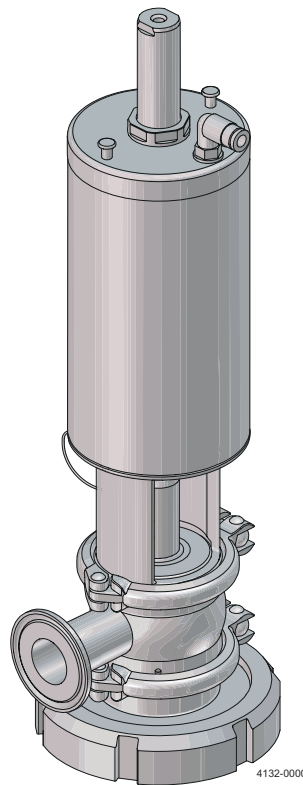


Alfa Laval Free Rotating Retractor and Free Rotating Retractor UltraPure

Wall Mounted Cleaning Devices



Lit. Code

200011059-3-EN-GB

Instruction Manual

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

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Contents

1	Declarations of Conformity	7
1.1	EU Declaration of Conformity	7
1.2	UK Declaration of Conformity	8
2	Safety	9
2.1	Safety Instructions and Warnings	9
2.1.1	Mandatory Action Signs	9
2.1.2	Warning Signs	10
2.2	General Safety Precautions	11
2.3	Warning Signs in Text	16
2.4	Requirements of Personnel	17
2.5	Recycling Information	17
3	Introduction	19
3.1	General description	20
3.1.1	Intended Use	21
3.1.2	Working Principle	22
3.1.3	Design Principle	23
3.2	Patents and Trademarks	23
3.3	Quality System	24
3.4	Marking	24
4	Installation	25
4.1	Unpacking/Delivery	25
4.2	General Installation	26
4.2.1	Process Setup Recommendation	27
4.2.2	Strainer Recommendations	28
4.2.3	Draining	28
4.2.3.1	2 inch Clamp Connection	29
4.2.3.2	3 inch RJT, DN80 Clamp and 3 inch Clamp	29
4.2.4	Welding Recommendation	29
4.2.5	Attachment to Supply Line	29
4.2.6	Installation of Externally Mounted Cleaning Devices	30
4.2.7	Recommended Installation (spacing)	31
5	Operation	33
5.1	Normal Operation	34
5.2	Recommended Cleaning	35
5.3	Troubleshooting	36
6	Maintenance	37

6.1	Preventive Maintenance.....	39
6.2	Recommended Service Intervals.....	41
6.3	Dismantling	42
6.3.1	Uninstall for Maintenance.....	42
6.3.2	Disassembly.....	44
6.4	Lipseal Replacement and Bushing Replacement.....	47
6.4.1	Removal of Lipseal and Bushing.....	47
6.4.2	Mounting Bushing.....	48
6.4.3	Mouting Lipseal.....	48
6.5	Static O-ring Replacement.....	48
6.6	Plug Seal Replacement.....	49
6.6.1	Removal of Plug Seal.....	49
6.6.2	Mounting Plug Seal.....	49
6.7	Actuator Bushing Replacement (Non-maintainable Actuator).....	51
6.8	Assembly.....	54
7	Technical Data.....	55
7.1	Alfa Laval Free Rotating Retractor.....	55
7.1.1	TECHNICAL DATA.....	55
7.1.2	PHYSICAL DATA.....	55
7.1.3	Dimensions.....	56
7.1.4	Performance Data.....	57
7.1.4.1	Flow Rate.....	57
7.1.4.2	Throw Length.....	58
8	Product Programme.....	59
8.1	Qualification Documentation.....	59
8.2	Accessories.....	60
8.2.1	Weld Plates.....	60
8.2.2	Inlet Connection Adaptors.....	60
8.2.3	Sensor and Control Units.....	61
8.2.4	Tools and Installation Material.....	62
9	Spare Parts.....	63
9.1	Ordering Spare Parts.....	63
9.2	Alfa Laval Service.....	63
10	Part Lists and Exploded Views.....	65
10.1	Standard Version - RJT Connection.....	65
10.2	Standard Version - 2 inch Clamp Connection.....	66
10.3	Standard Version - DN80 Connection.....	67
10.4	Standard Version - 3 inch Clamp Connection.....	68

11 Appendix..... 69
11.1 Appendix A - Weld Plate Installation..... 69

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1 Declarations of Conformity

1.1 EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Wall Mounted Cleaning Device

Designation

Free Rotating Retractor, Free Rotating Retractor UltraPure

Type

Serial number from 2023-0001 to 2030-99999

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC

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

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2023-12-30

Date (YYYY-MM-DD)



Signature

DoC Revison_01_122023



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

Wall Mounted Cleaning Device

Designation

Free Rotating Retractor, Free Rotating Retractor UltraPure

Type

Serial number from 2023-0001 to 2030-99999

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2023-12-30

Date (YYYY-MM-DD)





Signature

DoC Revison_01_122023



2 Safety

 	<p>Read this first</p> <p>This Instruction manual is designed for operators and service engineers working with the supplied Alfa Laval product.</p> <p>Operators must read and understand the chapters <i>Safety</i> on page 9, <i>Installation</i> on page 25 and <i>Operation</i> on page 33 for the respective product before carrying out any work or before you put the machine into service!</p> <p>Not following the instructions can result in serious accidents.</p> <p>This documentation describes the authorized way to use the machine. Alfa Laval take no responsibility for injury or damage if the equipment is used in any other way.</p> <p>This Instruction manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the machine.</p> <p>The user shall always read the chapter <i>Safety</i> on page 9 first. Then the user can skip to the relevant section for the task to be carried out or for the information needed.</p> <p>Always read the chapter <i>Technical Data</i> on page 55 thoroughly.</p> <p>This is the complete Instruction manual for the machine.</p>
--	---








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 Instructions and Warnings

2.1.1 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.

Safety

	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

2.1.2 Warning Signs

	General warning.
	Corrosive substance.
	Hot surface and burning danger.
	Cutting danger.
	Heavy object lifting.
	Transportation with forklift truck or other industrial vehicles if heavy.
	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).



Safety

2.2 General Safety Precautions








Installation

	Always follow this Instruction manual thoroughly.
	Ensure that the machine is compatible with the product and CIP media.
	Never dismantle or touch the machine or pipelines when processing hot fluids or when sterilising.
	Ensure that the tank being cleaned does not contain a combustible liquid or vapor having a risk of ignition or explosion. Any tank cleaning machine can develop a static electricity charge while in operation.
	Always ensure all pipelines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling.
	Always assemble the machine completely before start and make sure everything is in place and properly tightened.
	Ensure that the tank cleaning machine is properly grounded if the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion. Any tank cleaning machine can develop a static electricity charge while in operation.
	Always release compressed air after use.
	Never work on the machine or touch moving parts if the actuator is supplied with compressed air.
	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.



Safety





Operation




	<p>Always follow this Instruction manual thoroughly.</p>
	<p>Ensure that the machine is compatible with the product and CIP media.</p> <p>Always take necessary precautions if leakage occurs as this can lead to hazardous situations. If the liquid or vapor is hot, corrosive, or toxic, a leak would present a serious hazard to any personnel in the immediate vicinity or to any exposed electrical equipment.</p> <p>Always rinse well with clean water after cleaning.</p> <p>Always handle lye and acid with great care.</p> <p>Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.</p>
	<p>Never operate the machine unless it is properly mounted or installed.</p>
	<p>Never dismantle or touch the machine or pipelines when processing hot fluids or when sterilising.</p>
	<p>Ensure every tank opening is covered before operating the tank cleaning machine. These covers should be sealed well enough to withstand the full force of the liquid hitting the covers.</p>
	<p>Always release compressed air after use.</p>
	<p>Never work on the machine or touch moving parts if the actuator is supplied with compressed air.</p>







Safety

Maintenance







	<p>Always follow this Instruction manual thoroughly.</p> <p>Before maintaining the machine, carefully read chapter <i>Maintenance</i> on page 37.</p>
	<p>Always rinse well with clean water prior to maintenance.</p>
	<p>Always ensure all pipelines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling.</p> <p>Always assemble the machine completely before start and make sure everything is in place and properly tightened.</p>
	<p>Never dismantle or touch the machine or pipelines when processing hot liquids or when sterilising.</p>

	<p>Always release compressed air after use.</p>
	<p>Never work on the machine or touch moving parts if the actuator is supplied with compressed air.</p>
	<p>Do NOT attempt to disassemble the actuator due to spring under load danger!</p> <p>Do NOT attempt to cut the actuator open due to spring under load.</p>



Transportation and lifting

 	<p>Always ensure that personnel must have experience with lifting operations.</p> <p>Always ensure that the personnel use the correct protective equipment.</p>
	<p>Always ensure that compressed air is released.</p>
	<p>Always ensure that all connections are disconnected before attempting to remove the machine from the installation.</p>




 	<p>Always use predesigned lifting points if defined. Ensure that the lifting equipment is suitable for the machine.</p> <p>Always ensure the lifting point to be in line with centre of gravity. Adjust lifting point if necessary.</p> <p>Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p>
	<p>Always keep an eye on the load and stay clear during the lifting operation.</p>
	<p>Always drain liquid out of the machine before transportation.</p>
	<p>Always ensure sufficient fixing of the machine during transportation - if specially designed packaging material is available, it must be used.</p>
	<p>Always use original packaging or similar during transportation.</p>

Storage




	<p>Alfa Laval recommendation:</p> <ul style="list-style-type: none"> • Store the machine as supplied in original packaging • Port opening(s) should be protected against ingress • Bare steel (not stainless) should be lightly oiled/greased • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5° C to +40° C (23° F - 104° F) • Relative humidity less than 60%
	<ul style="list-style-type: none"> • No exposure to corrosive substances (including contained air) • Rinse the machine with clean water before storage

Noise

	<p>One meter from and 1.6 meter above the exhaust, the noise level of an actuator is approximately 77 dB(A) without noise damper and approximately 72 dB(A) with damper – measured at 7 bar air-pressure.</p>
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Hazards

 	<p>Burn Hazard</p> <p>Various surfaces of the machine and CIP supply line can be hot and cause burns. Wear protective gloves.</p>
  	<p>Corrosive Hazard</p> <p>Always handle cleaning liquids (e.g., lye and acid) with great care and in accordance with separate instructions for those liquids.</p> <p>Always follow the general rules and recommendations regarding ventilation, personnel protection etc. when using chemical cleaning agents and lubricants.</p>
 	<p>Cut Hazard</p> <p>Sharp edges, especially on the spray orifice, can cause cuts. Wear protective gloves.</p> <p>Avoid placing hands into machine orifice pinch points.</p>



Safety

Safety check

	<p>A visual inspection of any protective device (shield, guard, cover or other) on the machine shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.</p> <p>Inspection acceptance criteria:</p> <ul style="list-style-type: none"> • It should not be possible to reach moving parts originally protected by a protective device • The protective device must be securely mounted • Ensure that screws for the protective device are securely tightened <p>Procedure in case of non-acceptance:</p> <ul style="list-style-type: none"> • Fix and/or replace the protective device
---	--

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction manual.

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



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 machine.

NOTE

Indicates important information to simplify or clarify procedures.

Safety

2.4 Requirements of Personnel

Personnel type	Requirements
Operators	The operators shall read and understand the Instruction manual.
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 machine. In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.



2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.

	<ul style="list-style-type: none"> • 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
--	---

DANGER

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

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!

SPRING UNDER LOAD
Do not attempt to cut open

DO NOT DISASSEMBLE

WARNING

SPRING UNDER LOAD
DO NOT ATTEMPT TO CUT ACTUATOR OPEN
REFER TO SERVICE BULLETIN

Maintenance

During maintenance, oil (if used) and wear parts in the machine 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

Free Rotating Retractor

Safeguard product quality, prevent contamination, and meet hygienic processing standards with the Alfa Laval Free Rotating Retractor. This high-efficiency, retractable cleaning device prepares vessels for production quickly and economically. It removes residues from the interior surfaces of ducts, tanks, and other hard-to-clean confined spaces. Boost process uptime with this dynamic, resource-efficient retractable cleaning device.

Free Rotating Retractor UltraPure

When high-purity pharmaceutical processing is a must, select the Alfa Laval Free Rotating Retractor UltraPure. This wall-mounted cleaning device lets manufacturers spend less time cleaning and more time producing. Lift uptime and productivity with cleaner ducts and tanks, especially in those hard-to-reach shadow areas. This dynamic, resource-efficient, retractable cleaning device removes contaminants from the interior surfaces of processing vessels while reducing the total cost of ownership.

3.1 General description

This Instruction manual has been prepared as a guide for installing, operating, and maintaining the Alfa Laval machine. Should you require further assistance, Alfa Laval Technical Sales Support department and worldwide network of sales offices are pleased to help you. Please quote the type, article, and serial numbers with all your enquiries; this helps us to help you.

Refer to chapter [Marking](#) on page 24 for placement of type and serial number.

