SED Flow Control GmbH

Valves for aseptic applications

PRODUCT CATALOG

SMART IN FLOW CONTROL

Overview Aseptic Valves

	Steripur	KMA	KMD
Size	**Manually operated**		
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MA 10 DN 8-20mm	Type 397 Page 35 	Type 295 Page 50 , 51 	Type 289 Page 60 
MA 25-50 DN 15-50mm	Type 907 Page 36 	Type 905 Page 52, 53 	Type 982 Page 61 
MA 80-100 DN 65-100mm	Type 997 Page 37 	Type 995 Page 54 	Type 985 Page 62 
	Pneumatically operated		
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Detailed diaphragm valve overview see page 26 - 27

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A brief overview

SAMSON operates wherever there is controlled flow of oils, gases, vapors or chemical substances. Valves are our core business. With our valves, we are active in a market that has enormous potential for future innovations. We are further expanding the valves' decentralized intelligence. By developing new, smart systems, we are transforming process automation to the benefit of our customers and to achieve greater flexibility, safety and reliability in industrial processes.

Founded in 1907, SAMSON has grown into a world leading valves manufacturer with more than 600 million euros sales and 4500 employees in 50 subsidiaries all around the world.

SED Flow Control is an international operating company, leading in the development, production and worldwide sales of sophisticated valve technologies.

SED Flow Control was established in 1984 and became a member of the SAMSON Group in 2017. Thanks to the powerful support of a world leading valve company we are well prepared to all future challenges. Our mission is to provide high quality products for the life science and industrial market. A clearly defined range of products, our flexibility and our proximity to the clients are factors of considerable importance for our customers.

Our highly motivated employees in product management, engineering, sales and all other departments are pleased to work with our customers' challenges. Whether it is a big volume order, a short delivery time, or just an opportunity to find the most efficient process valve solution, SED is ready to take this challenge.

Our Advantages:

- Highly qualified employees with many years of experience in the development and manufacturing of valve components and systems.
- Valve technologies with an innovative design and creative customized solutions.
- Modular and compact assembly of our products.
- High vertical range of manufacturing allows for a high degree of flexibility.
- Comprehensive selection of accessories for valve monitoring and regulation.
- International sales network and a dedicated internal sales staff.

Headquater SAMSON AG Frankfurt (Main)

The office building is connected to the production building for direct communication with manufacturing.

Production building

Our company

CAD- CAM working station

Ultrasonic cleaning of valve bodies

Valve cluster assembled with Steripur patent and KMA actuation

We have installed the most modern machinery and individual production facilities which are fully adapted to current market requirements.

Specifically:

- The 3D-CAD-CAM network connects every CAD workstation with 3 and 5 axis CNC machining facilities, bringing our products from conception to development.

- Injection molding manufacturing, special injection molding machines, and tools adapted to high performance plastics and specific processes.

- Assembly in clean room facilities with ultrasonic clean washing including other automated assembly capabilities.

- Work stations which are ergonomically designed for the health and safety of our employees.

- Programmable welding machine and polishing work stations for aseptic diaphragm valves in order to guarantee the greatest flexibility and quality.

CNC machining center

What does quality mean for us at SED?

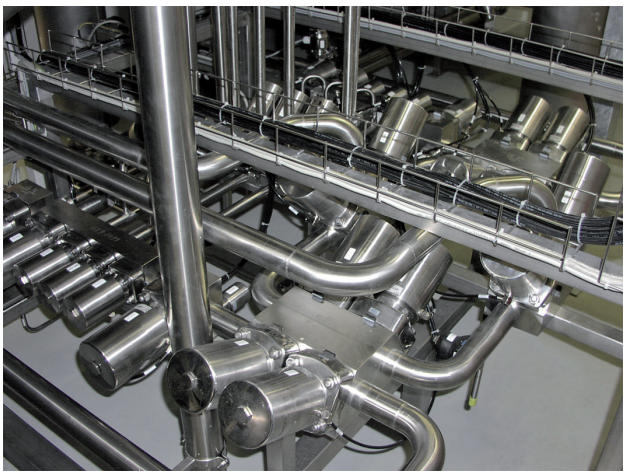
The complete satisfaction of our customer is our ultimate benchmark for quality.
Only then, may a successful and sustained existence in the market be guaranteed.

The prerequisite for quality is not only a functional product but also that the quality concept is applied comprehensively to all areas of our business.
This includes research and development, production, suppliers, services and our sales team.

Spectrometer and XRF spectroscopy material analysis

The Fundamental Areas of Our Quality Policy:

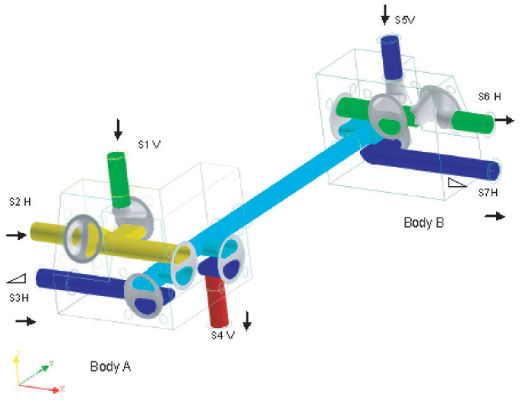
Products and Services:
An accelerated implementation of customized solutions is achieved with personal conversations and direct customer input.
This is supported by the specialization of SED through development and production areas with efficient experience and extensive training requirements.


Process system application with standard and multiport compact customized valve solutions

Suppliers:
The quality of our products is directly dependent on the performance of our suppliers.
Through a supplier qualification process, continuous assessments are performed, documented and form the basis of a close customer-supplier-relationship.

Work Sequences:
For each individual step of the manufacturing process the motto "My colleague is my customer" applies.
This means that everybody has to handle their production responsibility in a way that the internal customer is satisfied and that their best work is possible.

Customers:
Our customer is our employer and should see their visions and wishes realized. This means that our goal is to work together with our customers to develop solutions and implement these solutions with cost effective results.



3D modeling and flow direction of a multivalve cluster

Employees:
Our employees are SED's greatest asset.
Embracing quality is not the result of a single person but the outcome of successful teamwork.
The ability to develop new ideas, to take on responsibility and to show initiative and creativity brings us continuous development and improvement.
Each level of the company believes in our quality and growth philosophy and this is reinforced with continued education.

Testing

Complete Valve Assembly Inspection
- 100% according to checklist

Diaphragm Valve Seal Test
- Test according to DIN EN 12266-1
- 100% valve assemblies seal tested

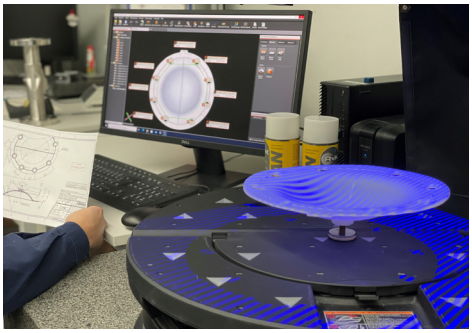
Internal Surface Finish
- 100% visual inspection
- Profilometer inspection as per specification

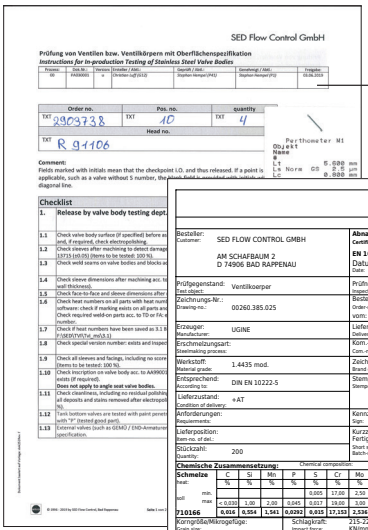
Weld Seam Testing
- 100% visual inspection
- 100% borescope inspection of all weld seams not directly visible with the eye or as per specification
- 100% pressure testing

Non-Destructive Testing for media contacted body material (on demand or internal specification requirements)
- Of material composition
  - Spectrometer
  - Delta ferrite
- Of material structure
  - Visually
  - Porosity testing by liquid penetration
  - X-ray
- Dimensional control
  - Standard and specific measuring device
  - Coordinate measuring machine (CMM)

Verification Certificates according to Specification DIN EN 10204
- 3.1 Analysis of the material traceability by batch number (U.S. Certified Mill Test Report-MTR). This also applies to all ASME BPE compliant material used in fabrications.
- 2.2 Confirmation of conformance by documentation of results
- 2.1 Confirmation of conformance with the specification

Borescope inspection of the interior surface and weld seams of valves for aseptic applications


High-accuray diaphragm measurement with visual 3D coordinate measuring machine


Checklist

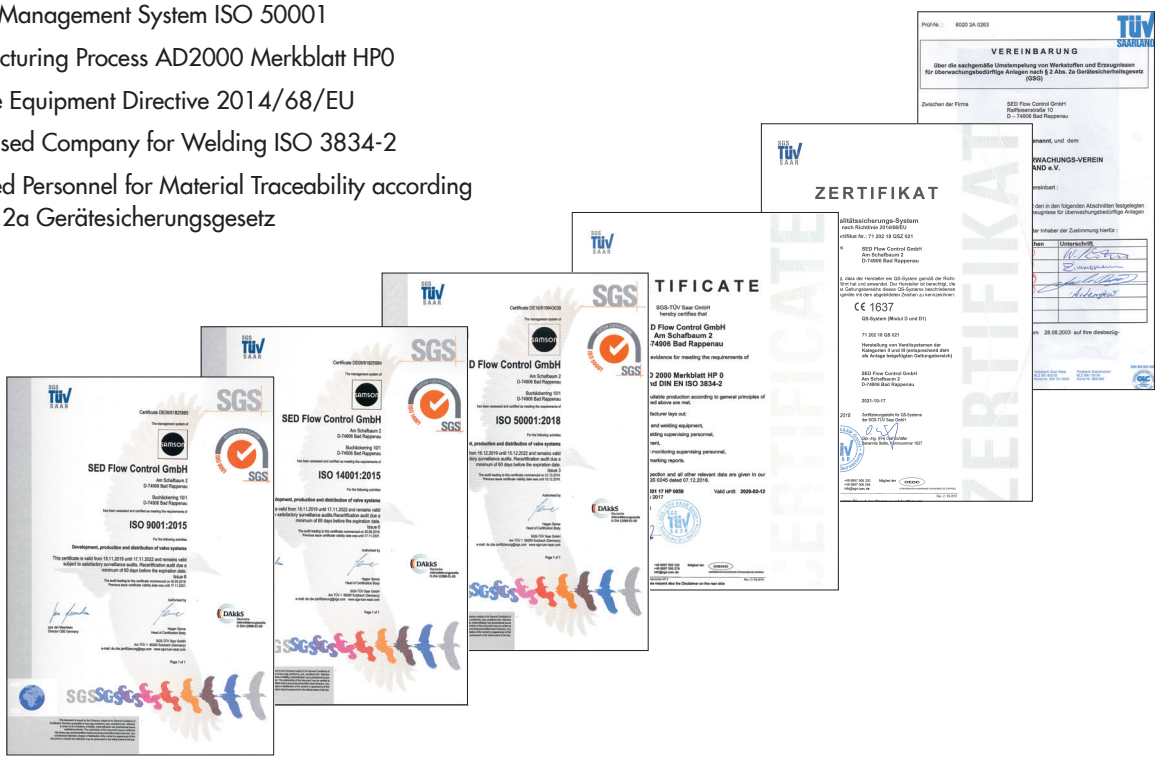
3.1 Analysis of the material


Zeiss Coordinate measuring machine (CMM)

Qualification, Certification and Documentation

Certified Process Qualification

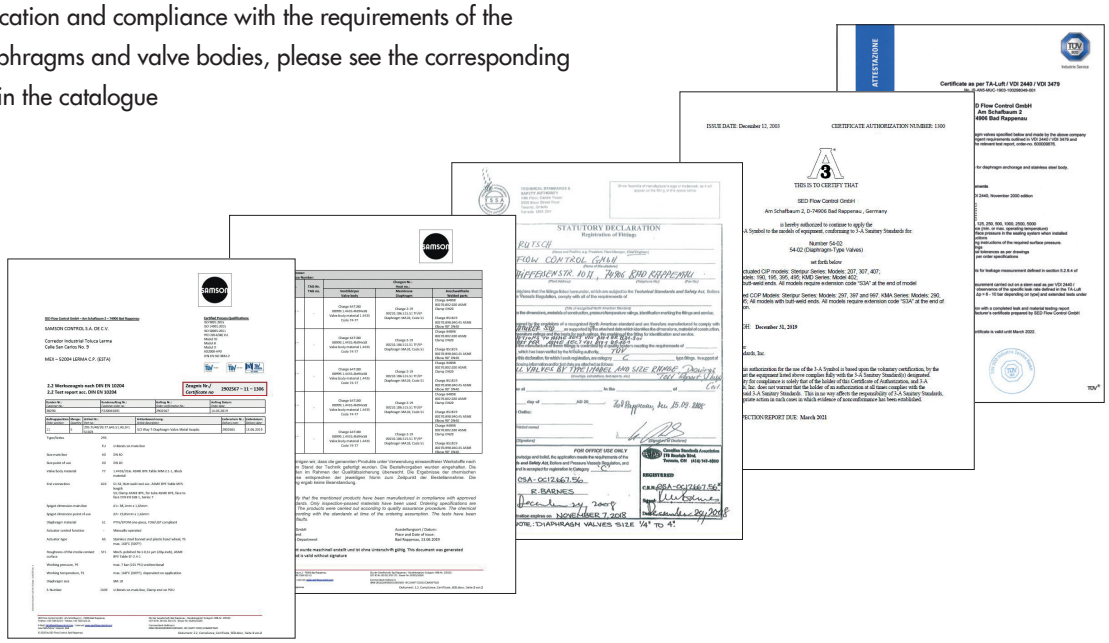
- Quality Management System ISO 9001
- Environment Management System ISO 14001
- Energy Management System ISO 50001
- Manufacturing Process AD2000 Merkblatt HP0
- Pressure Equipment Directive 2014/68/EU
- Specialised Company for Welding ISO 3834-2
- Qualified Personnel for Material Traceability according §2 Abs.2a Gerätesicherungsgesetz



Validation for the Aseptic Diaphragm Valve

- Compliance to 3-A Standard Section 54-02
- Compliance to CRN Canadian Standards Association
- Certification of Compliance according to EN 10204 2.2
- Certification of Compliance according to EN 10204 3.1
- Certification of an assessment according 2014/34/EU
- TA-Luft / VDI 2440 / VDI 3479

Note: For certification and compliance with the requirements of the valve diaphragms and valve bodies, please see the corresponding chapters in the catalogue



Flow Rate and Valve Sizing

In order to design valves for a process system correctly, the valve size is determined by the required flow rate. The Kv-value serves as a calculation basis for the different process conditions.
This value is stated in the following table with regard to nominal diameter and standards.

K_V-value

The K_V-value is a parameter defining the flow rate of valves. It describes the amount of water from 5° to 30°C which flows through the valve at a pressure loss of 1 bar. The K_{VS}-value describes the K_V-value when the valve is 100% open.

For water 5-30°C applies:

$$K_V = \frac{Q}{\sqrt{\Delta p}}$$

General Liquid Flow Formula:

$$K_V = Q \sqrt{\frac{\rho}{1000\,\Delta p}}$$

Test bench to determine and document flowrates and K_V (C_V) values

Conversion:
For the correct K_V to C_V conversion calculation, use only the stated units formulas below.
The K_V-value must be converted from (cubic meter / hour) by utilizing the following conversion factors.
In the US the flow rate of water is measured with the C_V-value in US-gallons per minute (gpm) with a pressure drop of Δp 1 PSI.

Conversion of K_V in C_V
$C_V = 1{,}17 \times K_V$

Conversion of C_V in K_V
$K_V = 0{,}86 \times C_V$

Explanations:

K_V	m^3/h	flow rate parameter
Q	m^3/h	volume flow rate
ρ	kg/m^3	specific gravity
p_1	bar	pressure before the valve
p_2	bar	pressure after the valve
Δp	bar	pressure drop through the valve $\Delta p = p_1 - p_2$

K_{VS}-Value (m^3/h)

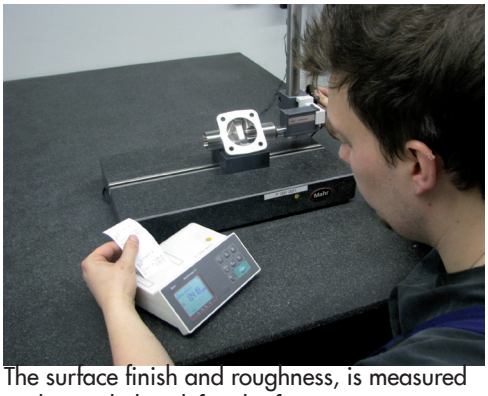
			Nominal diameter			Valve type
			ISO 1127	**DIN 11850**	**ASME-BPE**	
DN	NPS	**MA**	Code 40	Code 41-42	Code 45	
4	-	**8**	-	-	-	190/205/206/207 217/290/297
6	-	**8**	-	-	-	
8	1/4	**8**	2,4	-	0,7	
10	3/8	**8**	-	2,3	1,4	
15	1/2	**8**	-	-	2,0	
8	1/4	**10**	2,7	-	-	188/195/295 289/317/392 394/ 397
10	3/8	**10**	3,9	2,5	1,4	
15	1/2	**10**	5,3	4,7	2,2	
20	3/4	**10**	-	5,5	4,6	
15	1/2	**25**	10,5	9,5	-	385/395/402/407/417/495/592 905/907/982/985/995/997
20	3/4	**25**	13,0	11,5	6,8	
25	1	**25**	15,5	14,2	12,0	
32	1 1/4	**40**	43,0	-	-	
40	1 1/2	**40**	50,0	43,0	40,0	
50	2	**50**	64,0	52,0	48,0	
65	2 1/2	**80**	95,0	89,0	85,0	
80	3	**80**	127,0	123,0	110,0	
100	4	**100**	205	192,0	185,0	

The K_{VS}-values in the table refer to the specification with two-way valve bodies with EPDM diaphragm (depending on the specification variations are possible).
The K_{VS}-values with PTFE diaphragm may be lower due to higher stiffness of the material, particularly in applications with lower working pressure.

Surface Finish

The consistency of the interior surface has a great impact on the quality of an aseptic system process. By means of polishing, the interior contact surface is reduced.
The specified surface quality of the valve body is achieved through mechanical polishing and electro polishing.
According to the standards, SED offers surfaces with a surface finish up to a quality of 0,25 µm and 10 Ra.
At SED the stated surface finish always describes the maximum surface roughness value.

The surface finish is realized by automatic or manual mechanical polish processing. The methods that are applied depend on the internal contour and size of the valve body.
The surfaces of the valve bodies with the highest quality are produced through polishing with different grit sizes up to size 400.
The advantages of premium surfaces are a smoother interior surface as well as the reduction of the contact between the surface and the process medium.
Thus a more efficient cleaning and sterilization, lower risk of contamination by process fluids, and lower danger of product adhesion to the interior surface is achieved.

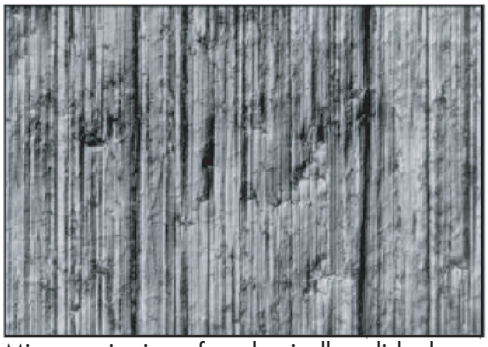


The surface finish and roughness, is measured and recorded at defined reference points according to DIN EN ISO 4287.

Electro Polishing

Electro polishing is an electrochemical process where the polishing part serves as anode and for example, copper as electrode.
The valve body is submerged into an electrolyte solution and a voltage between 2 and 25 volts is applied.
The current creates a strong chemical reaction, which removes material from the anode.
According to standardized procedures, the process has to be controlled in a way that at least 20 µm of surface material is removed.
The highest metal removal is achieved at the peak surfaces.

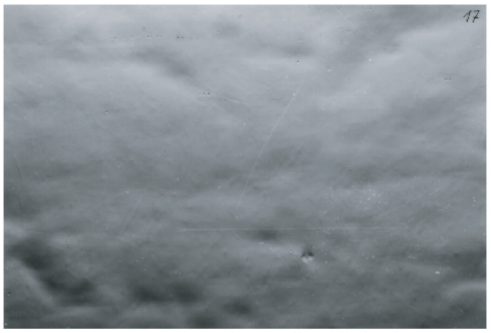
Microscopic view:



Microscopic view of mechanically polished surface with 400 grit Ra 0,25 µm / 10 µ-inch

Reasons for Electro Polishing

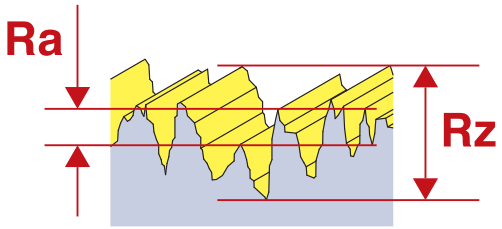
- High lustrous appearance
- Smoothening of the surface finish's peaks
- Surface tension reduction and adhesion of the process medium
- Removal of non-metallic inclusions
- Improved corrosion resistance through accumulation of chromium on the surface



Microscopic view of mechanically polished and electro polished Ra 0,25 µm / 10 µ-inch

Ra-Value

The arithmetic average Ra is used as a parameter for the surface finish profile.
L_t = 5,6 mm traversing length and l_n = 4,0 mm measuring range split in 5 single measuring sections l_r = 0,8 mm each measured transverse to the polished image.



Definition of the SED codes for Ra-Values

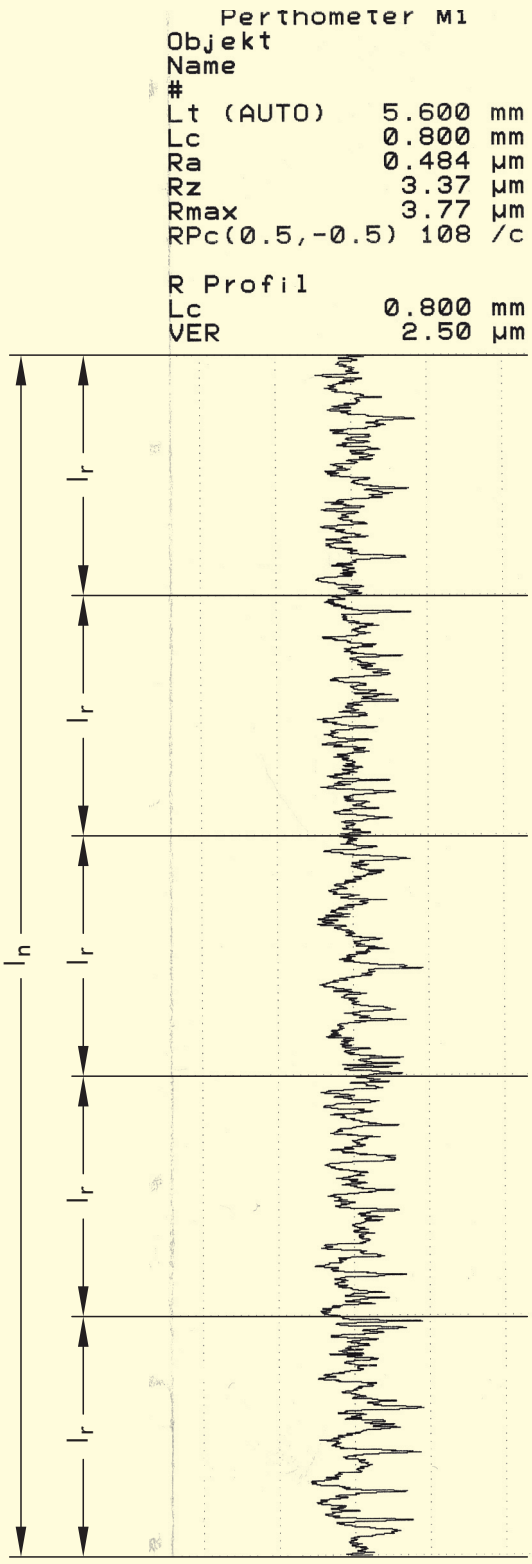
Allocation to the standard DIN 11866:

SED		DIN 11866	Mechanically Polished	Mechanically Polished and Electro-polished
Code	Ra max	hygiene class		
02	0,8		●	
03	0,8	HE3c		●
07	0,6		●	
08	0,6			●
09	0,4		●	
10	0,4	HE4c		●
14	0,25		●	
16	0,25	HE5c		●

Allocation to the standard ASME BPE Table SF-2.4-1:

SED and ASME BPE	Ra max		Mechanically Polished	Mechanically Polished and Electro-polished
Code	µ-inch	µm		
SF0	No Finish Requirement			
SF1	20	0,51	●	
SF2	25	0,64	●	
SF3	30	0,76	●	
SF4	15	0,38		●
SF5	20	0,51		●
SF6	25	0,64		●

Tape Print Out of Surface Finish



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Diaphragms

The diaphragm is the most important component that determines the performance characteristics of a diaphragm valve. You could say the diaphragm is the heart of our valve. It is the dynamic part that controls and closes the flow of the process medium. At the same time, the diaphragm is the only part that is in contact with the process medium besides the valve body and separates the medium area from the actuator side and the atmospheric environment.

The development of the formulation for the elastomer compounds for our diaphragms is carried out in close cooperation with a highly specialized company which has been developing, testing and producing diaphragm formulations for aseptic applications together with SED for many years.

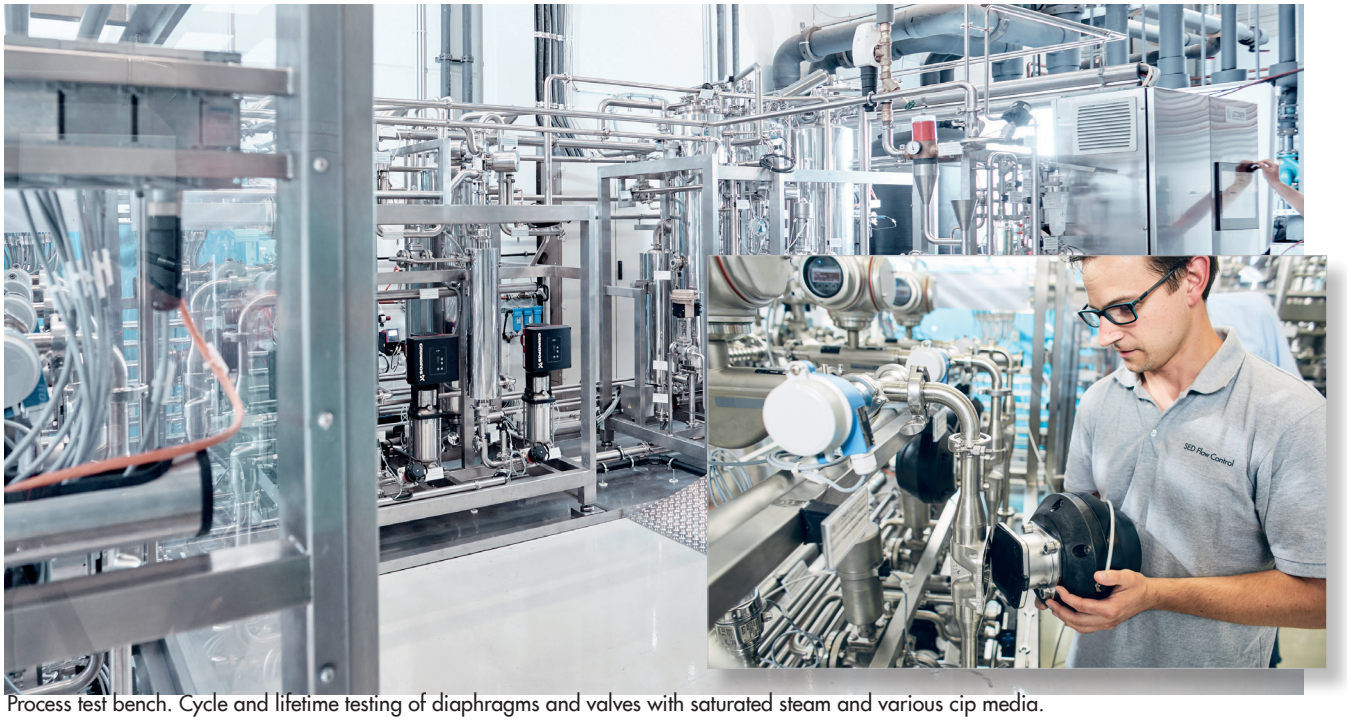
All diaphragms for aseptic applications used by SED have been tested and developed over many years on our own test benches and at third parties under a wide range of application-related operating conditions.

By purchasing and installation our new Test bench we brought this very high level of development to a higher one.

In our bench, process conditions such as those that exist in the pharmaceutical and food industries can be realistically simulated, thus enables us finding the latest development of new valve diaphragms to be obtained.

In addition to these test scenarios, which reproduce customer-specific applications, tests can also be carried out on this bench, which have become so to speak industrial standards. Here, for example, the extensive tests described in the ASME BPE should be mentioned.

With these and the possibilities offered by the Rolf Sandvoss Innovation Center based at our headquarter SAMSON AG FFM, we are well prepared for future challenges.



Process test bench. Cycle and lifetime testing of diaphragms and valves with saturated steam and various cip media.

Material		EPDM		PTFE/EPDM		PTFE/EPDM
MA		**8 - 100**		**25, 40, 50**	**8, 10**	**25 - 100**
Design		One-piece molded open		One-piece molded open		two-pieces molded closed
Temperaturerange	(°C)	-40 to 150		-20 to 150		-20 to 160
	(°F)	-40 to 300		-4 to 300		-4 to 300
SED Code		20	28	30	51	44

The temperatures listed here may apply to clean steam sterilization protocols and may not apply to continuous steam service.
Upon request, other diaphragms are available with other materials, bigger sizes and for higher temperature up to 175°C/350°F.

Diaphragms

Elastomer

PTFE/EPDM

EPDM
Ethylene-propylene elastomer peroxide cured. SED's EPDM is a specifically developed compound reinforced with a vulcanized woven fabric inlay and is always manufactured in the molded open position. This diaphragm design achieves higher stability for the diaphragm at higher temperatures and pressures. In addition, the woven fabric inlay is vulcanized over the embedded compressor stud in order to reinforce the elastomer-metal connection. Thus, the EPDM diaphragm is ideal for vacuum applications.

PTFE (TFM)
These PTFE diaphragms have been designed to offer the highest degree of chemical resistance, increased stability, longer flex life, less porosity, reduced cold flow and superior performance through temperature fluctuations between hot and cold and steam sterilization cycles.

MA8 and MA10
The diaphragm dimensions MA8 and MA10 are designed as one-piece diaphragms: This means that the EPDM back is bonded with the PTFE.
The diaphragms are always manufactured in the molded open position. These one-piece diaphragms feature smaller surface areas and are subject to shorter linear strokes which explains the excellent performance that has proved itself over time.

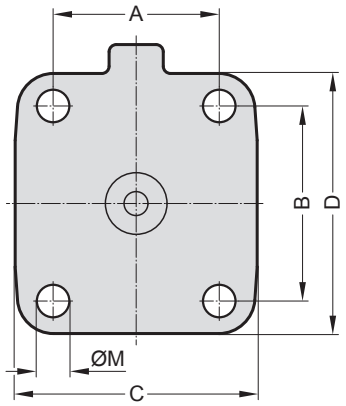
MA8 diaphragm incorporates an elastomer button for assembly with the valve operating mechanism. The MA10 utilizes a threaded stud assembly with the valve operating mechanism. Both these features eliminate the potential for point loading at the center of the diaphragm.

MA25 to MA100
The diaphragm dimensions MA25 to MA100 are designed as two-piece diaphragms-consisting of a separate EPDM backing cushion and a PTFE diaphragm. The diaphragm is always manufactured in the molded closed position. The advantage of this design for the MA25 to MA100 is that the diaphragm is in its molded shape while in the closed position of the valve. This reduces the force to close the valve and increases the diaphragm's life cycle.
In the two piece diaphragms the threaded stud connection is embedded in the PTFE of the diaphragm. To eliminate the potential of point loading at the center of the diaphragm, a floating suspension connection to the valve operating mechanism is utilized.

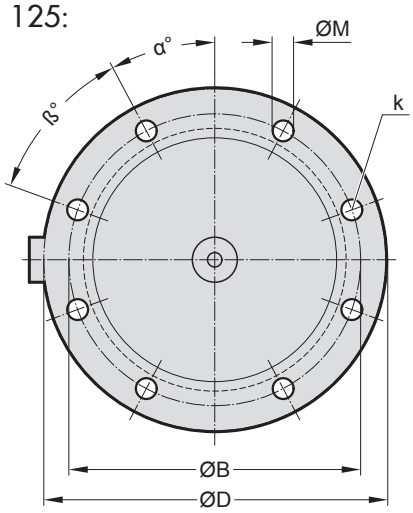
Note: Other diaphragm sizes and materials on request.

Diaphragms

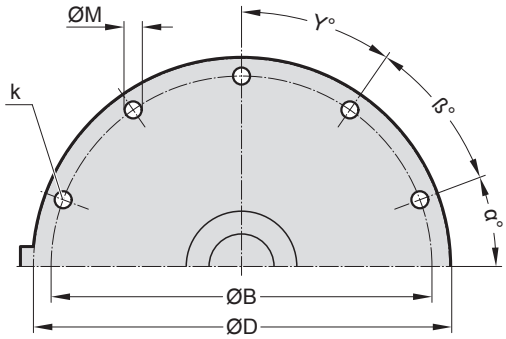
MA 8 - 80:



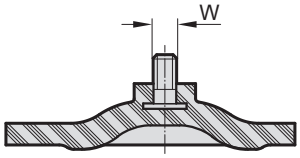
MA 100 - 125:



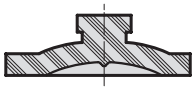
MA 150:



MA 10 - 150:



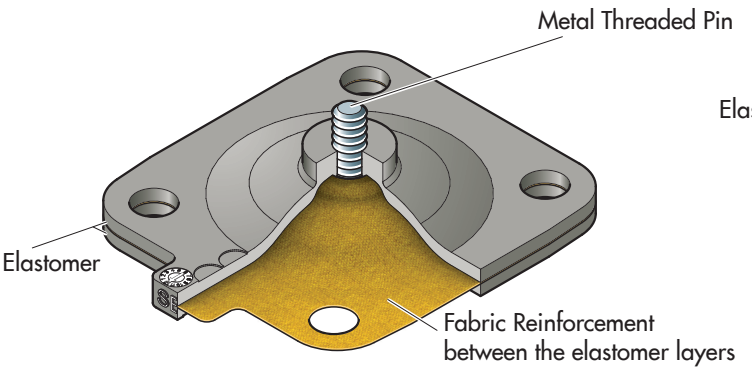
MA 8:



Dimensions (mm)

DN	NPS	MA	A	B	C	D	ØM	k	W	α	β	γ
4 - 15	1/4" - 1/2"	8	22	22	31,5	31,5	4,5	4	-	-	-	-
8 - 20	3/8" - 1/2"	10	42.5	37.5	52	47	5.5	4	M4	-	-	-
15 - 25	1/2" - 1"	25	46	54	67	72	9	4	1/4"	-	-	-
32 - 40	1 1/4" - 1 1/2"	40	65	70	90	100	13.5	4	1/4"	-	-	-
50	2"	50	78	82	106	124	13	4	1/4"	-	-	-
65R	2 1/2"	50	78	82	106	124	13	4	1/4"	-	-	-
65 - 80	2 1/2" - 3"	80	114	127	156	186	18	4	5/16"	-	-	-
100	4"	100	-	194	-	228	14.5	8	5/16"	20	42	-
125	5"	125	-	222	-	254	17.5	8	3/8"	43.5	43.5	-
150	6"	150	-	273	-	298.5	17.5	10	3/8"	35	35	35

Diaphragm Code 28

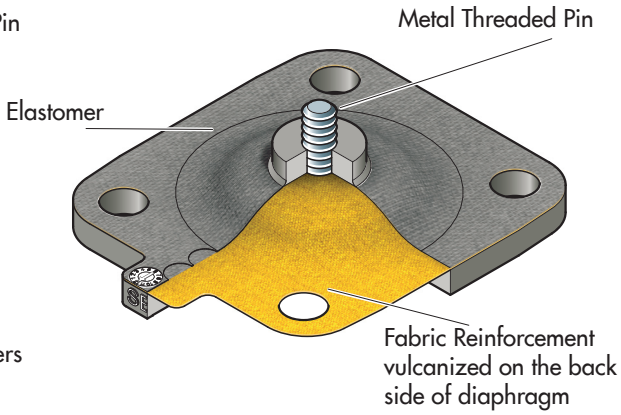


After a long and successful development accompanied by stringent tests, simulation of actual aseptic process applications and sterilization protocol, SED has released an improved elastomer formulation for our EPDM diaphragms. This EPDM diaphragm is made out of an improved compound material targeting critical aseptic applications with SIP steam sterilizing cycles and processes.

Features:

- The elastomer formulation for our Code 28 EPDM diaphragm is identical to the Code 20 EPDM diaphragm which has a different design and manufacturing process.
- Woven fabric reinforcement is positioned between two elastomer layers.
- Increased lifetime span under steam.
- All required approvals and conformities are available (See page 18).
- Diaphragm is interchangeable with all other SED diaphragm valves.

