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A Brief Overview

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

The SED versatile and comprehensive product offering provides many advantages to our customers. Our module design allows for 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 a high degree of flexibility.

• Comprehensive selection of accessories for valve monitoring and regulation.

• International sales network and a dedicated internal sales staff.
The company has installed the most modern machinery and individual production facilities which are fully adapted to current market requirements.

In Particular:

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

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

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

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

- Programmable welding machine and polishing work stations for aseptic diaphragm valves in order to guarantee the greatest flexibility and quality.
What Does Quality Mean at SED?

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

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

The Fundamental Areas of Our Quality Policy:

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

Suppliers:
The quality of our products is directly dependant 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.

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.
Quality Management System according to DIN EN ISO 9001

Pressure Equipment Directive No. 97/23/EG for the module D1

Declaration of Conformity according to guideline 94/9EG (ATEX)

Welding process AD-Certificate HPO/TRD201/TRR 100 and DIN EN 729-3

3-A Sanitary Standards Section 54-02

Material identification and traceability personnel according to §2 Abs. 2a Gerätesicherungsgesetz

Welder qualification according to DIN EN 287

Certificate of Compliance according to EHEDG Document No. 8 for SED diaphragm valves

Certificate of Conformity of the diaphragms according to FDA CFR Title #21 Section 177

Certification of Conformity of diaphragms according to USP Class VI - Test Section #87 & #88

Certification of Conformity of the diaphragms according to 3-A

Quality handbook and quality plan
Internal Surface Finish:
- 100% visual inspection
- Profilometer inspection as per specification

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

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

Complete Valve Assembly Inspection:
- 100% according to checklist

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

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

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

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

For water 5 – 30°C applies

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

- $K_V$ m$^3$/h flow rate parameter
- $Q$ m$^3$/h volume flow rate
- $\Delta p$ bar pressure drop through the valve

General Liquid Flow Formula

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

- $\rho$ kg/m$^3$ specific gravity
- $\Delta p = p_1 - p_2$

Conversion:
For the correct $K_V$ to $C_V$ conversion calculation, use only the stated units formulas above.
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 1 PSI.

Conversion of $K_V$ to $C_V$
$$C_V = 1.17 \times K_V$$

Conversion of $C_V$ to $K_V$
$$K_V = 0.86 \times C_V$$

The $K_{VS}$ - Values in the table refer to the specification with two-way valves with EPDM diaphragm.

<table>
<thead>
<tr>
<th>$K_{VS}$ - Value (m$^3$/h)</th>
<th>Nominal diameter</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DN</td>
<td>NPS</td>
<td>MA</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>1/4&quot;</td>
<td>8</td>
<td>2.4</td>
</tr>
<tr>
<td>10</td>
<td>3/8&quot;</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>1/2&quot;</td>
<td>8</td>
<td>-</td>
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<tr>
<td>8</td>
<td>1/4&quot;</td>
<td>10</td>
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<td>3/8&quot;</td>
<td>10</td>
<td>3.9</td>
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<td>1/2&quot;</td>
<td>10</td>
<td>5.3</td>
</tr>
<tr>
<td>20</td>
<td>3/4&quot;</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>1/2&quot;</td>
<td>25</td>
<td>10.5</td>
</tr>
<tr>
<td>20</td>
<td>3/4&quot;</td>
<td>25</td>
<td>13.0</td>
</tr>
<tr>
<td>25</td>
<td>1&quot;</td>
<td>25</td>
<td>15.5</td>
</tr>
<tr>
<td>32</td>
<td>1 1/4&quot;</td>
<td>40</td>
<td>43.0</td>
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<td>40</td>
<td>1 1/2&quot;</td>
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<tr>
<td>50</td>
<td>2&quot;</td>
<td>50</td>
<td>64.0</td>
</tr>
<tr>
<td>65</td>
<td>2 1/2&quot;</td>
<td>80</td>
<td>95.0</td>
</tr>
<tr>
<td>80</td>
<td>3&quot;</td>
<td>80</td>
<td>127.0</td>
</tr>
<tr>
<td>100</td>
<td>4&quot;</td>
<td>100</td>
<td>205</td>
</tr>
</tbody>
</table>

Depending on the specification variations are possible
Surface Finish

The consistency of the interior surface has a great impact on the quality of an aseptic system process. By means of polishing, the interior contact surface is reduced. The specified surface quality of the valve body is achieved through mechanical polishing and electro-polishing. According to the standards SED offers surfaces with a surface finish up to a quality of 0.25 µm and 10 Ra. At SED the stated surface finish always describes the maximum surface roughness value.

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

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.

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

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

Ra - Value
The arithmetic average Ra is used as parameter for the surface finish profile. 
L_t 5,6 mm traversing length/measuring range - 5 single measuring length L_c 0,8 mm each are measured transverse to the polished image.

Definition of the SED codes for Ra - Values
Allocation to the standard DIN 11866

<table>
<thead>
<tr>
<th>SED Code</th>
<th>Ra µm</th>
<th>Lc 0,8 mm</th>
<th>Hygiene Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>0,8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>0,8</td>
<td>HE3c</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>0,6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>0,6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>0,4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0,4</td>
<td>HE4c</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0,25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0,25</td>
<td>HE5c</td>
<td></td>
</tr>
</tbody>
</table>

Allocation to the standard ASME BPE Table SF-6
Mechanically Polished

<table>
<thead>
<tr>
<th>SED Code</th>
<th>ASME BPE</th>
<th>Ra average* µ-inch</th>
<th>Ra max µ-inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>SFV3</td>
<td>25</td>
<td>0,625</td>
</tr>
<tr>
<td>23</td>
<td>SFV2</td>
<td>20</td>
<td>0,5</td>
</tr>
<tr>
<td>24</td>
<td>SFV1</td>
<td>15</td>
<td>0,375</td>
</tr>
<tr>
<td>32</td>
<td>SFV6</td>
<td>20</td>
<td>0,5</td>
</tr>
<tr>
<td>33</td>
<td>SFV5</td>
<td>15</td>
<td>0,375</td>
</tr>
<tr>
<td>34</td>
<td>SFV4</td>
<td>10</td>
<td>0,25</td>
</tr>
</tbody>
</table>

*Ra average measured at four different points
Diaphragms

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

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

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

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

<table>
<thead>
<tr>
<th>Code</th>
<th>MA 8</th>
<th>MA 10</th>
<th>MA 25 - 80</th>
<th>MA 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>SED Code</td>
<td>18</td>
<td>30</td>
<td>44</td>
<td>12</td>
</tr>
<tr>
<td>MA</td>
<td>8 - 100</td>
<td>8 - 50</td>
<td>25 - 100</td>
<td>8 - 100</td>
</tr>
<tr>
<td>Material</td>
<td>EPDM</td>
<td>PTFE/EPDM</td>
<td>PTFE/EPDM</td>
<td>PTFE/EPDM</td>
</tr>
<tr>
<td>Design</td>
<td>One-piece molded open</td>
<td>One-piece molded open</td>
<td>Two-piece molded closed</td>
<td>Two-piece molded closed</td>
</tr>
<tr>
<td>Temperature Range (°C)</td>
<td>-40 to 150*</td>
<td>-20 to 150</td>
<td>-20 to 160</td>
<td></td>
</tr>
<tr>
<td>Temperature Range (°F)</td>
<td>-40 to 300*</td>
<td>-20 to 300</td>
<td>-20 to 320</td>
<td></td>
</tr>
<tr>
<td>FDA</td>
<td>3A</td>
<td>3A</td>
<td>3A</td>
<td>3A</td>
</tr>
<tr>
<td>USP Class VI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test section</td>
<td>#87 &amp; #88</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The listed temperatures may apply to clean steam sterilization protocols and may not apply to continuous steam service. Upon request, other diaphragms are available

1) with other materials

2) for higher temperature up to 175°C/ 350°F

*Diaphragm size
Diaphragms

EPDM SED Code 18
Ethylene-propylene elastomer peroxide cured. The EPDM, a SED specifically developed compound is reinforced with a vulcanized woven fabric inlay and is always manufactured in the molded open position. This diaphragm construction achieves higher stability for the diaphragm at elevated temperatures and pressures. In addition, the woven fabric inlay is vulcanized over the embedded compressor stud in order to strengthen the elastomer-metal connection. Thus, the EPDM diaphragm is ideal for vacuum applications.

The Code 18 Diaphragm:
• Complies to FDA CFR # 21 Section 177.2600
• Conforms to USP Class VI Test section #87 and #88
• 3A Sanitary Class II

(Certificate of Conformity available upon request)

PTFE (TFM) Diaphragm Code 30 and 44
These PTFE diaphragms have been designed and offer the highest degree of chemical resistance, increased stability, longer flex life, less porosity, reduced cold flow, and superior performance through temperature fluctuations between hot and cold and steam sterilization cycles.

MA8 and MA10
The diaphragm dimensions MA8 and MA10 are designed as one-piece diaphragms; this means that the EPDM back is bonded with the PTFE. The diaphragm is always manufactured in the molded open position. These one-piece diaphragms have less surface area and are subject to shorter linear strokes which explain the excellent performance that has proved itself over time.

