SED
FLOWCONTROL

VALVES FOR
ASEPTIC APPLICATIONS

www.sed-flowcontrol.com

Aseptic Applications

Pharmaceutical Project

Filtration Skid

Human blood fractionation

Filling

Mixing

Bioreactor Skid

Biopharm Project

Table of Contents

1 Introduction — Page

A Brief Overview 4
The Company 5
What does Quality mean at SED? 6

General Information
Testing 7
Qualification, Certification and Documentation 8
Flow Rate and Valve Sizing 9
Surface Finish 10, 11

2 Media Contacted Components
Diaphragms 14 - 17
Valve Bodies (fold out page) 18
Butt Weld Tube Ends (fold out page) 19

Aseptic Connections
Clamps 20
Aseptic Flanges and Aseptic Threads 21

3 Aseptic Diaphragm Valves
Overview Diaphragm Aseptic Valves 24 - 25
Why Aseptic Diaphragm Valve? 26
Self Draining - Two-Way Valve 27
Innovative Design 28 - 31
Aseptic Diaphragm Valves
Aseptic Diaphragm Valve Manual 32 - 41
Aseptic Diaphragm Valve Pneumatically Operated 42 - 55
Ordering Key and Ordering Example 56, 57

4 Aseptic Diaphragm Valve Configurations
D-Rule 60
Welded Valve Configurations 61 - 63

Multiport Valves
Why Multiport Valves? 64
Main line open, Loop Valves (e.g. T-Valve) 65 - 69
All lines and valve ports able to close 70 - 75
The way of customized multiport valve designs 76
Specification Multiport Valves 77

Tank Valves 78 - 81

Process Solutions
Sterile Sampling Unit 82
Purified Steam Sampling Unit 83

5 Angle Seat Valves
Description and Features 86
Applications 87
Ordering Key and Ordering Example 88, 89
Technical Data 90
2/2-Way Angle Seat Valves 91 - 97
Valve Body Threaded Socket and Butt Weld End 98
Valve Body Clamp Socket and Flange 99

6 System Components and Process Automation
Overview 102
Manual Adjustment - Optical Indication 103
Electrical Switch Boxes - Pilot Control 104

Detailed Information
3/2 Way Plastic Pilot Valve Type 602 / 603 105
Contact-Free Limit Switch 024.50 106, 107
Control Head Switch 024.63. - 024.89. 108

Process Automation, Electropneumatic Positioners 109, 110

Overview Product Range 111

Glossary 112

A Brief Overview

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

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.

Production building

The Company

CAD- CAM working station

Ultrasonic cleaning of valve bodies

Valve cluster assembled with patent Steripur and KMA actuation

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

Specifically:

- 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.

CNC machining center

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.

Spectrometer and RFA material analysis

The Fundamental Areas of Our Quality Policy:

Products and Services:

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

Process system application with standard and multiport compact customized valve solutions

Suppliers:

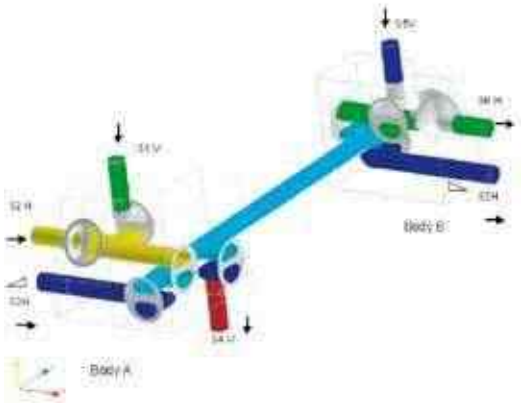
The quality of our products is directly dependent on the performance of our suppliers.
Through a supplier qualification process, continuous assessments are performed, documented and form the basis of a close customer-supplier-relationship.

Work Sequences:

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

Customers:

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



3D modeling and flow direction of a multivalve cluster

Employees:

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.

Testing

Complete Valve Assembly Inspection
- 100% according to checklist

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

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

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

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

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

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

Delta Ferrite measurement of stainless steel valve bodies

Zeiss Coordinate measuring machine (CMM)


TÜV
ZERTIFIKAT
TÜV
ZERTIFIKAT
SEᗡ
ZERTIFIKAT


TÜV

Flow Rate and Valve Sizing

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

K_V-value

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

For water 5-30°C applies:

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

General Liquid Flow Formula:

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

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

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

Explanations:

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

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

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

The K_{VS}-Values in the table refer to the specification with Two-Way valve bodies with EPDM diaphragm (Depending on the specification variations are possible).
The K_{VS}-Values with PTFE diaphragm maybe lower due to higher stiffness of the material, particularly in applications with lower working pressure.

Surface Finish

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

The surface finish is 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

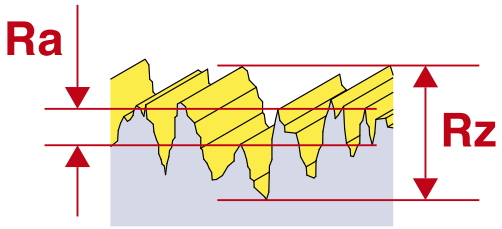
Reasons for Electro Polishing

- 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 and l_n = 4,0 mm measuring range split in 5 single measuring sections l_r = 0,8 mm each measured transverse to the polished image.



Definition of the SED codes for Ra-Values

Allocation to the standard DIN 11866:

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

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

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

Tape Print Out of Surface Finish

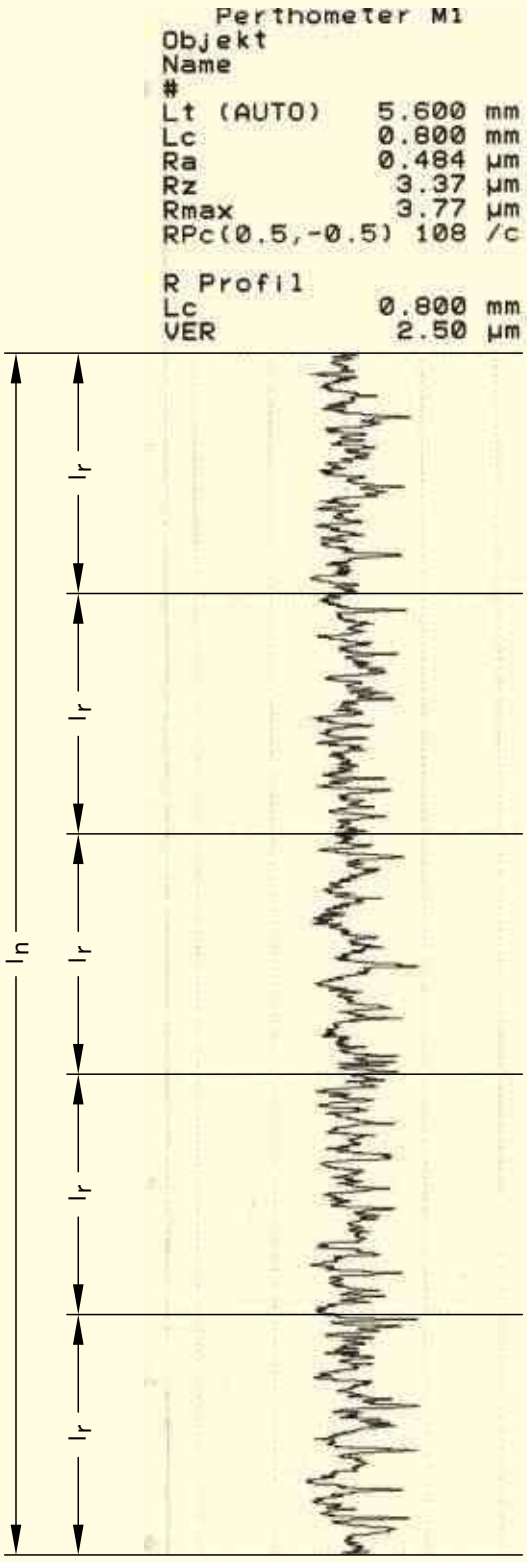


Table of Contents

		Page
1	**Introduction**	
	A Brief Overview	4
	The Company	5
	What does Quality mean at SED?	6
	General Information	
	Testing	7
	Qualification, Certification and Documentation	8
	Flow Rate and Valve Sizing	9
	Surface Finish	10, 11
2	**Media Contacted Components**	
	Diaphragms	14 - 17
	Valve Bodies (fold out page)	18
	Butt Weld Tube Ends (fold out page)	19
	Aseptic Connections	
	Clamps	20
	Aseptic Flanges and Aseptic Threads	21
3	**Aseptic Diaphragm Valves**	
	Overview Diaphragm Aseptic Valves	24 - 25
	Why Aseptic Diaphragm Valve?	26
	Self Draining - Two-Way Valve	27
	Innovative Design	28 - 31
	Aseptic Diaphragm Valves	
	Aseptic Diaphragm Valve Manual	32 - 41
	Aseptic Diaphragm Valve Pneumatically Operated	42 - 55
	Ordering Key and Ordering Example	56, 57
4	**Aseptic Diaphragm Valve Configurations**	
	D-Rule	60
	Welded Valve Configurations	61 - 63
	Multiport Valves	
	Why Multiport Valves?	64
	Main line open, Loop Valves (e.g. T-Valve)	65 - 69
	All lines and valve ports able to close	70 - 75
	The way of customized multiport valve designs	76
	Specification Multiport Valves	77
	Tank Valves	78 - 81
	Process Solutions	
	Sterile Sampling Unit	82
	Purified Steam Sampling Unit	83
5	**Angle Seat Valves**	
	Description and Features	86
	Applications	87
	Ordering Key and Ordering Example	88, 89
	Technical Data	90
	2/2-Way Angle Seat Valves	91 - 97
	Valve Body Threaded Socket and Butt Weld End	98
	Valve Body Clamp Socket and Flange	99
6	**System Components and Process Automation**	
	Overview	102
	Manual Adjustment - Optical Indication	103
	Electrical Switch Boxes - Pilot Control	104
	Detailed Information	
	3/2 Way Plastic Pilot Valve Type 602 / 603	105
	Contact-Free Limit Switch 024.50	106, 107
	Control Head Switch 024.63. - 024.89.	108
	Process Automation, Electropneumatic Positioners	109, 110
	Overview Product Range	111
	Glossary	112

Certification and Compliance for Validation

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

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

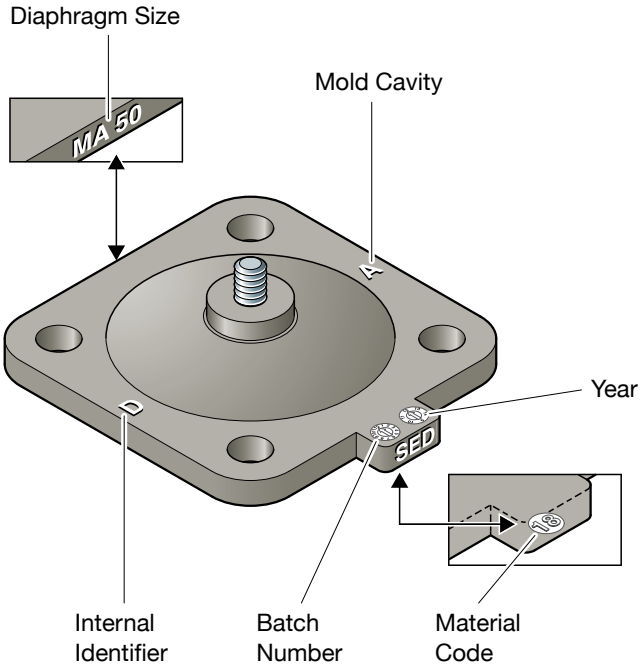
Diaphragm Traceability

All diaphragms are clearly indentified and the material is batch traceable by a set of unique codes molded into the diaphragm during the manufacturing process.
The traceability back to the formulation of the material with mechanical and physical properties is available.
The picture beside shows the permanent markings on the diaphragm. Depending on the size and material of the diaphragm, the location of these markings may vary.

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

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

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



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 or top works and the external atmosphere.
In addition the diaphragm is the dynamic part which the flow rate of the process medium is controlled and stopped.
The developing of formulation of compound is done closely with a specialised company developing, producing and testing compounds since many years together with SED for our market.
The SED diaphragms have been developed and tested over years and are subject to stringent testing specification in our own test stands and third party. These tests are continuously performed with different specification to simulate as close as possible different real processes. E.g. one of the testing is performed with a automatic saturated steam sterilisation loop. (see picture below).
The tests result has an influence on the design, composition of the materials, valve body design, actuation 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.

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

Diaphragm Dimensions MA 25 - 80 (mm)

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

*Diaphragm size

EPDM

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.

PTFE (TFM)

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.

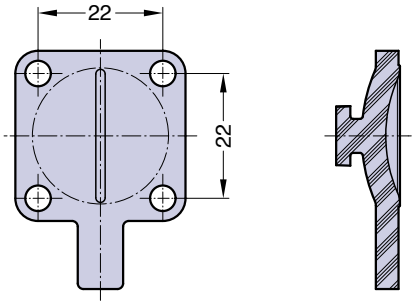
MA25 to MA100
The diaphragm dimensions MA25 to MA100 are designed as two-piece diaphragms-consisting of a separate EPDM backing cushion and PTFE diaphragm. The diaphragm is always manufactured in the molded closed position. The advantage of this design for the MA25 to MA100 is that the diaphragm is in 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.

SED Code		18	30	51	44
MA		**8 - 100**	**25, 40, 50**	**8, 10**	**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	-4 to 300		-4 to 320

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, bigger sizes and for higher temperature up to 175°C/350°F.

Diaphragms

MA 8



EPDM

Code 18

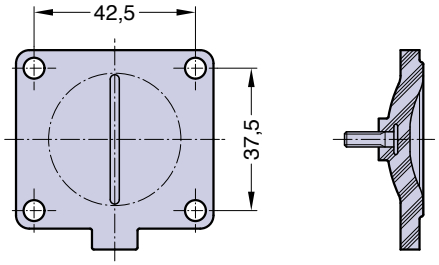
PTFE / EPDM

One-piece

Code 51

Molded Open

MA 10



EPDM

Code 18

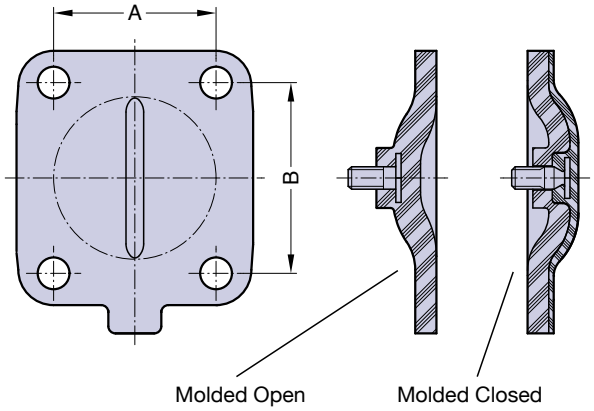
PTFE / EPDM

One-piece

Code 51

Molded Open

MA 25 - 80



EPDM

Code 18

Molded Open

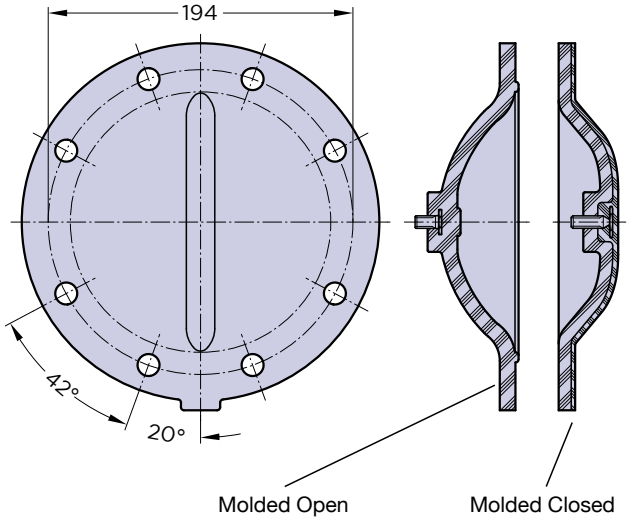
PTFE / EPDM

Two-piece

Code 44

Molded Closed

MA 100



EPDM

Code 18

Molded Open

PTFE / EPDM

Two-piece

Code 44

Molded Closed

Valve Bodies

The SED valve bodies as standard are manufactured of the material 1.4435 / S31603 ASME BPE Table MM-2.1-1 and according to EN 10204 inspection certificate 3.1/ Material Test Report (MTR). 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.

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.

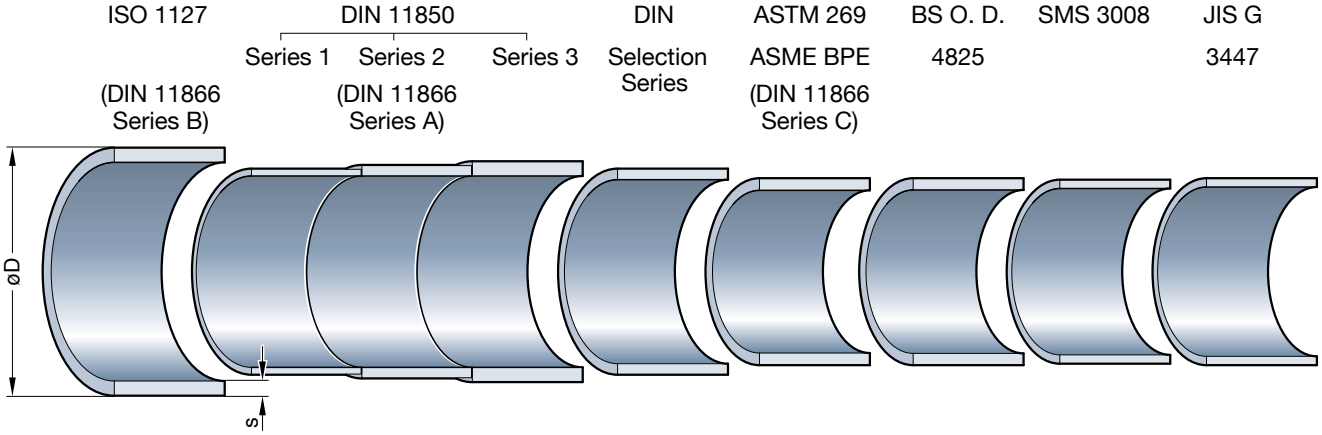
Component	Tube Size	Manufacturing Process
2/2 way body	4 - 80 mm / 1/4 - 3" 100 - 150 mm / 4 - 6" 4 - 100 mm / 1/4 - 4"	forged block material investment cast
Multiport body	4 - 150 mm / 1/4 - 6"	block material
Tank valve	4 - 150 mm / 1/4 - 6"	block material

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

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

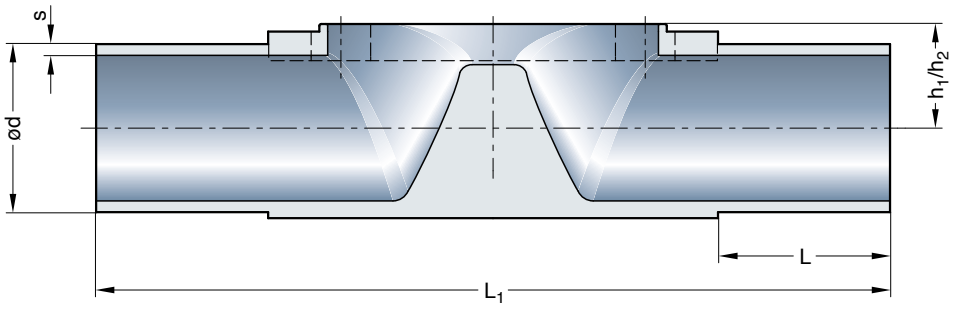
According ASME BPE 2014 Table MM-2.1-1 alloy comparable with material S31603 and listed in previous versions of ASME BPE as 316L.
Sulfur content ASME BPE always within 0,005 to 0,017.
Other alloys are available on request, below is a list of materials machined from solid block:
- Super-Austenitic Stainless Steel
- Duplex Stainless Steel
- Nickel Alloys
- Titanium

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



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		DIN	ASTM 269	BS O.D.	SMS	JIS G
								Series 1	Series 2	Selection	ASME BPE	4825	3008	3447
							DIN 11866 Series B		DIN 11866 Series A	Series	DIN 11866 Series C			
							40	41	42	39	45 [1]	94	49	97
DN	NPS	MA	L(min)	L1	h1	h2	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s	ød x s
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 [2]	8x1,0	-		-	-
8	1/4	**8**	20	72	9	9	**13,5x1,6**	-	10x1,0 [2]	10x1,0	6,35x0,89		-	-
10	3/8	**8**	20	72	9	9	-	12x1,0	**13x1,5**	-	9,53x0,89		-	-
15	1/2	**8**	20	72	9	9	-	-	-	-	**12,7x1,65**	12,7x1,2	-	-
Valve Type Manually Operated 289 / 295 / 397 Valve Type Pneumatically Operated 188 / 195 / 307 / 392														
8	-	**10**	25	108	12	12	13,5x1,6	-	-	-	-		-	-
10	3/8	**10**	25	108	12	12	**17,2x1,6**	12x1,0	13x1,5	-	9,53x0,89		-	-
15	1/2	**10**	25	108	12	12	**21,3x1,6**	18x1,0	**19x1,5**	18x1,5	12,7x1,65	12,7x1,2	-	-
20	3/4	**10**	25	108	12	12	-	-	23x1,5	22x1,5	**19,05x1,65**	19,05x1,2	-	-
Valve Type Manually Operated 905 / 985 / 995 / 997 Valve Type Pneumatically Operated 385 / 395 / 402 / 407 / 495 / 592														
15	-	**25**	25	120	13	16	21,3x1,6	18x1,0	19x1,5	-	12,7x1,65		-	-
20	3/4	**25**	25	120	16	16	**26,9x1,6**	22x1,0	**23x1,5**	-	19,05x1,65		-	-
25	1	**25**	25	120	19	19	**33,7x2,0**	28x1,0	**29x1,5**	28x1,5	**25,4x1,65**		25,0x1,2	25,4x1,2
32	1 1/4	**40**	25	153	24	26	**42,4x2,0**	34x1,0	**35x1,5**	-	31,75x1,65		33,7x1,2	31,8x1,2
40	1 1/2	**40**	25	153	24	26	**48,3x2,0**	40x1,0	**41x1,5**	-	**38,1x1,65**		38,0x1,2	38,1x1,2
50	2	**50**	30	173	32	32	**60,3x2,0**	52x1,0	**53x1,5**	-	**50,8x1,65**		51,0x1,2	50,8x1,5
65	2 1/2	**50**	30	173	32	32	-	-	-	-	**63,5x1,65**		63,5x1,6	63,5x2,0 [1]
65	2 1/2	**80**	25	216	47	47	**76,1x2,0**	-	**70x2,0**	-	**63,5x1,65**		63,5x1,6	63,5x2,0 [1]
80	3	**80**	30	254	47	47	**88,9x2,3**	-	**85x2,0**	-	**76,2x1,65**		76,1x1,6	76,3x2,0
100	4	**100**	30	305	61	58	**114,3x2,3**	-	**104x2,0**	-	**101,6x2,11**		101,6x2,0	101,6x2,1

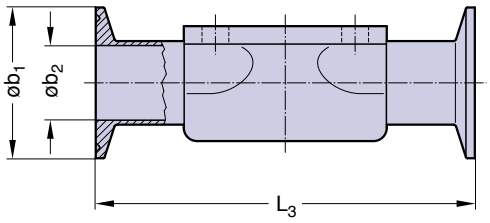
Dimensions in mm; MA = Diaphragm size / Upon request, other tube end standards are available / Preferred standards bold

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

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

Dimensions mm

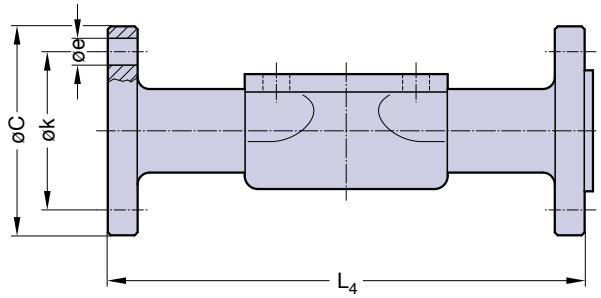
Clamp End Ident.			Similar **ISO 2852**			**DIN 32676**			**ASME BPE**			**ASME BPE**			**SMS 3017**		
Tube End Ident.			**ISO 1127**			**DIN 11850**			**ASME BPE**			**ASME BPE**			**SMS 3008**		
Code Face to face (FtF)			640			642			645			545			649		
Standard FtF			DIN EN 558-1			DIN EN 558-1			DIN EN 558-1			ASME BPE DT-V-1			DIN EN 558-1		
DN	NPS	**MA**	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1	L_3	b_2	b_1
8	1/4	**8**	*63,5	10,3	25,0	-	-	-	-	-	-	63,5	4,57	25,0	-	-	-
10	3/8	**8**	-	-	-	*63,5	10,0	34,0	-	-	-	63,5	7,75	25,0	-	-	-
15	1/2	**8**	-	-	-	-	-	-	*63,5	9,40	25,0	63,5	9,40	25,0	-	-	-
10	3/8	**10**	108	14,0	25,0	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	88,9	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	50,5	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	158,8	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	*222,3	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	222,3	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

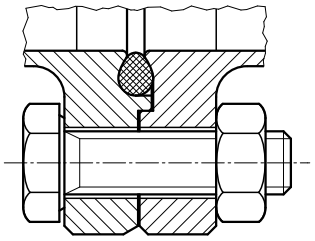
*Length differing from standard; other lengths on request

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.





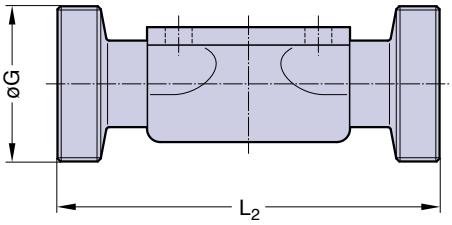
			DIN 11864-2-A Code 3.. (mm)			
DN	NPS	**MA**	L_4	C	k	e
10	3/8	**10**	130	54	37	ø 9
15	1/2	**25**	130	59	42	ø 9
20	3/4	**25**	150	64	47	ø 9
25	1	**25**	160	70	53	ø 9
32	1 1/4	**40**	180	76	59	ø 9
40	1 1/2	**40**	200	82	65	ø 9
50	2	**50**	230	94	77	ø 9
65	2 1/2	**80**	290	113	95	ø 9
80	3	**80**	310	133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

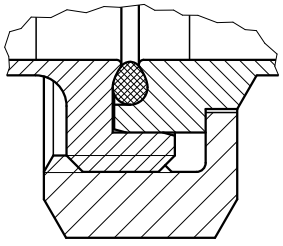
Aseptic Threads

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

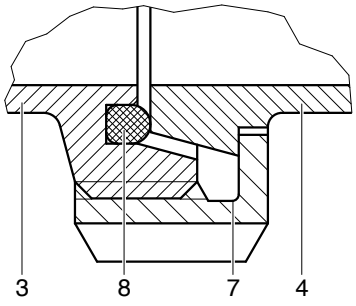
- Milk-threaded ends DIN 11851 with form sealing
- Aseptic connection according to DIN 11864-1 A with partly open o-ring for optimized cleaning features and a reduced dead leg. The threaded spigot, the liner and the interjacent o-ring are compressed against a metallic block with a spigot nut.

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

Table of Contents

		Page
1	**Introduction**	
	A Brief Overview	4
	The Company	5
	What does Quality mean at SED?	6
	General Information	
	Testing	7
	Qualification, Certification and Documentation	8
	Flow Rate and Valve Sizing	9
	Surface Finish	10, 11
2	**Media Contacted Components**	
	Diaphragms	14 - 17
	Valve Bodies (fold out page)	18
	Butt Weld Tube Ends (fold out page)	19
	Aseptic Connections	
	Clamps	20
	Aseptic Flanges and Aseptic Threads	21
3	**Aseptic Diaphragm Valves**	
	Overview Diaphragm Aseptic Valves	24 - 25
	Why Aseptic Diaphragm Valve?	26
	Self Draining - Two-Way Valve	27
	Innovative Design	28 - 31
	Aseptic Diaphragm Valves	
	Aseptic Diaphragm Valve Manual	32 - 41
	Aseptic Diaphragm Valve Pneumatically Operated	42 - 55
	Ordering Key and Ordering Example	56, 57
4	**Aseptic Diaphragm Valve Configurations**	
	D-Rule	60
	Welded Valve Configurations	61 - 63
	Multiport Valves	
	Why Multiport Valves?	64
	Main line open, Loop Valves (e.g. T-Valve)	65 - 69
	All lines and valve ports able to close	70 - 75
	The way of customized multiport valve designs	76
	Specification Multiport Valves	77
	Tank Valves	78 - 81
	Process Solutions	
	Sterile Sampling Unit	82
	Purified Steam Sampling Unit	83
5	**Angle Seat Valves**	
	Description and Features	86
	Applications	87
	Ordering Key and Ordering Example	88, 89
	Technical Data	90
	2/2-Way Angle Seat Valves	91 - 97
	Valve Body Threaded Socket and Butt Weld End	98
	Valve Body Clamp Socket and Flange	99
6	**System Components and Process Automation**	
	Overview	102
	Manual Adjustment - Optical Indication	103
	Electrical Switch Boxes - Pilot Control	104
	Detailed Information	
	3/2 Way Plastic Pilot Valve Type 602 / 603	105
	Contact-Free Limit Switch 024.50	106, 107
	Control Head Switch 024.63. - 024.89.	108
	Process Automation, Electropneumatic Positioners	109, 110
	Overview Product Range	111
	Glossary	112

Overview Aseptic Valves

Series	Description	Specification			
Steripur Stainless Steel Actuation	Control function available	Manual			
	Diaphragm size	**MA 8**	**MA 10**	**MA 25 - 50**	**MA 80 - 100**
	Diameter in mm (inch)	4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	65 - 100 (2 1/2 - 4)
	Type	**297**	**397**	**997**	
	Image				 DN 100
	Max. working pressure with				
	- *diaphragm EPDM in bar (psi)*	10 (150)	10 (150)	10 (150)	10 (150)
	- *diaphragm PTFE in bar (psi)*	10 (150)	10 (150)	10 (150)	8 (115)
	Details see page	**32 - 33**	**34 - 35**	**36 - 37**	

Series	Description	Specification			
KMA Actuation with Stainless Steel Bonnet	Control function available	Manual			
	Diaphragm size	**MA 8**	**MA 10**	**MA 25 - 50**	**MA 25 - 50 | 80 - 100**
	Diameter in mm (inch)	4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	15-50(3/4-2)|65-100(2 1/4-4)
	Type	**290**	**295**	**905**	**995**
	Image				
	Max. working pressure with				
	- *diaphragm EPDM in bar (psi)*	10 (150)	10 (150)	10 (150)	10 (150)
	- *diaphragm PTFE in bar (psi)*	10 (150)	10 (150)	10 (150)	DN15-50=10|DN65-100=8
	Details see page	**33**	**34 - 35**	**38 - 39**	**40**

Series	Description	Specification		
KMD Plastic Actuation directly mounted	Control function available	Manual		
	Diaphragm size	**MA 10**	**MA 25 - 50**	**MA 80 - 100**
	Diameter in mm (inch)	8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	65 - 100 (2 1/2 - 4)
	Type	**289**	**985**	
	Image			 DN 80
	Max. working pressure with			
	- *diaphragm EPDM in bar (psi)*	6 (87)	10 (150)	10 (150)
	- *diaphragm PTFE in bar (psi)*	6 (87)	10 (150)	8 (115)
	Details see page	**34 - 35**	**41**	

MA = Diaphragm size

Differentiations between the series see table page 28

Overview Aseptic Valves

Specification					Series
Pneumatically operated					**Steripur** Stainless Steel Actuation
NC	NC, NO, DA				
MA 8		**MA 10**	**MA 25 - 50**	**MA 80 | 100**	
4 - 15 (1/4 - 1/2)		8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	65 - 80 (2 1/2 - 3) | 100 (4)	
207.25	**207.30**	**307** [1]	**407** [1]	**407** [1]	
					
4,5 (65)	8 (115)	8 (115)	10 (150)	7 (100) | 6 (87)	
4 (60)	7 (100)	7 (100)	8 (115)	6 (87) | 5 (72)	
42 - 43		**45**	**48 - 49**		

Pneumatically operated				**KMA** Actuation with Stainless Steel Bonnet
NC, NO, DA				
MA 8	**MA 10**	**MA 25 - 50**	**MA 25 - 50 | 80 | 100**	
4 - 15 (1/4 - 1/2)	8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	15-50(3/4-2)|65-80(2 1/4-3)|100(4)	
190	**195**	**395**	**495**	
				
8 (116)	8 (116)	10 (150)	10 (150) | 7 (100) | 6 (87)	
7 (100)	7 (100)	8 (115)	8 (115) | 6 (87) | 5 (72)	
44	**46**	**51**	**50**	

	Pneumatically operated			**KMD** Plastic Actuation directly mounted
	NC, NO, DA			
	MA 10	**MA 25 - 50**	**MA 25 - 50 | 80**	
	8 - 20 (3/8 - 3/4)	15 - 50 (3/4 - 2)	15-50(3/4-2)|65-80(2 1/2-3)	
	188	**402**	**385**	
				
	8 (115)	10 (150)	10 (150) | 7 (100)	
	7 (100)	8 (115)	8 (115) | 6 (87)	
	47	**53**	**52**	

[1] available also with two-stage actuator, see page 54, 55

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.

