

Controlled Rotating Retractor, Controlled Rotating Retractor UltraPure

Wall mounted cleaning nozzles



Published by

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

The original instructions are in English

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1 Declarations of Conformity

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

Controlled Rotating Retractor, Controlled Rotating Retractor UltraPure

Type

2023-0001 - 2030-99999, AAX000000001-AAX999999999

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- ATEX Directive 2014/34/EU

The following harmonized standards are used: EN ISO 80079-36:2016, EN ISO 80079-37:2016, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

EC Type Examination Certificate number SGS26ATEX0037X and IECEx Certificate of Conformity number IECEx SGS 26.0011X

Marking:

 II 1G/- Ex h IIC T6...220°C Ga/-

 II 1D/- Ex h IIC T85°C...T166°C Da/-

The QAN (Quality Assurance Notification) is carried out by SGS Fimko Oy, Särkiniementie 3, Helsinki 00211, Finland. Notified Body No. 0598. EU Type Examination Certification is carried out by SGS Fimko Oy, Särkiniementie 3, Helsinki 00211, Finland. Notified Body no. 0598. IECEx Certificate of Conformity is carried out by Baseefa Ltd., Rockhead Business Park, Staden Lane, Buxton, Derbyshire SK17 9RZ, United Kingdom.

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2026-09-01

Date (YYYY-MM-DD)



Signature

DoC Revison_02_092026



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Serial number

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- Regulation (EU) 2023/1230 on machinery
- ATEX Directive 2014/34/EU

The following harmonized standards are used: EN ISO 80079-36:2016, EN ISO 80079-37:2016, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

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Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2027-01-20

Date (YYYY-MM-DD)

Signature

DoC Revison_03_012027



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

Controlled Rotating Retractor, Controlled Rotating Retractor UltraPure

Type

2023-0001 - 2030-99999, AAX0000000001-AAX999999999

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

The following harmonized standards are used: EN ISO 80079-36:2016, EN ISO 80079-37:2016, DS/EN ISO/IEC 80079-34:2011, Annex A, paragraph A.5.3 Rotating machines

EC Type Examination Certificate number SGS26ATEX0037X and IECEx Certificate of Conformity number IECEx SGS 26.0011X

Marking:



II 1G/- Ex h IIC T6...220°C Ga/-



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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2026-09-01

Date (YYYY-MM-DD)

Signature

DoC Revison_02_092026



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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.
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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

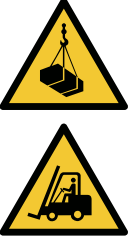
	General warning.
	Corrosive substance.
	Hot surface and burning danger.
	Cutting danger.
	Heavy object lifting.

	Transportation with forklift truck or other industrial vehicles if heavy.
	Electricity.
	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 (laser marked on actuator). Do not attempt to cut the actuator open due to spring under load (the lock wire opening is blocked).
	ATEX/IECEx warning.

2.2 Safety precautions

All warnings in the Instruction manual are summarised in this section. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.

Transportation and lifting

	Always ensure that personnel must have experience with lifting operations. Always ensure that the personnel use the correct protective equipment.
	Always ensure that compressed air is released.
	Always ensure that all connections are disconnected before attempting to remove the machine from the installation.
	Always use predesigned lifting points if defined. Ensure that the lifting equipment is suitable for the machine. Always ensure the lifting point to be in line with centre of gravity. Adjust lifting point if necessary. 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.
	Always drain liquid out of the machine before transportation.
	Always ensure sufficient fixing of the machine during transportation - if specially designed packaging material is available, it must be used.
	Always use original packaging or similar during transportation.

Installation

	Always follow this Instruction manual thoroughly. Before installing the machine and setting it into operation carefully read Safety on page 11, General installation on page 30 and Operation on page 41.
	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.
	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.
	Before installing the machine and setting it into operation carefully read Safety on page 11 and General installation on page 30, including Specific conditions for safe use in accordance with ATEX/IECEx certification on page 37 and take all necessary precautions according to your application and local regulations.
	Ensure that the tank cleaning device is properly grounded if the tank being cleaned contains a combustible liquid or vapor having a risk of ignition or explosion. Any tank cleaning device can develop a static electricity charge while in operation.

Operation

	Always follow this Instruction manual thoroughly. Before installing the machine and setting it into operation carefully read Safety on page 11, General installation on page 30 and Operation on page 41.
	Ensure that the machine is compatible with the product and CIP media. 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. 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 operate the machine unless it is properly mounted or installed.
	Never dismantle or touch the machine or pipelines when processing hot fluids or when sterilising.

	Ensure every tank opening is covered before operating the tank cleaning device. These covers should be sealed well enough to withstand the full force of the liquid hitting the covers.
	Always release compressed air after use.
	Never work on the machine or touch moving parts if the actuator is supplied with compressed air.
	 CAUTION Do not operate actuator with cleaning media pressure on.
	Before installing the machine and setting it into operation carefully read Safety on page 11 and General installation on page 30, including Specific conditions for safe use in accordance with ATEX/IECEx certification on page 37 and take all necessary precautions according to your application and local regulations.

Maintenance

	Always follow this Instruction manual thoroughly. Before maintaining the machine, carefully read Maintenance on page 45.
	Always rinse well with clean water prior to maintenance.
	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.
	Never dismantle or touch the machine or pipelines when processing hot liquids or when sterilising.
	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.
	Do NOT perform maintenance or repairs in an area where explosive atmospheres are present.

Storage

	Alfa Laval recommends: • Store the supplied Alfa Laval product 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%
	• No exposure to corrosive substances (including contained air) • Rinse the supplied Alfa Laval product with clean water before storage

Noise

	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.
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Hazards

	Burn Hazard Various surfaces of the supplied Alfa Laval product and CIP supply line can be hot and cause burns. Wear protective gloves.
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	Corrosive Hazard Always handle cleaning liquids (e.g., lye and acid) with great care and in accordance with separate instructions for those fluids. Always follow the general rules and recommendations regarding ventilation, personnel protection etc. when using chemical cleaning agents and lubricants.
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	Cut Hazard • Sharp edges, especially on the spray orifice, can cause cuts. Wear protective gloves • 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



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 or attempt to open 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.

2.6 How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit <http://www.alfalaval.com> to access the information directly.

3 Introduction

Alfa Laval Controlled Rotating Retractor

The Alfa Laval Controlled Rotating Retractor is a high-performance, resource-efficient CIP cleaning device that uses up to 55% less water and delivers up to 100x higher cleaning efficiency than static spray balls. Its extended reach, adjustable rotation speed, low maintenance, and real-time monitoring help reduce installation and operating costs. It also maximizes uptime, ensuring thorough cleaning of hard-to-access areas – even where devices cannot remain in place during operation.

Alfa Laval Controlled Rotating Retractor UltraPure

The Alfa Laval Controlled Rotating Retractor UltraPure is a hygienic rotating retractor for cleaning-in-place (CIP) of hard-to-access processing areas. This retractable CIP device uses up to 55% less water and delivers up to 100x higher cleaning efficiency than static spray balls. Its extended cleaning reach, adjustable rotation speed, low maintenance, and real-time monitoring help reduce installation and operating costs. It also maximizes uptime, ensuring thorough cleaning of hard-to-access areas– even where devices cannot remain in place during operation.

3.1 General description

This Instruction manual has been prepared as a guide for installing, operating, and maintaining the supplied Alfa Laval product. 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 [Marking](#) on page 26 for placement of type and serial number.

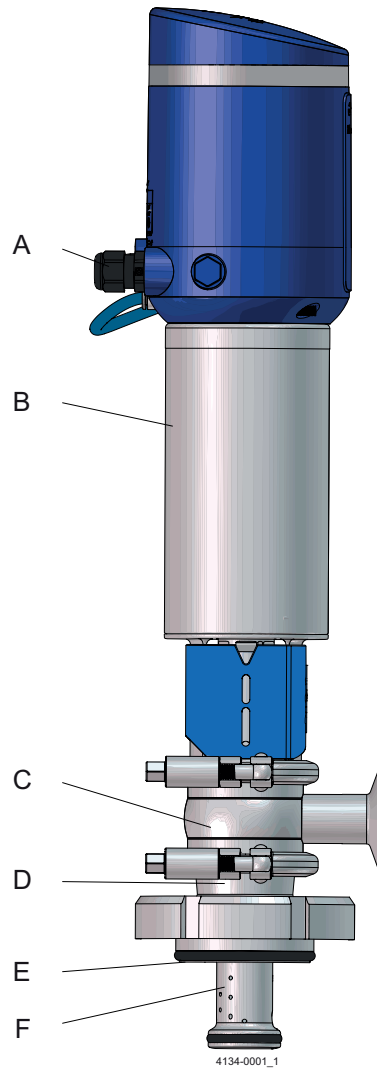
Preventive maintenance gives the best and most economical performance from the supplied Alfa Laval product. For maintenance recommendation see [Maintenance](#) on page 45.

NOTE

If the supplied Alfa Laval product 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 drawing indicates the main components of the supplied Alfa Laval product.

- A: Air supply inlet
- B: Actuator
- C: Inlet house
- D: Process adaptor
- E: Process connection
- F: Spray part
- G: ThinkTop V70



3.1.1 Intended use

For the purpose of this Instruction manual, tanks are defined as any compartment e.g., vessels, containers, semi-closed equipment ducts.

