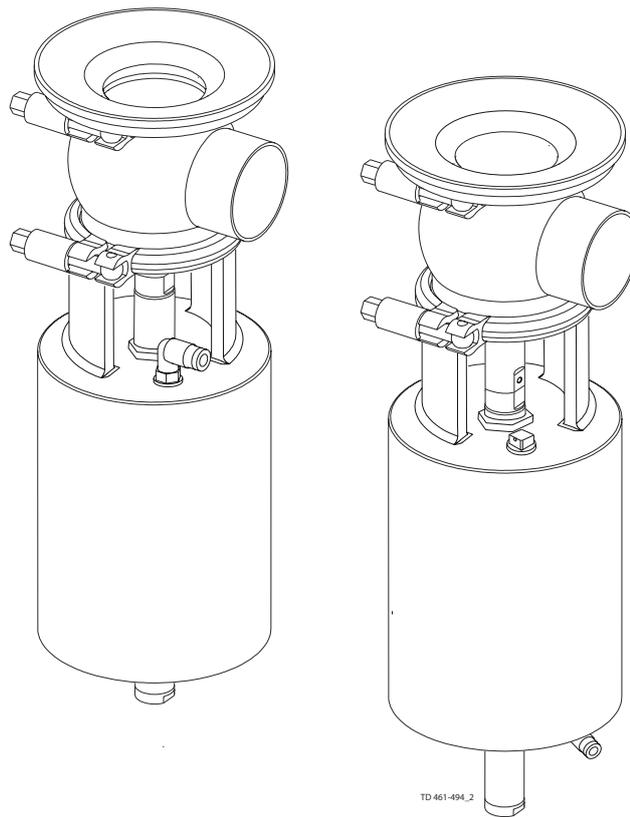


Unique Single Seat Valve - Tank Outlet



Lit. Code

200008029-2-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

Unique SSV PN10

Type

1000000-70000000000, AAX000000001-AAX999999999, AAB000000001-AAB999999999, ABJ000000001-ABJ999999999.

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive (PED) 2014/68/EU category 1 and subjected to assessment procedure Module A. May only be used for fluids in Group 2.

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

2024-05-01

Date (YYYY-MM-DD)



Signature

DoC Revison_ 01_052024 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-11-18



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

Unique SSV PN10

Type

1000000-70000000000, AAX000000001-AAX999999999, AAB000000001-AAB999999999, ABJ000000001-ABJ999999999.

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Pressure Equipment (Safety) Regulations 2016 *category 1 and subjected to assessment procedure Module A. May only be used for fluids in Group 2.*

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

2024-05-01

Date (YYYY-MM-DD)



Signature

DoC Revison_ 02_052024



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 (lasermarked on the actuator). Do not attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is blocked).
	Danger of injury (lasermarked on the actuator). Do not attempt to cut open actuator due to spring under load danger! (The lock wire opening is blocked).
	Danger of injury (label marked on actuator). Do not attempt to cut the actuator open due to spring under load (the lock wire opening is locked).

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 and air supply safely:</p> <ul style="list-style-type: none"> • The power supply disconnecting device and air supply 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>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</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 touch the valve or the pipelines when processing hot liquids or when sterilising.</p> <p>Never stick your fingers through the valve ports if the actuator is supplied with compressed air.</p>
	<p>Do NOT attempt to disassemble or by other means open the actuator due to spring under load danger!</p>

Operation

	<p>Always read Technical Data thoroughly.</p> <p>Never operate the valve unless a correct installation has been verified.</p> <p>Never dismantle the valve during operation or when pressurized.</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>Never touch the valve or the pipelines when processing hot liquids or when sterilising.</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>Always release compressed air after use.</p> <p>Never touch the moving parts if the actuator is supplied with compressed air.</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 work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Never service the valve when it is hot.</p>
	<p>Never cut the actuator open, due to spring under load danger - if marked with this warning</p> <p>Do NOT attempt to disassemble or by other means open the actuator due to spring under load danger!</p> <p>Never pressurize the valve/actuator when the valve is serviced unless specifically prescribed.</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 • Bare steel (not stainless) should be lightly oiled/greased • 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 bowl discs and threads, can cause cuts. Wear protective gloves



Crushing Hazard

- Avoid placing hands into valve orifice pinch points

Health Hazard

  	<p>Danger of injury: (an extra yellow label marked on the actuator from June 2016). Do NOT attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).</p> <p>Danger of injury (laser marked on the actuator). Do NOT attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is locked).</p> <p>Danger of injury (label marked on actuator). Do NOT attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).</p>
---	---

Safety check

	<p>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.</p> <p>Inspection acceptance criteria:</p> <ul style="list-style-type: none"> • 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 <p>Procedure in case of non-acceptance:</p> <ul style="list-style-type: none"> • 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.

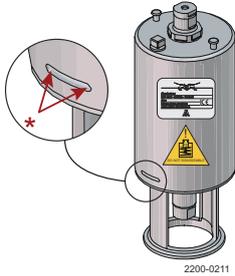
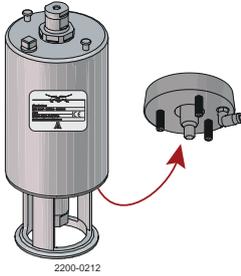
2.4 Actuator types

Different actuator types for the SSV valve

In June 2016 the below change was implemented and the “removable yoke with bolts” version is thereby phased out and replaced by the “yoke without bolts” version.

NOTE

It is important to check for warnings marked on the actuator when servicing an actuator - see below table.

	Non-maintainable actuator	Fully maintainable actuator	Fully maintainable actuator
Actuator type	Spring under load and cannot be opened  <p>*) Lock wire opening is locked when warning is marked on actuator</p>	Spring cage and can be opened 	Spring cage and can be opened 
Yoke type	Non-removable yoke	“Removable yoke with bolts”. If the yoke with bolts is damaged it has to be replaced by the “yoke without bolts”.	“Yoke without bolts”
Service	Not possible to service internally (it is not possible to change piston O-rings)	Yes	Yes
Marked with warnings	Yes	No	No
Year of production	From 2006	From 2006 to June 2016	From June 2016

2.5 Important Information

Actuators

If support air is utilised:

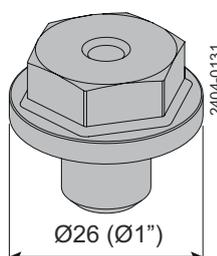
CAUTION Shock in the actuator must never occur.

To prevent shock in the actuator and to prevent exceeding 10 bar/145 PSI product pressure, Alfa Laval recommends **not** to exceed 3 bar/43.5 PSI support air on the spring side in all the Unique SSV actuators.

CAUTION Support air on high pressure actuator versions is not allowed.

If support air is connected always use the 3 bar/43.5 PSI air relief fittings = 9611995903/9611996094 (1/4" = 6.35 mm hose). Using the air relief fitting also extends the service life of the actuator piston O-ring.

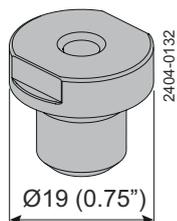
Obs. if using a 6 mm hose then use air relief fittings = 9611995903.



Pos. no. 5

For actuators, manufactured year 2005-2018, with serial number from 1000000 - 5999999 and from 20000000000 - 59999999999 always use steel adapter (pos 5) = 9614065301

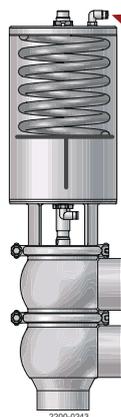
Tighten torque = 30 Nm/23 lbf-ft



Pos. no. 5

For actuators, manufactured year 2019 --> with serial number from 6000000 to 7000000 and from 60000000000 to 70000000000 always use steel adapter (pos 5) = 9615374701

Tighten torque = 15 Nm/11 lbf-ft



- * Alfa Laval recommends max. 3 bar support air.
- * Always use the "3 bar/43.5 PSI air relief fittings" on support air.
- * Alfa Laval article number = 9611995903/9611996094.
- * (1/4" = 6.35 mm hose).

2.6 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.

2.7 Recycling Information



If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



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 Unique SSV Tank Outlet is a versatile, reliable pneumatic single seat valve with a single contact surface between the plug and the seat to minimize the risk of contamination. Its compact, modular and hygienic design meets the highest process demands in terms of hygiene and safety.

Built on the well-proven Alfa Laval Unique SSV platform, it is designed for installations that open product flow into the tank (reverse-acting version) or close product flow from the tank (standard version).

Few moving parts ensure easy maintenance, high reliability and low total cost of ownership. A wide range of optional features enables customization to specific process requirements.

3.1 General information

The valve is a pneumatic seat valve in a hygienic and modular design remote-controlled by means of compressed air. It has few and simple moveable parts which results in a very reliable valve and low maintenance cost.

Standard design The Unique SSV Tank Outlet valve comes in a one body configuration, which can be delivered with or without a tank flange.

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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 57.

The valve is supplied as separate parts as standard (for welding).

The valve is assembled before delivery, if it is supplied with fittings.

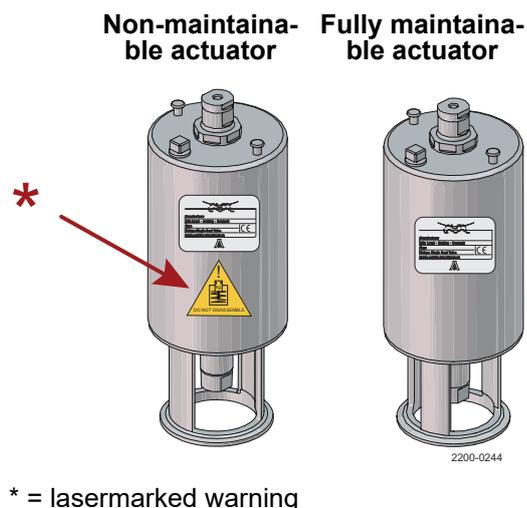
CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Complete valve, Standard valve or Reverse Acting valve (RA) (see later in this section)
2. Delivery note
3. Instruction manual

Actuator version can be ordered either “fully maintainable” (no warning marked on actuator) or as “non-maintainable” (warning marked on actuator).



