50)

Features

- *Standard valve body material 1.4435 in investment cast, forged or block material design*
- *Various connections selectable*
- *Various grades of surface finish available*
- *Operators from the GEMÜ modular system*
- *Cost effective*
- *No T piece required*
- *Valve 2 can be welded on with draining angle*

3D and 6D rule





Various regulations form the basis for plant designs. Plant operators are normally concerned with the FDA/GMP directives and the ASME/BPE standard. Both regulatory codes define exact geometric reference points for valve configurations. This rule describes the maximum permissible pipe section with a non-turbulent flow in a valve configuration between valve 1 and valve 2. This is either designated as the 3D (3 x dia. ID) rule or the 6D (6 x dia. ID) rule.

3D rule

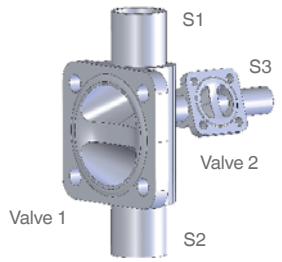
The longitudinal distance from the main valve inside diameter **lower edge** to the welded on sampling valve body sealing weir centre may not exceed 3-times the welded-on sampling valve body inside diameter.

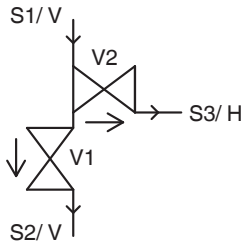
6D rule

The longitudinal distance from the main valve inside diameter **centre axis** to the welded on sampling valve body sealing weir centre may not exceed 6-times the welded-on sampling valve body inside diameter.

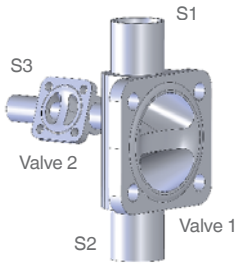
Welding configurations
Selection table

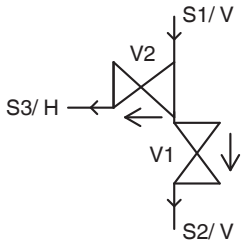
Configuration 1



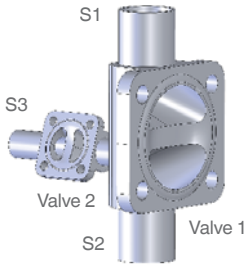


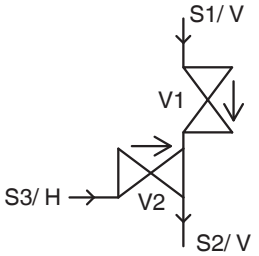
Configuration 2





Configuration 3





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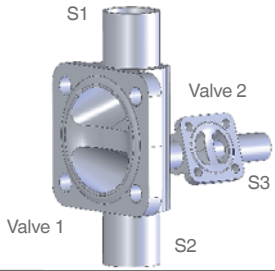
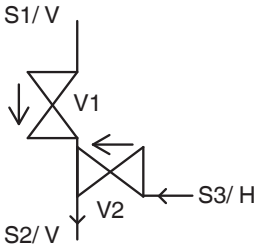
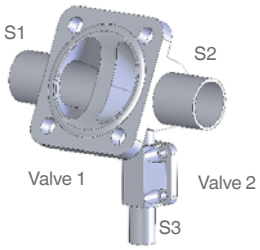
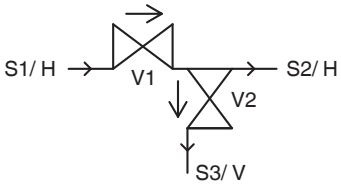


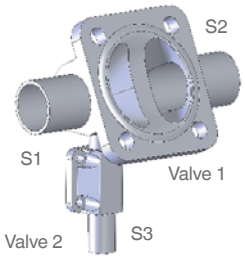


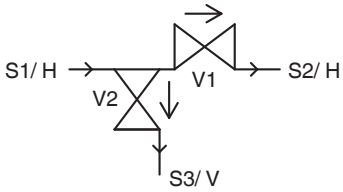
Configuration 5





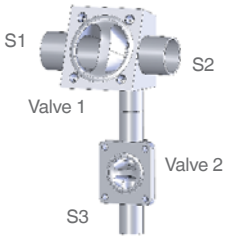
Configuration 6

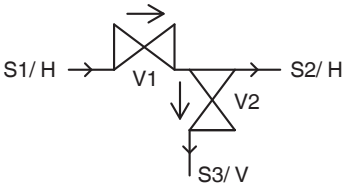




Configuration 7

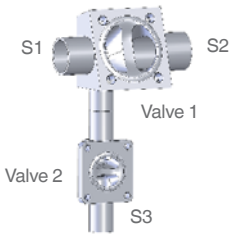
Main body M600, M600 03-01.FR

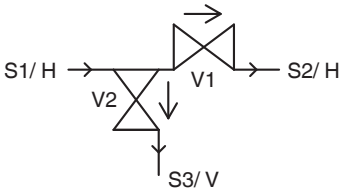




Configuration 8

Main body M600, M600 03-01.FL





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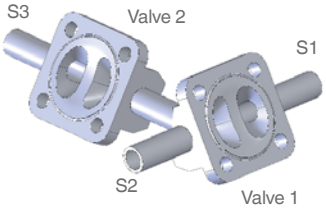
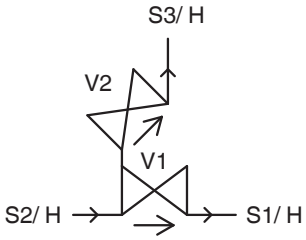


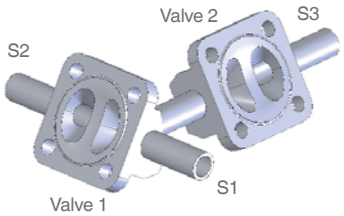


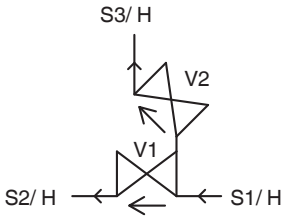
Note:
Since the max. diameter that can be welded on is limited, we ask that the GEMÜ specification sheet (see page 22) is always used to request the desired combinations.

