

The Proven Mixproof Range

SMP-BCA Aseptic Mixproof Valve with PTFE Diaphragm

Application

SMP-BCA is an aseptic double seat valve with PTFE diaphragm. It is available as a stop- or divert valve.

The valve is suited for aseptic operating conditions such as high sterilisation temperatures.

SMP-BCA is special designed for aseptic applications with the highest hygienic demands.

Working principle

SMP-BCA is operated by means of compressed air. The valve is a normally closed (NC) valve.

Sterile stem sealing towards the atmosphere is ensured by a special designed PTFE/rubber diaphragm unit. The PTFE diaphragm does not allow product residues to build up on the product contact surface.

The product lines are separated by two sealings and a sterile barrier chamber to avoid mixing of product and to ensure immediate indication in case of a leak from one of the plug seals. Two small pneumatic normally open (NO) valves control flow to and from the sterile barrier chamber. The barrier chamber must be clean and sterile when the main valve is closed.

The lower product lines on change over valves are separated by a single seal plug, without sterile barrier chamber.

Standard design

SMP-BCA is based on the SMP-BC valve design. It consists of actuator, bonnet, stem with diaphragm unit and valve bodies. The divert version is a three body design.

The valve is assembled by means of clamp rings and a stem clip system for easy maintenance.



Fi?dy combination 30.

Valve Body Combinations

3.2

Stop valve:

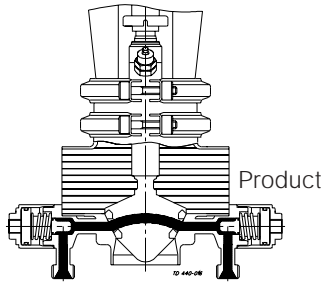
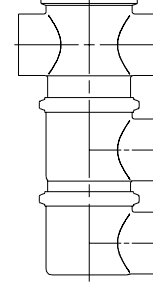
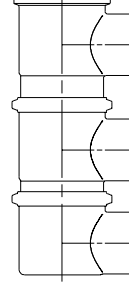
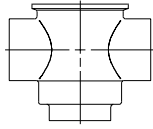
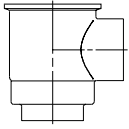
Divert valve:

Type 20

Type 30

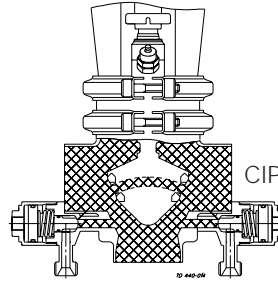
Type 111

Type 112

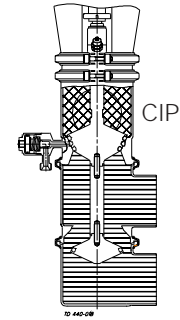


CIP or steam in CIP or steam out

- a. Closed stop valve:
Cleaning and sterilising of the barrier chamber.



- b. Open stop valve:
Cleaning of the valve body and the barrier chamber.

