

Alfa Laval SMP-BC

Double seal valves

Introduction

The Alfa Laval SMP-BC Mixproof Valve is a hygienic pneumatic double-seal valve that safely handles the simultaneous flow of two different products through the same valve without any risk of cross-contamination. Standardized and cost-effective, the top-loaded valve is designed for quick leakage detection to maximize product safety and low maintenance due to few moving parts. It is often used in Cleaning-in-Place (CIP) lines and can also be used in other systems handling products.

Application

The Alfa Laval SMP-BC Mixproof Valve is designed for hygienic applications that require additional safety, leakage detection and CIP in the dairy, food and beverage, personal care and many other industries.

Benefits

- Hygienic double-seal mixproof valve
- Versatile, modular design meets most hygienic application requirements
- Cost effective

Working principle

The Alfa Laval SMP-BC Mixproof Valve is controlled by means of compressed air from a remote location. The valve is fitted with two small pneumatic normally open (NO) valves, a detecting valve and a CIP valve. The valve plug has two seals, which form an atmospheric leakage chamber. Any product leakage is discharged through the detecting valve. The leakage chamber may be cleaned by supplying a CIP system into the detecting valve. The SMP-BC is insensitive to water hammer in the product line above the plug.

Standard design

The Alfa Laval SMP-BC Mixproof Valve consists of valve bodies, bonnet, plug and an actuator. Two versions are available: a shut-off valve with one valve body and a shut-off valve with two valve bodies. A plug clip system and clamp rings secure the valve bodies to the actuator. The valve can also be fitted with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.



TECHNICAL DATA

Pressure

Max. product pressure (depending on valve specifications):	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	500 to 800 kPa (5 to 8 bar)

Temperature

Temperature range:	-10°C to +140°C (EPDM)
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ATEX

Classification	II 2 G D*
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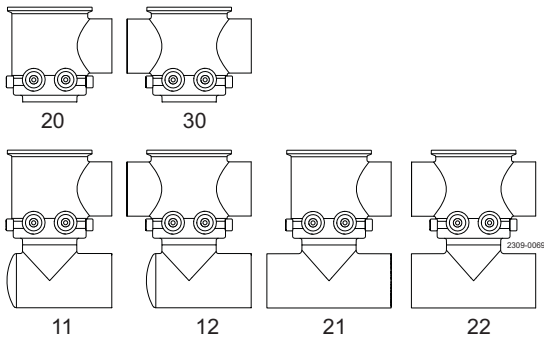
*This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source

PHYSICAL DATA

Material

Product wetted steel parts:	1.4401 (316L)
External surface finish	Semi-bright (blasted)
Internal surface finish	$Ra \leq 1.6 \mu m$
Optional:	Bright Polished $Ra \leq 0.8 \mu m$
Other steel parts:	1.4301 (304)
Product wetted seals:	EPDM (optional: NBR, FPM)
Other seals:	NBR

Valve body combination



Type 20 and 30 body versions are on request available in following configurations:

- Tee welded on lower port in 0 or 90 deg. version. Type: 21 and 22
- Bend welded on lower port in 0, 90, 180 or 270 deg. version. Type: 11 and 12

Options

- A. Male parts or clamp liners in accordance with required standard.
- B. Control and Indication: ThinkTop V50 and V70, IndiTop.
- C. Actuator with stronger spring.
- D. Larger actuator for valve sizes 38-51 mm/DN40-50.
- E. CIP installation kits.
- F. Other valve body combinations.
- G. Service tools for actuator.
- H. Tool for plug seals (Necessary for changing the seals).

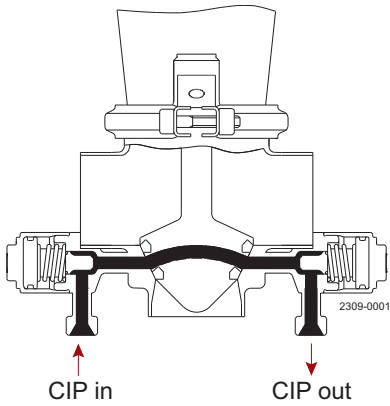
Note!

For further details, see also instruction manual ESE02255.

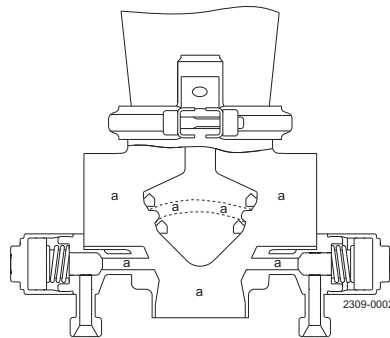
Air consumption (litres free air) for one stroke

Size	38-51 mm DN 40-50	63.5101.6 mm DN 65100	DN 125-150	DN 125-150
Stop valve	0.2 x air pressure (bar)	0.7 x air pressure (bar)	1.5 x air pressure (bar)	2.2 x air pressure (bar)
Actuator function	NC	NC	NC	NC
Stop valve			3.6 x air pressure (bar)	2.9 x air pressure (bar)
Actuator function			NC (Support air for closing)	NC (Support air for opening)

Operation/cleaning



a. Closed shut-off valve:
Cleaning of the leakage
chamber.

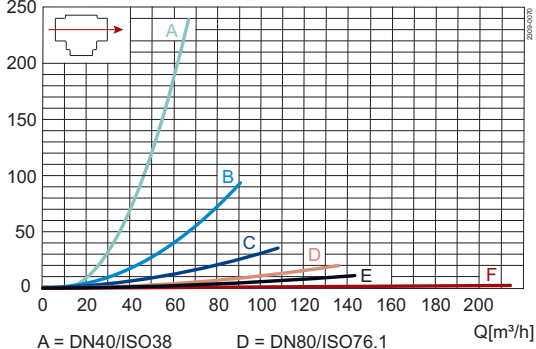


b. Open shut-off valve
a. Cleaning of the valve body and
the leakage chamber.

Pressure drop/capacity diagrams

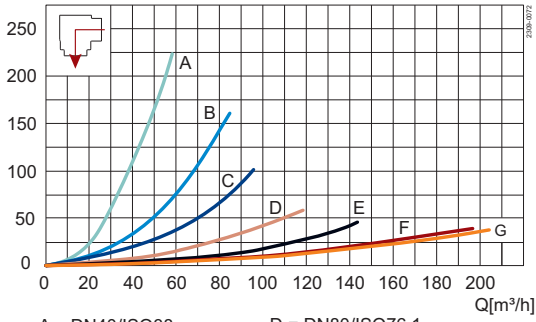
Shut-off valve:

ΔP (kPa)



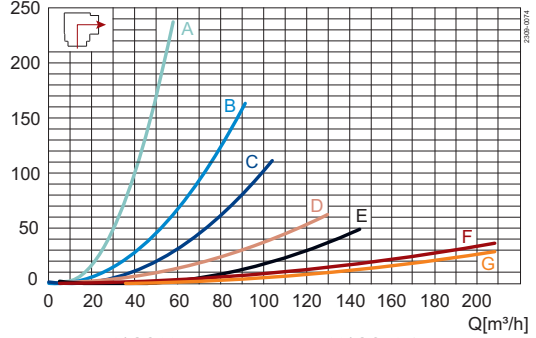
A = DN40/ISO38 D = DN80/ISO76.1
 B = DN50/ISO51 E = DN100/ISO101.6
 C = DN65/ISO63.5 F = DN125/DN150

ΔP (kPa)



A = DN40/ISO38 D = DN80/ISO76.1
 B = DN50/ISO51 E = DN100/ISO101.6
 C = DN65/ISO63.5 F = DN125
 G = DN150

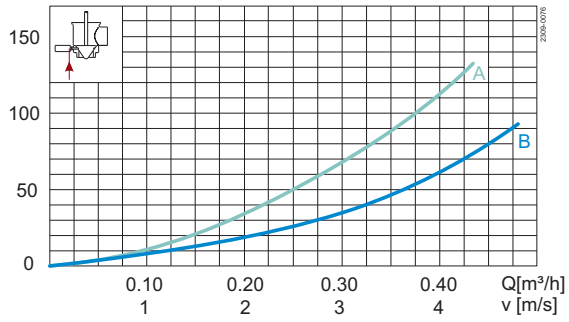
ΔP (kPa)



A = DN40/ISO38 D = DN80/ISO76.1
 B = DN50/ISO51 E = DN100/ISO101.6
 C = DN65/ISO63.5 F = DN125
 G = DN150

Leakage chamber, pressure drop and flow velocity.

ΔP (kPa)



A = CIP / Detecting valve $\varnothing 27$

B = CIP / Detecting valve $\varnothing 32$

Note! For the diagrams the following applies:

Medium: Water (20°C).

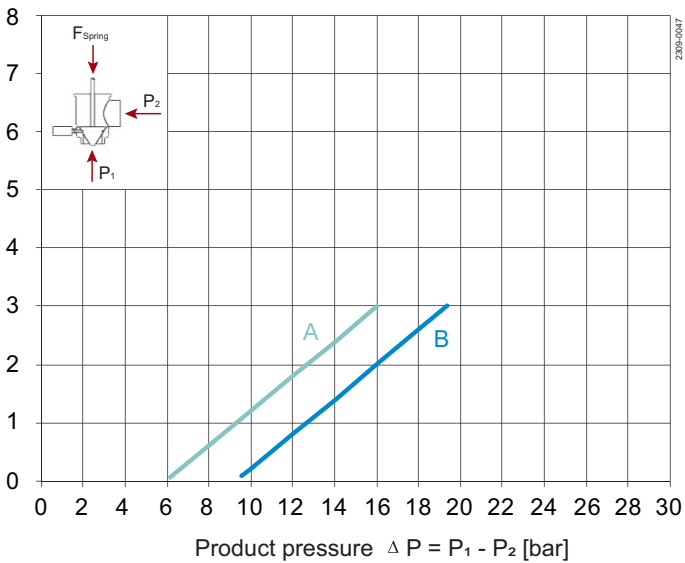
Measurement: In accordance with VDI 21

Max pressure difference/support air pressure diagrams

Upper plug max. product pressure without leakage, as a function of support air:

ø89 Actuator

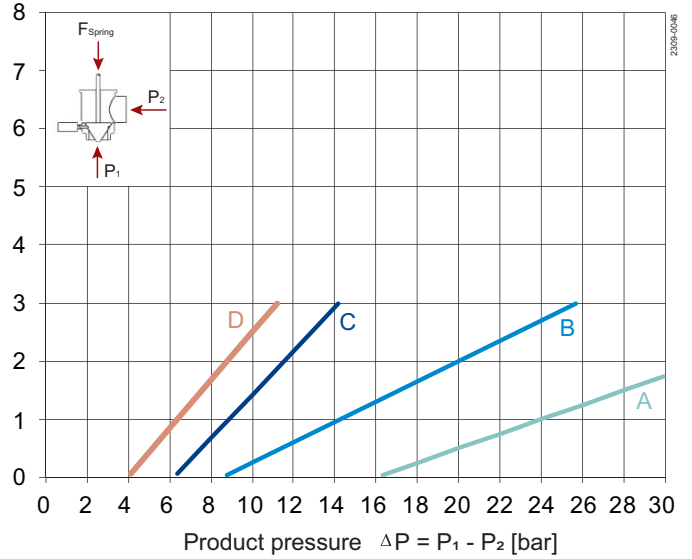
Support air P_{air} [bar]



A = ø89 Std. spring: DN40/DN50, ISO38/ISO51
 B = ø89 Strong spring: DN40/DN50, ISO38/ISO51

ø133 actuator with standard spring

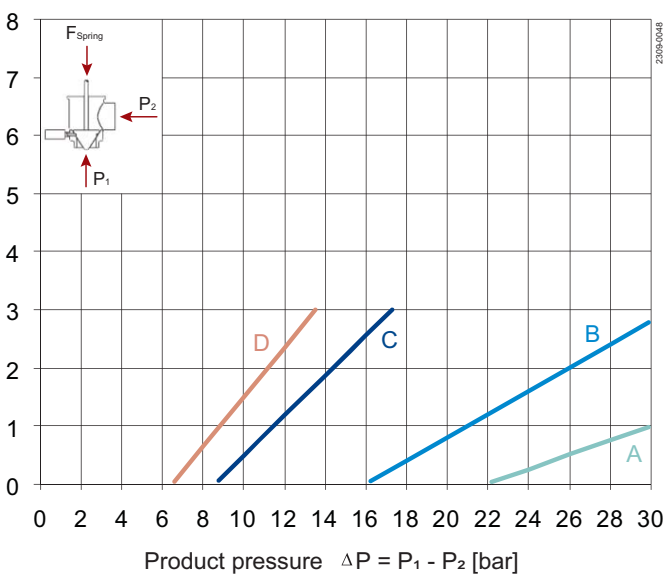
Support air P_{air} [bar]



A = DN40/DN50, ISO38/ISO51 C = DN80, ISO76.1
 B = DN65, ISO63.5 D = DN100, ISO101.6

ø133 actuator with strong spring

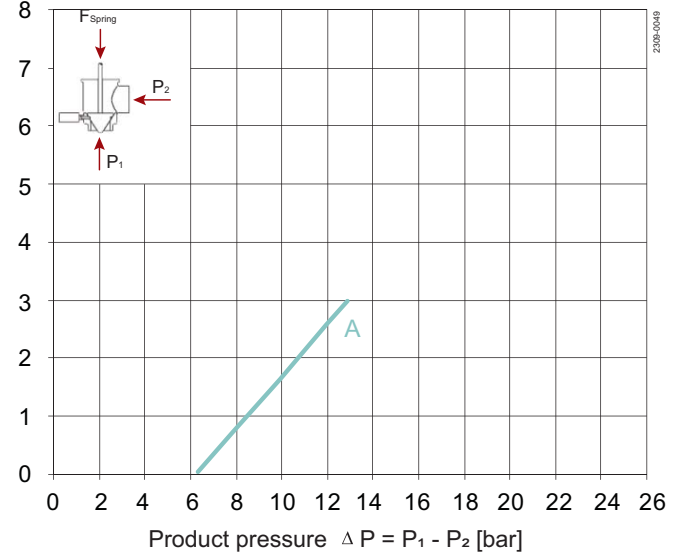
Support air P_{air} [bar]



A = DN40/DN50, ISO38/ISO51 C = DN80, ISO76.1
 B = DN65, ISO63.5 D = DN100, ISO101.6

ø199 actuator

Support air P_{air} [bar]