Diaphragm Code 20



Typically an elastomer is manufactured with a woven fabric reinforcement positioned in the middle of the EPDM diaphragm to improve it's mechanical properties, like strength and durability. This is accomplished by vulcanizing the woven fabric reinforcement between two elastomer layers.

A specific manufacturing process has been developed to vulcanize the woven fabric reinforcement on the back side of the EPDM diaphragm. With this manufacturing process the diaphragm achieves better performance in SIP steam sterilizing cycles and processes with reliability in critical sterile processes.

Features:

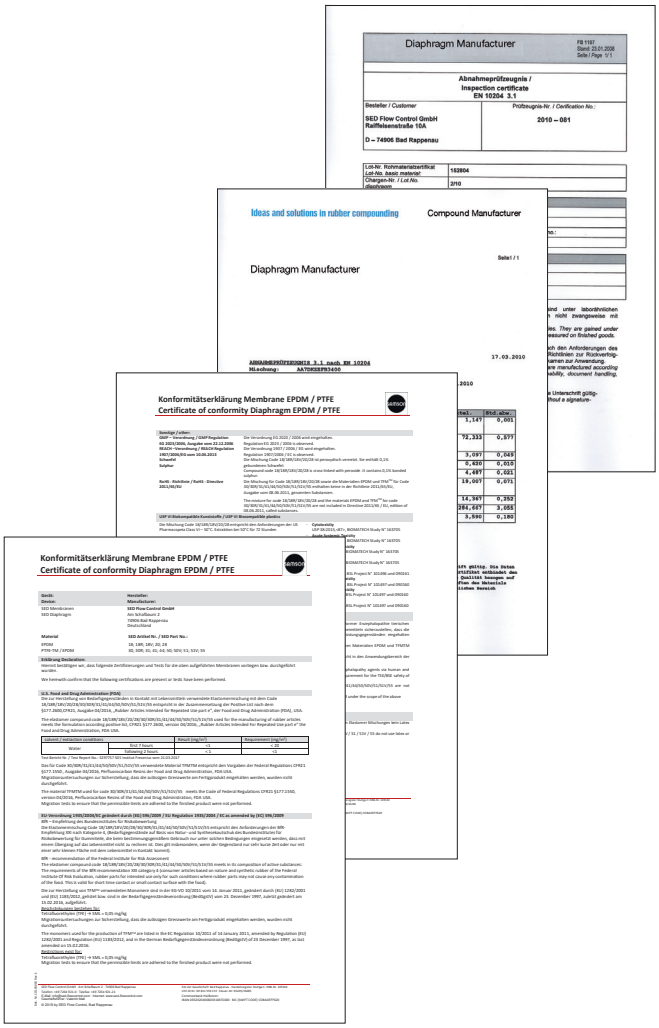
- The elastomer formulation for our Code 20 EPDM diaphragm is identical to the Code 28 EPDM diaphragm.
- Maximum distance from the media fabric to contact surface.
  - Damage to the fabric can be easily spotted.
- Friction between compressor and the back of the diaphragm is minimized.
  - Therefore reduced wear and longer life cycle.
- Better load distribution because of the maximum height of pure elastomer when the fabric is on the back side.
- Increased process safety due to only one fabric layer. The position of the fabric on the back side is exactly geometrically defined.
- Production control is easier when the fabric is on the back side.
- All required approvals and conformities are available (See page 18).
- Diaphragm is interchangeable with all other SED diaphragm valves.

Diaphragms

Certification and Compliance for Validation

At SED, we recognize the importance of the validation process in the aseptic industry.
This has led to an internal awareness and specific restructuring within the company to provide the highest level of reliability and regulatory compliance through the complete supply chain to provide a complete package of documentation for all components in contact with the medium.
With regard to this, the diaphragm is the key component to the valve's performance.

- All resin and additives used in the manufacturing process are FDA compliant.
- Compounding, physical properties and manufacturing process are documented
- Certificate of Conformance with FDA for all diaphragms
  - 21CFR177.2600 for Elastomers
  - 21CFR177.1550 for Perfluorocarbon resins
- Certificate of Conformance with USP 28 Class VI, Chapter 87 In-Vitro and Chapter 88 In-Vivo
- Testing for extractable organic substances on the basis of ISO 10993-18 (detection by GC-MS)
- Certificate of Conformance with 3-A
- TSE/BSE (ADCF) Certification of Compliance to EMEA/410/01 "Guidance on Minimising the Risk of Transmitting Animal Spongiform Encephalopathy Agents via Human and Veterinary Medical Products"
- Certificate of Traceability according EN 10204 3.1 of compounding and molding process with material analysis
- Test data available upon request
- REACH-Verordnung (EU) 1907/2006/EG is observed
- RoHS Directive 2011/65/EU is observed
- Certificate of Conformance with (EG) 596/2009



Diaphragms

Diaphragm Traceability

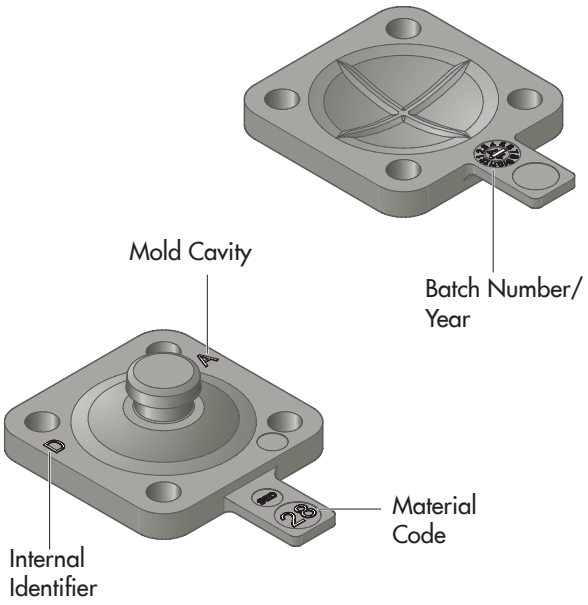
Every diaphragm is clearly identified, and the material is batch traceable by a set of unique codes molded into the diaphragm.

Information provided on the order and shipping documents as well as on the packaging is described by the following. With the request of the Material Analysis Traceability Certificate DIN EN 10204 3.1 for manufacturing and formulation the additionally provided information is shown in bold type.

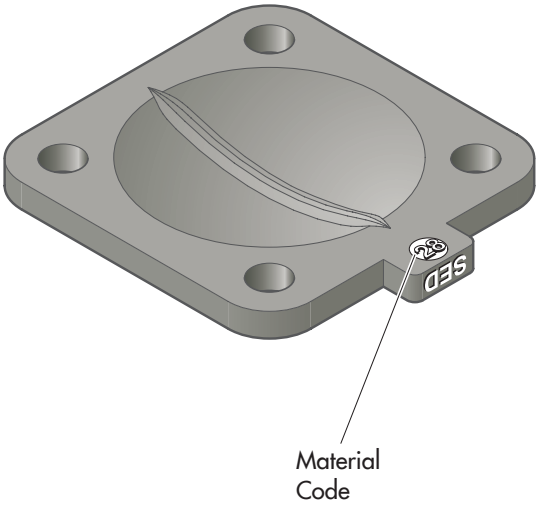
... on the order and shipping documents:
- SED article number, material code with description
- Customer article number on request
- **Batch number**
- **Shelf Life**

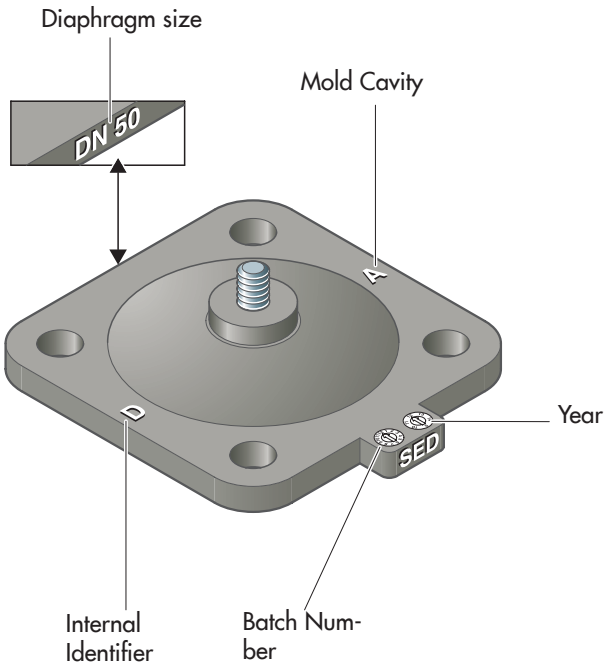
... on packaging in which the diaphragm is bagged and sealed in plastic:
- SED article number, material code with description
- Internal order series number
- Packaging quantity
- Customer article number on request
- **Batch number**
- **Shelf Life**

Example markings MA8



Example markings MA ≥ 25





Valve Bodies

SED valve bodies are manufactured to the 1.4435 / S31603 ASME BPE Table MM-2.1-1 material standard and according to EN 10204 inspection certificate 3.1/ Material Test Report (MTR). All valve bodies feature a stamped batch number that allows for traceability to the material properties and physical composition of the valve body. The interior body contour and contact surfaces are designed specifically to comply with the requirements of cGMP. Optimized cleanability and a cavity-free design eliminate entrapment areas and enhance diaphragm life span.
SED valve bodies are made out of raw forged, block material, or investment cast. Depending on the material and specification of the valve body, different manufacturing processes are used.

Forged Bodies
The forged body starts as a solid piece of stainless steel ingot. In the forging process the shape of the material is changed through pressure between forging tools at high temperatures.

Through the forging procedure a high density and homogeneous structure of the material is generated. This reduces the possibility of porosity or that any inclusions can emerge. After that, the forged body is mechanically machined according to specifications.

Block Bodies
When producing bodies made of solid wrought block or bar stock material, equal features to that of forging are achieved. The individual raw valve bodies are cut from the block or bar stock and then are mechanically machined according to specifications.
Every finished body can be supplied with a Delta Ferrite content of less than 0.5%.

Investment Cast
Investment cast bodies are produced in a pattern mould with wax containing the shape of the final valve body. By dipping the wax body in a ceramic material, the complete wax valve body is covered with ceramic. After melting the interior, the ceramic shell is filled with molten stainless steel. The surrounding ceramic coating is removed, which results in a very high dimensional accuracy and a clean and smooth surface.
In order to achieve high quality investment cast products, SED moulds are designed and optimized for high quality castings.
Bodies are checked according to detailed test specifications to ensure a reliable quality with regard to the material structure and density.

Component	Tube Size	Manufacturing Process
2/2 way body	4 - 80 mm / 1/4 - 3" 100 - 150 mm / 4 - 6" 4 - 100 mm / 1/4 - 4"	forged block material investment cast
Multiport body	4 - 150 mm / 1/4 - 6"	block material
Tank valve	4 - 150 mm / 1/4 - 6"	block material

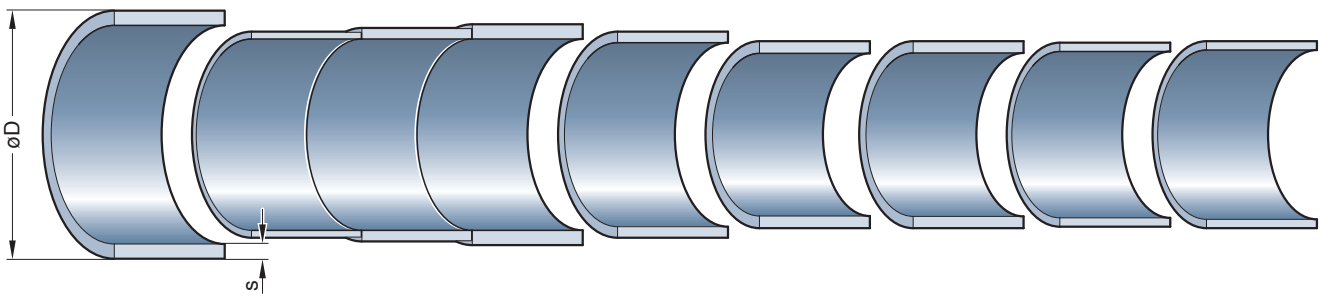
Chemical Composition
Values listed in this table are primary elements only and are not complete chemical compositions as listed in specific product type material specifications.

	1.4435
Element	Wt.%
Carbon, max.	0,030
Manganese, max.	2,00
Chromium	17,00-19,00
Nickel	12,50-15,00
Molybdenum	2,50-3,00

According ASME BPE Table MM-2.1-1 alloy comparable with material S31603 and listed in previous versions of ASME BPE as 316L.
Sulfur content ASME BPE always within 0,005 to 0,017.
Other alloys are available on request, below is a list of materials machined from solid block:
- Super-Austenitic Stainless Steel
- Duplex Stainless Steel
- Nickel alloys
- Titanium

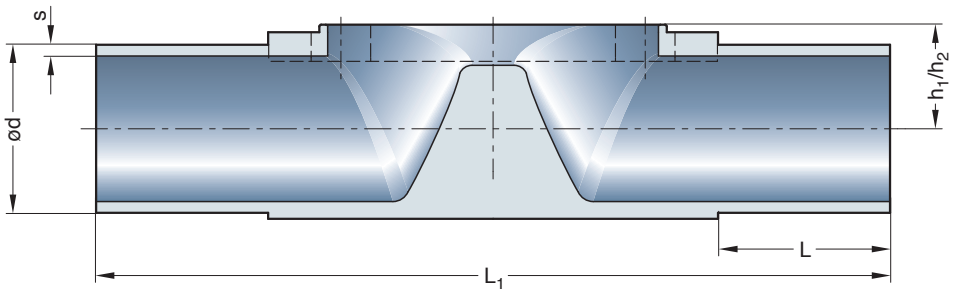
Tube End Standards
The following chart of international standards of pipe diameters identifies the different diameters comparing the example of a nominal diameter of DN 25.

ISO 1127	DIN 11850			DIN	ASTM 269	BS O. D.	SMS 3008	JIS G
	Series 1	Series 2	Series 3	Selection Series	ASME BPE	4825		3447
(DIN 11866 Series B)		(DIN 11866 Series A)			(DIN 11866 Series C)			



Butt Weld Tube Ends

We offer tube end outside diameter and wall thickness dimensions in accordance to several international standards. These standards and dimensions are listed in the table below.
In order to install a proper aseptic process piping system, it is important that the correct and consistent international tube end standards be followed throughout said aseptic process piping system. If the connecting tube ends are not identical and of the same diameter standard, performance reduction in the process piping system may occur, or the ability of self draining ends is not guaranteed.
The most common standard connection is the butt-welding of the tube endings without any additional material.
Examples of butt welding include automatic and orbital welding.
Besides the standard any customer-specified connection type is possible.
Some examples are displayed on the following pages.



h_1 = Investment cast bodies
h_2 = forged bodies

Butt weld Tube End Standard							ISO 1127	DIN 11850		DIN	ASTM 269	BS O.D.	SMS	JIS G	JIS G
								Series 1	Series 2	Selection	ASME BPE	4825	3008	3447	3459
							DIN 11866 Series B		DIN 11866 Series A	Series	DIN 11866 Series C				
Code							40	41	42	39	45 [1]	94	49	97	98 [3]
DN	NPS	MA	L(min)	L1	h1	h2	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s
Valve Type Manually Operated 205 / 206 / 290 /297 Valve Type Pneumatically Operated 190 / 207 / 217															
4	-	**8**	20	72	9	9	-	-	-	6x1,0	-	-	-	-	-
6	-	**8**	20	72	9	9	-	-	8x1,0 [2]	8x1,0	-	-	-	-	10,5x1,2
8	1/4	**8**	20	72	9	9	**13,5x1,6**	-	10x1,0 [2]	10x1,0	6,35x0,89	-	-	-	13,8x1,65
10	3/8	**8**	20	72	9	9	-	12x1,0	**13x1,5**	-	9,53x0,89	-	-	-	-
15	1/2	**8**	20	72	9	9	-	-	-	-	**12,7x1,65**	12,7x1,2	-	-	-
Valve Type Manually Operated 289 / 295 / 397 Valve Type Pneumatically Operated 188 / 195 / 317 / 392 / 394															
8	-	**10**	25	108	12	12	13,5x1,6	-	-	-	-	-	-	-	-
10	3/8	**10**	25	108	12	12	**17,2x1,6**	12x1,0	13x1,5	-	9,53x0,89 [3]	-	-	-	17,3x1,65
15	1/2	**10**	25	108	12	12	**21,3x1,6**	18x1,0	**19x1,5**	18x1,5	12,7x1,65	12,7x1,2	-	-	21,7x2,1
20	3/4	**10**	25	108	12	12	-	-	23x1,5	22x1,5	**19,05x1,65**	19,05x1,2	-	-	-
Valve Type Manually Operated 905 / 907 / 982 / 985 / 995 /997 Valve Type Pneumatically Operated 385 / 395 / 402 / 407/ 417 / 495 / 592															
15	-	**25**	25	120	13	16	21,3x1,6	18x1,0	19x1,5	-	12,7x1,65 [3]	-	-	-	21,7x2,1
20	3/4	**25**	25	120	16	16	**26,9x1,6**	22x1,0	**23x1,5**	-	19,05x1,65	-	-	-	27,2x2,1
25	1	**25**	25	120	19	19	**33,7x2,0**	28x1,0	**29x1,5**	28x1,5	**25,4x1,65**	-	25,0x1,2	25,4x1,2	-
32	1 1/4	**40**	25	153	24	26	**42,4x2,0**	34x1,0	**35x1,5**	-	31,75x1,65 [3]	-	33,7x1,2	31,8x1,2 [3]	-
40	1 1/2	**40**	25	153	24	26	**48,3x2,0**	40x1,0	**41x1,5**	-	**38,1x1,65**	-	38,0x1,2	38,1x1,2	-
50	2	**50**	30	173	32	32	**60,3x2,0**	52x1,0	**53x1,5**	-	**50,8x1,65**	-	51,0x1,2	50,8x1,5	-
65	2 1/2	**50**	30	173	32	32	-	-	-	-	**63,5x1,65**	-	63,5x1,6	63,5x2,0 [3]	-
65	2 1/2	**80**	25	216	47	47	**76,1x2,0**	-	**70x2,0**	-	**63,5x1,65**	-	63,5x1,6	63,5x2,0 [3]	-
80	3	**80**	30	254	47	47	**88,9x2,3**	-	**85x2,0**	-	**76,2x1,65**	-	76,1x1,6	76,3x2,0	-
100	4	**100**	30	305	61	58	**114,3x2,3**	-	**104x2,0**	-	**101,6x2,11**	-	101,6x2,0	101,6x2,1	-
125	5	**150**	30	450	100	90	**139,7x2,6**	-	**129x2,0**	-	-	-	-	-	-
150	6	**150**	30	450	100	96	**168,3x2,6**	-	**154x2,0**	-	**152,4x2,77**	-	-	-	-

Dimensions in mm; MA = Diaphragm size / Upon request, other tube end standards are available / Preferred standards bold

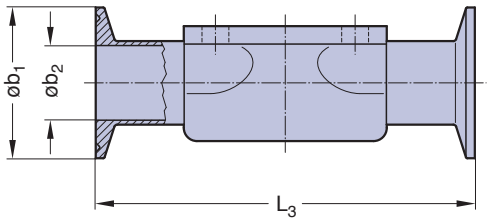
[1] ASTM 269 ASME BPE tube diameter (Code 45) in forged version optional also available in tube end length according ASME BPE (Code 95); Tube Size 1/4" to 2 1/2" L = 1,5" (38,1 mm); Tube Size 3" L = 1,75" (44,45 mm); Tube Size 4" L = 2" (50,8 mm); Tube Size 6" L = 2,5" (63,5 mm)
[2] DIN 11866 only
[3] Available only in forged design

Aseptic Connections

Clamps

Clamp connections are the most popular connection for easy assembly and breakdown of process lines and valves. Clamp end connections are designed for a face-to-face joint that is leak proof and free of crevices.
The clamp end has a machined beveled seat and is used with specifically formed sealing gaskets made of EPDM or PTFE.
The gasket is inserted between the opposing clamp ends and is tightened with a wing nut quick disconnect clamp.
In general, valve clamps ends are welded to the valve butt weld ends and polished according to the specified interior valve body surface finish.

Welded clamp ends are 100% visually inspected and compression tested. Clamp connections are available for all current pipe standard diameters.
If the connecting clamp ends are not identical and of the same diameter standard, there may be a reduction or step in the process piping system, or the ability of self draining ends is not guaranteed.
If assembled correctly, the clamp end process system offers a smooth, crevice-free, self-aligning joint that reduce the hazards of contamination and minimizes turbulence and pressure drop in the system.



Dimensions Inch

Clamp End Ident. / **Tube End Ident.**			**ASME BPE** / **ASME BPE**			**ASME BPE** / **ASME BPE**		
Code FtF			645			545		
Standard FtF			DIN EN 558-1			ASME BPE DT-V-1		
DN	NPS	**MA**	L_3	b_2	b_1	L_3	b_2	b_1
8	1/4	**8**	-	-	-	2,5	0,18	1
10	3/8	**8**	-	-	-	2,5	0,31	1
15	1/2	**8**	2,5	0,37	1	2,5	0,37	1
10	3/8	**10**	-	-	-	-	-	-
15	1/2	**10**	4,25	0,37	1	3,5	0,37	1
20	3/4	**10**	4,60	0,62	1	4,0	0,62	1
15	1/2	**25**	4,25	0,37	1	4,0	0,37	1
20	3/4	**25**	4,60	0,62	1	4,0	0,62	1
25	1	**25**	5,00	0,87	2	4,5	0,87	2
32	1 1/4	**40**	-	-	-	-	-	-
40	1 1/2	**40**	6,25	1,37	2	5,5	1,37	2
50	2	**50**	7,50	1,87	2,5	6,25	1,87	2,5
65	2 1/2	**80**	8,50	2,37	3	*8,75	2,37	3
80	3	**80**	10,00	2,87	3,5	8,75	2,87	3,5
100	4	**100**	12,00	3,83	4,5	11,5	3,83	4,5

Dimensions mm

Clamp End Ident. / **Tube End Ident.**			Similar **ISO 2852** / **ISO 1127**			**DIN 32676** / **DIN 11850**			**ASME BPE** / **ASME BPE**			**ASME BPE** / **ASME BPE**			**SMS 3017** / **SMS 3008**		
Code Face to face (FtF)			640			641/642			645			545			649		
Standard FtF			DIN EN 558-1			DIN EN 558-1			DIN EN 558-1			ASME BPE DT-4.4.1-1			DIN EN 558-1		
DN	NPS	**MA**	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1
8	1/4	**8**	*63,5	10,3	25,0	-	-	-	-	-	-	63,5	4,57	25,0	-	-	-
10	3/8	**8**	-	-	-	*63,5	10,0	34,0	-	-	-	63,5	7,75	25,0	-	-	-
15	1/2	**8**	-	-	-	-	-	-	*63,5	9,40	25,0	63,5	9,40	25,0	-	-	-
10	3/8	**10**	108,0	14,0	25,0	108,0	10,0	34,0	-	-	-	-	-	-	-	-	-
15	1/2	**10**	108,0	18,1	50,5	108,0	16,0	34,0	108,0	9,40	25,0	88,9	9,40	25,0	-	-	-
20	3/4	**10**	-	-	-	117,0	20,0	34,0	117,0	15,75	25,0	101,6	15,75	25,0	-	-	-
15	1/2	**25**	108,0	18,1	50,5	108,0	16,0	34,0	108,0	9,40	25,0	101,6	9,40	25,0	-	-	-
20	3/4	**25**	117,0	23,7	50,5	117,0	20,0	34,0	117,0	15,75	25,0	101,6	15,75	25,0	-	-	-
25	1	**25**	127,0	29,7	50,5	127,0	26,0	50,5	127,0	22,10	50,5	114,3	22,10	50,5	127,0	22,6	50,5
32	1 1/4	**40**	146,0	38,4	50,5	146,0	32,0	50,5	146,0	28,45	50,5	139,7	28,45	50,5	146,0	31,3	50,5
40	1 1/2	**40**	159,0	44,3	64,0	159,0	38,0	50,5	159,0	34,80	50,5	139,7	34,80	50,5	159,0	35,6	50,5
50	2	**50**	190,0	56,3	77,5	190,0	50,0	64,0	190,0	47,50	64,0	158,8	47,50	64,0	190,0	48,6	64,0
65	2 1/2	**80**	216,0	72,1	91,0	216,0	66,0	91,0	216,0	60,20	77,5	*222,3	60,20	77,5	216,0	60,3	77,5
80	3	**80**	254,0	84,3	106,0	254,0	81,0	106,0	254,0	72,90	91,0	222,3	72,90	91,0	254,0	72,9	91,0
100	4	**100**	305,0	109,7	130,0	305,0	100,0	119,0	305,0	97,38	119,0	292,1	97,38	119,0	305,0	97,6	119,0

*Length differing from standard; other lengths on request

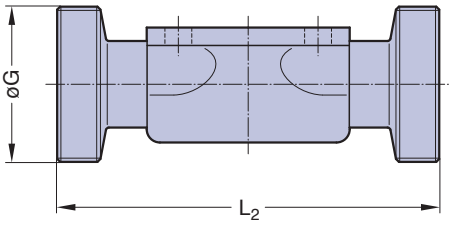
Aseptic Connections

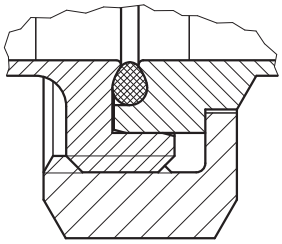
Aseptic Threads

Threaded spigot, liner and the interjacent seal are compressed with a spigot nut.

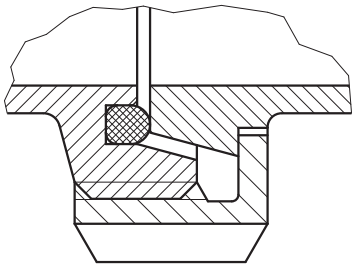
- Milk-threaded ends DIN 11851 with form sealing
- Aseptic connection according to DIN 11864-1 A with partly open o-ring for optimized cleaning features and a reduced dead leg. The threaded spigot, the liner and the interjacent o-ring are compressed against a metallic block with a spigot nut.

Connections are available for the current pipe standards within the aseptic application.
The threaded spigot and liner are welded with the pipe ends and the weld seam is polished according to the specified interior valve surface finish.





DIN 11864-1-A

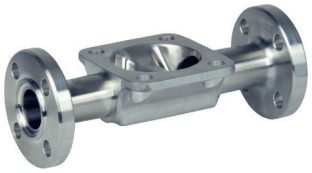


DIN 11851

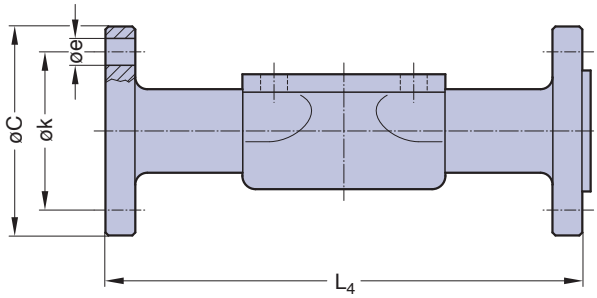
L in mm			DIN 11851 Code 8..		DIN 11864-1-A Code 4..	
DN	NPS	**MA**	L_2	G	L_2	G
4	-	**8**	-	-	-	-
6	-	**8**	-	-	-	-
8	1/4	**8**	-	-	-	-
10	3/8	**8**	92	Rd 28 x 1/8	92	Rd 28 x 1/8
15	1/2	**8**	-	-	-	-
8	1/4	**10**	-	-	-	-
10	3/8	**10**	118	Rd 28 x 1/8	118	Rd 28 x 1/8
15	1/2	**10**	118	Rd 34 x 1/8	118	Rd 34 x 1/8
20	3/4	**10**	-	-	-	-
15	1/2	**25**	118	Rd 34 x 1/8	120	Rd 34 x 1/8
20	3/4	**25**	118	Rd 44 x 1/6	144	Rd 44 x 1/6
25	1	**25**	128	Rd 52 x 1/6	164	Rd 52 x 1/6
32	1 1/4	**40**	147	Rd 58 x 1/6	192	Rd 58 x 1/6
40	1 1/2	**40**	160	Rd 65 x 1/6	214	Rd 65 x 1/6
50	2	**50**	191	Rd 78 x 1/6	244	Rd 78 x 1/6
65	2 1/2	**80**	246	Rd 95 x 1/6	314	Rd 95 x 1/6
80	3	**80**	256	Rd 110 x 1/4	342	Rd 110 x 1/4
100	4	**100**	-	-	-	Rd 130 x 1/4

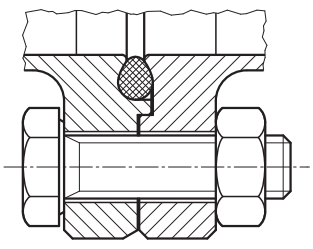
Aseptic Flanges

Aseptic flanges according to DIN 11864-2 Form A are connections with a partly open o-ring for optimized cleaning features and a reduced dead leg. The round flange and the groove flange are welded with the pipe ends and the weld seam is polished according to the specified interior valve body surface finish.



Connections are available for the current pipe standards within the aseptic application.
The round flange and the groove flange are welded orbital with the pipe endings and the weld seam is polished mechanically according to the valve body.





			DIN 11864-2-A Code 3.. (mm)			
DN	NPS	**MA**	L_4	C	k	e
10	3/8	**10**	130	54	37	ø 9
15	1/2	**25**	130	59	42	ø 9
20	3/4	**25**	150	64	47	ø 9
25	1	**25**	160	70	53	ø 9
32	1 1/4	**40**	180	76	59	ø 9
40	1 1/2	**40**	200	82	65	ø 9
50	2	**50**	230	94	77	ø 9
65	2 1/2	**80**	290	113	95	ø 9
80	3	**80**	310	133	112	ø 11
100	4	**100**	350	159	137	ø 11

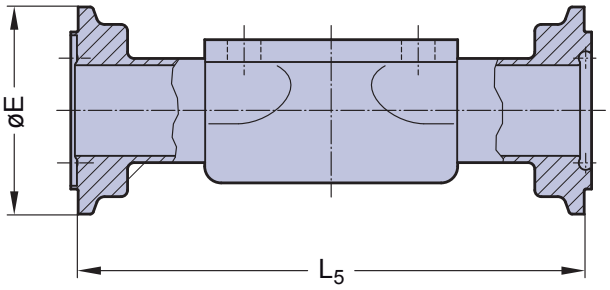
Aseptic Connections

Aseptic Clamps

Aseptic connection according to DIN 11864-3 with partly open o-ring for optimized cleaning features and a reduced dead leg. The aseptic clamp with groove, the aseptic clamp with collar and the interjacent o-ring are compressed against a metallic block with a closure clamp.

Connections are available for the current pipe standards within the aseptic application. The aseptic clamp with groove and the aseptic clamp with collar are welded with the pipe ends and the weld seam is polished according to the specified interior valve surface finish.

DN	NPS	MA	DIN 11864-3 L_5	DIN 11864-3 E
10	3/8	**8**	63,5	34
10	3/8	**10**	108	34
15	1/2	**10**	108	34
20	3/4	**10**	117	42
15	1/2	**25**	108	34
20	3/4	**25**	117	42
25	1	**25**	127	42
32	1 1/4	**40**	146	42
40	1 1/2	**40**	159	54
50	2	**50**	190	62
65	2 1/2	**80**	216	78
80	3	**80**	254	93
100	4	**100**	305	115



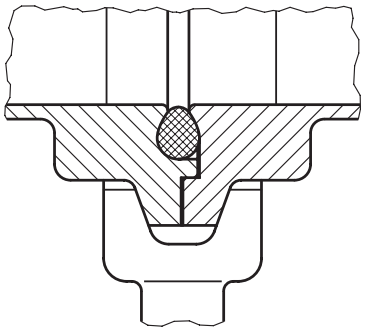


Table of Contents

Overview

Series	Description	Specification			
Steripur Stainless Steel Actuator	Control function available	Manually operated			
	Diaphragm size	**MA 8**	**MA 10**	**MA 25 - 50**	**MA 80 - 100**
	Diameter in mm (inch)	4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	65 - 100 (2 1/2 - 4)
	Type	**206**	**397**	**907**	**997**
	Image				 DN 100
	Max. working pressure with				
	- diaphragm EPDM in bar (psi)	10 (150)	10 (150)	10 (150)	10 (150)
	- diaphragm PTFE in bar (psi)	10 (150)	10 (150)	10 (150)	8 (115)
	Max. working temperature °C (°F) [2]	160 (320)			
	Details see page	**34**	**35**	**36**	**37**

Series	Description	Specification			
KMA Plastic Actuator with Stainless Steel Bonnet	Control function available	Manually operated			
	Diaphragm size	**MA 8**	**MA 10**	**MA 25 - 50**	**MA 80 - 100**
	Diameter in mm (inch)	4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	65 - 100 (2 1/2 - 4)
	Type	**205**	**295**	**905**	**995**
	Image				 DN 80
	Max. working pressure with				
	- diaphragm EPDM in bar (psi)	10 (150)	10 (150)	10 (150)	10 (150)
	- diaphragm PTFE in bar (psi)	10 (150)	10 (150)	10 (150)	8 (115)
	Max. working temperature °C (°F) [2]	160 (320)			
	Details see page	**48, 49**	**50, 51**	**52, 53**	**54**

Series	Description	Specification		
KMD Plastic Actuator directly mounted	Control function available	Manually operated		
	Diaphragm size	**MA 10**	**MA 25 - 50**	**MA 80 - 100**
	Diameter in mm (inch)	8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	65 - 100 (2 1/2 - 4)
	Type	**289**	**982**	**985**
	Image			 DN 100
	Max. working pressure with			
	- diaphragm EPDM in bar (psi)	6 (87)	10 (150)	10 (150)
	- diaphragm PTFE in bar (psi)	6 (87)	10 (150)	8 (115)
	Max. working temperature °C (°F), design HS [2]	150 (300)	NA	NA
	Max. working temperature °C (°F), design S [2]	80 (176)		
	Details see page	**60**	**61**	**62**

[2] dependent on application

MA = Diaphragm size

Differentiations between the series see table page 30

Specification				
Pneumatically operated				
NO, DA	NC	NC, NO, DA		
MA 8		**MA 10**	**MA 25 - 50**	**MA 80 | 100**
4 - 15 (1/4 - 1/2)		8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	65 - 100 (2 1/2 - 4)
217.25	**217.30**	**317** [1]	**417** [1]	**407**
				
8 (115)	8 (115)	8 (115)	10 (150)	7 (100) | 6 (87)
7 (100)	7 (100)	7 (100)	8 (115)	6 (87) | 5 (72)
		160 (320)		
38, 39		**40**	**42, 43**	**41**

Pneumatically operated			
NC, NO, DA			
MA 8	**MA 10**	**MA 25 - 50**	**MA 25 - 50 | 80 | 100**
4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	15 - 100 (3/4 - 4)
190	**195**	**395**	**495**
			
8 (115)	8 (115)	10 (150)	10 (150) | 7 (100) | 6 (87)
7 (100)	7 (100)	8 (115)	8 (115) | 6 (87) | 5 (72)
	160 (320)		
55	**56**	**57**	**58**

	Pneumatically operated		
	NC, NO, DA		
	MA 10	**MA 25 - 50**	**MA 25 - 50 | 80**
	8 - 20 (3/8 - 3/4)	15 - 65 (3/4 - 2 1/2)	15 - 80 (3/4 - 3)
	188	**402**	**385**
			
	8 (115)	10 (150)	10 (150) | 7 (100)
	7 (100)	8 (115)	8 (115) | 6 (87)
	150 (300)	150 (300)	NA
	80 (176)	NA	80 (176)
	63	**64**	**65**

[1] Also available as two-stage actuator for MA10 & MA25, see page 44 to 46

Why to choose an Aseptic Diaphragm Valve?

Standard valve assembly consists of three components: the valve body, diaphragm and actuator.
Due to its unique characteristics, the diaphragm valve has prevailed for aseptic processes. Demanding requirements for higher quality in process applications is proceeded by developing innovative and advanced solutions.
SED's priority is to commit the resources needed and achieve high quality standards based on continuous development beneficial for the customer's application.
This development provides the latest applied knowledge and standards, the requirement of compliances, and recommendations of the admission organizations.

