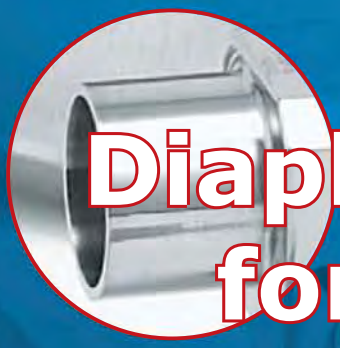
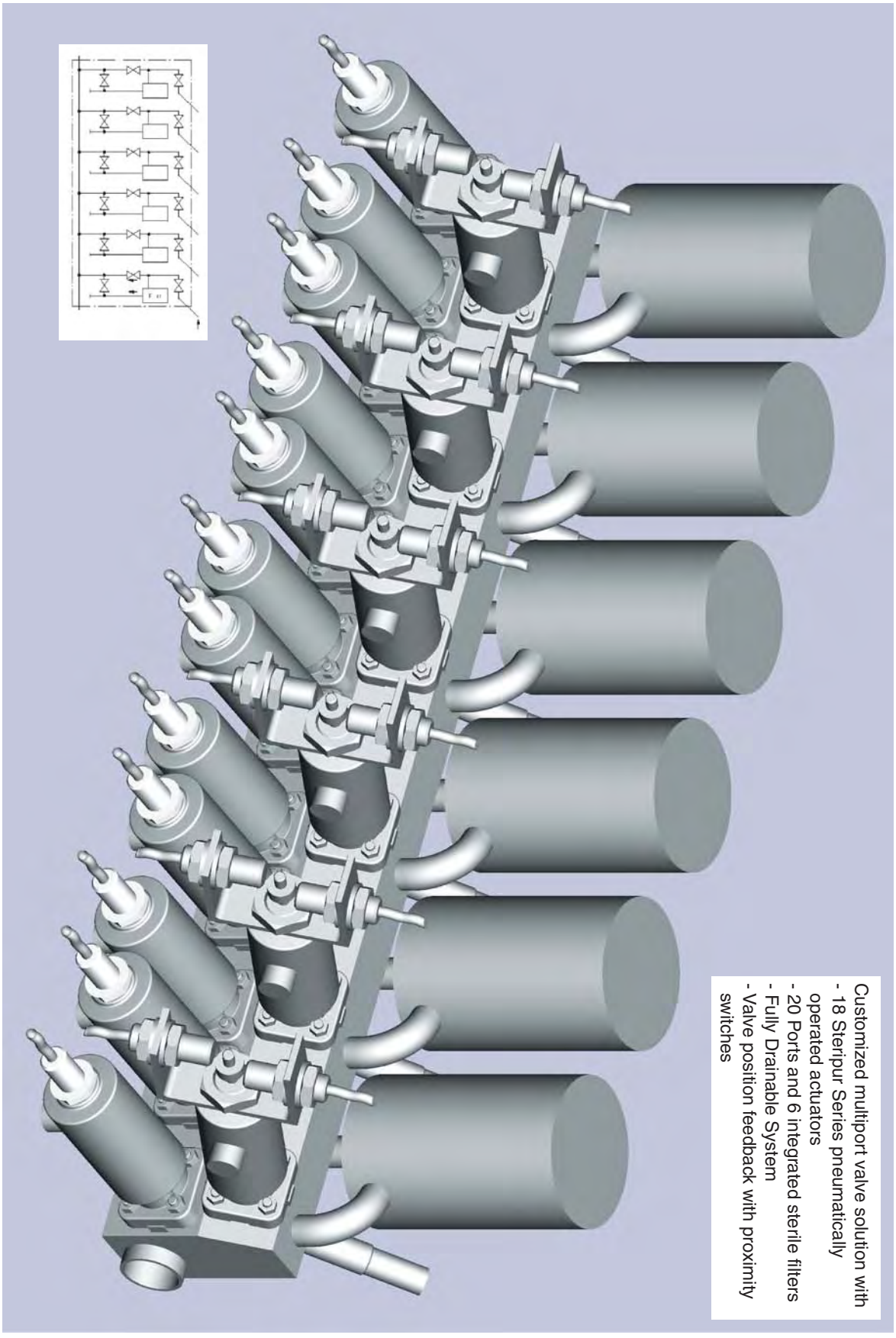


Diaphragm Valves for Aseptic Applications

SEC
FLOWCONTROL

Multiport Valve



Customized multiport valve solution with
- 18 Steripur Series pneumatically operated actuators
- 20 Ports and 6 integrated sterile filters
- Fully Drainable System
- Valve position feedback with proximity switches

Catalogue TD06 0018 Rev. c, Subject to alteration

Table of Contents

A Brief Overview

SED was founded in 1984 and is engaged in the development, manufacture and distribution of sophisticated valve technology and flow meters.
The aseptic diaphragm valve and all the corresponding components is the main focus of SED.
With more than 20 years of experience, continuous research and development guarantees that our products are of the highest quality and reliability in all process applications.

The SED versatile and comprehensive product offering provides many advantages to our customers. Our modular design allows for the reduction of stock inventory, prompt deliveries and our customized designs offer solutions for the most demanding process applications.

A market-oriented and complete range of system components for the monitoring and regulation of valves is readily available and is continuously improved and expanded to meet the market requirements.

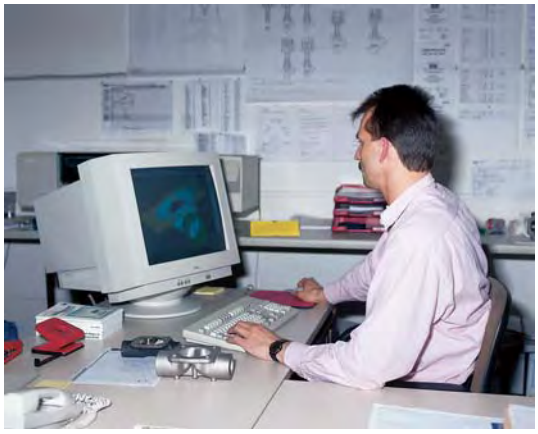
Our employees training and experience over the years have developed an attitude which is characterized by flexibility and meeting our customer's needs.

We continue to invest in our state-of-the-art production facilities which allows for the competitive manufacture of cost effective solutions for the special and demanding needs of our customer's high quality standards.

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.

The Company



The company has installed the most modern machinery and individual production facilities which are fully adapted to current market requirements.

In Particular:

- The 3D-CAD-CAM network connects all the CAD workstations with the 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.

What Does Quality Mean 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.

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.

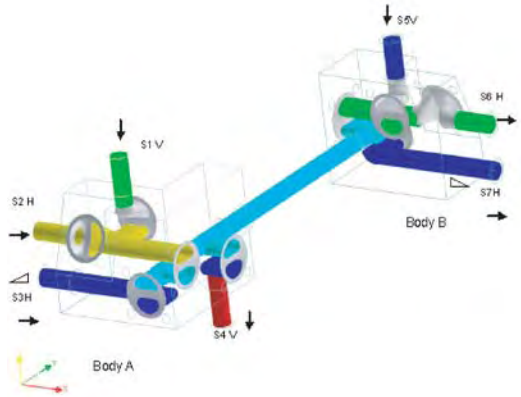
Customized valve solution for a process application

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.

Test stand sterilization process simulation. Cycle and lifetime testing of diaphragms and valves with saturated steam.

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.

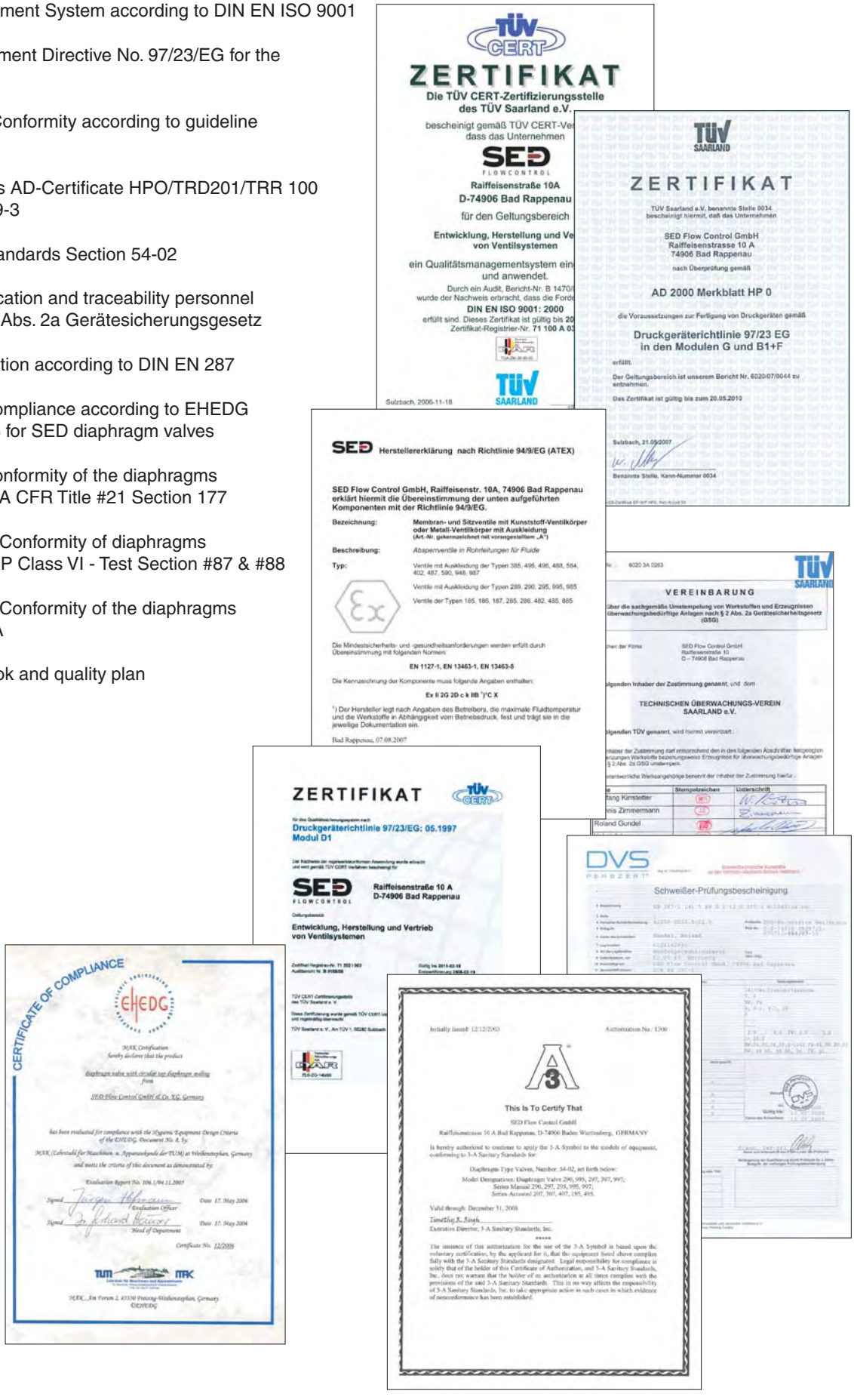


Layout valve cluster

Employees:
The greatest asset of our company is our employees.
Embracing quality is not the result of an individual 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.

Qualification, Certification and Documentation

- Quality Management System according to DIN EN ISO 9001
- Pressure Equipment Directive No. 97/23/EG for the module D1
- Declaration of Conformity according to guideline 94/9EG (ATEX)
- Welding process AD-Certificate HPO/TRD201/TRR 100 and DIN EN 729-3
- 3-A Sanitary Standards Section 54-02
- Material identification and traceability personnel according to §2 Abs. 2a Gerätesicherungsgesetz
- Welder qualification according to DIN EN 287
- Certificate of Compliance according to EHEDG Document No. 8 for SED diaphragm valves
- Certificate of Conformity of the diaphragms according to FDA CFR Title #21 Section 177
- Certification of Conformity of diaphragms according to USP Class VI - Test Section #87 & #88
- Certification of Conformity of the diaphragms according to 3-A
- Quality handbook and quality plan



Testing

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

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

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

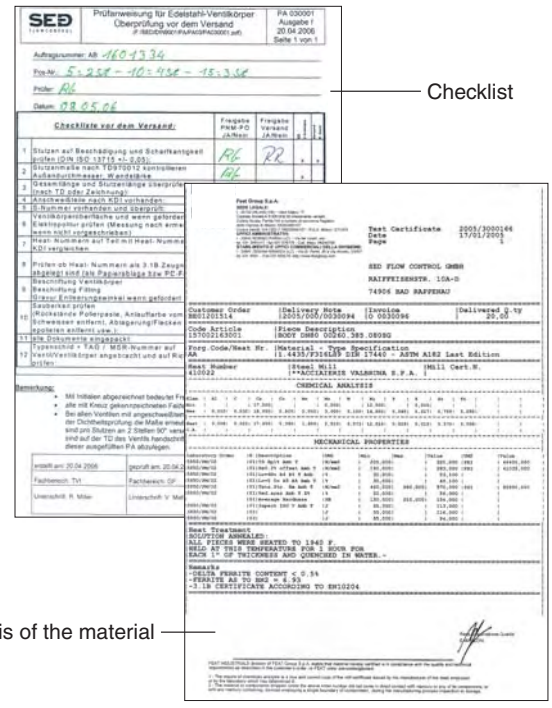
Complete Valve Assembly Inspection:
- 100% according to checklist

Non-Destructive Testing: (on demand or internal specification requirements)
- Delta Ferrite
- Porosity testing by liquid penetration
- X-ray

Verification Certificates according to Specification DIN EN 10204:
- 3.1 Analysis of the material traceability by heat 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

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

Delta Ferrite measurement of stainless steel valve bodies



Checklist

3.1 Analysis of the material

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 K_V-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 stand 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 to C_V
$C_V = 1{,}17 \times K_V$

Conversion of C_V to 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 41-43	Code 45	
4	-	8	-	-	-	190/207 290/297
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	-	-	188/195/307 289/295/397
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	2,2	385/402/407/495 985/995/997
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 valves with EPDM diaphragm (Depending on the specification variations are possible).

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.

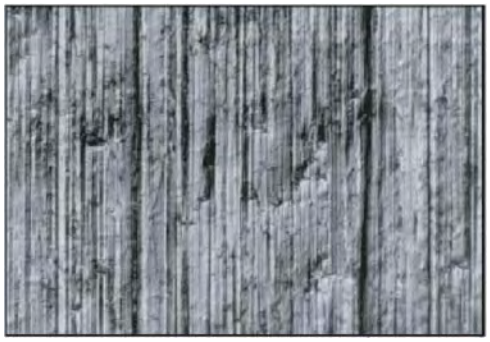
The surface finish is reached by automatic or manual mechanical polish processing. The methods that are applied depend on the internal contour and size of the valve body.
The surfaces of the valve bodies with the highest quality are produced through polishing with different grit sizes up to size 400.
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, 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 charged.
Through the current a strong chemical reaction develops which removes material from the anode.
According to the standardized procedure, 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 peaks of the metal surface.

Microscopic view:



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

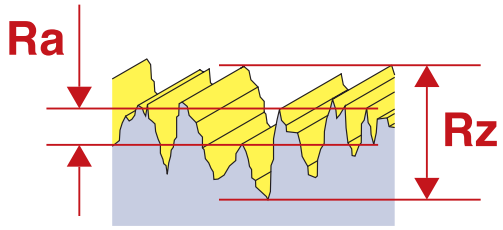
Reasons for Electro Polishing

- High lustrous appearance
- Smoothing of the peaks of the surface finish
- Reduction of the surface tension and adhesion of the process medium
- Removal of non-metallic inclusions
- Improved corrosion resistance through accumulation of chromium of 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 parameter for the surface finish profile.
L_t = 5,6 mm traversing length/measuring range - 5 single measuring length L_c = 0,8 mm each are measured transverse to the polished image.



Definition of the SED codes for Ra-Values

Allocation to the standard DIN 11866:

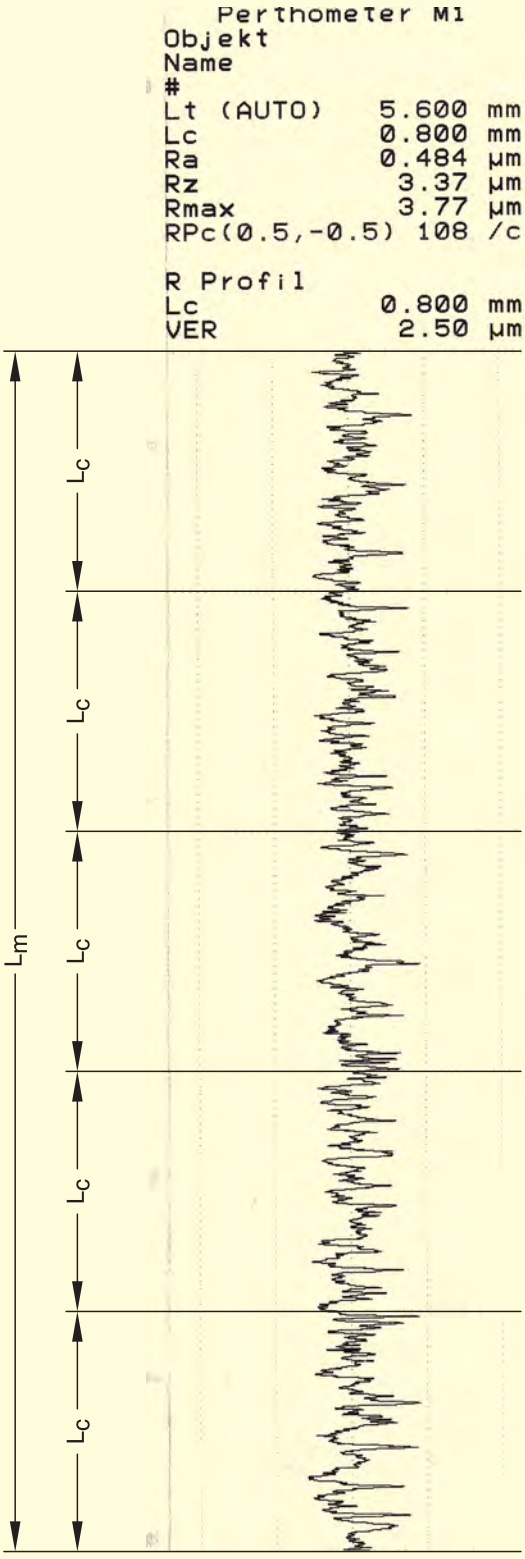
SED		DIN 11866	
Code	Ra µm	hygiene class	e-polished
02	0,8		
03	0,8	HE3c	●
07	0,6		
08	0,6		●
09	0,4		
10	0,4	HE4c	●
14	0,25		
16	0,25	HE5c	●

Allocation to the standard ASME BPE Table SF-6:

Mechanically Polished					
SED	ASME BPE	Ra average*		Ra max	
Code	Code	µ-inch	µm	µ-inch	µm
22	SFV3	25	0,625	30	0,75
23	SFV2	20	0,5	25	0,625
24	SFV1	15	0,375	20	0,5
Mechanically Polished and Electro Polished					
32	SFV6	20	0,5	25	0,625
33	SFV5	15	0,375	20	0,5
34	SFV4	10	0,25	15	0,375

*Ra average measured at four different points

Tape Print Out of Surface Finish



Diaphragms

The diaphragm is the most important component of the diaphragm valve.
Besides the valve body, the diaphragm is the only part which contacts the process medium.
The diaphragm separates the process medium from the actuator and the external atmosphere.
In addition, the diaphragm is the dynamic part which the flow rate of the process medium is controlled and stopped.
All aseptic diaphragms used by SED have been developed and tested over the years.
The SED diaphragms are subject to stringent testing in our own test stands at different operating conditions.

