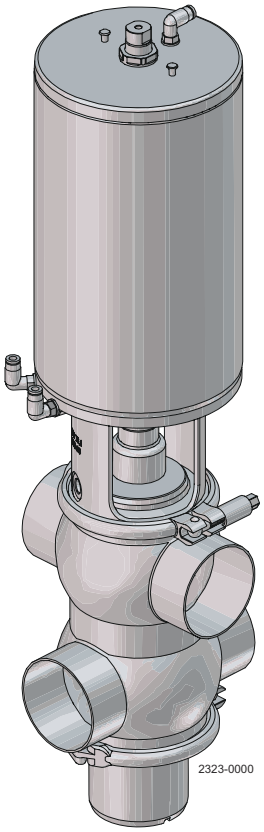
Alfa Laval Unique Mixproof Process

Double Seat valves



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Instruction Manual

BRITISH ENGLISH

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
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The original instructions are in English

Contents

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 PROCESS

Type

1181354-9999999, AAX000000001-AAX999999999.

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. Diameters ≥ DN125 may not be used for fluids Group 1.*

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

Vice President BU Hygienic Fluid Handling Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2025–05–01
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_ 02_052025 / This Declaration of Conformity replaces Declaration of Conformity dated 2024–08–01

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 PROCESS

Type

1181354-9999999, AAX000000001-AAX999999999.

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. Diameters ≥ DN125 may not be used for fluids Group 1.*

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

Vice President BU Hygienic Fluid Handling Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2025–05–01
Place	Date (YYYY-MM-DD)

DoC Revison_ 02_052025

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

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

Transportation and Lifting

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

Installation

	If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the valve is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them. **Always** assemble the valve completely before startup and make sure everything is in place and correctly tightened.
	**Never** work on the valve or touch moving parts if the actuator is supplied with compressed air. **Always** ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before installation, inspection, assembly, or dismantling of the valve.
	Do **NOT** attempt to disassemble or by other means open the actuator due to spring under load danger!

Operation

	**Never** operate the valve unless a correct installation has been verified. **Never** dismantle the valve during operation or when pressurized. **Never** pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing). **Never** throttle the leakage outlet. **Never** throttle the CIP outlet, if supplied.
	**Never** touch the valve or pipelines when hot.
	**Always** rinse well with clean water after cleaning. **Always** handle lye and acid with great care. **Always** follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.
	**Never** touch moving parts of the valve during operation. **Always** release compressed air after use.

Maintenance

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

- Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation
- **Preventive maintenance:** visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts
- **Repairs:** unscheduled break down of a component, often causing the system to stop. Damaged components must be replaced
- **Stock of Alfa Laval genuine spare parts:** Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing downtime in case of unplanned break downs

Always fit the seals correctly.

Always remove the CIP connections, if supplied, before service.

Always release compressed air after use.

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

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

Do **NOT** attempt to disassemble or by other means open the actuator due to spring under load danger!

Never pressurize the valve/actuator when the valve is serviced **unless specifically prescribed.**

Never service the valve with valve and pipelines under pressure **unless specifically prescribed.**

Storage

Alfa Laval recommend:

- Store the supplied Alfa Laval product as supplied in original packaging
- Port opening(s) should be protected against any ingress
- Store in a clean, dry place without direct sunlight or UV light
- Temperature range -5 °C to +40 °C (23 °F - 104 °F)
- Relative humidity less than 60%
- No exposure to corrosive substances (including contained air)

Noise

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

Hazards

Burn Hazard

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

Corrosive Hazard

- Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids
- When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.

Cut Hazard

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

Crushing Hazard

- Avoid placing hands into valve orifice pinch points

Safety check

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

Inspection acceptance criteria:

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

Procedure in case of non-acceptance:

- Fix and/or replace the protective device

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

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

DANGER

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

WARNING

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

CAUTION

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

NOTE

Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

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

Trainees

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

People in general

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

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

2.5 Recycling Information

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!

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 Mixproof Process valve is a versatile, double block-and-bleed valve that enables the simultaneous flow of two products or fluids through the same valve in valve matrices and pipelines without the risk of cross-contamination. This double seat valve with seat lift is a compact, cost-effective version of the premium Alfa Laval Unique Mixproof valve. High cleanability, the ability to withstand pressure peaks and its fit-for-purpose components make this valve a great addition to dairy, food and beverage applications. It comes in various sizes to meet your fundamental hygienic processing requirements.

3.1 General Information

The valve is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve.

The valve has two independent plug seals, forming a leakage chamber between them under atmospheric pressure during every working condition. In case of rare accidental leaking of product, this will flow into the leakage chamber and be discharged through the leakage outlet.

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4 Installation

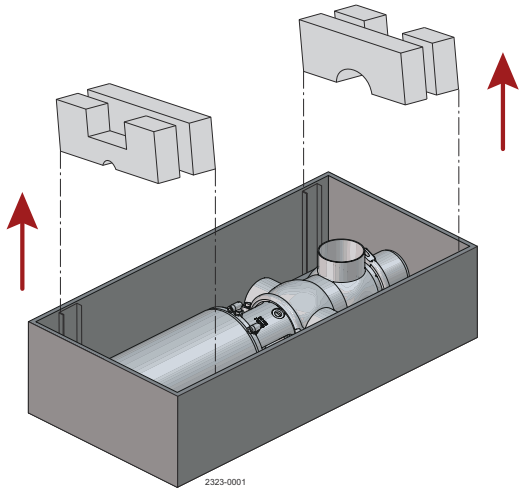
4.1 Unpacking/intermediate storage

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking. Check the delivery for:

1. Complete valve
2. Delivery note
3. Warning label

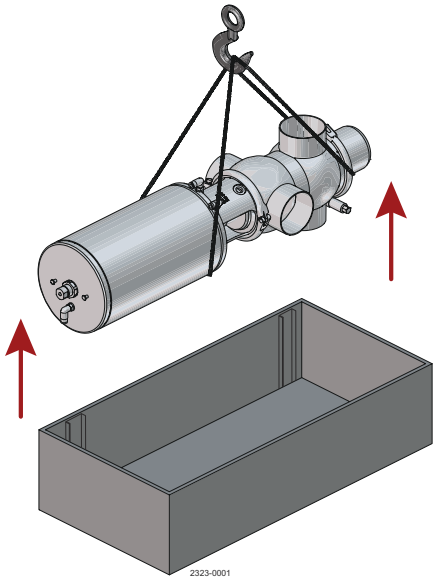
1 Remove upper support



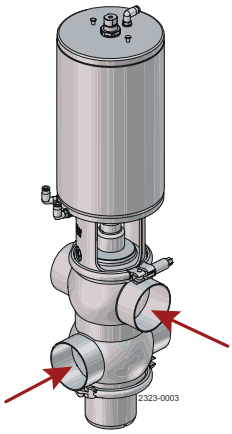
2 Lift out the valve.

NOTE

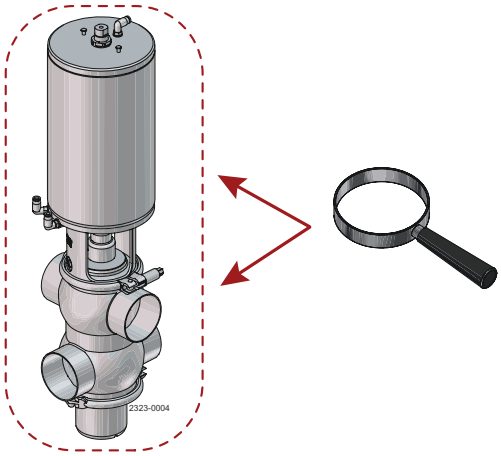
Please note weight of valve as printed on box.



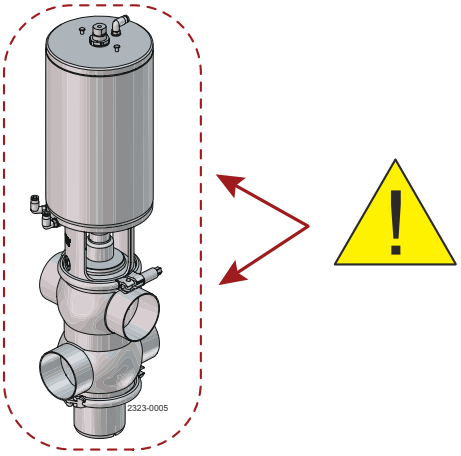
3 Remove possible packing materials from the valve ports.