Figure similar

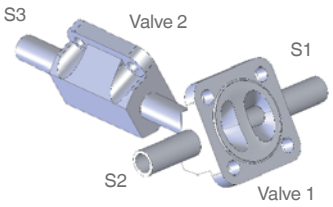
Continued on the next page

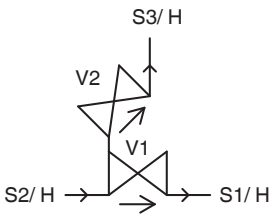
Configuration 10



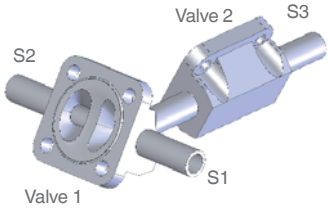


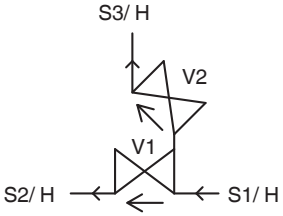
Configuration 11



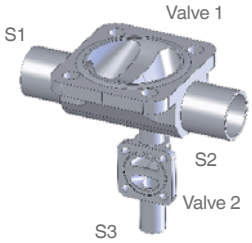


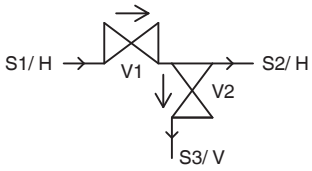
Configuration 12



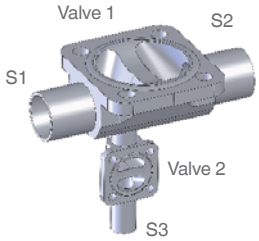


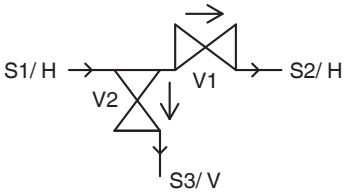
Configuration 13





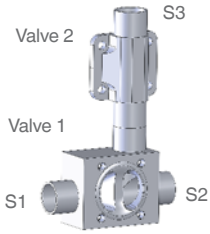
Configuration 14

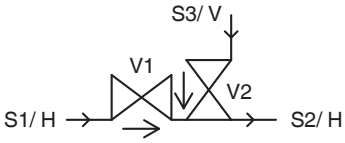




Configuration 15

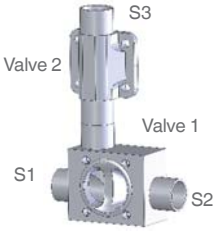
Main body M600, M600 03-01.ER

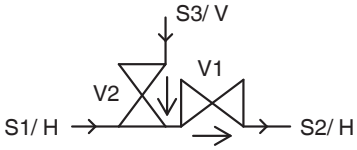




Configuration 16

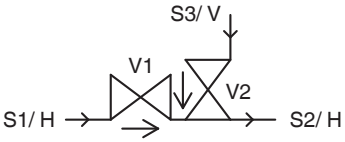
Main body M600, M600 03-01.EL





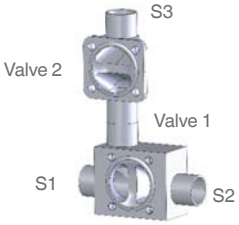
Configuration 17

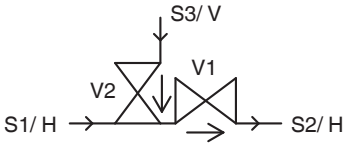
Main body M600, M600 03-01.ER



Configuration18

Main body M600, M600 03-01.EL

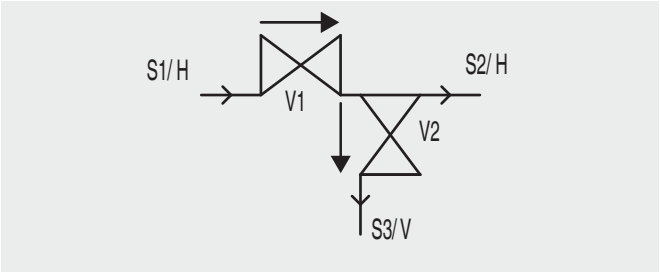


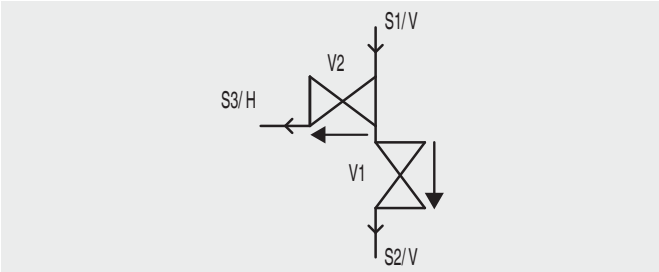


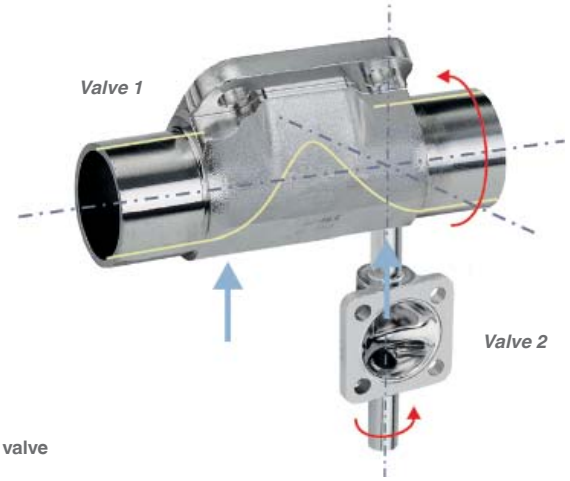
Note:
Since the max. diameter that can be welded on is limited, we ask that the GEMÜ specification sheet (see page 22) is always used to request the desired combinations.

Figure similar

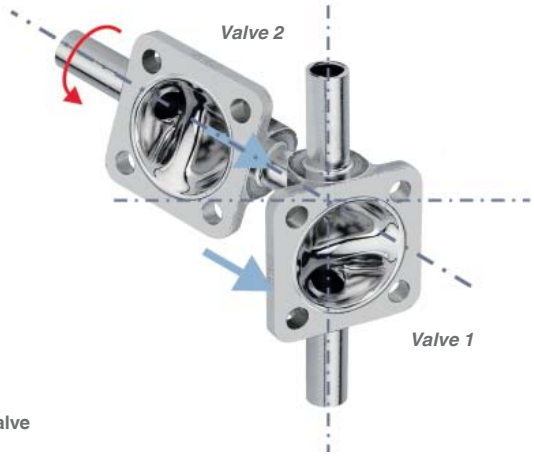
GMP / SAP configuration







SAP valve



GMP valve

As a rule, the nominal sizes of the two valves differ for GMP and SAP valve configurations. Combinations with the same nominal sizes can, however, also be produced. However, due to the valve geometries and the available space situation (e.g. relating to the actuator dimensions and body), there are also limitations. In these cases, GEMÜ is also able to offer multi-port valve blocks (series M600) manufactured from a single piece as a further customised solution.