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

MA25 to MA80
The diaphragm dimensions MA25 to MA100 are designed as two-piece diaphragms; consisting of a separate EPDM backing cushion and PTFE diaphragm. The diaphragm is always manufactured in the molded closed position. The advantage of this design for the MA25 to MA100 is that the diaphragm is in its molded shape while in the closed position of the valve. This reduces the force to close the valve and increases the life of the diaphragm.

In the two piece diaphragms the threaded stud connection is embedded in the PTFE of the diaphragm. To eliminate the potential of point loading at the center of the diaphragm, a floating suspension connection to the valve operating mechanism is utilized.

The Code 30 and 44 Diaphragm:
• Complies to FDA CFR # 21 Section 177.1550
• Conforms to USP Class VI Test section #87 and #88
• 3A Sanitary Class I

(Certificate of Conformity available upon request)
Valve Bodies

The SED valve bodies as standard are manufactured of the material 1.4435/316L ASME BPE Table DT-3 and according to EN 10204 inspection certificate 3.1. All valve bodies contain a stamped heat number that allows for traceability to the material properties and physical composition of the valve body. The interior body contour and contact surfaces are designed specifically to comply with the requirements of cGMP. Optimized cleanability and a cavity-free design eliminate entrapment areas and enhance diaphragm life. The SED valve bodies are produced out of raw forged, block material, or investment cast. Depending on the material and specification of the valve body, different manufacturing processes are used.

<table>
<thead>
<tr>
<th>Material 1.4435/316L Specification</th>
<th>Investment cast</th>
<th>Raw forged body</th>
<th>Made of block material</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/2 way body</td>
<td>4 - 100 mm / 1/4&quot; - 4&quot;</td>
<td>4 - 80 mm / 1/4&quot; - 3&quot;</td>
<td>100 - 150 mm / 4&quot; - 6&quot;</td>
</tr>
<tr>
<td>Multiport body</td>
<td>N.A.</td>
<td>N.A.</td>
<td>4 - 100 mm / 1/4&quot; - 4&quot;</td>
</tr>
<tr>
<td>Tank bottom body</td>
<td>N.A.</td>
<td>N.A.</td>
<td>4 - 100 mm / 1/4&quot; - 4&quot;</td>
</tr>
</tbody>
</table>

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

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 design and optimized for high quality castings. The bodies are checked according to detailed test specifications to ensure a reliable quality regarding the material structure and density.

Tube End Standards:
The following chart of international standards of pipe diameters identifies the different diameters comparing the example of a nominal diameter of DN 25.
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 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 ends without any additional material. Examples of butt welding include automatic and orbital welding. Besides this standard any customer specified connection type is possible. Some examples are displayed on the following pages.

### Butt Weld Tube Ends

<table>
<thead>
<tr>
<th>Butt Weld Tube End Standard</th>
<th>ISO 1127</th>
<th>DIN 11850 Series 1</th>
<th>Series 2</th>
<th>Series 3</th>
<th>DIN Selection Series</th>
<th>ASTM 269 ASME BPE</th>
<th>BS O.D.</th>
<th>SMS 3008</th>
<th>JIS G 3447</th>
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<tbody>
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<td>DN</td>
<td>NPS</td>
<td>MA</td>
<td>L (min)</td>
<td>L₁</td>
<td>h₁</td>
<td>h₂</td>
<td>ød x s</td>
<td>ød x s</td>
<td>ød x s</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>8</td>
<td>20</td>
<td>72</td>
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<table>
<thead>
<tr>
<th>Valve Type Manually Operated</th>
<th>290 / 297</th>
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</thead>
<tbody>
<tr>
<td>Valve Type Pneumatically Operated</td>
<td>190 / 207</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Valves Type Manually Operated</th>
<th>289 / 295 / 397</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Type Pneumatically Operated</td>
<td>188 / 195 / 307</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve Type Manually Operated</th>
<th>985 / 995 / 997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Type Pneumatically Operated</td>
<td>385 / 402 / 407 / 495</td>
</tr>
</tbody>
</table>

Sizes in mm
MA = Valve Diameter
*Only for Forged Bodies

**h₁ = Investment cast bodies**
**h₂ = forged bodies**
**Aseptic Connections**

**Clamps**

The clamp connection is the most popular connection for easy assembly and breakdown of process lines and valves. The clamp end connection is designed for a face-to-face joint that is leak proof and free of crevices. The clamp end has a machined beveled seat and is used with specifically formed sealing gaskets made of EPDM or PTFE. The gasket is inserted between the opposing clamp ends and is compressed tight with a wing nut quick disconnect clamp.

In general, the valve clamps ends are welded to the valve butt weld ends and polished according to the specified interior valve body surface finish.

The welded clamp ends are 100% visually inspected and compression tested. The clamp connections are available for all current pipe standard diameters. If the connecting clamp ends are not identical and of the same diameter standard, there may result a reduction or step in the process piping system or the ability of self draining ends is not guaranteed.

If assembled correctly, the clamp end process system offers a smooth, crevice-free, self-aligning joint that reduce the hazards of contamination but minimize turbulence and pressure drop through the system.

**Dimensions inch**

<table>
<thead>
<tr>
<th>Clamp End Ident.</th>
<th>ASME BPE</th>
<th>ASME BPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube End Ident.</td>
<td>Code 645</td>
<td>Code 545</td>
</tr>
<tr>
<td>DN NPS MA b2 b1</td>
<td>L3 b2 b1</td>
<td>L3 b2 b1</td>
</tr>
<tr>
<td>8 1/4&quot; 8</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>10 3/8&quot; 8</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>15 1/2&quot; 8</td>
<td>4,25 0,37 1</td>
<td>2,5 0,37 1</td>
</tr>
<tr>
<td>10 3/8&quot; 10</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>15 1/2&quot; 10</td>
<td>4,25 0,37 1</td>
<td>3,5 0,37 1</td>
</tr>
<tr>
<td>20 3/4&quot; 10</td>
<td>4,60 0,62 1</td>
<td>4,0 0,62 1</td>
</tr>
<tr>
<td>15 1/2&quot; 25</td>
<td>4,25 0,37 1</td>
<td>4,0 0,37 1</td>
</tr>
<tr>
<td>20 3/4&quot; 25</td>
<td>4,60 0,62 1</td>
<td>4,0 0,62 1</td>
</tr>
<tr>
<td>25 1&quot; 25</td>
<td>5,00 0,87 2</td>
<td>4,5 0,87 2</td>
</tr>
<tr>
<td>32 1 1/4&quot; 40</td>
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</tr>
<tr>
<td>40 1 1/2&quot; 40</td>
<td>6,25 1,37 2</td>
<td>5,5 1,37 2</td>
</tr>
<tr>
<td>50 2&quot; 50</td>
<td>7,50 1,87 2,5</td>
<td>6,25 1,87 2,5</td>
</tr>
<tr>
<td>65 2 1/2&quot; 80</td>
<td>8,50 2,37 3</td>
<td>7,65 2,37 3</td>
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<tr>
<td>80 3&quot; 80</td>
<td>10,00 2,87 3,5</td>
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<tr>
<td>100 4&quot; 100</td>
<td>12,00 3,83 4,5</td>
<td>11,5 3,83 4,5</td>
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**Dimensions mm**

<table>
<thead>
<tr>
<th>Clamp End Ident.</th>
<th>Similar ISO 2852</th>
<th>DIN 32676</th>
<th>ASME BPE</th>
<th>ASME BPE</th>
<th>ASME BPE</th>
<th>ASME BPE</th>
<th>SMS 3017</th>
<th>SMS 3008</th>
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<tbody>
<tr>
<td>DN NPS MA L3 b2 b1</td>
<td>L3 b2 b1</td>
<td>L3 b2 b1</td>
<td>L3 b2 b1</td>
<td>L3 b2 b1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 1/4&quot; 8</td>
<td>63,5 10,3 25,4</td>
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<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>10 3/8&quot; 8</td>
<td>88,9 10,0 34,0</td>
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<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>15 1/2&quot; 8</td>
<td>108,0 9,40 25,0</td>
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<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>10 3/8&quot; 10</td>
<td>108,0 10,0 34,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>15 1/2&quot; 10</td>
<td>108,0 16,0 34,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>20 3/4&quot; 10</td>
<td>108,0 16,0 34,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>15 1/2&quot; 25</td>
<td>108,0 16,0 34,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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</tr>
<tr>
<td>20 3/4&quot; 25</td>
<td>117,0 20,0 34,0</td>
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<td>- - -</td>
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</tr>
<tr>
<td>25 1&quot; 25</td>
<td>127,0 26,0 50,5</td>
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</tr>
<tr>
<td>32 1 1/4&quot; 40</td>
<td>146,0 32,0 50,5</td>
<td>- - -</td>
<td>- - -</td>
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<td></td>
</tr>
<tr>
<td>40 1 1/2&quot; 40</td>
<td>159,0 38,0 50,5</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>50 2&quot; 50</td>
<td>190,0 50,0 64,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>65 2 1/2&quot; 80</td>
<td>216,0 66,0 91,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>80 3&quot; 80</td>
<td>254,0 81,0 106,0</td>
<td>- - -</td>
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<td></td>
</tr>
<tr>
<td>100 4&quot; 100</td>
<td>305,0 100,0 119,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
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<td></td>
</tr>
</tbody>
</table>
Aseptic Connections

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, the groove flange and the interjacent o-ring are compressed against a metallic block with four bolts.