Standard valve:

Complete actuator

19. 2 x Clamps

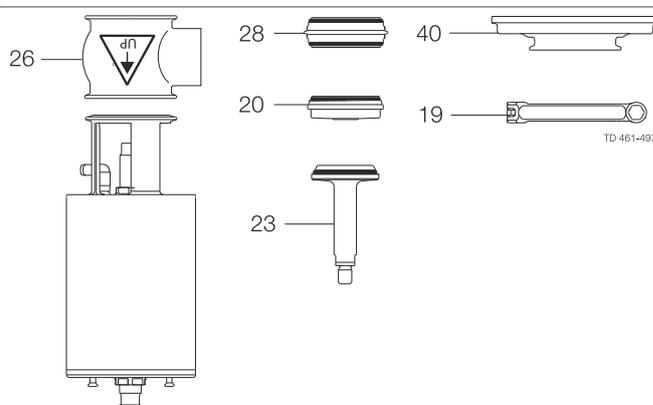
20. Bonnet

23. Valve plug

26. Valve body

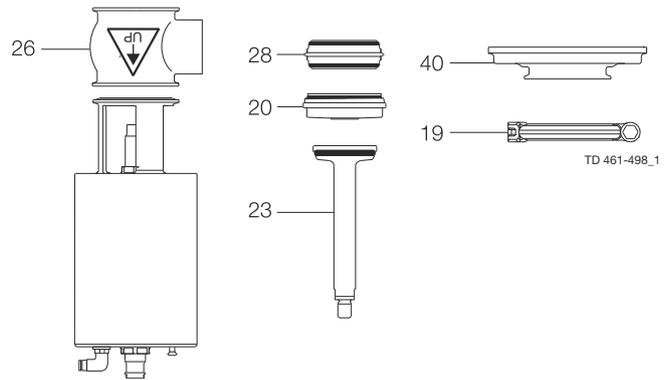
28. Valve seat

40. Tank flange



Reverse Acting valve:

- Complete actuator
- 19. 2 x clamps
- 20. Bonnet
- 23. Valve plug
- 26. Valve body
- 28. Valve seat
- 40. Tank flange



- 1 Remove possible 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

Study the instructions thoroughly and pay special attention to the warnings!
The valve has welding ends as standard but can also be supplied with fittings.
Always read *Technical Data* on page 53.

WARNING

Always release compressed air after use.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

WARNING

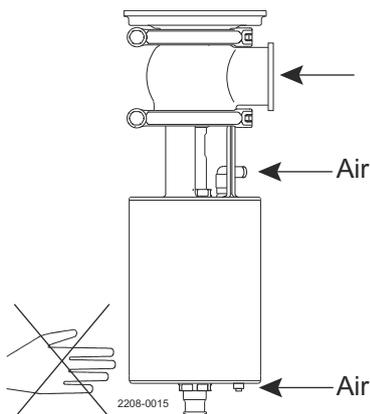
If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



WARNING Moving parts!

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



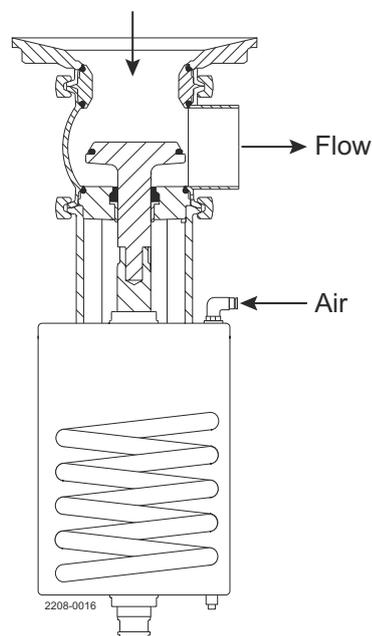
Avoid water hammering!

To avoid water hammering, it is recommended to install the valve so that the flow is against the spring closing direction.

Shock in the actuator must **never** occur.

- Excessive welding.
- Overloading of the pipelines.

Alternatively stop the flow while activating the valve or use a reverse acting valve.



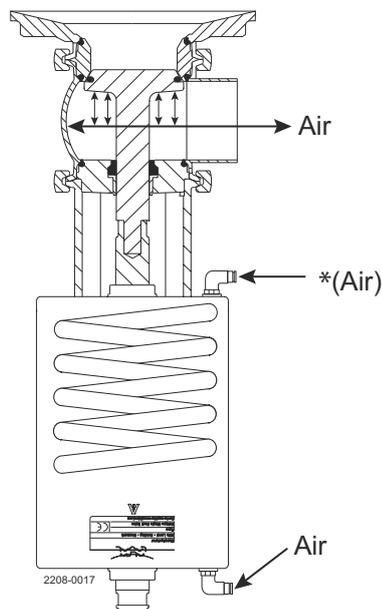
Pay special attention to shock in the actuator due to support air.

Shock in the actuator must **never** occur.

- *) Careful if using support air on spring side and a high product pressure above the plug, as this can result in a high "hammer effect" which can damage the actuator.

Use Alfa Laval part no. 9611995903 (US: 9611996094), which ensures max 3 bar (43.5 psi) support air pressure.

Alternatively remove the product pressure while activating the plug.

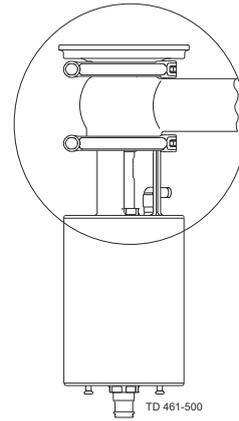


Risk of damage!

Avoid stressing the valve.

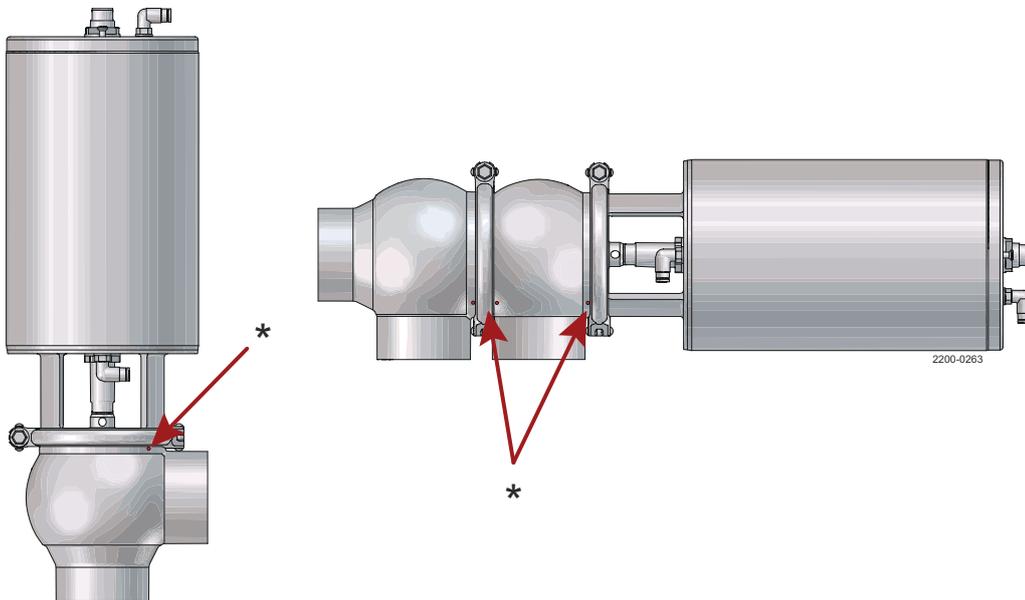
Pay special attention to:

- Vibrations
- Thermal expansion of the pipelines
- Excessive welding
- Overloading of the pipelines



Make sure that the leak detection hole in the valve body:

1. is visible, when mounting the valve vertically
2. always is downwards due to self-draining, when the valve is mounted horizontally



* = Leakage detection hole

4.3 Welding

NOTE

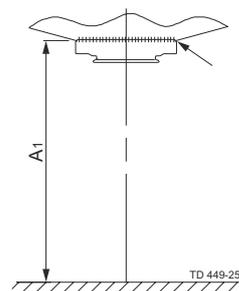
Study the instructions thoroughly.
 The valve is supplied as separate parts to facilitate the welding.
 The items refer to *Parts Lists and Exploded Views* on page 57.
 Check the valve for smooth operation after welding.

1 Before welding the flange into the tank please note:

a) Maintain the minimum clearances “A” to ensure that the actuator and the internal valve parts can be removed - please see information later in this section.

If there is a risk of foot damage, Alfa Laval recommends leaving a distance of 120 mm (4.7") below the valve (lowest point of actuator spindle).

Min. dimension



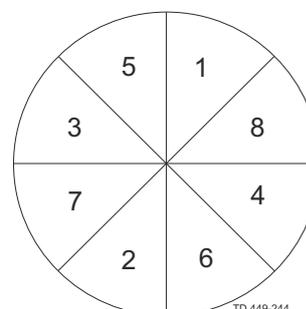
Size	DN/OD				DN			
	51	63.5	76.1	101.6	50	65	80	100
A ¹ mm (inches)	426 (16.8)	439 (17.3)	479 (18.9)	503 (19.8)	429 (16.9)	445 (17.5)	487 (19.2)	506 (19.8)

A¹ = Min. installation measure to allow the valve to be lifted out of the tank flange/ valve body (if long stroke actuator and/or indication unit is mounted, height must be added).

b) Only use pulsed arc welding and remember no gap between flange and tank plate.

