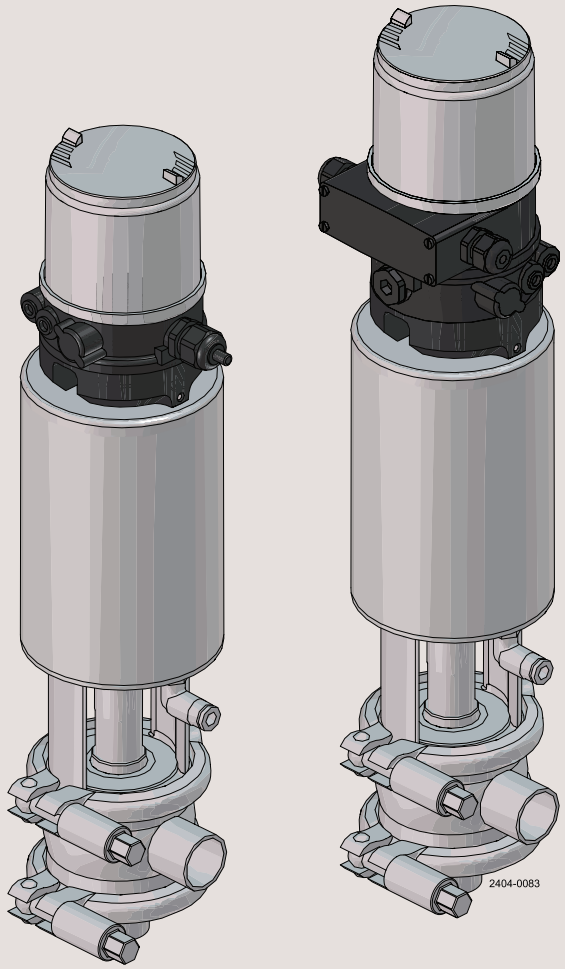
Instruction Manual

Unique RV-ST Regulating Valve



ESE02127-EN10 2023-04

Original manual

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The information herein is correct at the time of issue but may be subject to change without prior notice

1 Declarations of Conformity

EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Valve
Designation

Unique SSV PN10
Type

Serial number from 5099880 to 29999999999

is in conformity with the following directives with amendments:
- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 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.

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–10–01	
Place	Date (YYYY-MM-DD)	Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2016-06-01

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

Serial number from 5099880 to 29999999999

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

Global Product Quality Manager	Lars Kruse Andersen
Title	Name
Kolding, Denmark	2022–10–01
Place	Date (YYYY-MM-DD)
	Signature

DoC Revison_01_102022

2 Safety

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.

2.1 Important information

Always read the manual before using the valve!

WARNING
Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION
Indicates that special procedures must be followed to avoid damage to the valve.

NOTE
Indicates important information to simplify or clarify procedures.

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

The user shall always read the safety section first. Hereafter the user can skip to the relevant section for the task to be carried out or for the information needed.

This is the complete manual for the supplied product.

Operators
The operators shall read and understand the instruction manual for the supplied product.

Maintenance personnel
The maintenance personnel shall read and understand the 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.

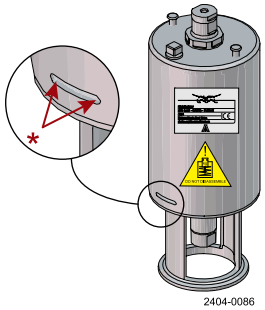
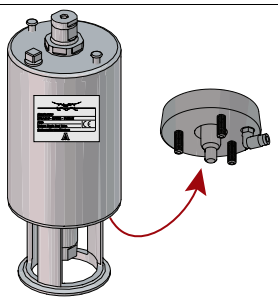
People in general
The public shall not have access to the supplied product.

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.

Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.

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.

Actuator type	**Non-maintainable actuator** Spring under load and **CANNOT** be opened  2404-0086 *) Lock wire opening is locked when warning is marked on actuator	**Fully maintainable actuator** Spring cage and can be opened  2404-0087	**Fully maintainable actuator** Spring cage and can be opened  2404-0088
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 Safety

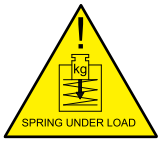
Unsafe practices and other important information are emphasised in this manual.
Warnings are emphasised by means of special signs.

2.2 Warning signs

General warning

Caustic agents

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).



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 locked)

All warnings in the manual are summarised on this page.
Pay special attention to the instructions below so that serious personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

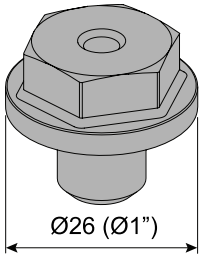
Actuators

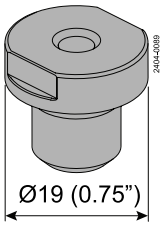
If support air is utilised:

- Shock in the actuator must **NEVER** occur
- Support air on high pressure actuator versions is **NOT** allowed

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.

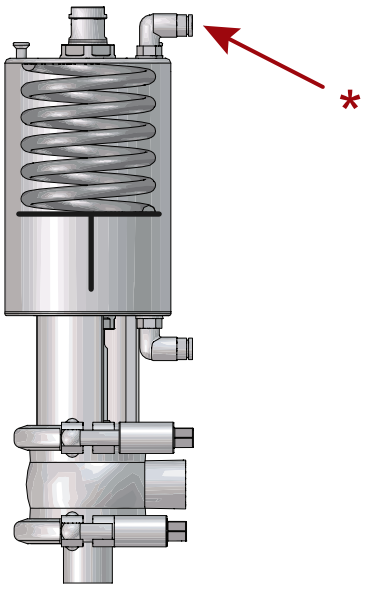
If support air is connected always use the 3 bar/43.5 PSI air relief fittings = 9611995903.
Using the air relief fitting also extends the service life of the actuator piston o-ring.





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

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



*) Alfa Laval recommends max. 3 bar/43.5 PSI support air
Always use the "3 bar/43.5 PSI air relief fittings" on support air.
Alfa Laval article number = 9611995903

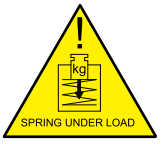
2 Safety

All warnings in the manual are summarised on this page.
Pay special attention to the instructions below so that serious personal injury and/or damage to the valve are avoided.

GENERAL
Always ensure that personnel must have experience with lifting operations.
Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary.
Always keep an eye on the load and stay clear during the lifting operation.
Always ensure that the lifting equipment is suitable for the specific supplied product.
Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.

INSTALLATION
Always read the technical data thoroughly (see section)
Always release compressed air after use
Never touch moving parts if the actuator is supplied with compressed air
Never touch the valve or the pipelines when processing hot liquids or when sterilising
Never dismantle the valve with valve and pipelines under pressure
Never dismantle the valve when it is hot

Never cut the actuator open, due to spring under load - if marked with this warning



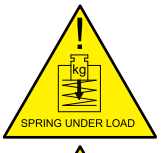
Do **NOT** attempt to disassemble the actuator due to spring under load danger!

OPERATION
Never dismantle the valve with valve and pipelines under pressure
Never dismantle the valve when it is hot
Always read the technical data thoroughly (see section)
Always release compressed air after use
Never touch the valve or the pipelines when processing hot liquids or when sterilising
Never touch moving parts if the actuator is supplied with compressed air
Always rinse well with clean water after cleaning
Always handle lye and acid with great care

NOTE
Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.

MAINTENANCE
Always read the technical data thoroughly (see section)
Always release compressed air after use
Never service the valve when it is hot
Never service the valve with valve and pipelines under pressure
Never stick your fingers through the valve ports if the actuator is supplied with compressed air
Never touch moving parts if the actuator is supplied with compressed air
Always use Alfa Laval genuine spare parts

Never cut the actuator open, due to spring under load danger - if marked with this warning



Do **NOT** attempt to disassemble the actuator due to spring under load danger!

All warnings in the manual are summarised on this page.
Pay special attention to the instructions below so that serious personal injury and/or damage to the valve are avoided.

TRANSPORTATION

Always ensure that compressed air is released
Always ensure that all connections are disconnected before attempting to remove the valve from the installation
Always drain liquid out of the valves before transportation
Always use predesigned lifting points if defined
Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available , it must be used.

STORAGE

Ideally, as a guide Alfa Laval recommend:

- Store supplied product as supplied in original packaging
- Port opening 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 to 40°C
- Relative humidity less than 60%
- No exposure to corrosive substances (also air contained).

3 Installation

The instruction manual is part of the delivery. Study the instructions carefully.
The items refer to the parts list and service kits section.
The valve is supplied as separate parts as standard (for welding).
The valve is assembled before delivery, if it is supplied with fittings.

3.1 Unpacking/delivery

Step 1
CAUTION
Alfa Laval cannot be held responsible for incorrect unpacking.

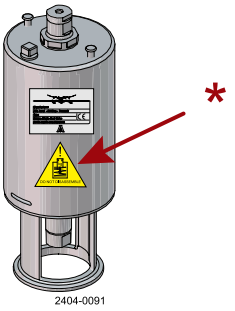
Check the delivery for:

1. Complete valve
2. Delivery note
3. Instruction Manual

Step 2
Actuator version can be ordered either “fully maintainable” (no warning marked on actuator) or as “non-maintainable” (warning marked on actuator).

* = lasermarked warning

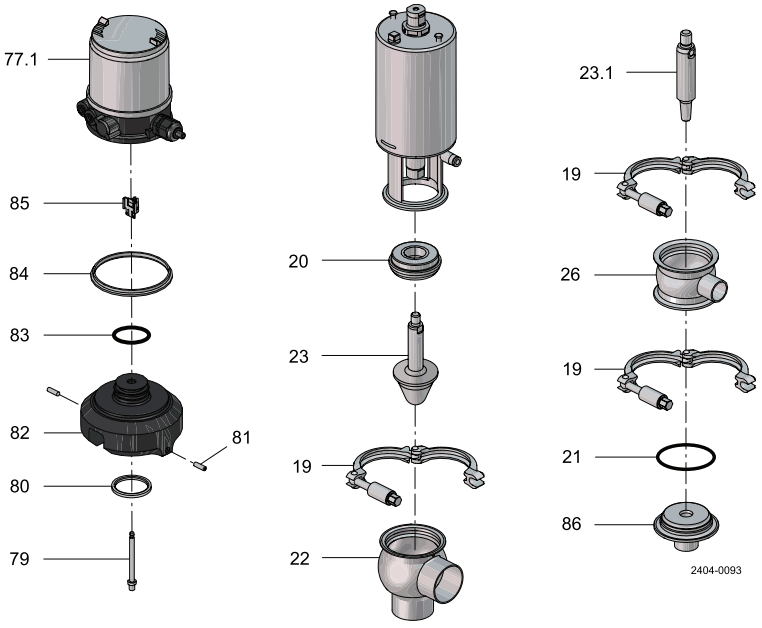
Non-maintainable actuator



Fully maintainable actuator

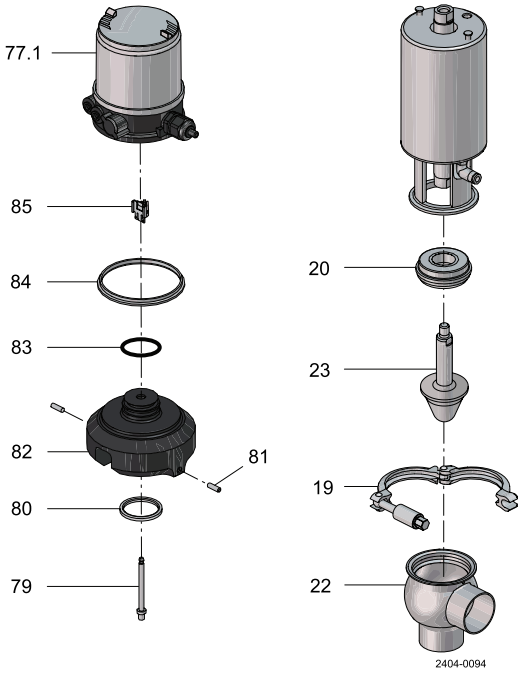
Step 3

1. Complete actuator
2. Bonnet (20)
3. Clamp (19)
4. Valve plug (23)
5. Valve body (22)
6. Positioner (77.1)
7. Adapter (82)
8. Spindle (79)
9. Special X-ring (80)
10. Allen screw (81)
11. Puck sensor pad (85)
12. O-ring (83)
13. Gasket for adapter (84)



The instruction manual is part of the delivery. Study the instructions carefully.
The items refer to the parts list and service kits section.
The valve is supplied as separate parts as standard (for welding).
The valve is assembled before delivery, if it is supplied with fittings.

