VALVES FOR
ASEPTIC APPLICATIONS

www.sed-flowcontrol.com
Aseptic Applications

Pharmaceutical Project

Filtration Skid

Human blood fractionation

Filling

Mixing

Bioreactor Skid

Biopharm Project
# Table of Contents

## 1 Introduction
- A Brief Overview 4
- The Company 5
- What does Quality mean at SED? 6

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

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

## 3 Aseptic Diaphragm Valves
- Overview Diaphragm Aseptic Valves 24 - 25
- Why Aseptic Diaphragm Valve? 26
- Self Draining - Two-Way Valve 27
- Innovative Design 28 - 31

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

## 5 Angle Seat Valves
- Description and Features 86
- Applications 87
- Ordering Key and Ordering Example 88, 89
- Technical Data 90

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

## Glossary

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

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

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

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

We continue to invest in our state-of-the-art production facilities which allows for the competitive manufacture of cost effective solutions for the special and demanding needs of our customer’s high quality standards.
The company has installed the most modern machinery and individual production facilities which are fully adapted to current market requirements.

Specifically:

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

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

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

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

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

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.

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

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

Complete Valve Assembly Inspection
• 100% according to checklist

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

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

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

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

Verification Certificates according to Specification DIN EN 10204
• 3.1 Analysis of the material traceability by heat number (U.S. Certified Mill Test Report-MTR). This also applies to all ASME BPE compliant material used in fabrications.
• 2.2 Confirmation of conformance by documentation of results
• 2.1 Confirmation of conformance with the specification
Certified Process Qualification
- Quality Management System ISO 9001
- Environment Management System ISO 14001
- Manufacturing Process HP0 AD2000
- Pressure Equipment Directive 97/23 EC
- Specialised Company for Welding ISO 3834-2
- Qualified Personnel for Material Traceability according §2 Abs.2a Gerätesicherungsgesetz
- ATEX certified Company

Validation for the Aseptic Diaphragm Valve
- Compliance to 3-A Standard Section 54-02
- Compliance of SED CDSA Design to EHEDG Hygienic Equipment Design Criteria Document No.8SED CDSA
- Compliance to CRN Canadian Standards Association
- Certification of Compliance according to EN 10204 2.2
- Certification of Compliance according to EN 10204 3.1
- Certification of an assessment according 94/9/EC
- TA-Luft / VDI 2440 / VDI 3479

Note: Certification and compliance for valve diaphragm and valve body see the corresponding sections in the catalogue
Flow Rate and Valve Sizing

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

**Kv-value**
The Kv-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 Kvs-value describes the Kv-value when the valve is 100% open.

For water 5-30°C applies:

\[
K_v = \frac{Q}{\sqrt{\Delta p}}
\]

General Liquid Flow Formula:

\[
K_v = Q \sqrt{\frac{\rho}{1000 \Delta p}}
\]

**Conversion:**
For the correct Kv to Cv conversion calculation, use only the stated units formulas below. The Kv-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 Cv-value in US-gallons per minute (gpm) with a pressure drop of Δp 1 PSI.

Conversion of Kv in Cv

\[
Cv = 1,17 \times K_v
\]

Conversion of Cv in Kv

\[
K_v = 0,86 \times C_v
\]

**Explanations:**

- **Kv** m³/h flow rate parameter
- **Q** m³/h volume flow rate
- **ρ** kg/m³ specific gravity
- **p₁** bar pressure before the valve
- **p₂** bar pressure after the valve
- **Δp** bar pressure drop through the valve

\[
Δp = p_1 - p_2
\]

**Kvs-Value (m³/h)**

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>ISO 1127 Code 40</th>
<th>DIN 11850 Code 41-42</th>
<th>ASME-BPE Code 45</th>
<th>Valve type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN NPS MA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - 8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6 - 8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8 1/4 8</td>
<td>2,4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10 3/8 8</td>
<td>-</td>
<td>2,3</td>
<td>1,4</td>
<td>-</td>
</tr>
<tr>
<td>15 1/2 8</td>
<td>-</td>
<td>-</td>
<td>2,0</td>
<td>-</td>
</tr>
<tr>
<td>15 1/2 10</td>
<td>2,7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10 3/8 10</td>
<td>3,9</td>
<td>2,5</td>
<td>1,4</td>
<td>-</td>
</tr>
<tr>
<td>15 1/2 10</td>
<td>5,3</td>
<td>4,7</td>
<td>2,2</td>
<td>-</td>
</tr>
<tr>
<td>20 3/4 10</td>
<td>-</td>
<td>5,5</td>
<td>4,6</td>
<td>-</td>
</tr>
<tr>
<td>15 1/2 25</td>
<td>10,5</td>
<td>9,5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20 3/4 25</td>
<td>13,0</td>
<td>11,5</td>
<td>6,8</td>
<td>-</td>
</tr>
<tr>
<td>25 1 25</td>
<td>15,5</td>
<td>14,2</td>
<td>12,0</td>
<td>-</td>
</tr>
<tr>
<td>32 1 1/4 40</td>
<td>43,0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>40 1 1/2 40</td>
<td>50,0</td>
<td>43,0</td>
<td>40,0</td>
<td>-</td>
</tr>
<tr>
<td>50 2 50</td>
<td>64,0</td>
<td>52,0</td>
<td>48,0</td>
<td>-</td>
</tr>
<tr>
<td>65 2 1/2 80</td>
<td>95,0</td>
<td>89,0</td>
<td>85,0</td>
<td>-</td>
</tr>
<tr>
<td>80 3 80</td>
<td>127,0</td>
<td>123,0</td>
<td>110,0</td>
<td>-</td>
</tr>
<tr>
<td>100 4 100</td>
<td>205</td>
<td>192,0</td>
<td>185,0</td>
<td>-</td>
</tr>
</tbody>
</table>

The Kvs-values in the table refer to the specification with Two-Way valve bodies with EPDM diaphragm (Depending on the specification variations are possible).

The Kvs-values with PTFE diaphragm maybe lower due to higher stiffness of the material, particularly in applications with lower working pressure.

Test stand to determine and document flowrates and Kᵥ (Cᵥ) values
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.
### Ra-Value

The arithmetic average Ra is used as parameter for the surface finish profile. $L_t = 5.6$ mm traversing length and $l_n = 4.0$ mm measuring range split in 5 single measuring sections $l_f = 0.8$ mm each 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</th>
<th>DIN 11866</th>
<th>Mechanically Polished</th>
<th>Mechanically Polished and Electro-polished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Ra max</td>
<td>hygiene class</td>
<td></td>
</tr>
<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>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SED and ASME BPE</th>
<th>Ra max</th>
<th>Mechanically Polished</th>
<th>Mechanically Polished and Electro-polished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>μ-inch</td>
<td>μm</td>
<td></td>
</tr>
<tr>
<td>SF0</td>
<td>No Finish Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF1</td>
<td>20</td>
<td>0,51</td>
<td></td>
</tr>
<tr>
<td>SF2</td>
<td>25</td>
<td>0,64</td>
<td></td>
</tr>
<tr>
<td>SF3</td>
<td>30</td>
<td>0,76</td>
<td></td>
</tr>
<tr>
<td>SF4</td>
<td>15</td>
<td>0,38</td>
<td></td>
</tr>
<tr>
<td>SF5</td>
<td>20</td>
<td>0,51</td>
<td></td>
</tr>
<tr>
<td>SF6</td>
<td>25</td>
<td>0,64</td>
<td></td>
</tr>
</tbody>
</table>

---

**Tape Print Out of Surface Finish**

![Tape Print Out of Surface Finish](image-url)
# Table of Contents

## 1 Introduction
- A Brief Overview .................................................. 4
- The Company ....................................................... 5
- What does Quality mean at SED? .................................. 6

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

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

## 4 Aseptic Connections
- Clamps ................................................................... 20
- Aseptic Flanges and Aseptic Threads ................................. 21

## 5 Aseptic Diaphragm Valves
- Overview Diaphragm Aseptic Valves ............................... 24 - 25
- Why Aseptic Diaphragm Valve? ..................................... 26
- Self Draining - Two-Way Valve ..................................... 27
- Innovative Design .................................................. 28 - 31

## 6 Aseptic Diaphragm Valve Configurations
- D-Rule ................................................................... 60
- Welded Valve Configurations ......................................... 61 - 63

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

## 8 Tank Valves
- 78 - 81

## 9 Process Solutions
- Sterile Sampling Unit ............................................. 82
- Purified Steam Sampling Unit ....................................... 83

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

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

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

## 11 Process Automation, Electropneumatic Positioners ................................. 109, 110

## 12 Overview Product Range
- ................................................................. 111

## 13 Glossary
- ................................................................. 112
**Certification and Compliance for Validation**

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

Related to it the key performance component in the diaphragm valve is the diaphragm.

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

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

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

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

... on packaging in which the diaphragm is bagged and sealed in plastic:
- SED article number, material code with description
- Internal order series number
- Packaging quantity
- Customer article number on request
- **Batch number**
- **Shelf Life**
The diaphragm is the most important component of the diaphragm valve. Besides the valve body, the diaphragm is the only part which contacts the process medium. The diaphragm separates the process medium from the actuator or top works and the external atmosphere. In addition the diaphragm is the dynamic part which the flow rate of the process medium is controlled and stopped.

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

All diaphragms are produced with an embedded stainless steel compressor stud for the engagement at the valve operating mechanism except for the diaphragm dimension MA8 which is connected with the valve activation by an elastomer button.

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

**EPDM**

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

**PTFE (TFM)**

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

**MA8 and MA10**

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

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

**MA25 to MA100**

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

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

### Diaphragm Dimensions MA 25 - 80 (mm)

<table>
<thead>
<tr>
<th>Material Design</th>
<th>One-piece molded open</th>
<th>One-piece molded open</th>
<th>Two-piece molded closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA*</td>
<td>25 40 50 80</td>
<td>25 40 50 80</td>
<td>25 100</td>
</tr>
<tr>
<td>Material</td>
<td>EPDM</td>
<td>PTFE / EPDM</td>
<td>PTFE / EPDM</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 to 150</td>
<td>-20 to 150</td>
<td>-20 to 160</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 to 300</td>
<td>-4 to 300</td>
<td>-4 to 320</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 with other materials, bigger sizes and for higher temperature up to 175°F/350°C.
Diaphragms

MA 8

EPDM

PTFE / EPDM
One-piece

Code 18
Molded Open

MA 10

EPDM

PTFE / EPDM
One-piece

Code 18
Molded Open

MA 25 - 80

EPDM

PTFE / EPDM
Two-piece

Code 18
Molded Open

MA 100

EPDM

PTFE / EPDM
Two-piece

Code 18
Molded Open

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

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

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

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

<table>
<thead>
<tr>
<th>Element</th>
<th>Wt.%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon, max.</td>
<td>0.030</td>
</tr>
<tr>
<td>Manganese, max.</td>
<td>2.00</td>
</tr>
<tr>
<td>Chromium</td>
<td>17.00-19.00</td>
</tr>
<tr>
<td>Nickel</td>
<td>12.50-15.00</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>2.50-3.00</td>
</tr>
</tbody>
</table>

According ASME BPE 2014 Table MM-2.1-1 alloy comparable with material S31603 and listed in previous versions of ASME BPE as 316L. Sulfur content ASME BPE always within 0.005 to 0.017. Other alloys are available on request, below is a list of materials machined from solid block:
- Super-Austenitic Stainless Steel
- Duplex Stainless Steel
- Nickel Alloys
- Titanium

**Tube End Standards**
The following chart of international standards of pipe diameters identifies the different diameters comparing the example of a nominal diameter of DN 25.
SED offers tube end outside diameter and wall thickness dimensions in accordance to the several international standards. These standards and dimensions are listed in the below table.

In order to install a proper aseptic process piping system, it is important that the correct and consistent international tube end standards be followed throughout the aseptic process piping system. If the connecting tube ends are not identical and of the same diameter standard, there may result a reduction or step in the process piping system or the ability of self draining ends is not guaranteed.

The most common standard connection is the butt-welding of the tube endings without any additional material. Examples of butt welding include automatic and orbital welding.

Besides the standard any customer-specified connection type is possible. Some examples are displayed on the following pages.