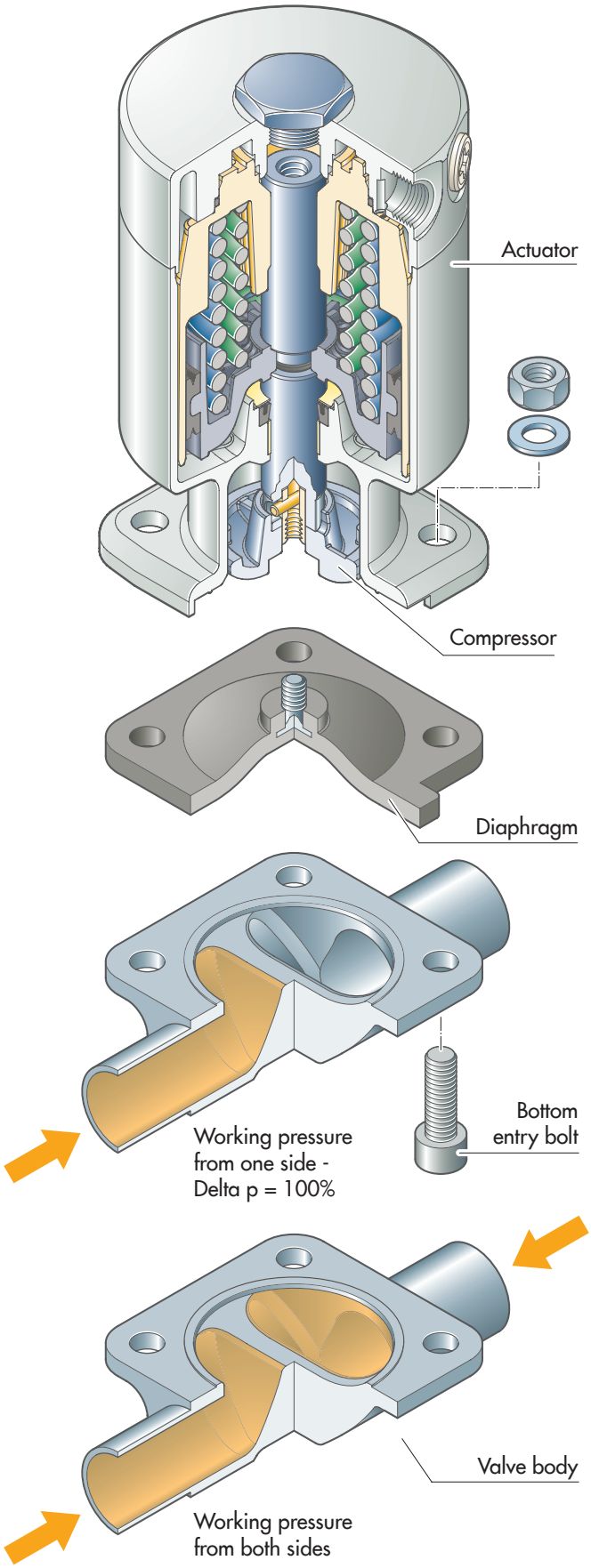
General and SED Specific Criteria:

- **Positive Closure**
  The resilient diaphragm bead in contact with the metal weir assures positive closure.
- **Ideal for CIP and SIP**
  Clean-in-place and Steam-in-place operations may be performed in-line without valve disassembly or operation.
- **In-Line Maintenance**
  The top entry design allows for in-line maintenance.
- **Bonnet Isolation**
  The diaphragm isolates the working parts of the valve from the process media.
- **Streamline Fluid Passage**
  A smooth contoured body, streamlined flow path and high quality interior surface prevents the accumulation of process fluids or contaminants.
- **Minimal Contact Surfaces**
  Minimal process contact surfaces (body and diaphragm) enhancing the ease of cleaning and sterilization.
- **One Centerline for Inlet and Outlet**
  One centerline for inlet and outlet simplifies installation and plant design work.
- **Modular Construction System**
  Modular valve construction system reduces complexity and maintenance expense.

Working Pressure from One and Both Sides for Pneumatic Operation
(see illustration on the right)

The reference to the maximum possible working pressure in this catalogue is only valid for uni-directional media with a pressure drop (Delta p = 100%) independent from the flow direction. Uni-directional working pressure corresponds to most applications.

If the media pressure is simultaneously the same on both sides (Delta p = 0%) i. e. due to a certain application of the valve in a loop installation, please ask a factory representative for the maximum possible working pressure tp specify the correct layout of the valve.
If the sum does not exceed the maximum possible working pressure from one side, the valve can be applied for that application.



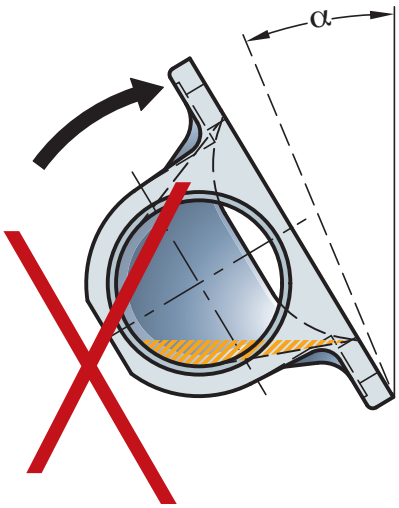
Self Draining - Two-Way Valve

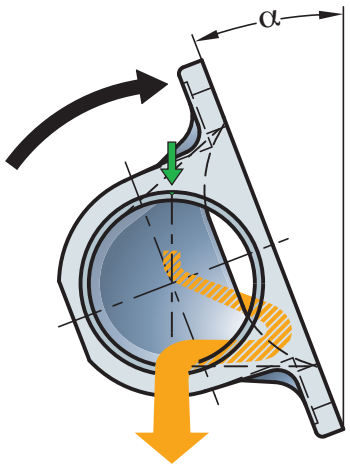
One of the most important criteria of all valves applied in aseptic processes is drainability.
This is the main reason why the diaphragm valve has prevailed as the valve of choice for aseptic process applications.

To achieve optimum self draining for horizontal installed valves, the following criteria are relevant:

- Correct design and inner contours of the two-way body
- Internal surface quality of the two-way body
- Cavity free valve assembly
- Self draining installation position
- End connections
- Slope of the installed two-way body
- Consistency of the medium

Installing the valve at the specific angle, allowing the medium to fully drain in the open position.
See the illustration below and the corresponding table showing the specific angle dependend on tube size and standard, as well as material selection of the two-way body.
Installing the tubing and valves with about 1% (10 mm/m) slope for long runs and 2% (20 mm/m) slope for short runs is recommended for optimal drainability. Ultimately, it is the system designer's / end user's responsibility to ensure drainability in the process system. Upon request, the tube end of the valve body is marked with a hash mark. If installed correctly, the hash mark must vertically cross the centerline of the tube end and be perpendicular to the pipe line. In addition, a template may be supplied for easy installation and adjustment of the drain angle.





VALVE-TYPE	VALVE SIZE			SELF DRAINING ANGLE					
				FORGED BODIES			INVESTMENT CAST BODIES		
	Tube end standard			ISO 1127 DIN 11866-B	DIN 11850-1/-2 DIN 11866-A	ASME BPE DIN 11866-C	ISO 1127 DIN 11866-B	DIN 11850-1/-2 DIN 11866-A	ASME BPE DIN 11866-C
	Code			40	41 / 42	45	40	41 / 42	45
	DN (mm)	NPS (inch)	MA	α (Degree)			α (Degree)		
190 205 / 206 207 / 217 290 / 297	4	-	8	-	-	-	-	22	-
	6	-	8	-	-	-	-	22	-
	8	1/4	8	20,5	-	33,2	12,5	22	42
	10	3/8	8	-	22,4	28,4	-	13,5	28,8
	15	1/2	8	-	-	25	-	-	15,5
188 / 195 295 / 289 317 / 392 394 / 397	8	-	10	26,6	-	-	31	-	-
	10	3/8	10	20,6	27,5	31,4	21	32	-
	15	1/2	10	12,8	17,3	28,8	10,5	16	33
	20	-	10	-	9,6	17,4	-	7	16,5
385 / 395 / 402 407 / 417 / 495 592 / 905 / 907 / 982 985 / 995 / 997	15	1/2	25	33,5	35,8	42,9	39,5	43	-
	20	-	25	27,3	31,5	36,1	29	36	43,5
	25	1	25	15,7	19,9	29,1	20	26	32,5
	32	1 1/4	40	18,4	24,7	27,6	21	28,5	-
	40	1 1/2	40	12,3	17,7	21,5	14	21	25
	50	2	50	12,4	16,1	18,5	13,5	19,5	22,5
	65	2 1/2	50	-	-	12,4	23	30	9
	65	2 1/2	80	21,1	23,3	26,6	23	30	30
	80	3	80	15,8	15,8	21,1	17	17	23
	100	4	100	17,1	18	19,3	19,5	19,5	19,5

MA = Diaphragm size
Drain angle tolerance is +/- 2 degrees for optimum drainability
All valve bodies are marked with the valid self draining angle.

Innovative Design

We offer three different series of manual and pneumatically operated aseptic diaphragm valves.
The selection of each is influenced by different criteria, i. e. application, technical specification, process system and plant design, available space, and last but not least the TCO (total cost of ownership).

The following table shows an overview of the performance and features of the three different series: Steripur, KMA, and KMD.
This table shall help you in finding the optimal solution for your application.

Position	Series / MA / Performance Features	Steripur			KMA			KMD	
		8	10	≥ 25	8	10	≥ 25	10	≥ 25
1	Stainless steel piston actuation	●	●	●					
2	Actuation with stainless steel manual bonnet or distance pieces				●	●	●		
3	Plastic actuation directly mounted to the valve body							●	●
4.1	Compact Design	●	●	●		●	Type 395 / 905	●	Type 402
4.2	Optional orientation of the air inlet port	●	●	●	●		Type 395	●	Type 402
5	Actuation for two-way bodies and welded configurations	●	●	●	●	●	●	●	●
6	Actuation suitable for two-way bodies, welded configurations, T-bodies, multiport bodies and tank bottom bodies	●	●	●	●	●	●		
7	Optimized internal cleaning because of circumferential defined sealing angle between process diaphragm and valve body (CDSA-Design)	●	●	●	●	●	●	●	●
8	Flexible diaphragm suspension	●	●	●	●	●	●	●	●
9	Encapsulated working diaphragm		●	●		●	●	●	●
10	Low weight						Type 395 / 905	●	●

MA = Diaphragm size

Positions 4 to 10 are explained individually and in detail on pages 31 to 33.

Innovative Design

Compact Design - Optional Orientation of the Air Inlet Port

Selection of the valve is determined by the necessary flow rate from which then the nominal diameter of the valve results. Due to physical coherences and a unified valve design, the compactness of the valve is restricted. Thus, the innovative designs of SED valve actuators offer specific advantages.

New process system and plant design standards require dead legs to be minimized. Dimensions of valve assemblies have significance if they affect dead legs in the process system which must be minimized as much as possible. When selecting welded configurations and multiport valves, the actuators size plays an important role in minimizing dead legs.

We offer actuators in a compact design with the following features:

- The outside diameter of the actuators is the same size or smaller as the bonnet flange of the body. The bonnet encapsulates the diaphragm and connects it with actuator and body.
- The direction of the control air connection (air inlet port) for the valve actuation can be orientated either in the flow direction or 90° to the flow direction.

It is possible to combine any various actuation models.

Air Inlet Port 90° to flow direction

Air Inlet Port in flow direction

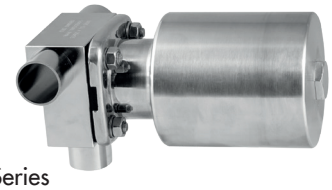
Actuation for Two-Way Bodies and Welded Configurations
Actuation suitable for Two-Way Bodies, Welded Configurations, T-Bodies, Multiport Bodies and Tank Bottom Bodies

Dependending on the valve body design two different ways of valve assembly are possible.

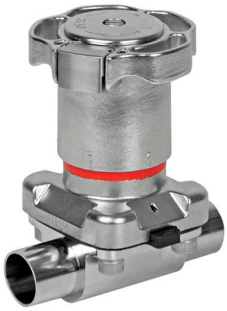
- Bottom Entry Assembly
  Two-way bodies and two-way body welded configurations allow for this kind of assembly. The advantage is having no bolt holes in the actuator and therefore no exposed parts like bolt threads, nuts, and washers. Ease of assembly for maintenance.
  This is the ideal design for sterile wash downs.

T-valve with U-bend
Valve KMA Series manually operated

- Through Bolt Hole Actuator Assembly
  Through bolt hole assembly is suitable for all body versions, two-ways, welded configurations, T-bodies, multiport, and tank bottom bodies. Through bolt holes are not available in some valve body designs because of interference with the interior flow path. Therefore the holes are drilled in the actuators and assembled with stud bolts threaded into the valve body.



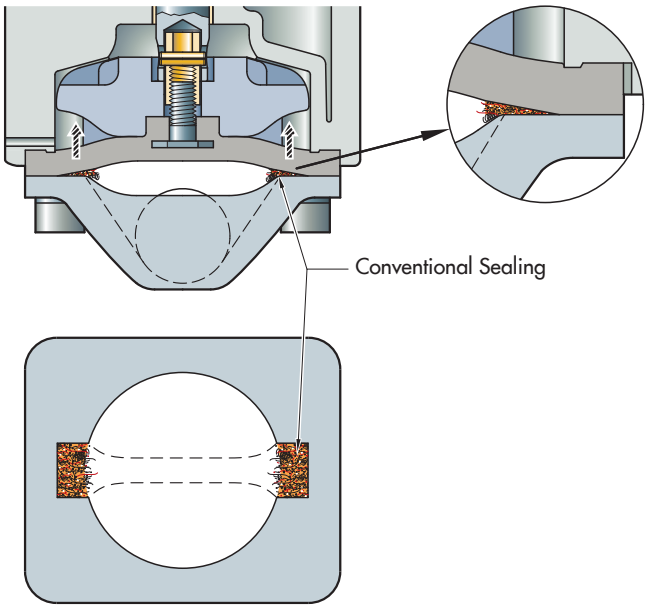
T-Valve
Steripur Series
Pneumatically operated



Two-Way Valve
Steripur Series
Manually operated

Innovative Design

Optimized Internal Cleaning because of Circumferential Defined Sealing Angle (CDSA-Design) between the Process Diaphragm and Valve Body



To achieve the highest level of sterility, the SED CDSA-Design Series was developed by utilizing new, qualified, and tested diaphragm valve technology. This unique design of the actuator reduces or eliminates product entrapment at the point beyond the radius of the weir on the body bonnet flange.

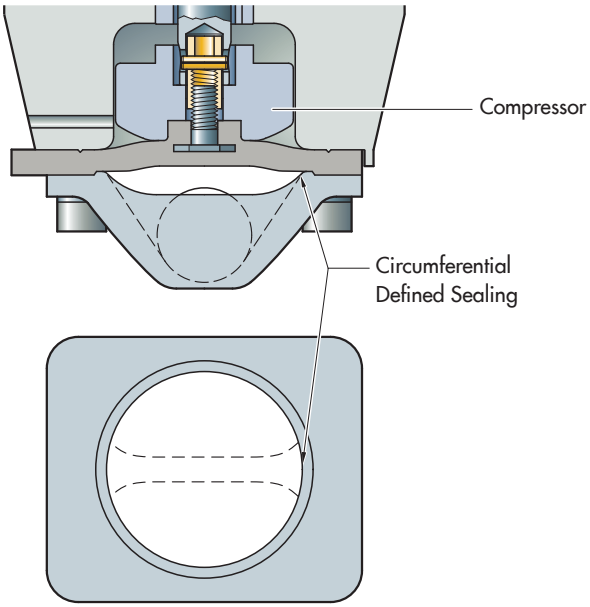
The CDSA sealing concept is achieved by the compressor being guided by the interior circular actuator lower housing providing a circumferential defined sealing angle at 360°. This reduces or eliminates entrapment because the seal over the weir and the circumference of the interior valve body is at the point and angle where the diaphragm and valve body make contact.

The conventional weir style design in the market does not provide this feature because the interior actuator lower housing guides the compressor. Typically, these compressors are designed with ends or fingers that extend beyond the radius of the weir onto the internal bonnet flange. Therefore, a circumferential defined sealing angle is not possible.

The effects of this design have the following advantages:

- Internal cleaning is more efficient and has been tested and qualified by EHEDG Document No. 08.
- Product entrapment reduced or eliminated on the body bonnet flange.
- Reduced cleaning time of SIP systems.
- Reduced use of chemicals and solutions in CIP systems.
- Improves valve drainability.
- Better sealing performance and evenly distributed closing force.
- Diaphragm life span is extended.

The same selection of diaphragms may be used for all SED series and versions of actuators.



Flexible Diaphragm Suspension

The diaphragm is connected to the valve spindle by means of a grub screw. An exception is the smallest diaphragm dimension MA 8 where a mushroom-shaped rubber cam serves as suspension and its elasticity ensures a flexible diaphragm suspension.

When using the threaded pin, the flexible suspension is achieved by means of a two-part spindle. The second part is the receptacle for the grub screw, which has 1.5 - 3 mm of play in the connection with the actual spindle.
This flexible suspension ensures that when the valve is closed, there is no point load on the diaphragm via the grub screw. The point load, which can occur when the valve is closed, would result in the grub screw damaging the diaphragm in the center after a short time and thus making it unusable.

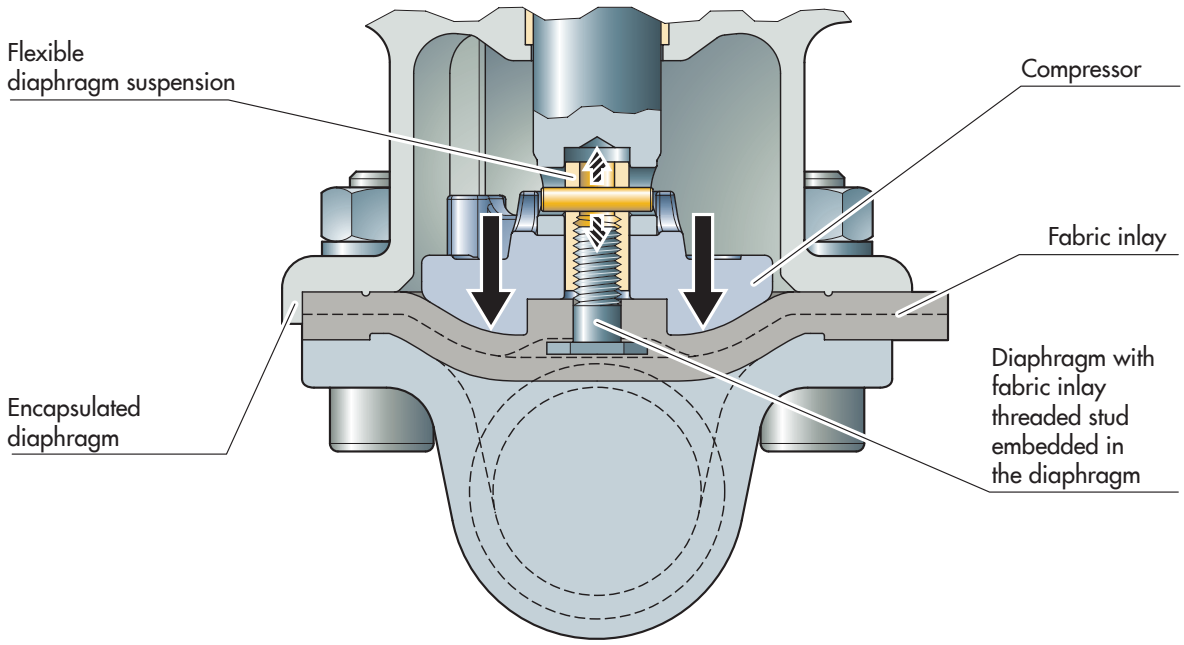
This is particularly important with two-piece PTFE diaphragms, since in this design the grub screw is pressed into the PTFE, which has hardly any elastic properties.

The slightest pressure, acting via the grub screw, would damage the PTFE and destroy the diaphragm.

In case of one-piece PTFE diaphragms or pure elastomer diaphragms where the threaded pin is embedded within in the elastomer, a punctual load is compensated by the elastomer. All nominal sizes of SED sterile diaphragm valves for which two-piece PTFE diaphragms can be used are designed with a flexible diaphragm suspension.

The flexible suspension also offers easier handling during maintenance when changing the diaphragm. This system offers advantages over bayonet and alternative threaded suspension, as different actuator designs are required depending on the diaphragm version.

The suspension of SED valves is always identical for Teflon and elastomer diaphragms, regardless of which diaphragm is installed.



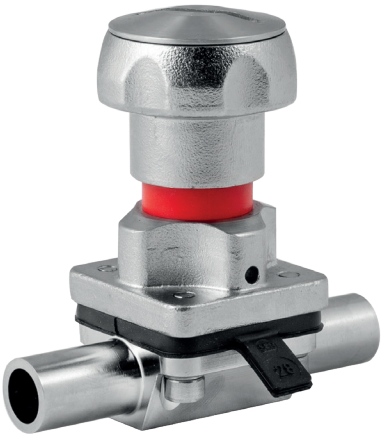
Encapsulated Working Diaphragm

All SED actuators partially encapsulate the process diaphragm.
This prevents the elastomer of the diaphragm from extruding beyond the body bonnet flange.

The encapsulated diaphragm offers a positive visual appearance of an assembled valve and reduces the risk of leakage to the exterior through the decrease of the diaphragm clamping. This is an important feature especially for applications with higher temperature and pressure.

Steripur 206

Manually operated Valve DN 4 - 15 mm (1/4" - 1/2")



Features
- **Stainless steel bonnet and hand wheel**
- Autoclavable
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension

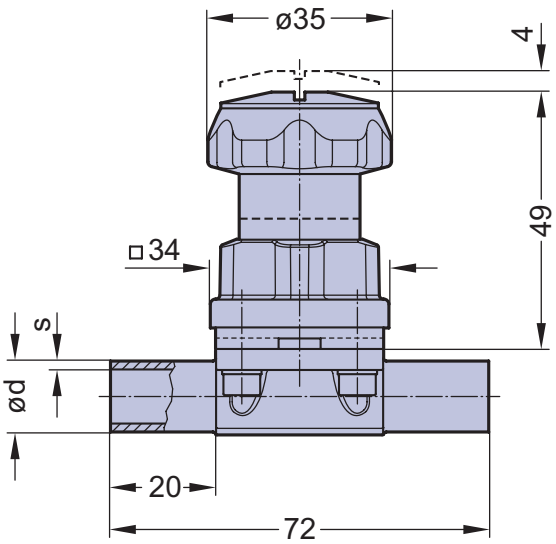
Optional
- Locking device

Butt weld ends
MA 8
Fold out page 21

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 8
Weight:	ca. 0,3 kg

Technical data also valid for multiport valve.



Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 397

Manually operated Valve DN 8 - 20 mm (3/8" - 3/4")

Features
- **Stainless steel bonnet and hand wheel**
- Autoclavable
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

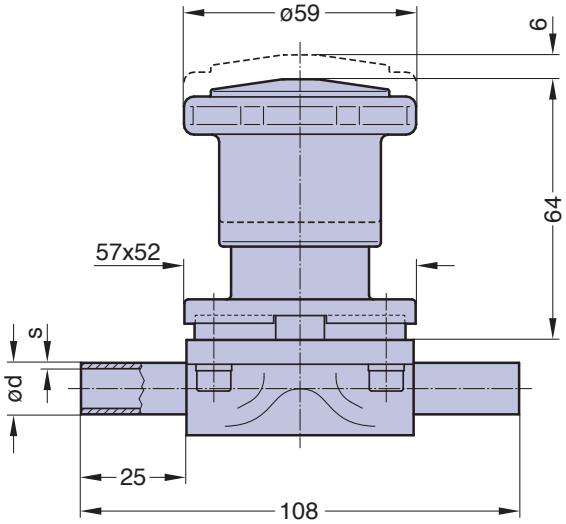
Optional
- Locking device

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies / Welded configurations T- bodies / Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,8 kg

Technical data also valid for multiport valve.

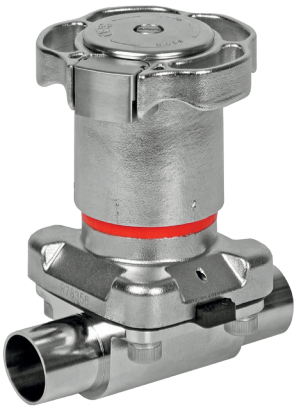
Butt weld ends
MA 10
Fold out page 21



Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 907

Manually operated Valve DN 15 - 50 mm (3/4" - 2 1/2")



Steripur 907, T01

Features
- **Stainless steel bonnet and hand wheel**
- Autoclavable
- Rising hand wheel with optical indicator and stroke indicator
- Sealed bonnet
- Internal travel stop
- Locking device
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

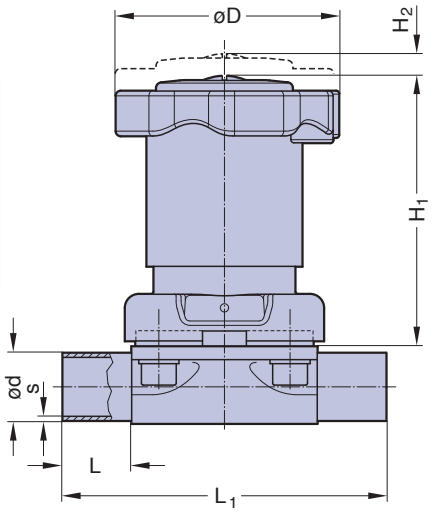
Optional
- Adjustable internal stroke limiter
- U-Lock for hand wheel
- Assembly of proximity switches

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m 3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 50
Fold out page 21



DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg) Steripur 907	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	100	10	84	2,1	2,2
32-40	40	25	153	119	16	112	3,5	3,7
50	50	30	173	136	20	135	4,8	5,9

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Manually operated Valve DN 65 - 100 mm (3/4" - 4")

DN 65 - 100

Features

- **Stainless steel bonnet and hand wheel**
- Non rising hand wheel with optical indicator
- Sealed bonnet
- Autoclavable
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

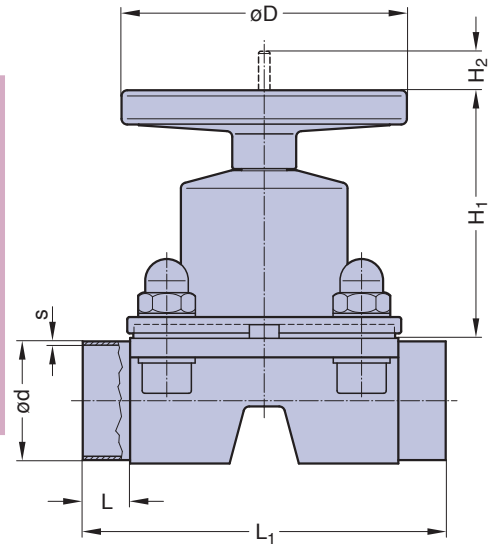
- Adjustable travel stop or stroke limiter
- Sealed bonnet
- Locking device

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi) DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 100
Fold out page 21



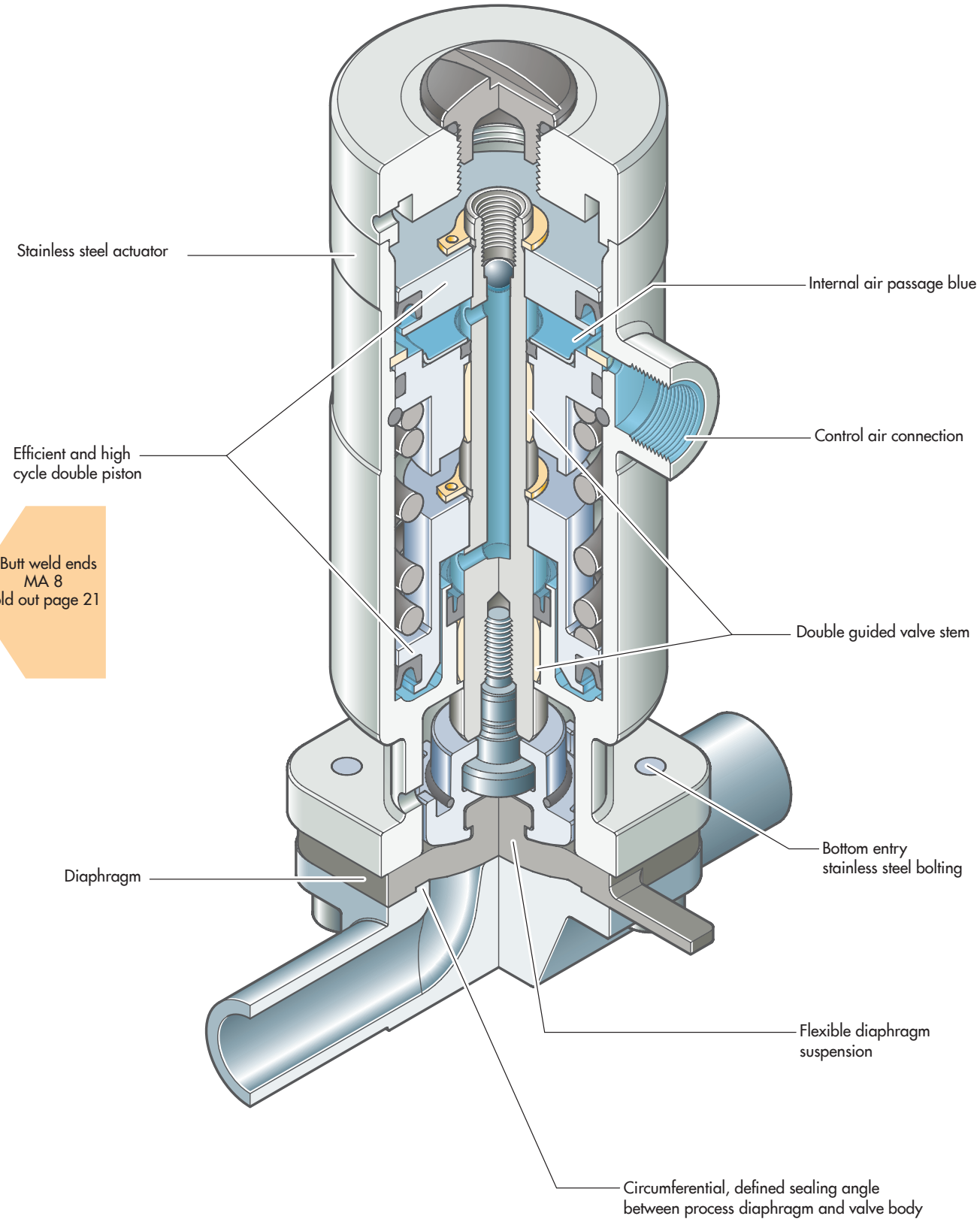
DN 65 - 100 (Drawing MA 80)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
65	80	30	216	180	38	198	13,0	15,0
80	80	30	254	180	38	198	13,0	15,0
100	100	30	305	220	50	252	22,0	20,0

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 217

Pneumatically operated Valve DN 4 - 15 mm (1/4" - 1/2")



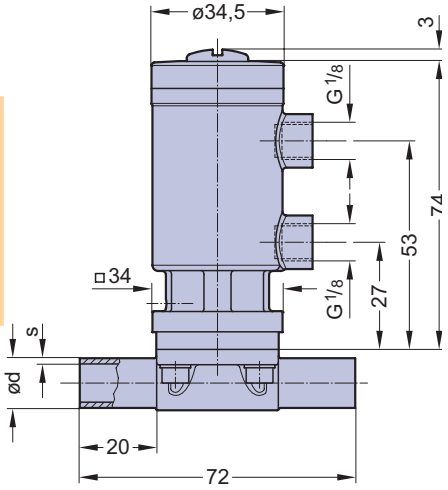
Sectional drawing shows Steripur 217.30

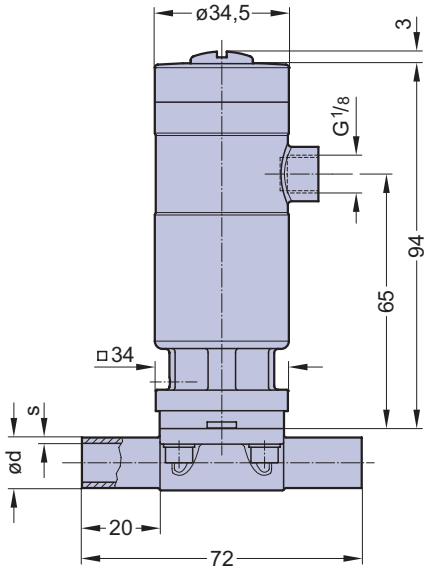
Pneumatically operated Valve DN 4 - 15 mm (1/4" - 1/2")

217.30 Cf. 4

217.25 Cf. 5 & 6

Butt weld ends
MA 8
Fold out page 21





Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

This valve is available in two different actuator designs. Type 217.30 is available in the control function fail safe close and performs at higher working pressures for standard application. Advantages of the type 217.25 are a very high cycle life and a smaller overall dimensional height. Type 217.25 is available in control functions fail safe open and double acting for standard working pressures.

Features

- **High cycle stainless steel piston actuator**
  Type 217.30 with double piston
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange connecting diaphragm and body
- Advantages in multiport bodies and various valve assemblies
- Low control air volume, high switching speed
- High repeatability
- Control air connection on the top, away from the process product line
- Direction of control air connection is mountable in 90° rotations
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Clean and polished exterior design ideal for sterile wash downs

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139 for this options
- Autoclavable

Technical Data

Control function (Cf.):	Pneumatically operated
217.30:	Fail safe close (NC): Cf. 1 & 4
217.25:	Fail safe open (NO): Cf. 2 & 5
	Double acting (DA): Cf. 3 & 6
	At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	At Cf. 4, 5 & 6 in flow direction, standard
	At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%)
217.30:	Cf: Fail safe close
	EPDM diaphragm 8 bar (115 psi)
	PTFE diaphragm 7 bar (100 psi)
217.25:	Cf: Fail safe open and double acting
	EPDM diaphragm 8 bar (115 psi)
	PTFE diaphragm 7 bar (100 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application	
Control pressure:		
217.30:	Cf. 1 & 4	4 - 7 bar (60 - 100 psi)
217.25:	Cf. 1 & 4	5,5 -7 bar (80 - 100 psi)
	Cf. 2, 3, 5 & 6	5,5 - 7 bar (80 - 100 psi)
Diaphragm material:	EPDM or PTFE	
Valve body material:	Forged 1.4435/ 316 L ASME/BPE	
	Investment cast 1.4435/ 316 L	
	Other alloys	
End connection:	Butt weld ends see fold out page 21	
	Clamps and flanges see page 22 to 24	
	Special ends	
Actuators suitable for:	Two-Way bodies, Welded configurations,	
	T-bodies, Multiport bodies,	
	Tank bottom bodies	
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9	
Diaphragm size:	MA 8	
Weight:	217.30: ca. 0,45 kg	
	217.25: ca. 0,44 kg	

Technical data also valid for multiport valve.

Type	MA	Filling volume (NL)	
		NC	NO/DA
217.25	8		0,013
217.30	8	0,013	

Steripur 317

Pneumatically operated Valve DN 8 - 20 mm (3/8" - 3/4")

Cf. 4

Features

- **High cycle stainless steel piston actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and various valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3 & 6 At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	At Cf. 4, 5 & 6 in flow direction, standard At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM diaphragm 8 bar (115 psi) PTFE diaphragm 7 bar (100 psi)

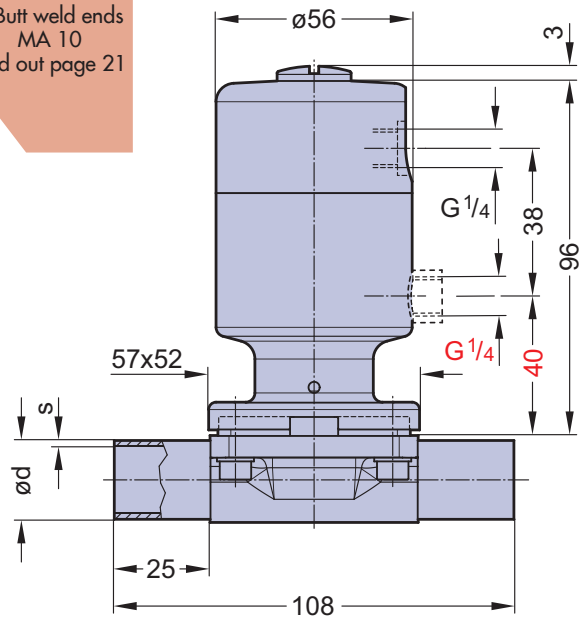
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4,2 - 7 bar (60 - 100 psi) Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 1,0 kg

Technical data also valid for multiport valve.

DN (mm)	MA	Filling volume (NL)	
		NC	NO/DA
8-20	10	0,035	0,030

Butt weld ends
MA 10
Fold out page 21



Red indicated values for DA Version

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Pneumatically operated Valve DN 65 - 100 mm (2 1/2" - 4")

Features

- **High cycle stainless steel piston actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and various valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1 & **4**
Fail safe open (NO): Cf. 2 & **5**
Double acting (DA): Cf. 3 & **6**
At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.

Direction
Control connection: At Cf. 4, 5 & 6, in flow direction, standard
At Cf. 1, 2 & 3, 90° to flow direction

Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	7 bar (100 psi)	6 bar (87 psi)
PTFE	6 bar (87 psi)	5 bar (72 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature: 160°C (320°F) dependent on application

Control pressure:
Cf. 1 & 4 DN 65-80 5 - 8 bar(72-115 psi)
Cf. 1 & 4 DN 100 6 - 8 bar(87-115 psi)
Cf. 2, 3, 5 & 6 DN 65-80 4,5-6 bar(65-87 psi)
Cf. 2, 3, 5 & 6 DN 100 5,5-7 bar(80-100 psi)

Diaphragm material: EPDM or PTFE

Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys

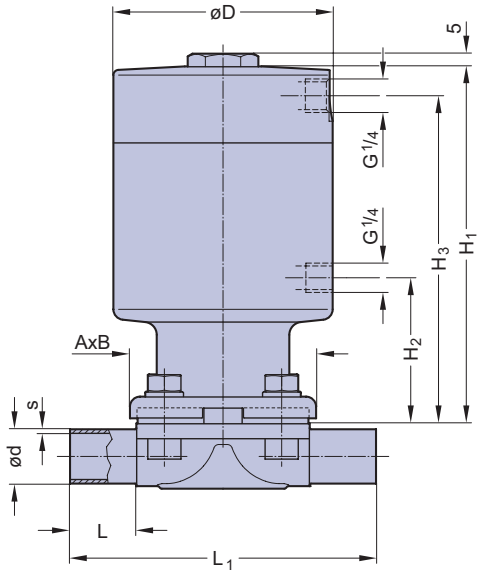
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24
Special ends

Actuators suitable for: Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies

Flow rate: Kv in m3/h (Cv in GPM) see page 9

Diaphragm size: MA see table below

Technical data also valid for multiport valve.



