

Alfa Laval Unique SSV Reverse Acting

Single seat valve

Introduction

The Alfa Laval Unique SSV Reverse Acting 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 demands in terms of hygiene and safety. Built on the well-proven Alfa Laval Unique SSV platform, it provides multiple solutions where the direction of the flow does not allow the use of a standard Alfa Laval Unique SSV to eliminate the risk of pressure shock.

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

Application

The Unique SSV Reverse Acting is designed for use in a broad range of hygienic applications across the dairy, food, beverage, brewery and many other industries.

Benefits

- Exceptional valve hygiene and durability
- 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 full vacuum due to the double lip seal
- Increased flexibility due to reverse-acting function

Standard design

The Unique SSV Reverse Acting is available in a two- or three-body configuration, with easy-to-configure valve bodies, plugs, actuator and clamp rings. The valve can be configured as a shut-off valve with two or four working ports or as a changeover valve with three to six ports.

To ensure flexibility, the valve seat that sits between the two bodies in both the shut-off and 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 also be fitted with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.

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

Working principle

The Alfa Laval Unique SSV Reverse Acting is operated by means of compressed air from a remote location. The actuator smooths operation and protects process lines against pressure peaks. The valve can be controlled using an Alfa Laval ThinkTop®.

TECHNICAL DATA

Temperature

Temperature range: 14°F to +284°F (EPDM)

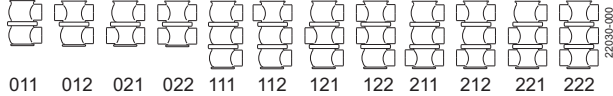
Pressure

Max. product pressure: 145 PSI (1000 kPa (10 bar))

Min. product pressure: Full vacuum

Air pressure: 72.5 to 101.5 PSI (5 - 7 bar)

Valve body combinations



Actuator function

- Pneumatic downward movement, spring return.
- Pneumatic upward movement, spring return.
- Pneumatic upward and downward movement (A/A).

PHYSICAL DATA

Materials

Product wetted steel parts: AISI 316L (internal Ra < 32 μ inch)

Other steel parts: AISI 304

External surface finish: Semi-bright (blasted)

Internal surface finish: Bright (polished), Ra < 32 μm

Plug seal: PTFE (TR2) (standard)

Optional elastomer plug seal: EPDM, HNBR or FPM

Other product wetted seals: EPDM (standard)

Optional product wetted seals: HNBR or FPM

Other seal: NBR

Options

- Male parts or clamp liners in accordance with required standard
- Control and Indication: IndiTop, ThinkTop or ThinkTop Basic
- Product wetted seals in HNBR or FPM
- Plug seals HNBR, FPM or TR2 plug (floating PTFE design)
- High pressure actuator
- Maintainable actuator
- External surface finish bright



Note!

For further details, see instruction ESE00213.

Other valves in the same basic design

- Long stroke valve
- Manually operated valve

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (inch)

	Nominal size						Shut-off 4" XL stroke
	1"	1½"	2"	2½"	3"	4"	
A ₁	13.3	13.96	16.21	17.19	19.05	21.00	32.9"
A ₂	13.77	14.79	17.23	18.22	20.3	22.22	32.9"
A ₃	15.18	16.5	19.27	20.75	23.10	26.02	N/A
A ₄	15.61	17.15	20.28	21.61	24.17	27.08	N/A
C	1.88	2.39	2.91	3.40	3.89	4.87	4.87
OD	0.98	1.50	2.01	2.50	3.00	4.00	4.00



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	Nominal size						Shut-off 4" XL stroke
	1"	1½"	2"	2½"	3"	4"	
ID	0.86	1.37	1.88	2.37	2.87	3.84	3.84
t	0.06	0.06	0.06	0.06	0.06	0.08	0.08
E	1.97	1.95	2.44	3.23	3.43	4.72	4.72
F ₁	0.47	0.83	1.02	1.02	1.22	1.22	2.95
F ₂	0.43	0.63	0.87	0.87	1.06	1.06	N/A
G	0.94	1.95	1.59	3.23	3.43	4.72	4.72
H	ø3.34	ø3.34	ø4.53	ø4.53	ø6.18	ø6.18	6.00
H (high pressure)	ø3.34	ø4.53	ø6.18	ø6.18	ø6.18	ø6.18	N/A
M (Tri-Clamp)	0.50	0.50	0.50	0.50	0.50	0.63	0.63
Weight (lb)							
Shut-off valve	10.14	10.58	17.20	9.5	34.84	43.65	48.50
Change-over valve	12.13	12.79	20.28	20.94	41.01	54.01	N/A

