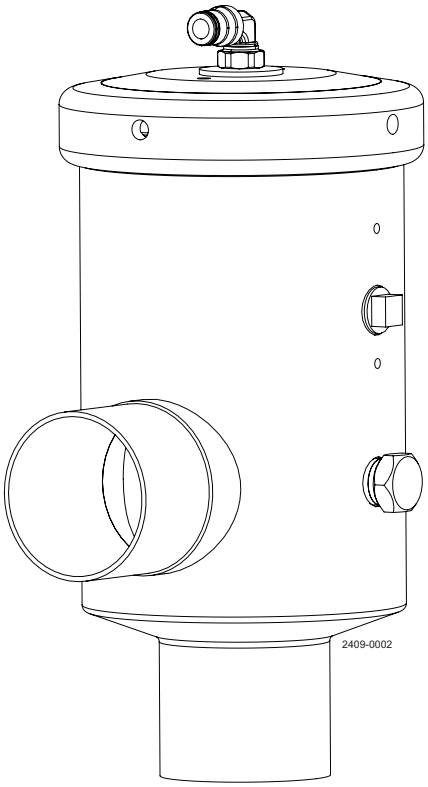
Alfa Laval SB Pressure Exhaust Valve



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Instruction Manual

British English

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

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 Exhaust Valve

Type

AAB000000001 to AAB999999999, 100700000001 to 100799999999

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC

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

Title	Name
Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist

Place	Date (YYYY-MM-DD)	Signature
Kolding, Denmark	2024-09-01	

DoC Revison_ 01_092024 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01

CE

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

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Serial number

is in conformity with the following directives with amendments:

- Regulation (EU) 2023/1230 on machinery

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2027-01-20
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_02_012027

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 Exhaust Valve

Type

AAB000000001 to AAB999999999, 100700000001 to 100799999999

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist	
Title	Name	
Kolding, Denmark	2024-09-01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_02_092024

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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 Burn Hazard.
	Cutting danger.
	Corrosive substance.
	Crushing of hands.

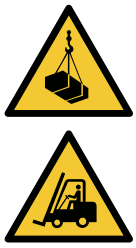
2.2 Safety Precautions

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

	To prevent unexpected start and contact with electrical live and moving parts. **Always** disconnect the power supply and air supply safely: • The power supply disconnecting device and air supply must be disconnected (in off position) and locked.

Transportation and Lifting

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

Installation

	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. **Always** release compressed air after use. **Always** assemble the valve completely before startup and make sure everything is in place and correctly tightened.
   	Never work on the valve or touch moving parts if the actuator is supplied with compressed air. **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. **Never** touch the valve or the pipelines when processing hot liquids or when sterilising.

Operation

	Always read ***Technical Data*** thoroughly. **Never** operate the valve unless a correct installation has been verified. **Never** dismantle the valve during operation or when pressurized.
	Never touch the valve or pipelines when hot. **Never** touch the valve or the pipelines when processing hot liquids or when sterilising.
	Always rinse well with clean water after cleaning. **Always** handle lye and acid with great care. **Always** follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.
	Never touch moving parts of the valve during operation. **Always** release compressed air after use. **Never** touch the moving parts if the actuator is supplied with compressed air.

Maintenance

In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance includes:

- 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

Always release compressed air after use.

Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.

Never work on the valve or touch moving parts if the actuator is supplied with compressed air.

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

Storage

Alfa Laval recommend:

- 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)

Noise

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.

Hazards

Burn Hazard

- Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves

Corrosive Hazard

- 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.

Cut Hazard

- Sharp edges, especially on threads, can cause cuts. Wear protective gloves

Crushing Hazard

- 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.

3 Introduction

The Alfa Laval SB Pressure Exhaust Valve is a pneumatic regulating valve that automatically releases pressure in a hygienic process tank when it exceeds the set pressure. To ensure safe pressure regulations at all times, the set pressure can easily be adjusted manually or from a remote location that is connected to the central control system.