Butt weld ends
MA 25 - 100
Fold out page 21

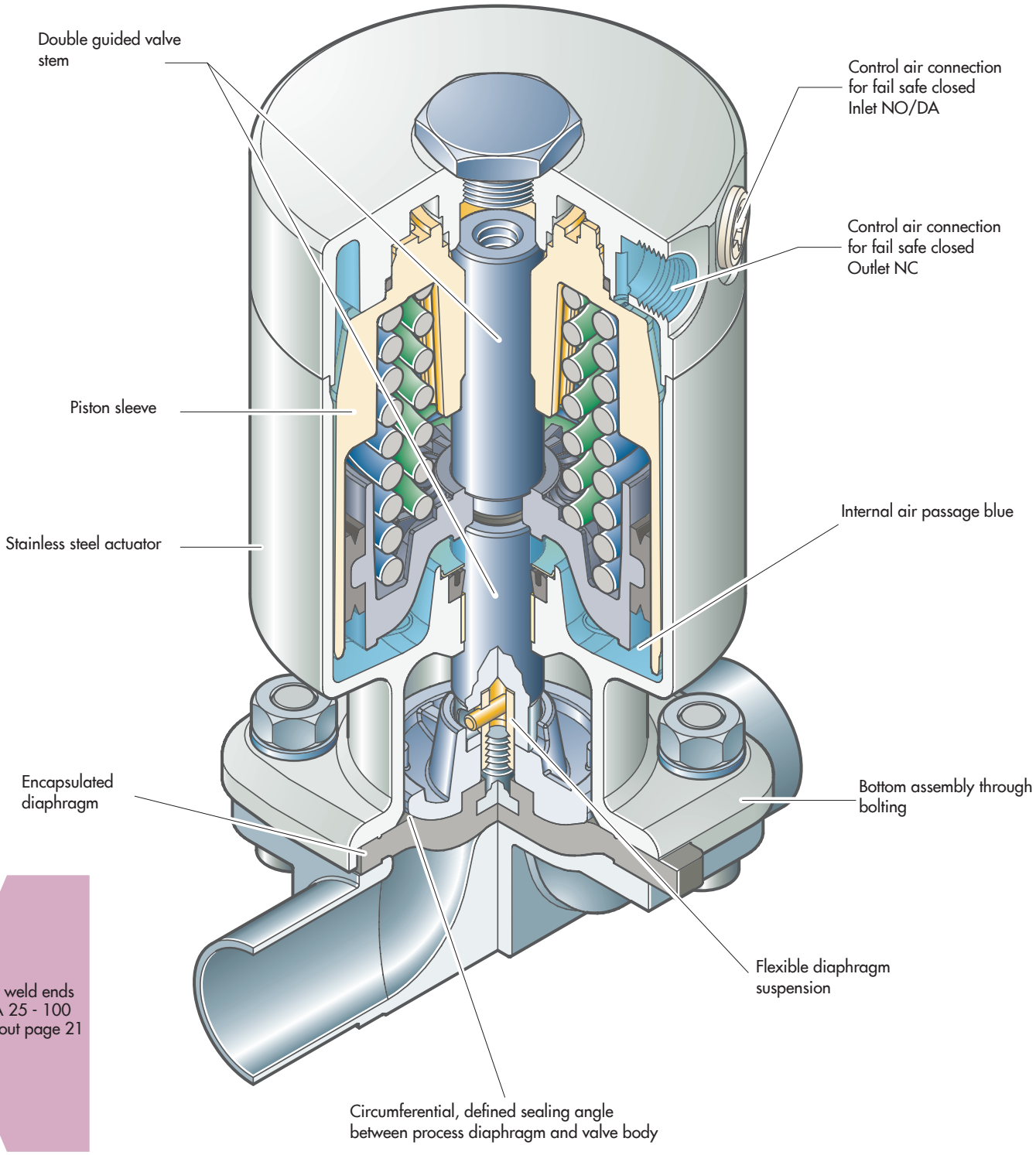
DN	MA	Dimensions (mm)							Total weight ca. (kg)	
(mm)		L	L_1	A x B	H_1	H_2	H_3	D	Investment cast	Forged
65	80	30	216	170x190	309	135	285	179	23,0	26,0
80	80	30	254	170x190	309	135	285	179	23,0	26,0
100	100	30	305	ø238	318	143	295	179	33,0	1,0

* Cf. 2, 3, 5, 6 = 170

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 417

Pneumatically operated Valve DN 15 - 50mm (3/4" - 2 1/2")

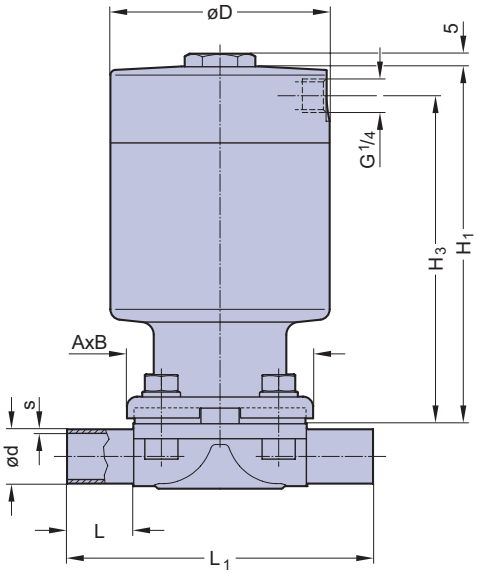


Butt weld ends
MA 25 - 100
Fold out page 21

Steripur 417

Pneumatically operated Valve DN 15 - 50mm (3/4" - 2 1/2")

DN 15 - 50 Cf. 4, 5, 6



Butt weld ends
MA 25 - 100
Fold out page 21

Features

- **High cycle stainless steel piston actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and various valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1 & **4**
Fail safe open (NO): Cf. 2 & **5**
Double acting (DA): Cf. 3 & **6**
At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.

Direction
Control connection: At Cf. 4, 5 & 6, in flow direction, standard
At Cf. 1, 2 & 3, 90° to flow direction

Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	DN 15-50 (1/2"-2")
EPDM	10 bar (150 psi)
PTFE	8 bar (115 psi)

Higher working pressures may be achieved with different actuators. Please consult a SED factory representative for working pressures above the indicated maximum.

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 & 4 DN 15-50 4,5 - 8 bar(65-115 psi)
Cf. 2, 3, 5 & 6 DN 15-50 4,5-6 bar(65-87 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for: Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies
Flow rate: Kv in m3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below

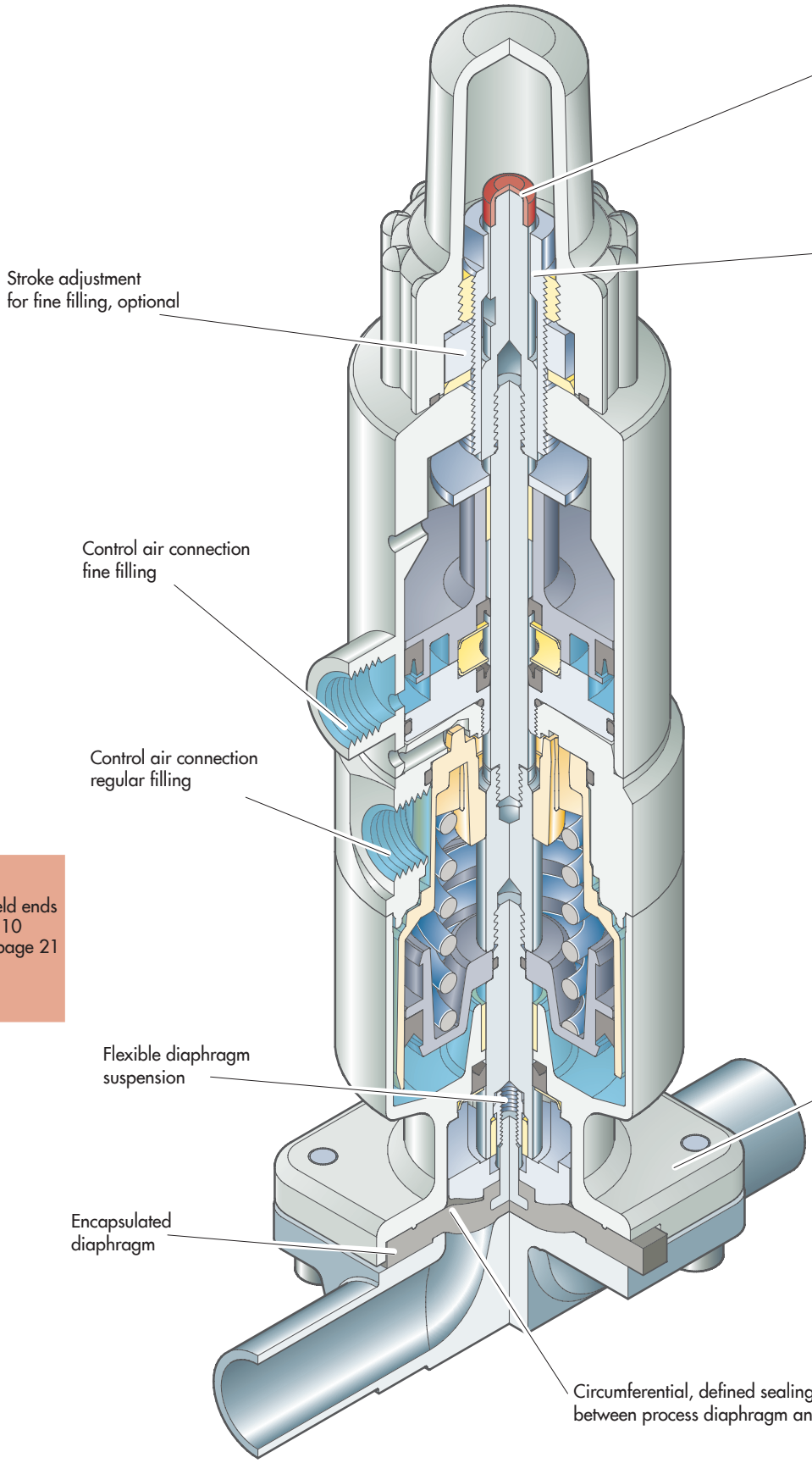
Technical data also valid for multiport valve.

DN (mm)	MA	Dimensions (mm)						Total weight ca. (kg)		Filling volume (NL)	
		L	L_1	A x B	H_1	H_3	D	Investment cast	Forged	NC	NO/DA
15-25	25	25	120	73x79	140	129	86	2,6	2,7	0,15	0,15
32-40	40	25	153	96x105	167	155	111	5,0	6,0	0,34	0,30
50	50	30	173	111x130	190	176	136	9,0	10,0	0,60	0,54

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 394

Pneumatically operated Valve DN 8 - 20 mm (3/8" - 3/4")



Butt weld ends
MA 10
Fold out page 21

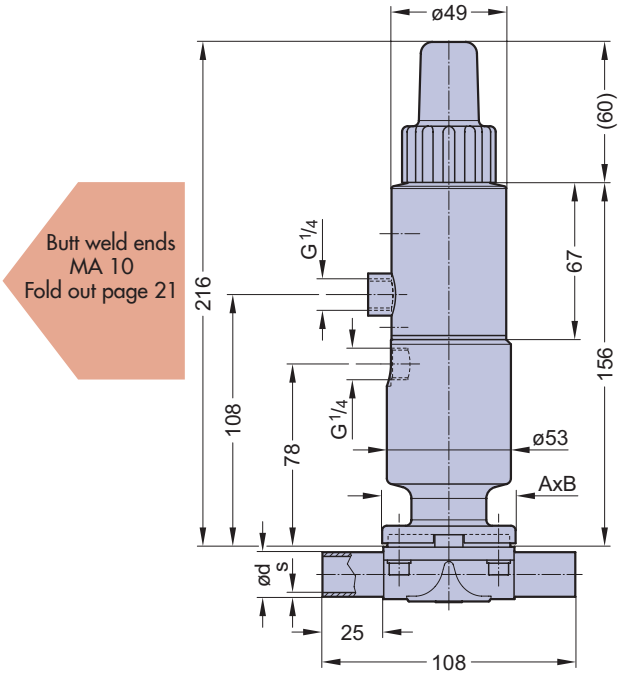
Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 394

Pneumatically operated Valve DN 8 - 20 mm (3/8" - 3/4")

Features
- **Two-stage stainless steel actuator**
- Second position adjustable with reduced flow for filling
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and various valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs
- Optical indicator

Optional
- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 138 and 139
- Fine filling adjustment



Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & **4** At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction Control connection:	At Cf. 4 in flow direction, standard At Cf. 1, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM Membrane 8 bar (115 psi) PTFE Membrane 7 bar (100 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4,5 - 7 bar (60 - 100 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 1,7 kg

Technical data also valid for multiport valve.

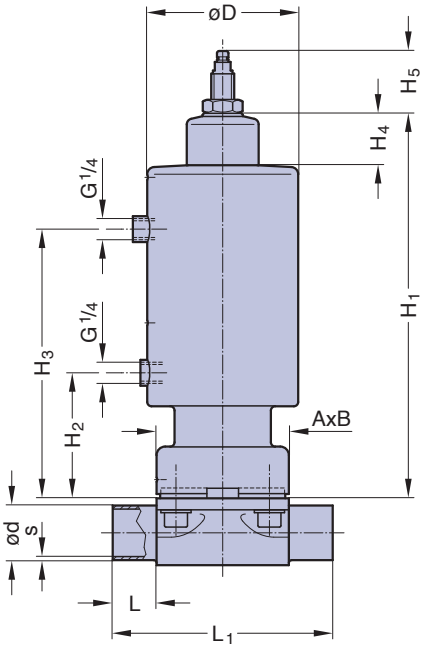
DN (mm)	MA	Filling volume (NL) NC
8-20	25	0,061

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Steripur 592

Pneumatically operated Valve DN 15 - 25 mm (3/4" - 1")

DN 50 Cf. 4



Butt weld ends
MA 25 - 50
Fold out page 21

Features

- **Two-stage stainless steel actuator**
- Second position adjustable with reduced flow for filling
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and various valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs
- Optical indicator

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 138 and 139

Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1 & **4**
At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.

Direction
Control connection: At Cf. 4 in flow direction, standard
At Cf. 1, 90° to flow direction

Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	DN 15 - 25 (3/4" - 1")
EPDM	10 bar (150 psi)
PTFE	8 bar (115 psi)

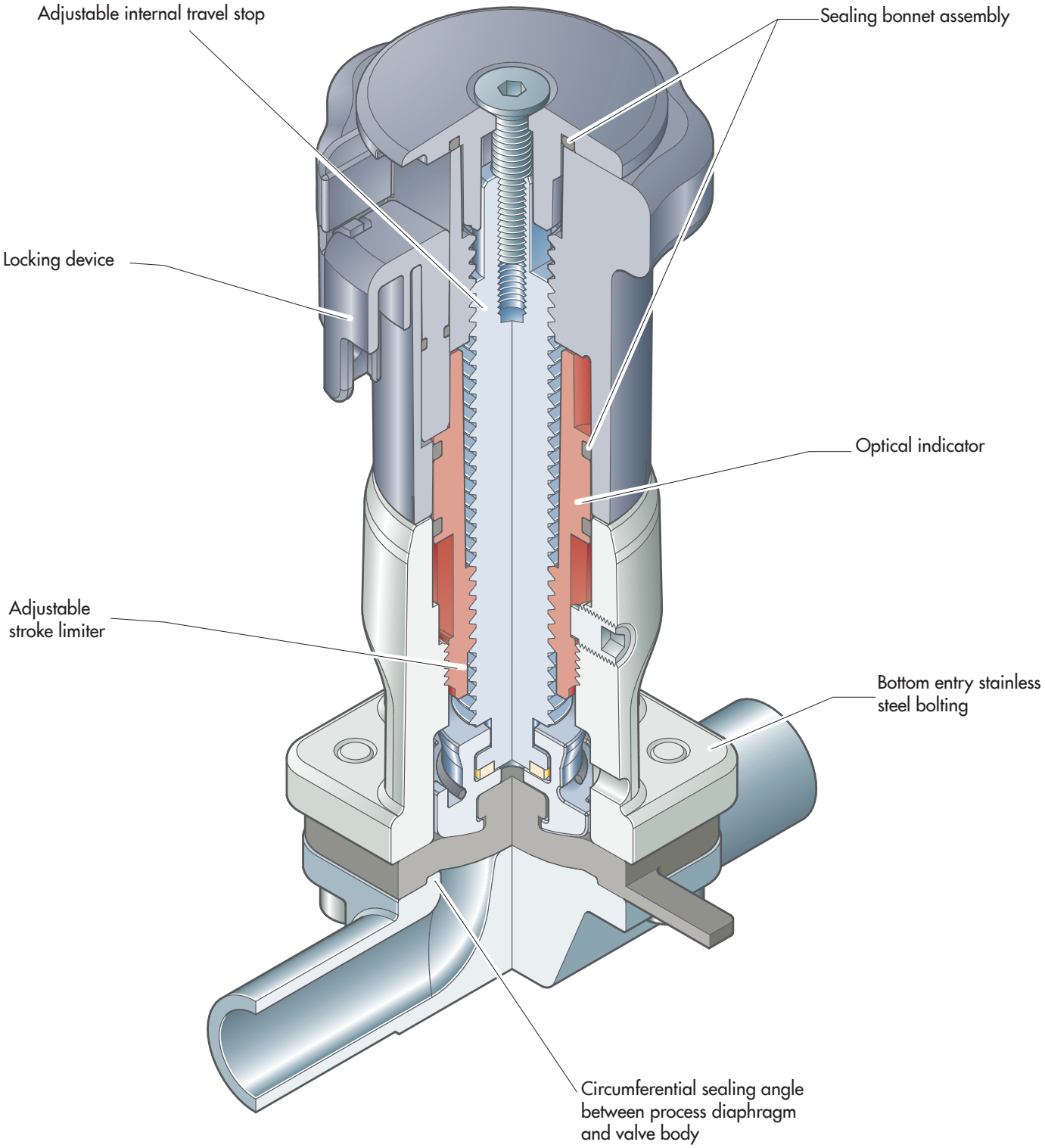
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 & 4 5 - 8 bar (72 - 115 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24
Special ends
Actuators suitable for: Two-Way bodies, Welded configurations, T-bodies, Multiport bodies, Tank bottom bodies
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below

Technical data also valid for multiport valve.

DN		Dimensions (mm)									Total weight ca. (kg)	
(mm)	MA	L	L_1	A x B	H_1	H_2	H_3	H_4	H_5	D	Investment cast	Forged
15-25	25	25	120	73x79	220	66	150	-	35	75	2,8	2,9

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.


Adjustable internal travel stop
Sealing bonnet assembly
Locking device
Optical indicator
Adjustable
stroke limiter
Bottom entry stainless
steel bolting
Circumferential sealing angle
between process diaphragm
and valve body

KMA 205

Manually operated Valve DN 4 - 15 mm (1/4" - 1/2")

KMA 205, S03

KMA 205, S02

Butt weld ends
MA 8
Fold out page 21

Features

- **Stainless steel bonnet and plastic hand wheel**
- Manually operated diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles of autoclaving.
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension

Specific features S02

- Adjustable internal stroke limiter
- Locking device

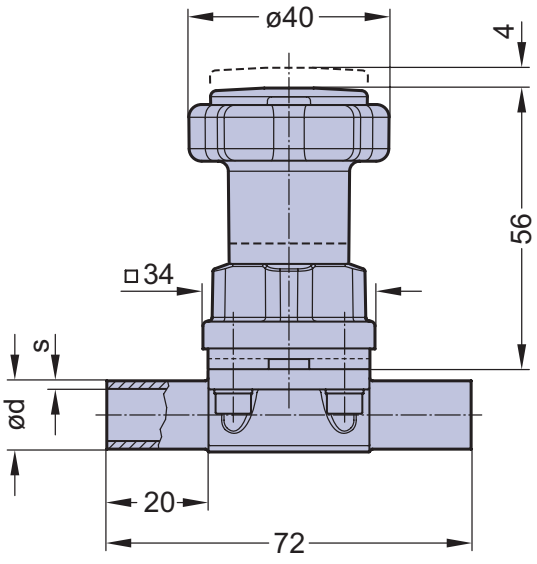
Optional features S02

- U-Lock for hand wheel
- Assembly of proximity switches

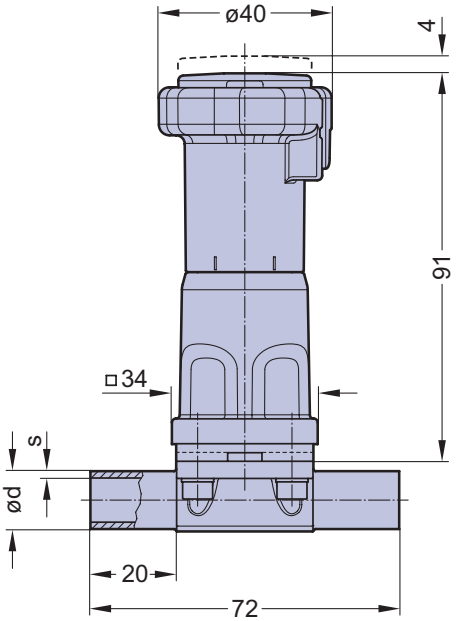
Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 8
Weight:	ca. 0,2 kg

Technical data also valid for multiport valve.



KMA 205

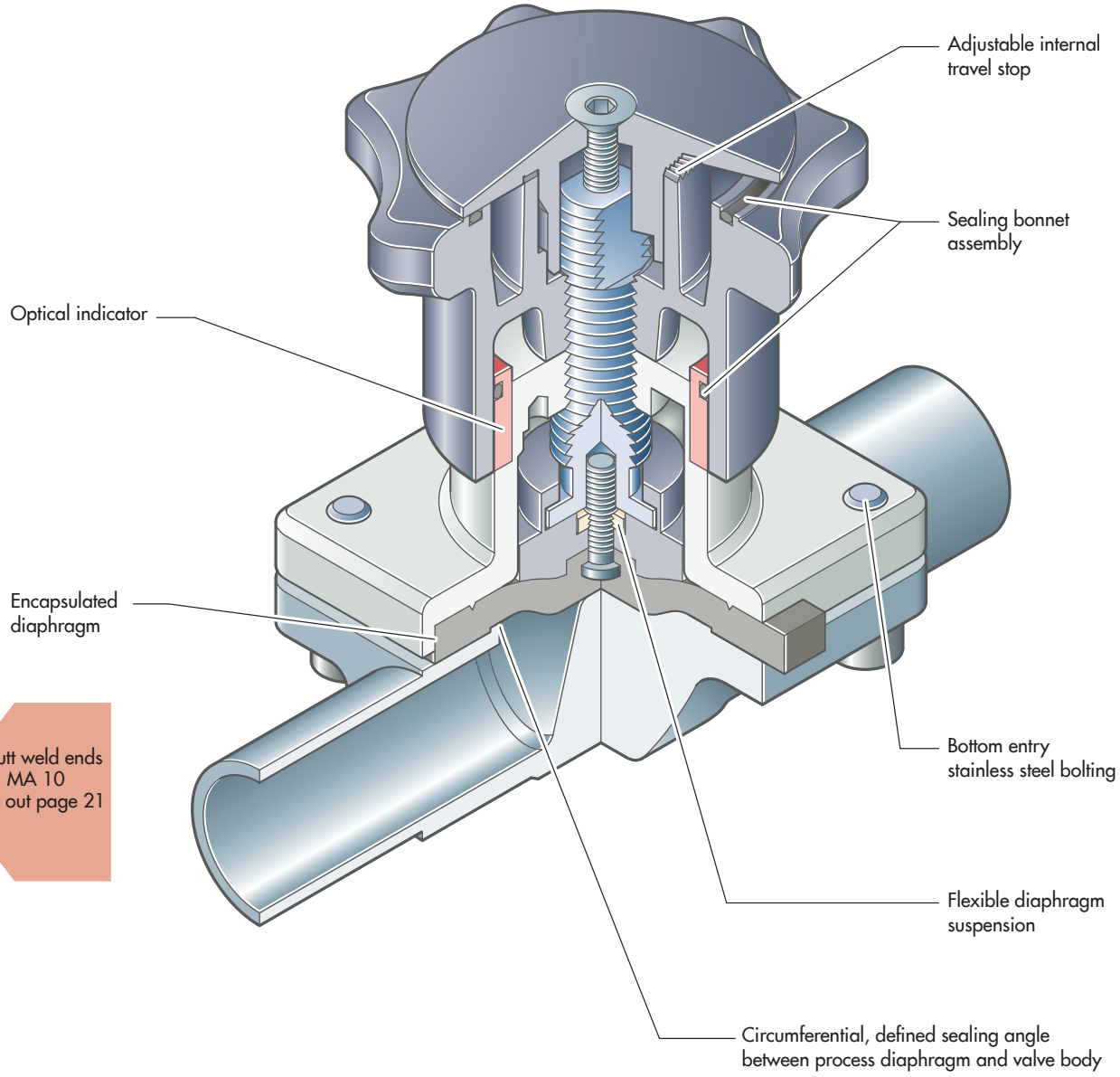


KMA 205

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMA 295

Manually operated Valve DN 8 - 20 mm (3/8" - 3/4")



KMA 295

Manually operated Valve DN 8 - 20 mm (3/8" - 3/4")

Features

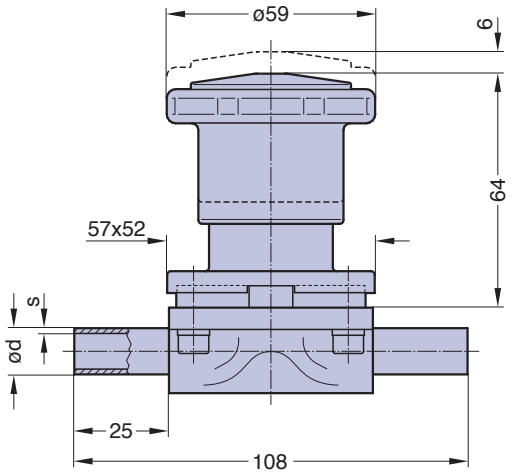
- **Stainless steel bonnet and plastic hand wheel**
- Manually operated diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles of autoclaving.
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies / Welded configurations T- bodies / Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,6 kg

Technical data also valid for multiport valve.

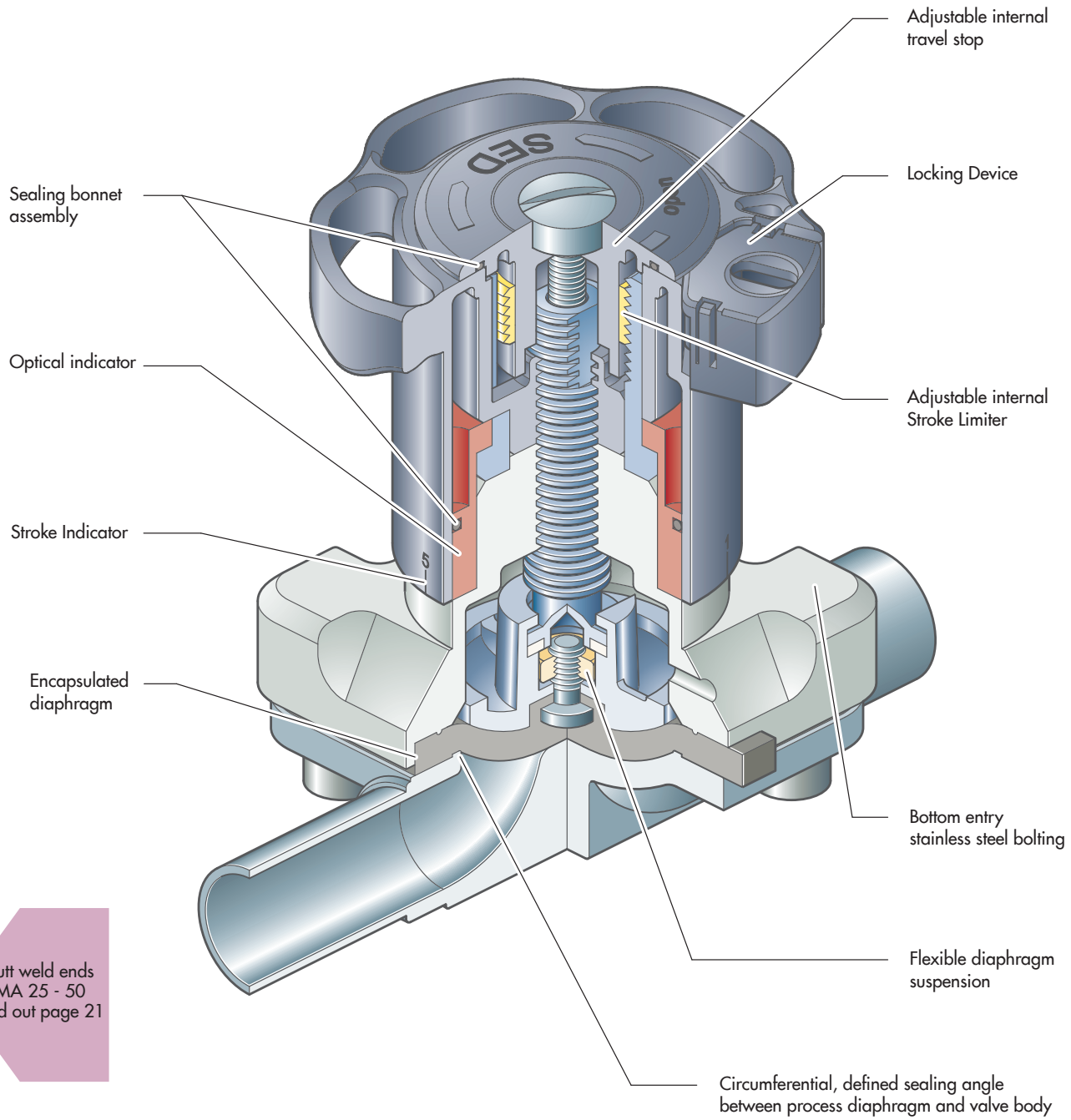
Butt weld ends
MA 10
Fold out page 21



Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMA 905

Manually operated Valve DN 15 - 50 mm (3/4" - 2 1/2")



Butt weld ends
MA 25 - 50
Fold out page 21

Introduction Video
https://www.youtube.com/channel/UCLbTtlLODsUzPKCQAcP7Lkw

KMA 905

Manually operated Valve DN 15 - 50 mm (3/4" - 2 1/2")

KMA 905 , S11

Features

- **Stainless steel bonnet and plastic hand wheel**
- Manually operated diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles of autoclaving.
- Rising hand wheel with optical indicator and stroke indicator
- Sealed bonnet
- Internal travel stop
- Locking device
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

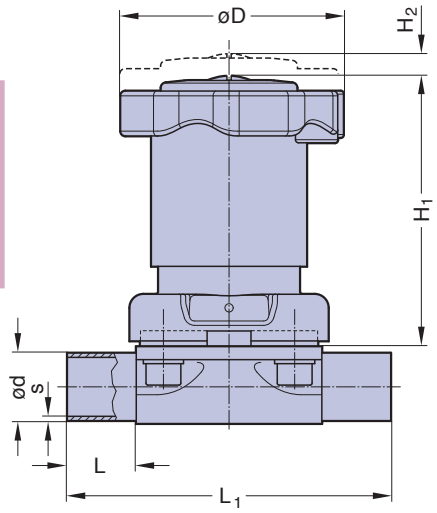
- Adjustable internal stroke limiter
- U-Lock for hand wheel
- Assembly of proximity switches

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m 3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 50
Fold out page 21



DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg) KMA 905	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	100	10	84	1,4	1,6
32-40	40	25	153	119	16	112	2,8	3,0
50	50	30	173	136	20	135	3,8	4,6

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMA 995

Manually operated Valve DN 65 - 100 mm (2 1/2" - 4")

DN 80, KMA 995

Features
- **Stainless steel bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 32

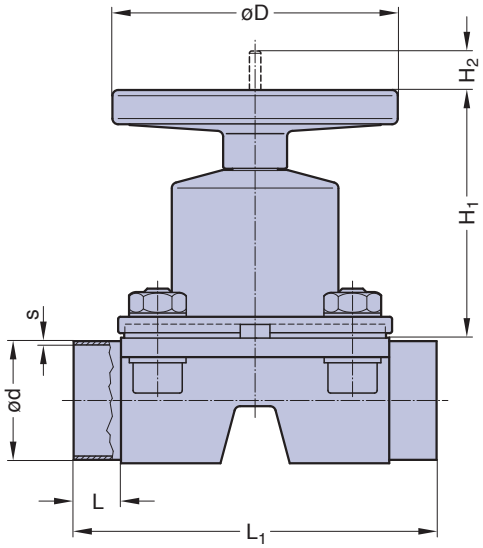
Optional
- Adjustable travel stop or stroke limiter
- Sealed bonnet
- Locking device

Technical Data

Control function:	Manually operated
Max. working pressure:	EPDM 10 bar (150 psi)
	PTFE 8 bar (115 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE
	Investment cast 1.4435/ 316L
	Other Alloys
End connection:	Butt weld ends see fold out page 21
	Clamps and flanges see page 22 to 24
	Special ends
Bonnets suitable for:	Two-Way bodies
	Welded configurations
	T- bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 100
Fold out page 21



DN 65 - 100 (Drawing MA 80)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
65	80	30	216	180	38	198	10,0	13,0
80	80	30	254	180	38	198	10,0	13,0
100	100	30	305	220	50	252	19,0	17,0

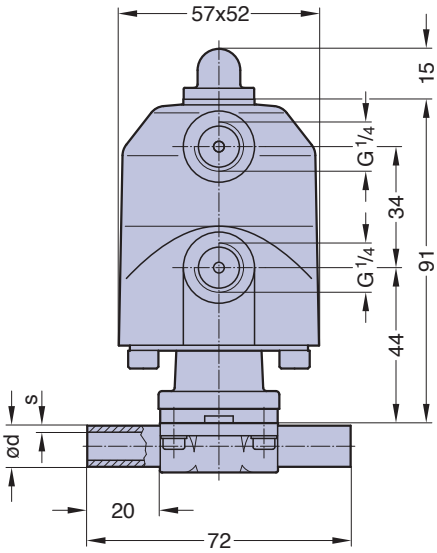
Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Pneumatically operated Valve DN 4 - 15 mm (1/4" - 1/2")

Cf. 1, 2 & 3

Cf. 4, 5 & 6

Butt weld ends
MA 8
Fold out page 21



Features

- **Efficient plastic piston actuator with stainless steel distance piece**
- Direction of control air connection is mountable in 90° rotations
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Optical indicator

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3 & 6 At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction Control connection:	At Cf. 1, 2 & 3, 90° to flow direction, standard At Cf. 4, 5 & 6 in flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM diaphragm 8 bar (115 psi) PTFE diaphragm 7 bar (100 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4 - 7 bar (60 - 100 psi) Cf. 2, 3, 5 & 6 3,5 - 4,5 bar (50 - 65 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 8
Weight:	ca. 0,5 kg

Technical data also valid for multiport valve.

DN (mm)	MA	Filling volume (NL)	
		NC	NO/DA
4-15	8	0,027	0,027

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

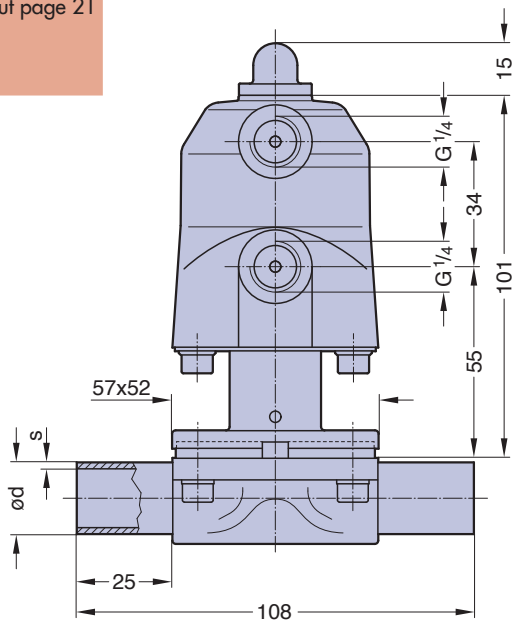
KMA 195

Pneumatically operated Valve DN 8 - 20 mm (3/8" - 3/4")

Cf. 1, 2 & 3

Cf. 4 & 5

Butt weld ends
MA 10
Fold out page 21



Features

- **Efficient plastic piston actuator with stainless steel distance piece**
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Optical indicator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- CDSA sealing concept, see page 32

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection in flow direction

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3 At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	
Max. working pressure:	At Cf. 1, 2 & 3, 90° to flow direction, standard Unidirectional (delta p = 100%) EPDM diaphragm 8 bar (115 psi) PTFE diaphragm 7 bar (100 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	
Control pressure:	160°C (320°F) dependent on application Cf. 1 4,2 - 7 bar (60 - 100 psi)
Diaphragm material:	Cf. 2, 3 4 - 5 bar (60 - 72 psi)
Valve body material:	EPDM or PTFE Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24
Actuators suitable for:	Special ends Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,8 kg

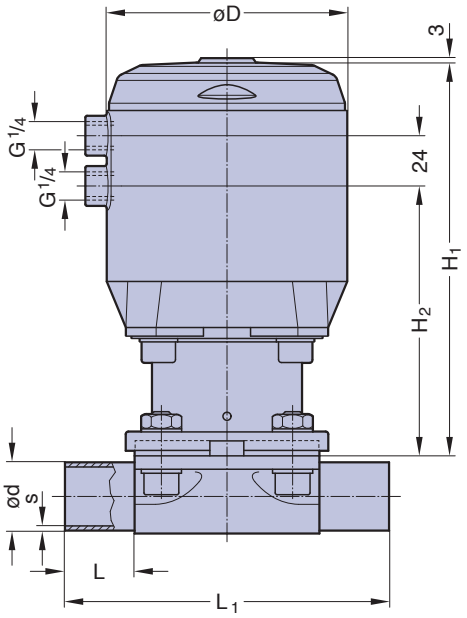
Technical data also valid for multiport valve.