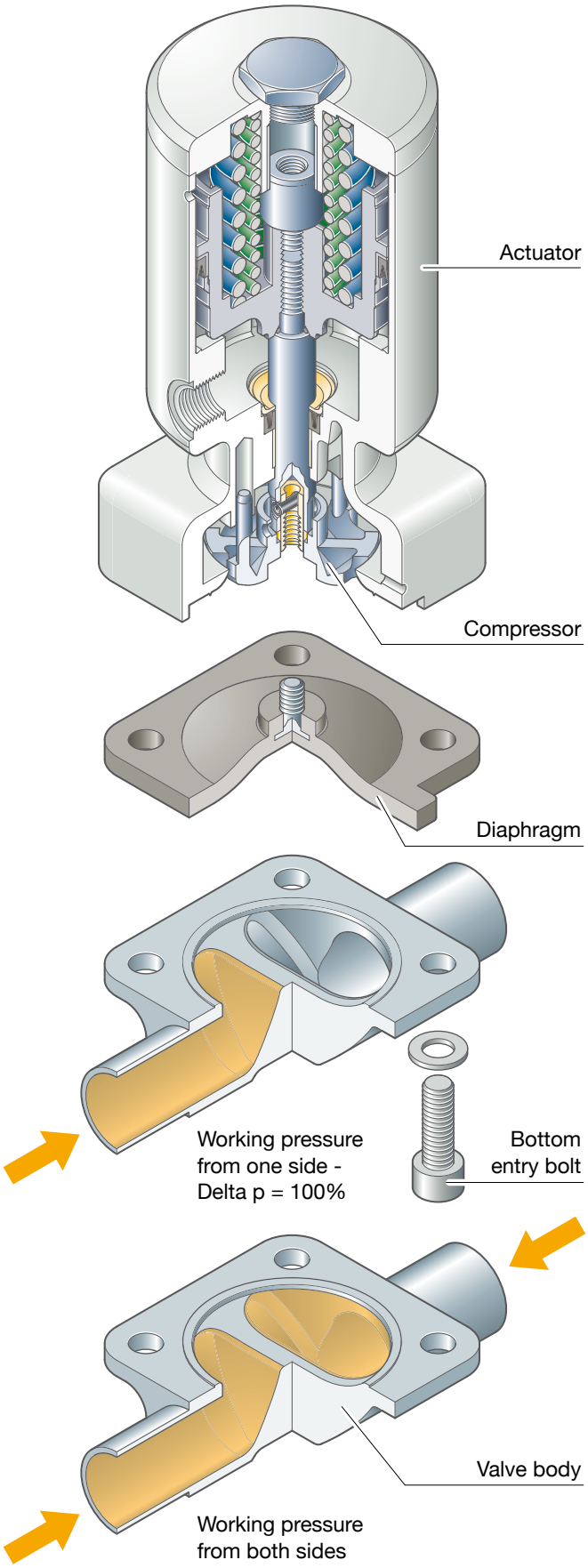
General and SED Specific Criteria:

- **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.



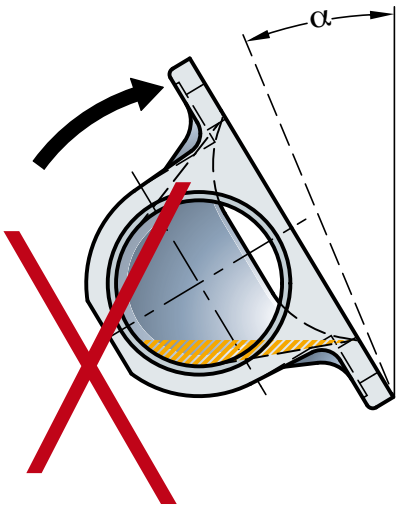
Self Draining - Two-Way Valve

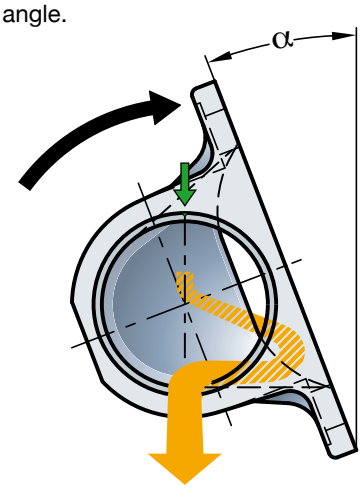
One of the most important criteria of all valves applied in aseptic processes is the drainability.
This feature has contributed substantially why the diaphragm valve has prevailed as the valve of choice for aseptic process applications.

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.





VALVE-TYPE	VALVE SIZE			SELF DRAINING ANGLE α (Degree)					
				FORGED BODIES			INVESTMENT CAST BODIES		
				ISO 1127	DIN 11850	ASME BPE	ISO 1127	DIN 11850	ASME BPE
				Code 40	Code 41+42	Code 45	Code 40	Code 41+42	Code 45
	(mm)	(inch)	MA	DIN 11866			DIN 11866		
	DN	NPS		Code 42			Code 42		
190 / 207 290 / 297	4	-	8	-	-	-	-	22	-
	6	-	8	-	-	-	-	22	-
	8	1/4	8	20,5	-	33,2	12,5	22	42
	10	3/8	8	-	22,4	28,4	-	13,5	28,5
	15	1/2	8	-	-	25	-	-	15,5
188 / 195 289 / 295 307 / 392 397	8	-	10	26,6	-	-	31	-	-
	10	3/8	10	20,6	-	31,4	21	32	-
	15	1/2	10	12,8	17,3	28,8	10,5	16	33
	20	-	10	-	9,6	17,4	-	7	16,5
385 / 395 / 402 407 / 495 592 / 905 / 985 995 / 997	15	1/2	25	33,5	35,8	42,9	39,5	43	54
	20	-	25	27,3	31,5	36,1	29	36	43,5
	25	1	25	15,7	19,9	29,1	20	26	32,5
	32	1 1/4	40	18,4	23,9	26,8	21	28,5	33
	40	1 1/2	40	12,3	17,7	21,5	14	21	25
	50	2	50	12,4	16,1	18,5	13,5	19,5	22,5
	65	2 1/2	50	-	-	12,4	23	30	9
	65	2 1/2	80	21,1	23,3	26,6	23	30	30
	80	3	80	15,8	15,8	21,1	17	17	23
	100	4	100	17,1	18	19,3	19,5	19,5	19,5

MA = Diaphragm size
Drain angle tolerance is +/- 2 degrees for optimum drainability
The latest revision of the self draining angles is available on www.sed-flowcontrol.com

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 / MA / Performance Features	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	Plastic actuation direct mounted to the valve body							●	●
4.1	Compact Design	●	●	●		●	Type 395 / 905	●	Type 402
4.2	Optional orientation of the air inlet port	●	●	●	●		Type 395	●	Type 402
5	Actuation for two-way bodies and welded configurations	●	●	●	●	●	●	●	●
6	Actuation suitable for two-way bodies, welded configurations, T-bodies, multiport bodies and tank bottom bodies	●	●	●	●	●	●		
7	Optimized internal cleaning because of circumferential defined sealing angle between process diaphragm and valve body (CDSA-Design)	●	●	●	●	●	●	●	●
8	Clean and smooth exterior ideal for sterile wash downs Bold bottom entry	●	●	●				●	●
9	Flexible diaphragm suspension	●	●	●	●	●	●	●	●
10	Encapsulated working diaphragm		●	●		●	●	●	●
11	Low weight						Type 395 / 905	●	●

MA = Diaphragm size

Positions 4 to 11 are explained individually and in detail on pages 29 to 31.

Compact Design - Optional Orientation of the Air Inlet Port

(Position 4 in Table Page 28)

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.

Air Inlet Port 90° to flow direction

Air Inlet Port in flow direction

Actuation for Two-Way Bodies and Welded Configurations

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

(Position 5 and 6 in Table Page 28)

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.

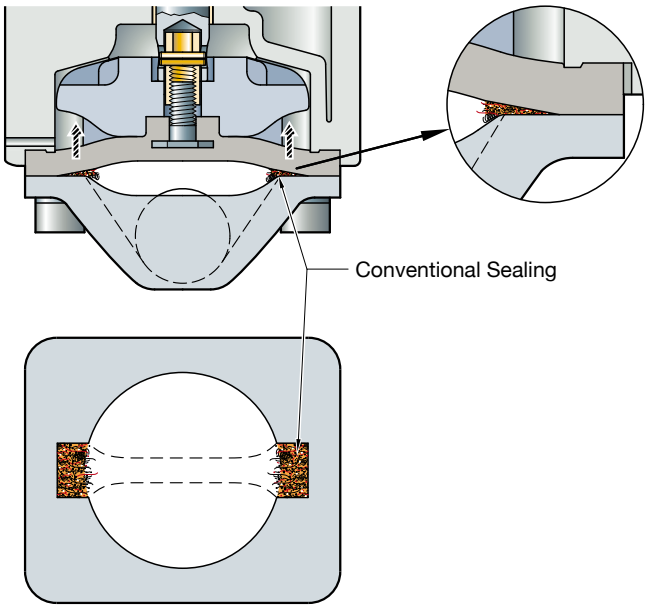
T-Valve
Steripur Series
Pneumatically operated

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

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 28)



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

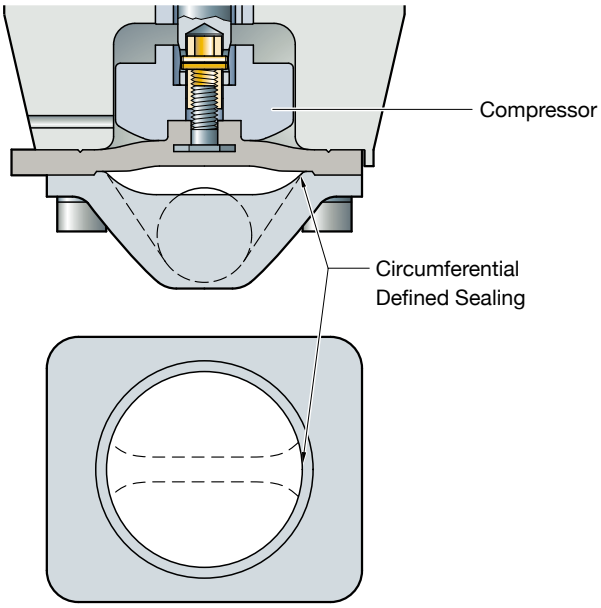
The CDSA sealing concept is achieved by the compressor being guided by the interior circular actuator lower housing providing a circumferential defined sealing angle at 360°. This reduces or eliminates entrapment because the seal over the weir and the circumference of the interior valve body is at the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

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 28)

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 48, 49 - Type Steripur 407 and Page 50 - Type KMA 495).

Flexible Diaphragm Suspension

(Position 9 in Table Page 28)

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.

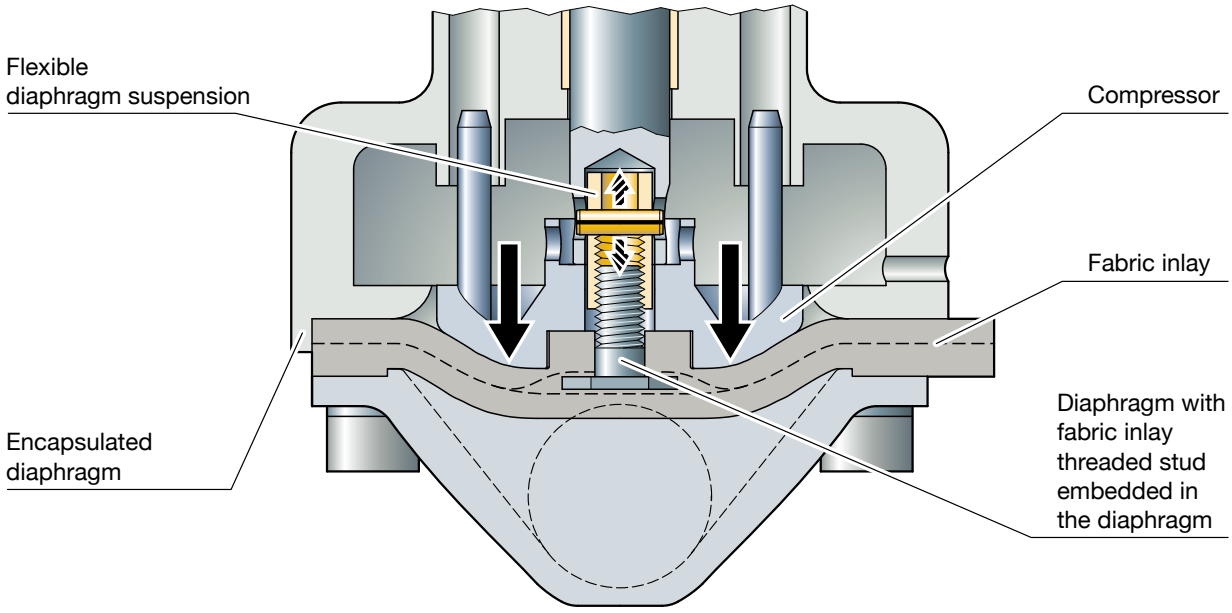
All other SED sizes have a threaded diaphragm stud for assembly to the spindle of the actuator. With the elastomer and one piece PTFE diaphragm versions, the threaded stud is vulcanized into the resilient elastomer material. This connection reduces the risk of point loading if properly assembled.

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).



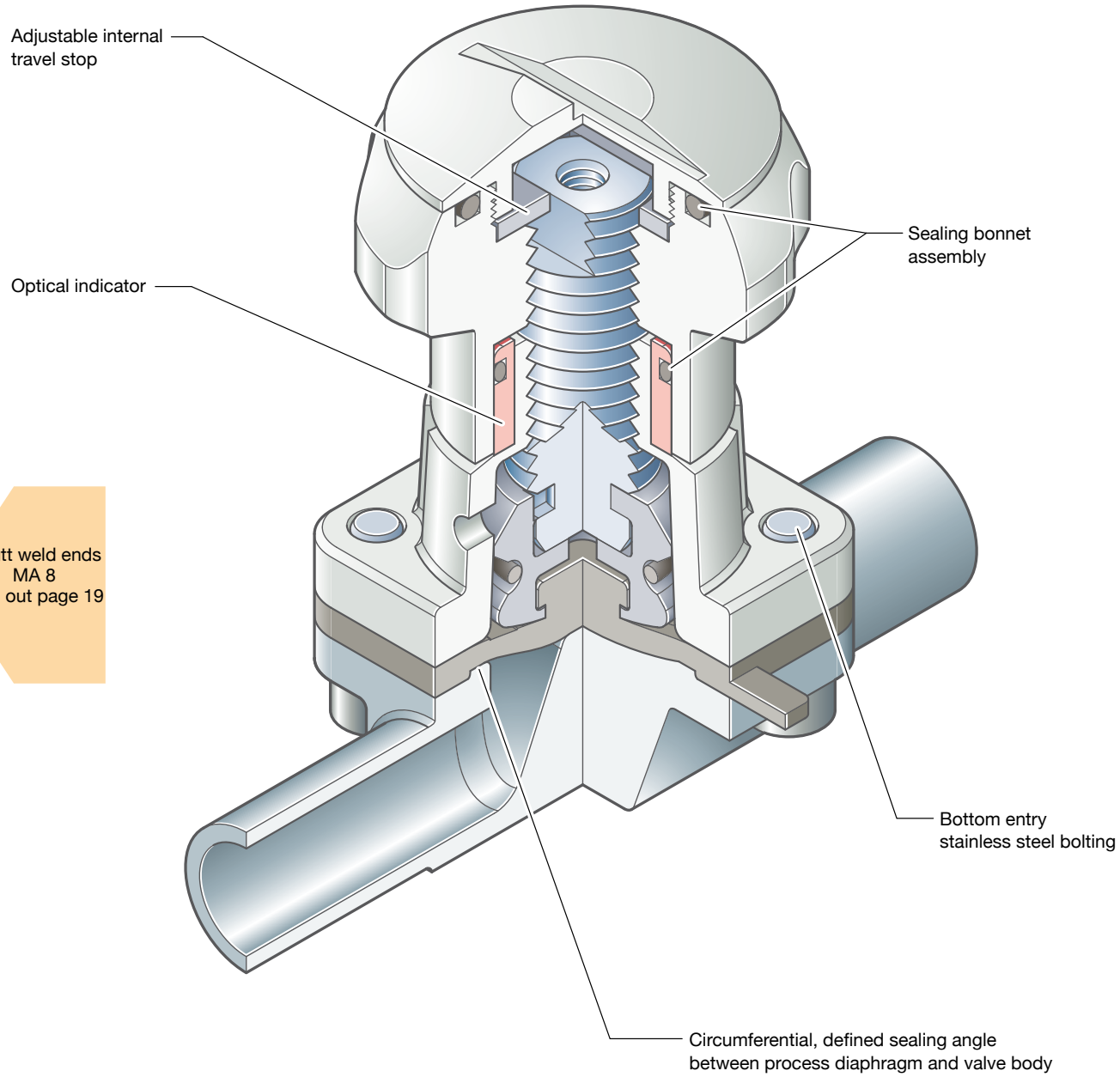
Encapsulated Working Diaphragm

(Position 10 in Table Page 28)

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")



Sectional drawing shows Steripur 297

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

Steripur 297

KMA 290

Butt weld ends
MA 8
Fold out page 19

Specific Features

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

Type 290 KMA
- **Stainless steel bonnet and plastic hand wheel**
- Manual diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles.

General Features

- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension

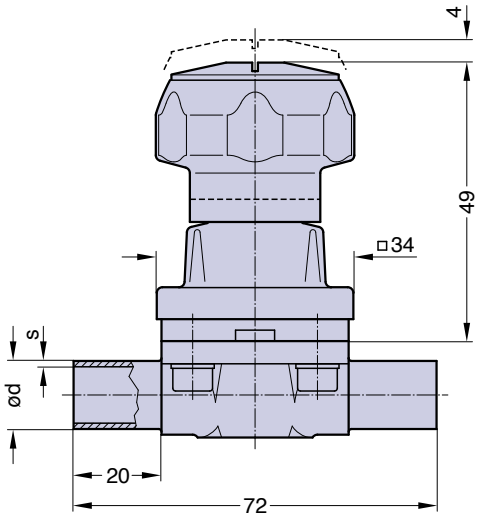
Optional

Type 297 Steripur
- Locking device

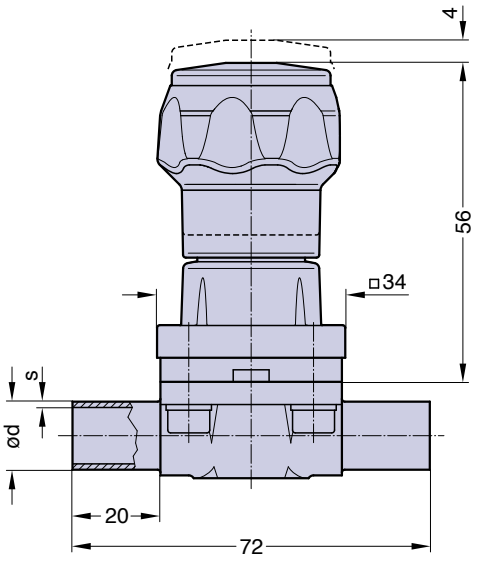
Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 8
Weight:	290: ca. 0,2 kg 297: ca. 0,3 kg

Technical data also valid for multiport valve.



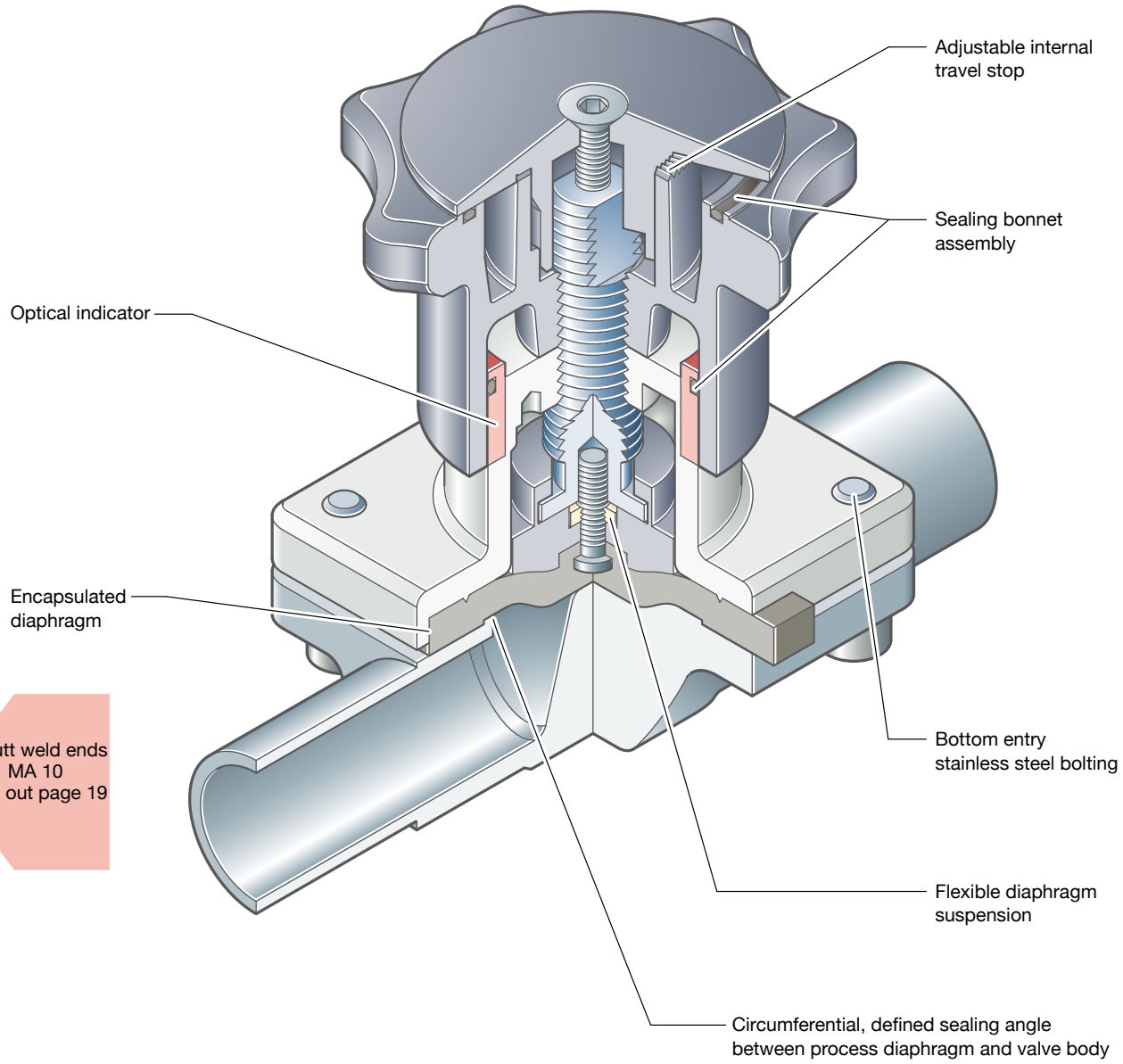
Steripur 297



KMA 290

Ordering key see page 56.

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



Sectional drawing shows KMA 295

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

Steripur 397

KMA 295

KMD 289

Butt weld ends
MA 10
Fold out page 19

Specific Features

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

Type 295 KMA
- **Stainless steel bonnet and plastic hand wheel**
- Manual diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles.

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

General Features

- Rising hand wheel
- Sealed bonnet with optical indicator
- Adjustable internal travel stop
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm

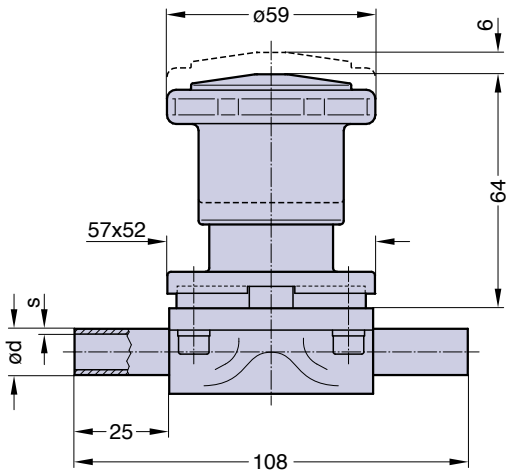
Optional

Type 397 Steripur
- Locking device

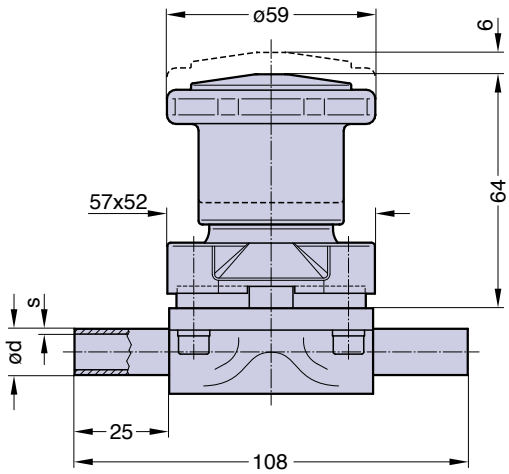
Technical Data

Control function:	Manually operated
Max. working pressure:	Type 295, 397: 10 bar (150 psi)
	Type 289: 6 bar (87 psi)
Max. working temperature:	Type 295, 397: 160°C (320°F) dependent on application
	Type 289 S-Version: 80°C (176°F) dependent on application
	Type 289 HS-Version: 150°C (300°F) dependent on application
Diaphragm material:	EPDM or PTFE
Body material:	Forged 1.4435/ 316L ASME/BPE
	Investment cast 1.4435/ 316L
	Other Alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Bonnets suitable for:	Two-Way bodies / Welded configurations
	T- bodies / Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	289: ca. 0,5 kg
	295: ca. 0,6 kg
	397: ca. 0,8 kg

Technical data also valid for multiport valve.



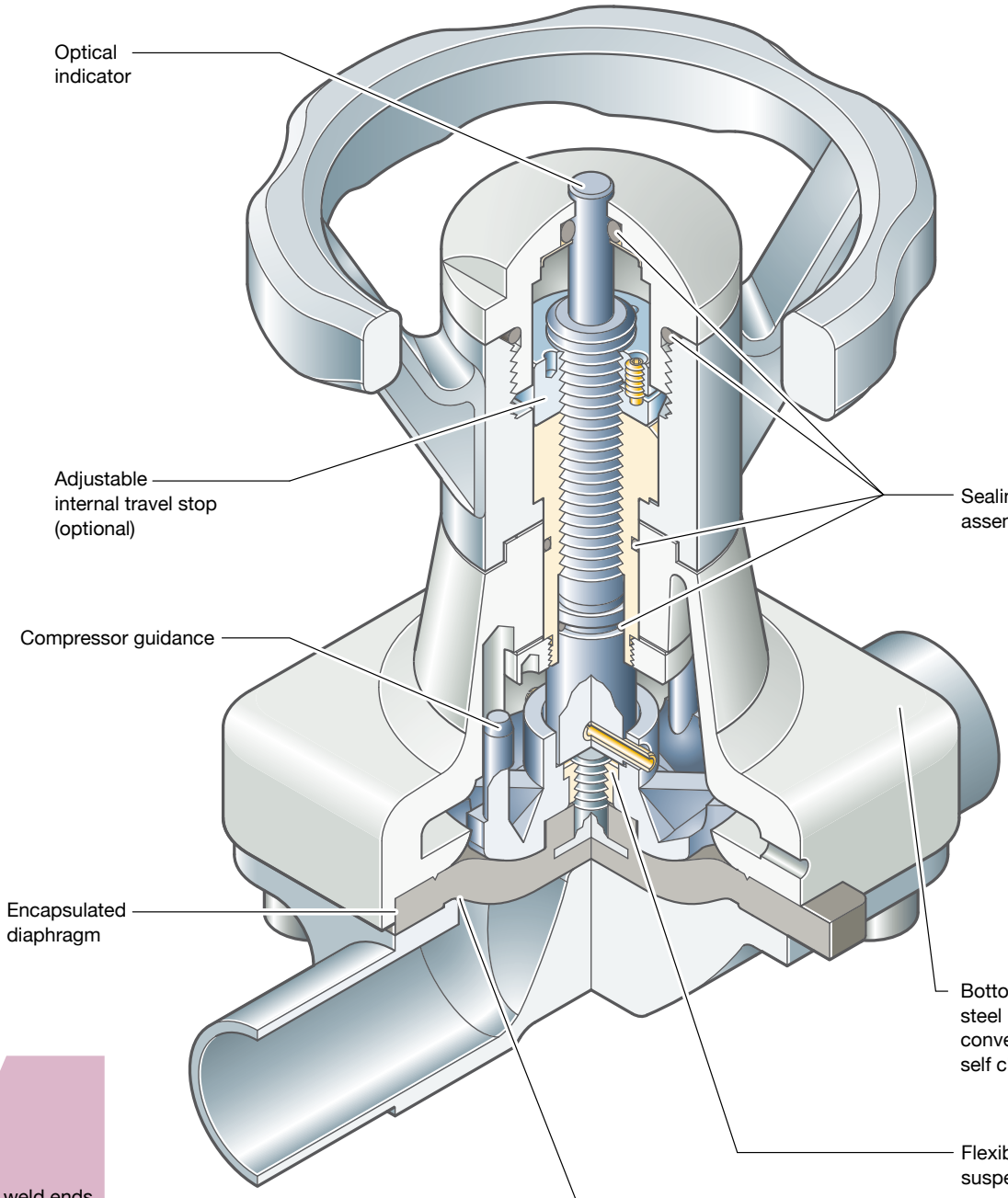
KMA 295 and Steripur 397



KMD 289

Ordering key see page 56.

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



Butt weld ends
MA 25 - 100
Fold out page 19

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

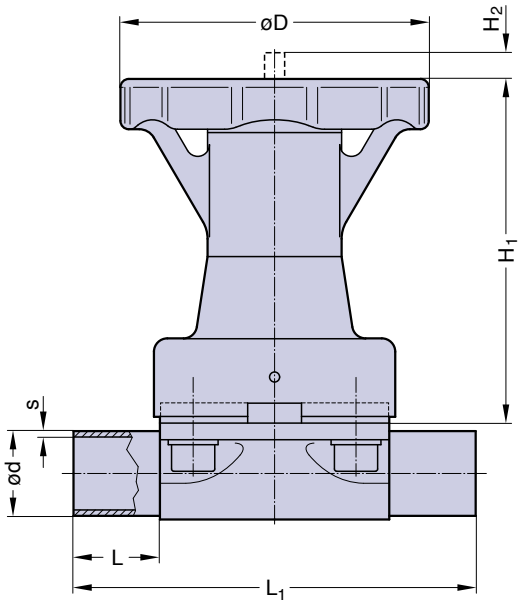
DN 15 - 50

Features

- **Stainless steel bonnet and hand wheel**
- Non rising hand wheel with optical indicator
- Sealed bonnet
- Autoclavable
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

- Adjustable internal travel stop or stroke limiter

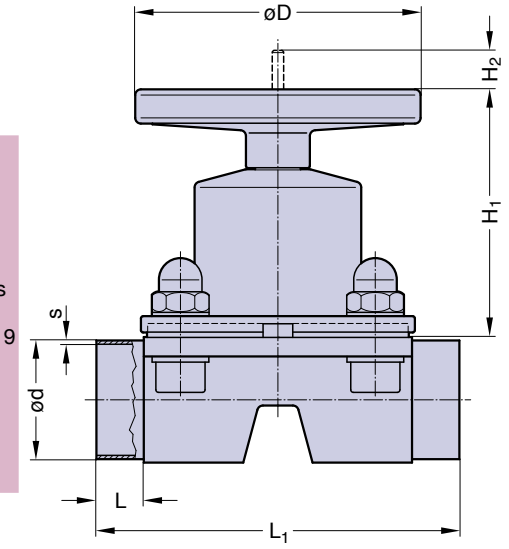


DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE
	Investment cast 1.4435/ 316L
	Other Alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Bonnets suitable for:	Two-Way bodies
	Welded configurations
	T- bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.



