

Alfa Laval Unique SSV Standard

Single seat valves

Introduction

The Alfa Laval Unique SSV Standard 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. It is built on the well-proven Alfa Laval Unique SSV platform. 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 Standard 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

Standard design

The Unique SSV Standard 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 shutoff valve with two 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.



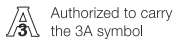
The valve can be fitted with Alfa Laval ThinkTop V-series for sensing and control of the valve. See ThinkTop datasheets for further details.

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

Working principle

The Alfa Laval Unique SSV Standard is operated by means of compressed air from a remote location. The actuator smooths operation and protects process lines against pressure peaks, while directing or diverting fluids. The valve can be controlled using an Alfa Laval ThinkTop®.

Certificates



TECHNICAL DATA

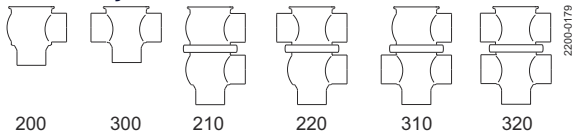
Temperature

Temperature range	14 °F to +284 °F (EPDM)
	14 °F to + 221 °F (TR2 - PTFE)
	14 °F to 320 °F (TR3 - PEEK)

Pressure

Max. product pressure	145 PSI (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)
- Actuator for intermediate position of the valve plug (optional)

PHYSICAL DATA

Materials

Product wetted steel parts:	AISI 316L (internal Ra < 32 µ inch)
Other steel parts:	AISI 304
Plug seal:	PTFE (TR2) (standard) Max. 230°F
Optional elastomer plug seal:	EPDM, HNBR or FPM
External surface finish:	Semi-bright (blasted)
Internal surface finish:	Bright (polished), Ra < 32 µin
Product wetted seals:	EPDM
Optional product wetted seals:	HNBR or FPM
Other seals:	NBR

Options

- Replaceable elastomer plug seals
- Control and Indication: ThinkTop V-Series
- Plug seals EPDM, HNBR, FPM, TR2 (PTFE) or TR3 (PEEK) floating seals design
- 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)

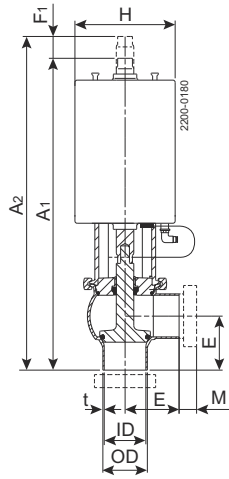


Figure 1. Shut-off valve

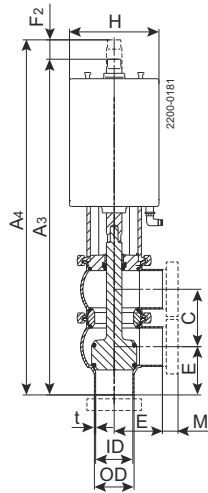


Figure 2. Change-over valve

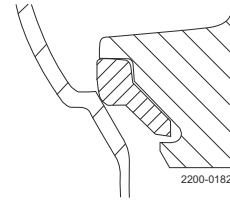


Figure 3. TR2-PTFE and TR3-PEEK Floating plug seal

	Nominal Size					
	1"	1.5"	2"	2.5"	3"	4"
A1	12.3	12.34	14.27	15.31	16.62	18.40
A2	12.89	13.13	15.3	16.29	17.8	19.58
A3	14.19	14.7	17.18	18.70	20.51	23.27
A4	14.66	15.41	18.04	19.57	21.57	24.33
A1 High pressure	13.78	13.76	15.37	16.41	21.04	22.80
A2 High pressure	14.31	14.55	16.36	17.39	22.17	23.95
A3 High pressure	15.60	16.18	18.28	19.81	24.91	27.67
A4 High pressure	16.07	16.85	19.15	23.46	25.91	28.67
C	1.88	2.39	2.91	3.4	3.89	4.87
OD	0.98	1.5	2.01	2.5	3	4
ID	0.86	1.37	1.88	2.37	2.87	3.84
t	0.05	0.06	0.06	0.06	0.06	0.08
E1	1.97	1.95	2.40	3.19	3.39	4.69
E2	1.97	1.95	2.40	3.19	3.39	4.69
F1	0.59	0.79	0.98	0.98	1.18	1.18
F1 High pressure	-	-	-	-	1.12	1.15
F2	0.47	0.67	0.87	0.87	1.06	1.06
F2 High pressure	-	-	-	-	1.00	1.00
H	3.35	3.35	4.53	4.53	6.20	6.20
H High pressure	4.53	4.53	6.20	6.20	6.20	6.20
M/ Clamp	0.5	0.5	0.5	0.5	0.5	0.63
Weight (lb)						
Shut-off valve	6.8	7.3	12.1	14.3	24.9	30.0
Change-over valve	8.6	9.3	15.7	18.7	30.9	39.7
Stop Valve: High pressure	10.4	10.6	20.9	22.0	21.6	31.3
Change-over valve: High pressure	10.8	11.2	22.3	23.8	24.0	36.4