DN (mm)	MA	Filling volume (NL)	
		NC	NO/DA
8-20	10	0,027	0,027

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Pneumatically operated Valve DN 15 - 50 mm (3/4" - 2 1/2")

Cf. 4, 5 & 6



Features

- **Plastic piston actuator with stainless steel distance piece**
- Compact design
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & **4** Fail safe open (NO): Cf. 2 & **5** Double acting (DA): Cf. 3 & **6** At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	At Cf. 4, 5 & 6, in flow direction, standard At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM Diaphragm 10 bar (150 psi) PTFE Diaphragm 8 bar (115 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4,5 - 7 bar (65 - 100 psi) Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table below

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 50
Fold out page 21

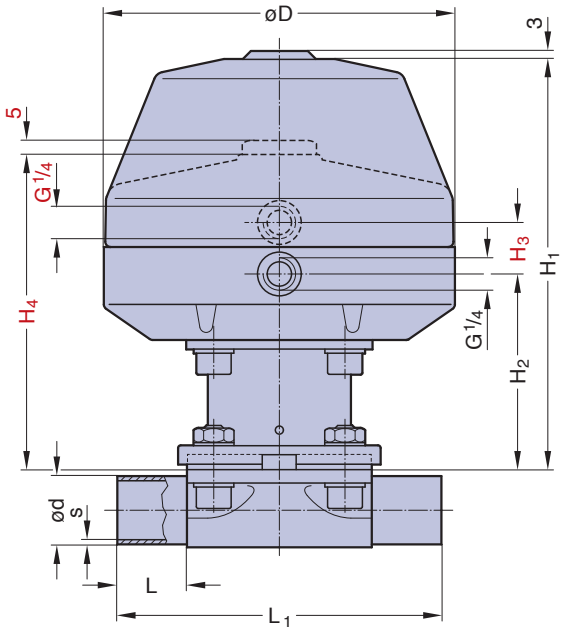
DN		Dimensions (mm)					Total weight ca. (kg)		Filling volume (NL)	
(mm)	MA	L	L_1	H_1	H_2	D	Investment cast	Forged	NC	NO/DA
15-25	25	25	120	160	107	95	1,9	2,0	0,17	0,20
32-40	40	25	153	190	129	115	3,9	4,2	0,31	0,34
50	50	30	173	236	171	144	7,0	8,0	0,68	0,80

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMA 495

Pneumatically operated Valve DN 15 - 100 mm (3/4" - 4")

Cf. 1



Features

- **Plastic diaphragm actuator with stainless steel distance piece**
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 32

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting

Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1
Fail safe open (NO): Cf. 2
Double acting (DA): Cf. 3
At control function NO/DA higher control pressure than required may affect the life-time of the working diaphragm.

Direction
Control connection: At Cf. 1, 2 & 3, 90° to flow direction, standard
Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	DN 15-50 (1/2"-2")	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	10 bar (150 psi)	7 bar (100 psi)	6 bar (87 psi)
PTFE	8 bar (115 psi)	6 bar (87 psi)	5 bar (72 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 DN 15-50 4,5 - 6 bar (65-87 psi)
Cf. 1 DN 65-80 4,5 - 7 bar (65-100 psi)
Cf. 1 DN 100 5,5 - 7 bar (80-100 psi)
Cf. 2 & 3 DN 15-80 4 - 5,5 bar (60-80 psi)
Cf. 2 & 3 DN 100 5 - 6,5 bar (72-93 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24
Special ends
Actuators suitable for: Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below
Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 100
Fold out page 21

DN	MA	Dimensions (mm)							Total weight ca. (kg)		Filling volume (NL)	
(mm)		L	L_1	H_1	H_2	H_3	H_4	D	Investment cast	Forged	NC	NO/DA
15-25	25	25	120	148	71	31	120	130	1,9	2,0	0,15	0,11
32-40	40	25	153	194	95	31	144	161	4,7	4,9	0,26	0,23
50	50	30	173	233	109	31	177	217	7,0	8,0	0,73	0,54
65	80	30	216	314	166	41	275	265	20,0	23,0	2,30	1,87
80	80	30	254	314	166	41	275	265	20,0	23,0	2,30	1,87
100	100	30	305	314	166	41	284	265	29,0	27,0	2,30	2,00

Note: H3 and H4 only for valves with Cf. 2 and Cf. 3 H1 only for valve with Cf. 1

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMD 289

Manually operated Valve DN 8 - 20 mm (3/8" - 3/4")

Features

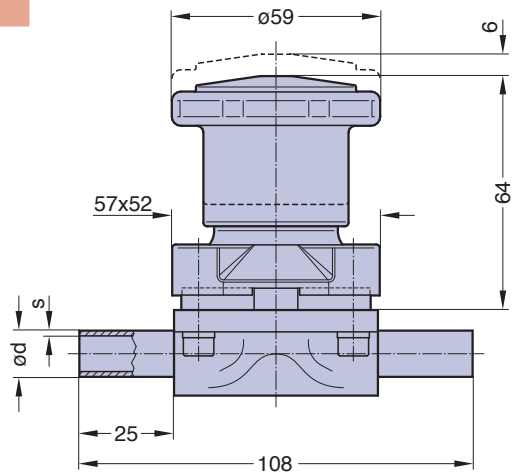
- **Plastic bonnet and hand wheel**
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm

Technical Data

Control function:	Manually operated
Max. working pressure:	6 bar (87 psi)
Max. working temperature:	S-Version: 80°C (176°F) dependent on application HS-Version: 150°C (300°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Bonnets suitable for:	Two-Way bodies / Welded configurations T- bodies / Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,5 kg

Technical data also valid for multiport valve.

Butt weld ends
MA 10
Fold out page 21



Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Manually operated Valve DN 15 - 50 mm (3/4" - 2 1/2")

Features

- **Plastic bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 32
- Locking device
  This system can be engaged by simply lifting the handwheel once it is in the required position.
  To release the operating mechanism, simply return the handwheel to its previous position by pushing it down.
  When the system is in the locked position, u-lock can be installed to protect the plant against unwanted interference.

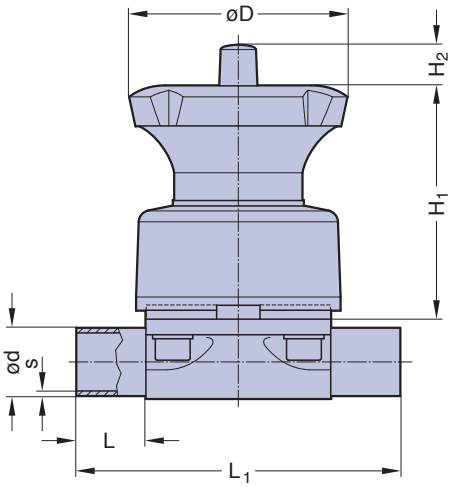
Optional

- Adjustable stroke limiter on top

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	80°C (176°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Suitable for:	Two-Way bodies, otherwise depending on design
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Butt weld ends
MA 25 - 50
Fold out page 21



DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	85	15	154	0,87	0,96
32-40	40	25	153	102	24	194	1,59	1,83
50	50	30	173	117	24	224	2,30	3,40

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMD 985

Manually operated Valve DN 65 - 100 mm (2 1/2" - 4")

DN 100, KMD 985

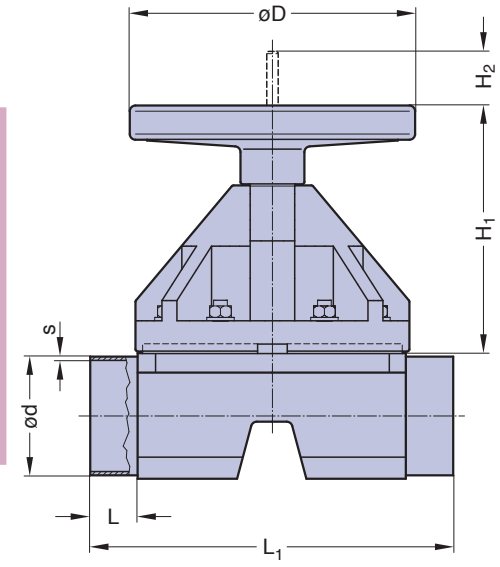
Features
- **Plastic bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 32

Optional
- Adjustable travel stop or stroke limiter on top
- Sealed bonnet
- Locking device

Technical Data

Control function:	Manually operated
Max. working pressure:	EPDM 10 bar (150 psi) PTFE 8 bar (115 psi)
Max. working temperature:	S-Version 80°C (176°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Butt weld ends
MA 25 - 100
Fold out page 21



DN 65 - 100 (Drawing MA 100)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
65	80	30	216	180	38	198	7,0	9,0
80	80	30	254	180	38	198	7,0	9,0
100	100	30	305	220	50	252	14,0	12,0

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

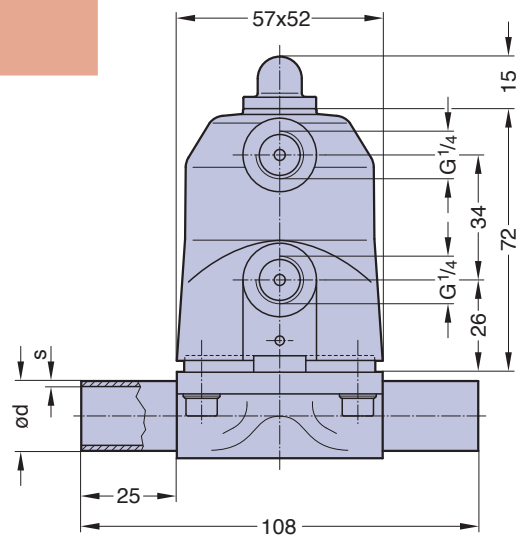
KMD 188

Pneumatically operated Valve DN 8 - 20 mm (3/8" - 3/4")

HS-Version, Cf. 1, 2 & 3

HS-Version, Cf. 4 & 5

Butt weld ends
MA 10
Fold out page 21



Features

- **Efficient plastic piston actuator directly assembled with the valve body**
- **Control air connection 90° to flow direction for side by side or other installations saving space**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Encapsulated diaphragm
- Optical indicator
- CDSA sealing concept, see page 32

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection in flow direction

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3 At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	At Cf. 1, 2 & 3, 90° to flow direction, standard At Cf. 4 & 5 in flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM diaphragm 8 bar (115 psi) PTFE diaphragm 7 bar (100 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	PS-Version 80°C (176°F) HS-Version 150°C (300°F) dependent on Application
Control pressure:	Cf. 1 & 4 4,2 - 7 bar (60 - 100 psi) Cf. 2, 3 & 5 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,6 kg

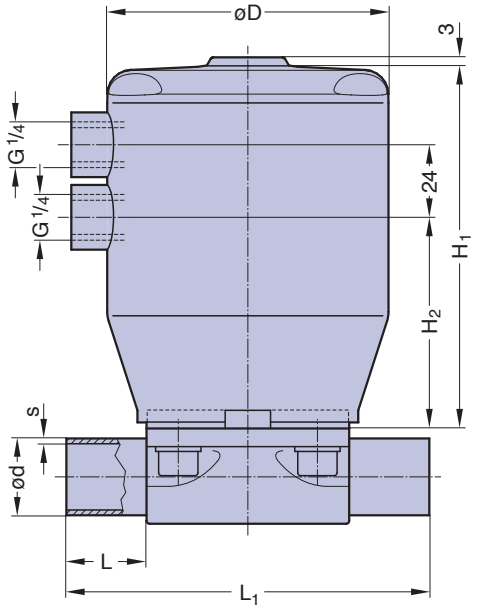
DN (mm)	MA	Filling volume (NL)	
		NC	NO/DA
8-20	10	0,027	0,027

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

KMD 402

Pneumatically operated Valve DN 15 - 50 mm (3/4" - 2 1/2")

Cf. 4, 5 & 6



Cf. 4, 5 & 6

Features

- **Plastic piston actuator**
- Compact design
- Actuator high resistance to heat transfer
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Smooth exterior design ideal for wash downs

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting
- Control air connection 90° to flow direction

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & **4** Fail safe open (NO): Cf. 2 & **5** Double acting (DA): Cf. 3 & **6** At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.
Direction	
Control connection:	At Cf. 4, 5 & 6, in flow direction, standard At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM Diaphragm 10 bar (150 psi) PTFE Diaphragm 8 bar (115 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	HS-Version 150°C (300°F) dependent on application
Control pressure:	Cf. 1 & 4 4,5 - 7 bar (65 - 100 psi) Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 21 Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table below

Butt weld ends
MA 25 - 50
Fold out page 21

DN		Dimensions (mm)					Total weight ca. (kg)		Filling volume (NL)	
(mm)	MA	L	L_1	H_1	H_2	D	Investment cast	Forged	NC	NO/DA
15-25	25	25	120	120	70	95	1,5	1,6	0,17	0,20
32-40	40	25	153	133	75	115	2,8	3,1	0,31	0,34
50	50	30	173	173	111	144	4,9	6,0	0,68	0,80

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Pneumatically operated Valve DN 15 - 80 mm (3/4" - 3")

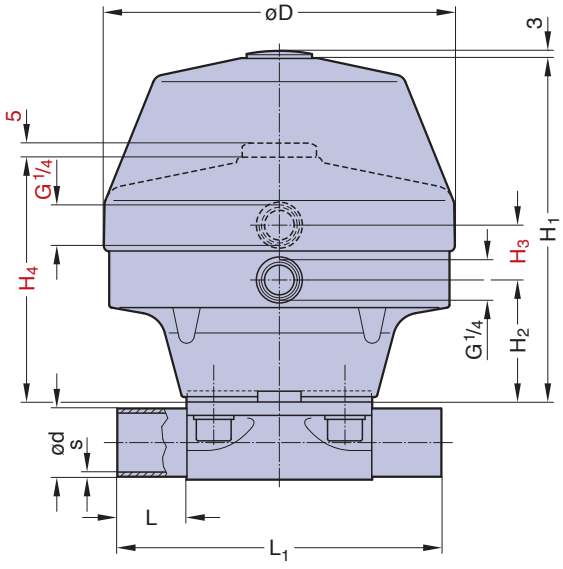
Cf. 1

Features

- **Plastic diaphragm actuator directly assembled with the valve body**
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 32

Optional

- Available with a wide range of control equipment and accessories see page 132 to 139, also for retrofitting



Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1
Fail safe open (NO): Cf. 2
Double acting (DA): Cf. 3
At control function NO/DA higher control pressure than required may affect the lifetime of the working diaphragm.

Direction
Control connection: At Cf. 1, 2 & 3, 90° to flow direction, standard
Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	DN 15-50 (1/2"-2")	DN 65-80 (2,5"-3")
EPDM	10 bar (150 psi)	7 bar (100 psi)
PTFE	8 bar (115 psi)	6 bar (87 psi)

Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature: S-Version 80°C (176°F)
Control pressure: Cf. 1 DN 15-50 4,5 - 6 bar (65-87 psi)
Cf. 1 DN 65-80 4,5 - 7 bar (65-100 psi)
Cf. 2 & 3 DN 15-80 4 - 5,5 bar (60-80 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24
Special ends
Actuators suitable for: Two-Way bodies
Welded configurations
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below

Butt weld ends MA 25 - 80 Fold out page 21

DN (mm)	MA	Dimensions (mm)							Total weight ca. (kg)		Filling volume (NL)	
		L	L_1	H_1	H_2	H_3	H_4	D	Investment cast	Forged	NC	NO/DA
15-25	25	25	120	128	49	31	97	130	1,9	2,0	0,16	0,13
32-40	40	25	153	176	77	31	131	161	3,8	4,1	0,36	0,28
50	50	30	173	214	91	31	161	217	8,0	9,0	1,15	0,50
65	80	30	216	269	121	41	229	265	16,0	18,0	1,15	0,50
80	80	30	254	269	121	41	229	265	16,0	18,0	1,15	0,50

Note: H3 and H4 only for valves with Cf. 2 and Cf. 3 H1 only for valve with Cf. 1

Valve type overview see page 26 and 27.
Ordering key see page 66 to 68.

Ordering key

1	2	3	4	5	6.1	6.2	7	8
Type	Size	Valve body material	Valve body end connection	Diaphragm material	Actuator control function	Actuator type	Surface roughness of the bodies in Ra	QR-/RFID

Pos.	Description	Code	Specification
1	**Type:**	217, 317, 407, 417	Steripur Series, stainless steel actuator, pneumatic
		206, 397, 907, 997	Steripur Series, stainless steel actuator, manual
		394, 592	Steripur Series, two stage stainless steel actuator, pneumatic
		190, 195, 395, 495	KMA Series, actuator with stainless steel adaptation, pneumatic
		205, 295, 905, 995	KMA Series, actuator with stainless steel adaptation, manual
		188, 385, 402	KMD Series, plastic actuator direct mounted, pneumatic
	See page 34 - 65	289, 982, 985	KMD Series, plastic actuator direct mounted, manual
2	**Size:** See page: 21	04 - 100	DN 4, 6, 8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100
3	**Valve body material:**	7	Stainless steel, investment cast 1.4435/S31603, ASME BPE Table MM-2.1-1
		77	Stainless steel, forged 1.4435/S31603, ASME BPE Table MM-2.1-1
		78	Stainless steel, forged 1.4435/S31603 Fe < 0,5%
	See page: 20	20	Hastelloy, C-22 2.4602
4	**Valve body end connections:**	39	Butt weld end acc. DIN
	(bolt letters most common versions)	**40**	**Butt weld end acc. EN ISO 1127 (DIN 11866 Series B)**
		41	Butt weld end acc. DIN 11850 Series 1
		42	**Butt weld end acc. DIN 11850 Series 2 (DIN 11866 Series A)**
		45	**Butt weld end acc. ASME BPE MFS length (DIN 11866 Series C)**
		49	Butt weld end acc. SMS 3008
		94	Butt weld end acc. BS 4825 R1
		95	Butt weld end acc. to ASME BPE Table DT-4.1-1 Tangent Length
		97	Butt weld end acc. JIS G 3447
		98	Butt weld end acc. JIS G 3459
	Valve body end connection for assembly:		**First digit stands for the end connection and last two digits for the tube standard**
		640	Clamp ISO 1127, for tube EN ISO 1127, face to face DIN EN 558-1, Series 7
		642	Clamp DIN 32676, for tube DIN 11850, face to face DIN EN 558-1, Series 7
		645	Clamp ASME BPE, for tube ASME BPE, face to face DIN EN 558-1, Series 7
		649	Clamp SMS 3017, for tube SMS 3008, face to face DIN EN 558-1, Series 7
		545	Clamp ASME BPE, for tube ASME BPE, face to face ASME BPE Table DT-4.4.1-1
		842	Aseptic Union DIN 11851, for tube DIN 11850 series 2 double-sided threaded spigot
		442	Aseptic Union DIN 11864-1-A, for tube DIN 11850 series 2 double-sided threaded spigot
		342	Aseptic flange DIN 11864-2-A, for tube DIN 11850 series 2, double-sided grooved
	See page 21 - 24	242	Aseptic clamp DIN 11864-3-A, for tube DIN 11850 series 2, double-sided grooved
5	**Diaphragm material:**	28	EPDM, FDA / USP compliant MA 8 -100, preferred for SIP applications
	(Other diaphragm materials on request)	20	EPDM, FDA / USP compliant MA 8 -100, preferred for SIP applications
		30	PTFE(TFM) / EPDM one-piece, FDA / USP compliant, MA 25, 40, 50
		51	PTFE(TFM) / EPDM one-piece, FDA / USP compliant, MA 8, MA 10
	See page 14 - 19	44	PTFE(TFM) / EPDM two-piece, FDA / USP compliant, MA 25 to MA 100
6.1	**Actuator control function (Cf.) and orientation air inlet connection:**		Manually operated
		1	Normally closed (NC), orientation 90° to flow direction
		2	Normally open (NO), orientation 90° to flow direction
		3	Double-acting (DA), orientation 90° to flow direction
		4	Normally closed (NC), orientation in flow direction
		5	Normally open (NO), orientation in flow direction
	See page 34 - 65	6	Double-acting (DA), orientation in flow direction
6.2	**Actuator type:**	25	Steripur, actuator size 25
		30	Steripur, actuator size 30
		45	Steripur, actuator size 45
		70	Steripur, actuator size 70
		100	Steripur, actuator size 100
		170	Steripur, actuator size 170
		T	Steripur, manually operated
		T01	Steripur, manually operated, incl. seal adjuster and locking device, Bonnet assembly bottom entry bolting
		T02	Steripur, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly bottom entry bolting
		T03	Steripur, manually operated, incl. seal adjuster, Bonnet assembly bottom entry bolting
		T11	Steripur, manually operated, incl. seal adjuster and locking device, Bonnet assembly through bolting
		T12	Steripur, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly through bolting
		T13	Steripur, manually operated, incl. seal adjuster, Bonnet assembly through bolting
	See page 34 - 46		

Ordering key

1	2	3	4	5	6.1	6.2	7	8
Type	Size	Valve body material	Valve body end connection	Diaphragm material	Actuator control function	Actuator type	Surface roughness of the bodies in Ra	QR-/RFID

Pos.	Description	Code	Specification
6.2	**Actuator type:**	S	KMD, Type 289, 385, 402, 982, 985 max. 80°C
		PS	KMD, Type 188 max 80°C
		HS	KMD for steam sterilizing up to max. 150°C
		AS	KMA
		S01	KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly bottom entry bolting
		S02	KMA, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly bottom entry bolting
		S03	KMA, manually operated, incl. seal adjuster, Bonnet assembly bottom entry bolting
		S11	KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly through bolting
		S12	KMA, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly through bolting
	See page 48 - 65	S13	KMA, manually operated, incl. seal adjuster, Bonnet assembly through bolting
7	**Surface roughness of the bodies in Ra: (µm)**	02	Internal mechanically polished Ra ≤ 0,8 µm
		03	Internal mechanically polished Ra ≤ 0,8 µm + Electropolished
		07	Internal mechanically polished Ra ≤ 0,6 µm
	Optional surface code SF 1-6 for spigot end (Pos. 4) code 45 or 95 only.	08	Internal mechanically polished Ra ≤ 0,6 µm + Electropolished
		09	Internal mechanically polished Ra ≤ 0,4 µm
		10	Internal mechanically polished Ra ≤ 0,4 µm + Electropolished
		14	Inside mechanically polished Ra ≤ 0,25 µm
		16	Inside mechanically polished Ra ≤ 0,25 µm + Electropolished
		SF0	No Finish Requirement
		SF1	ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch)
		SF2	ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch)
		SF3	ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,76 µm (30 µ-inch)
		SF4	ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,38 µm (15 µ-inch) + Electropolished
		SF5	ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch) + Electropolished
		SF6	ASME BPE Table SF-2.4-1
	See page 10 - 11		Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch) + Electropolished
8	**QR-Code / RFID:**	ID	Diaphragm including RFID. Valve body respectively actuator including laser etched QR-Code.
9	**S-Number:**	S...	To specify customized design and all the details for multiport valves

Preferred standards bold. Visit our website (Configurator) to specify the right product for your application

Ordering Example

Position:	1	2	3	4	5	6.1	6.2	7
Article Code:	495	. 25	. 77	. 42	. 28	. 1	AS	. 03

Type:
495
KMA Series
actuator with stainless steel adaption
pneumatic

Size:
DN 25

Valve body material:
Stainless steel, forged
1.4435/316L ASME BPE

Valve body end connection:
Butt weld tube end
DIN 11850 Series 2

Diaphragm material:
EPDM
FDA / USP compliant

Actuator control function and orientation air inlet connection:
Normally closed (NC)
orientation 90° to flow direction

Actuator type:
KMA for steam sterilizing up to max. 160° C

Surface roughness of the bodies in Ra:
Internal mechanical polish and electro polish
Ra ≤ 0,8 µm

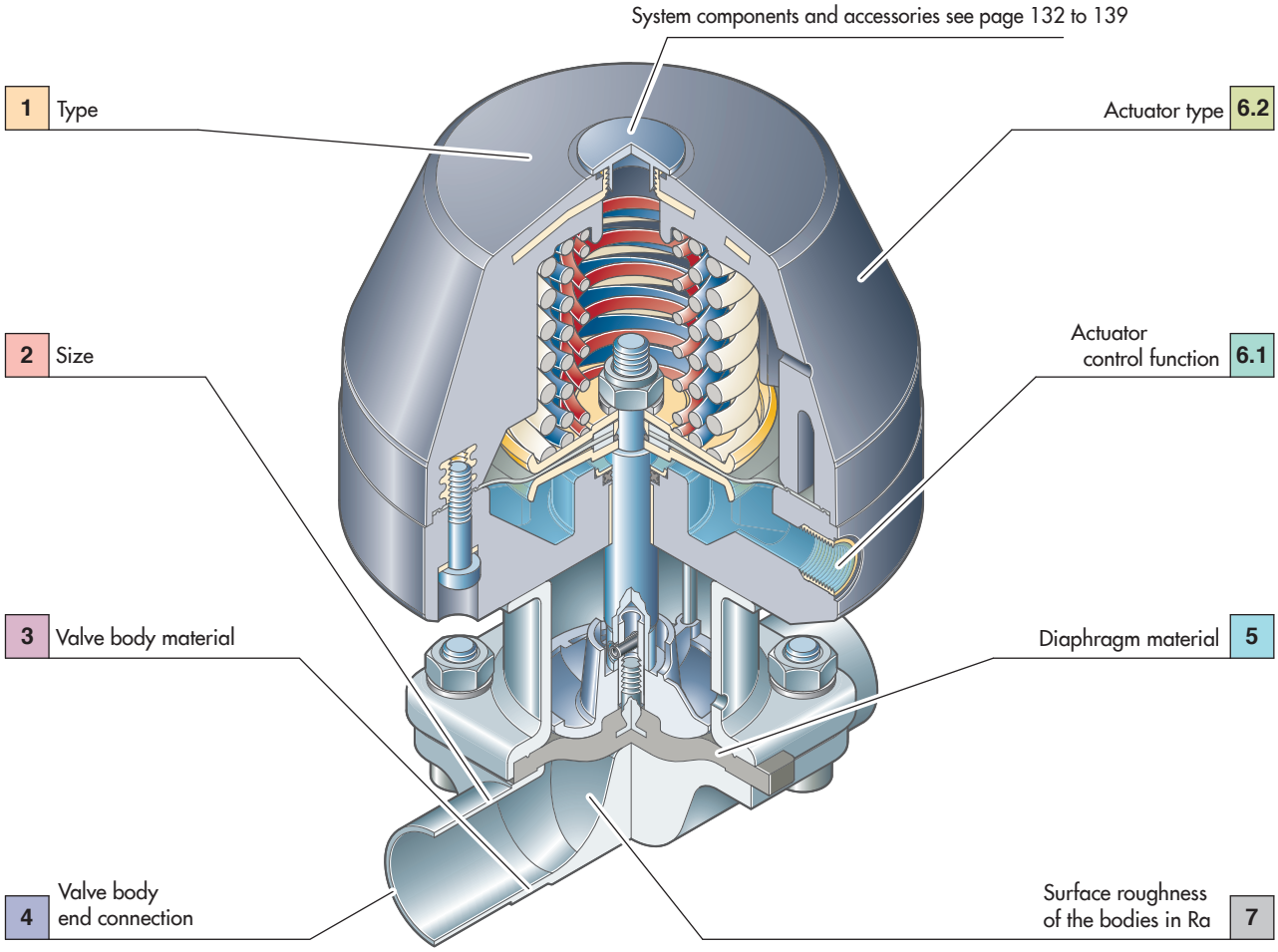


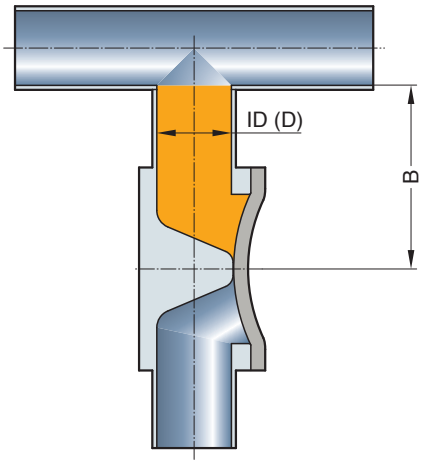
Table of Contents

D-Rule

The D-Rule is the dead leg as relation between the B and D dimension as described in ASME BPE.
This definition is a helpful guideline to describe the maximum allowable dead leg of combined components which are installed into aseptic process systems or process skids.
The dead leg is described with the B dimension in mm as an absolute value or as a relation between B/D.

Depending on the nominal diameters of the combinations and / or the positioning of the valve body, the relation can shift between 2:1 and 5:1. If the D-Rule is specified and the requirements cannot be met with a welded valve configuration, the solution is to manufacture the valve body as a multiport valve which is made from solid block material.

$$\text{D-Rule} = \frac{B}{D}$$



The B dimension and the relation of B/D are displayed in the dimensional data which can be provided on request.

Welded Valve Configurations

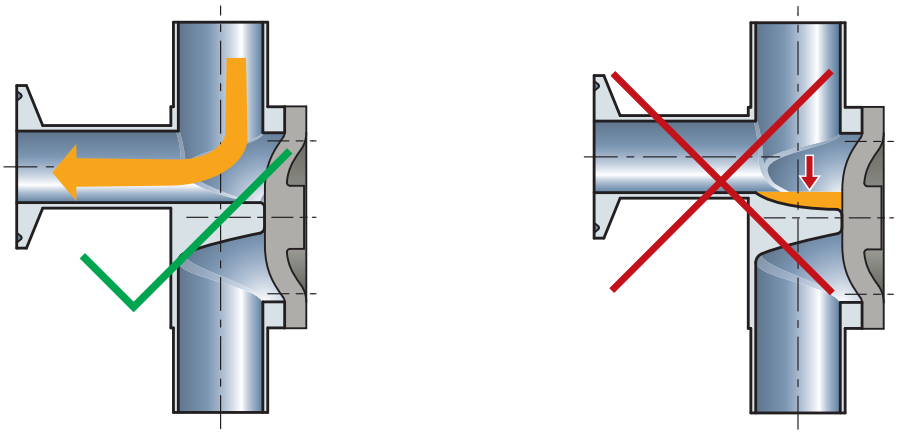
Welded valve configurations are designed to improve the process in aseptic production facilities by reducing the dead legs in accordance to cGMP. Welded valve configurations may be as simple as a valve by tube fabrication or as complex as multiple valve bodies of different sizes welded into a valve cluster. All welded end connections are available.
The applications are endless and the challenge is to efficiently meet the process needs.

Every welded valve configuration produced by SED follows a strict quality control. Every weld seams which are accessible are polished according to the interior surface specification. The completed welded valve configuration is visually inspected and 100% pressure tested.

Advantages of a Welded Valve Configuration:

- Totally self draining
- Minimized dead legs
- Reduced surface contact and hold up volume of the medium
- Compact assembly
- Reduced number of weld seams
- Ready-made assembly for field installation

During installation of welded valve configurations it is important to follow good piping practice to guarantee the valve assemblies drainability.



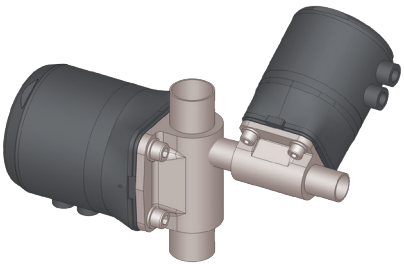
Welded Valve Configurations

The main valve orientation distinguishes between the two different principles: SL or SA

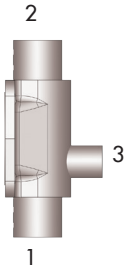
1) SL – L Pattern Configurations

The SL Fabrication is utilized in a vertical piping system to eliminate dead legs in point of use applications of high purity water systems or any other distribution systems.
This valve design serves as a 90-degree elbow for the piping system or as a valve by valve configuration.
In a valve by valve configuration the horizontal valve is orientated at the self-draining angle.

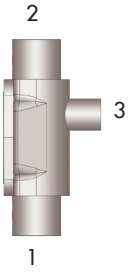
When the vertical main valve is opened it provides a sample untainted by bacterial growth or process contamination.
The size range available is up to DN 100 (4″) for both the main valve and L valve or tube port.

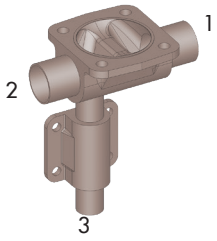


SL1.H

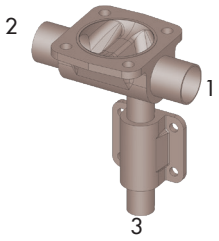


SL2.H





SL2.1.V



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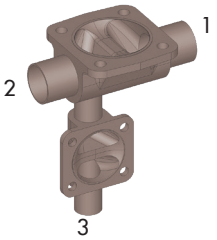
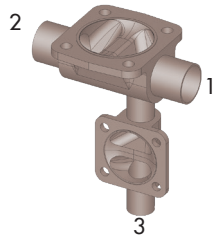
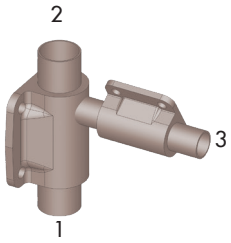


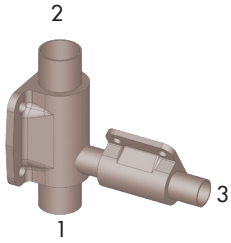
SL2.2.V



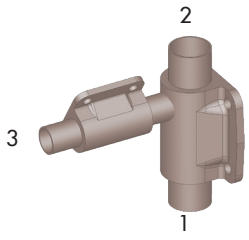
SL1.2.V



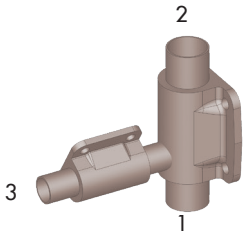
SL2.1.H



SL1.1.H



SL2.2.H



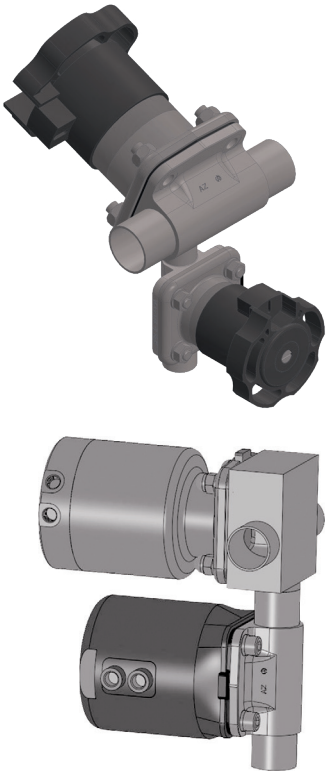
SL1.2.H

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.
All fabricated 2/2 way SA and SL orientations will have a dead leg. Manufacturing these valve orientations from a solid block body will minimize or eliminate the dead leg. See page 77 – 87.

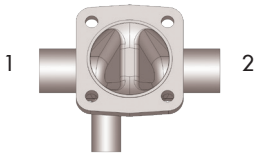
Welded Valve Configurations

2) SA – Sterile Access Configurations
The Sterile Access Fabrication is utilized in a horizontal piping system where the main valve is orientated at the self-draining angle and the access port is at the lowest drainable point of the waterway.
The sterile access maybe used for applications including sampling, steam, condensate or divert port.
The Sterile Access Fabrication is available with either a tube port or a vertical or horizontal valve port.

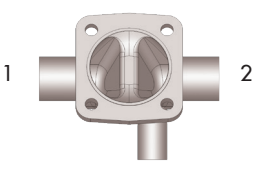
Sizes available are up to DN 100 (4") for both the main valve and access valve or tube port.
Sterile access fabrications use two standard 2/2 way valve bodies welded together per the required orientation.
In a few exceptions, a specially manufactured 2/2 way block is combined with a 2/2 standard valve (i.e. DN25 x DN25).

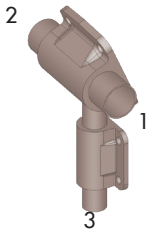


SA1.V

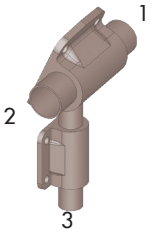


SA2.V

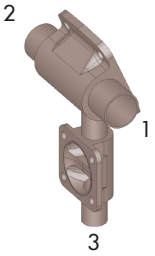




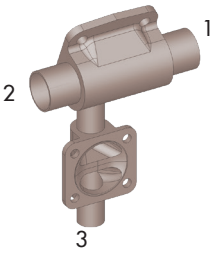
SA1.1.V



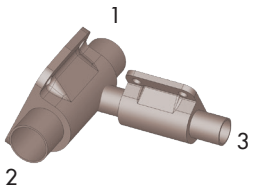
SA2.1.V



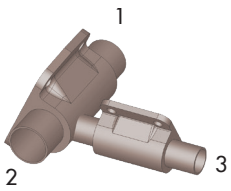
SA1.2.V



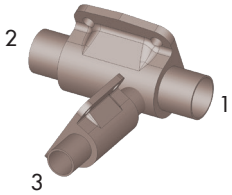
SA2.2.V



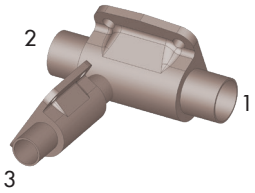
SA1.1.H



SA2.1.H



SA1.2.H



SA2.2.H

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.
All fabricated 2/2 way SA and SL orientations will have a dead leg. Manufacturing these valve orientations from a solid block body will minimize or eliminate the dead leg. See page 77 – 87.