Step 4
Remove possible packing materials from the valve/valve parts.
Inspect the valve/valve parts for visible transport damage.
Avoid damaging the valve/valve parts.



3 Installation

Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard but can also be supplied with fittings.

3.2 General installation

Step 1

- **CAUTION**
  Alfa Laval cannot be held responsible for incorrect installation.
- **Always** release compressed air after use.
- **Always** read the technical data thoroughly.
  See section .

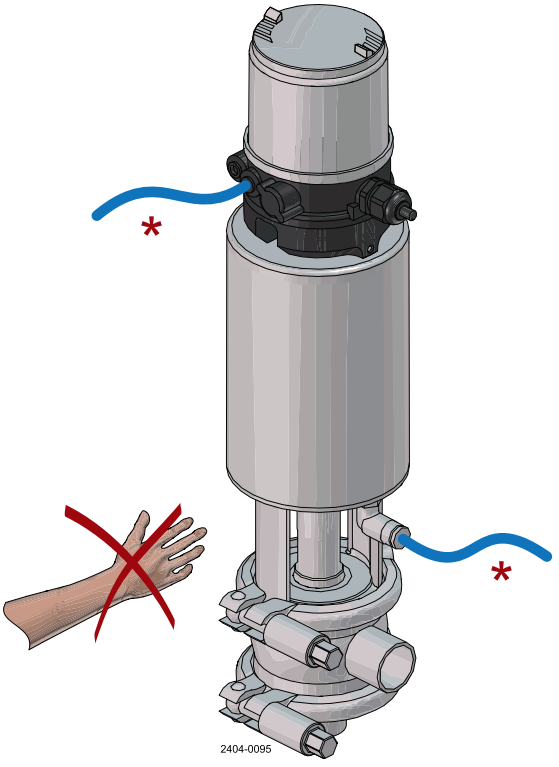
Do **NOT** attempt to disassemble the actuator due to spring under load danger!

If marked with this warning, do **NOT** attempt to cut the actuator open, due to spring under load danger!

Step 2

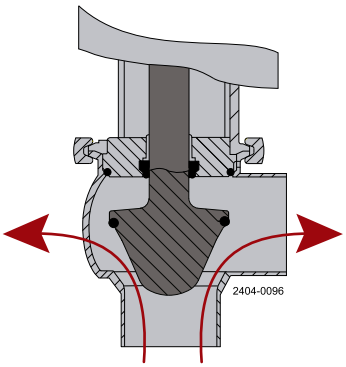
Never touch the moving parts if the actuator is supplied with compressed air.

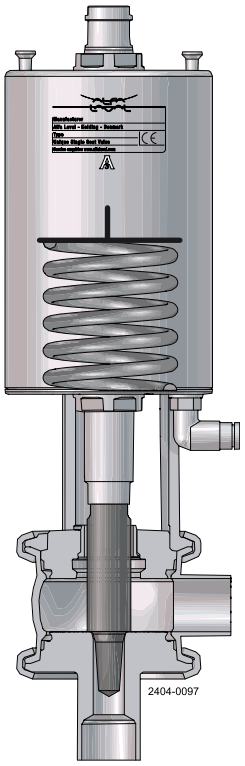
*) Air



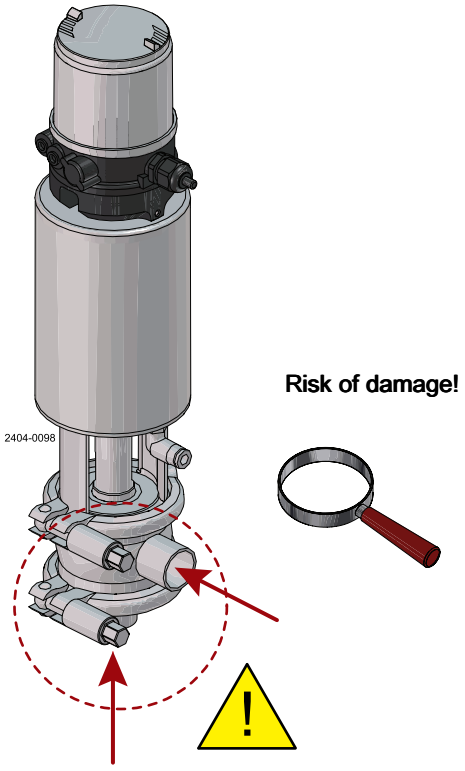
Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard but can also be supplied with fittings.

Step 3





Step 4
Avoid stressing the valve.
Pay special attention to:
- Vibrations
- Thermal expansion of the tubes
- Excessive welding
- Overloading of the pipelines



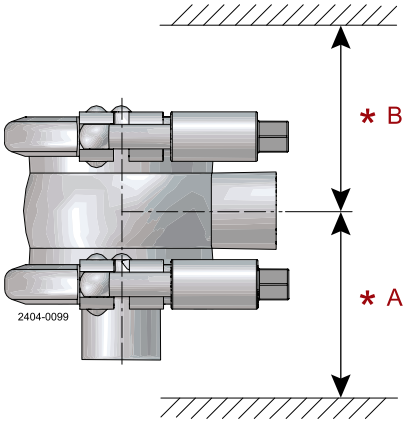
3 Installation

Study the instructions carefully.
The valve is supplied as separate parts to facilitate welding.
The items refer to the parts list and service kits section.
Check the valve for smooth operation after welding.

3.3 Welding

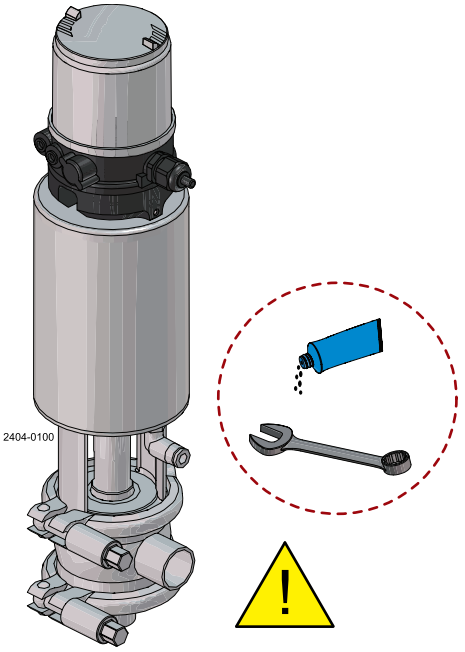
Step 1
Always install valves with more than one valve body so that the seals between the valve bodies can be replaced. Do not weld more than one valve body into the system.

Valve size	A (mm)	B (mm)
DN25/25 mm	*	630
DN40/38 mm	*	700
DN50/51 mm	*	750
DN65/63.5 mm	*	740
DN80/76 mm	*	800
DN100/101.6 mm	*	790



*A = Depending on body combination and piping solution.
*B = B (incl. top unit).

Step 2
Assemble the valve in accordance with the steps in chapter 5.4 Assembly of valve
Pay special attention to the warnings!

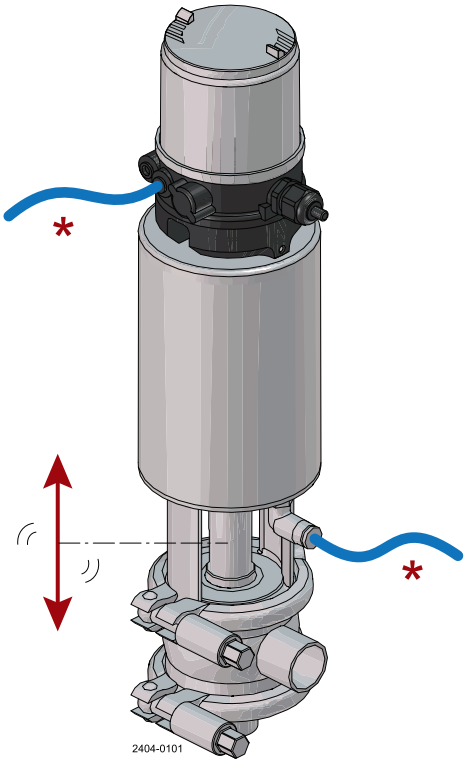


Study the instructions carefully.
The valve is supplied as separate parts to facilitate welding.
The items refer to the parts list and service kits section.
Check the valve for smooth operation after welding.

Step 3
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!

* = Air

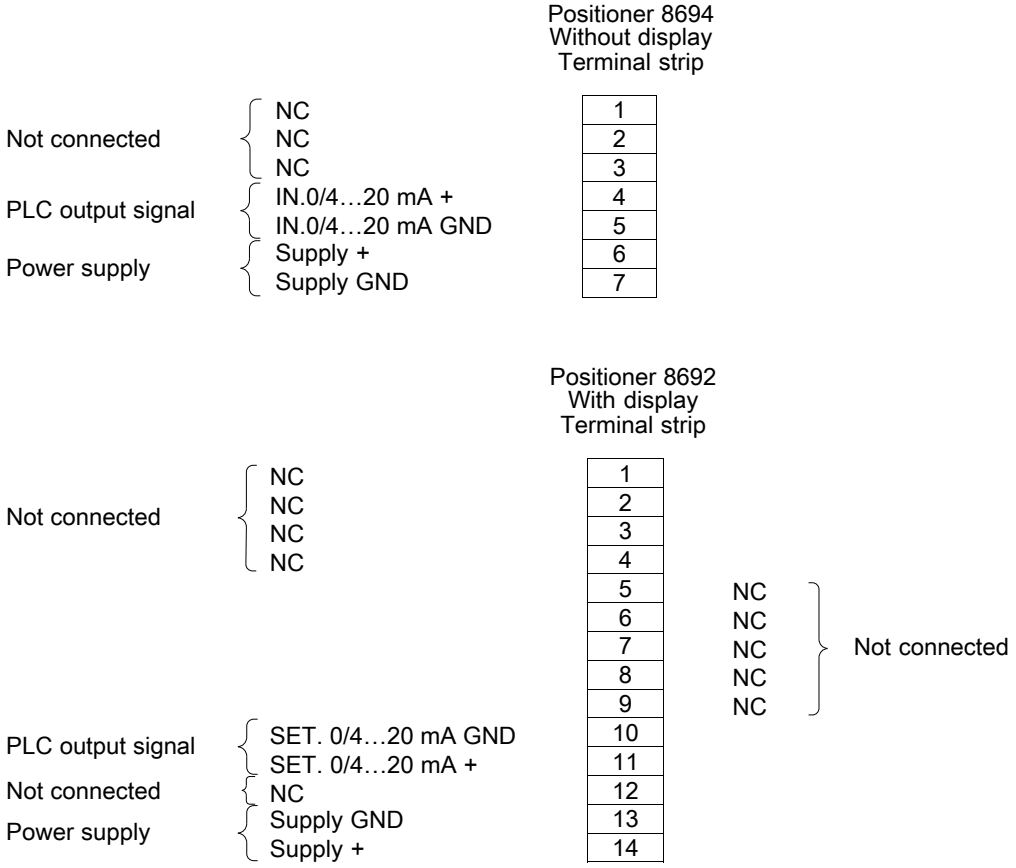


3 Installation

Study the instructions carefully.
The valve is supplied as separate parts to facilitate welding.
The items refer to the parts list and service kits section.
Check the valve for smooth operation after welding.