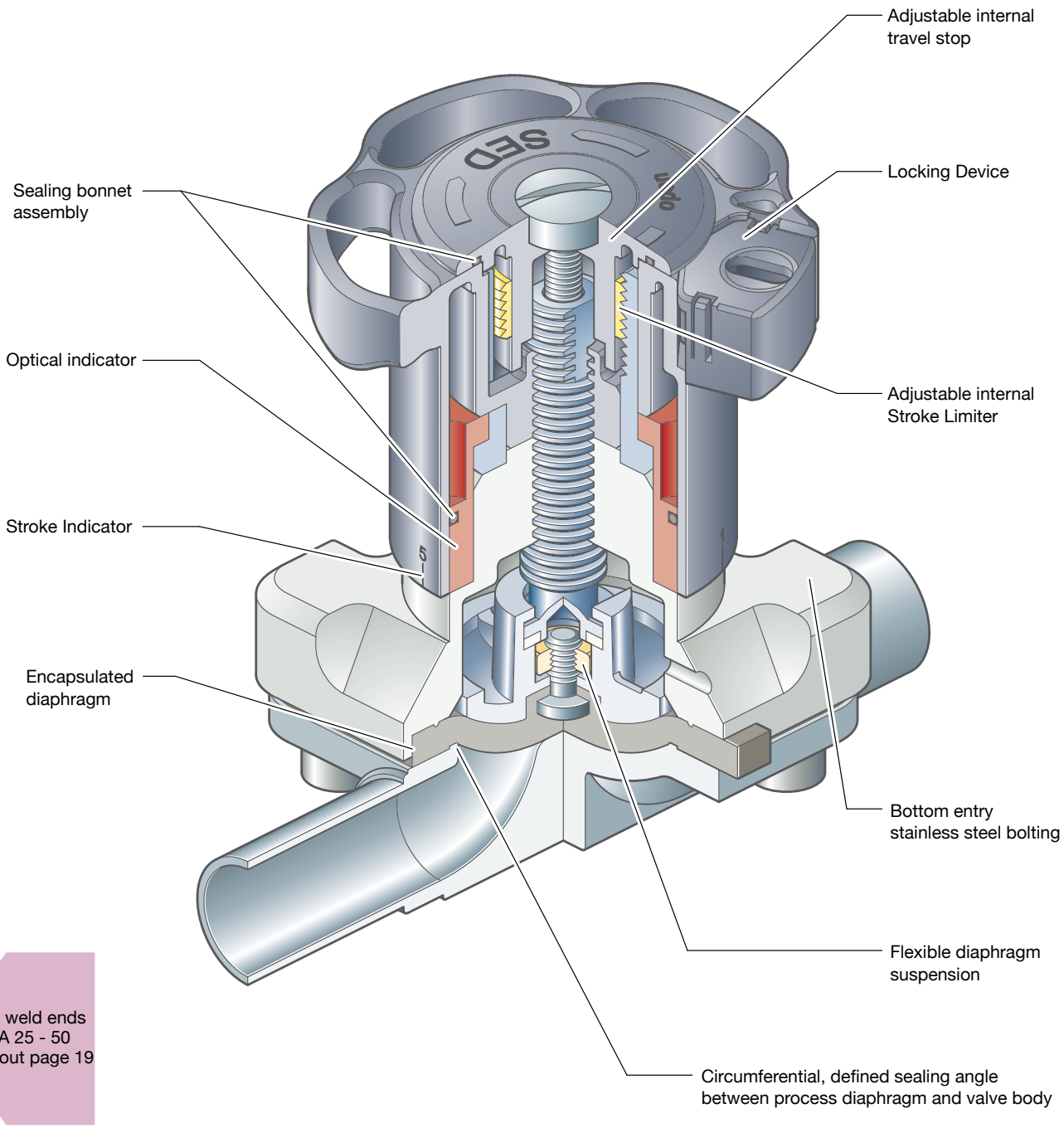
Butt weld ends
MA 25 - 100
Fold out page 19

DN 65 - 100 (Drawing MA 80)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	103	10	92	1,8	1,9
32-40	40	25	153	135	17	135	4,0	4,2
50	50	30	173	135	24	135	8,0	9,0
65	80	30	216	180	38	198	13,0	15,0
80	80	30	254	180	38	198	13,0	15,0
100	100	30	305	220	50	252	22,0	20,0

Ordering key see page 56.

Manual Valve DN 15 - 50 mm (3/4" - 2")



Butt weld ends
MA 25 - 50
Fold out page 19

Introduction Video
http://www.sed-flowcontrol.com/en/service/movies

Manual Valve DN 15 - 50 mm (3/4" - 2")

S01

S11

Features

- **Stainless steel bonnet and plastic hand wheel**
- Rising hand wheel with optical indicator and stroke indicator
- Sealed bonnet
- Internal travel stop
- Locking device
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

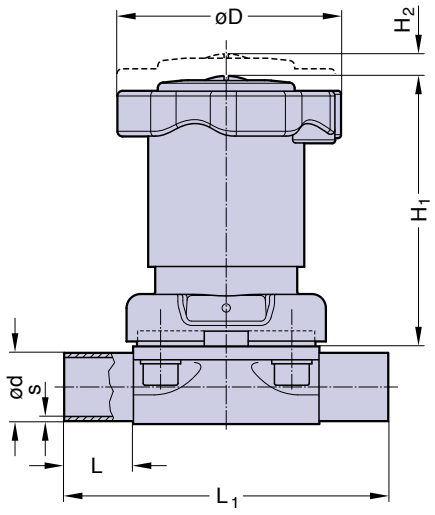
- Adjustable internal stroke limiter
- U-Lock for hand wheel
- Assembly of proximity switches
- Manual diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles.

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE Investment cast 1.4435/ 316L Other Alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Bonnets suitable for:	Two-Way bodies Welded configurations T- bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m 3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 50
Fold out page 19



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

Ordering key see page 56.

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

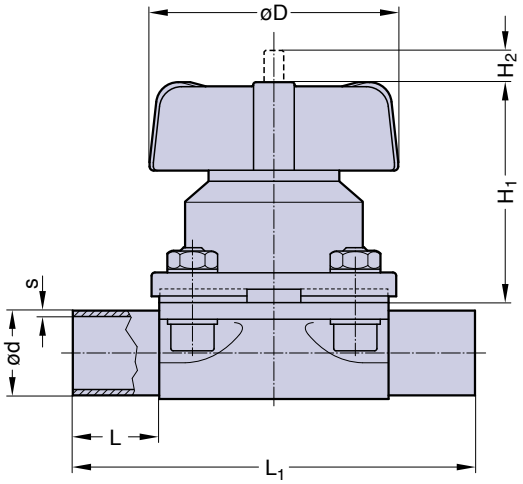
DN 15 - 50

Features

- **Stainless steel bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 30

Optional

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

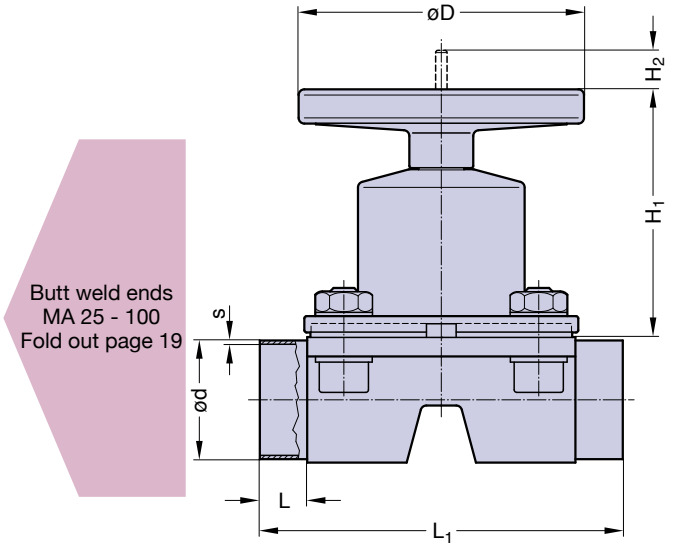


DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature:	160°C (320°F) dependent on application
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316L ASME/BPE
	Investment cast 1.4435/ 316L
	Other Alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Bonnets suitable for:	Two-Way bodies
	Welded configurations
	T- bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table

Technical data also valid for multiport valve.



DN 65 - 100 (Drawing MA 80)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	71	10	90	1,0	1,1
32-40	40	25	153	91	14	114	2,0	2,3
50	50	30	173	110	23	140	3,2	4,3
65	80	30	216	180	38	198	10,0	13,0
80	80	30	254	180	38	198	10,0	13,0
100	100	30	305	220	50	252	19,0	17,0

Ordering key see page 56.

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

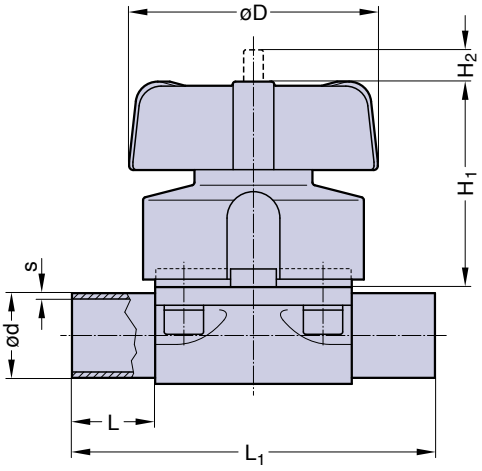
DN 15 - 50

Features

- **Plastic bonnet** and **plastic hand wheel**
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 30

Optional

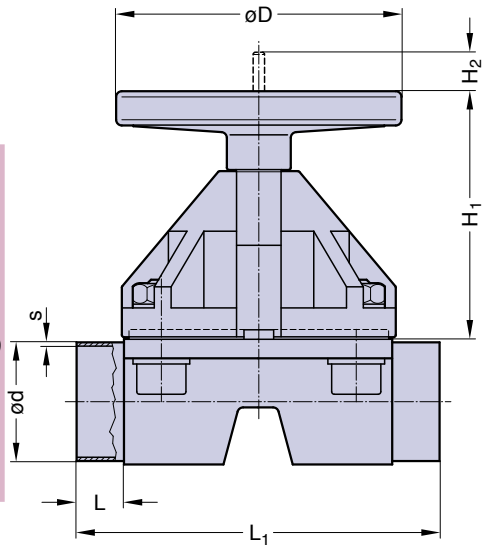
- Adjustable travel stop or stroke limiter on top
- Sealed bonnet
- Locking device



DN 15 - 50

Technical Data

Control function:	Manually operated
Max. working pressure:	10 bar (150 psi)
	DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature:	S-Version 80°C (176°F)
	HS-Version DN ≤ 50 150°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 19
	Clamps and flanges see page 20 and 21
	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



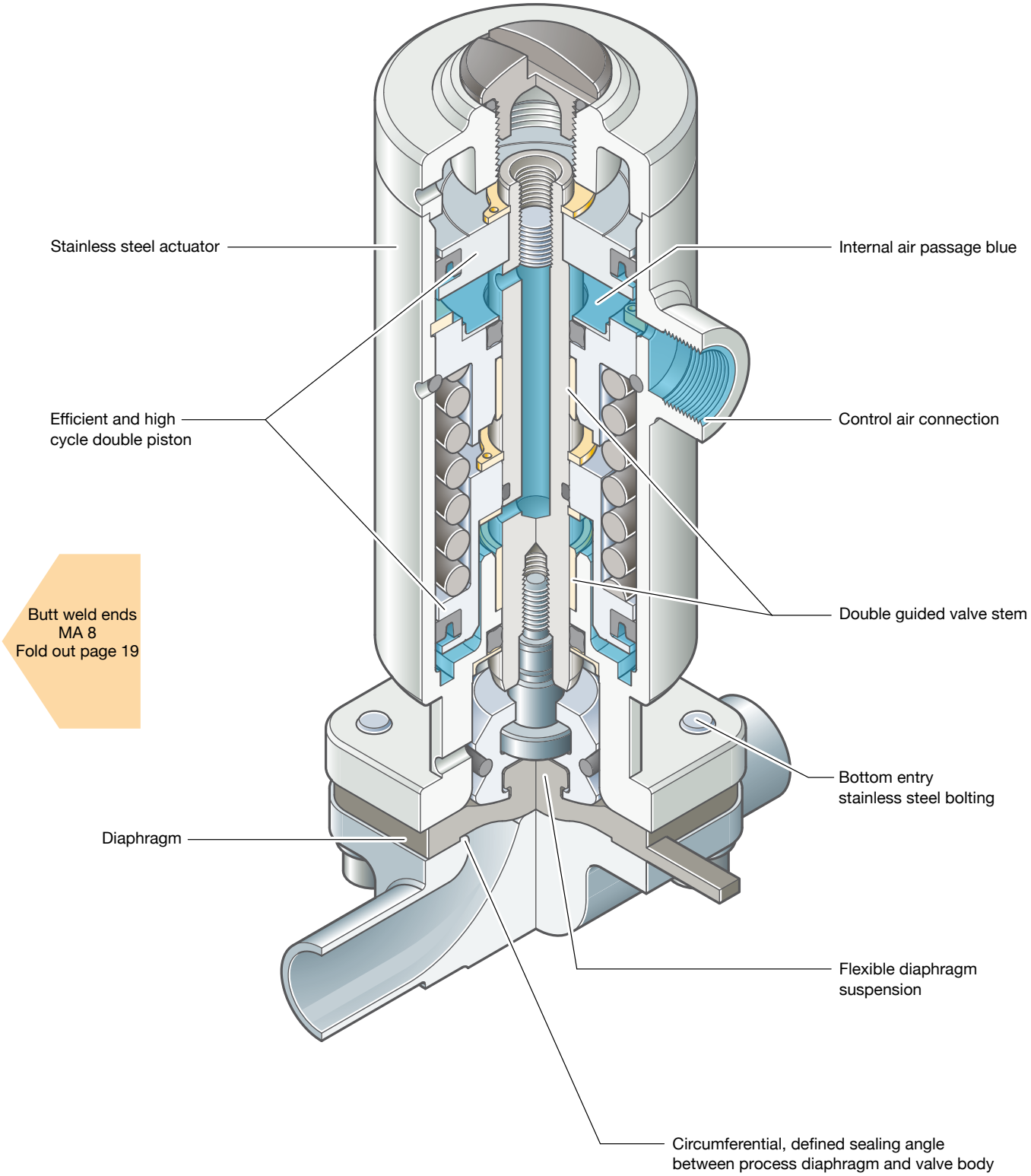
Butt weld ends
MA 25 - 100
Fold out page 19

DN 65 - 100 (Drawing MA 80)

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	71	10	90	0,8	0,9
32-40	40	25	153	91	14	114	1,6	1,9
50	50	30	173	110	23	140	2,6	3,7
65	80	30	216	180	38	198	7,0	9,0
80	80	30	254	180	38	198	7,0	9,0
100	100	30	305	220	50	252	14,0	12,0

Ordering key see page 56.

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



Sectional drawing shows Steripur 207.30

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

207.30 Cf. 4

207.25 Cf. 4, 5 & 6

This valve is available in two different designs.
The type 207.30 is available in the control function fail safe close and performs at a higher working pressure for standard application. The type 207.25 in control function fail safe close is mainly designed for filling applications or all other where the working pressure is lower. One advantages of this design are a longer diaphragm life time because there spring force is less. Other advantages of this design are a very high cycle life and a smaller overall dimensional height. Type 207.25 is also available in control functions fail safe open and double acting for standard working pressures.

Features

- **High cycle stainless steel piston actuator**
  Type 207.30 with double piston
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange connecting diaphragm and body
- Advantages in multiport bodies and manifold valve assemblies
- Low control air volume, high switching speed
- High repeatability
- Control air connection on the top, away from the process product line
- Direction of control air connection is mountable in 90° rotations
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Clean and polished exterior design ideal for sterile wash downs

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108 for this options
- Autoclavable

Technical Data

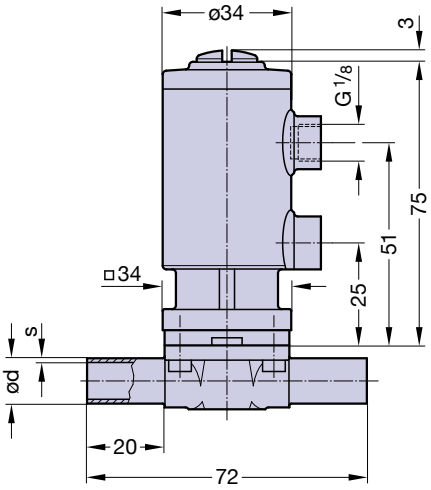
Control function (Cf.):	Pneumatically operated	
207.30:	Fail safe close (NC):	Cf. 1 & 4
207.25:	Fail safe close (NC):	Cf. 1 & 4
	Fail safe open (NO):	Cf. 2 & 5
	Double acting (DA):	Cf. 3 & 6
Direction		
Control connection:	At Cf. 4, 5 & 6 in flow direction, standard	
	At Cf. 1, 2 & 3, 90° to flow direction	
Max. working pressure:	Unidirectional (delta p = 100%)	
207.30:	Cf: Fail safe close	
	EPDM diaphragm 8 bar (115 psi)	
	PTFE diaphragm 7 bar (100 psi)	
207.25:	Cf: Fail safe close	
	EPDM diaphragm 4,5 bar (65 psi)	
	PTFE diaphragm 3,5 bar (60 psi)	
	Cf: Fail safe open and double acting	
	EPDM diaphragm 8 bar (115 psi)	
	PTFE diaphragm 7 bar (100 psi)	

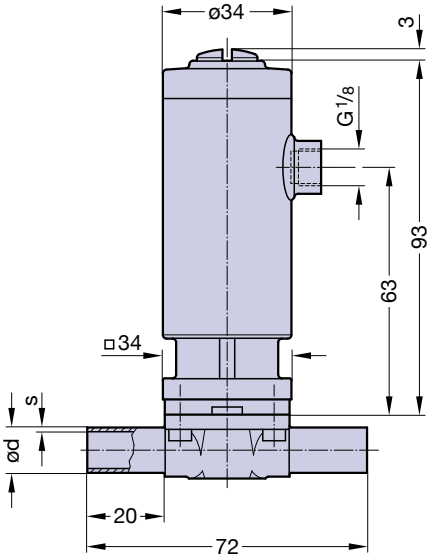
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:	160°C (320°F) dependent on application	
Control pressure:		
207.30:	Cf. 1 & 4	4 - 7 bar (60 - 100 psi)
207.25:	Cf. 1 & 4	5,5 -7 bar (80 - 100 psi)
	Cf. 2, 3, 5 & 6	5,5 - 7 bar (80 - 100 psi)
Diaphragm material:	EPDM or PTFE	
Valve body material:	Forged 1.4435/ 316 L ASME/BPE	
	Investment cast 1.4435/ 316 L	
	Other alloys	
End connection:	Butt weld ends see fold out page 19	
	Clamps and flanges see page 20 and 21	
	Special ends	
Actuators suitable for:	Two-Way bodies, Welded configurations,	
	T-bodies, Multiport bodies,	
	Tank bottom bodies	
Flow rate:	Kv in m³/h (Cv in GPM) see page 9	
Diaphragm size:	MA 8	
Weight:	207.30:	ca. 0,45 kg
	207.25:	ca. 0,44 kg

Technical data also valid for multiport valve.

Butt weld ends
MA 8
Fold out page 19





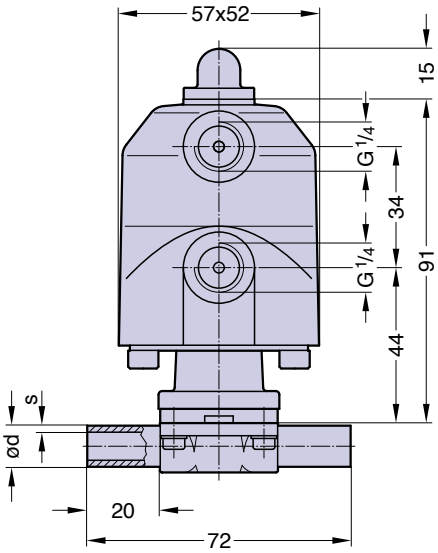
Ordering key see page 56.

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

Cf. 1, 2 & 3

Cf. 4, 5 & 6

Butt weld ends
MA 8
Fold out page 19



Features

- **Efficient plastic piston actuator with stainless steel distance piece**
- Direction of control air connection is mountable in 90° rotations
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Optical indicator

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, also for retrofitting

Technical Data

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

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

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4 - 7 bar (60 - 100 psi) Cf. 2, 3, 5 & 6 3,5 - 4,5 bar (50 - 65 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 8
Weight:	ca. 0,5 kg

Technical data also valid for multiport valve.

Ordering key see page 56.

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

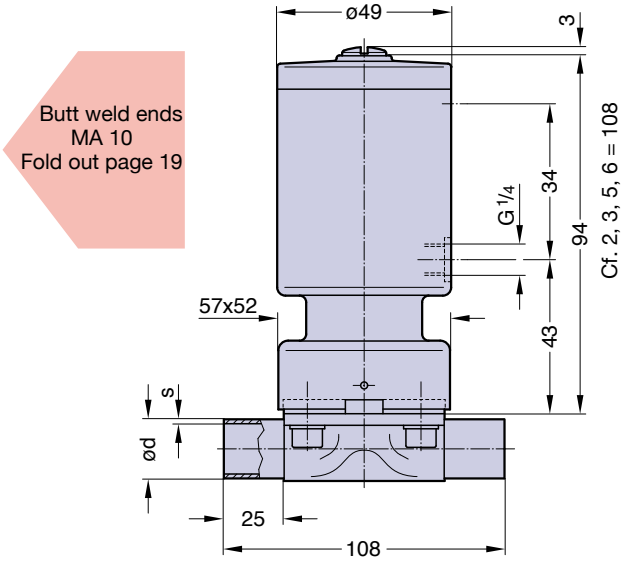
Cf. 4

Features

- **High cycle stainless steel piston actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- 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 102 to 108, 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 (115 psi)
	PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4,2 - 7 bar (60 - 100 psi)
	Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE
	Investment cast 1.4435/ 316 L
	Other alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Actuators suitable for:	Two-Way bodies
	Welded configurations
	T-bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 1,0 kg

Technical data also valid for multiport valve.

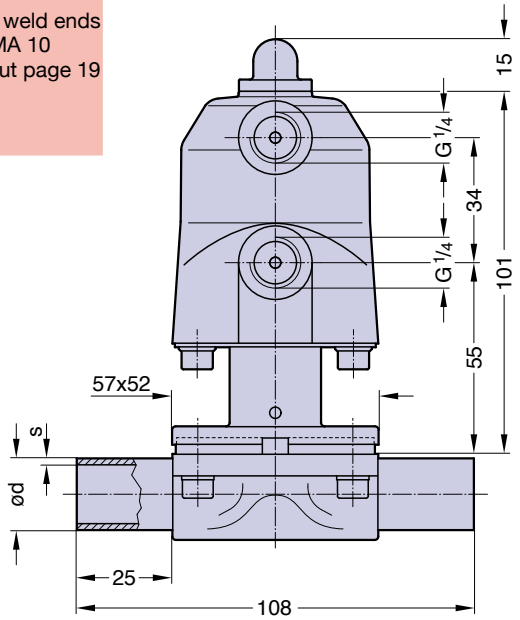
Ordering key see page 56.

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

Cf. 1, 2 & 3

Cf. 4 & 5

Butt weld ends
MA 10
Fold out page 19



Features

- **Efficient plastic piston actuator with stainless steel distance piece**
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Optical indicator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- CDSA sealing concept, see page 30

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, 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
Max. working pressure:	Unidirectional (delta p = 100%) EPDM diaphragm 8 bar (115 psi) PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 4,2 - 7 bar (60 - 100 psi) Cf. 2, 3 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations T-bodies Multiport bodies Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,8 kg

Technical data also valid for multiport valve.

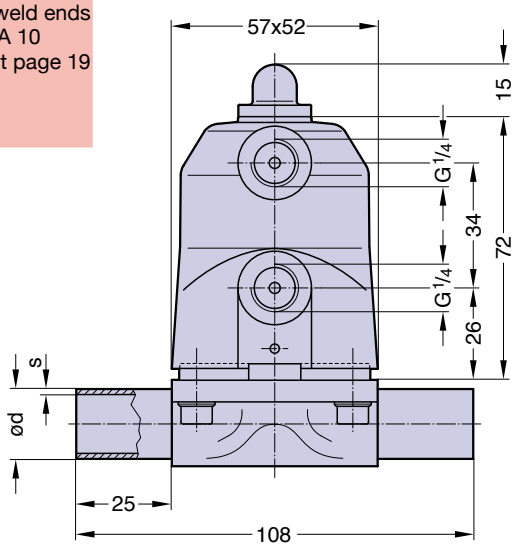
Ordering key see page 56.

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

Cf. 1, 2 & 3

Cf. 4 & 5

Butt weld ends
MA 10
Fold out page 19



Features

- **Efficient plastic piston actuator direct assembled with the valve body**
- **Control air connection 90° to flow direction for side by side or other installations saving space**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Encapsulated diaphragm
- Optical indicator
- CDSA sealing concept, see page 30

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, also for retrofitting
- Control air connection in flow direction

Technical Data

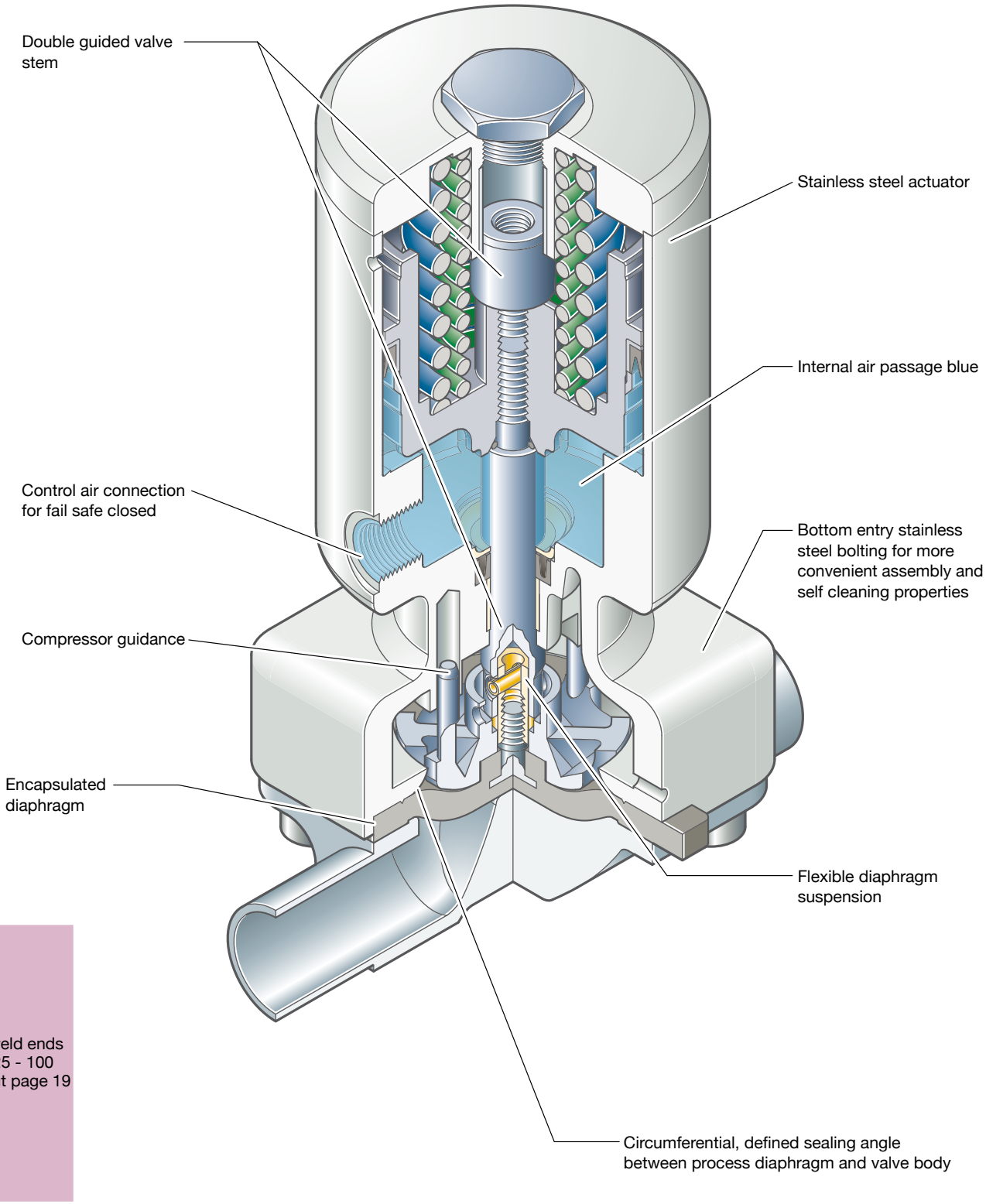
Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & 4 Fail safe open (NO): Cf. 2 & 5 Double acting (DA): Cf. 3
Direction	
Control connection:	At Cf. 1, 2 & 3, 90° to flow direction, standard At Cf. 4 & 5 in flow direction
Max. working pressure:	Unidirectional (delta p = 100%)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

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

Max. working temperature:	S-Version 80°C (176°F) HS-Version 150°C (300°F) dependent on Application
Control pressure:	Cf. 1 & 4 4,2 - 7 bar (60 - 100 psi) Cf. 2, 3 & 5 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 0,6 kg

Ordering key see page 56.

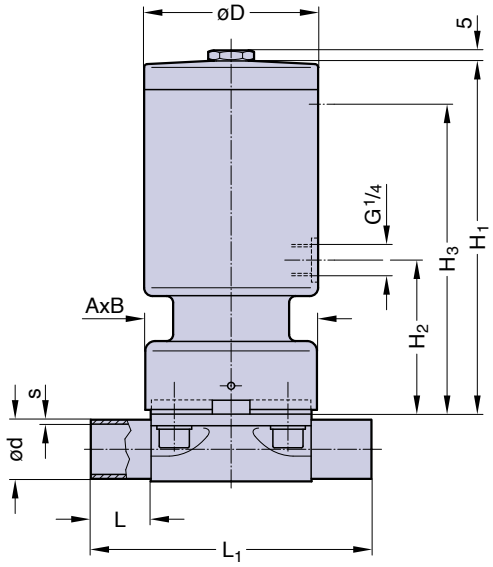
Pneumatically Operated Valve DN 15 - 100 mm (3/4" - 4")



Butt weld ends
MA 25 - 100
Fold out page 19

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

DN 15 - 50 Cf. 4



DN 15 - 50

Features

- **High cycle stainless steel piston actuator**
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- 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 102 to 108, 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 (1/2"-2")	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	10 bar (150 psi)	7 bar (100 psi)	6 bar (87 psi)
PTFE	8 bar (115 psi)	6 bar (87 psi)	5 bar (72 psi)

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

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

Control pressure:
Cf. 1 & 4 DN 15-80 5 - 8 bar(72-115 psi)
Cf. 1 & 4 DN 100 6 - 8 bar(87-115 psi)
Cf. 2, 3, 5 & 6 DN 15-80 4,5-6 bar(65-87 psi)
Cf. 2, 3, 5 & 6 DN 100 5,5-7 bar(80-100 psi)

Diaphragm material: EPDM or PTFE

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

End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends

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

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

Diaphragm size: MA see table below

Technical data also valid for multiport valve.