These tests are continuously performed in a saturated steam sterilization loop to determine estimated cycle life times.
The test results have an influence on the design, composition of materials, valve body design and complete valve assemblies.
All diaphragms are produced with an embedded stainless steel compressor stud for the engagement at the valve operating mechanism except for the diaphragm dimension MA8 which is connected with the valve activation by an elastomer button.

All diaphragm materials of the same size have the same engagement with the valve operating mechanism and may be interchanged in the valve without changing the diaphragm compressor and spindle.

The traceability of raw materials is available through the diaphragm code which defines the material and states the production lot and production date.

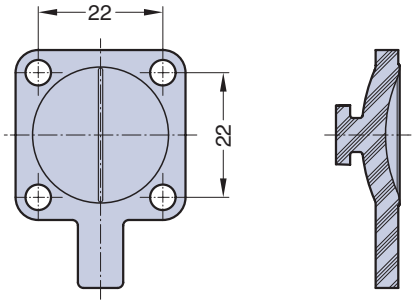
MA*	25	40	50	80
A	46	65	78	114
B	54	70	82	127

*Diaphragm size

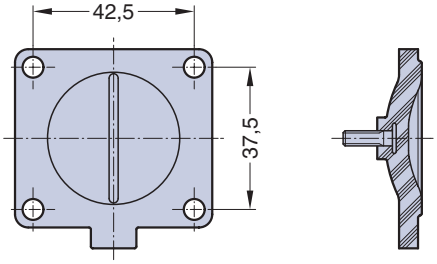
SED Code		18	30	44
MA		8 - 100	8 - 50	25 - 100
Material		EPDM	PTFE/ EPDM	PTFE/ EPDM
Design		One-piece Molded open	One-piece Molded open	Two-piece Molded closed
Temperature range	(°C)	-40 to 150*	-20 to 150	-20 to 160
	(°F)	-40 to 300*	-20 to 300	-20 to 320
FDA		√	√	√
3A		√	√	√
USP Class VI Test section #87 & #88		√	√	√

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

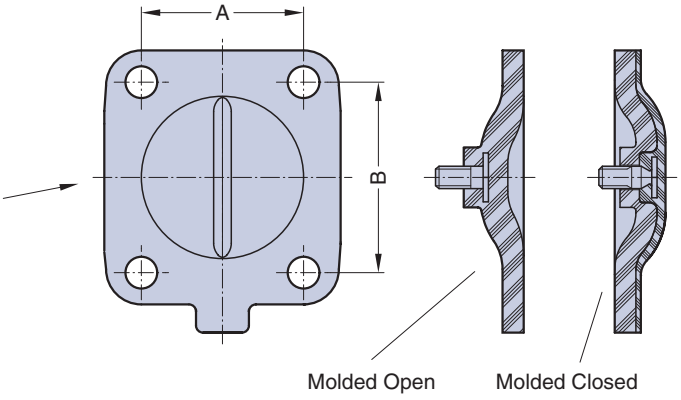
MA 8



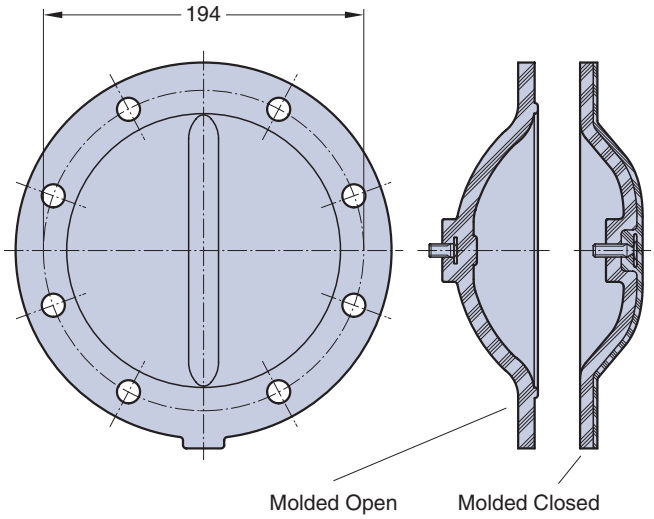
MA 10



MA 25 - 80



MA 100



Diaphragms

MA 8 **EPDM** **PTFE / EPDM**
One-piece

Molded Open

MA 10 **EPDM** **PTFE / EPDM**
One-piece

Molded Open

MA 25 - 80 **EPDM** **PTFE / EPDM**
Two-piece

Molded Open Molded Closed

MA 100 **EPDM** **PTFE / EPDM**
Two-piece

Molded Open Molded Closed

EPDM SED Code 18

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

The Code 18 Diaphragm

- Complies to FDA CFR # 21 Section 177.2600
- Conforms to USP Class VI Test section #87 and #88
- 3A Sanitary Class II

(Certificate of Conformity available upon request)

PTFE (TFM) Diaphragm Code 30 and 44

These PTFE diaphragms have been designed and 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 diaphragm is always manufactured in the molded open position. These one-piece diaphragms have less surface area and are subject to shorter linear strokes which explain 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 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 life of the diaphragm.

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.

The Code 30 and 44 Diaphragm

- Complies to FDA CFR # 21 Section 177.1550
- Conforms to USP Class VI Test section #87 and #88
- 3A Sanitary Class I

(Certificate of Conformity available upon request)

Valve Bodies

The SED valve bodies as standard are manufactured of the material 1.4435/316 L ASME BPE Table DT-3 and according to EN 10204 inspection certificate 3.1. All valve bodies contain a stamped heat 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. The SED valve bodies are produced out of raw forged, block material, or investment cast. Depending on the material and specification of the valve body, different manufacturing processes are used.

Material 1.4435/316L Specification	Investment cast	Raw forged body	Made of block material
2/2 way body	4 - 100 mm / 1/4" - 4"	4 - 80 mm / 1/4" - 3"	100 - 150 mm / 4" - 6"
Multiport body	N.A.	N.A.	4 - 100 mm / 1/4" - 4"
Tank bottom body	N.A.	N.A.	4 - 100 mm / 1/4" - 4"

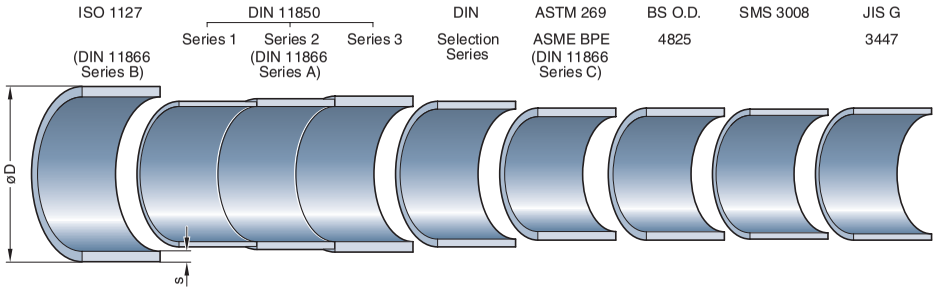
Other alloy materials are available, below is a list of materials machined from solid block.
1.4539 ASI904L
2.4602 Alloy C-22
2.4605 Alloy C-59
2.4819 Alloy C-276
and Titan

Forged Bodies
The forged body begins from a solid piece of stainless steel ingot. In the forging process the shape of the material is changed through pressure between forging tools at elevated temperatures.
Through the forging procedure a high density and homogeneous structure of the material is obtained. This reduces the possibility of porosity or that any inclusions can emerge. After that, the forged body is mechanically machined according to the specification.

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

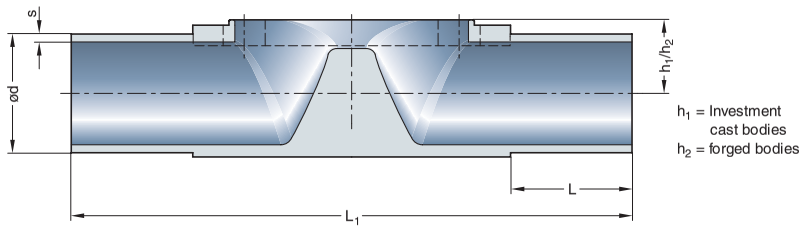
Investment Cast
The investment cast bodies are produced in a pattern filled with wax containing the shape of the final valve body.
By dipping the wax formed body in a ceramic material, the complete wax valve body is covered with ceramic.
After melting the interior wax body, the ceramic shell is filled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

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.



Butt Weld Tube Ends

SED offers tube end outside diameter and wall thickness dimensions in accordance to the several international standards. These standards and dimensions are listed in the below table.
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 the aseptic process piping system. If the connecting tube ends are not identical and of the same diameter standard, there may result a reduction or step in the process piping system 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 Series 1	DIN 11850 Series 2	DIN 11850 Series 3	DIN Selection Series	ASTM 269 ASME BPE	BS O.D. 4825		SMS 3008	JIS G 3447
						Code	40	41	42	43	39		45	94	49	97
DN	NPS	MA	L (min)	L_1	h_1	h_2	ød x s	ød x s	ød x s	ød x s	ød x s	ød	s	s	ød x s	ød x s
Valve Type Manually Operated 290 / 297 Valve Type Pneumatically Operated 190 / 207																
4	-	8	20	72	9	9	-	-	-	-	6x1,0	-	-	-	-	-
6	-	8	20	72	9	9	-	-	-	-	8x1,0	-	-	-	-	-
8	1/4"	8	20	72	9	9	13,5x1,6	-	-	-	10x1,0	6,35	0,89	1,20	-	-
10	3/8"	8	20	72	9	9	-	12x1,0	13x1,5	14x2,0	12x1,5	9,53	0,89	1,20	-	-
15	1/2"	8	20	72	9	9	-	-	-	-	-	12,70	1,65	1,20	-	-
Valve Type Manually Operated 289 / 295 / 397 Valve Type Pneumatically Operated 188 / 195 / 307																
8	1/4"	10	25	108	12	12	13,5x1,6	-	-	-	-	-	-	-	-	-
10	3/8"	10	25	108	12	12	17,2x1,6	12x1,0	13x1,5	14x2,0	12x1,5	9,53	0,89	1,20	-	-
15	1/2"	10	25	108	12	12	21,3x1,6	18x1,0	19x1,5	20x2,0	18x1,5	12,70	1,65	1,20	-	-
20	3/4"	10	25	108	12	12	-	22x1,0	[1]23x1,5	-	22x1,5	19,05	1,65	1,20	-	-
Valve Type Manually Operated 985 / 995 / 997 Valve Type Pneumatically Operated 385 / 402 / 407 / 495																
15	1/2"	25	25	120	13	16	21,3x1,6	18x1,0	19x1,5	20x2,0	18x1,5	12,70	-	1,20	-	-
20	3/4"	25	25	120	16	16	26,9x1,6	22x1,0	23x1,5	24x2,0	22x1,5	19,05	1,65	1,20	-	-
25	1"	25	25	120	19	19	33,7x2,0	28x1,0	29x1,5	30x2,0	28x1,5	25,40	1,65	1,60	25,0x1,2	25,4x1,2
32	1 1/4"	40	25	153	24	26	42,4x2,0	34x1,0	35x1,5	36x2,0	34x1,5	31,75	1,65	1,60	33,7x1,2	31,8x1,2
40	1 1/2"	40	25	153	24	26	48,3x2,0	40x1,0	41x1,5	42x2,0	40x1,5	38,10	1,65	1,60	38,0x1,2	38,1x1,2
50	2"	50	30	173	32	32	60,3x2,0	52x1,0	53x1,5	54x2,0	52x1,5	50,80	1,65	1,60	51,0x1,2	50,8x1,5
65	2 1/2"	80	30	216	47	47	76,1x2,0	-	[2]70x2,0	-	-	[2]63,50	1,65	1,60	[2]63,5x1,6	63,5x2,0
80	3"	80	30	254	47	47	88,9x2,3	-	85x2,0	-	-	76,20	1,65	1,60	76,1x1,6	76,3x2,0
100	4"	100	30	305	61	58	114,3x2,3	-	104x2,0	-	-	101,60	2,11	2,00	101,6x2,0	101,6x2,0

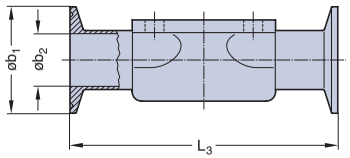
Sizes in mm; MA = Diaphragm size
[1] Investment cast body only
[2] Forged body only

Aseptic Connections

Clamps

The clamp connection is the most popular connection for easy assembly and breakdown of process lines and valves.
The clamp end connection is 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 compressed tight with a wing nut quick disconnect clamp.
In general, the valve clamps ends are welded to the valve butt weld ends and polished according to the specified interior valve body surface finish.

The welded clamp ends are 100% visually inspected and compression tested. The 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 result 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 but minimize turbulence and pressure drop through the system.



Dimensions inch

Clamp End Ident. Tube End Ident.			ASME BPE ASME BPE			ASME BPE ASME BPE		
			Code 645			Code 545		
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	4,25	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

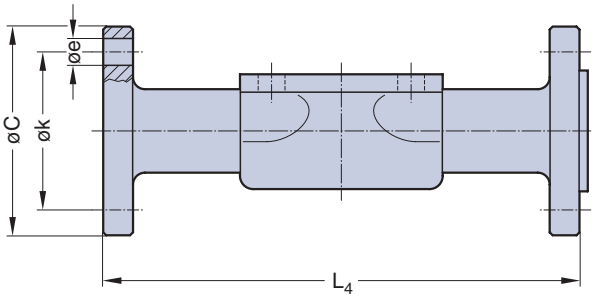
Clamp End Ident. Tube End Ident.			Similar ISO 2852 ISO 1127			DIN 32676 DIN 11850			ASME BPE ASME BPE			ASME BPE ASME BPE			SMS 3017 SMS 3008		
			Code 640			Code 642			Code 645			Code 545			Code 649		
Design			DIN EN 558-1			DIN EN 558-1			DIN EN 558-1			short design			DIN EN 558-1		
DN	NPS	MA	L_3	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	25,4	-	-	-	-	-	-	63,5	4,57	25,0	-	-	-
10	3/8"	8	-	-	-	*89,0	10,0	34,0	-	-	-	63,5	7,75	25,0	-	-	-
15	1/2"	8	-	-	-	-	-	-	*89,0	9,40	25,0	63,5	9,40	25,0	-	-	-
10	3/8"	10	108	14,0	25,4	108,0	10,0	34,0	-	-	-	-	-	-	-	-	-
15	1/2"	10	108	18,1	50,5	108,0	16,0	34,0	108,0	9,40	25,0	89,0	9,40	25,0	-	-	-
20	3/4"	10	-	-	-	-	-	-	117,0	15,75	25,0	101,6	15,75	25,0	-	-	-
15	1/2"	25	108	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	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	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	38,4	64,0	146,0	32,0	50,5	-	-	-	-	-	-	146,0	31,3	50,5
40	1 1/2"	40	159	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	56,3	77,5	190,0	50,0	64,0	190,0	47,50	64,0	158,75	47,50	64,0	190,0	48,6	64,0
65	2 1/2"	80	216	72,1	91,0	216,0	66,0	91,0	216,0	60,20	77,5	222,25	60,20	77,5	216,0	60,3	77,5
80	3"	80	254	84,3	106,0	254,0	81,0	106,0	254,0	72,90	91,0	222,25	72,90	91,0	254,0	72,9	91,0
100	4"	100	305	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

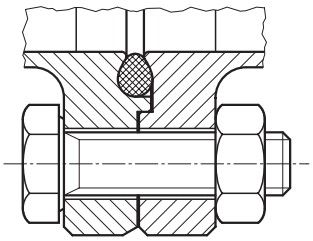
*Length differing from standard; other lengths on request

Aseptic 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.

The 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.





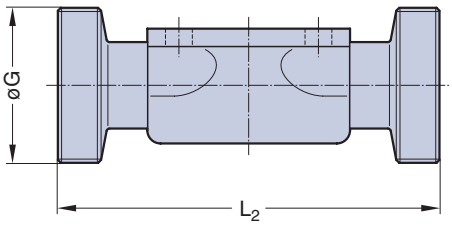
			DIN 11864-2-A			
			Code 3.. (mm)			
DN	NPS	MA	L_4	C	k	e
15	1/2"	25	130	59	42	ø 9
20	3/4"	25	150	64	47	ø 9
25	1"	25	160	70	53	ø 9
32	1 1/4"	40	180	76	59	ø 9
40	1 1/2"	40	200	82	65	ø 9
50	2"	50	230	94	77	ø 9
65	2 1/2"	80	290	113	95	ø 9
80	3"	80	310	133	112	ø 11
100	4"	100	350	159	137	ø 11

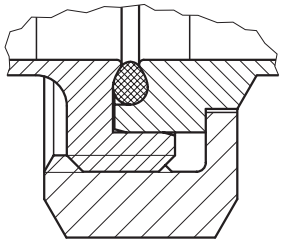
Aseptic Threads

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

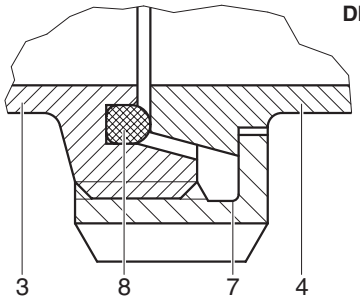
- Milk-threaded ends DIN 11851 with form sealing
- Aseptic connection according to DIN 11864-1 A with partly open o-ring for optimized cleaning features and a reduced dead leg. The threaded spigot, the liner and the interjacent o-ring are compressed against a metallic block with a spigot nut.

The 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		DIN 11864-1-A	
			Code 8..		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 1/8
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

Why Aseptic Diaphragm Valve?

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

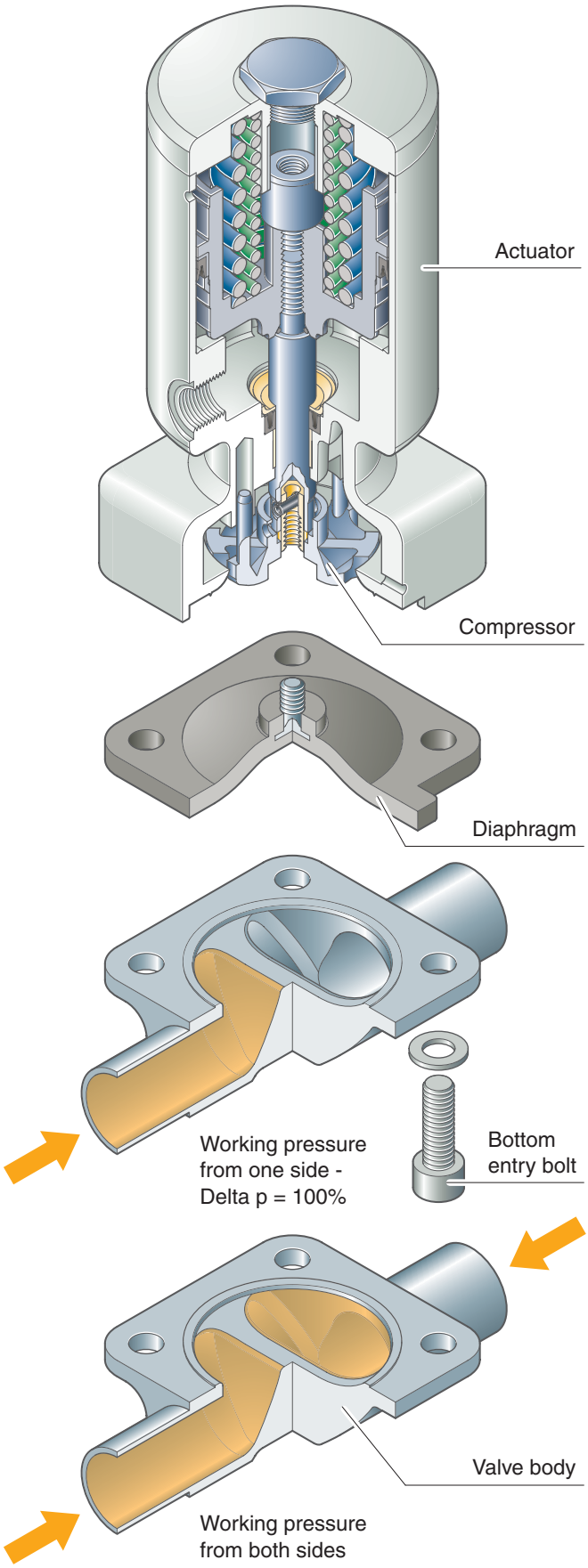
General and SED Specific Criteria:

- **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**
  The process contact surfaces (body and diaphragm) are minimal, 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 applications of the valve in a loop installation, please ask a factory representative for the maximum possible working pressure or to specify for the correct layout of the valve.
If the sum of the two pressures does not exceed the maximum possible working pressure from one side, the valve can be applied for that application.