<table>
<thead>
<tr>
<th>DN</th>
<th>NPS</th>
<th>MA</th>
<th>L₄</th>
<th>C</th>
<th>k</th>
<th>ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1/2&quot;</td>
<td>25</td>
<td>130</td>
<td>59</td>
<td>42</td>
<td>ø 9</td>
</tr>
<tr>
<td>20</td>
<td>3/4&quot;</td>
<td>25</td>
<td>150</td>
<td>64</td>
<td>47</td>
<td>ø 9</td>
</tr>
<tr>
<td>25</td>
<td>1&quot;</td>
<td>25</td>
<td>180</td>
<td>70</td>
<td>53</td>
<td>ø 9</td>
</tr>
<tr>
<td>32</td>
<td>1 1/4&quot;</td>
<td>40</td>
<td>180</td>
<td>76</td>
<td>59</td>
<td>ø 9</td>
</tr>
<tr>
<td>40</td>
<td>1 1/2&quot;</td>
<td>40</td>
<td>200</td>
<td>82</td>
<td>65</td>
<td>ø 9</td>
</tr>
<tr>
<td>50</td>
<td>2&quot;</td>
<td>50</td>
<td>230</td>
<td>94</td>
<td>77</td>
<td>ø 9</td>
</tr>
<tr>
<td>65</td>
<td>2 1/2&quot;</td>
<td>80</td>
<td>290</td>
<td>113</td>
<td>95</td>
<td>ø 9</td>
</tr>
<tr>
<td>80</td>
<td>3&quot;</td>
<td>80</td>
<td>310</td>
<td>133</td>
<td>112</td>
<td>ø 11</td>
</tr>
<tr>
<td>100</td>
<td>4&quot;</td>
<td>100</td>
<td>350</td>
<td>159</td>
<td>137</td>
<td>ø 11</td>
</tr>
</tbody>
</table>

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.

Aseptic Screwing

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.

<table>
<thead>
<tr>
<th>L in mm</th>
<th>DIN 11851</th>
<th>DIN 11864-1-A</th>
</tr>
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<tbody>
<tr>
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<td>NPS</td>
<td>MA</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>-</td>
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<tr>
<td>6</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>1 1/4&quot;</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>3/8&quot;</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>1/2&quot;</td>
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<td>1 1/4&quot;</td>
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<td>20</td>
<td>3/4&quot;</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>1&quot;</td>
<td>25</td>
</tr>
<tr>
<td>32</td>
<td>1 1/4&quot;</td>
<td>40</td>
</tr>
<tr>
<td>40</td>
<td>1 1/2&quot;</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>2&quot;</td>
<td>50</td>
</tr>
<tr>
<td>65</td>
<td>2 1/2&quot;</td>
<td>80</td>
</tr>
<tr>
<td>80</td>
<td>3&quot;</td>
<td>80</td>
</tr>
<tr>
<td>100</td>
<td>4&quot;</td>
<td>100</td>
</tr>
</tbody>
</table>
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 a 1/8" slope for long runs and _" slope for short runs and skids. This is recommended to insure 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 centreline of the tube end and be perpendicular to the pipe line. In addition, a template may be supplied for easy installation and adjustment of the drain angle.

Self Draining - Two-Way Valve

<table>
<thead>
<tr>
<th>VALVE SIZE</th>
<th>FORGED BODIES</th>
<th>INVESTMENT CAST BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ISO 1127</td>
<td>DIN 11850</td>
</tr>
<tr>
<td>4 - 8 8</td>
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<tr>
<td>6 - 8 8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8 1/4&quot; 8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10 3/8&quot; 8</td>
<td>-</td>
<td>22</td>
</tr>
<tr>
<td>15 1/2&quot; 8</td>
<td>-</td>
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<tr>
<td>8 1/4&quot; 10</td>
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<td>15 19</td>
<td>-</td>
</tr>
<tr>
<td>20 3/4&quot; 10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15 1/2&quot; 25</td>
<td>44 46 47</td>
<td>47 47 54</td>
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<td>20 3/4&quot; 25</td>
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<td>21 27 32</td>
<td>28 28 43</td>
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<tr>
<td>32 1 1/4&quot; 40</td>
<td>23 28 -</td>
<td>26 33 33</td>
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<tr>
<td>40 1 1/2&quot; 40</td>
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<td>18 23 24</td>
<td>17 23 23</td>
</tr>
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<td>-</td>
<td>16 -</td>
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<tr>
<td>65 2 1/2&quot; 80</td>
<td>23 25 29</td>
<td>24 -</td>
</tr>
<tr>
<td>80 3&quot; 80</td>
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<tr>
<td>100 4&quot; 100</td>
<td>- 19 19,5</td>
<td>23 23 23</td>
</tr>
</tbody>
</table>

MA = Diaphragm size

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# Overview Aseptic Valves

## Sizes and Control Function

<table>
<thead>
<tr>
<th>MA</th>
<th>Series</th>
<th>Steripur</th>
<th>KMA</th>
<th>KMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 8</td>
<td>DN 4 - 15mm (1/4&quot; - 1/2&quot;)</td>
<td>Type 207</td>
<td>Type 190</td>
<td>Page 33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type 297</td>
<td>Type 290</td>
<td>Page 25</td>
</tr>
<tr>
<td>MA 10</td>
<td>DN 8 - 20mm (3/8&quot; - 3/4&quot;)</td>
<td>Type 307</td>
<td>Type 195</td>
<td>Page 35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type 397</td>
<td>Type 295</td>
<td>Page 27</td>
</tr>
<tr>
<td></td>
<td>MA 25 - 100</td>
<td>Type 407</td>
<td>Type 495</td>
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<td>Type 997</td>
<td>Type 995</td>
<td>Page 29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type 385</td>
<td>Type 385</td>
<td>Page 41</td>
</tr>
</tbody>
</table>

**DN 4 - 15mm (1/4" - 1/2")**

**MA 8**

Pneumatically operated

**DN 8 - 20mm (3/8" - 3/4")**

**MA 10**

Pneumatically operated

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

**MA 25 - 100**

Pneumatically operated

**MA = Diaphragm size**
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.

<table>
<thead>
<tr>
<th>Positions</th>
<th>Series</th>
<th>Steripur</th>
<th>KMA</th>
<th>KMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stainless steel piston actuation</td>
<td>● ● ●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Actuation with stainless steel bonnet or distance piece</td>
<td>● ● ●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Thermoplastic actuation direct mounted to the valve body</td>
<td></td>
<td>● ●</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Compact Design - Optional orientation of the air inlet port</td>
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<td>●</td>
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Positions 4 to 11 are explained individually and in detail on pages 22 to 24.
Innovative Design

Compact Design and Optional Orientation of the Air Inlet Port
(Position 4 in Table Page 21)

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

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 to 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.

Actuators Suitable for Different Valve Bodies
(Position 5 and 6 in Table Page 21)

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

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

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

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

Two-Way Valve
Steripur Series
Pneumatically operated

T-Valve
Steripur Series
Manual

Air inlet

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

Multiport Manifold Valve with air inlet port in flow direction.

T-Valve
Steripur Series
Pneumatically operated

Two-Way Valve
Steripur Series
Manual

T-Valve
Steripur Series
Pneumatically operated

Two-Way Valve
Steripur Series
Manual
**Innovative Design**

**Optimized Internal Cleaning Because of Circumferential Defined Sealing Angle Between the Process Diaphragm and Valve Body**  
(Position 7 in Table Page 21)

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

The Steripur sealing is achieved by the compressor being guided by the interior circular actuator lower housing providing a circumferential defined sealing angle at 360°. This reduces or eliminates entrapment because the seal over the weir and the circumference of the interior valve body is at the point and angle where the diaphragm and valve body meet. Other selected SED actuator types have this same technology. (See the comparative illustration).

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

The effects of this design have the following advantages:

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

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

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**Clean and Smooth Exterior Ideal for Sterile Wash Downs of Two-Way Valves**  
(Position 8 in Table Page 21)

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

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

Flexible Diaphragm Suspension
(Position 9 in Table Page 21)

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

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

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

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

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

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

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

(See below illustration).