Butt weld ends
MA 25 - 100
Fold out page 19

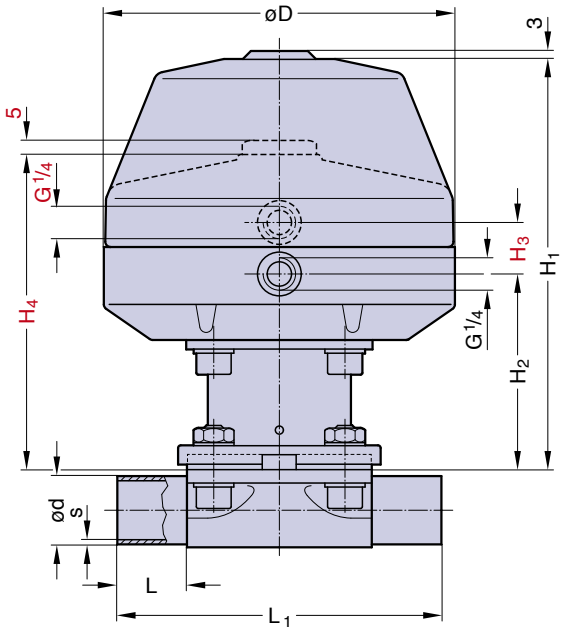
DN (mm)	MA	Dimensions (mm)							Total weight ca. (kg)	
		L	L_1	A x B	H_1	H_2	H_3	D	Investment cast	Forged
15-25	25	25	120	73x79	146*	66	133	75	2,6	2,7
32-40	40	25	153	96x105	180	75	160	105	6,0	7,0
50	50	30	173	110x130	216	77	180	105	9,0	10,0
65	80	30	216	170x190	309	135	285	179	23,0	26,0
80	80	30	254	170x190	309	135	285	179	23,0	26,0
100	100	30	305	ø238	318	143	295	179	33,0	1,0

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

Ordering key see page 56.

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

Cf. 1



Features

- **Plastic diaphragm actuator with stainless steel distance piece**
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 30

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, 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 (1/2"-2")	DN 65-80 (2,5"-3")	DN 100 (4")
EPDM	10 bar (150 psi)	7 bar (100 psi)	6 bar (87 psi)
PTFE	8 bar (115 psi)	6 bar (87 psi)	5 bar (72 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 DN 15-50 4,5 - 6 bar (65-87 psi)
Cf. 1 DN 65-80 4,5 - 7 bar (65-100 psi)
Cf. 1 DN 100 5,5 - 7 bar (80-100 psi)
Cf. 2 & 3 DN 15-80 4 - 5,5 bar (60-80 psi)
Cf. 2 & 3 DN 100 5 - 6,5 bar (72-93 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Actuators suitable for: Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below
Technical data also valid for multiport valve.

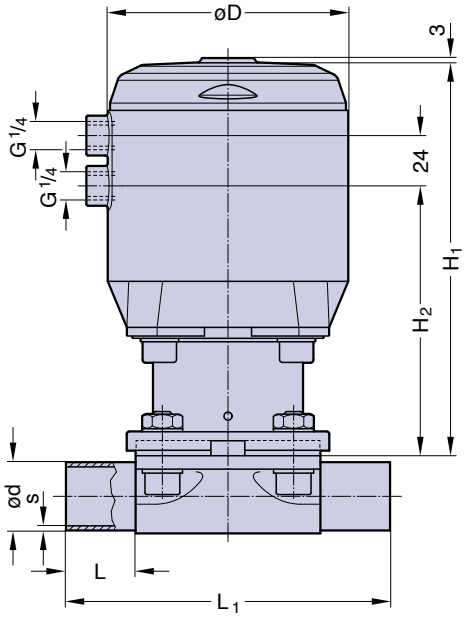
Butt weld ends
MA 25 - 100
Fold out page 19

DN (mm)	MA	Dimensions (mm)							Total weight ca. (kg)	
		L	L_1	H_1	H_2	H_3	H_4	D	Investment cast	Forged
15-25	25	25	120	148	71	31	120	130	1,9	2,0
32-40	40	25	153	194	95	31	144	161	4,7	4,9
50	50	30	173	233	109	31	177	217	7,0	8,0
65	80	30	216	314	166	41	275	265	20,0	23,0
80	80	30	254	314	166	41	275	265	20,0	23,0
100	100	30	305	314	166	41	284	265	29,0	27,0
Note: H3 and H4 only for valves with Cf. 2 and Cf. 3 H1 only for valve with Cf. 1										

Ordering key see page 56.

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

Cf. 4, 5 & 6



Features

- **Plastic piston actuator with stainless steel distance piece**
- Compact design
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, also for retrofitting
- Control air connection 90° to flow direction

Technical Data

Control function (Cf.):	Pneumatically operated
	Fail safe close (NC): Cf. 1 & **4**
	Fail safe open (NO): Cf. 2 & **5**
	Double acting (DA): Cf. 3 & **6**
Direction	
Control connection:	At Cf. 4, 5 & 6, in flow direction, standard
	At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%)
	EPDM Diaphragm 10 bar (150 psi)
	PTFE Diaphragm 8 bar (115 psi)
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.	
Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4,5 - 7 bar (65 - 100 psi)
	Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE
	Investment cast 1.4435/ 316 L
	Other alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Actuators suitable for:	Two-Way bodies
	Welded configurations
	T-bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table below
Technical data also valid for multiport valve.	

Butt weld ends
MA 25 - 50
Fold out page 19

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	160	107	95	1,9	2,0
32-40	40	25	153	190	129	115	3,9	4,2
50	50	30	173	236	171	144	7,0	8,0

Ordering key see page 56.

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

Cf. 1

Features

- **Plastic 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
- CDSA sealing concept, see page 30

Optional

- Available with a wide range of control equipment and accessories see page 102 to 108, also for retrofitting

Technical Data

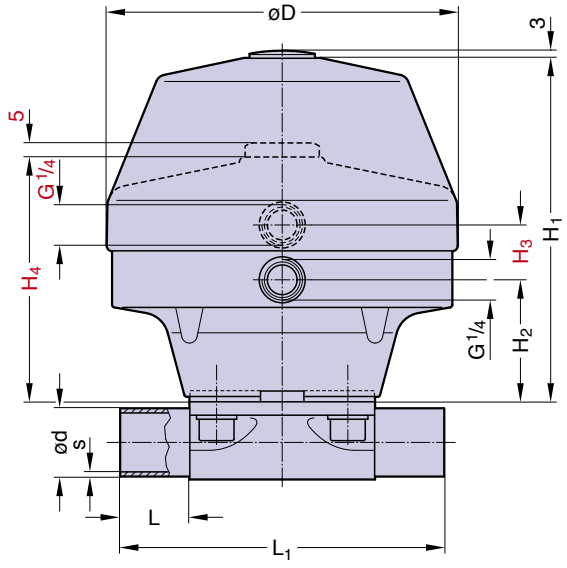
Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1
Fail safe open (NO): Cf. 2
Double acting (DA): Cf. 3

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

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

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

Max. working temperature: S-Version 80°C (176°F)
Control pressure: Cf. 1 DN 15-50 4,5 - 6 bar (65-87 psi)
Cf. 1 DN 65-80 4,5 - 7 bar (65-100 psi)
Cf. 2 & 3 DN 15-80 4 - 5,5 bar (60-80 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Actuators suitable for: Two-Way bodies
Welded configurations
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below



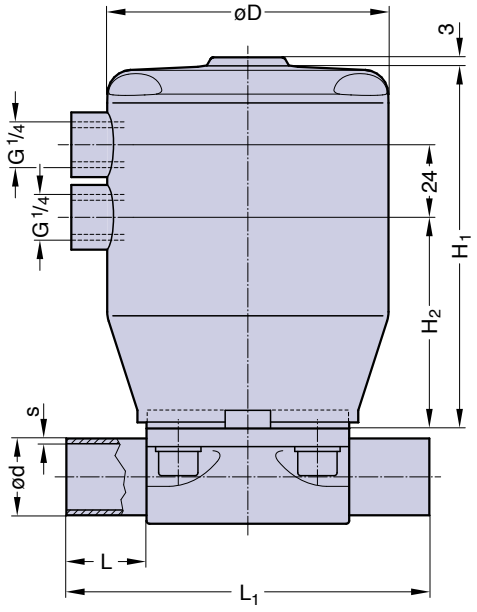
Butt weld ends
MA 25 - 80
Fold out page 19

DN (mm)	MA	Dimensions (mm)							Total weight ca. (kg)	
		L	L_1	H_1	H_2	H_3	H_4	D	Investment cast	Forged
15-25	25	25	120	153	49	31	97	130	1,9	2,0
32-40	40	25	153	176	77	31	131	161	3,8	4,1
50	50	30	173	214	91	31	161	217	8,0	9,0
65	80	30	216	269	121	41	229	265	16,0	18,0
80	80	30	254	269	121	41	229	265	16,0	18,0
Note: H3 and H4 only for valves with Cf. 2 and Cf. 3 H1 only for valve with Cf. 1										

Ordering key see page 56.

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

Cf. 4, 5 & 6



Cf. 1, 2 & 3

Features

- **Plastic piston actuator**
- Compact design
- Actuator high resistance to heat transfer
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- 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 102 to 108, also for retrofitting
- Control air connection 90° to flow direction

Technical Data

Control function (Cf.):	Pneumatically operated Fail safe close (NC): Cf. 1 & **4** Fail safe open (NO): Cf. 2 & **5** Double acting (DA): Cf. 3 & **6**
Direction	
Control connection:	At Cf. 4, 5 & 6, in flow direction, standard At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure:	Unidirectional (delta p = 100%) EPDM Diaphragm 10 bar (150 psi) PTFE Diaphragm 8 bar (115 psi)
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.	
Max. working temperature:	HS-Version 150°C (300°F) dependent on application
Control pressure:	Cf. 1 & 4 4,5 - 7 bar (65 - 100 psi) Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE Investment cast 1.4435/ 316 L Other alloys
End connection:	Butt weld ends see fold out page 19 Clamps and flanges see page 20 and 21 Special ends
Actuators suitable for:	Two-Way bodies Welded configurations
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA see table below

Butt weld ends
MA 25 - 50
Fold out page 19

DN (mm)	MA	Dimensions (mm)					Total weight ca. (kg)	
		L	L_1	H_1	H_2	D	Investment cast	Forged
15-25	25	25	120	120	70	95	1,5	1,6
32-40	40	25	153	133	75	115	2,8	3,1
50	50	30	173	173	111	144	4,9	6,0

Ordering key see page 56.

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

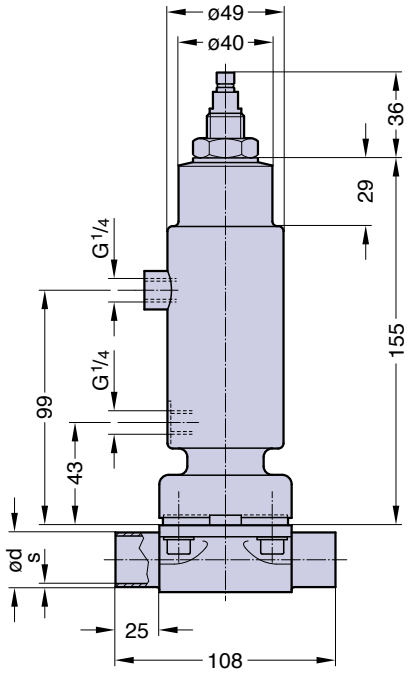
Features

- **Two stage stainless steel actuator**
- Second position adjustable with reduced flow for filling
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- 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 100 to 106, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 106

Butt weld ends
MA 10
Fold out page 19



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%)
	EPDM Membrane 8 bar (115 psi)
	PTFE Membrane 7 bar (100 psi)

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

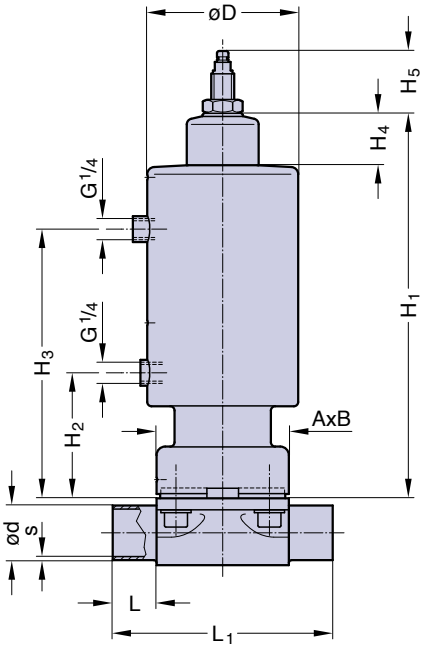
Max. working temperature:	160°C (320°F) dependent on application
Control pressure:	Cf. 1 & 4 4 - 7 bar (60 - 100 psi)
Diaphragm material:	EPDM or PTFE
Valve body material:	Forged 1.4435/ 316 L ASME/BPE
	Investment cast 1.4435/ 316 L
	Other alloys
End connection:	Butt weld ends see fold out page 19
	Clamps and flanges see page 20 and 21
	Special ends
Actuators suitable for:	Two-Way bodies
	Welded configurations
	T-bodies
	Multiport bodies
	Tank bottom bodies
Flow rate:	Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size:	MA 10
Weight:	ca. 1,4 kg

Technical data also valid for multiport valve.

Ordering key see page 56.

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

DN 50 Cf. 4



Butt weld ends
MA 25 - 50
Fold out page 19

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
- CDSA sealing concept, see page 30
- 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 100 to 106, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 106

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 (1/2" - 2")
EPDM	10 bar (150 psi)
PTFE	8 bar (115 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 & 4 5 - 8 bar (72 - 115 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Actuators suitable for: Two-Way bodies, Welded configurations, T-bodies, Multiport bodies, Tank bottom bodies
Flow rate: Kv in m^3/h (Cv in GPM) see page 9
Diaphragm size: MA see table below
Technical data also valid for multiport valve.

DN	MA	Dimensions (mm)									Total weight ca. (kg)	
(mm)		L	L_1	A x B	H_1	H_2	H_3	H_4	H_5	D	Investment cast	Forged
15-25	25	25	120	73x79	220	66	150	-	35	75	2,8	2,0
32-40	40	25	153	96x105	250	75	185	28	40	105	7,0	7,0
50	50	30	173	110x130	294	77	221	28	47	105	9,0	10,0

Ordering key see page 56.

Ordering key

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

Pos.	Description	Code	Specification
1	**Type:** See page 32 - 55	207, 307, 407 397, 297, 997 392, 592 190, 195, 395, 495 290, 295, 905, 995 188, 385, 402 289, 985	Steripur Series, stainless steel actuator, pneumatic Steripur Series, stainless steel actuator, manual Steripur Series, two stage stainless steel actuator, pneumatic KMA Series, actuator with stainless steel adaptation, pneumatic KMA Series, actuator with stainless steel adaptation, manual KMD Series, plastic actuator direct mounted, pneumatic KMD Series, plastic actuator direct mounted, manual
2	**Size:** See page: 19	04 - 100	DN 4, 6, 8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100
3	**Valve body material:** See page: 18	7 77 78 20	Stainless steel, investment cast 1.4435/S31603, ASME BPE Table MM-2.1-1 Stainless steel, forged 1.4435/S31603, ASME BPE Table MM-2.1-1 Stainless steel, forged 1.4435/S31603 Fe < 0,5% Hastelloy, C-22 2.4602
4	**Valve body end connections:** (bolt letters most common versions) **Valve body end connection for assembly:** See page 19 - 22	39 40 41 42 45 49 94 95 97 640 642 645 649 545 842 442 342 242	Butt weld end acc. DIN **Butt weld end acc. EN ISO 1127 (DIN 11866 Series B)** Butt weld end acc. DIN 11850 Series 1 **Butt weld end acc. DIN 11850 Series 2 (DIN 11866 Series A)** **Butt weld end acc. ASME BPE MFS length (DIN 11866 Series C)** Butt weld end acc. SMS 3008 Butt weld end acc. BS 4825 R1 Butt weld end acc. to ASME BPE Table DT-4.1-4 Tangent Length Butt weld end acc. JIS G 3447 **First digit stands for the end connection and last two digits for the tube standard** Clamp ISO 1127, for tube EN ISO 1127, face to face DIN EN 558-1, Series 7 Clamp DIN 32676, for tube DIN 11850, face to face DIN EN 558-1, Series 7 Clamp ASME BPE, for tube ASME BPE, face to face DIN EN 558-1, Series 7 Clamp SMS 3017, for tube SMS 3008, face to face DIN EN 558-1, Series 7 Clamp acc. to ASME BPE Table DT-4.4.1-1 Aseptic Union DIN 11851, for tube DIN 11850 series 2 double-sided threaded spigot Aseptic Union DIN 11864-1-A, for tube DIN 11850 series 2 double-sided threaded spigot Aseptic flange DIN 11864-2-A, for tube DIN 11850 series 2, double-sided grooved Aseptic clamp DIN 11864-3-A, for tube DIN 11850 series 2, double-sided grooved
5	**Diaphragm material:** (Other diaphragm materials on request) See page 14 - 17	18 30 51 44	EPDM, FDA / USP compliant MA 8 -100, preferred for SIP applications PTFE(TFM) / EPDM one-piece, FDA / USP compliant, MA 25, 40, 50 PTFE(TFM) / EPDM one-piece, FDA / USP compliant, MA 8, MA 10 PTFE(TFM) / EPDM two-piece, FDA / USP compliant, MA 25 to MA 100
6.1	**Actuator control function (Cf.) and orientation air inlet connection:** See page 32 - 55	 1 2 3 4 5 6	Manually operated Normally closed (NC), orientation 90° to flow direction Normally open (NO), orientation 90° to flow direction Double-acting (DA), orientation 90° to flow direction Normally closed (NC), orientation in flow direction Normally open (NO), orientation in flow direction Double-acting (DA), orientation in flow direction
6.2	**Actuator type:** See page 32 - 55	25 30 45 70 100 170 T AS S HS S01 S02 S03 S11 S12 S13	Steripur, actuator size 25 Steripur, actuator size 30 Steripur, actuator size 45 Steripur, actuator size 70 Steripur, actuator size 100 Steripur, actuator size 170 Steripur, manually operated KMA KMD max. 80°C KMD for steam sterilizing up to max. 150°C KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly bottom entry bolting KMA, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly bottom entry bolting KMA, manually operated, incl. seal adjuster, Bonnet assembly bottom entry bolting KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly through bolting KMA, manually operated, incl. seal adjuster, locking device and stroke limiter, Bonnet assembly through bolting KMA, manually operated, incl. seal adjuster, Bonnet assembly through bolting
7	**Surface roughness of the bodies in Ra: (µm)** Optional surface code SF 1-6 for spigot end (Pos. 4) code 45 or 95 only. See page 10 - 11	02 03 07 08 09 10 SF0 SF1 SF2 SF3 SF4 SF5 SF6	Internal mechanically polished Ra ≤ 0,8 µm Internal mechanically polished Ra ≤ 0,8 µm + Electropolished Internal mechanically polished Ra ≤ 0,6 µm Internal mechanically polished Ra ≤ 0,6 µm + Electropolished Internal mechanically polished Ra ≤ 0,4 µm Internal mechanically polished Ra ≤ 0,4 µm + Electropolished No Finish Requirement ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch) ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch) ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,76 µm (30 µ-inch) ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,38 µm (15 µ-inch) + Electropolished ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch) + Electropolished ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch) + Electropolished
8	**S-Number:**	S…	To specify customized design and all the details for multiport valves

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

Ordering Example

Position:	1	2	3	4	5	6.1	6.2	7
Article Code:	495	. 25	. 77	. 42	. 18	. 1	S	. 03

Type:
495
KMA Series
actuator with stainless steel adaption
pneumatic

Size:
DN 25

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

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

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

Actuator type:
KMA for steam sterilizing up to max. 160° 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 102 to 108

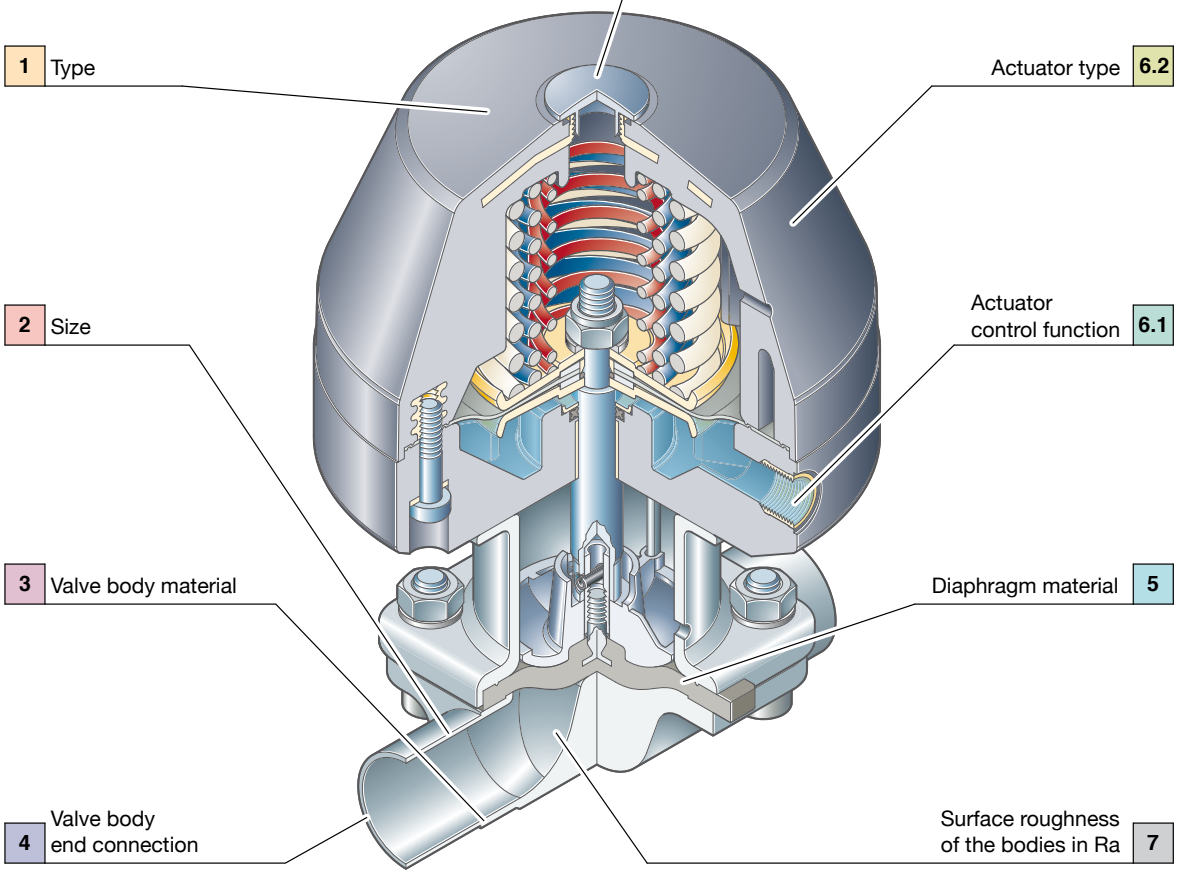


Table of Contents

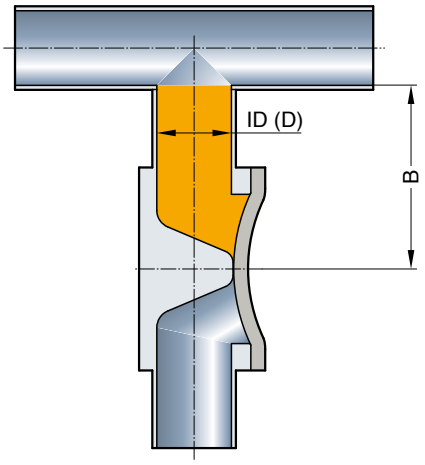
		Page
1	**Introduction**	
	A Brief Overview	4
	The Company	5
	What does Quality mean at SED?	6
	General Information	
	Testing	7
	Qualification, Certification and Documentation	8
	Flow Rate and Valve Sizing	9
	Surface Finish	10, 11
2	**Media Contacted Components**	
	Diaphragms	14 - 17
	Valve Bodies (fold out page)	18
	Butt Weld Tube Ends (fold out page)	19
	Aseptic Connections	
	Clamps	20
	Aseptic Flanges and Aseptic Threads	21
3	**Aseptic Diaphragm Valves**	
	Overview Diaphragm Aseptic Valves	24 - 25
	Why Aseptic Diaphragm Valve?	26
	Self Draining - Two-Way Valve	27
	Innovative Design	28 - 31
	Aseptic Diaphragm Valves	
	Aseptic Diaphragm Valve Manual	32 - 41
	Aseptic Diaphragm Valve Pneumatically Operated	42 - 55
	Ordering Key and Ordering Example	56, 57
4	**Aseptic Diaphragm Valve Configurations**	
	D-Rule	60
	Welded Valve Configurations	61 - 63
	Multiport Valves	
	Why Multiport Valves?	64
	Main line open, Loop Valves (e.g. T-Valve)	65 - 69
	All lines and valve ports able to close	70 - 75
	The way of customized multiport valve designs	76
	Specification Multiport Valves	77
	Tank Valves	78 - 81
	Process Solutions	
	Sterile Sampling Unit	82
	Purified Steam Sampling Unit	83
5	**Angle Seat Valves**	
	Description and Features	86
	Applications	87
	Ordering Key and Ordering Example	88, 89
	Technical Data	90
	2/2-Way Angle Seat Valves	91 - 97
	Valve Body Threaded Socket and Butt Weld End	98
	Valve Body Clamp Socket and Flange	99
6	**System Components and Process Automation**	
	Overview	102
	Manual Adjustment - Optical Indication	103
	Electrical Switch Boxes - Pilot Control	104
	Detailed Information	
	3/2 Way Plastic Pilot Valve Type 602 / 603	105
	Contact-Free Limit Switch 024.50	106, 107
	Control Head Switch 024.63. - 024.89.	108
	Process Automation, Electropneumatic Positioners	109, 110
	Overview Product Range	111
	Glossary	112

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

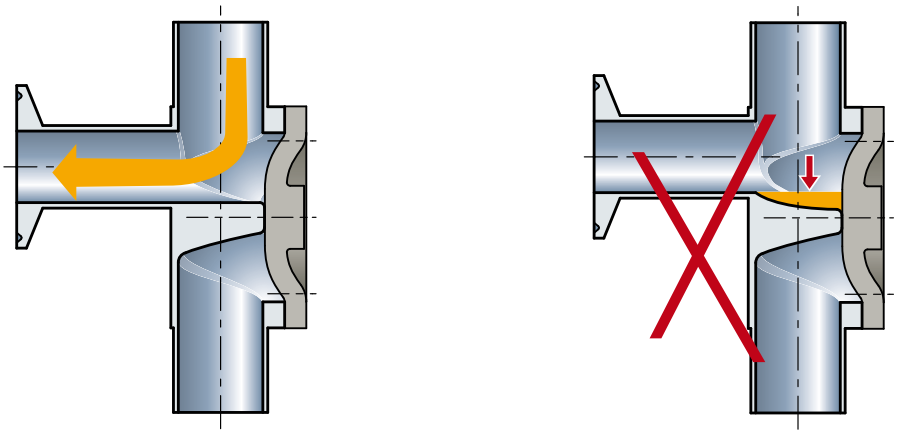
Welded valve configurations are designed to improve the process in aseptic production facilities by reducing the dead legs in accordance to cGMP. Welded valve configurations may be as simple as a valve by tube fabrication or as complex as multiple valve bodies of different sizes welded into a valve cluster. 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.



Welded Valve Configurations

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

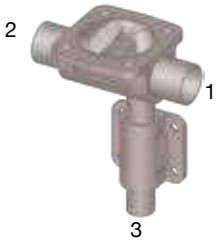
1) SL – L Pattern Configurations
The SL Fabrication is utilized in a vertical piping system to eliminate dead legs in point of use applications of high purity water systems or any other distribution systems. This valve design serves as a 90-degree elbow for the piping system or as a valve by valve configuration.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

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

SL1.H

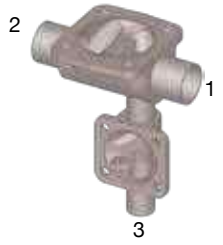
SL2.H

SL2.1.V



SL1.1.V

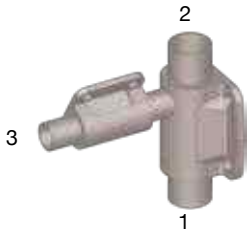
SL2.2.V



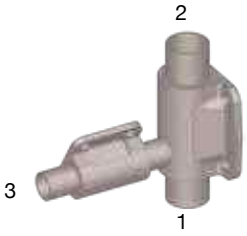
SL1.2.V

SL2.1.H

SL1.1.H



SL2.2.H



SL1.2.H

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.
All fabricated 2/2 way SA and SL orientations will have a dead leg. Manufacturing these valve orientations from a solid block body will minimize or eliminate the dead leg. See page 64 – 77.

2) SA – Sterile Access Configurations

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

The size range available is up to DN 100 (4") for both the main valve and access valve or tube port.
Sterile access fabrications use two standard 2/2 way valve bodies welded together per the required orientation.
In some same size (i.e. DN25 x DN25) sterile access fabrications a block body main valve may be selected for manufacturing.

SA1.V

SA2.V

SA1.1.V

SA2.1.V

SA1.2.V

SA2.2.V

SA1.1.H

SA2.1.H

SA1.2.H

SA2.2.H

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.
All fabricated 2/2 way SA and SL orientations will have a dead leg. Manufacturing these valve orientations from a solid block body will minimize or eliminate the dead leg. See page 64 – 77.

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.

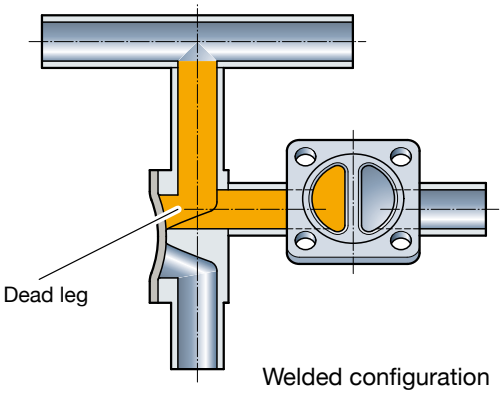
The ideal benefit for you, our customer, is achieved through active and cooperative teamwork of both parties during the design and specification of the valves. This refers especially to the process requirements dictated by the P&ID's for proper flow direction, drainability and installation restraints.

The Advantages at a Glance:

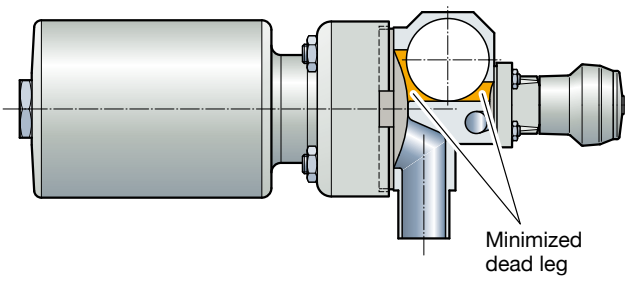
- Customer's specific design
- Compact design and smaller envelope dimension is achievable with the Steripur Series actuators
- Combination of many different nominal diameters
- Optimized drainability
- Minimized dead leg
- Reduces surface contact, hold up volume and cross contamination of the product
- 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:

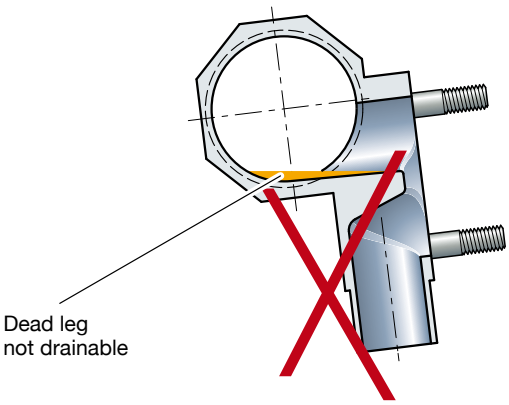


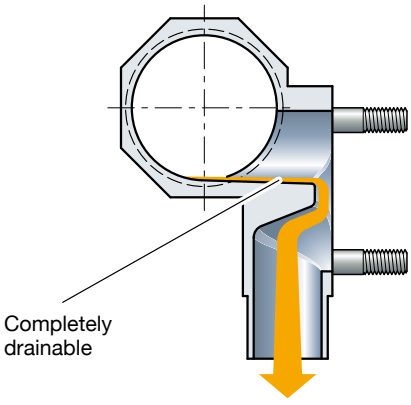
Welded configuration



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.