3.4 Electrical connection

Electrical connection



Study the instructions carefully.
The valve is supplied as separate parts to facilitate welding.
The items refer to the parts list and service kits section.
Check the valve for smooth operation after welding.

3.5 Recycling information

• Unpacking

- Packing material consists 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

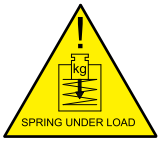
• Maintenance

- During maintenance, oil and wear parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non-metal wear parts must be disposed in accordance with local regulations

• Scrapping

- At end of use, the equipment must be recycled according to 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

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



If marked with this warning, do **NOT** attempt to cut the actuator open, due to spring under load danger!

4 Operation

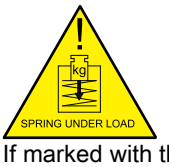
Study the instructions carefully and pay special attention to the warnings!
Ensure that the valve operates smoothly.
The items refer to the parts list and service kits section.

4.1 Operation

Step 1

- **CAUTION**
  Alfa Laval cannot be held responsible for incorrect installation.
- **Always** release compressed air after use.
- **Always** read the technical data thoroughly.
  See section 6 Technical data.
- **Always** use Alfa Laval genuine spare parts.
  The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

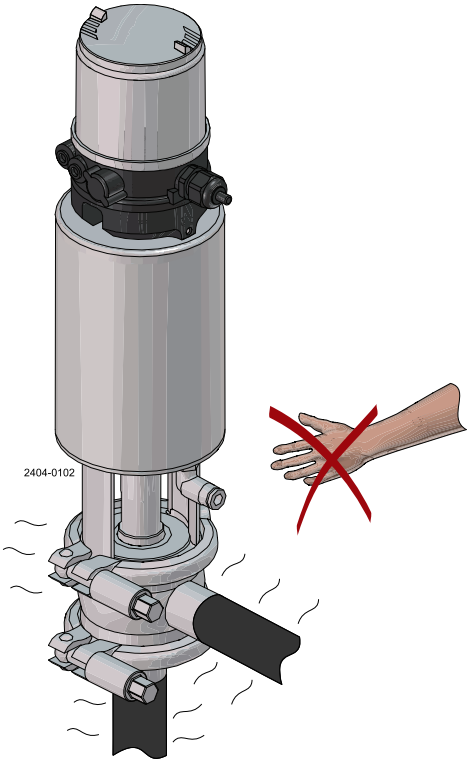
Do **NOT** attempt to disassemble the actuator due to spring under load danger!



If marked with this warning, do **NOT** attempt to cut the actuator open, due to spring under load danger!

Step 2

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

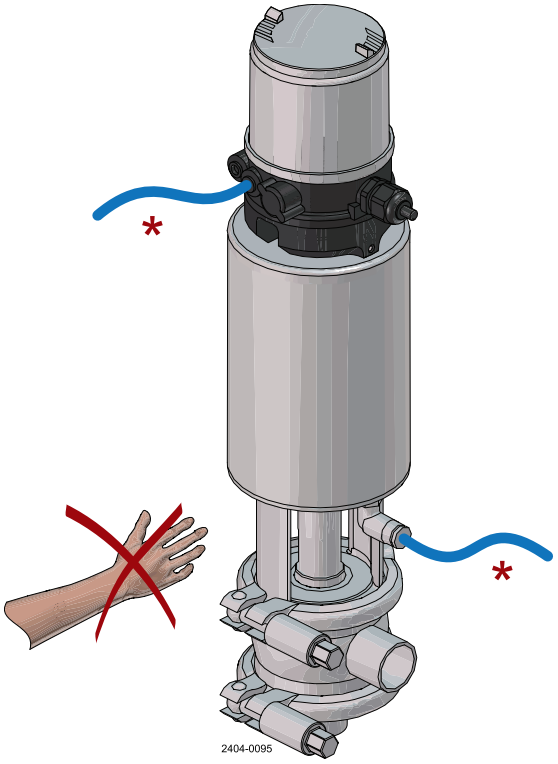


Study the instructions carefully and pay special attention to the warnings!
Ensure that the valve operates smoothly.
The items refer to the parts list and service kits section.

Step 3

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

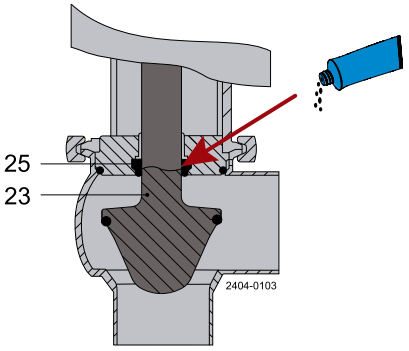
* = Air



Step 4

Lubrication of valves:

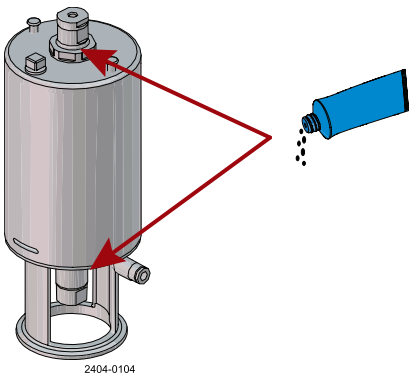
1. Ensure smooth movement between lip seal (25) and plug stem (23).
2. Lubricate with Alfa Laval Lubricant if necessary (see chapter 5.1 General maintenance).



Step 5

Lubrication of actuator

1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery).
2. Lubricate O-ring(s) with Molykote Longterm 2 plus if necessary.



4 Operation

Pay attention to possible faults. Study the instructions carefully.
The items refer to the parts list and service kits (chapter 7 Parts list and service kits).

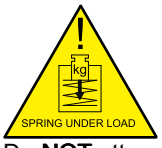
4.2 Troubleshooting

NOTE!
Study the maintenance instructions carefully before replacing worn parts. See chapter 5.1 General maintenance.

Problem	Cause/result	Repair
External product leakage	Worn or damaged lip seal and/or O-ring	- Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	- Worn or product affected plug seal	- Replace the seal - Replace with a seal of a different rubber grade
	- Product deposits on the seat and/or plug	- Frequent cleaning
	- Product pressure exceeds actuator specification	- 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. See section 2.3 Safety precautions and section 3.2 General installation , Step 4 - Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	- The flow direction should be against the closing direction. See section 3.2 General installation , - Throttle air release of solenoid in top unit
The valve does not open/close	Product pressure exceeds actuator specification	- 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

If marked with a danger warning, do **NOT** attempt to cut the actuator open, due to spring under load.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open due to spring under load danger!

The valve is designed for cleaning in place (CIP).
NaOH = Caustic soda.
HNO3 = Nitric acid.

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

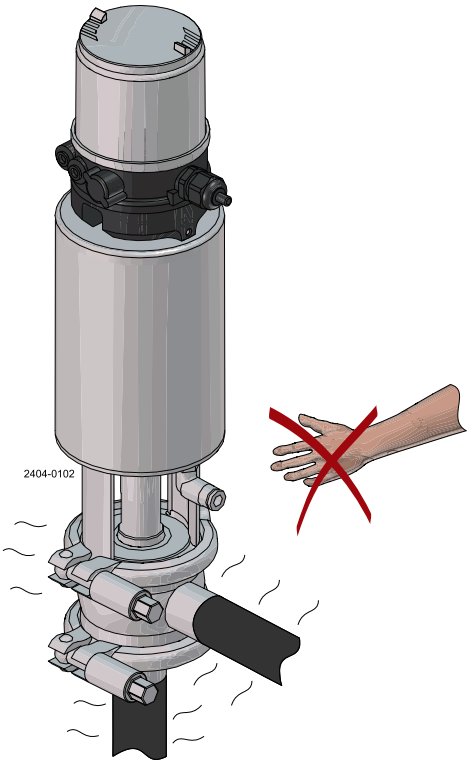
Caustic danger!

Always use rubber gloves!

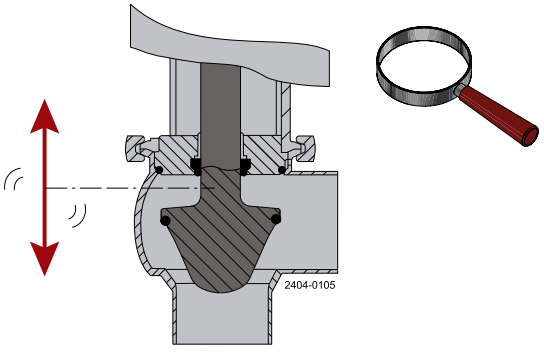
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilising.



Step 3
Clean the plug and the seats correctly.
Pay special attention to the warnings!
Lift and lower valve plug momentarily!



The valve is designed for cleaning in place (CIP).
NaOH = Caustic soda.
HNO3 = Nitric acid.

Step 4
Examples of cleaning agents:
Use clean water, free from chlorides.

1. 1% by weight NaOH at 70° C (158° F)

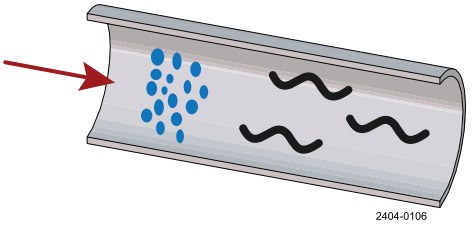
1 kg (2.2 lbs) NaOH	+	100 l (26.4 gal) water	=	Cleaning agent
2.2 l (0.6 gal) 33% NaOH	+	100 l (26.4 gal) water	=	Cleaning agent

2. 0.5% by weight HNO_3 at 70° C (158° F)

0.7 l (0.2 gal) 53% HNO_3	+	100 l (26.4 gal) water	=	Cleaning agent

Step 5
1. Avoid excessive concentration of the cleaning agent.
2. Adjust the cleaning flow to the process.
3. **Always** rinse well with clean water after cleaning.

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

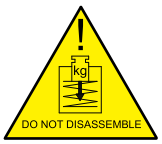


Maintain the valve regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and lip seals in stock.
Check the valve for smooth operation after service.

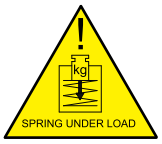
5.1 General maintenance

Step 1

- **CAUTION**
  Alfa Laval cannot be held responsible for incorrect installation.
- **Always** release compressed air after use.
- **Always** read the technical data thoroughly.
  See section 6 Technical data.
- **Always** use Alfa Laval genuine spare parts.
  The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.



Do **NOT** attempt to disassemble the actuator due to spring under load danger!



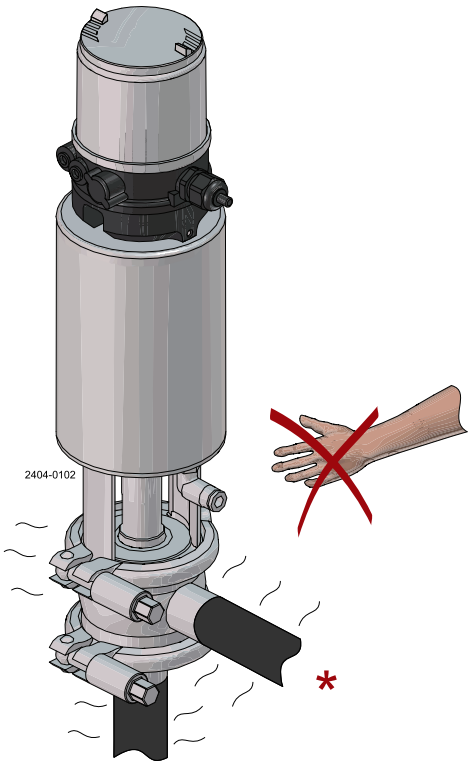
If marked with this warning, do **NOT** attempt to cut the actuator open, due to spring un.epsder load danger!