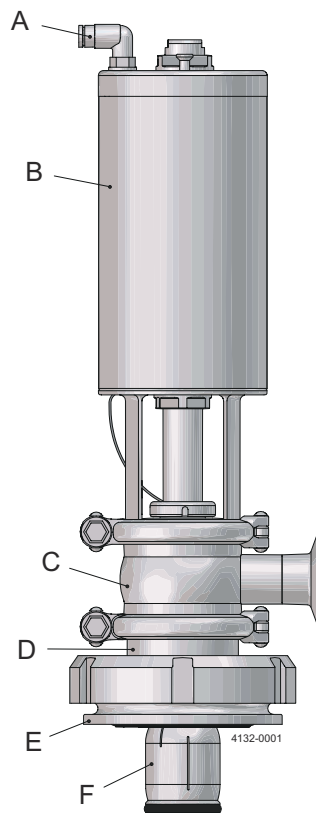
Preventive maintenance gives the best and most economical performance from the machine. For maintenance recommendation see chapter [Maintenance](#) on page 37.

NOTE

If the machine stops working unintentionally within the warranty period, please contact Alfa Laval Technical Sales Support department or worldwide network of sales offices. Please do not try to fix any mechanical problems on your own.

The Alfa Laval ThinkTop range can be mounted on the machine as a sensor and/or for control purposes.

The drawing indicates the main components of the machine.



- A: Air supply inlet
- B: Actuator
- C: Inlet house
- D: Process adaptor
- E: Process connection
- F: Spray head

3.1.1 Intended Use

For the purpose of this Instruction manual, compartments cover tanks, vessels, containers, semi-closed equipment etc.

The end-user should verify:

- that the machine is in conformity with respect to compartment size in which it is used
- that the construction materials (both metallic and nonmetallic) are compatibility with product, flushing media, cleaning media, temperatures, and pressure under the intended use

The machine is intended for use in closed compartments. If used in open environment, see instructions in chapter [Safety Instructions and Warnings](#) on page 9 and chapter [General Installation](#) on page 26.

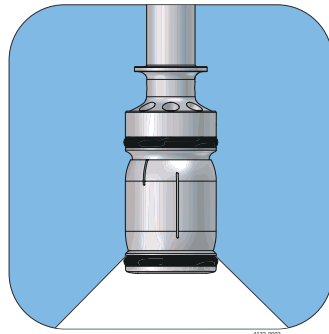
The Alfa Laval Free Rotating Retractor is designed for closed compartments and process equipment with moving internals, and processes where permanently installed tank cleaning machines may have an undesired influence on the process or product. For larger compartments, multiple Alfa Laval Free Rotating Retractors may be applied.

3.1.2 Working Principle

The Alfa Laval tank cleaning machine is media driven and media lubricated.

The Alfa Laval Free Rotating Retractor functions as a pneumatic open and a spring close seat valve. Applying air to the actuator extended the spray head out of the Inlet house.

The Alfa Laval Free Rotating Retractor is a sanitary cleaning machine of the rotating spray type for permanent installation. In the closed position, the installation forms a flush design with the compartment wall and the spray head is out of the product. It provides a 310 degrees cleaning pattern.



Spray pattern 310°

The cleaning media is directed through the 1" tri-clamp inlet connection into the inlet house. Adaptors for other inlet connections are available (see chapter [Inlet Connection Adaptors](#) on page 60). The liquid passes through holes in the connector to the spray head and out through the orifices and hydro bearings.

The spray head rotates between the two hydro bearings due to the reaction forces of the cleaning media expelled from the orifices. The spray head expel a swirling pattern of cleaning media throughout the closed compartment which generates a vibrating impact and cascading flow coverage of the targeted surfaces of the closed compartment.

The spray head is retracted by spring action to its closed position when diverting the air pressure away from the actuator.

The actuator can remain extended during a draining or purging phase.

3.1.3 Design Principle

The supplied machine is designed in accordance with the 3-A Sanitary Standards No. 78-04 as well as the guidelines of the European Hygienic Design Group (EHEDG) wherever feasible and thus complies with requirements to design, materials, surface finish and documentation.

The machine is completely self-cleaning except for the part of the plug facing towards the product. This surface is normally cleaned by a second tank cleaning machine. When properly installed the machine is self-draining, see chapter *Draining* on page 28.

- All permanent assemblies are fully welded
- No threads have been used in the product and cleaning media contact area
- Gaskets and seals are exposed to cleaning liquid

The product contact surface materials are (for specific information see chapter *Technical Data* on page 55):

- Metals: AISI 316 stainless steel (or better corrosion vice)
- Elastomers: complies with relevant food contact legislation (e.g. FDA, EU regulation) and pharma standards (e.g. USP 87, USP 88 Class VI, ISO 10993). For detailed information see Alfa Laval Anytime for specific Part ID's
- Polymers: complies with relevant food contact legislation (e.g. FDA, EU 10/2011) and pharma standards (e.g. USP 87, USP 88 Class VI, ISO 10993). For detailed information see Alfa Laval Anytime for specific Part ID's

The cleaning device is lubricated by the cleaning media. No oil, grease or other lubricants are used in the product contact area.

3.2 Patents and Trademarks

This Instruction manual is published by Alfa Laval Kolding A/S without any warranty. Improvements and changes may at any time be made by Alfa Laval Kolding A/S without prior notice. Such changes are incorporated in new editions.

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The Alfa Laval logotype is a trademark or a registered trademark of Alfa Laval Corporate AB. Other products or company names mentioned herein may be the trademarks of their respective owners. Any rights not expressly granted herein are reserved.

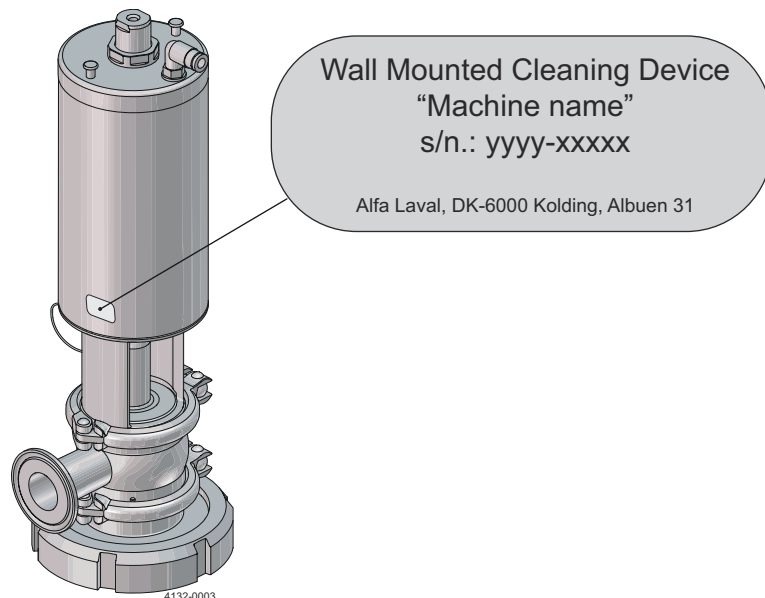
3.3 Quality System

The machine is produced according to Alfa Laval Kolding's ISO 9001 international standard certified quality system.

3.4 Marking

Alfa Laval machines are marked to allow for recognition of machine designation, machine type, serial number and manufacturing address.

The marking is placed on the tank cleaning machine as shown below.



Serial number explanation

Machines supplied with standard documentation or with Q-doc:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

4 Installation

Every machine is operationally tested before shipment and is ready to run after unpacking. No assembly is required prior to use. Any change to the operating conditions provided in this Instruction manual affects the performance of the machine.

4.1 Unpacking/Delivery

NOTE

Alfa Laval cannot be held responsible for incorrect unpacking.

Always read chapter *General Safety Precautions* on page 11.

Always read chapter *Technical Data* on page 55 thoroughly.

WARNING

Air supply

Always connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. To reduce risk of whiplash, fasten air supply hose to other supply lines as close to the push-in fitting as practically possible.

Unpacking and Initial Inspection

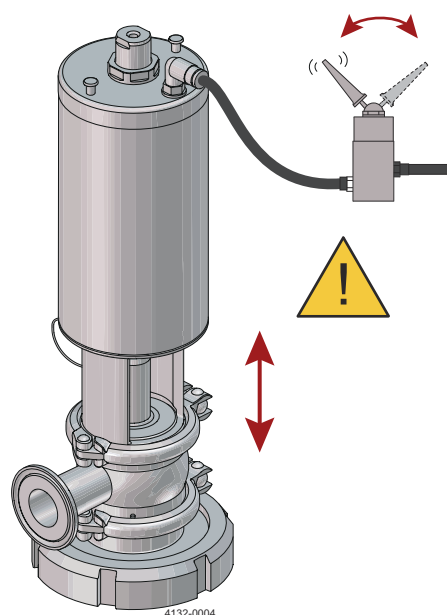
- Check delivery note
- Remove packing material from the machine
- Inspect the machine for visible transport damage
- Avoid damaging the machine

During handling and installation, handle the machine with care to not damage the surface finish of the machine.

The machine has been tested at the factory before shipping in accordance with the Test Specifications.

Upon arrival, check that the machine is in operating condition.

1. Supply compressed air to the actuator.
2. Open and close the valve several times to ensure it operates smoothly.
3. When in open position, spin the spray head with your fingers to ensure there is no restriction to rotation.



If the spray head does not extend or the spray head does not turn freely, contact Alfa Laval Technical Sales Support department or worldwide network of sales offices.

4.2 General Installation

NOTE

Alfa Laval cannot be held responsible for incorrect installation.

Always read chapter *General Safety Precautions* on page 11.

Always read chapter *Technical Data* on page 55 thoroughly.

Always release compressed air after use.

Always thoroughly flush supply lines and machines before installation to remove scale, remains from welding and grinding and other foreign matter.

Always install the machine in accordance with national regulations for safety and other relevant regulations and standards. In EU-countries, the complete system must fulfil the EU-Machinery Directive and depending on application, the EU-Pressure Equipment Directive and other relevant Directives and shall be CE-marked before it is set into operation.

DANGER

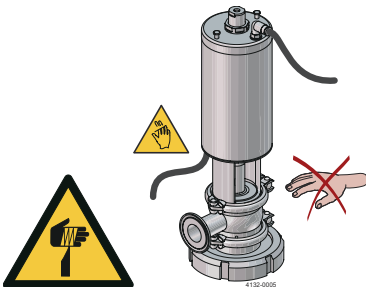
If the actuator is marked with one of the below warnings, do NOT attempt to disassemble it.

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!



WARNING

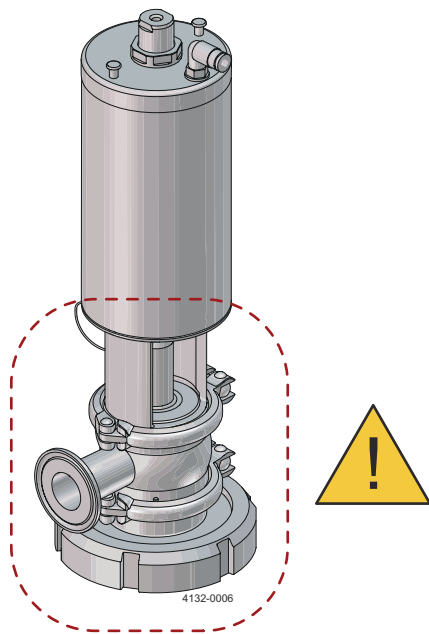
During operation, **never** touch moving parts if the actuator is supplied with compressed air.



CAUTION Avoid stressing the valve.

Pay special attention to:

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



WARNING Air supply

Always connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. To reduce risk of whiplash, fasten air supply hose to other supply lines as close to the push-in fitting as practically possible.

Installation Orientation

To be operational, the machine should be installed in the recommended orientation, as provided below. If required, the installation shall be made so that self-draining properties (see chapter [Draining](#) on page 28) of the machine is ensured.

- Any orientation is recommended

The machine shall be mounted (see chapter [Installation of Externally Mounted Cleaning Devices](#) on page 30) into the designate welded process connection (chapter [Weld Plates](#) on page 60) using appropriate fasteners.

4.2.1 Process Setup Recommendation

To separate the CIP system from the process it is recommended to install a shutoff valve close to the machine inlet.

 **CAUTION**

It is recommended that the liquid valve fitted is of a type that prevents hydraulic shocks. Hydraulic shocks may cause severe damage to the machine and/or the entire installation. Ideally, use a frequency controlled pump with a ramp function for start-up to supply the cleaning liquid.