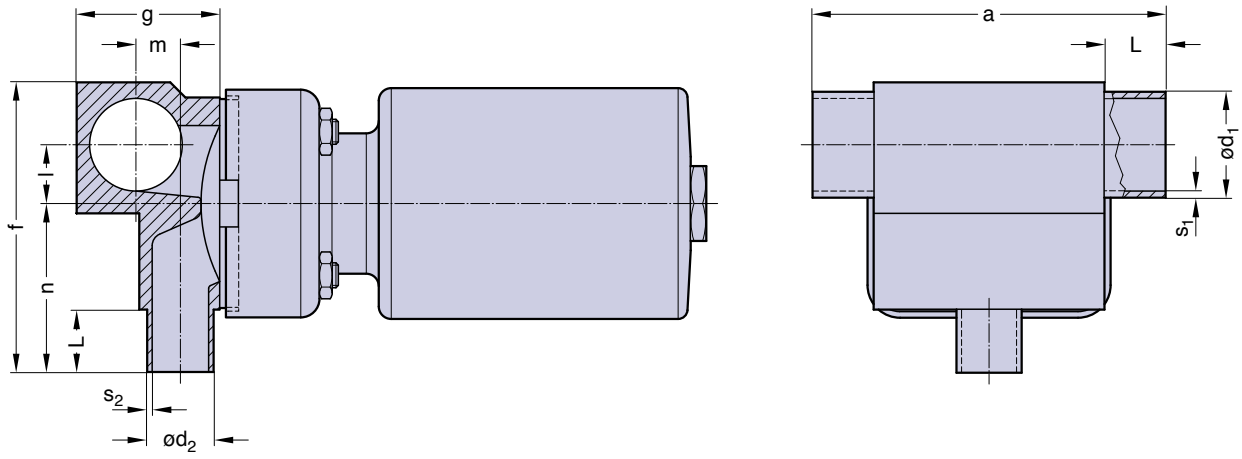
For the differentiation in the following tables, two main criteria are considered:

1) Multiport blocks with main line open for circulation (Page 65 to 69)

2) Multiport blocks with all lines and valve ports able to close (Page 70 to 75)

1) Main line open

T-Valve or ZDL-Valve



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

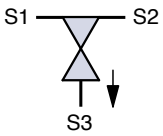
Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

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

Recommended installation:
S3 down



1) Main line open

Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

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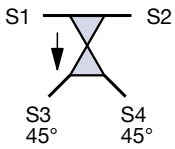
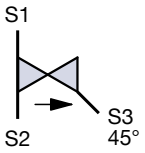
1.13)
TY-Valve
2 x Point of use or sampling valve ports
Optional available with U-bend for easy fit into the loop

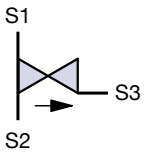
Recommended installation:
S3 and S4 - 45°down

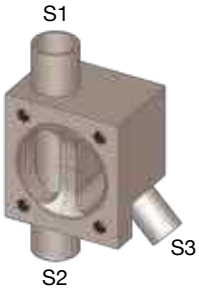


1.15)
TL- Valve, actuation left side
(illustration)
TR-Valve, actuation right side
1 x Point of use or sampling valve port
Main line vertical

Recommended installation:
S3 - 45° down

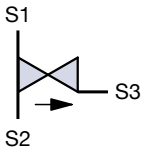


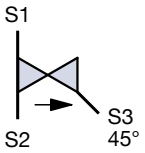




1.16)
TH- Valve
1 x Point of use or sampling valve port
Main line vertical and with horizontal outlet port

Recommended installation:
S2 down





1) Main line open

Description
For valve specification see page 77 as guideline

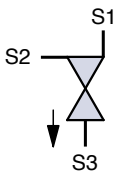
P&ID
Flow direction
Drain direction
Valve

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

---

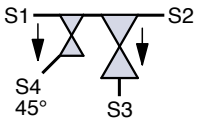
1.2)
LL 3/1 – S2 left side
(illustration)
LR 3/1 – S2 right side
1 x Point of use valve port with integrated directional flow 90° to the main line

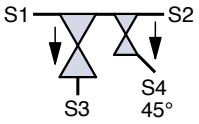
Recommended installation:
S3 down

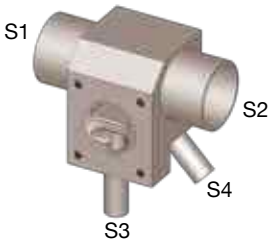


1.4)
MZL 4/2 – S4 left side
MZR 4/2 – S4 right side
(illustration)
1 x Point of use valve port
1 x Integral loop sample valve port
Sample valve be provides on either side of the valve body.
Back to back valve actuation

Recommended installation:
S3 down

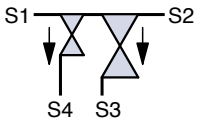


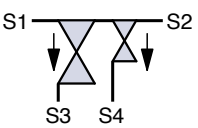




1.45)
MTL 4/2 – S4 left side
(illustration)
MTR 4/2 – S4 right side
2 x Point of Use Valve Port or Double Zero Dead Leg Tee Valve with different diaphragm size. One port maybe used for sampling and the second port for downstream processing.
One side valve actuation

Recommended installation:
S3 and S4 down





1) Main line open

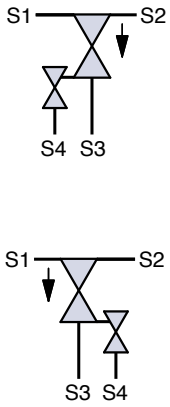
Description
For valve specification see page 77 as guideline

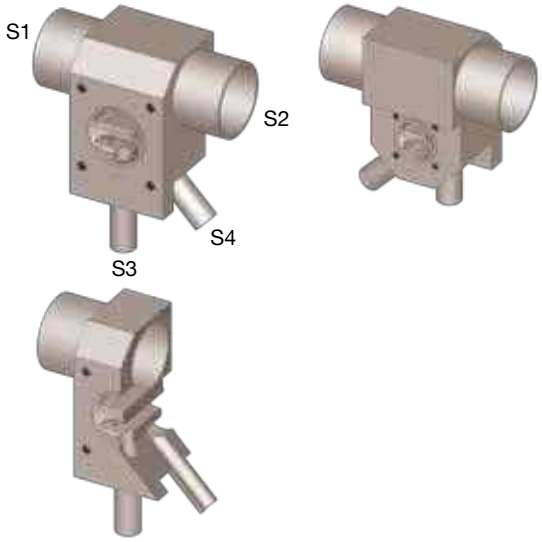
P&ID
Flow direction
Drain direction
Valve

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

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

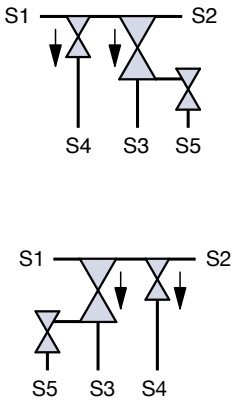
Recommended installation:
S3 down

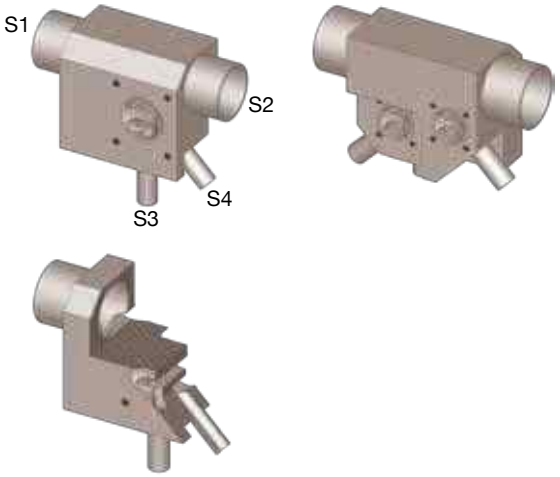




1.7)
MWL 5/3 – S4 left side
(illustration)
MWR 5/3 – S4 right side
1 x Point of use valve port
1 x Integral loop sample valve port
1 x Integral sample purge valve port below the weir.
Sample and purge valve be provides on either side of the valve body.
Back to back valve actuation

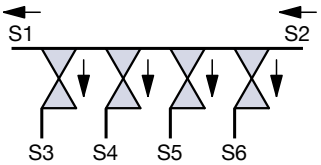
Recommended installation:
S3 down

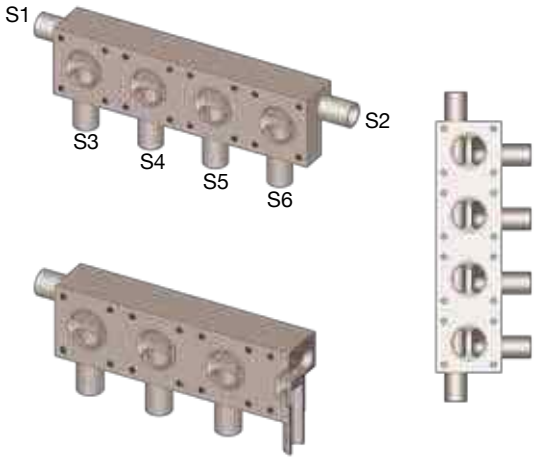




1.9)
MTE 6/4
4 x Point of use valve ports
The Number of valve ports is variable.
One side valve actuation

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





1) Main line open

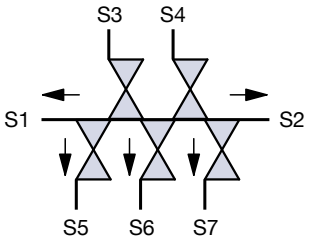
Description
For valve specification see page 77 as guideline

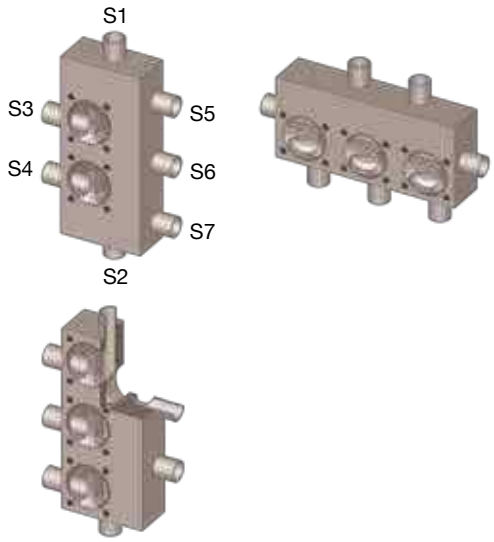
P&ID
Flow direction
Drain direction
Valve

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

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

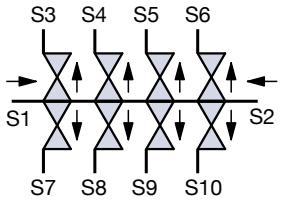
Recommended installation:
S1 and S2 horizontal
S3 to S7 can be vertical if tube outlets S3 to S7 are positioned to the lowest point of valve pocket like the picture shows.

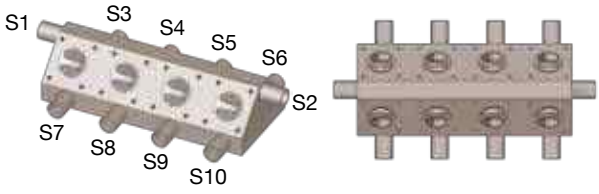


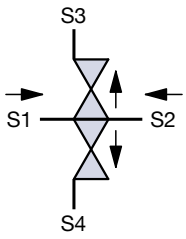


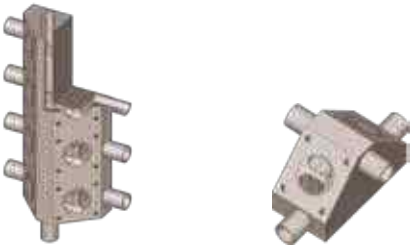
1.14)
MCE 4/2 to 16/14
2 to 14 Point of use valve ports
The number of valve ports is variable
No actuators on the back side

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



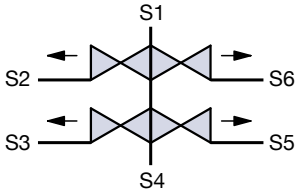


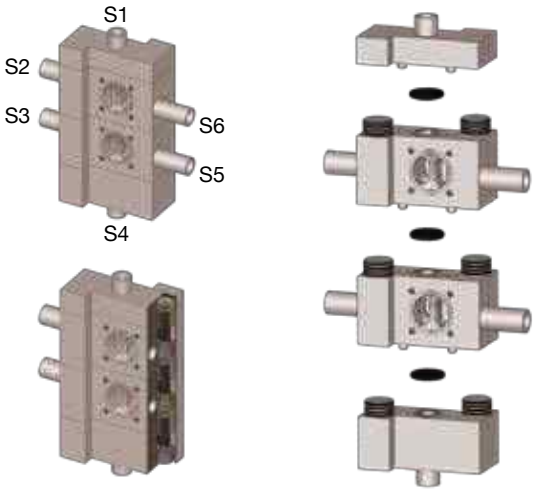




1.16)
MFF 4/2 to 32/30
Up to 30 point of use valve ports as flexible manifold system
Dependent on the requirements the number of valves installed can be between 2 and 30.
It is a mirror design to be suitable also for applying clamp connection.
It allows standardizing skids and other system solutions.
Aseptic O-ring connection according ASME/BPE and DIN 11864 see also catalogue page 21
Back to back valve actuation

Recommended installation:
S4 down





2) All lines and valve ports able to close

Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

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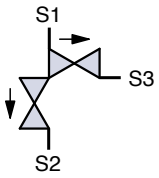
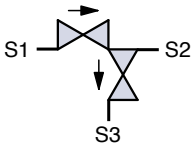
2.1)
MFE 3/2
1 x Valve horizontal
1 x Valve vertical
Back to back valve actuation

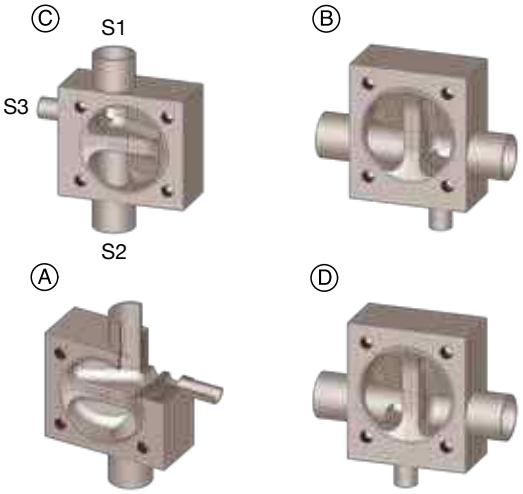
Recommended installation:
Dependent on design and application

Ⓐ



Ⓑ

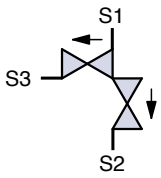


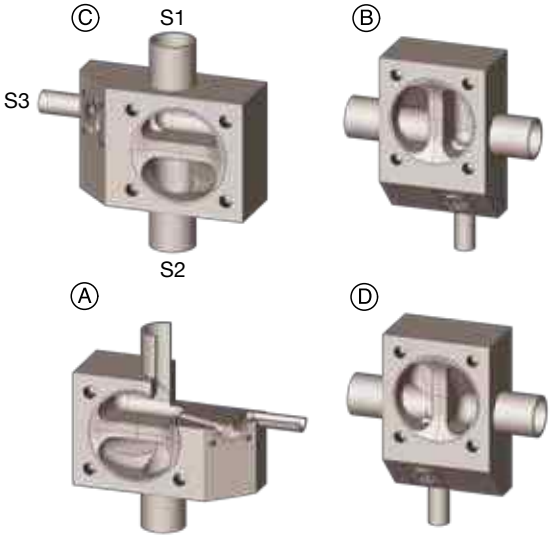


2.15)
GBE 3/2
1 x Valve horizontal
1 x Valve vertical
Function similar to pos. 2.1 but **no valve on the back side**

Recommended installation:
Dependent on design and application

Ⓒ

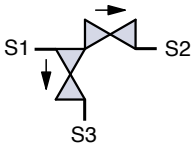


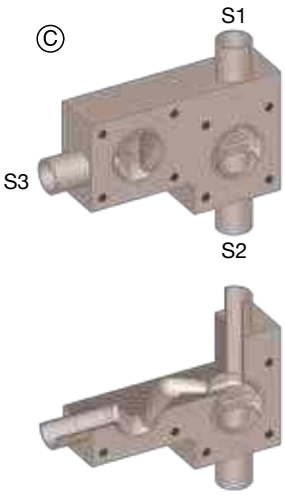


2.16)
MEP 3/2
1 x Valve horizontal
1 x Valve vertical
Illustration shows one version only.
Function similar to pos. 2.1 but **one side valve actuation**

Recommended installation:
Dependent on design and application

Ⓓ





2) All lines and valve ports able to close

Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

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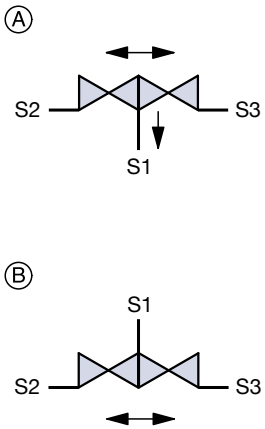
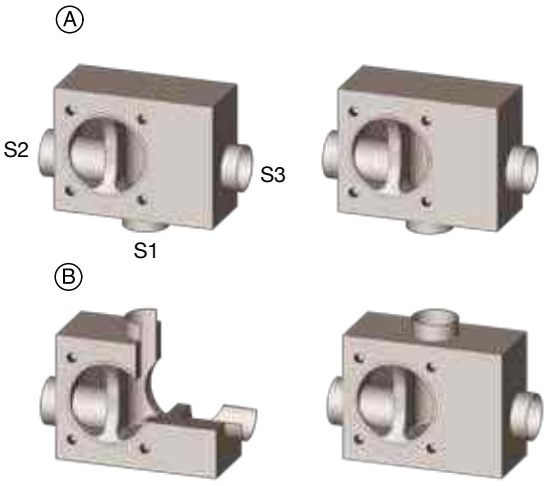
2.25)
MFE 3/2
2 x Valve horizontal
Back to back valve actuation

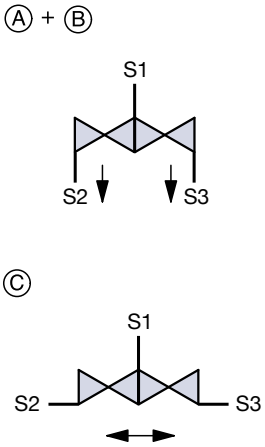
Recommended installation:
S1 vertical down or vertical up
Dependent on design and application

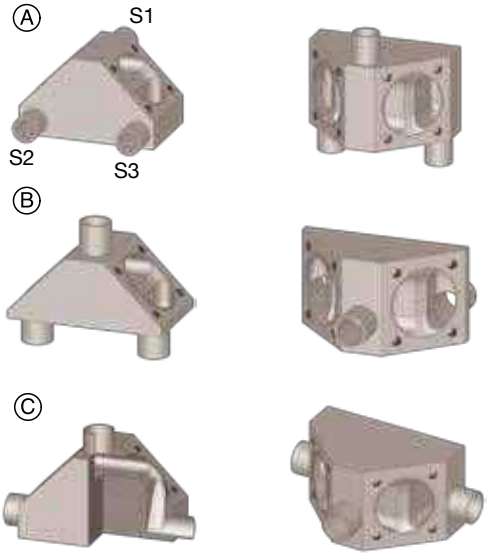




2.31)
MCE 3/2
2 x Valve horizontal
Function similar to pos. 2.25 but **no valve actuation on the back side**

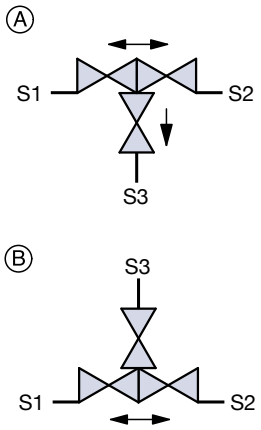
Recommended installation:
S1 horizontal or vertical
The 2- way divert valve block body allows for many different inlet and outlet orientations.
Some of them are illustrated

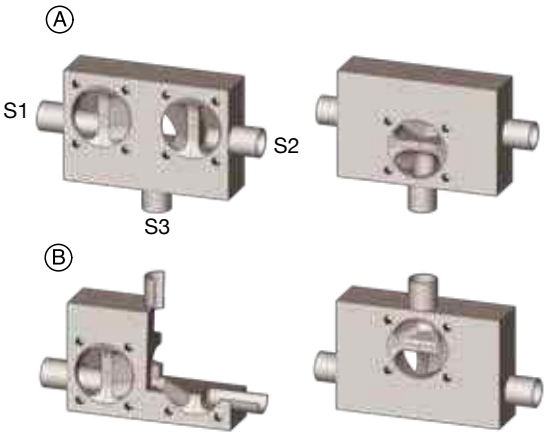




2.35)
MFE 3/3
2 x Valve horizontal
1 x Valve vertical
Back to back valve actuation

Recommended installation:
S3 vertical down or vertical up





2) All lines and valve ports able to close

Description
For valve specification see page 77 as guideline

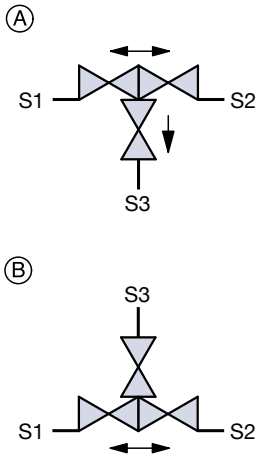
P&ID
Flow direction
Drain direction
Valve

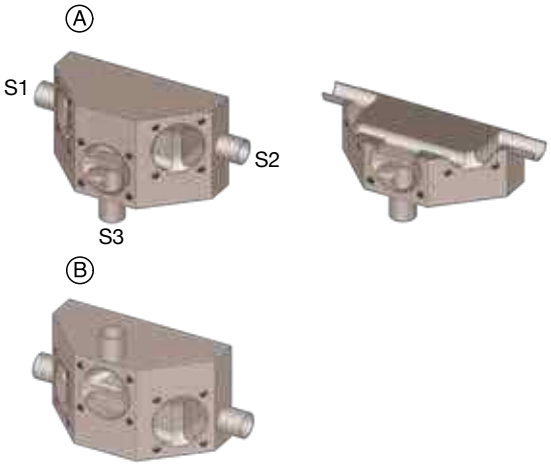
Illustration
Actuators and other options are included in some of the illustrations

---

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

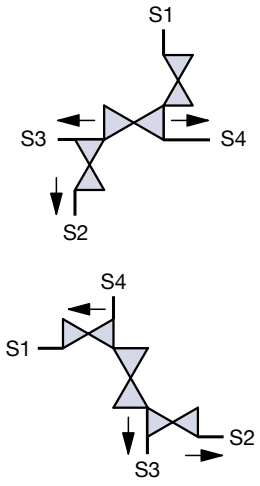
Recommended installation:
S3 vertical down or vertical up
The valve block body allows for many different inlet and outlet orientations.
Some of them are illustrated
Dependent on design and application

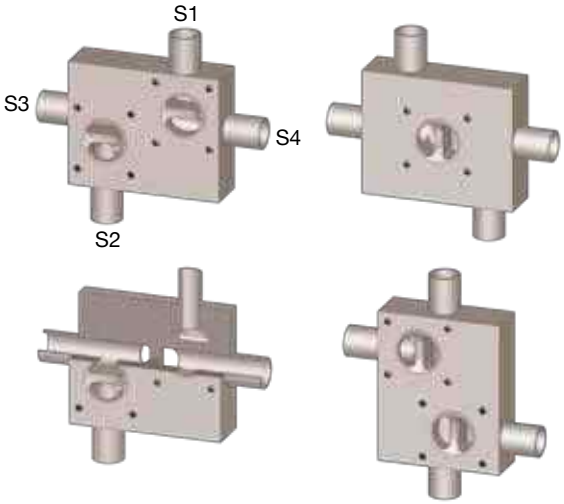




2.41)
MFE 4/3
1 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

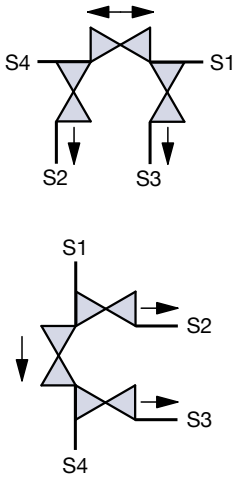
Recommended installation:
Main line isolation through S3 and S4, S1 vertical up sterilization valve port, S2 vertical down sterilization valve port.
Or S3 and S4 vertical dependent on design and application.

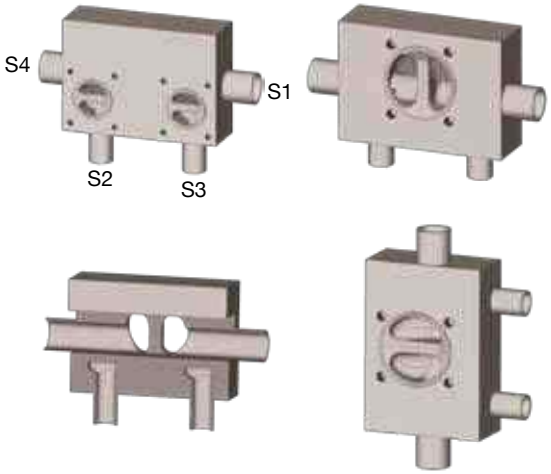




2.43)
MFE 4/3
1 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

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





2) All lines and valve ports able to close

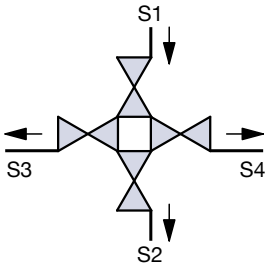
Description
For valve specification see page 77 as guideline

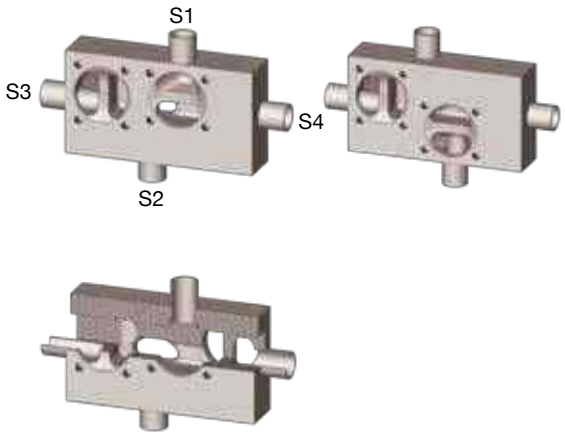
P&ID
Flow direction
Drain direction
Valve

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

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

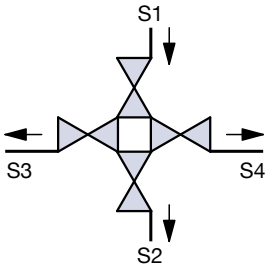
Recommended installation:
S2 vertical down

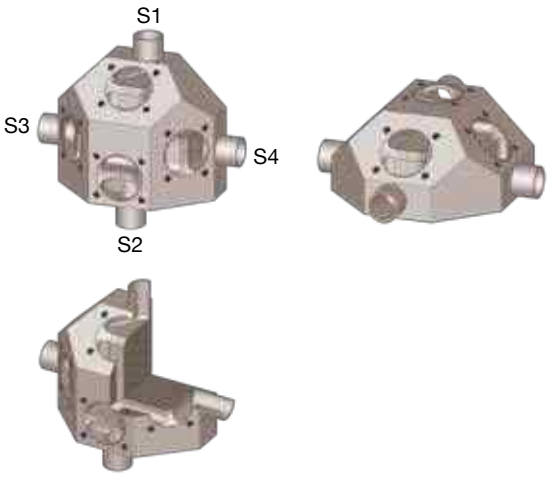




2.51)
MBE 4/4
2 x Valve horizontal
2 x Valve vertical
Function similar to pos. 2.35 but **no valve actuation one the back side**

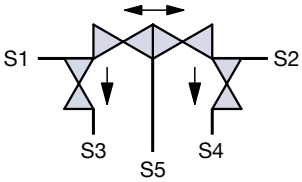
Recommended installation:
S2 vertical down or
S1 and S2 horizontal
The valve block body allows for many different inlet and outlet orientations.
Dependent on design and application

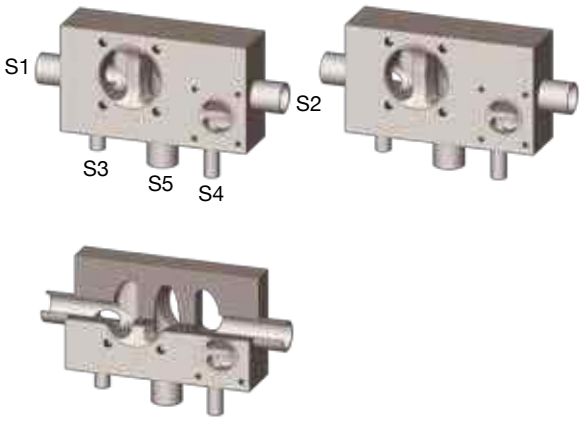




2.71)
MFE 5/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

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





2) All lines and valve ports able to close

Description
For valve specification see page 77 as guideline

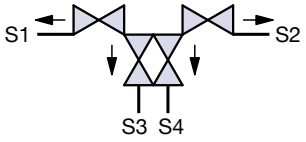
P&ID
Flow direction
Drain direction
Valve

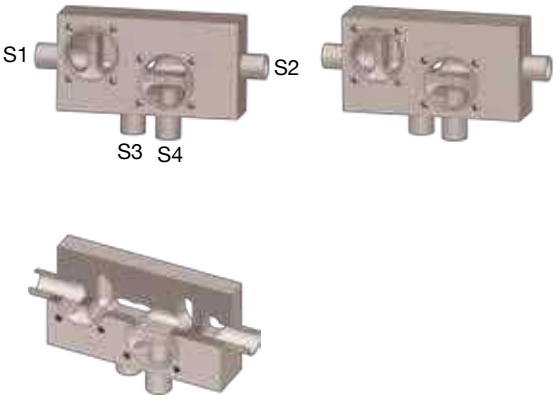
Illustration
Actuators and other options are included in some of the illustrations

---

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

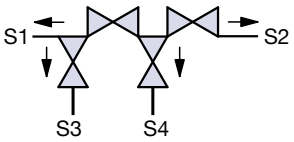
Recommended installation:
S3 and S4 vertical down
Dependent on design
and application
S3 and S4 vertical up

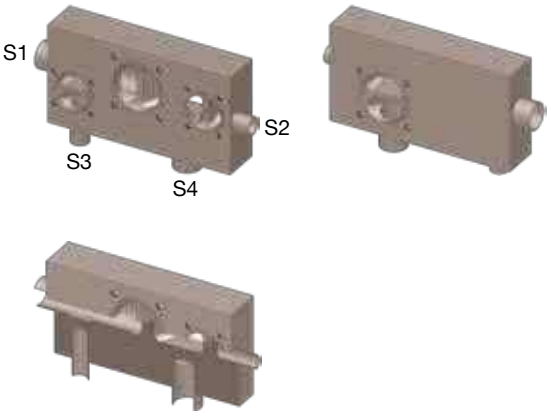




2.73)
MFE 4/4
2 x Valve horizontal
2 x Valve vertical
Back to back valve actuation

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

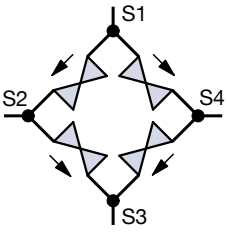


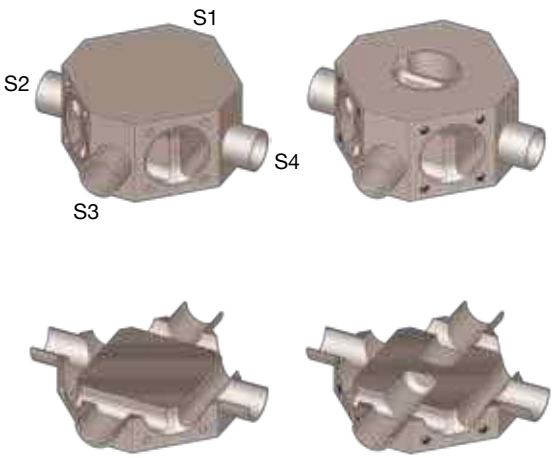


2.8)
MDE 4/4
no valve actuation on the back side
Chromatography valve without bypass

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

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





2) All lines and valve ports able to close

Description
For valve specification see page 77 as guideline

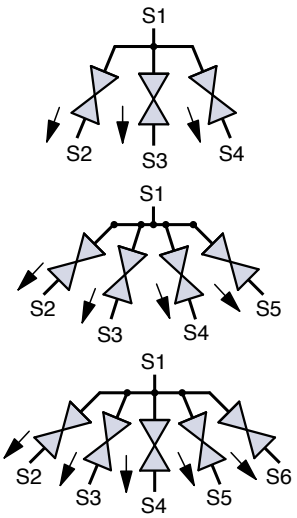
P&ID
Flow direction
Drain direction
Valve

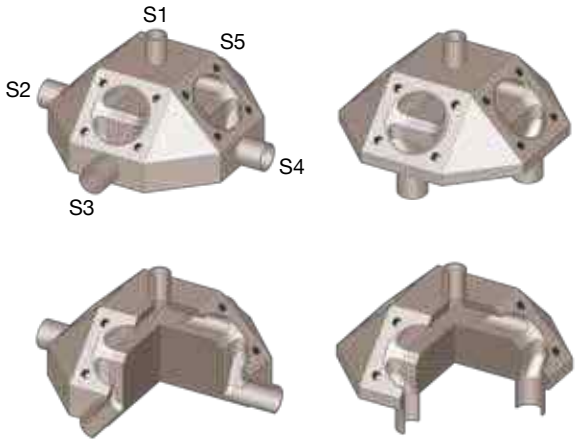
Illustration
Actuators and other options are included in some of the illustrations

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

MCS 5/4 Star Design
4x Valves vertical

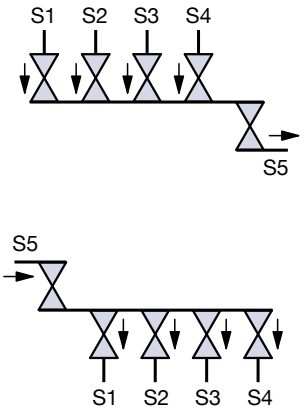
MCS 6/5 Star Design
5x Valves vertical
no valve actuation on the back side
Recommended installation:
S1 vertical; Depending on the diameter the star design is available with up to 7 valves.
The star design has also been manufactured with two opposing multiport block valves with one common port connection.

