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®.

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:	1000 kPa (10 bar) (145 psi)
Min. product pressure:	Full vacuum
Air pressure:	500 to 700 kPa (5 to 7 bar) (72.5 to 101.5 psi)

Valve Body Combinations



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
Other product wetted seals:	EPDM
Other seals:	NBR

Options

- Male parts or clamp liners in accordance with required standard.
- Weld ends or connection types other than Tri-Clamp.
- Control and Indication: ThinkTop V-Series
- Product wetted seals in HNBR or FPM.
- Plug seals HNBR, FPM or TR2 plug (floating PTFE design).
- High pressure actuator.
- Long stroke actuator (not available for Reverse Acting version).
- Maintainable actuator.
- External surface finish bright.

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.

- Reverse acting valve.
- Long stroke valve.
- Manually operated valve.
- Aseptic valve.
- Tangential valve.

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (mm)

Size	51	63.5	76.1	101.6	DN	DN	DN	DN
	mm	mm	mm	mm	50	65	80	100
A_1	426	439	479	503	429	445	487	506
A_2	393	406	446	470	396	412	454	473
A_3	368	381	416	440	371	387	424	443
A_4	390	403	443	467	393	409	451	470
A_5	364	377	412	436	367	383	420	439
C	30	30	30	30	30	30	30	30
OD	51	63.5	76.1	101.6	53	70	85	104
ID	47.8	60.3	72.9	97.6	50	66	81	100
t	1.6	1.6	1.6	2	1.5	2	2	2
E	61	81	86	119	62	82	87	120
E_1	67	73	79	92	68	76	84	93
F_1	25	25	30	30	25	25	30	30
F_2	26	26	31	31	26	26	31	31
H	114.9	114.9	154.3	154.3	114.9	114.9	154.3	154.3
J	148	163	178	198	148	163	178	198
S	16	16	21	21	16	16	21	21
M/ISO clamp	21	21	21	21	-	-	-	-
M/DIN clamp	-	-	-	-	21	28	28	28
M/DIN male	-	-	-	-	23	25	25	30
M/SMS male	20	24	24	35	-	-	-	-
Weight (kg)								
Standard	7.1	8.3	13.3	15.9	7.1	8.5	13.8	15.9
Reverse Acting	7.2	8.4	13.5	16.1	7.2	8.6	14	16

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)

[1] For exact A_1 - A_4 dimensions, please refer to informations in Anytime configurator.

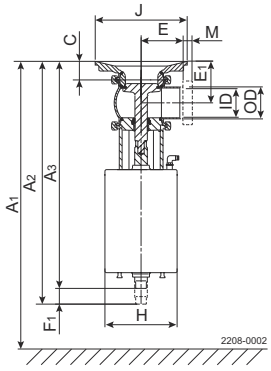


Figure 1. Standard

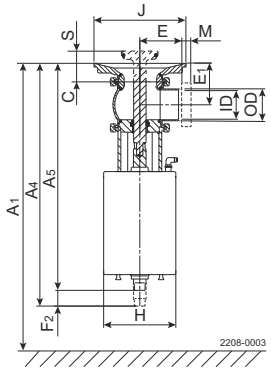


Figure 2. Reverse Acting



Figure 3. PTFE plug seal (TR2)

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.

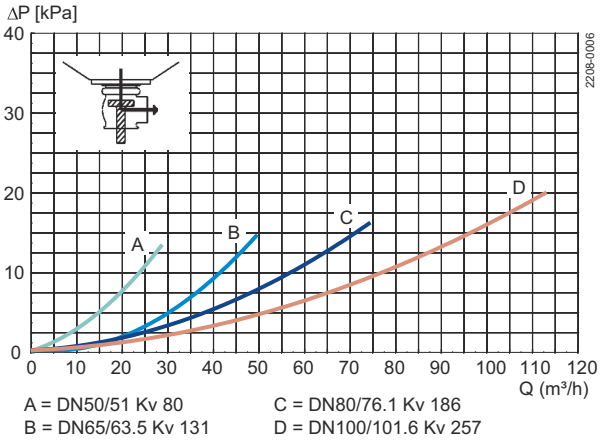
Air Connections Compressed air:

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

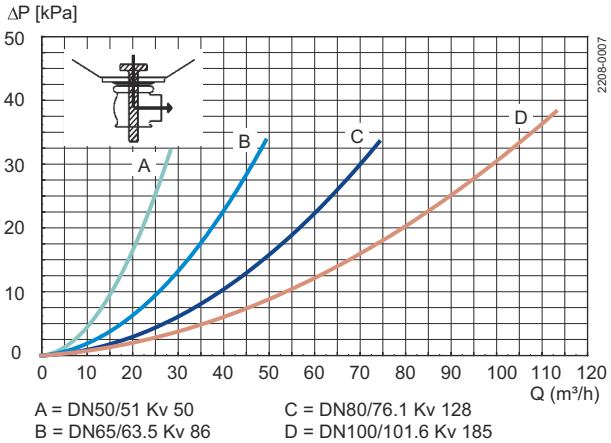
Actuator function

Air consumption (litres free air) for one stroke	
DN50-65 DN/	DN80100 DN/
OD 51-63.5 mm	**OD 76.1101.6 mm**
0.5 x air pressure [bar]	1.3 x air pressure [bar]

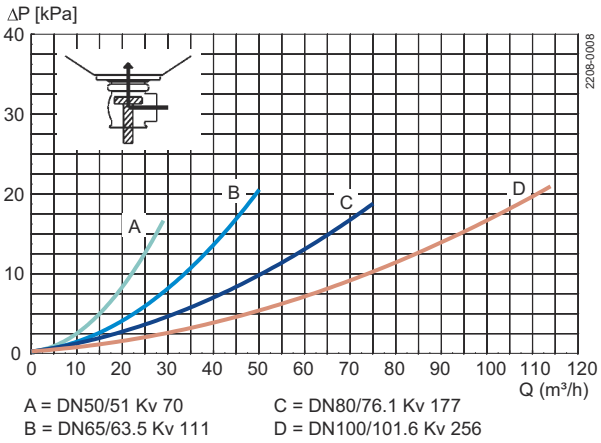
Pressure drop/capacity diagrams



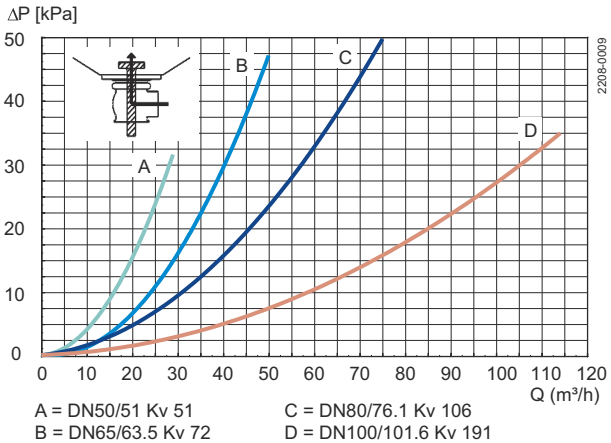
A = DN50/51 Kv 80
B = DN65/63.5 Kv 131
C = DN80/76.1 Kv 186
D = DN100/101.6 Kv 257



A = DN50/51 Kv 50
B = DN65/63.5 Kv 86
C = DN80/76.1 Kv 128
D = DN100/101.6 Kv 185



A = DN50/51 Kv 70
B = DN65/63.5 Kv 111
C = DN80/76.1 Kv 177
D = DN100/101.6 Kv 256



A = DN50/51 Kv 51
B = DN65/63.5 Kv 72
C = DN80/76.1 Kv 106
D = DN100/101.6 Kv 191

Note!
For the diagrams the following applies:
Medium: Water (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:

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

Where:

Q = Flow in m^3/h

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

Δ p = Pressure drop in bar over the valve

Where:

Q = Flow in m^3/h

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

Δ p = Pressure drop in bar over the valve

2.5" shut-off valve, where Kv = 111 (see table above)

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

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

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

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

Pressure data for Unique Single Seat Valve Tank Outlet



Figure 4. **1**

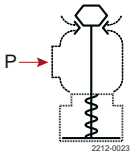


Figure 5. **2**

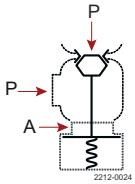


Figure 6. **3**

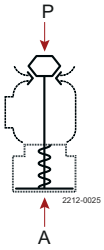


Figure 7. **4**

A = Air

P = Product pressure

Shut fully closed

Actuator / Valve body combination and direction of pressure	Max. pressure in bar without leakage at the valve seat			
	Valve size			
	DN50	DN 65	DN 80	DN 100
	DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
1	7.2	4.2	6.4	4.2
2	8.4	4.5	6.8	4.4

Actuator / Valve body combination and direction of pressure	Air pressure (bar)	Max. pressure in bar against which the valve can open			
		Valve size			
		DN50	DN 65	DN 80	DN 100
		DN/OD 51 mm	DN/OD 63.5 mm	DN/OD 76.1 mm	DN/OD 101.6 mm
3	6	10.0	9.0	10.0	6.9
4	6	10.0	8.3	9.9	6.6

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