4 Inspect the valve for visible transport damages



5 Avoid damaging the air connections, the leakage outlet, the valve ports, if supplied.



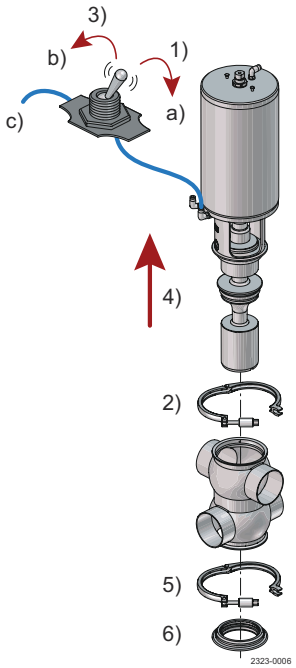
6 Disassemble according to illustrations 1 to 6 (please also see *Dismantling the valve*).

1. Supply compressed air
2. Remove upper clamp
3. Release compressed air
4. Lift out actuator with plugs
5. Remove lower clamp
6. Take away lower bonnet

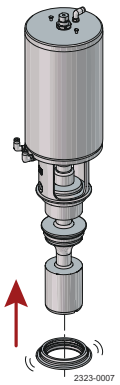
a = On

b = off

c = air

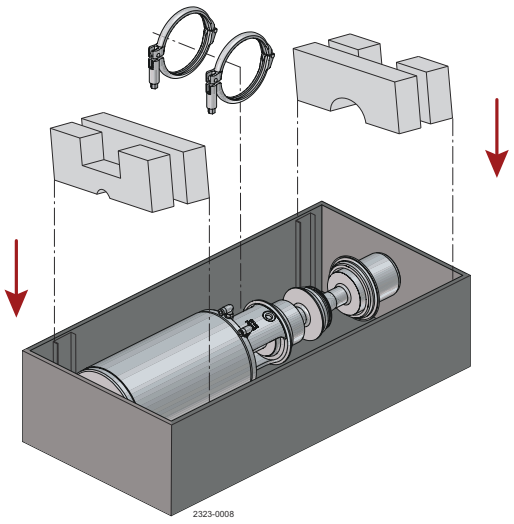


7 Mount lower bonnet on valve.



8

1. Place actuator part in the box
2. Add supports
3. Close box and store
   Advise!
   Mark the valve body and box with the same number before intermediate storage.



4.2 Installation

NOTE

Study the instructions carefully.

Always read the technical data carefully. See *Technical data*.

WARNING

Always release compressed air after use.

Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

NOTE

Always install the valve vertically.

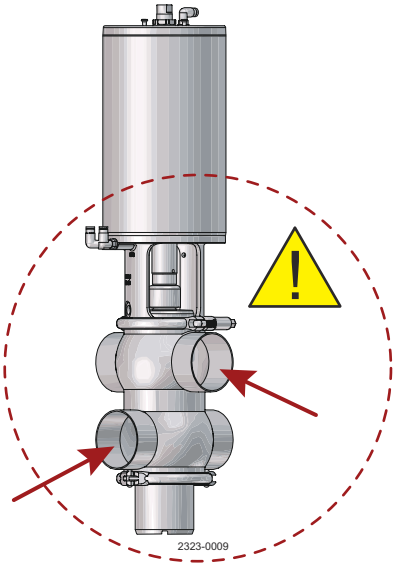
The leakage outlet must be turned downwards!

Fit the warning label supplied on the valve after installation so that it is normally visible.

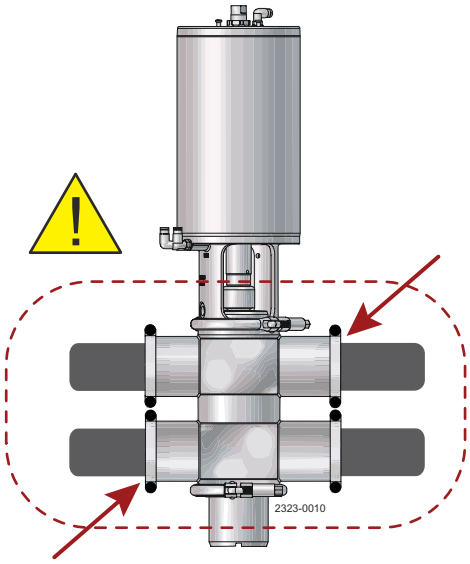
1 Avoid stressing the valve as this can result in deformation of the sealing area and misfunction of the valve (leakage or faulty indication).

Pay special attention to:

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



2 Fittings: Ensure that the connections are tight.

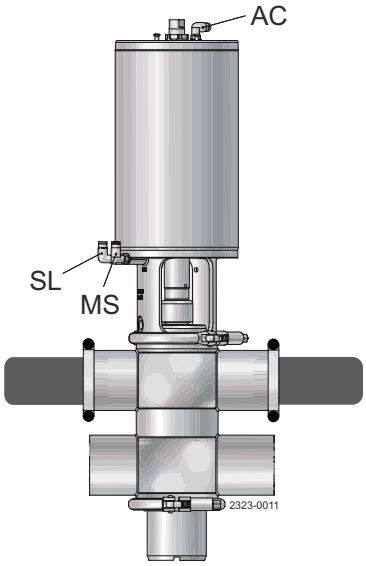


3 Air connection: R 1/8” (BSP).

AC = Lower seatlift

SL = Upper seatlift

MS = Mainstroke



4.3 Welding

NOTE

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

The valve has ends for welding as standard.

Weld carefully/aim at stressles welding to avoid deformation on sealing areas.

Check for valve for smooth operation after welding.

WARNING

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

1. Dismantle the valve in accordance with Step 1 in *Dismantling the valve*.

2. **NOTE**

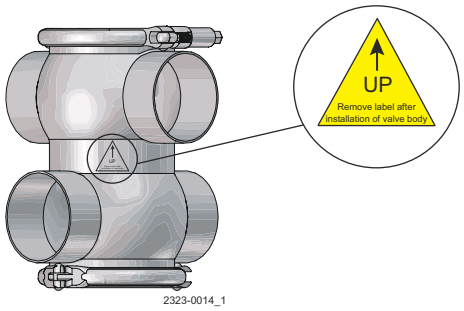
   Maintain the minimum clearances so that the actuator with the internal valve parts can be removed - please see later this section!

   WARNING

   If there is a risk of foot damage, Alfa Laval recommends to leave a distance of 120 mm / 4.7" below the valve (look at the specific built-in conditions).

3. **WARNING**

   Make sure to turn the valve body correctly - conical valve seat upwards.



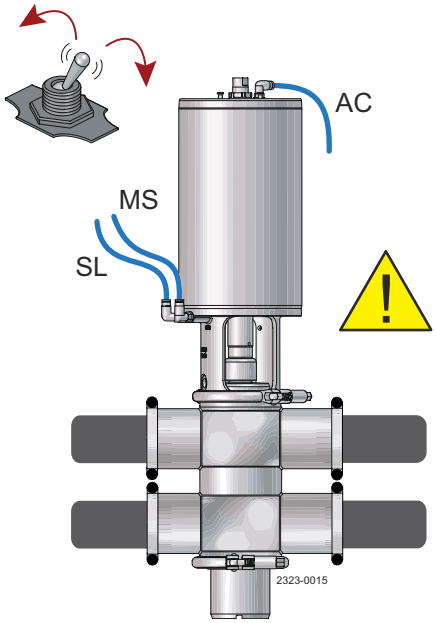
4. Assemble the valve in accordance with *Valve assembly* after welding. Pay special attention to the warnings!

5 **Pre-use check:**

a) Supply compressed air to MS, SL and AC one by one

b) Operate the valve several times to ensure that it runs smoothly

Pay special attention to the warnings!