SAP valve

The term SAP (**S**terile **A**ccess **P**ort) valve defines a configuration of two valves welded together, with the 2/2-way valve (1) being arranged horizontally. The valve (2) is welded on vertically in front of or behind the 2/2-way valve (1) sealing weir depending on the application.

GMP valve

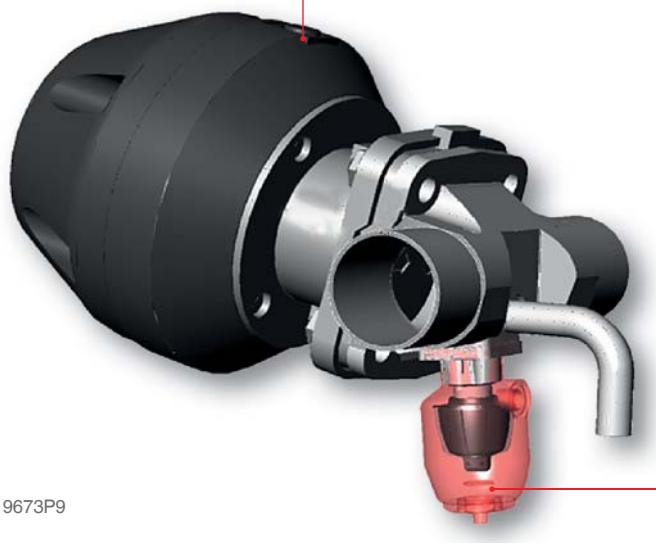
The term GMP (**G**ood **M**anufacturing **P**ractice) valve defines a configuration of two valves welded together, with the 2/2-way valve (1) being arranged vertically The valve (2) is welded on horizontally in front of or behind the 2/2-way valve (1) sealing weir depending on the application. It is twisted axially to the extent that its sealing weir is turned away from the volumetric flow and that the working medium can flow out unhindered even under depressurised conditions..

i-bodies

The GEMÜ i-body (integrated valve seat) can be seen as an intermediate step to full GEMÜ M-block design machined from a piece of block material. i-bodies are a special construction type of the classical 2/2-way valve bodies. The integrated valve seat of i-bodies is used for example as sampling, steam and condensate valve. The valve bodies have two valve seats and 3 pipe connections. They are manufactured from a forging blank or a piece of block material. The i-body offers a low cost and good alternative for a number of combinations. It already exhibits two essential features of an M-block. It has a greatly reduced dead volume and no internal weld. The drain or supply spigot is only welded on behind the valve seat.

i-bodies

Integrated sampling
Integrated steam / condensate valve



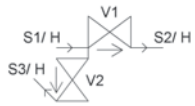
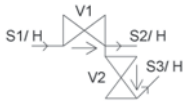
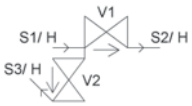
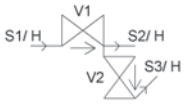
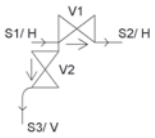
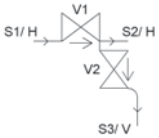
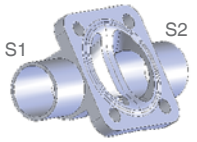
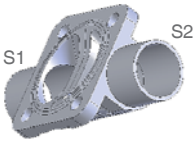
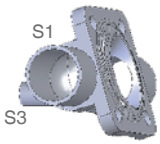
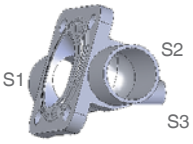
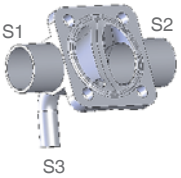
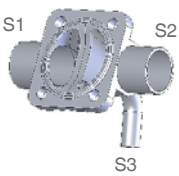
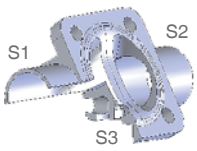
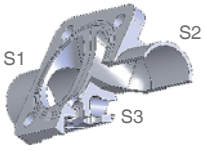
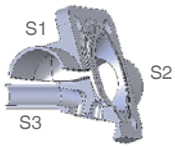
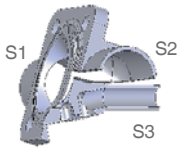
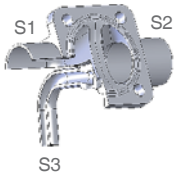
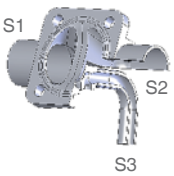
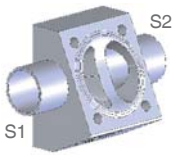
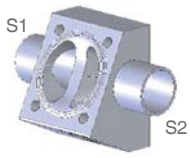
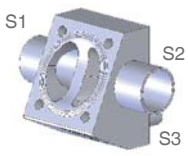
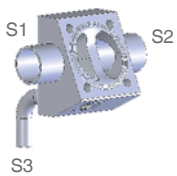
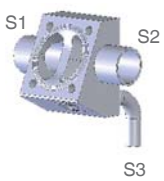
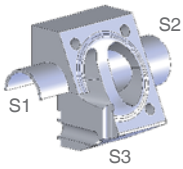
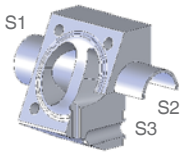
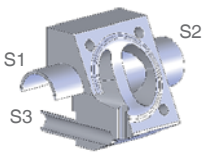
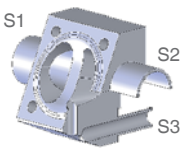
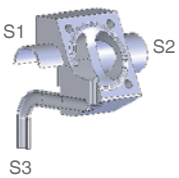
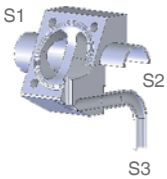
Features

