

# Alfa Laval Unique SSV Two Step

## Single seat valves

### Introduction

The Alfa Laval Unique SSV Two Step 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 ideal for dosing and two-stage filling to ensure an exact volume or for draining of two pipes at the same time while reducing the risk of pressure shocks. Adjustable lifting height makes it possible to match specific volumes and quantities.

Few moving parts ensure easy dismantling, high reliability and low maintenance costs. A wide range of optional features enables customization to specific process requirements.

### Application

The Unique SSV Two Step is designed for dosing and filling 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 defined seal compression
- Enhances product safety due to static seal leak detection
- Protection against full vacuum due to double lip seal
- Intermediate plug position

### Standard design

The Unique SSV Two Step 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 to three working ports, or as a changeover valve with up to five ports for drainage of two pipes simultaneously or in closing/filling applications.

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 degree of



opening for the intermediate position can be adjusted by removing spacer rings inside the actuator.

The valve can also be fitted with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.

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

### Working principle

The Alfa Laval Unique SSV Two Step is operated by means of compressed air from a remote location. The actuator smooths operation and an intermediate step protects process lines from pressure peaks while dosing and filling. The valve can be controlled using an Alfa Laval ThinkTop®.

### Certificates



## TECHNICAL DATA

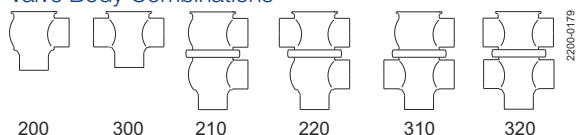
### Temperature

|                   |                        |
|-------------------|------------------------|
| 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 to 7 bar) |

### Valve Body Combinations



### Actuator function

- Pneumatic downward movement, spring return.
- Pneumatic upward movement, spring return.

## 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 the required standard.
- Control and Indication: IndiTop, ThinkTop or ThinkTop Basic.
- Product wetted seals in HNBR or FPM.
- Plug seals HNBR, FPM or TR2 plug (floating PTFE design).
- High pressure actuator (only ISO51, ISO63.5 and DN50, DN65).
- External surface finish bright.



### Note!

For further details, see instruction ESE00505.

### 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.

- Aseptic valve.

Semi-Maintainable actuator comes with 5 year warranty.

### Dimensions (mm)

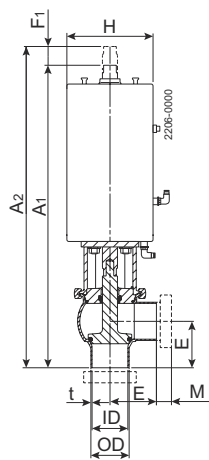
| Nominal size                        | Inch tubes<br>DN/OD |      |      |      |       | DIN tubes<br>DN |       |     |     |     | High Pressure       |      |                 |     |
|-------------------------------------|---------------------|------|------|------|-------|-----------------|-------|-----|-----|-----|---------------------|------|-----------------|-----|
|                                     | 38                  | 51   | 63.5 | 76.1 | 101.6 | 40              | 50    | 65  | 80  | 100 | Inch tubes<br>DN/OD |      | DIN tubes<br>DN |     |
| A <sub>1</sub> <sup>1</sup>         | 382                 | 395  | 422  | 458  | 504   | 384             | 397   | 422 | 462 | 506 | 426                 | 452  | 427             | 452 |
| A <sub>2</sub> <sup>1</sup>         | 402                 | 420  | 447  | 488  | 534   | 404             | 422   | 447 | 492 | 536 | 451                 | 477  | 452             | 477 |
| A <sub>3</sub> <sup>1</sup>         | 443                 | 469  | 508  | 557  | 627   | 448             | 472.5 | 514 | 569 | 632 | 500                 | 538  | 503             | 544 |
| A <sub>4</sub> <sup>1</sup>         | 460                 | 491  | 530  | 584  | 654   | 465             | 495   | 536 | 596 | 659 | 522                 | 560  | 525             | 566 |
| C                                   | 60.8                | 73.8 | 86.3 | 98.9 | 123.6 | 64              | 76    | 92  | 107 | 126 | 73.8                | 86.3 | 76              | 92  |
| OD                                  | 38                  | 51   | 63.5 | 76.1 | 101.6 | 41              | 53    | 70  | 85  | 104 | 51                  | 63.5 | 53              | 70  |
| ID                                  | 34.8                | 47.8 | 60.3 | 72.9 | 97.6  | 38              | 50    | 66  | 81  | 100 | 47.8                | 60.3 | 50              | 66  |
| t                                   | 1.6                 | 1.6  | 1.6  | 1.6  | 2     | 1.5             | 1.5   | 2   | 2   | 2   | 1.6                 | 1.6  | 1.5             | 2   |
| E                                   | 49.5                | 61   | 81   | 86   | 119   | 49.5            | 61    | 78  | 86  | 120 | 61                  | 81   | 61              | 78  |
| F <sub>1</sub>                      | 20                  | 25   | 25   | 30   | 30    | 20              | 25    | 25  | 30  | 30  | 25                  | 25   | 25              | 25  |
| F <sub>2</sub> Min. Two step stroke | 3                   | 3    | 3    | 2.5  | 2.5   | 3               | 3     | 3   | 2.5 | 2.5 | 6                   | 6    | 6               | 6   |