Multiport Valves

Why to choose Multiport Valves?

A multiport valve consists of a valve body machined from a solid block material with a minimum of three tube ends. Multiport valves can be produced with up to 20 actuators and 40 tube ends or even more depending on the feasibility of multiport valve manufacturing. The selection and specification of multiport valves in the aseptic process industry becomes more and more important. The reason for this are the advantages the product offers in optimizing aseptic process purity and efficient product manufacturing.

Innovative conceptual designs and modern machining capabilities are integrated through the CAD-CAM system creating profitable individual solutions with a high degree of flexibility. A prerequisite for this is an operational structure which supports a close relationship between sales, engineering and manufacturing. With a high vertical range of manufacturing at its factory, SED is in an excellent position to meet these challenging market needs. The continuous innovative development of multiport block valve products is a main focus of SED.

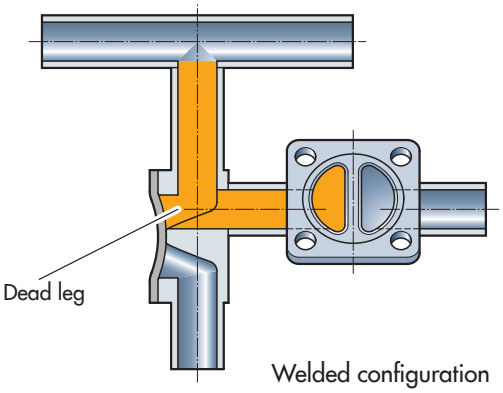
The ideal benefit for you, our customer, is achieved through active and cooperative teamwork of both parties during the design and specification of the valves. This refers especially to the process requirements dictated by the P&ID's for proper flow direction, drainability and installation restraints.

Advantages at a glance:

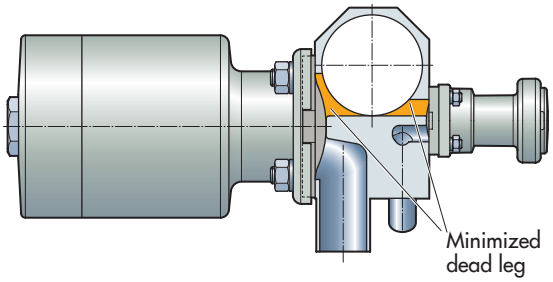
- Customer's specific design
- Compact design and smaller envelope dimension is achievable with the Steripur Series actuators
- Combination of many different nominal diameters
- Optimized drainability
- Minimized dead leg
- Reduced surface contact, hold up volume and cross contamination of the product
- Reduction of fittings, tubing and field welds in the system
- Reduced qualification and validation documentation requirements
- All end connections and materials are available according to the customer's specification

The application of multiport block valves is mainly for the distribution, point of use, sampling, diverting, mixing, bypass, drain and process sterilization (SIP/CIP).

The illustrations below compare the hold up volume and the compact design of a multiport block valve to a welded valve configuration:

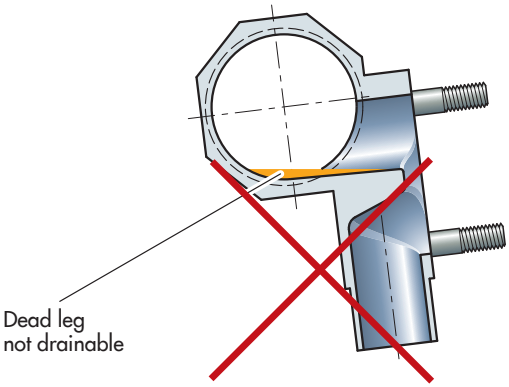


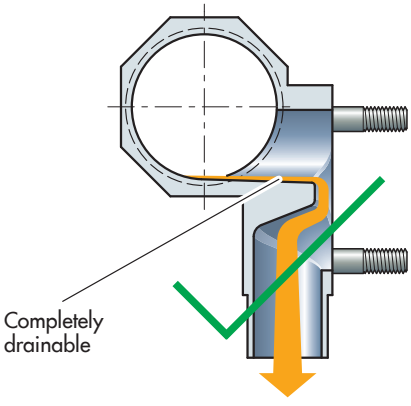
Welded configuration



Multiport block valve

The complete drainability is an important consideration for the design of multiport valves. The following illustration shows the correct and incorrect installation of a standard T-valve:





The following Multiport Valve pages display a selection of multiport block valves. These are examples that should assist in specifying the multiport block body. Up to size DN100 (4.0") and larger nominal diameters and nominal diameter combinations are available. Within this range, all tube standards, tube end orientations, and other application specific customized blocks can be specified. Some of the multiport block valves have become standard products for SED and years of development and manufacturing has resulted in efficiency in production.

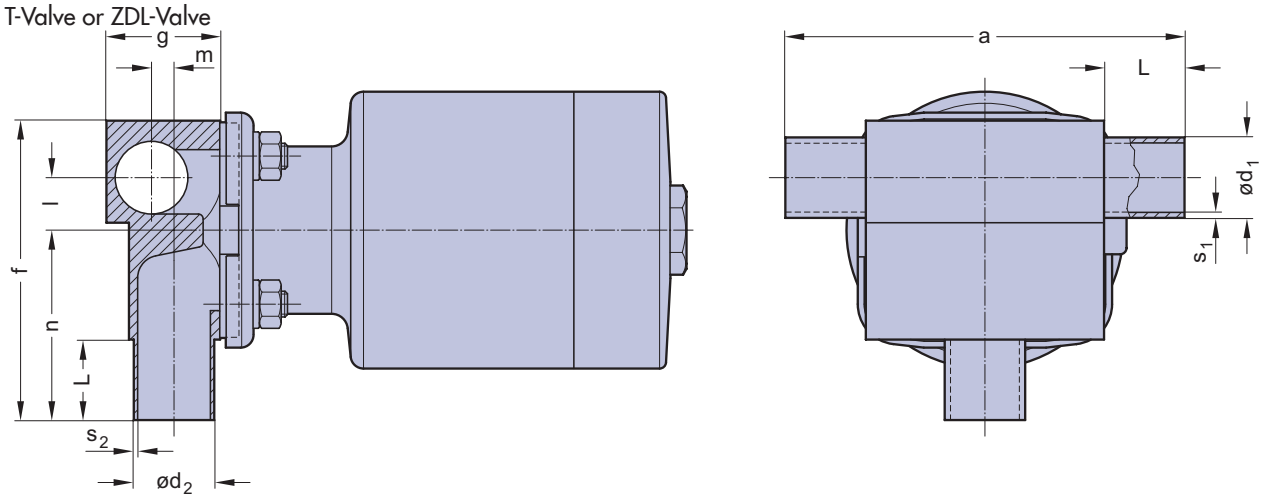
For the differentiation in the following tables, two main criteria are considered:

1) Multiport blocks with main line open for circulation (page 77 to 81)

2) Multiport blocks with all lines and valve ports able to close (page 82 to 87)

1) Main line open

T-Valve or ZDL-Valve



On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.

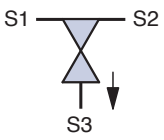
Description
For valve specification see page 89 as guideline

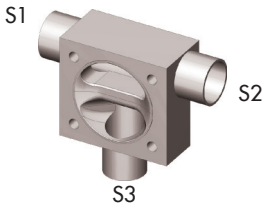
P&ID
Flow direction
Drain direction
Valve

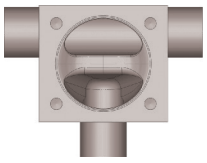
Illustration
Actuators and other options are included in some of the illustrations

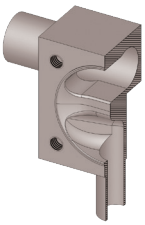
1.1)
T-Valve or ZDL-Valve
1 x Point of use or sampling valve port
Optional available with U-bend for easy fit into the loop

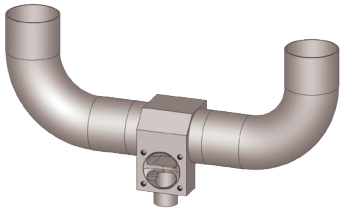
Recommended installation:
S3 down











1) Main line open

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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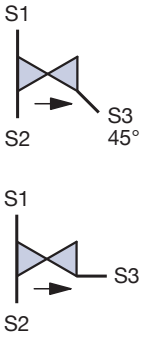
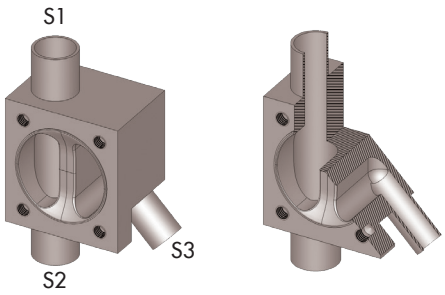
1.15)
TL- Valve, actuation left side
(illustration)
TR-Valve, actuation right side
1 x Point of use or sampling valve port
Main line vertical

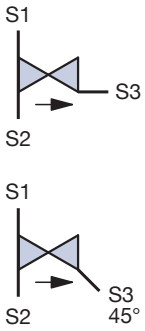
Recommended installation:
S3 - 45° down

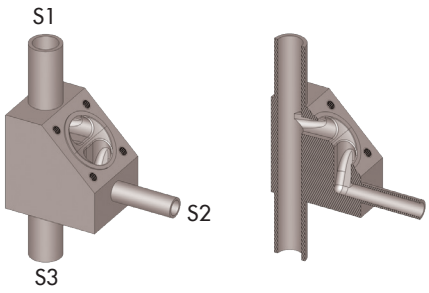




1.16)
TH- Valve
1 x Point of use or sampling valve port
Main line vertical and with horizontal outlet port

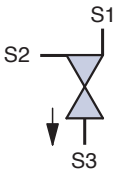
Recommended installation:
S2 down

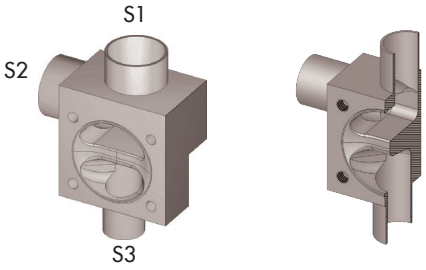




1.2)
LL 3/1 – S2 left side
(illustration)
LR 3/1 – S2 right side
1 x Point of use valve port with integrated directional flow 90° to the main line

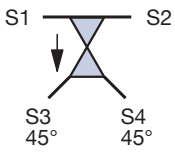
Recommended installation:
S3 down

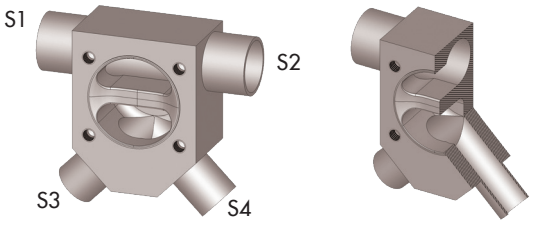




1.13)
TY-Valve
2 x Point of use or sampling valve ports
Optional available with U-bend for easy fit into the loop

Recommended installation:
S3 and S4 - 45°down





1) Main line open

Description
For valve specification see page 89 as guideline

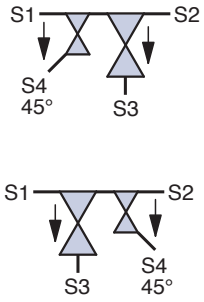
P&ID
Flow direction
Drain direction
Valve

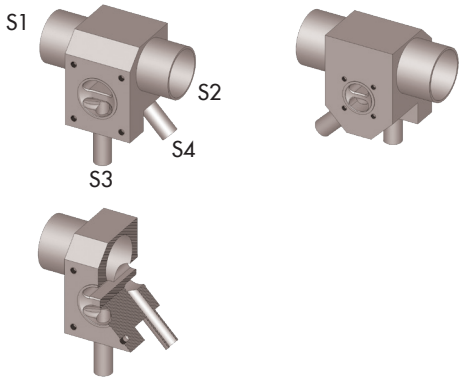
Illustration
Actuators and other options are included in some of the illustrations

---

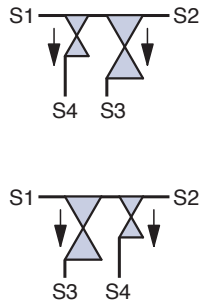
1.4)
MZL 4/2 – S4 left side
MZR 4/2 – S4 right side
(illustration)
1 x Point of use valve port
1 x Integral loop sample valve port
Sample valve be provides on either side of the valve body.
Back to back valve actuation

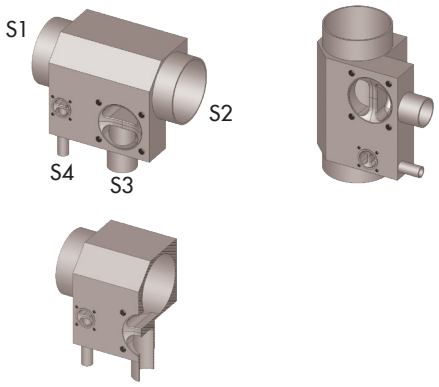
Recommended installation:
S3 down





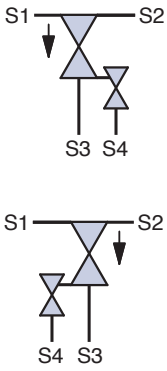
1.45)
MTL 4/2 – S4 left side
(illustration)
MTR 4/2 – S4 right side
2 x Point of Use Valve Port or Double Zero Dead Leg Tee Valve with different diaphragm size.
One port maybe used for sampling and the second port for downstream processing.
One side valve actuation
Recommended installation:
S3 and S4 down

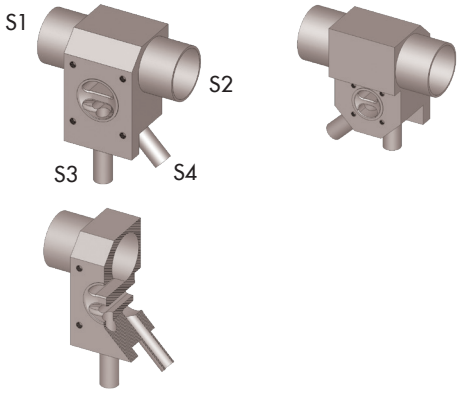




1.6)
MXL 4/2 – S4 left side
MXR 4/2 – S4 right side
(illustration)
1 x Point of use valve port
1 x Integral sample purge valve, valve port below the weir.
Sample valve be provides on either side of the valve body.
Back to back valve actuation

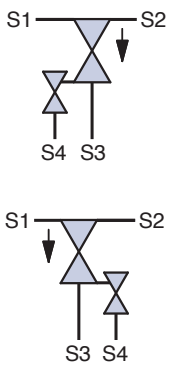
Recommended installation:
S3 down

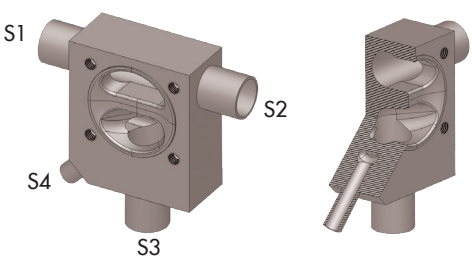




1.61)
MKL 4/2 – S4 left side
(illustration)
MKR 4/2 – S4 right side
1 x Point of use valve port
1 x Integral sample purge valve, valve port below the weir.
Sample valve be provides on either side of the valve body.
No valve actuation on the back side

Recommended installation:
S3 down





1) Main line open

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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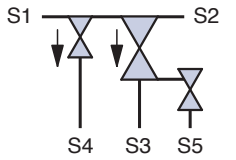
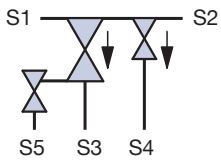
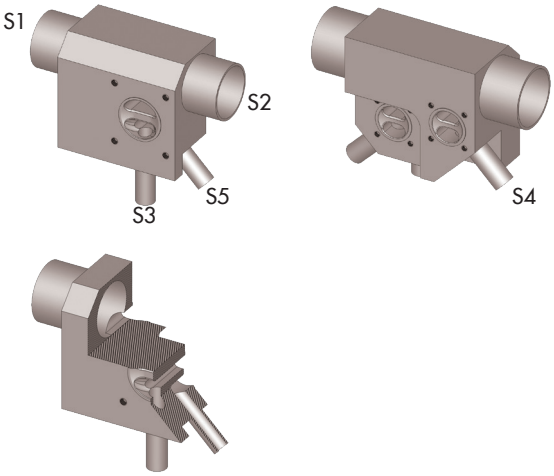
1.7)
MWL 5/3 – S4 left side
(illustration)
MWR 5/3 – S4 right side
1 x Point of use valve port
1 x Integral loop sample valve port
1 x Integral sample purge valve port below the weir.
Sample and purge valve be provides on either side of the valve body.
Back to back valve actuation

Recommended installation:
S3 down

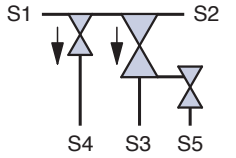


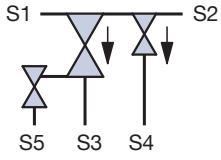


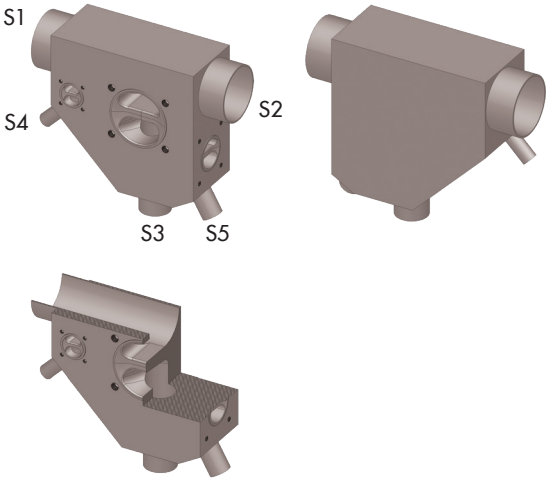


1.72)
MVL 5/3 – S4 left side
(illustration)
MVR 5/3 – S4 right side
1 x Point of use valve port
1 x Integral loop sample valve port
1 x Integral sample purge valve port below the weir.
Sample and purge valve be provides on either side of the valve body.
No valve actuation on the back side

Recommended installation:
S3 down

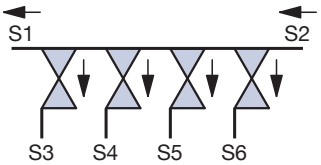


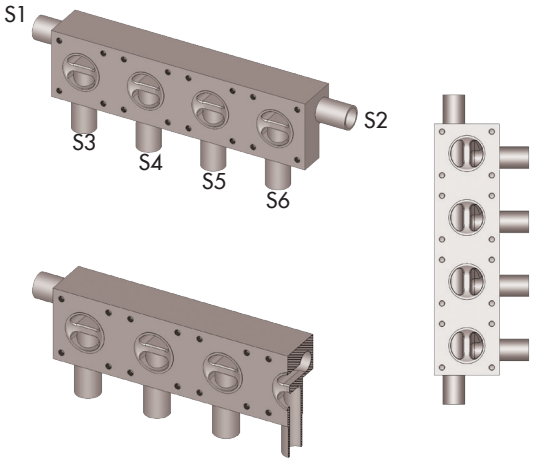




1.9)
MTE 6/4
4 x Point of use valve ports
The Number of valve ports is variable.
No valve actuation on the back side

Recommended installation:
S1 and S2 horizontal
S3 to S6 vertical down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S6 are positioned to the lowest point of valve pocket like the picture shows





1) Main line open

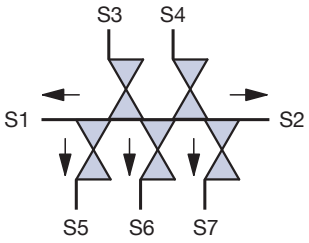
Description
For valve specification see page 89 as guideline

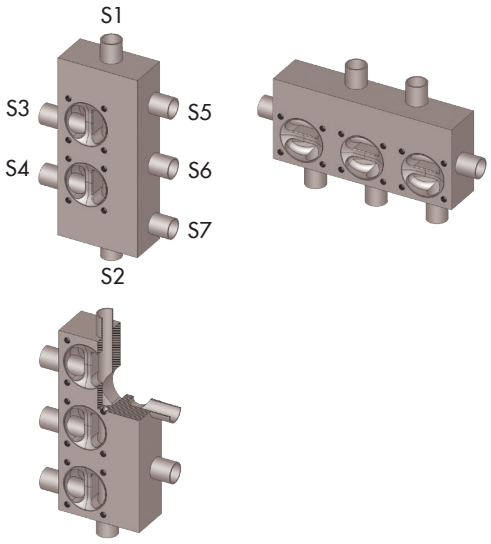
P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

1.11)
MTD 7/5
5 x Point of use valve ports
The number of valve ports is variable.
Back to back valve actuation

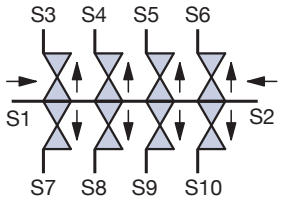
Recommended installation:
S1 and S2 horizontal
S3 to S7 can be vertical if tube outlets S3 to S7 are positioned to the lowest point of valve pocket like the picture shows.

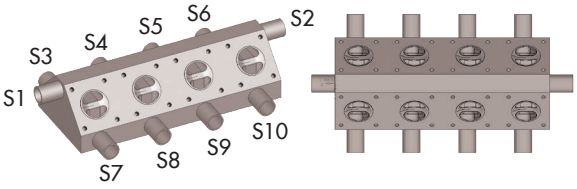


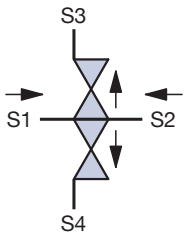


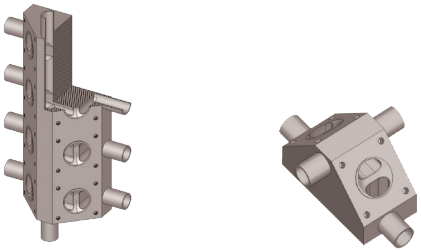
1.14)
MCE 4/2 to 16/14
2 to 14 Point of use valve ports
The number of valve ports is variable
No valve actuation on the back side

Recommended installation:
S1 and S2 horizontal
S3 to S4 or max S16 down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S4 or max S16 are positioned to the lowest point of valve pocket like the picture shows.



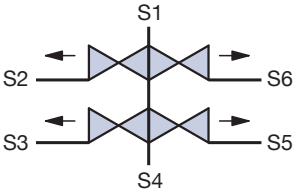


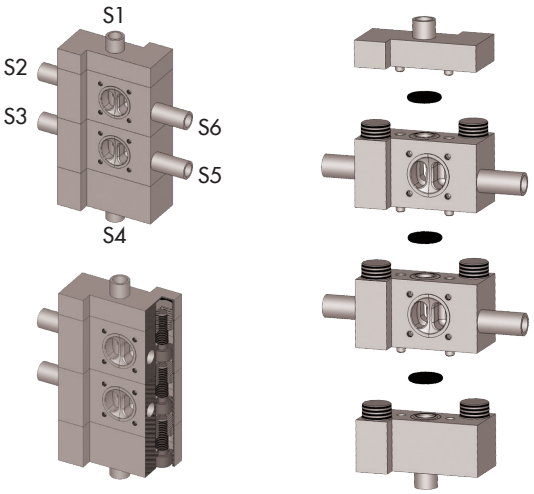




1.16)
MFE 4/2 to 32/30
Up to 30 point of use valve ports as flexible manifold system
Dependent on the requirements the number of valves installed can be between 2 and 30.
It is a mirror design to be suitable also for applying clamp connection.
It allows standardizing skids and other system solutions.
Aseptic O-ring connection according ASME/BPE and DIN 11864 see also catalogue page 23
Back to back valve actuation

Recommended installation:
S4 down





2) All lines and valve ports able to close

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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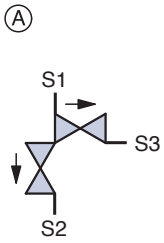
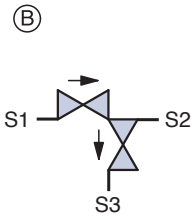
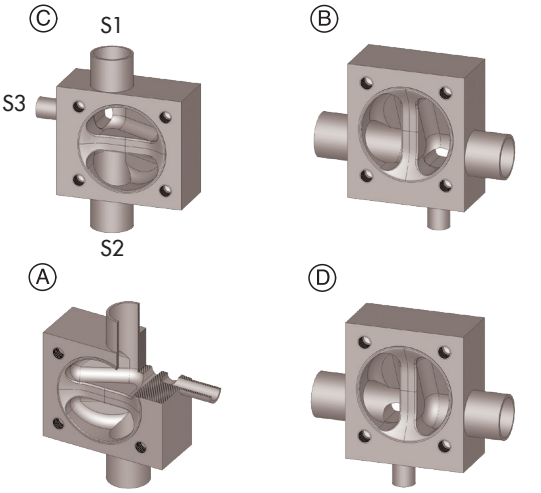
2.1)
MFE 3/2
1 x Valve horizontal
1 x Valve vertical
Back to back valve actuation

Recommended installation:
Dependent on design and application

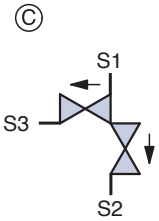


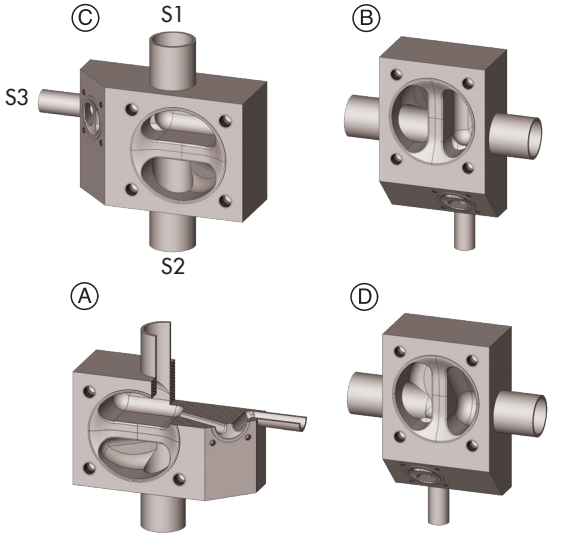




2.15)
MBE 3/2
1 x Valve horizontal
1 x Valve vertical
Function similar to pos. 2.1 but
No valve actuation on the back side

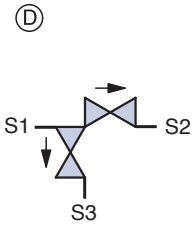
Recommended installation:
Dependent on design and application

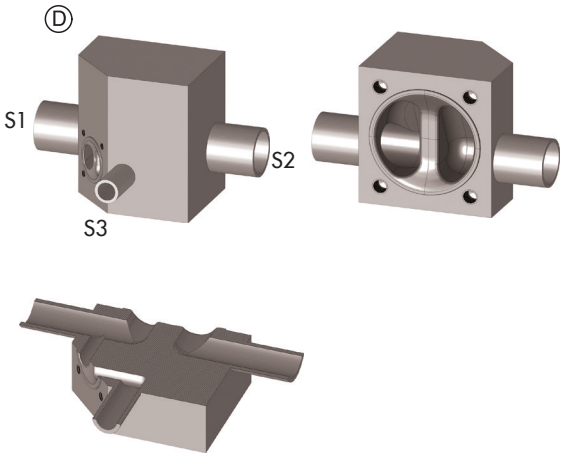




2.17)
MCE 3/2
2 x Valves horizontal
Illustration shows one version only.
Function similar to pos. 2.1

Recommended installation:
Dependent on design and application





2) All lines and valve ports able to close

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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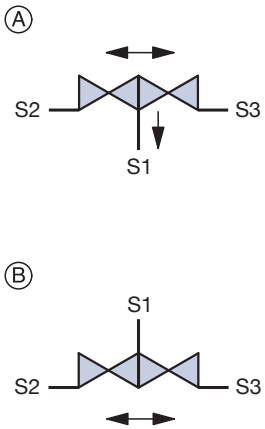
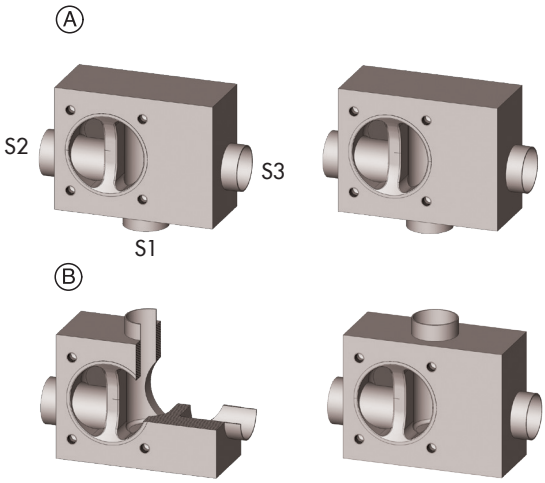
2.25)
MFE 3/2
2 x Valves horizontal
Back to back valve actuation

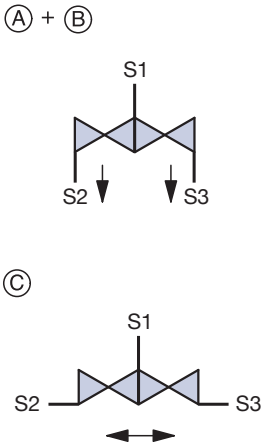
Recommended installation:
S1 vertical down or vertical up
Dependent on design and application

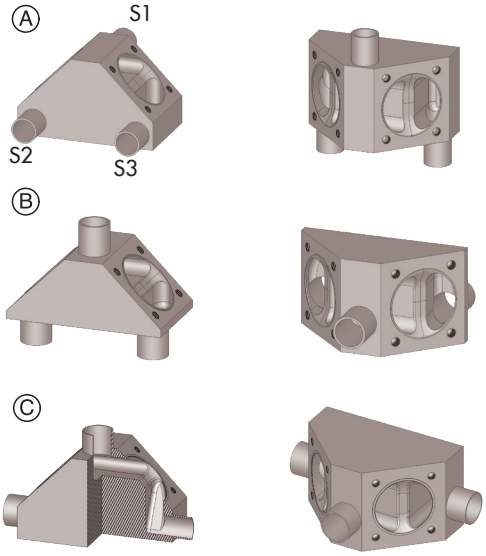




2.31)
MCE 3/2
2 x Valves horizontal
Function similar to pos. 2.25 but **no valve actuation on the back side**

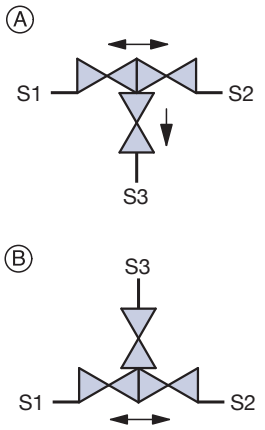
Recommended installation:
S1 horizontal or vertical
The 2- way divert valve block body allows for many different inlet and outlet orientations.
Some of them are illustrated

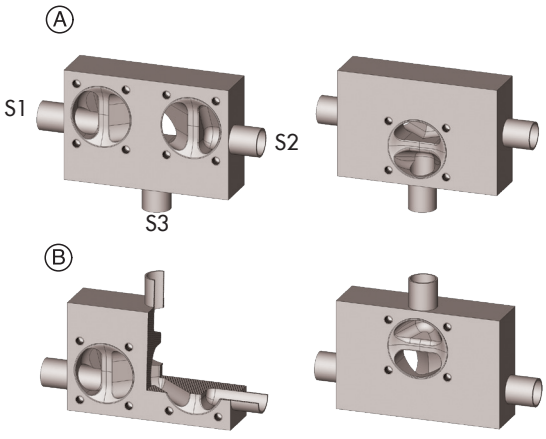




2.35)
MFE 3/3
2 x Valves horizontal
1 x Valve vertical
Back to back valve actuation

Recommended installation:
S3 vertical down or vertical up





2) All lines and valve ports able to close

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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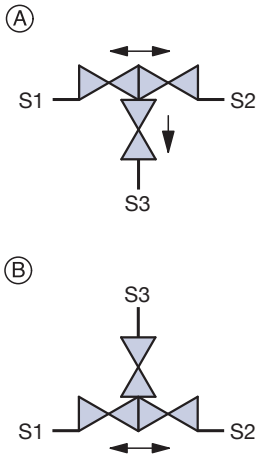
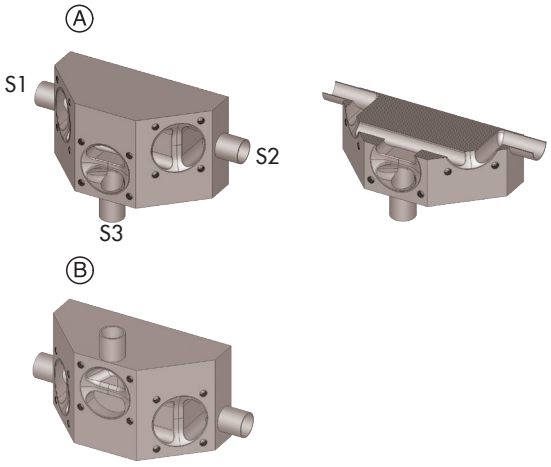
2.38)
MCE 3/3
2 x Valves horizontal
1 x Valve vertical
Function similar to pos. 2.35 but **no valve actuation on the back side**

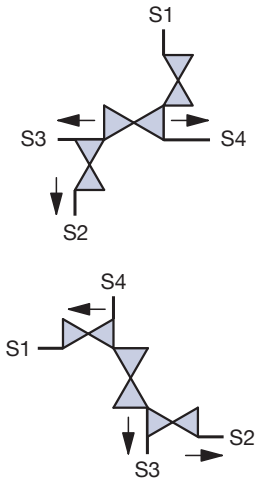
Recommended installation:
S3 vertical down or vertical up
The valve block body allows for many different inlet and outlet orientations.
Some of them are illustrated
Dependent on design and application

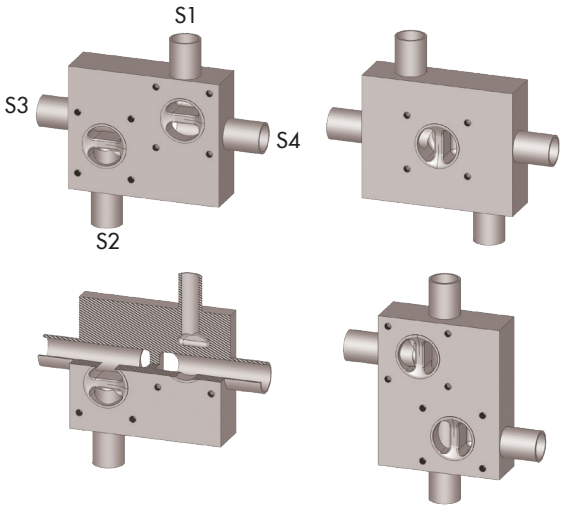




2.41)
MFE 4/3
1 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

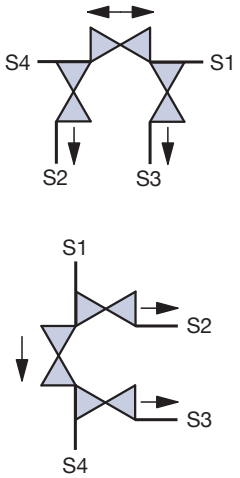
Recommended installation:
Main line isolation through S3 and S4, S1 vertical up sterilization valve port, S2 vertical down sterilization valve port.
Or S3 and S4 vertical dependent on design and application.

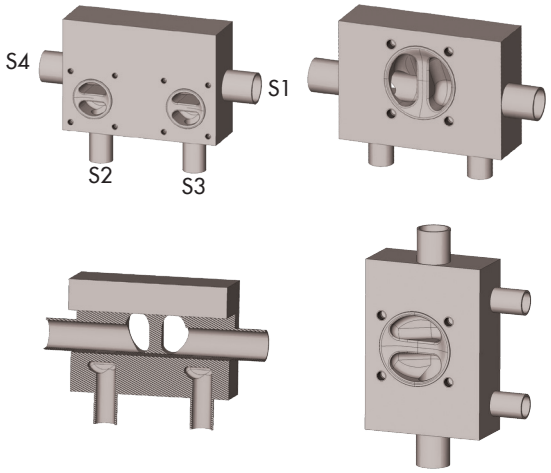




2.43)
MFE 4/3
1 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

Recommended installation:
S2, S3 vertical down or dependent on design and application
S4 vertical down.