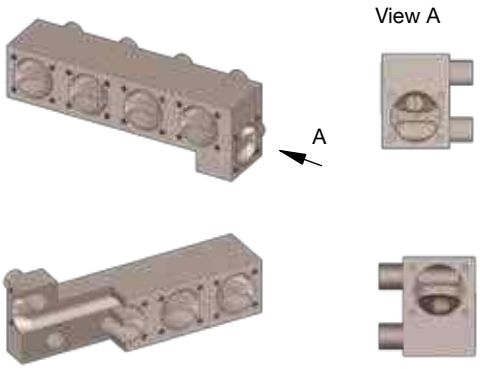




2.91)
MTA 5/5
5 Valves horizontal with one for drainage
no valve actuation on the back side

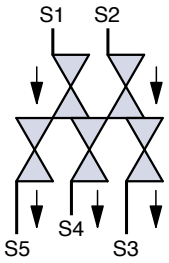
Recommended installation:
S5 as drainage valve.
Different inlet and outlet orientations e.g. S5 as inlet valve.

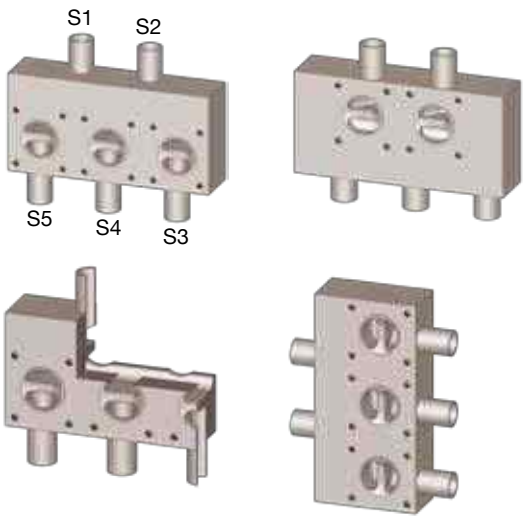




2.95)
MTE 5/5
5x Valve horizontal or vertical.
Back to back valve actuation

Recommended installation:
S1 to S5 vertical
S1 to S5 can be horizontal if the tubes positioned to the lowest point of the valve pocket
This block solution may be used for mixing, diverting, isolation or sterilization.

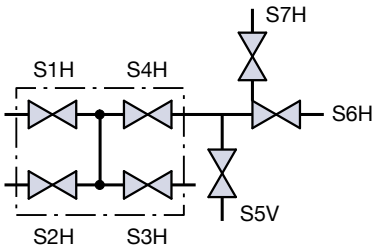


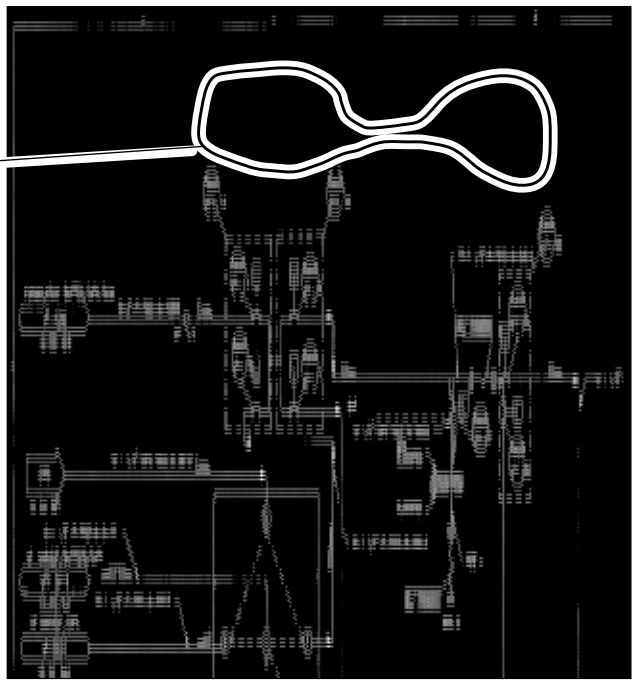


The way of customized multiport valve designs

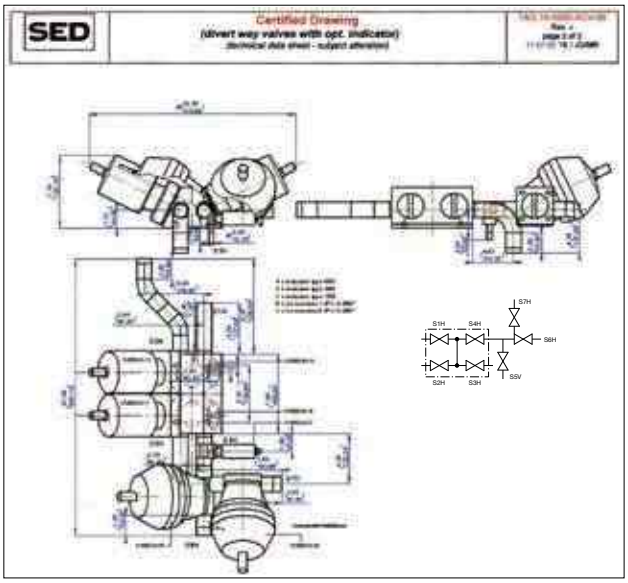
From the piping and instrumentation diagram (P&ID) to the finished plant installation of pharmaceutical and bio pharm projects.

P&ID Multiport Valve Cluster

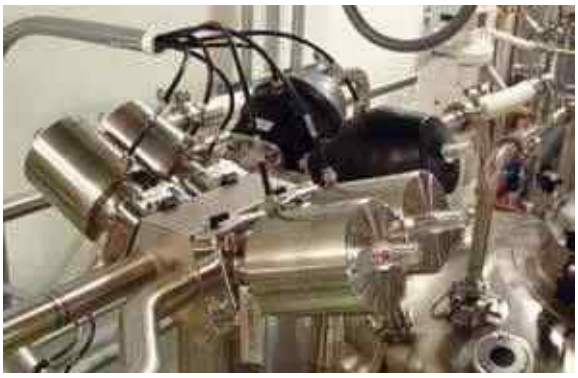




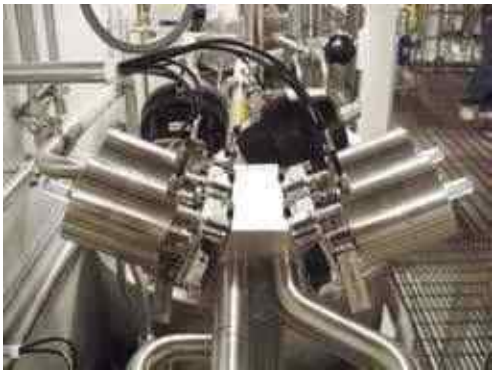
Drawing Multiport Valve Cluster



Images of the installation



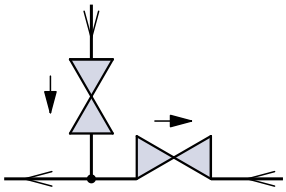
Multiport Valve Cluster



Specification

Your P&ID Sketch:

Example: P&ID



Tube End: S1, S2, ...

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

Flow Direction: →

Drain Direction: →

Valve Seat: 

Working pressure: _____ bar

Working temperature: _____ °C

Multiport valve body material:

1.4435/316L ☐

1.4435/316L (Fe < 0,5%) ☐

Other _____

Surface finish multiport body:

02	Ra ≤ 0,8 µm	☐
03	Ra ≤ 0,8 µm e-polished	☐
07	Ra ≤ 0,6 µm	☐
08	Ra ≤ 0,6 µm e-polished	☐
09	Ra ≤ 0,4 µm	☐
10	Ra ≤ 0,4 µm e-polished	☐

Diaphragm material:

EPDM Code _____

PTFE Code _____

Other _____

Page in catalogue: Page 19 Page 24 - 25 Page 102 - 110

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

Tank Valves

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.

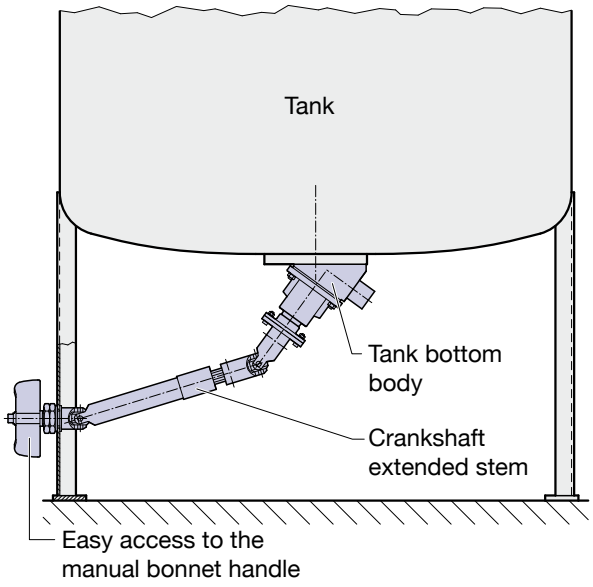
It is preferred to weld in the tank valve directly in the vessel. Mounting the valve directly to the tank minimizes the hold up volume, the most important criteria for this application. If removal of the tank valve from the tank is required, versions are offered with flange or clamp connections. Please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

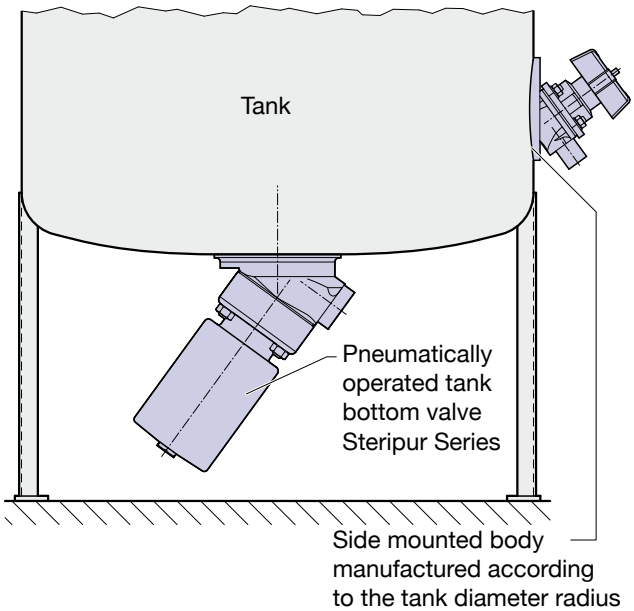
Tank bottom valves are typically used for tank discharge, draining, sampling, cleaning and/or sterilizing, rinsing and isolation of down stream processing.

The outlet port of the tank valve is available with all butt weld tube end standards (see fold-out page 19), aseptic clamp, screw connection (see page 20 and 21) 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





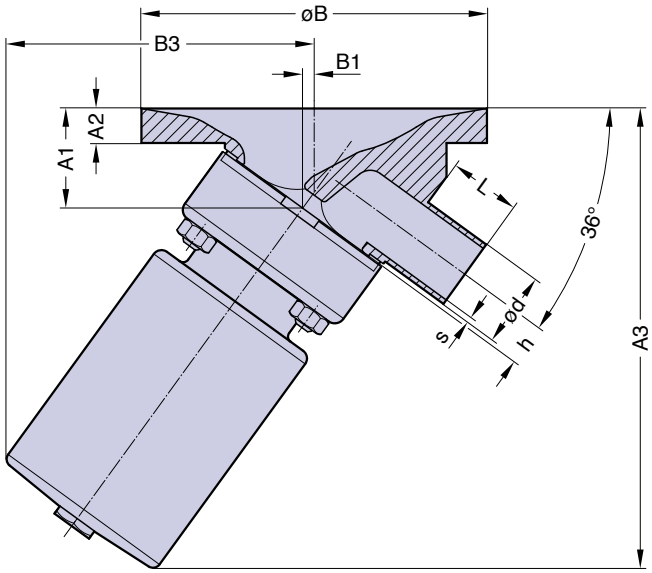
Steripur Series Manual

KMA Series Manual

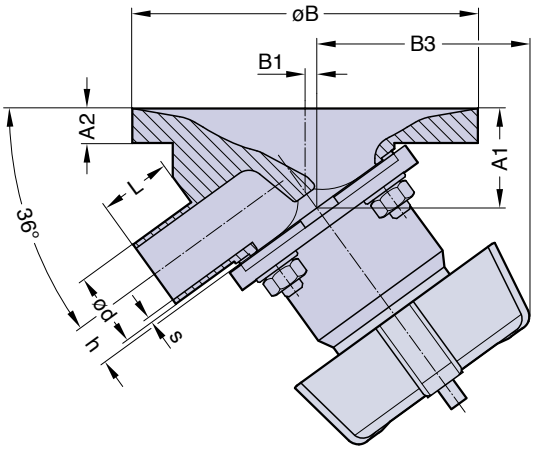
Steripur Series Pneumatically Operated

KMA Series Pneumatically Operated

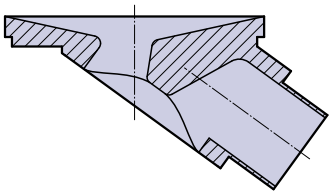
Example:
Drawing Steripur Series pneumatically operated



Example:
Drawing KMA Series manually operated



Common design



Advantages of the SED design:

- minimized hold up volume
- better mixability of media

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

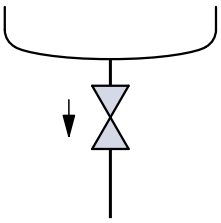
On request, all dimensional data sheets or 2D and 3D - CAD drawings are available.

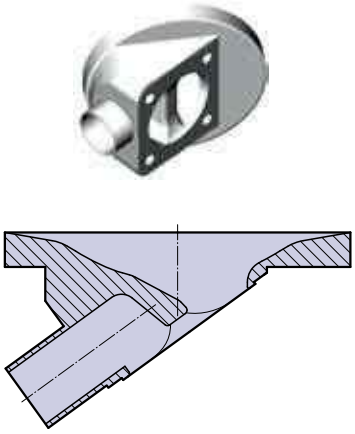
These include options for sampling, sterilization, and multi-outlet configurations.

Description	P&ID	Image
Select a tank valve or see page 77 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



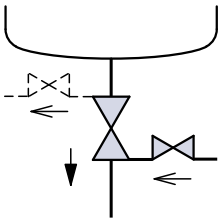


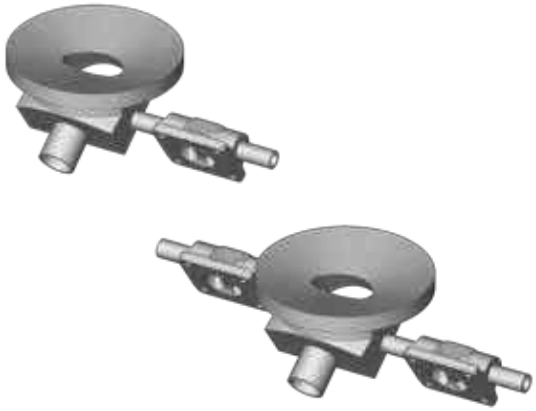
Description
Select a tank valve or see page 77 to sketch and specify your solution

P&ID
Flow direction
Drain direction
Valve

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

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



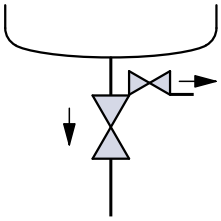


For all options the welded valve is rotated into the self draining position and extended to eliminate interference with the tank bottom

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

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

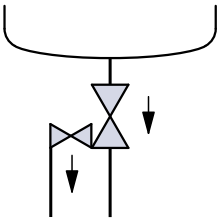
Like position 2 but includes an integral sample valve tank side. Right side and left side options are available and are fully drainable.



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

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

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

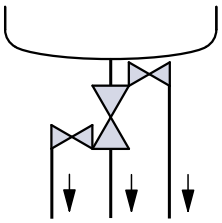


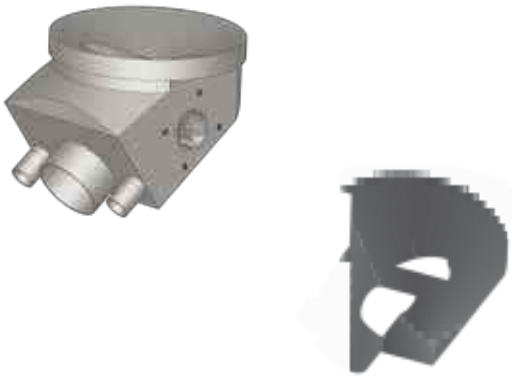
Description
Select a tank valve or see page 77 to sketch and specify your solution

P&ID
Flow direction
Drain direction
Valve

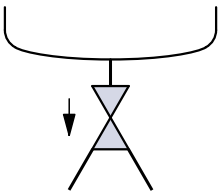
Image
Actuators and other options are included in some of the illustrations

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

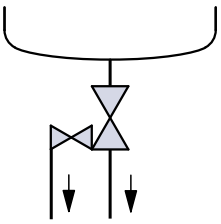




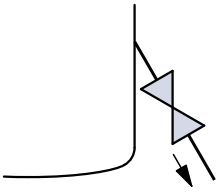
6)
BT 3/1
1x Main valve
2x Outlet port for loop installation or as two access ports

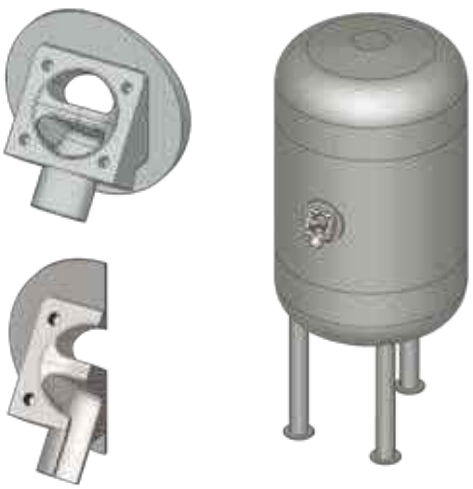


6.5)
BFL
Like position 4, but with flange for dismantling possibility



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





Sterile Sampling Unit

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

Advantages of the SED-Sterile Sampling Unit

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

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

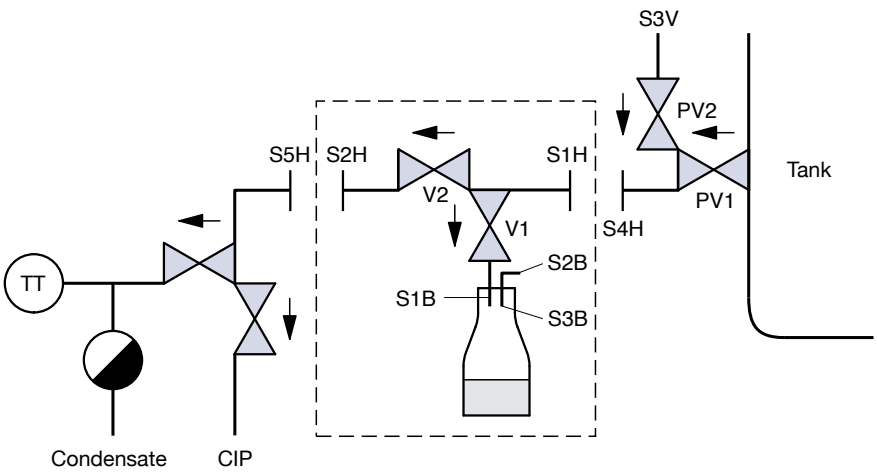
- one unit in use for taking sample
- one unit in the cleaning
- one unit in the sterilization
- one unit for safety

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

There are many different valve requirements when specifying the procedure for taking samples. There are not only the valves on the sampling unit but there is also a need for a valve combination or valve block on the tank and for the condensate and CIP solution as shown on the P&ID.
For applicable designs as valve configurations see page 62 - 63 and for multiport valves see page 70.

Sampling bottle with manual valves and handle

Sampling bottle with pneumatic actuated valves



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

Purified Steam Sampling Unit

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

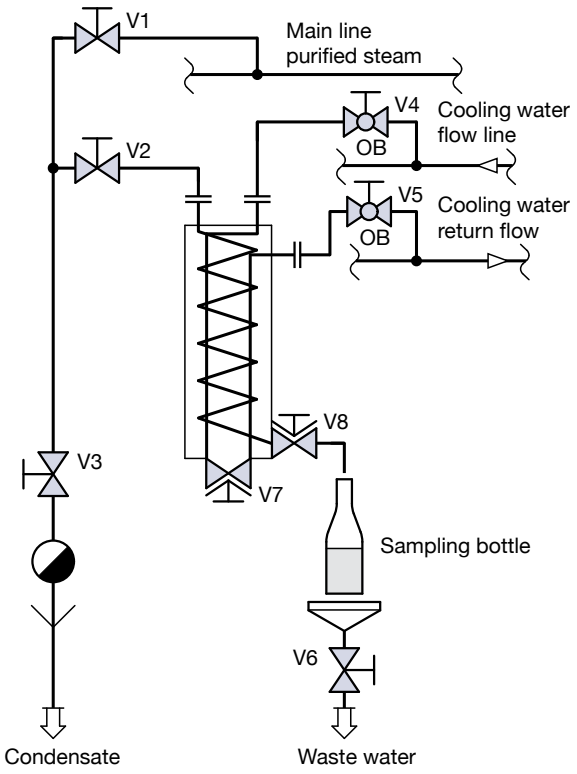
Conforming to GMP the purified sampling unit may be permanently installed or for flexible mobile use.

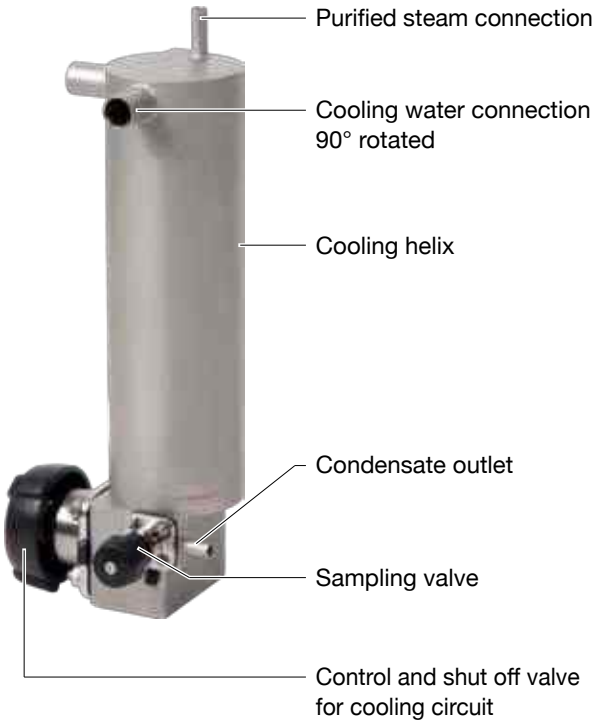
- Integrated diaphragm valve for sampling
- Unit easy to sterilize
- Minimized dead leg and completely self draining
- High grade stainless steel 1.4435/ 316L

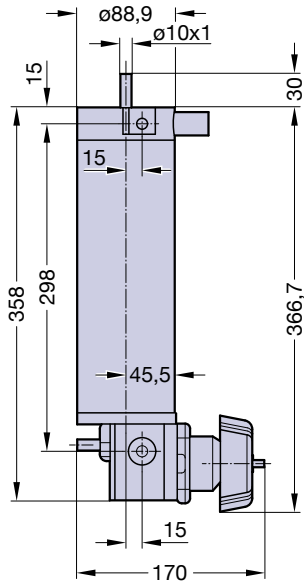
Features

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

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







V1 Shut off for main line purified steam

V2 Shut off to purified sampling system

V3 Shut off to steam trap

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

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

V6 Shut off to drainage

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

V8 Diaphragm valve for condensate sampling

Table of Contents

		Page
1	**Introduction**	
	A Brief Overview	4
	The Company	5
	What does Quality mean at SED?	6
	General Information	
	Testing	7
	Qualification, Certification and Documentation	8
	Flow Rate and Valve Sizing	9
	Surface Finish	10, 11
2	**Media Contacted Components**	
	Diaphragms	14 - 17
	Valve Bodies (fold out page)	18
	Butt Weld Tube Ends (fold out page)	19
	Aseptic Connections	
	Clamps	20
	Aseptic Flanges and Aseptic Threads	21
3	**Aseptic Diaphragm Valves**	
	Overview Diaphragm Aseptic Valves	24 - 25
	Why Aseptic Diaphragm Valve?	26
	Self Draining - Two-Way Valve	27
	Innovative Design	28 - 31
	Aseptic Diaphragm Valves	
	Aseptic Diaphragm Valve Manual	32 - 41
	Aseptic Diaphragm Valve Pneumatically Operated	42 - 55
	Ordering Key and Ordering Example	56, 57
4	**Aseptic Diaphragm Valve Configurations**	
	D-Rule	60
	Welded Valve Configurations	61 - 63
	Multiport Valves	
	Why Multiport Valves?	64
	Main line open, Loop Valves (e.g. T-Valve)	65 - 69
	All lines and valve ports able to close	70 - 75
	The way of customized multiport valve designs	76
	Specification Multiport Valves	77
	Tank Valves	78 - 81
	Process Solutions	
	Sterile Sampling Unit	82
	Purified Steam Sampling Unit	83
5	**Angle Seat Valves**	
	Description and Features	86
	Applications	87
	Ordering Key and Ordering Example	88, 89
	Technical Data	90
	2/2-Way Angle Seat Valves	91 - 97
	Valve Body Threaded Socket and Butt Weld End	98
	Valve Body Clamp Socket and Flange	99
6	**System Components and Process Automation**	
	Overview	102
	Manual Adjustment - Optical Indication	103
	Electrical Switch Boxes - Pilot Control	104
	Detailed Information	
	3/2 Way Plastic Pilot Valve Type 602 / 603	105
	Contact-Free Limit Switch 024.50	106, 107
	Control Head Switch 024.63. - 024.89.	108
	Process Automation, Electropneumatic Positioners	109, 110
	Overview Product Range	111
	Glossary	112

Description and Features

The SED Angle Seat Valve is composed of a 2/2-way angle seat valve body and a pneumatically operated piston actuator, which is mounted with a stainless steel adaption to the valve body.
Depending on the size, the actuators are made of plastic or aluminium.
The plastic actuators consist of a high temperature resistant plastic.
A self-adjusting gland assures reliable longlife performance. The gland is protected against dust and damage by a wiper, which is located in front of the gland.

The SED Angle Seat Valve is suitable for shut off, dosing, control and regulating liquid or gaseous media.
The angle seat valve can be designed to specific requirements.
Applications engineered for optimized flow characteristics is achieved by reduced Kv/Cv-values and equal percentage or linear flow curves.
Even simple solutions like noise reduction are possible.

Features

- High flow rate.
- Assembly of actuator is isolated from the media with sealing prior to the thread.
- 360° adjustable actuator orientation.
- Comprehensive modular accessories suitable for retrofitting after installation.
- Actuator options include normally closed, normally open, or double acting.
- Variety of valve body end connections including threaded socket, butt weld and socket weld in different international standards, flanged ends and sanitary clamps.

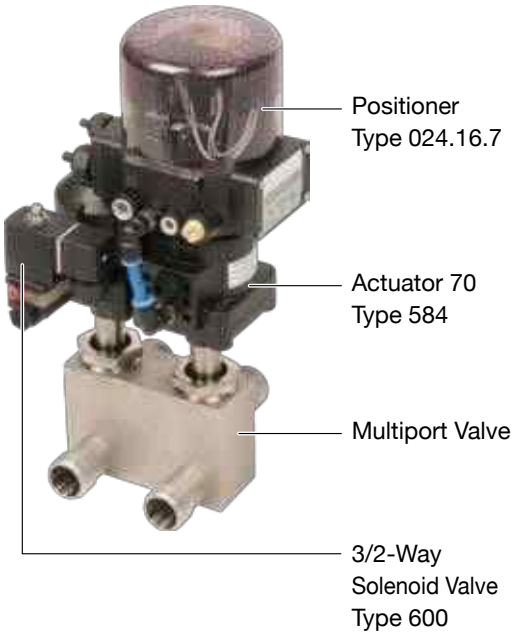
Industries, applications, and media where the SED seat valves may be used.

Industry:
Pharmaceutical, medical, food, beverage, cosmetics, chemical, packaging, plastic, rubber, textile and color industry.

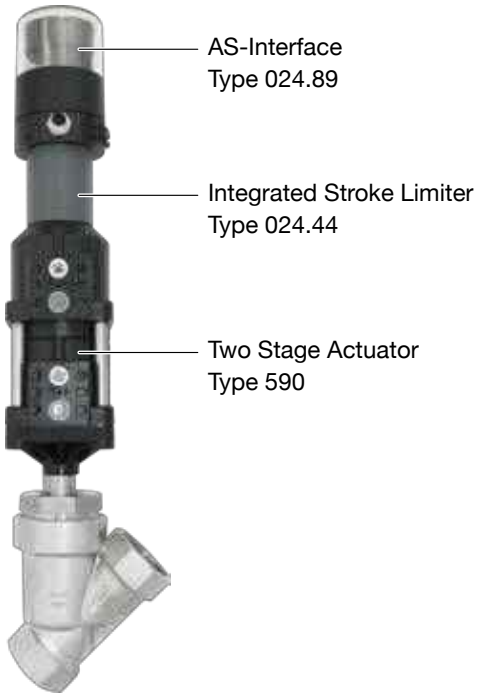
Applications:
Sterilization in CIP and SIP, autoclave, steam generation, washing and cleaning facilities, filling, cooling circuits, heating facilities, boiler construction, dosing, packaging, drying, temperature and pressure control and process flow.

Media:
Steam, water, cooling water, gases, nitrate, compressed air, oils and various chemicals.

Multiport valve for the control and shut off of heating or cooling media, heating of fermentation units and batch boilers.



2/2-way angle seat valves with two stage actuator, adjustable stroke limiter, AS-Interface and circumferential optical position indicator, used for the filling of production containers with weighing equipment.