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

* Internal stroke

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

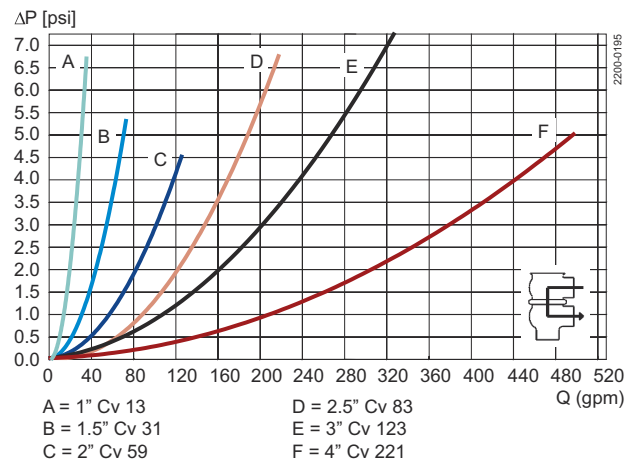
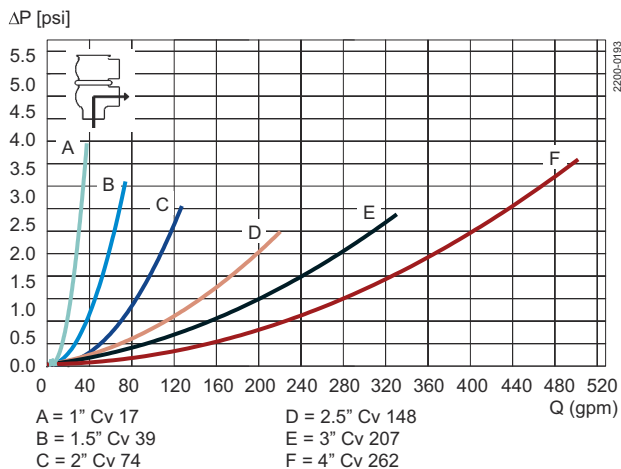
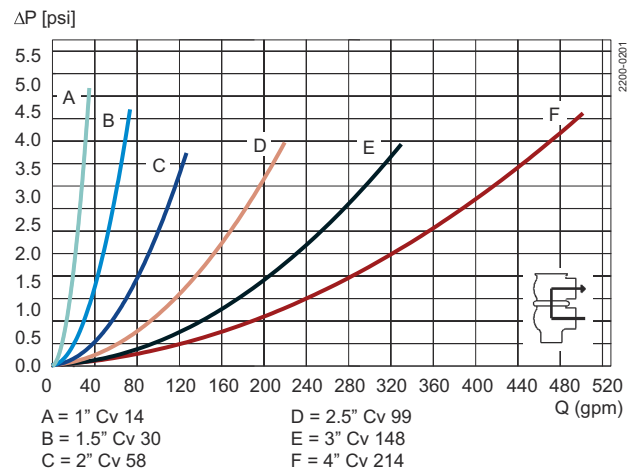