4.2.2 Strainer Recommendations

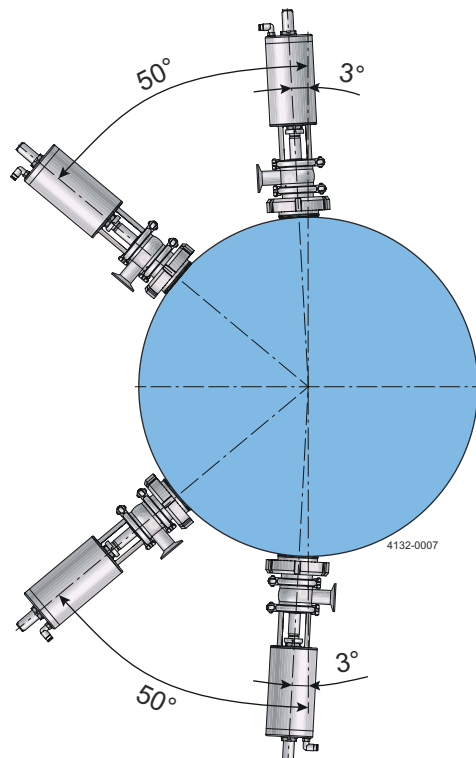
Larger particles may get trapped by the spray orifice, while smaller particles (e.g., fine sand) may be trapped by the smaller clearances of the machine and increase wear. Magnitude of the issues relies on the particle shape and properties (e.g., soft vs. hard). Experience shows that Alfa Laval tank cleaning machines may operate with strainer sizes larger than recommended below. Contact Alfa Laval Technical Sales Support department or worldwide network of sales offices.

For low amounts of particles in the recirculating CIP liquid, larger particles should be avoided and in this case a 0.250 mm strainer may be sufficient for a reliable operation. However, particles up to 0.8 mm can pass the spray orifice in the rotor.

For high amounts of particles in the recirculating CIP liquid, it is recommended to install a strainer according to the smallest clearance in the machines. For the Alfa Laval Free Rotating Retractor, a strainer of 0.1 mm is recommended.

4.2.3 Draining

The machine is drainable by gravity when positioned 3 degrees to 50 degrees from the vertical line on the lower hemisphere. From 3 degrees to 50 degrees from the vertical line on the upper hemisphere less than 0.3 ml liquid is retained. For other orientation see specific versions below.



4.2.3.1 2 inch Clamp Connection

For installation between 50 degrees from the vertical line on the upper hemisphere and 50 degrees from the vertical line on the lower hemisphere, the worst-case orientation (around horizontal and spray head in 2 specific orientation) less than 3 ml liquid is retained.

4.2.3.2 3 inch RJT, DN80 Clamp and 3 inch Clamp

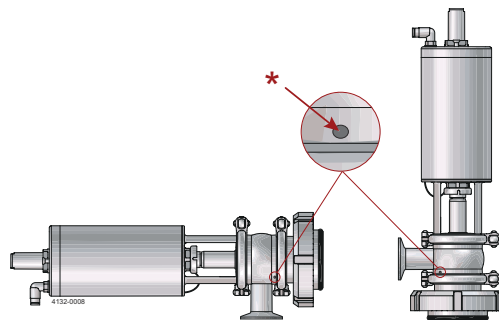
For installation between 50 degrees from the vertical line on the upper hemisphere and 50 degrees from the vertical line on the lower hemisphere, the worst-case orientation (spray head in 2 specific orientation) less than 1 ml liquid is retained.

Leak detection hole on inlet house

Make sure that the leak detection hole in the inlet house:

1. is visible, when mounting the retractor vertically.
2. is pointing downwards to allow leaking liquid do drain by gravity, when mounting the retractor horizontally.

* = Indicates leakage detection hole



4.2.4 Welding Recommendation

For welding recommendations see manual for Alfa Laval Retractor series Weld plates.

NOTE

For installation of weld plate see chapter [Appendix A - Weld Plate Installation](#) on page 69.

4.2.5 Attachment to Supply Line

NOTE

It is recommended to have a separate CIP supply line for each machine. If installed on a common CIP supply line, make sure that either:

1. each machine has the correct pressure at the inlet to each machine, or
2. only one of the machines run at a time with the correct inlet pressure.

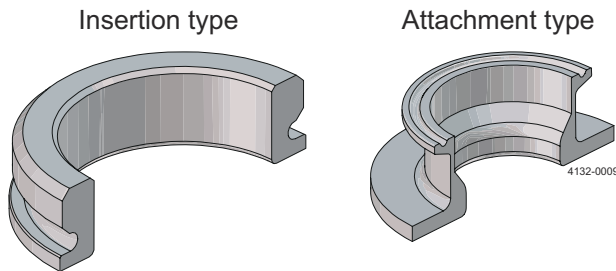
The machine is attached to the CIP supply line using the inlet connection.

For rigid supply lines, the inlet connection should align with the CIP supply line. Alternatively, flexible supply lines can be used.

4.2.6 Installation of Externally Mounted Cleaning Devices

Alfa Laval Free Rotating Retractor fits into several types of weld plates. See chapter [Weld Plates](#) on page 60.

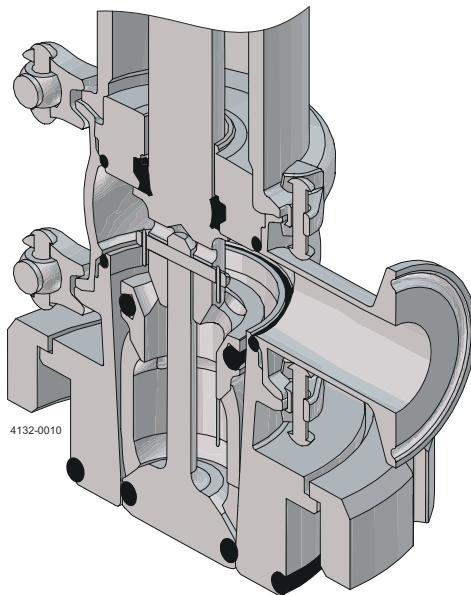
In principle, there are two different types of weld plates:



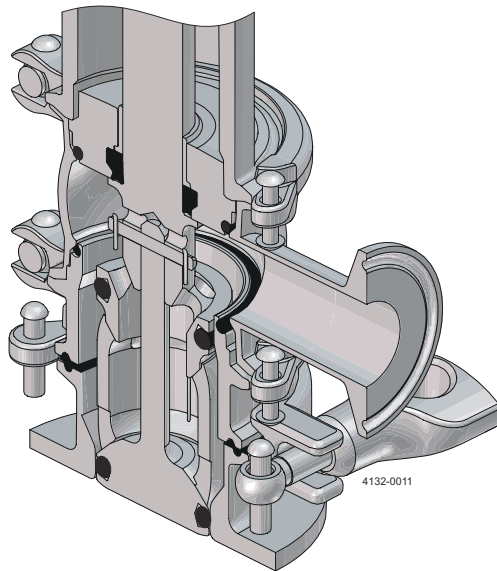
NOTE

For installation of weld plate please refer to chapter [Appendix](#) on page 69.

For the insertion type, the machine comes with a fully integrated home chamber (process adapter attached to the inlet house) that is inserted into the weld plate and attached by either a nut or a clamp connection. This nut or clamp is neither in product- nor cleaning media-contact. Before insertion, wet the O-ring going into the weld flange.



For the attachment type, the machine and the weld adaptor create the home chamber when the process adapter is attached to the weld plate. Attachment is done by a clamp connection. The gasket in this connection is in cleaning media-contact.



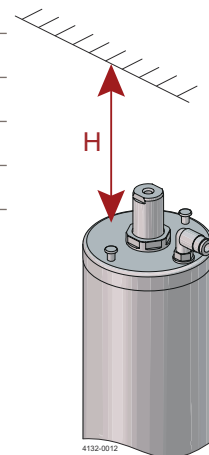
WARNING

Minimum free space above actuator

When installing the device with actuator without indication unit (for example a ThinkTop® unit), a minimum clearance (H) in continuation of the actuator is required to avoid pinching of body parts when the machine closes.

Dimensions based on ISO 13854.

Installation orientation:	Clearance (H) [mm/inch]:	Body part:
Vertical up	161 / 6.34	Hand
Vertical down	181 / 7.13	Foot
Horizontal	561 / 22.09	Body



4.2.7 Recommended Installation (spacing)

Reserved for future content.

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5 Operation

NOTE

Alfa Laval cannot be held responsible for incorrect operation.

Always read the chapter *General Safety Precautions* on page 11 thoroughly.

Always read the chapter *Technical Data* on page 55 thoroughly.

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

DANGER

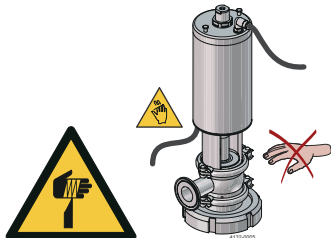
If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!



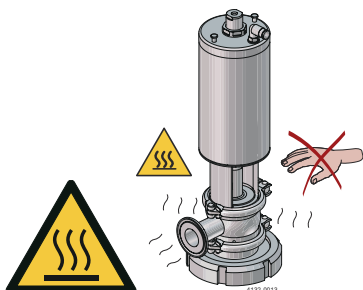
WARNING

During operation, **never** touch moving parts if the actuator is supplied with compressed air.



WARNING

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



CAUTION

Always handle CIP and SIP chemicals with great care.

Always use rubber gloves!

Always use protective goggles!

Always rinse with clean water after using a cleaning agent.

**NOTE**

Always store/dispose cleaning agents in accordance with current regulations/directives.

5.1 Normal Operation

NOTE Media

Only use media compatible with materials shown in chapter *Technical Data* on page 55.

Never use aggressive chemicals, excessive concentrations of chemicals at elevated temperatures, as well as certain solvents hydrochlorides. If you are in doubt, contact your local Alfa Laval sales office.

PEEK is not resistant to concentrated sulfuric acid. Normal detergents, moderate solutions of acids and alkalis are acceptable.

EPDM exposed to fatty materials may swell significantly.

NOTE Temperature

Never exceed 95° C (203° F) when flowing cleaning media through the machine. However, the machine stands surrounding temperatures of up to 140° C (284° F).

Steaming is not supported (contact Alfa Laval for recommendations).

CAUTION Steam cleaning

If steam cleaning is done through the machine, the steam pressure must not cause the machine to rotate.

**NOTE Pressure**

Always check that the CIP process connections are correctly mounted.

Always apply media pressure gradually to avoid hydraulic shocks. Hydraulic shocks might stress mechanical parts.

Recommended CIP working pressure: 1-3 bar (14.5 – 43.5 psi).

Never exceed CIP pressure of 5 bar (72.5 psi).

Recommended air supply pressure: 5-7 bar (72.5 – 101.5 psi).

Never exceed air supply pressure: 7 bar (101.5 psi).

Min. pressure inside duct system: Full vacuum.

**WARNING Air supply**

Always connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. To reduce risk of whiplash, fasten air supply hose to other supply lines as close to the push-in fitting as practically possible.

5.2 Recommended Cleaning

The internal surfaces of the cleaning device are cleaned by the cleaning liquid passing through the cleaning device. The external surfaces of the spray head are cleaned by cleaning liquid expelled from the cleaning device itself, either as targeted cleaning or free falling film cleaning. The surfaces of the machine exposed to the inside of the tank not targeted by cleaning liquid from the cleaning device itself are cleaned by the cleaning liquid sprayed on the surfaces from a second tank cleaning device.

- After use, flush the machine with fresh water
- Cleaning media should never be allowed to dry or remain in the system due to possible "salting out" or "scaling" of the cleaning media. If cleaning media contains volatile chloride solvents, it is recommended not to flush with water after use, as this might create hydrochloric acid
- Hot chemical may be used for cleaning and sterilization. If steaming is needed, contact you local Alfa Laval office for recommendation.
- Protect against scalding and burning

5.3 Troubleshooting

NOTE

Study the maintenance instructions carefully before replacing worn parts – see chapter [Maintenance](#) on page 37.

DANGER

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

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!



Problem	Possible causes	Action
Leakage at piston	<ul style="list-style-type: none"> Worn or damaged lipseal 	<ul style="list-style-type: none"> Replace lipseal
Leakage at clamp connections	<ul style="list-style-type: none"> Worn or damaged O-rings 	<ul style="list-style-type: none"> Replace O-ring
Leakage at seal towards product zone	<ul style="list-style-type: none"> Worn or product affected plug seal Product deposit on seal and or seat 	<ul style="list-style-type: none"> Replace seal More frequent cleaning
Piston is not restoring to original position	<ul style="list-style-type: none"> Damaged actuator Foreign objects in inlet house 	<ul style="list-style-type: none"> Replace actuator Inspect inlet house and remove foreign objects
Poor cleaning performance	<ul style="list-style-type: none"> Insufficient flow/pressure 	<ul style="list-style-type: none"> Refer to the pressure-flow graph to reconfirm the recommended operating conditions at the device Reconfirm minimum flow rate recommended for size of surface being cleaned (e.g., based on ASME BPE recommendations)
	<ul style="list-style-type: none"> Incorrect cleaning media 	<ul style="list-style-type: none"> Verify temperature and concentration of the cleaning media
	<ul style="list-style-type: none"> Insufficient time 	<ul style="list-style-type: none"> Verify cleaning time
	<ul style="list-style-type: none"> Debris in the orifice 	<ul style="list-style-type: none"> Inspect orifice and remove debris
	<ul style="list-style-type: none"> Poor drainage of compartment 	<ul style="list-style-type: none"> Ensure the compartment drains cleaning liquid at a rate equal to or higher than the flow rate of all cleaning devices.

