

# Alfa Laval SB Anti Vacuum House

Safety valves

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Lit. Code

200007933-1-EN-GB

Instruction Manual

**Published by**  
Alfa Laval Kolding A/S  
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DK-6000 Kolding, Denmark  
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**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

Alfa Laval SB Anti Vacuum House

Type

Serial number from AAB000000001 to AAC999999999

Serial number from 100700000001 to 1007999999999

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 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

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2025-02-01

Date (YYYY-MM-DD)



Signature

DoC Revison\_ 01\_ 022025 / This Declaration of Conformity replaces Declaration of Conformity dated 2023-10-26



## 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

Alfa Laval SB Anti Vacuum House

Type

Serial number from AAB000000001 to AAC999999999

Serial number from 100700000001 to 1007999999999

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

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

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

2025-02-01

Date (YYYY-MM-DD)



Signature

DoC Revison\_ 03\_022025



## 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.
	Danger of injury Do <b>not</b> attempt to disassemble the actuator due to spring under load danger!






## 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><b>Always</b> disconnect the power supply safely:</p> <ul style="list-style-type: none"> <li>• The power supply disconnecting device must be disconnected (in off position) and locked.</li> </ul>
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### Transportation and Lifting

  	<p><b>Never</b> lift or elevate in any way other than described in this manual.</p> <p><b>Always</b> use the original packaging or similar during transportation.</p> <p><b>Always</b> ensure that personnel must have experience with lifting operations.</p> <p><b>Always</b> ensure that all connections are disconnected before attempting to remove the valve from the installation.</p> <p><b>Always</b> ensure that no leakage of lubricants can occur.</p> <p><b>Always</b> drain liquid out of the valves before transportation.</p> <p><b>Always</b> ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used.</p> <p><b>Always</b> ensure that compressed air is released.</p>
 	<p><b>Always</b> use designated lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product.</p> <p><b>Always</b> ensure that the unit is securely fixed during transportation.</p> <p><b>Always</b> ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary.</p> <p><b>Always</b> use suitable transport device ie. forklift or pallet lifter.</p> <p><b>Always</b> use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p> <p><b>Always</b> 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><b>Always</b> release compressed air after use.</p> <p><b>Always</b> assemble the valve completely before startup and make sure everything is in place and correctly tightened.</p>
  	<p><b>Always</b> 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><b>Never</b> work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Do <b>NOT</b> attempt to disassemble or by other means open the actuator due to spring under load danger!</p>


## Operation

	<p>Always read <b>Technical Data</b> thoroughly.</p> <p><b>Never</b> operate the valve unless a correct installation has been verified.</p> <p><b>Never</b> cover or in any way restrict the valve, the valve must be able to work unobstructed at all time.</p> <p><b>Never</b> dismantle or touch the actuator for force opening if supplied with compressed air.</p>
	<p><b>Never</b> touch the valve or pipelines when hot.</p>
	<p><b>Always</b> rinse well with clean water after cleaning.</p> <p><b>Always</b> handle lye and acid with great care.</p> <p><b>Always</b> follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.</p>
	<p><b>Never</b> touch moving parts of the valve during operation.</p> <p><b>Never</b> dismantle the valve during operation or when pressurized.</p> <p><b>Always</b> 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"> <li>• Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation</li> <li>• <b>Preventive maintenance:</b> visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts</li> <li>• <b>Repairs:</b> unscheduled break down of a component, often causing the system to stop. Damaged components must be replaced</li> <li>• <b>Stock of Alfa Laval genuine spare parts:</b> Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing downtime in case of unplanned break downs</li> </ul>
 	<p><b>Always</b> release compressed air after use.</p> <p><b>Always</b> ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.</p> <p><b>Never</b> stick your fingers through the valve ports if the actuator is supplied with compressed air.</p> <p><b>Never</b> put your fingers between the valve and actuator for force opening.</p> <p><b>Never</b> touch the moving parts if the actuator for force opening is supplied with compressed air.</p>
 	<p><b>Never</b> work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Do <b>NOT</b> attempt to disassemble or by other means open the actuator due to spring under load danger!</p> <p><b>Never</b> pressurize the valve/actuator when the valve is serviced <b>unless specifically prescribed.</b></p>





