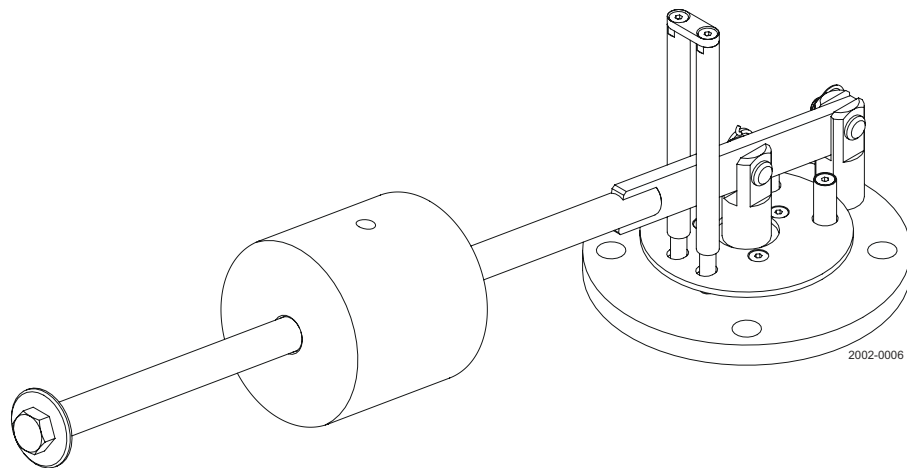


Alfa Laval SB Pressure Relief Valve



Lit. Code

200007939-1-EN-GB

Instruction Manual

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
+45 79 32 22 00

The original instructions are in English

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1 Declarations of Conformity

1.1 EU Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Valve

Designation

SB Pressure Relief Valve

Type

Serial number from AAB000000001 to AAC999999999

Serial number from 100700000001 to 100799999999

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive (PED) 2014/68/EU *Category IV, Fluids Group II*

Conformity Assessment According to Directive 2014/68/EU Annex III Module D

PED Quality Certificate No. QS-005-19 rev2

Notified Body Number: 1336

Inspecta Estonia OÜ

Teaduspargi 8

12618 Tallinn

ESTONIA

The person authorised to compile the technical file is the signer of this document.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Mikkel Nordkvist

Title

Name

Kolding, Denmark

2024-09-01

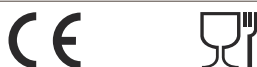


Place

Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_092024 / This Declaration of Conformity replaces Declaration of Conformity dated 2023-10-25



1.2 UK Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Valve

Designation

SB Pressure Relief Valve

Type

Serial number from AAB000000001 to AAC999999999

Serial number from 100700000001 to 100799999999

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Pressure Equipment (Safety) Regulations 2016 *Category IV, Fluids Group II*

PED Quality Certificate No. QS-005-19 rev2

Notified Body Number: 1336

Inspecta Estonia OÜ

Teaduspargi 8

12618 Tallinn

ESTONIA

Signed on behalf of: Alfa Laval Kolding A/S.

Vice President BU Hygienic Fluid Handling
Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2024-09-01

Date (YYYY-MM-DD)



Signature

DoC Revison_ 03_092024



2 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **Safety, Installation and Operating** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter **Safety** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter **Technical Data** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.





The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.



2.1 Safety Signs

Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs


	General warning.
	Transportation with forklift truck or other industrial vehicles if heavy.
	Hot surface and burning danger.
	Cutting danger.

	Corrosive substance.
	Crushing of hands.






2.2 Safety Precautions

All warnings in the Instruction Manual are summarised on these pages. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.






General

	<p>To prevent unexpected start and contact with electrical live and moving parts.</p> <p>Always disconnect the power supply safely:</p> <ul style="list-style-type: none"> • The power supply disconnecting device must be disconnected (in off position) and locked.
---	---





Transportation and Lifting

  	<p>Never lift or elevate in any way other than described in this manual.</p> <p>Always use the original packaging or similar during transportation.</p> <p>Always ensure that personnel must have experience with lifting operations.</p> <p>Always ensure that all connections are disconnected before attempting to remove the valve from the installation.</p> <p>Always ensure that no leakage of lubricants can occur.</p> <p>Always drain liquid out of the valves before transportation.</p> <p>Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used.</p> <p>Always ensure that compressed air is released.</p>
 	<p>Always use designated lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product.</p> <p>Always ensure that the unit is securely fixed during transportation.</p> <p>Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary.</p> <p>Always use suitable transport device ie. forklift or pallet lifter.</p> <p>Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p> <p>Always keep an eye on the load and stay clear during the lifting operation.</p>