<sup>1</sup> For exact A1 - A4 dimensions, please refer to informations in Anytime configurator.

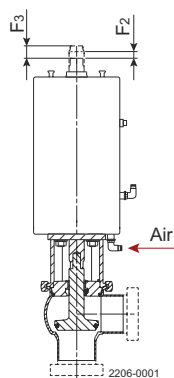
| Nominal size                        | Inch tubes<br>DN/OD |     |      |      |       | DIN tubes<br>DN |     |      |      |      | High Pressure       |      |                 |      |
|-------------------------------------|---------------------|-----|------|------|-------|-----------------|-----|------|------|------|---------------------|------|-----------------|------|
|                                     |                     |     |      |      |       |                 |     |      |      |      | Inch tubes<br>DN/OD |      | DIN tubes<br>DN |      |
|                                     | 38                  | 51  | 63.5 | 76.1 | 101.6 | 40              | 50  | 65   | 80   | 100  | 51                  | 63.5 | 50              | 65   |
| F <sub>3</sub> Max. Two step stroke | 6                   | 11  | 11   | 14   | 14    | 6               | 11  | 11   | 14   | 14   | 9                   | 9    | 9               | 9    |
| F <sub>4</sub>                      | 17                  | 22  | 22   | 27   | 27    | 17              | 22  | 22   | 27   | 27   | 22                  | 22   | 22              | 22   |
| F <sub>5</sub> Two step stroke      | 6.5                 | 11  | 11   | 14   | 14    | 6.5             | 11  | 11   | 14   | 14   | 9                   | 9    | 9               | 9    |
| H                                   | 115                 | 115 | 115  | 154  | 154   | 115             | 115 | 115  | 154  | 154  | 154                 | 154  | 154             | 154  |
| M (ISO clamp)                       | 21                  | 21  | 21   | 21   | 21    |                 |     |      |      |      | 21                  | 21   |                 |      |
| M (DIN clamp)                       | -                   | -   | -    | -    | -     | 21              | 21  | 28   | 28   | 28   |                     |      | 21              | 28   |
| M (DIN male)                        | -                   | -   | -    | -    | -     | 22              | 23  | 25   | 25   | 30   |                     |      | 23              | 25   |
| M (SMS male)                        | 20                  | 20  | 24   | 24   | 35    |                 |     |      |      |      | 20                  | 24   |                 |      |
| <b>Weight (kg)</b>                  |                     |     |      |      |       |                 |     |      |      |      |                     |      |                 |      |
| Stop valve                          | 7                   | 7.3 | 8.3  | 14.4 | 16.7  | 7               | 7.3 | 8.3  | 14.9 | 16.7 | 8.6                 | 9.6  | 8.6             | 9.6  |
| Change-over valve                   | 8                   | 8.9 | 10.3 | 17   | 21    | 8.2             | 8.9 | 10.5 | 17.9 | 21   | 10.2                | 11.6 | 10.2            | 11.8 |

<sup>1</sup> For exact A1 - A4 dimensions, please refer to informations in Anytime configurator.

