

Alfa Laval Unique SSV Aseptic

Single seat valves

Introduction

The Alfa Laval Unique SSV Aseptic is a versatile, reliable pneumatic single seat valve with a single contact surface between the plug and the seat to minimize the risk of contamination.

Its compact, modular and hygienic design meets the highest process requirements in terms of hygiene and safety. Built on the well-proven Alfa Laval Unique SSV platform, it features a one-piece diaphragm that provides hermetic sealing to prevent intrusion of contaminants from the atmosphere, ensuring full protection against the effects of microorganisms during processing. The special diaphragm can also be used with the Unique SSV Standard, Tangential, Two Step, Manual and Tank Outlet.

Few moving parts ensure easy maintenance, high reliability and low total cost of ownership. A wide range of optional features enables customization to specific process requirements.

Application

This Unique SSV Aseptic is designed for uninterrupted production in sterile and aseptic applications across the dairy, food, beverage, brewery, biotechnology, pharmaceutical and many other industries.

Benefits

- Durable, aseptic valve design
- Superior cleanability – smooth inner valve body without crevices
- Extended seal life due to the defined seal compression
- Enhanced product safety due to the static seal leak detection
- Protection against bacterial contamination
- Easy to configure

Standard design

The Unique SSV Aseptic is available in a one- or two-body configuration, with easy-to-configure valve bodies, plugs, actuator and clamp rings. The valve can be configured for aseptic processing as a shutoff valve with two or three working ports or as a changeover valve with three to five ports.



To ensure flexibility, the valve seat that sits between the two bodies in the changeover version is provided for assembly. The valve seals are optimized for durability and long service life through a defined compression design. The actuator is connected to the valve body using a yoke, and all components are assembled with clamp rings.

The valve can be fitted with Alfa Laval ThinkTop V-series for sensing and control of the valve. See ThinkTop datasheets for further details.

Using the Alfa Laval Anytime configurator, it is easy to customize to meet virtually any process requirement.

Working principle

The Alfa Laval Unique SSV Aseptic is operated by means of compressed air from a remote location. The actuator smooths operation and protects process lines against pressure peaks. An

integrated valve plug/diaphragm secures aseptic operation. The valve can be controlled using an Alfa Laval ThinkTop®.

Certificates

 Authorized to carry the 3A symbol

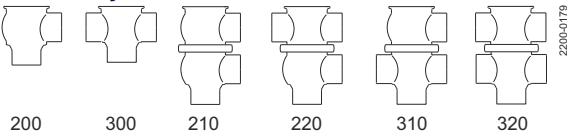
TECHNICAL DATA

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)
Max. sterilization temperature:	150 °C/380 kPa (3.8 bar)
Air pressure:	500-700 kPa (5-7 bar)



Note!
Vacuum is not recommended in aseptic applications.

Valve body combinations



Actuator function

- Pneumatic downward movement, spring return (NO)
- Pneumatic upward movement, spring return (NC)
- Pneumatic upward and downward movement (A/A)

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 seal:	EPDM
Other seals:	NBR
Diaphragm:	PTFE (Product wetted side)/EPDM

Options

- Male parts or clamp liners in accordance with required standard
- Control and Indication: ThinkTop V-Series
- Product wetted seals in HNBR or FPM
- Low pressure actuator
- High product pressure actuator
- Maintainable actuator
- 2 step/3 position actuator (not for DN/OD 25/DN 25)
- External surface bright



Note!
For further details, see instruction manual.

Other valves in the same basic design

The Unique SSV valve range includes several purpose built valves. Below are some of the valve models available, though please use the Alfa Laval Anytime configurator for full access to all models and options.

- Manually operated valve
- Two Step valve
- Tangential valve
- Tank Outlet valve

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (mm)