<table>
<thead>
<tr>
<th>Butt weld Tube End Standard</th>
<th>ISO 1127</th>
<th>DIN 11850 Series 1</th>
<th>DIN 11850 Series 2</th>
<th>DIN Selection</th>
<th>ASTM 269</th>
<th>ASME BPE</th>
<th>BS O.D.</th>
<th>SMS</th>
<th>JIS G</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN NPS MA L(mm) L1 h1 h2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - 8</td>
<td>40</td>
<td>41</td>
<td>42</td>
<td>39</td>
<td>45¹</td>
<td>94</td>
<td>49</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>6 - 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 1/4</td>
<td>13,5x1,6</td>
<td>-</td>
<td>8x1,0²</td>
<td>8x1,0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 3/8</td>
<td>-</td>
<td>12x1,0</td>
<td>13x1,5</td>
<td>-</td>
<td>9,53x0,89</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 1/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Valve Type Manually Operated 290 / 297
Valve Type Pneumatically Operated 190 / 207

| 8                           | 10       | 25 108 12 12          | 13,5x1,6            | -            | -        | 6x1,0    | -      | -   | -     |
| 10                          | 10       | 25 108 12 12          | 17,2x1,6            | 12x1,0       | 13x1,5   | -        | 9,53x0,89| -   | -     |
| 15                          | 10       | 25 108 12 12          | 21,3x1,6            | 18x1,0       | 19x1,5   | 18x1,5   | 12,7x1,65| 12,7x1,2| -     |
| 20                          | 10       | 25 108 12 12          | -                   | -            | 23x1,5   | 22x1,5   | 12,7x1,65| 19,05x1,65| 19,05x1,2| -     |

Valve Type Manually Operated 289 / 295 / 397
Valve Type Pneumatically Operated 188 / 195 / 307 / 392

| 15                          | 25       | 25 120 16 16          | 21,3x1,6            | 18x1,0       | 19x1,5   | -        | 12,7x1,65| -   | -     |
| 20                          | 25       | 25 120 16 16          | 26,9x1,6            | 22x1,0       | 23x1,5   | -        | 19,05x1,65| -  | -     |
| 25                          | 25       | 25 120 19 19          | 33,7x2,0            | 28x1,0       | 29x1,5   | 28x1,5   | 25,4x1,65| 25,0x1,2| 25,4x1,2|
| 32                          | 25       | 25 153 24 26          | 42,4x2,0            | 34x1,0       | 35x1,5   | -        | 31,7x1,65| 33,7x1,2| 31,8x1,2|
| 40                          | 25       | 25 153 24 26          | 48,3x2,0            | 40x1,0       | 41x1,5   | -        | 38,1x1,65| 38,0x1,2| 38,1x1,2|
| 50                          | 30       | 30 373 32 32          | 60,3x2,0            | 52x1,0       | 53x1,5   | -        | 50,8x1,65| 50,1x1,2| 50,8x1,5|
| 65                          | 25       | 25 173 32 32          | -                   | -            | -        | 63,1x1,65| 63,5x1,6| 63,5x2,0¹| -     |
| 65 2/12                     | 80       | 25 216 47 47          | 76,1x2,0            | -            | 70x2,0   | -        | 63,1x1,65| 63,5x1,6| 63,5x2,0¹|
| 80                          | 3        | 30 254 47 47          | 88,9x2,3            | -            | 85x2,0   | -        | 76,2x1,65| 76,1x1,6| 76,3x2,0|
| 100                         | 100      | 30 305 61 58          | 114,3x2,3           | -            | 104x2,0  | -        | 101,6x2,11| 101,6x2,0| 101,6x2,1|

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

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Face to face (FtF)</td>
<td>Standard FtF</td>
<td>DIN EN 558-1</td>
<td>DIN EN 558-1</td>
<td>DIN EN 558-1</td>
<td>DIN EN 558-1</td>
<td>ASME BPE DT-V-1</td>
<td>DIN EN 558-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DN NPS MA</td>
<td>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>L₃ b₂ b₁</td>
<td>L₃ b₂ b₁</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 1/4 8</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>63,5</td>
<td>*63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>10 3/8 8</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>63,5</td>
<td>*63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>15 1/2 8</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>10 3/8 10</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>15 1/2 10</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>20 3/4 10</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>15 1/2 25</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>20 3/4 25</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>25 1 25</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>32 1 1/4 40</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>40 1 1/2 40</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>50 2 50</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>65 2 1/2 80</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>80 3 80</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
<tr>
<td>100 4 100</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>108,0 16,0</td>
<td>63,5</td>
<td>63,5 9,40 25,0</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
<td>- - -</td>
</tr>
</tbody>
</table>

*Length differing from standard; other lengths on request
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 and the groove flange are welded with the pipe ends and the weld seam is polished according to the specified interior valve body surface finish.

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

<table>
<thead>
<tr>
<th>DN NPS MA</th>
<th>DIN 11864-2-A Code 3.. (mm)</th>
<th>DIN 11864-1-A Code 4..</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 3/8 10</td>
<td>L4 = 130, C = 54, k = 37, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>15 1/2 25</td>
<td>L4 = 130, C = 59, k = 42, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>20 3/4 25</td>
<td>L4 = 150, C = 64, k = 47, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>25 1 25</td>
<td>L4 = 160, C = 70, k = 53, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>32 1 1/4 40</td>
<td>L4 = 180, C = 76, k = 59, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>40 1 1/2 40</td>
<td>L4 = 200, C = 82, k = 65, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>50 2 50</td>
<td>L4 = 230, C = 94, k = 77, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>65 2 1/2 80</td>
<td>L4 = 290, C = 113, k = 95, e = 9</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>80 3 80</td>
<td>L4 = 310, C = 133, k = 112, e = 11</td>
<td>Rd 28 x 1/8</td>
</tr>
</tbody>
</table>

Aseptic Threads

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

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

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

<table>
<thead>
<tr>
<th>L in mm</th>
<th>DN NPS MA</th>
<th>DIN 11851 Code 8..</th>
<th>DIN 11864-1-A Code 4..</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 8</td>
<td>8</td>
<td>Rd 28 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>6 - 8</td>
<td>8</td>
<td>Rd 28 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>8 1/4 8</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>10 3/8 8</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 34 x 1/8</td>
</tr>
<tr>
<td>15 1/2 8</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>8 1/4 10</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>10 3/8 10</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>15 1/2 10</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>20 3/4 10</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 28 x 1/8</td>
</tr>
<tr>
<td>15 1/2 25</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 34 x 1/8</td>
</tr>
<tr>
<td>20 3/4 25</td>
<td>118</td>
<td>Rd 34 x 1/8</td>
<td>Rd 34 x 1/8</td>
</tr>
<tr>
<td>25 1 25</td>
<td>128</td>
<td>Rd 34 x 1/8</td>
<td>Rd 34 x 1/8</td>
</tr>
<tr>
<td>32 1 1/4 40</td>
<td>147</td>
<td>Rd 34 x 1/8</td>
<td>Rd 34 x 1/8</td>
</tr>
<tr>
<td>40 1 1/2 40</td>
<td>160</td>
<td>Rd 65 x 1/6</td>
<td>Rd 65 x 1/6</td>
</tr>
<tr>
<td>50 2 50</td>
<td>191</td>
<td>Rd 78 x 1/6</td>
<td>Rd 78 x 1/6</td>
</tr>
<tr>
<td>65 2 1/2 80</td>
<td>246</td>
<td>Rd 95 x 1/6</td>
<td>Rd 95 x 1/6</td>
</tr>
<tr>
<td>80 3 80</td>
<td>256</td>
<td>Rd 110 x 1/4</td>
<td>Rd 110 x 1/4</td>
</tr>
<tr>
<td>100 4 100</td>
<td>-</td>
<td>Rd 130 x 1/4</td>
<td>Rd 130 x 1/4</td>
</tr>
</tbody>
</table>
# Table of Contents

## 1 Introduction
- A Brief Overview...4
- The Company...5
- What does Quality mean at SED?...6

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

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

## 4 Aseptic Connections
- Clamps...20
- Aseptic Flanges and Aseptic Threads...21

## 5 Aseptic Diaphragm Valves
- Overview Diaphragm Aseptic Valves...24 - 25
- Why Aseptic Diaphragm Valve?...26
- Self Draining - Two-Way Valve...27
- Innovative Design...28 - 31

## 6 Ordering Key and Ordering Example

## 3 Aseptic Diaphragm Valves
- Overview Diaphragm Aseptic Valves...24 - 25
- Why Aseptic Diaphragm Valve?...26
- Self Draining - Two-Way Valve...27
- Innovative Design...28 - 31

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

## 5 Tank Valves
- 78 - 81

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

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

## 8 Process Automation, Electropneumatic Positioners...109, 110

## 9 Overview Product Range...111

## Glossary...112
### Overview Aseptic Valves

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steripur</strong></td>
<td>Stainless Steel Actuation</td>
<td></td>
</tr>
<tr>
<td>Control function available</td>
<td>Manual</td>
<td></td>
</tr>
<tr>
<td><strong>Diaphragm size</strong></td>
<td><strong>MA 8</strong></td>
<td><strong>MA 10</strong></td>
</tr>
<tr>
<td>Diameter in mm (inch)</td>
<td>4 - 15 (1/4 - 1/2)</td>
<td>8 - 20 (3/8 - 3/4)</td>
</tr>
<tr>
<td>Type</td>
<td>297</td>
<td>397</td>
</tr>
<tr>
<td>Image</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. working pressure with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- diaphragm EPDM in bar (psi)</td>
<td>10 (150)</td>
<td>10 (150)</td>
</tr>
<tr>
<td>- diaphragm PTFE in bar (psi)</td>
<td>10 (150)</td>
<td>10 (150)</td>
</tr>
<tr>
<td>Details see page</td>
<td>32 - 33</td>
<td>34 - 35</td>
</tr>
</tbody>
</table>

| KMA | Actuation with Stainless Steel Bonnet |  |
| Control function available | Manual |  |
| **Diaphragm size** | **MA 8** | **MA 10** | **MA 25 - 50** | **MA 25 - 50 |80 - 100** |
| Diameter in mm (inch) | 4 - 15 (1/4 - 1/2) | 8 - 20 (3/8 - 3/4) | 15 - 50 (3/4 - 2) | 65-150/65-180 |
| Type | 290 | 295 | 905 | 995 |
| Image |  |
| Actuation with Stainless Steel Bonnet |  |
| Max. working pressure with |  |
| - diaphragm EPDM in bar (psi) | 10 (150) | 10 (150) | 10 (150) | 10 (150) |
| - diaphragm PTFE in bar (psi) | 10 (150) | 10 (150) | 10 (150) | DN15-50=10 |DN65-100=8 |
| Details see page | 33 | 34 - 35 | 38 - 39 | 40 |

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

**MA =** Diaphragm size  
Differences between the series see table page 28
### Overview Aseptic Valves

**Specification**

<table>
<thead>
<tr>
<th>Series</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 8</td>
<td>Pneumatically operated</td>
</tr>
<tr>
<td>MA 10</td>
<td>NC, NO, DA</td>
</tr>
<tr>
<td>MA 25 - 50</td>
<td>NC, NO, DA</td>
</tr>
<tr>
<td>MA 80</td>
<td>Stainless Steel Actuation</td>
</tr>
<tr>
<td>MA 100</td>
<td>Stainless Steel Actuation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diaphragm size</th>
<th>MA 8</th>
<th>MA 10</th>
<th>MA 25 - 50</th>
<th>MA 80</th>
<th>MA 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter in mm (inch)</td>
<td>4 - 15 (1/4 - 1/2)</td>
<td>8 - 20 (3/8 - 3/4)</td>
<td>15 - 50 (3/4 - 2)</td>
<td>65 - 80 (2 1/2 - 3)</td>
<td>100 (4)</td>
</tr>
<tr>
<td>- diaphragm EPDM in bar (psi)</td>
<td>207.25</td>
<td>207.30</td>
<td>307</td>
<td>407</td>
<td>407</td>
</tr>
<tr>
<td>- diaphragm PTFE in bar (psi)</td>
<td>4.5 (65)</td>
<td>8 (115)</td>
<td>8 (115)</td>
<td>10 (150)</td>
<td>7 (100)</td>
</tr>
<tr>
<td>4 (60)</td>
<td>7 (100)</td>
<td>7 (100)</td>
<td>8 (115)</td>
<td>6 (87)</td>
<td>5 (72)</td>
</tr>
</tbody>
</table>

**Series Description**

- **KMD**: Actuation with Stainless Steel Bonnet
- **Plastic Actuation directly mounted**
- **Aseptic Diaphragm Valves**

**Aseptic Diaphragm Valves**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatically operated</td>
<td>KIMA</td>
</tr>
<tr>
<td>NC, NO, DA</td>
<td>Actuation with Stainless Steel Bonnet</td>
</tr>
<tr>
<td>MA 8</td>
<td>MA 10</td>
</tr>
<tr>
<td>Diameter in mm (inch)</td>
<td>4 - 15 (1/4 - 1/2)</td>
</tr>
<tr>
<td>- diaphragm EPDM in bar (psi)</td>
<td>190</td>
</tr>
<tr>
<td>- diaphragm PTFE in bar (psi)</td>
<td>8 (116)</td>
</tr>
<tr>
<td>7 (100)</td>
<td>7 (100)</td>
</tr>
<tr>
<td>44</td>
<td>46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specification</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatically operated</td>
<td>KMD</td>
</tr>
<tr>
<td>NC, NO, DA</td>
<td>Plastic Actuation directly mounted</td>
</tr>
<tr>
<td>MA 10</td>
<td>MA 25 - 50</td>
</tr>
<tr>
<td>Diameter in mm (inch)</td>
<td>8 - 20 (3/8 - 3/4)</td>
</tr>
<tr>
<td>- diaphragm EPDM in bar (psi)</td>
<td>188</td>
</tr>
<tr>
<td>- diaphragm PTFE in bar (psi)</td>
<td>8 (115)</td>
</tr>
<tr>
<td>7 (100)</td>
<td>8 (115)</td>
</tr>
<tr>
<td>47</td>
<td>53</td>
</tr>
</tbody>
</table>

¹ available also with two-stage actuator, see page 54, 55
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.
One of the most important criteria of all valves applied in aseptic processes is the drainability. This feature has contributed substantially why the diaphragm valve has prevailed as the valve of choice for aseptic process applications.