6 Maintenance

NOTE

Alfa Laval cannot be held responsible for incorrect maintenance.

Always read the chapter *General Safety Precautions* on page 11 thoroughly.

Always read the chapter *Technical Data* on page 55 thoroughly.

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

Alfa Laval recommend keeping service kits in stock to optimise uptime of your equipment.

DANGER

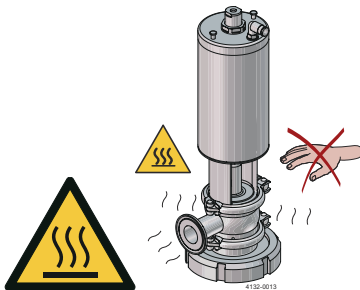
If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!



WARNING

Never touch the machine when processing hot fluids or when sterilising.

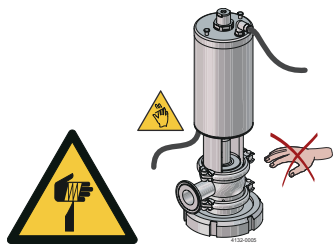


WARNING Air supply

Always connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. To reduce risk of whiplash, fasten air supply hose to other supply lines as close to the push-in fitting as practically possible.

CAUTION

During maintenance, caution is needed when the actuator is supplied with compressed air. Only touch moving parts with tools.



6.1 Preventive Maintenance

NOTE

Always handle the machine with care. Take proper action to protect fine surfaces from being damaged.

Use only proper tools (e.g., the Alfa Laval standard tool kit). **Never** force or hammer components together or apart. Always perform all assembly/disassembly steps in the order described in this Instruction manual.

Never assemble components without previous cleaning. This is especially important at mating surfaces.

Work in a clear well-lighted work area.

To optimise the operation of the machine and to minimize the down time due to repair activities, the maintenance should consist of:

- **Inspection and maintenance:** Strictly follow the technical documentation
- **Preventive maintenance:** Visual inspection of the machine 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 shall be replaced or repaired
- **Stock of Alfa Laval genuine spare parts:** Alfa Laval recommends keeping a stock of genuine spare parts facilitating preventive maintenance and reducing down time in case of unplanned breakdowns

Always use Alfa Laval genuine spare parts.

NOTE

According to “Regulation (EC) No 1935/2004 - Article 17” effective from 27th of October 2006, producers of food shall ensure traceability of the materials and articles intended to come into contact with foodstuffs. It is recommended that a traceability system is setup for replacement of wear parts and spare parts. This makes it possible to identify into which machine a given wear part or spare part has been inserted.

The recommended preventive maintenance program provided in chapter [Recommended Service Intervals](#) on page 41 is based on machines working in average conditions. However, a cleaning device, exposed to heavy soiling and recirculation CIP liquid containing abrasives and/or particulates needs more frequent attention than one exposed to light/no soiling and recirculation with ordinary CIP liquid. Alfa Laval Kolding A/S recommends that you adjust the maintenance program to suit the cleaning task in hand. Contact your local Alfa Laval sales office for discussion.

For further information regarding Alfa Laval Service Kits and service intervals, see chapter [Recommended Service Intervals](#) on page 41.

**NOTE**

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	<ul style="list-style-type: none"> • Regular inspection for leakage and smooth operation • Keep a record of the machine • Use the statistics for inspection planning Replace after leakage	<ul style="list-style-type: none"> • Regular inspection for leakage and smooth operation • Keep a record of the machine • Use the statistics for inspection planning Replace after leakage
Lubrication	Before fitting: Wet O-rings with water or, if accepted by end user, Alfa Laval Silicon based Food-grade Lubricant USDA H1 approved grease	Before fitting: Molykote Longterm 2 plus

6.2 Recommended Service Intervals

It is recommended that the wear parts are checked every 500 working hours (after 2000 working hours: inspection every 200 working hours) for machine working under normal conditions.

Recommended spare parts and service kits: See chapter [Spare Parts](#) on page 63.

(#) refers to position numbers, see chapter [Part Lists and Exploded Views](#) on page 65.

An inspection consists of:



Use only pure water at normal temperature for safety reasons.

Use goggles when checking rotation.



1. At a pressure of 0.3 bar (4.4 psi) open a hatch in the closed compartment to verify rotation and liquid is expelled from all orifices.
2. Un-install the machine as described in chapter [Uninstall for Maintenance](#) on page 42.
3. Visual inspection for foreign objects. Remove any objects and clean before rotation verification.
4. Rotation verification as described in chapter [Unpacking/Delivery](#) on page 25.
5. Disassemble the machine as described in chapter [Dismantling](#) on page 42.
 - a. Check lipseal (12) for visible wear
 - b. Check plug seals (9) for visible wear
 - c. Check spray head (7) for wear on bearing
6. Reassemble the machine as described in chapter [Assembly](#) on page 54.
7. Rotation verification as described in chapter [Unpacking/Delivery](#) on page 25.
8. Reinstall machine as the reverse of chapter [Uninstall for Maintenance](#) on page 42.

6.3 Dismantling

NOTE

Handle scrap correctly – See chapter [Recycling Information](#) on page 17.

NOTE

Alfa Laval Kolding A/S do not recommend or support disassembly of the actuator in the field due to spring under load danger. Please return the actuator to us for disassembly and repair. Replacement of bushings (21) and O-rings (20) (22) on the actuator is possible without opening the actuator (see chapter [Actuator Bushing Replacement \(Non-maintainable Actuator\)](#) on page 51).

DANGER

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

The spring inside is under load – any attempt to open the actuator can lead to severe injury or even death!

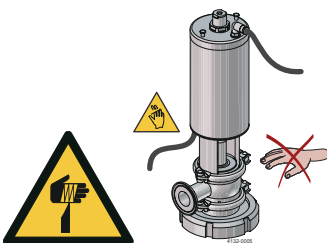


WARNING Air supply

Always connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. To reduce risk of whiplash, fasten air supply hose to other supply lines as close to the push-in fitting as practically possible.

CAUTION

During maintenance, caution is needed when the actuator is supplied with compressed air. Only touch moving parts with tools.



6.3.1 Uninstall for Maintenance

Disconnect the machine from the CIP supply line by loosening the cleaning media inlet connection (clamp or nut) and remove the gasket.

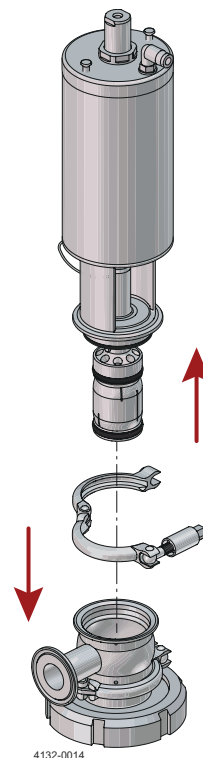
Uninstall machine as the reverse of chapter [Installation of Externally Mounted Cleaning Devices](#) on page 30.

Clean material build-up and deposits from external parts with water or suitable chemical cleaner, possibly Scotch-brite, S-Ultrafine.

1 **Option 1 – remove only actuator and spray part**

The design of the Alfa Laval retractable allows the user to only remove the actuator (B) and the spray part assembly in an easy operation to inspect the actuator (1), the spray head (7) and the plug seals (9). The inlet house (14) and process adaptor (16) then remain attached to the process connection (E). This significantly reduces the weight of the removed parts and save time as the supply line does not need to be removed for maintenance.

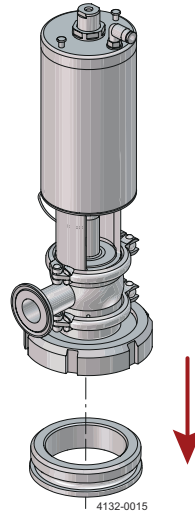
- a) Loosen and remove upper clamp (15) on inlet house (14).
- b) Withdraw the actuator (1) including connector (4), sealing element (10), spray part (7) and stator (8) from the inlet house (14).



2 Option 2 – remove the entire retractable device from the process connection

The design of the Alfa Laval Free Rotating Retractor allows the user to remove the entire retractor to inspect all parts.

- a) Dismount the connection (17) from the process connection (E) on the processing equipment.
- b) Withdraw the machine from the process connection (E).



6.3.2 Disassembly

NOTE

Before disassembly, **always** thoroughly read the disassembly instructions and the Spare Part manual available on anytime.alfalaval.com/alweb/.

Always replace all parts included in the Service Kit.

Always clean all tools and fixtures prior to assembly/disassembly to ensure that scratches and marks and trace of soil/corrosion from tools are avoided.

Never scratch or damage the surfaces of the machine.

Always place components on soft material.

Always check surfaces for product residues and clean all parts before assembly.

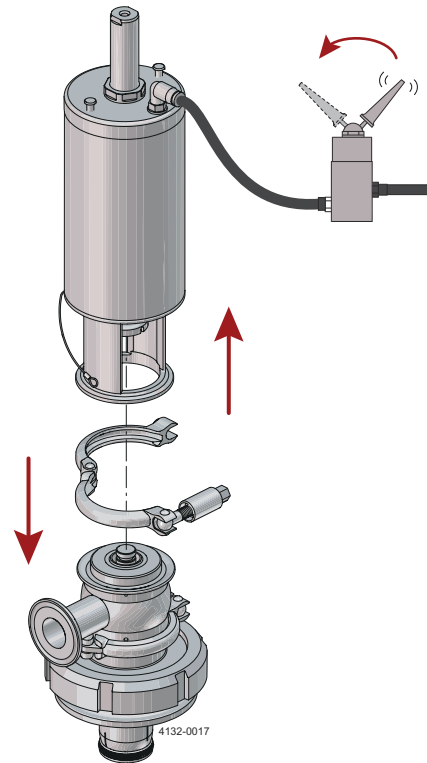
Always assemble the machine as described on the following pages.

CAUTION

During disassembly and assembly, the threads can gall. If any resistance is felt when screwing/unscrewing parts, proceed with caution.

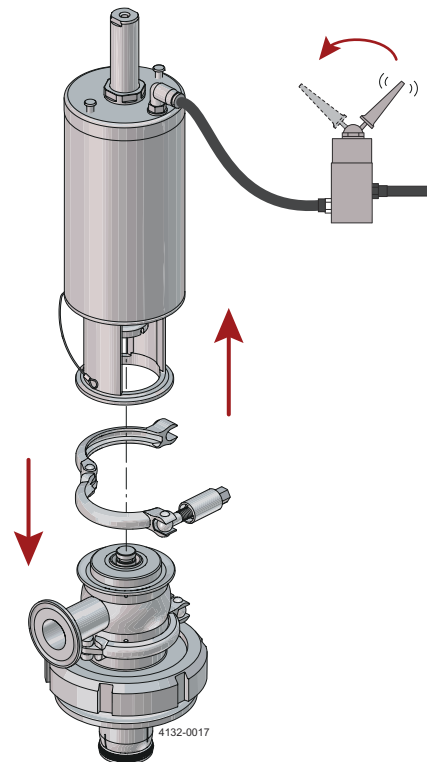
1

1. Add air supply to actuator (1) through air fitting (24) on the top of the actuator (1).
2. Open air supply and the output shaft of the actuator moves forward.
3. Release the lock ring (2) located between the inlet house (14) top and the actuator (1) bottom.
4. Remove the clip (3) connecting the output shaft of the actuator (1) and the connector (4).



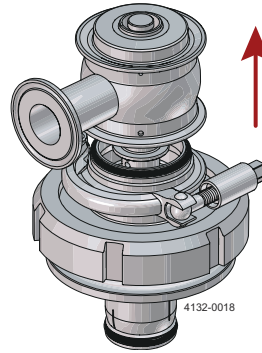
2

1. Close air supply and the output shaft of the actuator moves backwards.
2. Loosen and remove the upper clamp (15) on inlet house (14).
3. Remove actuator (1) from the inlet house (14).



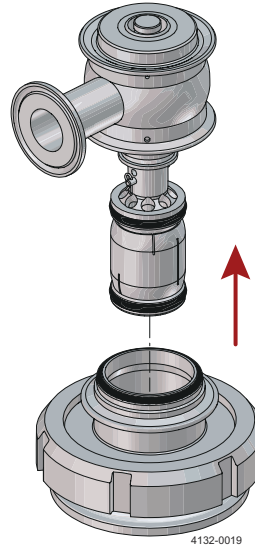
3

1. Wet plug seal with water.
2. Loosen and remove lower clamp (15) on inlet house (14).
3. Pull inlet house (14) apart from Process adaptor (16).