Installation

	<p>If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the valve is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them.</p> <p>Always release compressed air after use.</p> <p>Always assemble the valve completely before startup and make sure everything is in place and correctly tightened.</p>
  	<p>Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before installation, inspection, assembly, or dismantling of the valve.</p>
	<p>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</p>


Operation

	<p>Always read Technical Data thoroughly.</p> <p>Never operate the valve unless a correct installation has been verified.</p> <p>Never cover or in any way restrict the valve, the valve must be able to work unobstructed at all time.</p> <p>Never dismantle or touch the actuator for force opening if supplied with compressed air.</p>
	<p>Never touch the valve or pipelines when hot.</p>
	<p>Always rinse well with clean water after cleaning.</p> <p>Always handle lye and acid with great care.</p> <p>Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.</p>
	<p>Never touch moving parts of the valve during operation.</p> <p>Never dismantle the valve during operation or when pressurized.</p> <p>Always release compressed air after use.</p>


Maintenance

	<p>In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance includes:</p> <ul style="list-style-type: none"> • Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation • Preventive maintenance: visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts • Repairs: unscheduled break down of a component, often causing the system to stop. Damaged components must be replaced • Stock of Alfa Laval genuine spare parts: Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing downtime in case of unplanned break downs
 	<p>Always release compressed air after use.</p> <p>Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.</p> <p>Never stick your fingers through the valve ports if the actuator is supplied with compressed air.</p> <p>Never put your fingers between the valve and actuator for force opening.</p> <p>Never touch the moving parts if the actuator for force opening is supplied with compressed air.</p>
	<p>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</p>





Storage

	<p>Alfa Laval recommend:</p> <ul style="list-style-type: none"> • Store the supplied Alfa Laval product as supplied in original packaging • Port opening(s) should be protected against any ingress • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5 °C to +40 °C (23 °F - 104 °F) • Relative humidity less than 60% • No exposure to corrosive substances (including contained air)
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Noise

	<p>Under certain operating conditions, the supplied Alfa Laval product and/or the systems in which they are installed can produce high sound pressure levels. Appropriate noise protection measures should be taken when necessary and in accordance with local legislation.</p>
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Hazards

	<p>Burn Hazard</p> <ul style="list-style-type: none">• Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves
	<p>Corrosive Hazard</p> <ul style="list-style-type: none">• Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids• When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.
	<p>Cut Hazard</p> <ul style="list-style-type: none">• Sharp edges, especially on bowl discs and threads, can cause cuts. Wear protective gloves
	<p>Crushing Hazard</p> <ul style="list-style-type: none">• Avoid placing hands into valve orifice pinch points

Safety check



A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.

Inspection acceptance criteria:

- It should not be possible to reach moving parts originally protected by a protective device
- The protective device must be securely mounted
- Ensure that screws for the protective device are securely tightened

Procedure in case of non-acceptance:

- Fix and/or replace the protective device

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.

**DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.

**NOTE**

Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

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3 Introduction

The Alfa Laval SB Pressure Relief Valve is a hygienic safety valve that removes excess liquid that creates overpressure in a process tank or vessel due to overfilling. When pressure in the tank exceeds a pre-set value, the pressure relief valve opens to vent fluid in the event of liquid overfilling and closes when the tank or vessel pressure has returned below the set point. This prevents damage to the tank or vessel and help ensure safe operations.

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4 Installation

4.1 Unpacking/delivery

NOTE

The instruction manual is part of delivery.

Study the instructions thoroughly.

The items refer to the [Parts Lists and Exploded Views](#) on page 35.

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Valve seat and disc
2. Lever and weight
3. Bearing pins, washers and locking rings
4. Flange gasket (placed in valve seat)
5. Actuator for force opening (option)
6. Splash guard (option)
7. Proximity sensor (option)

① Remove any packing materials from the valve/valve parts.

② Inspect the valve/valve parts for visible transport damage.

Avoid damaging the valve/valve parts.

4.2 General installation

NOTE

Always read [Technical Data](#) on page 31 thoroughly.