## Storage

	<p><b>Alfa Laval recommend:</b></p> <ul style="list-style-type: none"> <li>• Store the supplied Alfa Laval product as supplied in original packaging</li> <li>• Port opening(s) should be protected against any ingress</li> <li>• Store in a clean, dry place without direct sunlight or UV light</li> <li>• Temperature range -5 °C to +40 °C (23 °F - 104 °F)</li> <li>• Relative humidity less than 60%</li> <li>• No exposure to corrosive substances (including contained air)</li> </ul>
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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><b>Burn Hazard</b></p> <ul style="list-style-type: none"><li>• Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves</li></ul>
	<p><b>Corrosive Hazard</b></p> <ul style="list-style-type: none"><li>• Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids</li><li>• When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.</li></ul>
	<p><b>Cut Hazard</b></p> <ul style="list-style-type: none"><li>• Sharp edges, especially on bowl discs and threads, can cause cuts. Wear protective gloves</li></ul>
	<p><b>Crushing Hazard</b></p> <ul style="list-style-type: none"><li>• Avoid placing hands into valve orifice pinch points</li></ul>

## 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.



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



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



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



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](http://www.alfalaval.com) to access the information directly.

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## 3 Introduction

The Alfa Laval SB Anti Vacuum House is a safety valve housing that minimizes the risk of implosion in closed process tanks or vessels that are subject to vacuum conditions while emptying the tank, cool rinsing after hot-cleaning, or caustic cleaning in a CO<sub>2</sub> atmosphere. It helps protect tanks from vacuum conditions that may cause tank implosion, damage or deformation. It can be combined with safety valves or pressure regulators mounted at the tank top. This is a cost-efficient, reliable and easy to install, it provides effective vacuum protection, while boosting process reliability, equipment and personnel safety.

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## 4 Installation

### 4.1 Unpacking/Delivery

#### NOTE

This Instruction Manual is part of the delivery.

Study the instructions carefully.

The items refer to the section *Parts Lists and Exploded Views* on page 33.

Alfa Laval cannot be held responsible for incorrect unpacking.

#### Check the delivery for:

- |                              |                                   |
|------------------------------|-----------------------------------|
| 1. Complete valve            | 5. Pressure regulator (option)    |
| 2. Drain collector (option)  | 6. Pressure relief valve (option) |
| 3. Force opener (option)     | 7. Blind plate (option)           |
| 4. Proximity sensor (option) |                                   |

1

1. Remove any packing materials from the valve/valve parts.
2. Inspect the valve/valve parts for visible transport damage.
3. Avoid damaging the valve/valve parts.

### 4.2 General Installation

#### NOTE

**Always** read *Technical Data* on page 29 thoroughly.

Alfa Laval cannot be held responsible for incorrect installation.

#### WARNING

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

### 4.3 Valve Assembly

The Anti Vacuum House is delivered as a fully assembled valve.

In the case of a Pressure Relief valve option, the weight and lever must be fitted by customer.

### 4.4 Installation of Valve and Accessories

The valve will normally be fitted with a 90-degree bend with a nut and liner or a flange connection.

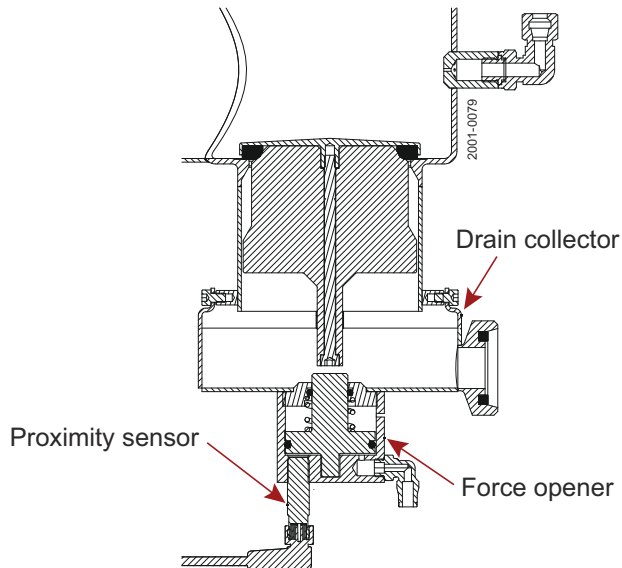
The valve must be fitted in an upright position. An inclination of max. 5° is acceptable.

The valve is equipped with a CIP nozzle and pipe fitting suitable for an OD8 mm steel pipe.

Connect CIP supply or blind of connection.

Ensure all connections are tight.

### Options



## 5 Operation

### 5.1 General Operation

#### NOTE

The Instruction Manual is part of the delivery.

Study the instructions carefully.