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

* To top of stem protector

** Internal stem stroke

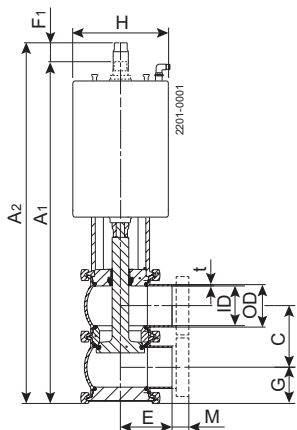


Figure 1. Shut-off valve

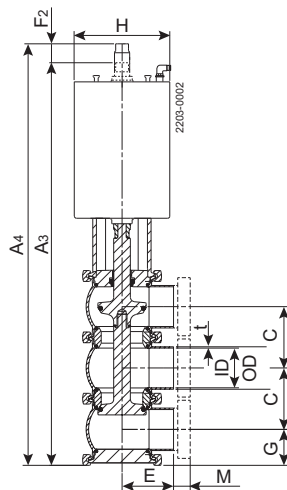


Figure 2. Change-over valve

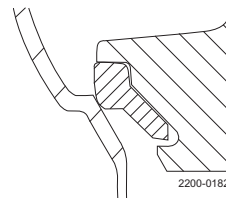


Figure 3. Replaceable elastomer plug seal

Please note!

Opening/closing time will be effected 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.

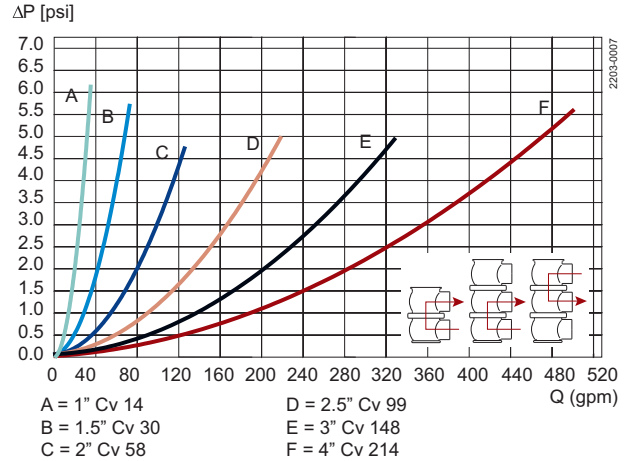
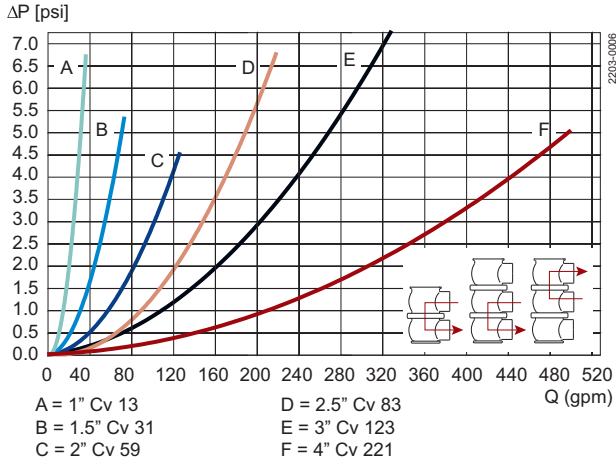
Air Connections Compressed air:

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

Size	Air Consumption (in ³ free air) for one stroke		
	1"-1½"	2"-2½"	3"-4"
NO and NC	0.96 x air pressure [psi]	2.17 x air pressure [psi]	5.51 x air pressure [psi]
A/A	1.94 x air pressure [psi]	4.82 x air pressure [psi]	11.15 x air pressure [psi]



Pressure drop/capacity diagrams



Note!

For the diagrams the following applies:

Medium: Water (68°F)

Measurement: In accordance with VDI2173

Pressure drop can also be calculated in Anytime configurator.

Pressure drop can also be calculated with the following formula:

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

Where

Q = Flow (gallon/minute).

Cv = gallon/minute at a pressure drop of 1 psi (see table above).