The end-user should verify:

- that the tank cleaning device is in conformity with respect to tank 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 tank cleaning device is intended for use in closed tanks. If used in open environment see instructions in [Safety](#) on page 11 and [General installation](#) on page 30.

The wetted parts of the machine (see [ATEX/IECEx marking](#) on page 27) can be used in explosive hazard zones ATEX/IECEx, provided it is installed according to safety instructions in local regulations.

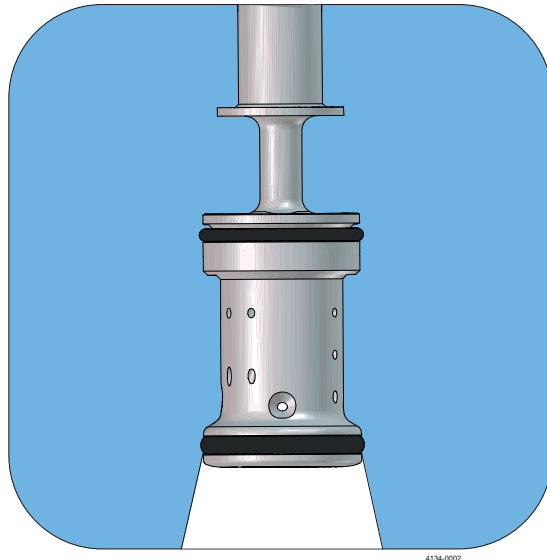
The Alfa Laval Controlled Rotating Retractor is designed for closed tanks and process equipment with moving internals, and processes where permanently installed tank cleaning devices may have an undesired influence on the process or product. For larger tanks, multiple Alfa Laval Controlled Rotating Retractors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

3.1.2 Working principle

The Alfa Laval tank cleaning device is pneumatic driven and media lubricated.

The Alfa Laval Controlled Rotating Retractor functions as a pneumatic open and a spring close seat valve. Applying air to the primary plug in the actuator extended the spray part out of the Inlet house.

The Alfa Laval Controlled Rotating Retractor is a sanitary tank cleaning device of the rotating spray type for permanent installation. In the closed position, the installation forms a flush design with the tank wall and the spray part is out of the product. It provides a 345 degrees cleaning pattern.



Spray pattern 345°

The cleaning media is directed through the 1" tri-clamp inlet connection into the inlet house. Adaptors for other inlet connections are available (see [Inlet connection adaptors](#) on page 73). The liquid passes through openings in the spray part and out through the orifices.

Applying air to alternating sides of the secondary plug in the actuator converts a linear movement to a reciprocal radial movement. The rotation speed can be adjusted by the throttle valves (see [Unpacking/delivery](#) on page 29). The axial position of the spray part is monitored by the ThinkTop. The axial movement of the secondary plug (and thereby the rotation of the spray part) is monitored by the ThinkTop.

Alternating air in the actuator is controlled by the ThinkTop build in software or, alternatively programmed in the PLC by the end user (see [Appendix B - ThinkTop setup](#) on page 87 for detailed information).

The spray part 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. For purging recommendations see 3-A accepted practices "604-5 Supplying Air Under Pressure in Contact With Milk, Milk Products and Product Contact Surfaces."

Application assistance and optimal position recommendation is available by contacting Alfa Laval Technical Sales Support department or worldwide network of sales offices.

3.1.3 Design principle

The supplied Alfa Laval product 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 device. When properly installed the machine is self-draining, see [Draining](#) on page 33.

- 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 [Technical Data](#) on page 65):

- Metals: AISI 316 stainless steel (or better corrosion-wise)
- 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 further details see Alfa Laval Anytime for specific Parts IDs
- Polymers: complies with relevant food legislation (e.g., FDA, EU 10/2011) and pharma standards (e.g., USP 87, USP 88 Class VI, ISO 10993). For further details see Alfa Laval Anytime for specific Parts IDs

The tank 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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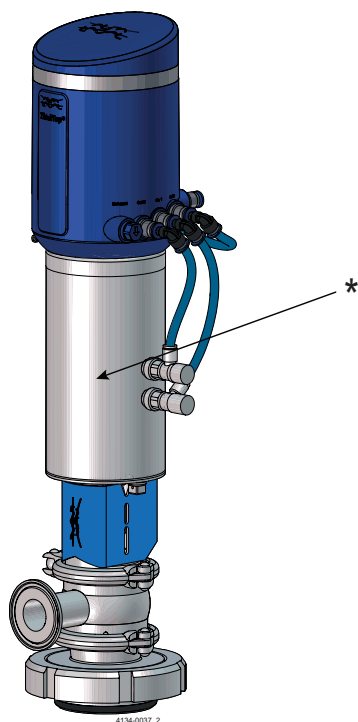
3.3 Quality system

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

3.4 Marking

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

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



* Marking area

Serial number designation

Machines supplied with standard documentation:

yyyy-xxxxx: serial number

yyyy: year

xxxxx: 5 digit sequential number

OR

Serial number designation

AAXxxxxxxxxx

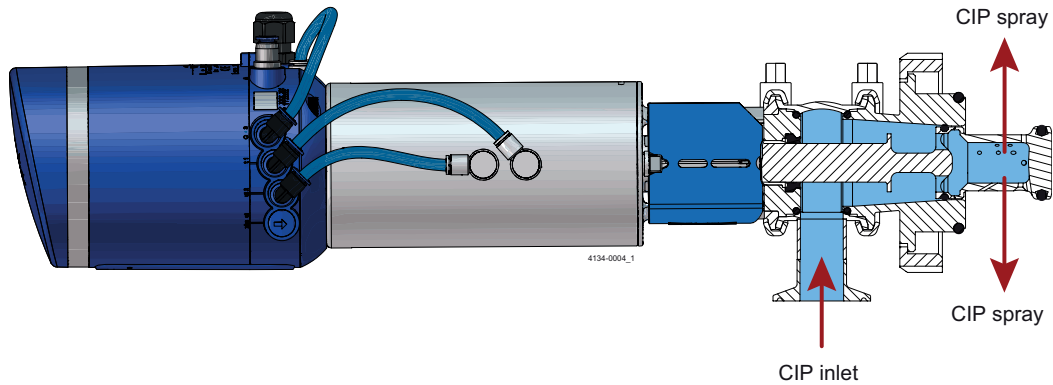
(three letters plus up to nine digits)

3.5 ATEX/IECEEx marking

The Alfa Laval Controlled Rotating Retractor is certified as category I component for the liquid contact part and no category for the non-liquid contact surfaces (see figure below).

The ATEX certification is carried out by the Notified Body SGS Fimko Oy, who has issued the certificate no. SGS26ATEX0037X.

The IECEx certification is carried out by the Certification Body SGS Baseefa Ltd., who has issued the certificate no. IECEx SGS 26.0011X.



NOTE Explosion protection type

Explosion protection type is constructional safety "c".

The marking on the ATEX/IECEEx certified Alfa Laval Controlled Rotating Retractor is as follows (for information on marking position and see serial number designation [Marking](#) on page 26):

A[®]

78-04

Wall Mounted Cleaning Device

"Machine name"

s/n.: yyyy-xxxxx

Alfa Laval, DK-6000 Kolding, Albuen 31

II 1G/- Ex h IIC T6...220°C Ga/-

II 1D/- Ex h IIIC T85°C...T166°C Da/-

CE

0598

SGS26ATEX0037X

IECEX SGS 26.0011X

Temp. operation: Max. 95°C

Temp. steaming: Max. 121°C

Tamb: 0°C to +150°C

CIP Pressure: Max. 5 bar

Air Pressure (actuator): Max. 7 bar

Piston axial speed: Max. 0.25 m/s

Spray head speed: Max. 20 RPM

OR

A[®]

78-04

Wall Mounted Cleaning Device

"Machine name"

s/n.: AAXxxxxxxxxxx

Alfa Laval, DK-6000 Kolding, Albuen 31

II 1G/- Ex h IIC T6...220°C Ga/-

II 1D/- Ex h IIIC T85°C...T166°C Da/-

CE

0598

SGS26ATEX0037X

IECEX SGS 26.0011X

Temp. operation: Max. 95°C

Temp. steaming: Max. 121°C

Tamb: 0°C to +150°C

CIP Pressure: Max. 5 bar

Air Pressure (actuator): Max. 7 bar

Piston axial speed: Max. 0.25 m/s

Spray head speed: Max. 20 RPM

3.6 ATEX/IECEx temperature class and code

The maximum surface temperature depends mainly on operating conditions which are the temperature of the cleaning fluid and the ambient temperature.

Group II EPL Ga

The gas temperature class is corrected with a safety margin of 80% due to a requirement for Group II EPL Ga equipment.

The gas temperature class depends on the fluid temperature (including heat generated due to friction) or the ambient temperature, whichever of the two is the highest.