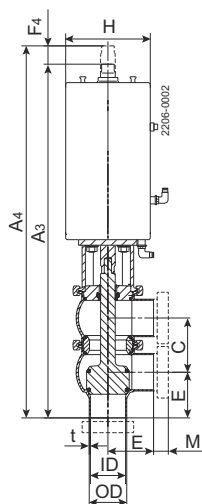
**Air Connections:** R 1/8" (BSP), internal thread.



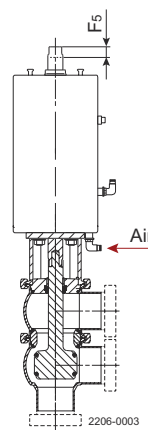
**Figure 1. Shut-off valve activated closed**



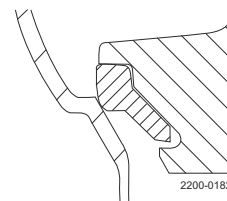
**Figure 2. Shut-off valve with two step stroke**



**Figure 3. Change-over valve closed**



**Figure 4. Change-over valve with two step stroke activated**



**Figure 5. Optional PTFE plug seal (TR2)**

| Air consumption (litres free air) for one stroke |                          |                            |                                 |
|--------------------------------------------------|--------------------------|----------------------------|---------------------------------|
| Size                                             | DN40 - DN/OD 38 mm       | DN50-65 - DN/OD 51-63.5 mm | DN80-100<br>DN/OD 76.1-101.6 mm |
| NO and NC                                        | 0.5 x air pressure [bar] | 0.5 x air pressure [bar]   | 1.3 x air pressure [bar]        |