The items refer to section *Parts Lists and Exploded Views* on page 33.

#### WARNING

**Never** obstruct or any way modify the valve plug.

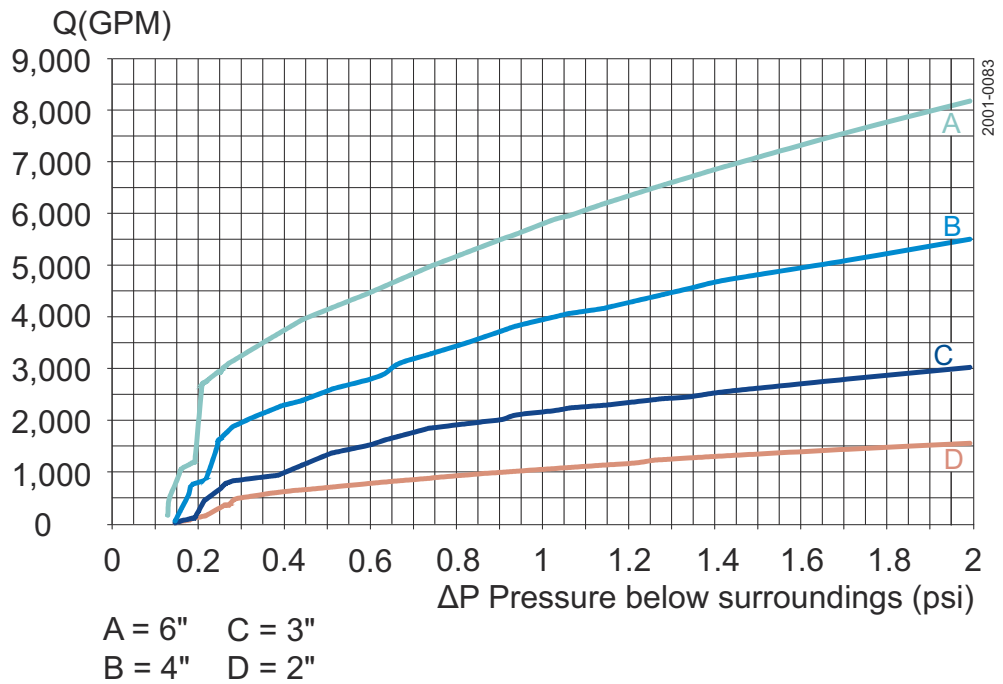
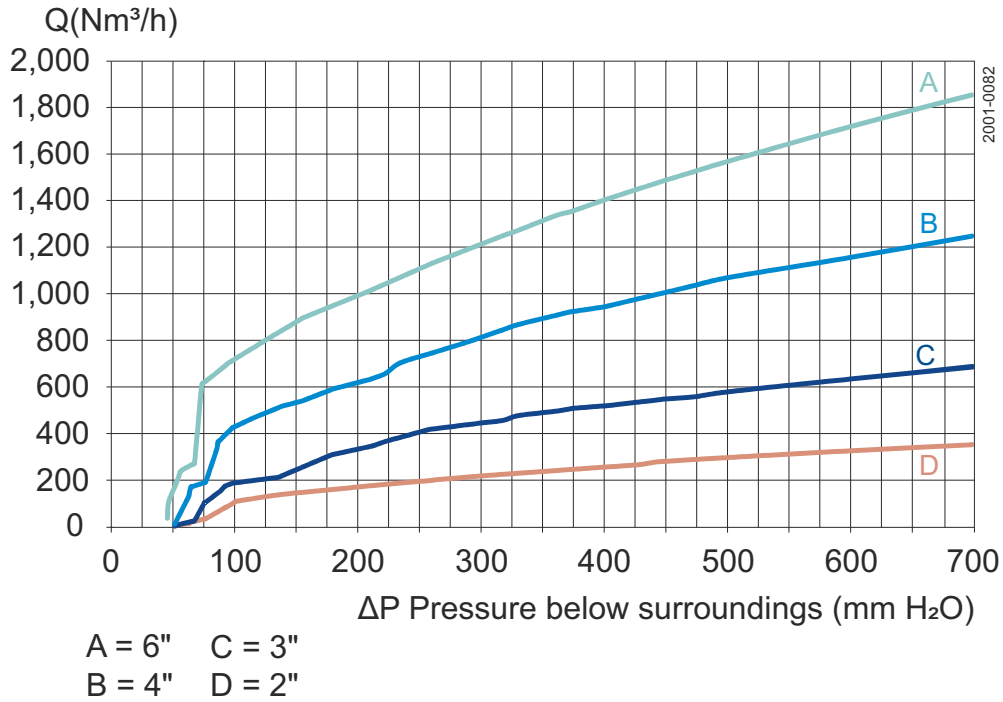
Alfa Laval cannot be held responsible for incorrect operation.

