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Alfa Laval Unique Mixproof UltraPure

Double seat valves

Introduction

Alfa Laval Unique Mixproof UltraPure (UP) Valve is a versatile, highly flexible double block-and-bleed valve for the safe and efficient management of fluids at intersection points in matrix piped systems of high-purity process lines. The valve enables the simultaneous flow of two different products or fluids through the same valve without the risk of cross-contamination.

Modular design and a wide variety of options enable the valve to be customized to meet any process requirement needed—whether higher demands on cleanability, the ability to withstand high pressure, or greater resistance against corrosive conditions.

This provides optimized efficiency, a higher degree of plant flexibility, maximum high-purity process uptime, and uncompromised levels of product safety.

Application

The Alfa Laval Unique Mixproof UP Valve is designed for continuous flow management of product in high-purity applications across the biotechnology, pharmaceutical and other high-purity industries where the Alfa Laval Q-doc documentation package and full traceability is a requirement.

Benefits

- Modular, high-purity design
- Cost-effective, spillage-free operation
- Optimized plant efficiency and enhanced cleanability
- Leakage detection and leakage chamber cleaning
- Full component traceability with Q-doc

Standard design

The Alfa Laval Unique Mixproof UP Valve is comprised of a series of base components, including valve body, valve plug, actuator, and cleaning options and accessories that support a wide range of applications. Leakage detection holes enable visual inspection without requiring valve disassembly and provide advance notification of parts wear. Few straightforward moveable parts contribute to reliable operation and reduced maintenance costs. The valve can also be fitted



with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.

Working principle

The Alfa Laval Unique Mixproof UP Valve is a normally closed (NC) valve controlled from a remote location by means of compressed air. The valve has two independent plug seals to separate the liquids; the space between the seals forms a leakage chamber under atmospheric pressure during every working condition. Leakage rarely occurs but, should it occur, product flows into the leakage chamber and exits through the bottom outlet for easy detection.

When the valve is open, the leakage chamber is closed. The product then flows from one line to the other. The radial design of the valve ensures that virtually no product spillage occurs during valve operation. It is possible to adapt valve cleaning and water hammer protection to the requirements of individual process specifications.

Certificates



Authorized to carry
the 3A symbol

TECHNICAL DATA

Pressure

Max. product pressure:	145 psi (10 bar)
Min. product pressure:	Full vacuum

Temperature

Temperature range:	23°F to +257°F (depending on elastomer)
Steaming in Place (SIP):	284°F - 40 mins (depending on elastomer)



Note! Steaming In Place. It is recommended to allow the valve to cool down to operational temperature before operating the valve to minimize seal wear

Actuator air pressure:	87 to 116 psi (6-8 bar)
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ATEX

Classification:	II 2 G D ¹
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Note! In order to use Unique Mixproof valves in ATEX environment, the blue plastic cover at lower plug must be removed for the valve types where the valve is delivered with the cover mounted

¹ This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source

PHYSICAL DATA

Materials

Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)

Surface finish choose from the following:

Internal:	Ra < 32 µin
Optional:	Ra < 20 µin or < 16 µin EP
External:	Polished



Note! The Ra values are only for the internal surface.

Product wetted seals:	EPDM Acc. To FDA & USP Class VI
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Other seals:

CIP seals:	EPDM
Actuator seals:	NBR
Guide strips:	PTFE

Pressure drop/capacity diagrams

ΔP (kPa)

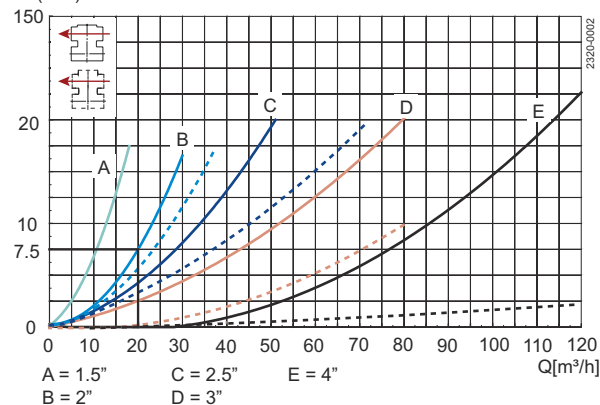


Figure 1. Pressure drop/capacity diagram, upper body.

Full lines: Balanced upper plug.

Dotted lines: Unbalanced upper plug.