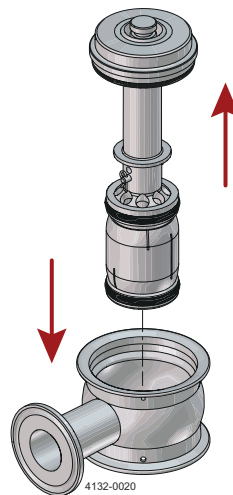
4

1. Pull inlet house (14) until spray head (7) is out of the Process adaptor (16). NB: for some adaptors some force is needed to pull the O-ring (9) past the valve seat in the Process adaptor (16).

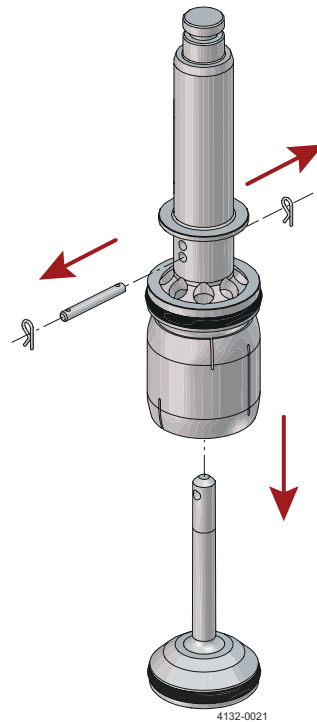


5

1. Push the spray head (7) through the inlet house (14).
2. Remove sealing element (10) from the Connector (4).



- 6
1. Remove clip (5) from pin (6).
 2. Remove pin (6) from connector (4).
 3. Withdraw stator (8) from connector (4) and spray head (7).



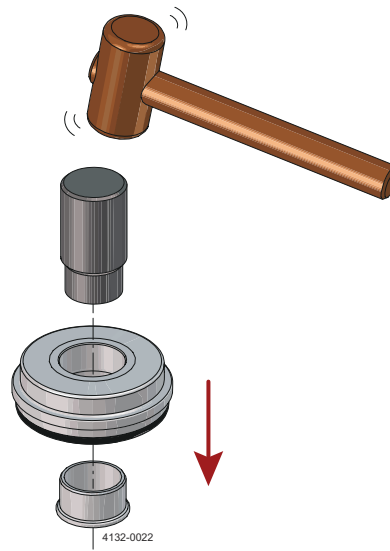
6.4 Lipseal Replacement and Bushing Replacement

6.4.1 Removal of Lipseal and Bushing

- 1 Remove lip seal (12) from sealing element (10) using a small flat headed screw driver.
- 2 Remove bushing (11) from sealing element (10) using bushing tool (9613160901) and rubber mallet.

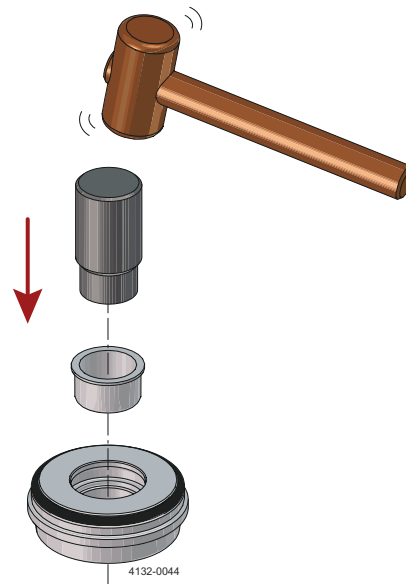
! NOTE

Be careful not to damage the bushing.



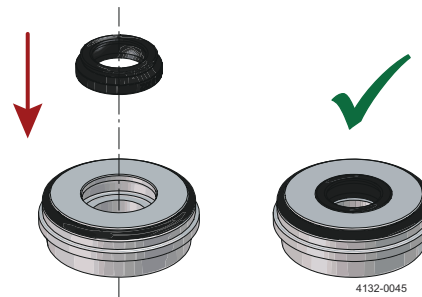
6.4.2 Mounting Bushing

- 1 Orientated the bushing (11) as shown. Press it slightly into the sealing element (10). Insert bushing tool (9613160901) into the bushing (11) and hammer the bushing (11) in place using the rubber mallet.



6.4.3 Mounting Lipseal

- 1 Orientate the lipseal (12) as shown. Squeeze the lipseal (12) to fit the cylindrical part of the lipseal (12) into the lipseal groove in the sealing element (10).



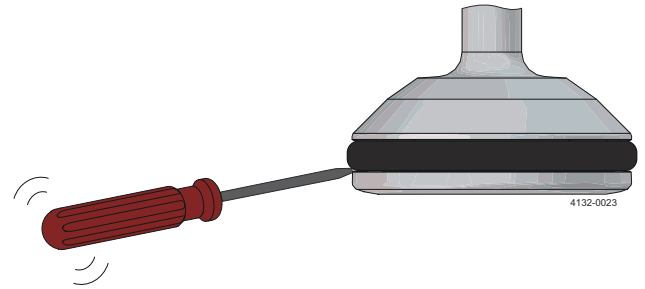
6.5 Static O-ring Replacement

- 1 Remove static O-rings (13) from sealing element (10) and process adaptor (16) and static O-ring (18) from process adaptor (16).
- 2 Insert static O-rings (13) on sealing element (10) and process adaptor (16) and static O-ring (18) on process adaptor (16). Make sure the O-rings are completely mounted in the O-ring grooves.

6.6 Plug Seal Replacement

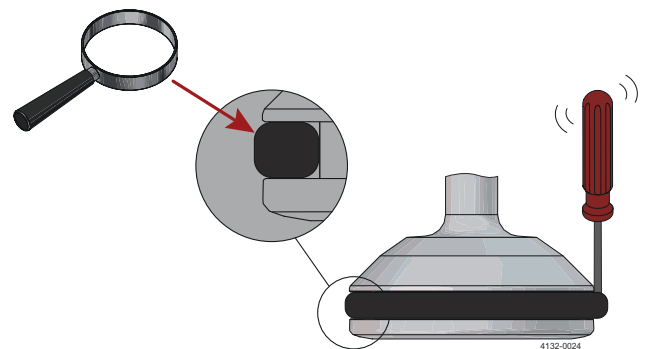
6.6.1 Removal of Plug Seal

- 1 Remove old plug seal (9) using a knife, a small flat headed screwdriver or similar. Be careful not to damage the stator (8) or connector (4) surface.

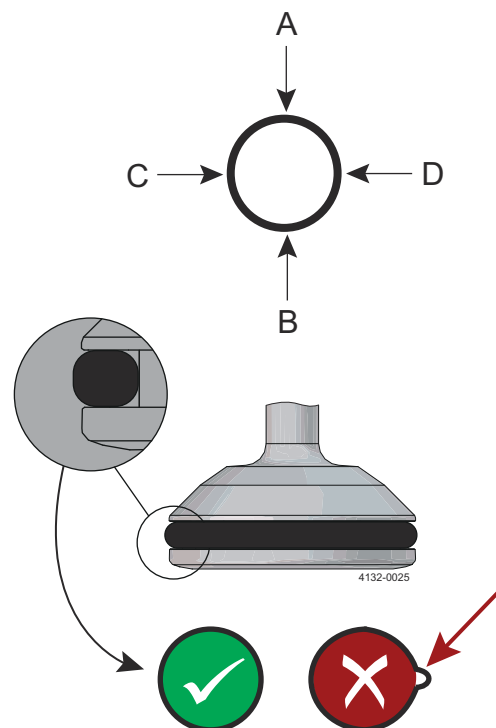


6.6.2 Mounting Plug Seal

- 1 Fit the plug seal (9) on the stator (8) or connector (4) without pressing into the groove.
Be careful not to twist the plug seal (9).
Use a small flat headed screwdriver (two turns) to fit the plug seal (9) properly and ensure it is not twisted.



- 2
 1. Wet plug seal (9) with a little water.
 2. To ensure correct mounting, press with your thumb on the plug seal (9), which must be done approximately 10 times and always with the opposite pressure points, from A to B and C to D.
 - a. The rest of the plug seal (9) can now be pressed into the groove so the whole plug seal (9) is mounted. Check that there are NO "bulge".
 - b. If there is little bulge – then use the screwdriver to eliminate the bulge.
 - c. Again, press with the thumb on the plug seal (9) and keep the pressure while rotating 360°.
 - d. Alternatively, press the plug seal and stator/connector into the plugseat of the process connector.



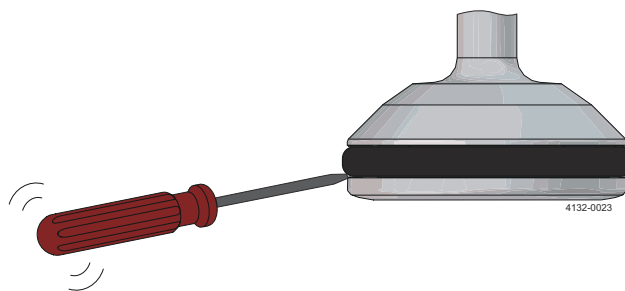
3

It is important to release compressed air behind the plug seal (9).

This is done with a small flat headed screwdriver.

It must be done in one or two different points on the circumference.

Be careful not to make marks on the surface of the stator (8) or connector (4) and plug seals (9).



6.7 Actuator Bushing Replacement (Non-maintainable Actuator)



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

The spring inside is under load — any attempt to open the actuator can lead to severe injury or even death!



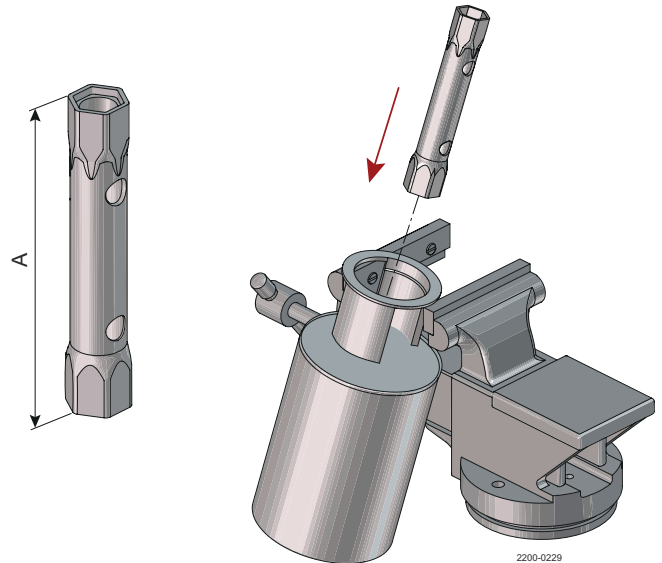
Tools needed for replacement:

1)

Use a 27 mm (1 1/16") tubular box wrench to unscrew and fasten the bushings (21).

This tool allows the actuator stem to fit inside and provide good access to the bushing (21) placed in the actuator yoke end.

The tubular box wrench can be bought from Alfa Laval as part of 9614198401.



2)

The actuator spindle can in some cases be forced off-center by the internal spring (see drawing).

If misaligned the spindle can be aligned with the bushing (21) thread using an aligning spindle and the thread adaptor.

The aligning spindle and thread adaptor can be bought from Alfa Laval as part of 9614198401. This also include the 27 mm (1 1/16") tubular box wrench with bushing inserted for the aligning spindle.

The aligning spindle can also be manufactured locally using below dimensions.

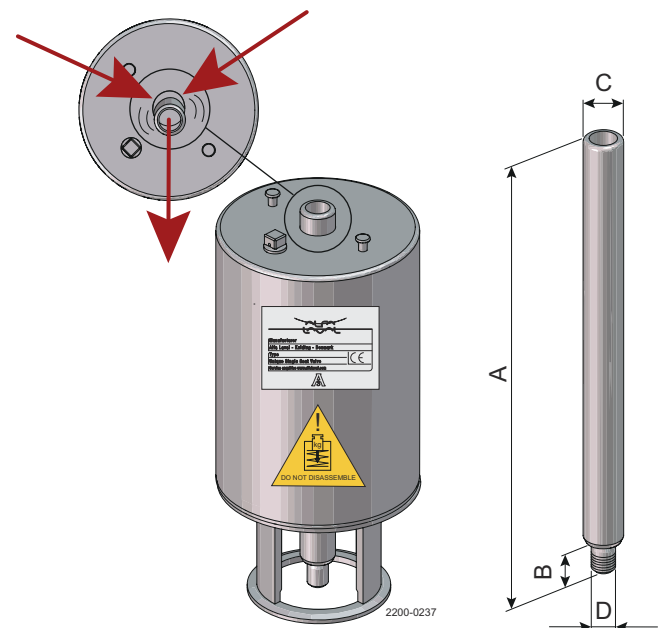
Dimensions

A = 280 mm (11")

B = 6 mm (0.63")

C = Rod \varnothing 20 mm (0.79")

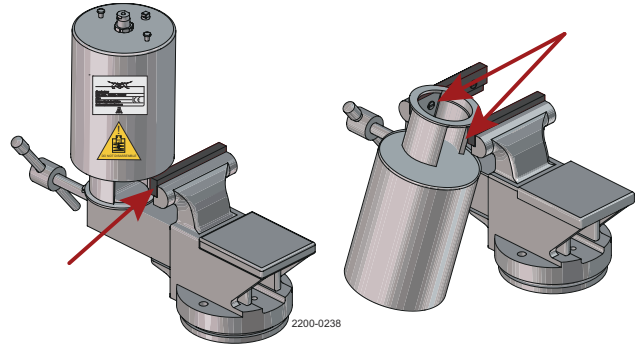
D = M6x1



Spindle forced off centre by spring inside actuator

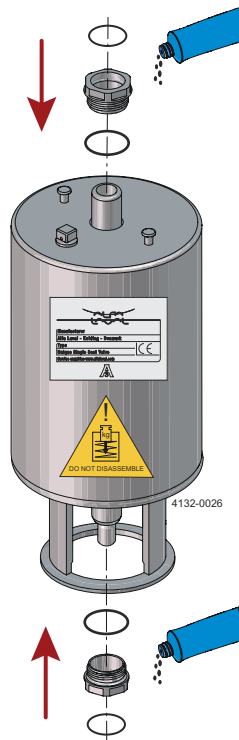
- 1 The actuator service kit contains two bushings (21) and four O-rings (20) (22).
Mount the thick O-ring (20) inside and the thin O-ring (22) outside the bushing (21).