### Operation range

Nominal size	Opening pressure	Allowable pressure PS
2"	50 mmH <sub>2</sub> O (0.07 psi)	4.5 bar (65 psi)
3"	50 mmH <sub>2</sub> O (0.07 psi)	4.5 bar (65 psi)
4"	50 mmH <sub>2</sub> O (0.07 psi)	4.5 bar (65 psi)
6"	50 mmH <sub>2</sub> O (0.07 psi)	4.5 bar (65 psi)

## 5.2 Discharge Capacity

Medium: Air





### 5.3 Recommended Cleaning

**⚠ WARNING Risk of burns!**

Never touch the supplied product or the pipelines when sterilizing.



**⚠ CAUTION**

Always handle lye and acid with great care.



**! NOTE**

The supplied product is designed for cleaning in place (CIP).

NaOH = Caustic soda.

HNO<sub>3</sub> = Nitric acid.

The cleaning agents must be stored/disposed of in accordance with current regulations/directives.

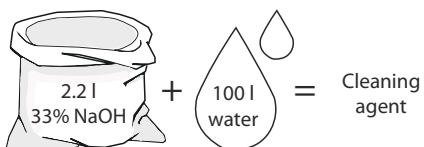
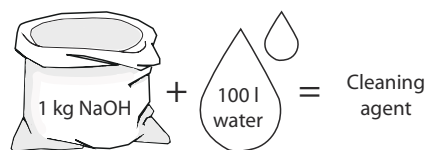
### Examples of cleaning agents

**! NOTE**

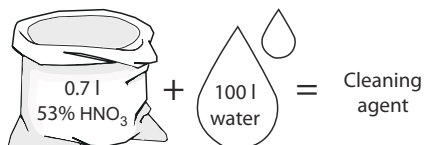
Use clean water free from chlorides.

#### Metric System

1. 1% by weight NaOH at 70°C

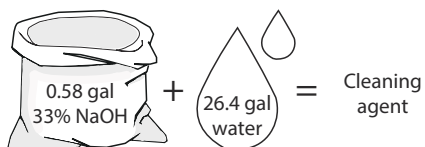
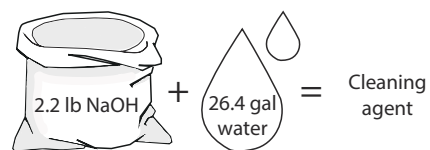


2. 0.5% by weight HNO<sub>3</sub> at 70°C

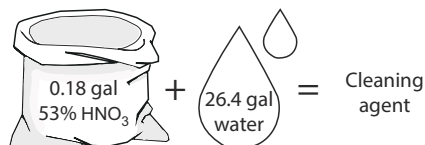


#### Imperial System

1. 1% by weight NaOH at 158°F



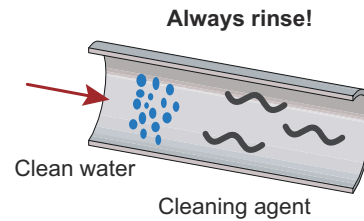
2. 0.5% by weight HNO<sub>3</sub> at 158°F



1. Avoid excessive concentration of the cleaning agent ⇒ **Dose gradually!**
2. Adjust the cleaning flow to the process  
**Milk sterilization/viscous liquids ⇒ Increase the cleaning flow!**



**Always** rinse well with clean water after the cleaning.



### 5.3.1 Cleaning

It is important that the valve seat is kept clean.

The Anti Vacuum House can be cleaned during tank CIP cycle by connecting the CIP nozzle to main CIP supply.

To prevent CIP detergent from spilling on the tank top, the use of a drain collector is recommended.

When the tank is cleaned depressurised, a small volume of cleaning fluid will pass the vacuum body and clean the seat. To ensure thorough flushing of the valve seat, force opening of the valve is necessary.

## 6 Maintenance

### 6.1 General Maintenance



Always read *Technical Data* on page 29 thoroughly.



**Never** service the valve when it is hot.

**Atmospheric pressure required!**

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



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



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



### Maintenance and lubrication intervals

Below are some guidelines for maintenance and lubrication intervals.

