# Alfa Laval SMP-BC

## Double seal valves

### Introduction

The Alfa Laval SMP-BC Mixproof Valve is a hygienic pneumatic double-seal valve that safely handles the simultaneous flow of two different products through the same valve without any risk of cross-contamination. Standardized and cost-effective, the top-loaded valve is designed for quick leakage detection to maximize product safety and low maintenance due to few moving parts. It is often used in Cleaning-in-Place (CIP) lines and can also be used in other systems handling products.

### Application

The Alfa Laval SMP-BC Mixproof Valve is designed for hygienic applications that require additional safety, leakage detection and CIP in the dairy, food and beverage, personal care and many other industries.

### Benefits

- Hygienic double-seal mixproof valve
- Versatile, modular design meets most hygienic application requirements
- Cost effective

### Working principle

The Alfa Laval SMP-BC Mixproof Valve is controlled by means of compressed air from a remote location. The valve is fitted with two small pneumatic normally open (NO) valves, a detecting valve and a CIP valve. The valve plug has two seals, which form an atmospheric leakage chamber. Any product leakage is discharged through the detecting valve. The leakage chamber may be cleaned by supplying a CIP system into the detecting valve. The SMP-BC is insensitive to water hammer in the product line above the plug.

### Standard design

The Alfa Laval SMP-BC Mixproof Valve consists of valve bodies, bonnet, plug and an actuator. Two versions are available: a shut-off valve with one valve body and a shut-off valve with two valve bodies. A plug clip system and clamp rings secure the valve bodies to the actuator. The valve can also be fitted with the Alfa Laval ThinkTop V50 and V70 for sensing and control of the valve.

## Technical data

| Pressure | |
|---|---|
| Max. product pressure (depending on valve specifications): | 1000 kPa / 145 PSI (10 bar) |
| Min. product pressure: | Full vacuum |
| Air pressure: | 500 to 800 kPa / 72.5 to 116 PSI (5 to 8 bar) |

| Temperature | |
|---|---|
| Temperature range: | -10°C to +140°C / 14°F to +284°F (EPDM) |

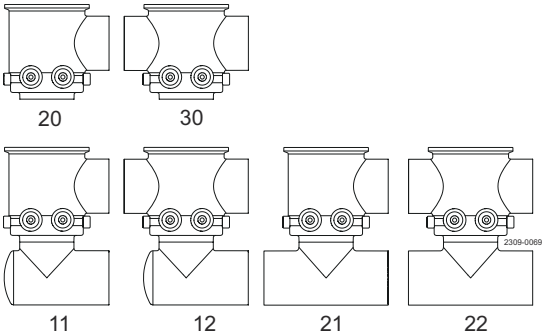
| ATEX | |
|---|---|
| Classification: | II 2 G D [1] |

[1] This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source.

## Physical data

| Material | |
|---|---|
| Product wetted steel parts: | 1.4401 (316L) |
| External surface finish: | Semi-bright (blasted) |
| Internal surface finish: | Ra ≤ 1.6 µm / ≤ 64 µinch |
| Optional: | Bright Polished Ra ≤ 0.8 µm / 32 µinch |
| Other steel parts: | 1.4301 (304) |
| Product wetted seals: | EPDM (optional: NBR) |
| Other seals: | NBR |

### Valve body combination




**Type 20 and 30 body versions are on request available in following configurations:**

- Tee welded on lower port in 0 or 90 deg. version. Type: 21 and 22
- Bend welded on lower port in 0, 90, 180 or 270 deg. version. Type: 11 and 12

## Options

- Male parts or clamp liners in accordance with required standard.
- Control and Indication: ThinkTop V50 and V70, IndiTop.
- Actuator with stronger spring.
- Larger actuator for valve sizes 1½”-2”.
- CIP installation kits.
- Other valve body combinations.
- Service tools for actuator.
- Tool for plug seals (Necessary for changing the seals).