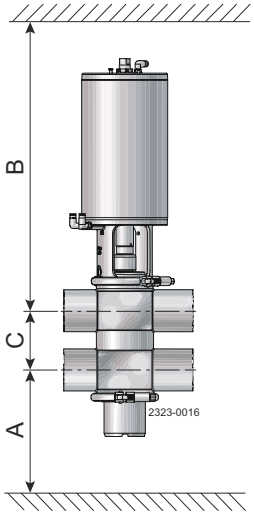
NOTE

If ThinkTop® is mounted, add 180 mm / 7.1" to B measure.

Table 1

a) Lower sealing element can be removed without taking out actuator and internal valve parts

b) Actuator and internal valve parts can be lifted out of the valve body



All measures in mm (1mm = 0.0394")

Size	ISO DN/OD						DIN DN					
	25	38	51	63.5	76.1	101.6	25	40	50	65	80	100
A	115	118	136	147	174	174	115	118	136	147	174	174
B	505	533	556.0	590.4	725.0	779.8	509	536	559.3	599.0	737.1	783.3
C[1]	47.8	60.8	73.8	86.3	98.9	123.6	52	64	76	92	107	126

[1] The measure C can always be calculated by the formula C = ½ ID upper + ½ ID lower + 26 mm (1").

NOTE

If ThinkTop® is mounted, add 180 mm /7.1" to B measure.

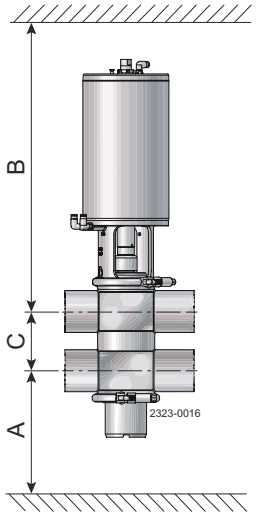


Table 2

a) Lower sealing element can only be dismantled if actuator and internal parts are removed.

	ISO						DIN					
Size	**DN/OD**						**DN**					
	25	**38**	**51**	**63.5**	**76.1**	**101.6**	**25**	**40**	**50**	**65**	**80**	**100**
A	90	93	111	122	149	149	90	93	111	122	149	149

5 Operation

5.1 Operation

NOTE

The valve is adjusted and tested before delivery.

Always read the technical data carefully. See *Technical data*

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

Pay attention to possible fault.

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

WARNING

Always release compressed air after use.

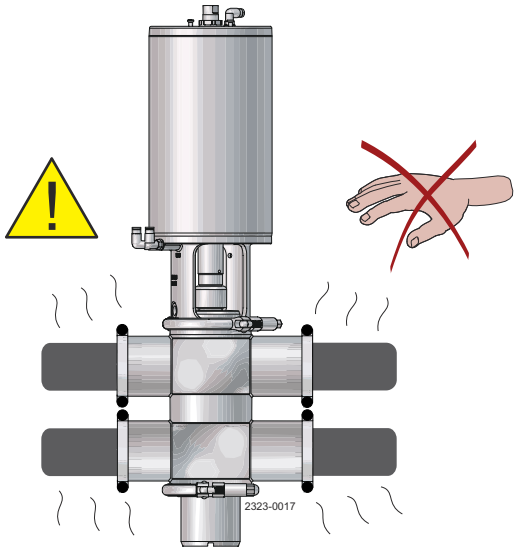
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).

Never pressurise air connections simultaneously as both valve plugs can be lifted (can cause mixing).

WARNING

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

The valve is adjusted and tested before delivery.



CAUTION

Alfa Laval cannot be held responsible for incorrect operation.

5.2 Fault finding and repair

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

Pay attention to possible fault.

The item refer to the part s list.

NOTE

Study the maintenance instructions carefully before replacing worn parts.

Problem	Cause/result	Repair
Leakage between sealing element (58) and lower plug (57)	Worn/product affected O-rings/ lip seal	• Replace the O-rings/lip seal (46/48) • Change rubber grade • Lubricate correctly
Leakage at the leakage outlet	• Particles between valve seats and plug • Worn/product affected plug seal rings • Plug not assembled correctly	• Remove the particles seals (51/56) • Check the plug seals • Replace the plug seals (51/56) • Change rubber grade • Plug not assembled correctly • Assemble plug, see step 3 section 5.5
Leakage at sealing element (47)/upper plug (50)	Worn/product affected O-rings/lip seal (46/48/55/61)	• Replace the O-rings/lip seal • Change rubber grade • Clean and if necessary replace guide ring (45)
Leakage at clamp (53)	• Too old/product affected O-rings (and 46 if clamped valve body) • Loose clamp (53)	• Change rubber grade • Tighten the clamp
CIP leakage	Worn O-rings (60)	Replace the O-rings
Leakage at spindle clamp (53)	Damaged O-ring (61) Worn/product	• Replace the O-ring affected lip seal (52) or spray nozzle (69) • Replace the plug seals • Change rubber grade
Lower plug not returning to closed position	• Wrong rubber grade • Wrongly fitted gasket • Mounted incorrectly (see section 2.3)	• Change rubber grade • Fit new gasket correctly • Correct installation
Plug returns with uneven movements (slip/stick effect)	• Wrong rubber grade • Wrongly fitted gasket • Mounted incorrectly (see section 2.3)	• Change rubber grade • Fit new gasket correctly • Correct installation

5.3 Recommended Cleaning

WARNING **Risk of burns!**

Never touch the supplied product or the pipelines when sterilizing.

CAUTION

Always handle lye and acid with great care.

NOTE

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

NaOH = Caustic soda.

HNO_3 = Nitric acid.

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

Recommended min. velocity for CIP: 1.5 m/sec.

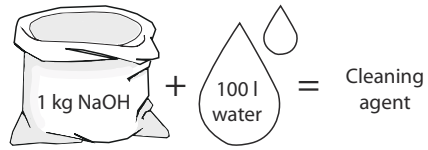
Examples of cleaning agents

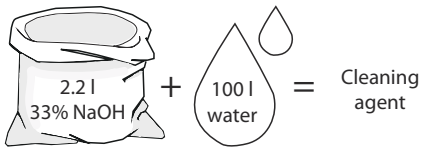
NOTE

Use clean water free from chlorides.

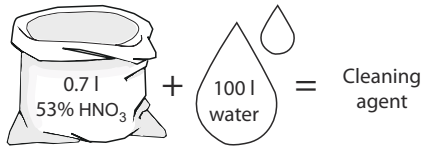
Metric System

1. 1% by weight NaOH at 70°C



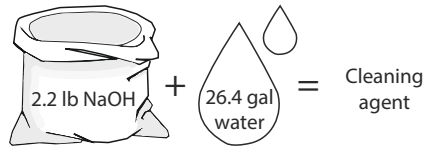


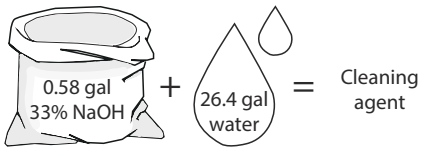
2. 0.5% by weight HNO_3 at 70°C



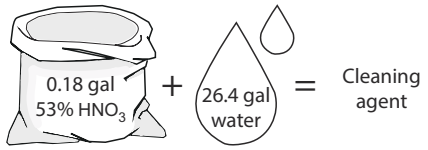
Imperial System

1. 1% by weight NaOH at 158°F





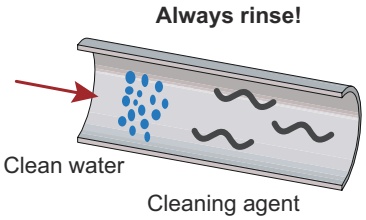
2. 0.5% by weight HNO_3 at 158°F



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.



