



Simply Unique Diaphragm Valves

Unique DV-ST UltraPure

Application

Alfa Laval Unique diaphragm valves offer a complete range covering every need, for use in sterile and ultra-hygienic processes. The Unique diaphragm valves include a wide variety of valve bodies, diaphragms, actuators, handles, automation and control units.

Standard Design

With its modular design, almost all configurations are feasible. The valve comprises:

- Valve body
- Diaphragm
- Handle or actuator
- Automation and control units

Documentation

All UltraPure valves are delivered with our comprehensive Q-Doc documentation package, which includes:

- 3.1/ MTR traceability certificate corresponding to EN 10204
- FDA - Declaration of conformity to FDA (CFR 21: 177.2600 or 177.1550)
- USP - Certificate of conformity to USP Class VI (Chapter 88, biological reactivity test)
- TSE/ADI - Declaration (Transmissible Spongiform Encephalopathy/Animal Derived Ingredients)
- Surface finish conformity declaration

The following documentation is available upon request:

- Surface finish certificate (Ra test results)
- ATEX certificate

Valve Body Design

The valve bodies are available in a wide variety of valve types and configuration options (dimension standards, connections, surface finish and material).

- 2-way valves
- T-valves
- Tank outlet valves
- Tandem valves
- Multi-port valves

Material and surface finish:

2-way valves are available in forged or cast material. T-valves, tank outlet valves and tandem valves are available in forged. Multiport valves are made from block material.



Valve types	Cast	Forged	Block
	CF3M (316L)	1.4435 (316L)	1.4435 (316L)
2-way valve	✓	✓	
T-valve		✓	✓
Tank outlet valve		✓	✓
Tandem valve		✓	✓
Multi-port valve			✓

Type	Cast	Forged and block
Material	CF3M (316L)	1.4435 (316L)
Delta ferrite	< 2.0%	< 0.5%
Sulphur content	< 0.04%	0.005-0.017%
Internal surface finish ¹⁾	Ra < 0.6µm	Ra < 0.5µm Ra < 0.4µm EP ²⁾
External surface finish	Blasted	Blasted

¹⁾ Other surface finishes are available on request.

0,6µm = SF2, 0,5µm = SF1, 0,4µm = SF4

²⁾ Electro Polished

Modular design

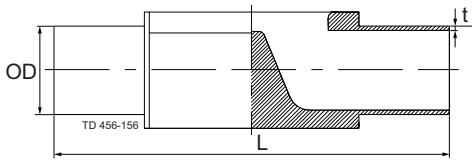
With its modular design, almost all configurations are feasible.

The valve comprises:

- Valve body
- Diaphragm
- Handle or actuator
- Automation and control units



Dimensions 2-way valve bodies:

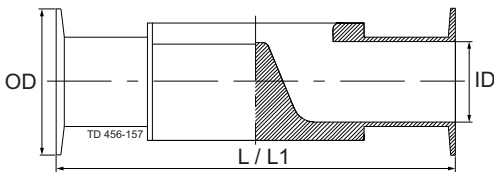


Weld ends: (mm)