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

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

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

### Table: Self Draining Angle

<table>
<thead>
<tr>
<th>VALVE-TYPE</th>
<th>VALVE SIZE</th>
<th>FORGED BODIES</th>
<th>INVESTMENT CAST BODIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ISO 1127</td>
<td>DIN 11850</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DIN 11866</td>
<td></td>
</tr>
<tr>
<td>DN NPS</td>
<td>MA</td>
<td>Code 40</td>
<td>Code 41+42</td>
</tr>
<tr>
<td>30 / 30</td>
<td>15 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>15 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>20 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>20 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>25 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>25 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>30 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>30 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>35 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>35 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>40 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>40 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>50 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>50 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>65 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>65 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>80 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>80 1/2</td>
<td>33.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>100 4</td>
<td>17.1</td>
<td>18.5</td>
</tr>
<tr>
<td></td>
<td>100 4</td>
<td>17.1</td>
<td>18.5</td>
</tr>
</tbody>
</table>

MA = Diaphragm size
Drain angle tolerance is +/- 2 degrees for optimum drainability

The latest revision of the self draining angles is available on [www.sed-flowcontrol.com](http://www.sed-flowcontrol.com)
Innovative Design

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

The following table shows an overview of the performance and features of the three different series: Steripur, KMA, and KMD. This table can support your decision which makes it easy to find the optimum solution for your application.

<table>
<thead>
<tr>
<th>Position</th>
<th>Performance Features</th>
<th>Series</th>
<th>Steripur</th>
<th>KMA</th>
<th>KMD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MA</td>
<td>8</td>
<td>10</td>
<td>≥ 25</td>
</tr>
<tr>
<td>1</td>
<td>Stainless steel piston actuation</td>
<td></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>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>Plastic actuation direct mounted to the valve body</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>4.1</td>
<td>Compact Design</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>4.2</td>
<td>Optional orientation of the air inlet port</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>5</td>
<td>Actuation for two-way bodies and welded configurations</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>6</td>
<td>Actuation suitable for two-way bodies, welded configurations, T-bodies, multiport bodies and tank bottom bodies</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>7</td>
<td>Optimized internal cleaning because of circumferential defined sealing angle between process diaphragm and valve body (CDSA-Design)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>8</td>
<td>Clean and smooth exterior ideal for sterile wash downs Bold bottom entry</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>9</td>
<td>Flexible diaphragm suspension</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>10</td>
<td>Encapsulated working diaphragm</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>11</td>
<td>Low weight</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

MA = Diaphragm size

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

Compact Design - Optional Orientation of the Air Inlet Port
(Position 4 in Table Page 28)
The selection of the valve is determined by the necessary flow rate from which the nominal diameter of the valve is determined. Due to physical limitations of space and the principle of the valve designs, the ability to improve the compactness of the valve assemblies is with the actuators. The innovative designs of SED valve actuators offer specific advantages.

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

SED offers actuators in a compact design with the following features:

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

It is possible to combine any different actuation models.

Actuation for Two-Way Bodies and Welded Configurations
Actuation suitable for Two-Way Bodies, Welded Configurations, T-Bodies, Multiport Bodies and Tank Bottom Bodies
(Position 5 and 6 in Table Page 28)
Dependent on the valve body design two different ways of valve assembly are possible.

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

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

---

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

T-Valve
Steripur Series
Pneumatically operated

Two-Way Valve
Steripur Series
Manual

www.sed-flowcontrol.com
Optimized Internal Cleaning because of Circumferential Defined Sealing Angle (CDSA-Design) between the Process Diaphragm and Valve Body
(Position 7 in Table Page 28)

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

The effects of this design have the following advantages:

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

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

Clean and Smooth Exterior Ideal for Sterile Wash Downs
(Position 8 in Table Page 28)

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

In addition, this design eliminates pockets, cut-outs, strengthening ribs, edges, sharp corners and rough surfaces.

(For a better understanding compare examples on page 48, 49 - Type Steripur 407 and Page 50 - Type KMA 495).
Flexible Diaphragm Suspension
(Position 9 in Table Page 28)

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

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

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

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

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

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

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

Encapsulated Working Diaphragm
(Position 10 in Table Page 28)

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

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

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

Adjustable internal travel stop

Sealing bonnet assembly

Optical indicator

Bottom entry stainless steel bolting

Circumferential, defined sealing angle between process diaphragm and valve body

Sectional drawing shows Steripur 297

www.sed-flowcontrol.com
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 plastic hand wheel
- Manual diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles.

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

Optional
Type 297 Steripur
- Locking device

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: 160°C (320°F) dependent on application
Diaphragm material: EPDM or PTFE
Body material: Forged 1.4435/316L ASME/BPE
Other Alloys
End connection: Butt weld ends see fold out page 19
Bonnets suitable for: Two-Way bodies
Bonnet styles: Welded configurations
Special ends: Multiport bodies
Tank bottom bodies
Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA 8
Weight: 290: ca. 0,2 kg
297: ca. 0,3 kg
Technical data also valid for multiport valve.

Ordering key see page 56.
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

Sectional drawing shows KMA 295
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 plastic hand wheel
- Manual diaphragm Valve with plastic hand wheel is suitable for a limited number of cycles.
Type 289 KMD
- Plastic bonnet and hand wheel

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

Optional
Type 397 Steripur
- Locking device

Technical Data
Control function: Manually operated
Max. working pressure: Type 295, 397: 10 bar (150 psi)
Type 289: 6 bar (87 psi)
Max. working temperature: Type 295, 397: 160°C (320°F)
dependent on application
Type 289 S-Version: 80°C (176°F)
dependent on application
Type 289 HS-Version: 150°C (300°F)
dependent on application
Diaphragm material: EPDM or PTFE
Body material: Forged 1.4435/316L ASME/BPE
Investment cast 1.4435/316L
Other Alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Bonnets suitable for: Two-Way bodies / Welded configurations
T-bodies / Multiport bodies
Tank bottom bodies
Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA 10
Weight:
289: ca. 0.5 kg
295: ca. 0.6 kg
397: ca. 0.8 kg
Technical data also valid for multiport valve.

Butt weld ends
MA 10
Fold out page 19

KMA 295

KMD 289

KMA 295 and Steripur 397

KMD 289

Ordering key see page 56.
Steripur 997

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

Optical indicator

Adjustable internal travel stop (optional)

Sealing bonnet assembly

Compressor guidance

Encapsulated diaphragm

Bottom entry stainless steel bolting for more convenient assembly and self cleaning properties

Flexible diaphragm suspension

Butt weld ends MA 25 - 100
Fold out page 19

Circumferential, defined sealing angle between process diaphragm and valve body
Steripur 997

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

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

Optional
- Adjustable internal travel stop or stroke limiter

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature: 160°C (320°F) dependent on application
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316L ASME/BPE
Investment cast 1.4435/ 316L
Other Alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Bonets 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
Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>L₁</td>
<td>H₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
<td>30</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>30</td>
<td>254</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>30</td>
<td>305</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
Manual Valve DN 15 - 50 mm (3/4" - 2")

- Adjustable internal travel stop
- Locking Device
- Adjustable internal Stroke Limiter
- Sealing bonnet assembly
- Optical indicator
- Stroke Indicator
- Encapsulated diaphragm
- Bottom entry stainless steel bolting
- Flexible diaphragm suspension
- Circumferential, defined sealing angle between process diaphragm and valve body

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

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

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

Technical Data
Control function: Manually operated
Max. working pressure: 10 bar (150 psi)
Max. working temperature: 160°C (320°F) dependent on application
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/316L ASME/BPE
Investment cast 1.4435/316L
Other Alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Bonnet 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
Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MA</td>
<td>L</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
### Technical Data

**Control function:** Manually operated  
**Max. working pressure:** 10 bar (150 psi)  
**Max. working temperature:** 160°C (320°F) dependent on application  
**Diaphragm material:** EPDM or PTFE  
**Valve body material:** Forged 1.4435/316L ASME/BPE  
**End connection:** Butt weld ends see fold out page 19  
**Bonnet suitable for:** Two-Way bodies  
**Flow rate:** Kv in m³/h (Cv in GPM) see page 9  
**Diaphragm size:** MA see table

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

### Features

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

### Dimensions and Weight

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>254</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>305</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
Manual Valve DN 15 - 100 mm (3/4" - 4")

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

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

Technical Data
Control function: Manually operated
Max. working pressure:
- 10 bar (150 psi)
- DN 65-100 diaphragm PTFE 8 bar (115 psi)
Max. working temperature:
- S-Version 80°C (176°F)
- HS-Version DN ≤ 50 150°C (300°F)
- dependent on application
Diaphragm material:
- EPDM or PTFE
Valve body material:
- Forged 1.4435/ 316L ASME/BPE
- Investment cast 1.4435/ 316L
- Other Alloys
End connection: Butt weld ends see fold out page 19
- Clamps and flanges see page 20 and 21
- Special ends
Suitable for:
- Bonnets up to DN 50: Two-Way bodies
- Bonnets bigger DN 50: Two-Way bodies
- Welded configurations
- T-bodies
- Multiport bodies
- Tank bottom bodies
Flow rate:
- Kv in m³/h (Cv in GPM) see page 9
Diaphragm size:
- MA see table

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
<td>30</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>30</td>
<td>254</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>30</td>
<td>305</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
Steripur 207

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

Sectional drawing shows Steripur 207.30

www.sed-flowcontrol.com
Steripur 207

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

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

Features

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

Optional

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

Technical Data

Control function (Cf.):

<table>
<thead>
<tr>
<th>207.30</th>
<th>207.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail safe close (NC): Cf. 1 &amp; 4</td>
<td>Fail safe close (NC): Cf. 1 &amp; 4</td>
</tr>
<tr>
<td>Fail safe open (NO): Cf. 2 &amp; 5</td>
<td>Double acting (DA): Cf. 3 &amp; 6</td>
</tr>
</tbody>
</table>

Direction

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

Max. working pressure:

<table>
<thead>
<tr>
<th>207.30</th>
<th>207.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDM diaphragm 8 bar (115 psi)</td>
<td>PTFE diaphragm 7 bar (100 psi)</td>
</tr>
<tr>
<td>PTFE diaphragm 7 bar (100 psi)</td>
<td>PTFE diaphragm 3.5 bar (60 psi)</td>
</tr>
<tr>
<td>CF: Fail safe close</td>
<td>CF: Fail safe open and double acting</td>
</tr>
<tr>
<td>EPDM diaphragm 4.5 bar (65 psi)</td>
<td>EPDM diaphragm 8 bar (115 psi)</td>
</tr>
<tr>
<td>PTFE diaphragm 3.5 bar (60 psi)</td>
<td>PTFE diaphragm 7 bar (100 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:

<table>
<thead>
<tr>
<th>207.30</th>
<th>207.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF: 1 &amp; 4</td>
<td>CF: 1 &amp; 4</td>
</tr>
<tr>
<td>4 - 7 bar (60 - 100 psi)</td>
<td>5.5 - 7 bar (80 - 100 psi)</td>
</tr>
<tr>
<td>CF: 2, 3, 5 &amp; 6</td>
<td>CF: 2, 3, 5 &amp; 6</td>
</tr>
<tr>
<td>5.5 - 7 bar (80 - 100 psi)</td>
<td>5.5 - 7 bar (80 - 100 psi)</td>
</tr>
</tbody>
</table>

Diaphragm material:

EPDM or PTFE

Valve body material:

Forged 1.4435/316 L ASME/BPE
Investment cast 1.4435/316 L
Other alloys

End connection:

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

Actuators suitable for:

Two-Way bodies, Welded configurations,
T-bodies, Multiport bodies,
Tank bottom bodies

Flow rate:

Kv in m³/h (Cv in GPM) see page 9

Diaphragm size:

MA 8

Weight:

<table>
<thead>
<tr>
<th>207.30</th>
<th>207.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>ca. 0.45 kg</td>
<td>ca. 0.44 kg</td>
</tr>
</tbody>
</table>

Technical data also valid for multiport valve.

Ordering key see page 56.

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

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

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

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

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM diaphragm 8 bar (115 psi)
  - PTFE diaphragm 7 bar (100 psi)

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

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

Control pressure:
- Cf. 1 & 4: 4 - 7 bar (60 - 100 psi)
- Cf. 2, 3, 5 & 6: 3.5 - 4.5 bar (50 - 65 psi)

Diaphragm material:
- EPDM or PTFE

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

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

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

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

Diaphragm size:
- MA 8

Weight:
- ca. 0.5 kg

Technical data also valid for multiport valve.