Step 2

Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.

* = Atmospheric pressure required!



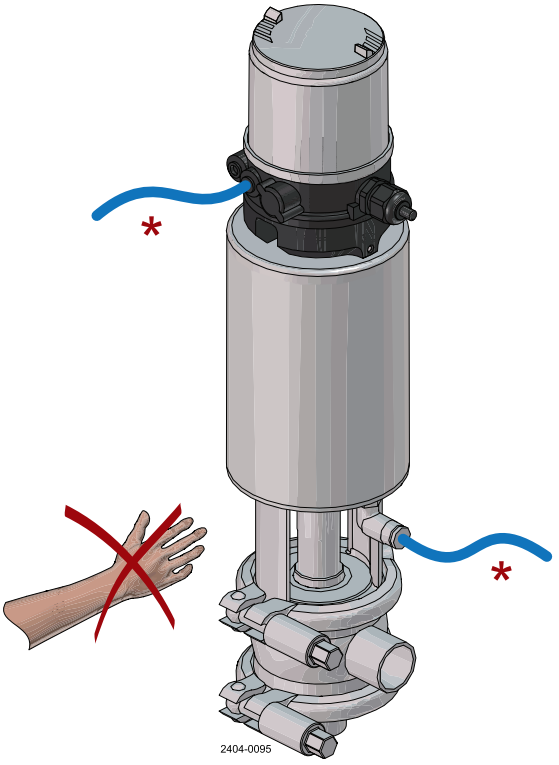
Maintain the valve regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and lip seals in stock.
Check the valve for smooth operation after service.

Step 3

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.

* = Air



Maintain the valve regularly.
Study the instructions carefully 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.

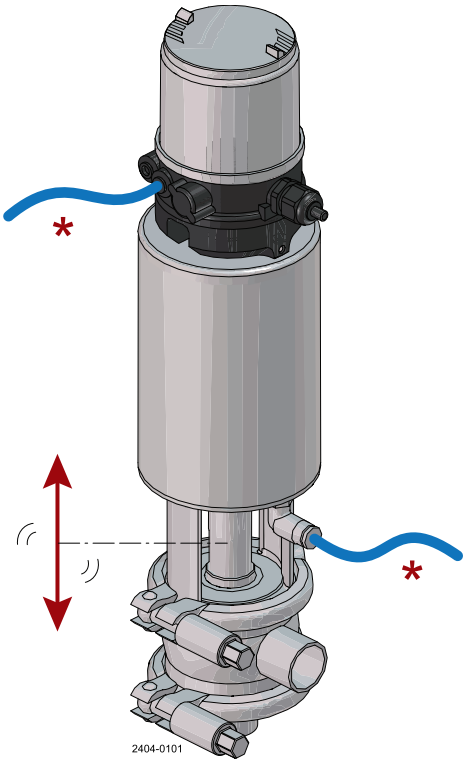
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	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**
Planned maintenance	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for inspection planning **Replace after leakage**	- Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for inspection planning **Replace after leakage**
Lubrication	**Before fitting** Alfa Laval Silicon based Food-grade Lubricant USDA H1 approved grease	**Before fitting** Molykote Longterm 2 plus

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!

* = Air



Recommended spare parts
Service kits (see section)

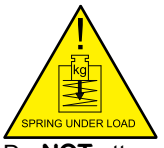
5 Maintenance

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.2 Dismantling of valve

If the actuator is marked with a danger warning, do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!

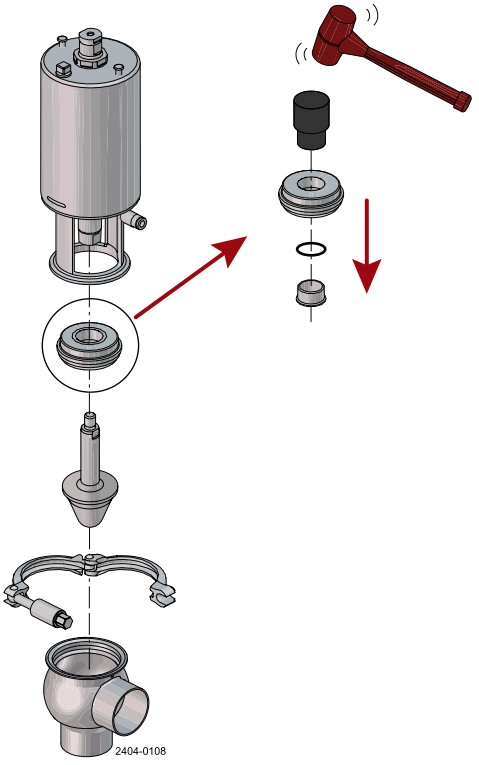


Do **NOT** attempt to cut the actuator open due to spring under load danger!

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

Pay special attention to the warnings!

Note!
For plug seal replacement please see chapter 5.3 Plug seal replacement



Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.3 Plug seal replacement

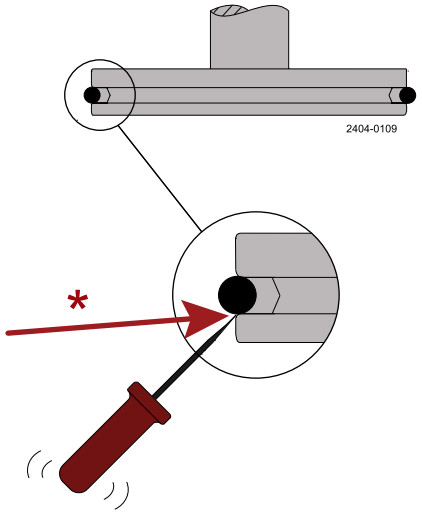
Attention!
Please be aware that the Needle Valve plug does not have an elastomer seal, and thus the valve will not close 100% tight.

Step 1

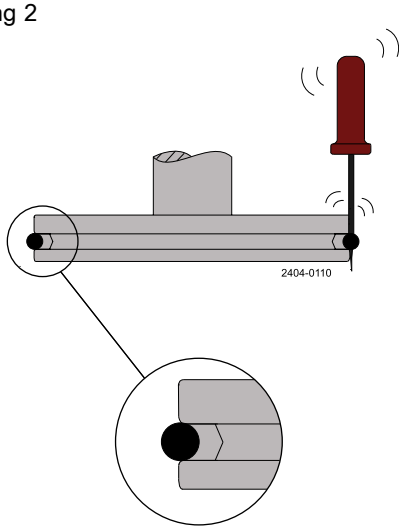
1. Remove old seal ring using a knife, screwdriver or similar.
   Be careful not to damage the plug surface.
   If using a screwdriver it must be placed underneath the plug groove (see drawing 1).
2. Grease the new seal ring with Paralique GTE 703, which is included in the service kit.
   Only use a very small amount of grease.
3. Fit the seal ring on the plug without pressing it into the groove.
   Be careful not to twist the seal ring.
   Use a screwdriver (two turns) to fit the seal ring properly and to ensure it is not twisted (see drawing 2).
4. The seal ring can now be mounted by hand or with the Alfa Laval plug tool.

* = It is important to place the screwdriver underneath the plug.

Drawing 1



Drawing 2

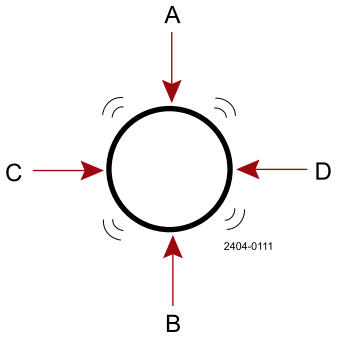


Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

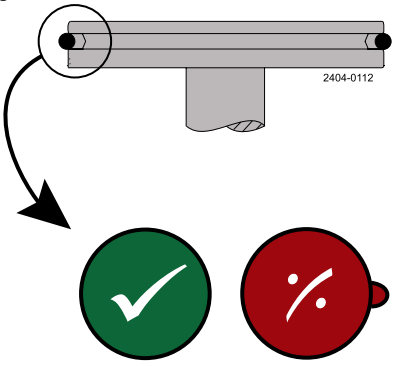
Step 2
Mounting plug seal ring by hand

1. Check the seal ring is premounted as described in step 1.
   To ensure correct mounting, press with your thumb on the seal ring, which must be done approximately 10 times and always with opposite pressure points, from A to B, to C and D (see drawing 3).
   The rest of the seal ring can now be pressed into the groove so the whole seal ring is mounted. Check that there are NO “bulge” (see drawing 4).
   If there is a little bulge – then use the screwdriver to eliminate the bulge.
   Again press with the thumb on the seal ring and keep the pressure while rotating 360° (see drawing 3).
2. It is important to release compressed air behind the seal ring. This is done with a screwdriver and always underneath the plug as shown.
   It must be done at one or two different points on the circumference.
   Be careful not to make marks on the surface of the plug and seal ring (see drawing 5).

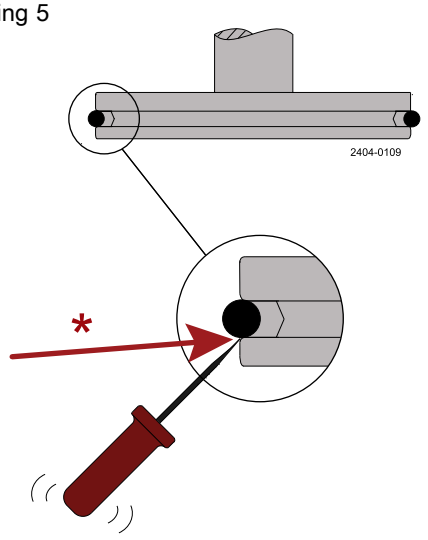
Drawing 3



Drawing 4



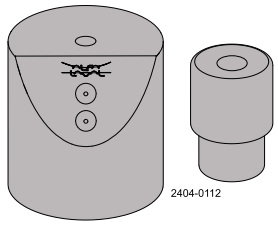
Drawing 5



* = it is important to place the screwdriver underneath the plug

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

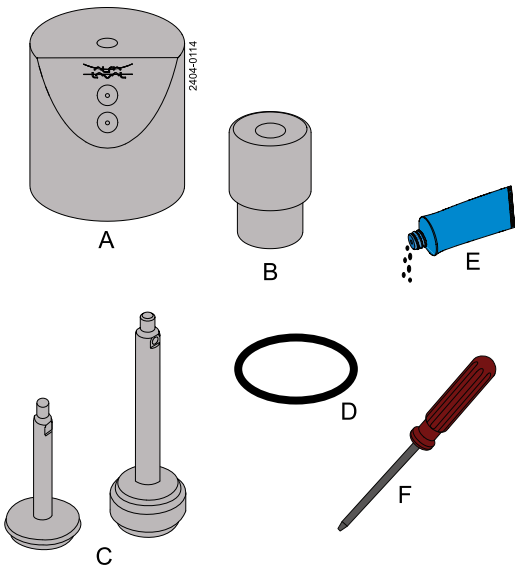
Step 3
Mounting plug seal ring with Alfa Laval plug seal tool

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

1. **Part B**
   “Part B” has a small and a large diameter as the tool can be used for two plug sizes – e.g. plug tool = 9613172902 can be used for DN50/ISO51 (small) and DN65/ISO63 (large).
   “Part B” therefore has to be turned so it matches the plug size diameter.
2. **Part A**
   “Part A” has an upper and lower exhaust hole, as the tool can be used for two plug sizes – e.g. plug tool = 9613172902.
   The upper exhaust hole is for the small plug size e.g. DN50/ISO51 (small) and the lower exhaust hole is for DN65/ISO63 (large).
   When using a “change-over plug” the ø20 spindle must also be fitted in “part A” and “part B” (see drawing 2).
   When using a “reverse acting plug” the ø20 spindle must only be fitted in “part A” (see drawing 2).
   When using a “standard shut-off plug” the ø20 spindle is only fitted in “part B” (see drawing 1).
3. Fit the plug spindle in “part B” or “part A”.
   Place “part A” onto “part B” and then press “hard” down on top of “part A”.
   Now fit the screwdriver into the exhaust hole and underneath the plug groove meanwhile keeping the pressure on “part A”. This should ensure correct removal of air behind the seal ring. Normally the sound “Psst” can be heard one time (see drawing 3).
   A “drill press” can of course also be used to press down on “part A”.
4. It is important to release compressed air behind the seal ring.
   This is done with a screwdriver and always underneath the plug as shown (see drawing 4).

