Alfa Laval Unique SSV Long Stroke

Single seat valves

Introduction

The Alfa Laval Unique SSV Long Stroke is 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 Unique SSV platform, it is especially suitable for use with highly viscous products and products containing particles and/or suspended solids due to its larger opening.

Application

This Unique SSV Long Stroke 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 thanks to the static seal leak detection
- Protection against full vacuum due to the double lip seal

Standard design

The Unique SSV Long Stroke 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 as a shut-off valve with two or three working ports or as a changeover valve with up 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 Long Stroke 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®.

Certificates

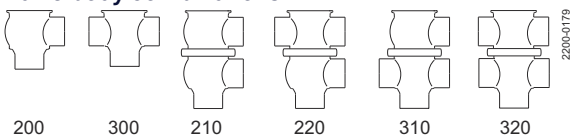
Authorized to carry the 3A symbol

TECHNICAL DATA

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

Pressure	
Max. product pressure (depending on valve specifications):	145 PSI (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	72.5 to 101.5 PSI (5 to 7 bar)

Valve body combinations



Actuator function

- Pneumatic downward movement, spring return
- Pneumatic upward movement, spring return
- Pneumatic upward and downward movement (AA)

PHYSICAL DATA

Materials	
Product wetted steel parts:	AISI 316L (internal Ra < 32 µ inch)
Other steel parts:	AISI 304
Plug seal:	PTFE (TR2) (standard)
Optional elastomer plug seal:	EPDM, HNBR or FPM
Optional productwetted seals:	HNBR or FPM
Other productwetted seals:	EPDM (standard)
Other seals:	NBR

Options

- Weld ends or connection types other than Tri-Clamp
- Control and Indication: ThinkTop V-Series
- Product wetted seals in HNBR or FPM
- Replaceable elastomer plug seals.
- External surface finish blasted.

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.

- Reverse acting valve
- Manually operated valve
- Tank Outlet valve
- Tangential valve

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (inch)

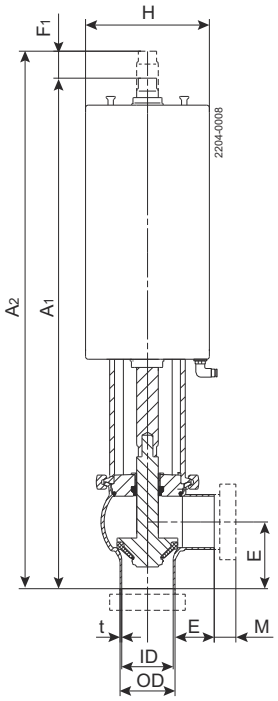


Figure 1. Shut-off valve

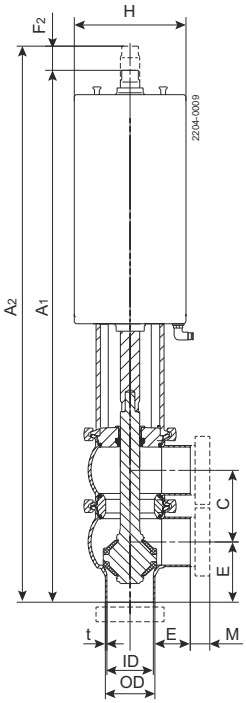


Figure 2. Change-over valve

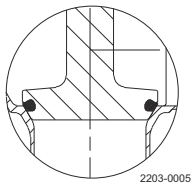


Figure 3. Replaceable elastomer plug seal

Nominal Size	Inch				
	1½"	2"	2½"	3"	4"
A_1	16.37	16.76	17.36	21.23	23.32
A_2	17.31	18.06	19.09	23.5	25.84
A_3	17.8	19.02	20.55	24.76	28.07
A_4	18.75	20.32	22.32	27	30.59
C	2.39	2.91	3.4	3.89	4.87
OD	1.5	2	2.5	3	4
ID	1.37	1.88	2.37	2.87	3.84
t	0.06	0.06	0.06	0.06	0.08
E_1	1.95	2.44	3.23	3.43	4.72
E_2	0.94	1.30	1.73	2.24	2.52
F_1	0.98	1.30	1.77	2.24	2.52
F_2	3.35	4.52	4.52	6.18	6.18
H	4.52	6.18	6.18	6.18	6.18
M (Tri-Clamp)	0.50	0.50	0.50	0.50	0.63
Weight (lb)					
Shut-off valve	13.4	14.7	16.8	33.2	38.8
Change-over valve	15	17.4	21	38.8	49.5

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

Please 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:

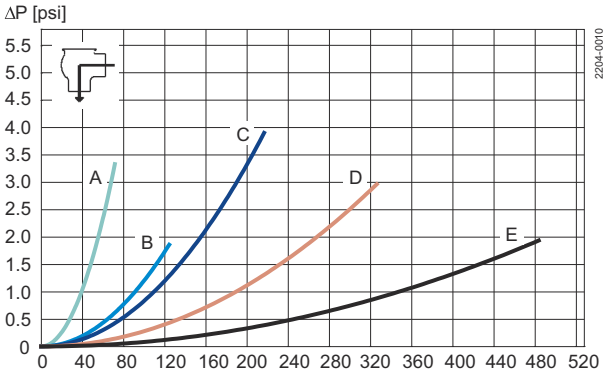
R 1/8" (BSP), internal thread.