- *Reduced weight*
- *Minimal deadleg*
- *No weld in the product area*
- *Compact*
- *Cost effective*
- *Available with spigots or elbows*
- *Draining in vertical installation position possible if adhering to the 3D-rule*

Available seat sizes for material 1.4435:

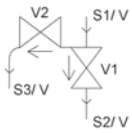
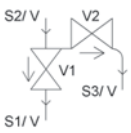
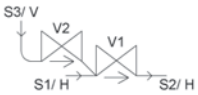
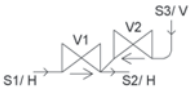
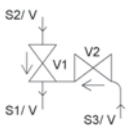
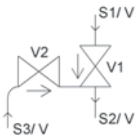
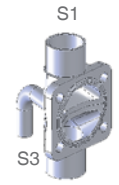
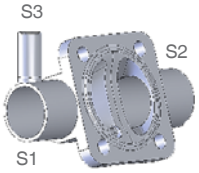
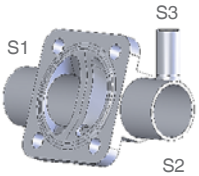
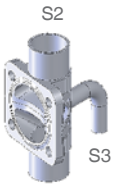
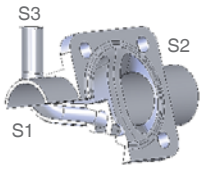
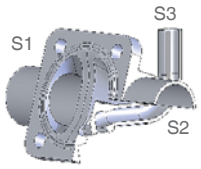
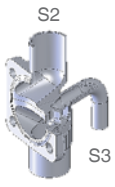
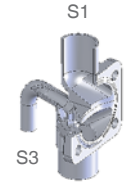
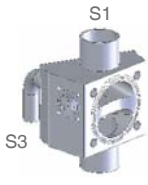
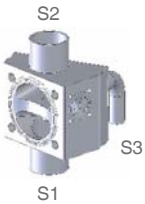
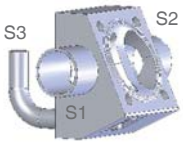
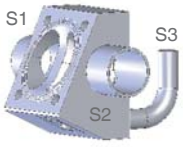
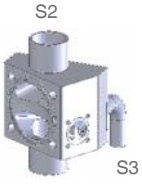
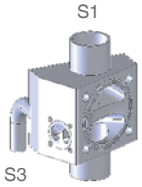
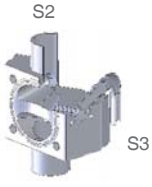
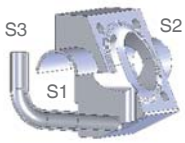
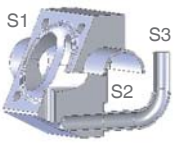
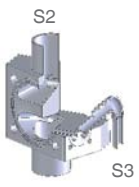
- *Diaphragm size 8/8 block material body*
- *Diaphragm size 10/8 block material body*
- *Diaphragm size 25/8 forged body*
- *Diaphragm size 40/8 forged body*
- *Diaphragm size 50/8 forged body*
- *Diaphragm size 80/10 forged body*
- *Diaphragm size 100/10 forged body*

i-bodies
Selection table

	IOL	IOR	I1L	I1R	I2L	I2R
Pictogram						
Forged bodies						
						
Block material bodies						
						
Weld-on parts	None	None	Pipe	Pipe	90° elbow	90° elbow

Continued on the next page

i-bodies
Selection table

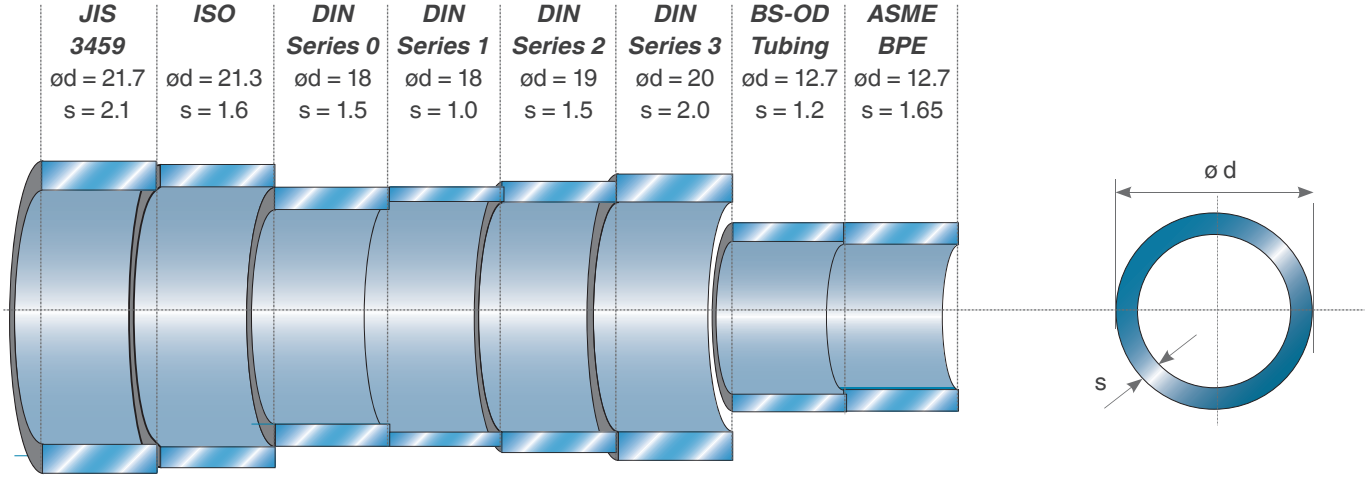
	I3L	I3R	I4L	I4R	I5L	I5R
Pictogram						
Forged bodies						
						
Block material bodies						
						
Weld-on parts	90° elbow	90° elbow	90° elbow	90° elbow	90° elbow	90° elbow

Butt weld connections / Surface finish

Modern, ergonomically shaped workstations and trained polishing staff give us the ability to provide high quality surface finishes. Depending on the required application, surface finishes from Ra 0.8 µm down to 0.25 µm can be achieved by polishing, electro polishing or a special process, we call “elysieren“.

Mechanical hand polishing is carried out at our works to ensure our high quality standard.
In principle, special connections requested by customers can be provided on GEMÜ butt weld spigot bodies and it is also possible to have different connections on one body.