Encapsulated Diaphragm
(Position 10 in Table Page 21)

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

The encapsulated diaphragm offers a positive visual appearance of an assembled valve and reduces the risk of a leakage to the exterior through the decrease of the diaphragm clamping. This is an important feature especially for higher temperature and pressure applications.
Steripur 297 / KMA 290

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

**Specific Features**
- Type 297 Steripur
  - Stainless steel bonnet and hand wheel
  - Autoclavable
- Type 290 KMA
  - Stainless steel bonnet and thermoplastic hand wheel
  - Autoclavable

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

**Technical Data**
- Control function: Manually operated
- Max. working pressure: 10 bar (150 psi)
- Max. working temperature: 160°C (320°F) dependent on application
- Diaphragm material: EPDM or PTFE
- Body material: Forged 1.4435/ 316L ASME/BPE
  - Investment cast 1.4435/ 316L
- Other Alloys
- End connection: Butt weld ends see fold out page 15
  - Clamps and flanges see page 16 and 17
  - Special ends
- Bonnets suitable for:
  - Two-Way bodies
  - Welded configurations
  - T-bodies
  - Multisport bodies
  - Tank bottom bodies
- Flow rate: Kv in m³/h (Cv in GPM) see page 9
- Diaphragm size: MA 8 for all body sizes
Manual Valve DN 8 - 20 mm (3/8" - 3/4")

- Adjustable internal travel stop
- Sealing bonnet assembly
- Optical indicator
- Encapsulated diaphragm
- Bottom entry stainless steel bolting
- Flexible diaphragm suspension
- Circumferential, defined sealing angle between process diaphragm and valve body
- Butt weld ends MA 10
- Fold out page 15
Steripur 397 / KMA 295 / KMD 289

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

Specific Features
Type 397 Steripur
- Stainless steel bonnet and hand wheel
- Autoclavable
Type 295 KMA
- Stainless steel bonnet and thermoplastic hand wheel
- Autoclavable
Type 289 KMD
- Thermoplastic bonnet and hand wheel

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

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: 160°C (320°F) dependent on application
Diaphragm material: EPDM or PTFE
Body material: Forged 1.4435/316L ASME/BPE
- Investment cast 1.4435/316L
- Other Alloys
End connection: Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends
Bonnets suitable for:
- Two-Way bodies
- Welded configurations
- T-bodies
- Multiport bodies
- Tank bottom bodies

Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA 10 for all body sizes

Butt weld ends
MA 10
Fold out page 15

KMD 289

KMA 295 and Steripur 397

www.sed-flowcontrol.com
Manual Valve DN 15 - 100 mm (1/2" - 4")

- Optical indicator
- Adjustable internal travel stop (optional)
- Compressor guidance
- Encapsulated diaphragm
- Sealing bonnet assembly
- Bottom entry stainless steel bolting for more convenient assembly and self-cleaning properties
- Flexible diaphragm suspension
- Circumferential, defined sealing angle between process diaphragm and valve body

Butt weld ends MA 25 - 100
Fold out page 15
Manual Valve DN 15 - 100 mm (1/2" - 4")

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

Optional
- Adjustable internal travel stop or stroke limiter

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: 175°C (350°F) dependent on application
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316L ASME/BPE
Other Alloys
End connection: Butt weld ends see fold out page 15
Bonnets suitable for: Two-Way bodies
Flow rate: Kᵥ in m³/h (Cᵥ in GPM) see page 9

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www.sed-flowcontrol.com
Manual Valve DN 15 - 100 mm (1/2" - 4")

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

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

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: 175°C (350°F) dependent on application
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316L ASME/BPE
End connection: Butt weld ends see fold out page 15
Bonnets suitable for: Two-Way bodies
Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA see table

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

Features
- Stainless steel bonnet and thermoplastic hand wheel
- Non rising hand wheel with optical indicator
- Flexible diaphragm suspension
- Encapsulated diaphragm

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

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: Standard 80°C (176°F)
            HT-Version 150°C (300°F) dependent on application
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316L ASME/BPE
            Investment cast 1.4435/ 316L
Other Alloys
End connection: Butt weld ends see fold out page 15
Clamps and flanges see page 16 and 17
Special ends
Suitable for:
Bonnets up to DN 50: Two-Way bodies
Bonnets bigger DN 50: Two-Way bodies
Welded configurations
T- bodies
Multiport bodies
Tank bottom bodies
Flow rate:
Diaphragm size:

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www.sed-flowcontrol.com
Steripur 207

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

- Stainless steel actuator
- Efficient and high cycle double piston
- Encapsulated diaphragm
- Butt weld ends MA 8
- Fold out page 15
- Internal air passage blue
- Control air connection for fail safe close and open
- Double guided valve stem
- Bottom entry stainless steel bolting
- Flexible diaphragm suspension
- Circumferential, defined sealing angle between process diaphragm and valve body
Steripur 207

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

Features
- High cycle double piston stainless steel actuator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange connecting diaphragm and body
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection on the top, away from the process product line
- Direction of control air connection is mountable in 90° rotations
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

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

Technical Data
Control function (Cf.):
- Pneumatically operated
- Fail safe close (NC): Cl. 1 & 4
- Fail safe open (NO): Cl. 2 & 5

Direction
- Control connection: At Cl. 4 & 5 in flow direction, standard
- At Cl. 1 & 2, 90° to flow direction

Max. working pressure:
- Unidirectional (delta p = 100%)
- EPDM diaphragm 8 bar (120 psi)
- PTFE diaphragm 7 bar (100 psi)

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

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

Control pressure:
- 4 - 7 bar (60 - 100 psi)
- 3,5 - 4,5 bar (50 - 65 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

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

Flow rate:
- Kv in m³/h (Cv in GPM) see page 9
- Diaphragm size: MA 8 all sizes
KMA 190

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

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

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

Technical Data
Control function (Cf.):
Pneumatically operated
Fail safe close (NC): Cf. 1 & 4
Fail safe open (NO): Cf. 2 & 5
Double acting (DA): Cf. 3 & 6
Direction
Control connection: At Cf. 1, 2 & 3, 90° to flow direction, standard
At Cf. 4, 5 & 6 in flow direction
Max. working pressure: Unidirectional (delta p = 100%)
EPDM diaphragm 8 bar (120 psi)
PTFE diaphragm 7 bar (100 psi)
Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.
Max. working temperature: 160°C (320°F) dependent on application
Control pressure:
Cf. 1 & 4 4 - 7 bar (60 - 100 psi)
Cf. 2, 3, 5 & 6 3.5 - 4.5 bar (50 - 65 psi)
Diaphragm material:
EPDM or PTFE
Valve body material:
Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 15
Clamps and flanges see page 16 and 17
Special ends
Actuators suitable for:
Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies
Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA 8 all sizes
Steripur 307

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

Features
- High cycle piston stainless steel actuator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

Optional
- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data
Control function (Ct.):
- Fail safe close (NC): Ct. 1 & 4
- Fail safe open (NO): Ct. 2 & 5
- Double acting (DA): Ct. 3 & 6

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM diaphragm 8 bar (120 psi)
  - PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure:
- Ct. 1 & 4 4 - 7 bar (60 - 100 psi)
- Ct. 2, 3, 5 & 6 4 - 5 bar (60 - 70 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

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

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

Diaphragm size:
- MA 10 all sizes
Pneumatically Operated Valve DN 8 - 20 mm (3/8'' - 3/4'')

Features
- Efficient thermoplastic piston actuator with stainless steel distance piece
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Optical indicator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange

Optional
- Available with a wide range of control equipment and accessories
- 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 & 6

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM diaphragm 8 bar (120 psi)
  - PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
- Control pressure:
  - Cf. 1 & 4: 4 - 7 bar (60 - 100 psi)
  - Cf. 2, 3, 5 & 6: 4 - 5 bar (60 - 70 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

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

Flow rate:
- Kv in m³/h (Cv in GPM) see page 9
- MA 10 all sizes
KMD 188

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

Features
- Efficient thermoplastic piston actuator direct assembled with the valve body
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Control air connection 90° to flow direction
- Encapsulated diaphragm
- Optical indicator

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

Features
- Efficient thermoplastic piston actuator direct assembled with the valve body
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Control air connection 90° to flow direction
- Encapsulated diaphragm
- Optical indicator

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

Technical Data
Control function (Cf.):
- Pneumatically operated
- Fail safe close (NC): Cf. 1 & 4
- Fail safe open (NO): Cf. 2 & 5
- Double acting (DA): Cf. 3 & 6

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM diaphragm 8 bar (120 psi)
  - PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature: 150°C (300°F) dependent on application

Control pressure:
- Cf. 1 & 4: 4 - 7 bar (60 - 100 psi)
- Cf. 2, 3, 5 & 6: 4 - 5 bar (60 - 70 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

Actuators suitable for:
- Two-Way bodies
- Welded configurations

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

Diaphragm size:
- MA 10 all sizes
Steripur 407

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

- Double guided valve stem
- Stainless steel actuator
- Internal air passage blue
- Bottom entry stainless steel bolting for more convenient assembly and self cleaning properties
- Control air connection for fail safe closed
- Compressor guidance
- Encapsulated diaphragm
- Flexible diaphragm suspension
- Circumferential, defined sealing angle between process diaphragm and valve body
- Butt weld ends MA 25 - 100
  Fold out page 15
Pneumatically Operated Valve DN 15 - 100 mm (1/2" - 4")

Features
- High cycle piston stainless steel actuator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

Optional
- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data
Control function (Cf.): Pneumatically operated
Fail safe close (NC): Cf. 1 & 4
Fail safe open (NO): Cf. 2 & 5
Double acting (DA): Cf. 3 & 6

Direction
Control connection: At Cf. 4, 5 & 6, in flow direction, standard
At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure: Unidirectional (delta p = 100%)

<table>
<thead>
<tr>
<th>Diaphragm Material</th>
<th>DN 15-50 (2&quot;)</th>
<th>DN 65-80 (2.5&quot;-3&quot;)</th>
<th>DN 100 (4&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDM</td>
<td>10 bar (150 psi)</td>
<td>7 bar (100 psi)</td>
<td>6 bar (90 psi)</td>
</tr>
<tr>
<td>PTFE</td>
<td>8 bar (120 psi)</td>
<td>6 bar (90 psi)</td>
<td>5 bar (75 psi)</td>
</tr>
</tbody>
</table>

