Alfa Laval Unique SSV Tangential

Single seat valves

Introduction

The Alfa Laval Unique SSV Tangential 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 Unique SSV platform, it provides complete drainability of the valve body near tank openings, on horizontally mounted ports, or wherever space restrictions make it difficult to install valves at other angles.

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 Tangential is designed to provide complete drainability of the valve body when space is limited 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 thanks to the static seal leak detection
- Protection against full vacuum due to the double lip seal

Standard design

The Unique SSV Tangential valve 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 ports or as a changeover valve with three 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

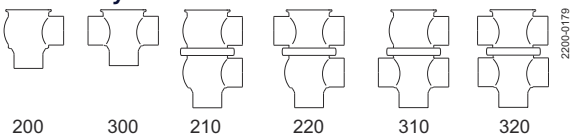
The Alfa Laval Unique SSV Tangential is operated by means of compressed air from a remote location. The actuator smooths operation and protects process lines against pressure peaks, while directing or diverting fluids. The valve can be controlled using an Alfa Laval ThinkTop®.

TECHNICAL DATA

Temperature	
Temperature range:	-10 °C to +140 °C (EPDM)

Pressure	
Max. product pressure	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Air pressure:	500 to 700 kPa (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:	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

- Weld ends or connection types other than Tri-Clamp
- Control and Indication: ThinkTop V-Series
- Product wetted seals in HNBR or FPM
- Plug seal HNBR, FPM or TR2 (floating PTFE design)
- High pressure actuator
- NO or A/A actuator
- 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

Semi-Maintainable actuator comes with 5 year warranty.

Dimensions (mm)

	Nominal Size			
	DN/OD 51 mm	**DN/OD 63.5 mm**	**DN/OD 76.1 mm**	**DN/OD 101.6 mm**
A_1 [1]	361	374	409	433
A_2 [1]	386	399	439	463
A_3 [1]	435	460	507	557

[1] For exact A1 - A4 dimensions, please refer to informations in Anytime configurator.

	Nominal Size			
	DN/OD 51 mm	**DN/OD 63.5 mm**	**DN/OD 76.1 mm**	**DN/OD 101.6 mm**
A_4 [1]	457	482	534	584
C	73.8	86.3	98.9	123.6
OD	51	63.5	76.1	101.6
ID	47.8	60.3	72.9	97.6
t	1.6	1.6	1.6	2
E	61	81	86	119
G	59.9	66.2	72.5	84.8
F_1	25	25	30	30
F_2	22	22	27	27
H	114.9	114.9	154.3	154.3
N	14.3	17.9	21.5	25
M/ISO Clamp	21	21	21	21
M/SMS male	20	24	24	35
Weight (kg)				
Shut-off valve	5.8	6.8	11.7	14.1
Change-over valve	7.4	9	14.5	18.8

[1] For exact A1 - A4 dimensions, please refer to informations in Anytime configurator.

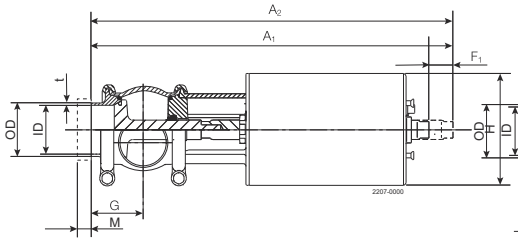


Figure 1. Shut-off valve

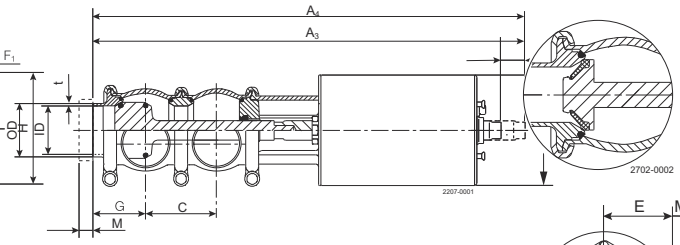


Figure 2. Change-over valve

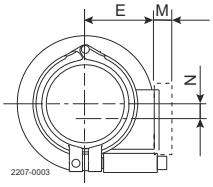


Figure 3. PTFE plug seal (TR2)

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

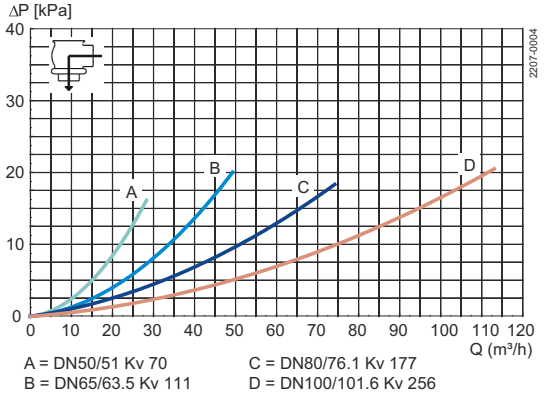
Air Connections Compressed air:

R 1/8" (BSP). Internal thread.