Table for determining temperature class (gas atmospheres)				
Gas Temperature class	Cleaning liquid temperature in operation T_p (°C)	Drying air or steam temperature in operation T_a (°C)	Ambient temperature range in operation T_{amb} (°C)	Ambient temperature range during draining (max. 1 min rotation) T_{amb} (°C)
85°C (T6)	$0 \leq T_p < +68$	$0 \leq T_a < +42$	$0 \leq T_{amb} < +68$	$0 \leq T_{amb} < +66.5$
100°C (T5)	$+68 \leq T_p < +80$	$+42 \leq T_a < +54$	$+68 \leq T_{amb} < +80$	$+66.5 \leq T_{amb} < +78.5$
135°C (T4)	$+80 \leq T_p < +95$	$+54 \leq T_a < +82$	$+80 \leq T_{amb} < +108$	$+78.5 \leq T_{amb} < +106.5$
200°C (T3)	N/A	$+82 \leq T_a < +134$	$+108 \leq T_{amb} < +150$	$+106.5 \leq T_{amb} < +150$
220°C	N/A	$+134 \leq T_a < +140$	N/A	N/A

Group III EPL Da

The dust temperature class depends on the fluid temperature (including heat generated due to friction) or the ambient temperature, whichever of the two is the highest.

No dust layer is considered.

Table for determining temperature class (Dust atmospheres)				
Gas Temperature class	Cleaning fluid temperature in operation T_p (°C)	Drying air or steam temperature in operation T_a (°C)	Ambient temperature range in operation T_{amb} (°C)	Ambient temperature range during draining (max. 1 min rotation) T_{amb} (°C)
T85°C	$0 \leq T_p < +85$	$0 \leq T_a < +59$	$0 \leq T_{amb} < +85$	$0 \leq T_{amb} < +83.5$
T100°C	$+85 \leq T_p < +95$	$+59 \leq T_a < +74$	$+85 \leq T_{amb} < +100$	$+83.5 \leq T_{amb} < +98.5$
T135°C	N/A	$+74 \leq T_a < +109$	$+100 \leq T_{amb} < +135$	$+98.5 \leq T_{amb} < +133.5$
T150°C	N/A	$+109 \leq T_a < +124$	$+135 \leq T_{amb} < +150$	$+133.5 \leq T_{amb} < +148.5$
T166°C	N/A	$+144 \leq T_a < +140$	$+150 \leq T_{amb} < +150$	$+148.5 \leq T_{amb} < +150$

Example of gas class determination

Cleaning fluid temperature is 67°C and ambient temperature is 7°C.

Gas class = T5

ATEX/IECEx marking on the equipment:



II 1G/- Ex h IIC T6...220°C Ga/-

II 1D/- Ex h IIC T85°C...T166°C Da/-

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



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.



NOTE

Alfa Laval cannot be held responsible for incorrect unpacking.

Always read [Safety precautions](#) on page 14.

Always read [Technical Data](#) on page 65.

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 using one the two options below.

For both options start with the following:

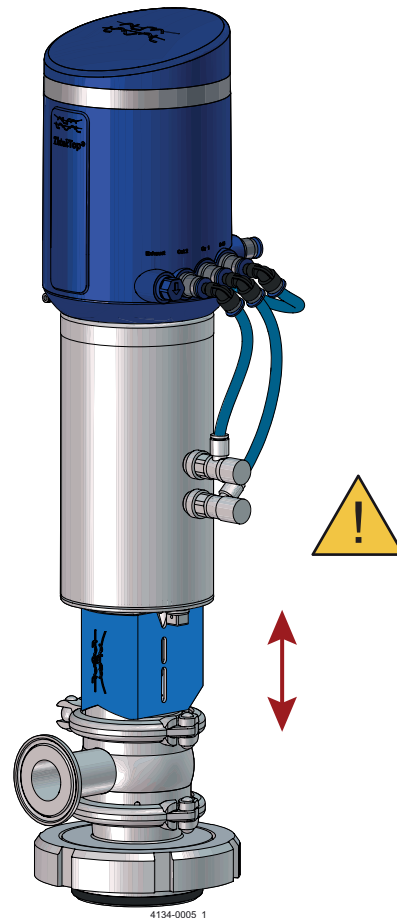
1. Attach the ThinkTop (17) to the top of the actuator.
2. Attach air hoses (19, 20 and 21) as shown in .
3. Attach air supply to the ThinkTop (17).
4. Supply compressed air to the ThinkTop (17).

Automate set-up

1. Perform Start-up and Auto-setup as shown in [Appendix B - ThinkTop setup](#) on page 87.
2. Check is complete.

Manual check

1. Open and close the valve several times to ensure it operates smoothly by manually operating the solenoid valves on the ThinkTop (see ThinkTop Instruction manual for more information).
2. Activate solenoid valve 3 - wait for the spray part to extended completely - keep valve 3 activated.
3. Activate solenoid valve 1 for 2 sec - no or very little rotation takes place - then deactivate.
4. Activate solenoid valve 2 until the spray part is done rotating clockwise direction (10 to 15 sec) (seen from the end of the spray part) - then deactivate.
5. Activate solenoid valve 1 until the spray part is done rotating counter clockwise direction (seen from the end of the spray part) - then deactivate.
6. Deactivate solenoid valve 3.
7. Check is complete.



If the spray part (3) does not extend or the spray part (3) does not turn freely, contact Alfa Laval Technical Sales Support department or worldwide network of sales offices.

4.2 General installation



DANGER

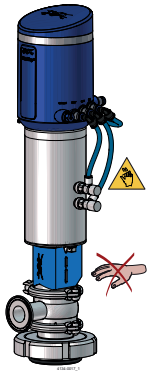
If the actuator is marked with one of the below warnings, do NOT attempt to disassemble it.

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



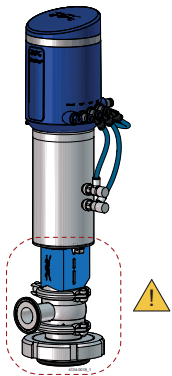
! WARNING

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.

! WARNING**Prevent startup**

Precaution shall be made to prevent starting the cleaning operation, while personnel are inside the tank or otherwise can be hit by water jets from the cleaner head.

 NOTE

Alfa Laval cannot be held responsible for incorrect installation.

Always read [Safety precautions](#) on page 14.

Always read [Technical Data](#) on page 65.

Always release compressed air after use.

Always thoroughly flush all supply lines and machines before installation to remove remains from welding, grinding, scale 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, the EU-ATEX/IECEx Directive and other relevant Directives, and shall be CE-marked before it is set into operation.

For information on use in potential explosive atmospheres see [Specific conditions for safe use in accordance with ATEX/IECEx certification](#) on page 37.

4.2.1 Installation orientation

To be operational, the supplied Alfa Laval product should be installed in the recommended orientation, as provided below. If required, the installation shall be made so that self-draining properties (see [Draining](#) on page 33) of the machine is ensured.

 NOTE

Recommended installation orientation

Any orientation.

4.2.2 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.

4.2.3 Strainer recommendations

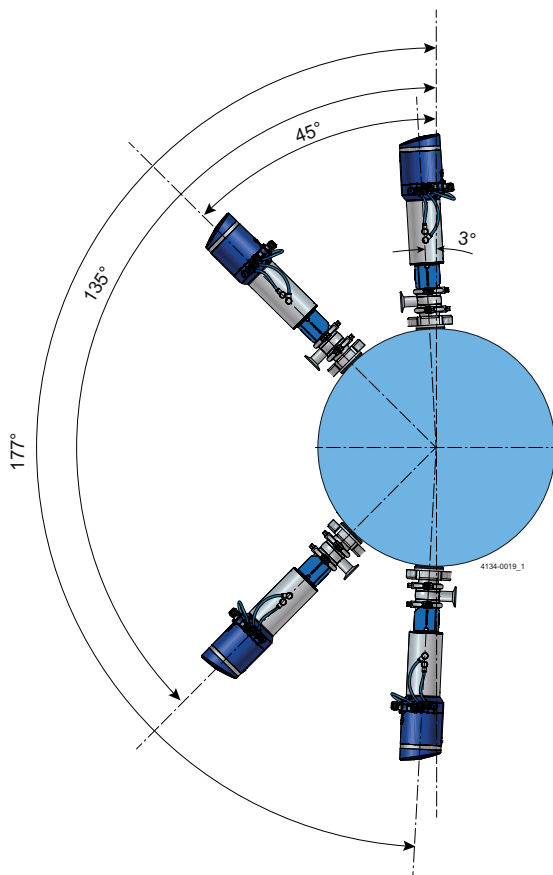
Larger particles may get trapped by the spray orifice, while smaller particles (e.g., fine sand) may be trapped by the smaller clearances of the machine and increase wear. Magnitude of the issues relies on the particle shape and properties (e.g., soft vs. hard). Experience shows that Alfa Laval tank cleaning devices 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 Controlled Rotating Retractor, a strainer of 0.9 mm is recommended.

4.2.4 Draining

The supplied Alfa Laval product is drainable by gravity when positioned from 3 degrees to 45 degrees and from 135 degrees to 177 degrees to vertical upwards. From 45 degrees to 135 degrees up to 2.0 ml may be retained (the volume depends on the stop position of the spray part and the process connection).



4.2.4.1 2 inch clamp connection

Closing process performed and a 30 sec cleaning process (without liquid) will results in:

3 - 45 degrees:	Drainable
45 - 135 degrees:	Max. 2.0 ml
135 - 177 degrees:	Drainable



WARNING Improved draining

Operation for improved draining for orientation between 0 degrees and 45 degrees:

If dried in open position before closing the Alfa Laval Controlled rotating retractor, liquid may get trapped within the Alfa Laval Controlled rotating retractor.

Closing and opening the retractor and let it rotate for 30 sec before drying is highly recommended.

Contact Alfa Laval for further information.