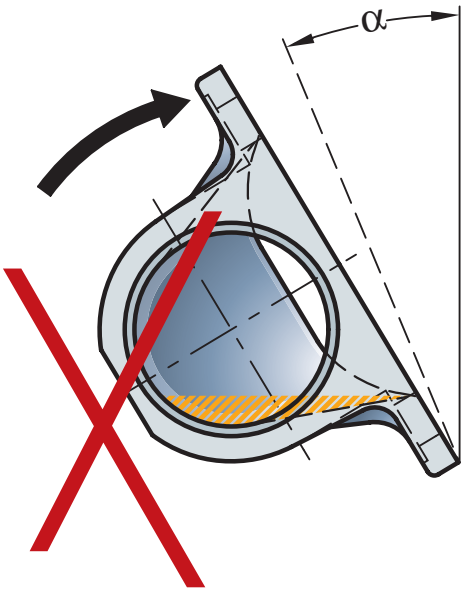
Self Draining - Two-Way Valve

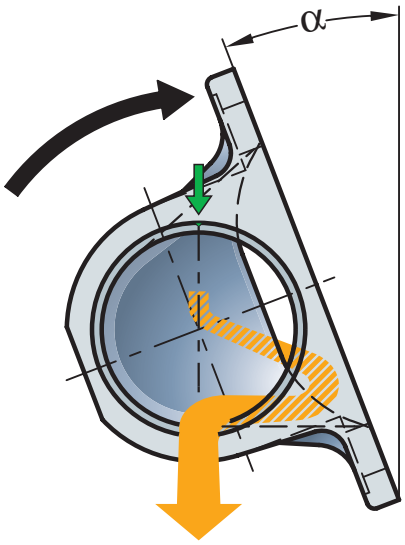
One of the most important criteria of all valves applied in aseptic processes is the drainability.
This feature has contributed substantially why the diaphragm valve has prevailed as the valve of choice for aseptic process applications.

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 media

It is essential that the valve be installed at the specific angle allowing the media to fully drain in the open position.
See the illustration below and the corresponding table showing the specific angle depended on tube size, standard, as well as the material selection of the two-way body.
For optimum drainability it is recommended to install the tubing and valves with about 1% (10 mm/m) slope for long runs and 2% (20 mm/m) slope for short runs. This is recommended to ensure the complete drainability of the process system. Drainability in the process system is ultimately the responsibility of the system designer and/or end user.
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.





SELF DRAINING ANGLE α (Grad)

VALVE SIZE			FORGED BODIES			INVESTMENT CAST BODIES		
			ISO 1127	DIN 11850	ASME BPE	ISO 1127	DIN 11850	ASME BPE
DN	NPS	MA	Code 40	Code 41-43	Code 45	Code 40	Code 41-43	Code 45
4	-	8	-	-	-	-	22	-
6	-	8	-	-	-	-	22	-
8	1/4"	8	18,4	-	29	21	22	22
10	3/8"	8	-	22	26	-	22	22
15	1/2"	8	-	-	22	-	-	22
8	1/4"	10	31,4	-	-	33	-	-
10	3/8"	10	20,5	26	27	19	33	21
15	1/2"	10	15	19	47,1	19	19	33
20	3/4"	10	-	34,6	39,7	-	19	19
15	1/2"	25	44	46	47	47	47	54
20	3/4"	25	30	35	40	43	43	47
25	1"	25	21	27	32	28	28	43
32	1 1/4"	40	23	28	-	26	33	33
40	1 1/2"	40	17	23	26	16	26	26
50	2"	50	18	23	24	17	23	23
65	2 1/2"	50	-	-	16	-	-	17
65	2 1/2"	80	23	25	28	24	-	-
80	3"	80	17	18	22	24	24	24
100	4"	100	17	19	19,5	23	23	23

MA = Diaphragm size

Overview Aseptic Valves

Sizes and Control function		Series* Steripur	KMA	KMD
DN 4 - 15mm (1/4" - 1/2") **MA 8**	Pneumatically operated	 **Type 207** Page 33	 **Type 190** Page 34	
	Manual	 **Type 297** Page 25	 **Type 290** Page 25	
DN 8 - 20mm (3/8" - 3/4") **MA 10**	Pneumatically operated	 **Type 307** Page 35	 **Type 195** Page 36	 **Type 188** Page 37
	Manual	 **Type 397** Page 27	 **Type 295** Page 27	 **Type 289** Page 27
DN 15 - 100mm (1/2" - 4") **MA 25 - 100**	Pneumatically operated	 **Type 407** Page 39	 **Type 495** Page 40	 **Type 385** Page 41 DN 15-80mm (1/2" - 3")  **Type 402** Page 42 DN 15-50mm (1/2" - 2")
	Manual	 **Type 997** Page 29	 **Type 995** Page 30	 **Type 985** Page 31

MA = Diaphragm size
*Differentiations between the series see table page 21

Innovative Design

SED offers 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 can support your decision which makes it easy to find the optimum solution for your application.

Position	Series / Performance Features / MA	Steripur			KMA			KMD	
		8	10	≥ 25	8	10	≥ 25	10	≥ 25
1	Stainless steel piston actuation	●	●	●					
2	Actuation with stainless steel bonnet or distance piece				●	●	●		
3	Thermoplastic actuation direct mounted to the valve body							●	●
4	Compact Design - Optional orientation of the air inlet port	●	●	●		●		●	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	●	●	●	●	●	●	●	Type 402
8	Clean and smooth exterior ideal for sterile wash downs	●	●	●				●	●
9	Flexible diaphragm suspension	●	●	●	●		●		●
10	Encapsulated working diaphragm	●	●	●	●	●	●	●	●
11	Light weight							●	●

MA = Diaphragm size

Positions 4 to 11 are explained individually and in detail on pages 22 to 24.

Compact Design - Optional Orientation of the Air Inlet Port

(Position 4 in Table Page 21)

The selection of the valve is determined by the necessary flow rate from which the nominal diameter of the valve is determined. Due to physical limitations of space and the principle of the valve designs, the ability to improve the compactness of the valve assemblies is with the actuators. 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 it affects 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.

SED offers 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 the diaphragm, 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 different actuation models.

Two-Way Valve with air inlet port 90° to flow direction.

Air inlet

Multiport Manifold Valve with 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

(Position 5 and 6 in Table Page 21)

Dependent 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.

- 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 possible 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.

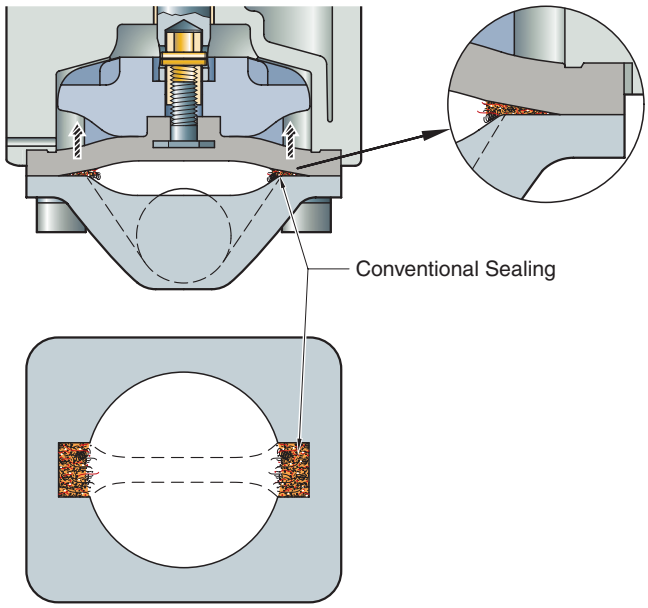
MZ - Multiport Valve
T-valve with U-bend and sample valve
Main valve KMA Series pneumatically operated
Sample valve Steripur Series manual

T-Valve
Steripur Series
Pneumatically operated

Two-Way Valve
Steripur Series
Manual

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

(Position 7 in Table Page 21)



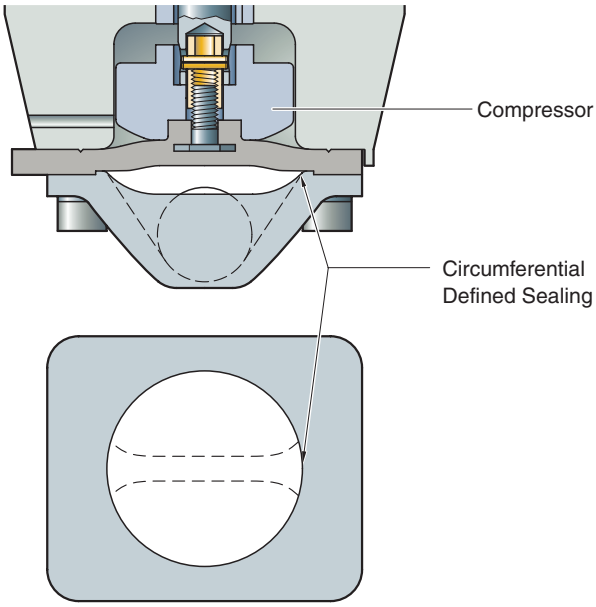
To achieve the highest level of sterility, the SED Steripur Series was developed by utilizing new, qualified, and tested diaphragm valve technology. This unique design of the actuator reduces or eliminates product entrapment at the point beyond the radius of the weir on the body bonnet flange.

The Steripur sealing 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 meet. Other selected SED actuator types have this same technology. (See the comparative illustration).

The conventional weir style design in the market does not provide this feature because the interior actuator lower housing has guidance for 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 lifetime is extended.



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

Clean and Smooth Exterior Ideal for Sterile Wash Downs

(Position 8 in Table Page 21)

The exterior design of the SED valve Steripur Series and KMD is ideal for cleaning and sterile wash downs. Because of bottom entry assembly with tapped threads in the actuator, there are no exposed parts.

In addition, this design eliminates pockets, cut-outs, strengthening ribs, edges, sharp corners and rough surfaces.
(For a better understanding compare examples on page 38 - Type Steripur 407 and Page 40 - Type KMA 495).

Flexible Diaphragm Suspension

(Position 9 in Table Page 21)

The flexible diaphragm suspension has different relevant performance depending on the selection of diaphragm material and type. The proper selection of diaphragm materials, type, and actuator components can eliminate point loading at center of the diaphragm. Point loading reduces the cycle life time of the diaphragm.

The smallest diaphragm size MA8 incorporates an elastomer button that is pressed into the compressor for connecting the diaphragm to the actuator. Because of the resilient elastomer material, it provides a flexible suspension throughout all the MA8 versions.

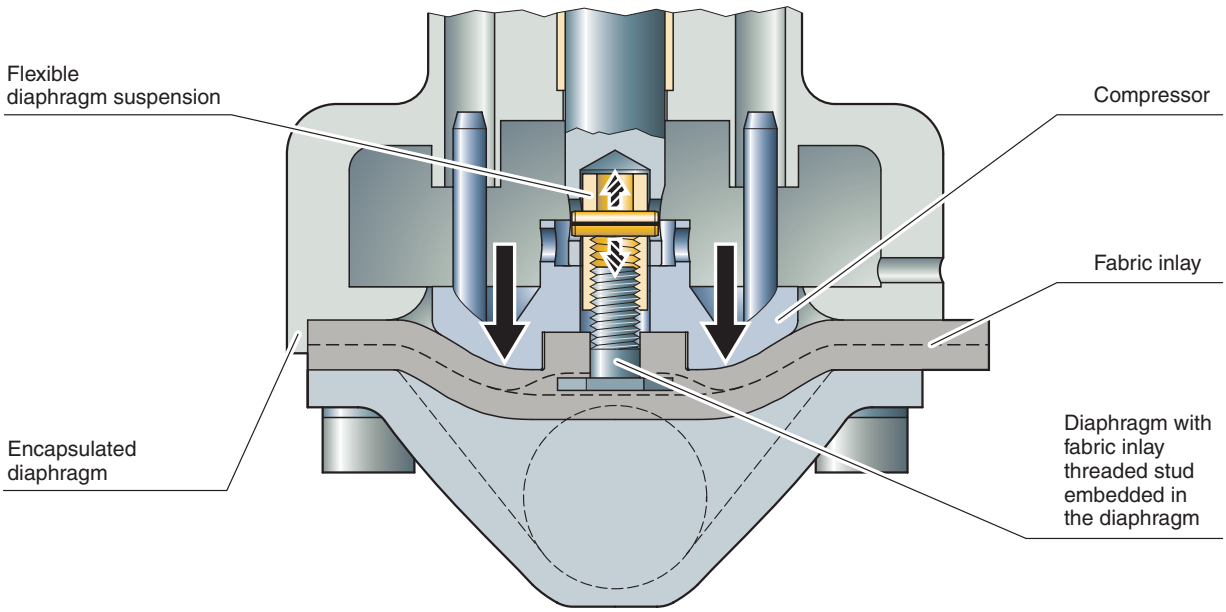
All other SED sizes have a threaded diaphragm stud for assembly to the spindle of the actuator. With the elastomer and one piece PTFE diaphragm versions, the threaded stud is vulcanized into the resilient elastomer material. This connection reduces the risk of point loading if properly assembled.

The two-piece PTFE and elastomer diaphragms have the threaded diaphragm stud embedded in the PTFE material. Point loading in center of the diaphragm in this case is almost unavoidable, resulting in diaphragm failure.

To eliminate point loading, SED supplies the flexible suspensions as standard for all valves that offer the option of using the two-piece diaphragm. The flexible diaphragm suspension assures that the closing force of the diaphragm will be absorbed by the elastomer of the diaphragm and the force evenly distributed across the weir of the body.

All of the SED diaphragms have the same assembly engagement by size regardless of the actuation or diaphragm materials and type. This is a tremendous advantage for diaphragm changes and replacement. There are systems in the market, i.e. bayonet connection and floating tube nut which require changing the spindle or compressor for different diaphragm materials and type.
This is not necessary with SED, select the valve and actuator and you may change to any of the SED diaphragm options without any additional parts or components.

The flexible diaphragm suspension is produced from a two-piece spindle in order to provide the necessary tolerance and scope between the two pieces. (See below illustration).



Encapsulated Working Diaphragm

(Position 10 in Table Page 21)

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 higher temperature and pressure applications.

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

Steripur 297

KMA 290

Butt weld ends
MA 8
Fold out page 15

Specific Features

Type 297 Steripur
- **Stainless steel bonnet and hand wheel**
- Autoclavable

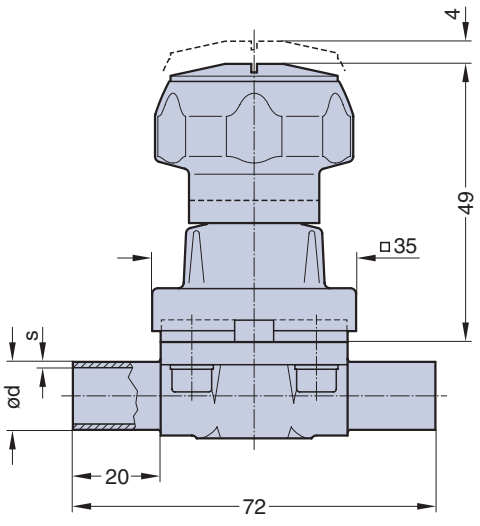
Type 290 KMA
- **Stainless steel bonnet and thermoplastic hand wheel**
- Autoclavable

General Features

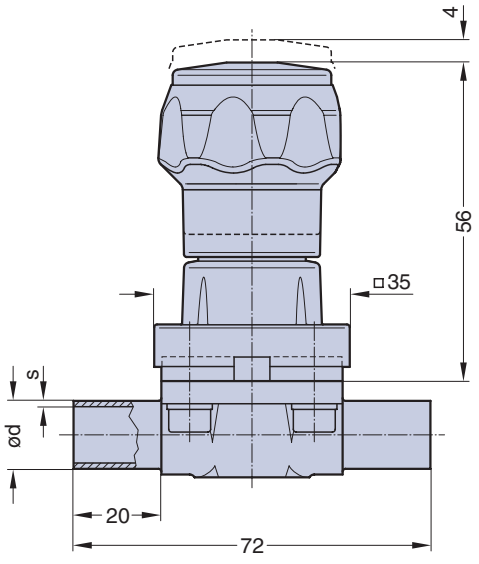
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm

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 15 Clamps and flanges see page 16 and 17 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 for all body sizes

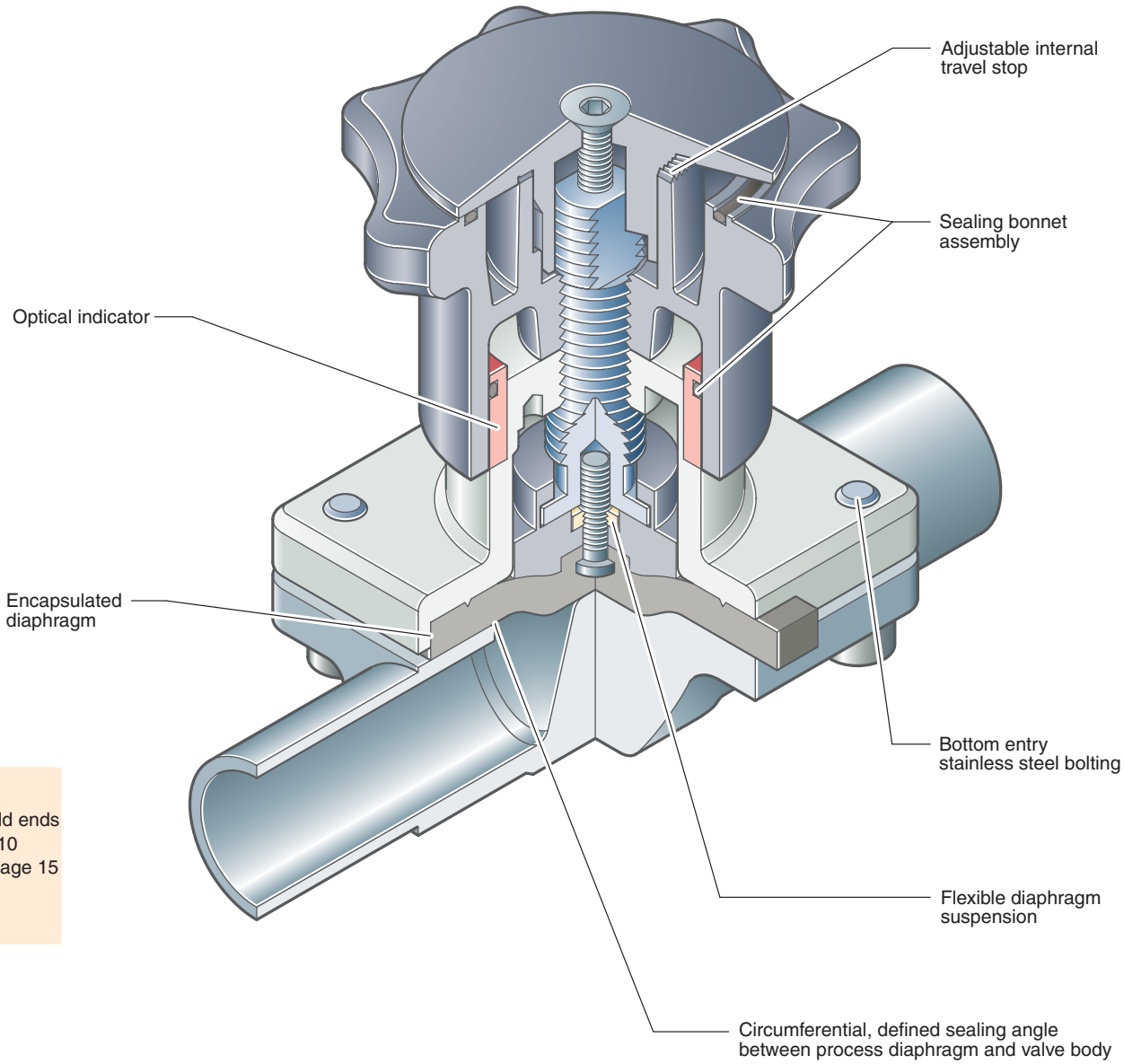


Steripur 297



KMA 290

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



Butt weld ends
MA 10
Fold out page 15

Sectional drawing shows KMA 295

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

KMD 289

Specific Features

Type 397 Steripur
- **Stainless steel bonnet and hand wheel**
- Autoclavable

Type 295 KMA
- **Stainless steel bonnet and thermoplastic hand wheel**
- Autoclavable