5.3.1 Cleaning procedure

NOTE

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

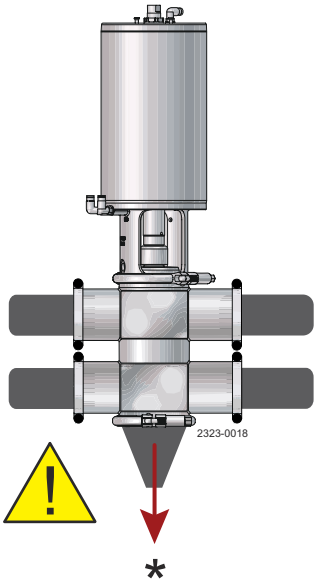
Internal leakage in the valve is externally visible by means of the leakage outlet.

WARNING

Never throttle the leakage indicator.

Never throttle the CIP outlet, if supplied. (Risk of mixing due to pressure build up).

* Leakage/CIP out



1 Valve pneumatic operation during cleaning in place.

Each valve seat shall be lifted during the length of the cleaning cycle. Seat lift durations shall not exceed 10 seconds.

These pneumatic functions include:

1. Upper valve seat lift (takes place during cleaning of upper valve body)
2. Lower valve seat push (takes place during cleaning of lower valve body)

The following chart presents an overview of these functions together with the recommended time durations at 21 psi / 1.5 bar CIP pressure. It is recommended to do seat lift/push in the middle of each step in the CIP sequence.

2

CIP event @ length per valve	Valve function	ThinkTop solenoid valve no.	ThinkTop solenoid valve mode	PLC timer seat lift/ push time	Burst seat clean time	Number of lifts/ push in each CIP step
Warm pre-rinse	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
@ 3 minutes	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
Hot alkaline wash	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
@ 10 minutes	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
Cold post wash	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
@ 3 minutes	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
Acidified rinse	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
@ 3 minutes	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
Cold final rinse	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
@ 3 minutes	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1

[1] Value depends on valve size, CIP pressure, product type, fat and sugar content. PLC timer is a recommended value Is a position based seat lift/push, value is with 6 bar air pressure. Feedback signal high for min. 2 sec. Value depends on sufficient CIP liquid pressure, product type, fat and sugar content

Validation of cleanliness is mandatory to ensure product safety.

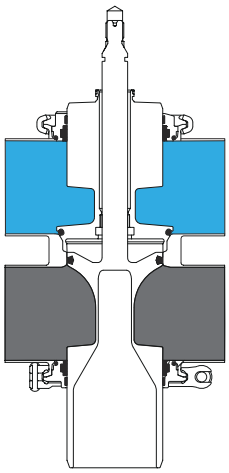
Variations caused by compressed air are typically:

- Long air supply hoses
- Small inner diameter on air supply hoses
- Limited availability of compressed air

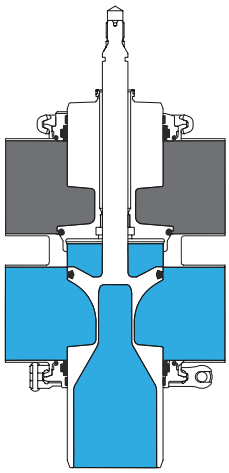
3 **Seat-cleaning cycles:**

Pay special attention to the warnings!

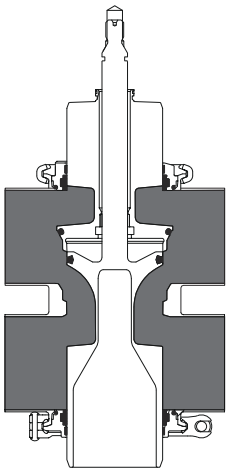
Closed valve



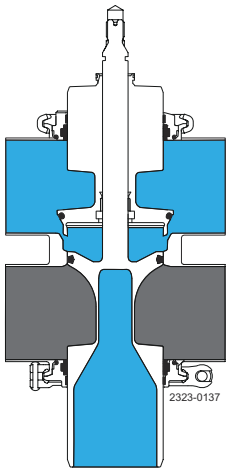
Cleaning through lower line



Open valve



Cleaning through upper line



6 Maintenance

6.1 General maintenance

NOTE

Maintain the valve/actuator regularly.

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

Always use Alfa Laval genuine spare parts, and keep rubber seals and guide rings in stock.

Internal leakage in the valve is externally visible.

Check the valve for smooth operation after service.

Always read the technical data carefully. See *Technical data*.

All scrap must be stored/discharged in accordance with current rules/directives.

WARNING

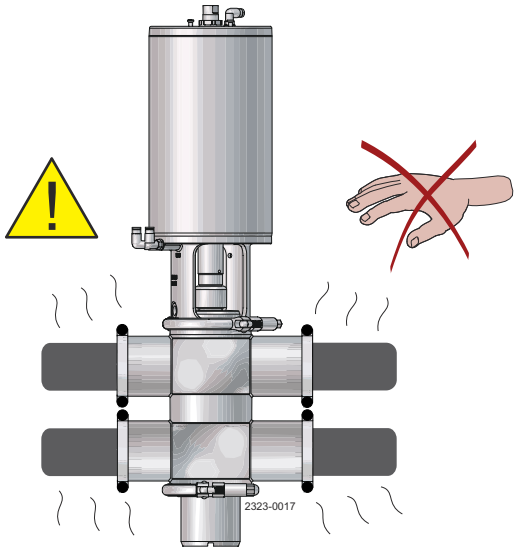
Always fit the seals correctly (risk of mixing).

Always release compressed air after use.

WARNING

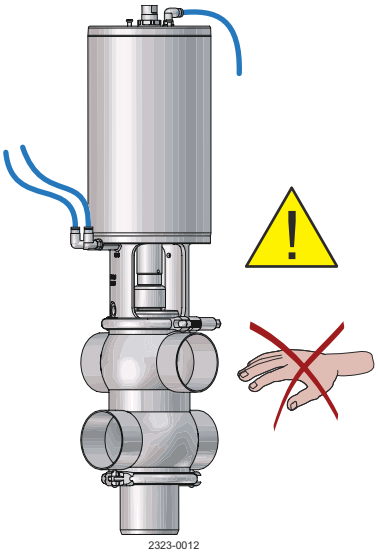
Never service the valve when it is hot.

Never service the valve with valve/actuator under pressure.



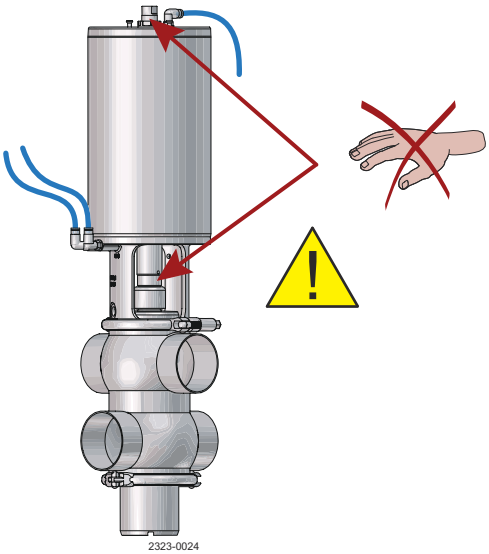
WARNING

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



WARNING

Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).



6.2 Actuator Bushing Replacement (Non-maintainable Actuator)

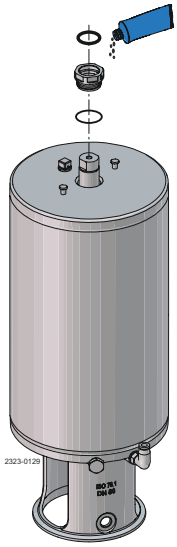
WARNING

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

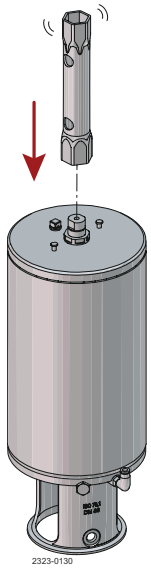
- The actuator service kit contains one bushing and two O-rings
- Mount the thick O-ring inside and the thin O-ring outside the bushing
- Lubricate the stem and O-rings with "Molykote Longterm 2 Plus" or an equivalent grease before sliding the new bushing onto the actuator stem



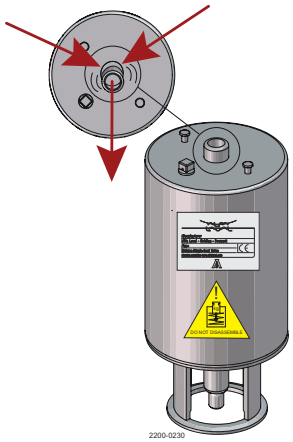
Introduction - Standard tubular box wrench

Use a 27 mm(1 1/16") tubular box wrench to unmount 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.