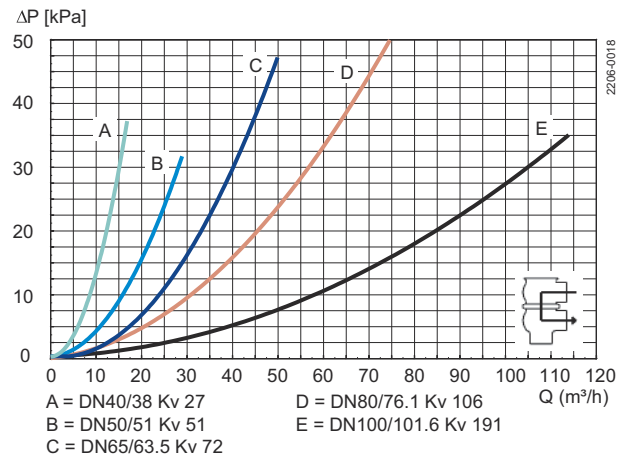
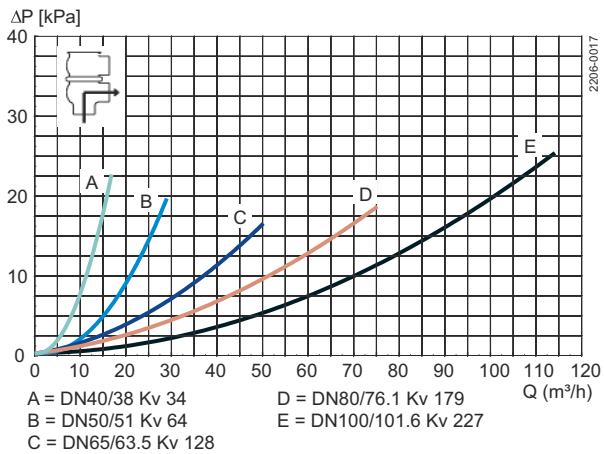
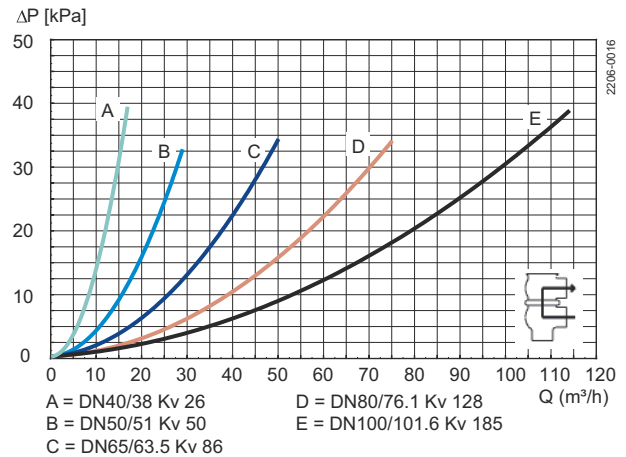
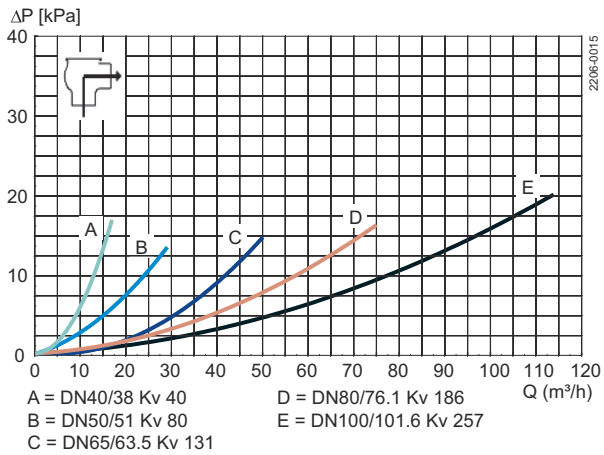
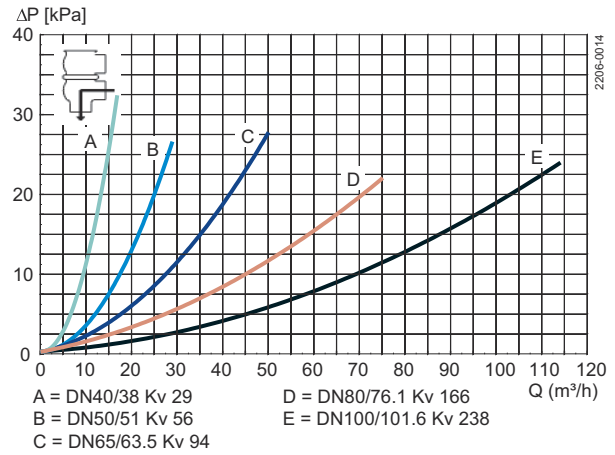
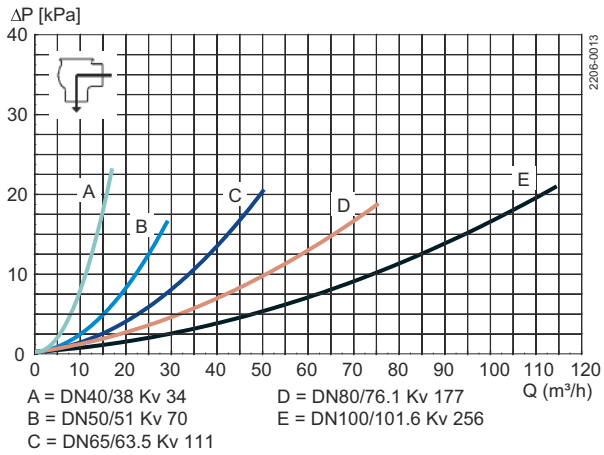
**Note!**

Vacuum is not recommended in aseptic applications.

**Opening/closing time will be affected by the following:**

- The air supply (air pressure).
- The length and dimensions of the air hoses.
- The number of valves connected to the same air hose.
- Use of a single solenoid valve for serial connected air actuator functions.
- Product pressure.

## Pressure drop/capacity diagrams



### Note!

For the diagrams the following applies:

Medium: Water (20°C)

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:

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

Where

Q = Flow in m³/h.

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

$\Delta p$  = Pressure drop in bar over the valve.

How to calculate the pressure drop for an ISO 2.5" shut-off valve if the flow is 40 m<sup>3</sup>/h

2.5" shut-off valve, where  $K_v = 111$  (See table above).