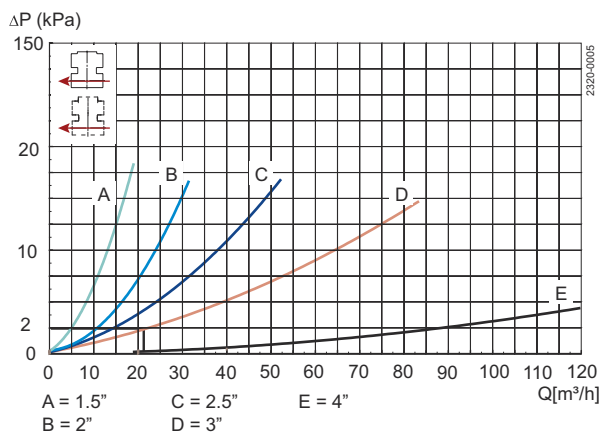


Figure 2. Pressure drop/capacity diagram, lower body, balanced

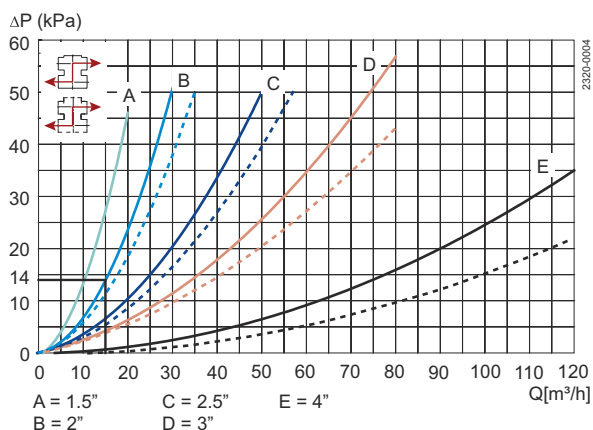


Figure 3. Pressure drop/capacity diagram, between bodies.

Full lines: Balanced.

Dotted lines: Unbalanced.



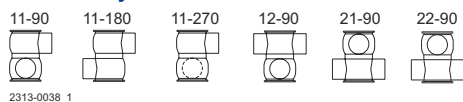
Note!

For the diagrams the following applies:

Medium: Water. (68°F)

Measurement: In accordance with VDI 2173.

Valve body combinations



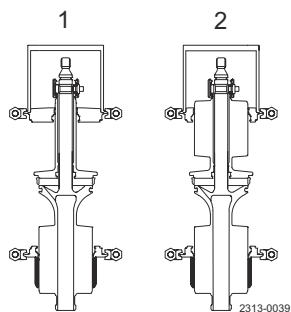
Valve body combinations, example: type 11-90

1 Number of ports - lower valve body

1 Number of ports - upper valve body

90° Angle between ports

Balancing plugs:



1. Lower balanced plug
2. Upper and lower balanced plugs

Options

- Control and Indication: ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Leakage chamber collection
- Other sizes, options and configurations on request

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

Air and CIP consumption

ASME BPE	1½"	2"	2½"	3"	4"
Kv-value					
Upper Seat-lift [gallon/h]	396.26	396.26	660.43	660.43	818.93
Lower Seat-lift [m³/h]	237.75	237.75	501.93	501.93	660.43
Air consumption					
Upper Seat-lift ¹ [n gallon]	0.052	0.05	0.11	0.11	0.16
Lower Seat-lift ¹ [n gallon]	0.29	0.29	0.03	0.03	0.06
Main Movement ¹ [n gallon]	0.23	0.23	0.43	0.43	0.74

¹ [n litre] = volume at atmospheric pressure. Formula to estimate CIP flow during seat lift: (for liquids with comparable viscosity and density to water): $Q = K_v \cdot \sqrt{\Delta p} Q = \text{CIP - flow (m}^3/\text{h)}$ $K_v = K_v$ value from the above table $p = \text{CIP pressure (bar)}$

Actuator

	STD Operating pressure at 87 psi air pressure				
Actuator Type	3	4BS ¹	4SS ²	5BS ¹	5SS ²
Actuator dimensions øD x L	4.72 x 9.06	6.18 x 9.92	7.32 x 11.06	7.32 x 11.06	7.32 x 14.92
Connection Size					
ASME BPE					
1½"	STD ³	OP ⁴			145 psi

¹ BS = Basic spring

² SS = Strong spring

³ STD: Normal size of actuator

⁴ OP: Alternative size of actuator (NB: For choice and performance of optional actuators please contact Alfa Laval or refer to the Anytime Configurator).