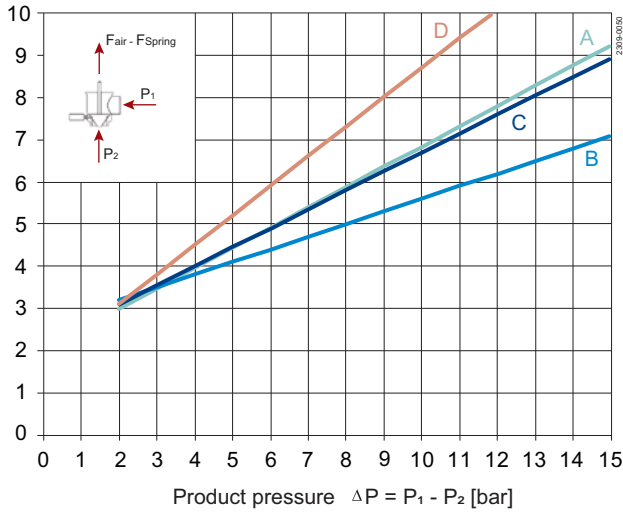


A = DN125, DN150

Upper plug max. product pressure against which the valve can open, as a function of air pressure:

ø89 Actuator with standard spring

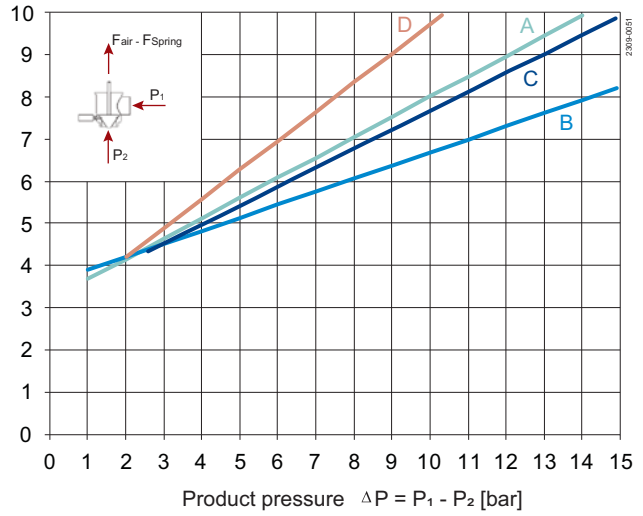
Support air P_{air} [bar]



- A = DN40/DN50, ISO38/ISO51
- B = DN65, ISO63.5
- C = DN80, ISO76.1
- D = DN100, ISO101.6

ø89 actuator with strong spring

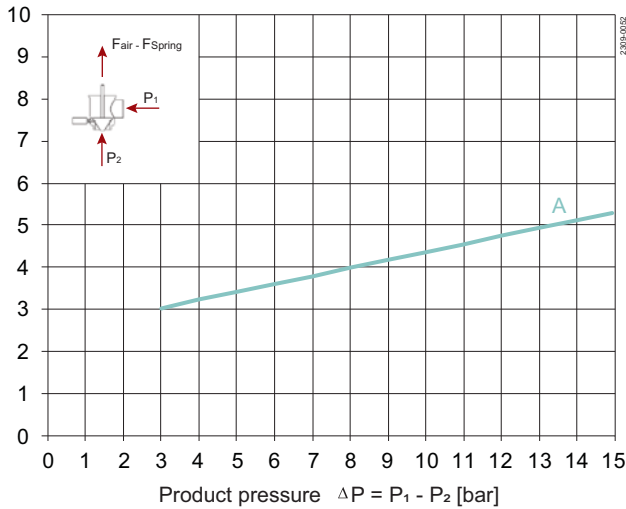
Support air P_{air} [bar]



- A = DN40/DN50, ISO38/ISO51
- B = DN65, ISO63.5
- C = DN80, ISO76.1
- D = DN100, ISO101.6

ø133 actuator with standard spring

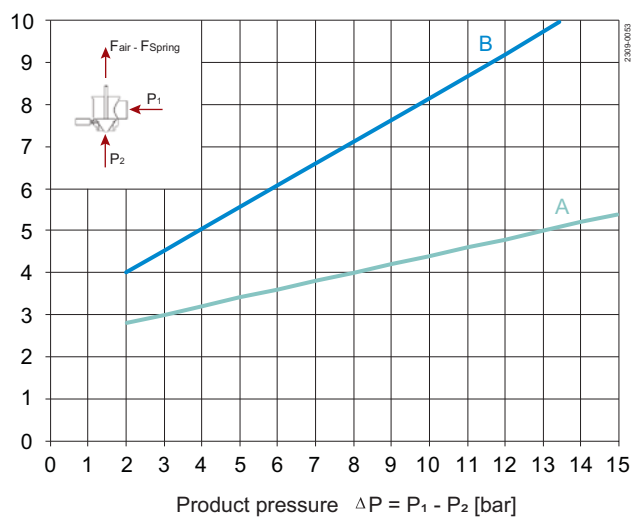
Support air P_{air} [bar]



- A = DN40/DN50, ISO38/ISO51

ø133 actuator with strong spring

Support air P_{air} [bar]

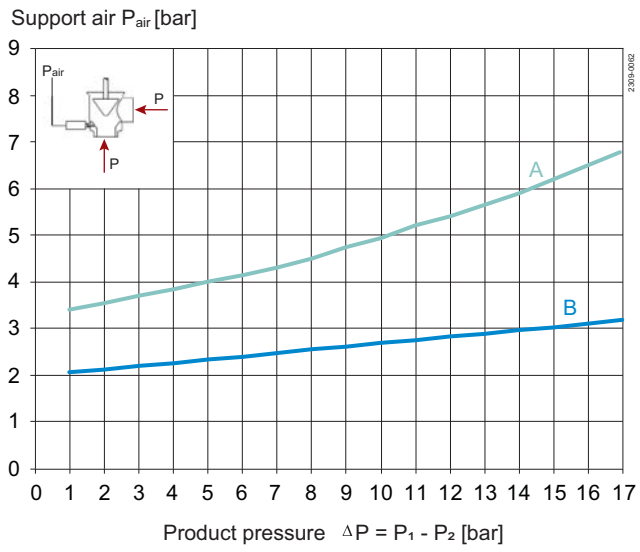


- A = DN40/DN50, ISO38/ISO51
- B = DN125, DN150

Note! If actuator is supported by air on spring side; max allowable pressure is 300 kPa (3 bar)

Air reduction valve: Alfa Laval item no. 9611995903 ensuring max 3 bar support air.

CIP/detecting valves. Max. product pressure without leakage, as a function of air pressure:

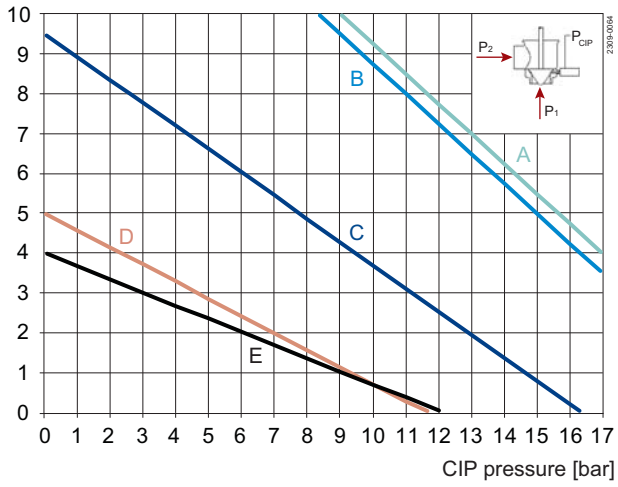


A = CIP valve $\varnothing 27$
B = CIP valve $\varnothing 32$

Max. CIP pressure in leakage chamber without leakage to product area, as a function of product pressure.

ø89 Actuator with standard spring

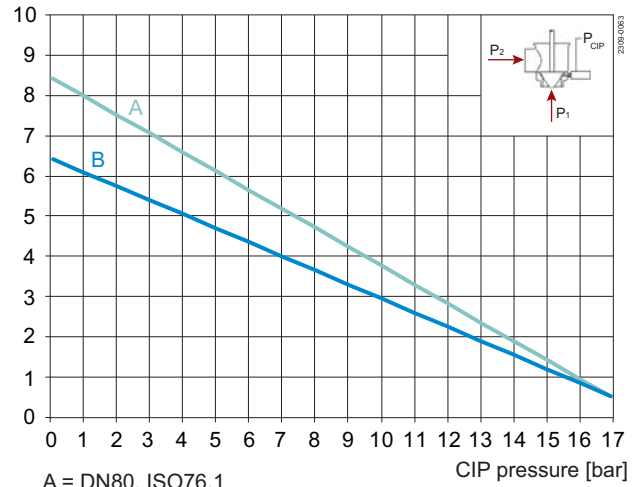
Product pressure $\Delta P = P_1 - P_2$ [bar]



- A = DN40, ISO38
- B = DN50, ISO51
- C = DN65, ISO63.5
- D = DN80, ISO76.1
- E = DN100, ISO101.6

ø89 actuator with strong spring

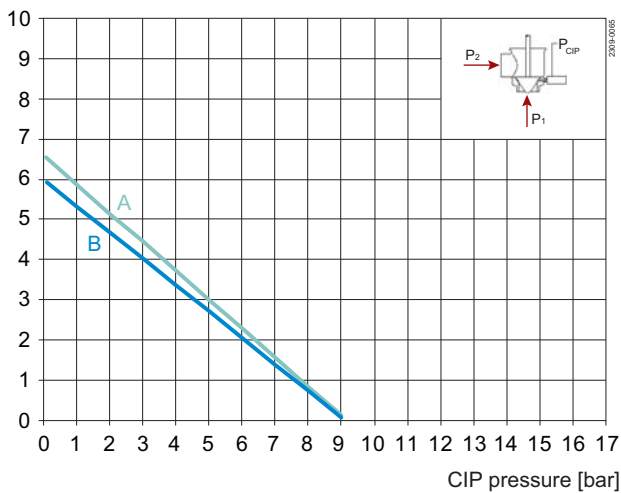
Product pressure $\Delta P = P_1 - P_2$ [bar]



- A = DN80, ISO76.1
- B = DN100, ISO101.6

ø133 actuator with standard spring

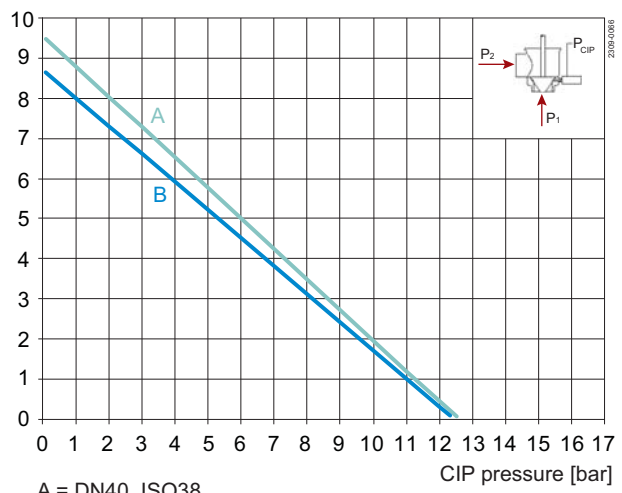
Product pressure $\Delta P = P_1 - P_2$ [bar]



- A = DN40, ISO38
- B = DN50, ISO51

ø133 actuator with strong spring

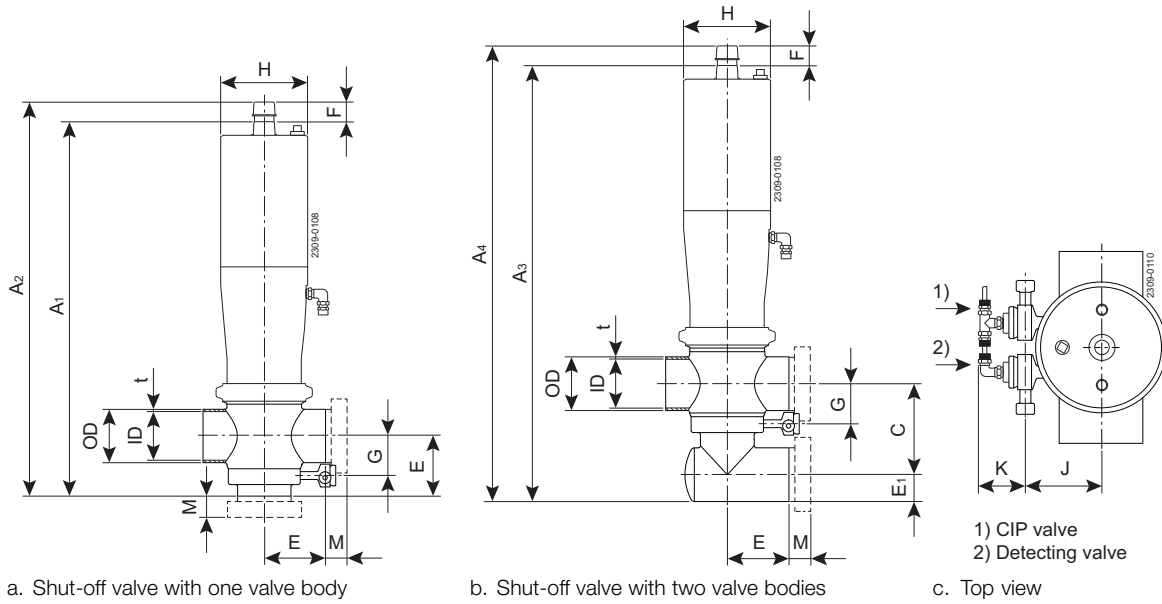
Product pressure $\Delta P = P_1 - P_2$ [bar]



- A = DN40, ISO38
- B = DN50, ISO51

Note! If actuator is supported by air on spring side; max allowable pressure is 300 kPa (3 bar)

Dimensions (mm)



a. Shut-off valve with one valve body

b. Shut-off valve with two valve bodies

c. Top view

Size	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm	40 DN	50 DN	65 DN	80 DN	100 DN	125 DN	150 DN
A ₁	345	355	433	455	527	343	354	430	456	526	535	584
A ₂	370	380	458	487	559	368	379	455	488	558	580	629
A ₃	485.8	505.8	616.2	651.1	751.8	485	506	616	667	752		
A ₄	510.8	530.8	648.2	683.1	783.8	510	531	641	699	784		
C	90	102	124	129	157	90	102	124	134	157		
C ₁	80	84	108	115	150	80	84	108	120.5	150		
OD	38.1	50.8	63.5	76.1	101.6	41	53	70	85	104	129	154
ID	34.9	47.6	60.3	72.1	97.6	38	50	66	81	100	125	150
t	1.6	1.6	1.6	2.0	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0
E	49.5	61.5	82.3	87.3	133.5	49.5	61.5	82.3	87.3	133.5	150	150
E ₁	20.5	26.8	33.2	39.1	51.8	22	28	36	43.5	53		
F	25	25	32	32	32	25	25	32	32	32	49	49
G	27	33.3	39.7	45.6	58.3	28.5	34.5	42.5	50	59.5	72	84.5
H	89	89	133	133	133	89	89	133	133	133	199	199
J	46.7	46.7	57	66.6	84.3	46.7	46.7	57	66.6	84.3	99.5	99.5
K	63	63	63	63	63	63	63	63	63	63	58.5	58.5
M/ISO clamp	21	21	21	21	21							
M/ISO male	21	21	21	21	21							
M/DIN male						22	23	25	25	30	46	50
M/SMS male	20	20	24	24	35							
M/BS male	22	22	22	22	27							
Weight (kg)												
Shut-off valve with one valve body	6.0	6.3	12.8	13.3	16.6	6.0	6.3	12.8	14.0	16.6	43.4	44.5
Weight (kg)												
Shut-off valve with two valve bodies	7.1	7.4	14.2	15.9	21.4	7.1	7.4	14.4	17.1	21.6		

Air Connections Compressed air:

R 1/8" (BSP), internal thread.