4.2.4.2 3 inch RJT, DN80 clamp and 3 inch clamp

Closing process performed and a 30 sec cleaning process (without liquid) will results in:

3 - 45 degrees:	Drainable
45 - 135 degrees:	Max. 0.045 ml
135 - 177 degrees:	Drainable



WARNING Improved draining

Operation for improved draining for orientation between 0 degrees and 45 degrees:

If dried in open position before closing the Alfa Laval Controlled rotating retractor, liquid may get trapped within the Alfa Laval Controlled rotating retractor.

Closing and opening the retractor and let it rotate for 30 sec before drying is highly recommended.

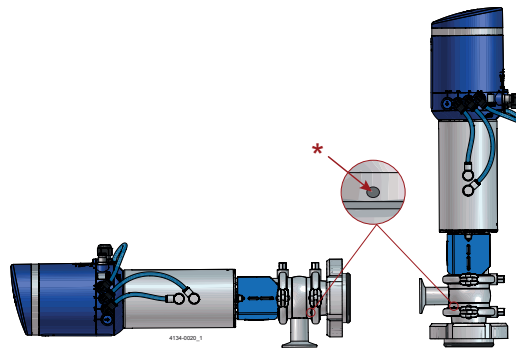
Contact Alfa Laval for further information.

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



4.2.5 Welding recommendation



NOTE

For installation of weld plate see [Appendix A - Weld plate installation](#) on page 85.

4.2.6 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 runs 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.

4.2.7 Installation of externally mounted tank cleaning devices

The machine shall be mounted into or onto the designate welded process connection (see [Weld plates](#) on page 72) using appropriate fasteners.

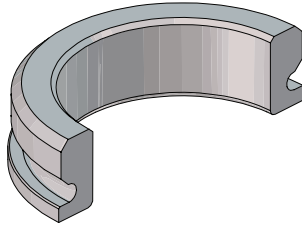
NOTE

For full functionality the installation should be made so the end of the wall mounted cleaning device is flush ($L/D \sim 0$) with the tank wall.

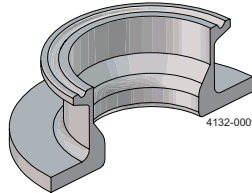
Alfa Laval Controlled Rotating Retractor fits into several types of weld plates. See [Weld plates](#) on page 72.

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

Insertion type



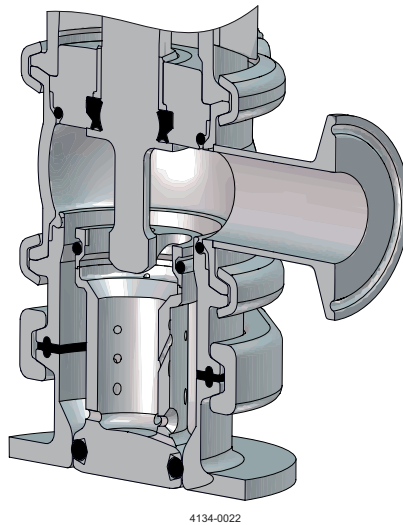
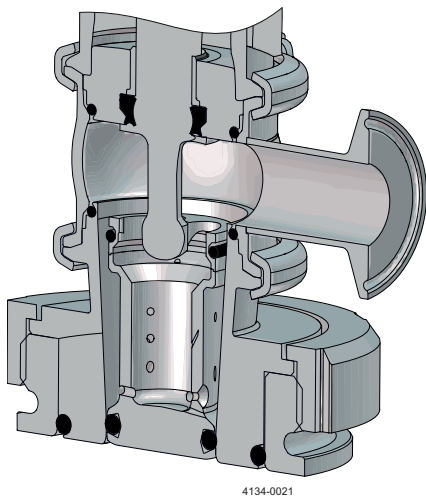
Attachment type



NOTE

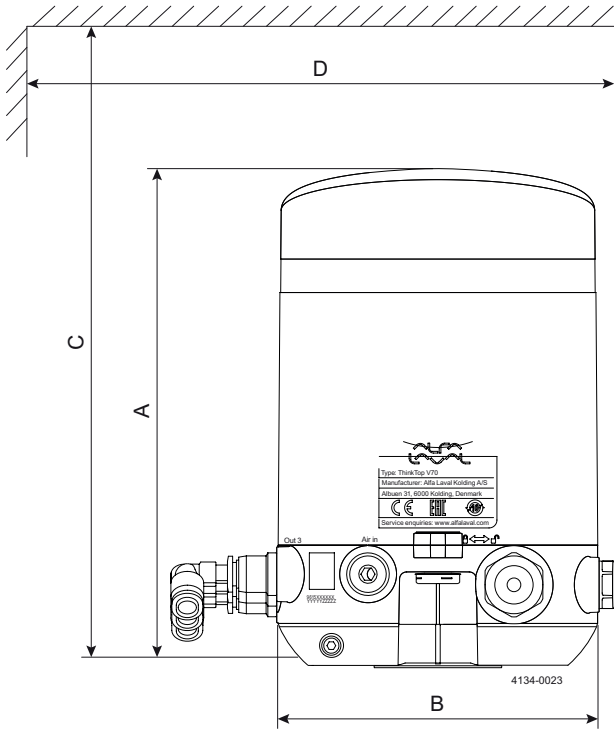
For installation of weld plate please refer to [Weld plates](#) on page 72.

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.

Dimensions mm	
A	164.0 mm
B	105.0 mm
C	250.0 mm
D	170.0 mm



4.2.8 Recommended installation (spacing)

Reserved for future content.

4.3 Specific conditions for safe use in accordance with ATEX/IECEx certification

Directive 2014/34/EU



NOTE

Explosion protection type

Explosion protection type is constructional safety "c".

Warning:

Operating guidance



The unit shall be operated in line with guidance provided by IEC/TS 60079-32-1 for tank cleaning.

Warning:

Temperature class and ambient temperature range



The maximum surface temperature depends mainly on operating conditions which are the temperature of the cleaning fluid and ambient temperature.

The temperature class and ambient temperature range are shown in [ATEX/IECEx temperature class and code](#) on page 28.

Warning:

Max. permitted temperature



Not in operation: Ambient temperature range of 0°C to +150°C.

Unit in CIP operation: The upper ambient shall not exceed 95°C, and the maximum permitted cleaning fluid temperature shall not exceed 95°C.

Unit in SIP operation: The upper ambient shall not exceed 150°C, and the maximum permitted steam temperature shall not exceed 140°C.

Warning:

Draining using compressed air



Drain only using inert gas or clean air.

Warning:

Earthed when in use



The unit shall be effectively earthed at all times when in use maintaining metal to metal continuity, via the grounding wire between the actuator and the shaft of the spray part, and via the units' installation.

Warning:

Max. permitted steaming temperature



The maximum permitted steam temperature through the machine and ambient temperature is 140 °C.

Warning: Steaming tanks larger than 100 m³

Tanks with capacities larger than 100 m³ that could contain a flammable atmosphere should not be steam cleaned, as steam cleaning tanks produces an electrostatically charged mist.

Tanks smaller than 100 m³ may be steam cleaned.

Warning: Tank size information

The unit shall not be operated in a vessel having an enclosed volume of greater than 100 m³.

Warning: Process generated electrostatic

The user shall address the electrostatic hazards generated from the process of the equipment in accordance with guidance document IEC/TS 60079-32-1.

Warning: Electrostatically charged liquid

Liquids can become electrostatically charged when they move relative to contacting solids or the spraying of liquids can also create a highly charged mist or spray. The liquid shall be made electrically conductive by additives or otherwise.

For further information see IEC/TS 60079-32-1

Warning: Appropriate cleaning fluid

The cleaning fluid shall be either a non-flammable liquid, or a flammable liquid used below its flashpoint. When used for cleaning tanks containing potentially flammable liquids and/or dust atmospheres, and a potentially flammable fluid is used, below its flashpoint, as the cleaning fluid, then an assessment of the potential hybrid mixture shall be undertaken by the user prior to operation.

Warning: Fluid pressure

The maximum permitted cleaning fluid pressure is 5 bar.

Warning: Piston speed

The air pressure for the actuator shall not exceed 7 bar, ensuring the axial movement of the spray head shall not exceed 0.25 m/s.

Warning: Tanks containing mixers

For tanks with internal moving parts the unit shall be fully retracted from the tank before the tank goes back into service.

Warning: Dust layers

Do not allow dust layers to build up on the unit.

Warning: Actuator

Only a pneumatic actuator supplied by Alfa Laval Kolding A/S shall be used. The actuator shall only be mounted in a safe area.

Warning: Rotation speed

The throttle valve shall not be set higher than level 3, ensuring the rotation shall not exceed 20 RPM.

Warning: Rotation without liquid flow

During cleaning, purgning and steaming: Rotation of the spray part is not allowed without fluid through the device.

During draining: Rotate the spray part for a maximum of 1 min.

In addition to the above mentioned precautions relating to the ATEX/IECEx guidelines Directive 2014/34/EU, [Safety precautions](#) on page 14 must be observed.

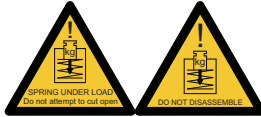
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5 Operation

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 type of breakage or attempt to open the actuator can lead to severe injury or even death!