Ordering key see page 56.
Steripur 307

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

Features
- High cycle stainless steel piston actuator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

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

Technical Data

<table>
<thead>
<tr>
<th>Control function (Cf.):</th>
<th>Pneumatically operated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail safe close (NC):</td>
<td>Cf. 1 &amp; 4</td>
</tr>
<tr>
<td>Fail safe open (NO):</td>
<td>Cf. 2 &amp; 5</td>
</tr>
<tr>
<td>Double acting (DA):</td>
<td>Cf. 3 &amp; 6</td>
</tr>
</tbody>
</table>

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM diaphragm 8 bar (115 psi)
  - PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure:
- Cf. 1 & 4: 4.2 - 7 bar (60 - 100 psi)
- Cf. 2, 3, 5 & 6: 4 - 5 bar (60 - 72 psi)

Diaphragm material:
- EPDM or PTFE

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

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

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

Flow rate:
- Kv in m³/h (Cv in GPM) see page 9
Diaphragm size:
- MA 10

Weight: ca. 1.0 kg

Technical data also valid for multiport valve.

Ordering key see page 56.
KMA 195

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

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

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

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

Direction
Control connection: At Cf. 1, 2 & 3, 90° to flow direction, standard
Max. working pressure: Unidirectional (delta p = 100%)
EPDM diaphragm 8 bar (115 psi)
PTFE diaphragm 7 bar (100 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 4.2 - 7 bar (60 - 100 psi)
Cf. 2, 3 4 - 5 bar (60 - 72 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/316 L ASME/BPE
Investment cast 1.4435/316 L
Other alloys
End connection: Butt weld ends see fold out page 19
Special ends
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
Weight: ca. 0.8 kg
Technical data also valid for multiport valve.

Ordering key see page 56.

www.sed-flowcontrol.com
Pneumatically Operated Valve DN 8 - 20 mm (3/8" - 3/4")

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

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

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

Direction
- Control connection:
  - At Cf. 1, 2 & 3, 90° to flow direction, standard
  - At Cf. 4 & 5 in flow direction
- Max. working pressure:
  - Unidirectional (delta p = 100%)
    - EPDM diaphragm 8 bar (115 psi)
    - PTFE diaphragm 7 bar (100 psi)
- Higher working pressure may be achieved with different actuator. Please consult a SED factory representative for working pressure above the indicated maximum.

Max. working temperature:
- S-Version 80°C (176°F)
- HS-Version 150°C (300°F)
  - dependent on Application

Control pressure:
- Cf. 1 & 4 4.2 - 7 bar (60 - 100 psi)
- Cf. 2, 3 & 5 4 - 5 bar (60 - 72 psi)

Diaphragm material:
- EPDM or PTFE

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

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

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

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

Diaphragm size:
- MA 10

Weight:
- ca. 0.6 kg

Ordering key see page 56.
Steripur 407

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

- Double guided valve stem
- Stainless steel actuator
- Internal air passage blue
- Control air connection for fail safe closed
- Compressor guidance
- Encapsulated diaphragm
- 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 19

www.sed-flowcontrol.com
Steripur 407

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

Features
- High cycle stainless steel piston actuator
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs

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

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

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - Diaphragm material:
    - EPDM: DN 15-50 (1/2"-2") DN 65-80 (2.5"-3") DN 100 (4")
      - EPDM: 10 bar (150 psi) 7 bar (100 psi) 6 bar (87 psi)
      - PTFE: 8 bar (115 psi) 6 bar (87 psi) 5 bar (72 psi)

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

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

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

End connection:
- Buttweld ends see fold out page 19

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

Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L x L₁</td>
<td>A x B</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
<td>30</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>30</td>
<td>254</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>30</td>
<td>305</td>
</tr>
</tbody>
</table>

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

Ordering key see page 56.
Pneumatically Operated Valve DN 15 - 100 mm (3/4" - 4")

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

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

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

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

Diaphragm
<table>
<thead>
<tr>
<th>Diaphragm</th>
<th>DN 15-50 (1/2&quot;-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>5 bar (72 psi)</td>
</tr>
<tr>
<td>PTFE</td>
<td>8 bar (115 psi)</td>
<td>6 bar (87 psi)</td>
<td>5 bar (72 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 DN 15-50 4,5 - 6 bar (65-87 psi)
- Cf. 1 DN 65-80 4,5 - 7 bar (65-100 psi)
- Cf. 1 DN 100 5,5 - 7 bar (80-100 psi)
- Cf. 2 & 3 DN 15-80 4 - 5,5 bar (60-80 psi)
- Cf. 2 & 3 DN 100 5 - 6,5 bar (72-93 psi)

Diaphragm material:
- EPDM or PTFE

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

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

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

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

Diaphragm size:
- MA see table below
- Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>L₁</td>
<td>H₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>60</td>
<td>30</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>30</td>
<td>254</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>30</td>
<td>305</td>
</tr>
</tbody>
</table>

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

Ordering key see page 56.
KMA 395

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

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

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

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

Direction
Control connection: At Cf. 4, 5 & 6, in flow direction, standard
At Cf. 1, 2 & 3, 90° to flow direction
Max. working pressure: Unidirectional (delta p = 100%)
EPDM Diaphragm 10 bar (150 psi)
PTFE Diaphragm 8 bar (115 psi)

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

Max. working temperature: 160°C (320°F) dependent on application
Control pressure: Cf. 1 & 4 4,5 - 7 bar (65 - 100 psi)
Cf. 2, 3, 5 & 6 4 - 5 bar (60 - 72 psi)
Diaphragm material: EPDM or PTFE
Valve body material: Forged 1.4435/ 316 L ASME/BPE
Investment cast 1.4435/ 316 L
Other alloys
End connection: Butt weld ends see fold out page 19
Clamps and flanges see page 20 and 21
Special ends
Actuators suitable for:
Two-Way bodies
Welded configurations
T-bodies
Multiport bodies
Tank bottom bodies

Flow rate: Kv in m³/h (Cv in GPM) see page 9
Diaphragm size: MA see table below
Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
</tbody>
</table>

Ordering key see page 56.

www.sed-flowcontrol.com
KMD 385

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

Features
- Plastic diaphragm actuator direct assembled with the valve body
- Actuator high resistance to heat transfer
- Smooth exterior design ideal for wash downs
- Control air connection 90° to flow direction
- Flexible diaphragm suspension
- Encapsulated diaphragm
- CDSA sealing concept, see page 30

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

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

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

<table>
<thead>
<tr>
<th>Control function</th>
<th>Diaphragm material</th>
<th>Valve body material</th>
<th>End connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatically operated</td>
<td>EPDM</td>
<td>Forged 1.4435/316 L ASME/BPE</td>
<td>Butt weld ends see fold out page 19</td>
</tr>
<tr>
<td>Fail safe close (NC)</td>
<td>EPDM</td>
<td>Investment cast 1.4435/316 L</td>
<td>Clamps and flanges see page 20 and 21</td>
</tr>
<tr>
<td>Fail safe open (NO)</td>
<td>EPDM or PTFE</td>
<td>Other alloys</td>
<td>Special ends</td>
</tr>
<tr>
<td>Double acting (DA)</td>
<td>EPDM or PTFE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
<tr>
<td>65</td>
<td>80</td>
<td>30</td>
<td>216</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>30</td>
<td>254</td>
</tr>
</tbody>
</table>

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

Ordering key see page 56.
Pneumatically Operated Valve DN 15 - 50 mm (3/4" - 2")

Features
- Plastic piston actuator
- Compact design
- Actuator high resistance to heat transfer
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Smooth exterior design ideal for wash downs

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

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

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - EPDM Diaphragm: 10 bar (150 psi)
  - PTFE Diaphragm: 8 bar (115 psi)

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

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

Control pressure:
- Cf. 1 & 4
  - 4.5 - 7 bar (65 - 100 psi)
- Cf. 2, 3, 5 & 6
  - 4 - 5 bar (60 - 72 psi)

Diaphragm material:
- EPDM or PTFE

Valve body material:
- Cast 1.4435/316 L
- Investment cast 1.4435/316 L
- Other alloys

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

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

Flow rate:
- Kv in 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>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
Steripur 392

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

Features
- Two stage stainless steel actuator
- Second position adjustable with reduced flow for filling
- Compact design, the outside diameter of the actuator is the same size as the bonnet flange
- Advantages in multiport bodies and manifold valve assemblies
- Control air connection in flow direction
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs
- Optical indicator

Optional
- Available with a wide range of control equipment and accessories see page 100 to 106, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 106

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

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

Max. working pressure:
- Unidirectional (delta p = 100%) EPDM Membrane 8 bar (115 psi)
- PTFE Membrane 7 bar (100 psi)

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

Control pressure:
- Cf. 1 & 4 4 - 7 bar (60 - 100 psi)

Diaphragm material:
- EPDM or PTFE

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

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

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

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

Diaphragm size:
- MA 10

Weight:
- ca. 1.4 kg

Technical data also valid for multiport valve.

Ordering key see page 56.
Steripur 592

Pneumatically Operated Valve DN 15 - 50 mm (3/4" - 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
- CDSA sealing concept, see page 30
- Flexible diaphragm suspension
- Encapsulated diaphragm
- Clean and polished exterior design ideal for sterile wash downs
- Optical indicator

Optional
- Available with a wide range of control equipment and accessories see page 100 to 106, also for retrofitting
- Control air connection 90° to flow direction
- Autoclavable
- Indication of 3 positions with 024.50, see page 106

Technical Data

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

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

Max. working pressure:
- Unidirectional (delta p = 100%)
  - Diaphragm DN 15 - 50 (1/2" - 2")
    - EPDM 10 bar (150 psi)
    - PTFE 8 bar (115 psi)

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

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

Control pressure:
- Cf. 1 & 4 5 - 8 bar (72 - 115 psi)
- EPDM or PTFE

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

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

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

Special ends

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

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

Diaphragm size:
- MA see table below

Technical data also valid for multiport valve.

<table>
<thead>
<tr>
<th>DN (mm)</th>
<th>MA</th>
<th>Dimensions (mm)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>L₁</td>
</tr>
<tr>
<td>15-25</td>
<td>25</td>
<td>25</td>
<td>120</td>
</tr>
<tr>
<td>32-40</td>
<td>40</td>
<td>25</td>
<td>153</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>30</td>
<td>173</td>
</tr>
</tbody>
</table>