Port size		Length	ASME BPE	ISO 2037	Series A/DIN	Series B/ISO	BS 4825
DN	Inch	L	OD x t	OD x t	OD x t	OD x t	OD x t
8	¼"	89	6.35 x 0.89 ¹⁾	12.00 x 1.00 ¹⁾	10.00 x 1.00 ¹⁾	13.50 x 1.60 ¹⁾	
10	⅜"	89	9.53 x 0.89 ¹⁾	12.70 x 1.00 ¹⁾	13.00 x 1.50	17.20 x 1.60	
15	½"	110	12.70 x 1.65	17.20 x 1.00 ¹⁾	19.00 x 1.50	21.30 x 1.60	12.70 x 1.20 ¹⁾
20	¾"	119	19.05 x 1.65	21.30 x 1.00 ¹⁾	23.00 x 1.50	26.90 x 1.60	19.05 x 1.20 ¹⁾
25	1"	129	25.40 x 1.65	25.00 x 1.20	29.00 x 1.50	33.70 x 2.00	25.40 x 1.60
40	1 ½"	161	38.10 x 1.65	38.00 x 1.20	41.00 x 1.50	48.30 x 2.00	38.10 x 1.60
50	2"	192	50.80 x 1.65	51.00 x 1.20	53.00 x 1.50	60.30 x 2.00	50.80 x 1.60
65	2 ½"	218	63.50 x 1.65 ¹⁾	63.50 x 1.60 ¹⁾	70.00 x 2.00	76.10 x 2.00 ²⁾	63.50 x 1.60 ¹⁾
80	3"	256	76.20 x 1.65 ¹⁾	76.10 x 1.60 ¹⁾	85.00 x 2.00	88.90 x 2.30	76.20 x 1.60 ¹⁾

¹⁾ Forged only

²⁾ Cast valves 76.10 x 2.30



Clamp ends: (mm)

Port size		Length	Length	Clamp ASME BPE		Clamp ISO 2852		Clamp DIN 32676		Clamp DIN 32676		Clamp for BS 4825	
DN	Inch	L	L1 ²⁾	for ASME BPE OD	ID	for ISO 2037 OD	ID	for Series A/DIN OD	ID	for Series B/ISO OD	ID	OD	ID
8	¼"	65	65	25.00	4.57 ¹⁾	34.00	10.00 ¹⁾	25.00	8.00 ¹⁾	25.0	10.3 ¹⁾		
10	⅜"	65	65	25.00	7.75 ¹⁾	34.0	10.70 ¹⁾	34.00	10.00 ¹⁾	25.0	14.0 ¹⁾		
15	½"	108	89	25.00	9.40	34.00	15.20 ¹⁾	34.00	16.00 ¹⁾	50.5	18.1 ¹⁾	25.00	9.50
20	¾"	118	102	25.00	15.75	50.50	19.30 ¹⁾	34.00	20.00 ¹⁾	50.5	23.7 ¹⁾	25.00	15.90
25	1"	127	114	50.50	22.10	50.50	22.60	50.50	26.00 ¹⁾	50.5	29.7 ¹⁾	50.50	22.20
40	1 ½"	159	140	50.50	34.80	50.50	35.60	50.50	38.00 ¹⁾	64.0	44.3 ¹⁾	50.50	34.90
50	2"	191	159	64.00	47.50	64.00	48.60	64.00	50.00 ¹⁾	77.5	56.3 ¹⁾	64.00	47.60
65	2 ½"	216	194	77.50	60.20 ¹⁾	77.50	60.30 ¹⁾	91.00	66.00 ¹⁾	91.0	72.1 ¹⁾	77.50	60.30 ¹⁾
80	3"	254	222	91.00	72.90 ¹⁾	91.00	72.90 ¹⁾	106.00	81.00 ¹⁾	106.0	84.3 ¹⁾	91.00	73.00 ¹⁾

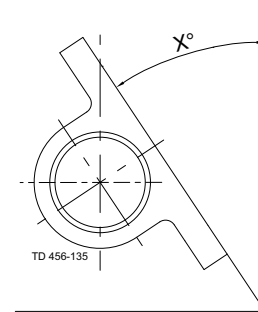
¹⁾ Forged only

²⁾ ASME BPE Clamp, short version, forged valves only

Other sizes and connections available on request.

Drain angle x :

Port size		ASME BPE	ISO 2037	Series A/ DIN11866	Series B/ ISO 1127	BS 4825
DN	Inch					
8	1/4"	37°	27°	27°	22°	37°
10	3/8"	33°	28°	28°	31°	35°
15	1/2"	32°	23°	23°	18°	33°
20	3/4"	26°	23°	23°	15°	27°
25	1"	21°	25°	21°	20°	25°
40	1 1/2"	24°	24°	22°	18°	24°
50	2"	24°	24°	23°	20°	24°
65	2 1/2"	20°	22°	19°	15°	22°
80	3"	21°	25°	22°	15°	25°



Drain angle x :

Other valve body configurations

T-valve body:

Alfa Laval also offers T-valve bodies where the weir of the T-valve is as close as possible to the internal contour of the main tube and thereby minimises dead leg.