**Note!**
For further details, see also instruction manual ESE02255.

## Air Consumption at 80 PSI

| Size | 1.5-inch - 2-inch | 2.5-inch - 3-inch | 5-inch - 6-inch |
|---|---|---|---|
| Shut-off valve - Actuator function | 67.1 $in^3$ | 235.0 $in^3$ | 503.4 $in^3$ |
| Shut-off valve - Actuator function | | | 1208.2 $in^3$ |

## Operation/cleaning

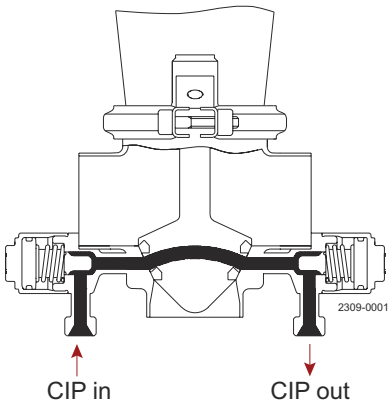



**Figure 1. Closed shut-off valve: cleaning of the leakage chamber**

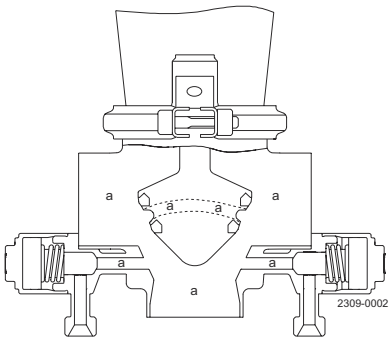
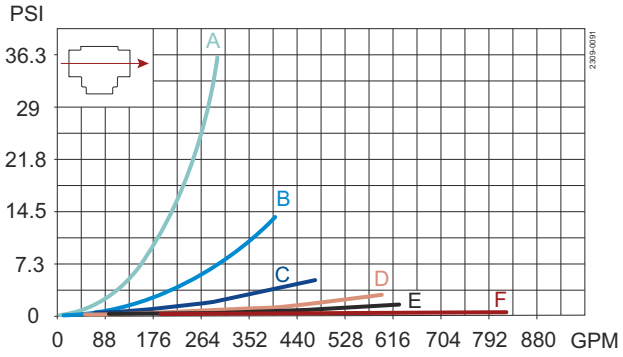


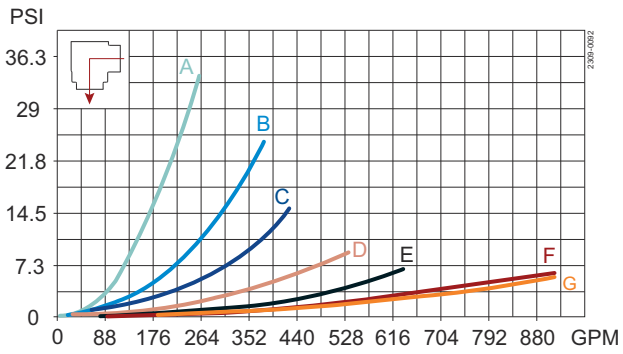

**Figure 2. Open shut-off valve: cleaning of the valve body and the leakage chamber**

## Pressure drop/capacity diagrams

**Shut-off valve:**




A = 1.5” / DN40
B = 2” / DN50
C = 2.5” / DN65
D = 3” / DN80
E = 4” / DN100
F = DN125 / DN150




A = 1.5” / DN40
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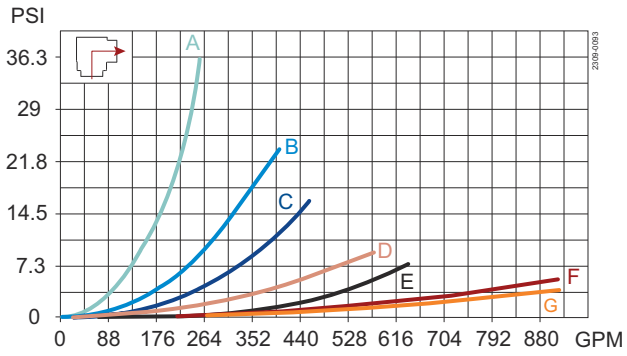
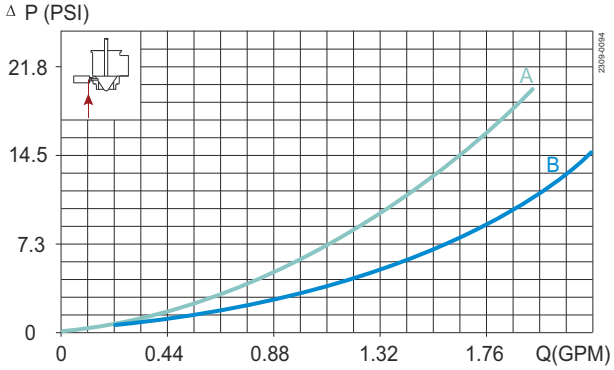