3.1 General information

The Pressure Exhaust Valve is to be used in a system for remote control of the working pressure in tanks during a process creating increasing pressure. The Pressure Exhaust Valve can be mounted directly on top of the tank, as part of a tank top system or located elsewhere in the pipework.

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4 Installation

4.1 Unpacking/delivery

NOTE

The instruction manual is part of the delivery. Study the instructions thoroughly.

The items refer to *Parts lists and exploded views* on page 33.

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

- Complete valve
- Instruction manual

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 29 thoroughly.

WARNING

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

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

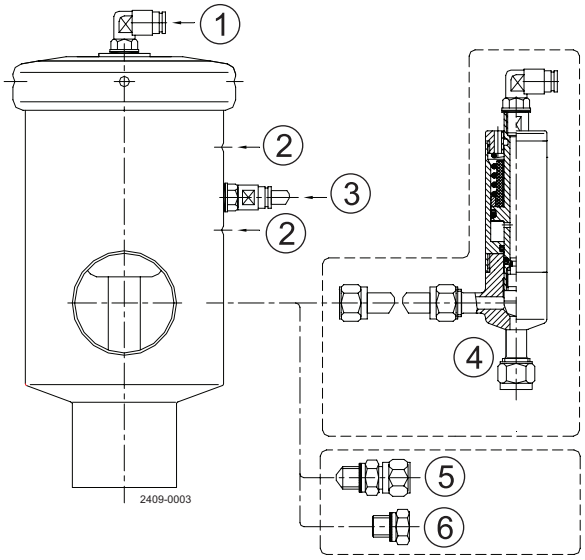
4.3 Valve installation

The Pressure Exhaust valve is produced with male part acc. DIN 11851 or weld end acc. ISO 2037.

Connections for control air and force opening are 1/8" BSP, delivered with fittings for O.D 6 x 1 mm nylon hoses. Cleaning nozzle and closing plug are included.

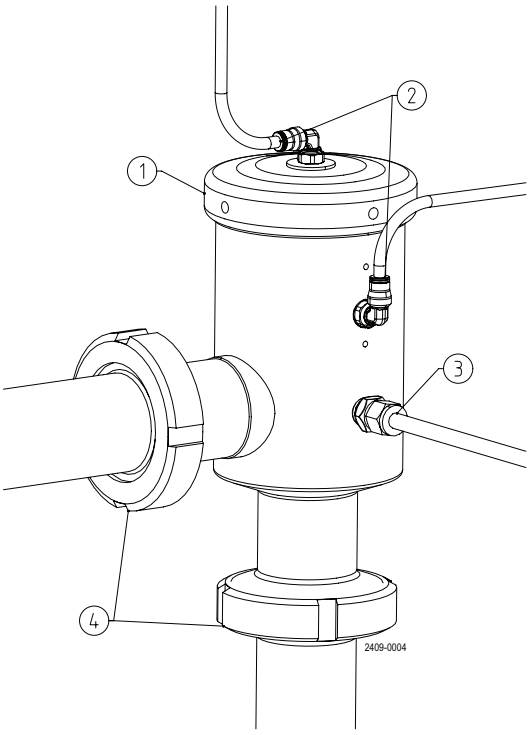
The cleaning nozzle is equipped with a fitting for O.D 8 x 1 mm stainless steel pipe and should further be equipped with a CIP supply valve if needed.