The T-valves are available as machined from block or from forged material.



For dimensions and further details, please contact Alfa Laval.

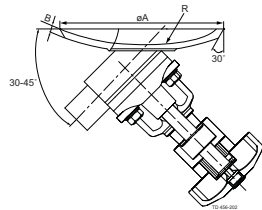
Tank outlet valve body:

Alfa Laval also offers compact tank outlet valves with minimised dead leg and complete drainability. The tank outlet valves are available as machined from block or from forged material and is available both as a tank bottom valve and a tank wall valve.



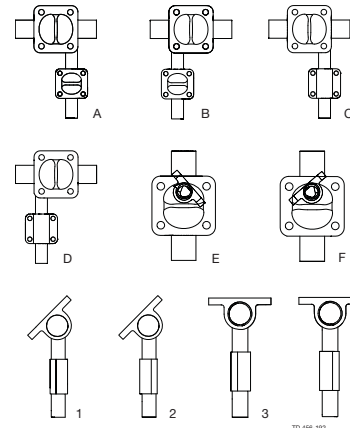
DN	øA (mm)	B (mm)	R (mm)
15 (1/2")	90	6	500
20 (3/4")	100	6	600
25 (1")	120	6	750
40 (1 1/2")	150	6	900
50 (2")	180	6	1000

Other dimensions on request



Tandem valve body:

The tandem valves are available in a wide variety of angles and positions. Tandem valves are available as machined from block or from forged material.



For dimensions and further details, please contact Alfa Laval.

Multi-port valve body:

Multi-port valves are a space and time saving alternative to valve clusters. Alfa Laval offers customised solutions for both simple and complex processes.



For more details, please contact Alfa Laval.

Diaphragm design:

The diaphragms are available in soft elastomers (EPDM, FPM and Silicone) as well as hard elastomers (PTFE and TFM).

The hard elastomers are supported by a soft elastomer (EPDM or FPM). The 2-piece design allows the two elastomers to work independently of each other, thereby reducing tension caused by different thermic properties.

Diaphragms are available with 3 different types of connection: thread, bayonet and button connection.

- Threaded connections are used on all soft elastomers \geq DN 25 (1")
- Bayonet connections are used on all hard elastomer \geq DN 15 (1/2")
- Button connections are used on all small sizes.

Material selection:

Each application has different working conditions and therefore different demands on the diaphragm. In order to select the most suitable diaphragm for your application, the following factors should be considered:

- Working pressure
- Application temperatures
- Process fluids (product, cleaning liquid, sterilisation, passivation, etc.)

Soft elastomers (EPDM, FPM and Silicon) are suitable for most applications and for high working temperatures. A typical feature of soft elastomer diaphragms is their suitability for mechanical polluted media. In addition, EPDM is suitable for continuous steam application, whereas FPM is not recommended for use in steam applications.

Hard elastomers offer the highest possible degree of chemical resistance. Our TFM (PFTE grade) elastomer is a more flexible material and has some of the features of soft elastomer including for example low creep.

for further information, please see the following page or contact Alfa Laval for further guidance.