Ordering key see page 56.
### Ordering key

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Type:</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>207, 307, 407</td>
<td>Steripur Series, stainless steel actuator, pneumatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>397, 297, 997</td>
<td>Steripur Series, stainless steel actuator, manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>392, 592</td>
<td>Steripur Series, two stage stainless steel actuator, pneumatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>190, 195, 395, 495</td>
<td>KMA Series, actuator with stainless steel adaptation, pneumatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>290, 295, 905, 995</td>
<td>KMA Series, actuator with stainless steel adaptation, manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>188, 385, 402, 289, 985</td>
<td>KMD Series, plastic actuator direct mounted, pneumatic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See page 32 - 55</td>
<td>KMD Series, plastic actuator direct mounted, manual</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Size:</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>04 - 100</td>
<td>See page: 19</td>
<td>DN 4, 6, 8, 10, 15, 20, 25, 30, 40, 50, 60, 80</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Valve body material:</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>See page: 18</td>
<td>7</td>
<td>Stainless steel, investment cast 1.4435/S31603, ASME BPE Table MM-2.1-1</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td>Stainless steel, forged 1.4435/S31603, ASME BPE Table MM-2.1-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>Stainless steel, forged 1.4435/S31603 Fe &lt; 0,5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Hastelloy, C-22 2.4602</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Valve body end connections: (bolt letters most common versions)</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Butt weld end acc. DIN</td>
<td>39</td>
<td>Butt weld end acc. EN ISO 1127 (DIN 11866 Series B)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. DIN 11850 Series 1</td>
<td>40</td>
<td>Butt weld end acc. DIN 11850 Series 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. DIN 11850 Series 2 (DIN 11866 Series A)</td>
<td>41</td>
<td>Butt weld end acc. DIN 11850 Series 2 (DIN 11866 Series A)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. ASME BPE FPS length (DIN 11866 Series C)</td>
<td>42</td>
<td>Butt weld end acc. ASME BPE FPS length (DIN 11866 Series C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. SMS 3008</td>
<td>43</td>
<td>Butt weld end acc. SMS 3008</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. BS 4825 R1</td>
<td>44</td>
<td>Butt weld end acc. to ASME BPE Table DT-4.1-4 Tangent Length</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc.</td>
<td>45</td>
<td>Butt weld end acc. to ASME BPE Table DT-4.1-4 Tangent Length</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butt weld end acc. JIS G 3447</td>
<td>46</td>
<td>Butt weld end acc. JIS G 3447</td>
<td></td>
</tr>
<tr>
<td></td>
<td>First digit stands for the end connection and last two digits for the tube standard</td>
<td>See page 19 - 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Valve body end connection for assembly:</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Clamp ISO 1127, for tube EN ISO 1127, face to face DIN EN 558-1, Series 7</td>
<td>541</td>
<td>Clamp ISO 1127, for tube EN ISO 1127, face to face DIN EN 558-1, Series 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clamp DIN 32676, for tube DIN 11850, face to face DIN EN 558-1, Series 7</td>
<td>542</td>
<td>Clamp DIN 32676, for tube DIN 11850, face to face DIN EN 558-1, Series 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clamp ASME BPE, face to face DIN EN 558-1, Series 7</td>
<td>543</td>
<td>Clamp ASME BPE, face to face DIN EN 558-1, Series 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clamp SMS 3017, for tube SMS 3008, face to face DIN EN 558-1, Series 7</td>
<td>544</td>
<td>Clamp SMS 3017, for tube SMS 3008, face to face DIN EN 558-1, Series 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clamp acc. to ASME BPE Table DT-4.1-1</td>
<td>545</td>
<td>Clamp acc. to ASME BPE Table DT-4.1-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic Union DIN 11851, for tube DIN 11850 series 2 double-sided threaded spigot</td>
<td>546</td>
<td>Aseptic Union DIN 11851, for tube DIN 11850 series 2 double-sided threaded spigot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic Union DIN 11864-1-A, for tube DIN 11850 series 2 double-sided threaded spigot</td>
<td>547</td>
<td>Aseptic Union DIN 11864-1-A, for tube DIN 11850 series 2 double-sided threaded spigot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic flange DIN 11864-2-A, for tube DIN 11850 series 2, double-sided grooved</td>
<td>548</td>
<td>Aseptic flange DIN 11864-2-A, for tube DIN 11850 series 2, double-sided grooved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic clamp DIN 11864-3-A, for tube DIN 11850 series 2, double-sided grooved</td>
<td>549</td>
<td>Aseptic clamp DIN 11864-3-A, for tube DIN 11850 series 2, double-sided grooved</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Diaphragm material: (Other diaphragm materials on request)</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>See page 14 - 17</td>
<td>18</td>
<td>EPDM, FDA / USP compliant MA 8 - 100, preferred for SIP applications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>PTFE/TFM / EPDM one-piece, FDA / USP compliant, MA 25, 40, 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>PTFE/TFM / EPDM one-piece, FDA / USP compliant, MA 8, 20, 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>PTFE/EPDM / EPDM two-piece, FDA / USP compliant, MA 25 to MA 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Actuator control function: (Other diaphragm materials on request)</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>See page 32 - 55</td>
<td>1</td>
<td>Manually operated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Normally open (NO), orientation 90° to flow direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Double-acting (DA), orientation 90° to flow direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Normally closed (NC), orientation in flow direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Normally open (NO), orientation in flow direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Double-acting (DA), orientation in flow direction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Actuator type:</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>25</td>
<td>Steripur, actuator size 25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Steripur, actuator size 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>Steripur, actuator size 45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70</td>
<td>Steripur, actuator size 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Steripur, actuator size 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>170</td>
<td>Steripur, actuator size 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>Steripur, manually operated</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>KMA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td>KMD max. 80°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HS</td>
<td>KMD for steam sterilizing up to max. 150°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S01</td>
<td>KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly bottom entry bolting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S02</td>
<td>KMA, manually operated, incl. seal adjuster, locking device and stroke limiter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S03</td>
<td>KMA, manually operated, incl. seal adjuster, Bonnet assembly bottom entry bolting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S11</td>
<td>KMA, manually operated, incl. seal adjuster and locking device, Bonnet assembly through bolting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S12</td>
<td>KMA, manually operated, incl. seal adjuster, locking device and stroke limiter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S13</td>
<td>KMA, manually operated, incl. seal adjuster, Bonnet assembly through bolting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Surface roughness of the bodies in Ra (µm)</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>See page 32 - 55</td>
<td>02</td>
<td>Internally mechanically polished Ra ≤ 0,8 µm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>03</td>
<td>Internally mechanically polished Ra ≤ 0,8 µm + Electropolished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>07</td>
<td>Internally mechanically polished Ra ≤ 0,6 µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>08</td>
<td>Internally mechanically polished Ra ≤ 0,6 µm + Electropolished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>09</td>
<td>Internally mechanically polished Ra ≤ 0,4 µm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Internally mechanically polished Ra ≤ 0,4 µm + Electropolished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF0</td>
<td>No Finish Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF1</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF2</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF3</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,76 µm (30 µ-inch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF4</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,36 µm (15 µ-inch) + Electropolished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF5</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,51 µm (20 µ-inch) + Electropolished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SF6</td>
<td>ASME BPE Table SF-2.4-1 Internal mechanically polished Ra ≤ 0,64 µm (25 µ-inch) + Electropolished</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pos.</th>
<th>S-Number:</th>
<th>Description</th>
<th>Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>S...</td>
<td>To specify customized design and all the details for multiport valves</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Position:**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6.1</th>
<th>6.2</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>495</td>
<td>25</td>
<td>77</td>
</tr>
</tbody>
</table>

**Article Code:**

495 25 77 42 18 1 S 03

**Type:**

495  
KMA Series  
actuator with stainless steel adaption pneumatic

**Size:**

DN 25

**Valve body material:**

Stainless steel, forged  
1.4435/316L ASME BPE

**Valve body end connection:**

Butt weld tube end  
DIN 11850 Series 2

**Surface roughness of the bodies in Ra:**

Internal mechanical polish and electro polish  
Ra ≤ 0.8 µm

**Actuator type:**

KMA for steam sterilizing up to max. 160° C

**Actuator control function and orientation air inlet connection:**

Normally closed (NC) orientation 90° to flow direction

**Diaphragm material:**

EPDM  
FDA / USP compliant

**System components and accessories see page 102 to 108**

# Table of Contents

1 **Introduction**
   - A Brief Overview
   - The Company
   - What does Quality mean at SED?

2 **General Information**
   - Testing
   - Qualification, Certification and Documentation
   - Flow Rate and Valve Sizing
   - Surface Finish

3 **Media Contacted Components**
   - Diaphragms
   - Valve Bodies (fold out page)
   - Butt Weld Tube Ends (fold out page)
   - Aseptic Connections
     - Clamps
     - Aseptic Flanges and Aseptic Threads

4 **Aseptic Diaphragm Valves**
   - Overview Diaphragm Aseptic Valves
   - Why Aseptic Diaphragm Valve?
   - Self Draining - Two-Way Valve
   - Innovative Design
   - Aseptic Diaphragm Valves
     - Aseptic Diaphragm Valve Manual
     - Aseptic Diaphragm Valve Pneumatically Operated
   - Ordering Key and Ordering Example

5 **Aseptic Diaphragm Valve Configurations**
   - D-Rule
   - Welded Valve Configurations
   - Multiport Valves
     - Why Multiport Valves?
     - Main line open, Loop Valves (e.g. T-Valve)
     - All lines and valve ports able to close
     - The way of customized multiport valve designs
     - Specification Multiport Valves
   - Tank Valves
   - Process Solutions
     - Sterile Sampling Unit
     - Purified Steam Sampling Unit

6 **Angle Seat Valves**
   - Description and Features
   - Applications
   - Ordering Key and Ordering Example
   - Technical Data
   - 2/2-Way Angle Seat Valves
   - Valve Body Threaded Socket and Butt Weld End
   - Valve Body Clamp Socket and Flange

7 **System Components and Process Automation**
   - Overview
   - Manual Adjustment - Optical Indication
   - Electrical Switch Boxes - Pilot Control
   - Detailed Information
     - 3/2 Way Plastic Pilot Valve Type 602 / 603
     - Contact-Free Limit Switch 024.50
     - Control Head Switch 024.63. - 024.89.
   - Process Automation, Electropneumatic Positioners
   - Overview Product Range
   - Glossary

---

[59] www.sed-flowcontrol.com
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 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.

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

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.

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

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

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

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

On request, all dimensional data sheets or 2D and 3D - CAD drawings are available. All fabricated 2/2 way SA and SL orientations will have a dead leg. Manufacturing these valve orientations from a solid block body will minimize or eliminate the dead leg. See page 64 – 77.
2) SA – Sterile Access Configurations
The Sterile Access Fabrication is utilized in a horizontal piping system where the main valve is orientated at the self-draining angle and the access port is at the lowest drainable point of the waterway.
The sterile access maybe used for applications including sampling, steam, condensate or divert port.
The Sterile Access Fabrication is available with either a tube port or a vertical or horizontal valve port.

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

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

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

The Advantages at a Glance:

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

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

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

1) Main line open

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

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

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

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

Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

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

Recommended installation:
S3 down

www.sed-flowcontrol.com
1) Main line open

**Description**
For valve specification see page 77 as guideline

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

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

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

Recommended installation: S3 and S4 - 45° down

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

Recommended installation: S3 - 45° down

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

Recommended installation: S2 down
Multiport Valves

1) Main line open

Description
For valve specification see page 77 as guideline

P&ID

<table>
<thead>
<tr>
<th>Flow direction</th>
<th>Drain direction</th>
<th>Valve</th>
</tr>
</thead>
</table>

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

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

Recommended installation: S3 down

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

Back to back valve actuation

Recommended installation: S3 down

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

One side valve actuation

Recommended installation: S3 and S4 down
**Multiport Valves**

1) **Main line open**

<table>
<thead>
<tr>
<th>Description</th>
<th>P&amp;ID</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>For valve specification see page 77 as guideline</td>
<td>Flow direction</td>
<td>Actuators and other options are included in some of the illustrations</td>
</tr>
<tr>
<td><strong>Illustration</strong></td>
<td>Drain direction</td>
<td></td>
</tr>
</tbody>
</table>

#### 1.6) MXL 4/2 – S4 left side  
MXR 4/2 – S4 right side  
(illustration)

1 x Point of use valve port  
1 x Integral sample purge valve, valve port below the weir.  
Sample valve be provides on either side of the valve body.  
**Back to back valve actuation**

Recommended installation:  
S3 down

#### 1.7) MWL 5/3 – S4 left side  
MWR 5/3 – S4 right side  
(illustration)

1 x Point of use valve port  
1 x Integral loop sample valve port  
1 x Integral sample purge valve port below the weir.  
Sample and purge valve be provides on either side of the valve body.  
**Back to back valve actuation**

Recommended installation:  
S3 down

#### 1.9) MTE 6/4

4 x Point of use valve ports  
The Number of valve ports is variable.  
**One side valve actuation**

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

www.sed-flowcontrol.com
Multiport Valves

1) Main line open

Description
For valve specification see page 77 as guideline

P&ID
Flow direction
Drain direction
Valve

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

1.11) MTD 7/5
5 x Point of use valve ports
The number of valve ports is variable.
Back to back valve actuation
Recommended installation:
S1 and S2 horizontal
S3 to S7 can be vertical if tube outlets S3 to S7 are positioned to the lowest point of valve pocket like the picture shows.

1.14) MCE 4/2 to 16/14
2 to 14 Point of use valve ports
The number of valve ports is variable
No actuators on the back side
Recommended installation:
S1 and S2 horizontal
S3 to S4 or max S16 down or vertical up orientation.
S1 and S2 can be vertical if tube outlets S3 to S4 or max S16 are positioned to the lowest point of valve pocket like the picture shows.

1.16) MFF 4/2 to 32/30
Up to 30 point of use valve ports as flexible manifold system
Dependent on the requirements the number of valves installed can be between 2 and 30.
It is a mirror design to be suitable also for applying clamp connection.
It allows standardizing skids and other system solutions.
Aseptic O-ring connection according ASME/BPE and DIN 11864 see also catalogue page 21
Back to back valve actuation
Recommended installation:
S4 down
## Multiport Valves

### 2) All lines and valve ports able to close

#### Description
For valve specification see page 77 as guideline

<table>
<thead>
<tr>
<th>P&amp;ID</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Flow direction][Drain direction][Valve]</td>
<td>Actuators and other options are included in some of the illustrations</td>
</tr>
</tbody>
</table>

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

Recommended installation: Dependent on design and application

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

Recommended installation: Dependent on design and application

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

Recommended installation: Dependent on design and application

[www.sed-flowcontrol.com](http://www.sed-flowcontrol.com)
2) All lines and valve ports able to close

**Description**
For valve specification see page 77 as guideline

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

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

---

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

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

---

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

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

---

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

Recommended installation:
S3 vertical down or vertical up
2) All lines and valve ports able to close

**Description**
For valve specification see page 77 as guideline

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

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

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

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

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

Recommended installation:
S2, S3 vertical down or dependent on design and application
S4 vertical down.
2) All lines and valve ports able to close

**Description**
For valve specification see page 77 as guideline

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

---

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

Recommended installation: S2 vertical down

---

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

Recommended installation: S2 vertical down or S1 and S2 horizontal

The valve block body allows for many different inlet and outlet orientations. Dependent on design and application

---

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

Recommended installation: S3, S4, S5 vertical down

Dependent on design and application

S3, S4, S5 vertical up
2) All lines and valve ports able to close

**Description**
For valve specification see page 77 as guideline

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

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

---

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

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

---

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

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

---

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

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

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

### 2) All lines and valve ports able to close

### Description
For valve specification see page 77 as guideline

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

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

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

**MCS 5/4 Star Design**
4x Valves vertical

**MCS 6/5 Star Design**
5x Valves vertical

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

#### 2.91)
**MTA 5/5**
5 Valves horizontal with one for drainage

**no valve actuation on the back side**
Recommended installation: S5 as drainage valve. Different inlet and outlet orientations e.g. S5 as inlet valve.