Type 289 KMD
- **Thermoplastic bonnet and hand wheel**

General Features

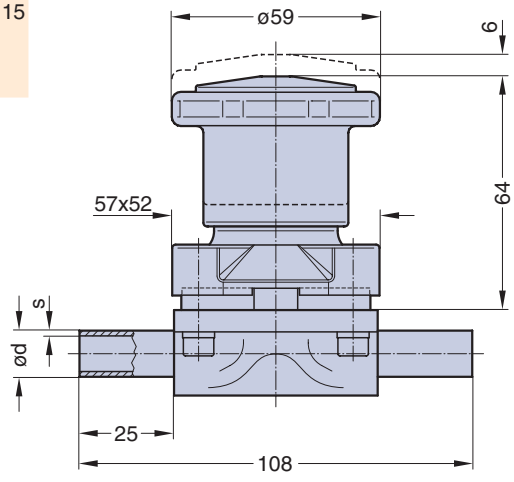
- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm

Steripur 397

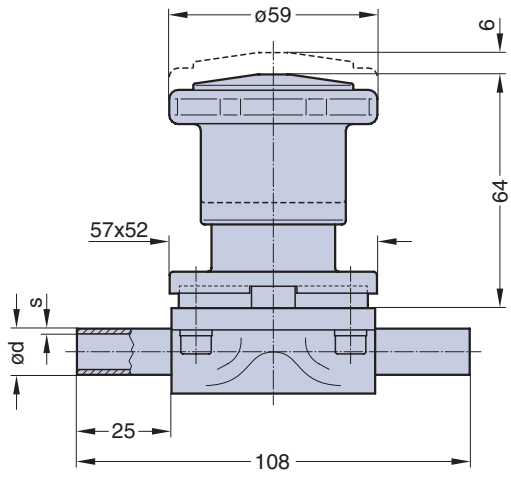
Technical Data

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 15 Clamps and flanges see page 16 and 17 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 for all body sizes

Butt weld ends
MA 10
Fold out page 15

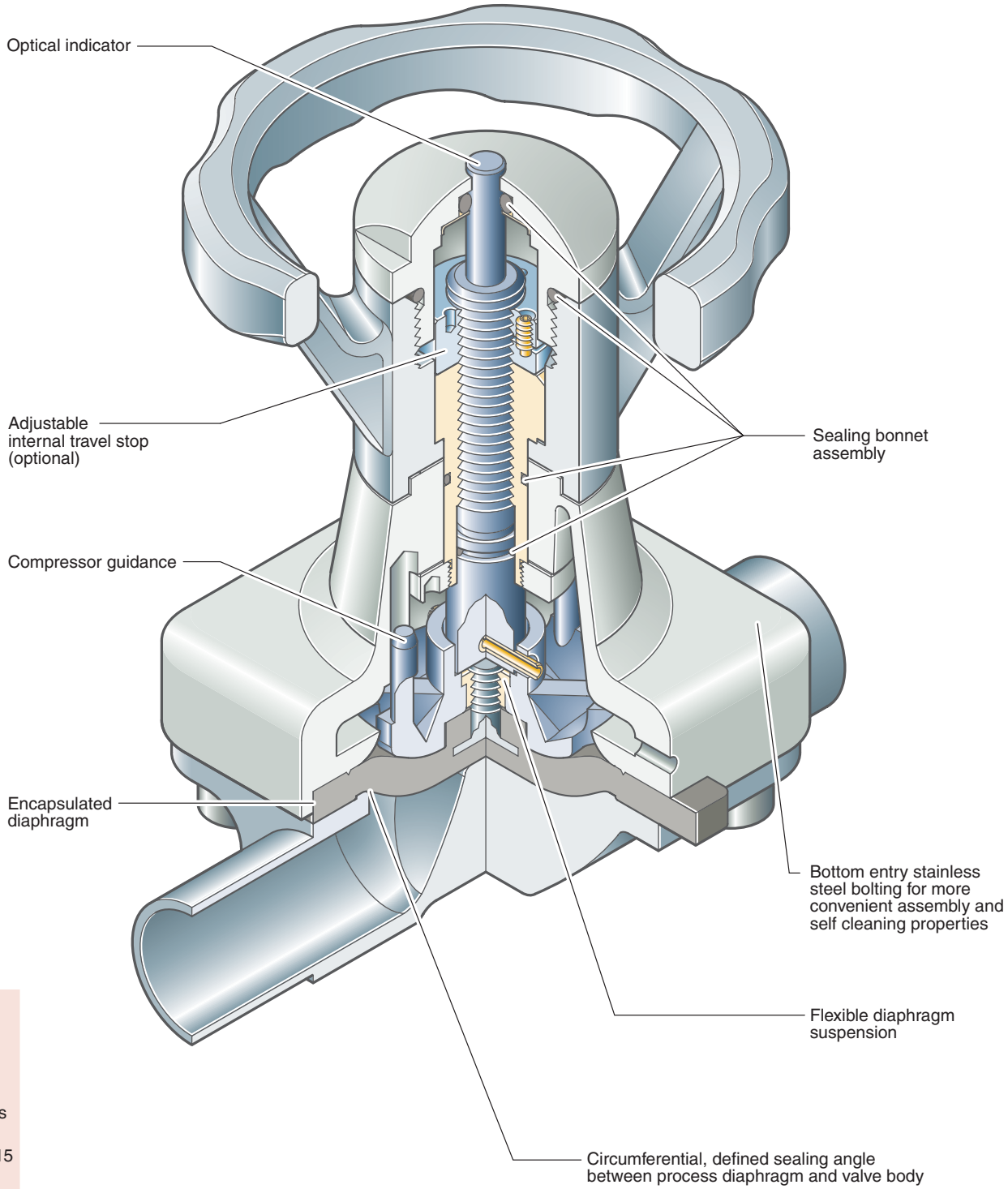


KMD 289



KMA 295 and Steripur 397

Manual Valve DN 15 - 100 mm (1/2" - 4")



Butt weld ends
MA 25 - 100
Fold out page 15

Manual Valve DN 15 - 100 mm (1/2" - 4")

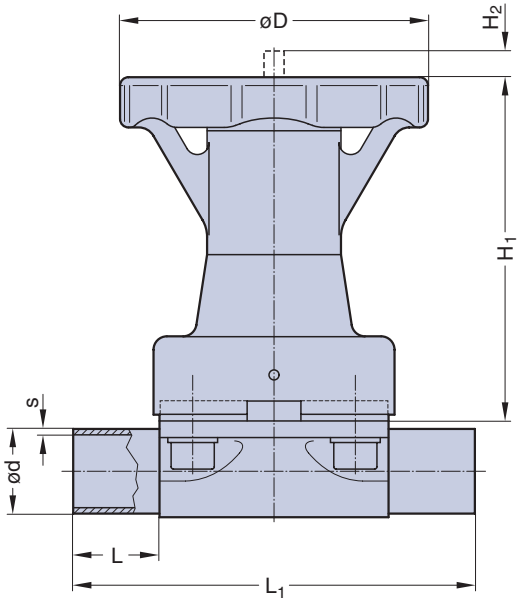
DN 15 - 50

Features

- **Stainless steel bonnet and hand wheel**
- Non rising hand wheel with optical indicator
- Sealed bonnet
- Autoclavable
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

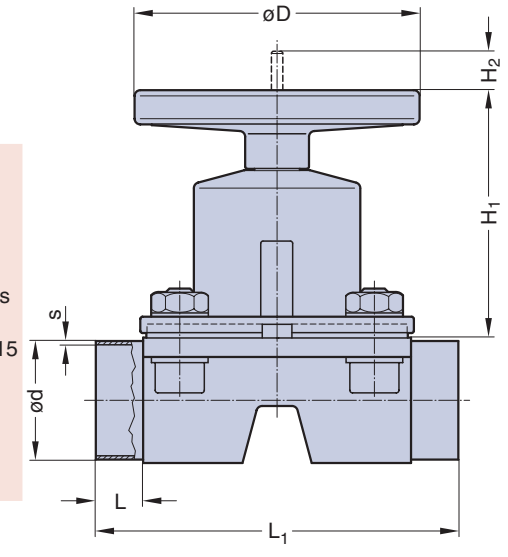
- Adjustable internal travel stop or stroke limiter



DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (120 psi)
Max. working temperature:	175°C (350°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 15
	Clamps and flanges see page 16 and 17
	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



DN 65 - 100

Butt weld ends
MA 25 - 100
Fold out page 15

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	103	10	92
32-40	40	25	153	135	17	135
50	50	30	173	135	24	135
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

Manual Valve DN 15 - 100 mm (1/2" - 4")

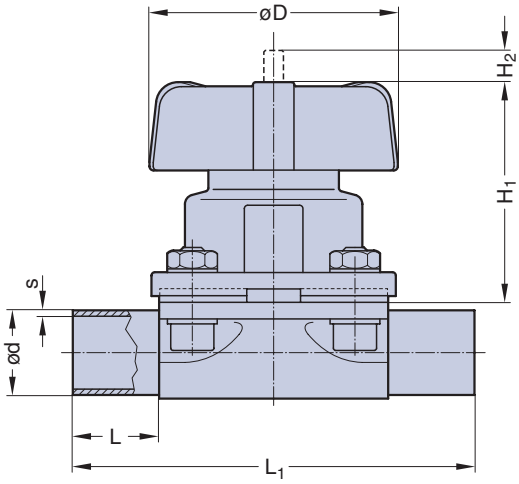
DN 15 - 50

Features

- **Stainless steel bonnet** and **thermoplastic hand wheel**
- Non rising hand wheel with optical indicator
- Circumferential, defined sealing angle
  between process diaphragm and valve body up to DN 50
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

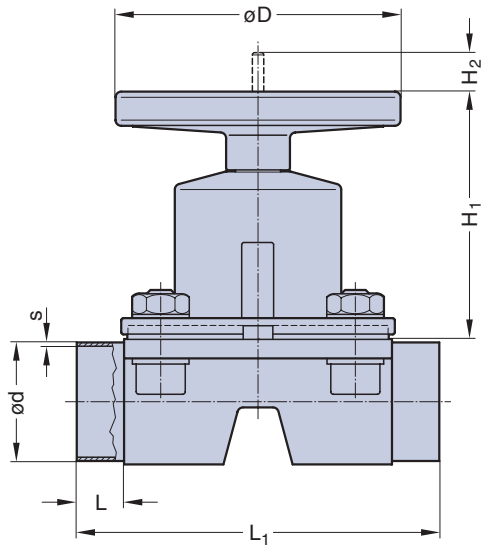
- Adjustable travel stop or stroke limiter
- Sealed bonnet
- Autoclavable
- Locking device



DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (120 psi)
Max. working temperature:	175°C (350°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 15
	Clamps and flanges see page 16 and 17
	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



DN 65 - 100

Butt weld ends
MA 25 - 100
Fold out page 15

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	71	10	90
32-40	40	25	153	91	14	114
50	50	30	173	110	23	140
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

Manual Valve DN 15 - 100 mm (1/2" - 4")

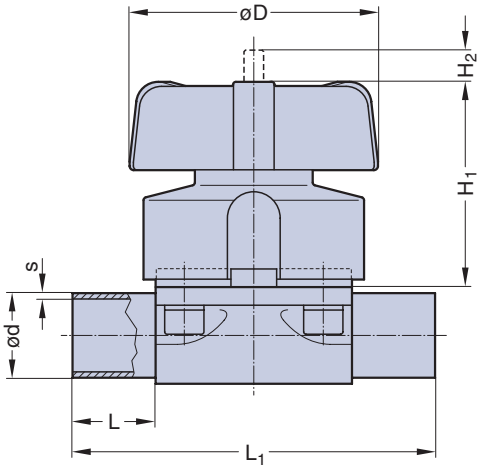
DN 15 - 50

Features

- **Thermoplastic bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

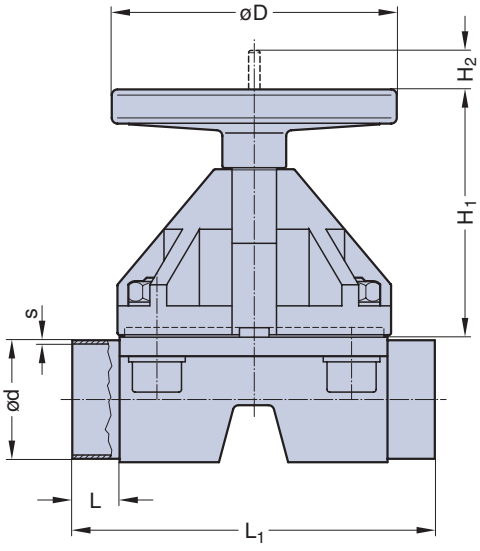
- Adjustable travel stop or stroke limiter on top
- Sealed bonnet
- Locking device



DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (120 psi)
Max. working temperature:	Standard 80°C (176°F)
	HS-Version 150°C (300°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 15
	Clamps and flanges see page 16 and 17
	Special ends
Suitable for:	
Bonnets up to DN 50:	Two-Way bodies
Bonnets bigger DN 50:	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

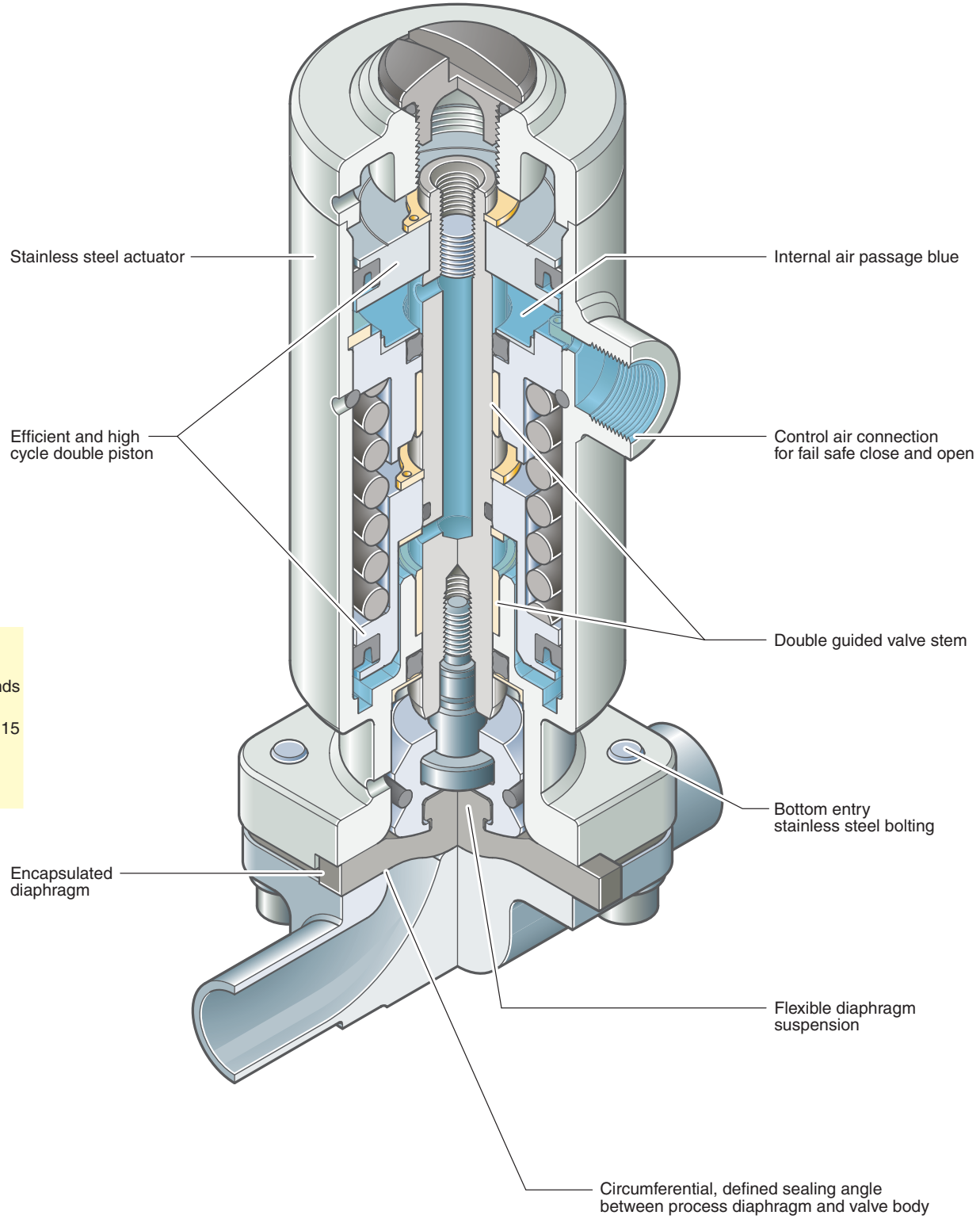


DN 65 - 100

Butt weld ends
MA 25 - 100
Fold out page 15

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	71	10	90
32-40	40	25	153	91	14	114
50	50	30	173	110	23	140
65	80	30	216	180	38	198
80	80	30	254	180	38	198
100	100	30	305	220	50	252

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



Butt weld ends
MA 8
Fold out page 15

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

Cf. 4 & 5

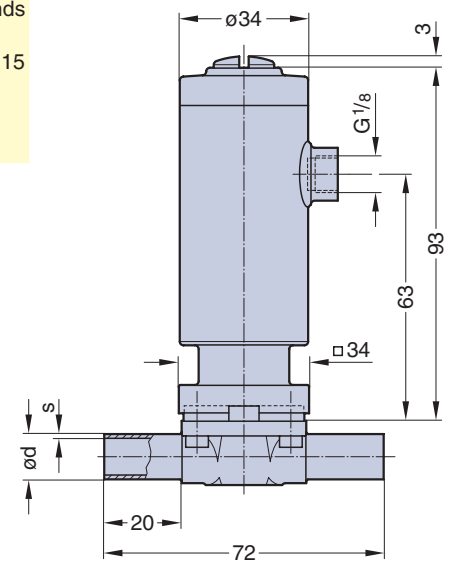
Features

- **High cycle double piston stainless steel actuator**
- 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 manifold valve assemblies
- Control air connection on the top, away from the process product line
- Direction of control air connection is mountable in 90° rotations
- Circumferential, defined sealing angle between process diaphragm and valve body
- 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 59 to 64, also for retrofitting
- Autoclavable

Butt weld ends
MA 8
Fold out page 15



Technical Data

Control function (Cf.):	Pneumatically operated
	Fail safe close (NC): Cf. 1 & 4
	Fail safe open (NO): Cf. 2 & 5
Direction	
Control connection:	At Cf. 4 & 5 in flow direction, standard
	At Cf. 1 & 2, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%)
	EPDM diaphragm 8 bar (120 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 15
	Clamps and flanges see page 16 and 17
	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 all sizes

Type 207 with lower closing force up to 4 bar working pressure and less height is also available.