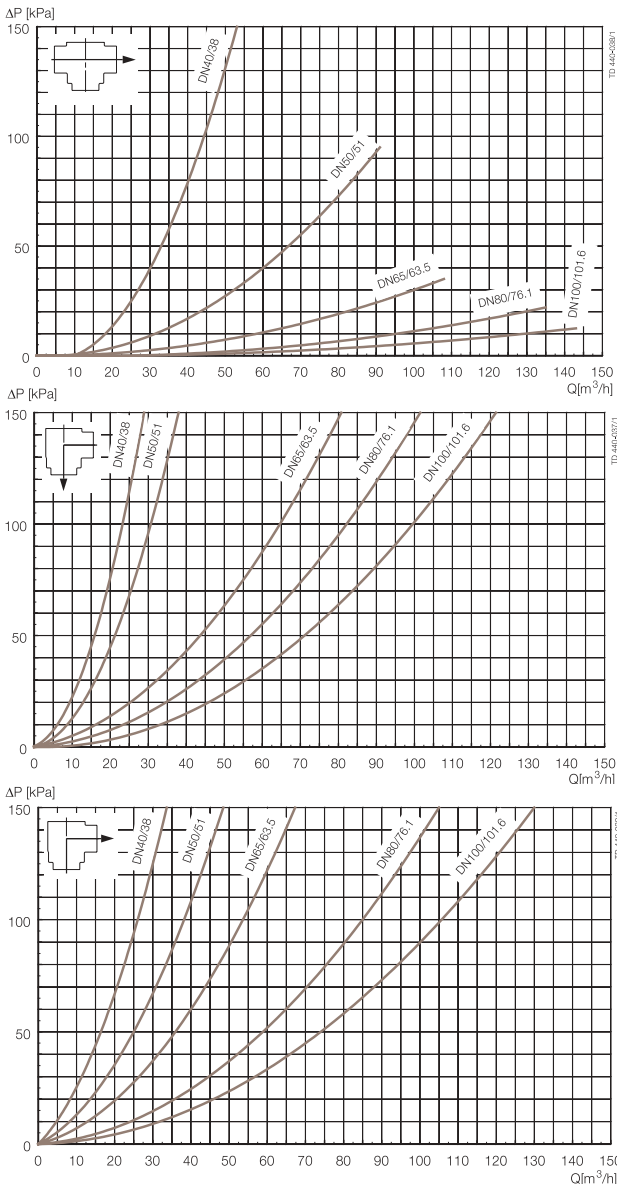


- c. Closed divert valve:
Cleaning of the upper valve body.

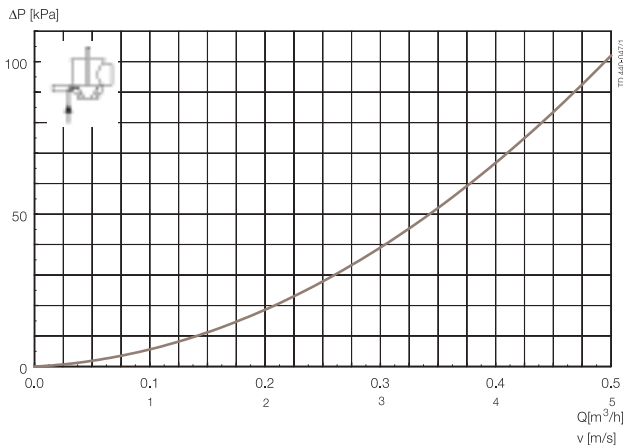
Fig. 2. Operation/cleaning.

Pressure drop/capacity diagrams

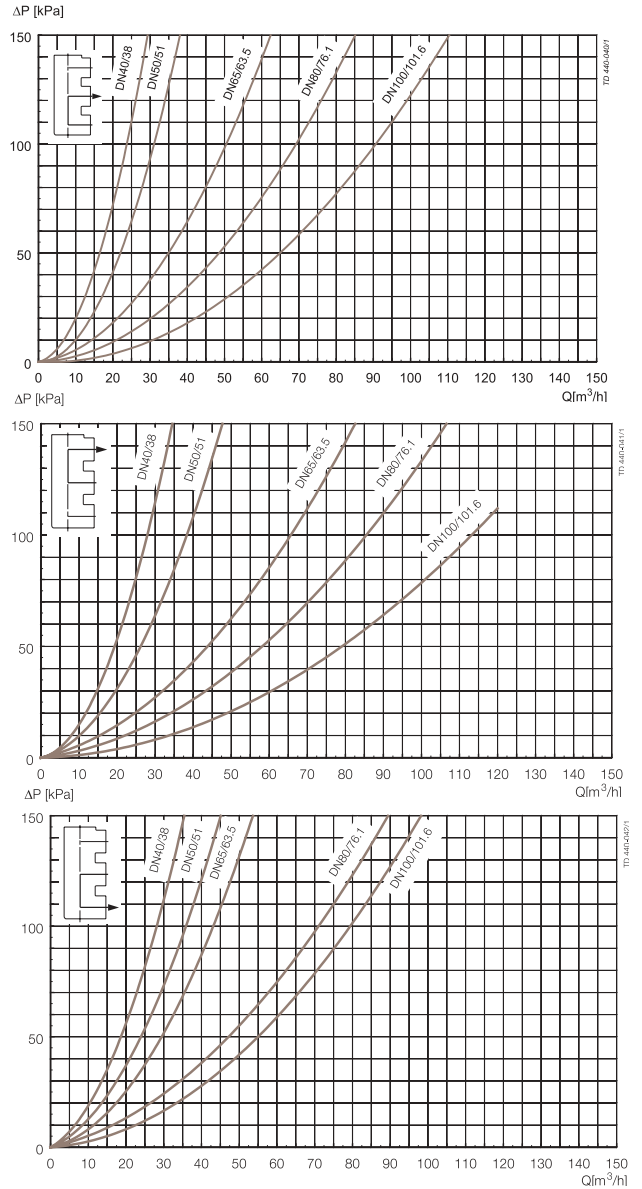
Stop valve:



CIP chamber:



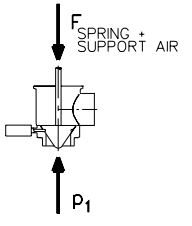
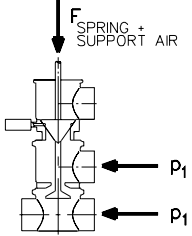
Divert valve:



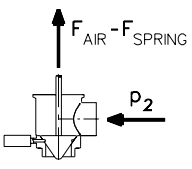
NOTE! For the diagrams the following applies:
 Medium: Water (20°C).
 Measurement: In accordance with VDI 2173.

Pressure data for SMP-BCA

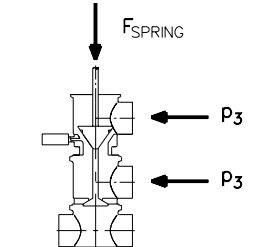
1. Upper plug. Max. product pressure P_1 without leakage due to pressure shocks, as a function of support air pressure.

| Direction of pressure | Valve size | Actuator size | Spring type | Support air pressure (bar) | | | | |
|---|------------|---------------|-------------|----------------------------|------|------|------|------|
| | | | | 0 | 3 | 5 | 6 | 7 |
|  | 38mm/ | Ø89 | Normal | 6.0 | 16.0 | 22.5 | 26.2 | 29.5 |
| | DN40 | Ø89 | Strong | 9.6 | 19.5 | 26.3 | 30.0 | 30.0 |
| | | Ø133 | Normal | 16.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| | Ø133 | Strong | 22.0 | 30.0 | 30.0 | 30.0 | 30.0 | |
|  | 51mm/ | Ø89 | Normal | 6.0 | 16.0 | 22.5 | 26.2 | 29.5 |
| | DN50 | Ø89 | Strong | 9.6 | 19.5 | 26.3 | 30.0 | 30.0 |
| | | Ø133 | Normal | 16.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| | Ø133 | Strong | 22.0 | 30.0 | 30.0 | 30.0 | 30.0 | |
| | 63.5mm/ | Ø133 | Normal | 9.6 | 25.5 | 30.0 | 30.0 | 30.0 |
| | DN65 | Ø133 | Strong | 16.0 | 30.0 | 30.0 | 30.0 | 30.0 |
| 76.1mm/ | | Ø133 | Normal | 6.5 | 14.5 | 19.5 | 22.4 | 26.8 |
| DN80 | Ø133 | Strong | 9.2 | 17.5 | 23.5 | 26.2 | 29.5 | |
| 101.6mm/ | Ø133 | Normal | 4.0 | 11.0 | 16.0 | 18.4 | 20.6 | |
| DN100 | Ø133 | Strong | 6.5 | 14.4 | 19.6 | 22.2 | 25.0 | |