Pos. 1.	Set point pressure
Pos. 2.	Leakage indicator hole
Pos. 3	Force opening pressure
Pos. 4	CIP supply valve
Pos. 5	Cleaning nozzle
Pos. 6	Closing plug



Union connection

- The Pressure Exhaust valve should preferably be mounted in a vertical position
- Ensure the valve nut is tight (pos. 1)
- Ensure the valve air supply connections are tight (pos. 2)
- Ensure the cleaning nozzle or closing plug is tight (pos. 3)
- Ensure that the in and outlet connections are tight (pos. 4)



Weld connection

- Before welding, the valve must be disassembled so the gasket and O-rings are not damaged by the heat
- For disassembly and assembly procedures, please refer to chapter *Maintenance* on page 25
- The Pressure Exhaust valve should preferably be mounted in a vertical position
- Ensure the valve nut is tight (pos. 1)
- Ensure the valve air supply connections are tight (pos. 2)
- Ensure the cleaning nozzle or closing plug is tight (pos. 3)
- Ensure that the in and outlet connections are tight (pos. 4)

5 Operation

5.1 Operation

NOTE

Study the instructions carefully and pay special attention to the warnings!

Ensure that the valve operates smoothly.

The items refer to *Parts lists and exploded views* on page 33.

Always read *Technical Data* on page 29 thoroughly.

CAUTION

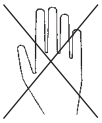
Alfa Laval cannot be held responsible for incorrect operation.

WARNING

Always release compressed air after use.

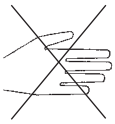
WARNING **Burn hazard!**

Never touch the valve or the pipelines when processing hot liquids or sterilizing.



WARNING **Moving parts!**

Never touch the moving parts if the actuator is supplied with compressed air.



- The Pressure Exhaust valve is operated by means of a set point pressure being applied to the top of the valve
- The pressure regulation will be identical to the set point pressure
- When the system pressure exceeds the set point pressure, the valve will open and blow off through the valve side branch for atmospheric discharge or collection
- To ensure correct working conditions there should be no backpressure after the vent port
- The set point pressure is adjusted to the required pressure either by means of a manual precision regulator or an IP converter controlled by a PLC

5.2 Recommended cleaning

WARNING **Caustic hazard!**

Always handle lye and acid with great care.

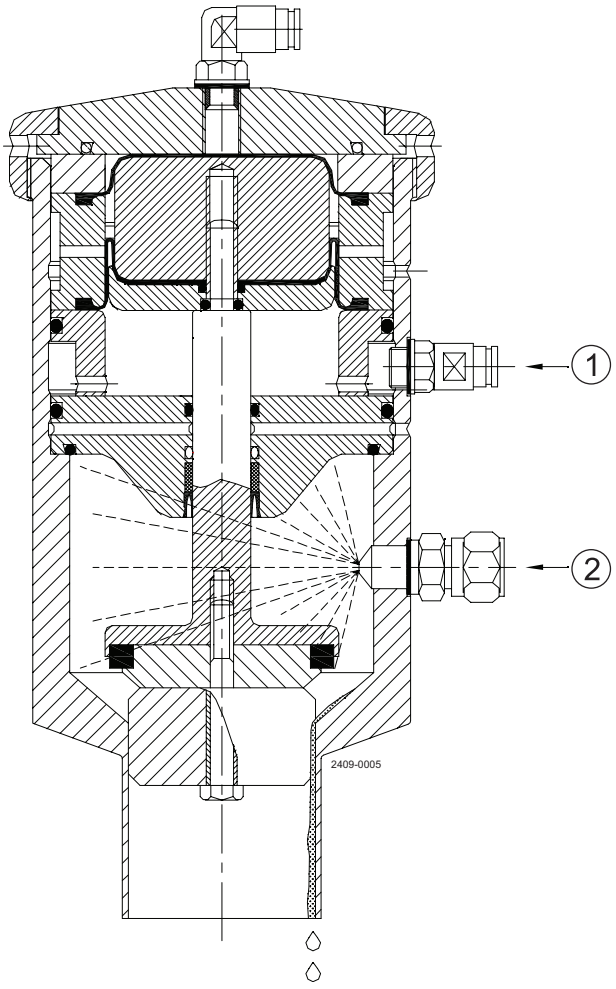
Always use rubber gloves!

Always use protective goggles!

During CIP, the valve is force opened, letting the liquid run into the tank.

CIP liquid is let into the house through the nozzle on the side of the house.