WARNING

Always release compressed air from the actuator for force opening after use.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

4.3 Valve assembly

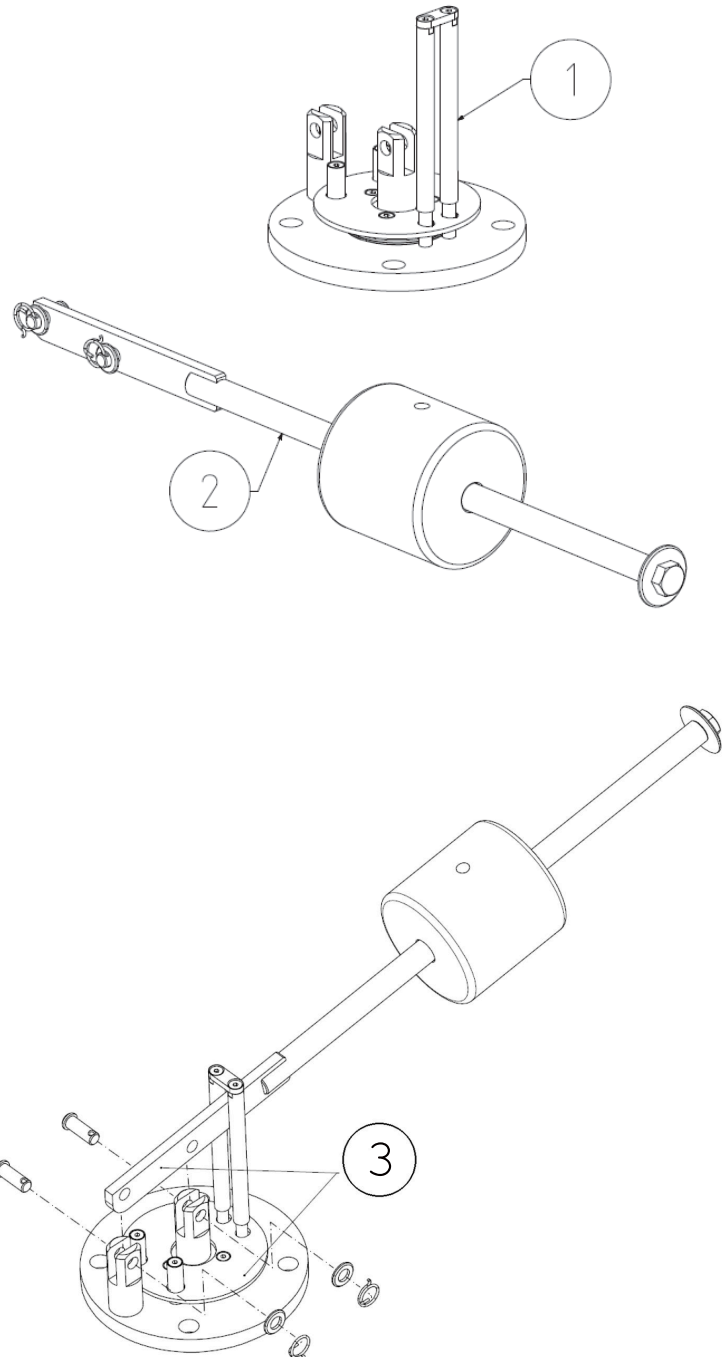
NOTE

The lever and weight are to be assembled with valve seat and disc.

Make sure the serial number engraved on the disc matches the serial number engraved on the lever.

Pos. 1. Valve seat and disc

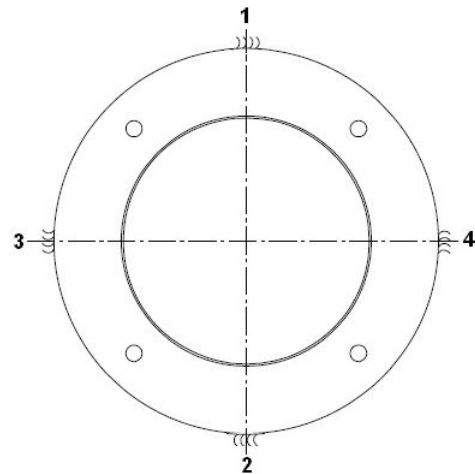
Pos. 2. Lever and weight



Pos 3. Serial number

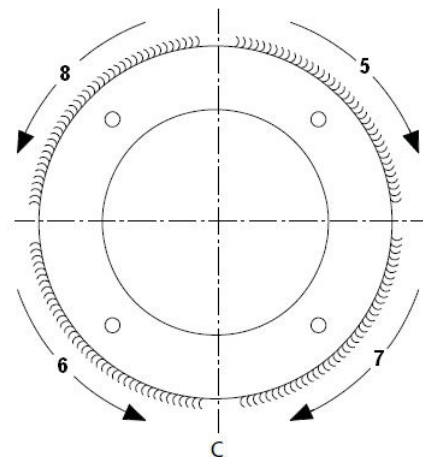
4.4 Welding procedures for welding flange