Diaphragm properties:

Code	Description	Temperature recommendations °C			Documentation			Available sizes	Available Diaphragm connections:		
		Min.	Max.	Max.	FDA	USP	TSE		Button	Thread	Bayonet
S2	EPDM	-40°C	130°C	150°C ¹⁾	✓	✓	✓	DN 8 - 100	DN 8 - 20	DN 25 - 100	
93/70	PTFE/FPM	-5°C	175°C	150°C ²⁾	✓	✓	✓	DN 8 - 100	DN 8 - 10	DN 15 - 100	
93/S2	PTFE/EPDM	-5°C	175°C	150°C ²⁾	✓	✓	✓	DN 15 - 100		DN 15 - 100	
LC/S2	TFM/EPDM	-5°C	175°C	150°C ²⁾	✓	✓	✓	DN 8 - 100	DN 8 - 10	DN 15 - 100	

¹⁾ Continuous temperature

²⁾ 40 min. steam sterilisation

³⁾ FPM on request

FDA - Declaration of conformity to FDA (CFR 21: 177.2600 or 177.1550)

USP - Certificate of conformity to USP Class VI (chapter 88, biological reactivity test)

TSE/ADI Declaration (Transmissible Spongiform Encephalopathy /Animal Derived Ingredients)

Handle and actuator options:

The diaphragm valves can be operated by a handle or a pneumatic actuator. Alfa Laval offers 4 different types of manual handles and 3 different types of pneumatic actuators. The special design of the actuators enables quick conversion of the control function (NC to Air/Air to NO) and permits adjustment of the spring pressure to optimise the sealing life.

The handles and actuators are available in different materials: Stainless Steel (SS), Composite (C) and with various features and options.

Actuators

			
Model	SS/SS	C/SS	C/C
Sizes	DN 8 - 50	DN 8 - 80	DN 15 - 50 & 100
Housing	Stainless steel	PPS / PP-GF ¹⁾	PPS / PP-GF ¹⁾
Intermediate part	Stainless steel	Stainless steel	PPS / PP-GF ¹⁾
Compressor, stem	Stainless steel	Stainless steel	Stainless steel ²⁾
Max. working pressure	10 bar	10 bar	10 bar
Max. temperature control media	80°C	50°C	50°C
Max. pressure control media	6 bar	6 bar	6 bar
ATEX, Ex II 2GDc	✓	✓	
Optical positioner	✓	✓	✓
Interchangeable control function		✓	✓ ⁴⁾
Adjustable spring pressure	✓	✓	✓
Autoclavable	✓ ³⁾	✓ ³⁾	✓ ³⁾





¹⁾ PPS (Polyphenylene sulphide) for sizes up to 2" and PP (Polypropylene) with glass fibre or sizes from 2 ½" and up

²⁾ Compressor for 4" (DN100) is made from Aluminium

³⁾ 121°C for max. 60 min

⁴⁾ NO + A/A actuator in C/C is not possible to mount on PTFE diaphragm.

Handles

				
Model	SS/SS	SS/SS	SS/SS	C/C
Size	DN 8 - 50	DN 65 - 80	DN 8 - 80	DN 15 - 50
Handwheel	Stainless steel	Stainless steel	POM ²⁾	PP
Bonnet	Stainless steel	Stainless steel	Stainless steel	PP
Spindle + compressor	Stainless steel	Stainless steel	Stainless steel	Brass
Max. working pressure	10 bar	10 bar	10 bar	10 bar
Overclosure protection	✓	✓	✓	✓
Optical positioner	✓	✓	✓	✓
Lockable (if ordered)				✓
Autoclavable	✓ ³⁾	✓ ³⁾	✓ ³⁾	✓ ⁴⁾

¹⁾ For DN 65 and up, the compressor is nickel plated cast iron

²⁾ POM (Polyoxymethylene)

³⁾ 121°C for max. 60 min.

⁴⁾ Max. working temperature 80°C

Automation and control units:

A wide range of automation and control units are available for actuators consisting of:

- Controls unit
- Indication units
- Electrical ATEX units
- Stroke limiters

Ordering

The valves are sold as complete valves and the item numbers for the standard program are included in the ordering leaflets.

For other configurations please specify:

- Port size
- Body configuration
- Tube standard
- Connection
- Surface finish
- Stainless steel quality
- Diaphragm type
- Handle or actuator type
- Additions including hash marks, leakage detection etc.

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