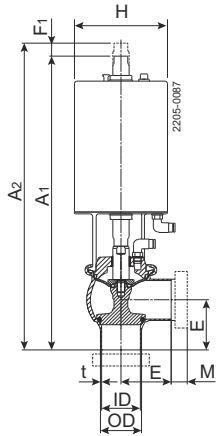


Figure 1. Shut-off valve

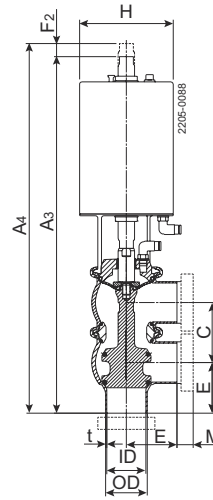


Figure 2. Change-over valve

Nominal size	DN/OD						DIN/DN					
	25	38	51	63.5	76.1	101.6	25	40	50	65	80	100
A ₁	308	314	367	394	432	482	312	316	369	397	436	484
A ₂	319	325	382	409	451	501	323	327	384	412	455	503
A ₃	356	375	441	480	531	606	364	380	444.5	489	543	610
A ₄	364	384	454	493	547	622	372	389	458	502	559	626
C	47.8	60.8	73.8	86.3	98.9	123.6	52	64	76	92	107	126
OD	25	38	51	63.5	76.1	101.6	29	41	53	70	85	104
ID	21.8	34.8	47.8	60.3	72.9	97.6	26	38	50	66	81	100
t	1.2	1.6	1.6	1.6	1.6	2	1.5	1.5	1.5	2	2	2
E	50	49.5	61	81	86	119	50	49.5	61	78	86	120
F ₁	11	11	15	15	19	19	11	11	15	15	19	19
F ₂	8	9	13	13	16	16	8	9	13	13	16	16
H	85	85	114.9	114.9	154.3	154.3	85	85	114.9	114.9	154.3	154.3
M/ISO clamp	21	21	21	21	21	21	-	-	-	-	-	-
M/DIN clamp	-	-	-	-	-	-	21	21	21	28	28	28
M/DIN male	-	-	-	-	-	-	22	22	23	25	25	30
M/SMS male	20	20	20	24	24	35	-	-	-	-	-	-
Weight (kg)												
Shut off valve	3.1	3.3	5.6	6.6	11.5	14	3.2	3.4	5.6	6.8	11.9	13.9
Change-over valve	3.9	4.2	7.2	8.7	14.2	18.4	4.1	4.5	7.1	9	15.1	18.3

For exact high pressure actuator dimension (A and F) - please refer to information in Anytime configurator.



Note!