Spindle forced off centre by spring inside actuator



Introduction - Aligning spindle

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

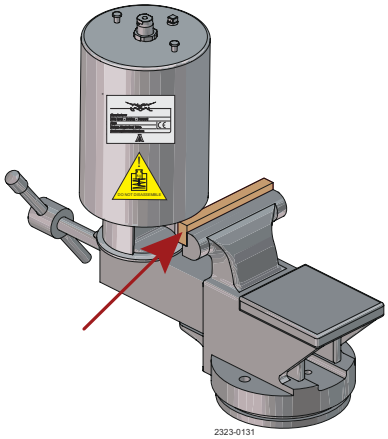
In cases with misalignment of the actuator stem in relation to the bushing thread, as shown, the tubular box wrench together with a spindle for alignment and an adapter are a great help and will ensure a reliable mounting of the bushing.

The aligning spindle can be purchased from Alfa Laval (**9614198401**) which also include a 27 mm(1 1/16") tubular box wrench.

1

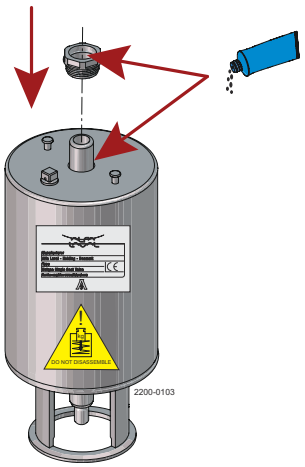
The actuator must be fixed in a vice, Alfa Laval recommend use of soft jaws.

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



2

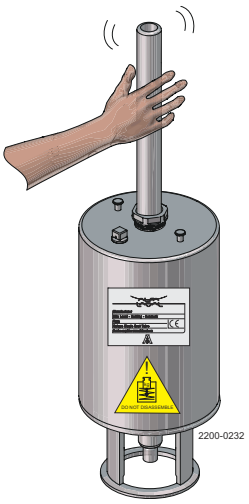
Slide the lubricated bushing onto the actuator stem.



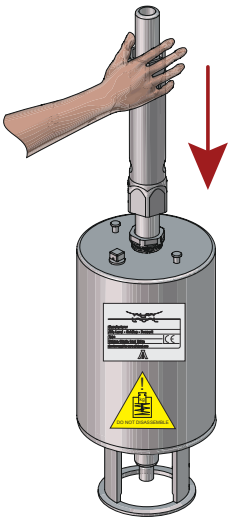
3

Fit the aligning spindle to the actuator stem using adapter and apply the tubular box wrench.

Aligning spindle



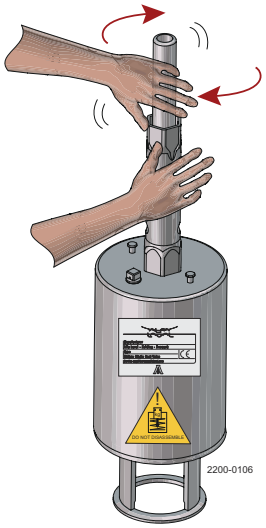
Tubular box wrench



4

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.



6.3 Dismantling the valve

NOTE

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

The items refer to the parts list.

Handle scrap correctly.

Always use Alfa Laval genuine spare parts. Replace seals if necessary.

1 Disassemble valve acc. to illustrations (1 to 6).

a) Supply compressed air to MS.

b) Loosen and remove upper clamp (53).

c) Release compressed air.

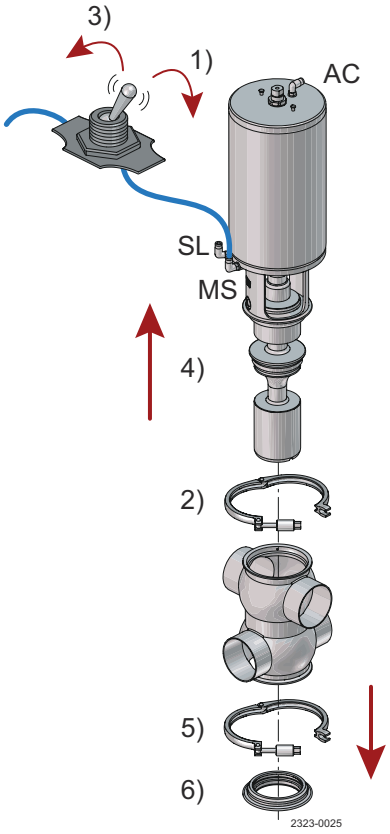
d) Lift out the actuator together with the internal valve parts from valve body (54).

e) Loosen and remove lower clamp (53).

f) Take away lower sealing element (58).

NOTE

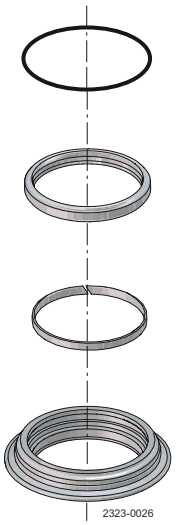
Release compressed air.



2 Dismantling of lower sealing element.

a) Pull out guide ring(45).

b) Pull out Lip seal (48).



3

a) Supply compressed air for AC1.

b) **ISO 25/DN25 and ISO 38/DN40:**

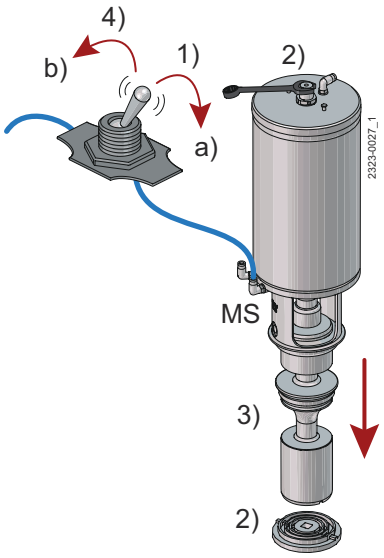
Loosen lower plug (57) by using a torque wrench.

While counter holding actuator stem.

ISO 51/DN50, ISO 63.5/DN65, ISO 76.1/ DN80 and ISO 101.6/DN100:

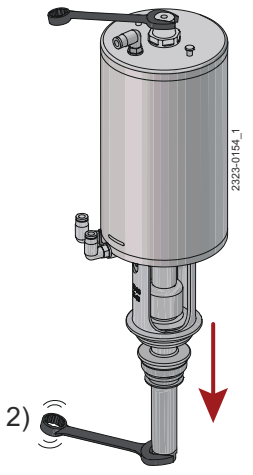
Loosen lower plug (57) by using Alfa Laval 8010032615 tool together with a torque wrench.

While counter holding actuator stem.



c) Remove the lower plug.

d) Release compressed air.



a = on

b = off

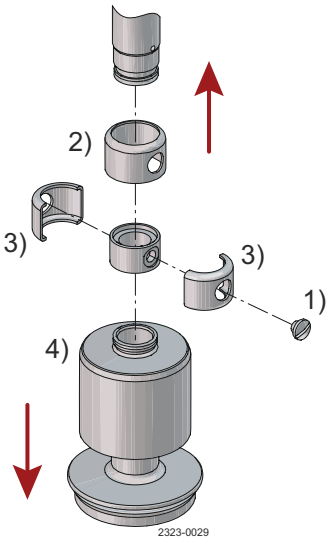
4 Remove coupling system and upper plug.

a) Unscrew plug (41).

b) Pull up lock (44) over piston rod.

c) Pull away clamps (43) from spindle liner (42).