1 Spot weld from outside



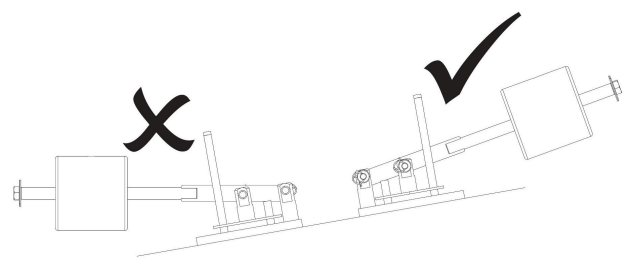
- 2 Weld the following sections first from the outside then from the inside, and cool with air between each section.

Spot weld from inside



- 3
- Ensure that the surface flatness tolerance equals ± 0.2
 - Grind and polish the welding flange

The valve should be seated horizontally. An inclination of max. 10° is acceptable but the lever must then point upwards.

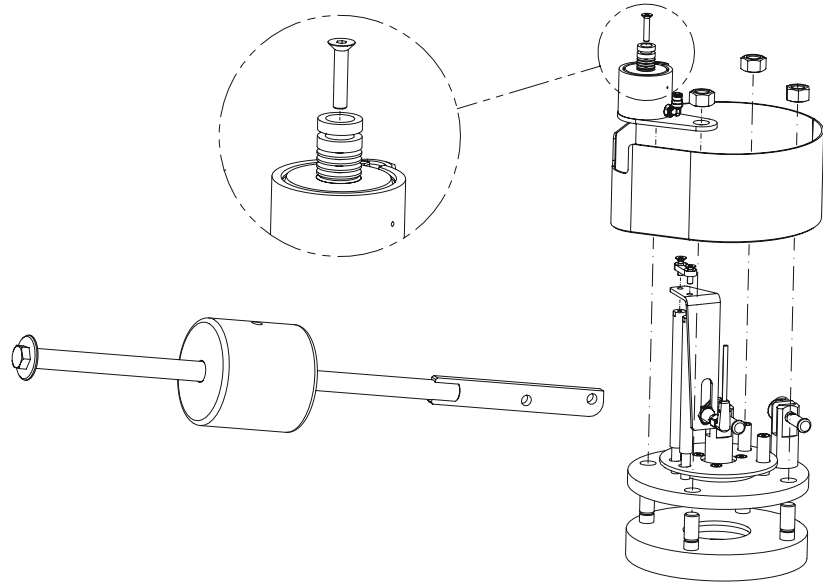


4.5 Installation of valve and accessories

The valve is to be fitted with M16 bolts. The options Splash guard and Force opener are also to be fitted with M16 bolts. The Proximity sensor is to be fitted by the valve's M6 screws.

Options

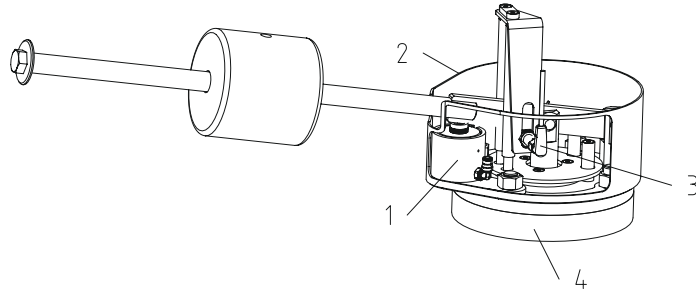
1. Force opener¹
2. Splash guard
3. Proximity sensor
4. Welding flange