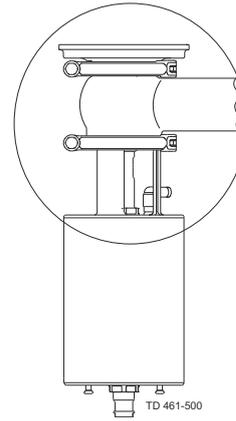
Tack weld **always** on the opposite side (8 segments with filler metal). Weld root if possible without filler metal.

Welding of the final run must be carried out in 8 segments to avoid cracking.



- 2 Assemble the valve in accordance with the steps in [Valve Assembly](#) on page 43.

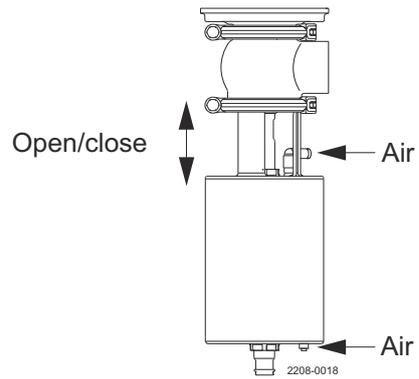
Pay special attention to the warnings!



- 3 **Pre-use check:**

- a) Supply compressed air to the actuator
- b) Open and close the valve several times to ensure that it operates smoothly

Pay special attention to the warnings!



5 Operation

5.1 Operation

NOTE

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

Ensure that the valve operates smoothly.

The items (#) refer to *Parts Lists and Exploded Views* on page 57.

Always read *Technical Data* on page 53.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

WARNING

Always release compressed air after use.

WARNING

Always use Alfa Laval genuine spare parts.

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

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

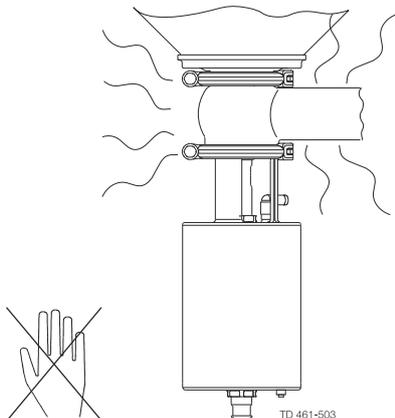
The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



WARNING

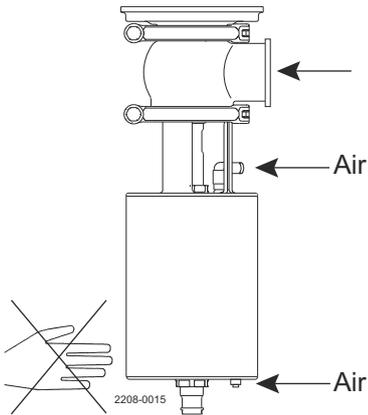
Burn hazard!

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



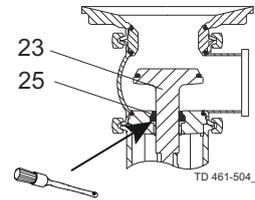
WARNING Moving parts!

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



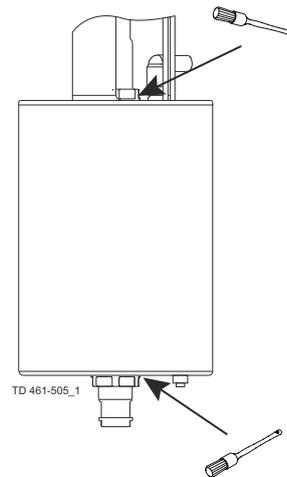
Lubrication of valves:

1. Ensure smooth movement between lip seal (25) and plug stem (23)
2. Lubricate the lip seal with Alfa Laval Lubricant if necessary (see [General maintenance](#) on page 35)



Lubrication of actuator

1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery)
2. Lubricate all seals with Molykote Longterm 2 plus if necessary



5.2 Troubleshooting

NOTE

Pay attention to possible faults.

Study the instructions thoroughly.

The items (#) refer to *Parts Lists and Exploded Views* on page 57.

Study *General maintenance* on page 35 thoroughly before replacing worn parts!

Problem	Cause/result	Repair
External product leakage	Worn or damaged lipseal and/or O-ring	<ul style="list-style-type: none"> Replace the seals Replace with seals of a different rubber grade
Internal product leakage	<ul style="list-style-type: none"> Worn or product affected plug seal 	<ul style="list-style-type: none"> Replace the seal Replace with a seal of a different rubber grade
	<ul style="list-style-type: none"> Product deposits on the seat and/or plug 	<ul style="list-style-type: none"> Frequent cleaning
	<ul style="list-style-type: none"> Product pressure exceeds actuator specification 	<ul style="list-style-type: none"> Replace with a high pressure actuator Use auxiliary air on the spring side (do not exceed 3 bar/43.5 psi). Alfa Laval article number = 9611995903 (US: 9611996094). See <i>Important Information</i> on page 17 and <i>General installation</i> on page 24 Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	<ul style="list-style-type: none"> The flow direction should be against the closing direction. See <i>General installation</i> on page 24 Throttle air release of solenoid in top unit
The valve does not open/close	Product pressure exceeds actuator specification	<ul style="list-style-type: none"> Replace with a high pressure actuator Reduce product pressure Use auxiliary air on the spring side. Always use the pressure relief fittings (3 bar/43.5 psi) on support side. Alfa Laval article number = 9611995903 (US: 9611996094)

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



5.3 Recommended Cleaning

NOTE

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

NaOH = Caustic soda.

HNO₃ = Nitric acid.

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

CAUTION

Never touch the supplied product or the pipelines when sterilizing.

Always handle lye and acid with great care.

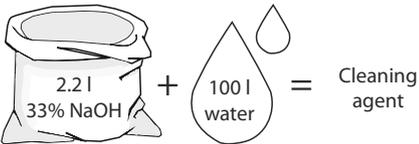
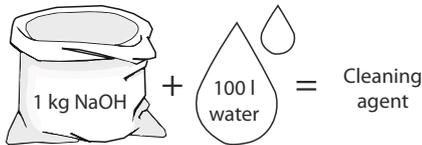


Examples of cleaning agents

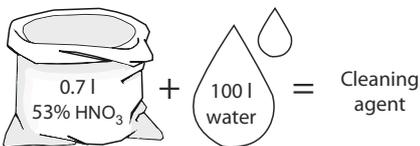
Use clean water free from chlorides

Metric System

1. 1% by weight NaOH at 70°C

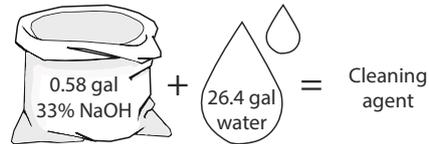
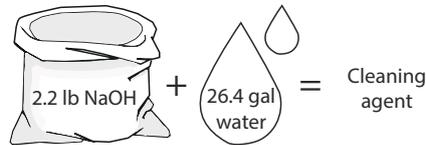


2. 0.5% by weight HNO₃ at 70°C

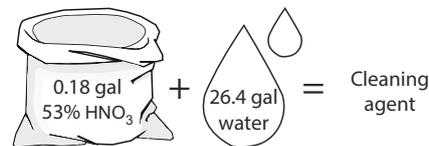


Imperial System

1. 1% by weight NaOH at 158°F



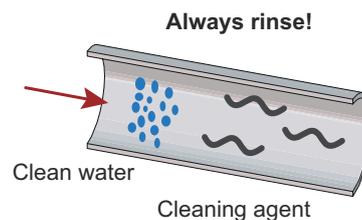
2. 0.5% by weight HNO₃ at 158°F



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!

CAUTION

Always rinse well with clean water after the cleaning.

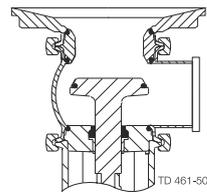


5.4 Cleaning

CAUTION

Clean the plug and the seats correctly.

Lift and lower valve plug momentarily.



Shut-off valve

This page is intentionally left blank.

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 seals and lip seals in stock.

Check the valve for smooth operation after service.

Always read *Technical Data* on page 53.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

WARNING

Always release compressed air after use.

WARNING

Always use Alfa Laval genuine spare parts.

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

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!

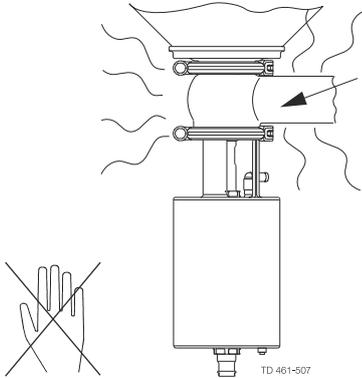


WARNING Burn hazard!!

Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.

Atmospheric pressure required!

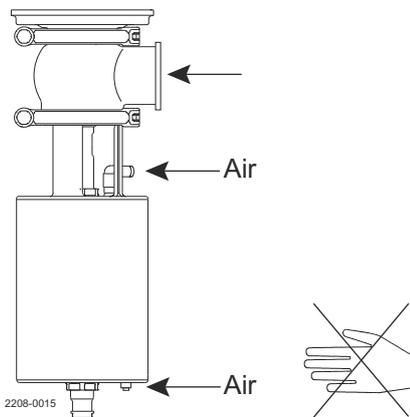


WARNING Cutting hazard!

Moving parts!

Never stick your fingers through the valve ports if the actuator is supplied with compressed air.