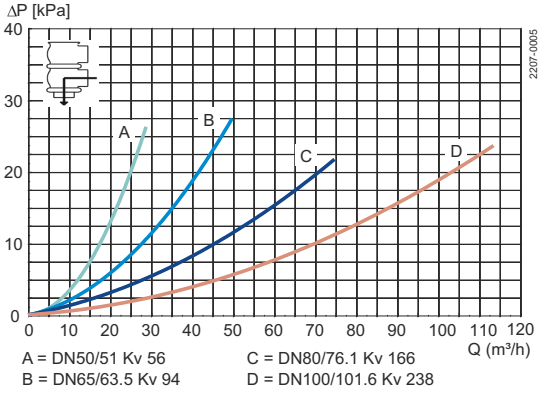
Air Consumption (Litres free air) for one stroke

Size	**DN/OD 51 - 63.5 mm**	**DN/OD 76.1 - 101.6 mm**
NO and NC	0.15 x air pressure [bar]	1.3 x air pressure [bar]
A/A	1.1 x air pressure [bar]	2.7 x air pressure [bar]

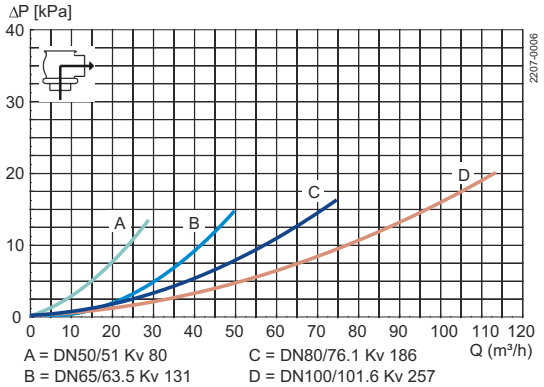
Pressure drop/capacity diagrams



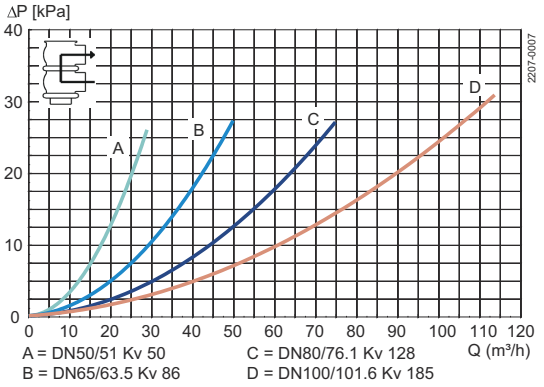
A = DN50/51 Kv 70
B = DN65/63.5 Kv 111
C = DN80/76.1 Kv 177
D = DN100/101.6 Kv 256



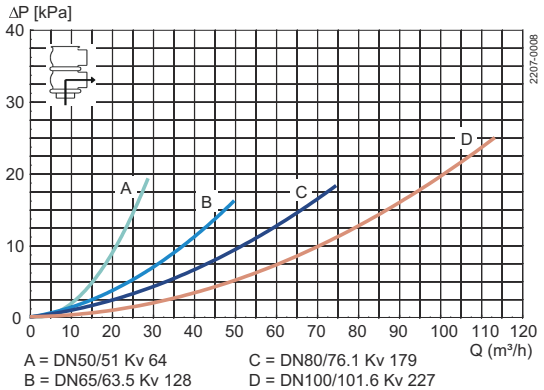
A = DN50/51 Kv 56
B = DN65/63.5 Kv 94
C = DN80/76.1 Kv 166
D = DN100/101.6 Kv 238



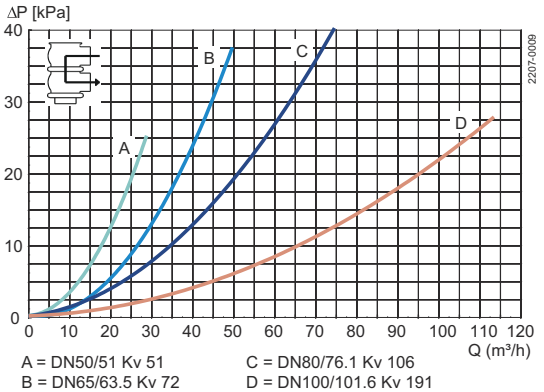
A = DN50/51 Kv 80
B = DN65/63.5 Kv 131
C = DN80/76.1 Kv 186
D = DN100/101.6 Kv 257



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 64
B = DN65/63.5 Kv 128
C = DN80/76.1 Kv 179
D = DN100/101.6 Kv 227



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).