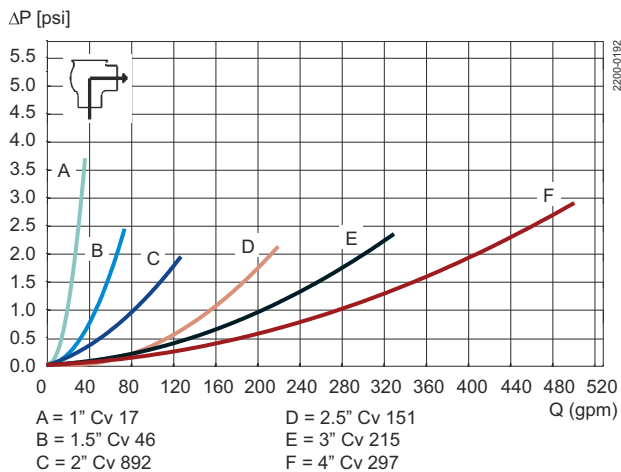
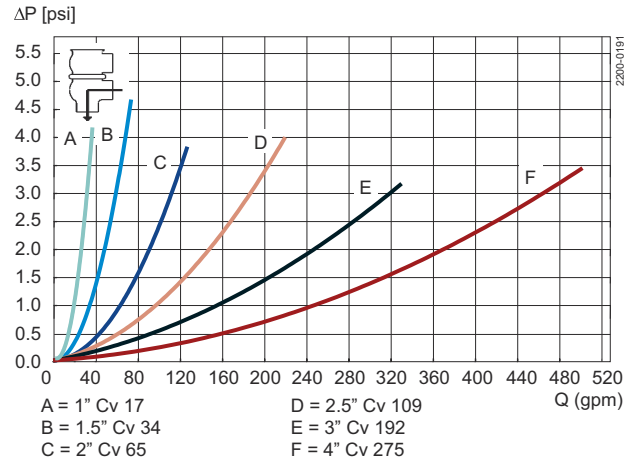
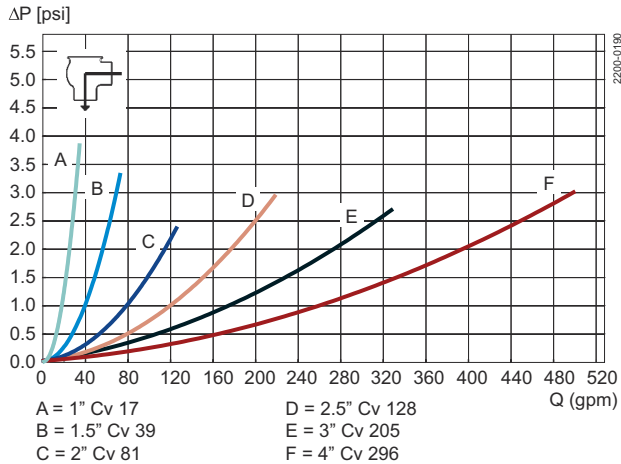
- Use of single solenoid valve for serial connected air actuator functions
- Product pressure