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

Max. working temperature: 175°C (350°F) dependent on application
Control pressure: Cf. 1 & 4
DN 15-80: 5 - 8 bar(70-120 psi)
DN 100: 6 - 8 bar(90-120 psi)
Cf. 2, 3, 5 & 6
DN 15-80: 4,5-6 bar(65-90 psi)
DN 100: 5,5-7 bar(80-100 psi)

Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys

End connection: Butt weld ends see fold out page 15
Clamps and flanges see page 16 and 17
Special ends

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

Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA see table below

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>L</th>
<th>L₁</th>
<th>A x B</th>
<th>H₁</th>
<th>H₂</th>
<th>H₃</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
<td>73x79</td>
<td>151</td>
<td>66</td>
<td>133</td>
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<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
<td>96x105</td>
<td>180</td>
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<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
<td>111x130</td>
<td>216</td>
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<td>180</td>
<td>105</td>
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<tr>
<td>65</td>
<td>80</td>
<td>30</td>
<td>216</td>
<td>190x170</td>
<td>309</td>
<td>135</td>
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<td>30</td>
<td>254</td>
<td>190x170</td>
<td>309</td>
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<tr>
<td>100</td>
<td>100</td>
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<td>305</td>
<td>ø238</td>
<td>318</td>
<td>143</td>
<td>295</td>
<td>175</td>
</tr>
</tbody>
</table>

www.sed-flowcontrol.com
KMA 495

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

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

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

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

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

<table>
<thead>
<tr>
<th>Diaphragm</th>
<th>DN 15-50 (2&quot;)</th>
<th>DN 65-80 (2,5&quot;-3&quot;)</th>
<th>DN 100 (4&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDM</td>
<td>10 bar (150 psi)</td>
<td>7 bar (100 psi)</td>
<td>6 bar (90 psi)</td>
</tr>
<tr>
<td>PTFE</td>
<td>8 bar (120 psi)</td>
<td>6 bar (90 psi)</td>
<td>5 bar (75 psi)</td>
</tr>
</tbody>
</table>

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

Max. working temperature: 175°C (350°F) dependent on application

Control pressure:
- Cf. 1 DN 15 - 50 4.5 - 6 bar (65-90 psi)
- Cf. 1 DN 65 - 80 4.5 - 7 bar (65-100 psi)
- Cf. 1 DN 100 5.5 - 7 bar (90-100 psi)
- Cf. 2 & 3 DN 15 - 80 4 - 5.5 bar (60-80 psi)
- Cf. 2 & 3 DN 100 5 - 6.5 bar (70-95 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

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

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

Diaphragm size:
- MA see table below

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MA</td>
</tr>
<tr>
<td>15-25</td>
<td></td>
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<tr>
<td>32-40</td>
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<td></td>
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<tr>
<td>80</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

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

Butt weld ends MA 25 - 100
Fold out page 15

www.sed-flowcontrol.com
Pneumatically Operated Valve DN 15 - 80 mm (1/2" - 3")

Features
- Thermoplastic diaphragm actuator direct assembled with the valve body
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm

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

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

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

<table>
<thead>
<tr>
<th>Diaphragm Material</th>
<th>DN 15-50 (2&quot;)</th>
<th>DN 65-80 (2,5&quot;-3&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDM</td>
<td>10 bar (150 psi)</td>
<td>7 bar (100 psi)</td>
</tr>
<tr>
<td>PTFE</td>
<td>8 bar (120 psi)</td>
<td>6 bar (90 psi)</td>
</tr>
</tbody>
</table>

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: 150°C (300°F) dependent on application
Control pressure:
- Cl. 1 DN 15 - 50 4.5 - 6 bar (65-90 psi)
- Cl. 1 DN 65 - 80 4.5 - 7 bar (65-100 psi)
- Cl. 2 & 3 DN 15 - 80 4 - 5.5 bar (60-80 psi)

Diaphragm material: EPDM or PTFE
Valve body material:
- Forged 1.4435/316 L ASME/BPE
- Investment cast 1.4435/316 L
- Other alloys

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

Actuators suitable for:
- Two-Way bodies
- Welded configurations

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

Diaphragm size:
- MA see table below

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA</td>
<td>L</td>
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<td>15-25</td>
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<td>32-40</td>
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<td>50</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
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</tbody>
</table>

Note: H₃ and H₄ only for valves with Cl. 2 and Cl. 3
H₁ only for valve with Cl. 1
KMD 402

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

Features
- Thermoplastic piston actuator
- Compact design
- Actuator high resistance to heat transfer
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Smooth exterior design ideal for wash downs

Optional
- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting
- Control air connection 90° to flow direction

Technical Data
Control function (Cf.):
- Pneumatically operated
- Fail safe close (NC): Cf. 1 & 4
- Fail safe open (NO): Cf. 2 & 5
- Double acting (DA): Cf. 3 & 6

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM Diaphragm 10 bar (150 psi)
  - PTFE Diaphragm 8 bar (120 psi)

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

Max. working temperature: 150°C (300°F) dependent on application

Control pressure:
- Cf. 1 & 4: 4,5 - 7 bar (65 - 100 psi)
- Cf. 2, 3, 5 & 6: 4 - 5 bar (60 - 70 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

Actuators suitable for:
- Two-Way bodies
- Welded configurations

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

Diaphragm size:
- MA see table below

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MA</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Butt weld ends MA 25 - 100
Fold out page 15
Steripur 592

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

Features
- Two stage stainless steel actuator
- Second position adjustable with reduced flow for filling
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- Circumferential, defined sealing angle between process diaphragm and valve body
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs
- Optical indicator

Optional
- Available with a wide range of control equipment and accessories see page 59 to 64, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable

Technical Data
Control function (Cf.):
- Pneumatically operated
  - Fail safe close (NC): Cf. 1 & 4

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

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

Diaphragm Material:

<table>
<thead>
<tr>
<th>Diaphragm</th>
<th>DN (2&quot;)</th>
<th>EPDM</th>
<th>10 bar (150 psi)</th>
<th>PTFE</th>
<th>8 bar (120 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN 15-50</td>
<td>2&quot;</td>
<td>10 bar</td>
<td>150 psi</td>
<td>8 bar</td>
<td>120 psi</td>
</tr>
</tbody>
</table>

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

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

Control pressure:
- Cf. 1 & 4: 5 - 8 bar (70 - 120 psi)

Diaphragm material:
- EPDM or PTFE

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

End connection:
- Butt weld ends see fold out page 15
- Clamps and flanges see page 16 and 17
- Special ends

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

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

Diaphragm size:
- MA see table below

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>L</th>
<th>L₁</th>
<th>A x B</th>
<th>H₁</th>
<th>H₂</th>
<th>H₃</th>
<th>H₄</th>
<th>H₅</th>
<th>D</th>
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</thead>
<tbody>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
<td>73x79</td>
<td>220</td>
<td>66</td>
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<td>-</td>
<td>35</td>
<td>75</td>
</tr>
<tr>
<td>32-40</td>
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<td>25</td>
<td>153</td>
<td>96x105</td>
<td>260</td>
<td>68</td>
<td>180</td>
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<td>46</td>
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<td>110x130</td>
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<td>190</td>
<td>34</td>
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<td>105</td>
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</tbody>
</table>