Exhaust holes for screwdriver

ø20 hole for plug spindle

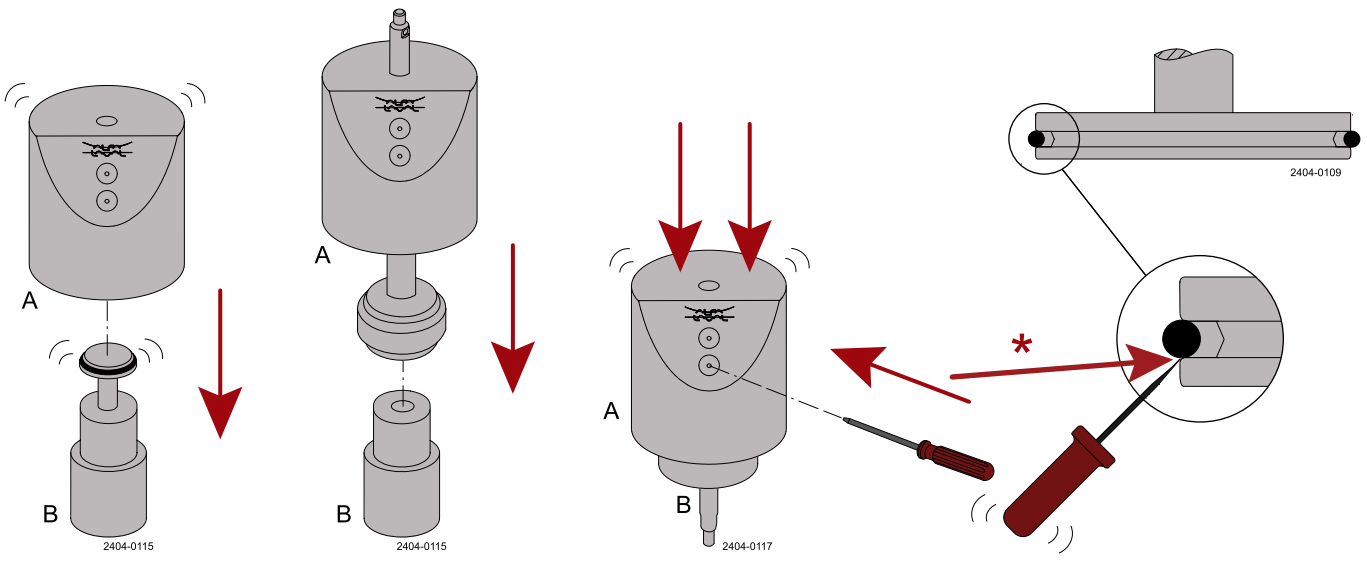


A. Part A
B. Part B
C. Plugs
D. O-ring
E. Grease Paralique GTE703 from service kit
F. Screwdriver (no sharp corner)

5 Maintenance

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

Drawing 1 Drawing 2 Drawing 3 Drawing 4



* = It is important to place the screwdriver underneath the plug.

5.4 Assembly of valve

Reverse order of .
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**
- Shut-off plug tighten torque = **20 Nm**

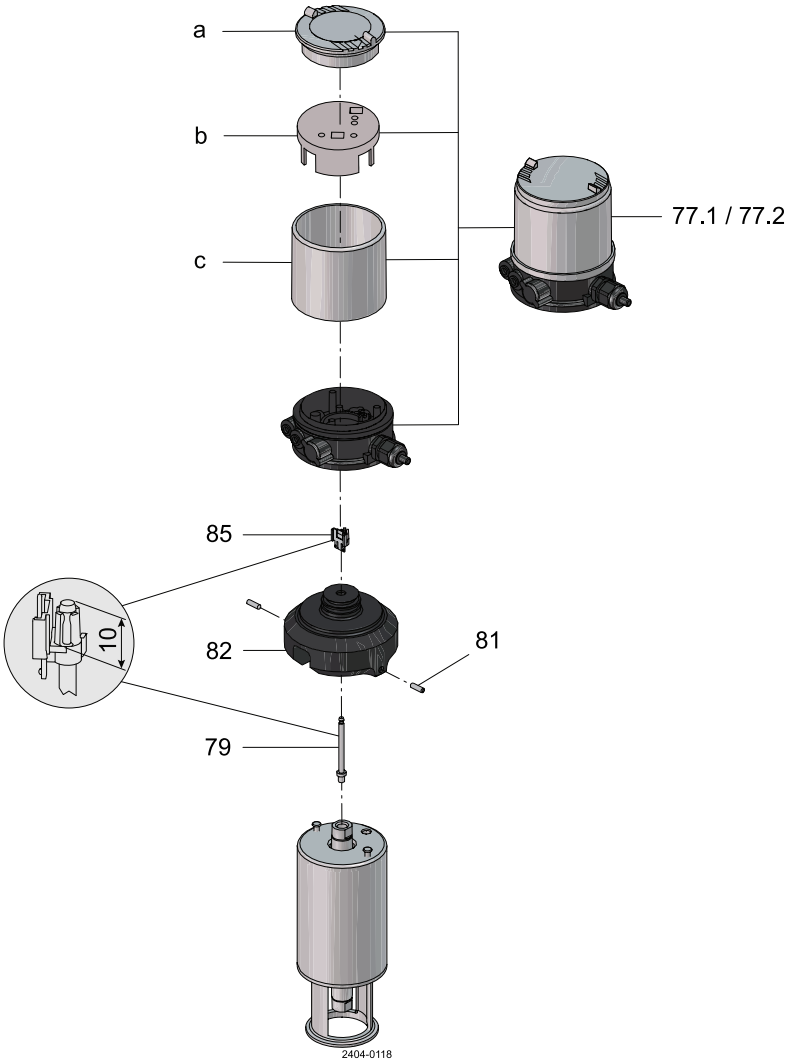
If there are vibrations in the pipeline, Alfa Laval recommends to use Loctite no. 243.
The clamps' thread must be lubricated before tightening - max. torque for the clamps is 10-12 Nm.

Pay special attention to the warnings.

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.5 Assembly instruction for positioner

1. Mount the indication spindle (79) in top of actuator spindle (5).
2. Mount adapter (82) on top of actuator.
3. Fasten adapter by cross tighten the screws (81).
4. Mount the sensor pad (85) on the top of the inducation spindle (79).
5. Remove top lid (a) and the cover (b) from positioner (77.1/77.2).
6. Grease seals lighty before assembly of the other parts with Alfa Laval Lubricant.
7. Centring the sensor pad (85) in the guide rail inside the positioner when mounting the positioner unit (77.1/77.2) down over the adapter.
8. Fasten positioner (77.1/77.2) by cross tighten the screws.
9. Bring the actuator in top position (by using air if necessary).
10. Wire the electric connections according to “Quick start guide”.
11. Assemble the cover (c) and the top lid (a) again.
12. Mount the actuator on the valve and make the settings according to “Quick start guide”.



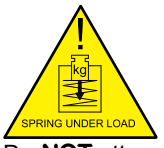
5 Maintenance

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.6 Actuator bushing replacement

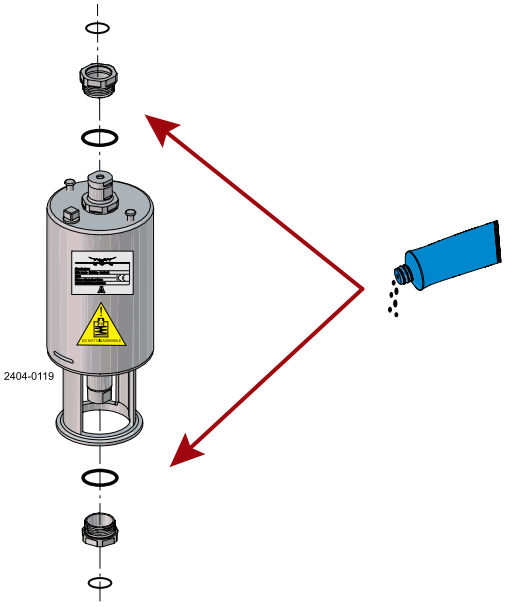
If the actuator is marked with a danger warning, do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



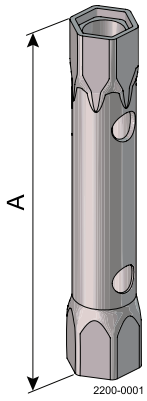
Do **NOT** attempt to cut the actuator open due to spring under load danger!

Step 1
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.
- Always lubricate the spindle and o-rings thoroughly with “Molykote Longterm 2 Plus” before mounting the new bushings.



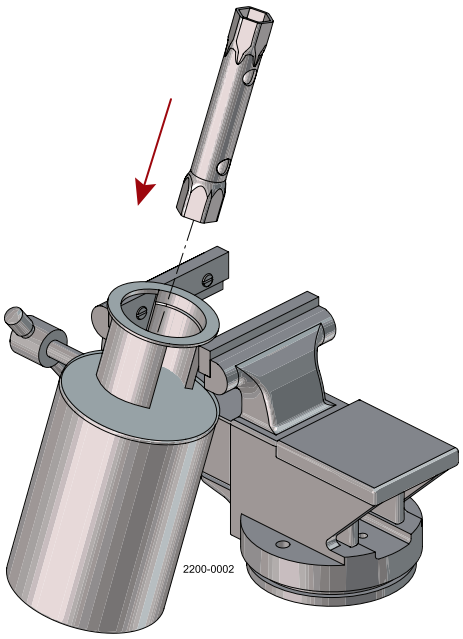
Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

Step 2
Introduction - Standard socket wrench
Use a 27 mm socket wrench to mount the bushings, as the space in the yoke is limited.
A socket wrench 24x27 (length = 185 mm) is a standard tool, which can be purchased from all tool shops.



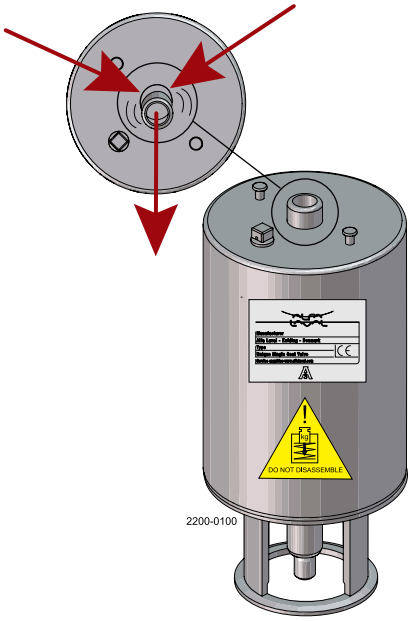
A = 185 mm

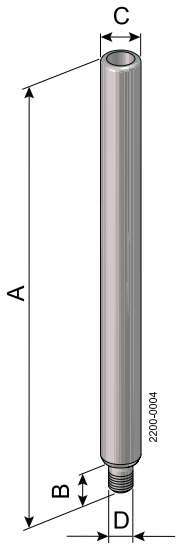
Example:
Socket wrench - 24x27 mm
Supplier: Gedore Tool
EAN4010886621264



Step 3
Introduction - Aligning spindle
The actuator spindle can in some cases be forced off centre by the internal spring, see drawing below.
In these cases, the alignment spindle shown below, together with the socket wrench, is a great help and ensures a reliable mounting of the bushing. The spindle can either be purchased from Alfa Laval together with the socket wrench (**9614-1984-01**) or it can be manufactured locally using the below dimensions.