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

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

The way of customized multiport valve designs

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

P&ID Multiport Valve Cluster

Drawing Multiport Valve Cluster

Images of the installation

www.sed-flowcontrol.com
### Specification

**Your P&ID Sketch:**

Example: P&ID

![P&ID Sketch](image)

- **Working pressure:** ________ bar
- **Working temperature:** ________ °C

**Multiport valve body material:**
1.4435/316L
1.4435/316L (Fe < 0,5%)
Other

**Surface finish multiport body:**
- 02 Ra ≤ 0,8 µm
- 03 Ra ≤ 0,8 µm e-polished
- 07 Ra ≤ 0,6 µm
- 08 Ra ≤ 0,6 µm e-polished
- 09 Ra ≤ 0,4 µm
- 10 Ra ≤ 0,4 µm e-polished

**Diaphragm material:**
- EPDM Code ________
- PTFE Code ________
- Other ________

### Tube End Connection

<table>
<thead>
<tr>
<th>Tube end No</th>
<th>Preferred Installation</th>
<th>Tube end connection</th>
<th>Actuator</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td></td>
<td>DN, s[mm], D[mm], Code</td>
<td>Actuator Type, Control Function, Accessories / Comments</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tank Valves

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

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

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 down stream processing.

The outlet port of the tank valve is available with all butt weld tube end standards (see fold-out page 19), aseptic clamp, screw connection (see page 20 and 21) or other special ends. The size range available is the same as the two-way valve.
Tank Valves

Example:
Drawing Steripur Series pneumatically operated

Example:
Drawing KMA Series manually operated

Common design

Advantages of the SED design:
- minimized hold up volume
- better mixability of media

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

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

P&ID
- Flow direction
- Drain direction
- Valve

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

1) BT
1x Valve port

Standard tank bottom body

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

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

Advantages of the SED design:
Tank Valves

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

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

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

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

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

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

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

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

Like position 2 but includes an integral outlet valve. Right side and left side options are available and are fully drainable.
### Description
Select a tank valve or see page 77 to sketch and specify your solution.

<table>
<thead>
<tr>
<th>5) BW 4/3</th>
<th>6) BT 3/1</th>
<th>6.5) BFL</th>
<th>8) BU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x Main Valve</td>
<td>1x Main valve</td>
<td>Like position 4, but with flange for dismantling possibility.</td>
<td>1x Tank wall side sample valve</td>
</tr>
<tr>
<td>1x Sample valve tank side right</td>
<td>2x Outlet port for loop installation or as two access ports</td>
<td></td>
<td>All previous position options are available with the tank side sample valve. Machined welding pad to match the radius of the tank diameter.</td>
</tr>
<tr>
<td>1x CIP/ SIP cleaning outlet valve left</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like position 2 but includes integral valves that are fully drainable.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Image
Actuators and other options are included in some of the illustrations.
Sterile Sampling Unit

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

Advantages of the SED-Sterile Sampling Unit

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

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

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

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

There are many different valve requirements when specifying the procedure for taking samples. There are not only the valves on the sampling unit but there is also a need for a valve combination or valve block on the tank and for the condensate and CIP solution as shown on the P&ID.

For applicable designs as valve configurations see page 62 – 63 and for multiport valves see page 70.

---

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

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

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

Features

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

| Cooling capacity: | approx. 0.5 l/min (132 gpm) |
| Condensate temperature: | 30°C (86°F) |
| Max. pressure vessel: | 10 bar (150 psi) |
| Max. pressure cooling helix: | 10 to -0.9 bar (150 to -13 psi) |
| Max. temperature: | 150°C (302°F) |
| Content cooling helix: | 0.125 l (0.033 gallon) |
| Weight: | 6.5 kg |

V1 Shut off for main line purified steam
V2 Shut off to purified sampling system
V3 Shut off to steam trap
V4 Shut off cooling water entering, valve blocked in open position
V5 Shut off to cooling return flow, valve blocked in open position
V6 Shut off to drainage
V7 Diaphragm valve for shut off and regulating the cooling circuit within the unit
V8 Diaphragm valve for condensate sampling

The diagram illustrates the Purified Steam Sampling Unit with various components labeled. The labels include:
- Purified steam connection
- Cooling water connection 90° rotated
- Cooling helix
- Condensate outlet
- Sampling valve
- Control and shut off valve for cooling circuit
- Main line purified steam
- Cooling water flow line
- Cooling water return flow
- Sampling bottle
- Condensate
- Waste water
Table of Contents

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

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

3. Media Contacted Components
   Diaphragms                             14 - 17
   Valve Bodies (fold out page)           18
   Butt Weld Tube Ends (fold out page)    19
   Aseptic Connections
     Clamps                                20
     Aseptic Flanges and Aseptic Threads   21

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

5. Aseptic Diaphragm Valve Configurations
   D-Rule                                  60
   Welded Valve Configurations            61 - 63
   Multiport Valves
     Why Multiport Valves?                64
     Main line open, Loop Valves (e.g. T-Valve) 65 - 69
     All lines and valve ports able to close 70 - 75
     The way of customized multiport valve designs 76
     Specification Multiport Valves        77
   Tank Valves                            78 - 81
   Process Solutions
     Sterile Sampling Unit                82
     Purified Steam Sampling Unit         83

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

7. System Components and Process Automation
   Overview                               102
   Manual Adjustment - Optical Indication 103
   Electrical Switch Boxes - Pilot Control 104
   Detailed Information
     3/2 Way Plastic Pilot Valve Type 602 / 603 105
     Contact-Free Limit Switch 024.50          106, 107
     Control Head Switch 024.63. - 024.89.     108
   Process Automation, Electropneumatic Positioners 109, 110

8. Glossary                              112
The SED Angle Seat Valve is composed of a 2/2-way angle seat valve body and a pneumatically operated piston actuator, which is mounted with a stainless steel adaption to the valve body. Depending on the size, the actuators are made of plastic or aluminium. The plastic actuators consist of a high temperature resistant plastic. A self-adjusting gland assures reliable longlife performance. The gland is protected against dust and damage by a wiper, which is located in front of the gland.

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

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

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

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

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

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

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

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

### Ordering Example

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

**Code:**

```
1 2 3 4 5 6 7
5 8 4 . 2 5 . 7 . 1 . 3 . 1 4 5
```

**Artikel No.:** 5 8 4 . 2 5 . 7 . 1 . 3 . 1 4 5

**Type:**

584

Pneumatic valve

Plastic actuator

Material PAMX D6

**Size:**

DN 25

**Valve Body Material:**

Stainless steel, investment cast 1.4404/316L

**Valve Body End Connection:**

Threaded socket

**Actuator Type:**

Plastic actuator with Stainless steel adaption, piston Ø 45

**Actuator Control Function:**

Normally closed (NC), orientation 90° to flow direction

**Sealing:**

Encapsulated circumferential PTFE sealing

---

**Bold = preferential standards**
Type 584, Actuator 70

1. Type

2. Size

3. Valve Body Material

4. Valve Body End Connection

5. Sealing

6. Actuator Control Function (NC)

7. Actuator Type

Features

- Central thread for mounting accessories and system components
- With anti-twist and guided safeguard and controlled piston
- Namur-flange
- Control connection for Cf. NO and DA and direct mounting Pilot Solenoid valve
- Control connection for Cf. NC and DA and direct mounting Pilot Solenoid valve
- Self adjusting sealing gland packing

Flow above the seat (see adjoining, colored table)

Flow below the seat (see adjoining, colored table)

www.sed-flowcontrol.com
## Technical Data

### Operating Conditions

<table>
<thead>
<tr>
<th>Operating Medium</th>
<th>Neutral, aggressive, gaseous, and liquid media. Media must be compatible with the materials of construction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity</td>
<td>Max. 600 mm²/sec</td>
</tr>
<tr>
<td>Medium Temperature</td>
<td>-10 to +180°C for PTFE sealing</td>
</tr>
<tr>
<td>Working Pressure</td>
<td>See table</td>
</tr>
<tr>
<td>Control Medium</td>
<td>Neutral gases, air</td>
</tr>
<tr>
<td>Temperature</td>
<td>Max. +80°C</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-10 to +90°C</td>
</tr>
</tbody>
</table>

### Working Pressure for Valves

#### with flow below the seat

<table>
<thead>
<tr>
<th>Actuator Type Code</th>
<th>Ø Actuator Type</th>
<th>Control Function (Cf.)</th>
<th>Control Pressure min. - max. (bar)</th>
<th>Size</th>
<th>Working Pressure max. (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>580</td>
<td>45</td>
<td>1 (NC)</td>
<td>4,5-8</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>581</td>
<td>45</td>
<td>Manually op.</td>
<td></td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>45</td>
<td>1 (NC)</td>
<td>4,5-8</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>585</td>
<td>45</td>
<td>1 (NC)</td>
<td>4,0-10</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>584/590</td>
<td>70</td>
<td>1 (NC)</td>
<td>4,5-8</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584/590</td>
<td>70</td>
<td>Manually op.</td>
<td></td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>585</td>
<td>70</td>
<td>1 (NC)</td>
<td>4,5-8</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>585</td>
<td>70</td>
<td>1 (NC)</td>
<td>4,0-10</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>1 (NC)</td>
<td>4,5-8</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>1 (NC)</td>
<td>4,0-10</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>3 (DA)</td>
<td>page 93</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>3 (DA)</td>
<td>page 94</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>3 (DA)</td>
<td>page 95</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>3 (DA)</td>
<td>page 96</td>
<td>25</td>
<td>6</td>
</tr>
</tbody>
</table>

#### with flow above the seat

<table>
<thead>
<tr>
<th>Actuator Type Code</th>
<th>Ø Actuator Type</th>
<th>Control Function (Cf.)</th>
<th>Control Pressure min. - max. (bar)</th>
<th>Size</th>
<th>Working Pressure max. (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>584</td>
<td>45</td>
<td>1 (NC)</td>
<td>page 94</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>584</td>
<td>70</td>
<td>1 (NC)</td>
<td>page 95</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

All pressures are gauge pressures.
Type 584, Actuator 43

Actuator 43 (NO), flow below the seat

Actuator 43 (DA), flow below the seat

Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90. All pressures are gauge pressures.
Type 584, Actuator 45 and Actuator 46

Actuator 45 (NO), flow below the seat

Actuator 45 (DA), flow below the seat

Actuator 46 (NC), flow above the seat

Measurement and weight table Actuator type 45 and 46

<table>
<thead>
<tr>
<th>DN</th>
<th>SW</th>
<th>$V_1$</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>36</td>
<td>130</td>
<td>0.8</td>
</tr>
<tr>
<td>20</td>
<td>41</td>
<td>136</td>
<td>1.1</td>
</tr>
<tr>
<td>25</td>
<td>46</td>
<td>140</td>
<td>1.2</td>
</tr>
</tbody>
</table>

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

Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.
Type 584, Actuator 70 and Actuator 71

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

Actuator 70 (NO), flow below the seat

<table>
<thead>
<tr>
<th>DN</th>
<th>Control pressure (bar)</th>
<th>Working pressure (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>32</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>50</td>
<td>6</td>
<td>25</td>
</tr>
</tbody>
</table>

Actuator 70 (DA), flow below the seat

<table>
<thead>
<tr>
<th>DN</th>
<th>Control pressure (bar)</th>
<th>Working pressure (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>32</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>50</td>
<td>6</td>
<td>25</td>
</tr>
</tbody>
</table>

Actuator 71 (NC), flow above the seat

<table>
<thead>
<tr>
<th>DN</th>
<th>Control pressure (bar)</th>
<th>Working pressure (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>32</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>40</td>
<td>5</td>
<td>20</td>
</tr>
</tbody>
</table>

Measurement and weight table Actuator type 70 and 71

<table>
<thead>
<tr>
<th>DN</th>
<th>SW</th>
<th>V₁</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>36</td>
<td>162</td>
<td>1.2</td>
</tr>
<tr>
<td>20</td>
<td>41</td>
<td>173</td>
<td>1.3</td>
</tr>
<tr>
<td>25</td>
<td>46</td>
<td>173</td>
<td>1.6</td>
</tr>
<tr>
<td>32</td>
<td>55</td>
<td>179</td>
<td>2.1</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>185</td>
<td>2.2</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
<td>192</td>
<td>3.2</td>
</tr>
</tbody>
</table>

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

Working pressure normally closed (Cf. 1), flow below the seat as well as Working terms, see table page 90.
All pressures are gauge pressures.
Actuator 120 (NO), flow below the seat

Actuator 120 (DA), flow below the seat

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

All pressures are gauge pressures.
**Type 590, Two Stage Actuator 70**

2/2-Way Angle Seat Valves with Two Stage Actuator

The pneumatically controlled two stage piston actuator is made of two plastic actuators. The two stages can be independently actuated from each other.

In order to open the valve completely with the full flowrate, the lower piston has to be actuated. Limited opening or flowrate is possible by actuating the upper piston.

An adjustable stroke limiter allows to adjust the linear movement of the upper position. An optical indicator which is directly connected with the valve spindle shows the stroke.

The control function of the valve is normally closed (Cf.1).