Butt weld ends
MA 25 - 100
Fold out page 15

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### Ordering Key

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Type:</strong></td>
<td>207, 307, 407</td>
<td>Steripur Series, stainless steel actuator, pneumatic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>397, 297, 997</td>
<td>Steripur Series, stainless steel actuator, manual</td>
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<td>190, 195, 495</td>
<td>KMA Series, actuator with stainless steel adaptation, pneumatic</td>
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<tr>
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<td></td>
<td>290, 295, 995</td>
<td>KMA Series, actuator with stainless steel adaptation, manual</td>
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<td>188, 385, 402</td>
<td>KMD Series, plastic actuator direct mounted, pneumatic</td>
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<td>KMD Series, plastic actuator direct mounted, manual</td>
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<td><strong>Size:</strong></td>
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<td>DN 4, 6, 8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100</td>
</tr>
<tr>
<td></td>
<td>See page: 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Valve body material:</strong></td>
<td>7</td>
<td>Stainless steel, investment cast 1.4435/316 L</td>
</tr>
<tr>
<td></td>
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<td>77</td>
<td>Stainless steel, forged 1.4435/316 L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>78</td>
<td>Stainless steel, forged 1.4435/316 L Fe &lt; 0,5%</td>
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<td></td>
<td>20</td>
<td>Hastelloy, C-22 2.4602</td>
</tr>
<tr>
<td>4</td>
<td><strong>Valve body butt weld tube end connections</strong> (bolt letters most common versions)</td>
<td>39</td>
<td>Butt weld end acc. DIN</td>
</tr>
<tr>
<td></td>
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<td>40</td>
<td>Butt weld end acc. EN ISO 1127</td>
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<td>Butt weld end acc. DIN 11850 Series 1</td>
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<td>Butt weld end acc. DIN 11850 Series 2</td>
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<td>Butt weld end acc. DIN 11850 Series 3</td>
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<td>45</td>
<td>Butt weld end acc. ASME/ BPE</td>
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<td>Butt weld end acc. BS 4825 R1</td>
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<td>Butt weld end acc. JIS 3447</td>
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<td>5</td>
<td><strong>Diaphragm - material:</strong></td>
<td>1</td>
<td>EPDM, FDA compliant, MA4-100</td>
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<tr>
<td></td>
<td>(Other diaphragm materials on request)</td>
<td>18</td>
<td>EPDM, FDA / USP compliant MA4-100, preferred for SIP applications</td>
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<tr>
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<td>PTFE(TFM) / EPDM one-piece, FDA / USP compliant, MA4 to MA50</td>
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<td>PTFE(TFM) / EPDM two-piece, FDA / USP compliant, MA25 to MA100</td>
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<tr>
<td>6.1</td>
<td><strong>Actuator control function (CF.) and orientation air inlet connection</strong></td>
<td></td>
<td>manually operated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Normally closed (NC), orientation 90° to flow direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Normally open (NO), orientation 90° to flow direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Double-acting (DA), orientation 90° to flow direction</td>
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<td>Normally closed (NC), orientation in flow direction</td>
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<td>Normally open (NO), orientation in flow direction</td>
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<td>6</td>
<td>Double-acting (DA), orientation in flow direction</td>
</tr>
<tr>
<td>6.2</td>
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<td>Steripur, actuator size 30</td>
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<tr>
<td></td>
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<td>S</td>
<td>KMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HS</td>
<td>KMD max. 80° C</td>
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<tr>
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<td></td>
<td></td>
<td>KMD for steam sterilizing up to max. 150° C</td>
</tr>
<tr>
<td>7</td>
<td><strong>Surface roughness of the bodies in Ra: (µm)</strong></td>
<td>00</td>
<td>Interior blasted Ra 6.3 µm only cast bodies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01</td>
<td>Interior blasted Ra 6.3 µm electro polished only cast bodies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02</td>
<td>Internal mechanically polished Ra 0.8 µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>03</td>
<td>Internal mechanically polished Ra 0.8 µm + electro polished</td>
</tr>
<tr>
<td></td>
<td></td>
<td>07</td>
<td>Internal mechanically polished Ra 0.6 µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>08</td>
<td>Internal mechanically polished Ra 0.6 µm + electro polished</td>
</tr>
<tr>
<td></td>
<td></td>
<td>09</td>
<td>Internal mechanically polished Ra 0.4 µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>Internal mechanically polished Ra 0.4 µm + electro polished</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>Internal mechanically polished Ra 0.25 µm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>Internal mechanically polished Ra 0.25 µm + electro polished</td>
</tr>
<tr>
<td>8</td>
<td><strong>S-Number</strong></td>
<td>S...</td>
<td>To specify customized design and all the details for multiport valves</td>
</tr>
</tbody>
</table>

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

Article Code: 385 . 25 . 77 . 42 . 18 . 1 HS . 03

Type:
385
KMD Series
plastic actuator
direct mounted
pneumatic

Size:
DN 25

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

Tube end connection:
Butt weld tube end
DIN 11850 Series 2

Surface roughness of the body:
Internal mechanical polish and electro polish
Ra ≤ 0.8 µm

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

Actuator control function:
Normally closed (NC) orientation 90° to flow direction

Diaphragm material:
EPDM
FDA / USP compliant

System components and accessories see page 59 to 64.
Welded valve configurations are designed to improve the process in aseptic production facilities by reducing the dead legs in accordance to cGMP. Welded valve configurations may be as simple as a valve by tube fabrication or as complex as multiple valve bodies of different sizes welded into a valve cluster. All welded end connections are available. The applications are endless and the challenge is to efficiently meet the process needs.

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

**Advantages of a Welded Valve Configuration:**
- Totally self draining
- Minimized dead legs
- Reduces surface contact and hold up volume of the medium
- Compact assembly
- Reduces number of welds
- Provides a ready-made assembly for field installation

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

**D-Rule**

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

Depending on the nominal diameters of the combinations and / or the positioning of the valve body, the relation can shift between 2:1 and 5:1. If the D-Rule is specified and the requirements cannot 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.

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

The main valve orientation distinguishes between the two different principles:

1) SL or GMP
The SL Fabrication is utilized in a vertical piping system to eliminate dead legs in point of use applications of high purity water systems or any other distribution systems. This valve design serves as a 90-degree elbow for the piping system or as a valve by valve configuration. In a valve by valve configuration the horizontal valve is orientated at the self-draining angle. When the vertical main valve is opened it provides a sample untainted by bacterial growth or process contamination. The size range available is up to DN 100 (4”) for both the main valve and L valve or tube port. See the following illustrations with possible combinations.

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

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

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

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

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

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

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

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.
Multiport Valves

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:

- Multiport blocks with main line open for circulation (Position 1; Page 49 to 51)
- Multiport blocks with all lines and valve ports able to close (Position 2; Page 52 to 54)

### 1) Multiport block valves with main line open

**T-Valve or ZDL-Valve**

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

<table>
<thead>
<tr>
<th>Description</th>
<th>P&amp;ID</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>For valve specification see page 55 as guideline</td>
<td>Flow direction, Drain direction, Valve</td>
<td>Actuators and other options are included in some of the illustrations</td>
</tr>
</tbody>
</table>

#### 1.1) T-Valve or ZDL-Valve

1x Point of use valve port

- Recommended installation: S3 down
- Illustration right side: T-Valve with U-bend added for distribution loop installation

#### 1.2) ML3/1

1x Point of use valve port with integrated directional flow 90° to the main line

- Recommended installation: S3 down

---

www.sed-flowcontrol.com 49
Multiport Valves

1) Multiport block valves with main line open

**Description**
For valve specification see page 55 as guideline

**P&ID**
- Flow direction
- Drain direction
- Valve

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

1.3)
**MY 3/1**
1x Point of use valve port with Y main line inlet and outlet.
Thus the inlet and outlet dimension of the main line is reduced and can meet the centerline dimensions of an ASME BPE 180° U-bend.
Installation position: S3 down

1.4)
**MZ 4/2**
1x Point of use valve port
1x Integral loop sample valve port
Installation position: S3 down

1.5)
**MZ 4/2 – A**
**MZ 5/2 – B**
1x Point of use valve port
1x Integral loop sample valve port
1x Outlet valve port
Installation position: S4 down

1.6)
**MX 4/2**
1x Point of use valve port
1x Integral sample purge valve port below the weir
Installation position: S3 down
Multiport Valves

1) Multiport block valves with main line open

**Description**
For valve specification see page 55 as guideline

**P&ID**
- Flow direction
- Drain direction
- Valve

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

---

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

Recommended installation: S4 down

---

1.8)
**MF 6/4**
1x Point of use valve port
1x Integral loop sample valve port
2x Integral sample purge valve ports below the weir.

Recommended installation: S4 down

---

1.9)
**MC 6/4**
4x Point of use valve ports
The number of valve ports is variable
Recommended installation: S1 and S2 horizontal
S3 to S6 vertical down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S6 are positioned to the lowest point of valve pocket

---

1.10)
**MX 12/10**
10x Point of use valve ports
The number of valve ports is variable
Recommended installation: S1 and S2 horizontal
S3 to S10 horizontal or vertical down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S10 are positioned to the lowest point of valve pocket
2) Multiport block valves with all lines and valve ports able to close

**Description**
For valve specification see page 55 as guideline

**P&ID**
- Flow direction
- Drain direction
- Valve

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

2.1) **MF 3/2**
1x Valve horizontal self draining
1x Valve vertical
SL and SA block solution with minimized dead leg

Recommended installation:
Dependent on application S2 or S3 down

2.2) **MF 3/2**
2x Valves horizontal self draining
SA block solution with minimized dead leg

Recommended installation:
S1, S2, and S3 horizontal

2.3) **MC 3/2**
2x Valves vertical

Recommended installation:
S1 to S3 vertical. S1 to S3 can be horizontal if tube outlets are positioned to the lowest point of the valve pockets.

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

Recommended installation:
S2 down
For 90° rotation, the block design has to be modified to provide drain ability
2) Multiport block valves with all lines and valve ports able to close

<table>
<thead>
<tr>
<th>Description</th>
<th>P&amp;ID</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>For valve specification</td>
<td>➔ Flow direction</td>
<td>Actuators and other options are included</td>
</tr>
<tr>
<td>see page 55 as guideline</td>
<td>➔ Drain direction</td>
<td>in some of the illustrations</td>
</tr>
<tr>
<td></td>
<td>➔ Valve</td>
<td></td>
</tr>
</tbody>
</table>

2.5) **MF 4/4** Cross over

4x Valves horizontal

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

2.6) **MC 4/4**

4x Valves vertical

Recommended installation position:
S1 vertical up

2.7) **MF 5/4**

2x Valves horizontal
2x Valves vertical

Represents 2 SA configurations

Recommended installation:
S1 and S2 horizontal

2.8) **MF 4/4**

4x Valves vertical
Chromatography valve without bypass

**MF 4/5 (A)**

5x Valves vertical
Chromatography valve with bypass

Recommended installation:
S2 and S4 horizontal
S1 and S3 vertical
## Multiport Valves

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

<table>
<thead>
<tr>
<th>Description</th>
<th>P&amp;ID</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>For valve specification see page 55 as guideline</td>
<td>Flow direction ➔ Drain direction ▼ Valve</td>
<td>Actuators and other options are included in some of the illustrations</td>
</tr>
</tbody>
</table>

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

Recommended installation: S1 vertical

Depending on the diameter the star design is available with up to 7 valves. The star design has also been manufactured with two opposing multiport block valves with one common port connection.