Spindle forced off centre by spring inside actuator

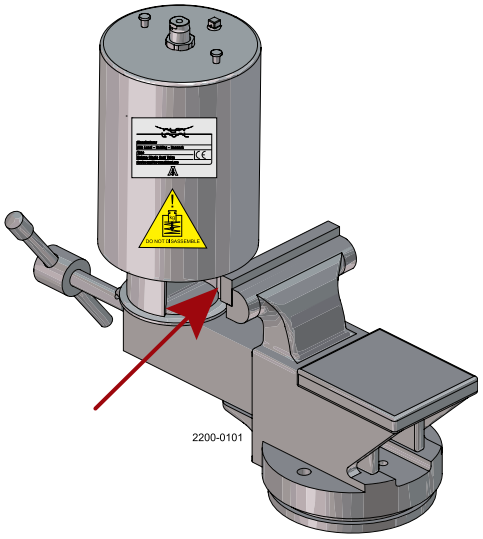


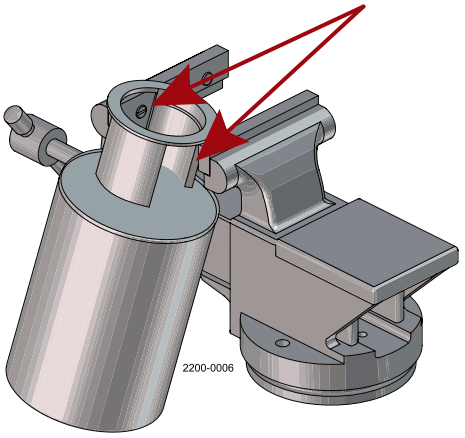


A = 280 mm
B = 16 mm
C = Rod ø20 mm
D = M12 x 1.5

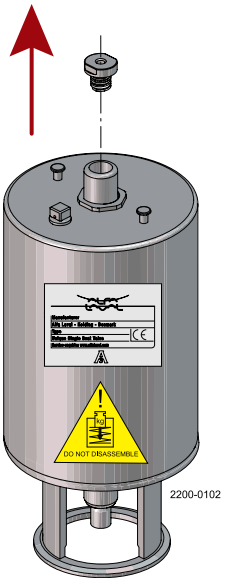
Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

Step 4
The actuator must be carefully fixed in a vice if it is dismounted from the valve. Be careful not to press the yoke flange oval when fixing the actuator in the vice. Only fix carefully on the “yoke leg” as shown below.





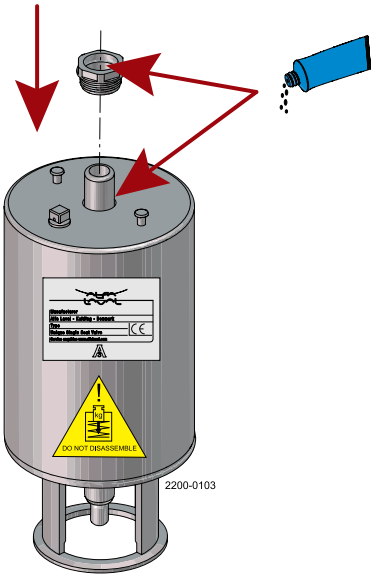
Step 5
Remove adapter screw.
(After spindle alignment the adapter screw has to be remounted.)



Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

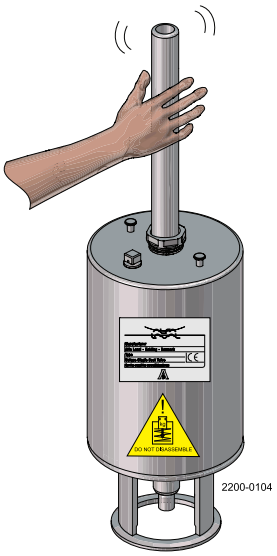
Step 6

1. Lubricate thoroughly both the actuator spindle and o-rings.
2. Grease with “Molykote Longterm 2 plus”.
3. Fit the **bushing** on the spindle.

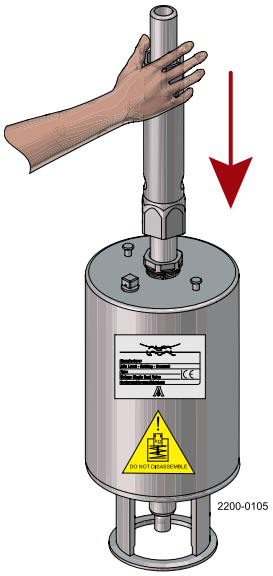


Step 7

Fit the aligning spindle to the actuator spindle, and then mount the socket wrench.



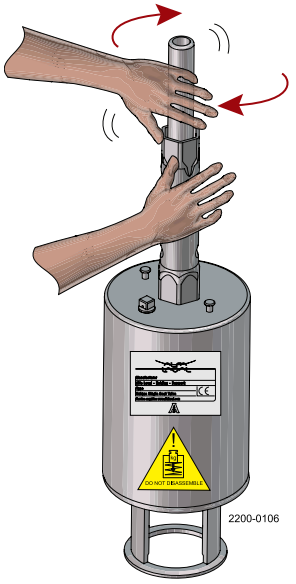
Aligning spindle



Socket wrench

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

Step 8
Now pull the aligning spindle to centre the actuator spindle. In this position rotate the **bushing** 180° backwards and then begin to fasten the bushing. Make sure that the thread catches evenly!
The bushing must only be tightened with a torque of 10 Nm (7 lb-ft) which can be done by turning “hard” by hand.

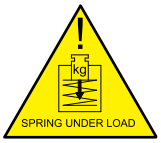


Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.7 Dismantling of fully maintainable actuator (removable yoke with bolts/2006-June 2016)

If the actuator is marked with a danger warning, do **NOT** attempt to cut the actuator open.
See also section

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



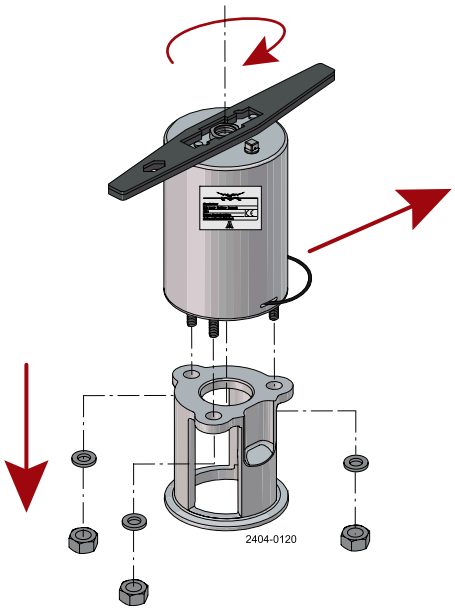
Do **NOT** attempt to cut the actuator open due to spring under load danger!

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

1. Rotate cylinder.
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 A/A actuator has no spring assembly.

Rotate cylinder with service tool.

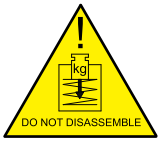


5 Maintenance

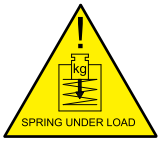
Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.8 Assembly of optional maintainable actuator

If the actuator is marked with a danger warning, do **NOT** attempt to cut the actuator open.
See also section



Do **NOT** attempt to disassemble the actuator due to spring under load danger!

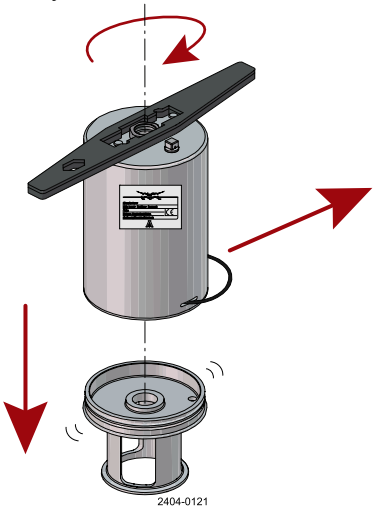


Do **NOT** attempt to cut the actuator open due to spring under load danger!

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

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

Rotate cylinder with service tool.



5.9 Mounting of fully maintainable actuator

Depending on type of actuator choose step 1 or step 2.

Step 1
Reverse order of
Tighten nuts to a torque of 17 Nm.
Lubricate O-rings (3, 7, 11) with Molykote Longterm 2 plus before fitting.
Tighten bushings with a torque = 10 Nm and be careful not to overtightened. See also

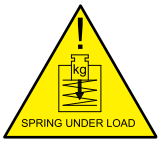
Step 2
Reverse order of
Lubricate O-rings (3, 7, 11) with Molykote Longterm 2 plus before fitting.
Tighten bushings with a torque = 10 Nm and be careful not to overtightened. See also

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.

5.10 Changing pneumatic movement on fully maintainable actuator (NC/NO)

If the actuator is marked with a danger warning, do **NOT** attempt to cut the actuator open.
See also section .

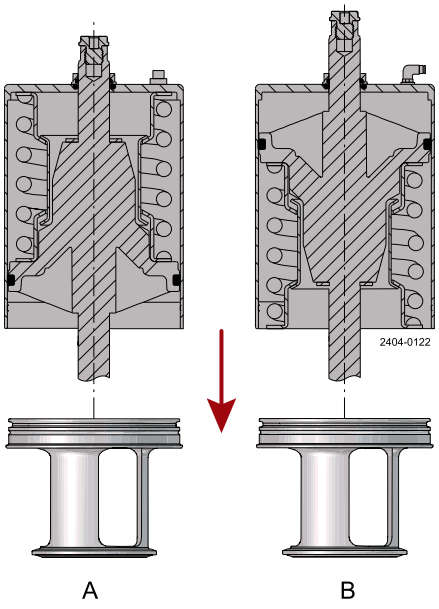
Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open due to spring under load danger!

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

1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Reverse piston and spring assembly.
4. Reverse adapter, air fitting and plug to opposite end.
5. Reassemble in reverse order (3 to 1).



A. = Pneumatic movement - upwards (NC)
B. = Pneumatic movement - downwards (NO)

6 Technical data

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

6.1 Technical data positioner

The valve is remote-controlled by a digital electro-pneumatic process controller. It has few and simple moveable parts which results in a very reliable valve.

Material:	
Body	PPS, Stainless Steel
Cover	PC
Sealing	EPDM
Power supply	24 VDC +/- 10%
Ripple	10%, no technical direct current
Setpoint setting	4 to 20 mA
Output resistance	180
Control medium:	Neutral gases, air DIN ISO 8573-1
Dust concentration	Class 5 (<40µm particle size)
Particle density	Class 5 (<10mg/m^3)
Pressure condensation point	Class 3 (<-20°C/68°F)
Oil concentration	Class 5 (<25mg/m^3)
Ambient temperature	0 to +60°C/32 to 140°F
Pilot air ports	Push-in connector (external ø6 mm or 1/4") or threaded ports G1/8
Supply pressure	Low air flow rate 5 to 7 bar [1)]
Air input filter	Exchangeable (mesh aperture~0.1mm)
Position detection module	Contact-free, wear-free
Stroke range valve spindle	3 to 28 mm
Installation	As required, preferably with actuator in upright position
Protection class	IP 65/67 according to EN 60529 (NEMA4x in preparation)
Power consumption	< 3.5 W
Electrical connection:	
Cable gland (in preparation)	1xM16x1.5 (cable-ø5-10mm), terminal screws (1.5 mm^2)
Protection class	3 according to VDE 0580
Conformity	EMC directive 2014/30/EU

1) The supply pressure has to be 0.5-1 bar / 7.25-14.5 PSI above the minimum required pilot pressure for the valve actuator.