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

Cf. 1, 2 & 3

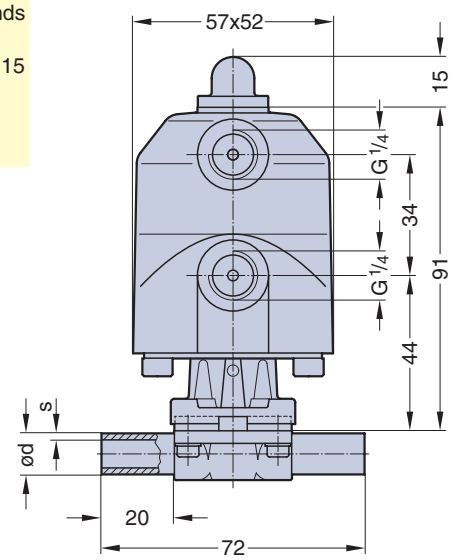
Features

- **Efficient thermoplastic piston actuator with stainless steel distance piece**
- Direction of control air connection is mountable in 90° rotations
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Optical indicator

Optional

- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting

Butt weld ends
MA 8
Fold out page 15



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
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 (120 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 15
	Clamps and flanges see page 16 and 17
	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 all sizes

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

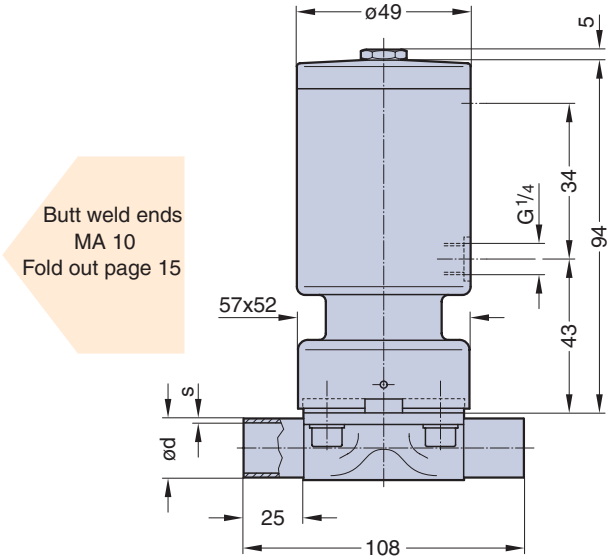
Cf. 4

Features

- **High cycle piston stainless steel actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- 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 59 to 64, 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
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 (120 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 4 - 5 bar (60 - 70 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 15
	Clamps and flanges see page 16 and 17
	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 all sizes

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

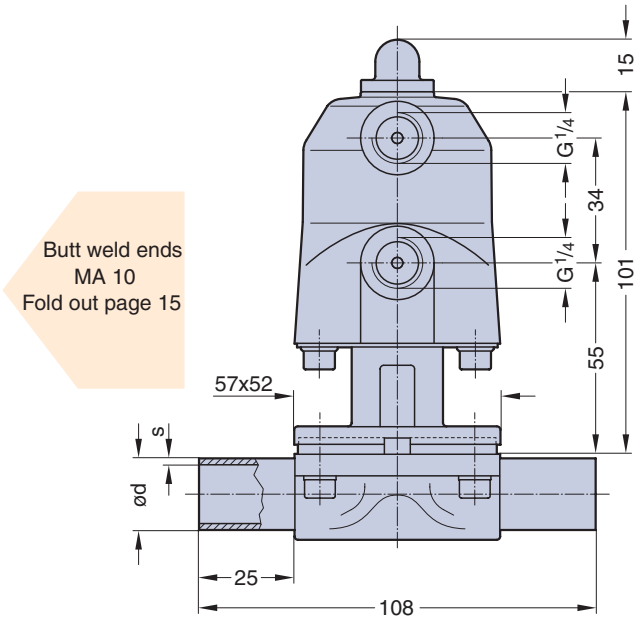
Cf. 1, 2 & 3

Features

- **Efficient thermoplastic 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

Optional

- Available with a wide range of control equipment and accessories see page 59 to 64, 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
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 (120 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 4 - 5 bar (60 - 70 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 15
	Clamps and flanges see page 16 and 17
	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 all sizes

KMD 188

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

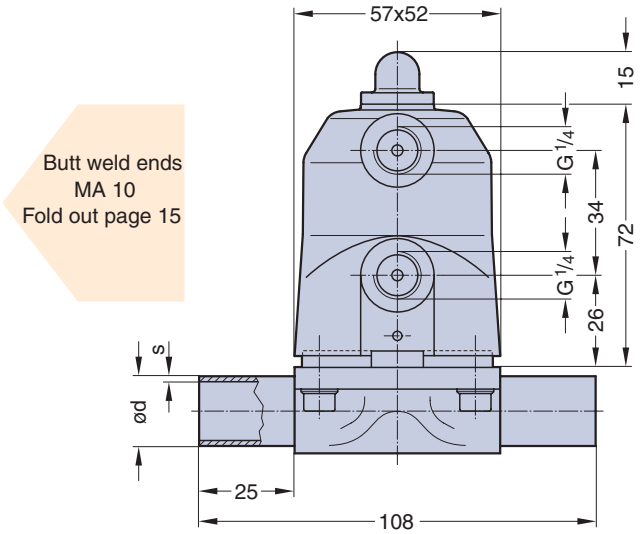
Cf. 1, 2 & 3

Features

- **Efficient thermoplastic piston actuator direct assembled with the valve body**
- 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
- Control air connection 90° to flow direction
- Encapsulated diaphragm
- Optical indicator

Optional

- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting
- Control air connection in flow direction



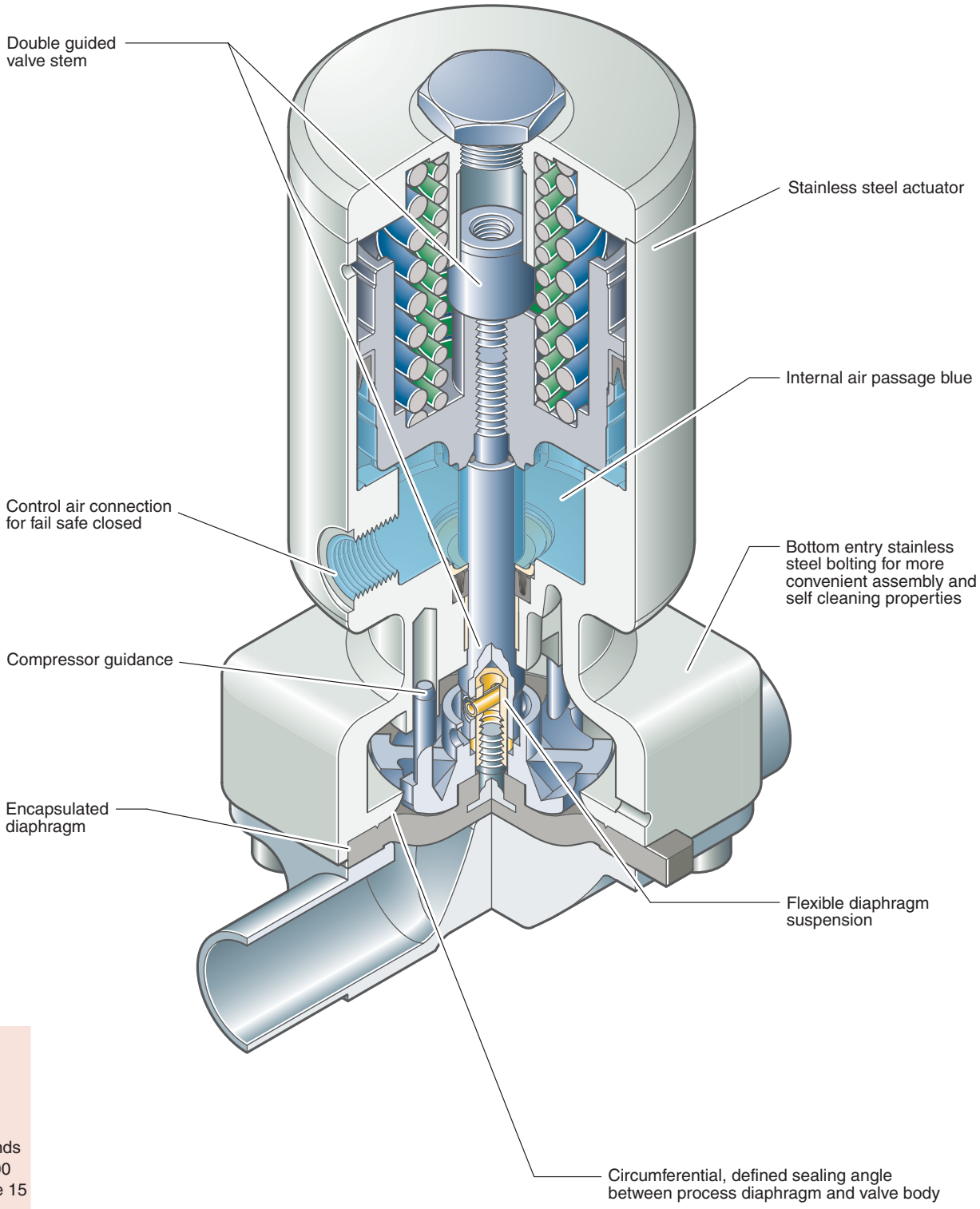
Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3
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 (120 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:	Standard 80°C (176°F) HS-Version 150°C (300°F) dependent on application
Control pressure:	Cf. 1 & 4 4 - 7 bar (60 - 100 psi) Cf. 2, 3 & 5 4 - 5 bar (60 - 70 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 15 Clamps and flanges see page 16 and 17 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 all sizes

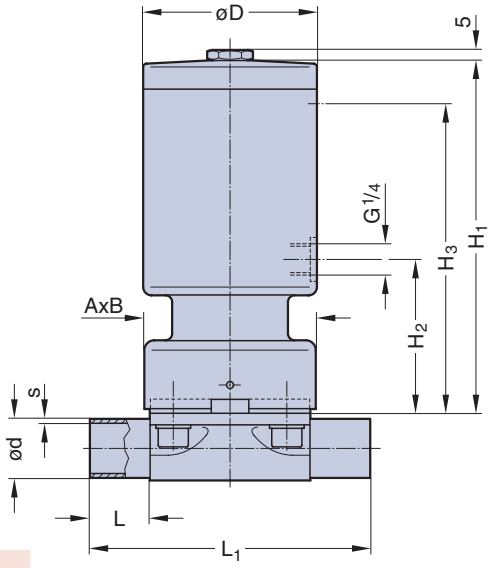
Pneumatically Operated Valve DN 15 - 100 mm (1/2" - 4")



Butt weld ends
MA 25 - 100
Fold out page 15

Pneumatically Operated Valve DN 15 - 100 mm (1/2" - 4")

DN 15 - 50 Cf. 4



DN 15 - 50

Butt weld ends
MA 25 - 100
Fold out page 15

Features

- **High cycle piston stainless steel actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- 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 59 to 64, 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

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 (2")	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	10 bar (150 psi)	7 bar (100 psi)	6 bar (90 psi)
PTFE	8 bar (120 psi)	6 bar (90 psi)	5 bar (75 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: 175°C (350°F) dependent on application
Control pressure: Cf. 1 & 4 DN 15-80 5 - 8 bar(70-120 psi)
Cf. 1 & 4 DN 100 6 - 8 bar(90-120 psi)
Cf. 2, 3, 5 & 6 DN 15-80 4,5-6 bar(65-90 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 15
Clamps and flanges see page 16 and 17
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

DN (mm)	Dimensions (mm)							
	MA	L	L_1	A x B	H_1	H_2	H_3	D
15-25	25	25	120	73x79	151	66	133	75
32-40	40	25	153	96x105	180	75	160	105
50	50	30	173	111x130	216	77	180	105
65	80	30	216	190x170	309	135	285	175
80	80	30	254	190x170	309	135	285	175
100	100	30	305	ø238	318	143	295	175

Pneumatically Operated Valve DN 15 - 100 mm (1/2" - 4")

Cf. 1

Features

- **Thermoplastic diaphragm actuator with stainless steel distance piece**
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting

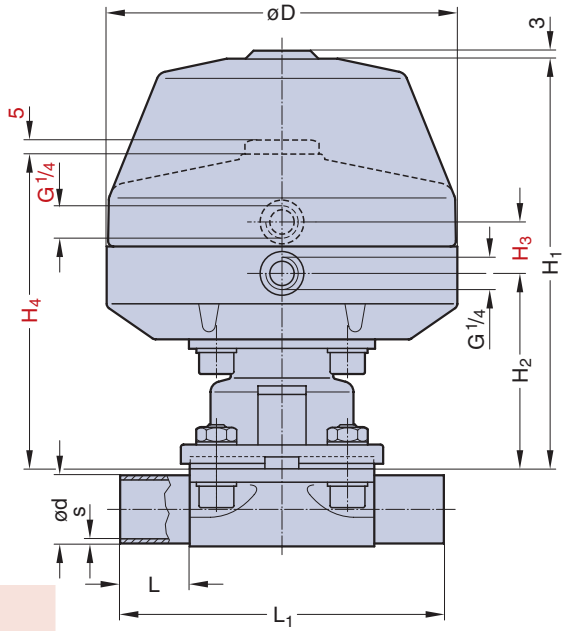
Technical Data

Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1
Fail safe open (NO): Cf. 2
Double acting (DA): Cf. 3

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

Diaphragm	DN 15-50 (2")	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	10 bar (150 psi)	7 bar (100 psi)	6 bar (90 psi)
PTFE	8 bar (120 psi)	6 bar (90 psi)	5 bar (75 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: 175°C (350°F) dependent on application
Control pressure: Cf. 1 DN 15 - 50 4,5 - 6 bar (65-90 psi)
Cf. 1 DN 65 - 80 4,5 - 7 bar (65-100 psi)
Cf. 1 DN 100 5,5 - 7 bar (90-100 psi)
Cf. 2 & 3 DN 15 - 80 4 - 5,5 bar (60-80 psi)
Cf. 2 & 3 DN 100 5 - 6,5 bar (70-95 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 15
Clamps and flanges see page 16 and 17
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



DN (mm)	Dimensions (mm)							
	MA	L	L_1	H_1	H_2	H_3	H_4	D
15-25	25	25	120	153	71	31	120	130
32-40	40	25	153	194	95	31	144	161
50	50	30	173	233	109	31	177	217
65	80	30	216	314	166	41	275	265
80	80	30	254	314	166	41	275	265
100	100	30	305	314	166	41	284	265

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

Butt weld ends
MA 25 - 100
Fold out page 15

Pneumatically Operated Valve DN 15 - 80 mm (1/2" - 3")

Cf. 1

Features

- **Thermoplastic diaphragm actuator direct 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

Optional

- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting

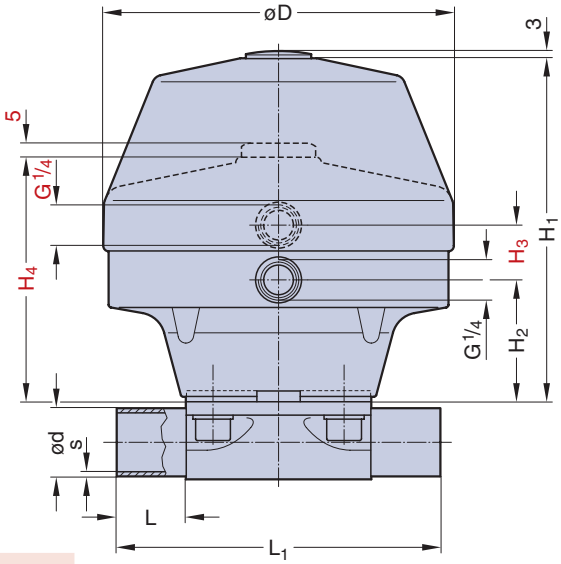
Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 Fail safe open (NO): Cf. 2 Double acting (DA): Cf. 3
Direction	
Control connection:	At Cf. 1, 2 & 3, 90° to flow direction, standard
Max. working pressure:	Unidirectional (delta p = 100%)

Diaphragm	DN 15-50 (2")	DN 65-80 (2,5"-3")
EPDM	10 bar (150 psi)	7 bar (100 psi)
PTFE	8 bar (120 psi)	6 bar (90 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:	Standard 80°C (176°F) HS-Version 150°C (300°F) dependent on application
Control pressure:	Cf. 1 DN 15 - 50 4,5 - 6 bar (65-90 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 15 Clamps and flanges see page 16 and 17 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



DN (mm)	Dimensions (mm)							
	MA	L	L_1	H_1	H_2	H_3	H_4	D
15-25	25	25	120	130	49	31	97	130
32-40	40	25	153	176	77	31	131	161
50	50	30	173	214	91	31	161	217
65	80	30	216	269	121	41	229	265
80	80	30	254	269	121	41	229	265

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

Butt weld ends
MA 25 - 100
Fold out page 15

Pneumatically Operated Valve DN 15 - 50 mm (1/2" - 2")

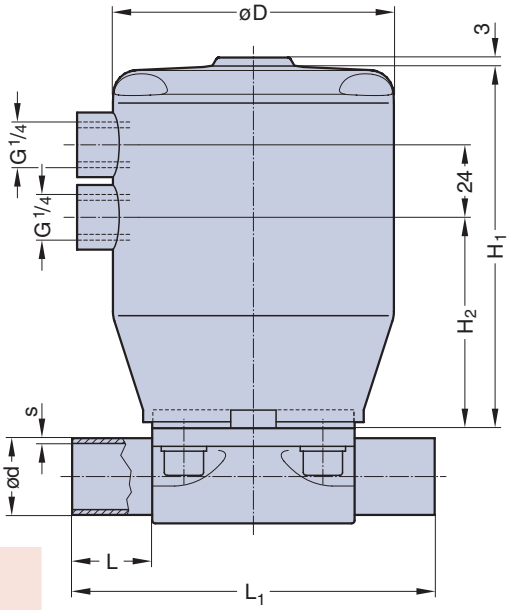
Cf. 4, 5 & 6

Features

- **Thermoplastic piston actuator**
- Compact design
- Actuator high resistance to heat transfer
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- 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 59 to 64, also for retrofitting
- Control air connection 90° to flow direction



Butt weld ends
MA 25 - 100
Fold out page 15

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
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 (120 psi)

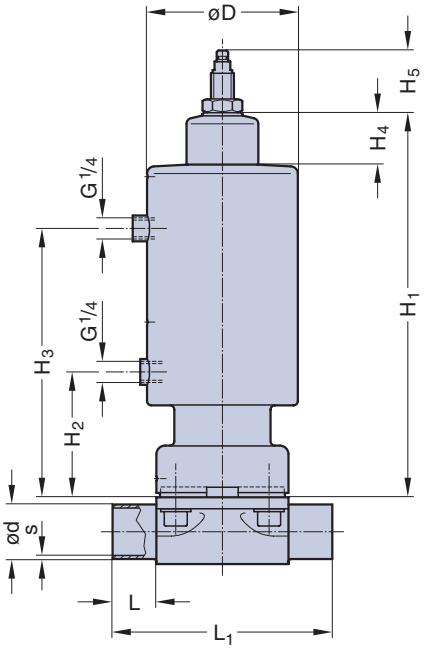
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	Standard 80°C (176°F)
	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 - 70 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 15
	Clamps and flanges see page 16 and 17
	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

DN (mm)	Dimensions (mm)					
	MA	L	L_1	H_1	H_2	D
15-25	25	25	120	120	70	92
32-40	40	25	153	133	75	112
50	50	30	173	176	111	143

Pneumatically Operated Valve DN 15 - 50 mm (1/2" - 2")

DN 50 Cf. 4



Butt weld ends
MA 25 - 100
Fold out page 15

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 manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- 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 59 to 64, 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

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 - 50 (2")
EPDM	10 bar (150 psi)
PTFE	8 bar (120 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 (70 - 120 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 15
Clamps and flanges see page 16 and 17
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

DN (mm)	Dimensions (mm)									
	MA	L	L_1	A x B	H_1	H_2	H_3	H_4	H_5	D
15-25	25	25	120	73x79	220	66	150	-	35	75
32-40	40	25	153	96x105	250	75	185	28	40	105
50	50	30	173	110x130	294	77	221	28	47	105

Type 592 is also available in MA 10 as type 392.