<b>Valve</b>	<p>To ensure the valve operates correctly, test of function at regular intervals is required.</p> <p>Intervals are dependent on operation conditions and should be specified by the user or local regulations.</p> <p>Alfa Laval recommend intervals of once every 6-12 months.</p> <p>Plug seal and gasket replacement every 2-5 years.</p>
<b>Actuator for force opening</b>	<p>Disassemble, clean and lubricate the actuator every 2-5 years.</p> <p>O-ring replacement every 2-5 years.</p>

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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

Nominal size	Opening pressure ( $\Delta P$ )	Allowable pressure PS
2"	50 mmH <sub>2</sub> O / 0.07 psi	4.5 bar / 65 psi
3"	50 mmH <sub>2</sub> O / 0.07 psi	4.5 bar / 65 psi
4"	50 mmH <sub>2</sub> O / 0.07 psi	4.5 bar / 65 psi
6"	50 mmH <sub>2</sub> O / 0.07 psi	4.5 bar / 65 psi

Weight	
2"	1.5 kg / 3.3 lbs
3"	3.0 kg / 6.6 lbs
4"	5.8 kg / 12.8 lbs
6"	13.1 kg / 28.9 lbs

CIP nozzle flow rate	
2"	0.35 m <sup>3</sup> /h @ 1 bar / (1.5 GPM @ 14.5 psi)
3"	0.35 m <sup>3</sup> /h @ 1 bar / (1.5 GPM @ 14.5 psi)
4"	0.35 m <sup>3</sup> /h @ 1 bar / (1.5 GPM @ 14.5 psi)
6"	5.1 m <sup>3</sup> /h @ 1 bar / (22.45 GPM @ 14.5 psi)

Temperature	
Max. operating temperature:	80 °C / 176 °F
Max. sterilization temperature:	120 °C / 248 °F (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)

## 7.2 Physical Data

### Materials

Product wetted steel parts:	EN 1.4404 (AISI 316L)
-----------------------------	-----------------------

Product wetted seals:	EPDM
-----------------------	------

### Connections

Nut and liner:	acc. DIN 11851
----------------	----------------

Clamp ferrule:	ISO 2852
----------------	----------

Nut and liner:	acc. SMS Swedish Standard Union
----------------	---------------------------------

Weld End:	acc. DIN 11850 or ISO 2037 depending on valve size
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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



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:

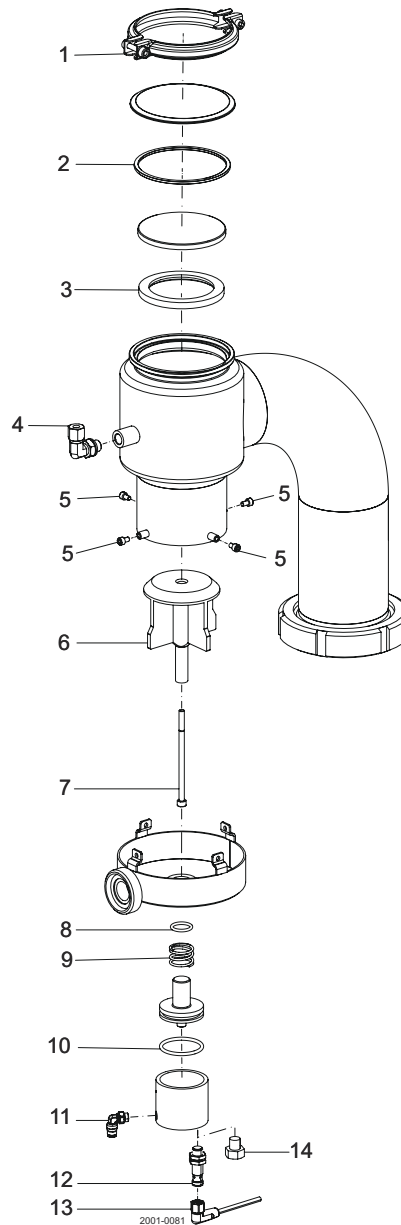
- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied 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 SB Anti Vacuum House



Pos.	Qty.	Denomination
1	1	Clamp
2	1	Seal ring
3	1	Plug seal
4	1	CIP inlet
5	4	Screw
6	1	Vacuum tail
7	1	Screw

Pos.	Qty.	Denomination
8	1	O-ring
9	1	Spring
10	1	O-ring
11	1	Air fitting
12	1	Sensor
13	1	Sensor cable
14	1	Plug