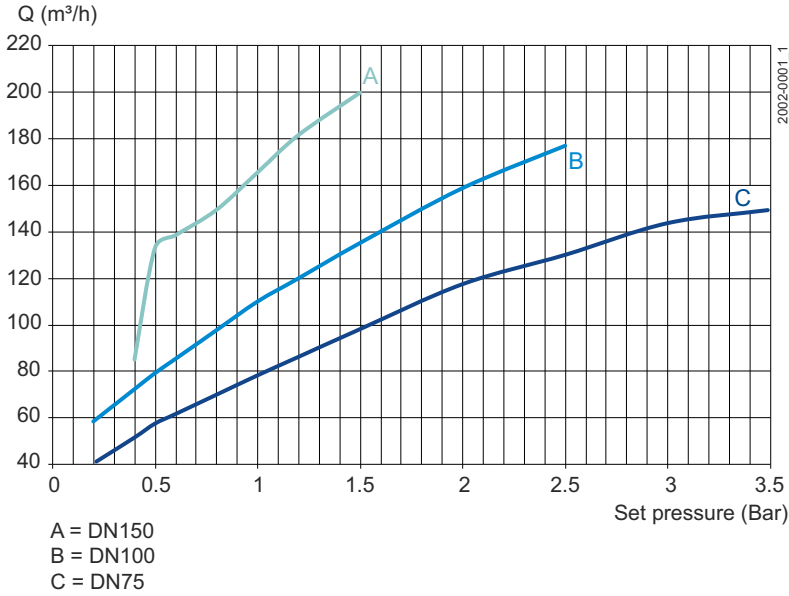
¹ The force opener is delivered with a spacer kit. Adjust the spacer kit to a recommended gap of 2-4 mm (0.08" - 0.16") between piston and lever.

Tightening torques for bolts:

M16	218 Nm
M6	11 Nm



5.2 Discharge Capacity



In accordance with EN 4126-1

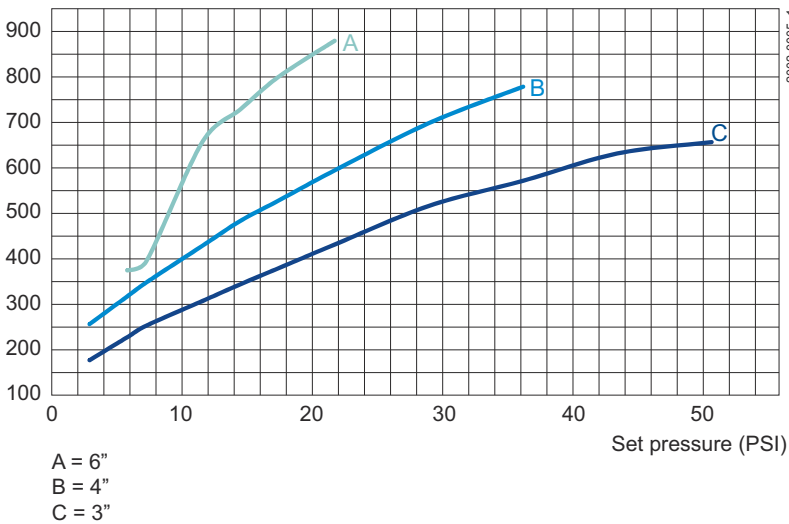
Capacity measured at:

$\Delta P = 10\%$ Set pressure ≥ 1 bar

$\Delta P = 0.1 \times$ Set pressure < 1 bar

Medium: water (20 °C)

Q (GPM US)



In accordance with EN 4126-1

Capacity measured at:

$\Delta P = 10\%$ Set pressure ≥ 14.5 psi

$\Delta P = 1.45$ Set pressure < 14.5 psi

Medium: water (68 °F)

5.3 Recommended cleaning

 **WARNING** Caustic hazard!

Always handle lye and acid with great care.

Always use rubber gloves!

Always use protective goggles!



It is important that the valve seat is kept clean.

Assuming the valve is operating normally, the valve disc is satisfactorily cleaned during the tank cleaning cycle as part of the tank.

It is recommended that the valve is supplied with the option of Force opener and Splash guard.

Force opener	For opening of valve during tank cleaning cycle for complete valve seat cleaning.
Splash guard	For containing CIP fluid spray from the tank cleaning cycle.

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6 Maintenance

6.1 General maintenance

NOTE

Always read *Technical Data* on page 31 thoroughly.

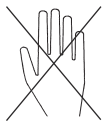
WARNING

Never service the valve when it is hot.

Never service the valve with the valve or actuator under pressure.

Atmospheric pressure required!

Burning hazard!



WARNING

Cutting hazard!

Never put your fingers between the valve and the actuator for force opening.



WARNING

Moving parts!

Never touch the moving parts of the actuator for force opening if supplied with compressed air.