6.2 Technical data - valve/actuator

Data - valve/actuator	
Max. product pressure	10 bar (1000 kPa) (145 psi)
Min. product pressure	Full vacuum (depending on product specifications)
Temperature range	-10°C to + 140°C / 14 to 284°F (standard EPDM seal)
Air pressure, actuator	5 to 7 bar (500 to 700 kPa) (72.5 to 101.5 psi)
Materials - valve/actuator	
Product wetted steel parts	AISI 316L (internal Ra < 0.8 / 31.5 µin)
Other steel parts	AISI 304
Product wetted seals	EPDM (standard)
Optional product wetted seals	HNBR and FPM
Other seals	NBR

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Weight (kg)

Size	25 mm	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm	DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
Weight (kg)	3.1	7.3	9.5	10.5	16.4	18.6	3.2	7.3	9.5	10.5	16.4	18.6

Safety check
A visual inspection of any protective device (shield, guard, cover or other) on the supplied 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.

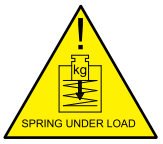
7 Parts list and service kits

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

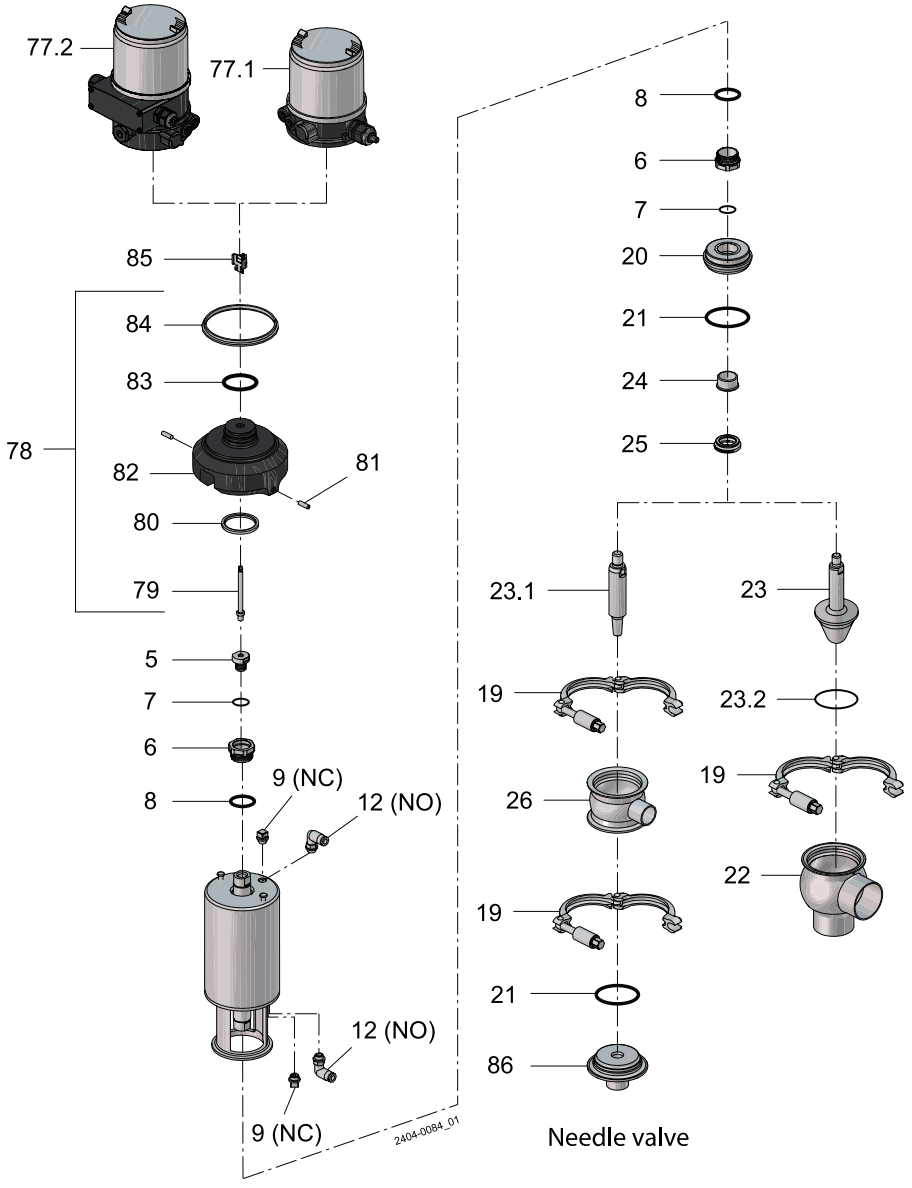
7.1 Unique RV-ST Regulating Valve (sizes 25mm-51mm/DN25-DN50)

If the actuator is marked with a danger warning do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open, due to spring under load danger!



It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Parts list

Pos.		Qty	Denomination
			Actuator
6	□	2	Bushing
7	□	2	O-ring
8	□	2	O-ring
9		1	Plug
12		1	Air fitting
		1	Clamp
20		1	Bonnet
21	♦	2	O-ring
22		1	Valve body, lower
23		1	Needle
		1	Plug, Kv 4
		1	Plug, Kv 6
		1	Plug, Kv 10
		1	Plug, Kv 14
		1	Plug, Kv 16
		1	Plug, Kv 44
		1	Plug, Kv 25
		1	Plug, Kv 9
		1	Plug, Kv 30
		1	Plug, Kv 51
		1	Plug, Kv 75
		1	Plug, Kv 4
		1	Plug, Kv 6
		1	Plug, Kv 10
		1	Plug, Kv 14
		1	Plug, Kv 16
		1	Plug, Kv 25
		1	Plug, Kv 44
		1	Plug, Kv 9
		1	Plug, Kv 30
		1	Plug, Kv 51
		1	Plug, Kv 75
		1	Plug, Kv 4
		1	Plug, Kv 6
		1	Plug, Kv 10
		1	Plug, Kv 14
		1	Plug, Kv 16
		1	Plug, Kv 44
		1	Plug, Kv 25
		1	Plug, Kv 9
		1	Plug, Kv 30
		1	Plug, Kv 51
		1	Plug, Kv 75
		1	Plug, Kv 4
		1	Plug, Kv 6
		1	Plug, Kv 10
		1	Plug, Kv 14
		1	Plug, Kv 16
		1	Plug, Kv 25
		1	Plug, Kv 44
		1	Plug, Kv 9
		1	Plug, Kv 30
		1	Plug, Kv 51
		1	Plug, Kv 75
		1	Plug, Kv 14
		1	Plug, Kv 16
		1	Plug, Kv 25
		1	Plug, Kv 44
		1	Plug, Kv 9
		1	Plug, Kv 30
		1	Plug, Kv 51
		1	Plug, Kv 75
		1	Plug, Kv 4
		1	Plug, Kv 6
		1	Plug, Kv 10

7 Parts list and service kits

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Service kits

	Denomination	25 mm DN25 Needle	25 mm DN25 Standard	DN40 38 mm	DN50 51 mm
□	**Service kit, actuator**	**9611926500**	**9611926500**	**9611926500**	**9611926500**
	Service kits for product wetted parts				
♦	**Service kit, EPDM**	**9611926958**	**9611926961**	**9611926502**	**9611926503**
♦	**Service kit, HNBR**	**9611926959**	**9611926962**	**9611926508**	**9611926509**
♦	**Service kit, FPM**	**9611926960**	**9611926963**	**9611926514**	**9611926515**

Parts marked with □ are included in the service kits (actuator)
Parts marked with ♦ are included in the service kits (product wetted parts)

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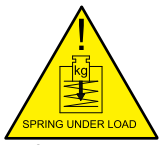
It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

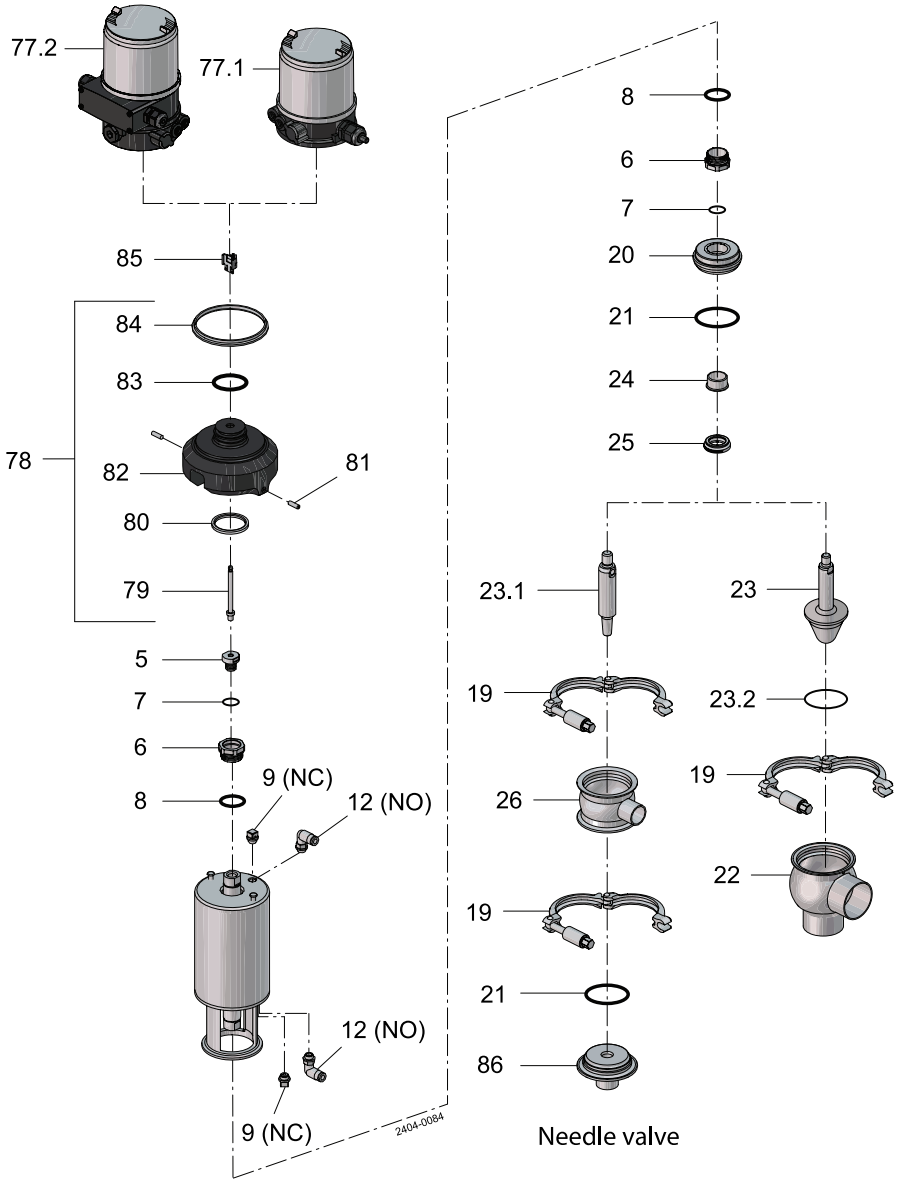
7.2 Unique RV-ST Regulating Valve (sizes 63.5mm-101.6mm/DN65-DN100)

If the actuator is marked with a danger warning do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open, due to spring under load danger!