2) All lines and valve ports able to close

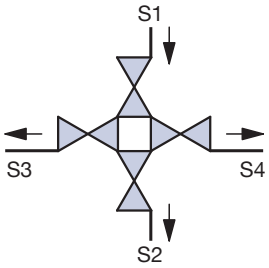
Description
For valve specification see page 89 as guideline

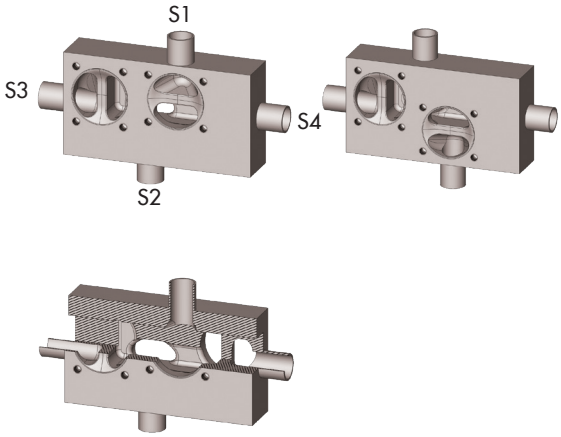
P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

2.49)
MFE 4/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

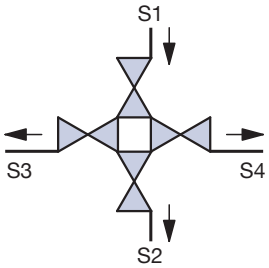
Recommended installation:
S2 vertical down

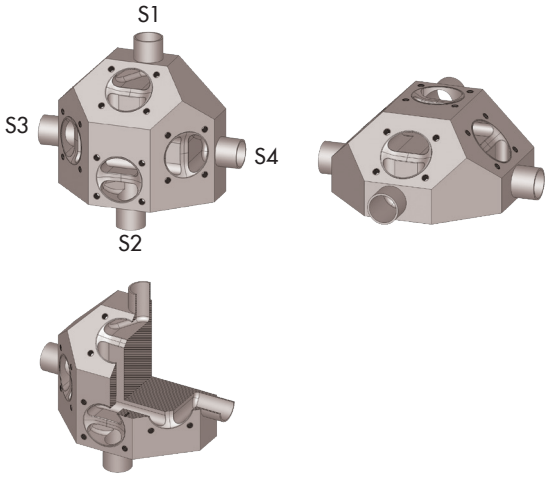




2.51)
MBE 4/4
2 x Valve horizontal
2 x Valve vertical
Function similar to pos. 2.35 but **no valve actuation one the back side**

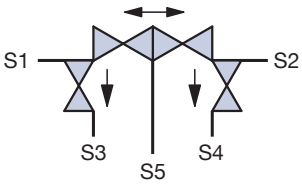
Recommended installation:
S2 vertical down or
S1 and S2 horizontal
The valve block body allows for many different inlet and outlet orientations.
Dependent on design and application

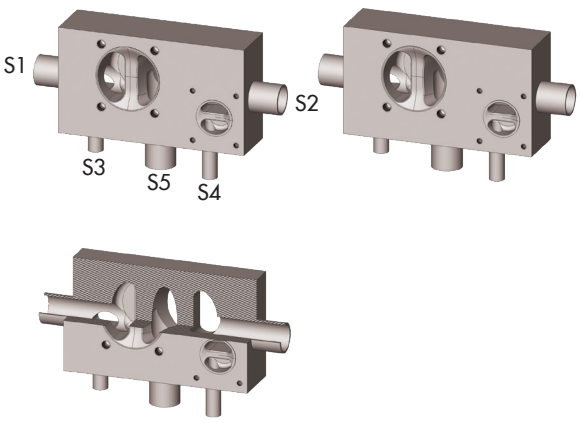




2.71)
MFE 5/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

Recommended installation:
S3, S4, S5 vertical down
Dependent on design and application
S3, S4, S5 vertical up





2) All lines and valve ports able to close

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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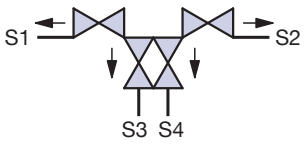
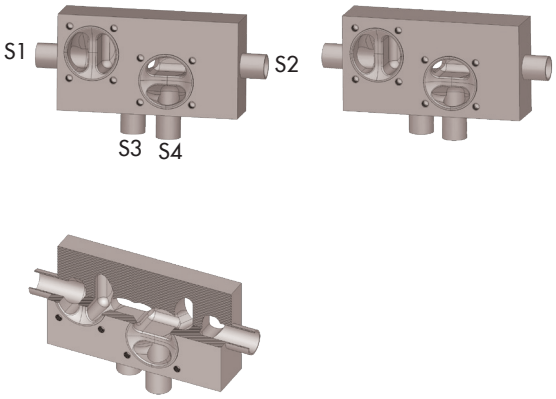
2.72)
MFE 4/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

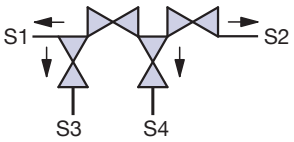
Recommended installation:
S3 and S4 vertical down
Dependent on design
and application
S3 and S4 vertical up

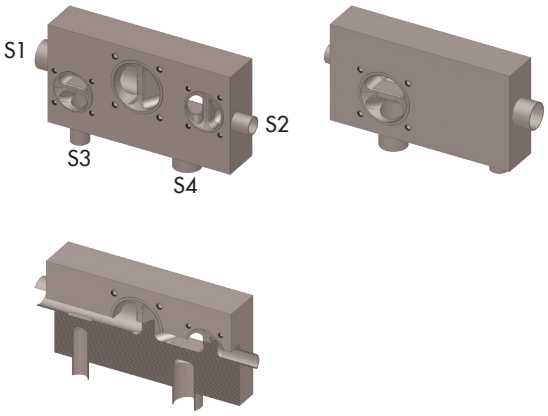




2.73)
MFE 4/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

Recommended installation:
S3 and S4 vertical down
Dependent on design
and application
S3 and S4 vertical up

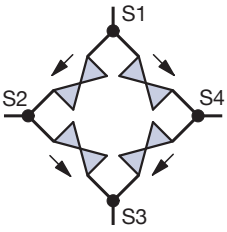


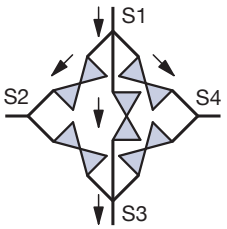


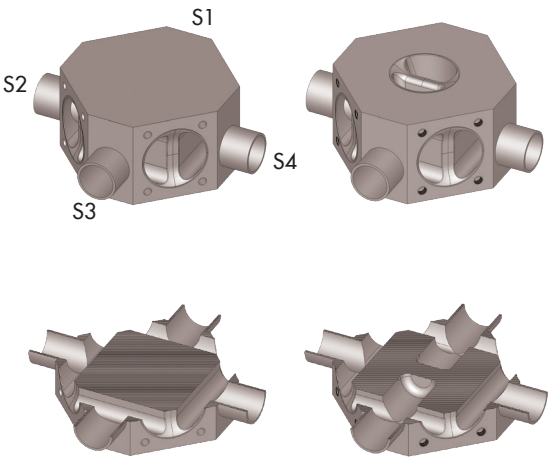
2.8)
MDE 4/4
no valve actuation on the back side
Chromatography valve without bypass

MDE 4/5
no valve actuation on the back side
Chromatography valve with bypass

Recommended installation:
S2 and S4 horizontal
S1 and S3 horizontal.
Or S1 to S4 horizontal







2) All lines and valve ports able to close

Description
For valve specification see page 89 as guideline

P&ID
Flow direction
Drain direction
Valve

Illustration
Actuators and other options are included in some of the illustrations

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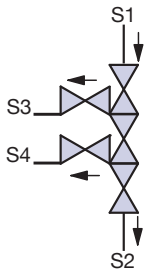
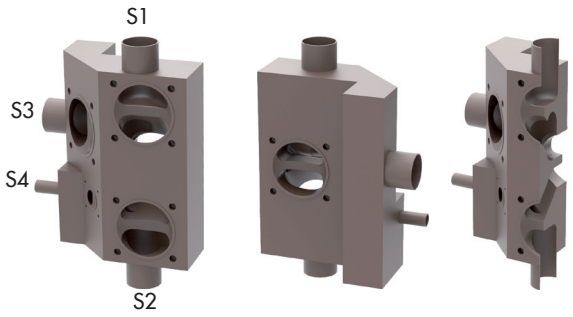
2.81)
MFE 4/5
3 x Valve vertical
2 x Valve horizontal

Recommended installation:
S1 vertical up or down
Dependent on design and application

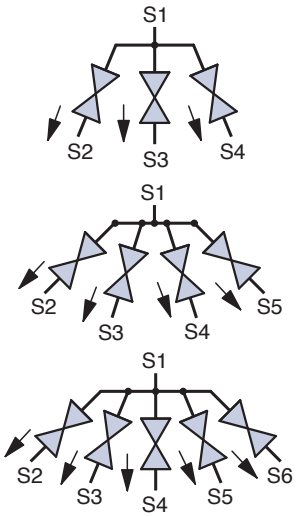


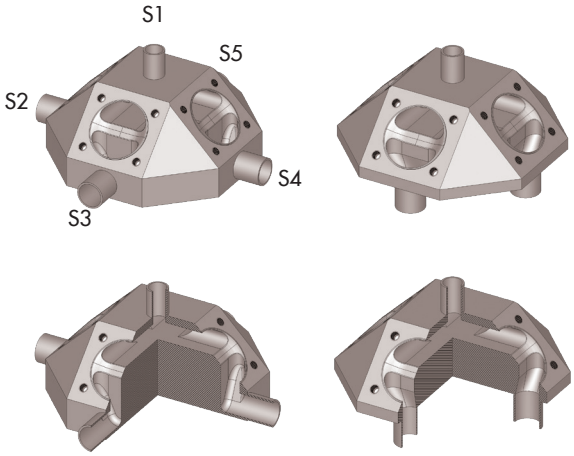


2.9)
MCS 4/3 Star Design
3x Valves vertical

MCS 5/4 Star Design
4x Valves vertical

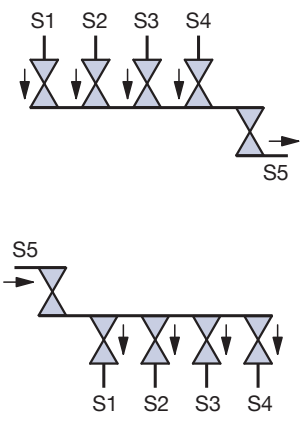
MCS 6/5 Star Design
5x Valves vertical
no valve actuation on the back side
Recommended installation:
S1 vertical; Depending on the diameter the star design is available with up to 7 valves.
The star design has also been manufactured with two opposing multiport block valves with one common port connection.

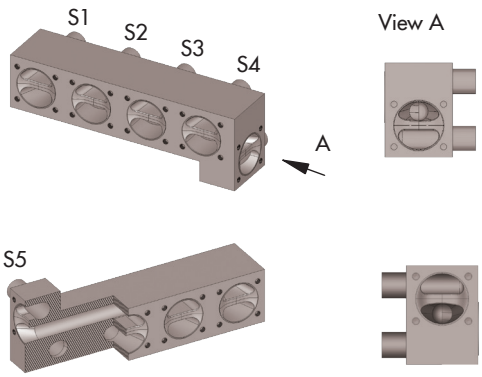




2.91)
MTA 5/5
5 Valves horizontal with one for drainage
no valve actuation on the back side

Recommended installation:
S5 as drainage valve.
Different inlet and outlet orientations e.g. S5 as inlet valve.

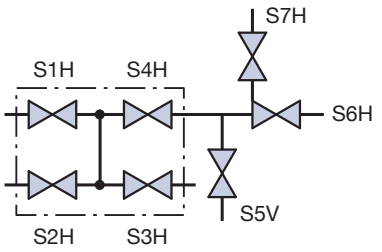


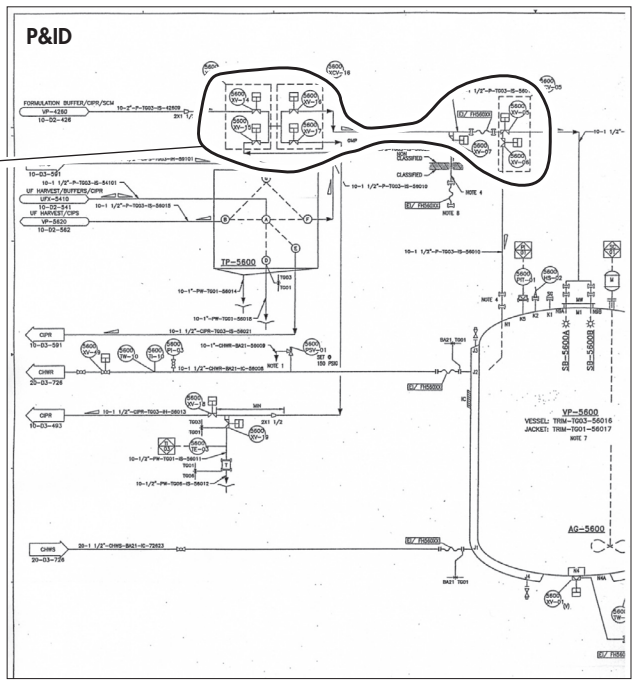


Emergence of customized multiport valve designs

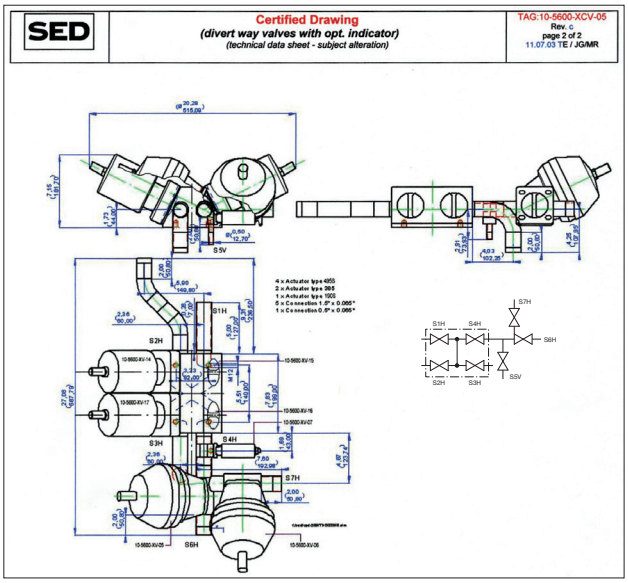
From the piping and instrumentation diagram (P&ID) to the finished plant installation of pharmaceutical and bio pharm projects.

P&ID Multiport Valve Cluster

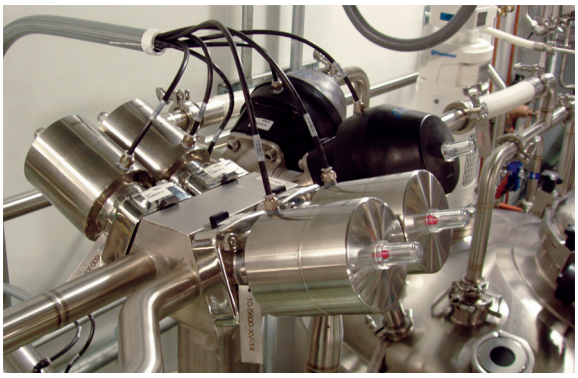




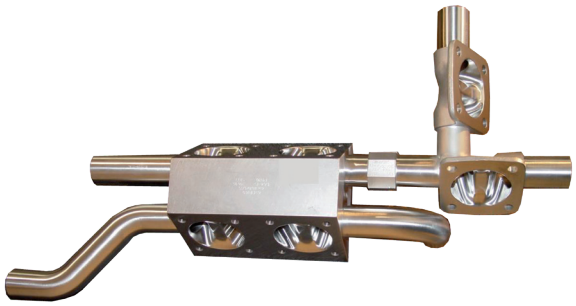
Drawing Multiport Valve Cluster

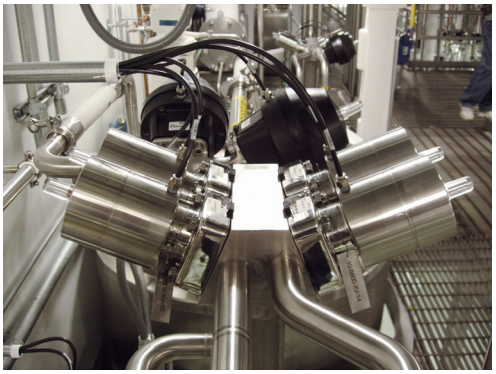


Images of the installation



Multiport Valve Cluster





Multiport Valves

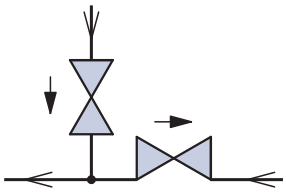
For multiport valve configuration, please use our online configurator.

If it's a version not yet to find in the configurator, please use this form.

Specification form

Your P&ID Sketch:

Example: P&ID



Tube End: S1, S2, ...

Preferred Installation: Horizontal (H) / Vertical (V)

Flow Direction: →

Drain Direction: ➔

Valve Seat: 

Working pressure: _____ bar

Working temperature: _____ °C

Multiport valve body material:

1.4435/316L ☐

1.4435/316L (Fe < 0,5%) ☐

Other _____

Surface finish multiport body:

02 Ra ≤ 0,8 µm ☐

03 Ra ≤ 0,8 µm e-polished ☐

07 Ra ≤ 0,6 µm ☐

08 Ra ≤ 0,6 µm e-polished ☐

09 Ra ≤ 0,4 µm ☐

10 Ra ≤ 0,4 µm e-polished ☐

SF1 Ra ≤ 0,51 (20 µ-inch) ☐

SF2 Ra ≤ 0,64 (25 µ-inch) ☐

SF3 Ra ≤ 0,76 (30 µ-inch) ☐

SF4 Ra ≤ 0,38 (15 µ-inch) e-polished ☐

SF5 Ra ≤ 0,51 (20 µ-inch) e-polished ☐

SF6 Ra ≤ 0,61 (25 µ-inch) e-polished ☐

Diaphragm material:

EPDM Code _____

PTFE Code _____

Other _____

Page in catalogue: Page 21 Page 26 - 27 Page 132 - 139

Tube end	Preferred	Tube end connection				Actuator		Other
No	Installation	DN	s[mm]	D[mm]	Code	Actuator Type	Control Function	Accessories / Comments
S1								
S2								
S3								
S4								
S5								
S6								
S7								
S8								
S9								
S10								
S11								
S12								

Tank Valves

SED Tank Bottom Valves are designed for applications in the aseptic process industry offering a pocket-free interior surface, minimized sump, eliminating entrapment areas and minimizing flow resistance thus reducing the potential for process contamination. SED tank bottom valves incorporate the same features and performance of a standard diaphragm valve utilizing the same valve components for a flush mounted tank bottom valve or side mounted tank and sample valve.

Tank valve bodies are machined from solid bar stock material 1.4435/316L ASME BPE, or investment cast material. Other alloy materials are available according to specifications. The standard design offers one valve port outlet. There is a number of different options available for sampling, sterilization and multi-outlet configurations that are standard in the SED product range of customized solutions.

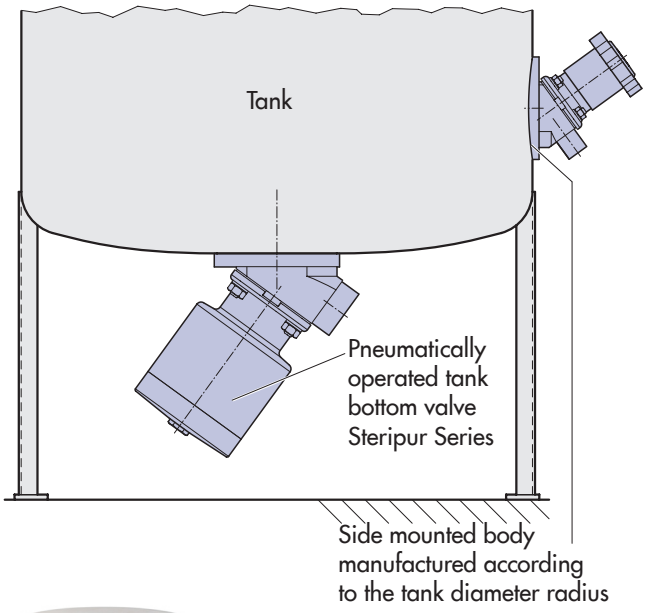
It is preferred to weld the tank valve directly into the vessel. Mounting the valve directly to the tank minimizes the hold up volume, the most important criteria for this application. If removal of the tank valve from the tank is required, versions are offered with flange or clamp connections. Please consult an SED technical representative for these options.

Tank bottom valves are typically used for tank discharge, draining, sampling, cleaning and/or sterilizing, rinsing and isolation of down stream processing.

The outlet port of the tank valve is available with all butt weld tube end standards (see fold-out page 21), aseptic clamp, screw connection (see page 22 and 24) or other special ends. The size range available is the same as the two-way valve.

Features:

- Tank body machined from a solid bar stock material
- 1.4435/316L ASME BPE material
- Other alloy options available as specified
- Minimized dead leg and internal sump
- Suitable for mounting with SED Steripur Series and KMA Series Actuation
- Optional manual operation via an extended crankshaft stem



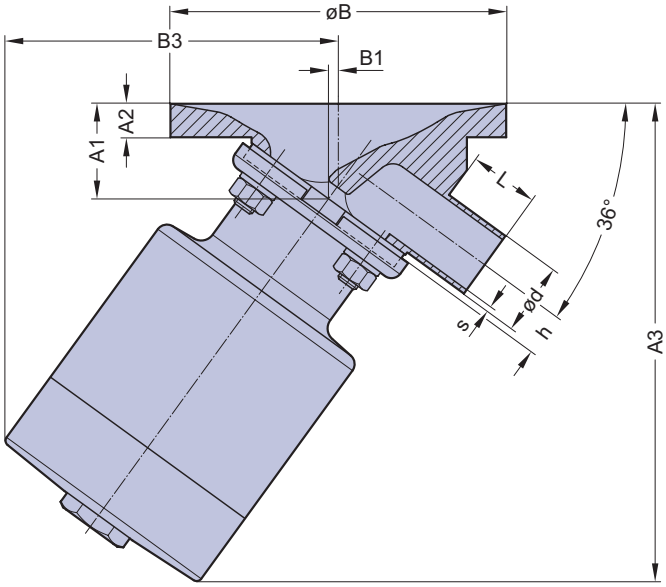
Steripur Series Manual

Steripur Series Pneumatically Operated

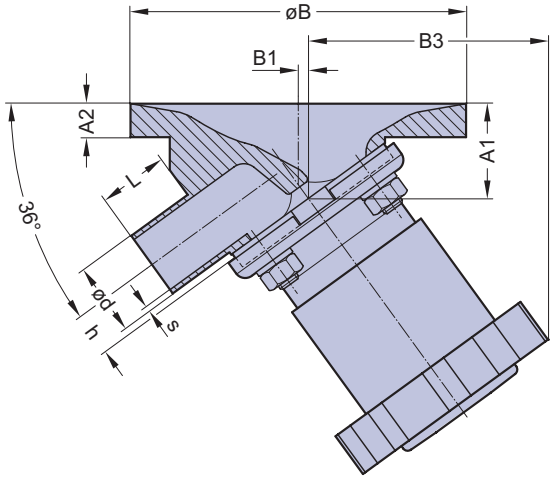
KMA Series Manual

KMA Series Pneumatically Operated

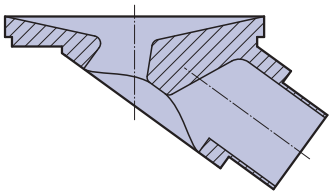
Example:
Drawing Steripur Series pneumatically operated



Example:
Drawing KMA Series manually operated



Common design



Advantages of the SED design:

- minimized hold up volume
- better mixability of media

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.

The following two pages show a table of some examples of standard and customized designs of tank diaphragm valves.

These include options for sampling, sterilization, and multi-outlet configurations.

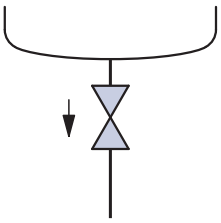
Description
Select a tank valve or see page 89 to sketch and specify your solution

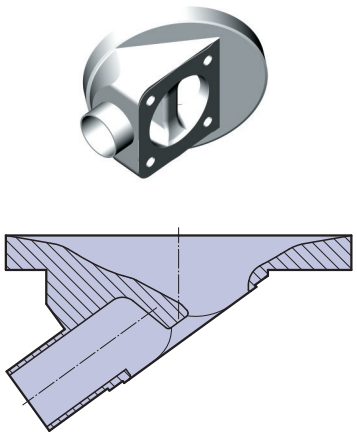
P&ID
Flow direction
Drain direction
Valve

Image
Actuators and other options are included in some of the illustrations

1)
BT
1x Valve port

Standard tank bottom body





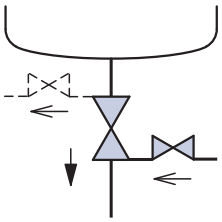
Tank Valves

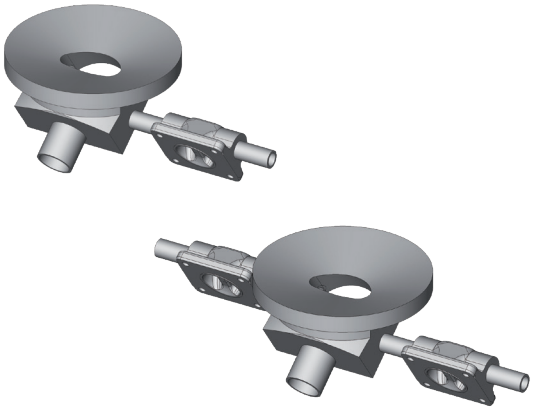
Description
Select a tank valve or see page 89 to sketch and specify your solution

P&ID
Flow direction
Drain direction
Valve

Image
Actuators and other options are included in some of the illustrations

2)
1x Valve machined from bar stock
BZL 3/1 with one welded valve tank side left
BZR 3/1 with one welded valve tank side right
BXL 3/1 with one welded valve outlet left
BXR 3/1 with one welded valve outlet right
BW 4/1 with one welded valve tank side left and one welded valve outlet right



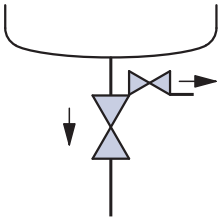


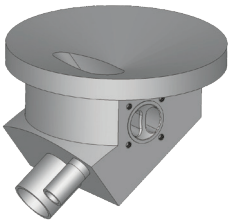
For all options the welded valve is rotated into the self draining position and extended to eliminate interference with the tank bottom

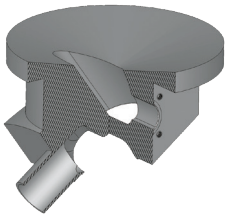
3)
BZR 3/2 (Illustration)
1x Main Valve
1x Sample valve tank side right

BZL 3/2
1x Main Valve
1x Sample valve tank side left

Like position 2 but includes an integral sample valve tank side. Right side and left side options are available and are fully drainable.



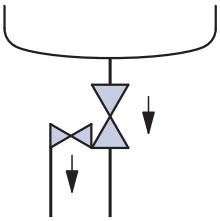


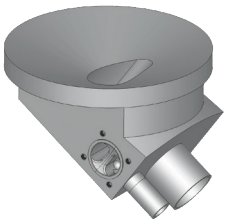


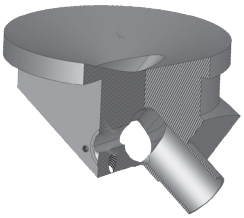
4)
BXL 3/2 (Illustration)
1x Main Valve
1x Sample valve outlet left

BXR 3/2
1x Main Valve
1x Sample valve outlet right

Like position 2 but includes an integral outlet valve. Right side and left side options are available and are fully drainable.





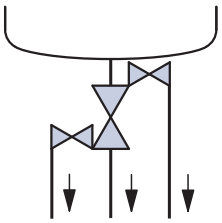


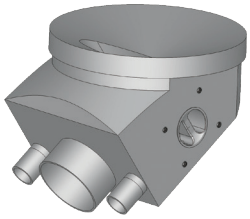
Description
Select a tank valve or see page 89 to sketch and specify your solution

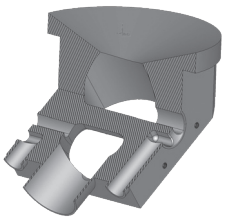
P&ID
Flow direction
Drain direction
Valve

Image
Actuators and other options are included in some of the illustrations

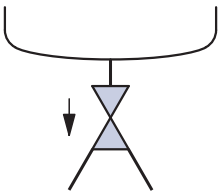
5)
BW 4/3
1x Main Valve
1x Sample valve tank side right
1x CIP/ SIP cleaning outlet valve left
Like position 2 but includes integral valves that are fully drainable.

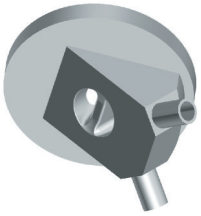




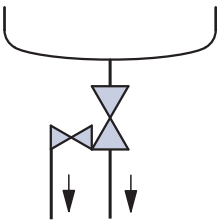


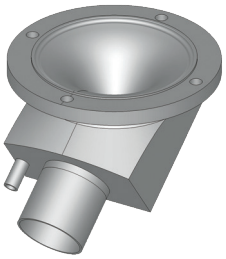
6)
BT 3/1
1x Main valve
2x Outlet port for loop installation or as two access ports



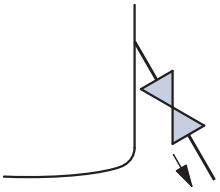


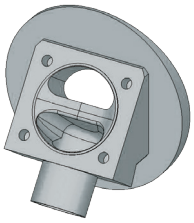
6.5)
BFL
Like position 4, but with flange for dismantling possibility

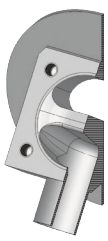




8)
BU
1x Tank wall side sample valve
All previous position options are available with the tank side sample valve.
Machined welding pad to match the radius of the tank diameter.







Sterile Sampling Unit

Sampling units are suitable to take sterile samples from all liquids in aseptic processes i.e. High purity water, High purity steam, Fermentation processes, Parenteral drugs, etc.
Samples can be taken in a continuous process with pneumatic controlled diaphragm valves or typically as a system with manual valves and a handle to bring the complete unit to a laboratory for analyzing the sample in sterile conditions.

Advantages of the SED-Sterile Sampling Unit

- Integral valve unit directly mounted to the sampling bottle
- CIP/ SIP function in one single valve component
- Efficiency in sterilization direct from the point of use
- Autoclavable system
- Less heat transfer
- Compact design
- Material traceability available acc. to EN 10204 3.1
- Less weight

The recommended number of sampling units needed in a plant to qualify the process and continue the cycle of taking samples is:

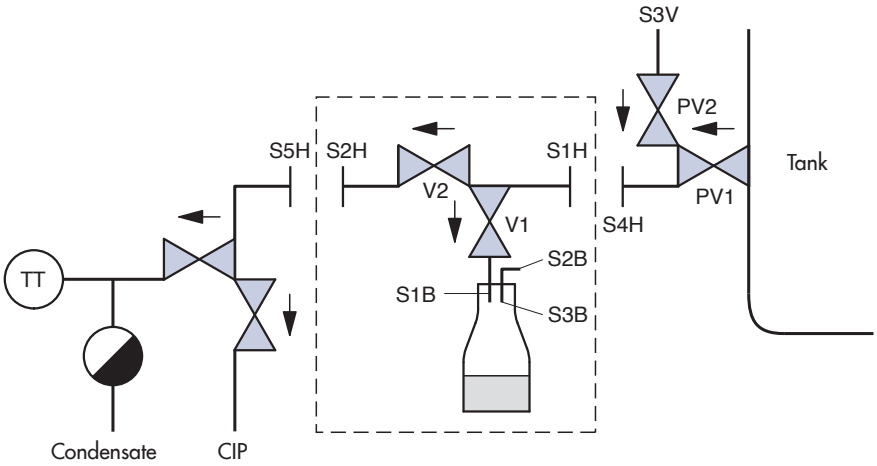
- one unit in use for taking sample
- one unit in the cleaning
- one unit in the sterilization
- one unit for safety

Eventually more units are needed if the testing of a sample takes longer, the frequency is high, or the laboratory is far away or external from the sampling point. Depending on the process, the locations of taking samples (i.e. parenteral drugs) can be several hundreds.

There are many different valve requirements when specifying the procedure for taking samples. There are not only the valves on the sampling unit but there is also a need for a valve combination or valve block on the tank and for the condensate and CIP solution as shown on the P&ID.
For applicable designs as valve configurations see page 74, 75 and for multiport valves see page 77-87.

Sampling bottle with manual valves and handle

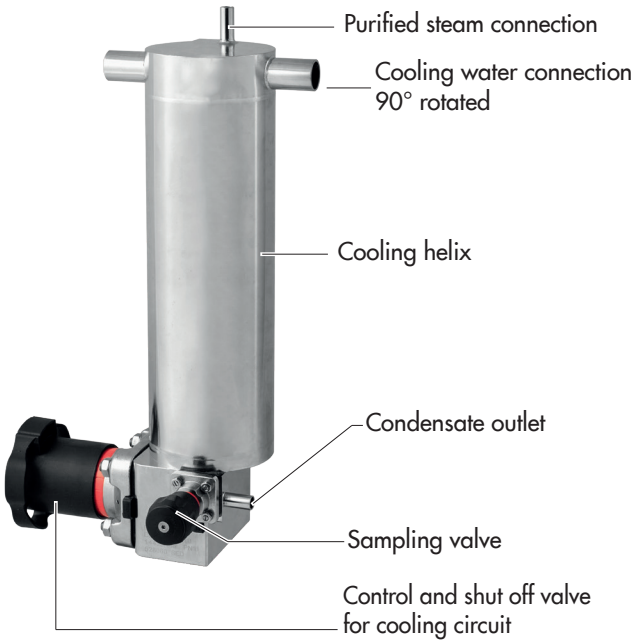
Sampling bottle with pneumatic actuated valves



Sterile Sampling Unit
S1B Inlet sample
S2B Vent outlet
S3B Vent bottle
S1H Sampling connection and CIP / SIP inlet
S2H Outlet CIP / SIP

Purified Steam Sampling Unit

This unit consists of a cooling coil with an integrated valve for sampling. Simple sterilization of the unit is possible before taking a sample. By regulating the internal cooling circuit with the integrated diaphragm valve, the operator can control the temperature of the purified steam condensate. Also the diaphragm valve allows for shutting off the cooling circuit. All process connections are designed as butt weld or clamp end in order to integrate the unit easily into the process system as per customer request.



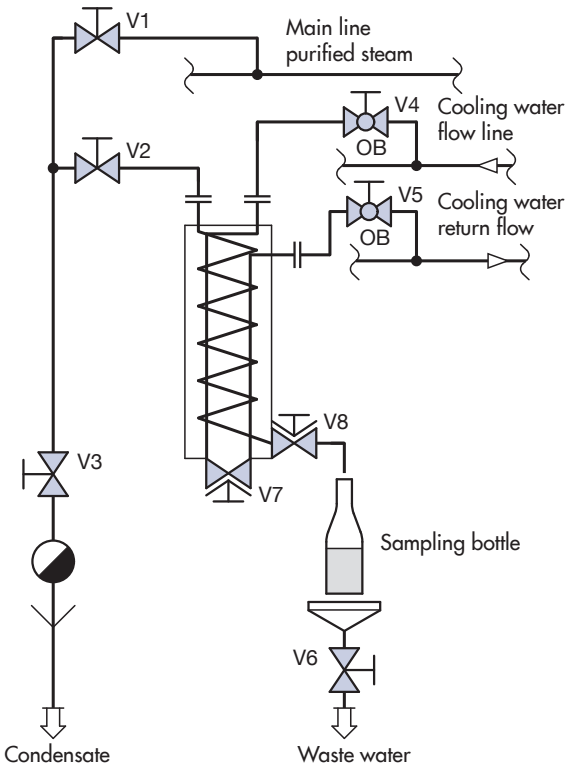
Conforming to GMP the purified sampling unit may be permanently installed or for flexible mobile use.