- 2 The actuator must be fixed in a vise. 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" (see drawing).



- 3 Unscrew and remove the bushing (21) with the two O-rings (20) (22).

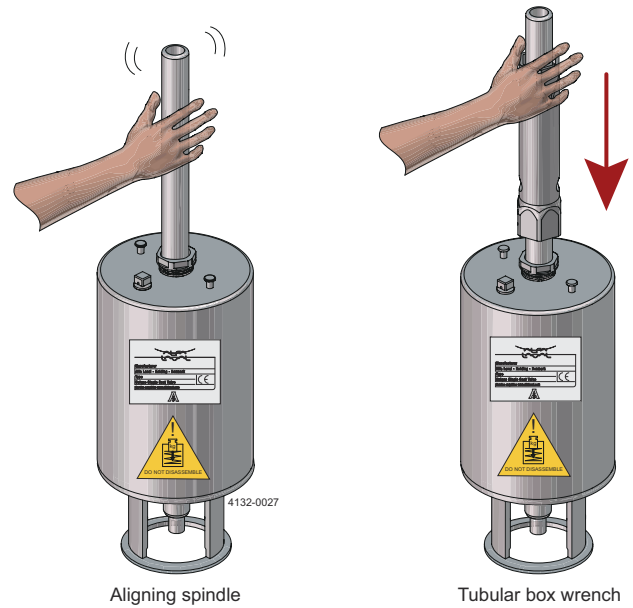
- 4 Lubricate the stem and O-rings (20) (22) with "Muolykote Longterm 2 Plus" or an equivalent grease before sliding the new bushings (21) onto the actuator stem.
Slide the lubricated bushing (21) with the two O-rings (20) (22) onto the actuator stem.



- 5** Fit the aligning spindle to the actuator stem and slide the tubular box wrench onto the aligning spindle.

Move the tubular box wrench so the thread on the bushing aligns with the thread in the actuator.

When aligned, initial fasten the bushing using the fingers. Ensure the thread engages easily.



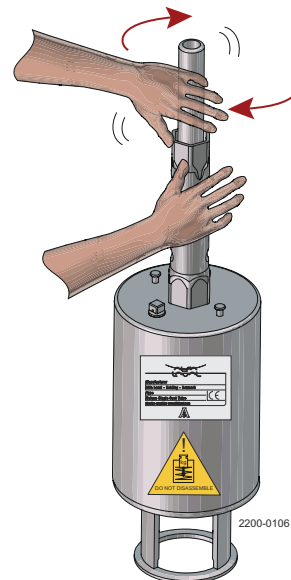
Aligning spindle

Tubular box wrench

- 6** Lower the tubular box wrench onto the bushing.

Fasten the bushing (21).

Recommended torque is 10 Nm (7 lb-ft) which is achievable by hand tightening only.



2200-0106

6.8 Assembly

 **NOTE**

All parts shall be cleaned thoroughly before reassembling.

Any deposit remaining on the parts can cause difficulty disassembling again.

Reverse order of chapter *Disassembly* on page 44.

Lubricate lip seal (12) and plug seal (9) with water.

Remember to mount the spray head (7) in the correct orientation otherwise the pin (6) for assembly cannot be mounted.

The clamp (15) threads must be lubricated before tightening – max. torque for the clamps is 10-12 Nm (8-9 lbf – ft).

7 Technical Data

NOTE

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

Inform all personnel about the technical data.

7.1 Alfa Laval Free Rotating Retractor

7.1.1 TECHNICAL DATA

Temperature/pressure – process contact

Temperature range – liquid service	-10° C to 95° C (14° F to 284° F)
Temperature max. – steam/gas service	Max. 121° C (250° F)
Temperature max. – ambient	Max. 150° C (304° F)
Pressure range – liquid service	1-3 bar (14.5 psi to 43.5 psi)
Pressure max. – liquid service	5 bar (72.5 psi)
Pressure max. – steam/gas	Contact Alfa Laval for information
Pressure min. – vessel	Full Vacuum

Temperature/pressure – actuator

Temperature range	-10° C to 60° C (14° F to 140° F)
Pressure range - supply	5-7 bar (72.5 psi to 101.5 psi)

Misc.

Wetting radius (see performance data)	900 mm (35.5 inch)
Cleaning radius (see performance data)	800 mm (31.5 inch)
Lubrication – product contact	Cleaning media
Air supply connection	6 mm (0.24 inch)

7.1.2 PHYSICAL DATA

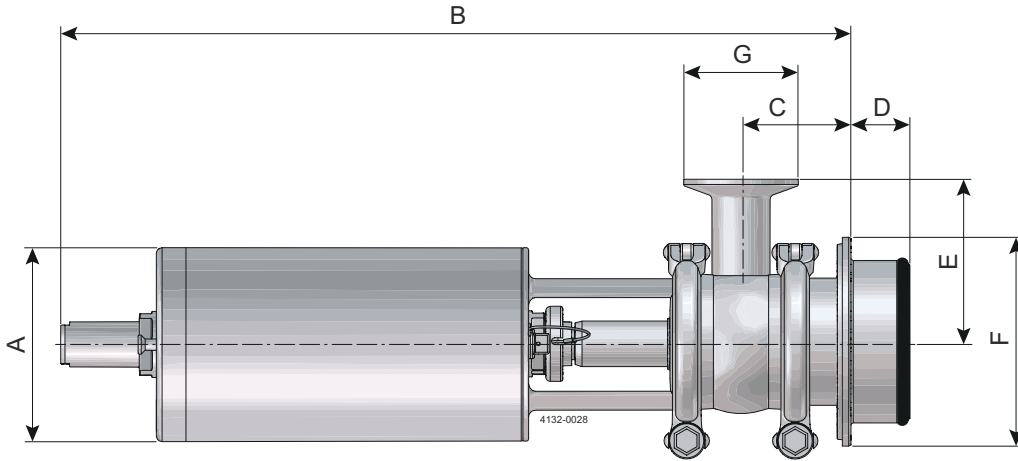
Materials

Steel parts – product wetted	AISI 316
Steel parts – non-product wetted	AISI 304, AISI 304L, AISI 302, Brass
Seal parts – product wetted	EPDM
Seal parts – non-product wetted exposed	NBR, FPM
Polymer parts – product wetted	PEEK
Polymer parts – non-product wetted exposed	Igildur, PP

Surface roughness

External surface finish	Bead blasted
Internal surface finish – cleaning media	Ra 0.8 µm / Ra 32 µi
Internal surface finish - product	Free Rotating Retractor: Ra 0.8 µm / Ra 32 µi Free Rotating Retractor UltraPure: Ra 0.38 µm EP / Ra 15 µi EP

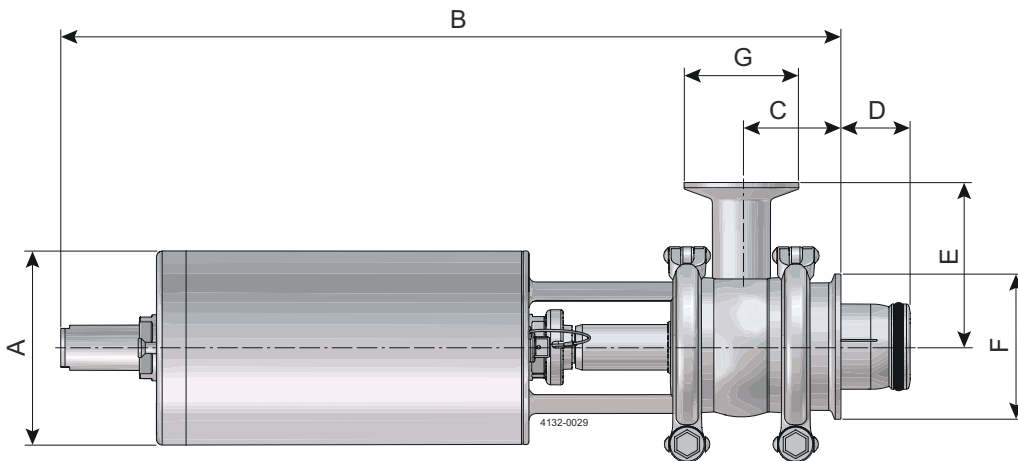
7.1.3 Dimensions



Tank connection	Inlet connection	Dimension mm / inch					Weight
F	G	A	B	C	D	E	Kg / lb
3 inch RJT	1 inch Clamp	85 / 3.3	365.4 / 14.39	48.4 / 1.91	26.0 / 1.02	71.5 / 2.81	5.3 / 11.7
DN80 Clamp ¹			361.8 / 14.24	44.9 / 1.77	29.5 / 1.16		4.7 / 10.4
3 inch Clamp ²			368.4 / 14.50	51.4 / 2.02	23.0 / 0.91		4.5 / 10.0

¹ DIN 11866

² ISO 2852



Tank connection	Inlet connection	Dimension mm / inch					Weight
F	G	A	B	C	D	E	Kg / lb
2 inch Clamp ¹	1 inch Clamp	85 / 3.3	361 / 14.21	44 / 1.73	30.5 / 1.20	71.5 / 2.81	4.0 / 8.8

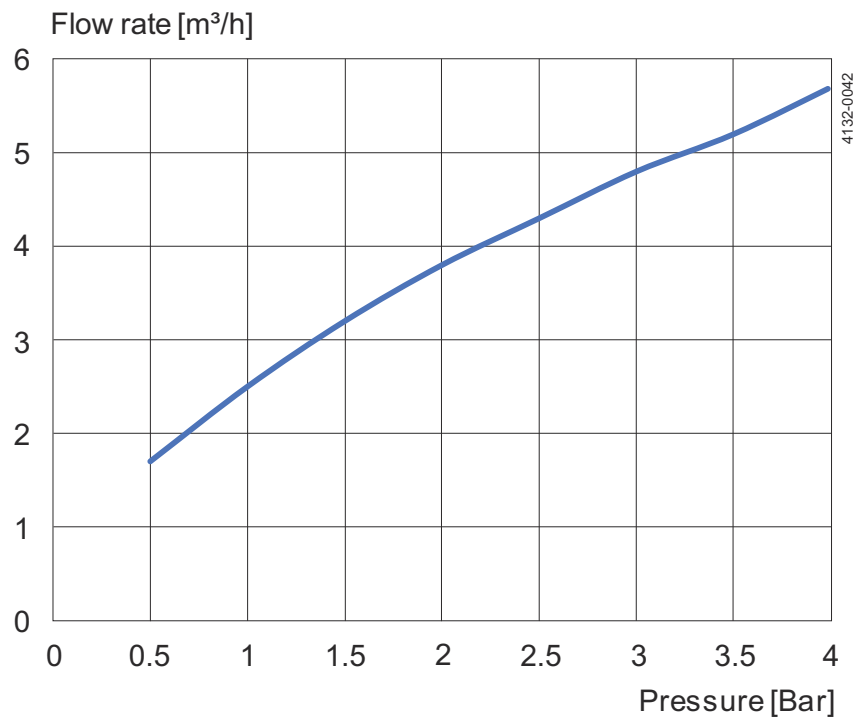
¹ ISO 2852

7.1.4 Performance Data

NOTE

The inlet pressure has been measured immediately before the machine inlet. To achieve the performance indicated in the curves, the pressure drop in the supply lines between pump and machine must be taken into consideration.