Below are some guidelines for maintenance and lubrication intervals.

Valve

To ensure the valve operates correctly, test of function at regular intervals is required.

Intervals are dependent on operation conditions and should be specified by the user or local regulations.

Alfa Laval recommend intervals of once every 6-12 months.

O-ring and flange gasket replacement every 2-5 years.

To ensure correct mounting of O-ring, the O-ring should be lubricated with soapy water. Do not use grease, oil or equivalent.

Actuator for force opening

Disassemble, clean and lubricate the actuator every 2-5 years.

O-ring replacement every 2-5 years.

7 Technical Data

NOTE

Technical data must be observed during installation, operation and maintenance.
All personnel should be informed about the technical data.

7.1 Technical Data

Nominal size	Set Pressure Range
75 mm / 3"	0.2 - 3.5 bar / 2.9 - 50.8 psi
100 mm / 4"	0.2 - 2.5 bar / 2.9 - 36.3 psi
150 mm / 6"	0.4 - 1.5 bar / 5.8 - 21.8 psi

Temperature	
Max. operating temperature	80 °C
Max. sterilization temperature	140 °C (max. 30 min.)

Actuator data

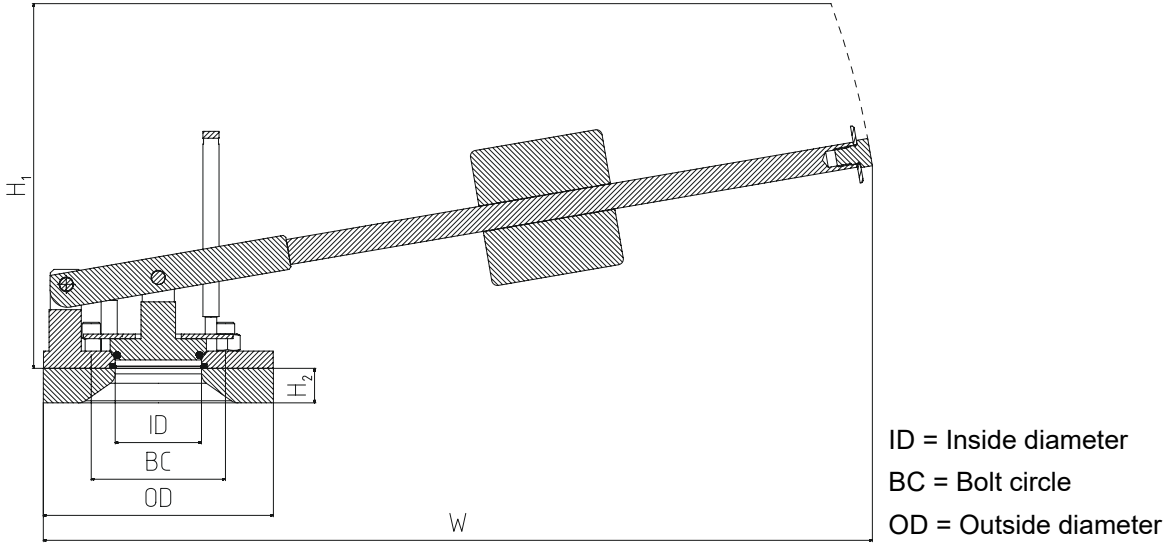
Actuator for force opening	
Max. air supply	10 bar / 145 psi
Min. air supply	5 bar / 72.5 psi

Noise	
Noise of actuator	75 dB(A)

Weight

Nominal size	Set pressure range	Weight
75 mm / 3"	0.2 -0.3 bar / 2.9-4.35 psi	10.8 kg
	0.4 bar / 5.8 psi	12.8 kg
	0.5 -0.6 bar / 7.3-8.7 psi	14.8 kg
	0.5 -0.6 bar / 7.3-8.7 psi	14.8 kg
	0.7-1.0 bar / 10.2-14.5 psi	18.8 kg
	1.1-1.3 bar / 16-18.9 psi	20.8 kg
	1.4-2.1 bar / 20.3-30.5 psi	24.8 kg
	2.2-2.9 bar / 32-42 psi	29.8 kg
100 mm / 4"	3.0-3.5 bar / 43.5-50.8 psi	38.8 kg
	0.2 -0.3 bar / 2.9-4.35 psi	12.9 kg
	0.4-0.7 bar / 5.8-10.2 psi	14.9 kg
	0.8-1.4 bar / 11.6-20.3 psi	24.9 kg
	1.5-1.8 bar / 21.8-26.1 psi	29.9 kg
150 mm / 6"	1.9-2.5 bar / 27.6-36.3 psi	38.9 kg
	0.4-0.8 bar / 5.8-11.6 psi	41.5 kg
	0.9-1.2 bar / 13.1-17.4 psi	50.5 kg
	1.3-1.5 bar / 18.9-21.8 psi	62.5 kg

