

Why to choose Multiport Valves?

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

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

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

Advantages at a glance:

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

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

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







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





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

1) Main line open





- 1) Multiport blocks with main line open for circulation (page 77 to 81)
- 2) Multiport blocks with all lines and valve ports able to close (page 82 to 87)



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

Description

For valve specification see page 89 as guideline



Illustration

Actuators and other options are included in some of the illustrations



Recommended installation: S3 down







1) Main line open





1) Main line open

Description

For valve specification see page 89 as guideline

1.4)

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

Recommended installation: S3 down

1.45)

MTL 4/2 – S4 left side (illustration)

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

1.6)

MXL 4/2 – S4 left side MXR 4/2 – S4 right side

(illustration) 1 x Point of use valve port

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

Recommended installation: S3 down

1.61)

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

Recommended installation: S3 down

Flow direction
 Drain direction
 Valve

Illustration

Actuators and other options are included in some of the illustrations





S2

Ŧ

S5

S2

S2

S2

S3

S4

1) Main line open

Description

For valve specification see page 89 as guideline

1.7)

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

Back to back valve actuation

Recommended installation: S3 down

1.72)

MVL 5/3 – S4 left side (illustration)

MVR 5/3 – S4 right side 1 x Point of use valve port 1 x Integral loop sample valve

port

1 x Integral sample purge valve port below the weir.

Sample and purge valve be provides on either side of the valve body.

No valve actuation on the back side

Recommended installation: S3 down

1.9) MTE 6/4

4 x Point of use valve ports The Number of valve ports is variable. **No valve actuation on the back** side

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

P&ID

S1

S1

S5

S1

S1

₽ S5

S3 S4

S3 S4

S4

S3 S5

Flow direction
 Drain direction
 Valve

Illustration

Actuators and other options are included in some of the illustrations













1) Main line open

Description

For valve specification see page 89 as guideline

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.

P&ID

S1

Flow direction
 Drain direction
 Valve

S3

S5

S6

S7

<u>S</u>4

Illustration

Actuators and other options are included in some of the illustrations



1.14)

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

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

1.16)

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

Recommended installation: S4 down





















2) All lines and valve ports able to close

Description

For valve specification see page 89 as guideline

2.1)

2.15)

side

2.17)

only.

MCE 3/2

MBE 3/2

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

Recommended installation: Dependent on design and application



Flow direction Drain direction - Valve

Illustration

Actuators and other options are included in some of the illustrations





2) All lines and valve ports able to close

Description

For valve specification see page 89 as guideline

P&ID

Flow direction
 Drain direction
 Valve

Illustration

Actuators and other options are included in some of the illustrations



4



2) All lines and valve ports able to close

Description

For valve specification see page 89 as guideline

2.38)

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

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

2.41)

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

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



- Valve

(A)

S1

(B)

S1

Flow direction

Drain direction

Illustration

Actuators and other options are included in some of the illustrations





S3



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.









SED Flow Control GmbH



2) All lines and valve ports able to close

P&ID

- Valve

Description

For valve specification see page 89 as guideline

2.49)

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

Recommended installation: S2 vertical down



Flow direction

Drain direction

Illustration

Actuators and other options are included in some of the illustrations



2.51)

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

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

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

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









2) All lines and valve ports able to close

Description

For valve specification see page 89 as guideline

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



Flow direction Drain direction - Valve



Actuators and other options are included in some of the illustrations





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





S1









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

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









2) All lines and valve ports able to close

Description

For valve specification see page 89 as guideline

2.81)

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

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

P&ID

→ Flow direction → Drain direction → Valve

S

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.

















Aseptic Diaphragm Valve Configurations



Emergence of customized multiport valve designs

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





Drawing Multiport Valve Cluster





Images of the installation







For multiport valve configuration, please use our online configurator.

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

Specification form

Your P&ID Sketch:	Example: P&ID	Working pressure:bar
	↓ × →	Working temperature:°C
		Multiport valve body material: 1.4435/316L 1.4435/316L (Fe < 0,5%)
		Surface finish multiport body: 02 Ra ≤ 0,8 µm 03 Ra ≤ 0,8 µm e-polished 07 Ra ≤ 0,6 µm
Tubo End:	\$1. \$2	$08 \text{Ra} \le 0.6 \text{ µm e-polished}$ $09 \text{Ra} \le 0.4 \text{ µm}$ $10 \text{Ra} \le 0.4 \text{ µm e-polished}$ $SE1 \text{Ra} \le 0.51 (20 \text{ u-inch})$
IDDE EIIG.	51, 52,	$SF2 Rg \le 0.64 (25 \mu-inch)$
Preferred Installation:	Horizontal (H) / Vertical (V)	SF3 Ra ≤ 0,76 (30 µ-inch)
		SF4 Ra ≤ 0,38 (15 µ-inch) e-polished
Flow Direction:	\rightarrow	SF5 Ra ≤ 0,51 (20 µ-inch) e-polished
		SF6 Ra \leq 0,61 (25 µ-inch) e-polished
Drain Direction:	-	Dianhuran material:
Valve Seat:		EPDM Code PTFE Code
		O ther

Page in catalogue:		Page 21				Page 26 - 27	Pag	ge 132 - 139
Tube end	Preferred	Tube end connection			1	Actu	Other	
No	Installation	DN	s[mm]	D[mm]	Code	Actuator Type	Control Function	Accessories / Comments
S1								
S2								
S3								
S4								
S5								
S6								
S7								
S8								
S9								
S10								
S11								
S12								



Aseptic Diaphragm Valve Configurations

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