**Application**

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

<table>
<thead>
<tr>
<th>DN</th>
<th>SW</th>
<th>(V_1)</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>36</td>
<td>232</td>
<td>1,9</td>
</tr>
<tr>
<td>20</td>
<td>41</td>
<td>238</td>
<td>2,1</td>
</tr>
<tr>
<td>25</td>
<td>46</td>
<td>243</td>
<td>2,2</td>
</tr>
<tr>
<td>32</td>
<td>55</td>
<td>249</td>
<td>2,9</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>255</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
<td>263</td>
<td>4</td>
</tr>
</tbody>
</table>

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

Working pressure normally closed (Cf. 1), flow below the seat as well as working pressure, see table page 90.
All pressures are gauge pressures.
Advantages:
- Hygienic design, easy cleaning
- High temperature resistance
- Minimized dead leg design
- Optical position indicator
- Easy maintenance
- Good regulation properties
- Clean and smooth exterior for sterile washdowns

### Measurement and weight table

<table>
<thead>
<tr>
<th>DN</th>
<th>$V_1$</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>137</td>
<td>1,1</td>
</tr>
<tr>
<td>20</td>
<td>135</td>
<td>1,3</td>
</tr>
<tr>
<td>25</td>
<td>135</td>
<td>1,6</td>
</tr>
<tr>
<td>32</td>
<td>154</td>
<td>2,3</td>
</tr>
<tr>
<td>40</td>
<td>154</td>
<td>2,8</td>
</tr>
<tr>
<td>50</td>
<td>154</td>
<td>4,3</td>
</tr>
</tbody>
</table>

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

Working pressure, see table page 90.
All pressures are gauge pressures.
Advantages:
- Hygienic design, easy cleaning
- High temperature resistance
- Stainless steel below
- Minimized dead leg design
- Optical position indicator
- Easy maintenance
- Good regulation properties
- Clean and smooth exterior for sterile washdowns

Specific application:
- Pure or clean steam and gaseous media

<table>
<thead>
<tr>
<th>DN</th>
<th>SW</th>
<th>( V_1 )</th>
<th>Total weight ca. (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>36</td>
<td>177</td>
<td>1,8</td>
</tr>
<tr>
<td>20</td>
<td>41</td>
<td>168</td>
<td>1,9</td>
</tr>
<tr>
<td>25</td>
<td>46</td>
<td>175</td>
<td>2,1</td>
</tr>
<tr>
<td>32</td>
<td>55</td>
<td>183</td>
<td>2,9</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>189</td>
<td>3,4</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
<td>197</td>
<td>4,4</td>
</tr>
</tbody>
</table>

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

Working pressure, see table page 90.
All pressures are gauge pressures.
Valve Body Threaded Socket and Butt Weld End

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

<table>
<thead>
<tr>
<th>DN</th>
<th>LG</th>
<th>BG</th>
<th>G</th>
<th>t1</th>
<th>NPT</th>
<th>t1N</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>65</td>
<td>17</td>
<td>G 1/2</td>
<td>15,0</td>
<td>NPT 1/2</td>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>20</td>
<td>75</td>
<td>18</td>
<td>G 3/4</td>
<td>14,0</td>
<td>NPT 3/4</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>25</td>
<td>90</td>
<td>24</td>
<td>G 1</td>
<td>15,0</td>
<td>NPT 1</td>
<td>17</td>
<td>39</td>
</tr>
<tr>
<td>32</td>
<td>110</td>
<td>33</td>
<td>G 1 1/4</td>
<td>17,0</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50</td>
</tr>
<tr>
<td>40</td>
<td>120</td>
<td>30</td>
<td>G 1 1/2</td>
<td>17,0</td>
<td>NPT 1 1/2</td>
<td>21</td>
<td>55</td>
</tr>
<tr>
<td>50</td>
<td>150</td>
<td>40</td>
<td>G 2</td>
<td>18,5</td>
<td>NPT 2</td>
<td>22</td>
<td>70</td>
</tr>
<tr>
<td>65</td>
<td>190</td>
<td>46</td>
<td>G 2 1/2</td>
<td>26,0</td>
<td>NPT 2 1/2</td>
<td>30</td>
<td>85</td>
</tr>
</tbody>
</table>

Measurements in mm, G-Thread

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

<table>
<thead>
<tr>
<th>DN</th>
<th>LS_K</th>
<th>L_S</th>
<th>B_S</th>
<th>s</th>
<th>rd</th>
<th>s</th>
<th>rd</th>
<th>s</th>
<th>rd</th>
<th>s</th>
<th>rd</th>
<th>s</th>
<th>rd</th>
<th>s</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>105</td>
<td>105</td>
<td>35,5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>17,2</td>
</tr>
<tr>
<td>15</td>
<td>105</td>
<td>105</td>
<td>35,5</td>
<td>18</td>
<td>1</td>
<td>19</td>
<td>1,5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>21,3</td>
</tr>
<tr>
<td>20</td>
<td>108</td>
<td>125</td>
<td>39</td>
<td>22</td>
<td>1</td>
<td>23</td>
<td>1,5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>26,9</td>
</tr>
<tr>
<td>25</td>
<td>135</td>
<td>135</td>
<td>39,5</td>
<td>28</td>
<td>1</td>
<td>29</td>
<td>1,5</td>
<td>25</td>
<td>1,2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>33,7</td>
</tr>
<tr>
<td>32</td>
<td>155</td>
<td>155</td>
<td>48</td>
<td>34</td>
<td>1</td>
<td>35</td>
<td>1,5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>42,4</td>
</tr>
<tr>
<td>40</td>
<td>146</td>
<td>175</td>
<td>47</td>
<td>40</td>
<td>1</td>
<td>41</td>
<td>1,5</td>
<td>38</td>
<td>1,2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>48,3</td>
</tr>
<tr>
<td>50</td>
<td>160</td>
<td>205</td>
<td>48</td>
<td>52</td>
<td>1</td>
<td>53</td>
<td>1,5</td>
<td>51</td>
<td>1,2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>60,3</td>
</tr>
<tr>
<td>65</td>
<td>285</td>
<td>285</td>
<td>96</td>
<td>-</td>
<td>-</td>
<td>70</td>
<td>2</td>
<td>63,5</td>
<td>1,6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>76,1</td>
</tr>
<tr>
<td>80</td>
<td>-</td>
<td>285</td>
<td>96</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>76,1</td>
<td>1,6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>76,2</td>
</tr>
</tbody>
</table>

L_S = preferred standard for ISO 1127 Code 40K, other lengths on request, B_S valid for L_S

Measurements in mm, preferential standards in bold
Valve Body Clamp Socket and Flange

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

<table>
<thead>
<tr>
<th>Clamp End ident.</th>
<th>Tube End ident.</th>
<th>Similar</th>
<th>ISO 2852</th>
<th>DIN 32676</th>
<th>DIN 11850</th>
<th>ASME BPE</th>
<th>ASME BPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ISO 1127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ISO 1127</td>
<td>DIN 11850</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DN</th>
<th>NPS</th>
<th>Lc</th>
<th>Bc</th>
<th>øb1</th>
<th>øb2</th>
<th>øb1</th>
<th>øb2</th>
<th>øb1</th>
<th>øb2</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1/2</td>
<td>130</td>
<td>48</td>
<td>18.1</td>
<td>50.5</td>
<td>16</td>
<td>34</td>
<td>9.4</td>
<td>25</td>
</tr>
<tr>
<td>20</td>
<td>3/4</td>
<td>150</td>
<td>54</td>
<td>23.7</td>
<td>50.5</td>
<td>20</td>
<td>34</td>
<td>15.75</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>160</td>
<td>56</td>
<td>29.7</td>
<td>50.5</td>
<td>26</td>
<td>50.5</td>
<td>22.1</td>
<td>50.5</td>
</tr>
<tr>
<td>32</td>
<td>1 1/4</td>
<td>180</td>
<td>60.5</td>
<td>38.4</td>
<td>64</td>
<td>32</td>
<td>50.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>40</td>
<td>1 1/2</td>
<td>200</td>
<td>67</td>
<td>44.3</td>
<td>64</td>
<td>38</td>
<td>50.5</td>
<td>34.8</td>
<td>50.5</td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>230</td>
<td>73</td>
<td>56.3</td>
<td>77.5</td>
<td>50</td>
<td>64</td>
<td>47.5</td>
<td>64</td>
</tr>
<tr>
<td>65</td>
<td>2 1/2</td>
<td>290</td>
<td>-</td>
<td>72.1</td>
<td>91</td>
<td>66</td>
<td>91</td>
<td>60.2</td>
<td>77.5</td>
</tr>
<tr>
<td>80</td>
<td>3</td>
<td>310</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>72.9</td>
<td>91</td>
</tr>
</tbody>
</table>

Measurements in mm, NPS inch

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

<table>
<thead>
<tr>
<th>DN</th>
<th>LF</th>
<th>BF</th>
<th>øD</th>
<th>ød</th>
<th>øk</th>
<th>number of drilling</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>115</td>
<td>32</td>
<td>90</td>
<td>14</td>
<td>60</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>130</td>
<td>42</td>
<td>95</td>
<td>14</td>
<td>65</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
<td>54</td>
<td>105</td>
<td>14</td>
<td>75</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>160</td>
<td>56</td>
<td>115</td>
<td>18</td>
<td>85</td>
<td>4</td>
</tr>
<tr>
<td>32</td>
<td>180</td>
<td>59</td>
<td>140</td>
<td>18</td>
<td>100</td>
<td>4</td>
</tr>
<tr>
<td>40</td>
<td>200</td>
<td>71</td>
<td>150</td>
<td>18</td>
<td>110</td>
<td>4</td>
</tr>
<tr>
<td>50</td>
<td>230</td>
<td>83</td>
<td>165</td>
<td>18</td>
<td>125</td>
<td>4</td>
</tr>
<tr>
<td>65</td>
<td>290</td>
<td>-</td>
<td>185</td>
<td>18</td>
<td>145</td>
<td>4</td>
</tr>
<tr>
<td>80</td>
<td>310</td>
<td>-</td>
<td>200</td>
<td>18</td>
<td>160</td>
<td>8</td>
</tr>
</tbody>
</table>

Measurements in mm
## Table of Contents

### 1 Introduction
- A Brief Overview
- The Company
- What does Quality mean at SED?

### 2 General Information
- Testing
- Qualification, Certification and Documentation
- Flow Rate and Valve Sizing
- Surface Finish

### 3 Media Contacted Components
- Diaphragms
- Valve Bodies (fold out page)
- Butt Weld Tube Ends (fold out page)
- Aseptic Connections
  - Clamps
  - Aseptic Flanges and Aseptic Threads

### 4 Aseptic Diaphragm Valves
- Overview Diaphragm Aseptic Valves
- Why Aseptic Diaphragm Valve?
- Self Draining - Two-Way Valve
- Innovative Design
- Aseptic Diaphragm Valves
  - Aseptic Diaphragm Valve Manual
  - Aseptic Diaphragm Valve Pneumatically Operated

### 5 Ordering Key and Ordering Example

### 3 Aseptic Diaphragm Valve Configurations
- D-Rule
- Welded Valve Configurations

### 5 Multiport Valves
- Why Multiport Valves?
- Main line open, Loop Valves (e.g. T-Valve)
- All lines and valve ports able to close
- The way of customized multiport valve designs
- Specification Multiport Valves

### 6 Tank Valves
- Sterile Sampling Unit
- Purified Steam Sampling Unit

### 5 Angle Seat Valves
- Description and Features
- Applications
- Ordering Key and Ordering Example
- Technical Data
- 2/2-Way Angle Seat Valves
- Valve Body Threaded Socket and Butt Weld End
- Valve Body Clamp Socket and Flange

### 6 System Components and Process Automation
- Overview
- Manual Adjustment - Optical Indication
- Electrical Switch Boxes - Pilot Control
- Detailed Information
  - 3/2 Way Plastic Pilot Valve Type 602 / 603
  - Contact-Free Limit Switch 024.50
  - Control Head Switch 024.63. - 024.89.
- Process Automation, Electropneumatic Positioners
- Overview Product Range
- Glossary

www.sed-flowcontrol.com
<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Size (MA)</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>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>103</td>
</tr>
<tr>
<td>Stroke limiter</td>
<td>024.11</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>103</td>
</tr>
<tr>
<td>Stroke Limiter with hand wheel</td>
<td>024.11.2</td>
<td>10</td>
<td>8 - 20</td>
<td>●</td>
<td></td>
<td>103</td>
</tr>
<tr>
<td>Stroke limiter with optical position indicator</td>
<td>024.12</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>103</td>
</tr>
<tr>
<td>Manual override with optical position indicator</td>
<td>024.13</td>
<td>8 - 50</td>
<td>4 - 50</td>
<td>●</td>
<td></td>
<td>103</td>
</tr>
<tr>
<td>Stroke - Seal Adjuster</td>
<td>024.14</td>
<td>8 - 25</td>
<td>4 - 25</td>
<td>●</td>
<td></td>
<td>103</td>
</tr>
<tr>
<td>Travel stop</td>
<td>024.886</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>103</td>
</tr>
<tr>
<td>Contact - Free Limit Switch</td>
<td>024.50</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>104, 106 - 107</td>
</tr>
<tr>
<td>Control head switch with optical indicator &quot;catch the eye&quot;</td>
<td>024.63</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>104, 108</td>
</tr>
<tr>
<td></td>
<td>024.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>024.65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control head switch with optical indicator AS - Interface &quot;catch the eye&quot;</td>
<td>024.89</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>104, 108</td>
</tr>
<tr>
<td>Limit switch with one mechanical switch and optical indicator</td>
<td>024.90</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td>●</td>
<td>104</td>
</tr>
<tr>
<td>Pilot valve for direct mounting</td>
<td>602</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>104</td>
</tr>
<tr>
<td>Pilot valve for manifold mounting</td>
<td>603</td>
<td>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td>104</td>
</tr>
<tr>
<td>Manual valve prepared for mounting proximity switch</td>
<td>024.96</td>
<td>25 - 100</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>8 - 100</td>
<td>4 - 100</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

System Components and Accessories are shown on page 103 - 108.
Manual Adjustment - Optical Indication

024.10 Optical Position Indicator

024.11 Stroke Limiter

024.11.2 Stroke Limiter with hand wheel

024.12 Stroke Limiter with Optical Position Indicator

024.13 Manual Override with Optical Position Indicator

024.14. Stroke - Seal Adjuster

024.886 Travel Stop

Upon request combinations of Manual Adjustments with Switch Boxes are available
System Components and Process Automation

Electrical Switch Boxes - Pilot Control

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

024.90
Limit Switch open position

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

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

602
Pilot Valve for direct mounting

603
Pilot Valve for manifold mounting

Upon request combinations of Manual Adjustments with Switch Boxes are available

www.sed-flowcontrol.com
System Components and Process Automation

3/2 Way Plastic Pilot Valve Type 602 / 603

Description
The solenoid valves are electromagnetic, direct actuated pilot valves to control pneumatically operated valve actuators. Applicable media are filtered, lubricated or non lubricated air and neutral gaseous fluids.