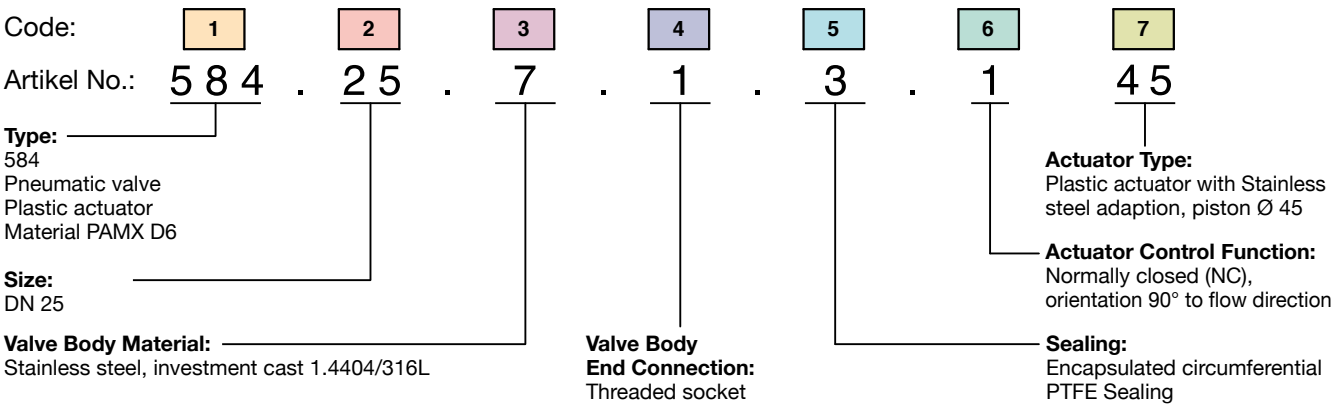


Bioreactor from Solaris biotechnology with SED 2/2-Way Angle Seat Valves for purified steam and diaphragm valves for aseptic media.

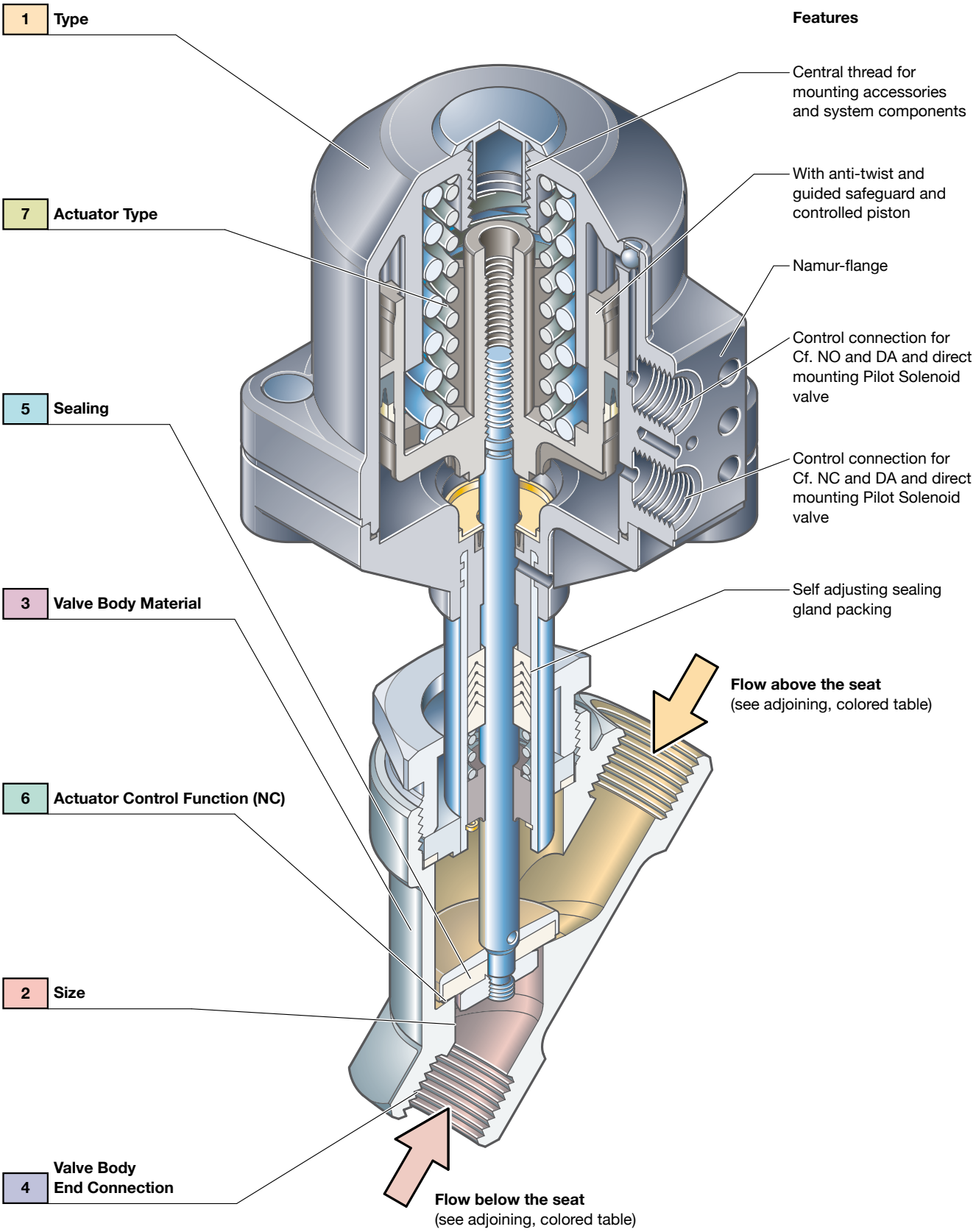
Ordering Key and Ordering Example

Pos.	Description	Code	Specification
1	**Type:**	580	Manual valve, plastic hand wheel
		581	Manual valve, stainless steel hand wheel, metal bellow
		584	Pneumatic valve, plastic actuator material PAMX D6
		585	Pneumatic valve, aluminium actuator
		590	Pneumatic valve, two stage plastic actuator (only Cf. 1)
2	**Size:**	08-80	DN 8, 10, 15, 20, 25, 32, 40, 50, 65, 80
3	**Valve body material:**	7	Stainless steel, investment cast 1.4404/S31603, ASME BPE Table MM-2.1.1-1
		75	Stainless steel, investment cast 1.4408
4	**Valve body end connection:**	**1**	Threaded socket BSP
		1N	Threaded socket NPT
		40	Butt weld end ISO 1127 (DIN 11866 Series B)
		41	Butt weld end DIN 11850 Series 1
		42	Butt weld end DIN 11850 Series 2 (DIN 11866 Series A)
		45	Butt weld end ASTM 269 ASME BPE (DIN 11866 Series C)
		49	Butt weld end SMS 3008
		51	Flange PN10/16 DIN 2564, face to face DIN EN 558-1, Series 1
		740	Clamp ISO 1127, for tube EN ISO 1127 face to face DIN EN 558-1, Series 1
		742	Clamp DIN 32676, for tube DIN 11850 face to face DIN EN 558-1, Series 1
		745	Clamp ASME BPE, for tube ASME BPE face to face DIN EN 558-1, Series 1
5	**Sealing:**	3	Encapsulated circumferential PTFE sealing
6	**Actuator control function:**		Manually operated
		1	Normally closed (NC), orientation 90° to flow direction
		2	Normally open (NO), orientation 90° to flow direction
		3	Double action (DA), orientation in flow direction
7	**Actuator type:**	S	Plastic hand wheel
		T	Stainless steel hand wheel
		43	Plastic actuator with Stainless steel adaption, piston Ø 45 Flow **below** the seat
		44	Plastic actuator with Stainless steel adaption, piston Ø 45 Flow **above** the seat
		45	Plastic actuator with Stainless steel adaption, piston Ø 45 Flow **below** the seat
		46	Plastic actuator with Stainless steel adaption, piston Ø 45 Flow **above** the seat
		70	Plastic actuator with Stainless steel adaption, piston Ø 70 Flow **below** the seat
		71	Plastic actuator with Stainless steel adaption, piston Ø 70 Flow **above** the seat
		120	Aluminium actuator with Stainless steel adaption, piston Ø 120 Flow **below** the seat

Bold = preferential standards



Type 584, Actuator 70



Operating Conditions

Operating Medium:	Neutral, agressive, gaseous, and liquid media. Media must be compatible with the materials of construction.
Viscosity:	Max. 600 mm^2/sec
Medium Temperature:	-10 to +180°C for PTFE sealing
Working Pressure:	See table
Control Medium:	Neutral gases, air
Temperature	
Control Medium:	Max. +80°C
Working Temperature:	-10 to +90°C

Size:	DN 8-80
Valve Body Material:	See ordering key page 88
Sealing:	PTFE capsuled (NBR, FKM, EPDM on request)
Actuator Material:	See ordering key page 88
Filling Volume:	Actuator 43, 45, 46 0,03 dm^3
	Actuator 70/71 0,13 dm^3
	Actuator 120 0,63 dm^3

Kv-Value Water (m^3/h)

Size	8	10-15	15	20	25	32	40	50	65
Kv-Value actuator type code 43	2,1	2,4							
Kv-Value for all actuator types except code 43			5,2	10,0	15,0	22,5	40,0	72,0	105,0

Measuring at 20°C, 1 bar pressure at the valve input and the free outlet, measured at the valve body with threaded socket.

Working Pressure for Valves with flow **below** the seat

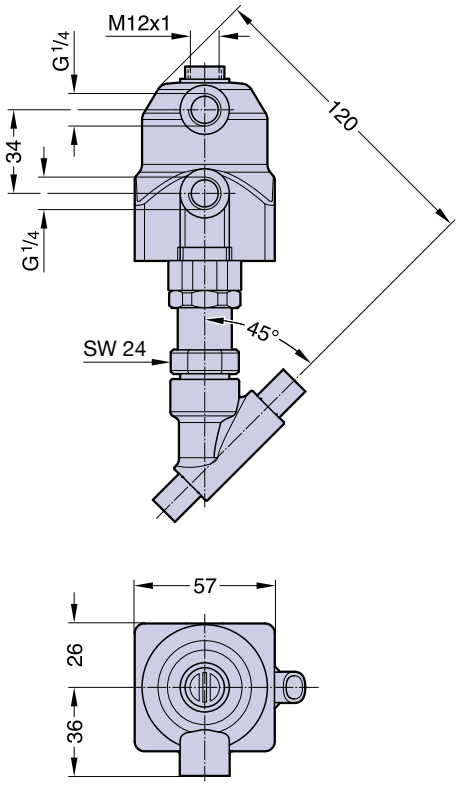
Actuator Type Code	Type	Ø Actuator Piston	Control Function (Cf.)	Control Pressure min. - max. (bar)	Size 8-15	15	20	25	32	40	50	65	80
					Working Pressure max. (bar)								
	580		Manually op.			16	16	16	10	10	10		
	581		Manually op.			10	10	10	10	10	10		
43	584	45	1 (NC)	4,5-8	16								
45	584	45	1 (NC)	4,5-8		11	6	2,5					
70	584/590	70	1 (NC)	4,5-8		25	20	10	7	4,5	3		
120	585	120	1 (NC)	4,0-10			25	25	16				
120	585	120	1 (NC)	4,0-10						16	10	7	7
43	584	45	2 (NO)	page 93	25								
45	584	45	2 (NO)	page 94		25	22	14					
70	584	70	2 (NO)	page 95		25	25	25	25	16	11		
120	585	120	2 (NO)	page 96						25	25	22	16
43	584	45	3 (DA)	page 93	25								
45	584	45	3 (DA)	page 94		25	25	20					
70	584	70	3 (DA)	page 95		25	25	25	25	17	11		
120	585	120	3 (DA)	page 96						25	25	22	16

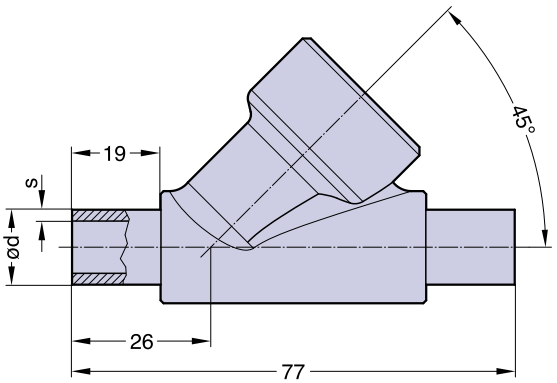
Working Pressure for Valves with flow **above** the seat (suitable to only a limited extent for liquid media, there is a danger of waterhammer)

Actuator Type Code	Type	Ø Actuator Piston	Control Function (Cf.)	Control Pressure min. - max. (bar)	Size 8-15	15	20	25	32	40	50	65	80
					Working Pressure max. (bar)								
46	584	45	1 (NC)	page 94		10	10	10					
71	584	70	1 (NC)	page 95		10	10	10	10	10	10		

All pressures are gauge pressures.

Type 584, Actuator 43





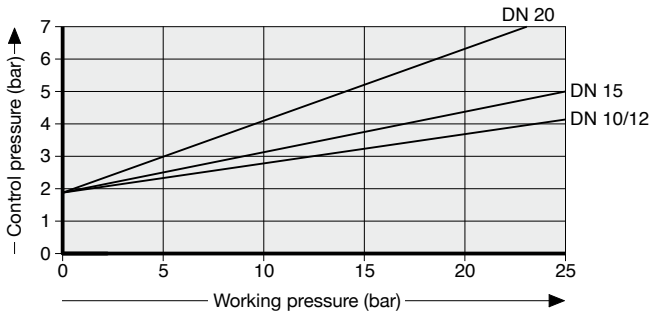
(Clampversion 102)

Butt Weld End [mm]
Valve Body Material Investment Cast 1.4404 (Code 7)

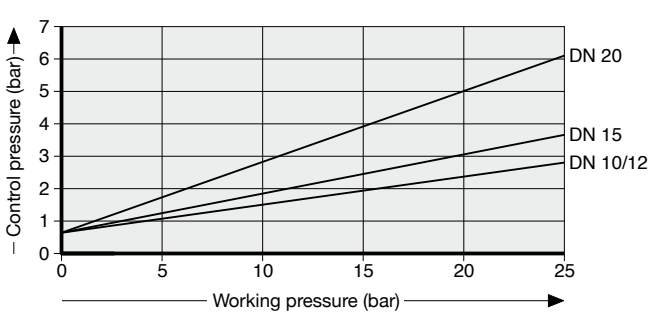
	Connection Code							
	DIN 11850 Series 1		DIN 11850 Series 2		ASTM 269 ASME BPE		ISO 1127	
	41		42		45		40	
DN	ød	s	ød	s	ød	s	ød	s
8	-	-	-	-	-	-	**13,5**	**1,6**
10	12	1	**13**	**1,5**	-	-	-	-
15	-	-	-	-	**12,7**	**1,65**	-	-

Weight ca. 0,7 kg, preferential standards in bold

Actuator 43 (NO), flow below the seat

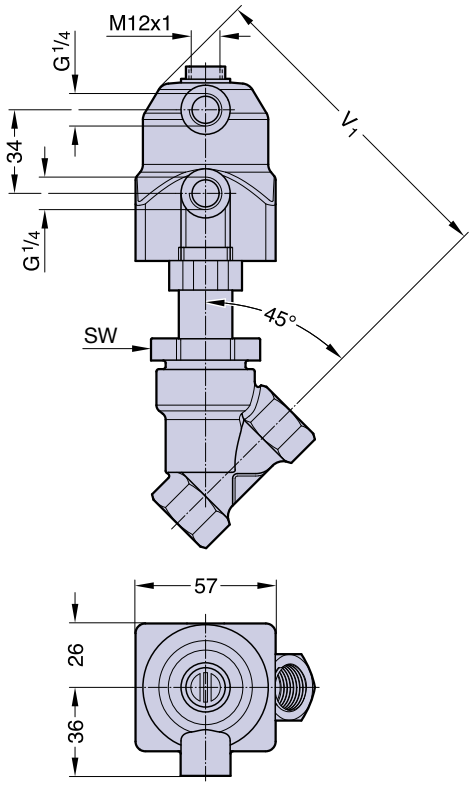


Actuator 43 (DA), flow below the seat

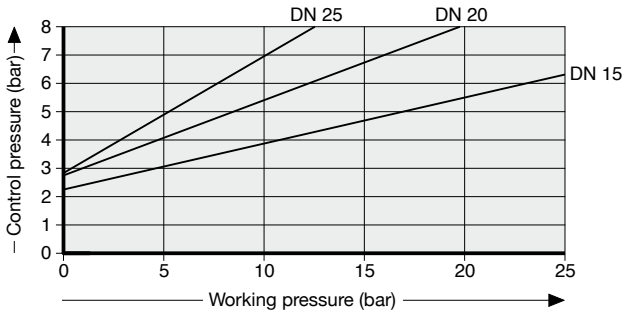


Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.

Type 584, Actuator 45 and Actuator 46



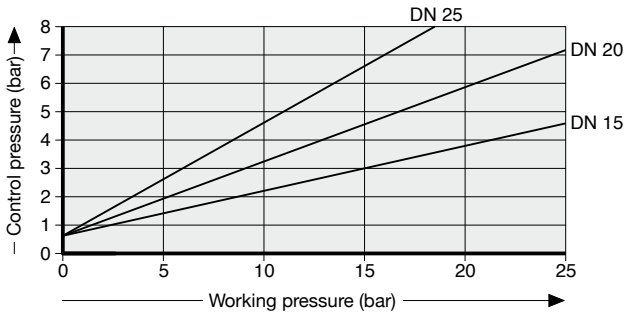
Actuator 45 (NO), flow below the seat



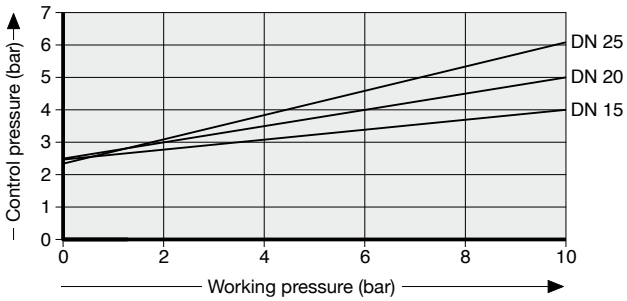
Measurement and weight table Actuator type 45 and 46			
DN	SW	V_1	Total weight ca. (kg)
15	36	130	0,8
20	41	136	1,1
25	46	140	1,2

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Actuator 45 (DA), flow below the seat

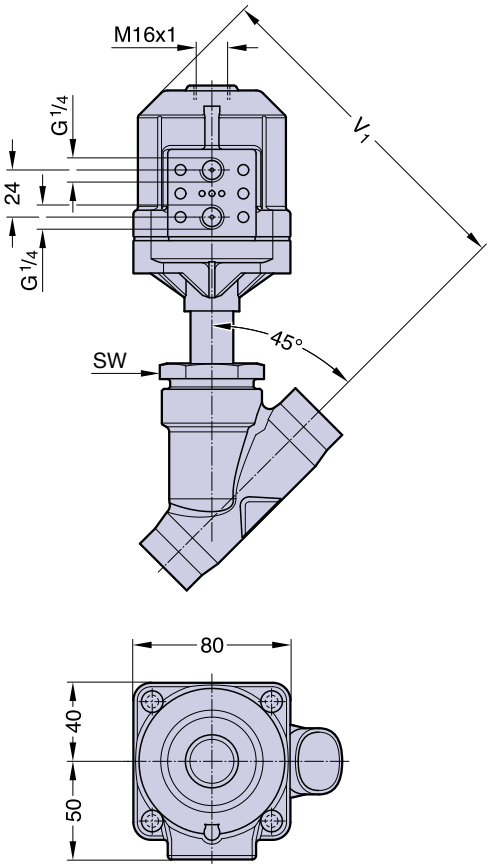


Actuator 46 (NC), flow above the seat

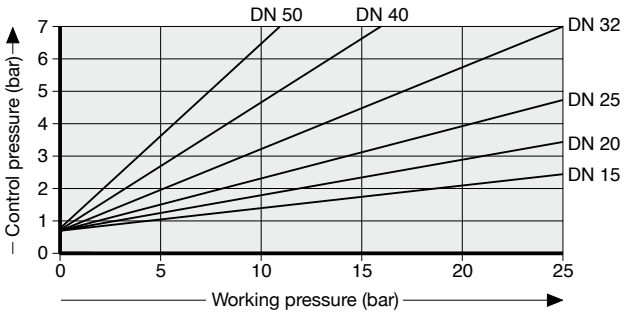


Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.

Namur-Flange
The threaded bushing 024.583.001 for the valve mounting necessary is available on request.



Actuator 70 (NO), flow below the seat

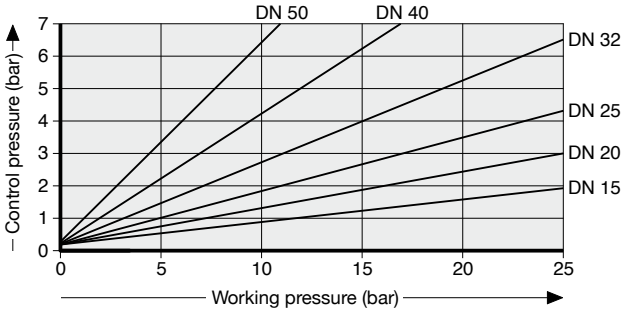


Measurement and weight table Actuator type 70 and 71

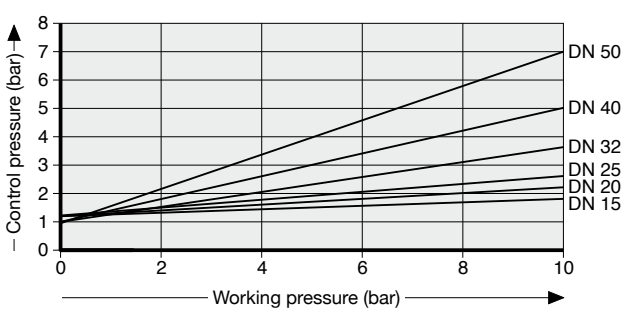
DN	SW	V_1	Total weight ca. (kg)
15	36	162	1,2
20	41	173	1,3
25	46	173	1,6
32	55	179	2,1
40	60	185	2,2
50	75	192	3,2

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Actuator 70 (DA), flow below the seat

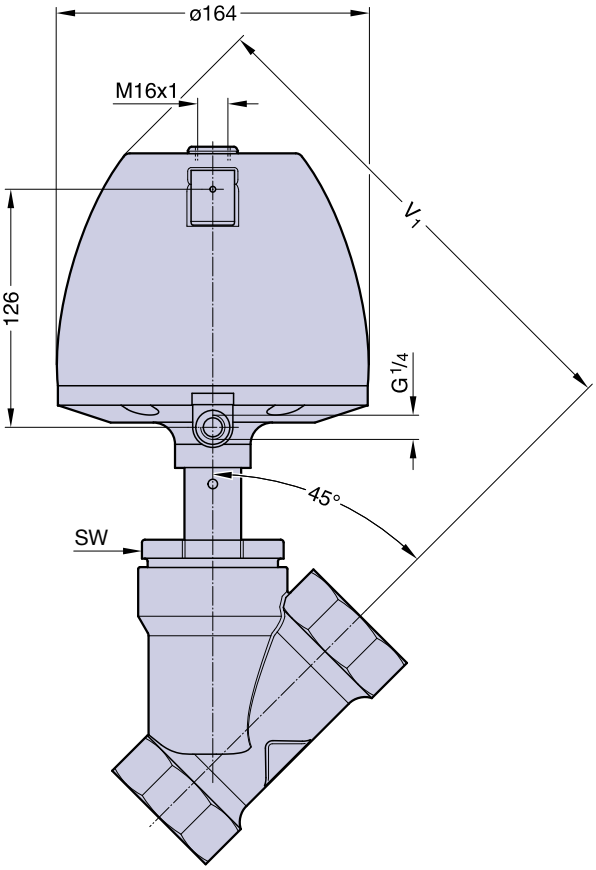


Actuator 71 (NC), flow above the seat



Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.

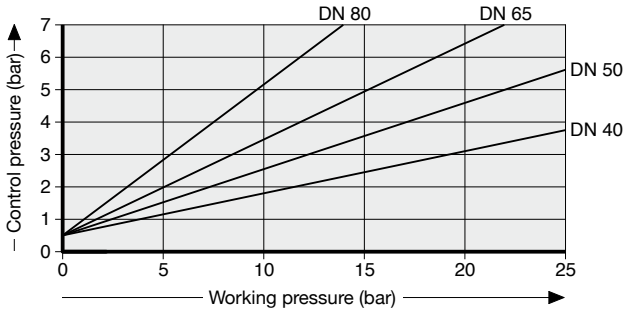
Type 585, Actuator 120



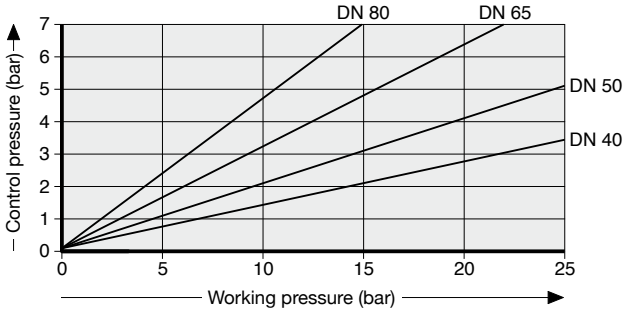
Measurement and weight table Actuator type 120			
DN	SW	V_1	Total weight ca. (kg)
20	41	237	4,9
25	46	241	5,2
32	55	247	5,5
40	60	253	5,7
50	75	260	5,9
65	75	273	8,8
80	75	273	8,8

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Actuator 120 (NO), flow below the seat

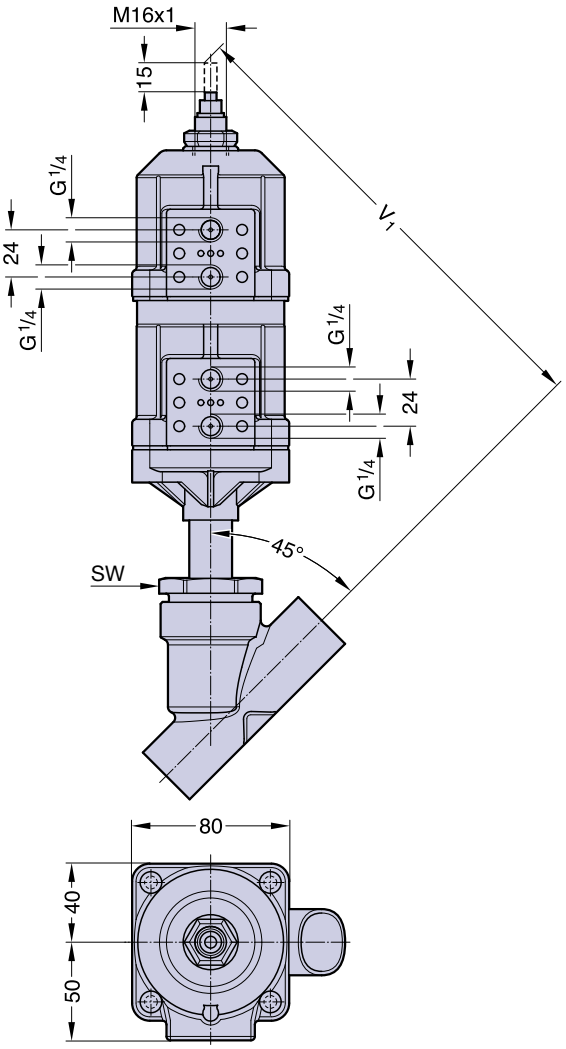


Actuator 120 (DA), flow below the seat



Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.

Type 590, Two Stage Actuator 70



2/2-Way Angle Seat Valves with Two Stage Actuator
The pneumatically controlled two stage piston actuator is made of two plastic actuators. The two stages can be independently actuated from each other.
In order to open the valve completely with the full flowrate, the lower piston has to be actuated. Limited opening or flowrate is possible by actuating the upper piston.
An adjustable stroke limiter allows to adjust the linear movement of the upper position. An optical indicator which is directly connected with the valve spindle shows the stroke.
The control function of the valve is normally closed (Cf.1).

Application
The valve is mainly used for filling with controlled filling of a tank, container or barrel. For filling, the valve is completely opened with the full flow rate. At the end of the filling cycle, the valve automatically reduces to the second stage of filling with a reduced flow rate for an accurate finish fill.

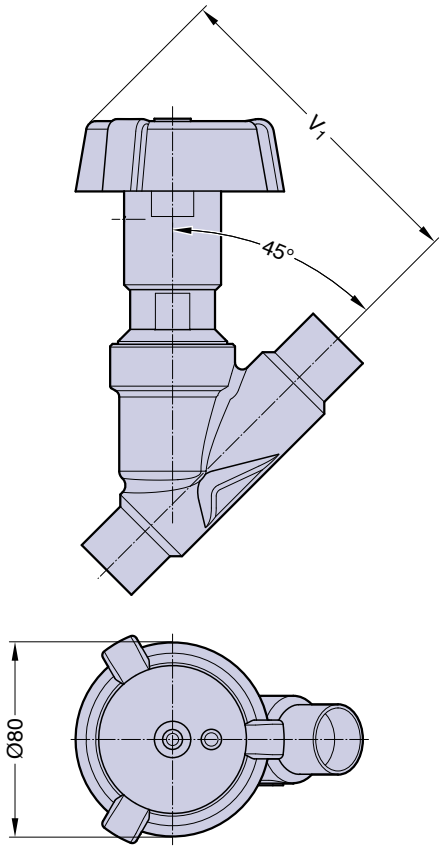
Type 590 Two Stage Valve DN 15-50
Measurement and weight table Actuator type 70

DN	SW	V_1	Total weight ca. (kg)
15	36	232	1,9
20	41	238	2,1
25	46	243	2,2
32	55	249	2,9
40	60	255	3
50	75	263	4

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Working pressure normally closed (Cf. 1), flow below the seat as well as working pressure, see table page 90.
All pressures are gauge pressures.

Type 580, Manually operated



Advantages:

- Hygenic design, easy cleaning
- High temperature resistance
- Minimized dead leg design
- Optical position indicator
- Easy maintenance
- Good regulation properties
- Clean and smooth exterior for sterile washdowns

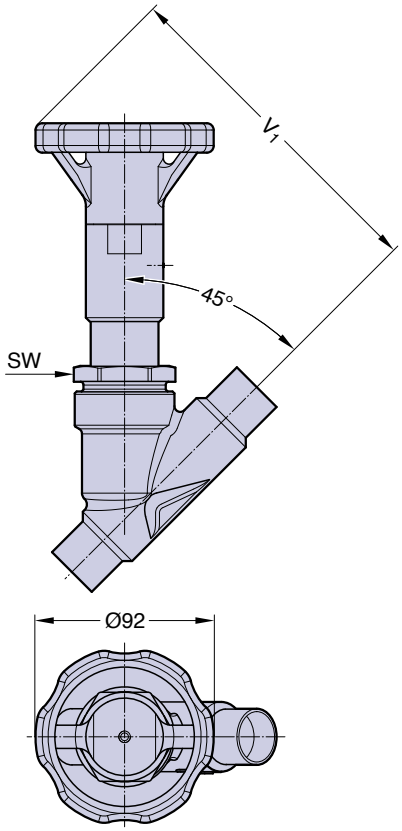
Measurement and weight table

DN	V_1	Total weight ca. (kg)
15	137	1,1
20	135	1,3
25	135	1,6
32	154	2,3
40	154	2,8
50	154	4,3

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Working pressure, see table page 90.
All pressures are gauge pressures.

Type 581, Manually operated



Advantages:

- Hygenic design, easy cleaning
- High temperature resistance
- Stainless steel below
- Minimized dead leg design
- Optical position indicator
- Easy maintenance
- Good regulation properties
- Clean and smooth exterior for sterile washdowns

Specific application:

- Pure or clean steam and gaseous media

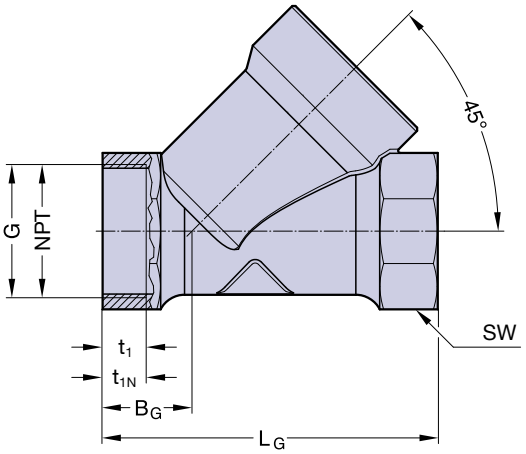
Measurement and weight table

DN	SW	V_1	Total weight ca. (kg)
15	36	177	1,8
20	41	168	1,9
25	46	175	2,1
32	55	183	2,9
40	60	189	3,4
50	75	197	4,4

Valve body types see page 98 - 99
Control equipment and accessories see page 102 - 108

Working pressure, see table page 90.
All pressures are gauge pressures.