7 Parts list and service kits

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Parts list

Pos.		Qty	Denomination
			Actuator, complete (NO)
			Actuator, complete (NC)
			Actuator, complete (A/A)
			Actuator, complete (NO) - US
			Actuator, complete (NC) - US
			Actuator, complete (A/A) - US
6		2	Bushing
7		2	O-ring
8		2	O-ring
9		1	Plug
12		1	Air fitting
		1	Air fitting - US
19		2	Clamp
		1	Clamp
20		1	Bonnet
21	♦	2	O-ring
22		1	Valve body, lower
24		1	Bushing
25	♦	1	Lip seal
76		1	Positioner 8694 (incl. Pos. 77 to 85) - without display
		1	Positioner 8692 (incl. Pos. 77 to 85) - with display
		1	Positioner 8694 (incl. Pos. 77 to 85) - US - without display
		1	Positioner 8692 (incl. Pos. 77 to 85) - US - with display
77.1		1	Positioner 8694 without display
		1	Positioner 8692 with display
77.2		1	Positioner 8694 without display - US
		1	Positioner 8692 with display - US
78		1	Adapter, cpl. (incl. Pos. 79 to 84)
79		1	Spindle
80		1	Special X-ring
81		2	Allen screw
82		1	Adapter
83		1	O-ring
84		1	Gasket for adapter
85		1	Puck sensorpad, cpl.
99		1	Puck sensorpad, cpl. (Green)

Service kits

	Denomination	63.5 mm DN65	76.1 mm DN80	101.6 mm DN100
□	**Service kit, actuator**	**9611926500**	**9611926500**	**9611926500**
	Service kits for product wetted parts			
♦	**Service kit, EPDM**	**9611926504**	**9611926505**	**9611926506**
♦	**Service kit, HNBR**	**9611926510**	**9611926511**	**9611926512**
♦	**Service kit, FPM**	**9611926516**	**9611926517**	**9611926518**

Parts marked with □ are included in the service kits (actuator)
Parts marked with♦are included in the service kits (product wetted parts)
Tool for bushing (pos. 24) 9613160901

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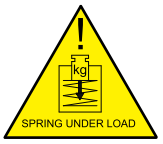
7 Parts list and service kits

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

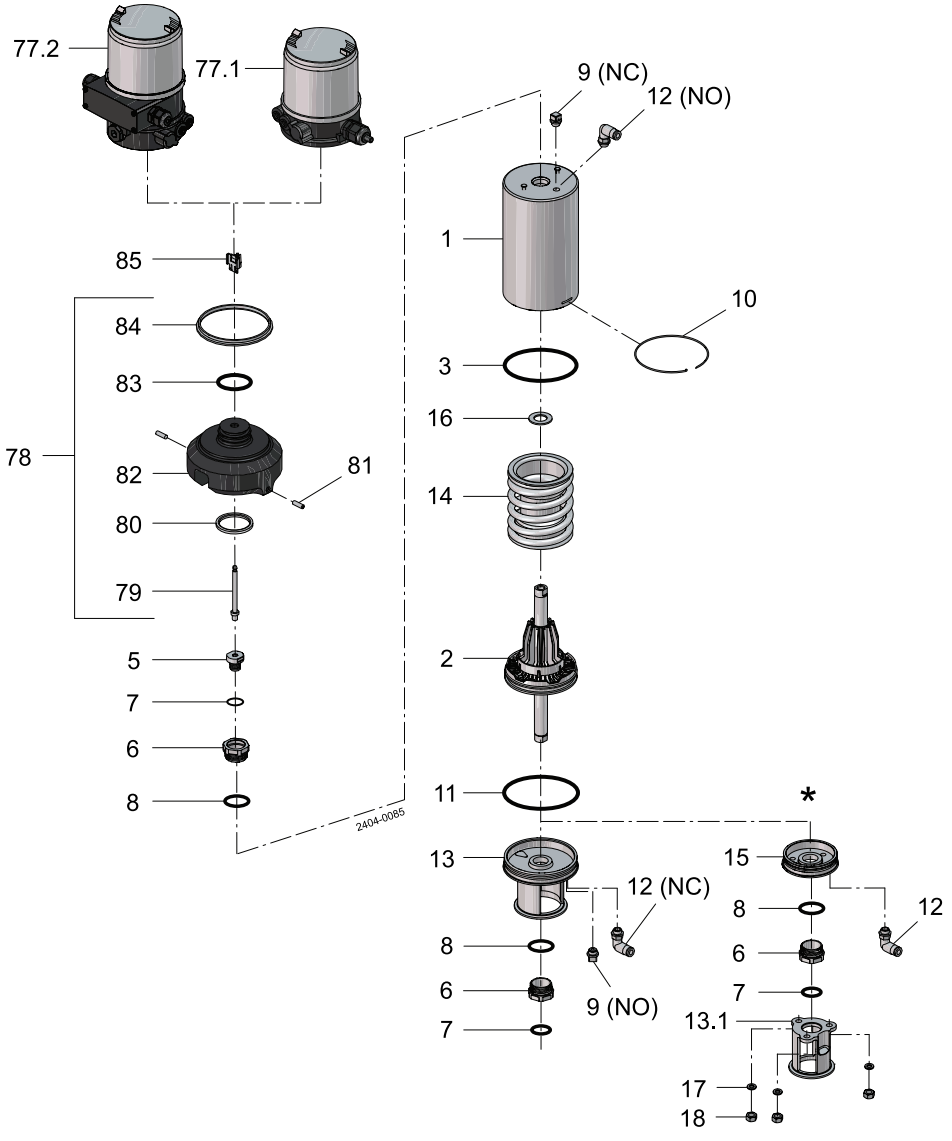
7.3 Maintainable actuator (sizes 25mm-51mm/DN25-DN50)

If the actuator is marked with a danger warning do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open, due to spring under load danger!



*) “Removable yoke bolts” version, product from 2006 to June 2016.
Replaced by “yoke without bolts” (13)

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Parts list

Pos.		Qty	Denomination
			Actuator
1		1	Cylinder
2		1	Piston
3	•	1	O-ring
6	•	2	Bushing
7	•	2	O-ring
8	•	2	O-ring
9		1	Plug
10		1	Lock wire
11	•	1	O-ring
12		1	Air fitting
13		1	Yoke without bolts (0616 -)
13.1		1	Yoke (- 0616)
14		1	Spring assembly
15		1	Bottom (- 0616)
16	•	1	Support disc
17		3	Washer (- 0616)
18		3	Nut (- 0616)
76		1	Positioner 8694
77.1		1	Positioner 8694 without display
77.2		1	Positioner 8694 without display - US
78		1	Adapter, cpl. (incl. Pos. 79 to 84)
79		1	Spindle
80		1	Special X-ring
81		2	Allen screw
82		1	Adapter
83		1	O-ring
84		1	Gasket for adapter
85		1	Puck sensorpad, cpl.

Service kits

	Denomination	25 mm DN25 Needle	25 mm DN25 Standard	DN40 38 mm	DN50 51 mm
•	**Service kit, actuator**	**9611926497**	**9611926497**	**9611926497**	**9611926498**

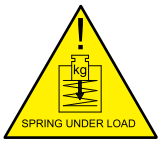
7 Parts list and service kits

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

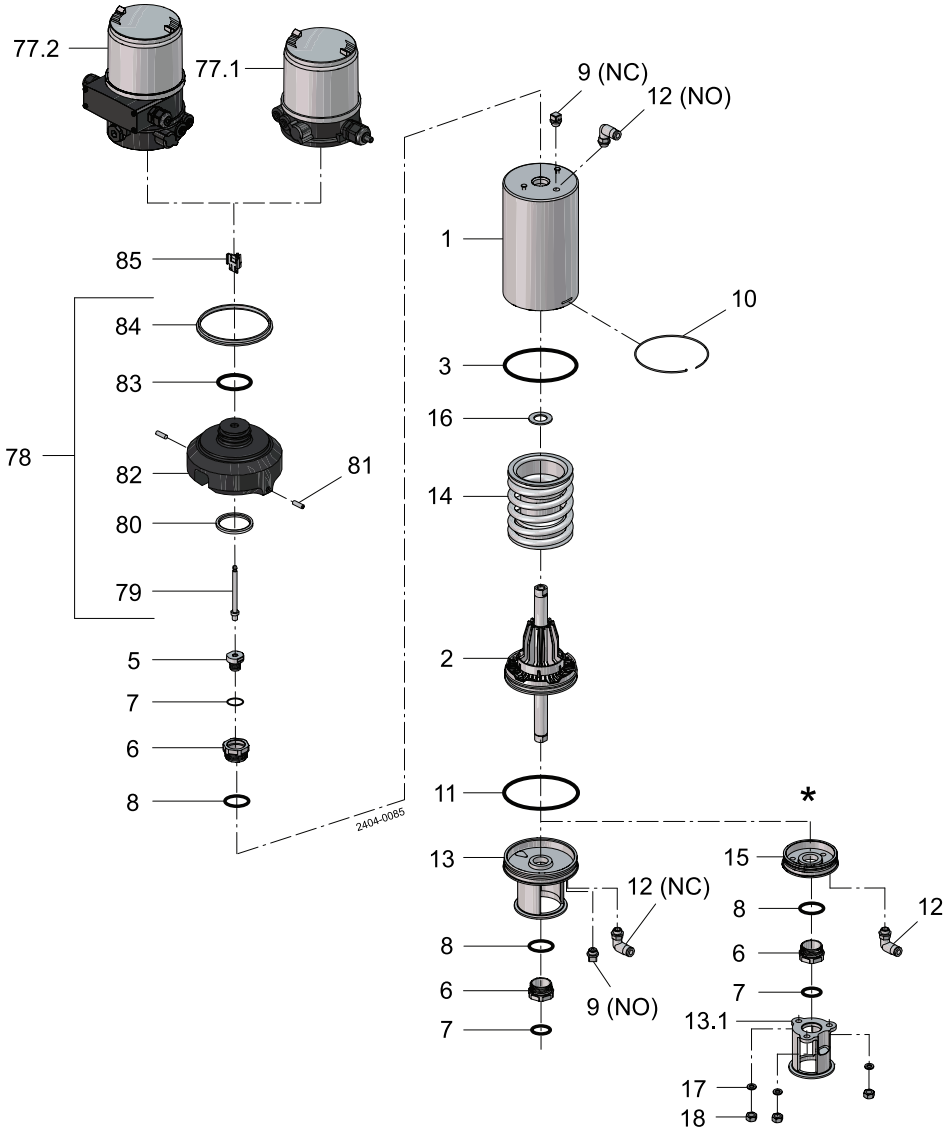
7.4 Maintainable actuator (sizes 63.5mm-101.6mm/DN65-DN100)

If the actuator is marked with a danger warning do **NOT** attempt to cut the actuator open.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!



Do **NOT** attempt to cut the actuator open, due to spring under load danger!



*) “Removable yoke bolts” version, product from 2006 to June 2016.
Replaced by “yoke without bolts” (13)

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.

Parts list

Pos.		Qty	Denomination
			Actuator
1		1	Cylinder
2		1	Piston
3	•	1	O-ring
6	•	2	Bushing
7	•	2	O-ring
8	•	2	O-ring
9		1	Plug
10		1	Lock wire
11	•	1	O-ring
12		1	Air fitting
13		1	Yoke without bolts (0616 -)
13.1		1	Yoke (- 0616)
14		1	Spring assembly
15		1	Bottom (- 0616)
16	•	1	Support disc
18		3	Nut (- 0616)
76		1	Positioner
77.1		1	Positioner 8694 without display
77.2		1	Positioner 8694 without display - US
78		1	Adapter, cpl. (incl. Pos. 79 to 84)
79		1	Spindle
80		1	Special X-ring
81		2	Allen screw
82		1	Adapter
83		1	O-ring
84		1	Gasket for adapter
85		1	Puck sensorpad, cpl.

Service kits

	Denomination	63.5 mm DN65	76.1 mm DN80	101.6 mm DN100
•	**Service kit, actuator**	**9611926498**	**9611926499**	**9611926499**

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.