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



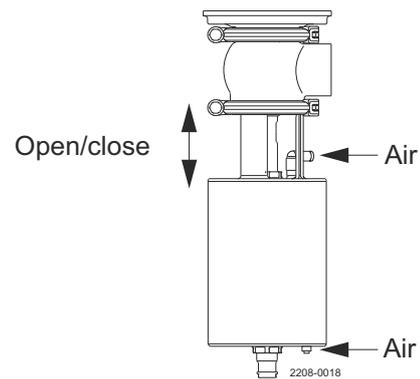
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	Product wetted seals	Actuator bushings complete
Preventive maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions
Maintenance after leakage (leakage normally starts slowly)	Replace at the end of the day	Replace when possible

	Product wetted seals	Actuator bushings complete
Planned maintenance	<ul style="list-style-type: none"> Regular inspection for leakage and smooth operation Keep a record of the valve Use the statistics for inspection planning <p>Replace after leakage</p>	<ul style="list-style-type: none"> Regular inspection for leakage and smooth operation Keep a record of the actuator Use the statistics for inspection planning <p>Replace after leakage</p>
Lubrication	<p>Before fitting</p> <p>Alfa Laval Silicon based Food-grade Lubricant USDA H1 approved grease</p>	<p>Before fitting</p> <p>Molykote Longterm 2 plus</p>

Pre-use check:

1. Supply compressed air to the actuator.
 2. Open and close the valve several times to ensure that it operates smoothly.
- Pay special attention to the warnings!**



Recommended spare parts:

See [Parts Lists and Exploded Views](#) on page 57.

6.2 Dismantling the valve

NOTE

Study the instructions thoroughly.

The items refer to [Parts Lists and Exploded Views](#) on page 57.

Handle scrap correctly.

NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



Standard:

1. Supply compressed air to the actuator (only NC)
2. Loosen and remove lower clamp
3. Lift away the actuator
4. Release compressed air (only NC)
5. Unscrew and remove valve plug
6. Remove O-ring, lip seal and bushing in bonnet. (Use bushing tool and rubber mallet. See drawing)

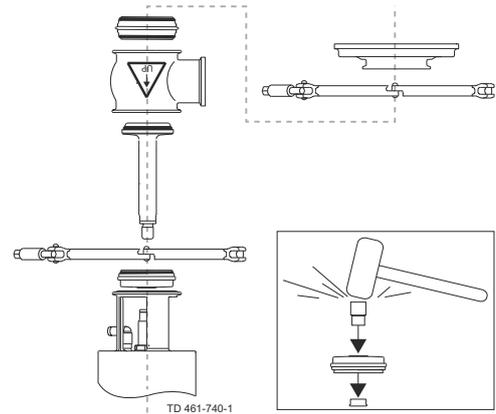
! NOTE

Be careful not to damage the bushing.

7. Loosen and remove upper clamp
8. Remove valve body
9. Remove seat and O-rings

Pay special attention to the warnings!**! NOTE**

For plug seal replacement please see [Plug Seal Replacement \(Elastomer\)](#) on page 39.

**! NOTE**

Be careful not to damage the bushing.

Reverse Acting:

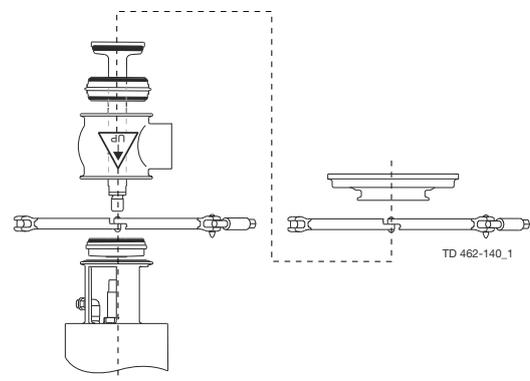
1. Loosen and remove upper clamp
2. Lift away the actuator and valve body
3. Supply compressed air to the actuator (only NC)
4. Unscrew and remove valve plug
5. Release compressed air (only NC)
6. Remove seat and O-rings
7. Loosen and remove lower clamp
8. Remove valve body
9. Remove O-ring, lip seal and bushing in bonnet. (Use bushing tool and rubber mallet. See drawing, step 1a)

! NOTE

Be careful not to damage the bushing

Pay special attention to the warnings!

For plug seal replacement please see [Plug Seal Replacement \(Elastomer\)](#) on page 39.



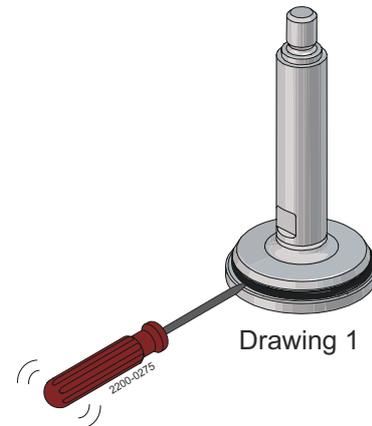
6.3 Plug Seal Replacement (Elastomer)

6.3.1 Removal of Plug Seal

Remove old seal ring using a knife, screwdriver or similar. Be careful not to damage the plug surface.

NOTE

Be careful not to scratch the plug surface.



6.3.2 Pre-mounting of plug seal

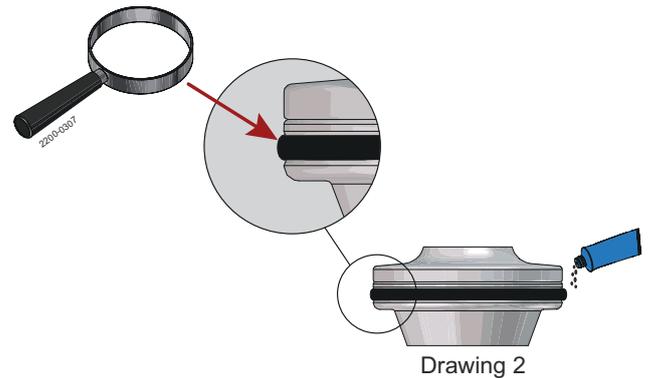
- 1 Lubricate the new plug seal with Alfa Laval Silicone based Food-grade Lubricant, which is included in the service kit.

Only a small amount is needed.

- 2 Fit the plug seal onto the plug seal groove.

NOTE

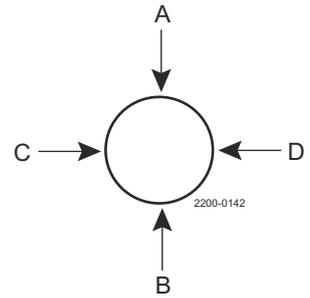
Be careful not to twist the plug seal.



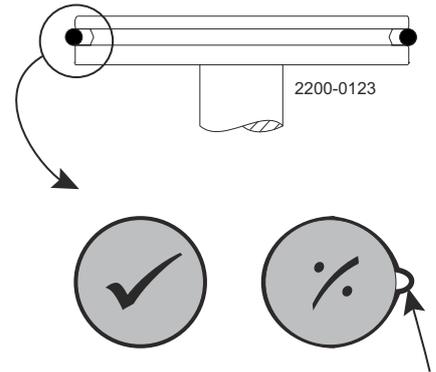
- 3 The plug seal can now be mounted by hand or with the Alfa Laval plug tool.

6.3.3 Mounting plug seal by hand

- 1 Ensure full circumferential seating of the sealing by applying opposite pressure with your fingers. Eg. A - B and C - D.



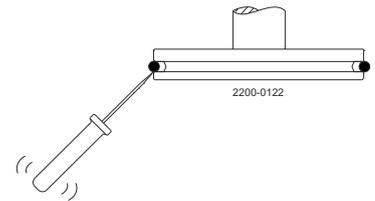
If a bulge is present, apply pressure on the plug seal and keep the pressure while rotating the plug 360°.



- 2 If necessary, trapped air behind the plug seal can be relieved by use of a small flat-blade screwdriver.

NOTE

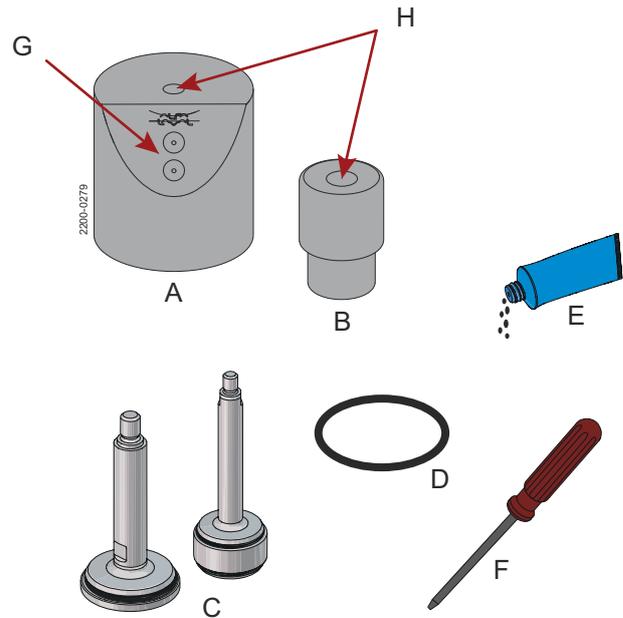
Be careful not to scratch the surface of the plug and/or damage the seal.