Air Connections Compressed air:

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

Air Consumption (ln ³ free air) for one stroke			
Size	1"-1½"	2"-2½"	3"-4"
NO and NC	0.2 x air pressure [PSI]	0.5 x air pressure [PSI]	1.3 x air pressure [PSI]
A/A	0.5 x air pressure [PSI]	1.1 x air pressure [PSI]	2.7 x air pressure [PSI]

Pressure drop/capacity diagrams



Note!

For the diagrams the following applies:

Medium: Water (68° F/20° C)

Measurement: In accordance with VDI2173

Pressure drop can also be calculated in Anytime configurator

Pressure drop can also be calculated with the following formula:

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

Where

Q = Flow (gallon/minute).

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

Δ p = 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)

Pressure data for Unique Single Seat Valve standard

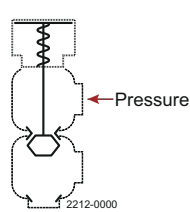


Figure 4. 1

Figure 5. 2

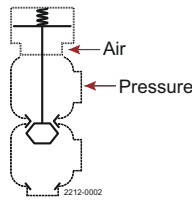


Figure 6. 3

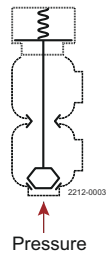


Figure 7. 4

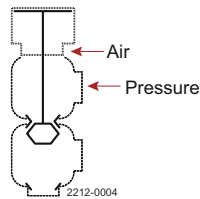


Figure 8. 5

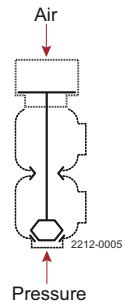


Figure 9. 6

Shut-off and Change-over valves

			Max. pressure in psi without leakage at the valve seat					
Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Valve size					
			1"	1½"	2"	2½"	3"	4"
Figure 4. 1		NO	145.0	119.0	122.0	65.0	99.0	64.0
	72.5		133.0	64.0	86.0	49.0	64.0	42.0
	101.5		145.0	145.0	145.0	113.0	145.0	97.0
Figure 5. 2	72.5	NO	145.0	83.0	99.0	54.0	68.0	44.0
	87.0		145.0	142.0	145.0	88.0	112.0	73.0
	101.5		145.0	145.0	145.0	123.0	145.0	100.0
Figure 6. 3	72.5	NC	145.0	91.0	104.0	61.0	93.0	61.0
	87.0		145.0	145.0	145.0	145.0	145.0	136.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0
Figure 7. 4	72.5	NC	145.0	145.0	145.0	145.0	145.0	145.0
	87.0		145.0	145.0	145.0	145.0	145.0	145.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0
Figure 8. 5	72.5	A/A	145.0	145.0	145.0	145.0	145.0	132.0
	87.0		145.0	145.0	145.0	145.0	145.0	145.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0
Figure 9. 6	72.5	A/A	145.0	145.0	145.0	145.0	145.0	145.0
	87.0		145.0	145.0	145.0	145.0	145.0	145.0
	101.5		145.0	145.0	145.0	145.0	145.0	145.0

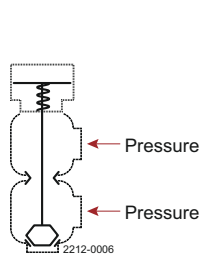


Figure 10. 7

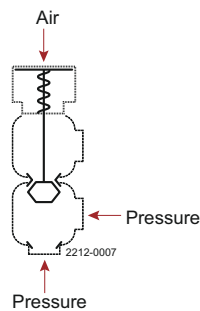


Figure 11. 8

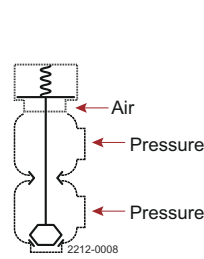


Figure 12. 9

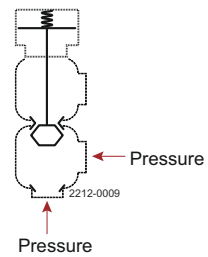


Figure 13. 10

Shut-off and Change-over valves

Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Max. pressure in psi against which the valve can open					
			Valve size					
			1"	1½"	2"	2½"	3"	4"
Figure 10. 7		NO	145	145.0	145.0	107.3	140.7	91.4
	72.5		145	113.1	145.0	88.5	103.0	68.2
Figure 11. 8	87.0	NO	145	145.0	145.0	120.4	143.6	95.7
	101.5		145	145	145.0	145.0	145.0	123.3
	72.5		145	145.0	145.0	95.7	108.8	71.1
Figure 12. 9	87.0	NC	145	145.0	145.0	130.5	145.0	100.1
	101.5		145	145.0	145.0	145.0	145.0	127.6
Figure 13. 10		NC	145	140.7	145.0	98.6	132.0	88.5

Shut-off and Change-over valves with high pressure actuator option

Actuator / Valve body combination and direction of pressure	Air pressure (psi)	Plug position	Max. pressure in psi without leakage at the valve seat					
			Valve size					
			1"	1½"	2"	2½"	3"	4"
Figure 4. 1		NO	145.0	145.0	145.0	145.0	-	-
Figure 5. 2	87.0	NO	145.0	145.0	145.0	145.0	-	-
Figure 6. 3	87.0	NC	145.0	145.0	145.0	145.0	72.5	43.5
Figure 7. 4		NC	145.0	145.0	145.0	139.2	145.0	101.5

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