- Force opening pressure is applied 5-10 bar (Pos. 1)
- Cleaning fluid is applied through cleaning nozzle (Pos. 2)



6 Maintenance

6.1 General maintenance

NOTE

Maintain the valve regularly.

Study the instructions thoroughly and pay special attention to the warnings!

Always keep spare rubber and seal parts in stock.

Check the valve for smooth operation after service.

Always read *Technical Data* on page 29 thoroughly.

WARNING

All scrap must be stored in accordance with current regulations.

WARNING

Always release compressed air after use.

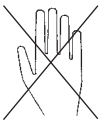
WARNING

Never service the valve when it is hot.

Never service the valve with the valve and pipelines under pressure.

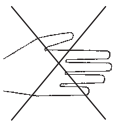
Atmospheric pressure required!

Burn hazard!



WARNING **Moving parts!**

Never touch the moving parts if the actuator is supplied with compressed air.



A disciplined maintenance programme is essential to minimise breakdowns and maximise equipment life.

It is important that the valve is inspected regularly.

Gaskets and O-rings to be replaced approx. every 2-3 years.

1 **Disassembling the valve**

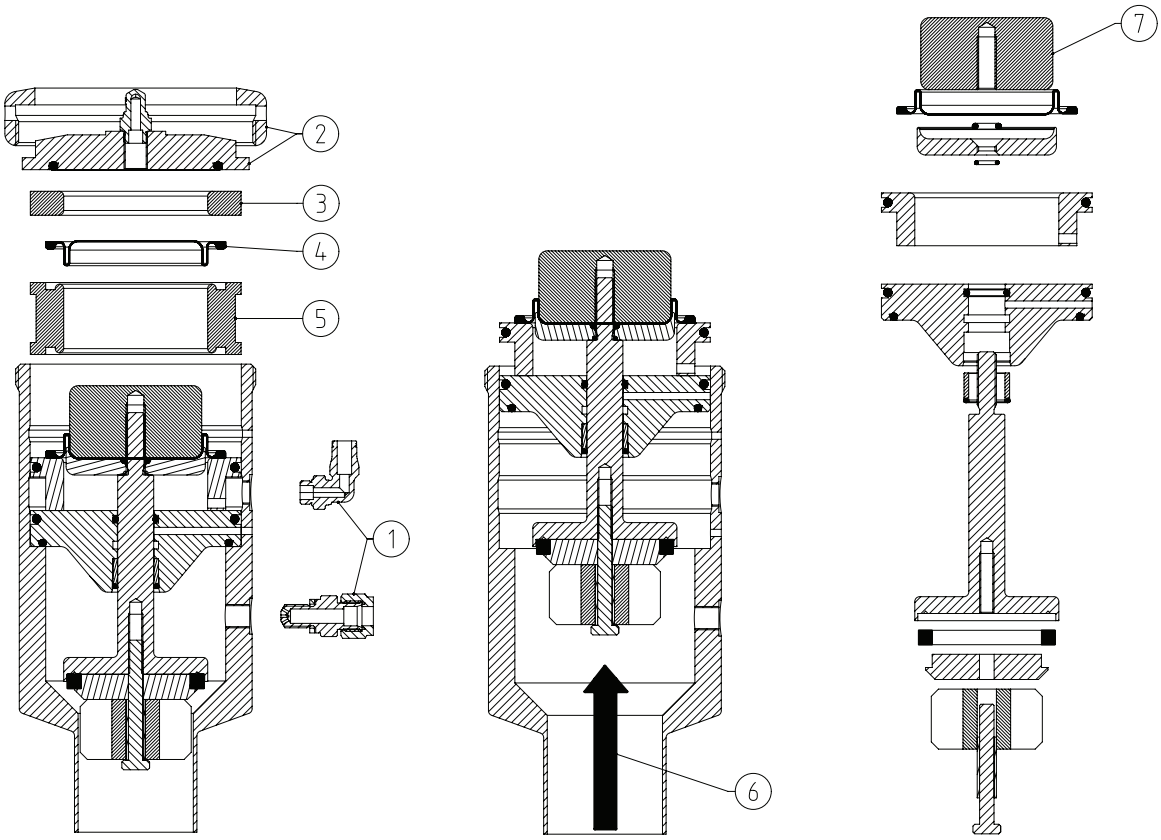
- Disconnect the pneumatic and CIP connections to the Pressure Exhaust Valve
- Unscrew the connectors for force opener and cleaning nozzle (pos. 1)
- Unscrew valve nut and remove cover (pos. 2)
- Remove upper lining (pos 3.)
- Remove diaphragm (pos. 4)
- Remove intermediate lining (pos. 5)