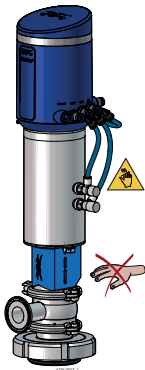
WARNING

Prevent startup

Precaution shall be made to prevent starting the cleaning operation, while personnel are inside the tank or otherwise can be hit by water jets from the cleaner head.

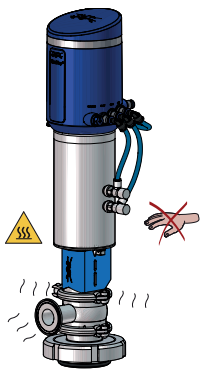
WARNING

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



WARNING

Never touch the supplied Alfa Laval product and 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

Alfa Laval cannot be held responsible for incorrect operation.

Always read [Safety precautions](#) on page 14.

Always read [Technical Data](#) on page 65.

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

 NOTE

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

5.1 Normal operation

 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.

 NOTE **Media**

Only use media compatible with materials shown in chapter [Technical Data](#) on page 65.

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. For milk fat specifically, the fat content shall not exceed 8% for the EPDM used in the machine.

 NOTE **Temperature**

Never exceed 95°C (203°F) when flowing cleaning media through the machine. However, the machine withstands surrounding temperatures of up to 150°C (302°F).

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.

Always see [Technical Data](#) on page 65 for recommended and maximum operating parameters.

NOTE Vessel drainage

Ensure the tank bottom is drained during cleaning.

Ensure tank bottom is pitched toward an opening large enough to avoid liquid buildup or puddling.

Always use a scavenger or suction pump if gravity is insufficient to avoid liquid buildup.

5.2 Recommended cleaning

The internal surfaces of the tank cleaning device are cleaned by the cleaning liquid passing through the tank cleaning device. The external surfaces of the spray part are cleaned by cleaning liquid expelled from the tank cleaning device itself, either as targeted cleaning or free falling film cleaning. The surfaces of the tank cleaning device exposed to the inside of the tank not targeted by cleaning liquid from the tank 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 your 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 [Maintenance](#) on page 45.

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 type of breakage of the actuator can lead to severe injury or even death!



Problem	Possible causes	Action
Leakage at piston	Worn or damaged lipseal	Replace lipseal
Leakage at clamp connections	Worn or damaged O-rings	Replace O-ring
Leakage at seal towards product zone	- Worn or product affected plug seal - Product deposit on seal and or seat	- Replace seal - More frequent cleaning
Piston is not restoring to original position	- Damaged actuator - Foreign objects in inlet house	- Replace actuator - Inspect inlet house and remove foreign objects
Poor cleaning performance	Insufficient flow/pressure	- 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)
	Incorrect cleaning media	Verify temperature and concentration of the cleaning media
	Insufficient time	Verify cleaning time
	Debris in the orifice	Inspect orifice and remove debris
	Poor drainage of tank	Ensure the tank drains cleaning liquid at a rate equal to or higher than the flow rate of all tank cleaning devices.

6 Maintenance

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!



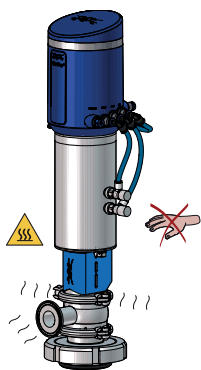
WARNING

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



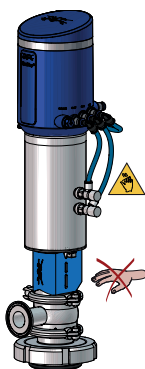
WARNING

Never touch the supplied Alfa Laval product and pipelines when processing hot liquids or when sterilising.



CAUTION

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



 NOTE

Alfa Laval cannot be held responsible for incorrect maintenance.

Always read [Safety precautions](#) on page 14.

Always read [Technical Data](#) on page 65.

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.

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 all mating surfaces.

Work in a clear well-lighted work area.

Always use Alfa Laval genuine spare parts.

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

- **Inspection and maintenance:** 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 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

 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 [Recommended service intervals](#) on page 48 is based on tank cleaning devices working in average conditions. However, a tank 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 [Recommended service intervals](#) on page 48.

Maintenance and lubrication intervals

Below are some guidelines for maintenance and lubrication intervals.



Please note that the guidelines are for normal working conditions in one shift.

	Product wetted seals	Actuator bushings complete
Preventive maintenance	Replace after 12 months depending on working conditions. When opening and closing the retractor in dry conditions, plug shall be replaced after 60 CIPs.	Replace after 5 years depending on working conditions.
Maintenance after leakage (leakage normally starts slowly)	Replace at the end of the day.	Replace when possible.
Planned maintenance	- Regular inspection for leakage and smooth operation - Keep a record of the machine - Use the statistics for inspection planning Replace after leakage	- 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

6.1.1 Maintenance product contact parts made of plastic

These plastic parts are designed for safe contact with food and should only be used as intended, as stated in the product Instruction Manual provided with this product. Using these parts outside their intended purpose (e.g., exposure to excessive heat, harsh chemicals, or incompatible foods) may increase the risk of harmful substances migrating into food. Always use the product as intended to avoid risks.

Normal Usage Changes:

Minor scratches, slight discolouration over time, fading of printed markings, deformation

Changes Affecting Safety:

Cracks or chalkiness, blisters or chips, sticky or tarnished surfaces, unusual odours.

How to Prevent/Slow Down Deterioration:

- Use it within the permitted temperature limits and limits for CIP¹
- Do not use abrasive cleaners or scouring pads
- Do not use in contact with foods for which it is not intended (See: product Instruction Manual)

¹ Cleaning In Place

Handling, Cleaning, and Storing Instructions

- Follow the recommended cleaning procedure and only use permitted chemicals or detergents in correct concentrations and temperatures
- Store in a cool, dry place, protected from UV-light

When to Replace

Replace the plastic part if you notice:

- Cracks, chalkiness, blisters, chips or sticky surface, discolouration (if it does not come from the media itself)
- Any change in appearance that raises doubts about safety

Conditions for Discontinuing Use

- If the part shows any of the safety-related deterioration signs above
- After a recommended period of use (see service interval)
- If the part has been exposed to conditions outside the product's (manufacturer's) instructions (e.g., high heat, harsh chemicals, excessive concentration/temperatures of CIP¹)

6.2 Service and repair of ATEX/IECEx certified machines



All service and repair of ATEX/IECEx certified machines can be performed by Alfa Laval Kolding A/S, Denmark or by an Alfa Laval service center approved by Alfa Laval Kolding A/S.

Changes to the machine are not allowed without approval by the person responsible for the ATEX/IECEx certification at Alfa Laval. If changes are made – or spare parts other than Alfa Laval original spare parts are used – the EC Type Examination certification (the ATEX/IECEx Directive) is no longer valid.

In order to ensure compliance with the ATEX/IECEx regulations and keep the machine ATEX/IECEx certification valid, the service or repair must be performed by an authorized person with knowledge of the ATEX/IECEx requirements and regulations. All spare parts must be original Alfa Laval spare parts and the repair or service must be done according to the instructions in this manual.

If a customer wishes to carry out service or repair himself, it is the responsibility of the repair shop to ensure that the ATEX/IECEx are met in any way possible. After performing service or repair, the repair shop thus carries the full responsibility for traceability of all relevant documents in order to ensure the retention of the ATEX/IECEx certification of the machine.



6.3 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 Spare part manual available in [Alfa Laval product catalogue Anytime](#) or in the [Close at hand spare part catalogue](#).



(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.



Use only pure water at normal temperature for safety reasons.

Use goggles when checking rotation.



An inspection consists of:

1. At a pressure of 0.3 bar (4.4 psi) open a hatch in the tank to verify rotation and liquid is expelled from all orifices. If needed proceed to next step.
2. Un-install the machine as described in [Uninstall for maintenance](#) on page 51.
3. Visual inspection for foreign objects. Remove any objects and clean before rotation verification.
4. Rotation verification as described in [Unpacking/delivery](#) on page 29.
5. Disassemble the machine as described in [Dismantling](#) on page 50.
 - a. Check lip seal (7) for visible wear.
 - b. Check plug seal (5) for visible wear.
 - c. Check O-ring (4) for visible wear.
6. Reassemble the machine as described in [Assembly](#) on page 64.
7. Rotation verification as described in [Unpacking/delivery](#) on page 29.
8. Reinstall machine as the reverse of [Uninstall for maintenance](#) on page 51.
9. Fill in service log

6.4 Dismantling

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 type of breakage of the actuator can lead to severe injury or even death!

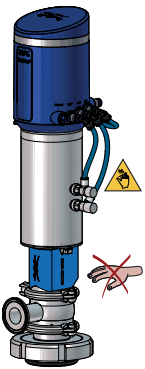


WARNING Air supply

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.



NOTE

Handle scrap correctly – see [Recycling information](#) on page 20.

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 [Actuator bushing replacement \(non-maintainable actuator\)](#) on page 61).

6.4.1 Uninstall for maintenance

The unique design of the Alfa Laval Controlled Rotating Retractor allows for 2 different options for dismantling:

- **Option 1:** Remove only actuator and spray part from the retractor to inspect wear parts. The CIP supply line does not need to be disconnected.
- **Option 2:** Remove the entire retractable device from the process connection and then dismantel the retractor. The CIP supply line shall be disconnected by loosening the cleaning media inlet connection (clamp or nut) and remove the gasket.