A = 1.5” / DN40
B = 2” / DN50
C = 2.5” / DN65
D = 3” / DN80
E = 4” / DN100
F = DN125
G = DN150

**Leakage chamber, pressure drop and flow velocity**

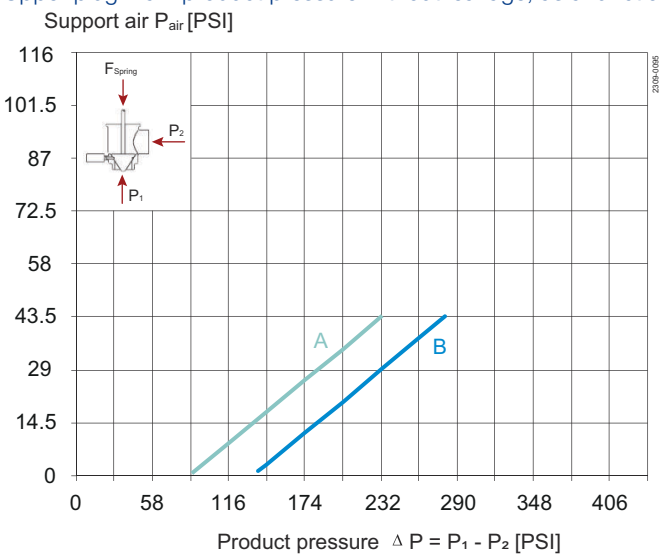



A = CIP / Detecting valve ø27
B = CIP / Detecting valve ø32

**Note!**
For the diagrams the following applies:
Medium: Water (68°F).
Measurement: In accordance with VDI 2.

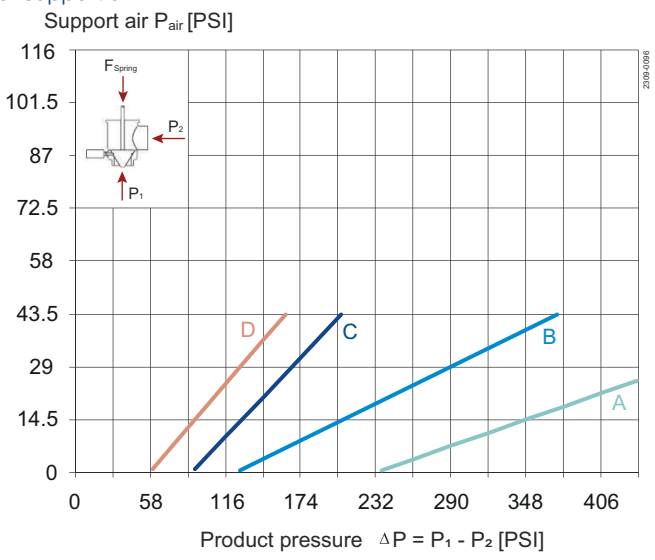
## Max pressure difference/support air pressure diagrams

Upper plug max. product pressure without leakage, as a function of support air:



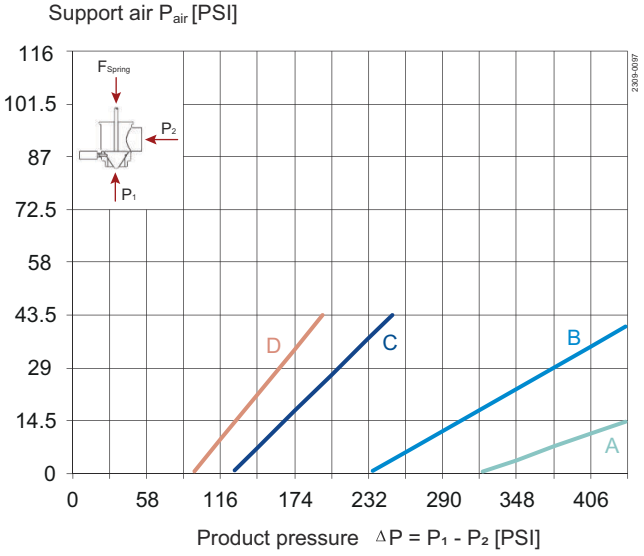

A = ø89 Std. spring: 1.5”/2”, DN40/DN50
B = ø89 Strong spring: 1.5”/2”, DN40/DN50