CIP connection:

R 3/8" (BSP), external thread.

Leakage connection:

R 3/8" (BSP), external thread.

Caution, opening/closing time:

Opening/closing time will be affected by the following:

- The air supply (air pressure).
- The length and dimensions of the air hoses.
- Number of valves connected to the same air hose.
- Use of single solenoid valve for serial connected air actuator functions.
- Product pressure.

Alfa Laval Aseptic Mixproof

Double seat valves

Introduction

The Alfa Laval Aseptic Mixproof Valve is an advanced double block-and-bleed mixproof valve for use in hygienic and aseptic processes that demand a contaminant-free environment. The valve enables the simultaneous flow of two different products or fluids through the same valve without the risk of cross-contamination. Its one-piece diaphragm ensures hermetic sealing and prevents intrusion from the atmosphere, even during unwanted pressure spikes.

With a flexible, modular design, the Aseptic Mixproof Valve is easy to configure in Alfa Laval Anytime to meet virtually any process requirement. Choose from a broad range of components, including seat lift, temperature sensor or transmitter. Plus its design makes maintenance quick and easy, thereby reducing the total cost of ownership to the lowest level possible compared to other aseptic valves.

Application

This aseptic double-seat mixproof valve is designed for use in aseptic process applications across the dairy, food, beverage, and many other industries.

Benefits

- Exceptional hygiene for maximum product safety and minimal product loss
- Outstanding flexibility and modularity to meet virtually any requirement
- More uptime due to exceptional cleanability
- Up to 45% lower total cost of ownership compared to other aseptic valves
- Ease of maintenance and parts replacement

Standard design

The Alfa Laval Aseptic Mixproof Valve is a normally closed (NC) valve controlled from a remote location by means of compressed air. An integrated valve plug/diaphragm ensures aseptic operation. There is a total of four valves: two main product valves, which are normally closed (NC), and two small leakage detection valves, which are either normally open/normally open (NO/NO) or normally closed/normally open (NC/NO). 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 Aseptic Mixproof Valve is comprised of a series of base components, including valve body, valve plug/diaphragm, actuator, and cleaning options and accessories that support a wide range of aseptic applications. Composed of a PTFE face and reinforced EPDM backing, the diaphragm creates a hermetic seal to ensure aseptic processing conditions. Leakage detection holes enable visual inspection without requiring valve disassembly and provide advanced notification of parts wear. Few straightforward moveable parts contribute to reliable operation and reduced maintenance costs.

When main actuation takes place, all four valves operate simultaneously. The two product valves open and the two leakage detection valves close to prevent product spillage. Please observe the maximum allowable working pressure for diaphragms on the product valves.




The product lines are separated by two individual plugs (two normally closed valves) and a sterile leakage chamber that acts as a barrier to prevent product mixing and to provide immediate indication of any leakage from either of the two plug seals.

Two small leakage detection valves (NO/NO or NC/NO) control the flow of steam into and out of the leakage chamber; these must be kept clean and sterile when the main valves are closed. As an option, one of the two leakage detection valves can be supplied as a changeover valve to maintain the flow of steam, ensuring a continuous steam barrier in both leakage detection valves during the main actuation of the product valves.

A changeover valve may be used to control the steam flow in order to bypass the leakage chamber. On the steam-forward line, you can add an additional aseptic SSV valve to build up a condensate reservoir in order to flush the leakage chamber after main activation.

Certificates

 Authorized to carry the 3A symbol

TECHNICAL DATA

Temperature	
Temperature range:	-10°C to +140°C (EPDM)
Max. sterilization temperature (<1 min):	150°C/380 kPa (3.8 bar)

Pressure	
Pressure range:	0-800 kPa (0-8 bar)
Air pressure:	500-700 kPa (5-7 bar)
Pressure range, support air:	0-300 kPa / 0-3 bar

Note! Vacuum is not recommended in aseptic applications.

PHYSICAL DATA

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

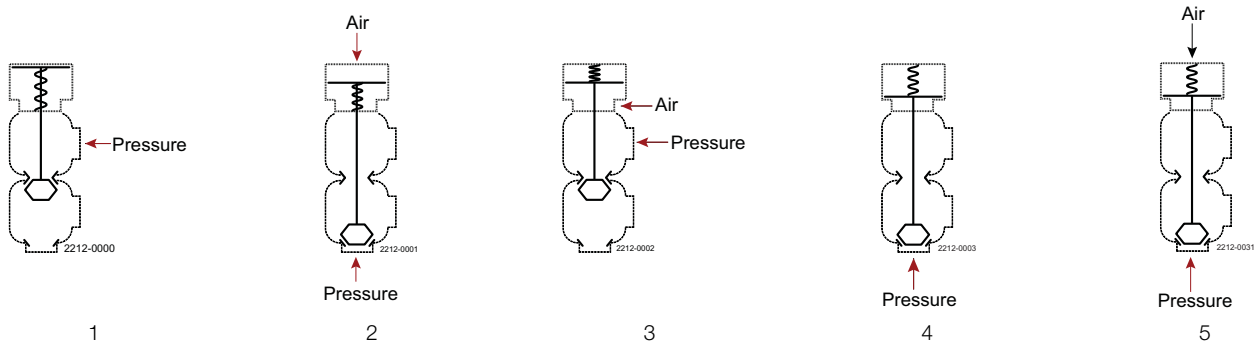
Surface finish	
External surface finish:	Semi-bright (blasted)
Internal surface finish:	Bright (polished), Ra < 0.8 µm

Seals	
Product wetted seals:	EPDM
Optional product wetted seals:	HNBR
Other seals:	NBR
Diaphragm:	PTFE (Product wetted side) / EPDM

Option	
Temperature sensor (PT100):	with or without transmitter
Steam valve	Hygienic or Aseptic

Sizes	
Main valve ISO:	51 mm; 63.5 mm; 76.1 mm

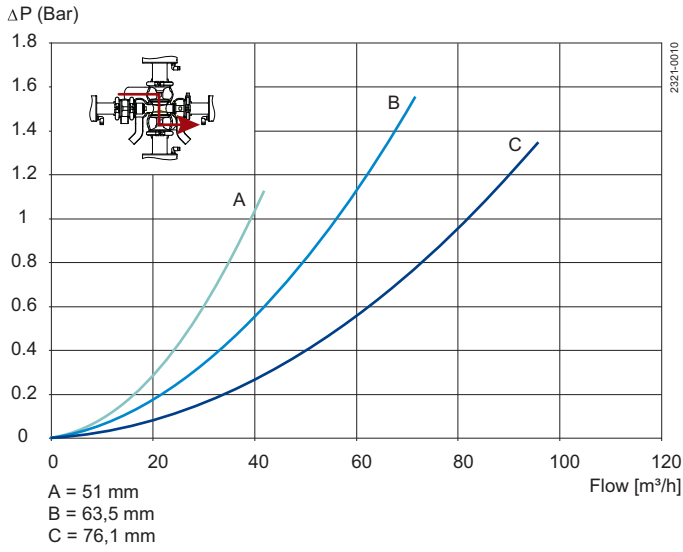
Shut fully closed. Max. static pressure without leakage



Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Plug position	Valve size			Leakage detection valve	
			Main valve				
			51mm	63.5mm	76.1mm		
1		NO				25mm	8 bar
2	6	NO				25mm	8 bar
3	6	NC				25mm	8 bar
4		NC	7.5 bar	4.5 bar	7 bar	25mm	8 bar
5*	3	NC	8 bar	8 bar	8 bar	25mm	8 bar

* support air

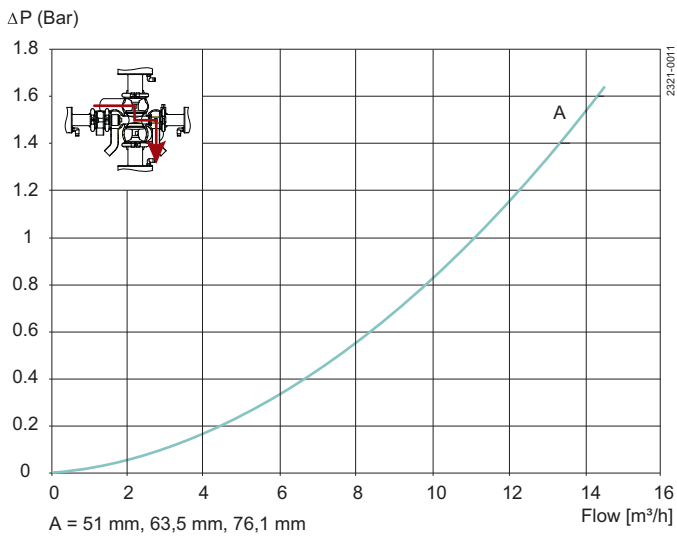
Pressure drop/capacity diagrams



Seat lift

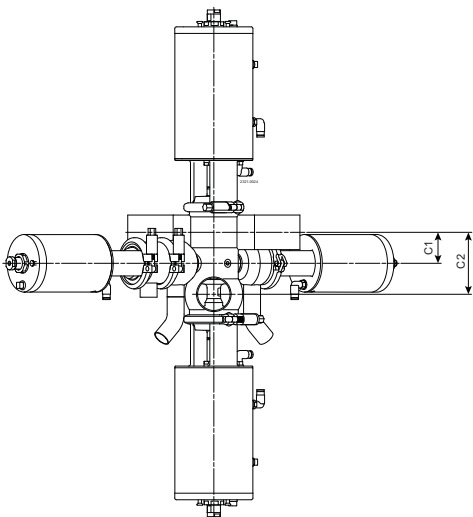
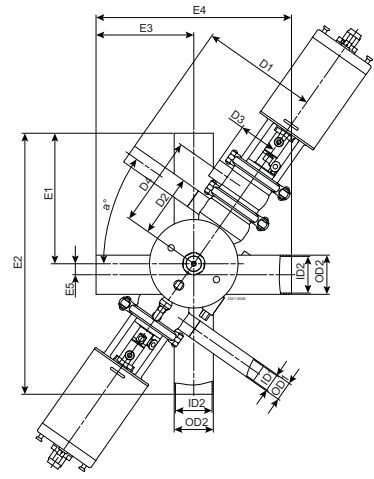
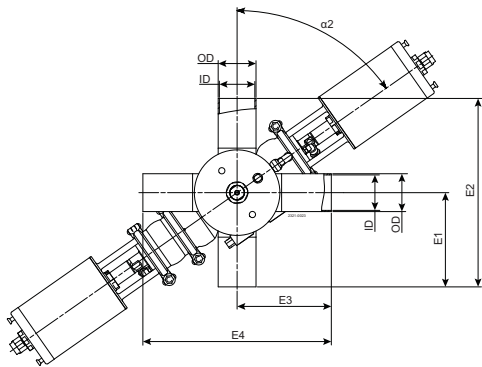
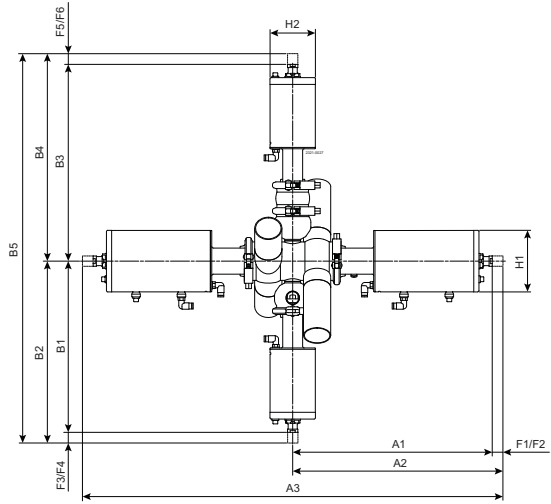
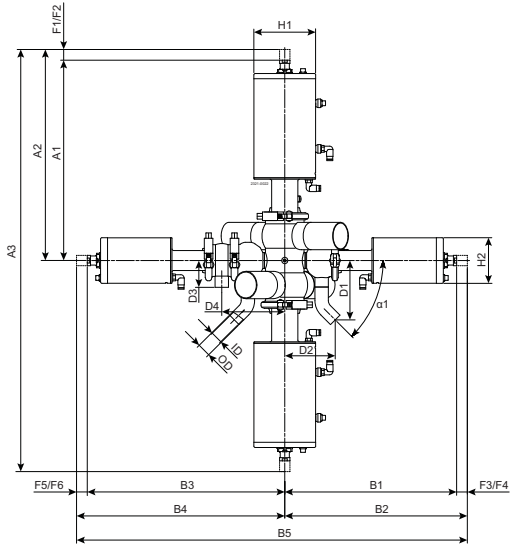
Kv-Value

51 mm	3.1 m³/hr
63.5 mm	3.6 m³/hr
76.1 mm	4.1 m³/hr

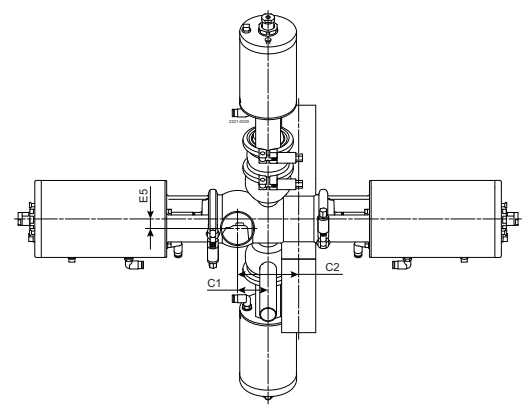


Dimensions (mm)

Note: Choose the version that is fully drainable in your installation setup.