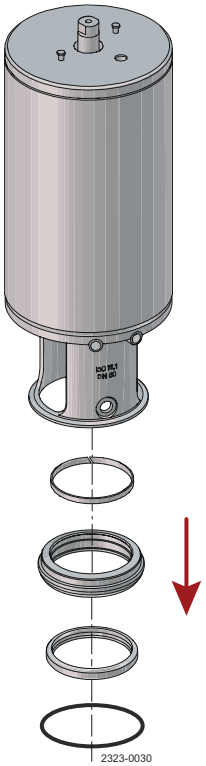
d) Pull out upper plug (50). Make sure spindle liner is free of both piston rod and upper plug.



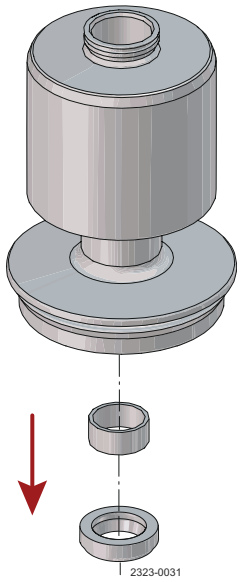
5

a) Pull out upper sealing element (47) from yoke.

b) Pull out O-ring, Lip seal and guide ring from upper sealing element.



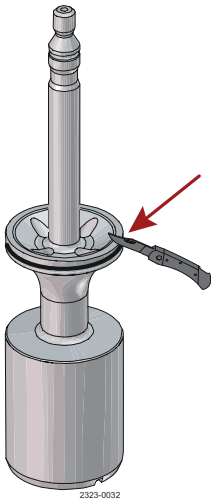
6 Remove lip seal (52) and guide ring. For removal and replacement of plug seal (51), please see *Upper plug seal replacement.*.



6.4 Lower plug, replacement of radial seal

DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
25 mm	**38 mm**	**51 mm**	**63.5 mm**	**76.1 mm**	**101.6 mm**
Seat Ø35	Seat Ø35	Seat Ø44.3	Seat Ø60.3	Seat Ø75.3	Seat Ø94.3
8010034471	8010034471	8010025092	8010025083	8010025086	8010025089

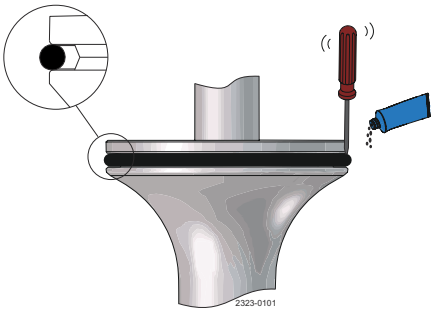
1. Cut and remove old seal ring (56) using a knife, screwdriver or similar. Be careful not to scratch the plug.



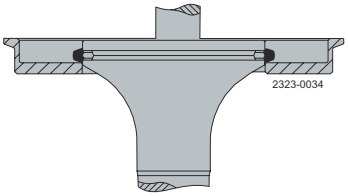
2. Pre-mount seal ring as shown on drawing.

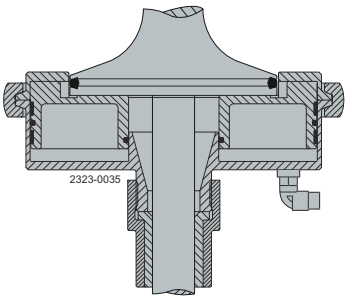
   Rotate along circumference to fix gasket as shown in the picture.

   Carefully lubricate sealings with acceptable soap or lubricant, before pre-mounting.



3. Place lower tool part.





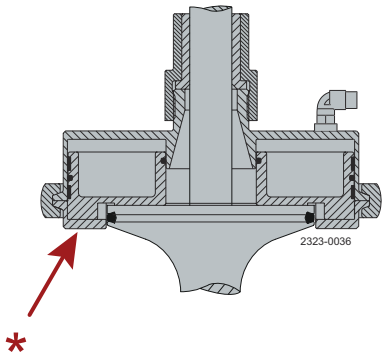
Tool for radial sealing, lower plug.

4

a) Place upper tool part including piston.

b) Clamp the two tool parts together.

* Tool marked with item number.



5

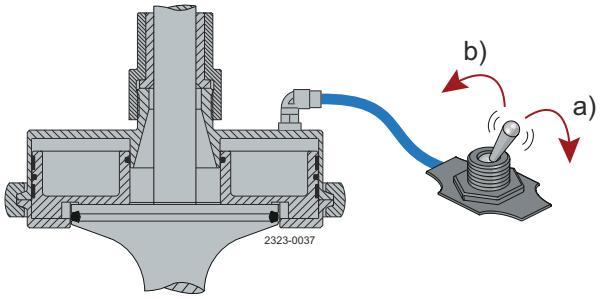
a) Supply compressed air.

b) Release compressed air.

c) Remove tool parts.

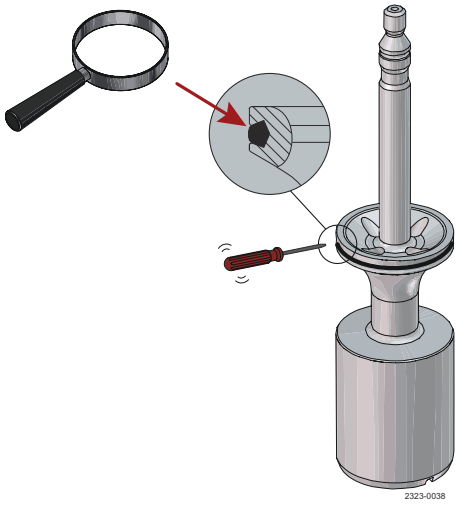
a = on

b = off



6

Inspect the seal to ensure it does not twist in the groove, and press in the 4 outsticking points with a screwdriver!



6.5 Upper plug seal replacement

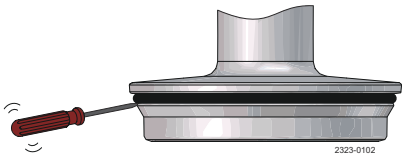
DN 25	DN 40	DN 50	DN 65	DN 80	DN 100
25 mm	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm
8010034706	8010034706	8010028280	8010028191	8010028311	8010028184

1

a) 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 Figure 1).



It is important to place the screwdriver underneath the plug.

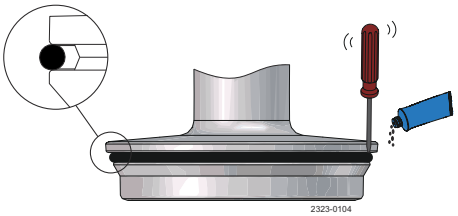
b) Grease the new seal ring with AL Silicone based lubricant, which is included in the service kit.

Only use a very small amount of grease.

c) 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 Figure 2).

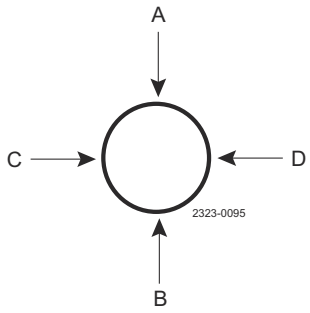


d) The seal ring can now be mounted by hand or with the Alfa Laval plug tool.

2 **Mounting plug seal ring by hand.**

a) Check the seal ring is premounted as described in step 1.

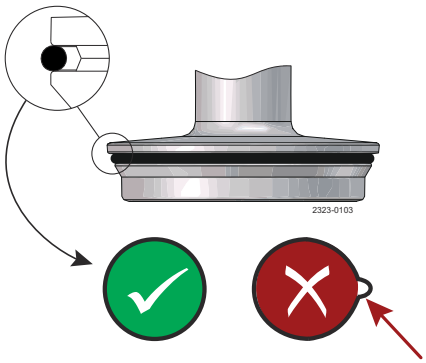
To ensure correct mounting, press with your thumb on the seal ring, which must be done approximately 10 times and always with opposite pressure points, from A to B, to C and D (see Figure 3).



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 Figure 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 Figure 3).



b) It is important to release compressed air behind the seal ring.

This is done with a screwdriver and always underneath the plug see Figure 1.

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 Figure 5).

3

a) **Part A**

“Part A” has an upper and lower exhaust hole.