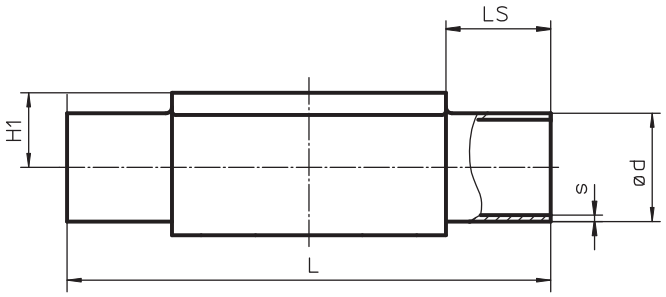
The difference between tube specifications (Example DN 15)



Valve body surface finish, internal contour			
	Forged body - Codes 40, 42, F4 Block material - Codes 41, 43	Investment casting Codes 32, 34	Code
Ra ≤ 0.8 µm, mechanically polished internal, blasted external	X	X	1502
Ra ≤ 0.8 µm, electropolished internal/external	X	-	1503
Ra ≤ 0.6 µm, mechanically polished internal, blasted external	X	X	1507
Ra ≤ 0.6 µm, electropolished internal/external	X	-	1508
Ra ≤ 0.4 µm, mechanically polished internal, blasted external	X	-	1536
Ra ≤ 0.4 µm, electropolished internal/external	X	-	1537
Ra ≤ 0.25 µm, mechanically polished internal, blasted external	X	-	1527
Ra ≤ 0.25 µm, electropolished internal/external	X	-	1516

Ra acc. to DIN 4768; at defined reference points. Surface finish data refers to media wetted surfaces.

Butt weld connections



Optimum draining angle see brochures “2/2-way valve bodies and T valve bodies in stainless steel“

Dimensions in mm

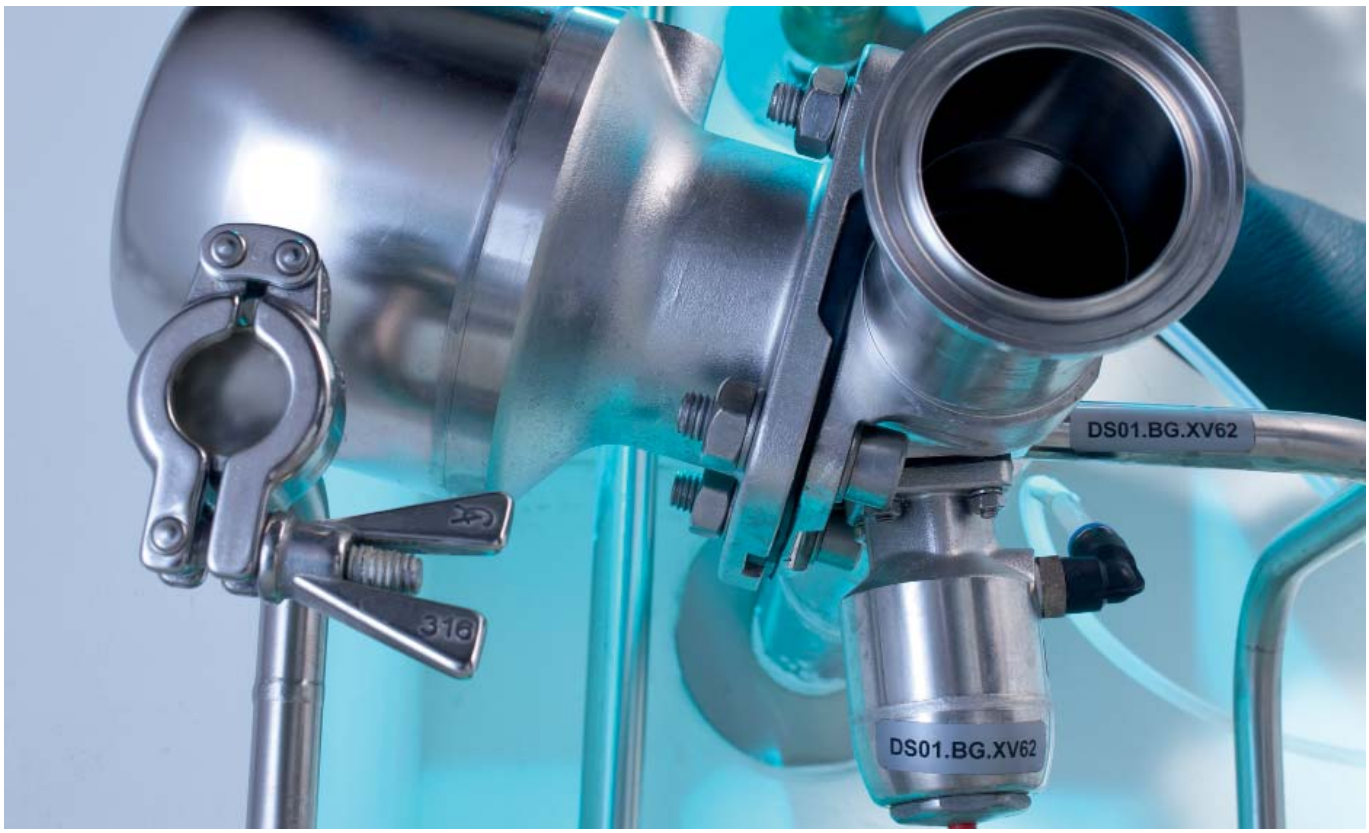
						DIN Series 0 Code 0		DIN 11850 Series 1 Code 16		DIN 11850 Series 2 Code 17		DIN 11850 Series 3 Code 18		DIN 11866 Series A Code 1A		DIN 11866 Series B Code 1B		EN ISO 1127 Code 60	
MG	DN	NPS	L	LS	H1	ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	ød	s
8	4	-	72	20	8.5	6	1.0	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	72	20	8.5	8	1.0	-	-	-	-	-	-	8	1.0	10.2	1.6	10.2	1.6
	8	¼"	72	20	8.5	10	1.0	-	-	-	-	-	-	10	1.0	13.5	1.6	13.5	1.6
	10	⅜"	72	20	8.5	-	-	12	1.0	13	1.5	14	2.0	13	1.5	-	-	-	-
	15	½"	72	20	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	10	⅜"	108	25	12.5	-	-	12	1.0	13	1.5	14	2.0	13	1.5	17.2	1.6	17.2	1.6
	15	½"	108	25	12.5	18	1.5	18	1.0	19	1.5	20	2.0	19	1.5	21.3	1.6	21.3	1.6
	20	¾"	108	25	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	15	½"	120	25	13.0	19.0	18	1.5	18	1.0	19	1.5	20	2.0	19	1.5	21.3	1.6	21.3	1.6
	20	¾"	120	25	16.0	19.0	22	1.5	22	1.0	23	1.5	24	2.0	23	1.5	26.9	1.6	26.9	1.6
	25	1"	120	25	19.0	19.0	28	1.5	28	1.0	29	1.5	30	2.0	29	1.5	33.7	2.0	33.7	2.0
40	32	1 ¼"	153	25	24.0	26.0	34	1.5	34	1.0	35	1.5	36	2.0	35	1.5	42.4	2.0	42.4	2.0
	40	1 ½"	153	25	26.0	26.0	40	1.5	40	1.0	41	1.5	42	2.0	41	1.5	48.3	2.0	48.3	2.0
50	50	2"	173	30	32.0	32.0	52	1.5	52	1.0	53	1.5	54	2.0	53	1.5	60.3	2.0	60.3	2.0
80	65	2 ½"	216	30	-	62.0	-	-	-	-	70	2.0	-	-	70	2.0	76.1	2.0	76.1	2.0
	80	3"	254	30	-	62.0	-	-	-	-	85	2.0	-	-	85	2.0	88.9	2.3	88.9	2.3
100	100	4"	305	30	-	76.0	-	-	-	-	104	2.0	-	-	104	2.0	114.3	2.3	114.3	2.3