7.1.4.1 Flow Rate

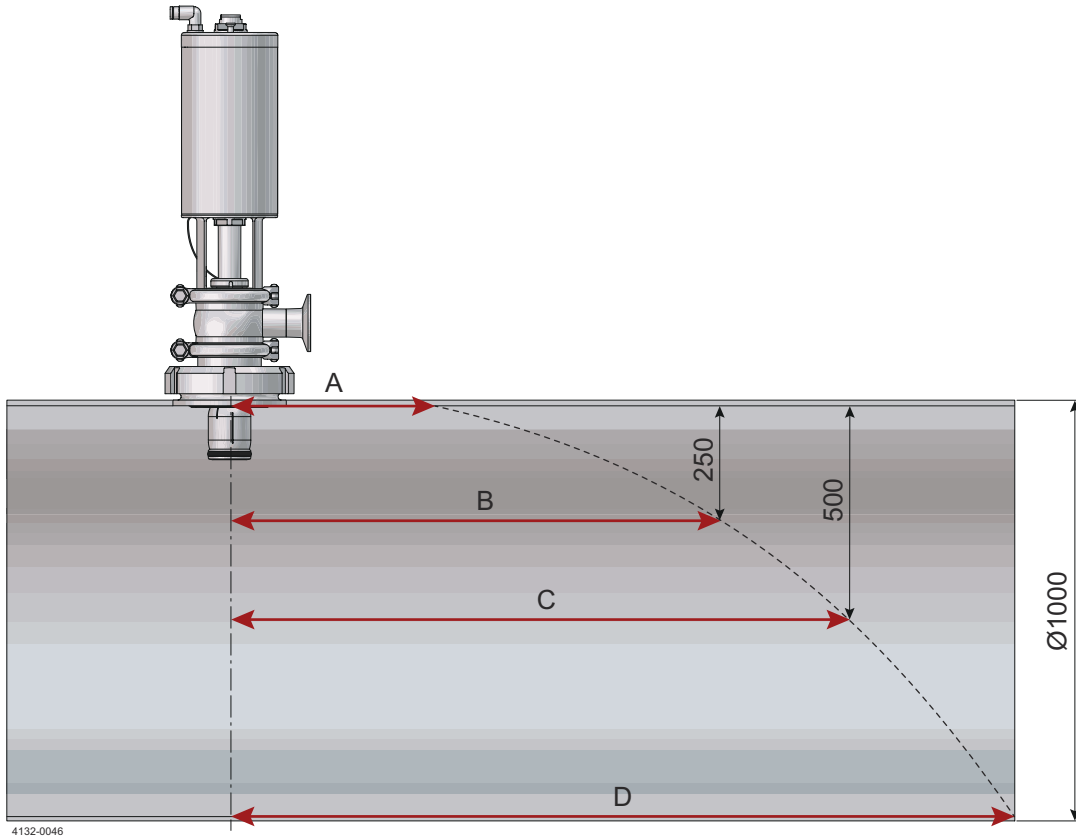


7.1.4.2 Throw Length

NOTE

Throw lengths are measured as horizontal throw length. Effective throw length varies depending on substance to be removed, cleaning procedure and agent.

Throw length distance of the machine installed vertically at the top to the circular duct. Along the top wall, throw lengths are smallest. Further down the side of the circular duct, the throw length increases.



4132-0046

Wetting distance mm / inch

Pressure	A	B	C	D
2 bar	900 / 35.5	3300 / 130	4000 / 158	4800 / 189

Cleaning distance mm / inch

Pressure	A	B	C	D
2 bar	800 / 31.5			

8 Product Programme

Please go to Anytime for possible configurations and item numbers.

8.1 Qualification Documentation

Documentation specification

Standard version

Q-doc	<p>Equipment Documentation includes:</p> <ul style="list-style-type: none"> • EN 1935/2004 DoC • EN 10204 type 3.1 inspection Certificate and DoC • FDA DoC • GMP EC 2023/2006 DoC • EU 10/2011 DoC • ADI DoC • QC DoC
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UltraPure version

Q-doc	<p>Equipment Documentation includes:</p> <ul style="list-style-type: none"> • EN 1935/2004 DoC • EN 10204 type 3.1 inspection Certificate and DoC • FDA DoC • GMP EC 2023/2006 DoC • EU 10/2011 DoC • ADI DoC • QC DoC • USP 87 and 88 Class VI or ISO 10993-5 and ISO 10993-6, 10, 11
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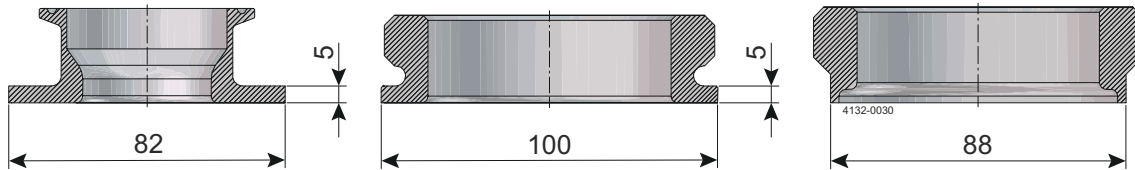
8.2 Accessories

8.2.1 Weld Plates

Process connections

Item no:	Denomination
8010013956	2 inch Clamp weld adaptor
8010019832	3 inch RJT weld adaptor, for hole in duct
8010019833	3 inch RJT weld adaptor, for pull out on duct

For more information see manual for Alfa Laval Retractor series Weld plates.

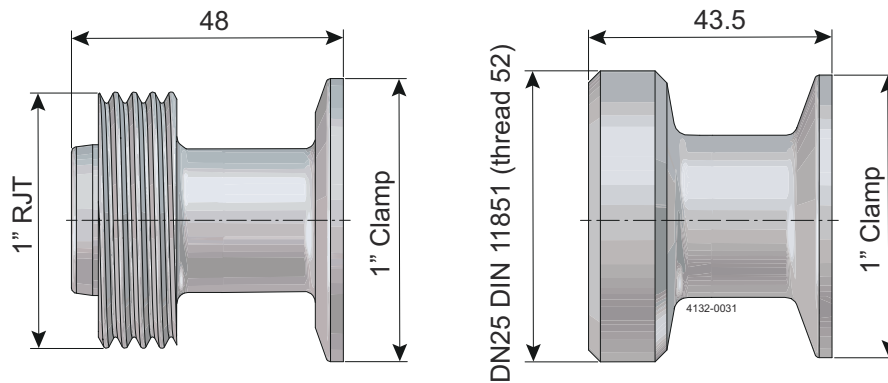


8.2.2 Inlet Connection Adaptors

Item no:	Denomination
8010019834	1 inch Clamp ¹ to 1 inch RJT (male part)
8010027772	1 inch Clamp ¹ to DN25 DIN (male part)

¹ ISO 2852

Gasket (9611991358) and clamp (211053) to be ordered separately.



8.2.3 Sensor and Control Units

The Alfa Laval Free Rotating Retractor can work with or without a sensor or a control unit. Alfa Laval ThinkTop V20 and V50 series fit onto the actuator of the Alfa Laval Free Rotating Retractor if sensor or control unit is needed.

Please go to Anytime for possible configurations and item numbers.

8.2.4 Tools and Installation Material

Tools available for assembly and disassembly

Item no.	Denomination
9614198401	Actuator tool for mounting of bushing
9613160901	Sealing element tool for mounting bushing
Commodity	Rubber Mallet
Commodity	M10 fork/ring key or similar
Commodity	Nose-pliers
Commodity	Small flat headed screw driver

Installation material for connecting Alfa Laval machine to the process

Item no.	Denomination
9611991358	Gasket for 1"Clamp ISO 2852
211053	Clamp or 1"-1½" ISO 2852
290043	Gasket for 2"Clamp ISO 2852
211054	Clamp for 2" ISO 2852
9611992017	Gasket for DN80 Clamp DIN11866
9611994459	Clamp for DN80 DIN11866
9611990769	Gasket for 3"Clamp ISO 2852
211056	Clamp for 3" ISO 2852
9611992821	Gasket for 1"RJT
9611991269	Gasket for DN25 DIN11851

9 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.

9.1 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

9.2 Alfa Laval Service

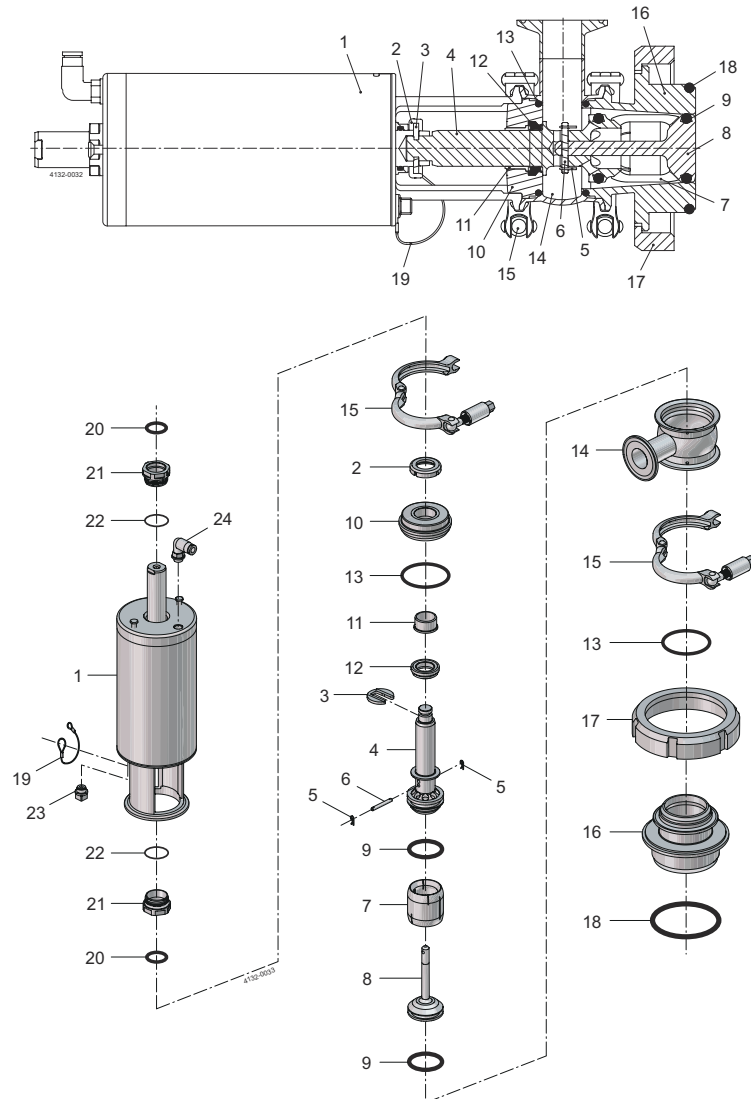
Alfa Laval is represented in all larger countries of the world.

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

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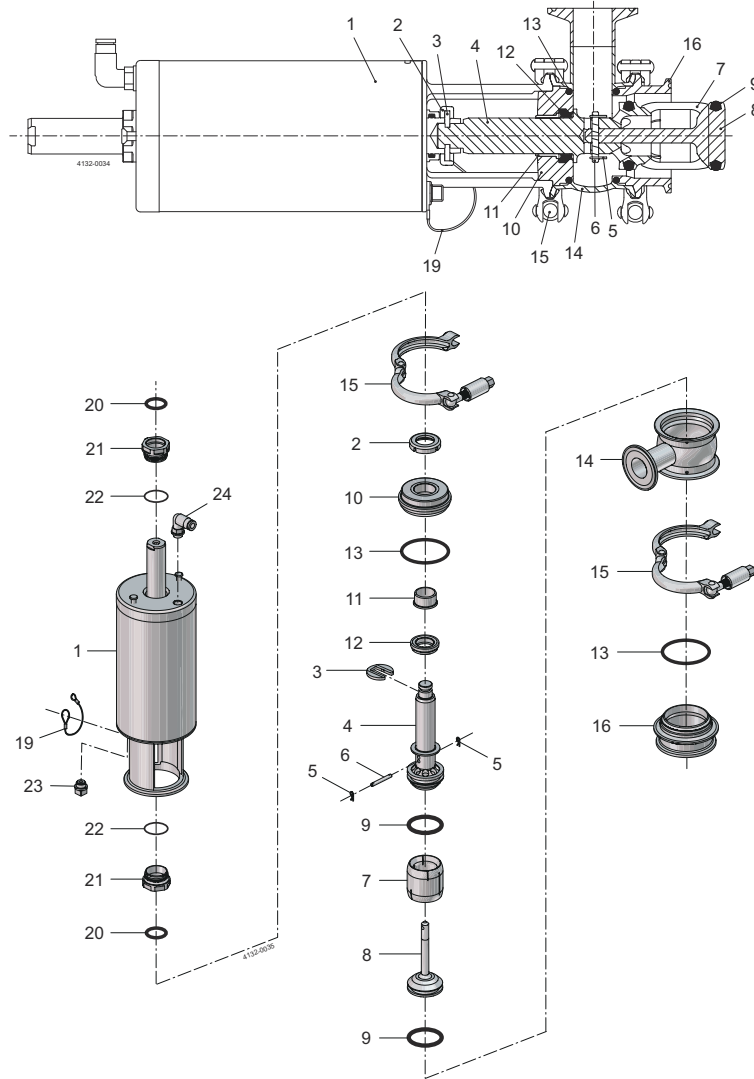
10 Part Lists and Exploded Views