Interface requirements



Interface requirements (mm)

Nominal size	ID	BC	OD	Bolts	H1	H2	W
75 / 3"	75 / 2.95"	165 / 6.5"	200 / 7.87"	4xM16	375 / 14.76"	30 / 1.18"	740 / 29.13"
100 / 4"	100 / 3.94"	165 / 6.5"	200 / 7.87"	4xM16	375 / 14.76"	30 / 1.18"	740 / 29.13"
150 / 6"	150 / 5.91"	230 / 9.06"	270 / 10.63"	8xM16	430 / 16.93"	30 / 1.18"	1050 / 41.34"

7.2 Physical Data

Materials

Product wetted steel parts:	EN 1.4404 (AISI 316L) with 3.1 cert.
Product wetted steel surfaces:	Surface roughness Ra < 0.8 μm (32 μin)
Product wetted seals:	EPDM

8 Spare Parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

8.1 Ordering Spare Parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

8.2 Alfa Laval Service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

8.3 Warranty - Definition



The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



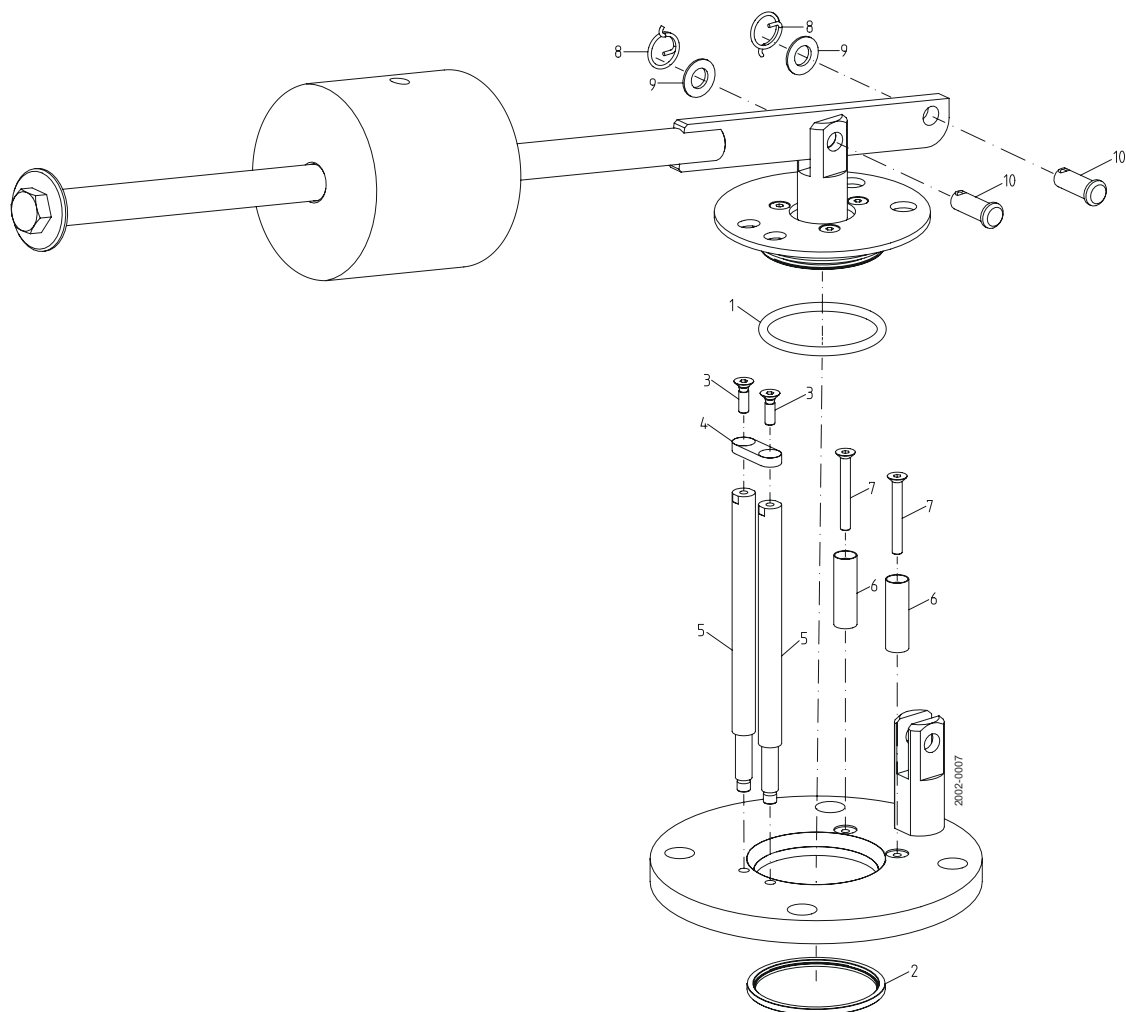
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorized persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 7)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