MG = diaphragm size

Continued on the next page

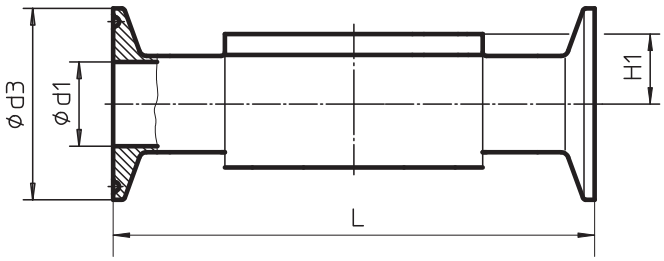
Dimensions in mm							JIS-G 3447 Code 35		JIS-G 3459 Code 36		SMS 3008 Code 37		BS 4825 Code 55		ASME BPE Code 59		ANSI/ASME B36.19M 10s Code 63		ANSI/ASME B36.19M 40s Code 65	
MG	DN	NPS	L	LS	H1		ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	ød	s
8	4	-	72	20	8.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	72	20	8.5		-	-	10.5	1.20	-	-	-	-	-	-	10.3	1.24	10.3	1.73
	8	¼"	72	20	8.5		-	-	13.8	1.65	-	-	6.35	1.2	6.35	0.89	13.7	1.65	13.7	2.24
	10	⅜"	72	20	8.5		-	-	-	-	-	-	9.53	1.2	9.53	0.89	-	-	-	-
	15	½"	72	20	8.5		-	-	-	-	-	-	12.70	1.2	12.70	1.65	-	-	-	-
10	10	⅜"	108	25	12.5		-	-	17.3	1.65	-	-	9.53	1.2	9.53	0.89	17.1	1.65	17.1	2.31
	15	½"	108	25	12.5		-	-	21.7	2.10	-	-	12.70	1.2	12.70	1.65	21.3	2.11	21.3	2.77
	20	¾"	108	25	12.5		-	-	-	-	-	-	19.05	1.2	19.05	1.65	-	-	-	-
25	15	½"	120	25	13.0	19.0	-	-	21.7	2.10	-	-	-	-	-	-	21.3	2.11	21.3	2.77
	20	¾"	120	25	16.0	19.0	-	-	27.2	2.10	-	-	19.05	1.2	19.05	1.65	26.7	2.11	26.7	2.87
	25	1"	120	25	19.0	19.0	25.4	1.2	34.0	2.80	25.0	1.2	-	-	25.40	1.65	33.4	2.77	33.4	3.38
40	32	1 ¼"	153	25	24.0	26.0	31.8	1.2	42.7	2.80	33.7	1.2	-	-	-	-	42.2	2.77	42.2	3.56
	40	1 ½"	153	25	26.0	26.0	38.1	1.2	48.6	2.80	38.0	1.2	-	-	38.10	1.65	48.3	2.77	48.3	3.68
50	50	2"	173	30	32.0	32.0	50.8	1.5	60.5	2.80	51.0	1.2	-	-	50.80	1.65	60.3	2.77	60.3	3.91
80	65	2 ½"	216	30	-	62.0	63.5	2.0	76.3	3.00	63.5	1.6	-	-	63.50	1.65	73.0	3.05	73.0	5.16
	80	3"	254	30	-	62.0	76.3	2.0	89.1	3.00	76.1	1.6	-	-	76.20	1.65	88.9	3.05	88.9	5.49
100	100	4"	305	30	-	76.0	101.6	2.0	114.3	3.00	101.6	2.0	-	-	101.60	2.11	114.3	3.05	114.3	6.02

MG = diaphragm size



Clamp bodies

All clamp connections are machined according to the spigot dimensions e.g. to DIN 11850, EN ISO 1127, SMS 3008 or ASME BPE. We ask our customers to state which version or standard the connections shall comply with.