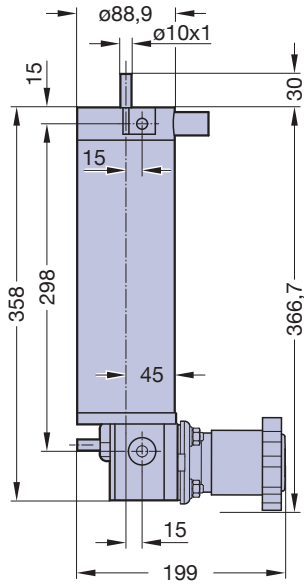
- Integrated diaphragm valve for sampling
- Unit easy to sterilize
- Minimized dead leg and completely self draining
- High grade stainless steel 1.4435/ 316L

Features

- High condensation performance
- Time saving sampling
- Compact design
- Tube end or clamp end connection according specification
- Integrated sampling and control valve for cooling circuit
- Easy installation due to standardized compact unit
- Unit for mobile use

Cooling capacity:	approx. 0,5 l/min[1] (132 gpm)
Condensate temperature:	30°C (86°F)
Max. pressure vessel:	10 bar (150 psi)
Max. pressure cooling helix:	10 to -0,9 bar (150 to -13 psi)
Max. temperature:	150°C (302°F)
Content cooling helix:	0,125 l (0,033 gallon)
Weight:	6,5 kg





V1 Shut off for main line purified steam

V2 Shut off to purified sampling system

V3 Shut off to steam trap

V4 Shut off cooling water entering, valve blocked in open position

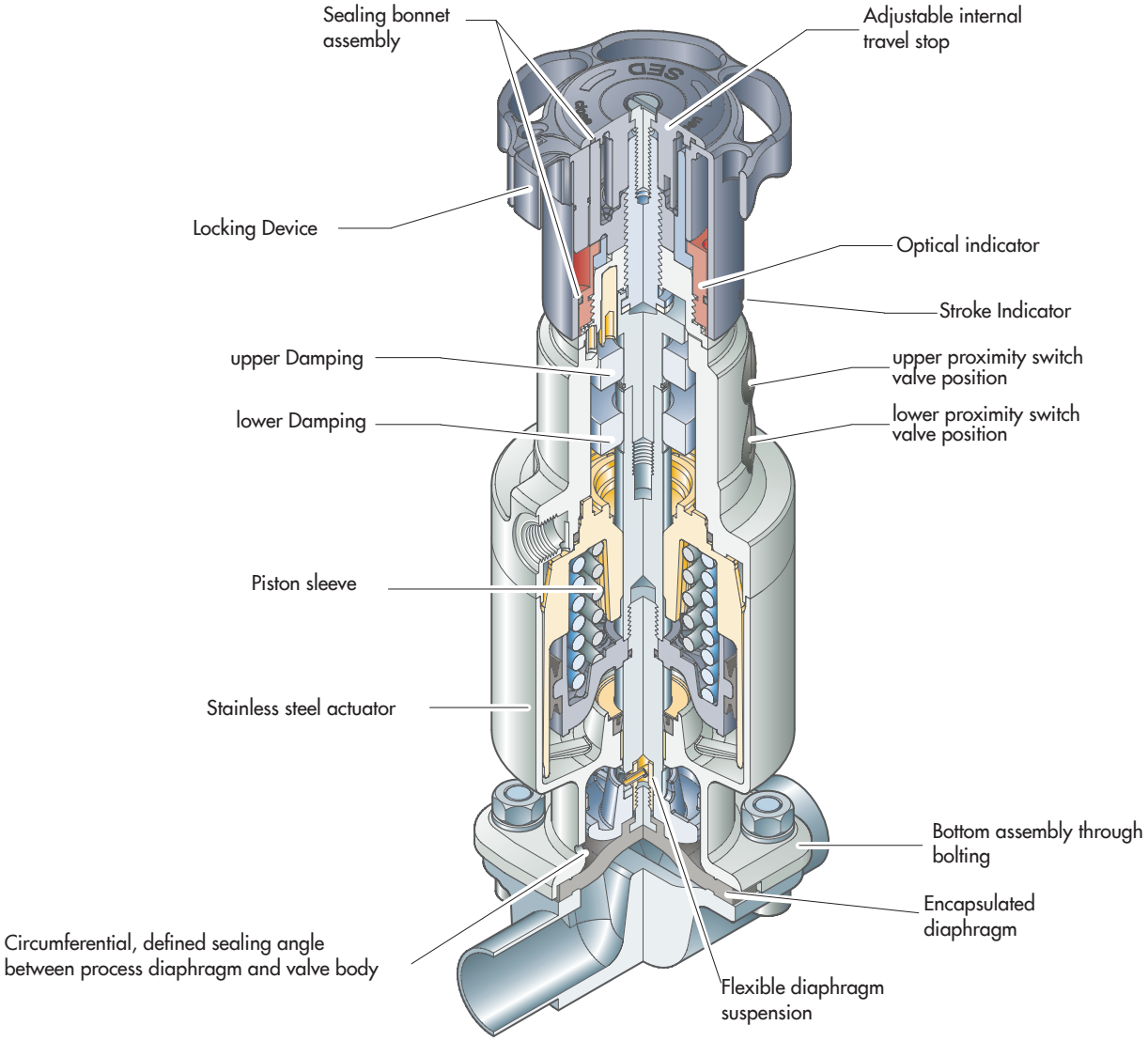
V5 Shut off to cooling return flow, valve blocked in open position

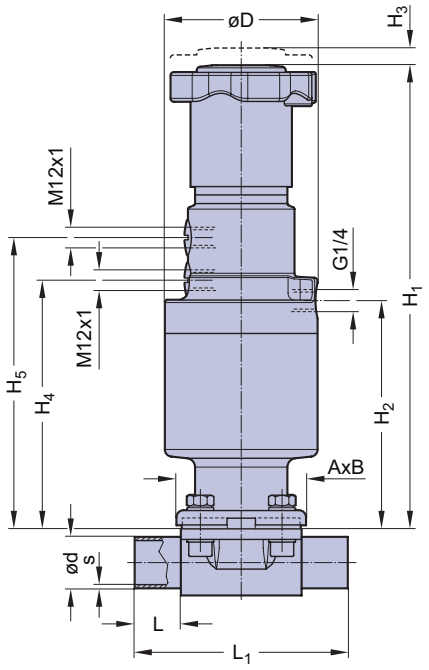
V6 Shut off to drainage

V7 Diaphragm valve for shut off and regulating the cooling circuit within the unit

V8 Diaphragm valve for condensate sampling

Steripur 417 PM, manual pneumatically oversteerable DN 15 - 25 mm (3/4" - 1")





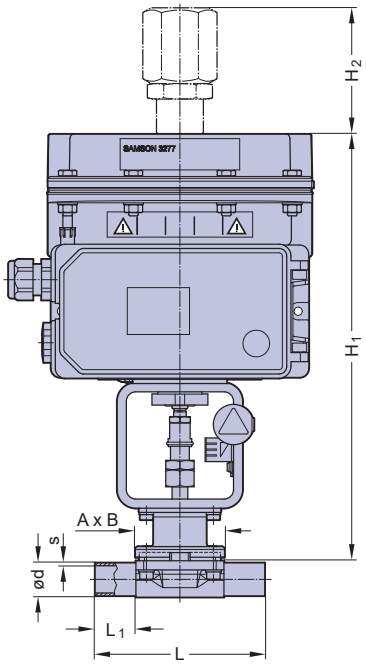
Features
- Stainless steel actuator
- Compact design
- Advantages where space is limited
- Excellent design options for multiport valves
- Control air connection in flow direction or 90° to the flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

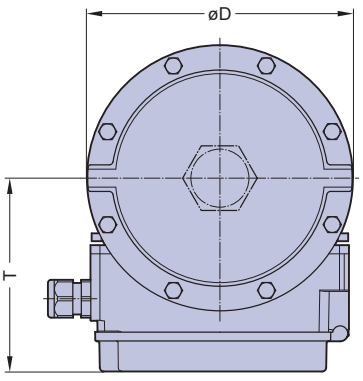
Optional
- Integrated stroke limiter
- U-lock for handwheel
- Mounting of proximity sensors

Technical Data see page 42 and 43

DN		Dimensions (mm)										
(mm)	MA	D	H1	H2	H3	H4	H5	A x B	d	s	L	L1
15-25	25	86	261	128	9	140	164	73 x 79	29	1,5	26	120

Type 327, pneumatically operated diaphragm control valve DN 4 - 25 mm (1/4" - 1")





Features

- High-precision diaphragm actuator and positioner
- Contact-free sensor system
- Automatic initialization
- Various valve body materials
- Control air connection in flow direction
- CDSA sealing concept, see page 32
- Flexible diaphragm suspension

Optional

- Stroke limiter
- Manometer

Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): **4**
Fail safe open (NO): **5**
At control function NO higher control pressure than required may affect the lifetime of the working diaphragm.

Direction
Control connection: At Cf. 4, 5 in flow direction
Max. working pressure: Unidirectional (delta p = 100%)

Diaphragm	MA8 DN 4-15 (1/4"-1/2")	MA10 DN 8-20 (3/8"-3/4")	MA25 DN 15-25 (1/4"-1")
EPDM	10 bar (145 psi)	10 bar (145 psi)	10 bar (145 psi)
FPM	10 bar (145 psi)	10 bar (145 psi)	10 bar (145 psi)
PTFE-TM/EPDM	10 bar (145 psi)	10 bar (145 psi)	8 bar (115 psi)

Higher working pressures may be achieved with different actuators. Please consult a SED factory representative for working pressures above the indicated maximum.

Code actuator type	Actuator surface [cm²]	Nominal stroke [mm]	Bench range [bar/psi]
21 [1]	120	7.5	0,8...1,6 /12...23
31			0,8...1,6 / 12...23
37 [2]	120	15	1,4...2,3 [3] / 20...33 [3]

[1] Standard version MA8/MA10
[2] Standard version MA25
[3] Pre-loaded springs

Max. working temperature: 160°C (320°F) dependent on application
Diaphragm material: EPDM, FPM, PTFE-TM/EPDM
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 21
Clamps and flanges see page 22 to 24 Special ends
Actuators suitable for: Two-Way bodies
Other bodies upon request
Flow rate: Kv in m3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below

	Pos.	MA8	MA10	MA25
Dimensions (mm)	A x B	34x34	57x52	73x79
	D	168	168	168
	H2	-	-	80
	T	35+X	35+X	35+X

X: For positioner 024.16.3xx (3730): 96,5mm
For positioner 024.16.25x (3725): 62,5mm

Table of Contents

Overview

Description	Type	Diaphragm size (MA)	Suitable for valve			Detail see page
			Range	Pneumatically operated	Manual	
Optical position indicator	024.10	**8 - 100**	DN 4 - 100	●	●	133
Stroke limiter	024.11	**8 - 100**	DN 4 - 100	●	●	133
Stroke Limiter with hand wheel	024.12.2	**8**	DN 8 - 15	●		133
Stroke limiter with optical position indicator	024.12	**8 - 100**	DN 4 - 100	●	●	133
Manual override with optical position indicator	024.13	**8 - 50**	DN 4 - 50	●		133
Handwheel to open normally closed valves (NC) or close normally open valves (NO)	024.42	**25 - 100**	DN 15 - 100	●		133
Contact - Free Limit Switch	024.50	**8 - 100**	DN 4 - 100	●		134, 138, 139
Control head switch with optical indicator "catch the eye"	024.63 024.64 024.65	**8 - 100**	DN 4 - 100	●		134, 137
Control head switch with "catch the eye" optical indicator AS - Interface	024.89	**8 - 100**	DN 4 - 100	●		134, 137
Limit switch with one mechanical switch and optical indicator	024.90	**8 - 100**	DN 4 - 100	●	●	134
Pilot valve for direct mounting	600	**8 - 100**	200 NL	●		135
Pilot valve for direct mounting	602	**8 - 100**	60 NL	●		136
Pilot valve for manifold mounting	603	**8 - 100**	60 NL	●		136
Pilot valve for manifold mounting	605	**8 - 100**	200 NL	●		135
Manual valve prepared for mounting proximity switch	024.96	**25 - 100**	DN 15 - 100		●	
Adapter for direct mounting one proximity direct on top in the valve actuator	SO795	**8 - 100**	DN 4 - 100	●		
Travel stop	024.886	**8 - 100**	DN 4 - 100	●	●	

System Components and Accessories are shown on page 133 - 139.

Manual Adjustment - Optical Indication

024.11
Stroke Limiter
optional with cap

024.12.2
Stroke Limiter
with hand wheel

024.12
Stroke Limiter
with Optical Position
Indicator
optional with cap

024.13
Manual Override
with Optical
Position Indicator

024.10
Optical Position Indicator

024.42
Handwheel to open normally
closed valves (NC) or close
normally open valves (NO)

Upon request combinations of Manual Adjustments with Switch Boxes are available

Electrical Switch Boxes - Pilot Control

024.50
Contact - Free Limit Switch
(See page 138 - 139)

024.90
Limit Switch open position

024.63-024.65
Control Head Switch for open and close with optical indicator catches the eye
(See page 137)
024.89
AS-Interface Control Head Switch for open and close position with optical indicator catches the eye
(See page 137)

602
Pilot Valve for direct mounting

Upon request combinations of Manual Adjustments with Switch Boxes are available

3/2 Way Plastic Pilot Valve Type 600 / 605

Description

Direct solenoid actuated poppet valve, normally closed and normally open.
Solenoid valve for filtered, lubricated or non lubricated air, neutral gasesous and liquid fluids.

Features

- Compact design
- Interchangeable solenoid system
- Plastic overmolded solenoid
- suited for coarse vacuum
- Exhuast port provided with silencer
- Standard manual override
- Current draw 5 W

Type 600

Connetions: Threaded socket 1/8" BSP.
Inlet and Outlet arranged at an angle of 90°.
Suitable for direct mounting on process valve, by hollow screw with 1/4" or 1/8" BSP thread.

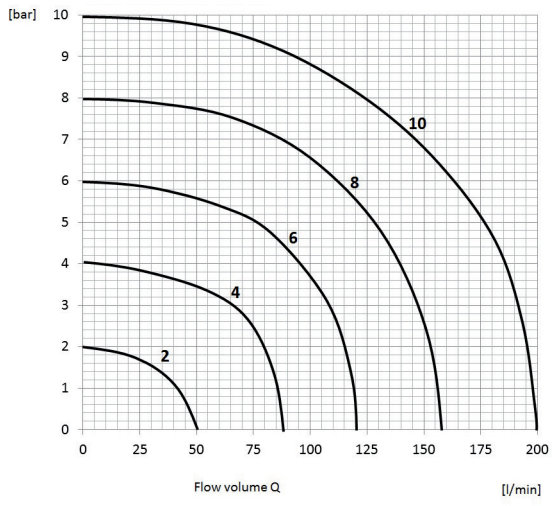
Type 605

Connections: threaded inlet G 1/4" outlet G 1/8".
Inlet and outlet arranged at an angle of 90°.
Suitable for manifold mounting. May also be used as a single valve.

Technical Data

Nominal size	1,6 mm
Line connection	G 1/8"
Operating pressure	0 - 10 bar
Flow rate	Qn 200 l/min
Voltages	
AC	24V40-60 Hz, 110V40-60 Hz, 220V40-60 Hz
DC	12V, 24V, 48V, 100V, 110V, 200V

Switching time appr.	On 14 ms
	Out 9 ms
Current draw	5W (6VA)
Protection Class ICE/EN 60529	IP 65
Temperature range	-10 to +60°C
AC	210 g
DC	PBT



The diagram illustrates the flow rate for gases in normal litres per minute.
For examples:
inlet pressure 6 bar and pressure drop (Δ p) 2 bar.
mark the point of intersection of the 6 bar curve and the horizontal line for 2 bar Δ p.
Move vertically from this point tp the bottom scale and read off the flow rate in NL per minute.

3/2 Way Plastic Pilot Valve Type 602

Description

The solenoid valves are electromagnetic, directly actuated pilot valves to control pneumatically operated valve actuators. Applicable media are filtered, lubricated or non lubricated air and neutral gaseous fluids.
Type 602 is equipped with a hollow screw and made for direct mounting on the user.

Type 602
Banjo with push-in connection for tube Ø 6mm

Type 602
Banjo with threaded socket G1/8''

Features

- Compact design
- Identical position of all ports for version normally open and normally closed (except connection M5)
- Plastic wrapped electromagnet
- Interchangeable solenoid system
- 360° adjustable position of electromagnet
- Also suitable for coarse vacuum
- Silenced exhaust port
- Manual override (depending on version)
- Any installation position possible
- Cable plug can be mounted turned by 180°
- Combined exhaust optional
- Optional
  - ATEX-Version for explosion-risk areas
  - UL-approval

Standard versions

Type	Cf.	Version	Connection			Manual-override	Fig.
			P1	P2	P3		
602.1,2.32.24.2.1.S5.1.xx*	1	Direct mounting, Banjo	Push-in connection f. tube Ø 6mm	G1/8″ or G1/4″	Plunger	Yes	1
602.1,2.32.24.2.1.35.1.xx*	1	Direct mounting, Banjo	Threaded socket G1/8″	G1/8″ or G1/4″	Plunger	Yes	1
602.1,2.32.24.2.2.S5.1.xx*	2	Direct mounting, Banjo	Push-in connection f. tube Ø 6mm	G1/8″ or G1/4″	Plunger	No	1
602.1,2.32.24.2.2.35.1.xx*	2	Direct mounting, Banjo	Threaded socket G1/8″	G1/8″ or G1/4″	Plunger	No	1
602.1,2.32.24.2.2.M5.1.xx*	2	Direct mounting, Banjo	Thread M5 at plunger	G1/8″ or G1/4″	G1/8″	Yes	2

For detailed information please see TD130020

Control Head Switch 024.63. – 024.65./024.89.

The SED electrical control head is an innovative development based on years of experience in manufacturing electrical accessories for process valves.
Depending on the version, the electrical control head provides signals for both open and closed positions of the valve and includes an integral solenoid valve for a direct air line connection to the actuator.

Easy to assemble:
Due to the design, the electrical control head is suitable for assembly with all linear valves. The threaded adapter of the electrical control head is designed to screw into the top of the valve actuator. A spring pushes the stem of the electrical control head onto the valve actuator stem. The spring allows for the electrical control head stem to follow freely the linear movement of the valve actuator stem. This electrical control head may be mounted on the valve actuator in the field without disassembly of any components.

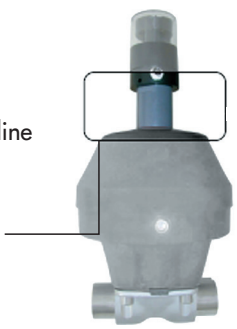
Self Positioning:
After mounting the electrical control head, the two cams activating the switches in the electrical control head will be mechanically moved by overcoming their holding force on the spindle. To adjust the closed position, the electrical control head stem will be pushed down until contact is made with the valve actuator stem.
The adjustment of the open position takes place at the first stroke of the valve. The circumferential optical indicator is suspended on the cam for the closed position and represents the entire stroke of the valve.
For the electrical connection a pre-wired pin or Bus-connection is available. The electrical control head has a reliable output and service life and contributes considerably to cost savings when considering assembly, application, and self adjustment as compared to other conventional control head options available.

Features:

- **Increased air flow rate 230 Nl/min**
- Circumferential eye-catching optical indicator representing the full stroke
- Ease of assembly and may be assembled with the valve actuator in the field
- Time saving electrical interface via pre-wired pin or a Bus-connection
- Compact design
- Position feedback versions with:
  - Electromechanical switch
  - Inductive initiators Namur or PNP
  - AS-Interface
- Suitable for mounting on linear valves
- Depending on the specification, LED indication is available

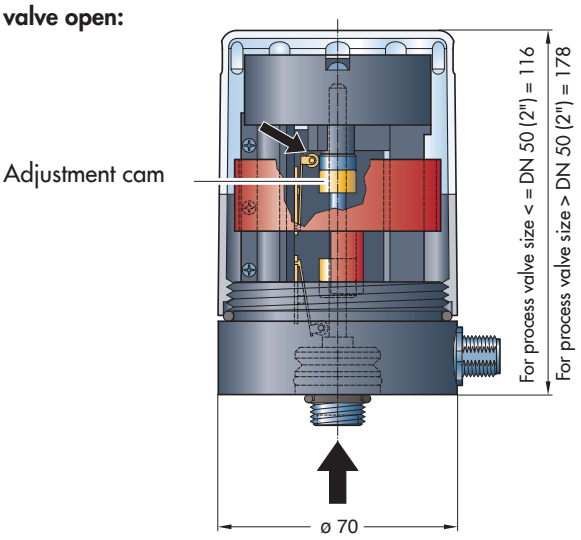
Optional:

- Integral solenoid valve with direct air line connection to actuator
- Stroke limiter for the valve stroke adjustment
- ATEX version for 024.64.

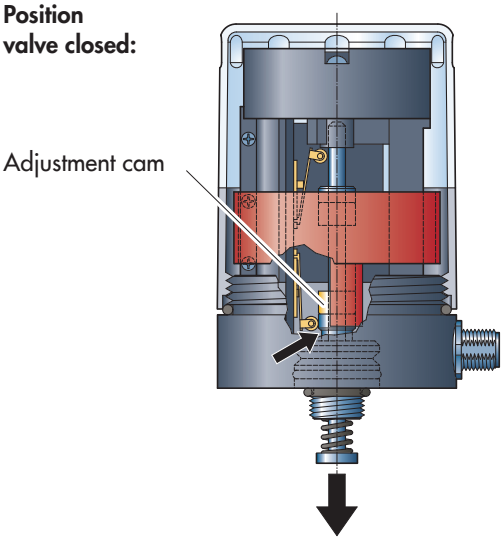


For more details see TD15 0094

Position valve open:



Position valve closed:



Versions Control Head

Code	Electrical Connection	Electro-mechanical limit switch Open/Close (pcs)	Proximity switch		Solenoid Valves[1] (pcs)
			Namur (2-wire) (pcs)	PNP (3-wire) (pcs)	
024.63.	Pre-wired 8 pins M12 x 1	2			
024.64.	Pre-wired 8 pins M12 x 1		2		
024.65.	Pre-wired 8 pins M12 x 1			2	
024.89.6 AS-Interface	Pre-wired 4 pins M12 x 1	2			1
024.89.7 AS-Interface	Pre-wired 4 pins M12 x 1			2	1

The ASI version offers the integral solenoid valve as standard.
[1] On request, two 3/2 way solenoid valves can be integrated for all versions.

Contact - Free Limit Switch 024.50

Limit switches are used to control, monitor and view the position of the valve or to activate other system components.

There are different versions of on/off limit switches in the market. The most common are based on the principle of mechanical switches, proximity sensors or potentiometers.

We have designed and engineered a contact-free limit switch with magnet field measurement technology. Apart from lifetime and among other features the advanced design allows also a more reliable sealing method.

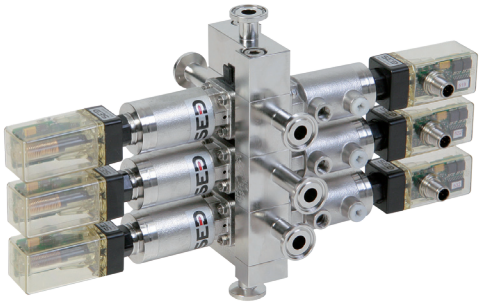
Standard Version

Features

- For single and double acting valve control functions
- Suitable for linear and rotary actuators
- Power supply and programming 24V DC or 8V DC
- Linear stroke measurement of 3-45 mm
- Indicates two or three positions
- Backlash free stroke transmission
- Short circuit proof
- M12, 5 pin A-coded connection

Optional:

- Atex II 3G
- IO-Link



Application example

Advantages

- Contact-Free magnetic measuring design
- Colored LED light feedback of valve position visible for 360°
- Compact and robust design
- Hermetically sealed
- Easy mounting without additional adapter kits
- Can be mounted on all standard valves up to DN100
- 360° adjustable mounting position
- Initial programming by light or 24V Signal (5th pin)
- Set point protection
- High switching current (not valid for IO-Link)
- High chemical resistance

Contact - Free Limit Switch 024.50

Technical Data

Material Housing	PPSU
Mechanical Adaption	St. Steel M12x1, M16x1
Ambient Temperature	-10°C to + 70°C
Maximum Pressure	8 bar
Power Supply	Standard and II 3G = 24V optional 8V
Power Consumption	0,7 W
Maximum Power Input	30 mA
Electrical Connection	Multipol M12, 5 Pin, A-coded
Switching Current	1 ... 800 mA
Stroke range	3 - 45 mm
Accuracy	+/- 0,1 mm
Protection Class	IP67 according EN 60529
Conformity according CE	EMV 2014/30/EU
Mounting Position	any
Initialization	Light or 24V Trigger/IO-Link

Ordering Key

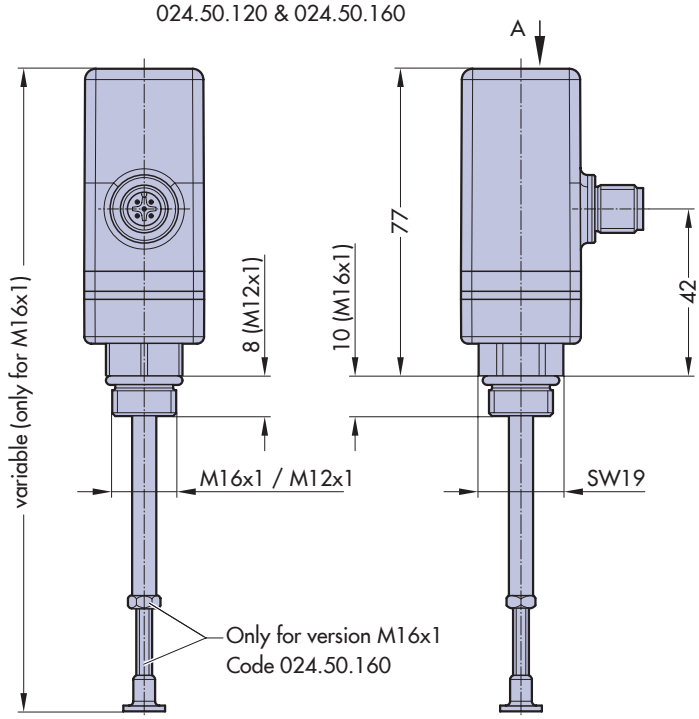
	Code	
Assembly Thread	**for Linear Actuator**	**for Rotary Actuator**
M12x1	024.50.120	n.a.
M16x1	024.50.160	024.50.260

Optical Position Feedback

Position	LED Indication
open	permanent green
interim, if any	permanent yellow
closed	permanent blue
moving open	blinking green
moving closed	blinking blue

Dimensional Drawing

024.50.120 & 024.50.160



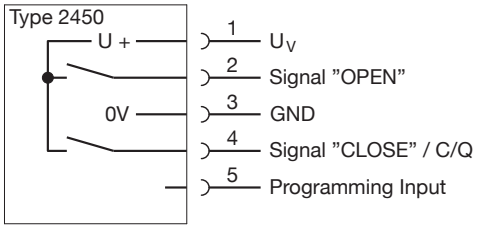
Accessories

- 2 m cable with 4 pin female plug for explosion-risk areas, Code 00311.2450.006.4
- 5 m cable with 5 pin female plug, Code 00311.2450.006.1
- 10 m cable with 5 pin female plug, Code 00311.2450.006.2

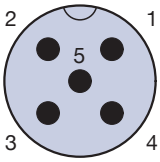
Optional

Teach-In cable for the programming via the 5th pin, Code 00311.2450.005

Electrical Connection



Pin Configuration



5 pin, M12, A-coded

Electropneumatic Positioners ECOCENT 024.16.7

for central mounting on the top of the process control valves

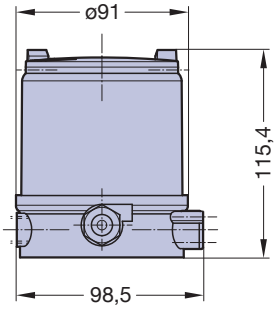
Main Features:

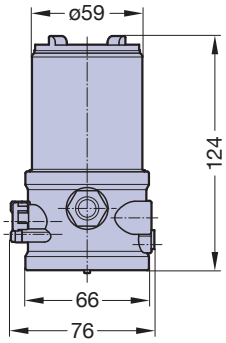
- Compact stainless steel, high performance plastic design
- Contact- free continuous sensor measuring of the valve spindle position
- Easy start up
- Pneumatic positioning for single acting actuators
- High air flow rate for type 024.16.720
- Close tight function

Type 024.16.720

Valve assembled with Positioner 024.16.710

Type	024.16.720	024.16.710
Recommended for valve size	DN 50 - 100	DN 8 - 50





Body; Cocer; Sealing	PPS/stainless steel; PC transparent; EPDM	PPS/stainless steel; PC transparent; EPDM
Ambient temperature	0 - 55°C	0 - 55°C
Control medium	Neutral gases, air according DIN ISO 8573-1	Neutral gases, air according DIN ISO 8573-1
Pilot air ports	G 1/8	G 1/8
Supply pressure; Air flow rate	3 - 7 bar 1; 130 Nl/min	1 - 7 bar 1; 7 Nl/min
Intrinsic air consumption	0 l/min	0 l/min
Power supply	24 V DC +/- 10%	24 V DC +/- 10%
Power consumption	< 3,5 W	< 3,5 W
Electrical connection	Multipol M12 (8- pins), stainless steel	Multipol M12 (8- pins), stainless steel
Setpoint setting; Input resistance	4 to 20 mA; 180 Ohm	4 to 20 mA; 180 Ohm
Analogue feedback 4 - 20 mA	Standard	Optional
Stroke range valve spindle	3 - 45 mm	3…28 mm
Binary input	0 - 5 V = log "0", 10 - 30 V = log "1"	0 - 5 V = log "0", 10 - 30 V = log "1"
AS-Interface	optional	NO
Operation	2 Key button	2 Key button
Visualisation	2 LEDs	2 LEDs
Protection class	IP65/67 according to EN 60529 (only if cables plugs and sockets have been connected properly and in compliance with the exhaust air concept in chapter "pneumatic connection of positioner")	
Conformity	subject to CE according EMV2004/108/EG	subject to CE according EMV2004/108/EG
Approval	CSA on request.	CSA on request.
Process controller	Optional	NO

[1] Pressure stated in bar: are access to atmosphere; the supply pressure has to be 0,5 - 1 bar above the minimum required pilot pressure for the valve actuator

Electropneumatic Positioner 024.16.251

Main Features:

- Three touch-sensitive keys and display for convenient operation
- Intuitive operation with simple menu navigation
- Automatic initialization
- UV-resistant housing
- Various attachment options
- Protected non-contact sensor for precise control
- ATEX approval II 2 G Ex ia IIC T4 Gb

Type	**024.16.251**
Recommended for valve size	MA 25 - MA 100 (other sizes on request)
Body; Sealing	Housing Polyhtalamid (PPA); Top Polycarbonat (PC); PUR
Ambient temperature	-20°C to 80°C
Control medium	Neutral gas; air according to DIN ISO 8573-1
Pilot air ports	G1/4 or 1/4 NPT
Supply pressure	up to 7 bar
Air flow rate	at dp 6 bar 140 Nl/min
Intrinsic air consumption	<= 100 Nl/h.
Power supply	24 VDC +/- 10%
Power consumption	approx. 0,5 W
Electrical connection	Terminal connection block
Cable gland	M20x1,5
Setting point; input resistance	4-20 mA; 315 Ohm
Stroke range valve spindle	3,75-50 mm
Operation	3 capacitive buttons
Visualisation	LCD-Display
Protection class	IP66
Type of ignition protection	II 2G Ex ia IIc T4
Conformity	EMV/2004/108/EG
Approval	EAC
Optional	Pressure gauge
Assembly	Assembly set required

Electropneumatic Positioner 024.16.3xx

Main Features:

- High air capacity
- High precision controlling due to non-contact position sensing
- Simple one-knob, menu-driven operation
- automatic start-up
- Integrated diagnostic functions
- ATEX version available

Type	024.16.3xx
Body	Die-cast aluminum or stainless steel housing
Ambient temperature	-20 ... +80 °C [1]
Control medium	neutral gases, air according DIN ISO 8573-1
Pilot air ports	Standard: G 1/4 Optional: 1/4 NPT
Supply pressure	1.4 - 7 bar
Air flow rate	140 l/min at dp 6 bar
Intrinsic air consumption	Independent of supply air approx. 65 Nl/h
Power supply	3.75 mA for display/operation 3.90 mA for pneumatic function
Load impedance	≤ 9.3 V (corresponds to 465 Ω at 20 mA)
Electrical connection	Standard: 1x M20x1,5 - cable gland (plastic, black) Optional: 2x M20x1,5 - cable gland (plastic, black)
Communication	without / HART® / PROFIBUS® / FOUNDATION™ fieldbus
Signal range	4 ... 20 mA
Stroke range valve spindle	3,6 - 50mm
Operation	Simple one-knob
Visualisation	LCD display
Protection class	IP66
Type of ignition protection	II 2G Ex ia IIC T6 Gb/II 2D Ex ia IIIC T85 °C Db IP66 II 2D Ex tb IIIC T85 °C Db II 3G Ex nA IIC T6 Gc/II 3D Ex tb IIIC T85 °C Gb II 3G Ex nA IIC T6 Gc
Conformity	Complying with EN 61000-6-2, EN 61000-6-3, EN 61326-1 and NAMUR Recommendation NE 21
Approvals	EAC
Optional	Binary input 24V DC Forced venting function
Assembly	Mounting kit required

[1] The temperature limits for the explosion-protected devices may be restricted by the limits specified in the test certificates.

Overview Product Range

Diaphragm Valve

Aseptic Diaphragm Valve

Industrial Metal Diaphragm Valve

Plastic Diaphragm Valve

Angle Seat Valve

Two-Way Metal Angle Seat Valve

Aseptic Process Solution

Sterile sampling unit

System Components

Contact - Free Limit Switch

Control Head

Digital Electropneumatic Positioner

Flow Measurement

Variable Area Flowmeter

Glossary

Term	Acronym	Definition
3A Sanitary Standards and Accepted Practices	**3A**	Determines criteria for the cleanability of dairy processing equipment. They have been adopted by many other liquid processing industries outside of dairy.
Active Pharmaceutical Ingredients	**API**	A substance used in a finished pharmaceutical product (FPP), intended to furnish pharmacological activity or to otherwise have direct effect in the diagnosis, cure, mitigation, treatment or prevention of disease, or to have direct effect in restoring, correcting or modifying physiological functions in human beings.
American Society of Mechanical Engineers	**ASME**	Creates consensus standards for Mechanical Engineering
American Society for the Testing of Materials	**ASTM**	Creates consensus standards for material quality and material quality testing methods.
Approved for Construction	**AFC**	An Approved for Construction (AFC) means that drawings and documents are reviewed and approved by authorities of internal and external organisations including the client team members for the construction. A Construction team must use only AFC marked or stamped drawings and documents for the construction works and activities.
BioProcessing Equipment Committee	**BPE**	A sub-committee of ASME. It creates engineering standards for the design, specification, manufacture and documentation of equipment used for biopharm processes.
Clean in Place	**CIP**	The technique of cleaning process line components without the need for relocation or disassembly.
Circumferential Defined Sealing Angle	**CDSA**	Circumferential Defined Sealing Angle (CDSA-Design) SED sealing concept Innovation by SED Flow Control
Comite Européen de Normalisation	**CEN**	Committee for European Standardization Creates standards that reflect the best practices in each industry and is supported by DIN and ISO.
Current Good Manufacturing Practices	**cGMP**	Current design and operating practices developed by the pharmaceutical industry to meet FDA requirements as published in the Code of Federal Regulations. They reflect the least common denominator of practices in the industry at present.
Deionized Water	**DIW**	Process of the extraction of deionized water through ion exchange resins.
Deutsches Institut für Normung	**DIN**	German Institute for Standardization Creates engineering standards for Germany and is contributing body to CEN and ISO.
Design Qualification	**DQ**	Design Qualification is used at the stage where a design that has been developed from the, VMP / URS /GAMP 5 / cGMP / and other Health and Safety Guidelines, is reviewed and documented by competent persons to ensure that the designed equipment, if built, will satisfy all the detailed specified requirements.
Electro-Polish	**EP or E/P**	Electrochemical polishing process for metal components where metal ions are removed from the surface of the metal.
European Pharmacopoeia	**EP**	European counterpart to USP. A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices and diagnostics.
Engineering, Procurement, and Construction	**EPC**	Engineering, Procurement, and Construction" is a particular form of contracting arrangement used in some industries where the EPC Contractor is made responsible for all the activities from design, procurement, construction, to commissioning and handover of the project to the End-User or Owner.
Factory Acceptance Test	**FAT**	Is usually preformed at the vendor prior to shipping to a client. The vendor tests the system in accordance with the clients approved test plans and specifications to show that system is at a point to be installed and tested on site.

Glossary

Term	Acronym	Definition
Food and Drug Administration (USA)	**FDA**	Enforcement agency of the U.S. Government for food, drug and cosmetics manufacturing. Author of the U.S. cGMP's. Responsible for new product approvals, plant inspections and product recalls.
International Standards Organization	**ISO**	Creates consensus standards for engineering and quality systems.
International Society for Pharmaceutical Engineering	**ISPE**	The world's largest not-for-profit association serving its Members by leading scientific, technical and regulatory advancement throughout the entire pharmaceutical lifecycle.
Installation Qualification	**IQ**	The Installation Qualification Protocol verifies the proper installation and configuration of a System.
Mill Test Report or Material Test Report	**MTR**	A document certifying the composition of a metal from a particular heat batch.
Operational Qualification	**OQ**	The Operational Qualification Protocol is a collection of test cases used to verify the proper functioning of a system.
Performance Qualification	**PQ**	Performance Qualifications are a collection of test cases used to verify that a system performs as expected under simulated real-world conditions.
Piping and Instrumentation Diagram	**P&ID**	American standard for process diagrams Diagrams on which the process, the instruments and the flow scheme are defined
Point of Use	**POU**	A valve outlet in a recirculation utility system (typically a water system).
Purified Water	**PW**	Ingredient water (not for injection) or rinse water for pharmaceutical products conforming to USP guidelines. Obtained by distillation, reverse osmosis, ion exchange or any other suitable process.
Site Acceptance Test	**SAT**	A SAT is a Site Acceptance Test the system is tested in accordance to client approved test plans and specifications to show the system is installed properly and interfaces with other systems and peripherals in its working environment.
Steam in Place	**SIP**	Sanitization of process line components by the use of steam without the need for relocation or disassembly.
Total Oxidizable Carbon or Total Organic Carbon	**TOC**	A measure of the amount of organic compounds in a water sample. Carbon is oxidized and the level of CO2 is measured. The proposed USP water standards are based on TOC analysis.
United States Pharmacopoeia	**USP**	A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices, and diagnostics. The FDA enforces the established standards.
User Requirement Specification	**URS**	The User Requirements Specification describes the business needs for what users require from the system. User Requirements Specifications are written early in the validation process, typically before the system is created.
Water for Injection	**WFI**	Water for use as a solvent for the preparation of parenteral products conforming to USP guidelines. Obtained most commonly by distillation.