Vertical mount



Horizontal mount

Size	51 mm	63.5 mm	76.1 mm	51 mm	63.5 mm	76.1 mm
	Vertical mount			Horizontal mount		
A1	374	386	440	374	386	440
A2	388	400	457	388	400	457
A3	776	801	914	776	801	914
B1	335	343	350	335	343	350
B2	350	358	366	350	358	366
B3	381	389	396	381	389	396
B4	391	399	407	391	399	407
B5	741	757	772	741	757	772
C1	45.7	52.0	58.3	45.7	52.0	58.3
C2	91.4	103.9	116.5	91.4	103.9	116.5
D1	110.7	110.7	110.7	172.5	172.5	172.5
D2	94.2	102.2	109.7	68.8	76.8	84.3
D3	50	50	50	50	50	50
D4	117.5	125.5	133.0	117.5	125.5	133.0
E1	127	133	139	170.0	216.0	226.0
E2	254	266	278	340.0	432.0	452.0
E3	127	133	139	127	133	139
E4	254	266	278	254	266	278
E5	-	-	-	14.4	18	21.6
$\alpha 1$	45°	45°	45°	-	-	-
$\alpha 2$	55°	55°	55°	55°	55°	55°
F1	14	14	17	14	14	17
F2	2	2	2	2	2	2
F3	10	10	10	10	10	10
F4	15	15	15	15	15	15
F5	8	8	8	8	8	8
F6	12	12	12	12	12	12
H1	115	115	157.5	115	115	157.5
H2	85	85	85	85	85	85
t1	1.2	1.2	1.2	1.2	1.2	1.2
t2	1.6	1.6	1.6	1.6	1.6	1.6
ID1	22.6	22.6	22.6	22.6	22.6	22.6
ID2	47.8	60.3	72.9	47.8	60.3	72.9
OD1	25	25	25	25	25	25
OD2	51	63.5	76.1	51	63.5	76.1
Weight (kg) (max)	29	30	45	29	30	45

Alfa Laval Unique Mixproof Tank Outlet

Double seat valves

Introduction

The Alfa Laval Unique Mixproof Tank Outlet (TO) 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. Specially designed for mounting directly on the tank bottom or wall at the inlets and outlets, the valve enables the safe handling of two different products or fluids through the same valve.

It provides full drainability and cleanability all the way up to the tank--without any risk of cross-contamination.

Modular design and a wide variety of options enable the valve to be customized to meet any process requirement for all mixproof tank outlet operations allowing two different products in pipeline and tank.

Application

The Alfa Laval Unique Mixproof TO Valve is designed for continuous flow management and process safety in hygienic tank inlet and outlets across the dairy, food, beverage, and many other industries.

Benefits

- Enhanced product safety
- Cost-effective, spillage-free operation
- Optimized plant efficiency and enhanced cleanability
- Leakage detection and leakage chamber cleaning
- Configurable to fit your specific needs

Standard design

The Alfa Laval Unique Mixproof TO 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. There are two versions: the Unique Mixproof TO Valve and the Unique Mixproof TO Valve with external cleaning. It is possible to install the Unique Mixproof TO in a horizontal position.

The valve body is connected either to tank flange or a stub flange with a clamp and can be turned in any position upon loosening the clamp slightly. Supplied with TÜV approval AD 2000 and inspection certificate 3.1 according to EN10204, the tank flange is welded directly into the tank. Please note that it is important to observe the welding guideline in instruction manuals.

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 TO Valve is a normally closed (NC) valve controlled from a remote location by means of compressed air. The valve has two independent plugs and seals to separate the liquids; the space between the seals forms a leakage chamber at 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 the tank to the line. The radial design of the valve ensures that virtually no product spillage occurs during valve operation. It is possible to adapt valve cleaning to the requirements of individual process specifications.

TECHNICAL DATA

Pressure	
Max. product pressure in pipeline:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	Max. 800 kPa (8 bar)

Temperature	
Temperature range:	-5°C to +125°C (Depending on rubber quality)

ATEX	
Product wetted steel parts:	II 2 G D

*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

**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

PHYSICAL DATA

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

Surface finish - choose from the following:	
Internal/external Matt (blasted)	Ra<1.6 µm
Internal Bright (polished)	Ra<0.8 µm
Internal/external Bright (internal polished)	Ra<0.8 µm

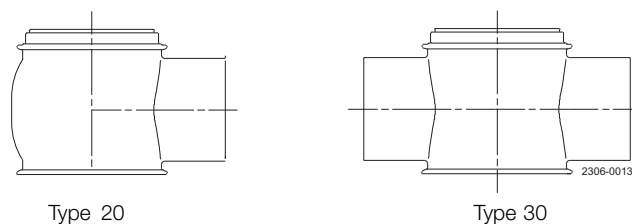
Note! The Ra values are only for the internal surface.

Product wetted seals:	EPDM
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Other seals:	
CIP seals:	EPDM
Actuator seals:	NBR
Guide strips:	PTFE

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

Valve Body Combinations



SpiralClean

The Alfa Laval SpiralClean system to clean the balanced plug and leakage chamber.

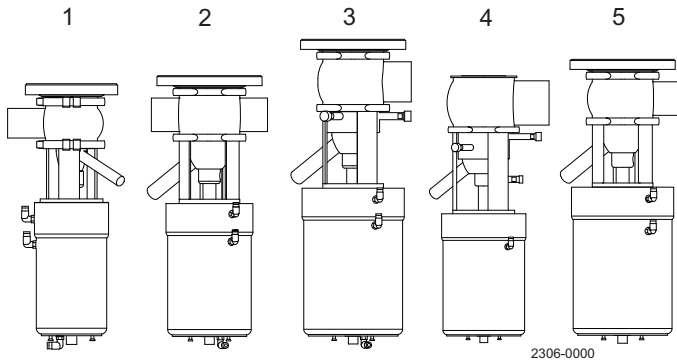
The system cleans more efficiently, uses less cleaning fluid by ensuring that a directional flow of CIP fluid reaches all the surfaces in much less time than with conventional systems.

Selection guide

The drawings below gives an overview of all options when choosing the valve to fit your process, thus demonstrating the actual flexibility of the Unique Mixproof tank outlet valve.

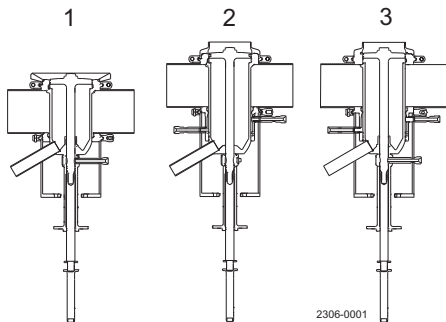
The Unique-TO concept offers balanced plug in pipe line, seat lift, CIP for the plugs and leakage chambers and any combination in between.

Unique-TO size flexibility



1. DN50 with tank flange, group 3 actuator including seat lift and seat push
2. ISO63.5 (2½") with tank flange, group 4 basic actuator including seat lift and seat push
3. ISO76.1 (3") with spiral on upper balanced plug and tank flange, group 5 basic actuator including seat lift and seat push
4. DN150 with spiralclean on leakage chamber upper balanced plug and group 4 basic actuator
5. ISO 63.5 (2½") with tank flange, group 4 basic actuator including seat lift

Unique-TO hygienic flexibility (spiral clean options)



1. External CIP of leakage chamber
2. External CIP of upper balanced plug
3. External CIP cleaning of leakage chamber and upper balanced plug

Standard configurations

To assist you in the selection we have included some standard configurations:

- Unique-TO
- Unique-TO with external cleaning.

You can either choose these directly or add additional features ensuring that the valve suits your specific needs.

Unique-TO meets the typical demands of a process valve in the food and drink industry.

- Actuator with seat lift integrated.
- Standard balanced plug in pipeline.

Unique-TO with external cleaning meets the highest demands for hygienic processing.

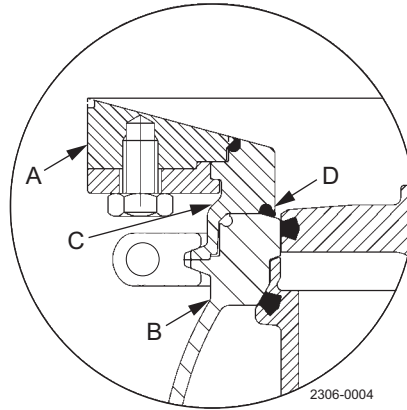
- Actuator with seat lift integrated.
- Standard balanced plug in pipeline.
- SpiralClean of leakage chamber and balanced plug

Options

- Male parts or clamp liners in accordance with required standard
- Control and Indication: ThinkTop
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM
- Various internal/external surface finish
- 3A (hygienic standard) on request
- Blind flange
- Conversion flange that enables replacement of an SMP-TO valve though reusing the existing SMP-TO tank flange - see fig. 1.
- Tank connection supplied separately

Fig. 1

Converting from SMP-TO valve to Unique-TO valve in tank flange



- A. SMP-TO tank flange
- B. Unique Mixproof TO valve
- C. Conversion flange
- D. O-ring for conversion flange

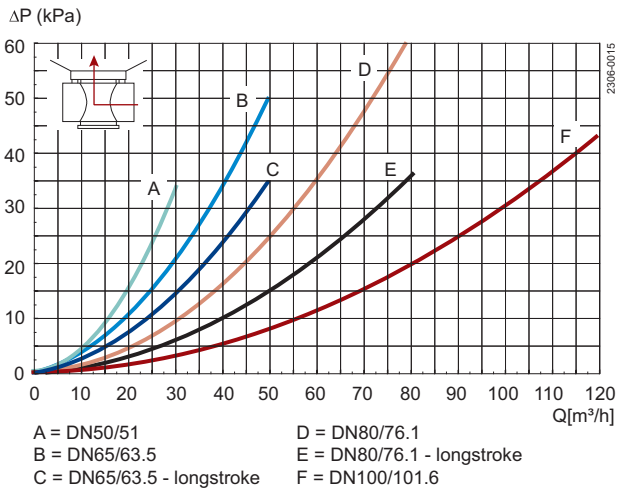
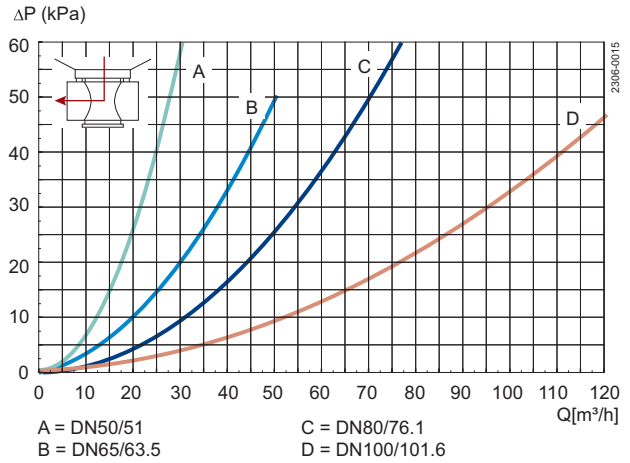
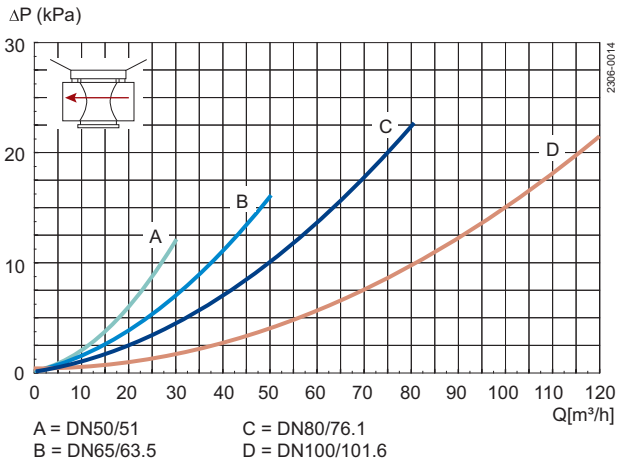
When Unique-TO is mounted on a SMP-TO flange via the Alfa Laval conversion flange add 28 mm to valve height dimensions (A1-A4)

Size		Max. size of particle (mm)	Max. tank pressure (kPa)	Actuator size 3-Basic (ø120x230)	Actuator size 4-Basic (ø157x252)	Actuator size 5-Basic (ø186x281)	Opening pressure in pipe line at 6 bar air pressure (kPa)
inch	DIN						
51	DN50	ø9	400	Standard			1000
63.5	DN65	ø15	450		Standard		1000
63.5	DN65	ø31	600			Long stroke	1000
76.1	DN80	ø15	450		Standard		1000
76.1	DN80	ø31	600			Long stroke	1000
101.6	DN100	ø31	450			Standard	1000
101.6	DN100	ø15	350		Option		1000
	DN125	ø33	350			Standard	1000
	DN125	ø15	250		Option		1000
	DN150	ø33	350			Standard	1000
	DN150	ø15	250		Option		1000

Notes:

Max. pressure in tank means that a higher pressure in tank will open the valve. It is possible to open with 10 bar (1000 kPa) in pipe line. When closing the valve the pressure cannot be higher than "Max. Tank pressure".

Pressure drop/capacity diagrams



Note!

For the diagrams the following applies:

Medium: Water (20° C)

Measurement: In accordance with VDI 2173

Air and CIP consumption

Size	DN/OD				DN						Longstroke				
	ISO-DIN	51	63.5	76.1	101.6	50	65	80	100	125	150	DN/OD		DN	
												63.5	76.1	65	80
Air consumption for Balanced Seat-lift Litre = volume at atmosphere pressure	0.20	0.40	0.40	0.62	0.20	0.40	0.40	0.62	0.62	0.62		0.40	0.40	0.40	0.40
Air consumption for Tank Seat-lift Litre = volume at atmosphere pressure	1.10	0.13	0.13	0.21	1.10	0.13	0.13	0.21	0.21	0.21		0.13	0.13	0.13	0.13
Air consumption for Main Movement Litre = volume at atmosphere pressure	0.86	1.63	1.63	2.79	0.86	1.62	1.62	2.79	2.79	2.79		1.63	1.63	1.62	1.62
Kv-value for Balanced CIP Seat-lift [m ³ /h]	1.50	2.50	2.50	1.90	1.50	2.50	2.50	1.90	3.70	3.70		2.50	2.50	2.50	2.50
Kv-value for Tank Seat-lift [m ³ /h]	0.90	1.90	1.90	1.40	0.90	1.90	1.90	1.40	3.10	3.10		1.90	1.90	1.90	1.90
Kv-value for SpiralClean Spindle CIP [m ³ /h]	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12		0.12	0.12	0.12	0.12
Kv-value for SpiralClean External CIP in leakage chamber [m ³ /h]	0.25	0.29	0.29	0.29	0.25	0.29	0.29	0.29	0.29	0.29		0.29	0.29	0.29	0.29

Note!