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

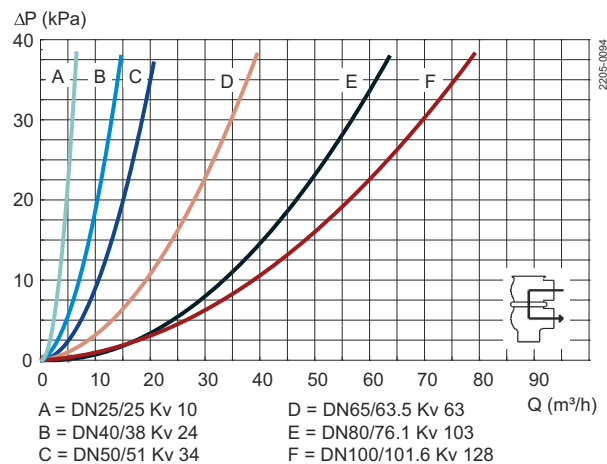
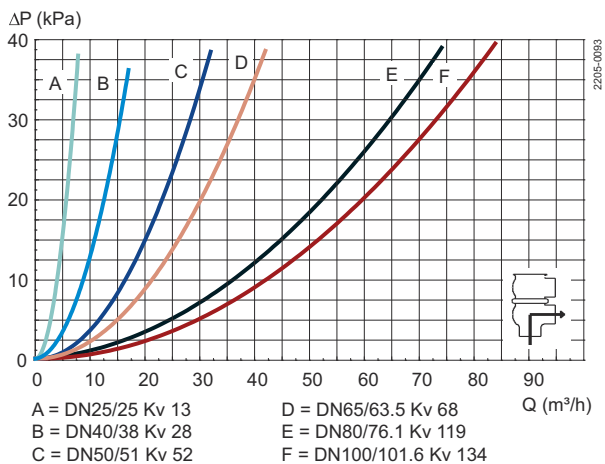
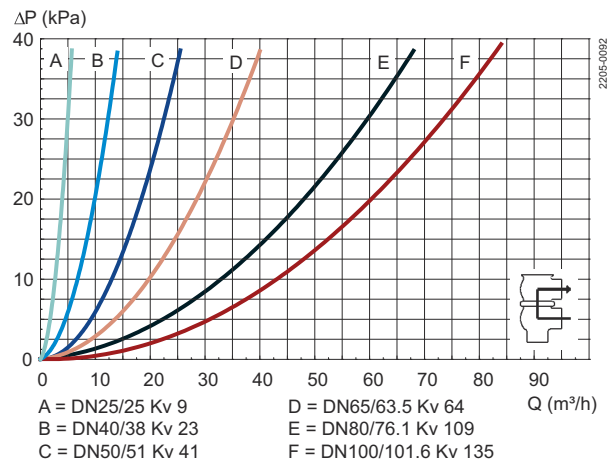
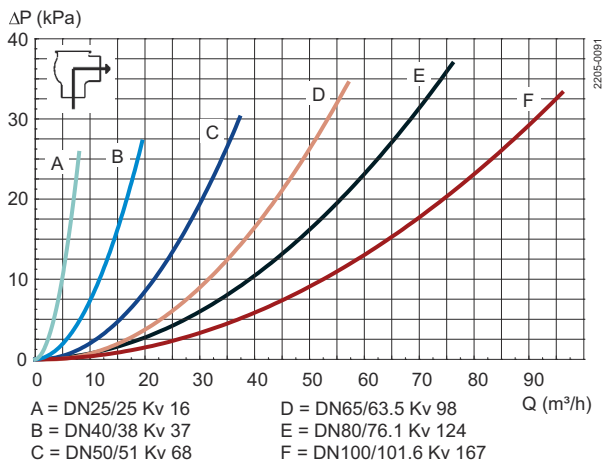
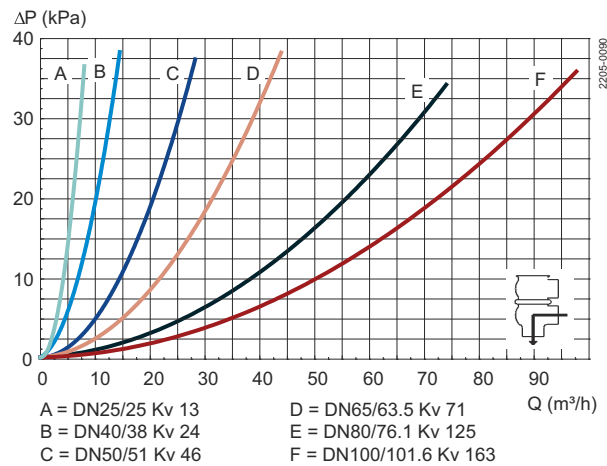
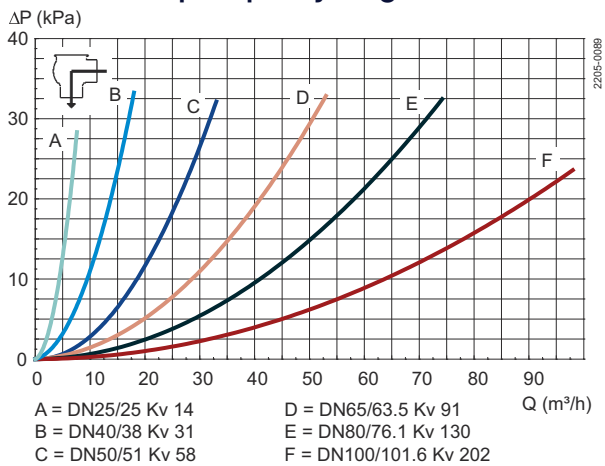
Air Connections Compressed air:

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

Air consumption (litres free air) for one stroke

Size	DN25-40	DN50-65	DN80-100
	DN/OD 25-38 mm	DN/OD 51-63.5 mm	DN/OD 76.1-101.6 mm
NO and NC	0.2 x air pressure [bar]	0.5 x air pressure [bar]	1.3 x air pressure [bar]
A/A	0.5 x air pressure [bar]	1.1 x air pressure [bar]	2.7 x air pressure [bar]

Pressure drop/capacity diagrams



Note!

For the diagrams the following applies:

Medium: Water (20 °C)

Measurement: In accordance with VDI 2173

Pressure drop can also be calculated in Anytime configurator.

Pressure drop can also be calculated with the following formula:

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

Where

Q = Flow in m^3/h .

K_v = m^3/h at a pressure drop of 1 bar (see table above).

Δp = Pressure drop in bar over the valve.

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Q = Flow in m^3/h .

K_v = m^3/h at a pressure drop of 1 bar (see table above).