2. Upper plug. Max. product pressure P_2 against which the valve can open, as a function of air pressure.

| Direction of pressure | Valve size | Actuator size | Spring type | Air pressure (bar) | | | | |
|---|------------|---------------|-------------|--------------------|-----|-----|-----|-----|
| | | | | 3 | 4 | 5 | 6 | 7 |
|  | 38mm/ | Ø89 | Normal | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| | DN40 | Ø89 | Strong | - | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Normal | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| | Ø133 | Strong | - | 8.0 | 8.0 | 8.0 | 8.0 | |
| | 51mm/ | Ø89 | Normal | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| | DN50 | Ø89 | Strong | - | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Normal | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| | Ø133 | Strong | - | 8.0 | 8.0 | 8.0 | 8.0 | |
| | 63.5mm/ | Ø133 | Normal | 4.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| | DN65 | Ø133 | Strong | - | 1.4 | 8.0 | 8.0 | 8.0 |
| | | 76.1mm/ | Ø133 | Normal | 2.8 | 7.0 | 8.0 | 8.0 |
| | DN80 | Ø133 | Strong | - | 2.0 | 5.4 | 8.0 | 8.0 |
| 101.6mm/ | | Ø133 | Normal | 2.2 | 4.6 | 7.2 | 8.0 | 8.0 |
| DN100 | Ø133 | Strong | - | 1.6 | 4.2 | 6.6 | 8.0 | |

3. Upper valve. Max. product pressure P_3 in upper valve body at which the valve can close.

| Direction of pressure | Valve size | Actuator size, spring type | | | |
|---|---------------|----------------------------|-------------|--------------|--------------|
| | | Ø89, Normal | Ø89, Strong | Ø133, Normal | Ø133, Strong |
|  | 38mm/DN40 | 2.7 | 4.5 | 8.0 | 8.0 |
| | 51mm/DN50 | 2.4 | 4.0 | 6.0 | 8.0 |
| | 63.5mm/DN65 | - | - | 7.0 | 8.0 |
| | 76.1mm/DN80 | - | - | 7.0 | 8.0 |
| | 101.6mm/DN100 | - | - | 5.0 | 8.0 |

Pressure data for SMP-BCA

4. Lower valve, change-over. Max. product pressure P_4 without leakage, as a function of air pressure.

| Direction of pressure | Valve size | Actuator size | Spring type | Air pressure (bar) | | | | |
|-----------------------|-------------------|---------------|-------------|--------------------|-----|-----|-----|-----|
| | | | | 3 | 4 | 5 | 6 | 7 |
| | 38mm/ DN40 | Ø89 | Normal | * | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø89 | Strong | * | * | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Normal | 8.6 | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Strong | * | * | 8.0 | 8.0 | 8.0 |
| | 51mm/ DN50 | Ø89 | Normal | * | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø89 | Strong | * | 4.8 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Normal | 8.6 | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Strong | * | * | 8.0 | 8.0 | 8.0 |
| | 63.5mm/ DN65 | Ø133 | Normal | 3.4 | 8.0 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Strong | * | * | 8.0 | 8.0 | 8.0 |
| | 76.1mm/ DN80 | Ø133 | Normal | * | 7.6 | 8.0 | 8.0 | 8.0 |
| | | Ø133 | Strong | * | * | 5.6 | 8.0 | 8.0 |
| | 101.6mm/ DN100 | Ø133 | Normal | * | 4.6 | 9.2 | 8.0 | 8.0 |
| | | Ø133 | Strong | * | * | 3.8 | 7.2 | 8.0 |