![MC 4/3 Star Design](image)

### 2.10) MF 6/5
- 5x Valves vertical
- S5 Inlet
- S6 Drainage

Recommended installation: S6 down

![MF 6/5](image)

### 2.11) MF 6/6
- 4x Valves horizontal
- 2x Valves vertical
- S5 and S6 for drainage

Recommended Installation: S5 and S6 down

![MF 6/6](image)

### 2.12) Example:

Multiport valve assembly designed based on a P&ID combination of multiport block and welded valve configurations with full drain ability and minimal 4:1 dead leg.

Designed and manufactured by SED.

![Example](image)
### Specification Multiport Valves

#### Your P&ID Sketch

Example: P&ID

---

**Tube End:** S1, S2,...

**Preferred Installation:** Horizontal / Vertical

**Flow Direction:** ➡️

**Drain Direction:** ➡️

**Valve Seat:**

**Valve seat horizontal axis rotated in self draining position**

**Intersection:**

---

<table>
<thead>
<tr>
<th>Tube end</th>
<th>Tube end connection</th>
<th>Actuator</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>DN</td>
<td>s[mm]</td>
<td>D[mm]</td>
</tr>
<tr>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td></td>
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<td>S3</td>
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<td>S9</td>
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<tr>
<td>S10</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>S11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

**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

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 downstream processing.

The outlet port of the tank valve is available with all butt weld tube end standards, (see fold-out page 15), aseptic clamp, screw connection, (see page 16 and 17) or other special ends. The size range available is the same as the two-way valve.
# Tank Bottom Valve

Example:
Drawing Steripur Series pneumatically operated

Example:
Drawing KMA Series manually operated

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

<table>
<thead>
<tr>
<th>Description</th>
<th>P&amp;ID</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a tank valve or see page 55 to sketch and specify your solution</td>
<td>➡️ Flow direction ➡️ Drain direction ▶️ Valve</td>
<td>Actuators and other options are included in some of the illustrations</td>
</tr>
</tbody>
</table>

### 1) BT
1x Valve port

Standard tank bottom body
Tank body for the tank bottom

### 2) 1x Valve machined from bar stock

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZL 3/1</td>
<td>With one welded valve tank side left</td>
</tr>
<tr>
<td>BZR 3/1</td>
<td>With one welded valve tank side right</td>
</tr>
<tr>
<td>BXL 3/1</td>
<td>With one welded valve outlet left</td>
</tr>
<tr>
<td>BXR 3/1</td>
<td>With one welded valve outlet right</td>
</tr>
<tr>
<td>BW 4/1</td>
<td>With one welded valve tank side left and one welded valve outlet right</td>
</tr>
</tbody>
</table>

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

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

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

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

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

Description
Select a tank valve or see page 55 to sketch and specify your solution

4) BZL 3/2
1x Main Valve
1x Sample valve outlet left
Like position 2 but includes an integral outlet valve. Right side and left side options are available and are fully drainable.

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

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

7) BT 5/4
4x Main valves
1x Port
Application with 4 internal tank partitions.

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

9) BF
Customized for aseptic modular retainer mounted in aseptic piping installations.
# System Components and Accessories

## Overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Size (DN)</th>
<th>Pneumatically operated</th>
<th>Manual</th>
<th>Detail see page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical position indicator</td>
<td>024.10</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>60</td>
</tr>
<tr>
<td>Stroke limiter</td>
<td>024.11</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>60</td>
</tr>
<tr>
<td>Stroke limiter with optical position indicator</td>
<td>024.12</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>60</td>
</tr>
<tr>
<td>Manual override with optical position indicator</td>
<td>024.13</td>
<td>4 - 50</td>
<td>●</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>Travel stop</td>
<td>024.886</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>60</td>
</tr>
<tr>
<td>Manual override with hand wheel</td>
<td>024.40</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>Control head switch with optical indicator catch the eye</td>
<td>024.63</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>61, 64</td>
</tr>
<tr>
<td></td>
<td>024.64</td>
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<td></td>
<td>024.65</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ASI-Interface control head switch with optical indicator catch the eye</td>
<td>024.89</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Limit switch with one mechanical switch and optical indicator</td>
<td>024.90</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>61</td>
</tr>
<tr>
<td>Catch the eye with proximity switches and travel stop</td>
<td>024.98</td>
<td>15 - 50</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Catch the eye with proximity switches and stroke limiter</td>
<td>024.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting bracket for proximity switch</td>
<td>024.45</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Limit switch with LED</td>
<td>024.62</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Pilot valve for direct mounting</td>
<td>600</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Pilot valve for manifold mounting</td>
<td>605</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td>61</td>
</tr>
<tr>
<td>Digital positioner separate for remote control or directly mounting via a bracket on the top of the valve</td>
<td>024.16.400</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td>62, 63</td>
</tr>
<tr>
<td>Digital positioner central for direct mounting</td>
<td>024.16.700</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td>62, 63</td>
</tr>
<tr>
<td>Paddle wheel flow sensor</td>
<td>F24</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>Manual valve prepared for mounting proximity switch</td>
<td>024.96</td>
<td>15 - 100</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapter for direct mounting one proximity direct on top in the valve actuator</td>
<td>SO795</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
System Components and Accessories

Manual Adjustment - Optical Indication

- 024.10 Optical position indicator
- 024.11 Stroke limiter
- 024.12 Stroke limiter with optical position indicator
- 024.13 Manual override with optical position indicator
- 024.40 Manual override with hand wheel
- 024.886 Travel stop
System Components and Accessories

Electrical Switch Boxes - Manual Adjustment - Pilot Control

- **024.62** Limit switch with LED
- **024.45** Mounting bracket for proximity switch
- **024.98** Catch the Eye with travel stop and proximity switches for open and closed
- **024.99** Catch the Eye with stroke limiter and proximity switches for open and closed
- **024.90** Limit switch open position
- **024.63 - 024.65** Control Head Switch for open and close with optical indicator catches the eye
  See page 64
- **024.89** AS-Interface Control Head Switch for open and close position with optical indicator catches the eye
  See page 64

- **605** Pilot valve for manifold mounting
- **600** Pilot valve for direct mounting
24.16.4
**Positioner Separate**
Electropneumatic positioner for pneumatically actuated valves with internal or external path-measuring system

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

Operational diagramm

Valve Steripur Series Type 407

External path measuring

Paddlewheel Flow Sensor
Housing material 1.4435
Paddlewheel ECTFE
Electropneumatic Positioner

Type 024.16.7 Positioner Central
Electro pneumatic positioner for pneumatically actuated control valves

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

Technical Data

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

Type 024.16.4 Positioner Separate
Electro pneumatic positioner for pneumatically actuated control valves

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

Technical Data

<table>
<thead>
<tr>
<th>Housing/Body material</th>
<th>Aluminum lacquered</th>
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</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>0…+60 °C</td>
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<tr>
<td>Control medium</td>
<td>Quality classes to DIN ISO 8573-1</td>
</tr>
<tr>
<td>Control air connection</td>
<td>G1/8 internal thread</td>
</tr>
<tr>
<td>Supply pressure*</td>
<td>0…6 bar</td>
</tr>
<tr>
<td>Intrinsic air consumption</td>
<td>0 L/min</td>
</tr>
<tr>
<td>Flow capacity</td>
<td>low 35 L/min, high 70 L/min</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>24 V DC +/- 10%</td>
</tr>
<tr>
<td>Residual ripple</td>
<td>10% Not industrial DC!</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 10 W</td>
</tr>
<tr>
<td>Input for setpoint</td>
<td>0/4…20 mA, 0…10 V</td>
</tr>
<tr>
<td>Input for process signal</td>
<td>4…20 mA</td>
</tr>
<tr>
<td>Binary input</td>
<td>Can be configured as a normally open or normally closed contact</td>
</tr>
<tr>
<td>Terminations</td>
<td>1.5 mm bolted terminals two cable glands</td>
</tr>
<tr>
<td>Type of protection</td>
<td>IP65 to EN 60529</td>
</tr>
<tr>
<td>Lift turn of internal path-measuring system</td>
<td>10…80 mm</td>
</tr>
<tr>
<td>Option</td>
<td>analog feedback (4-20mA)</td>
</tr>
</tbody>
</table>

*Pressure stated in (bar): are excess to atmosphere
The SED control head switch is an innovative development based on years of experience in manufacturing electrical accessories for process valves. Depending on the version, the control head provides signals for both open and closed positions of the valve and includes an integral solenoid valve for a direct air line connection to the actuator.

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

**Self Positioning:**
After mounting the control head, the two cams activating the switches in the control head will be mechanically moved by overcoming their holding force on the spindle. To adjust the closed position, the control head switch stem will be pushed down until contact is made with the valve actuator arm. The adjustment of the open position takes place at the first stroke of the valve. The circumferential optical indicator is suspended on the cam for the closed position and represents the entire stroke of the valve.

For the electrical connection a pre-wired pin or Bus-connection is available. The control head has a reliable output and service life and contributes considerably to cost savings when considering assembly, application, and self adjustment as compared to other conventional control head options available.