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

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

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

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

#### Pressure data for Unique Single Seat Valve Two Step

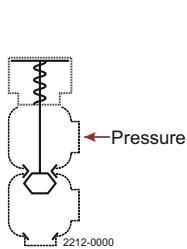


Figure 6. 1

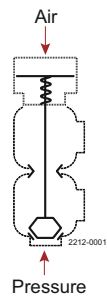


Figure 7. 2

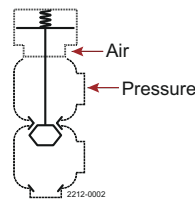


Figure 8. 3

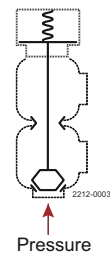


Figure 9. 4

#### 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                                          | DN 40<br>DN/OD<br>38 mm | DN50<br>DN/OD<br>51 mm | DN 65<br>DN/OD<br>63.5 mm | DN 80<br>DN/OD<br>76.1 mm | DN 100<br>DN/OD<br>101.6 mm |
| 1                                                           |                    | NO                                                     | 10.0                    | 8.4                    | 4.5                       | 6.8                       | 4.4                         |
| 2                                                           | 6                  | NO                                                     | 10.0                    | 9.6                    | 5.6                       | 7.2                       | 4.8                         |
| 3                                                           | 6                  | NC                                                     | 10.0                    | 10.0                   | 6.1                       | 7.7                       | 5.0                         |
| 4                                                           |                    | NC                                                     | 10.0                    | 7.2                    | 4.2                       | 6.4                       | 4.2                         |

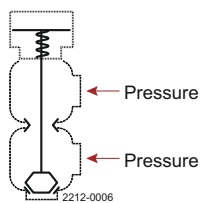


Figure 10. 5

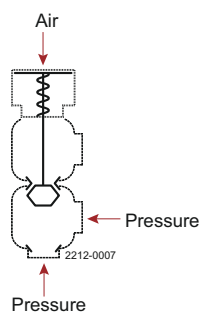


Figure 11. 6

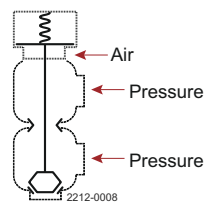


Figure 12. 7

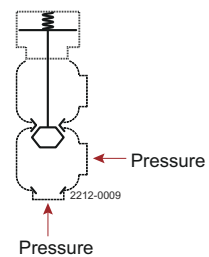


Figure 13. 8

#### 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                                         | DN 40<br>DN/OD<br>38 mm | DN50<br>DN/OD<br>51 mm | DN 65<br>DN/OD<br>63.5 mm | DN 80<br>DN/OD<br>76.1 mm | DN 100<br>DN/OD<br>101.6 mm |
| 5                                                           |                    | NO                                                    | 10.0                    | 10.0                   | 7.4                       | 9.7                       | 6.3                         |
| 6                                                           | 6                  | NO                                                    | 10.0                    | 10.0                   | 8.3                       | 9.9                       | 6.6                         |
| 7                                                           | 6                  | NC                                                    | 10.0                    | 10.0                   | 9.0                       | 10.0                      | 6.9                         |
| 8                                                           |                    | NC                                                    | 9.7                     | 10.0                   | 6.8                       | 9.1                       | 6.1                         |

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

| Max. pressure in bar without leakage at the valve seat            |                          |                  |                        |                           |
|-------------------------------------------------------------------|--------------------------|------------------|------------------------|---------------------------|
| Actuator / Valve body<br>combination and direction<br>of pressure | Air<br>pressure<br>(bar) | Plug<br>position | Valve size             |                           |
|                                                                   |                          |                  | DN50<br>DN/OD<br>51 mm | DN 65<br>DN/OD<br>63.5 mm |
| 1                                                                 |                          | NO               | 10.0                   | 10.0                      |
| 2                                                                 | 6                        | NO               | 10.0                   | 10.0                      |
| 3                                                                 | 6                        | NC               | 10.0                   | 10.0                      |
| 4                                                                 |                          | NC               | 10.0                   | 10.0                      |

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