The upper exhaust hole is for the lower plug and the lower exhaust hole is for the upper plug.

b) **Part B**

Used for mounting seal on lower plug.

c) **Part C**

Used for mounting seal on upper plug.

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”.

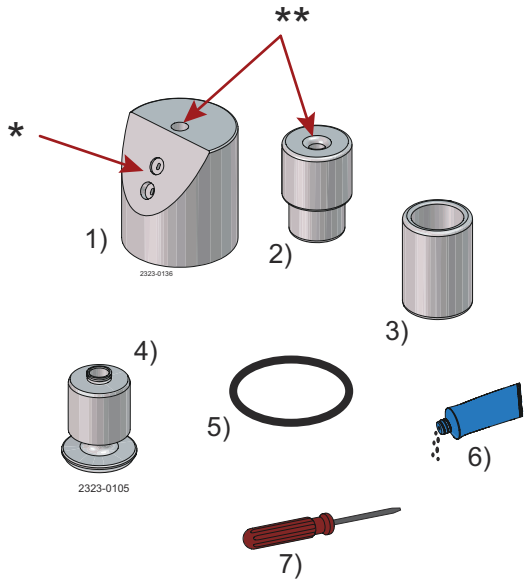
Now fit the screwdriver into the exhaust hole and underneath the plug groove meanwhile keeping the pressure on “part A”.

This should ensure correct removal of air behind the seal ring. Normally the sound “Psst” can be heard one time.

A “drill press” can of course also be used to press down on “part A”.

d) It is important to release compressed air behind the seal ring.

This is done with a screwdriver and always underneath the plug as shown.



1) Part A

2) Part B

3) Part C

4) Plugs

5) O-ring

6) Grease Alfa Laval Silicone based lubrication from service kit

7) Screwdriver (no sharp corner)

*) Exhaust holes for screwdriver.

**) Hole for plug spindle.

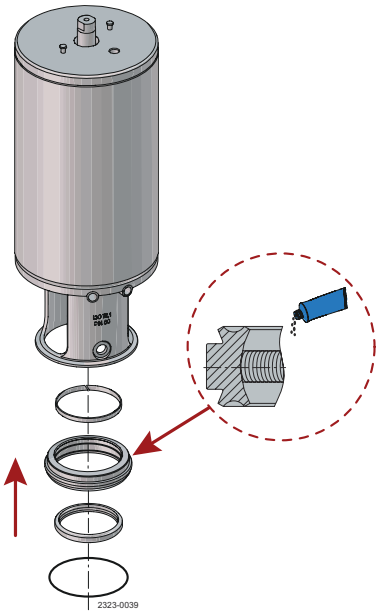
6.6 Valve assembly

1

a) Fit O-ring (46) (do not twist), lip seal (48) and guide ring (45) in upper sealing element (47) (Lubricate with Alfa Laval Lubricant).

> **NOTE**
>
> The O-ring should be gently pressed into the groove.

b) Fit upper sealing element in yoke.

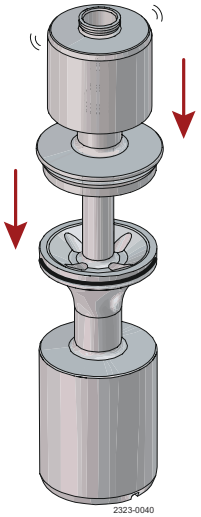


2

a) Insert lip seal (57) and guide ring (45) in upper plug and the O-ring (55) in the lower plug.

b) Press lower plug (57) rapidly into upper plug (50) through the lip seal.

> **NOTE**
>
> Do not damage the lips when lower plug (57) with O-ring (55) passes the lip seal.



3

Place coupling system and upper plug.

a) Place O-rings (61).

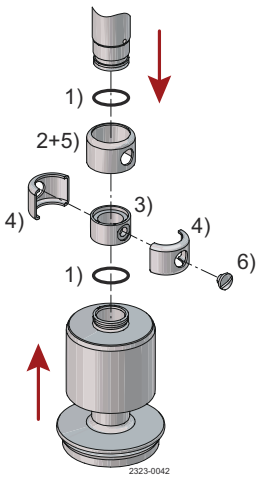
b) Push lock (44) up over piston rod.

c) Place spindle liner (42) on piston rod. Fit upper plug (50).

d) Mount clamps (43) on spindle liner (42).

e) Fit lock (44).

f) Fit plug (41).

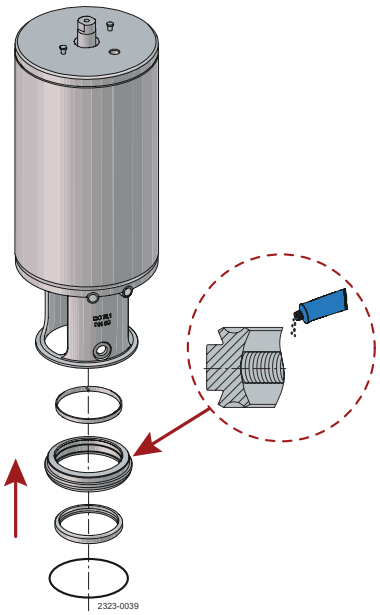


4 Recommended torque values for fitting upper and lower plug parts:

Dimension	Nm / lbf-ft.
25 mm / DN25 **38 mm / DN40**	5 / 3.7
51 mm / DN50 **63.5 mm / DN65** **76.1 mm / DN80** **101.6 mm / DN100**	20 / 14.8

5 Fit lip seal (48) and guide ring (45) and O-ring (46) (do not twist the O-ring) and press it gently into the groove.

Lubricate with Alfa Laval Lubricant.



6

CAUTION

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

Always supply compressed air, before demounting the valve.

Reassemble valve according to illustrations (1 - 6).

a) Fit lower sealing element (58).

b) Fit and tighten lower clamp (53).

c) Supply compressed air and mount the actuator together with the internal valve parts from valve body (54).

d) Fit and tighten upper clamp (53). Greasing of clamp and clamp nut recommended!

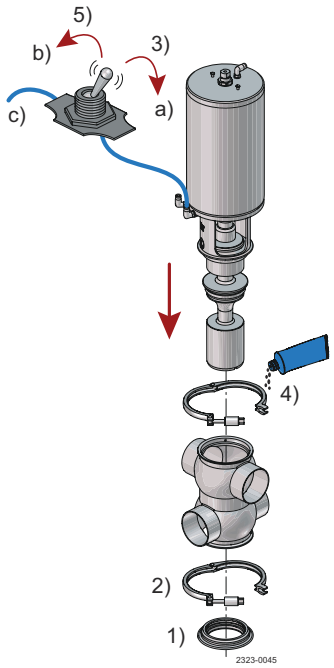
(Maximum torque for clamp nut: 10 Nm / 7.4 lbf-ft.

e) Release compressed air.

a = on

b = off

c = air



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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

Pressure		
Max. product pressure:		1000 kPa (10 bar) / 145 psi
Min. product pressure:		Full Vacuum
Air pressure range:		600-800 kPa (6-8 bar) / 87-116 psi
Products acc. to 2014/68/EC:		Category I, Fluids group 1

Temperature		
Temperature range:	EPDM	-5 °C to +125 °C / 23 °F to 257 °F
	HNBR	-5 °C to +125 °C / 23 °F to 257 °F

ATEX	
Classification:	II 2 G D[1]

[1] This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source

7.2 Physical Data

Materials	
Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)

Surface finish	
External (semi-bright):	Ra< 1.6 µm / Ra< 64 µi
Internal (polished):	Ra< 0.8 µm / Ra< 32 µi

Product wetted seals	
Sealing Material:	EPDM, FPM, HNBR

Other seals	
Actuator seals:	NBR
Guide strip:	PTFE

Formula to estimate CIP flow during seat lift (for liquids with comparable viscosity and density to water):

- Q = Kv √ Δ p
- Q = CIP - flow (m³/h)
- Kv = Kv value from the above table
- Δ p = CIP pressure (bar)
- Cv = 1.163 x Kv gpm
- 1 bar = 14.5 psi