6.3.4 Mounting plug seal with Alfa Laval plug seal tool

Mounting tool for elastomer plug seals	DN40 38 mm	DN50 - DN65 51 mm - 63.5 mm	DN80 - DN100 76.1 mm - 101.6 mm
	9613172901	9613172902	9613172903

- A. Part A
- B. Part B
- C. Plugs
- D. O-ring
- E. Alfa Laval Silicone based Food-grade Lubricant from service kit
- F. Flat-blade screwdriver (no sharp corner)
- G. Exhaust holes for screwdriver
- H. $\varnothing 20$ hole for plug spindle

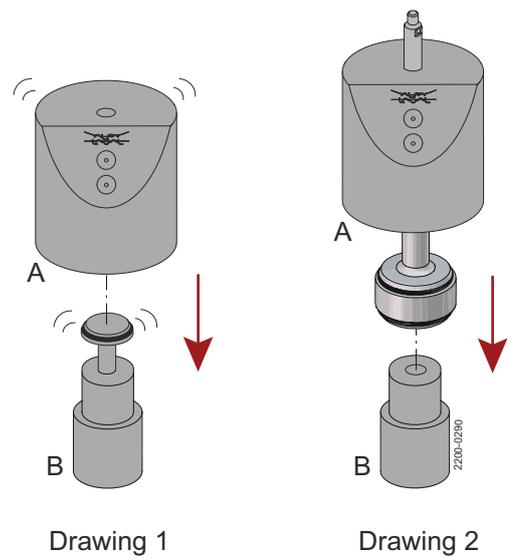


1 Assembly

For shut-off plug - See drawing 1.

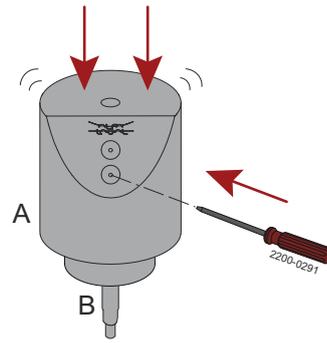
For reverse acting plug - See drawing 2.

For change-over plug - See drawing 1 + 2.



2

- a) Fit the plug according to plug type.
- b) Apply force to push Part A and B together which will ensure full circumferential seating of the sealing.
- c) To relieve trapped air behind the plug sealing, insert the flat-blade screwdriver through the applicable exhaust hole on part A and fit it between the plug sealing and plug.



With the flat-blade screwdriver fitted apply force again and a single "hiss" sound can be heard.

! NOTE

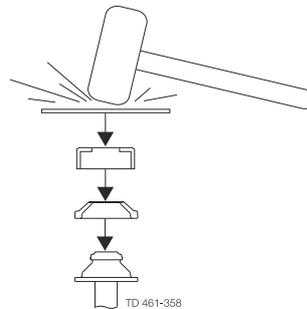
Be careful not to scratch the surface of the plug and/or damage the seal.

6.4 Plug Seat Ring Replacement (TR2 and TR3)

! NOTE

Use the mounting tool for TR2 and TR3- see spare part.

- 1 Place the plug element on a firm support.
- 2 Using a utility knife, partially and *CAREFULLY* cut through the upper ring portion of the TR2 plug avoiding contact with stainless steel stem. For TR3 use a finetoothed hacksaw.
- 3 Force apart both cut ends of the plug for removal from stem.
- 4 For TR2 and TR3 plugs are installed by applying uniform pressure on all sides. (Pressure can be applied by using the seat assembly tool).



-
- 5 Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem.

Reverse the tool and tab again to secure proper fit.

-
- 6 Examine seat assembly to be sure the TR2 and TR3 plug is properly mounted, holding the seat assembly in one hand - rotate the TR2 and TR3 plug. (For proper CIP cleaning the TR2 and TR3 plug should turn freely on the stem).
-

6.5 Valve Assembly

Reverse order of *Dismantling the valve* on page 37.

Lubricate O-ring (21) and lip seal (25) with Alfa Laval Lubricant.

Remember to tighten spindle and plug (use two 17 mm spanners).

- Change-over plug tighten torque = **30 Nm (22 lbf - ft)**
- Shut-off plug tighten torque = **20 Nm (15 lbf - ft)**

If there are vibrations in the pipeline, Alfa Laval recommends to use Loctite no. 243.

The clamps' thread must be lubricated before tightening - torque for the clamps is 10-12 Nm (8-9 lbf - ft).

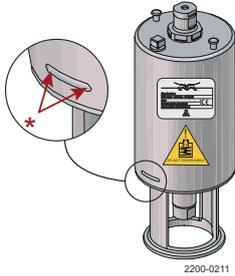
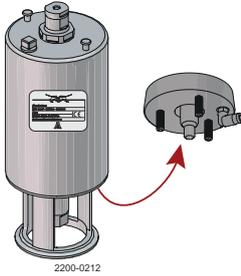
6.6 Actuator types

Different actuator types for the SSV valve

In June 2016 the below change was implemented and the “removable yoke with bolts” version is thereby phased out and replaced by the “yoke without bolts” version.

NOTE

It is important to check for warnings marked on the actuator when servicing an actuator - see below table.

	Non-maintainable actuator	Fully maintainable actuator	Fully maintainable actuator
Actuator type	Spring under load and cannot be opened  <p>*) Lock wire opening is locked when warning is marked on actuator</p>	Spring cage and can be opened 	Spring cage and can be opened 
Yoke type	Non-removable yoke	“Removable yoke with bolts”. If the yoke with bolts is damaged it has to be replaced by the “yoke without bolts”.	“Yoke without bolts”
Service	Not possible to service internally (it is not possible to change piston O-rings)	Yes	Yes
Marked with warnings	Yes	No	No
Year of production	From 2006	From 2006 to June 2016	From June 2016

6.7 Actuator Bushing Replacement (Non-maintainable Actuator)

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



Introduction

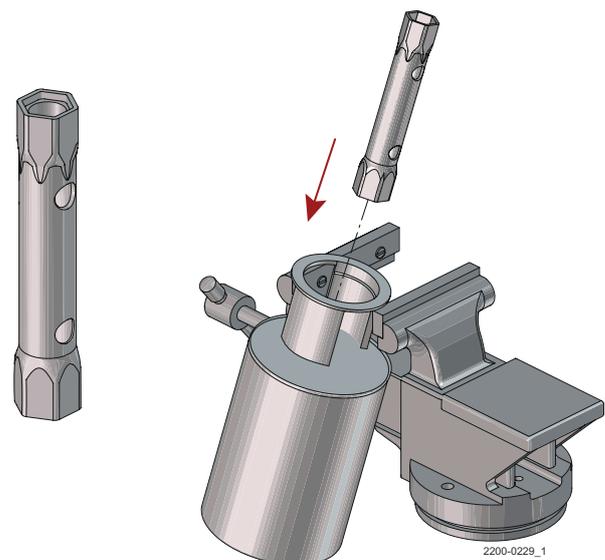
- The actuator service kit contains two bushings and four O-rings
- Mount the thick O-ring inside and the thin O-ring outside the bushing
- Lubricate the stem and O-rings with "Molykote Longterm 2 Plus" or an equivalent grease before sliding the new bushings onto the actuator stem



Introduction - Standard tubular box wrench

Use a 27 mm (1 1/16") tubular box wrench to un-mount and/or mount the bushings.

This tool will allow the actuator stem to fit inside and will provide good access to the bushing placed in the actuator yoke end.



Introduction - Aligning spindle

The actuator spindle can in some cases be forced off centre by the internal spring, as shown.

In cases with misalignment of the actuator stem in relation to the bushing thread, as shown, the tubular box wrench together with a spindle for alignment is a great help and will ensure a reliable mounting of the bushing.

The aligning spindle can either be purchased from Alfa Laval (9614198401) which also include a 27 mm (1 1/16") tubular box wrench or it can be manufactured locally using below dimensions.

Dimension A is based on a tubular box wrench with a total length of 185 mm (7 1/4").

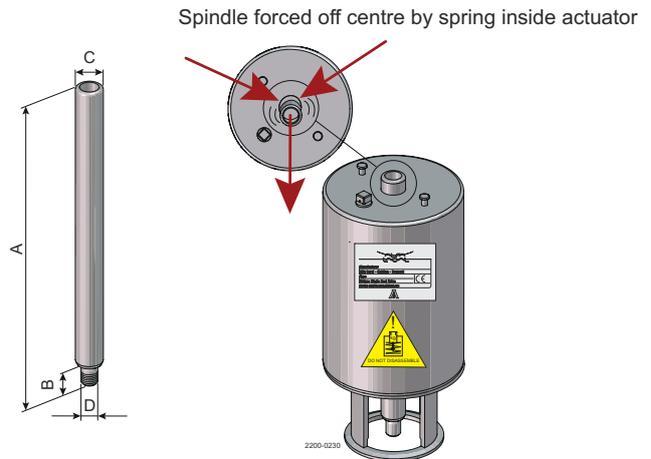
Dimensions

A = 280 mm (11")

B = 16 mm (0.63")

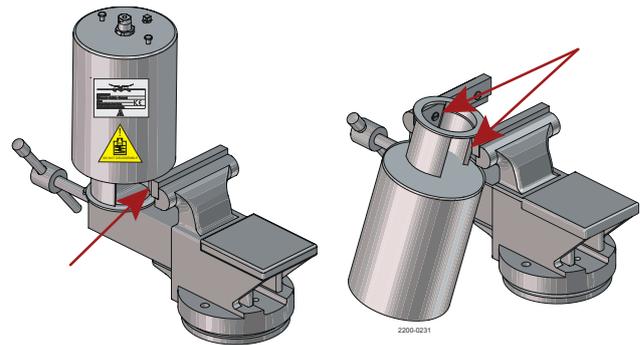
C = Rod \varnothing 20 mm (0.79")

D = M12 x 1.5

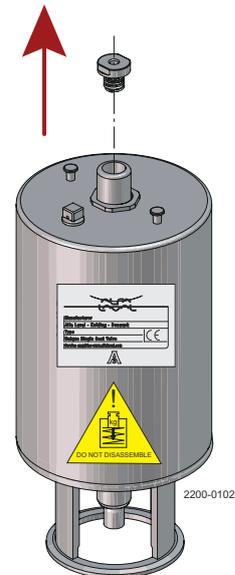


- 1 The actuator must be fixed in a vice, Alfa Laval recommend use of soft jaws.