**Figure 3. ø89 actuator**



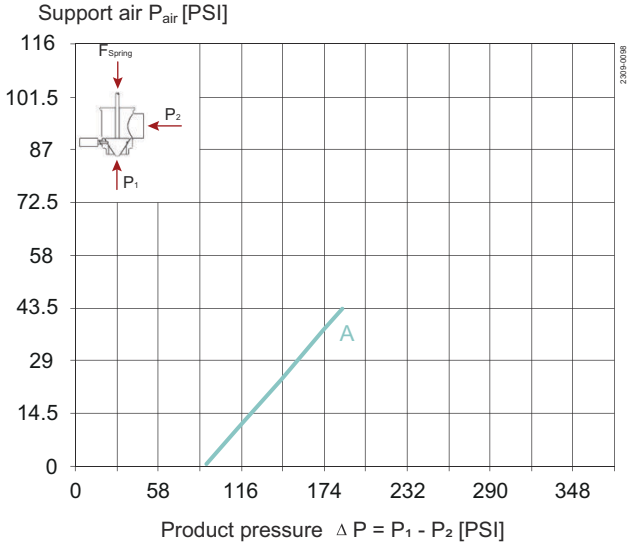

A = 1.5”/2”, DN40/DN50
B = 2.5”, DN65
C = 3”, DN80
D = 4”, DN100

**Figure 4. ø133 actuator with standard spring**




A = 1.5”/2”, DN40/DN50
B = 2.5”, DN65
C = 3”, DN80
D = 4”, DN100

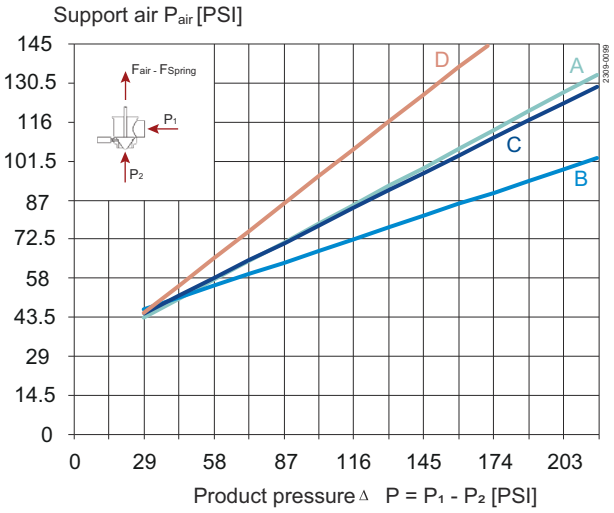
**Figure 5. ø133 actuator with strong spring**




A = DN125 / DN150

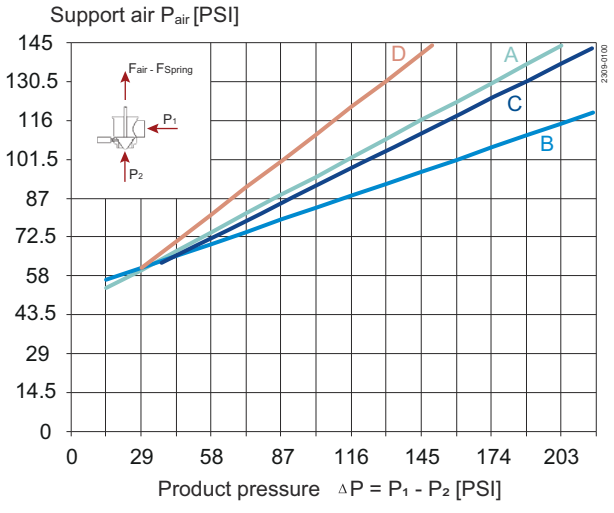
**Figure 6. ø199 actuator**

Upper plug max. product pressure against which the valve can open, as a function of air pressure:



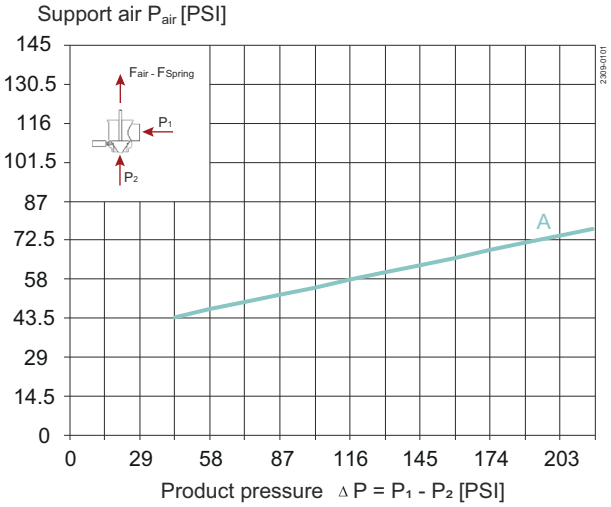

A = 1.5”/2”, DN40/DN50 C = 3”, DN80
B = 2.5”, DN65 D = 4”, DN100

**Figure 7. ø89 actuator with standard spring**



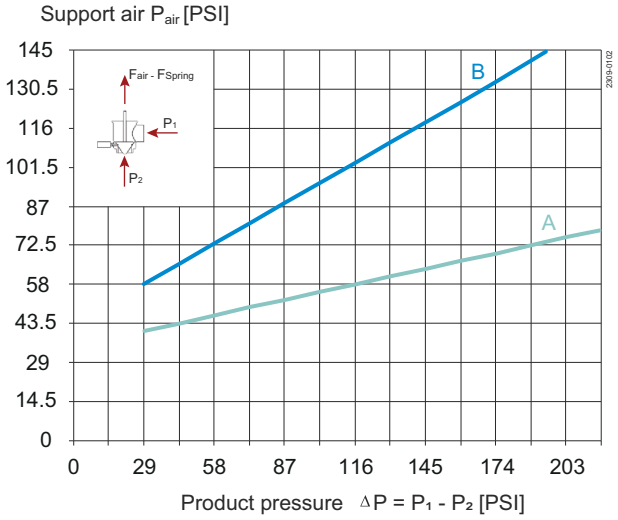

A = 1.5”/2”, DN40/DN50 C = 3”, DN80
B = 2.5”, DN65 D = 4”, DN100

**Figure 8. ø89 actuator with strong spring**




A = 1.5”/2”, DN40/DN50

**Figure 9. ø133 actuator with standard spring**

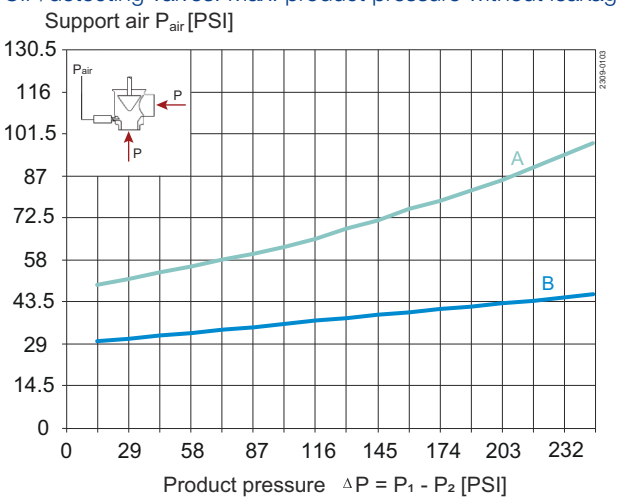



A = 1.5”/2”, DN40/DN50
B = DN125/DN150

**Figure 10. ø133 actuator with strong spring**

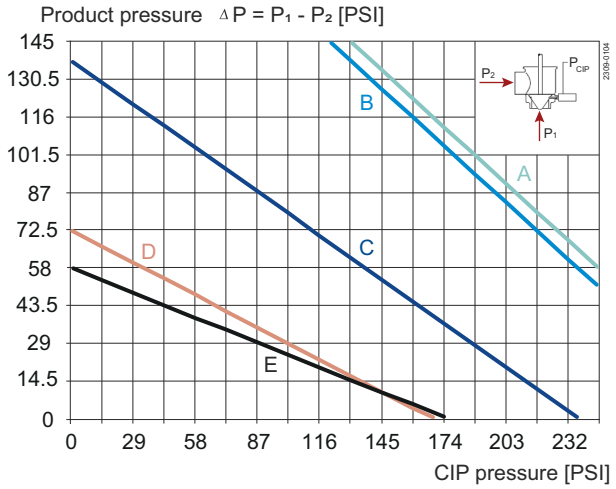
**Note!**
If actuator is supported by air on spring side max allowable pressure is 345 PSI (3 bar).
Air reduction valve: Alfa Laval item no. 9611995903 ensuring max 45 PSI support air.