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

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

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

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

Pressure data for Unique Single Seat Valve Tangential body/Tank valve

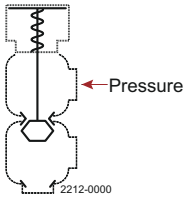


Figure 4. **1**

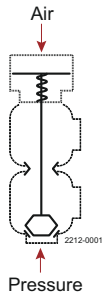


Figure 5. **2**

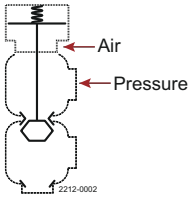


Figure 6. **3**

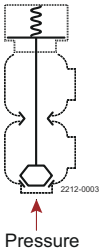


Figure 7. **4**

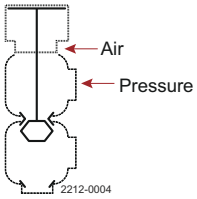


Figure 8. **5**

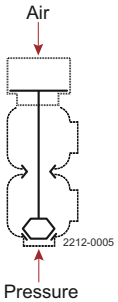


Figure 9. **6**

Shut-off and change-over valves

			Max. pressure in bar without leakage at the valve seat			
			Valve size			
Actuator / Valve body combination and direction of pressure	**Air pressure (bar)**	**Plug position**	**DN50 DN/OD 51 mm**	**DN 65 DN/OD 63.5 mm**	**DN 80 DN/OD 76.1 mm**	**DN 100 DN/OD 101.6 mm**
Figure 4. 1		NO	8.4	4.5	6.8	4.4
Figure 5. 2	6	NO	9.6	5.6	7.2	4.8
Figure 6. 3	6	NC	10.0	6.1	7.7	5.0
Figure 7. 4		NC	7.2	4.2	6.4	4.2
Figure 8. 5	6	A/A	10.0	10.0	10.0	10.0
Figure 9. 6	6	A/A	10.0	10.0	10.0	10.0

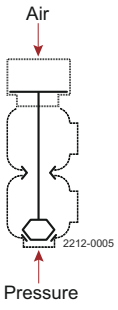


Figure 10. **7**

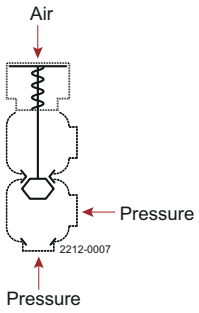


Figure 11. **8**

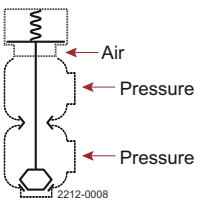


Figure 12. **9**

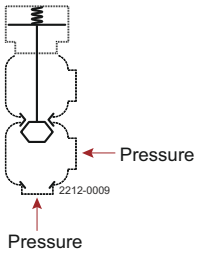


Figure 13. **10**

Shut-off and change-over valves

			Max. pressure in bar against which the valve can open			
			Valve size			
Actuator / Valve body combination and direction of pressure	**Air pressure (bar)**	**Plug position**	**DN50 DN/OD 51 mm**	**DN 65 DN/OD 63.5 mm**	**DN 80 DN/OD 76.1 mm**	**DN 100 DN/OD 101.6 mm**
Figure 10. 7		NO	10.0	7.7	9.7	6.3
Figure 11. 8	6	NO	10.0	6.3	9.9	6.6
Figure 12. 9	6	NC	10.0	9.0	10.0	6.9
Figure 13. 10		NC	10.0	6.8	9.1	6.1

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

			Max. pressure in bar against which the valve can open			
			Valve size			
Actuator / Valve body combination and direction of pressure	**Air pressure (bar)**	**Plug position**	**DN50 DN/OD 51 mm**	**DN 65 DN/OD 63.5 mm**	**DN 80 DN/OD 76.1 mm**	**DN 100 DN/OD 101.6 mm**
Figure 4. 1		NO	10.0	10.0	-	-
Figure 5. 2	6	NO	10.0	10.0	-	-
Figure 6. 3	6	NC	10.0	10.0	5.0	3.0
Figure 7. 4		NC	10.0	10.0	10.0	7.0

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