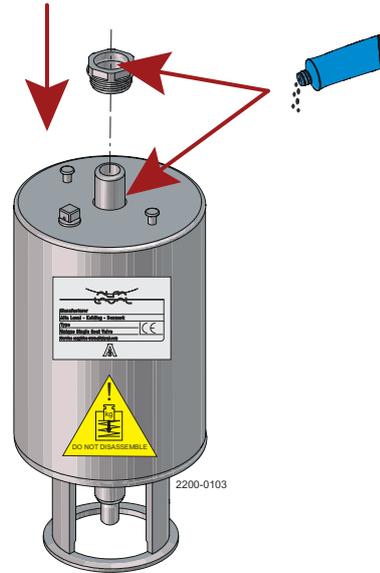
Be careful not to damage the yoke by over tightening and only fix carefully on the "yoke leg", as shown.



- 2 Remove the adaptor screw.

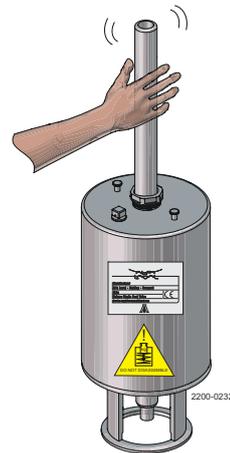


- 3 Slide the lubricated bushing onto the actuator stem.

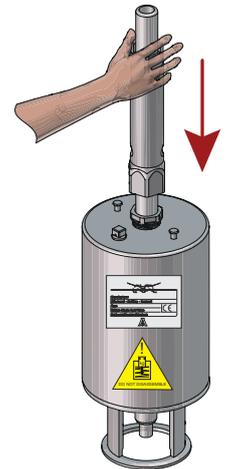


- 4 Fit the aligning spindle to the actuator stem and apply the tubular box wrench.

Aligning spindle

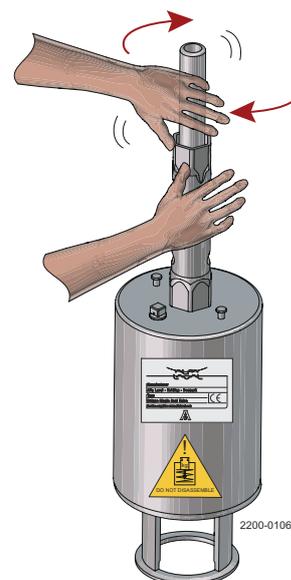


Tubular box wrench



- 5 Now pull the aligning spindle to center the actuator stem in relation to the bushing thread. When centered, initiate fastening of the bushing. Ensure the thread catches evenly!

The bushing must only be tightened with a torque of 10 Nm (7 lb-ft) which is achievable by hand tightening only.



6 Mount adaptor screw.



6.8 Dismantling and mounting of Fully Maintainable Actuator (Removable Yoke with Bolts/2006-June 2016)

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



1

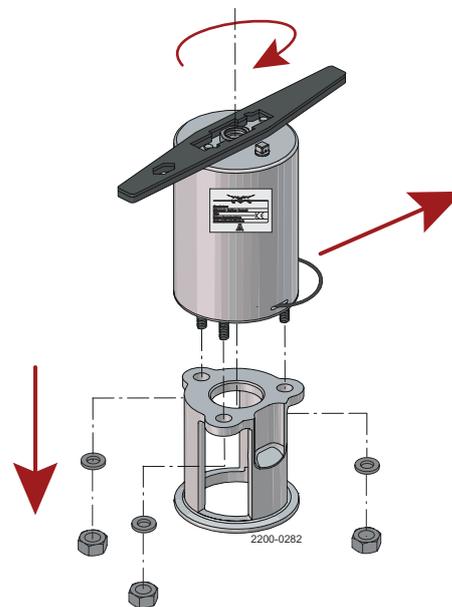
Before dismantling check that the actuator is not marked with a warning.

See also [Actuator types](#) on page 16.

1. Rotate the cylinder with service tool
2. Remove lock wire and pull away cylinder
3. Unscrew nuts and remove yoke
4. Top and bottom bushings
5. Remove piston with O-ring and spring assembly
6. Remove O-rings and support disc

NOTE

The Air/Air actuator has no spring assembly.



2

1. Lubricate O-rings (3, 7, 11) with "Molykote Longterm 2 plus" or an equivalent grease before mounting
2. Tighten nuts to a torque of 17 Nm (12 lbf - ft)
3. Assemble the actuator in reverse order of step 1
4. Follow the assembly procedure in section 6.6 for installing the bushings

6.9 Dismantling and mounting of Fully Maintainable Actuator (Yoke without Bolts/June 2016 ->)

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



1

Before dismantling check that the actuator is not marked with a warning.

See also [Actuator types](#) on page 16.

1. Rotate the cylinder with service tool
2. Remove lock wire and pull away cylinder
3. Remove top and bottom bushings
4. Remove piston with O-ring and spring assembly



2

1. Lubricate O-rings (3, 7, 11) with "Molykote Longterm 2 plus" or an equivalent grease before mounting
2. Assemble the actuator in reverse order of step 1
3. Follow the assembly procedure in section 6.6 for installing the bushings

6.10 Changing Pneumatic Movement on Fully Maintainable Actuator (NC/NO)

WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



1

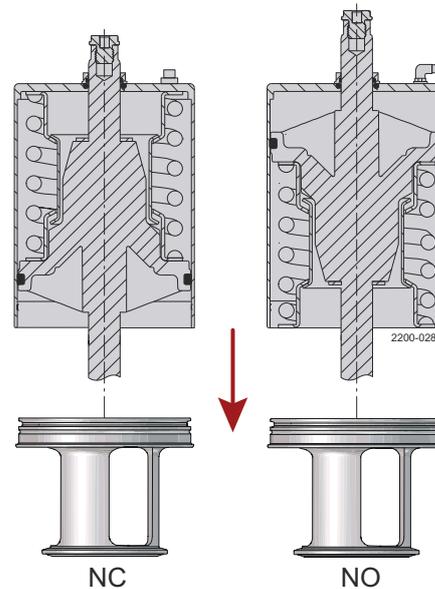
Before dismantling check that the actuator is not marked with a warning.

See also [Actuator types](#) on page 16.

1. Remove adaptor screw, air fitting and air plug
2. Rotate the cylinder with service tool
3. Remove lock wire and pull away cylinder
4. Reverse piston and spring assembly inside cylinder
5. Reassemble in reverse order (c. to a.)
6. Mount adaptor screw, air fitting and air plug in accordance with NC or NO

NC = Pneumatic movement - upwards

NO = Pneumatic movement - downwards



NOTE

The A/A actuator has no spring assembly.

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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

Temperature	
Temperature range:	EPDM seal: -10 °C to +140 °C (14 °F to 284 °F)
Max. product pressure in tank:	750 kPa (7.5 bar) if max. 20 °C (109 psi - max. 68 °F)
	650 kPa (6.5 bar) if max. 100 °C (94 psi - max 212 °F)
	450 kPa (4.5 bar) if max. 150 °C (65 psi - 302 °F)
Pressure	
Max. product pressure in pipeline (depends on valve specs):	1000 kPa (10 bar) (145 psi)
Max. product pressure in tank (depends on valve specs and temp.):	1000 kPa (10 bar) max 20 °C (145 psi - max. 68 °F)
	850 kPa (8.5 bar) max 100 °C (123 psi - max 212 °F)
	750 kPa (7.5 bar) max 150 °C (109 psi - max 302 °F)
Min. product pressure:	Full vacuum
Air pressure:	500 to 700 kPa (5 to 7 bar) (72.5 to 101.5 psi)

Valve Body Combinations

7.2 Physical Data

Materials	
Product wetted steel parts:	1.4404 (316L) (internal Ra < 0.8 µm)
Other steel parts:	1.4301 (304)
External surface finish:	Semi-bright (blasted)
Internal surface finish:	Bright (polished). Ra < 0.8 µm
Plug seal:	EPDM
Optional plug seal:	PTFE (TR2) and PEEK (TR3)
Other product wetted seals:	EPDM
Optional product wetted seals:	HNBR and FPM
Other seals:	NBR

Weight

kg (lb)

Size	51 mm (2")	63.5 mm (2½")	76.1 mm (3")	101.6 mm (4")	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")
Standard	7.1 (15.6)	8.3 (18.3)	13.3 (29.3)	15.9 (35.1)	7.1 (15.6)	8.5 (18.7)	13.8 (30.4)	15.9 (35.1)
Reverse Acting	7.2 (15.9)	8.4 (18.5)	13.5 (29.8)	16.1 (35.5)	7.2 (15.9)	8.6 (19)	14 (30.9)	16 (35.3)

7.3 Noise



One metre / 3 ft away from and 1.6 metres / 5 ft above the exhaust, the noise level of a valve actuator will be approximately 77 dB(A) without noise damper and approximately 72 dB(A) with damper - measured at 7 bar air-pressure.

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.