						STD Operating pressure at 87 psi air pressure
2"	STD ³	OP ⁴	OP ⁴			145 psi
2½"	OP ⁴	STD ³	OP ⁴	OP ⁴	OP ⁴	145 psi
3"	OP ⁴	STD ³	OP ⁴	OP ⁴	OP ⁴	145 psi
4"		OP ⁴	OP ⁴	STD ³	OP ⁴	145 psi

¹ BS = Basic spring

² SS = Strong spring

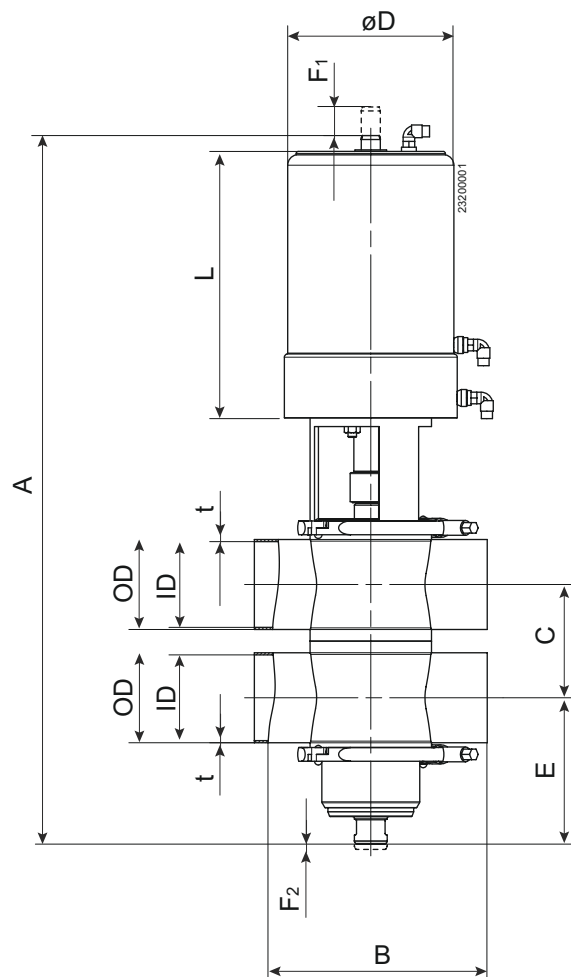
³ STD: Normal size of actuator

⁴ OP: Alternative size of actuator (NB: For choice and performance of optional actuators please contact Alfa Laval or refer to the Anytime Configurator).

Radial Seat Diameter

ASME BPE	Seat (mm)	Seat (in)
1½"	ø53.3	ø2.10
2"	ø53.3	ø2.10
2½"	ø81.3	ø3.20
3"	ø81.3	ø3.20
4"	ø100.3	ø3.95

Dimensions (inch)



Size ASME BPE	DN/OD									
	1½"		2"		2½"		3"		4"	
	mm	in	mm	in	mm	in	mm	in	mm	in
A -	530	20.87	575	22.64	670	26.38	670	26.38	791	31.14
B	170	6.69	220	8.66	220	8.66	220	8.66	300	11.81
C ¹	60.8	2.39	73.5	2.89	86.2	3.39	98.9	3.89	123.4	4.86

¹ The measure C can always be calculated by the formula $C = \frac{1}{2}ID_{upper} + \frac{1}{2}ID_{lower} + 26 \text{ mm (1.02 in)}$.

Size ASME BPE	DN/OD									
	1½"		2"		2½"		3"		4"	
	mm	in	mm	in	mm	in	mm	in	mm	in
OD	38.1	1.5	50.8	2	63.5	2.5	76.2	3	101.6	4.00
ID	34.8	1.37	47.5	1.87	60.2	2.37	72.9	2.87	97.4	3.83
T	1.65	0.06	1.65	0.06	1.65	0.06	1.65	0.06	2.11	0.08
E	100	3.94	121	4.76	149	5.87	142	5.59	177	6.97
F1	31.5	1.24	31.5	1.24	38	1.5	38	1.5	59	2.32
F2	5	0.2	5	0.2	5	0.2	5	0.2	5	0.20
øD -	120	4.72	120	4.72	157	6.18	157	6.18	186	7.32
L -	230	9.06	230	9.06	252	9.92	252	9.92	281	11.06
Weight (kg) (lb) -	13.5	29.76	15	33.07	24	52.91	24	52.91	34	74.96

¹ The measure C can always be calculated by the formula $C = \frac{1}{2}ID_{upper} + \frac{1}{2}ID_{lower} + 26 \text{ mm (1.02 in.)}$.

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