**Features:**
- Self adjusting
- Circumferential catch the eye optical indicator representing the full stroke
- Ease of assembly and may be assembled with the valve actuator in the field
- Time saving electrical interface via pre-wired pin or a Bus-connection
- Compact design
- 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

**Versions Control Head**

<table>
<thead>
<tr>
<th>Code</th>
<th>Electrical connection</th>
<th>Electro-mechanical limit switch Open/ Close (pcs)</th>
<th>Proximity switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>024.63..</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2 (pcs)</td>
<td>Namur (2-wire)</td>
</tr>
<tr>
<td>024.64..</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2 (pcs)</td>
<td>PNP (3-wire)</td>
</tr>
<tr>
<td>024.65..</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2 (pcs)</td>
<td></td>
</tr>
<tr>
<td>024.89..</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2 (pcs)</td>
<td></td>
</tr>
<tr>
<td>024.89..</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2 (pcs)</td>
<td></td>
</tr>
</tbody>
</table>

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

**Diaphragm Valve**
- Aseptic Diaphragm Valve
- Industrial Metal Diaphragm Valve
- Plastic Diaphragm Valve

**Seat Valve**
- Two-Way Metal Globe Valve
- Two-Way Metal Angle Seat Valve

**System Components**
- Solenoid Valve
- Switches and Manual Adjustment
- Electropneumatic Positioner

**Flow Measurement**
- Variable Area Flowmeters
- Paddle Wheel Flow Sensor
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A Sanitary Standards and Accepted Practices</td>
<td>3A</td>
<td>Determines criteria for the cleanability of dairy processing equipment. They have been adopted by many other liquid processing industries outside of dairy.</td>
</tr>
<tr>
<td>American Society of Mechanical Engineers</td>
<td>ASME</td>
<td>Creates consensus standards for Mechanical Engineering</td>
</tr>
<tr>
<td>American Society for the Testing of Materials</td>
<td>ASTM</td>
<td>Creates consensus standards for material quality and material quality testing methods.</td>
</tr>
<tr>
<td>BioProcessing Equipment Committee</td>
<td>BPEC</td>
<td>A sub-committee of ASME. It creates engineering standards for the design, specification, manufacture and documentation of equipment used for biopharm processes.</td>
</tr>
<tr>
<td>Clean in Place</td>
<td>CIP</td>
<td>The technique of cleaning process line components without the need for relocation or disassembly.</td>
</tr>
<tr>
<td>Comite Européen de Normalisation</td>
<td>CEN</td>
<td>Committee for European Standardization Creates standards that reflect the best practices in each industry and is supported by DIN and ISO.</td>
</tr>
<tr>
<td>Current Good Manufacturing Practices</td>
<td>cGMP</td>
<td>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.</td>
</tr>
<tr>
<td>Deionized Water</td>
<td>DIW</td>
<td>Process of the extraction of deionized water through ion exchange resins.</td>
</tr>
<tr>
<td>Deutsches Institut für Normung</td>
<td>DIN</td>
<td>German Institute for Standardization Creates engineering standards for Germany and is contributing body to CEN and ISO.</td>
</tr>
<tr>
<td>Electro-Polish</td>
<td>EP or E/P</td>
<td>Electrochemical polishing process for metal components where metal ions are removed from the surface of the metal.</td>
</tr>
<tr>
<td>European Hygienic Equipment Design Group</td>
<td>EHEDG</td>
<td>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.</td>
</tr>
<tr>
<td>European Pharmacopoeia</td>
<td>EP</td>
<td>European counterpart to USP. A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices and diagnostics.</td>
</tr>
<tr>
<td>Food and Drug Administration (USA)</td>
<td>FDA</td>
<td>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.</td>
</tr>
<tr>
<td>International Standards Organization</td>
<td>ISO</td>
<td>Creates consensus standards for engineering and quality systems.</td>
</tr>
<tr>
<td>Mill Test Report or Material Test Report</td>
<td>MTR</td>
<td>A document certifying the composition of a metal from a particular heat batch.</td>
</tr>
<tr>
<td>Piping and Instrumentation Diagram</td>
<td>P&amp;ID</td>
<td>American standard for process diagrams Diagrams on which the process, the instruments and the flow scheme are defined.</td>
</tr>
<tr>
<td>Point of Use</td>
<td>POU</td>
<td>A valve outlet in a recirculation utility system (typically a water system).</td>
</tr>
<tr>
<td>Purified Water</td>
<td>PW</td>
<td>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.</td>
</tr>
<tr>
<td>Steam in Place</td>
<td>SIP</td>
<td>Sanitization of process line components by the use of steam without the need for relocation or disassembly.</td>
</tr>
<tr>
<td>Total Oxidizable Carbon or Total Organic Carbon</td>
<td>TOC</td>
<td>A measure of the amount of organic compounds in a water sample. Carbon is oxidized and the level of CO2 is measured. The proposed USP water standards are based on TOC analysis.</td>
</tr>
<tr>
<td>United States Pharmacopoeia</td>
<td>USP</td>
<td>A private, non-profit organization that sets standards for drugs, drug ingredients, medical devices, and diagnostics. The FDA enforces the established standards.</td>
</tr>
<tr>
<td>Water for Injection</td>
<td>WFI</td>
<td>Water for use as a solvent for the preparation of parenteral products conforming to USP guidelines. Obtained most commonly by distillation.</td>
</tr>
</tbody>
</table>
## SED Flow Control

<table>
<thead>
<tr>
<th>Size</th>
<th>SED Flow Control</th>
<th>SED DG</th>
<th>SED DG</th>
<th>Figure Number</th>
<th>Figure Number</th>
<th>Body Material</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td>.25 1/4 BI Series</td>
<td>402</td>
<td>407</td>
<td>NO</td>
<td>497</td>
<td>316L Forged Stainless Steel</td>
</tr>
<tr>
<td>10</td>
<td>.25 1/2 BI Series</td>
<td>402</td>
<td>495</td>
<td>1/2 Standard Fractional</td>
<td>385</td>
<td>316L Stainless Steel Block Body or Bar Stock Body</td>
</tr>
<tr>
<td>20</td>
<td>.75 3/4 Standard Fractional / Large Body</td>
<td>402</td>
<td>495</td>
<td>NC</td>
<td>385</td>
<td>Special Alloy</td>
</tr>
<tr>
<td>25</td>
<td>1.5 1 Standard Body</td>
<td>407</td>
<td>495</td>
<td>1 Standard Body</td>
<td>385</td>
<td>Special Alloy</td>
</tr>
<tr>
<td>40</td>
<td>1.5 1 Standard Body</td>
<td>407</td>
<td>495</td>
<td>1 Standard Body</td>
<td>385</td>
<td>Special Alloy</td>
</tr>
<tr>
<td>50</td>
<td>2.0 2 Standard Body</td>
<td>407</td>
<td>385</td>
<td>NC</td>
<td>385</td>
<td>Special Alloy</td>
</tr>
<tr>
<td>65</td>
<td>2.5 3/4 Machined from 3.0&quot; or 4.0&quot; Forged Body</td>
<td>407</td>
<td>385</td>
<td>NC</td>
<td>385</td>
<td>Special Alloy</td>
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<tr>
<td>80</td>
<td>3.0 3 Standard Body</td>
<td>407</td>
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<td>NC</td>
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<tr>
<td>100</td>
<td>4.0 4 Machined from Black Body</td>
<td>407</td>
<td>385</td>
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## SED Flow Control

<table>
<thead>
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<th>Size</th>
<th>SED Flow Control</th>
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<td>289</td>
<td>289S</td>
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## SED Flow Control

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<th>Size</th>
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<th>SED DG</th>
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<th>Figure Number</th>
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<tr>
<td>10</td>
<td>DA</td>
<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
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<td>20</td>
<td>DA</td>
<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
<td>Special Alloy</td>
</tr>
<tr>
<td>30</td>
<td>DA</td>
<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
<td>Special Alloy</td>
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<tr>
<td>40</td>
<td>DA</td>
<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
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<th>Figure Number</th>
<th>Figure Number</th>
<th>Body Material</th>
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<tbody>
<tr>
<td>50</td>
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<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
<td>Special Alloy</td>
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<td>DA</td>
<td>402</td>
<td>495</td>
<td>DA</td>
<td>496</td>
<td>Special Alloy</td>
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<table>
<thead>
<tr>
<th>Size</th>
<th>SED Flow Control</th>
<th>SED DG</th>
<th>SED DG</th>
<th>Figure Number</th>
<th>Figure Number</th>
<th>Body Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>12407</td>
<td>Rhea Drive • Suite 101 • Plainfield, IL • 60585</td>
<td>Toll Free 1-800-SED-1344</td>
<td><a href="http://www.sed4valves.com">www.sed4valves.com</a></td>
<td>BPE SFV</td>
<td>Grit</td>
<td>Max Ra</td>
</tr>
</tbody>
</table>
SED Flow Control GmbH
Raiffeisenstraße 10A
D- 74906 Bad Rappenau
Postfach 1306
D- 74900 Bad Rappenau
Telefon +49(0)7264/921-0
Telefax +49(0)7264/921-21
E-Mail: info@sed-flowcontrol.com
Internet: www.sed-flowcontrol.com