Pipe				Code 59 ASME-BPE			Code 60 EN ISO 1127			Code 59 ASME-BPE			Code 16,17,18 DIN 11850			Code 37 SMS3008			Code 35 JIS-G3447			Code 36 JIS-G3459		
Clamp connection				Code 80			Code 82			Code 88			Code 8A			Code 8E			Code 8F			Code 8H		
MG	DN	NPS	H1	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L
8	8	¼"	8	4.57	25	63.5	10.30	25.0	63.5	-	-	-	-	-	-	-	-	-	-	-	-	10.5	34	88.9
	10	⅜"	8	7.75	25	63.5	-	-	-	-	-	-	10.00	34	88.9	-	-	-	-	-	-	-	-	-
	15	½"	8	9.40	25	63.5	-	-	-	9.40	25	108	-	-	-	-	-	-	-	-	-	-	-	-
10	10	⅜"	12.5	-	-	-	14.00	25.0	108	-	-	-	10.00	34	108	-	-	-	-	-	-	14.00	34	108
	15	½"	12.5	9.40	25	88.9	18.10	50.5	108	9.40	25	108	16.00	34	108	-	-	-	-	-	-	17.50	34	108
	20	¾"	12.5	15.75	25	101.6	-	-	-	15.75	25	117	-	-	-	-	-	-	-	-	-	-	-	-
25	15	½"	19	9.40	25	101.6	18.10	50.5	108	9.40	25	108	16.00	34	108	-	-	-	-	-	-	17.50	34	108
	20	¾"	19	15.75	25	101.6	23.70	50.5	117	15.75	25	117	20.00	34	117	-	-	-	-	-	-	-	-	-
	25	1"	19	22.10	50.5	114.3	29.70	50.5	127	22.10	50.5	127	26.00	50.5	127	22.60	50.5	127	23.00	50.5	127	-	-	-
40	32	1 ¼"	26	-	-	-	38.40	64.0	146	-	-	-	32.00	50.5	146	31.30	50.5	146	29.40	50.5	146	-	-	-
	40	1 ½"	26	34.80	50.5	139.7	44.30	64.0	159	34.80	50.5	159	38.00	50.5	159	35.60	50.5	159	35.70	50.5	159	-	-	-
50	50	2"	32	47.50	64	158.75	56.30	77.5	190	47.50	64	190	50.00	64	190	48.60	64	190	47.80	64	190	-	-	-
80	65	2 ½"	62	60.20	77.5	193.68	72.10	91.0	216	60.20	77.5	216	66.00	91	216	60.30	77.5	216	59.50	77.5	216	-	-	-
	80	3"	62	72.90	91	222.25	84.30	106.0	254	72.90	91	254	81.00	106	254	72.90	91	254	72.30	91	254	-	-	-
100	100	4"	76	97.38	119	292.1	109.70	144.5	305	97.38	119	305	100.00	119	305	97.60	119	305	97.60	119	305	-	-	-

Dimensions in mm
MG = diaphragm size

Selection of operators
W600 valve configurations

	Manually operated					
Type	**9601**	**9602**	**9612**	**9673**	**9653**	**9654**
Material	Stainless steel, plastic handwheel, with optical position indicator and seal adjuster	Stainless steel, with optical position indicator and seal adjuster	Stainless steel, plastic handwheel, with optical position indicator and seal adjuster	Stainless steel, plastic handwheel, with optical position indicator and seal adjuster	Stainless steel, plastic handwheel, with optical position indicator, stroke limiter/seal adjuster, lockable, optional: electrical position indicator	Stainless steel, with optical position indicator, stroke limiter/seal adjuster, lockable, optional: electrical position indicator
Autoclavable	●	●	●	●	●	●
Operating temperature*	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C
Operating pressure*	0 to 10 bar	0 to 10 bar	0 to 10 bar	0 to 10 bar	0 to 10 bar	0 to 10 bar
DN	4 - 15	4 - 15	10 - 20	15 - 50	10 - 100	4 - 100
Diaphragm size 8	●	●	-	-	-	●
Diaphragm size 10	-	-	●	-	●	●
Diaphragm size 25	-	-	-	●	●	●
Diaphragm size 40	-	-	-	●	●	●
Diaphragm size 50	-	-	-	●	●	●
Diaphragm size 80	-	-	-	-	●	●
Diaphragm size 100	-	-	-	-	●	●

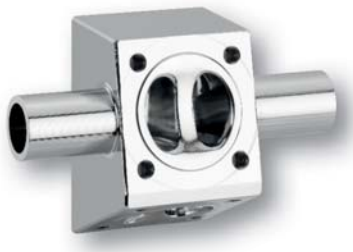
* dependent on diaphragm material, see technical datasheet

Selection of operators
W600 valve configurations

Pneumatically operated

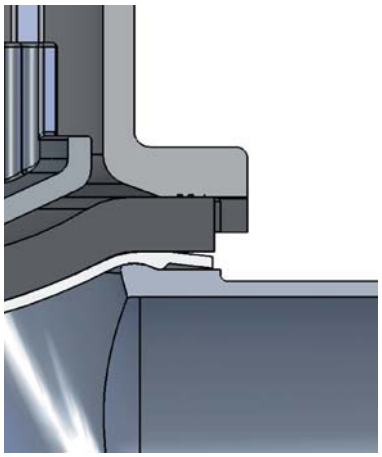
Type	9605	9625	9687	9650	9650TL	9651
Material	Plastic, with stainless steel distance piece, optical position indicator	Plastic, with stainless steel distance piece, optical position indicator	Plastic, with stainless steel distance piece	Stainless steel, with optical position indicator, optionally autoclavable	Safety valve, stainless steel, mounting facility for proximity switches	Stainless steel, with integrated automation module
Autoclavable	-	-	-	● (DN 4-25)	-	-
Operating temperature*	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C	-10 to 150 °C
Operating pressure*	0 to 8 bar	0 to 6 bar	0 to 10 bar	0 to 10 bar	0 to 8 bar	0 to 10 bar
DN	4 to 15	10 to 20	10 to 100	4 to 100	4 to 25	4 to 25
Supply voltage	-	-	-	-	-	-
Diaphragm size 8	●	-	-	●	●	●
Diaphragm size 10	-	●	●	●	●	●
Diaphragm size 25	-	-	●	●	●	●
Diaphragm size 40	-	-	●	●	-	-
Diaphragm size 50	-	-	●	●	-	-
Diaphragm size 80	-	-	●	●	-	-
Diaphragm size 100	-	-	●	●	-	-

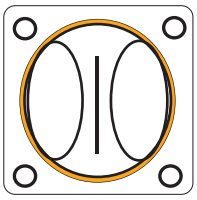
* dependent on diaphragm material, see technical datasheet