Both options are explained in details below.

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

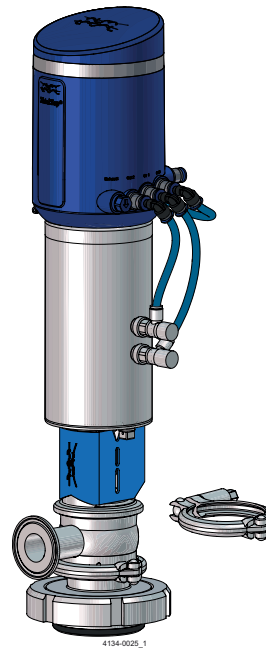


(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

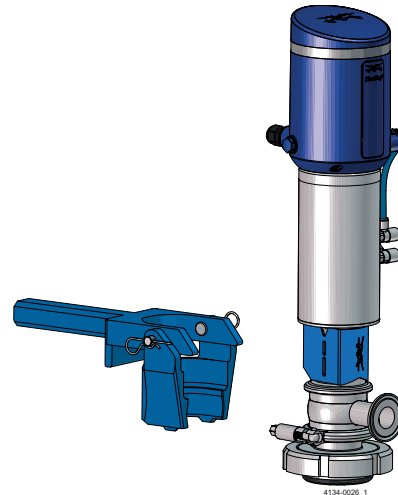
1 Option 1 – remove only actuator and spray part

The design of the Alfa Laval retractable allows the user to only remove the actuator (B, see [General description](#) on page 21) and the spray part assembly in an easy operation to inspect the actuator (16), the spray part (3) and the plug seal (5). The inlet house (10) and process adaptor (13) then remain attached to the process connection (E, see [General description](#) on page 21). This significantly reduces the weight of the removed parts and save time as the supply line does not need to be removed for maintenance.

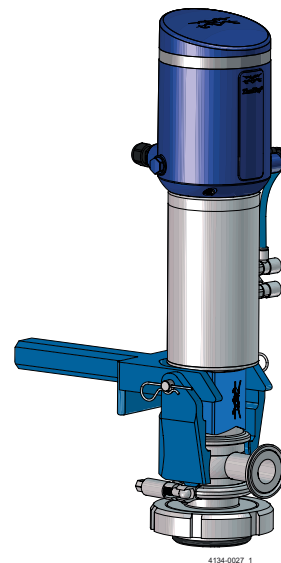
- a) Loosen and remove upper clamp (11) on inlet house (10).



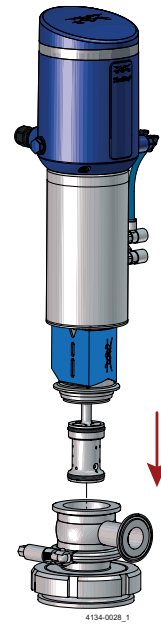
- b) Insert tool (8010056638) around the yoke of the actuator (16). This can be done one-handed. When in place, the tool will fit tightly around the yoke so it can be operated one-handed.



- c) Push down on the handle of the tool to release the plug seal (5) from the plug seal seat.
- d) Remove the tool from the yoke.



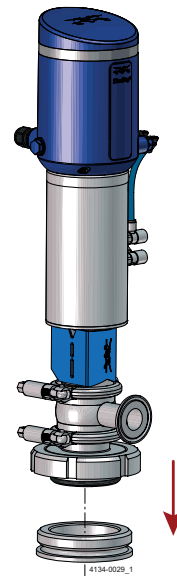
- e) Withdraw the actuator (16) including spray part (3) from the inlet house (10).
- f) If the lip seal does not require inspection go to [Plug seal replacement](#) on page 59.



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

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

- a) Dismount the connection (15) from the process connection (E, see [General description](#) on page 21) on the processing equipment.
- b) Withdraw the machine from the process connection (E, see [General description](#) on page 21).



6.4.2 Disassembly

CAUTION

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

! 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.

6.4.2.1 Uninstalled using option 1 (only parts with moving parts are removed from process line)

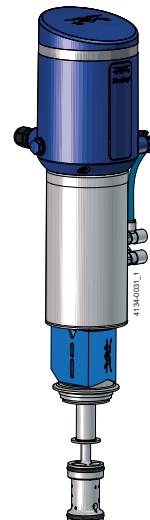
! NOTE

If option 2 was performed for removing the Alfa Laval retractor go to [Uninstalled using option 2 \(entire retractor removed from the process line\)](#) on page 56.

! NOTE

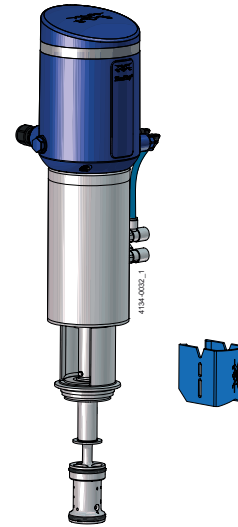
(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

- 1 a) Connect an air supply directly to the air fitting at the top of the actuator (located in the cavity in the ThinkTop).
- b) Apply pressurised air to move the spray part into the open position.



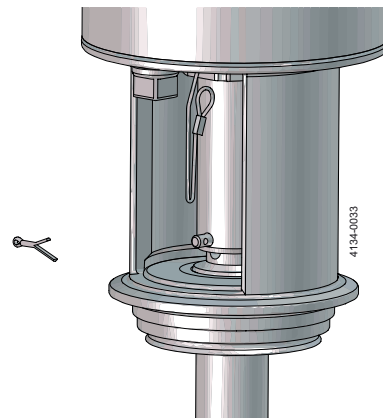
2

- a) Remove the shield (12) from the yoke.



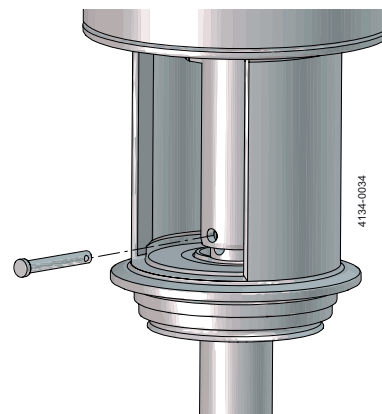
3

- a) Use a plier to unbend the cottor pin (2).
- b) Withdraw the cottor pin (2) from the pin (1).



4

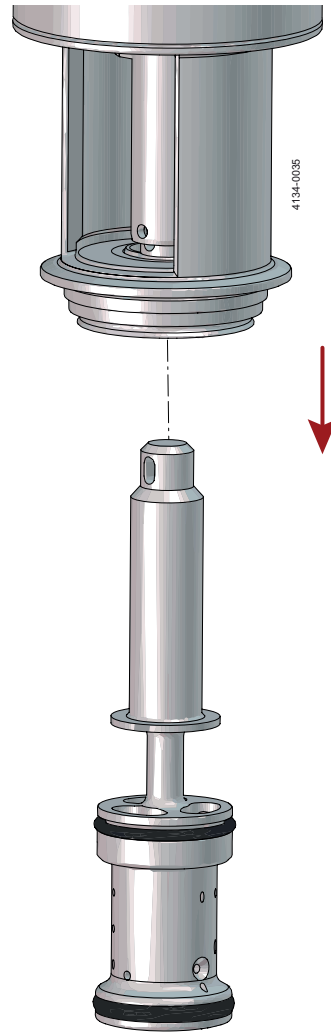
- a) Use a plier to push and/or withdraw the pin (1) from the connection between the output shaft of the actuator (16) and the spray part (3).



5

- a) Withdraw the spray part (3) from the output shaft of the actuator (16) and out through the lip seal (7).

This allows for inspection of the lip seal (7), the floating o-ring (4) and the plug seal (5).



6.4.2.2 Uninstalled using option 2 (entire retractor removed from the process line)

! NOTE

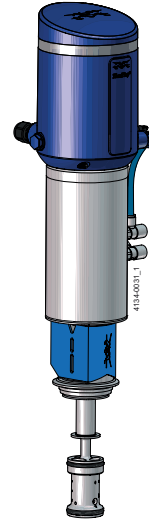
If option 2 was performed for removing the Alfa Laval retractor, perform either option 1 using the Alfa Laval tool 8010056638 for removing the actuator and spray assembly from the valve body and then the instruction in *Uninstalled using option 1 (only parts with moving parts are removed from process line)* on page 54.

! NOTE

(#) refers to position numbers, see *Parts lists and exploded views* on page 77.

1

- a) Connect an air supply directly to the air fitting at the top of the actuator (16), located in the cavity in the ThinkTop (17).
- b) Apply pressurised air to move the spray part (3) into the open position.



2

- a) Wet plug seal (5) with water.
- b) Remove the pressurized air to move the spray part (3) into the closed position.

3

- a) Loosen and remove the upper clamp (11) on the inlet house (10).

4

- a) Push on the end of the spray part (3) to push the plug seal (5) past the process adaptor (13).

! NOTE

For some adaptors some force is needed to press the plug seal (5) past the valve seat in the process adaptor (13).

- b) Withdraw the actuator (16) and spray part assembly (3) from the inlet house (10).

Further disassembly is done according to [Uninstalled using option 1 \(only parts with moving parts are removed from process line\)](#) on page 54.