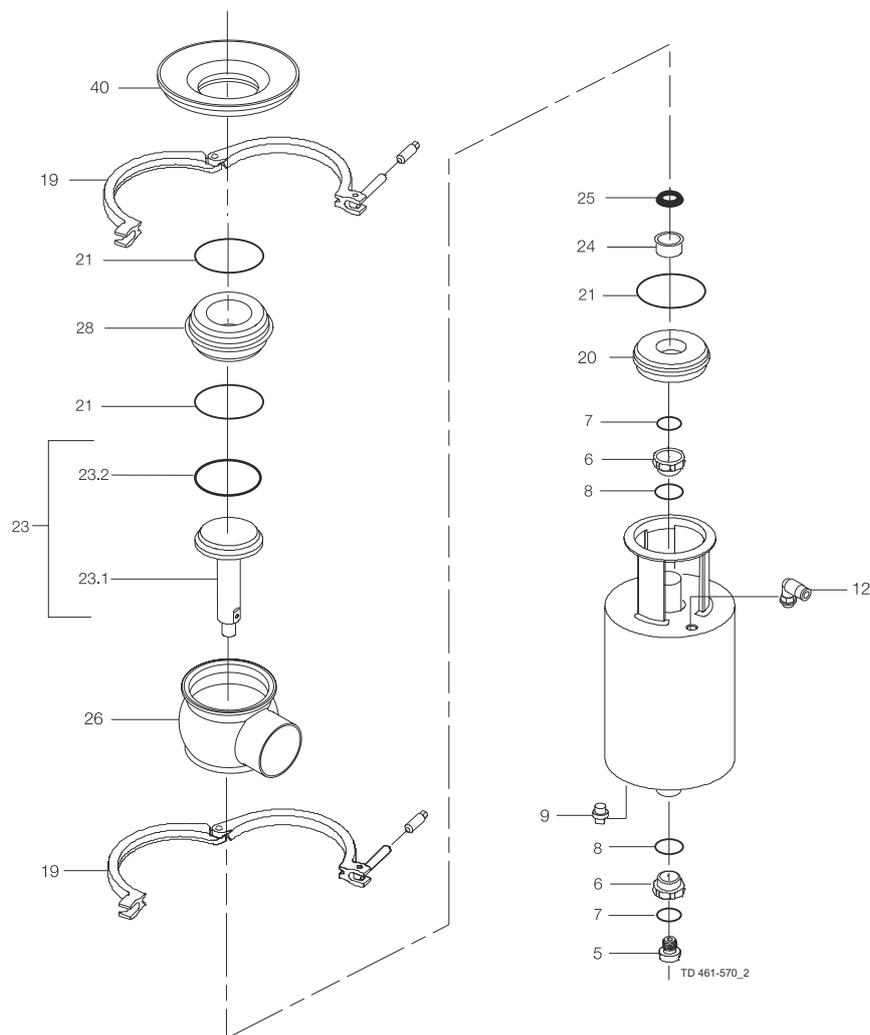
Liability and warranty are excluded:

- 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

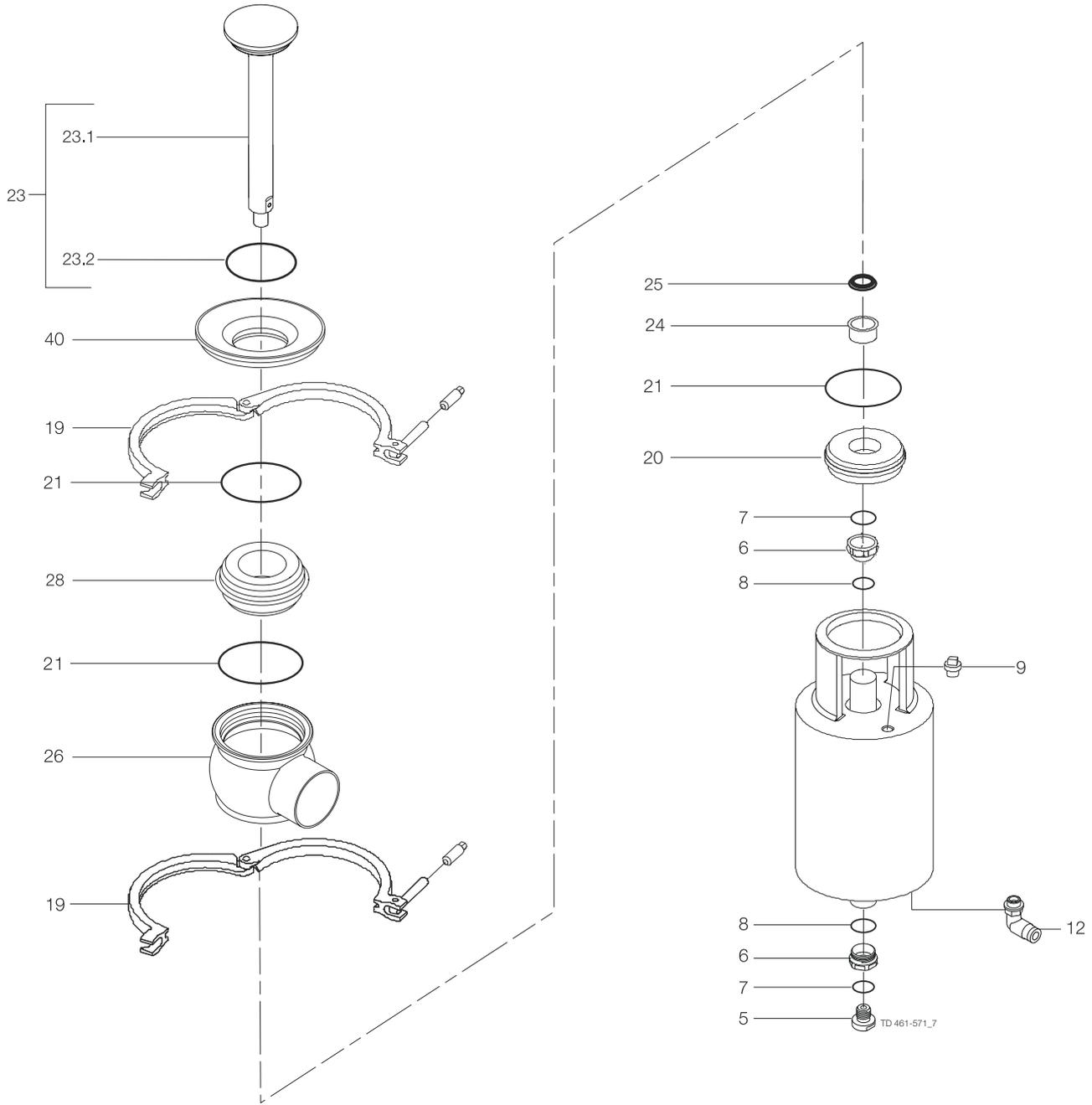
9.1 Unique Single Seat Valve - Tank Outlet



Pos.	Qty.	Denomination
		Actuator
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
12	1 (2)	Air fitting
19	2	Clamp
20	1	Bonnet

Pos.	Qty.	Denomination
21	3	O-ring
23	1	Plug
23.1	1	Plug
23.1	1	Plug seal
24	1	Bushing
25	1	Lip seal
26	1	Valve body
28	1	Seat
40	1	Tank flange

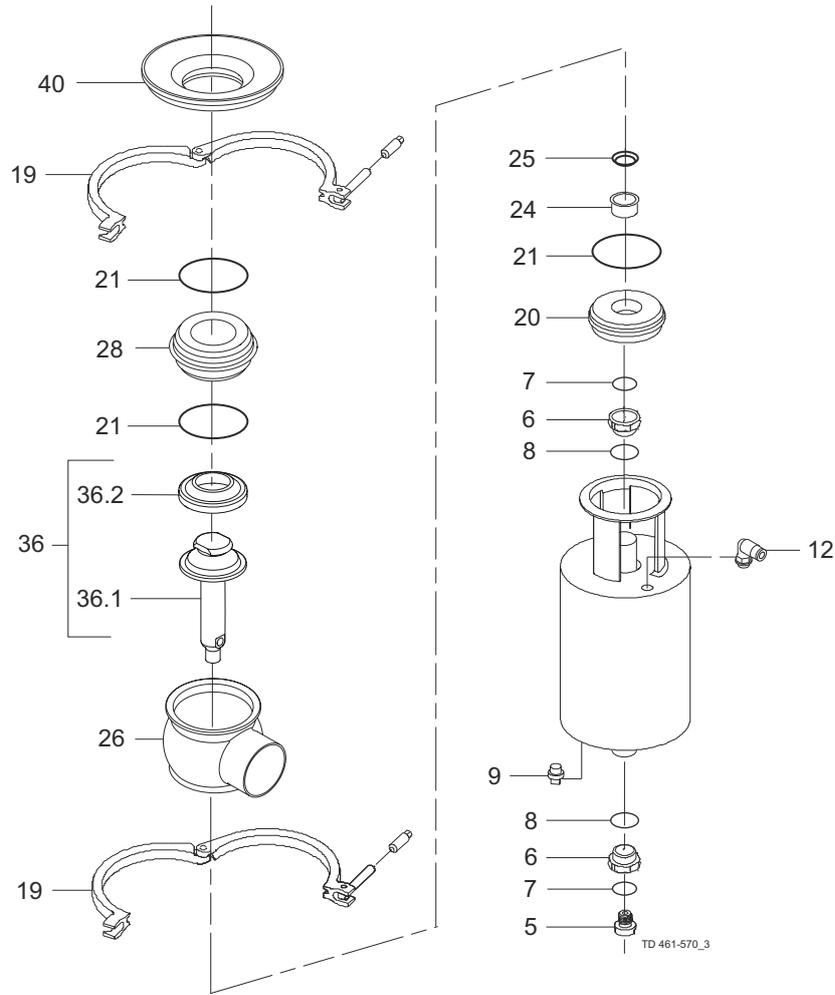
9.2 Unique Single Seat Valve - Tank Outlet - Reverse Acting



Pos.	Qty.	Denomination
		Actuator
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
12	1 (2)	Air fitting
19	2	Clamp
20	1	Bonnet