Recommended min. pressure for SpiralClean: 2 bar.

Formula to estimate CIP flow during seat lift:

(for liquids with comparable viscosity and density to water):

$$Q = K_v \cdot \sqrt{\Delta p}$$

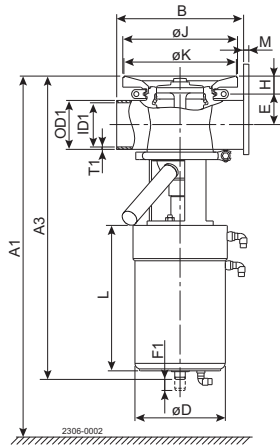
Q = CIP - flow (m³/h)

K_v = K_v value from the above table

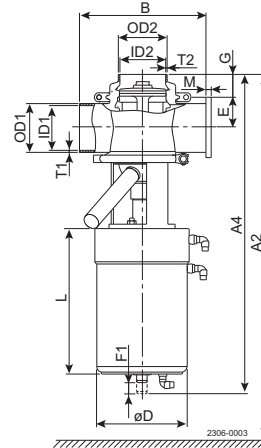
Δ p = CIP pressure (bar)

Dimensions (mm)

Unique-TO connected to tank flange



Unique-TO connected to stub flange



A1 + A2 = Min. clearance to allow that actuator and internal valve parts can be lifted out of the valve body. If ThinkTop is mounted, add 180 mm.

Size	DN/OD											Longstroke			
	51	63.5	76.1	101.6	50	65	80	100	125	150	DN/OD	DN			
ISO-DIN											63.5	76.1	65	80	
A1 min. dimension. Unique-TO	579	646	659	753	577	652	667	755	805	890	700	713	706	721	
A1 min. dimension. Unique-TO with external cleaning	616	686	699	813	614	692	707	815	865	---	740	753	746	761	
A2 min. dimension Unique-TO	588	655	668	762	586	661	676	764	814	899	709	722	715	730	
A2 min. dimension Unique-TO with external cleaning	625	695	708	822	623	701	716	824	874	---	749	762	755	770	
A3 Unique-TO	468	526	526	594	468	526	526	594	620	680	575	575	575	575	
A3 Unique-TO with external cleaning	505	566	566	654	505	566	566	654	680	---	615	615	615	615	
A4 Unique-TO	477	535	535	603	477	535	535	603	629	689	584	584	584	584	
A4 Unique-TO with external cleaning	514	575	575	663	514	575	575	663	689	---	624	624	624	624	
B	220	220	220	300	220	220	220	300	300	300	220	220	220	220	
OD1	51	63.5	76.1	101.6	53	70	85	104	129	154	63.5	76.1	70	85	
ID1	47.8	60.3	72.9	97.6	50	66	81	100	125	150	60.3	72.9	66	81	
t1	1.6	1.6	1.6	2.0	1.5	2.0	2.0	2.0	2.0	2.0	1.6	1.6	2.0	2.0	
E	36.9	43.2	49.5	61.8	38	46	53.5	63	75.5	88	43.2	49.5	46	53.5	
F1	31.5	38	38	59	31.5	38	38	59	59	59	59	59	59	59	
F2 (Tank plug)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
G	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
H	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
øD	120	157	157	186	120	157	157	186	186	186	186	186	186	186	
L	230	252	252	281	230	252	252	281	281	281	281	281	281	281	
OD2	51	63.5	76.1	101.6	53	70	85	104	129	129	63.5	76.1	70	85	
ID2	47.8	60.3	72.9	97.6	50	66	81	100	125	125	60.3	72.9	66	81	
t2	1.6	1.6	1.6	2.0	1.5	2.0	2.0	2.0	2.0	2.0	1.6	1.6	2.0	2.0	
øJ	159	199	199	199	159	199	199	199	199	199	199	199	199	199	
øK	155	195	195	195	155	195	195	195	195	195	195	195	195	195	
M/ISO clamp	21	21	21	21	---	---	---	---	---	---	21	21	---	---	
M/DIN clamp	---	---	---	---	21	21	21	21	28	28	---	---	21	21	
M/ISO male	21	21	21	21	---	---	---	---	---	---	21	21	---	---	
M/DIN male	---	---	---	---	23	25	25	30	46	50	---	---	25	25	
M/SMS male	20	24	24	35	---	---	---	---	---	---	24	24	---	---	
M/BS male	22	22	22	27	---	---	---	---	---	---	22	22	---	---	
Weight [kg]* Unique TO	12.5	22.5	22.5	33	12.5	22.5	22.5	33	36	38	28	28	28	28	
Weight [kg]* Unique TO with external cleaning	13	23.5	23.5	34	13	23.5	23.5	34	37	---	29	29	29	29	

* = without tank flange

Alfa Laval Unique Mixproof Large Particle Valve (Unique LP)

Double seat valves

Introduction

The Alfa Laval Unique Mixproof Large Particle (LP) 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. 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—whether higher demands on cleanability, the ability to withstand high pressure by means of balanced plugs. The valve is designed for gentle handling of products containing large particulates up to 1¾" (45 mm) or products with high viscosity.

Application

The Alfa Laval Unique LP Mixproof Valve is designed for use in hygienic processes that require process safety and continuous flow management of fluids with large particles that require gentle handling across the dairy, food, beverage, and many other industries.

Benefits

- Enhanced product safety
- Spillage-free operation
- Optimized plant efficiency and enhanced cleanability
- Gentle product handling
- Easy maintenance

Standard design

The Alfa Laval Unique Mixproof LP Valve is comprised of a series of base components, including valve body, valve plug and actuator. There are two sizes: 4" and 6". The standard 6" valve comes equipped with balanced lower plug to protect against the effects of pressure peaks and water hammering. To accommodate 1¾" (45 mm) particles, the 4" valve is not equipped with a balanced lower plug but comes with a boost actuator to accommodate a product pressure of up to 10 bar.

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.

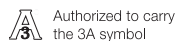


Working principle

The Alfa Laval Unique Mixproof LP 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 at 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.

Certificates



TECHNICAL DATA

Pressure

Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	Max. 8 bar

Temperature

Temperature range:	-5 °C to +125 °C (Depending on elastomer type)
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ATEX

Classification:	II 2 G D*
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*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

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

PHYSICAL DATA

Materials

Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)
External surface finish	Semi-bright (blasted)
Internal surface finish	Bright (polished), Ra < 0.8 µm
Product wetted parts:	EPDM
Other seals:	
CIP seals:	EPDM
Actuator seals:	NBR
Guide strips	PTFE

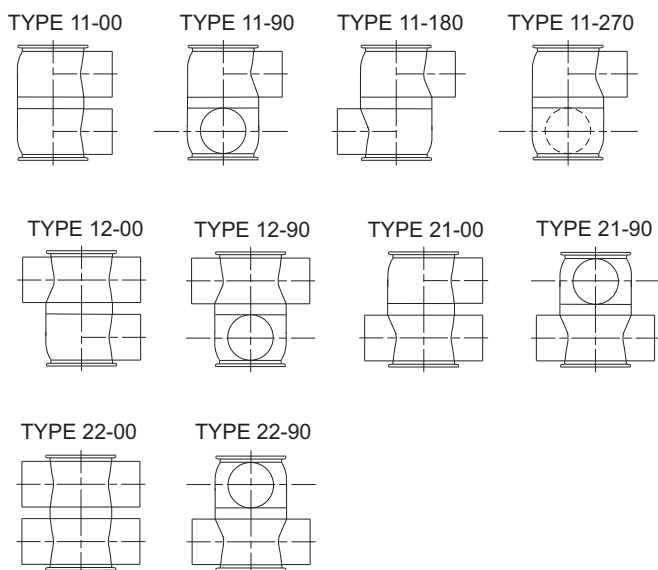
Availability

This LP edition of the Unique Mixproof valve is a high-end valve with regards to process security as well as from a hygienic point of view. The Unique Mixproof LP valve is available in 4" and 6" sizes.

Options

- Male parts or clamp liners in accordance with required standard
- Control and Indication: ThinkTop
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM

Valve body combinations



Pressure drop/capacity diagrams

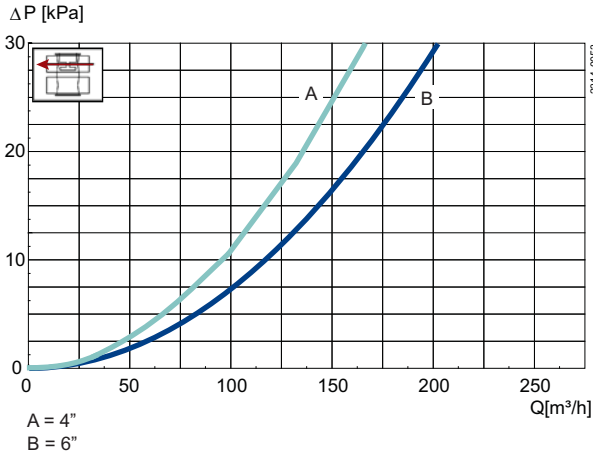


Fig. 2. Pressure drop/capacity diagram, upper bodies.

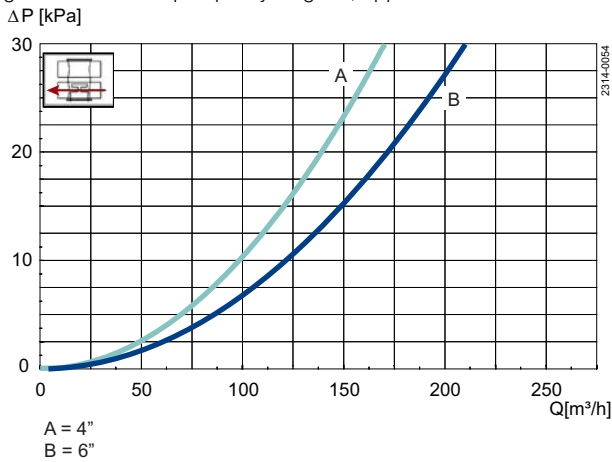


Fig. 4. Pressure drop/capacity diagram, lower body.

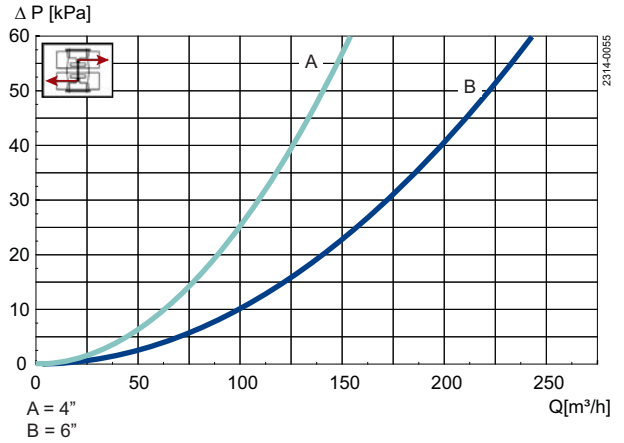


Fig. 3. Pressure drop/capacity diagram, between bodies.

Note!

For the diagrams the following applies:

Medium: Water (20 °C).

Measurement: In accordance with VDI 2173.

Air and CIP consumption

Size		OD	OD
		4"	6"
Kv-value			
Upper Seat-lift	[m³/h]	3.2	7.1
Lower Seat-lift	[m³/h]	2.9	6.0
Air consumption			
Upper Seat-lift	* [n litre]	0.62	0.62
Lower Seat-lift	* [n litre]	0.21	0.21
Main Movement	* [n litre]	3.54	3.54

Note!

* [n litre] = volume at atmospheric pressure

Formula to estimate CIP flow during seat lift:

(for liquids with comparable viscosity and density to water):

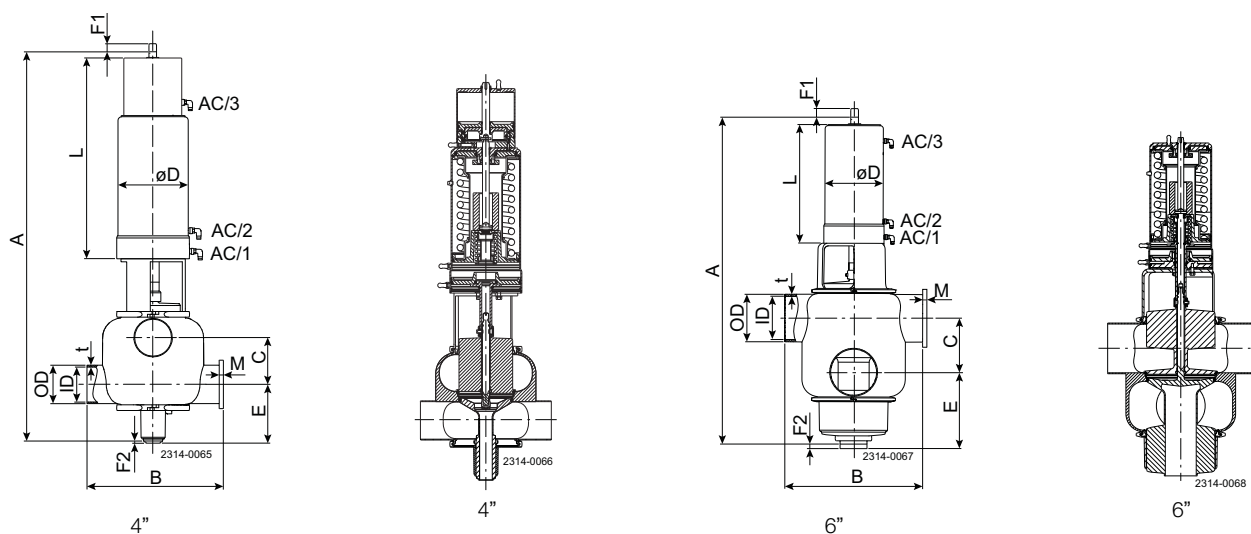
$$Q = K_v \cdot \sqrt{\Delta p}$$

$$Q = \text{CIP - flow (m}^3/\text{h)}$$

K_v = K_v value from the above table

Δp = CIP pressure (bar)

Dimensions (mm)



Size	4"	6"
A	1038.00	1002.00
B	350.00	440.00
**C	123.60	172.67
OD	101.60	152.40
ID	97.60	146.86
t	2.00	2.77
E	166.00	211.00
F1	75.00	75.00
F2	5.00	5.00
øD	186.00	186.00
L	534.00	379.00
M/Tri-clamp	21.00	38.60
Weight (kg)	64.90	86.20

NOTE!

**The measure C can always be calculated by the formula

$$C = \frac{1}{2}ID_{\text{upper}} + \frac{1}{2}ID_{\text{lower}} + 26\text{mm}.$$

Alfa Laval Unique Mixproof Horizontal Tank

Double seat valves

Introduction

The Alfa Laval Unique Mixproof Horizontal Tank 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.