6.5 Lipseal replacement and bushing replacement

! NOTE

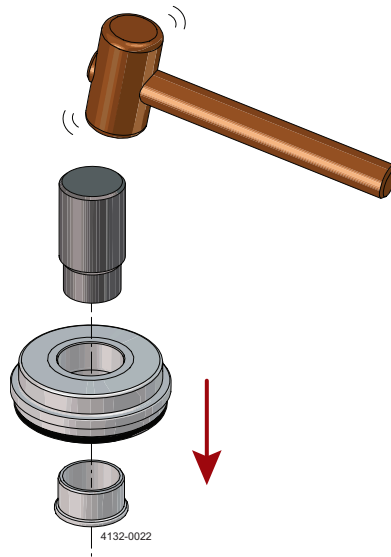
(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

6.5.1 Removal of lipseal and bushing

- 1 Remove lip seal (7) from sealing element (8) using a small flat headed screw driver.
- 2 Remove bushing (6) from sealing element (8) using bushing tool (9613160901) and rubber mallet.

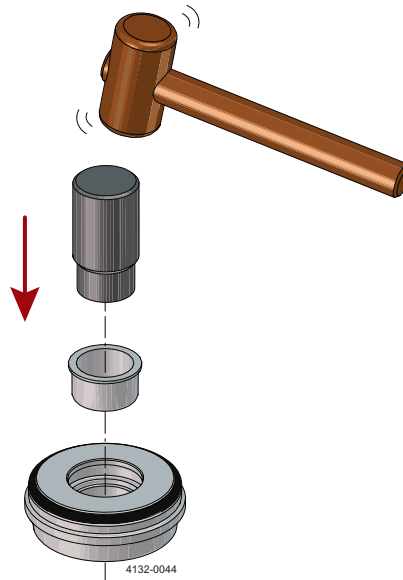
! NOTE

Be careful not to damage the bushing.



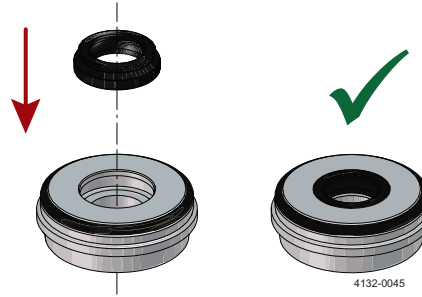
6.5.2 Mounting bushing

- 1 Orientated the bushing (6) as shown. Press it slightly into the sealing element (8). Insert bushing tool (9613160901) into the bushing (6) and hammer the bushing (6) in place using the rubber mallet.



6.5.3 Mounting lipseal

- 1 Orientate the lip seal (7) as shown. Squeeze the lip seal (7) to fit the cylindrical part of the lip seal (7) into the lip seal groove in the sealing element (8).



6.6 Static O-ring replacement



(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

- 1 Remove static O-rings (9) from sealing element (8) and process adaptor (13) and static O-ring (14) from process adaptor (13).
- 2 Insert static O-rings (9) on sealing element (8) and process adaptor (13) and static O-ring (14) on process adaptor (13). Make sure the O-rings are completely mounted in the O-ring grooves.

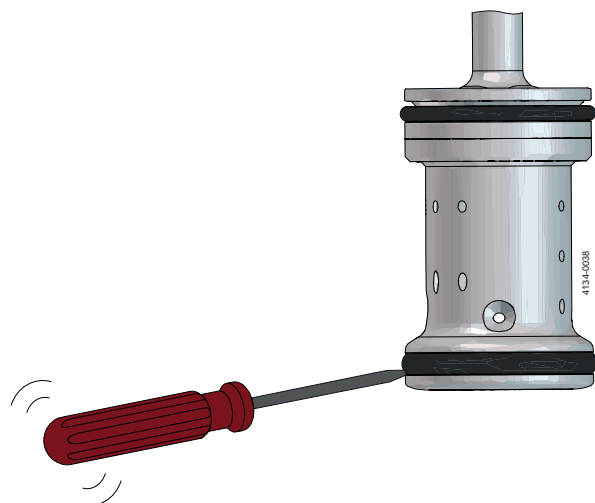
6.7 Plug seal replacement



(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

6.7.1 Removal of plug seal

- 1 Remove old plug seal (5) using a knife, a small flat headed screwdriver or similar. Be careful not to damage the spray part (3) surface.



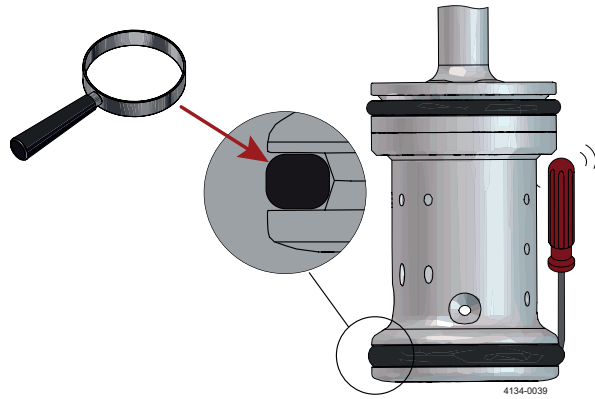
6.7.2 Mounting plug seal

1

Fit the plug seal (5) on the spray part (3) without pressing into the groove.

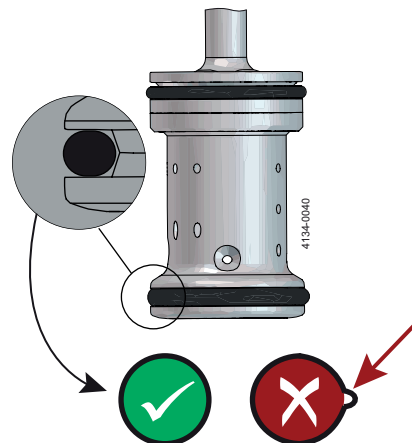
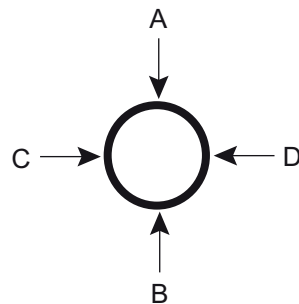
Be careful not to twist the plug seal (5).

Use a small flat headed screwdriver (two turns) to fit the plug seal (5) properly and ensure it is not twisted.



2

1. Wet plug seal (5) with a little water.
2. To ensure correct mounting, press with your thumb on the plug seal (5), 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 (5) can now be pressed into the groove so the whole plug seal (5) 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 (5) and keep the pressure while rotating 360°.
 - d. Alternatively, press the plug seal and spray part into the plugseat of the process connector.



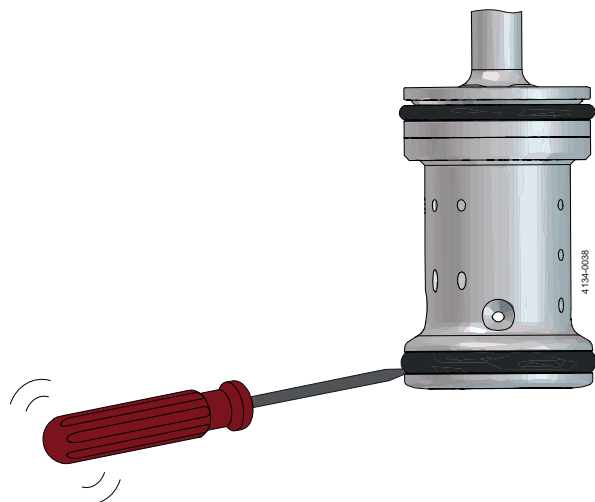
3

It is important to release compressed air behind the plug seal (5).

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 spray part (3) and plug seals (5).

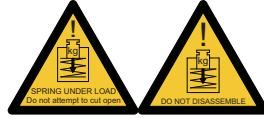


6.8 Actuator bushing replacement (non-maintainable actuator)

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 type of breakage of the actuator can lead to severe injury or even death!



NOTE

(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

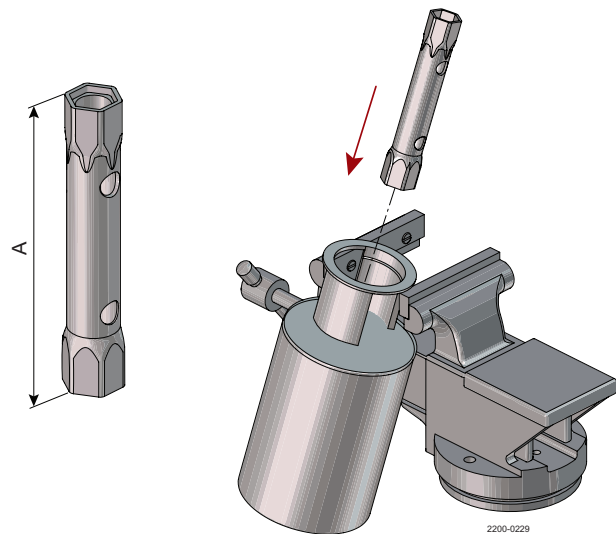
Tools needed for replacement:

1)

Use a 27 mm (1 1/16") tubular box wrench to unscrew and fasten the bushings (23).

This tool allows the actuator stem to fit inside and provide good access to the bushing (23) 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 (23) 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.