Type 602 is equipped with a hollow screw and made for direct mounting on the user.
Type 603 is designed for manifold mounting, where a variable amount of single pilot valves are assembled together and connected to the pneumatically operated valve actuators by pneumatic lines.

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

Standard versions

<table>
<thead>
<tr>
<th>Type</th>
<th>Cf.</th>
<th>Version</th>
<th>Connection</th>
<th>Manual-override</th>
<th>Fig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>602.1,2.32.24.2.1.S5.1.xx*</td>
<td>1</td>
<td>Direct mounting, Banjo</td>
<td>Push-in connection f. tube Ø 6mm G1/8&quot; or G1/4&quot; Plunger</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>602.1,2.32.24.2.1.35.1.xx*</td>
<td>1</td>
<td>Direct mounting, Banjo</td>
<td>Threaded socket G1/8&quot; G1/8&quot; or G1/4&quot; Plunger</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>602.1,2.32.24.2.2.55.1.xx*</td>
<td>2</td>
<td>Direct mounting, Banjo</td>
<td>Push-in connection f. tube Ø 6mm G1/8&quot; or G1/4&quot; Plunger</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>602.1,2.32.24.2.2.35.1.xx*</td>
<td>2</td>
<td>Direct mounting, Banjo</td>
<td>Threaded socket G1/8&quot; G1/8&quot; or G1/4&quot; Plunger</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>602.1,2.32.24.2.2.5.M5.1.xx*</td>
<td>2</td>
<td>Direct mounting, Banjo</td>
<td>Thread M5 at plunger G1/8&quot; or G1/4&quot; G1/8&quot;</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>603.1,2.32.24.2.1.43.1.xx*</td>
<td>1</td>
<td>Manifold mounting</td>
<td>Threaded socket G1/4&quot; G1/8&quot; Plunger</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>603.1,2.32.24.2.2.43.1.xx*</td>
<td>2</td>
<td>Manifold mounting</td>
<td>Threaded socket G1/4&quot; G1/8&quot; Plunger</td>
<td>No</td>
<td>3</td>
</tr>
</tbody>
</table>

For detailed information please see TD130020
Limit switches are used to control, monitor and view the position of the valve or to activate other system components.

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

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

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

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

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

Contact - Free Limit Switch 024.50

Technical Data

<table>
<thead>
<tr>
<th>Material Housing</th>
<th>PPSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Adaption</td>
<td>St. Steel M12x1, M16x1, other options</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>-10°C to +70°C</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>8 bar</td>
</tr>
<tr>
<td>Power Supply</td>
<td>24V DC +/- 10%</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>0.7 W</td>
</tr>
<tr>
<td>Maximum Power Input</td>
<td>30 mA</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>Multipol M12, 5 Pin, A-coded</td>
</tr>
<tr>
<td>Switching Current</td>
<td>1 ... 800 mA</td>
</tr>
<tr>
<td>Stroke Range</td>
<td>3 - 45 mm</td>
</tr>
<tr>
<td>Accuracy</td>
<td>+/- 0.1 mm</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP67 according EN 60529</td>
</tr>
<tr>
<td>Conformity according CE</td>
<td>EMV-9/336/EWG</td>
</tr>
<tr>
<td>Mounting Position</td>
<td>any</td>
</tr>
<tr>
<td>Initialization</td>
<td>Light or 24V Signal (5th pin)</td>
</tr>
</tbody>
</table>

Ordering Key

<table>
<thead>
<tr>
<th>Assembly Thread</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>for Linear Actuator</td>
<td>for Rotary Actuator</td>
</tr>
<tr>
<td>M12x1</td>
<td>024.50.120</td>
</tr>
<tr>
<td>M16x1</td>
<td>024.50.160</td>
</tr>
</tbody>
</table>

Optical Position Feedback

<table>
<thead>
<tr>
<th>Position</th>
<th>LED Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>open</td>
<td>permanent green</td>
</tr>
<tr>
<td>interim, if any</td>
<td>permanent yellow</td>
</tr>
<tr>
<td>closed</td>
<td>permanent blue</td>
</tr>
<tr>
<td>moving open</td>
<td>blinking green</td>
</tr>
<tr>
<td>moving closed</td>
<td>blinking blue</td>
</tr>
</tbody>
</table>

Dimensional Drawing

Accessories

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

Optional

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

Electrical Connection

Pin Configuration

Ordering Key

View A

Introduction Video
Installation Introduction

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

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

**Positioning:**
After mounting the electrical control head, the two cams activating the switches in the electrical control head will be mechanically moved by overcoming their holding force on the spindle. To adjust the closed position, the electric control head stem will be pushed down until contact is made with the valve actuator stem.

The adjustment of the open position takes place at the first stroke of the valve. The circumferential optical indicator is suspended on the cam for the closed position and represents the entire stroke of the valve. For the electrical connection a pre-wired pin or Bus-connection is available. The electrical control head has a reliable output and service life and contributes considerably to cost savings when considering assembly, application, and self adjustment as compared to other conventional control head options available.

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

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

For more details see TD15 0094

### 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 Namur (2-wire) (pcs)</th>
<th>Proximity switch PNP (3-wire) (pcs)</th>
<th>Solenoid Valves¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>024.63.</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>024.64.</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>024.65.</td>
<td>Pre-wired 8 pins M12 x 1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>024.89.6 AS-Interface</td>
<td>Pre-wired 4 pins M12 x 1</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>024.89.7 AS-Interface</td>
<td>Pre-wired 4 pins M12 x 1</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

¹On request, two 3/2 way solenoid valves can be integrated for all versions.

For more details see TD15 0094
**Electropneumatic Positioners EOCENT 024.16.7**

for central mounting on the top of the process control valves

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

---

**Technical Data:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Recommended for valve size</th>
<th>Type 024.16.710</th>
<th>Type 024.16.720</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DN 8 - 50</td>
<td>DN 8 - 50</td>
<td>DN 50 - 100</td>
</tr>
</tbody>
</table>

**Type**

- 024.16.710
- 024.16.720

**Technical Data:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>024.16.710</th>
<th>024.16.720</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body; C core; Sealing</td>
<td>PPS/stainless steel; PC transparent; EPDM</td>
<td>PPS/stainless steel; PC transparent; EPDM</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 - 55°C</td>
<td>0 - 55°C</td>
</tr>
<tr>
<td>Control medium</td>
<td>Neutral gases, air according DIN ISO 8573-1</td>
<td>Neutral gases, air according DIN ISO 8573-1</td>
</tr>
<tr>
<td>Pilot air ports</td>
<td>G 1/8</td>
<td>G 1/8</td>
</tr>
<tr>
<td>Supply pressure; Air flow rate</td>
<td>1 - 7 bar; 7 Ni/min</td>
<td>3 - 7 bar; 130 Ni/min</td>
</tr>
<tr>
<td>Intrinsic air consumption</td>
<td>0 l/min</td>
<td>0 l/min</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V DC +/- 10%</td>
<td>24 V DC +/- 10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 3.5 W</td>
<td>&lt; 3.5 W</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Multipol M12 (8- pins), stainless steel</td>
<td>Multipol M12 (8- pins), stainless steel</td>
</tr>
<tr>
<td>Setpoint setting; Output resistance</td>
<td>4 to 20 mA; 180 Ohm</td>
<td>4 to 20 mA; 180 Ohm</td>
</tr>
<tr>
<td>Analogue feedback</td>
<td>Optional</td>
<td>Standard</td>
</tr>
<tr>
<td>Stroke range valve spindle</td>
<td>3...28 mm</td>
<td>3 - 45 mm</td>
</tr>
<tr>
<td>Binary input</td>
<td>0 - 5 V = log &quot;0&quot;, 10 - 30 V = log &quot;1&quot;</td>
<td>0 - 5 V = log &quot;0&quot;, 10 - 30 V = log &quot;1&quot;</td>
</tr>
<tr>
<td>AS-Interface</td>
<td>NO</td>
<td>optional</td>
</tr>
<tr>
<td>Operation</td>
<td>2 Key button</td>
<td>2 Key button</td>
</tr>
<tr>
<td>Visualisation</td>
<td>2 LEDs</td>
<td>2 LEDs</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65/67 according to EN 60529 (only if cables plugs and sockets have been connected properly and in compliance with the exhaust air concept in chapter <em>pneumatic connection of positioner</em>)</td>
<td></td>
</tr>
<tr>
<td>Conformity</td>
<td>subject to CE according EMV2004/108/EG</td>
<td>subject to CE according EMV2004/108/EG</td>
</tr>
<tr>
<td>Approval</td>
<td>CSA on request</td>
<td>CSA on request</td>
</tr>
<tr>
<td>Process controller</td>
<td>NO</td>
<td>Optional</td>
</tr>
</tbody>
</table>

---

1 Pressure stated in bar: are access to atmosphere; the supply pressure has to be 0,5 - 1 bar above the minimum required pilot pressure for the valve actuator.
Operational diagramm for process valves big stroke range and with remote control installation

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

**Type**

**Technical Data:**

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body; Sealing</td>
<td>Aluminum plastic coated; EPDM</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 - 60°C</td>
</tr>
<tr>
<td>Control medium</td>
<td>Neutral gases, air according DIN ISO 8573-1</td>
</tr>
<tr>
<td>Pilot air ports</td>
<td>G 1/4</td>
</tr>
<tr>
<td>Supply pressure</td>
<td>1.4 - 7 bar 1)</td>
</tr>
<tr>
<td>Air flow rate</td>
<td>Single and double-acting up to 150 Nl/min (Q_{N, a} = 100 Nl/min acc. Definition with decrease in pressure from 7 to 6 bar absolute)</td>
</tr>
<tr>
<td>Intrinsic air consumption</td>
<td>0 l/min</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V DC +/- 10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 3,5 W</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>M12 (8 Pins)</td>
</tr>
<tr>
<td>Cable gland</td>
<td>2 x M20 x 1,5 (cable Ø 10 mm) on screw terminal</td>
</tr>
<tr>
<td>Remote version</td>
<td>1 x M12 x 1,5 (cable Ø3 to 6,5 mm)</td>
</tr>
<tr>
<td>Setting point; input resistance</td>
<td>5 to 20 mA / 180 Ohm (0 - 20 mA adjustable with configuration software)</td>
</tr>
<tr>
<td>Binary Input</td>
<td>0 - 5 V = log &quot;0&quot;, 10 - 30 V = log &quot;1&quot;</td>
</tr>
<tr>
<td>Stroke range valve spindle</td>
<td>Min. 30° on the rotary shaft, depending on lever</td>
</tr>
<tr>
<td>Operation</td>
<td>2 Key button</td>
</tr>
<tr>
<td>Visualisation</td>
<td>2 LEDs</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65/67 acc. EN 60529</td>
</tr>
<tr>
<td>Type of ignition protection</td>
<td>II 3 G nA II B T4</td>
</tr>
<tr>
<td>Conformity</td>
<td>EMV2004/108/EG</td>
</tr>
<tr>
<td>Approvals</td>
<td>CSA</td>
</tr>
<tr>
<td>Optional</td>
<td>Process controller</td>
</tr>
<tr>
<td></td>
<td>Analogue feedback</td>
</tr>
<tr>
<td></td>
<td>AS-Interface</td>
</tr>
</tbody>
</table>

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

**Operational diagramm**
Overview Product Range

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

Angle Seat Valve
- Two-Way Metal Angle Seat Valve

Flow Measurement
- Variable Area Flowmeter

Aseptic Process Solution
- Sterile sampling unit

System Components
- Contact - Free Limit Switch
- Control Head
- Digital Electropneumatic Positioner

www.sed-flowcontrol.com
<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>BPE</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>
Website


Product Configurator

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

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

Manual diaphragm valve type 905


Contact - Free Limit switch 024.50