10.1 Standard Version - RJT Connection



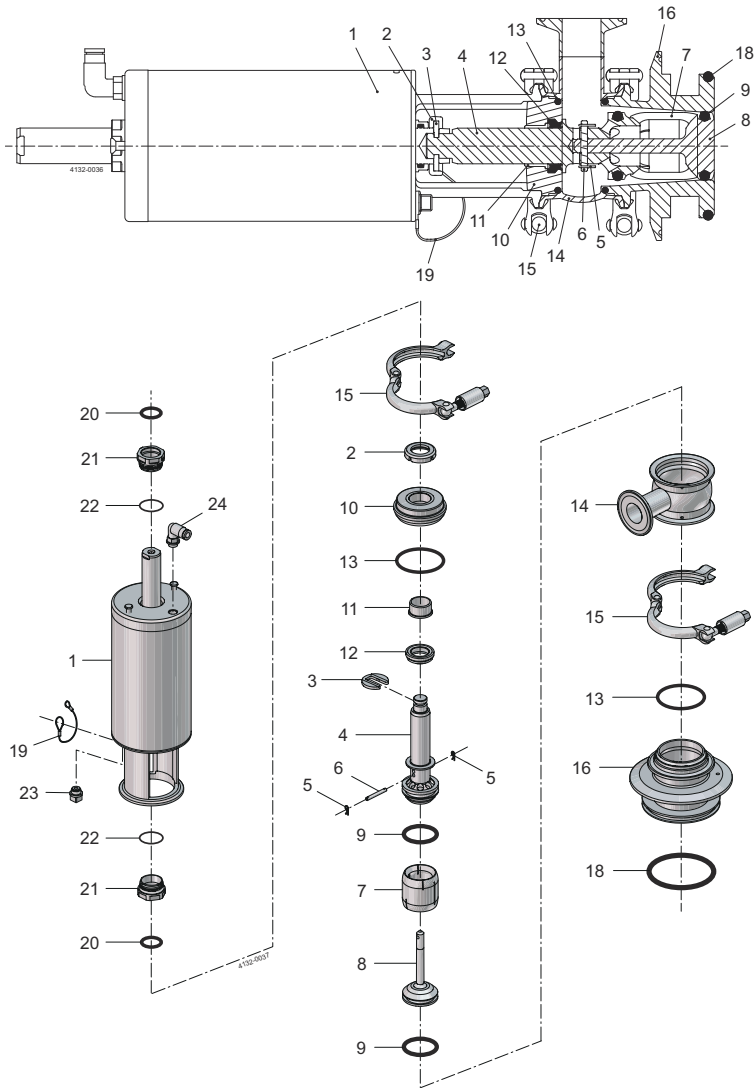
Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
1	1	Actuator	13	2	O-ring
2	1	Lock ring	14	1	Inlet house
3	1	Clip	15	2	Clamp
4	1	Connector	16	1	Process adaptor
5	2	Clip	17	1	Nut
6	1	Pin	18	1	O-ring
7	1	Spray head	19	1	Grounding wire
8	1	Stator	20	2	O-ring
9	2	Plug seal	21	2	Bushing
10	1	Sealing element	22	2	O-ring
11	1	Bushing	23	1	Plug
12	1	Lipseal	24	1	Air fitting

10.2 Standard Version - 2 inch Clamp Connection



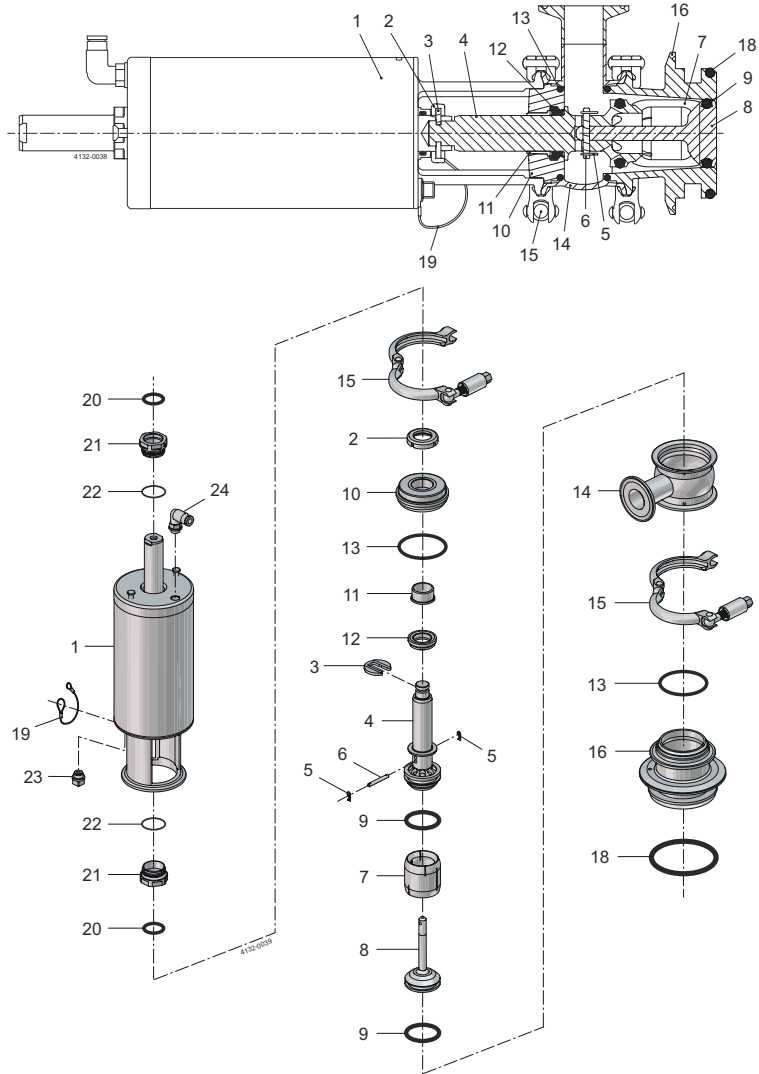
Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
1	1	Actuator	13	2	O-ring
2	1	Lock ring	14	1	Inlet house
3	1	Clip	15	2	Clamp
4	1	Connector	16	1	Process adaptor
5	2	Clip			
6	1	Pin			
7	1	Spray head	19	1	Grounding wire
8	1	Stator	20	2	O-ring
9	2	Plug seal	21	2	Bushing
10	1	Sealing element	22	2	O-ring
11	1	Bushing	23	1	Plug
12	1	Lipseal	24	1	Air fitting

10.3 Standard Version - DN80 Connection



Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
1	1	Actuator	13	2	O-ring
2	1	Lock ring	14	1	Inlet house
3	1	Clip	15	2	Clamp
4	1	Connector	16	1	Process adaptor
5	2	Clip			
6	1	Pin	18	1	O-ring
7	1	Spray head	19	1	Grounding wire
8	1	Stator	20	2	O-ring
9	2	Plug seal	21	2	Bushing
10	1	Sealing element	22	2	O-ring
11	1	Bushing	23	1	Plug
12	1	Lipseal	24	1	Air fitting

10.4 Standard Version - 3 inch Clamp Connection



Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
1	1	Actuator	13	2	O-ring
2	1	Lock ring	14	1	Inlet house
3	1	Clip	15	2	Clamp
4	1	Connector	16	1	Process adaptor
5	2	Clip			
6	1	Pin	18	1	O-ring
7	1	Spray head	19	1	Grounding wire
8	1	Stator	20	2	O-ring
9	2	Plug seal	21	2	Bushing
10	1	Sealing element	22	2	O-ring
11	1	Bushing	23	1	Plug
12	1	Lipseal	24	1	Air fitting

11 Appendix

11.1 Appendix A - Weld Plate Installation

⚠ WARNING

Always pay special attention to the instructions below so that severe personal injury and/or damage to the weld plate and device is avoided.

Always read this Instruction manual thoroughly.

Only install the device when the tank is depressurized and cooled down.

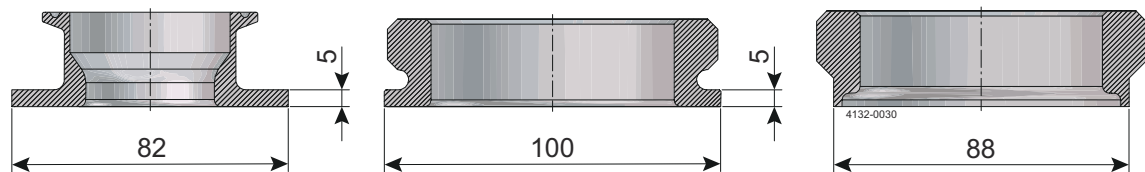
Only use qualified technical personnel to install the weld plate. They shall have read and understood the Instruction manual!

! NOTE

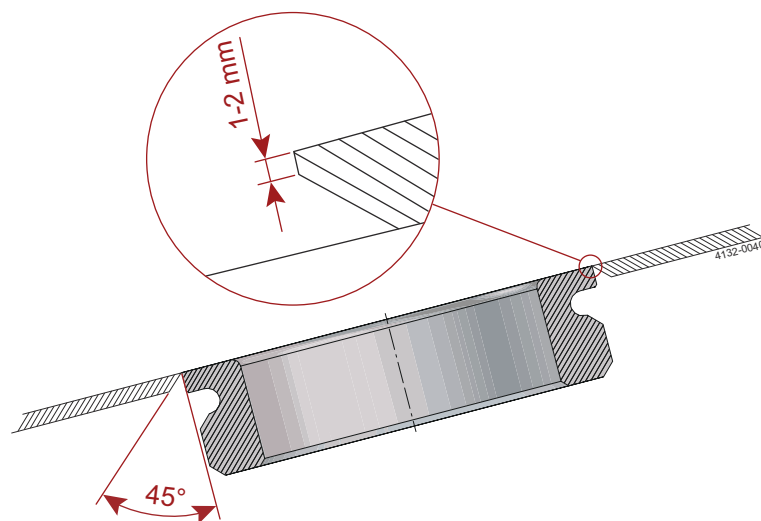
To ensure a hygienic weld (avoid or remove discoloration) it is recommended to use either shielding gas or post-treatment of the welding zone.

Incorrect welding procedures may deform and warp the weld plate - therefore, it is recommended to use a heat sink during welding to dissipate heat from the welding area.

Dimensional information



1. Cut a hole in the compartment sized to the diameter of the weld plate (the gap between the hole and weld plate must be as small as possible).
2. Chamfer the outer edges by 45 degrees, leaving a 1-2 mm (0.039"-0.078") opening with the original diameter toward the inside of the compartment.



3. Align the inside of the weld plate with the inside of the compartment surface.

4. Using appropriate filler, tack weld the weld plate to the compartment in positions 1 and 2 from inside of the compartment if possible as shown (Image 1). Ensure the weld plate is level; adjust if needed, and then tack weld it at positions 3 and 4. Ensure the weld zone is cooled down with compressed air between each point.
5. Continue tack welding the weld plate at positions 5 through 8, preferable from the inside of the compartment if possible as shown (Image 2).
6. Allow the weld plate and welded areas to cool, using compressed air to speed the process as needed. Do not quench with water, as this may cause warping due to material shrinkage.
7. Weld between positions 3 and 4 from the outside, and then cool the welded section using compressed air. Continue welding between the tack weld points 3 and 4 in opposite direction. Ensure that the welded sections are cooled down with compressed air after each welding.
8. Allow the region to cool, then repeat step 7 from inside of the compartment, if possible.
9. Once the welding is complete, allow the weld plate to cool completely to room temperature. Do not quench the area with water, as this may cause warping of due to material shrinkage.
10. If grinding and polishing is performed, the area should be allowed to cool between grinding and polishing.

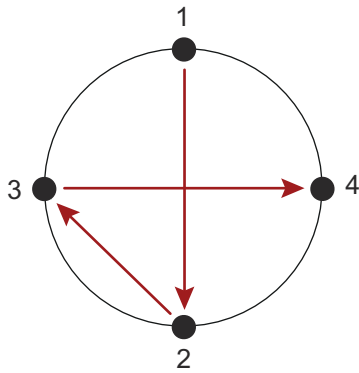


Image 1

From inside the compartment if possible

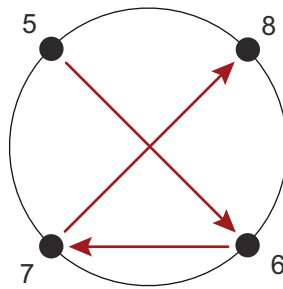


Image 2

From inside the compartment if possible

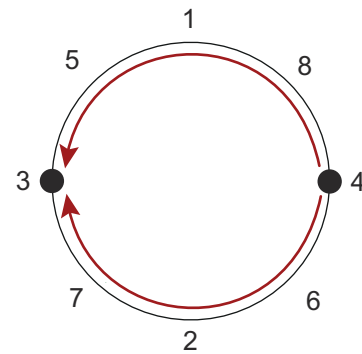


Image 3

First from outside the compartment if possible

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