CIP/detecting valves. Max. product pressure without leakage, as a function of air pressure:



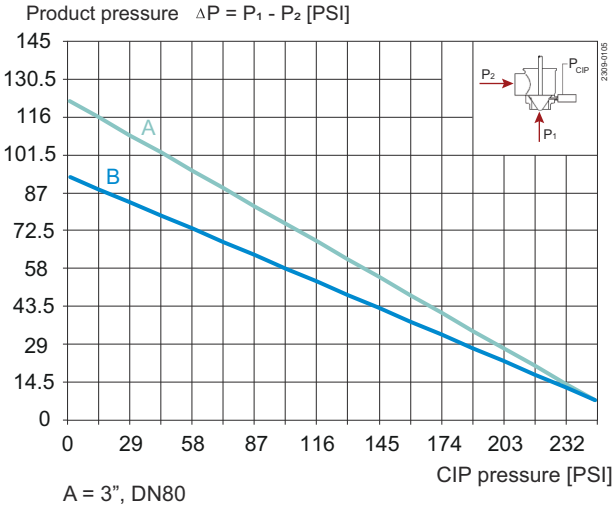

A = CIP valve ø27
B = CIP valve ø32

Max. CIP pressure in leakage chamber without leakage to product area, as a function of product pressure:



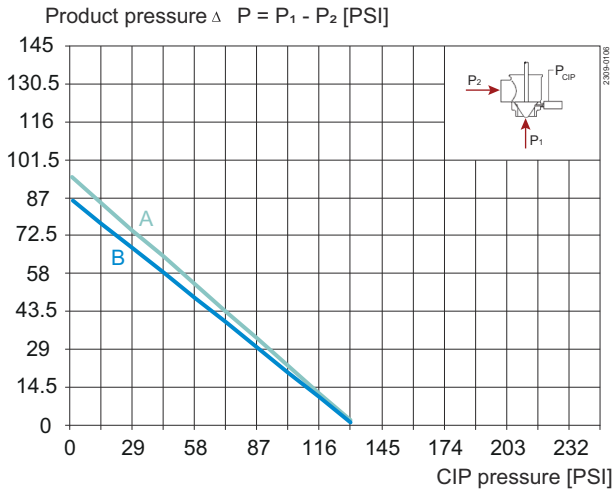

A = 1.5”, DN40
B = 2”, DN50
C = 2.5”, DN65
D = 3”, DN80
E = 4”, DN100

**Figure 11. ø89 actuator with standard spring**



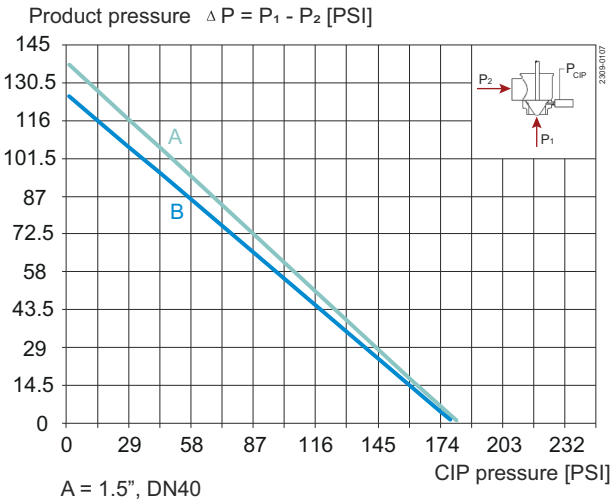

A = 3”, DN80
B = 4”, DN100

**Figure 12. ø89 actuator with strong spring**




A = 1.5”, DN40
B = 2”, DN50

**Figure 13. ø133 actuator with standard spring**




A = 1.5”, DN40
B = 2”, DN50

**Figure 14. ø133 actuator with strong spring**

**Note!**
If actuator is supported by air on spring side max allowable pressure is 345 PSI (3 bar).

## Dimensions (inch)

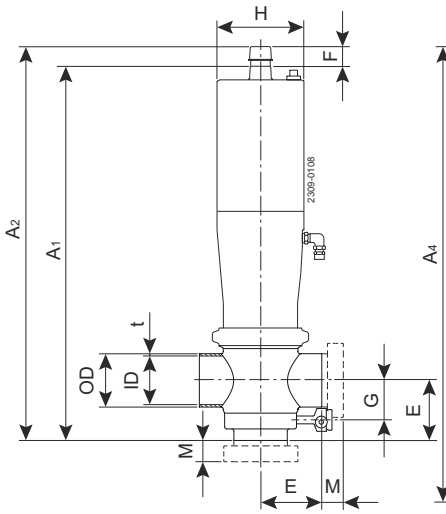



Figure 15. Shut-off valve with one valve body

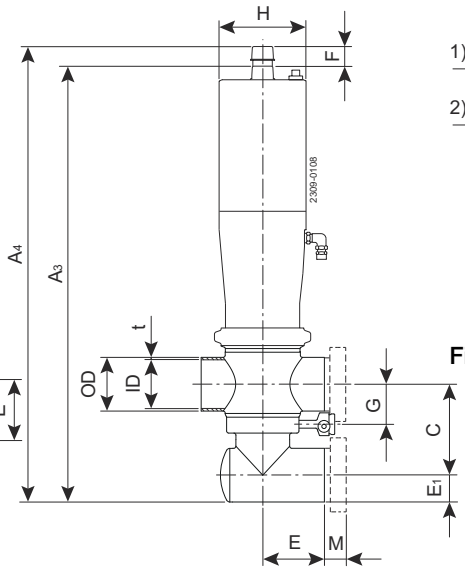
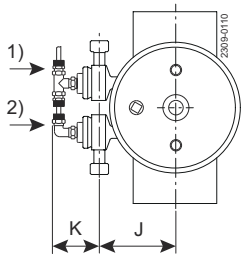



Figure 16. Shut-off valve with two valve bodies




1) CIP valve
2) Detecting valve

Figure 17. Top view

| Size | 1½" | 2" | 2½" | 3" | 4" | DN125 | DN150 |
|---|---|---|---|---|---|---|---|
| A1 | 13.58 | 13.98 | 17.05 | 17.91 | 20.75 | 21.06 | 23.00 |
| A2 | 14.57 | 14.96 | 18.03 | 19.17 | 22.01 | 22.84 | 24.76 |
| A3 | 16.27 | 16.61 | 20.00 | 21.10 | 24.06 | | |