2

- Using a nylon mallet, carefully knock out rest of the internal assembly (pos. 6)

3

- Unscrew piston for diaphragm (pos. 7)
- Dismantle remaining part
- Replace O-rings, seals rings and variseal



Assembly is carried out in the opposite order to disassembly.

Note! Top membrane must be fitted as in the following illustration.

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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

Size (diameter)	Pressure Range
38 mm / 1.5"	1-4 bar / 14.5-58 psi
51 mm / 2"	0.5-4 bar / 7.25-58 psi

Connection	
Unions	DIN 11851
Weld end acc.	ISO 2037

Force opening	
Max. air supply	20 bar / 290 psi
Min. air supply	5 bar / 87 psi
Noise of actuator	65 dB(A)

Weight

Size (diameter)	Weight
38 mm / 1.5"	2.7 kg
51 mm / 2"	5.6 kg

7.2 Physical Data

Materials	
Product wetted steel parts:	EN 1.4404 (AISI 316L)
Product wetted steel surfaces:	Surface roughness Ra<0.8 µm (<32 µ")
Product wetted O-rings:	EPDM
Product wetted seals:	EPDM
Product wetted polymers:	Polypropylene

Connection

Weld End acc. ISO 2037

Unions DIN 11851

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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

WARNING

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.

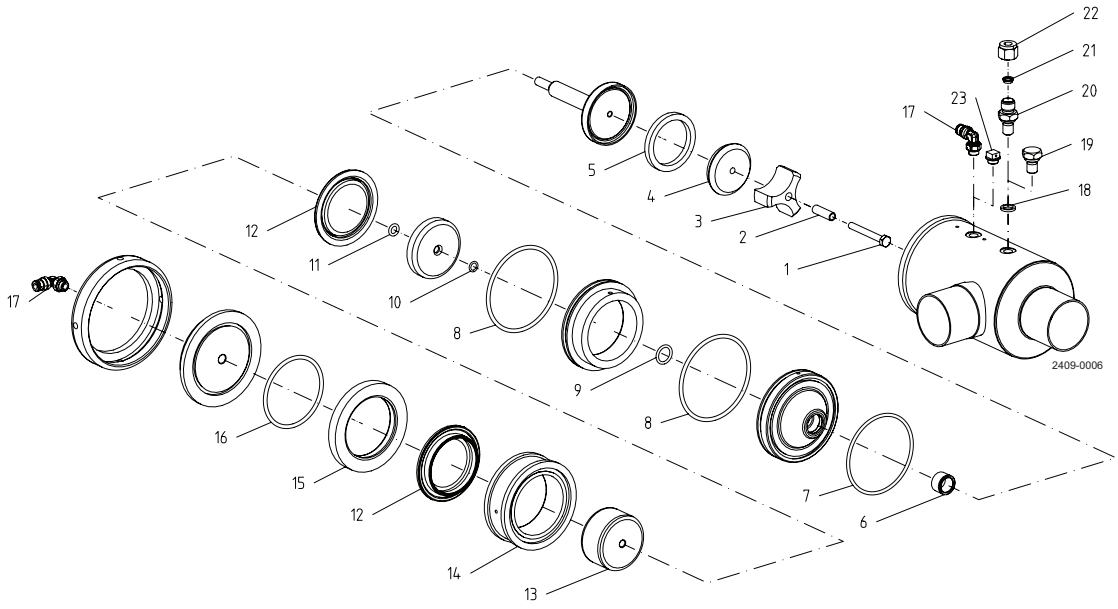
Liability and warranty are excluded:

- 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-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see *Safety* on page 9)
- 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

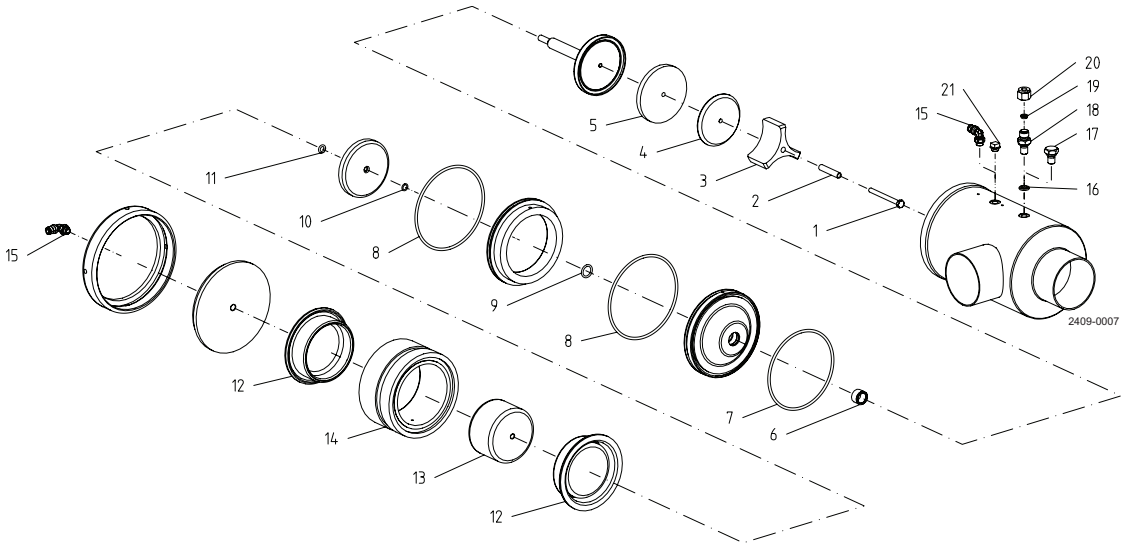
9.1 Pressure Exhaust; 38–51 mm



Pos.	Qty.	Denomination
1	1	Screw
2	1	Bushing
3	1	Guide fin
4	1	Disc
5	1	Gasket, EPDM
6	1	Variseal
7	1	O-ring, EPDM
8	2	O-ring, NBR
9	1	O-ring, NBR
10	1	O-ring, NBR
11	1	O-ring, NBR
12	2	Diaphragm

Pos.	Qty.	Denomination
13	1	Support for diaphragm
14	1	Intermediate lining for diaphragm
15	1	Upper lining for diaphragm
16	1	O-ring, NBR
17	2	Air inlet
18	1	Washer
19	1	Plug
20	1	CIP nozzle
21	1	Ferrule set
22	1	Nut
23	1	Water rejector

9.2 Pressure Exhaust; 76.1 mm



Pos.	Qty.	Denomination
1	1	Screw
2	1	Bushing
3	1	Guide fin
4	1	Disc
5	1	Gasket, EPDM
6	1	Variseal
7	1	O-ring, EPDM
8	2	O-ring, NBR
9	1	O-ring, NBR
10	1	O-ring, NBR
11	1	O-ring, NBR

Pos.	Qty.	Denomination
12	2	Diaphragm
13	1	Support for diaphragm
14	1	Intermediate lining for diaphragm
15	2	Air inlet
16	1	Washer
17	1	Plug
18	1	CIP nozzle
19	1	Ferrule set
20	1	Nut
21	1	Washer rejector