Ordering Key

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

Pos.	Description	Code	Specification
1	**Type:**	207, 307, 407	Steripur Series, stainless steel actuator, pneumatic
		397, 297, 997	Steripur Series, stainless steel actuator, manual
		190, 195, 495	KMA Series, actuator with stainless steel adaptation, pneumatic
		290, 295, 995	KMA Series, actuator with stainless steel adaptation, manual
		188, 385, 402	KMD Series, plastic actuator direct mounted, pneumatic
	See page 20 and 25 - 43	289, 985	KMD Series, plastic actuator direct mounted, manual
2	**Size:** See page: 15	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 1.4435/316 L
		77	Stainless steel, forged 1.4435/316 L
		78	Stainless steel, forged 1.4435/316 L Fe < 0,5%
	See page: 14	20	Hastelloy, C-22 2.4602
4	**Valve body butt weld tube end connections:**	39	Butt weld end acc. DIN
		40	**Butt weld end acc. EN ISO 1127**
	(bolt letters most common	41	Butt weld end acc. DIN 11850 Series 1
	versions)	42	**Butt weld end acc. DIN 11850 Series 2**
		43	Butt weld end acc. DIN 11850 Series 3
		45	**Butt weld end acc. ASME/ BPE**
		49	Butt weld end acc. SMS 1146
		94	Butt weld end acc. BS 4825 R1
		97	Butt weld end acc. JIS 3447
	Valve body tube 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, short design
		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
	See page 15 - 17	342	Aseptic flange DIN 11864-2-A, for tube DIN 11850 series 2 , double-sided grooved
5	**Diaphragm material:**	1	EPDM, FDA compliant, MA4-100
	(Other diaphragm materials	18	EPDM, FDA / USP compliant MA4-100, preferred for SIP applications
	on request)	30	PTFE(TFM) /EPDM one-piece, FDA / USP compliant, MA4 to MA50
	See page 12 - 13	44	PTFE(TFM) /EPDM two-piece, FDA / USP compliant, MA25 to MA100
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
	page 25 - 43	6	Double-acting (DA), orientation in flow direction
6.2	**Actuator type:**	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
		S	KMA
		S	KMD max. 80°C
	page 25 - 43	HS	KMD for steam sterilizing up to max. 150°C
7	**Surface roughness of the bodies in Ra: (µm)**	00	Interior blasted Ra ≤ 6,3 µm only cast bodies
		01	Interior blasted Ra ≤ 6,3 µm electro polished only cast bodies
		02	Internal mechanically polished Ra ≤ 0,8 µm
		03	Internal mechanically polished Ra ≤ 0,8 µm + electro polished
		07	Internal mechanically polished Ra ≤ 0,6 µm
		08	Internal mechanically polished Ra ≤ 0,6 µm + electro polished
		09	Internal mechanically polished Ra ≤ 0,4 µm
		10	Internal mechanically polished Ra ≤ 0,4 µm + electro polished
		14	Internal mechanically polished Ra ≤ 0,25 µm
	page 10 - 11	16	Internal mechanically polished Ra ≤ 0,25 µm + electro polished
8	**S-Number:**	S...	To specify customized design and all the details for multiport valves

On the CD included in the last page of this catalogue you find a product selection program

Ordering Example

Position:	1	2	3	4	5	6.1	6.2	7
Article Code:	385	. 25	. 77	. 42	. 18	. 1	HS	. 03

Type:
385
KMD Series
plastic actuator
direct mounted
pneumatic

Size:
DN 25

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

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

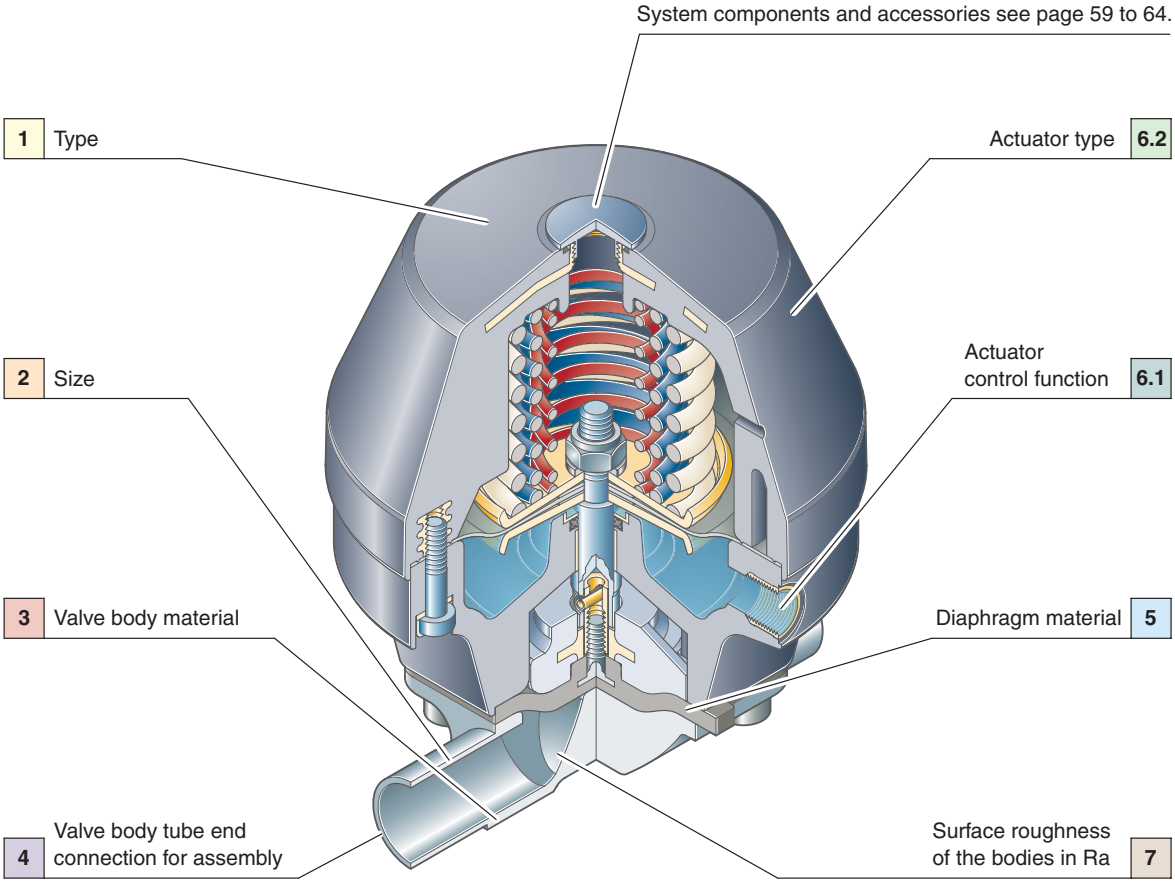
Surface roughness of the bodies in Ra:
Internal mechanical polish
and electro polish
Ra ≤ 0,8 µm

Actuator type:
KMD for steam
sterilizing up to
max. 150° C

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

Diaphragm material:
EPDM
FDA / USP compliant

System components and accessories see page 59 to 64.



Welded Valve Configurations

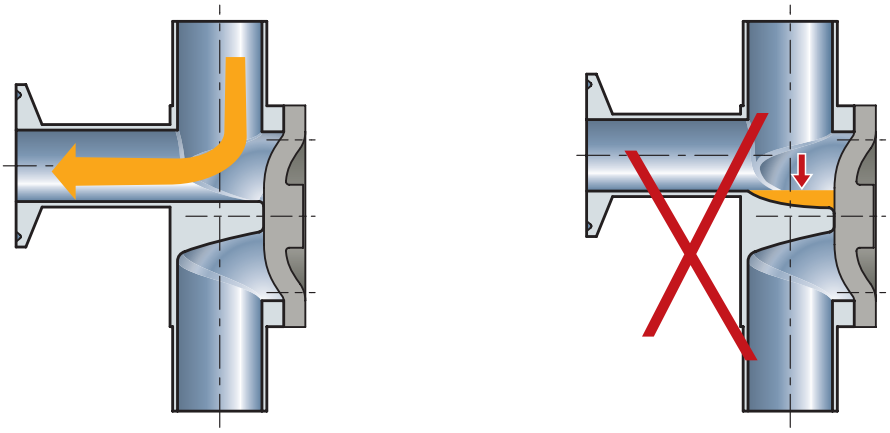
Welded valve configurations are designed to improve the process in aseptic production facilities by reducing the dead legs in accordance to cGMP. Welded valve configurations may be as simple as a valve by tube fabrication or as complex as multiple valve bodies of different sizes welded into a valve cluster.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

Strict quality control is followed for every welded valve configuration produced by SED. All weld seams that are accessible are polished according to the interior surface specification.
The completed welded valve configuration is visually inspected and 100% are pressure tested.

Advantages of a Welded Valve Configuration:

- Totally self draining
- Minimized dead legs
- Reduces surface contact and hold up volume of the medium
- Compact assembly
- Reduces number of welds
- Provides a 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.

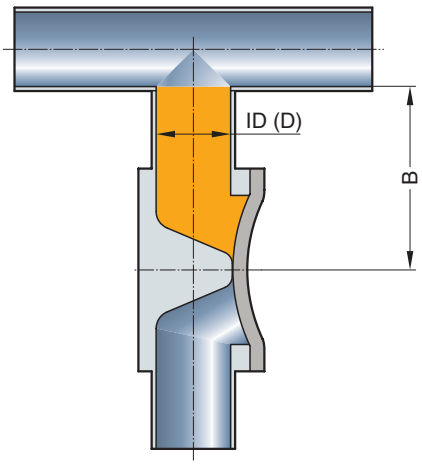


D-Rule

The D-Rule is the dead leg as a relationship 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 absolute value or as a relationship of 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 can not be met with a welded valve configuration, the solution is manufacturing of the valve body as a multiport valve which is made from solid block material.

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



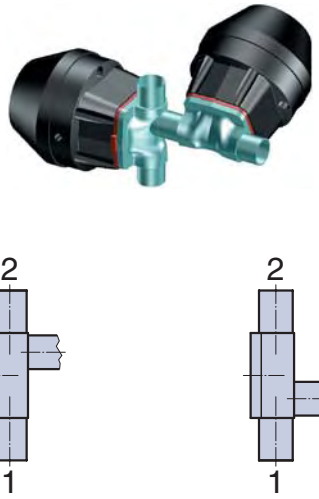
The B dimension and the relation of B/D are displayed in the dimensional data which can be provided on request.

Welded Valve Configurations

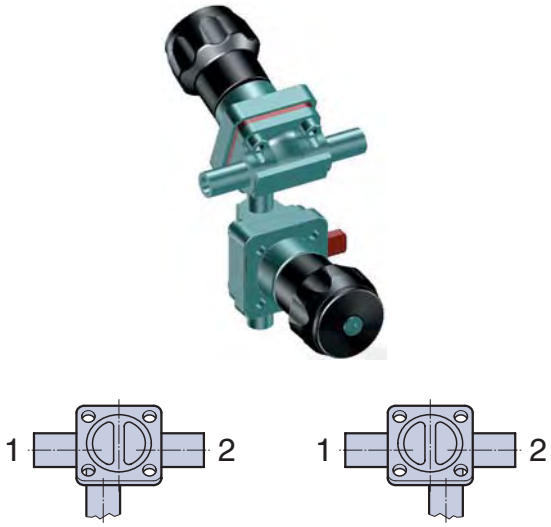
The main valve orientation distinguishes between the two different principles:

1) SL or GMP
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. See the following illustrations with possible combinations.

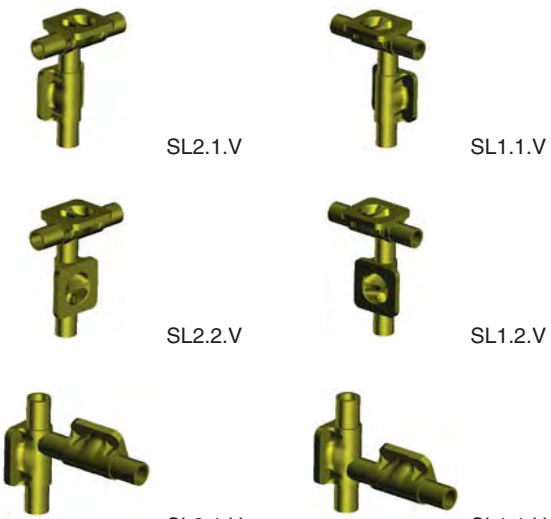
2) SA or SAP
The Sterile Access Fabrication is utilized in a horizontal piping system where the main valve is orientated at the self-draining angle and the access port is at the lowest drainable point of the waterway. The sterile access maybe used for applications including sampling, steam, condensate or divert port. The Sterile Access Fabrication is available with either a tube port or a vertical or horizontal valve port.
The size range available is up to DN 100 (4") for both the main valve and access valve or tube port.
See the following illustrations with possible combinations



SL - L Pattern Configurations



SA - Sterile Access Configurations



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

Why 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 is found in 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.

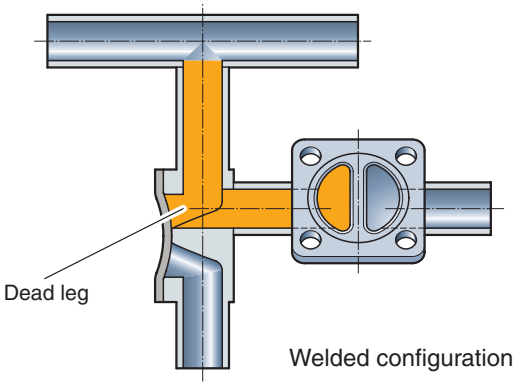
The ideal benefit for you, our customer, is achieved through active and cooperative teamwork of both parties during the design and specification of the valves. This refers especially to the process requirements dictated by the P&ID's for proper flow direction, drainability and installation restraints.

The Advantages at a Glance:

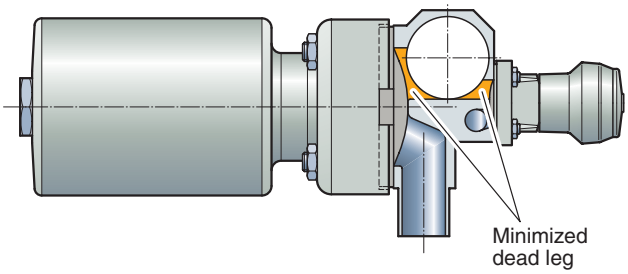
- Customer's specific design
- Compact design and smaller envelope dimension is achievable with the Steripur Series actuators
- Combination of many different nominal diameters
- Optimized drainability
- Minimized dead leg
- Reduces surface contact, hold up volume and cross contamination of the product
- Reduction of fittings, tubing and field welds in the system
- Reduces 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 below illustrations compare the hold up volume and the compact design of a multiport block valve to a welded valve configuration:

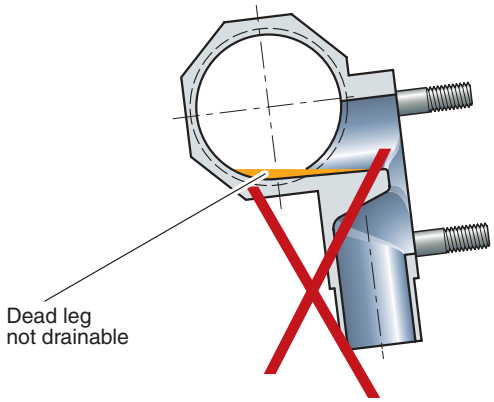


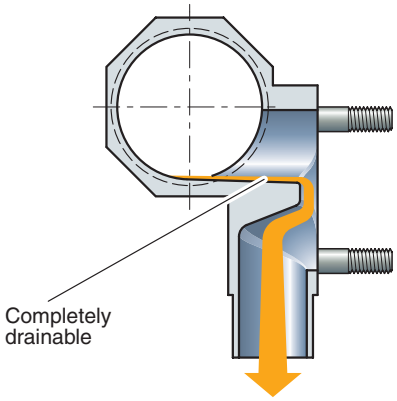
Welded configuration



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 allowed for efficiency in production.