| A4 | 17.26 | 17.60 | 21.26 | 22.36 | 25.32 | | |
| C | 3.86 | 4.02 | 4.88 | 5.08 | 6.54 | | |
| C1 | 3.15 | 3.31 | 4.25 | 4.53 | 5.91 | | |
| OD | 1.50 | 2.00 | 2.50 | 3.00 | 4.00 | 5.08 | 6.06 |
| ID | 1.37 | 1.87 | 2.37 | 2.84 | 3.84 | 4.92 | 5.91 |
| t | 0.06 | 0.06 | 0.06 | 0.08 | 0.08 | 0.08 | 0.08 |
| E | 1.95 | 2.42 | 3.24 | 3.44 | 5.26 | 5.91 | 5.91 |
| E1 | 0.81 | 1.06 | 1.31 | 1.54 | 2.04 | | |
| F | 0.98 | 0.98 | 1.26 | 1.26 | 1.26 | 1.93 | 1.93 |
| G | 1.06 | 1.31 | 1.56 | 1.80 | 2.30 | 2.83 | 3.33 |
| H | 3.50 | 3.50 | 5.24 | 5.24 | 5.24 | 7.83 | 7.83 |
| J | 1.84 | 1.84 | 2.24 | 2.62 | 3.32 | 3.92 | 3.92 |
| K | 2.48 | 2.48 | 2.48 | 2.48 | 2.48 | 2.30 | 2.30 |
| Tri-Clamp® | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | | |
| M/DIN male | | | | | | 1.81 | 1.97 |
| Weight (lb.) Shut-off valve with one valve body | 13.23 | 13.89 | 28.22 | 29.32 | 36.60 | 1.69 | 1.75 |
| Weight (lb.) Shut-off valve with two valve bodies | 15.65 | 16.13 | 31.31 | 35.05 | 47.18 | 95.68 | 98.11 |

**Air Connections Compressed air:**

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

**CIP connection:**

R 3/8" (BSP), external thread.

**Leakage connection:**

R 3/8" (BSP), external thread.

**Caution, opening/closing time:**

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.



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**How to contact Alfa Laval**

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