* = Valve cannot close

5. Upper valve. Max. CIP pressure P_{CIP} without leakage to product area as a function of product pressure below plug.

| Direction of pressure | Valve size | Actuator size | Spring type | Product pressure P_5 below plug (bar) | | | | |
|-----------------------|-------------------|---------------|-------------|---|------|------|------|------|
| | | | | 0 | 2 | 4 | 6 | 8 |
| | 38mm/ DN40 | Ø89 | Normal | 9.0 | 6.3 | 3.5 | 0.8 | - |
| | | Ø89 | Strong | 10.0 | 9.9 | 7.2 | 4.6 | 2.0 |
| | | Ø133 | Normal | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | | Ø133 | Strong | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | 51mm/ DN50 | Ø89 | Normal | 9.0 | 6.3 | 3.5 | 0.8 | - |
| | | Ø89 | Strong | 10.0 | 9.6 | 6.7 | 3.8 | 1.0 |
| | | Ø133 | Normal | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | | Ø133 | Strong | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | 63.5mm/ DN65 | Ø133 | Normal | 10.0 | 10.0 | 9.3 | 5.8 | 2.5 |
| | | Ø133 | Strong | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| | 76.1mm/ DN80 | Ø133 | Normal | 10.0 | 10.0 | 8.5 | 4.7 | 1.0 |
| | | Ø133 | Strong | 10.0 | 6.9 | 2.3 | - | - |
| | 101.6mm/ DN100 | Ø133 | Normal | 10.0 | 6.0 | - | - | - |
| | | Ø133 | Strong | 10.0 | 10.0 | 6.5 | 1.4 | - |

NOTE! Max. recommended CIP pressure = 100 kPa (1 bar).

Dimensions (mm)

| Size | 38 mm | 51 mm | 63.5 mm | 76.1 mm | 101.6 mm | 40 DN | 50 DN | 65 DN | 80 DN | 100 DN |
|-------------------------|----------|----------|------------|------------|-------------|----------|----------|----------|----------|-----------|
| A1 | 371 | 381 | 459 | 481 | 553 | 369 | 379 | 456 | 482 | 552 |
| A2 | 385 | 395 | 473 | 501 | 573 | 383 | 393 | 470 | 502 | 572 |
| A3 | 511 | 532 | 642 | 677 | 778 | 511 | 532 | 642 | 693 | 778 |
| A4 | 525 | 546 | 662 | 697 | 798 | 525 | 546 | 662 | 713 | 798 |
| C | 90 | 102 | 124 | 129 | 157 | 90 | 102 | 124 | 134 | 157 |
| C1 | 80 | 84 | 108 | 115 | 150 | 80 | 84 | 108 | 120.5 | 150 |
| OD | 38 | 50.8 | 63.5 | 76.1 | 101.6 | 41 | 53 | 70 | 85 | 104 |
| ID | 34.9 | 47.6 | 60.3 | 72.1 | 97.6 | 38 | 50 | 66 | 81 | 100 |
| t | 1.6 | 1.6 | 1.6 | 2.0 | 2.0 | 1.5 | 1.5 | 2.0 | 2.0 | 2.0 |
| E | 49.5 | 61.5 | 82.3 | 87.3 | 133.5 | 49.5 | 61.5 | 82.3 | 87.3 | 133.5 |
| E1 | 20.5 | 26.8 | 33.2 | 39.1 | 51.8 | 22 | 28 | 36 | 43.5 | 53 |
| F1 | 14 | 14 | 14 | 20 | 20 | 14 | 14 | 14 | 20 | 20 |
| F2 | 14 | 14 | 20 | 20 | 20 | 14 | 14 | 20 | 20 | 20 |
| G | 27 | 33.3 | 39.7 | 45.6 | 58.3 | 28.5 | 34.5 | 42.5 | 50 | 59.5 |
| H | 89 | 89 | 89 | 133 | 133 | 89 | 89 | 89 | 133 | 133 |
| J | 46.7 | 46.7 | 57 | 66.6 | 84.3 | 46.7 | 46.7 | 57 | 66.6 | 84.3 |
| K | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| M/ISO clamp | | 21 | 21 | 21 | 21 | 21 | | | | |
| M/ISO male | 21 | 21 | 21 | 21 | 21 | | | | | |
| M/DIN male | | | | | 22 | 23 | 25 | 25 | 30 | |
| M/SMS male | | 20 | 20 | 24 | 24 | 35 | | | | |
| M/BS male | 22 | 22 | 22 | 22 | 27 | | | | | |
| Weight (kg): Stop valve | 6.5 | 6.8 | 13.3 | 14.9 | 18.2 | 6.5 | 6.8 | 13.3 | 15.6 | 18.2 |
| Divert valve | 8.2 | 8.6 | 15.5 | 18.6 | 24.6 | 8.2 | 8.6 | 15.5 | 19.6 | 24.6 |