Max. size of solids (inch)	**Valve size (DN/OD)**				
	1½"	**2"**	**2½"**	**3"**	**4"**
Shut-off valve	0.83	1.26	1.57	2.13	2.28
Change-over valve (plug up/lower body)	0.87	1.38	1.26	1.69	2.13
Change-over valve (plug down/between bodies)	0.35	0.60	0.91	1.18	1.57

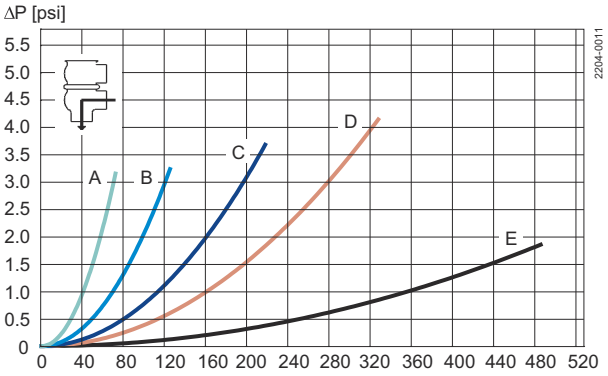
Air consumption (In^3 free air) for one stroke

Size	**1½" - 2½"**	**3" - 4"**
NO and NC	0.8 x air pressure [PSI]	2 x air pressure [PSI]
A/A	1.4 x air pressure [PSI]	3.9 x air pressure [PSI]

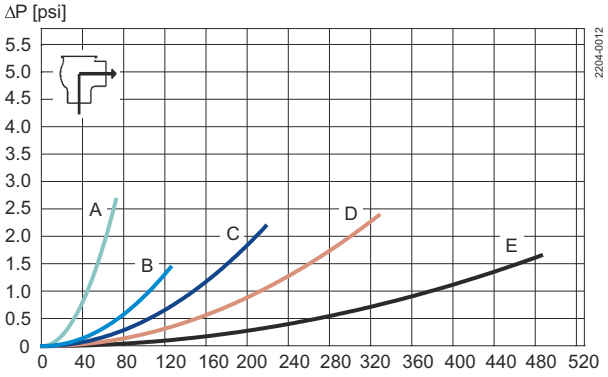
Pressure drop/capacity diagrams



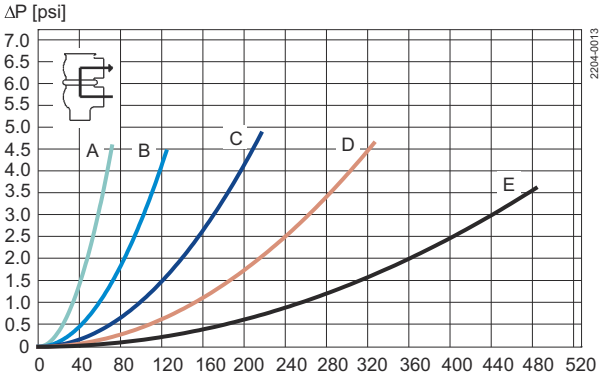
A = 1.5” Cv 39
B = 2” Cv 91
C = 2.5” Cv 110
E = 3” Cv 190
F = 4” Cv 348



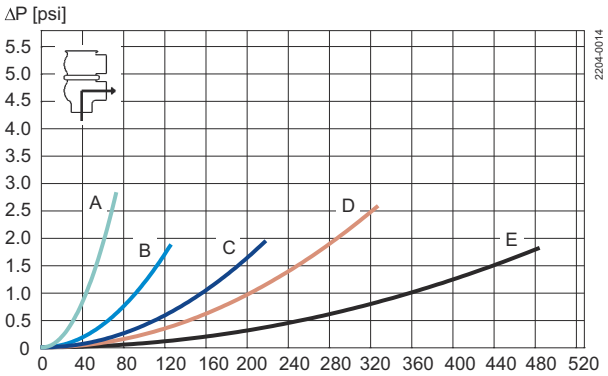
A = 1.5” Cv 40
B = 2” Cv 69
C = 2.5” Cv 113
E = 3” Cv 161
F = 4” Cv 356