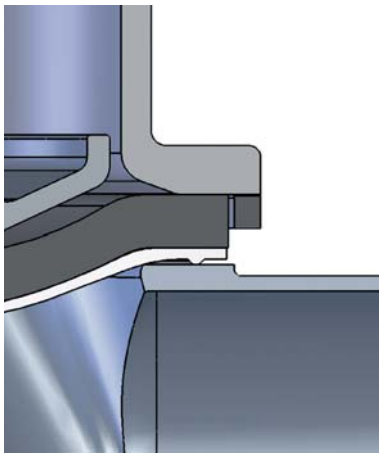


Pneumatically operated		Motorized	
9658/9688	**9660**	**9618**	**9698**
Two stage actuator, stainless steel	Filling valve, stainless steel with optical position indicator	Plastic, with or without stainless steel distance piece, optical position indicator	Plastic, with or without stainless steel distance piece, optical position indicator and manual override
-	-	-	-
-10 to 150 °C	-10 to 150 °C	0 to 130 °C (without distance piece 15 to 50 °C)	0 to 150 °C
0 to 10 bar	0 to 5 bar	0 to 6 bar	0 to 6 bar
10 to 50	4 to 25	4 to 15	15 to 50
-	-	24 VDC, 120 VAC, 230 VAC, 50/60Hz	24 VDC, 120 VAC, 230 VAC, 50/60Hz
●	●	●	-
●	●	●	-
●	●	-	●
●	-	-	●
●	-	-	●
-	-	-	-
-	-	-	-

EHEDG certified seal system







GEMÜ seal system

Conventional seal systems

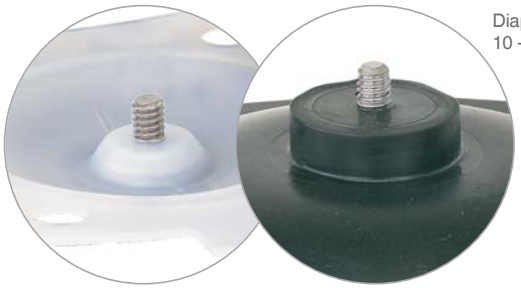
GEMÜ® Seal system
CERTIFIED
EHEDG
TYPE EL
JUNE 2006

As a leading manufacturer world-wide we had the GEMÜ diaphragm seal system certified in 2002 and were granted the EHEDG certificate.

GEMÜ flexible diaphragm fixing

The diaphragm is uniformly fixed in the compressor by means of a threaded pin. The only exception is the smallest diaphragm size (diaphragm size 8), which is pushed in with a rubber pin. The uniform fixing method applies both to soft elastomer and PTFE diaphragms. The largest advantage of fixing by means of a threaded pin, e.g. in comparison to a bayonet fitting, is the even transfer of forces onto the large area of the flanks of the screw thread. This prevents damage to the mechanical connection between compressor and diaphragm especially under vacuum operating conditions. The uniform fixing of elastomer and PTFE diaphragms enables subsequent replacement of the diaphragm while using the same actuator.

Diaphragm size 8



Diaphragm size 10 - 100

Materials and certificates

Type	Designation of the test certificate in accordance with EN 10204	Content of the certificate	Confirmation of the certificate by
2.1	Certificate of compliance with the order	Confirmation of compliance with the order	the manufacturer
2.2	Test report	Confirmation of compliance with the order with specification of results of non-specific testing	the manufacturer
3.1	Inspection certificate 3.1	Confirmation of compliance with the order with specification of results of specific testing	the manufacturer acceptance officer independent of the production division
3.2	Inspection certificate 3.2	Confirmation of compliance with the order with specification of results of specific testing	the manufacturer acceptance officer independent of the production division **and** the acceptance officer commissioned by the purchaser or the acceptance officer named in the official regulations

The table above provides an overview of the possible certificates which are generally available. The type of certificate and its content must be specified exactly before ordering to be able to provide the required documents. Later requests of certificates may not be possible or possible only under certain conditions.

Our specialists are happy to answer any questions you might have.

Valve configurations specification

Please complete this form and return it to your nearest GEMÜ office or to the address listed below!

Configuration no.: _____

Quantity _____

Operating pressure _____ bar

Working medium temperature _____ °C

Valve 1

	DN	s [mm]	D_a [mm]	Code
Spigot S1				
Spigot S2				

Valve 2

	DN	s [mm]	D_a [mm]	Code
Spigot S3				

○ **no deadleg requirement** ○ **3xD - rule*** ○ **6xD - rule***

Operator type _____

Control function _____

Accessories _____

Comment _____

Body material Main 2/2 way body

	Block material / Forged body
1.4435	○
1.4435 BN 2 (Δ Fe < 0,5%)	○
1.4539	○
Other _____	

Diaphragm material

EPDM	○	Code _____
PTFE	○	Code _____
Other	○	_____

Surface finish internal finish

1502	(Ra) ≤ 0,8 µm	○
1503	(Ra) ≤ 0,8 µm e-pol.	○
1507	(Ra) ≤ 0,6 µm	○
1508	(Ra) ≤ 0,6 µm e-pol.	○
1536	(Ra) ≤ 0,4 µm	○
1537	(Ra) ≤ 0,4 µm e-pol.	○
1527	(Ra) ≤ 0,25 µm	○
1516	(Ra) ≤ 0,25 µm e-pol.	○

For GEMÜ use only!

Type key: _____

Angle of rotation α*: _____
(specified at works)

* Please contact us for an overview of angles of rotation, if required.

Operator type _____

Control function _____

Accessories _____

Comment _____

Body material Second 2/2 way body

	Block material / Forged body
1.4435	○
1.4435 BN 2 (Δ Fe < 0,5%)	○
1.4539	○
Other _____	

Diaphragm material

EPDM	○	Code _____
PTFE	○	Code _____
Other	○	_____

Surface finish internal finish

1502	(Ra) ≤ 0,8 µm	○
1503	(Ra) ≤ 0,8 µm e-pol.	○
1507	(Ra) ≤ 0,6 µm	○
1508	(Ra) ≤ 0,6 µm e-pol.	○
1536	(Ra) ≤ 0,4 µm	○
1537	(Ra) ≤ 0,4 µm e-pol.	○
1527	(Ra) ≤ 0,25 µm	○
1516	(Ra) ≤ 0,25 µm e-pol.	○

For GEMÜ use only!

Type key: _____

Angle of rotation α*: _____
(specified at works)

* Please contact us for an overview of angles of rotation, if required.

The technical details of each enquiry will be checked by GEMÜ.

Contact (GEMÜ): _____

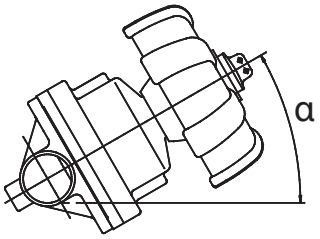
Customer: _____

Dept.: _____

Address: _____

_____

Phone: _____ e-mail: _____



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