To improve the cleanliness of the horizontal tank connections. It ensures that no area of the tank inlet or tank outlet is left uncleaned, it is specifically designed for horizontal mounting on the side of a tank or as a space-saving alternative at the bottom of a cone-formed tank. Its self-cleaning design provides state-of-the-art cleanability in the shadow area, where no Cleaning-in-Place pressure or flow from the tank side to clean the connection.

Based on the proven and versatile Alfa Laval Unique Mixproof Valve, the Unique HT Mixproof Valve enables the benefits of having two different products or fluids in the same valve without any risk of cross-contamination. The valve provides greater flexibility by filling and emptying a tank at the same time.

Application

The Alfa Laval Unique HT Mixproof Valve is designed for continuous flow management and process safety for horizontal tank inlet and outlet applications across the dairy, food, beverage and many other industries.

Benefits

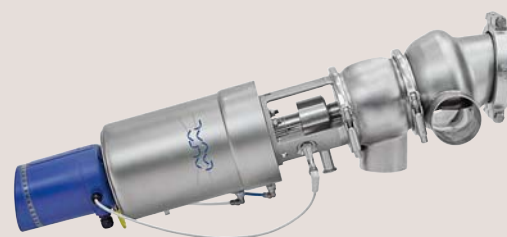
- Enhanced product safety, cleanability and operating efficiency
- Spillage-free operation with leakage detection and leakage chamber cleaning
- Easy maintenance and parts replacement
- Low total cost of ownership
- Capable of cleaning shadow areas in tank connections

Standard design

The Alfa Laval Unique HT Mixproof Valve is comprised of a series of base components, including valve body, valve plug, actuator, seat lift and two patented Cleaning-in-Place (CIP) nozzles.

The double tangential design of the valve body ensures full drainability in any position, when mounted at the bottom of a cone-shaped tank or on the side. The design of the single valve body makes it suitable to weld directly on the tank or to connect it using a tri-clamp. There are three sizes: 2½", 3" and 4". The 4" model features a 45-mm opening, which enables the passage of large particles or efficient handling of high viscosity fluids.

The valve is self-cleaning, thanks to two patented CIP nozzles. The first nozzle is designed specifically for plug cleaning. This double-acting nozzle projects cleaning media through the tank connection, ensuring complete cleaning of the seat contact surfaces as well as the shadow area of the tank port. The second is a rotating CIP nozzle incorporated into the unit for optimum cleaning of the full-bore leakage chamber.



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.

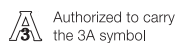
The valve can also be fitted with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.

Working principle

The Alfa Laval Unique HT Mixproof Valve is a normally closed (NC) valve controlled from a remote location by means of compressed air. The valve has two independent plugs to separate the liquids; the space between the seals forms a leakage chamber at atmospheric pressure during every working condition. Leakage rarely occurs but, should it occur, product leaks 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



TECHNICAL DATA

Pressure

Max. product pressure in pipeline:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	Max. 8 bar (800 kPa)

Temperature

Temperature range:	-5°C to +125°C (depending on rubber quality)
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ATEX

Classification:	II 2 G D*
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*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

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

PHYSICAL DATA

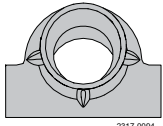
Materials

Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)
External surface finish:	Semi-bright (blasted)
Internal surface finish:	Bright (polished), Ra < 1.6 µm
Product wetted seals:	EPDM

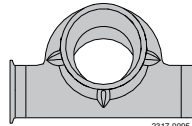
Other seals:

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

Valve body combination



Welding ends



Clamp ends

State of the art – Cleanability

The Unique Mixproof HT valve also provides a state of the art solution when there is no CIP pressure or flow from the tank side to clean the seat and plug. The valve is self-cleaning, thanks to two patented Cleaning-in-Place (CIP) nozzles. The first nozzle is designed specifically for plug cleaning. This double-acting nozzle projects cleaning solution through the tank connection, ensuring complete cleaning of the seat contact surfaces as well as the shadow area of the tank port. The second is a rotating CIP nozzle incorporated into the unit for optimum cleaning of the full-bore leakage chamber.

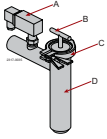
The design of the single valve body makes it suitable to weld directly on the tank or to connect it via a Tri-clamp.

The 4" and 6" models feature a 45-mm opening, which enables the passage of very large particles or efficient handling of high viscosity fluids.

Options:

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM
- CIP validation kit that enables monitoring of CIP flow to internal CIP nozzles - See fig. 1

CIP validation kit



- A. Flow switch
- B. Filter element
- C. Clamp ring
- D. Filter house

fig. 1

Size Inch	Max. size of particle (mm)	Max. tank pressure (bar)	Actuator size 4-Basic (ø157x254)	Actuator size 5-Basic (ø185x280)	Opening pressure in pipe line at 6 bar air pressure (kPa)
2½"	32	5.9	Standard		1000
3"	32	5.9	Standard		1000
4"	45	5.9		Long stroke	1000

Notes:

Max. pressure in tank means that a higher pressure in tank will open the valve.

It is possible to open with 10 bar (1000 kPa) in pipe line.

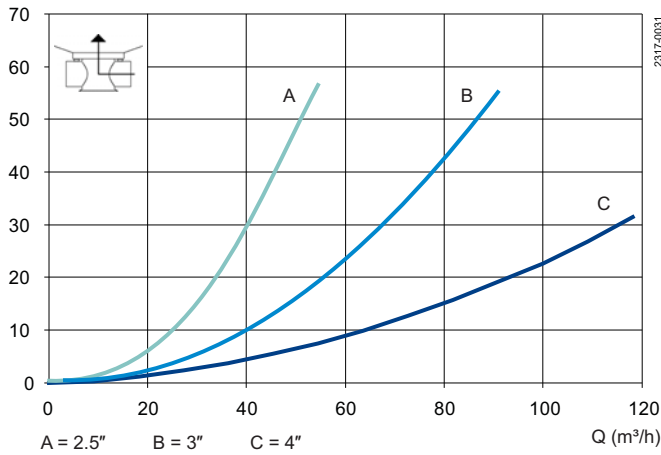
When closing the valve the pressure can not be higher than "Max. Tank pressure".

* Max. tank pressure seat push tank plug.

Pressure drop/capacity diagrams

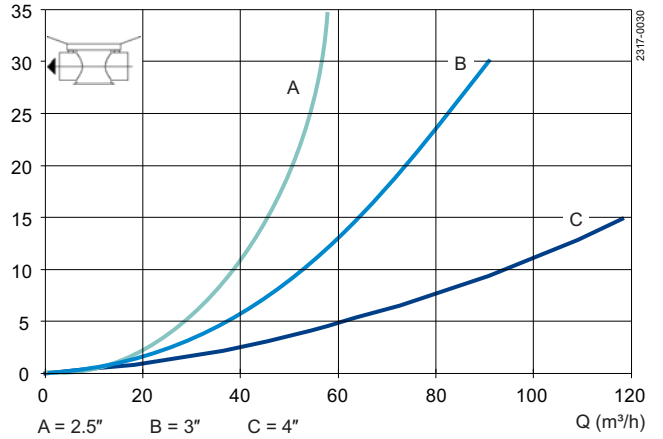
Unique Mixproof Horizontal Tank Valve - to tank

ΔP (kPa)



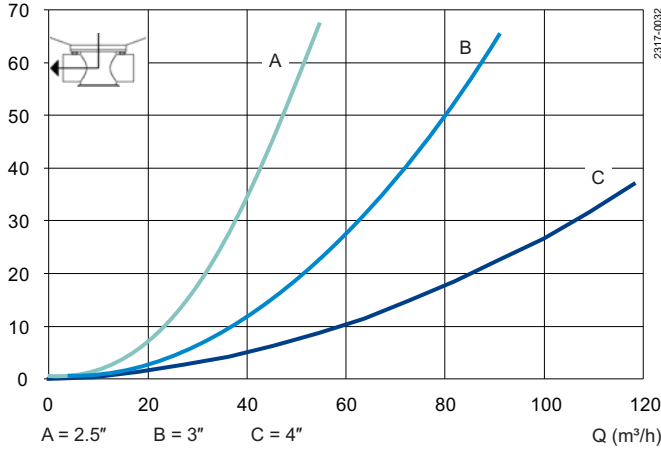
Unique Mixproof Horizontal Tank Valve - straight through

ΔP (kPa)



Unique Mixproof Horizontal Tank Valve - from tank

ΔP (kPa)



Air and CIP consumption

Size	DN/OD		
	2½"	3"	4"
Kv-value			
Upper Seat-lift [m³/h]	2.5	2.5	3.1
Lower Seat-lift (tank seat lift) [m³/h]	11.5	11.5	34.1
Air consumption			
Upper Seat-lift * [n litre]	0.4	0.4	0.62
Lower Seat-lift (tank seat lift) * [n litre]	0.13	0.13	0.21
Main Movement * [n litre]	1.62	1.62	3.54
Kv-value - SpiralClean			
External CIP in leakage chamber [m³/h]	1.52	1.52	1.52

Note!

* [n litre] = volume at atmospheric pressure

Recommended min. pressure for External CIP in leakage chamber 3 bar.

Formula to estimate CIP flow during seat lift:

(for liquids with comparable viscosity and density to water):

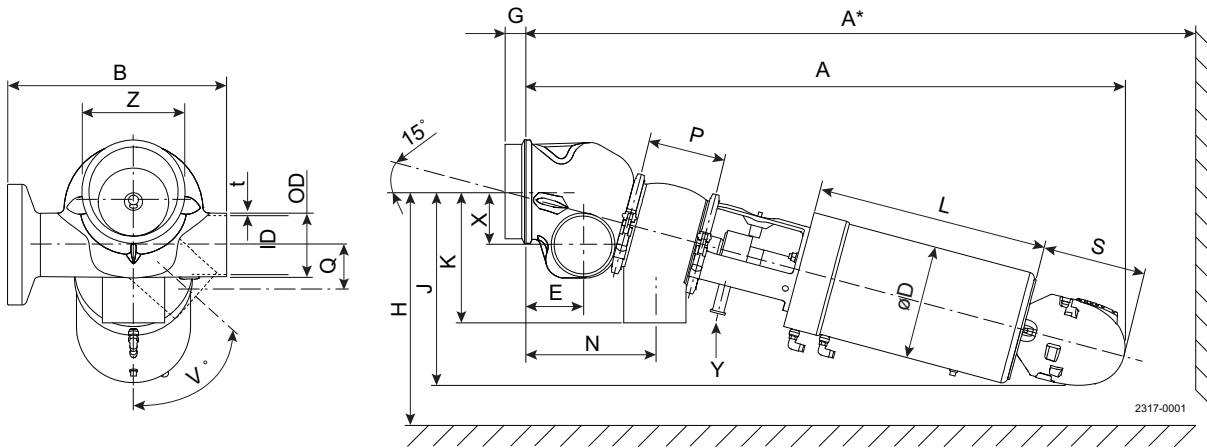
$$Q = Kv \cdot \sqrt{\Delta p}$$

$$Q = \text{CIP - flow (m}^3\text{/h)}$$

Kv = Kv value from the above table

Δ p = CIP pressure (bar)

Dimensions (mm)



Size	2.5"	3"	4"
A	735	759	977
A*	867	904	1155
B (same for welding and clamp)	245	245	342
OD	63.5	76.1	101.6
ID	60.3	72.9	97.6
t	1.6	1.6	2
ØD	186	186	186
E	70.9	77.2	92.2
F1	38	38	75
F2 (Tank plug)	10	10	10
G	15.9	15.9	38.1
H	281	291	364
J	246	252	317
K	153	158	215
L	252	252	379
N	152	170	210
P	89.3	101.9	126.6
Q	15.9	15.9	38.1
S	180	180	180
V°	0-67°	0-60°	0-53°
X	38,3	36,6	52,6
Y	3/4" clamp ferrule	3/4" clamp ferrule	3/4" clamp ferrule
Z	4"	4"	6"
Weight (kg)	13.0	14.2	43.1

Alfa Laval Unique Mixproof

Double seat valves

Introduction

The Alfa Laval Unique Mixproof 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. 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—whether higher demands on cleanability and the ability to withstand pressure peaks.

Application

The Alfa Laval Unique Mixproof is designed for continuous flow management and process safety in hygienic processes where product safety is at the top of the agenda across the dairy, food, beverage and many other industries.

Benefits

- Enhanced product safety
- Cost-effective, spillage-free operation
- Optimized plant efficiency and enhanced cleanability
- Leakage detection and leakage chamber cleaning
- Fully configurable to fit your exact needs

Standard design

The Alfa Laval Unique Mixproof 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. There are four pre-configured versions: the Unique Mixproof Basic; the Unique Mixproof SeatClean Valve; the Unique Mixproof HighClean Valve; and the Unique Mixproof UltraClean Valve. 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 Valve is a normally closed (NC) valve controlled from a remote location by means of compressed air. The valve has two independent plugs and seals to separate the liquids; the space between the seals forms a leakage chamber at 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.

TECHNICAL DATA

Pressure	
Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	Max. 800 kPa (8 bar)

Temperature	
Temperature range:	-5°C to +125°C

ATEX	
Classification:	II 2 G D*

*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

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

PHYSICAL DATA

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

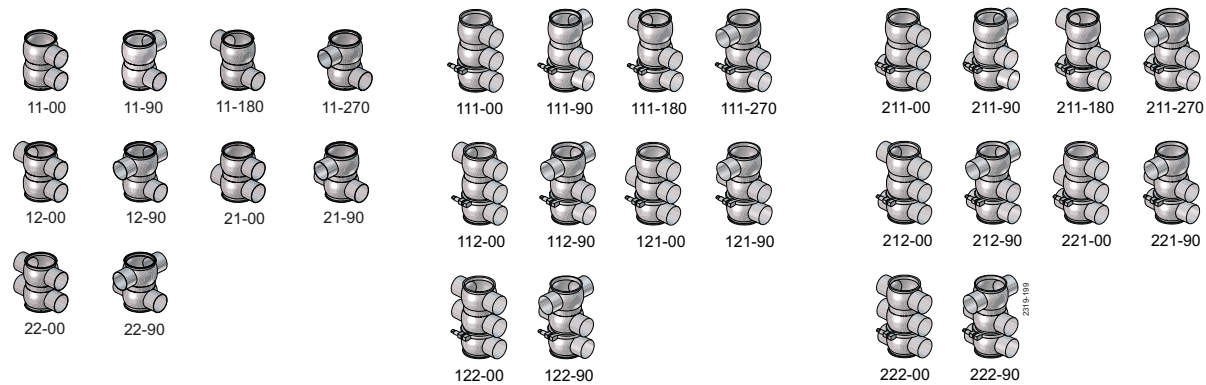
Surface finish choose from the following:	
Internal/external semi-bright	Ra< 1.6µm
Internal Bright (polished)	Ra< 0.8µm
Internal/external Bright (polished)	Ra< 0.8µm

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

Product wetted seals:	EPDM
-----------------------	------

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

Valve body combination



Valve body combinations, example: type 11-00

- 1 Number of ports - lower valve body
- 1 Number of ports - middle valve body
- 1 Number of ports - upper valve body
- 00 Angle between

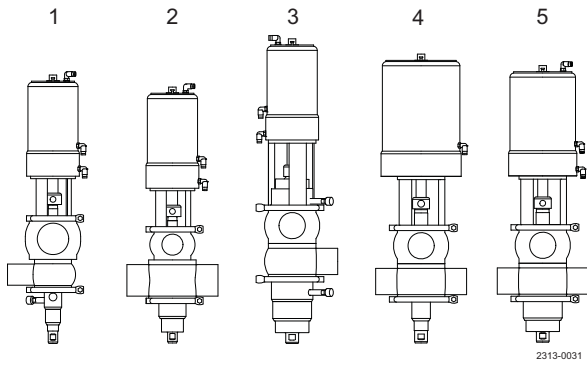
SpiralClean

The Alfa Laval SpiralClean system to clean the upper and lower balanced plugs and leakage chamber. The system cleans more efficiently, uses less cleaning fluid by ensuring that a directional flow of CIP fluid reaches all the surfaces in much less time than with conventional systems.