Δp = Pressure drop in bar over the valve.

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

2.5" shut-off valve, where $K_v = 111$ (See table above).

$40 = 111 \times \sqrt{\Delta p}$

$$\Delta p = \left(\frac{40}{111}\right)^2 = 0.13 \text{ bar}$$

(This is approx. the same pressure drop by reading the y-axis above)

Pressure data for Unique Single Seat Valve Aseptic

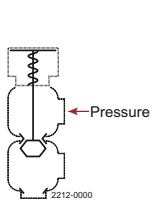


Figure 3.1

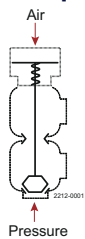


Figure 4.2

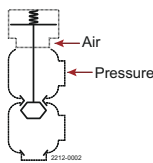


Figure 5.3

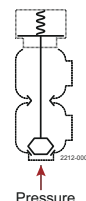


Figure 6.4

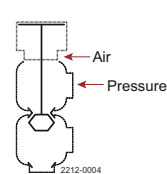


Figure 7.5

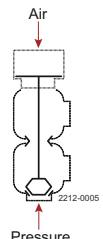


Figure 8.6

Shut fully closed. Max. static pressure without leakage

Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Plug position	Valve size					
			DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
			DN/OD 25 mm	DN/OD 38 mm	DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
Figure 3.1		NO	8.0	6.0	8.0	4.4	7.5	5.5
Figure 4.2	6	NO	8.0	7.6	8.0	5.6	7.2	4.8
Figure 5.3	6	NC	8.0	8.0	8.0	6.8	7.5	5.0
Figure 6.4		NC	8.0	6.3	7.2	4.2	6.4	4.2
Figure 7.5	6	A/A	8.0	8.0	8.0	8.0	8.0	8.0
Figure 8.6	6	A/A	8.0	8.0	8.0	8.0	8.0	8.0

Shut fully closed. Options with high pressure actuator - Max. static pressure without leakage

Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Plug position	Valve size					
			DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
			DN/OD 25 mm	DN/OD 38 mm	DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
Figure 3.1		NO	8.0	8.0	8.0	8.0	-	-
Figure 4.2	6	NO	8.0	8.0	8.0	8.0	-	-
Figure 5.3	6	NC	8.0	8.0	8.0	8.0	8.0	4.1
Figure 6.4		NC	8.0	8.0	8.0	8.0	8.0	7.0

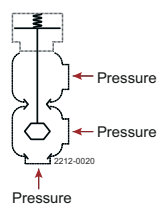


Figure 9.1

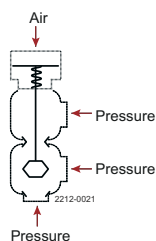


Figure 10.2

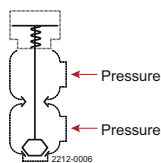


Figure 11.3

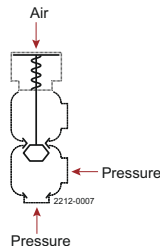


Figure 12.4

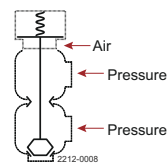


Figure 13.5

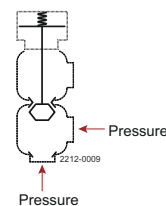


Figure 14.6

Valve is closing. Approximately max. pressure in bar at which the valve can close by means of the spring or air pressure

Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Plug position	Valve size					
			DN 25	DN 40	DN50	DN 65	DN 80	DN 100
			DN/OD 25 mm	DN/OD 38 mm	DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
Figure 9.1		NC	6.5	6.5	8.0	8.0	7.3	7.6
Figure 10.2	6	NO	8.0	8.0	8.0	8.0	7.9	8.0

Seat fully closed - Standard valve. Approximately pressure in bar, at which the valve plug can change positions by the spring or air pressure

Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Plug position	Valve size					
			DN 25	DN 40	DN50	DN 65	DN 80	DN 100
			DN/OD 25 mm	DN/OD 38 mm	DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
Figure 11.3		NO	8.0	8.0	8.0	8.0	8.0	8.0
Figure 12.4	6	NO	8.0	8.0	8.0	8.0	8.0	8.0
Figure 13.5	6	NC	8.0	8.0	8.0	8.0	8.0	8.0
Figure 14.6		NC	8.0	8.0	8.0	5.7	8.0	5.4

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