Alfa Laval Unique SSV Tank Outlet

Single seat valves

Introduction

The Alfa Laval Unique SSV Tank Outlet 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 is designed for installations that open product flow into the tank (reverse-acting version) or close product flow from the tank (standard version).

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

The Unique SSV Tank Outlet is designed for use as a shut-off valve when closing product flow from a tank or as a reverse-acting valve when opening product flow into a tank in 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 Alfa Laval Unique SSV Tank Outlet valve is available in a one-body configuration with plugs, actuator, clamp rings, and up to two ports.

To ensure flexibility, 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.



An optional tank flange is available. When supplied, it is welded directly into the tank. Upon request, it can be supplied with TÜV approval AD 2000 and inspection certificate 3.1 according to EN10204.

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 Tank Outlet is operated by means of compressed air from a remote location. The valve can be controlled using an Alfa Laval ThinkTop®.

Certificates

Authorized to carry the 3A symbol

Technical Data

Temperature	
Temperature range:	EPDM seal: -10 °C to +140 °C (14 °F to 284 °F)
Max. product pressure in tank:	750 kPa (7.5 bar) if max. 20 °C (109 psi - max. 68 °F)
	650 kPa (6.5 bar) if max. 100 °C (94 psi - max 212 °F)
	450 kPa (4.5 bar) if max. 150 °C (65 psi - 302 °F)

Pressure	
Max. product pressure in pipeline (depends on valve specs):	1000 kPa (10 bar) (145 psi)
Max. product pressure in tank (depends on valve specs and temp.):	1000 kPa (10 bar) max 20 °C (145 psi - max. 68 °F) 850 kPa (8.5 bar) max 100 °C (123 psi - max 212 °F) 750 kPa (7.5 bar) max 150 °C (109 psi - max 302 °F)
Min. product pressure:	Full vacuum
Air pressure:	500 to 700 kPa (5 to 7 bar) (72.5 to 101.5 psi)

Valve Body Combinations



001 002

Physical Data

Materials	
Product wetted steel parts:	1.4404 (316L) (internal Ra < 32 µ inch)
Other steel parts:	1.4301 (304)
External surface finish;	Semi-bright (blasted)
Internal surface finish:	Bright (polished). Ra < 0.8 µm
Plug seal:	PTFE (TR2) (standard)
Optional elastomer plug seal:	EPDM. HNBR or FPM
Optional product wetted seals:	HNBR and FPM
Other seals:	NBR

Options

- Weld ends or connection types other than Tri-Clamp.
- Control and Indication: ThinkTop V-Series
- Aseptic version.
- Product wetted seals in HNBR or FPM.
- Replaceable elastomer plug seals.
- Manually operated.
- NO or A/A actuator.
- High pressure actuator.
- Long stroke actuator.
- Maintainable actuator.
- External surface finish bright.
- Adapter to mount to 32-154 & 32-595 tank flange “Model 7635”.

Note!
For further details, see instruction manual.

Other valves in the same basic design

The 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.

- Single Seat valve.
- Reverse acting valve.
- Long stroke valve.
- Manually operated valve.
- Aseptic valve.

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (inch)

Size	2"	2½"	3"	4"
A1	16.79	17.28	18.84	19.81
A2	15.49	15.98	17.5	18.51
A3	14.50	15.00	16.36	17.33
A4	15.37	15.86	17.42	18.39
A5	14.35	14.84	16.20	17.17
C	1.18	1.2	1.18	1.18
OD	2.01	2.5	3.0	4
ID	1.88	2.37	2.87	3.84
t	0.06	0.06	0.06	0.08
E	2.40	3.19	3.39	4.69
E1	2.63	2.88	3.13	3.61
F1	0.98	0.98	1.18	1.18
F2	1.02	1.02	1.22	1.22
H	4.52	4.52	6.07	6.07
J	5.83	6.42	7.01	7.80
S	0.61	0.61	0.81	0.81
M/ Clamp	0.50	0.50	0.50	0.63
O	1.02	1.02	1.02	1.02
N	4.2	4.2	5.87	5.87
P	2.59	2.84	3.09	3.57
R	1.96	1.96	2.63	2.63
Weight (lb)				
Standard	7.1	8.3	13.3	15.9
Reverse Acting	7.2	8.4	13.5	16.1

A_1 = min. installation measure to allow that valve can be lifted out of the tank flange / valve body (if Indication Unit is mounted, height must be added)

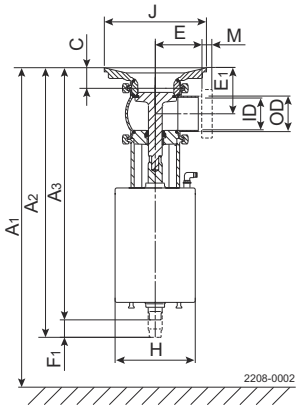


Figure 1. Standard

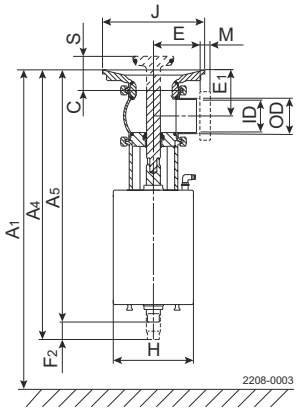


Figure 2. Reverse Acting

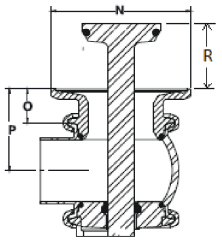


Figure 3. Flange adapter

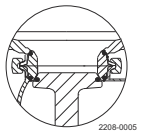


Figure 4. Replaceable elastomer plug seal

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.