Selection guide

The drawings below give an overview of all options when choosing the valve to fit your process, thus demonstrating the actual flexibility of the Unique Mixproof Valve.

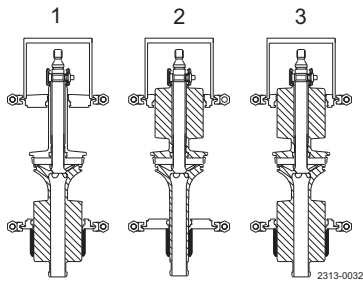
Size flexibility



The Unique Mixproof concept offers balanced and unbalanced plugs, seat lift, CIP for the plugs and leakage chambers and any combination in between.

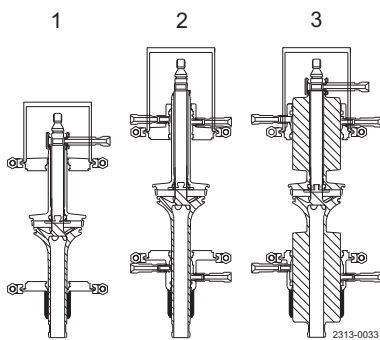
1. ISO 51 (2")/ISO 76.1 (3"), 11-90, with spiral clean on lower unbalanced plug, group 3 basic actuator incl. seat lift and seat push
2. ISO 76.1(3")/ISO 51 (2"), 22-90, with lower balanced plug, basic actuator incl. seat lift and seat push
3. ISO 63.5 (2½"), 12-90, with SpiralClean of upper, lower spindle and leakage chamber, upper and lower balanced plug, basic actuator incl. seat lift and seat push
4. ISO 63.5 (2½"), 22-90, with spiral clean on leakage chamber, unbalanced plugs, group 5 basic actuator
5. ISO 63.5 (2½"), 22-90, with lower balanced plug, group 4 basic actuator incl. seat lift and seat push

Balancing flexibility



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

Hygienic flexibility (spiral clean options)



1. External CIP of leakage chamber
2. External CIP of upper and lower unbalanced plug
3. External CIP of leakage chamber upper and lower balanced plug

Standard configurations

To assist you in the selection we have included some standard configurations:

- Unique Basic
- Unique SeatClean
- Unique HighClean
- Unique UltraClean

You can either choose these directly or add additional features ensuring that the valve suits your specific needs.

Unique Basic has the basic components, providing significant safety and leakage detection.

- Actuator without seatlift.
- Unbalanced plugs.
- No SpiralClean of leakage chamber or plugs.
- Not applicable for 3-body version

Unique SeatClean meets the typical demands of a process valve in the food and drink industry.

- Actuator with seat lift integrated.
- Balanced lower plug, Unbalanced upper plug.
- No SpiralClean of leakage chamber or plugs.

Unique HighClean is sure to meet your processing needs when dealing with sticky products or if no recontamination can be accepted at all.

- Actuator without seatlift integrated.
- Balanced lower and upper plug.
- SpiralClean of leakage chamber as well as of upper and lower plug.
- Not applicable for 3-body version.

Unique UltraClean meets the highest demands for hygienic processing. It has:

- Actuator with seat lift integrated.
- Balanced lower and upper plug.
- SpiralClean of leakage chamber, upper and lower plug

Options

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
- Side indication for detection of upper seat lift
- Product wetted seals in HNBR, NBR or FPM
- Various internal/external surface finish
- 3A (hygienic standard) on request
- Mixed housing (Not applicable for 3-body version)

Pressure drop/capacity diagrams

Example to determine pressure drop:

Upper body size:	DN/OD 51mm. Balanced upper plug. Capacity = 20 m ³ /h
Lower body size:	DN/OD 76.1mm. Balanced lower plug. Capacity = 20 m ³ /h
Between bodies:	Capacity = 15 m ³ /h

Result:

From fig. 1, $\Delta p = 7.5$ kPa through upper body.

From fig. 2, $\Delta p = 2$ kPa through lower body.

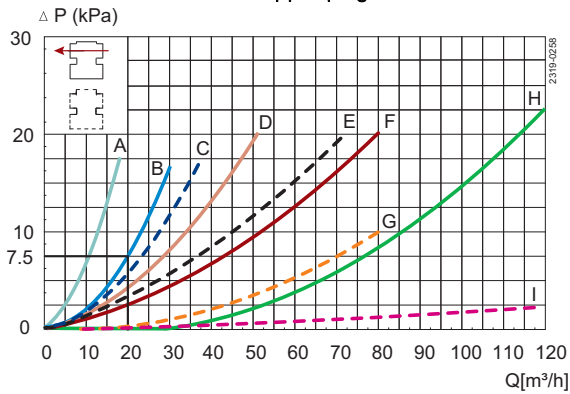
From fig. 3, $\Delta p = 14$ kPa seeing that:

1. The smallest body determines the curve for Δp between bodies.
2. Always choose the curve for balanced plugs if upper plug is balanced. If only lower plug is balanced, always choose the curve for unbalanced.

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

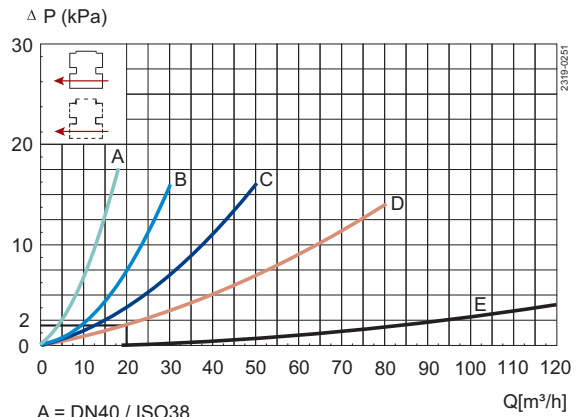
Full lines: Balanced upper plug.

Dotted lines: Unbalanced upper plug.



A = DN40 / ISO38	F = DN80 / ISO76.1 / Sch5 3"
B = DN50 / ISO51 / Sch5 2"	G = DN80 / ISO76.1 / Sch5 3"
C = DN50 / ISO51 / Sch5 2"	H = DN100 / ISO101.6 / Sch5 4"
D = DN65 / ISO63.5	I = DN100 / ISO101.6 / Sch5 4"
E = DN65 / ISO63.5	

Fig. 2. Pressure drop/capacity diagram, lower body, balanced and unbalanced lower plugs.

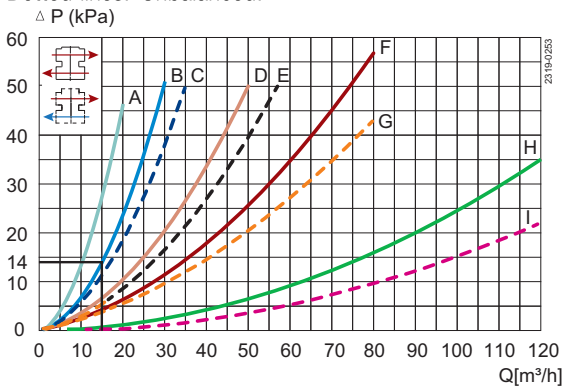


A = DN40 / ISO38
B = DN50 / ISO51 / Sch5 2"
C = DN65 / ISO63.5
D = DN80 / ISO76.1 / Sch5 3"
E = DN100 / ISO101.6 / Sch5 4"

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

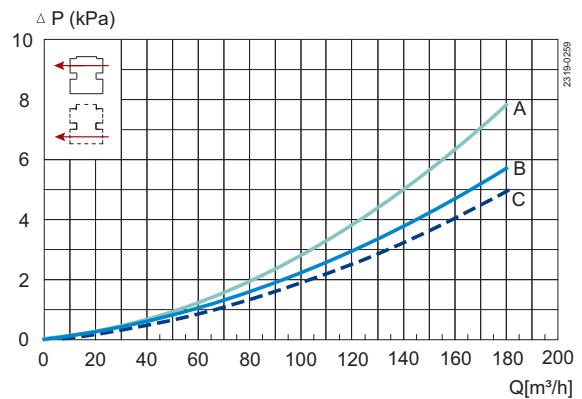
Full lines: Balanced.

Dotted lines: Unbalanced.



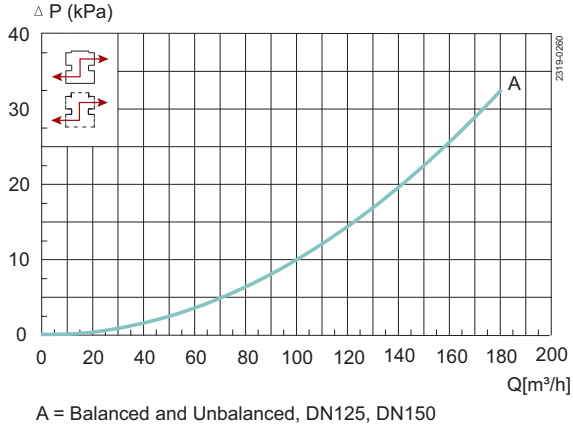
A = DN40 / ISO38	F = DN80 / ISO76.1 / Sch5 3"
B = DN50 / ISO51 / Sch5 2"	G = DN80 / ISO76.1 / Sch5 3"
C = DN50 / ISO51 / Sch5 2"	H = DN100 / ISO101.6 / Sch5 4"
D = DN65 / ISO63.5	I = DN100 / ISO101.6 / Sch5 4"
E = DN65 / ISO63.5	

Fig. 4. Pressure drop/capacity diagram, through bodies DN 125, DN 150



A = Balanced Upper Plug
B = Unbalanced Upper Plug
C = Balanced and Unbalanced Lower Plug

Fig. 5. Pressure drop/capacity diagram between bodies



Pressure drop/capacity diagrams for 3 body valve

Fig. 6. Between middle and lower body

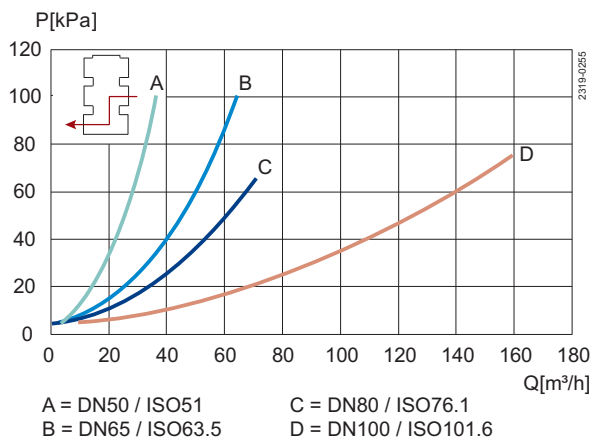


Fig. 7. Between middle and upper body

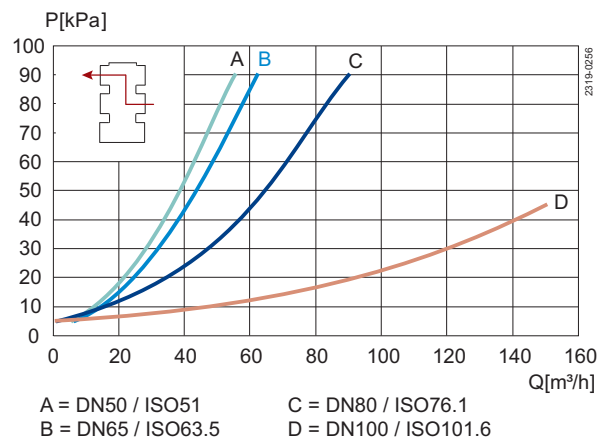
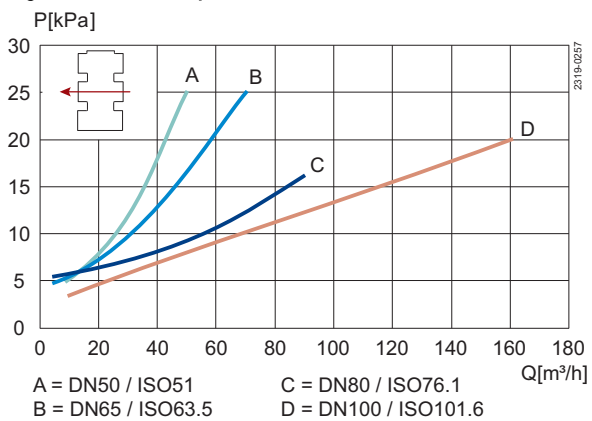


Fig. 8. Middle body



Note! For the diagrams the following applies:
 Medium: Water (20°C).
 Measurement: In accordance with VDI 2173.

Air and CIP consumption

Size ISO/DIN	DN/OD						DN					
	38	51	63.5	76.1	101.6	40	50	65	80	100	125	150
Kv-value												
Upper Seat-lift [m ³ /h]	1.5	1.5	2.5	2.5	3.1	1.5	1.5	2.5	2.5	3.1	3.7	3.7
Lower Seat-lift [m ³ /h]	0.9	0.9	1.9	1.9	2.5	0.9	0.9	1.9	1.9	2.5	3.1	3.1
Air consumption												
Upper Seat-lift * [n litre]	0.2	0.2	0.4	0.4	0.62	0.2	0.2	0.4	0.4	0.62	0.62	0.62
Lower Seat-lift * [n litre]	1.1	1.1	0.13	0.13	0.21	1.1	1.1	0.13	0.13	0.21	0.21	0.21
Main Movement * [n litre]	0.86	0.86	1.63	1.63	2.79	0.86	0.86	1.62	1.62	2.79	2.79	2.79
Kv-value - SpiralClean												
Spindle CIP [m ³ /h]	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
External CIP of leakage chamber [m ³ /h]	0.25	0.25	0.29	0.29	0.29	0.25	0.25	0.29	0.29	0.29	0.29	0.29

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Note!