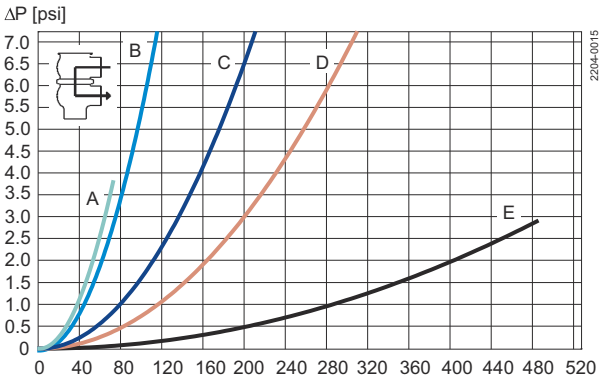
A = 1.5” Cv 44
B = 2” Cv 104
C = 2.5” Cv 147
E = 3” Cv 212
F = 4” Cv 377



A = 1.5” Cv 34
B = 2” Cv 59
C = 2.5” Cv 98
E = 3” Cv 151
F = 4” Cv 254



A = 1.5” Cv 43
B = 2” Cv 91
C = 2.5” Cv 156
E = 3” Cv 203
F = 4” Cv 360



A = 1.5” Cv 37
B = 2” Cv 43
C = 2.5” Cv 79
E = 3” Cv 116
F = 4” Cv 286

Note!
For the diagrams the following applies:
Medium: Water 68° F
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:
$Q = Cv \times \sqrt{\Delta p}$
Where
$Q = Cv \times \sqrt{\Delta p}$
Q = Flow (gallon/minute).
Cv = gallon/minute at a pressure drop of 14.5 psi (see table above).
Δ p = Pressure drop in psi over the valve.
2.5" shut-off valve, where Cv = 128 (See table above).
$Q = Cv \times \sqrt{\Delta p}$
$160 = 128 \times \sqrt{\Delta p}$
$\Delta p = \left(\frac{160}{128}\right)^2 = 1{,}6 \text{ psi}$

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

Pressure data for Unique Single Seat Valve Long Stroke

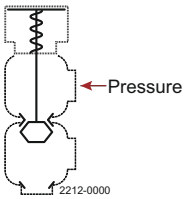


Figure 4. **1**

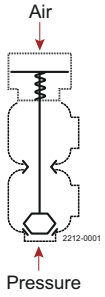


Figure 5. **2**

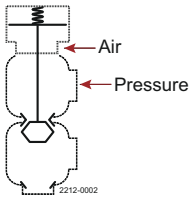


Figure 6. **3**

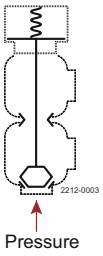


Figure 7. **4**

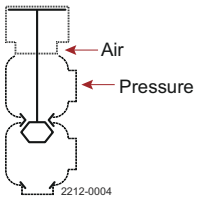


Figure 8. **5**

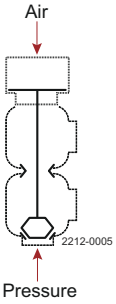


Figure 9. **6**

Shut-off and Change-over valves

			Max. pressure in PSI without leakage at the valve seat				
			Valve size				
Actuator / Valve body combination and direction of pressure	**Air pressure (PSI)**	**Plug position**	**DN 40 DN/OD 1½"**	**DN50 DN/OD 2"**	**DN 65 DN/OD 2½"**	**DN 80 DN/OD 3"**	**DN 100 DN/OD 4"**
Figure 4. 1		NO	145	129	70	103	67
Figure 5. 2	87	NO	145	125	73	99	64
Figure 6. 3	87	NC	145	144	78	104	67
Figure 7. 4		NC	145	110	64	97	64
Figure 8. 5	87	A/A	145	145	145	145	145
Figure 9. 6	87	A/A	145	145	145	145	145

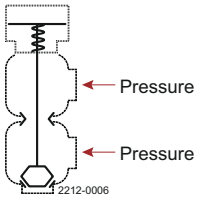


Figure 10. **7**

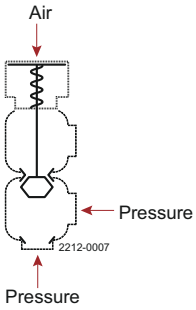


Figure 11. **8**

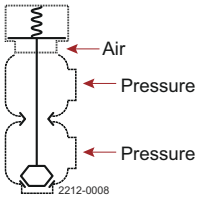


Figure 12. **9**

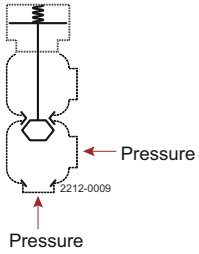


Figure 13. **10**

Shut-off and Change-over valves

			Max. pressure in PSI against which the valve can open				
			Valve size				
Actuator / Valve body combination and direction of pressure	**Air pressure (PSI)**	**Plug position**	**DN 40 DN/OD 1½″**	**DN50 DN/OD 2″**	**DN 65 DN/OD 2½″**	**DN 80 DN/OD 3″**	**DN 100 DN/OD 4″**
Figure 10. 7		NO	145	145	117	145	97
Figure 11. 8	87	NO	145	145	116	141	94
Figure 12. 9	87	NC	145	145	126	145	97
Figure 13. 10		NC	145	145	109	139	93

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