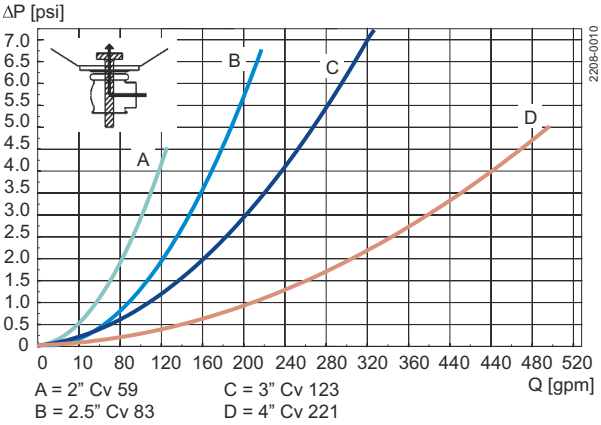
Air Connections Compressed air:

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

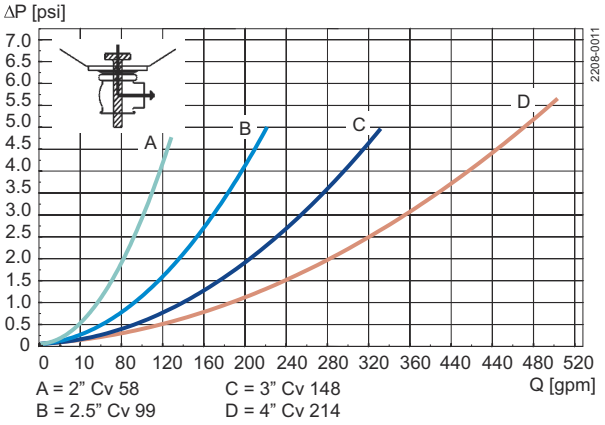
Actuator function

Air consumption (In^3 free air) for one stroke	
2" - 2½"	**3" - 4"**
2.17 x air pressure [psi]	5.51 x air pressure [psi]

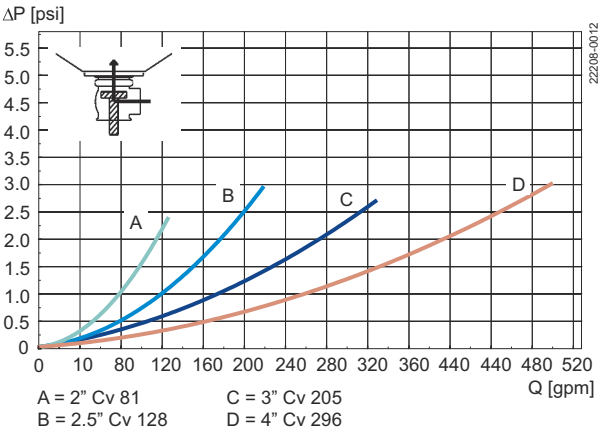
Pressure drop/capacity diagrams



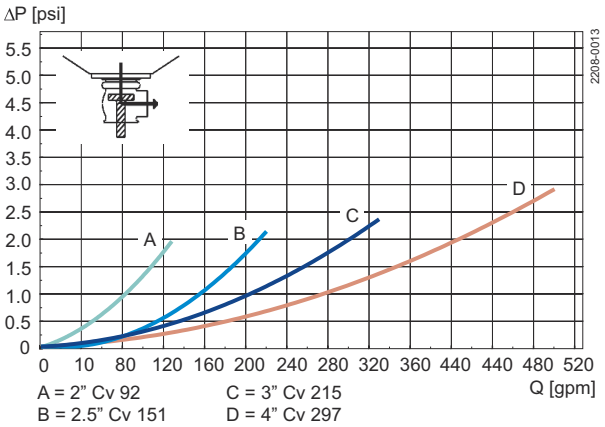
A = 2" Cv 59
B = 2.5" Cv 83
C = 3" Cv 123
D = 4" Cv 221



A = 2" Cv 58
B = 2.5" Cv 99
C = 3" Cv 148
D = 4" Cv 214



A = 2" Cv 81
B = 2.5" Cv 128
C = 3" Cv 205
D = 4" Cv 296



A = 2" Cv 92
B = 2.5" Cv 151
C = 3" Cv 215
D = 4" Cv 297

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:

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

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

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

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

Q = Kv x √Δp

160 = 128 x √Δp

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

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

Pressure data for Unique Single Seat Valve Tank Outlet



Figure 5. **1**

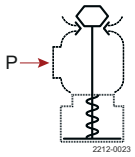


Figure 6. **2**

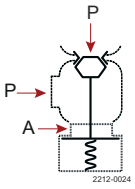


Figure 7. **3**

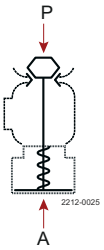


Figure 8. **4**

A = Air

P = Product pressure

Shut fully closed

Actuator / Valve body combination and direction of pressure	Max. pressure in PSI without leakage at the valve seat			
	Valve size			
	2"	2½"	3"	4"
1	104	61	93	61
2	122	65	99	64

Actuator / Valve body combination and direction of pressure	Air pressure (PSI)	Max. pressure in PSI against which the valve can open			
		Valve size			
		2"	2½"	3"	4"
3	87	145	131	145	100
4	87	145	121	144	96

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