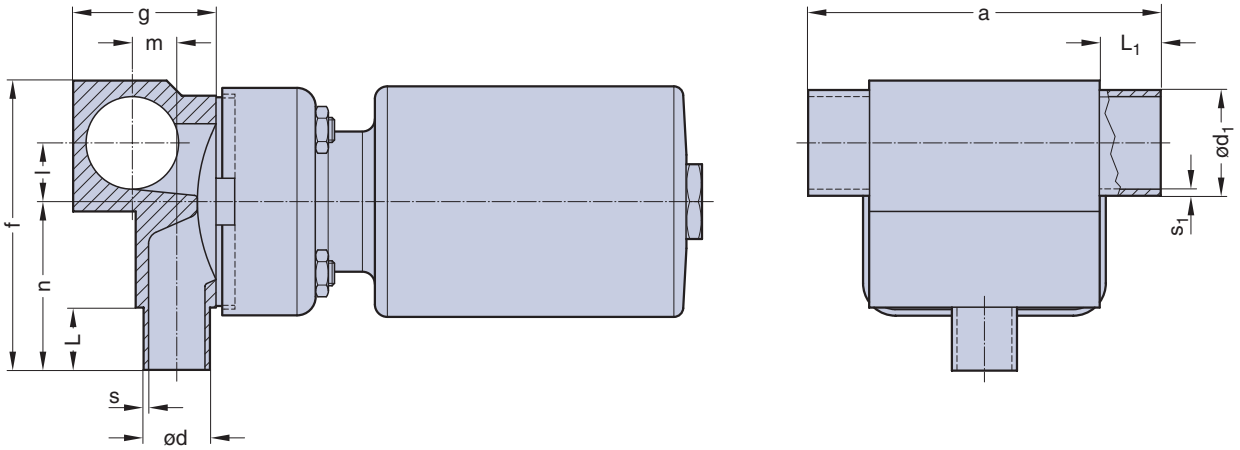
For the differentiation in the following tables, two main criteria are considered:

1) Multiport blocks with main line open for circulation (Page 49 to 51)

2) Multiport blocks with all lines and valve ports able to close (Page 52 to 54)

1) Multiport block valves with 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 55 as guideline

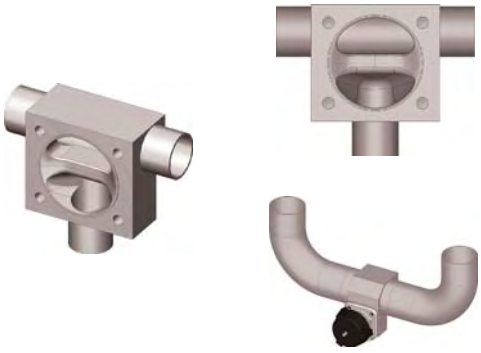
P&ID
Flow direction
Drain direction
Valve

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

1.1)
T-Valve or ZDL-Valve
1x Point of use valve port

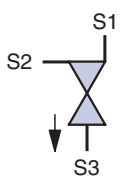
Recommended installation:
S3 down

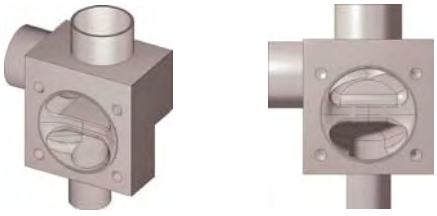
Illustration right side:
T-Valve with U-bend added for distribution loop installation



1.2)
ML 3/1
1x Point of use valve port with integrated directional flow 90° to the main line

Recommended installation:
S3 down





1) Multiport block valves with main line open

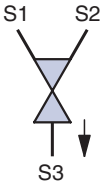
Description
For valve specification see page 55 as guideline

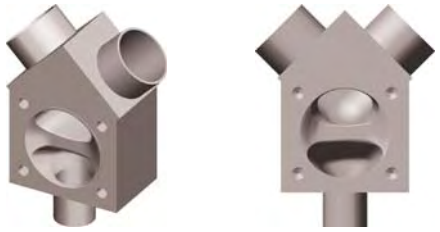
P&ID
Flow direction
Drain direction
Valve

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

1.3)
MY 3/1
1x Point of use valve port with Y main line inlet and outlet. Thus the inlet and outlet dimension of the main line is reduced and can meet the centerline dimensions of an ASME BPE 180° U-bend.

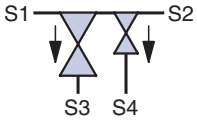
Recommended installation:
S3 down

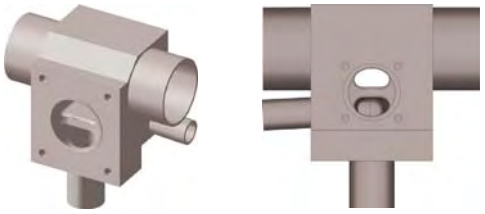




1.4)
MZ 4/2
1x Point of use valve port
1x Integral loop sample valve port
Can be opposite positioned as showed on the picture or sidewise.

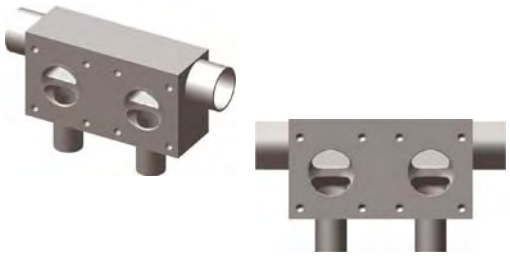
Recommended installation:
S3 down





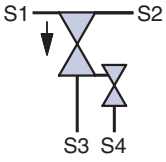
1.45)
MT 4/2
2x Point of Use Valve Port or Double Zero Dead Leg Tee Valve. One port may be used for sampling and the second port for down stream processing.

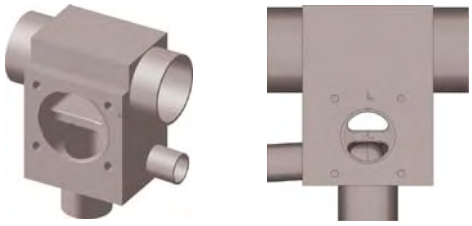
Recommended installation:
S3 and S4 down



1.6)
MX 4/2
1x Point of use valve port
1x Integral sample purge valve, valve port below the weir
Can be opposite positioned as showed on the picture or sidewise.

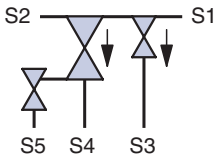
Recommended installation:
S3 down

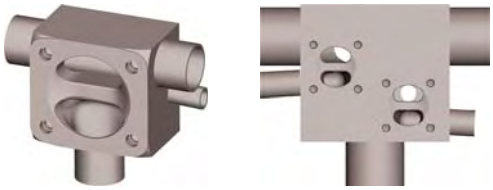




1.7)
MW 5/3
1x Point of use valve port
1x Integral loop sample valve port
1x Integral sample purge valve port below the weir.

Recommended installation:
S4 down





1) Multiport block valves with main line open

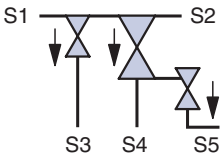
Description
For valve specification see page 55 as guideline

P&ID
Flow direction
Drain direction
Valve

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

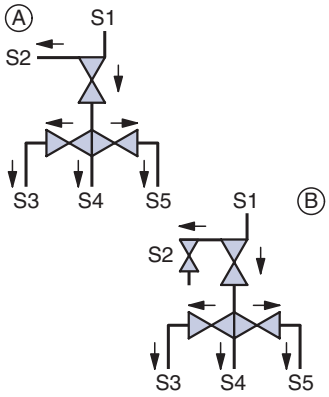
1.71)
MWP 5/3
Zero Dead Leg U-bend with
1 x point of use valve port,
1 x integral sample valve port
and 1 x integral purge valve port
below the weir.

Recommended installation:
S3 sample port down, S4 point of use valve port down, S5 purge port valve down or horizontal



1.8) MF 3/1
1x Point of use valve port with integrated directional flow 90° to the main line
1.8 A) MF 5/3
2x Integral sample purge valve port below the weir
1.8 B) MF 6/4
1x Integral loop sample valve port
2x Integral sample purge valve port below the weir

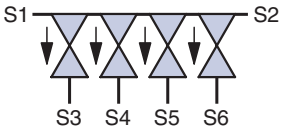
Recommended installation:
S5 and S3 down, S4 horizontal



P&ID: A

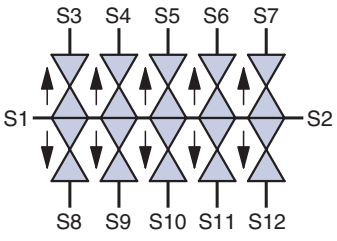
1.9)
MT 6/4
4x Point of use valve ports
The number of valve ports is variable

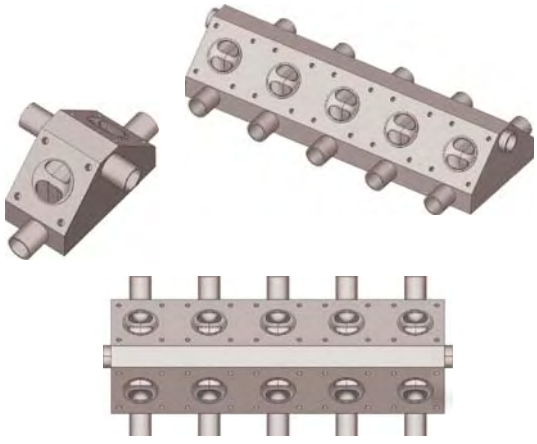
Recommended installation:
S1 and S2 horizontal
S3 to S6 vertical down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S6 are positioned to the lowest point of valve pocket



1.10)
MX 12/10
10x Point of use valve ports
The number of valve ports is variable

Recommended installation:
S1 and S2 horizontal
S3 to S10 horizontal or vertical down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S10 are positioned to the lowest point of valve pocket





2) Multiport block valves with all lines and valve ports able to close

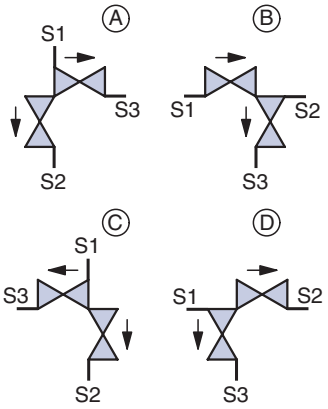
Description
For valve specification see page 55 as guideline

P&ID
Flow direction
Drain direction
Valve

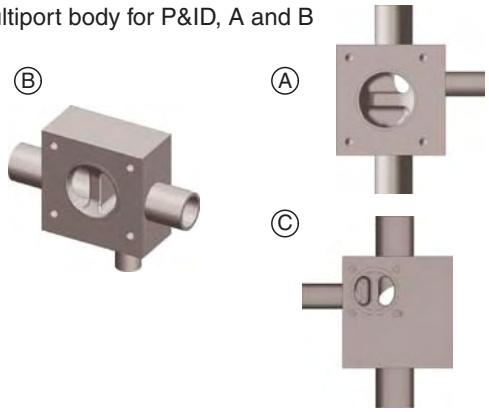
Illustration
Actuators and other options are included in some of the illustrations

2.1)
MFE 3/2
1x Valve horizontal
1x Valve vertical
Two parallel opposite orientated valve actuators.

Recommended installation:
Dependent on application

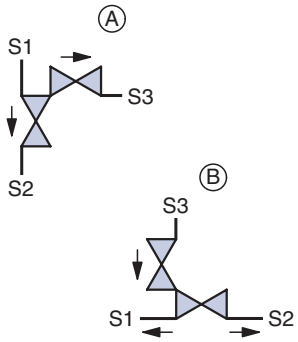


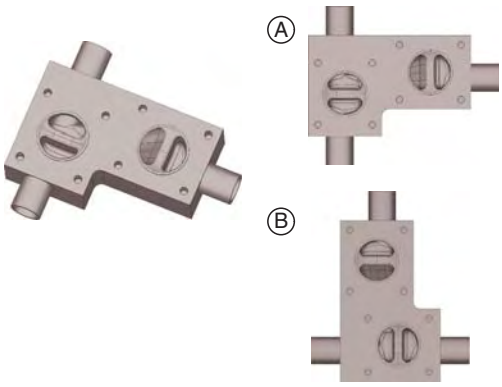
Multiport body for P&ID, A and B



2.11)
MFEP 3/2
Alternate to position 2.1)
1x Valve horizontal
1x Valve vertical
SL or SA block solution with 2D dead leg dimensions.

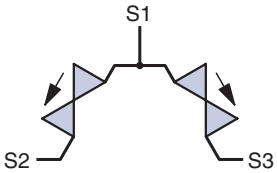
Recommended installation:
Dependant on application

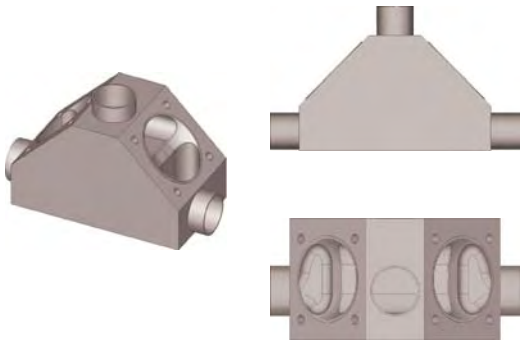




2.31)
MCE 3/2
2-Way Divert Valve

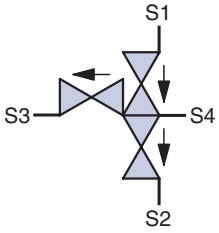
Recommended installation:
S1 vertical,
S2 and S3 horizontal.
The 2-way divert valve block body allows for many different inlet and outlet orientations.

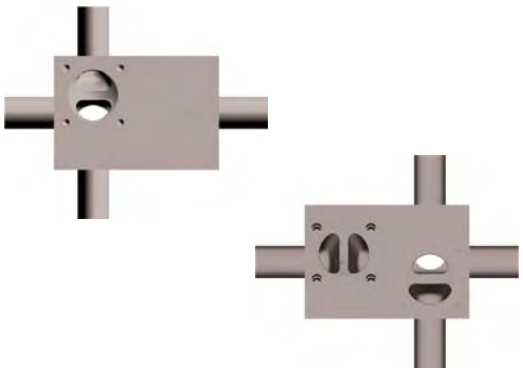




2.4)
MF 4/3
1x Valve horizontal
2x Valves vertical

Recommended installation:
S2 down
For 90° rotation, the block design has to be modified to provide drain ability





2) Multiport block valves with all lines and valve ports able to close

Description
For valve specification see page 55 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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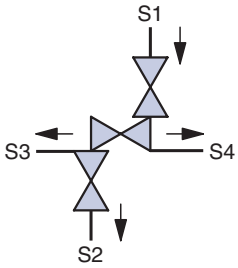
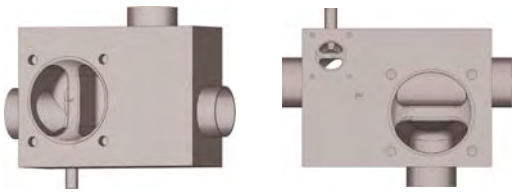
2.41)
MFE 4/3
1x Valve horizontal
2x Valve vertical

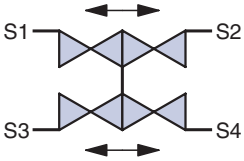
Recommended installation:
Main line isolation through S3 and S4,
S1 vertical up sterilization valve port,
S2 vertical down point of use, sample or drain valve port.





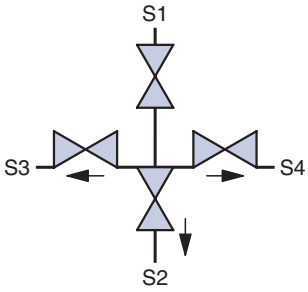
2.5)
MF 4/4 Cross over
4x Valves horizontal

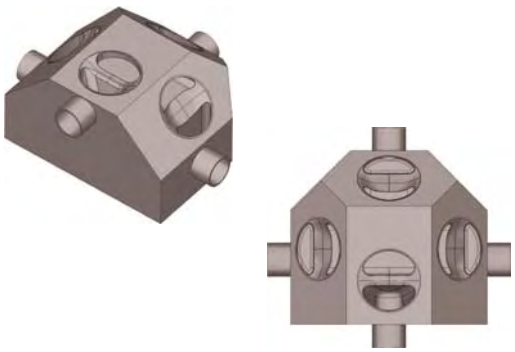
Recommended installation:
S1 to S4 horizontal position but it is also applicable in vertical position



2.51)
MBE 4/4
1x Valve inlet isolation
3x Valve divert process flow

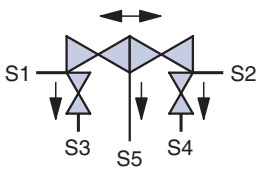
Recommended installation:
S1 horizontal inlet,
S2 horizontal straight through outlet,
S3 and S4 90 degree horizontal outlet.





2.71)
MT 5/4
2x Valve horizontal
2x Valve vertical

Recommended installation:
S1 and S2 horizontal with main line isolation, S3, S4, and S5 orientation vertical up or vertical down.



2) Multiport block valves with all lines and valve ports able to close

Description
For valve specification see page 55 as guideline

P&ID
Flow direction
Drain direction
Valve

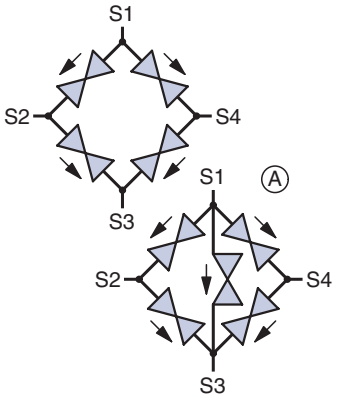
Illustration
Actuators and other options are included in some of the illustrations

---

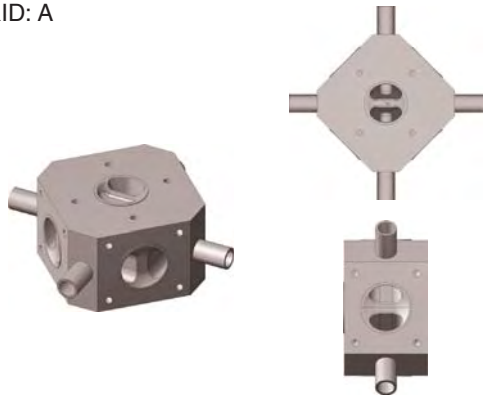
2.8)
MF 4/4
4x Valves vertical
Chromatography valve
without bypass

MF 4/5 (A)
5x Valves vertical
Chromatography valve
with bypass

Recommended installation:
S2 and S4 horizontal
S1 and S3 vertical

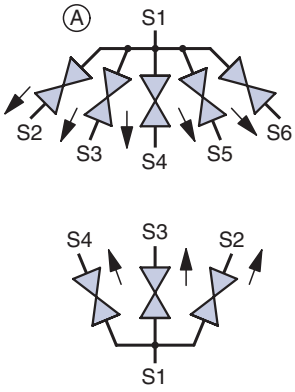


P&ID: A

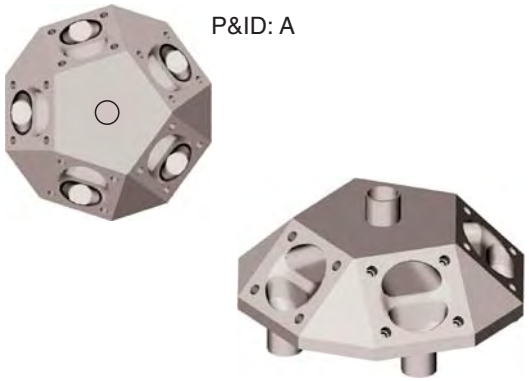


2.9)
MC 4/3 Star Design
3x Valves vertical
MC 6/5 Star Design
5x Valves vertical

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.

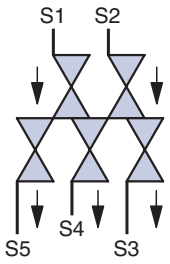


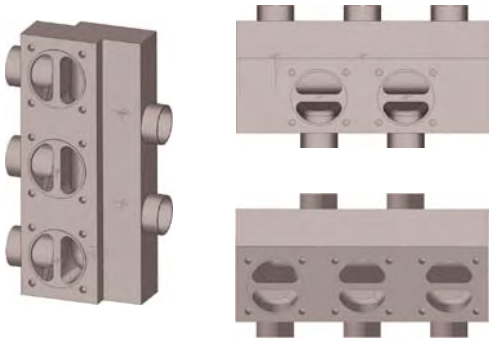
P&ID: A



2.95)
MT 5/5
5x Valve horizontal or vertical.

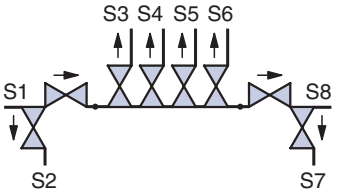
Recommended installation:
This block solution may be used for mixing, diverting, isolation or sterilization.

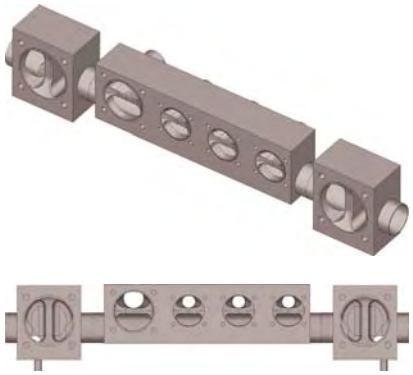




2.96)
4 valve block body manifold with 2 valve block body sterile access isolation on inlet and outlet.