Air Connections

Compressed air:

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

CIP connection:

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

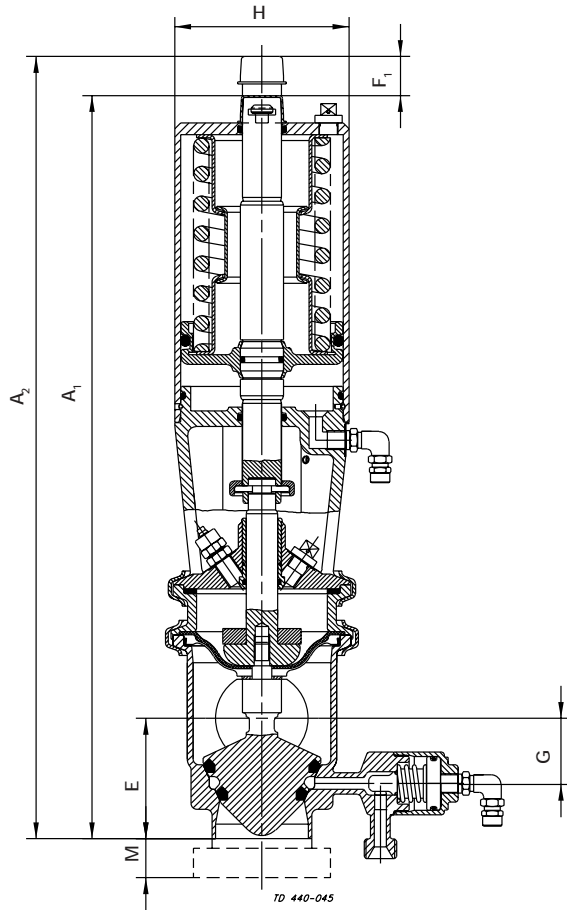
Leakage connection:

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

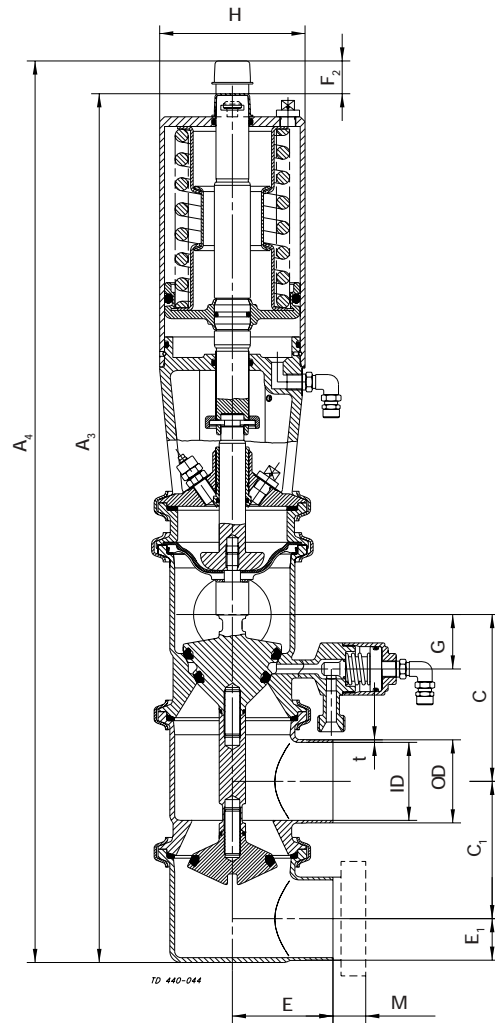
Caution, opening/closing time:

Opening/closing time will be affected by the following:

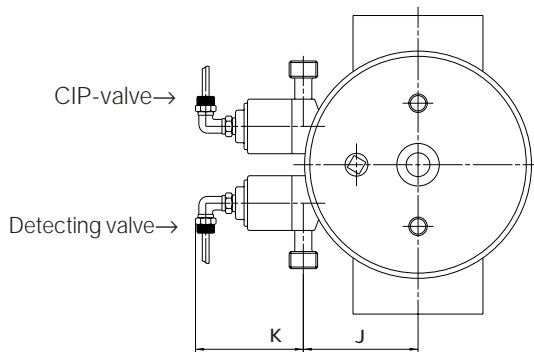
- The air supply (air pressure).
- The length and dimensions of the air hoses.
- Number of valves connected to the same air hose.
- Use of single solenoid valve for serial connected air actuator functions.
- Product pressure.



a. Stop valve.



b. Divert valve.



c. Top view

Fig. 2. Dimensions.

Technical data

Pressure range: 0-800 kPa (0-8 bar).
 Temperature range: -10°C to 140°C (EPDM).
 Optimum process conditions: >50 kPa (0.5 bar), >20°C.
 Max. sterilization temperature (steam - short time) 150°C - 380 kPa (3.8 bar).
 Air pressure: 500-800 kPa (5-8 bar).

Note! Vacuum is not recommended in aseptic applications.

| Air consumption (litres free air) | | |
|-----------------------------------|--------------------------------------|--|
| Size | 38 mm, 51 mm/DN40,50 Actuator Ø89 | 63.5, 76.1,101.6 mm/DN 65, 80,100 Actuator Ø133 |
| Stop valve/ Divert valve | 0.2 x Air pressure (bar) | 0.7 x Air pressure (bar) |

Expected lifetime of diaphragm unit under normal conditions:

(no pressure shocks or cavitation).

| Size/Type | Stop valve activations | Divert valve activations |
|---------------|------------------------|--------------------------|
| 38mm/DN40 | 12.000 | 10.000 |
| 51mm/DN50 | 12.000 | 10.000 |
| 63.5mm/DN65 | 12.000 | 5.000 |
| 76.1mm/DN80 | 5.000 | 5.000 |
| 101.6mm/DN100 | 5.000 | 5.000 |

Note! Activating the valve without internal product pressure reduces lifetime of diaphragm unit.

Materials

Product wetted steel parts: Acid-resistant steel 1.4404 (316L).
 Other steel parts: Stainless steel 1.4301 (304) (304).
 Finish: Semi-bright.
 Product wetted seals: EPDM, PTFE.
 Other seals: Nitrile (NBR), EPDM.

Options

- A) Male parts or clamp ends in accordance with required standard.
- B) Control & Indication (see chapter in Product Catalogue).
- C) Larger actuator for valve sizes 38-51 mm/DN 40-50.
- D) CIP installation kits.
- E) Other valve body combinations.
- F) Surface roughness, product wetted parts: $Ra \leq 0.8 \mu\text{m}$.
- G) Product wetted seals of Nitrile (NBR) or Fluorinated rubber (FPM).
- H) Service tool for actuator.
- I) Tool for plug seals (Necessary for changing the seals).

Ordering

Please state the following when ordering:

- Valve type.
- Valve port combination: Type nos.
- Valve port size combination, (lower and upper ports).
- Connections if not welding ends.
- Other options.

Note! For further details, see also PD 65036 and instruction IM 70811.