Δp = Pressure drop in psi over the valve.

How to calculate the pressure drop for an ISO 2.5" shut-off valve if the flow is 160 gallon/minute.

2.5" shut-off valve, where Cv = 128 (See table above).

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

$$160 = 128 \times \sqrt{\Delta p}$$

$$\Delta p = \left(\frac{160}{128} \right)^2 = 1,6 \text{ psi}$$

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



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Pressure data for Unique Single Seat Valve Reverse Acting

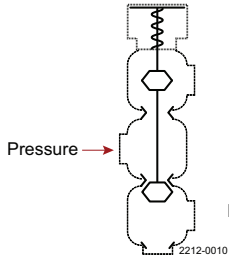


Figure 4.1

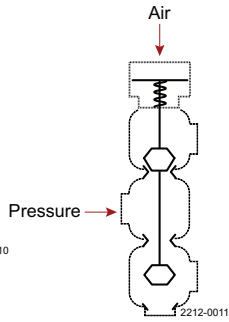


Figure 5.2

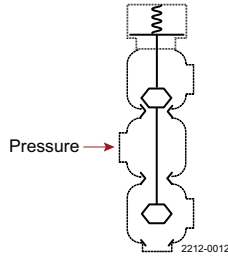


Figure 6.3

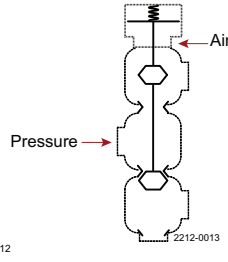


Figure 7.4

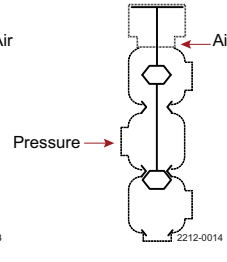


Figure 8.5

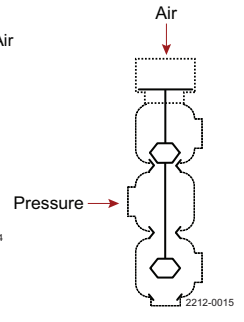


Figure 9.6

Shut-off and Change-over valves

Actuator/valve body combination and direction of pressure	Air pressure (PSI)	Plug position	Max. pressure in bar without leakage at the valve seat					
			Valve size					
			DN25 DN/OD	DN40 DN/OD	DN50 DN/OD	DN65 DN/OD	DN80 DN/OD	DN100 DN/OD
Change-over valve			1"	1½"	2"	2½"	3"	4"
1		NC	145	119	122	65	99	64
2	87	NC	145	110	139	81	104	70
3		NO	145	91	104	61	93	61
4	87	NO	145	145	145	88	112	5.0
5	87	A/A	145	145	145	145	131	84
6	87	A/A	145	145	145	145	123	81

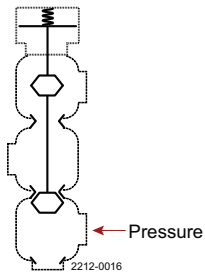


Figure 10.7

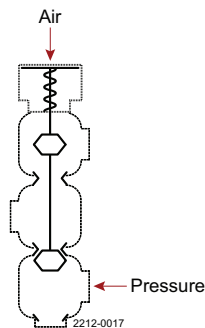


Figure 11.8

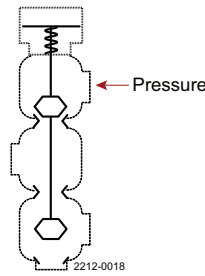


Figure 12.9

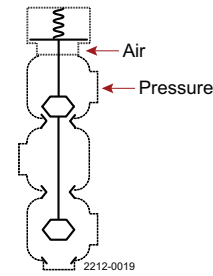


Figure 13.10

Shut-off and Change-over valves

Actuator/valve body combination and direction of pressure	Air pressure (PSI)	Plug position	Max. pressure in bar against which the valve can open					
			Valve size					
			DN25 DN/OD	DN40 DN/OD	DN50 DN/OD	DN65 DN/OD	DN80 DN/OD	DN100 DN/OD
Change-over valve			1"	1½"	2"	2½"	3"	4"
7		NO	145	141	145	99	67	45
8	87	NC	145	145	145	120	144	96
9		NC	145	145	145	107	71	46
10	87	NO	145	145	145	131	145	100



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