7.3 Air and CIP consumption

Table 1: Between bodies

Size		DN/OD						DN					
ISO/DIN		25 mm / 1"	38 mm / 1½"	51 mm / 2"	63.5 mm / 2½"	76.1 mm / 3"	101.6 mm / 4"	25	40	50	65	80	100
Kv-value	[m³/h]	10.2	23.3	26.9	64.3	95.8	194.5	10.2	23.3	26.9	64.3	95.8	194.5
Cv-value	[GPM/ psi]	11.8	26.9	31.1	74.3	110.8	224.8						

Kv-value / Cv-value

Size		DN/OD						DN					
ISO/DIN		25 mm / 1"	38 mm / 1½"	51 mm / 2"	63.5 mm / 2½"	76.1 mm / 3"	101.6 mm / 4"	25	38	50	65	80	100
Upper Seat-lift	[m³/h]	0.93	0.91	1.28	1.68	1.92	2.69	0.93	0.91	1.28	1.68	1.92	2.69
	[GPM/ psi]	1.08	1.06	1.48	1.95	2.23	3.11						
Lower Seat-push	[m³/h]	0.78	0.78	0.81	1.33	1.90	1.92	0.78	0.78	0.81	1.33	1.90	1.92
	[GPM/ psi]	0.91	0.91	0.94	1.53	2.19	2.22						

Air consumption

Size		DN/OD						DN					
ISO/DIN		25 mm / 1"	38 mm / 1½"	51 mm / 2"	63.5 mm / 2½"	76.1 mm / 3"	101.6 mm / 4"	25	38	50	65	80	100
Upper Seat-lift	[L]	0.02	0.02	0.02	0.02	0.08	0.08	0.02	0.02	0.02	0.02	0.08	0.08
	[in³]	1.41	1.41	1.41	1.41	4.70	4.70						
Lower Seat-push	[L]	0.97	0.97	0.97	0.97	2.76	2.76	0.97	0.97	0.97	0.97	2.76	2.76
	[in³]	59.23	59.23	59.23	59.23	168.38	168.38						
Main Movement	[L]	0.55	0.55	0.55	0.55	1.31	1.31	0.55	0.55	0.55	0.55	1.31	1.31
	[in³]	33.78	33.78	33.78	33.78	79.86	79.86						

8 Spare Parts

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

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

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

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

8.1 Ordering Spare Parts

When ordering spare parts, please always state:

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

8.2 Alfa Laval Service

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

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

8.3 Warranty - Definition

WARNING

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

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

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

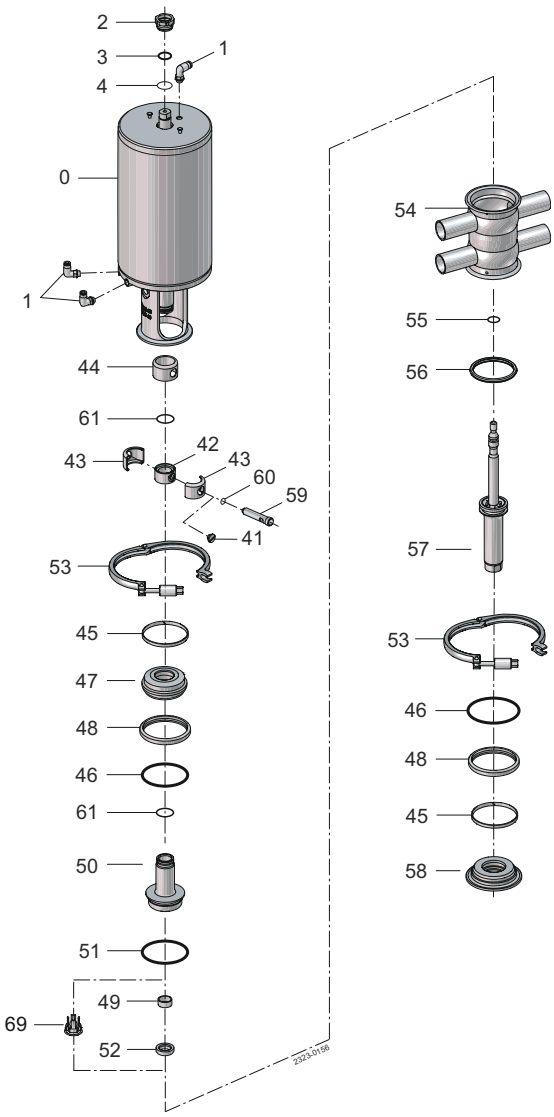
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see *Safety* on page 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

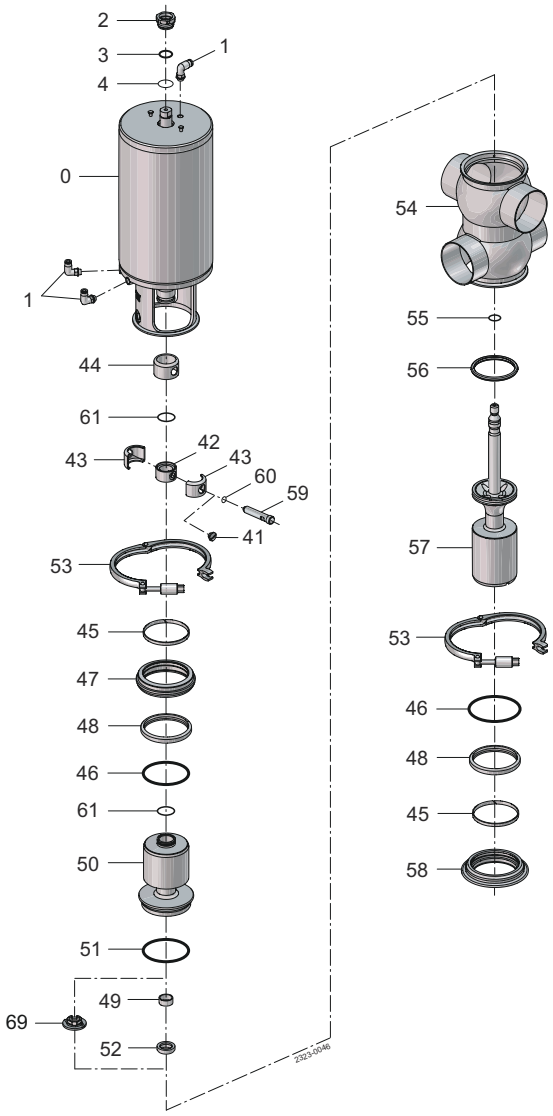
9.1 Unique Mixproof Process, 1"-1½"



Pos.	Qty.	Denomination
0	1	Actuator
1	3	Air fitting
2	1	Bushing
3	1	O-ring
4	1	O-ring
41	1	Plug
42	1	Spindle liner
43	2	Clamp
44	1	Lock
45	2	Guide ring
46	2	O-ring
47	1	Sealing element
48	2	Lipseal
49	1	Guide ring
50	1	Plug

Pos.	Qty.	Denomination
51	1	Plug seal
52	1	Lip seal
53	2	Clamp
54	1	Valve body
55	1	O-ring
56	1	Seal ring
57	1	Plug
58	1	Sealing element
59	1	Flushing tube
60	1	O-ring
61	2	O-ring
63	2	Valve body
64	1	Valve seat
69	1	Spray nozzle

9.2 Unique Mixproof Process, 2"-4"



Pos.	Qty.	Denomination
0	1	Actuator
1	3	Air fitting
2	1	Bushing
3	1	O-ring
4	1	O-ring
41	1	Plug
42	1	Spindle liner
43	2	Clamp
44	1	Lock
45	2	Guide ring
46	2	O-ring
47	1	Sealing element
48	2	Lipseal
49	1	Guide ring
50	1	Plug

Pos.	Qty.	Denomination
51	1	Plug seal
52	1	Lip seal
53	2	Clamp
54	1	Valve body
55	1	O-ring
56	1	Seal ring
57	1	Plug
58	1	Sealing element
59	1	Flushing tube
60	1	O-ring
61	2	O-ring
63	2	Valve body
64	1	Valve seat
69	1	Spray nozzle