* [n litre] = volume at atmospheric pressure

Recommended min. pressure for SpiralClean: 2 bar.

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.

Δp = CIP pressure (bar).

Actuator

Actuator Type	STD					STD/STD*	
	Operating pressure for SeatClean, High Clean and Ultra Clean at 6 bar air pressure					Operating pressure for Basic at 6 bar air pressure	
Actuator dimensions	3	4BS ¹	4SS ²	5BS	5SS		
$\varnothing D \times L$	120 x	157 x	186 x	186 x	186 x		
Connection Size							
ISO							
DIN (DN)							
(DN/OD)							
38	40	STD	OP			1000 kPa	600 kPa
51	50	STD	OP	OP		1000 kPa	600 kPa
63.5	65	OP	STD	STD*	OP	OP	1000 kPa
76.1	80	OP	STD	STD*	OP	OP	1000 kPa
101.6	100		OP	OP	STD	STD*	1000 kPa
	125		OP	OP	STD	STD*	800 kPa

STD: Normal size of actuator

STD*: Normal size actuator if lower plug is UNBALANCED

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

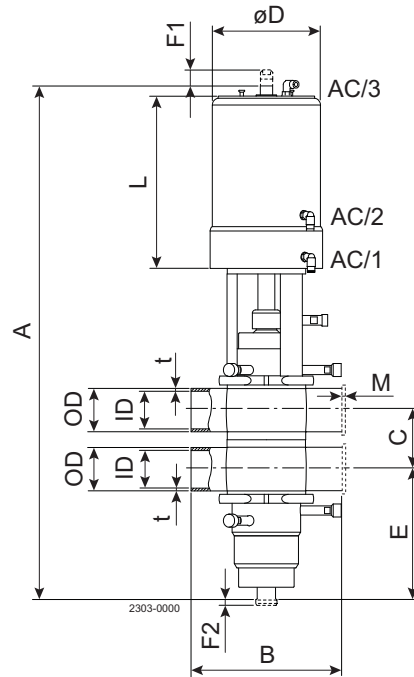
1 BS = Basic spring

2 SS = Strong spring

Radial Seat Diameter

ISO (DN/OD)	DIN (DN)	Seat
38	40	$\varnothing 53.3$
51	50	$\varnothing 53.3$
63.5	65	$\varnothing 81.3$
76.1	80	$\varnothing 81.3$
101.6	100	$\varnothing 100.3$
	125	$\varnothing 115.3$
	150	$\varnothing 115.3$

Dimensions (mm)



Note for mixed bodies

1. The seat always applies to the smallest valve body.
2. Dimension B is equal with the largest valve body size.

ISO/DIN	Size	DN/OD						DN					
		38	51	63.5	76.1	101.6	40	50	65	80	100	125	150
*A - BasicClean		530	575	699	699	899	530	575	699	699	899	993	993
*A - SeatClean		530	575	670	670	791	530	575	670	670	791	895	895
*A - HighClean + UltraClean		611	656	760	760	922	611	656	760	760	922	1026	1026
B		170	220	220	220	300	170	220	220	220	300	300	300
**C		60.8	73.8	86.3	98.9	123.6	64	76	92	107	126	151	176
OD		38	51	63.5	76.1	101.6	41	53	70	85	104	129	154
ID		34.8	47.8	60.3	72.9	97.6	38	50	66	81	100	125	150
t		1.6	1.6	1.6	1.6	2.0	1.5	1.5	2.0	2.0	2.0	2.0	2.0
E - Basic/SeatClean		100	121	149	142	177	99	119	146	138	176	215	202.5
E - HighClean/UltraClean		144	165	200	193	248	143	163	197	189	247	286	273.5
F1		31.5	31.5	38	38	59	31.5	31.5	38	38	59	59	59
F2		5	5	5	5	5	5	5	5	5	5	5	5
øD - Basic		120	120	186	186	186	120	120	186	186	186	186	186
øD - SeatClean, HighClean and UltraClean		120	120	157	157	186	120	120	157	157	186	186	186
L - Basic		230	230	281	281	379	230	230	281	281	379	379	379
L - SeatClean, HighClean and UltraClean		230	230	252	252	281	230	230	252	252	281	281	281
M/ISO clamp		21	21	21	21	21							
M/DIN clamp							21	21	21	21	21	28	28
M/ISO male		21	21	21	21	21							
M/DIN male							22	23	25	25	30	46	50
M/SMS male		20	20	24	24	35							
M/BS male		22	22	22	22	27							
Weight (kg) - Basic		13.5	15	24	24	34	13.5	15	24	24	34	44	45
Weight (kg) - SeatClean		13.5	15	24	24	34	13.5	15	24	24	34	47	48
Weight (kg) - High-/UltraClean		14.5	16	27	27	38	14.5	16	27	27	38	51	52

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Note! * For the A-measure if different upper/lower body sizes, please refer to Anytime configurator or contact Alfa Laval.

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

Dimension for 3-body version

Group Size ISO-DIN	3 DN/OD 51	4 DN/OD 63.5	4 DN/OD 76.1	5 DN/OD 101.6	3 DN 50	4 DN 65	4 DN 80	5 DN 100
A - without Spiral Clean	615.6	714.65	728.45	877.2	615.6	714.7	744.7	877.3
A - with Spiral Clean	696.1	804.65	818.45	1008.2	696.1	804.7	834.7	1008.3
A - Flushed	611.2	706.75	726.25	872.7	615.6	714.7	744.7	877.3
B	220	220	220	300	220	220	220	300
**C	73.8	86.3	98.9	123.6	76	92	107	126
OD	51	63.5	76.1	101.6	53	70	85	104
ID	47.8	60.3	72.9	97.6	50	66	81	100
t	1.6	1.6	1.6	2	1.5	2	2	2
E - without Spiral Clean	86.7	107.5	102.4	139.5	83.4	99.0	106.5	136.0
E - with Spiral Clean	130.2	158.0	152.9	210.5	126.9	149.5	157.0	207.0
E - Flushed	82.3	99.6	100.2	135.0	83.4	99.0	106.5	136.0
F1	31.5	38	38	59	31.5	38	38	59
F2	5	5	5	5	5	5	5	5
øD	120	157	157	186	120	157	157	186
L	230	252	252	281	230	252	252	281
M/ISO clamp	21	21	21	21				
M/DIN clamp					21	21	21	21
M/ISO male	21	21	21	21				
M/DIN male					23	25	25	30
M/SMS male	20	24	24	35				
M/BS male	22	22	22	27				

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



TECHNICAL DATA

Pressure

Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum

Temperature

Temperature range:	-5°C to +125°C (depending on elastomer)
Steaming in Place (SIP):	140°C - 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:	600 to 800 kPa (6-8 bar)
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ATEX

Classification:	II 2 G D*
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*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

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

PHYSICAL DATA

Materials

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

Surface finish choose from the following:

Internal:	Ra < 0.8µm
Optional:	Ra 0.5 or Ra 0.4 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

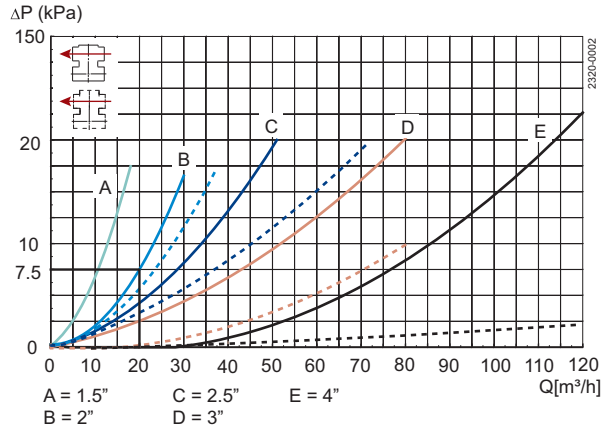


Fig. 3. Pressure drop/capacity diagram, upper body. Full lines: Balanced upper plug. Dotted lines: Unbalanced upper plug.

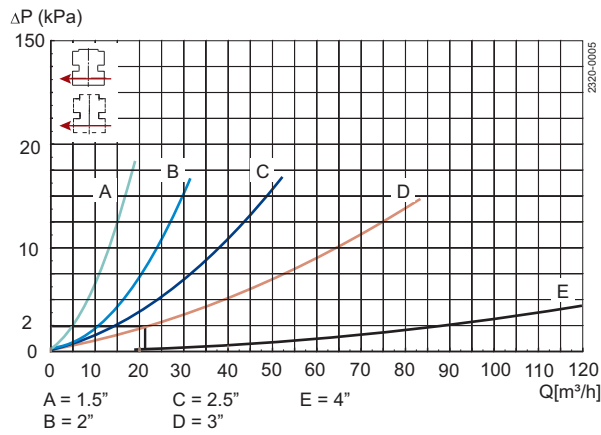


Fig. 4. Pressure drop/capacity diagram, lower body, balanced

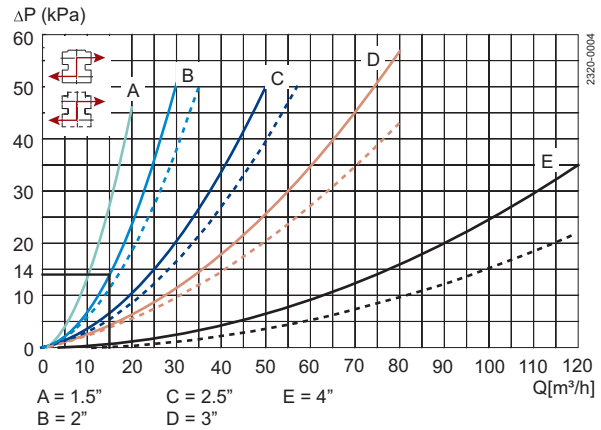
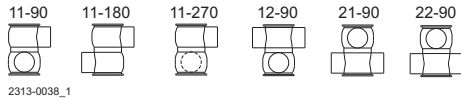


Fig. 5. Pressure drop/capacity diagram, between bodies.
Full lines: Balanced.
Dotted lines: Unbalanced.

Notel For the diagrams the following applies: Medium:
Water (20°C).
Measurement: In accordance with VDI 2173.

Valve body combinations

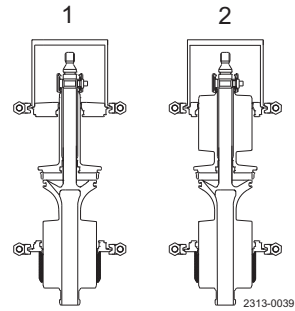


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Valve body combinations, example: type 11-90

- 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 [m³/h]	1.5	1.5	2.5	2.5	3.1
Lower Seat-lift [m³/h]	0.9	0.9	1.9	1.9	2.5
Air consumption					
Upper Seat-lift * [n litre]	0.2	0.2	0.4	0.4	0.62
Lower Seat-lift * [n litre]	1.1	1.1	0.13	0.13	0.21
Main Movement * [n litre]	0.86	0.86	1.63	1.63	2.79

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Note * [n litre] = volume at atmospheric pressure. Formula to estimate CIP flow during seat lift: (for liquids with comparable viscosity and density to water):

$$Q = Kv \cdot \sqrt{\Delta p}$$

$$Q = \text{CIP - flow (m}^3\text{/h)}$$

$$Kv = \text{Kv value from the above table}$$

$$p = \text{CIP pressure (bar)}$$

Actuator

						STD Operating pressure at 6 bar air pressure
Actuator Type	3	4BS1	4SS2	5BS	5SS	
Actuator dimensions	120 x 230	157 x 252	186 x 281	186 x 281	186 x 379	
∅D x L						
Connection Size						
ASME BPE						
1½"	STD	OP				1000 kPa
2"	STD	OP	OP			1000 kPa
2½"	OP	STD	OP	OP	OP	1000 kPa
3"	OP	STD	OP	OP	OP	1000 kPa
4"		OP	OP	STD	OP	1000 kPa

STD: Normal size of actuator

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

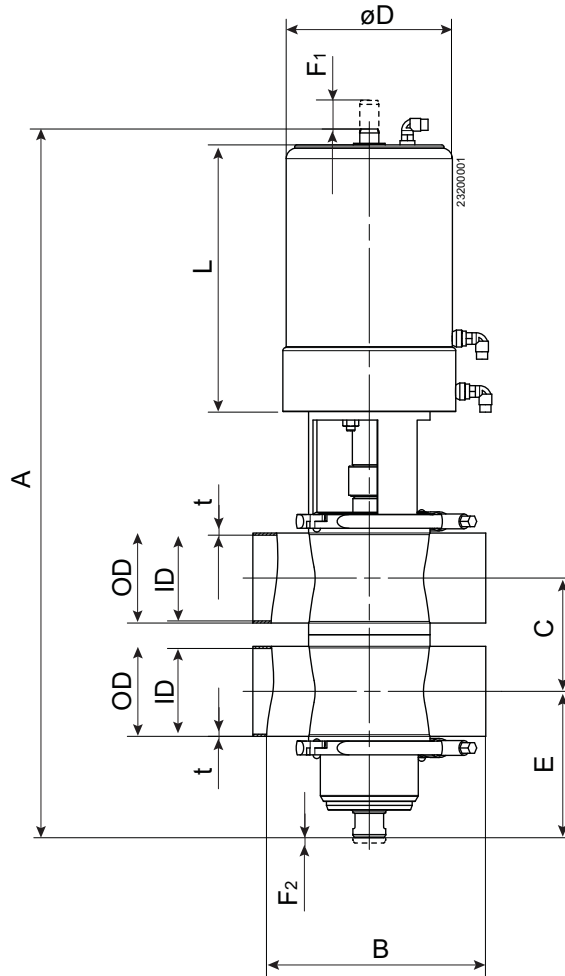
1 BS = Basic spring

2 SS = Strong spring

Radial Seat Diameter

ASME BPE	Seat (mm)	Seat (in)
1½"	∅53.3	∅2.10
2"	∅53.3	∅2.10
2½"	∅81.3	∅3.20
3"	∅81.3	∅3.20
4"	∅100.3	∅3.95

Dimensions (mm)



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	60.8	2.39	73.5	2.89	86.2	3.39	98.9	3.89	123.4	4.86
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

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