Pos.	Qty.	Denomination
21	3	O-ring
23	1	Plug
23.1	1	Plug
23.2	1	Plug seal
24	1	Bushing
25	1	Lip seal
26	1	Valve body
28	1	Seat
40	1	Tank flange

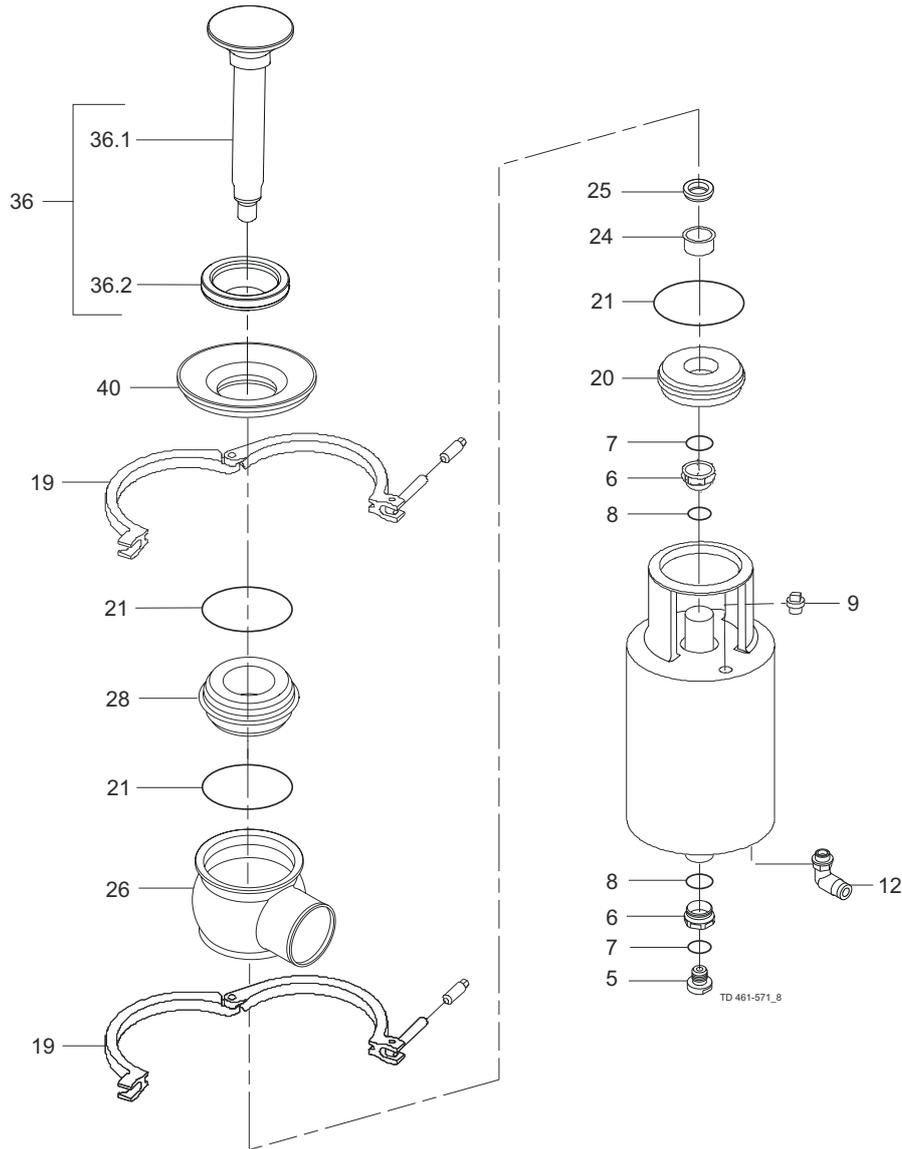
9.3 Unique SSV - TR2 - Tank Outlet Valve



Pos.	Qty.	Denomination
		Actuator
	1	Lip seal
		Plug seal
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
12	1(2)	Air fitting
19	2	Clamp

Pos.	Qty.	Denomination
20	1	Bonnet
21	3	O-ring
24	1	Bushing
25	1	Lip seal
26	1	Valve body
28	1	Seat
36	1	Plug
36.1	1	Plug
36.2	1	Plug seal
40	1	Tank flange

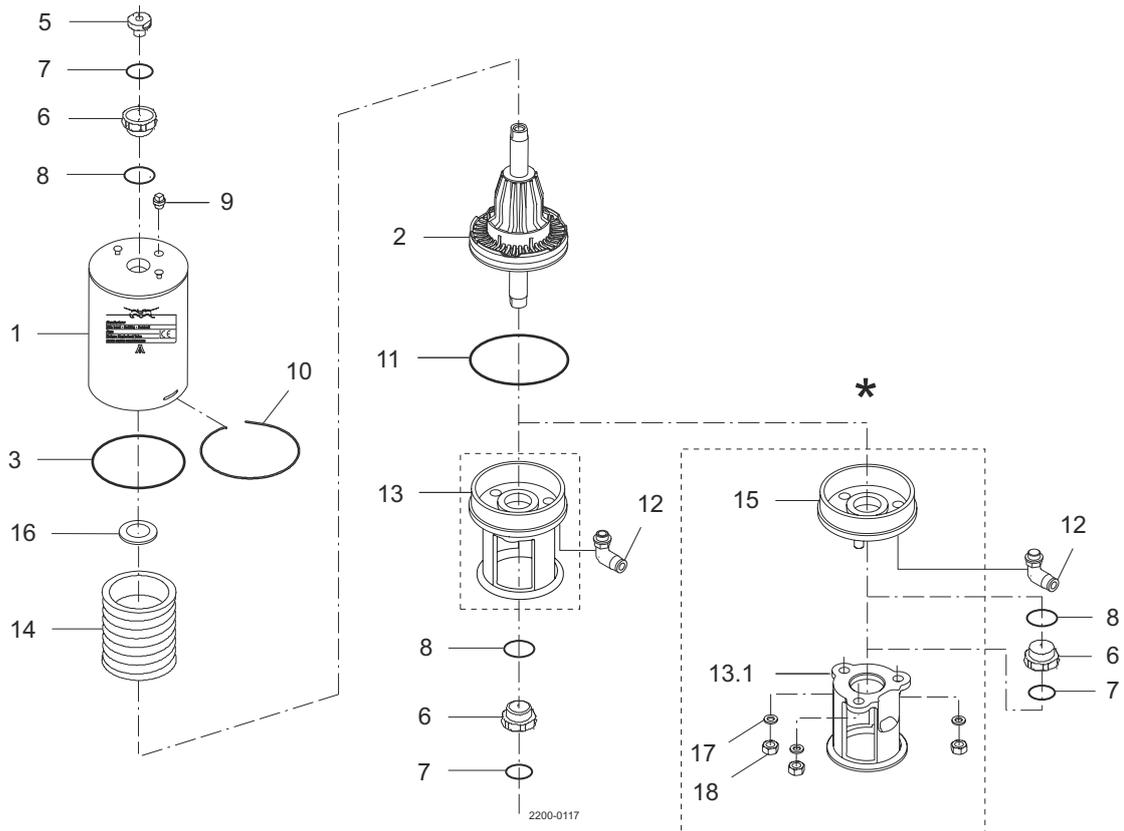
9.4 Unique SSV - TR2 - Reverse Acting - Tank Outlet Valve



Pos.	Qty.	Denomination
		Actuator
		O-ring
		Lip seal
		Plug seal
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
12	1(2)	Air fitting
19	2	Clamp

Pos.	Qty.	Denomination
20	1	Bonnet
21	3	O-ring
24	1	Bushing
25	1	Lip seal
26	1	Valve body
28	1	Seat
36	1	Plug
36.1	1	Plug
36.2	1	Plug seal
40	1	Tank flange

9.5 Maintainable actuator

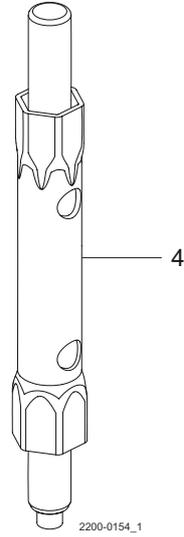
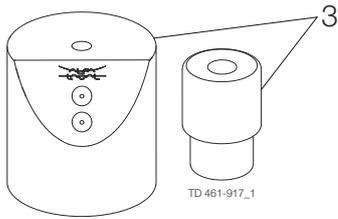
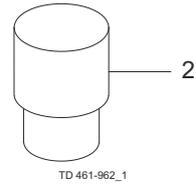
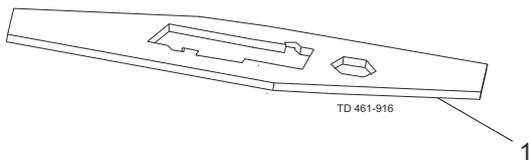


*) "Removable yoke with bolts" version, produced from 2006 to 2016.
 Replaced by "yoke without bolts" (13).

Pos.	Qty.	Denomination
1	1	Cylinder
2	1	Piston
3	1	O-ring
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
10	1	Lock wire

Pos.	Qty.	Denomination
11	1	O-ring
12	1 (2)	Air fitting (only 2 for A/A)
13	1	Yoke without bolts
13.1	1	Yoke (-> 0616)
14	1	Spring assembly
15	1	Bottom (-> 0616)
16	1 (2)	Support disc (only 2 for A/A)
17	3	Washer (-> 0616)
18	3	Nut (-> 0616)

9.6 Mounting Tool - Unique SSV - Tank Outlet Valve



Pos.	Qty.	Denomination
1	1	Service tool for Maintainable actuator
2	1	Tool for bushing (pos. 24)
3	1	Mounting tool for elastomer plug seals
4	1	Tool for actuator bushing (pos. 6)