2x Valve vertical sterile access
2x Valve horizontal isolation main line
4x Valve horizontal x vertical inlet

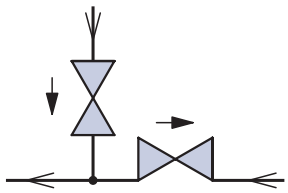




Specification Multiport Valves

Your P&ID Sketch:

Example: P&ID



Tube End: S1, S2, ...

Interior Polish Ra ≤ µm:
≤ µinch:

Preferred Installation: Horizontal (h) / Vertical (v)

Diaphragm Material:

Flow Direction:

Block Material:

Drain Direction:

Valve Seat: 

Valve seat horizontal axis rotated in self draining position 

Intersection: 

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 Valve

The SED Tank Bottom Valve is 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. The SED tank bottom valve incorporates 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.

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

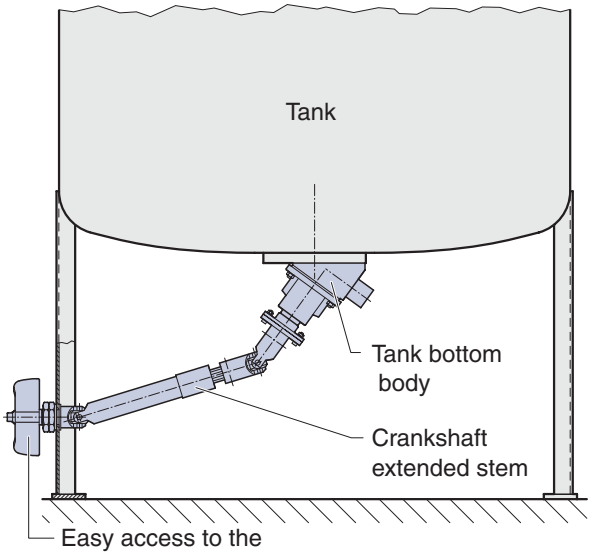
It is preferred to weld in the tank valve directly in the vessel. Mounting the valve directly to the tank minimizes the hold up volume, the most important criteria for this application. If removal of the tank valve from the tank is required, versions are offered with flange or clamp connections. Please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

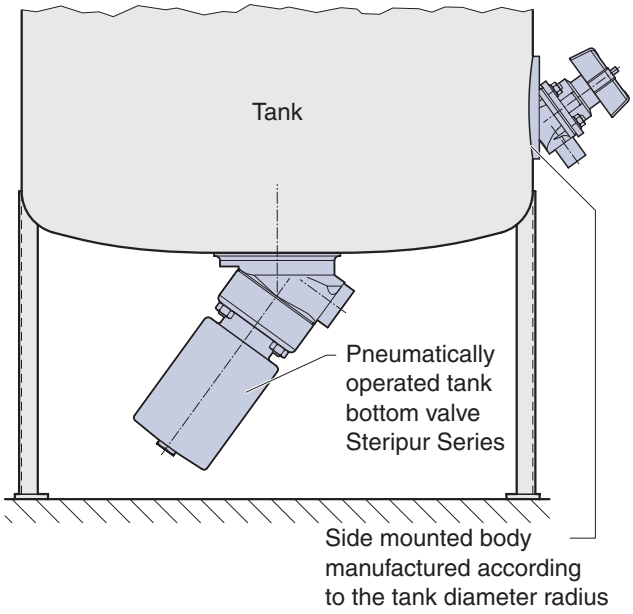
Tank bottom valves are typically used for tank discharge, draining, sampling, cleaning and/or sterilizing, rinsing and isolation of down stream processing.

The outlet port of the tank valve is available with all butt weld tube end standards (see fold-out page 15), aseptic clamp, screw connection (see page 16 and 17) 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
- Material 1.4435/316L ASME/ BPE
- 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

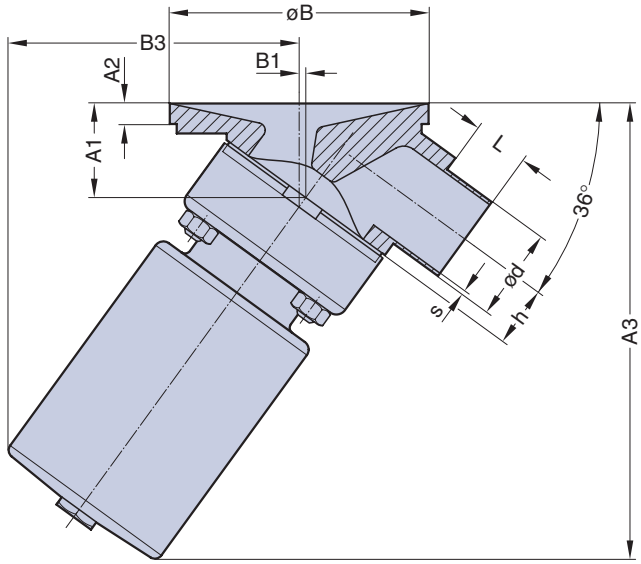
Steripur Series Pneumatically Operated

KMA Series Manual

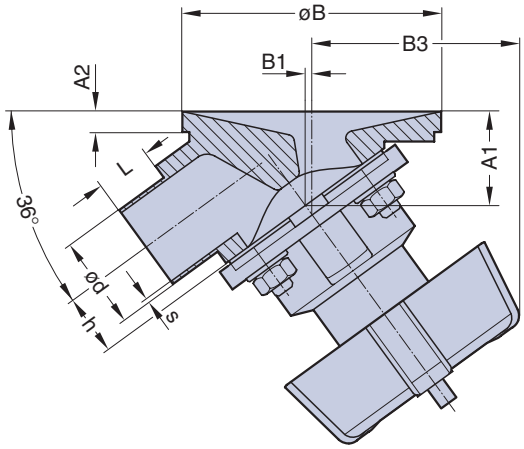
KMA Series Pneumatically Operated

Tank Valve

Example:
Drawing Steripur Series pneumatically operated



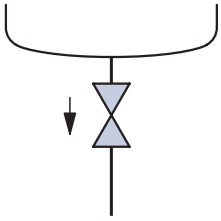
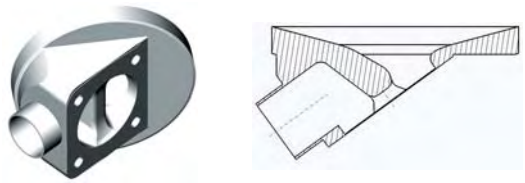
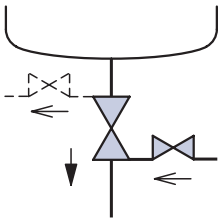
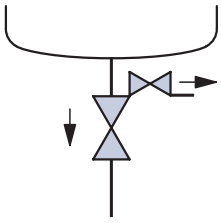
Example:
Drawing KMA Series manually operated

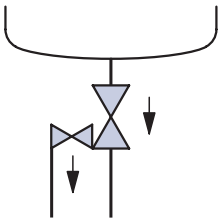
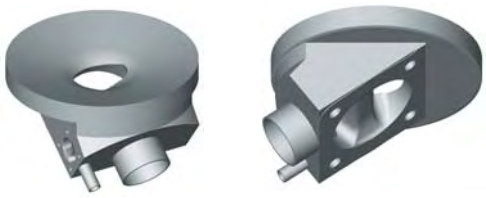
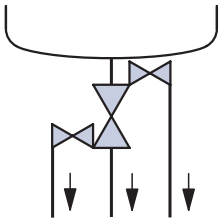
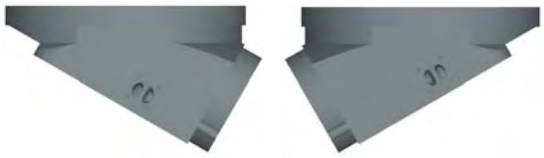
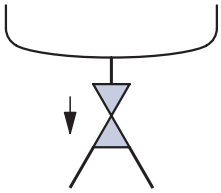
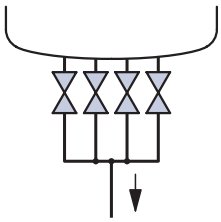
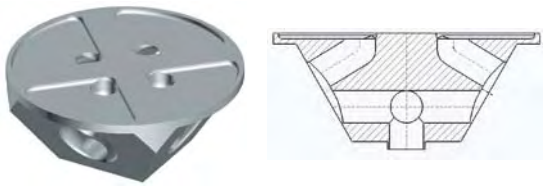
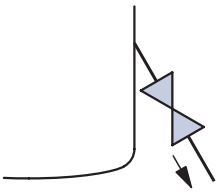
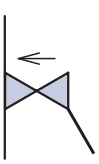
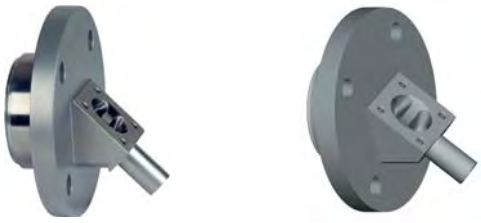


On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.

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	**P&ID**	**Image**
Select a tank valve or see page 55 to sketch and specify your solution	→ Flow direction → Drain direction ⋈ Valve	Actuators and other options are included in some of the illustrations
1) **BT** 1x Valve port Standard tank bottom body Tank body for the tank bottom		
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** 1x Main Valve 1x Sample valve tank side right Like position 2 but includes an integral sample valve tank side. Right side and left side options are available and are fully drainable.		

Description	P&ID	Image
Select a tank valve or see page 55 to sketch and specify your solution	Flow direction Drain direction Valve	Actuators and other options are included in some of the illustrations
4) **BXL 3/2** 1x Main Valve 1x Sample valve outlet left Like position 2 but includes an integral outlet valve. Right side and left side options are available and are fully drainable.		
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		
7) **BT 5/4** 4x Main valves 1x Port Application with 4 internal tank partitions.		
8) **BU** 1x Tank 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.		
9) **BF** Customized for aseptic modular retainer mounted in aseptic piping installations.		

Overview

Description	Type	Suitable for valve			Detail see page
		Size (DN)	Pneumatically operated	Manual	
Optical position indicator	024.10	4 - 100	●	●	60
Stroke limiter	024.11	4 - 100	●	●	60
Stroke limiter with optical position indicator	024.12	4 - 100	●	●	60
Manual override with optical position indicator	024.13	4 - 50	●		60
Travel stop	024.886	4 - 100	●	●	60
Manual override with hand wheel	024.42	4 - 100	●		60
Control head switch with optical indicator "catch the eye"	024.63 024.64 024.65	4 - 100	●		61, 64
AS-Interface control head switch with optical indicator "catch the eye"	024.89	4 - 100	●		61
Limit switch with one mechanical switch and optical indicator	024.90	4 - 100	●	●	61
Catch the eye with proximity switches and travel stop Catch the eye with proximity switches and stroke limiter	024.98 024.99	15 - 50	●		61
Mounting bracket for proximity switch	024.45	15 - 100	●		61
Limit switch with LED	024.62	4 - 100	●		61
Pilot valve for direct mounting	600	15 - 100	●		61
Pilot valve for manifold mounting	605	15 - 100	●		61
Digital positioner separate for remote control or directly mounting via a bracket on the top of the valve	024.16.400	15 - 100	●		62, 63
Digital positioner central for direct mounting	024.16.700	15 - 100	●		62, 63
Paddle wheel flow sensor	F24	4 - 100	●		62
Manual valve prepared for mounting proximity switch	024.96	15 - 100		●	
Adapter for direct mounting one proximity direct on top in the valve actuator	SO795	4 - 100	●		

System Components and Accessories are shown on page 60 - 65.

Manual Adjustment - Optical Indication

024.11
Stroke limiter

024.12
Stroke limiter
with optical
position indicator

024.13
Manual override
with optical
position indicator

024.886
Travel stop

024.10
Optical position indicator

024.42
Manual override
with hand wheel

Electrical Switch Boxes - Manual Adjustment - Pilot Control

024.62
Limit switch with LED

024.45
Mounting bracket
for proximity switch

024.98
"Catch the Eye" with travel stop and proximity switches for open and closed
024.99
"Catch the Eye" with stroke limiter and proximity switches for open and closed

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 64)
024.89
AS-Interface Control Head Switch for open and close position with optical indicator catches the eye
(See page 64)

605
Pilot valve for
manifold mounting

600
Pilot valve for
direct mounting

Process Automation

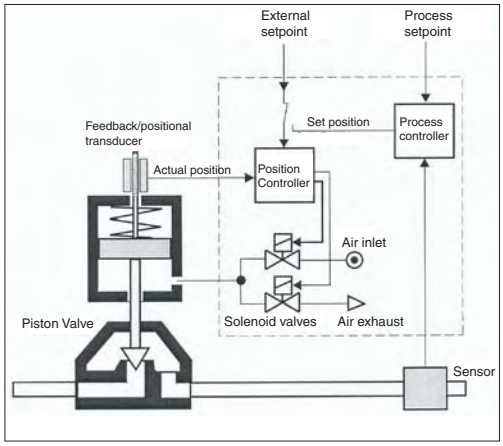
024.16.4
Positioner Separate
Electropneumatic positioner for pneumatically actuated valves with internal or external path-measuring system

External path measuring

Valve Steripur Series Type 407

024.16.7
Positioner Central
Electropneumatic positioner for pneumatically actuated valves
Optional as process controller with PID characteristics

Paddlewheel Flow Sensor
Housing material 1.4435
Paddlewheel ECTFE



Operational diagramm

Electropneumatic Positioner

Type 024.16.7 Positioner Central

Electropneumatic positioner for pneumatically actuated control valves

Main Features:

- Position sensor for continuous measurement of the current position in the pneumatic actuator
- Microprocessor controlled electronics for signal processing, actual/setpoint
- Pneumatic positioning system for single or double acting actuators

Technical Data:

Housing/ Cover material	PPE/PA/ PSU (transparent)
Control air and ambient temperature	-10…+50 °C
Control medium	Quality classes to DIN ISO 8573-1
Control air connection	G1/4; NPT _ on request
Supply pressure*	3…7_ bar
Flow capacity Q_{Nn}	100 L/min
Intrinsic air consumption	0 L/min
Operating voltage	24 V DC +/- 10%
Residual ripple	10% Not industrial DC!
Power consumption	< 5 W
Electrical connection	3 bushings (M16x1,5, screw terminals)
Set point setting	0/4…20 mA; 0…5/10 V
Input resistance for setpoint signal	180 Ohm with 0/4…20 mA 19 kOhm with 0…5/10 V
Sensor Inputs for process controller	4…20ma PT100, frequency
Input resistance for process value signal	180 Ohm with 4 - 20 mA 17 kOhm with frequency
Lift turn	5…45 mm
Options	2 binary outputs, inductive proximity switches, analog feedback, process controller
Bus communication	Profibus DP or DeviceNet
Operating panel and configuration	Module with 3 keys for parametrization
Display for setpoint and process value	8-digit, 16 segment LC display
Type of protection	IP65 to EN 60529
Conformity	CE to EMV-9/336/EWG

Type 024.16.4 Positioner Separate

Electropneumatic positioner for pneumatically actuated control valves

Main Features:

- Regulation range of internal path-measuring system for remote assembly
- Microprocessor/electronic unit for signal processing and control
- Pneumatic positioning system for single or double acting actuators

Technical Data:

Housing/ Body material:	Aluminum lacquered
Operating temperature	0…+60 °C
Control medium	Quality classes to DIN ISO 8573-1
Control air connection	G1/8 internal thread
Supply pressure*	0…6 bar
Intrinsic air consumption	0 L/min
Flow capacity	low 35 L/min, high 70 L/min
Operating voltage	24 V DC +/- 10%
Residual ripple	10% Not industrial DC!
Power consumption	< 10 W
Input for setpoint	0/4…20 mA, 0…10 V
Input for process signal	4…20 mA
Binary input	Can be configured as a normally open or normally closed contact
Terminations	1,5 mm_ bolted terminals two cable glands
Type of protection	IP65 to EN 60529
Lift turn of internal path- measuring system	10…80 mm
Option	analog feedback (4-20mA)

*Pressure stated in bar: are excess to atmosphere

Control Head Switch 024.63. - 024.89.

The SED control head switch is an innovative development based on years of experience in manufacturing electrical accessories for process valves. Depending on the version, the 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.

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

Self Positioning:
After mounting the control head, the two cams activating the switches in the control head will be mechanically moved by overcoming their holding force on the spindle. To adjust the closed position, the control head switch 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 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.

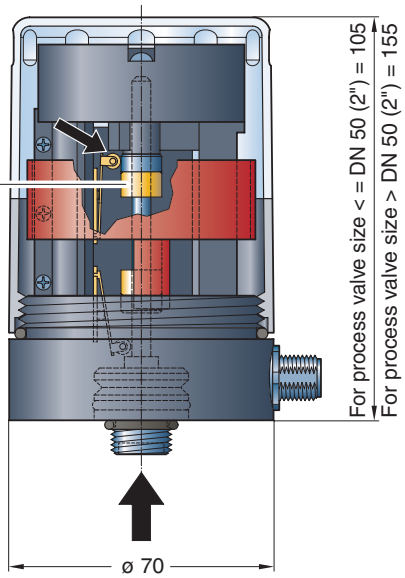
Features:

- Self adjusting
- Circumferential catch the eye 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

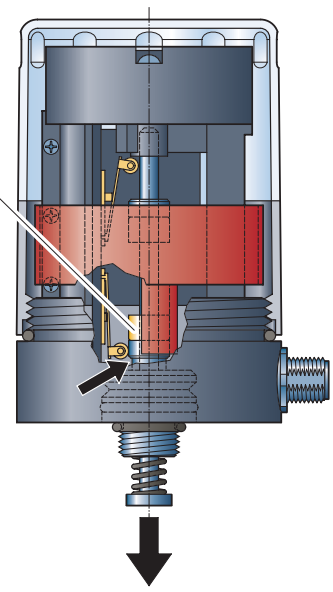
Optional:

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

Position valve open:



Position valve closed:



Versions Control Head

Code	Electrical connection	Electro-mechanical limit switch Open/ Close	Proximity switch	
			Namur (2-wire)	PNP (3-wire)
		(pcs)	(pcs)	(pcs)
024.63.6..	Pre-wired 8 pins M12 x 1	2		
024.64.6..	Pre-wired 8 pins M12 x 1		2	
024.65.6..	Pre-wired 8 pins M12 x 1			2
024.89.6.. AS-Interface	Pre-wired 4 pins M12 x 1	2		
024.89.7.. AS-Interface	Pre-wired 4 pins M12 x 1			2

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

SED Product Range

Diaphragm Valve

Aseptic Diaphragm Valve

Industrial Metal Diaphragm Valve

Plastic Diaphragm Valve

System Components

Solenoid Valve

Switches and Manual Adjustment

Electropneumatic Positioner

Seat Valve

Two-Way Metal Globe Valve

Two-Way Metal Angle Seat Valve

Flow Measurement

Variable Area Flowmeters

Paddle Wheel Flow Sensor

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.
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.
BioProcessing Equipment Committee	**BPEC**	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.
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.
Electro-Polish	**EP or E/P**	Electrochemical polishing process for metal components where metal ions are removed from the surface of the metal.
European Hygienic Equipment Design Group	**EHEDG**	The group's objective is to provide standardization organizations (CEN and ISO) with specialist views on hygienic and aseptic design by publishing requirements and test methods. Accredited bodies carry out cleaning tests which are certified if successful.
European Pharmacopoeia	**EP**	European counterpart to USP. A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices and diagnostics.
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.
Mill Test Report or Material Test Report	**MTR**	A document certifying the composition of a metal from a particular heat batch.
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.
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.
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.

CD with Product Selection and Configuration Data Base and PDFs of the Catalogue

If you are interested in our product configurator and the catalogue as PDF, we would be pleased to send you on CD.

The configurator selects the appropriate valve(s) based on your settings and provides the full specification.

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