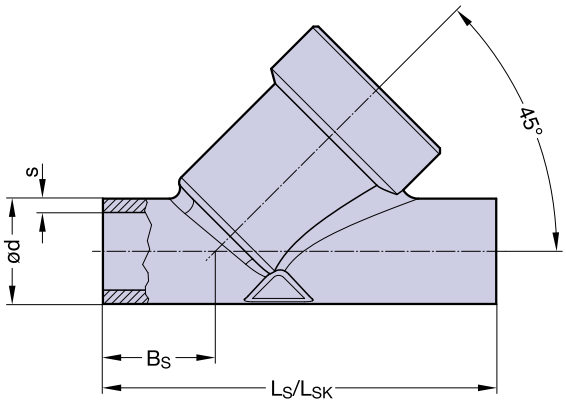
Valve Body Threaded Socket and Butt Weld End



Threaded Socket, Connection Code 1 (DIN ISO 228) & 1N (NPT), **Valve Body Material 1.4408 (Code 75)**

			DIN ISO 228, Code 1		NPT, Code 1N			
DN	L_G	B_G	G	t_1	NPT	t_{1N}	SW	
15	65	17	G 1/2	15,0	NPT 1/2	16	27	6-kt
20	75	18	G 3/4	14,0	NPT 3/4	17	32	6-kt
25	90	24	G 1	15,0	NPT 1	17	39	6-kt
32	110	33	G 1 1/4	17,0	n.a.	n.a.	50	8-kt
40	120	30	G 1 1/2	17,0	NPT 1 1/2	21	55	8-kt
50	150	40	G 2	18,5	NPT 2	22	70	8-kt
65	190	46	G 2 1/2	26,0	NPT 2 1/2	30	85	8-kt

Measurements in mm, G-Thread

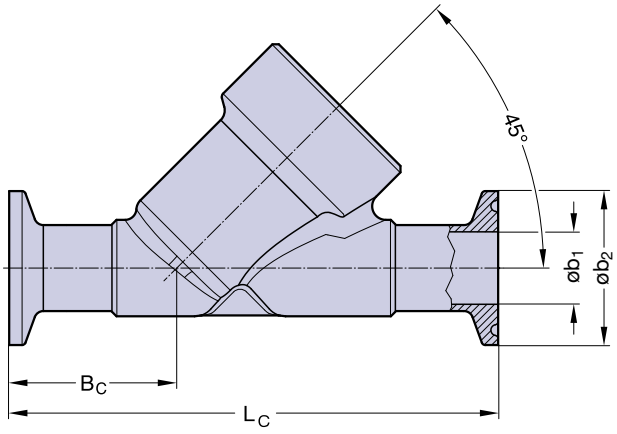


Butt Weld End, Valve Body Material 1.4404/316L (Code 7)

				Connection Code									
				DIN 11850				**SMS**		**ASTM 269**		**ISO 1127**	
				Series 1		**Series 2**		**3008**		**ASME BPE**			
				41		**42**		**49**		**45**		**40**	
DN	L_{SK}	L_S	B_S	ød	s	ød	s	ød	s	ød	s	ød	s
10	105	105	35,5	-	-	-	-	-	-	-	-	**17,2**	**1,6**
15	105	105	35,5	18	1	**19**	**1,5**	-	-	**12,7**	**1,65**	**21,3**	**1,6**
20	108	125	39	22	1	**23**	**1,5**	-	-	**19,05**	**1,65**	**26,9**	**1,6**
25	135	135	38,5	28	1	**29**	**1,5**	25	1,2	**25,4**	**1,65**	**33,7**	**2**
32	155	155	48	34	1	**35**	**1,5**	-	-	-	-	**42,4**	**2**
40	146	175	47	40	1	**41**	**1,5**	38	1,2	**38,1**	**1,65**	**48,3**	**2**
50	160	205	48	52	1	**53**	**1,5**	51	1,2	**50,8**	**1,65**	**60,3**	**2**
65	285	285	96	-	-	**70**	**2**	63,5	1,6	**63,5**	**1,65**	**76,1**	**2**
80	-	285	96	-	-	-	-	76,1	1,6	**76,2**	**1,65**	-	-

L_{SK} = preferred standard for ISO 1127 Code 40K, other lengths on request, B_S valid for L_S
Measurements in mm, preferential standards in bold

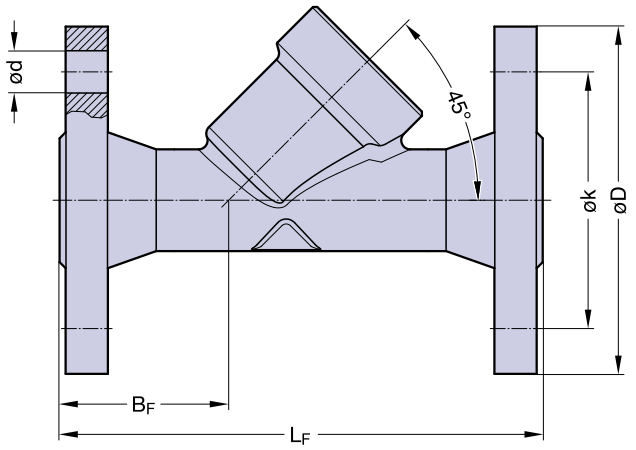
Valve Body Clamp Socket and Flange



Clamp Socket, Valve Body Material 1.4404/316L (Code 7)

				Connection-Code					
Clamp End ident.				Similar **ISO 2852**		**DIN 32676**		**ASME BPE**	
Tube End ident.				**ISO 1127**		**DIN 11850**		**ASME BPE**	
				740		**742**		**745**	
DN	NPS	L_C	B_C	$øb_1$	$øb_2$	$øb_1$	$øb_2$	$øb_1$	$øb_2$
15	1/2	130	48	18,1	50,5	16	34	9,4	25
20	3/4	150	54	23,7	50,5	20	34	15,75	25
25	1	160	56	29,7	50,5	26	50,5	22,1	50,5
32	1 1/4	180	60,5	38,4	64	32	50,5	-	-
40	1 1/2	200	67	44,3	64	38	50,5	34,8	50,5
50	2	230	73	56,3	77,5	50	64	47,5	64
65	2 1/2	290	-	72,1	91	66	91	60,2	77,5
80	3	310	-	-	-	-	-	72,9	91

Measurements in mm, NPS inch



Flange, Connection Code 51, Valve Body Material 1.4408 (Code 75)

DN	L_F	B_F	øD	ød	øk	number of drilling
10	115	32	90	14	60	4
15	130	42	95	14	65	4
20	150	54	105	14	75	4
25	160	56	115	18	85	4
32	180	59	140	18	100	4
40	200	71	150	18	110	4
50	230	83	165	18	125	4
65	290	-	185	18	145	4
80	310	-	200	18	160	8

Measurements in mm

Table of Contents

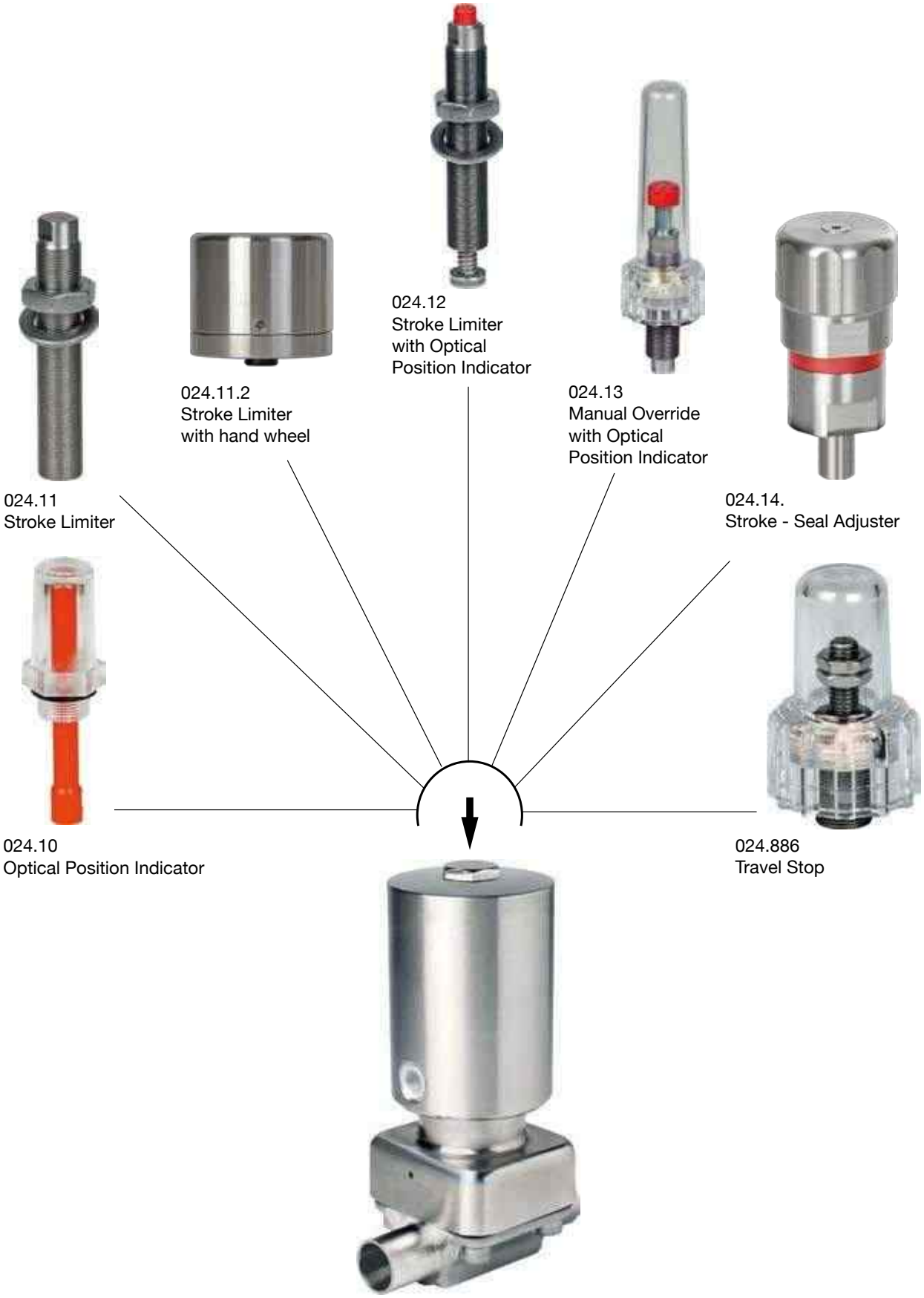
		Page
1	**Introduction**	
	A Brief Overview	4
	The Company	5
	What does Quality mean at SED?	6
	General Information	
	Testing	7
	Qualification, Certification and Documentation	8
	Flow Rate and Valve Sizing	9
	Surface Finish	10, 11
2	**Media Contacted Components**	
	Diaphragms	14 - 17
	Valve Bodies (fold out page)	18
	Butt Weld Tube Ends (fold out page)	19
	Aseptic Connections	
	Clamps	20
	Aseptic Flanges and Aseptic Threads	21
3	**Aseptic Diaphragm Valves**	
	Overview Diaphragm Aseptic Valves	24 - 25
	Why Aseptic Diaphragm Valve?	26
	Self Draining - Two-Way Valve	27
	Innovative Design	28 - 31
	Aseptic Diaphragm Valves	
	Aseptic Diaphragm Valve Manual	32 - 41
	Aseptic Diaphragm Valve Pneumatically Operated	42 - 55
	Ordering Key and Ordering Example	56, 57
4	**Aseptic Diaphragm Valve Configurations**	
	D-Rule	60
	Welded Valve Configurations	61 - 63
	Multiport Valves	
	Why Multiport Valves?	64
	Main line open, Loop Valves (e.g. T-Valve)	65 - 69
	All lines and valve ports able to close	70 - 75
	The way of customized multiport valve designs	76
	Specification Multiport Valves	77
	Tank Valves	78 - 81
	Process Solutions	
	Sterile Sampling Unit	82
	Purified Steam Sampling Unit	83
5	**Angle Seat Valves**	
	Description and Features	86
	Applications	87
	Ordering Key and Ordering Example	88, 89
	Technical Data	90
	2/2-Way Angle Seat Valves	91 - 97
	Valve Body Threaded Socket and Butt Weld End	98
	Valve Body Clamp Socket and Flange	99
6	**System Components and Process Automation**	
	Overview	102
	Manual Adjustment - Optical Indication	103
	Electrical Switch Boxes - Pilot Control	104
	Detailed Information	
	3/2 Way Plastic Pilot Valve Type 602 / 603	105
	Contact-Free Limit Switch 024.50	106, 107
	Control Head Switch 024.63. - 024.89.	108
	Process Automation, Electropneumatic Positioners	109, 110
	Overview Product Range	111
	Glossary	112

Overview

Description	Type	Diaphragm size (MA)	Suitable for valve: Size (DN)	Suitable for valve: Pneumatically operated	Suitable for valve: Manual	Detail see page
Optical position indicator	024.10	**8 - 100**	4 - 100	●	●	103
Stroke limiter	024.11	**8 - 100**	4 - 100	●	●	103
Stroke Limiter with hand wheel	024.11.2	**10**	8 - 20	●		103
Stroke limiter with optical position indicator	024.12	**8 - 100**	4 - 100	●	●	103
Manual override with optical position indicator	024.13	**8 - 50**	4 - 50	●		103
Stroke - Seal Adjuster	024.14	**8 - 25**	4 - 25	●		103
Travel stop	024.886	**8 - 100**	4 - 100	●	●	103
Contact - Free Limit Switch	**024.50**	**8 - 100**	**4 - 100**	●		**104, 106 - 107**
Control head switch with optical indicator "catch the eye"	024.63 024.64 024.65	**8 - 100**	4 - 100	●		104, 108
Control head switch with optical indicator AS - Interface "catch the eye"	024.89	**8 - 100**	4 - 100	●		104, 108
Limit switch with one mechanical switch and optical indicator	024.90	**8 - 100**	4 - 100	●	●	104
Pilot valve for direct mounting	602	**8 - 100**	4 - 100	●		104
Pilot valve for manifold mounting	603	**8 - 100**	4 - 100	●		104
Manual valve prepared for mounting proximity switch	024.96	**25 - 100**	15 - 100		●	
Adapter for direct mounting one proximity direct on top in the valve actuator	SO795	**8 - 100**	4 - 100	●		

System Components and Accessories are shown on page 103 - 108.

Manual Adjustment - Optical Indication



Upon request combinations of Manual Adjustments with Switch Boxes are available

Electrical Switch Boxes - Pilot Control

024.50
Contact - Free Limit Switch
Optional: ATEX approved Version /
Stainless Steel Version
(See page 106 - 107)

024.90
Limit Switch open position

603
Pilot Valve for
manifold mounting

024.63-024.65
Control Head Switch for
open and close with optical
indicator catches the eye
(See page 108)
024.89
AS-Interface Control Head
Switch for open and close
position with optical indicator
catches the eye
(See page 108)

602
Pilot Valve for
direct mounting

Upon request combinations of Manual Adjustments with Switch Boxes are available

3/2 Way Plastic Pilot Valve Type 602 / 603

Description

The solenoid valves are electromagnetic, direct actuated pilot valves to control pneumatically operated valve actuators. Applicable media are filtered, lubricated or non lubricated air and neutral gaseous fluids.
Type 602 is equipped with a hollow screw and made for direct mounting on the user.
Type 603 is designed for manifold mounting, where a variable amount of single pilot valves are assembled together and connected to the pneumatically operated valve actuators by pneumatic lines.

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

Type 602
Banjo with threaded socket G1/8”

Type 603
Manifold assembly

Features

- Compact design
- Identical position of all ports for version normally open and normally closed (except connection M5)
- Plastic wrapped electromagnet
- Interchangeable solenoid system
- 360° adjustable position of electromagnet
- Also suitable for coarse vacuum
- Silenced exhaust port
- Manual override (depending on version)
- Any installation position possible
- Cable plug can be mounted turned by 180°
- Combined exhaust optional
- Optional
  - ATEX-Version for explosion-risk areas
  - UL-approval
- Mounting rail for manifold mounting
  Type 603 available as option

Standard versions

Type	Cf.	Version	Connection			Manual-override	Fig.
			P1	P2	P3		
602.1,2.32.24.2.1.S5.1.xx*	1	Direct mounting, Banjo	Push-in connection f. tube Ø 6mm	G1/8” or G1/4”	Plunger	Yes	1
602.1,2.32.24.2.1.35.1.xx*	1	Direct mounting, Banjo	Threaded socket G1/8“	G1/8” or G1/4”	Plunger	Yes	1
602.1,2.32.24.2.2.S5.1.xx*	2	Direct mounting, Banjo	Push-in connection f. tube Ø 6mm	G1/8” or G1/4”	Plunger	No	1
602.1,2.32.24.2.2.35.1.xx*	2	Direct mounting, Banjo	Threaded socket G1/8“	G1/8” or G1/4”	Plunger	No	1
602.1,2.32.24.2.2.M5.1.xx*	2	Direct mounting, Banjo	Thread M5 at plunger	G1/8” or G1/4”	G1/8”	Yes	2
603.1,2.32.24.2.1.43.1.xx*	1	Manifold mounting	Threaded socket G1/4“	G1/8”	Plunger	Yes	3
603.1,2.32.24.2.2.43.1.xx*	2	Manifold mounting	Threaded socket G1/4“	G1/8”	Plunger	No	3

For detailed information please see TD130020

Contact - Free Limit Switch 024.50

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

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

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

Standard Version

Features

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

Optional:

- Atex II 2G
  II 2D
  II 3G
- AS-Interface (in preparation)

Stainless Steel Version
Visualization via window

Advantages

- Contact-Free magnetic measuring design
- Colored LED light feedback of valve position visible for 360°
- Compact and robust design
- Hermetically sealed
- Easy mounting without additional adapter kits
- Mounts to all standard valves up to DN100
- 360° adjustable mounting position
- Initial programming by light or 24V Signal (5th pin)
- Set point protection
- High switching current
- High chemical resistance

Application example

Contact - Free Limit Switch 024.50

Technical Data

Material Housing	PPSU
Mechanical Adaption	St. Steel M12x1, M16x1, other options
Ambient Temperature	-10°C to + 70°C
Maximum Pressure	8 bar
Power Supply	24V DC +/- 10%
Power Consumption	0,7 W
Maximum Power Input	30 mA
Electrical Connection	Multipol M12, 5 Pin, A-coded
Switching Current	1 ... 800 mA
Stroke Range	3 - 45 mm
Accuracy	+/- 0,1 mm
Protection Class	IP67 according EN 60529
Conformity according CE	EMV-9/336/EWG
Mounting Position	any
Initialization	Light or 24V Signal (5th pin)

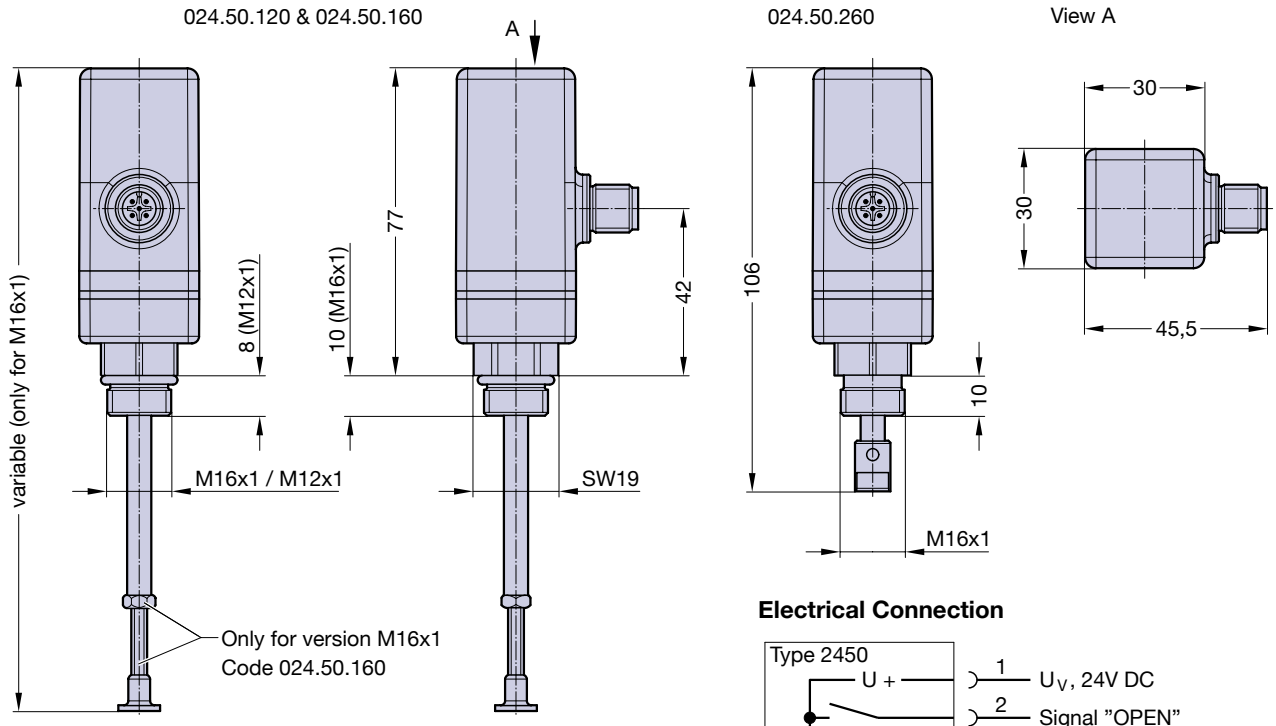
Ordering Key

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

Optical Position Feedback

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

Dimensional Drawing



Accessories

- 2 m cable with 4 pin female plug for explosion-risk areas, Code 00311.2450.006.4
- 5 m cable with 5 pin female plug, Code 00311.2450.006.1
- 15 m cable with 5 pin female plug, Code 00311.2450.006.6

Optional

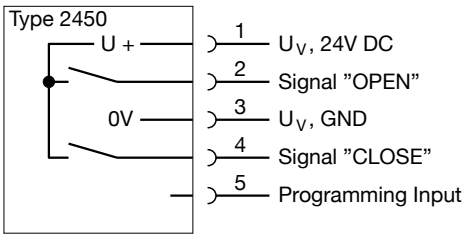
Teach-In cable for the programming via the 5th pin, Code 00311.2450.005

Introduction Video

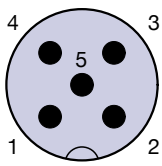
Installation Introduction

http://www.sed-flowcontrol.com/en/service/movies

Electrical Connection



Pin Configuration



5 pin, M12, A-coded

Control Head Switch 024.63. - 024.89.

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

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

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

Features:

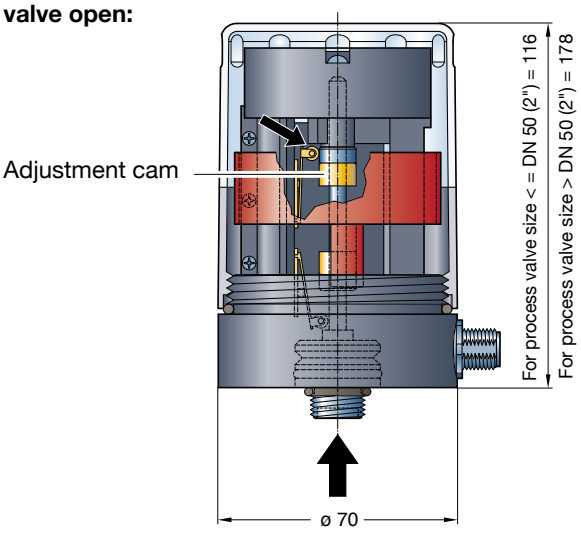
- **Increased air flow rate 230 Nl/min**
- Circumferential catch the eye optical indicator representing the full stroke
- Ease of assembly and may be assembled with the valve actuator in the field
- Time saving electrical interface via pre-wired pin or a Bus-connection
- Compact design
- Position feedback 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:

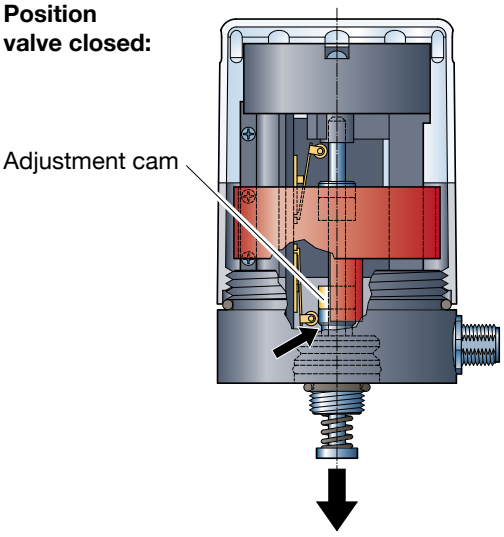
- Integral solenoid valve with direct air line connection to actuator
- Stroke limiter for the valve stroke adjustment

For more details see TD15 0094

Position valve open:



Position valve closed:



Versions Control Head

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

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

Electropneumatic Positioners ECOCENT 024.16.7

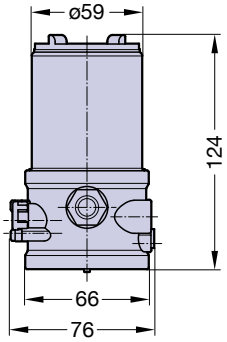
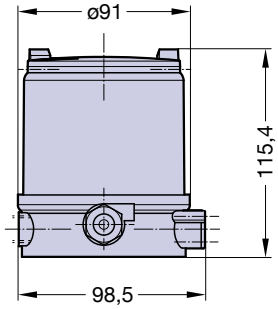
for central mounting on the top of the process control valves

Main Features:

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

Type 024.16.720

Valve assembled with Positioner 024.16.710

Type	024.16.710	024.16.720
Recommended for valve size	DN 8 - 50	DN 50 - 100
		
Technical Data:		
Body; Cocer; Sealing	PPS/stainless steel; PC transparent; EPDM	PPS/stainless steel; PC transparent; EPDM
Ambient temperature	0 - 55°C	0 - 55°C
Control medium	Neutral gases, air according DIN ISO 8573-1	Neutral gases, air according DIN ISO 8573-1
Pilot air ports	G 1/8	G 1/8
Supply pressure; Air flow rate	1 - 7 bar [1]; 7 Nl/min	3 - 7 bar [1]; 130 Nl/min
Intrinsic air consumption	0 l/min	0 l/min
Power supply	24 V DC +/- 10%	24 V DC +/- 10%
Power consumption	< 3,5 W	< 3,5 W
Electrical connection	Multipol M12 (8- pins), stainless steel	Multipol M12 (8- pins), stainless steel
Setpoint setting; Output resistance	4 to 20 mA; 180 Ohm	4 to 20 mA; 180 Ohm
Analogue feedback 4 - 20 mA	Optional	Standard
Stroke range valve spindle	3…28 mm	3 - 45 mm
Binary input	0 - 5 V = log "0", 10 - 30 V = log "1"	0 - 5 V = log "0", 10 - 30 V = log "1"
AS-Interface	NO	optional
Operation	2 Key button	2 Key button
Visualisation	2 LEDs	2 LEDs
Protection class	IP65/67 according to EN 60529 (only if cables plugs and sockets have been connected properly and in compliance with the exhaust air concept in chapter "pneumatic connection of positioner")	
Conformity	subject to CE according EMV2004/108/EG	subject to CE according EMV2004/108/EG
Approval	CSA on request.	CSA on request.
Process controller	NO	Optional

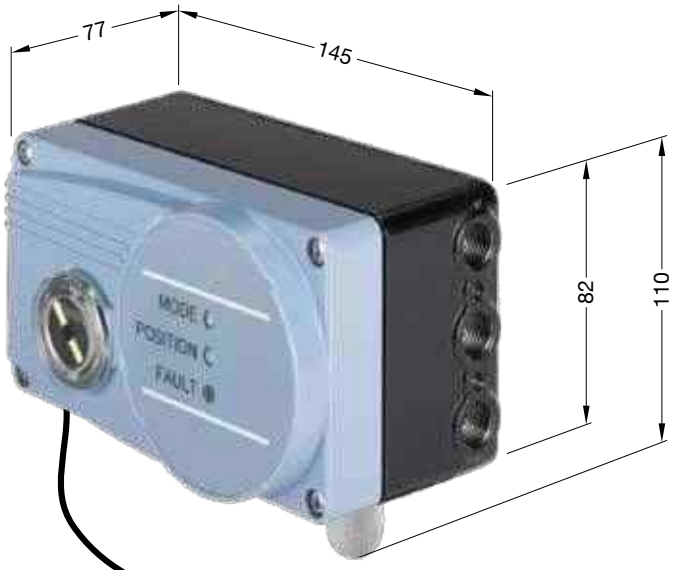
[1] Pressure stated in bar: are access to atmosphere; the supply pressure has to be 0,5 - 1 bar above the minimum required pilot pressure for the valve actuator

Electropneumatic Positioner ECOSIDE 024.16.42

for process valves big stroke range and with remote control installation

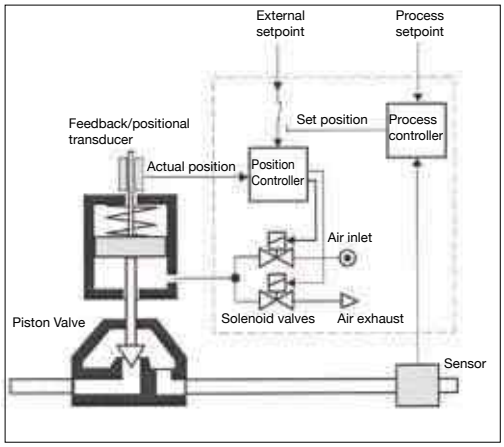
Main Features:

- Compact metal housing
- Contact- free continuous sensor measuring of the valve spindle position
- Simple start up using tune function
- Pneumatic positioning for single and double-acting actuators
- High air capacity
- Standardized for assembly according IEC 534-6 / VDI VDE 3845
- Available as remote version with position sensor
- Close tight function
- ATEX-Version available



Type	**024.16.420**
Technical Data:	
Body; Sealing	Aluminum plastic coated; EPDM
Ambient temperature	0 - 60°C
Control medium	Neutral gases, air according DIN ISO 8573-1
Pilot air ports	G 1/4
Supply pressure	1,4 - 7 bar [1]
Air flow rate	Single and double-acting up to 150 Nl/min (Q_{Nn} = 100 Nl/min acc. Definition with decrease in pressure from 7 to 6 bar absolute)
Intrinsic air consumption	0 l/min
Power supply	24 V DC +/- 10%
Power consumption	< 3,5 W
Electrical connection	M12 (8 Pins)
Cable gland	2 x M20 x 1,5 (cable Ø 10 mm) on screw terminal
Remote version	1 x M12 x 1,5 (cable Ø3 to 6,5 mm)
Setting point; input resistance	5 to 20 mA / 180 Ohm (0 - 20 mA adjustable with configuration software)
Binary Input	0 - 5 V = log "0", 10 - 30 V = log "1"
Stroke range valve spindle	Min. 30° on the rotary shaft, depending on lever
Operation	2 Key button
Visualisation	2 LEDs
Protection class	IP65/67 acc. EN 60529
Type of ignition protection	II 3 G nA II B T4 II 3 D tD A22 T135°
Conformity	EMV2004/108/EG
Approvals	CSA
Optional	Process controller Analogue feedback AS-Interface

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



Operational diagramm

Overview Product Range

Diaphragm Valve

Aseptic Diaphragm Valve

Industrial Metal Diaphragm Valve

Plastic Diaphragm Valve

Angle Seat Valve

Two-Way Metal Angle Seat Valve

Aseptic Process Solution

Sterile sampling unit

System Components

Contact - Free Limit Switch

Control Head

Digital Electropneumatic Positioner

Flow Measurement

Variable Area Flowmeter

Measuring 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	**BPE**	A sub-committee of ASME. It creates engineering standards for the design, specification, manufacture and documentation of equipment used for biopharm processes.
Clean in Place	**CIP**	The technique of cleaning process line components without the need for relocation or disassembly.
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 CO_2 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.

Website

http:www.sed-flowcontrol.com/en/

Product Configurator

http:www.sed-flowcontrol.com/en/konfigurator

- Easy **configuration of products** live on the screen
- Automatic creation of **CAD- files** in various file formats
- Send request and download product descriptions

Manual diaphragm valve type 905

http://www.sed-flowcontrol.com/en/service/movies

Contact - Free Limit switch 024.50

http://www.sed-flowcontrol.com/en/service/movies

Aliaxis
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