9 Parts Lists and Exploded Views

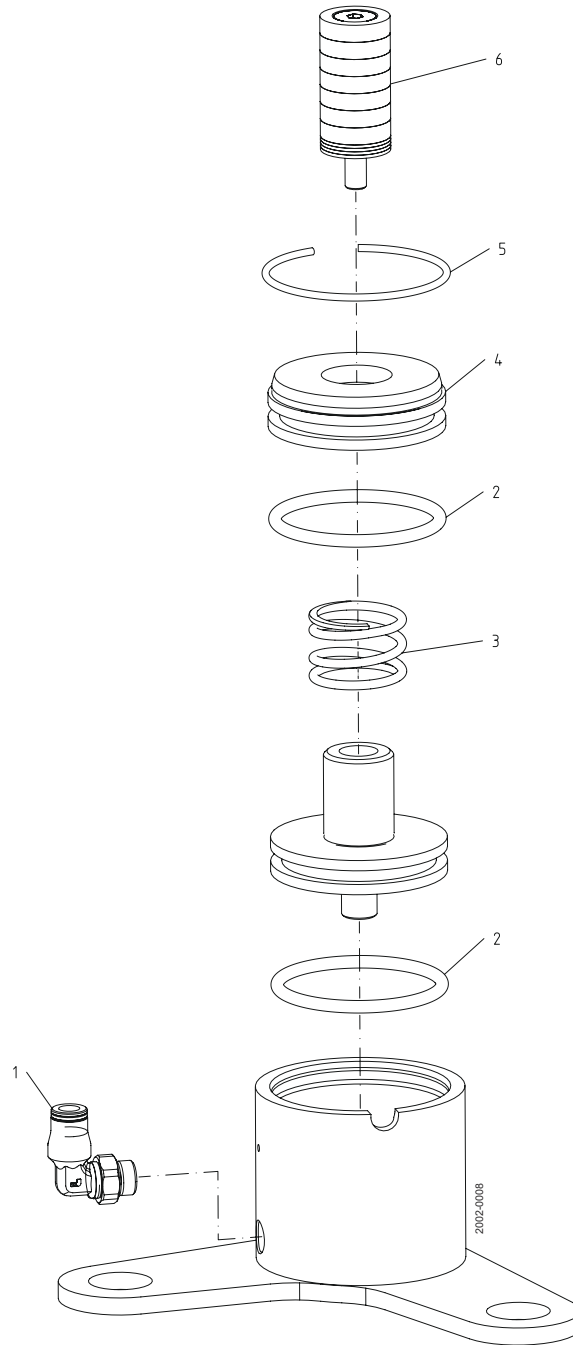
9.1 Pressure Relief Valve



Pos.	Qty.	Denomination
1	1	O-ring, EPDM
2	1	Gasket, EPDM
3	2	Screw
4	1	P.R.V. guide stop $\text{\O}150/6''$
4	1	P.R.V. guide stop $\text{\O}75/3'' - \text{\O}100/4''$
5	2	P.R.V. guide pin

Pos.	Qty.	Denomination
6	2	P.R.V. guide pin small
7	2	Screw
8	2	Locking ring
9	2	Washer
10	2	Bearing tap

9.2 Force Opener



Pos.	Qty.	Denomination
1	1	Air fitting
2	2	O-ring, NBR
3	1	Spring

Pos.	Qty.	Denomination
4	1	Force opener cover
5	1	Locking ring
6	1	Spacer kit