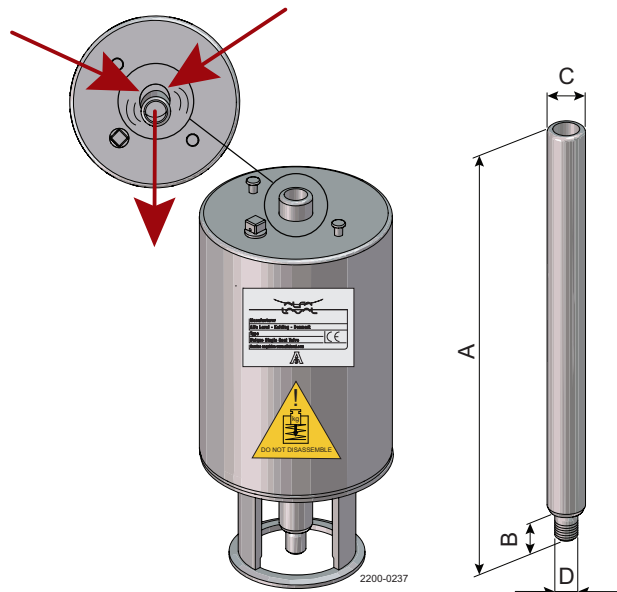
Dimensions

A = 280 mm (11")

B = 6 mm (0.63")

C = Rod Ø20 mm (0.79")

D = M6x1



Spindle forced off centre by spring inside actuator

1

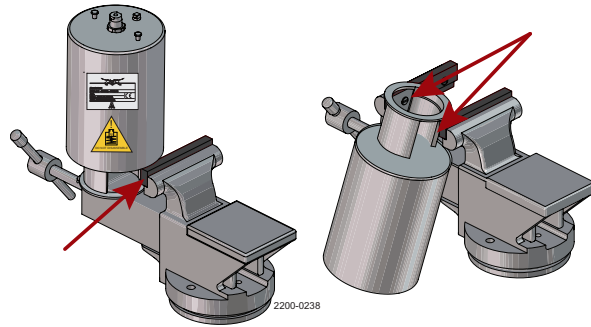
The actuator service kit contains two bushings (23) and four O-rings (22) (24).

Mount the thick O-ring (22) inside and the thin O-ring (24) outside the bushing (23).

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 (23) with the two O-rings (22) (24).

4

Lubricate the stem and O-rings (22) (24) with "Muolykote Longterm 2 Plus" or an equivalent grease before sliding the new bushings (23) onto the actuator stem.

Slide the lubricated bushing (23) with the two O-rings (22) (24) onto the actuator stem.

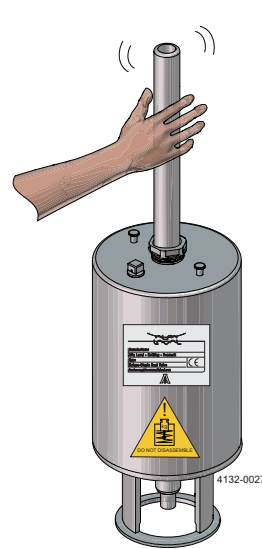


5

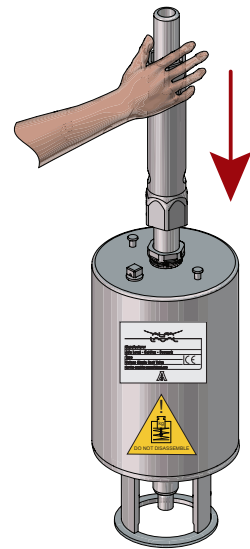
Fit the aligning spindle to the actuator stem and slide the tubular box wrench onto the aligning spindle.

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



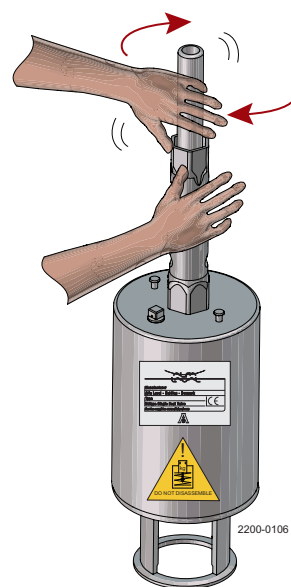
Tubular box wrench

6

Lower the tubular box wrench onto the bushing.

Fasten the bushing (23).

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



2200-0106

6.9 Assembly

NOTE

All parts must be cleaned thoroughly before reassembling.

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

Reverse order of [Disassembly](#) on page 53.

NOTE

(#) refers to position numbers, see [Parts lists and exploded views](#) on page 77.

Lubricate lip seal (7) and plug seal (5) with water.

The clamp (11) threads must be lubricated before tightening – max. torque for the clamps is 10-12 Nm (8-9 lbf – ft).

7 Technical Data



Technical data must be observed during installation, operation and maintenance.
All personnel should be informed about the technical data.

7.1 Alfa Laval Controlled Rotating Retractor

For additional information regarding the ThinkTop, please refer to the ThinkTop instruction manual, available on [Anytime](#) or at www.alfalaval.com.

7.1.1 Technical data

Temperature/pressure – process contact	
Temperature range – liquid service:	-10°C to 95°C / 14°F to 203°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 / 14.5–43.5 psi
Pressure max. – liquid service:	5 bar / 72.5 psi
Pressure max. – steam/gas:	2 bar / 29 psi
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 / 72.5-101.5 psi
Misc.	
Wetting radius:	See performance data
Cleaning radius:	See performance data
Lubrication – product contact:	Cleaning media
Air supply connection:	6 mm / ¼ inch adaptor included in the box

7.1.2 Physical data

Materials

Steel parts – product wetted:	AISI 316/316L
Steel parts – non-product wetted:	AISI 304, AISI 304L, AISI 302, Chemically nickel-plated brass
Seal parts – product wetted:	EPDM
Seal parts – non-product wetted exposed:	NBR, FPM
Polymer parts – product wetted:	PTFE
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:	Ra 0.8 µm / Ra 32 µi Ra 0.38 µm EP / Ra 15 µi EP

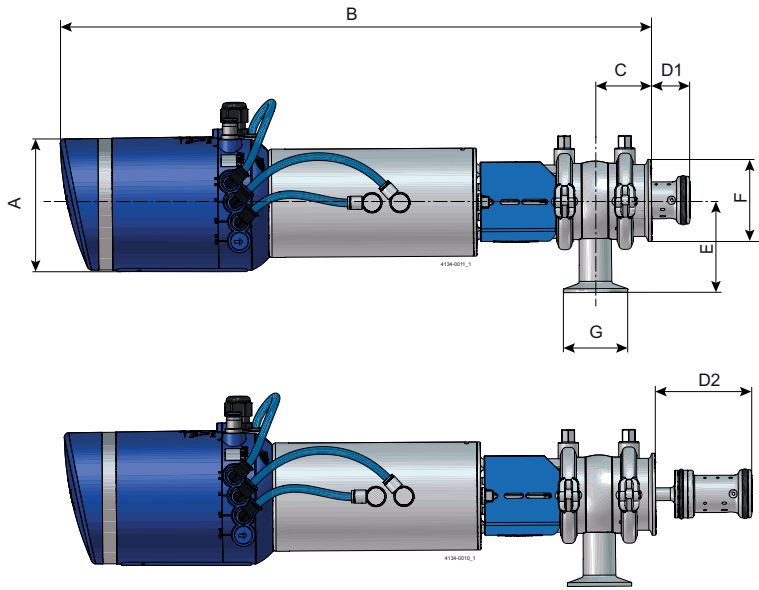
Communication

Digital PNP
AS-Interface v2.1, 31 node
AS-Interface v3.0, 62 node
IO-Link

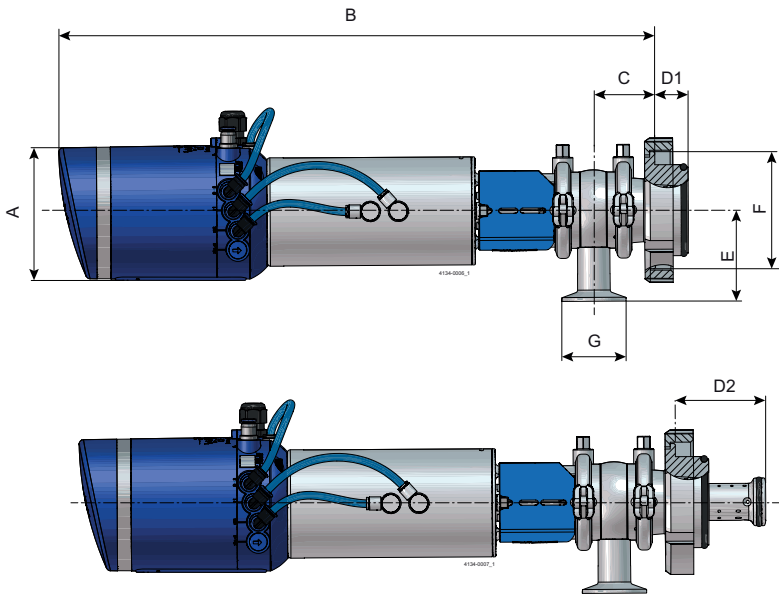
Automation

Updated V70 ThinkTop with auto setup

7.1.3 Dimensions



Tank connection	Inlet connection	Dimension (mm / inch)						Weight
F	G	A	B	C	D1	D2	E	Kg / lb
2 inch clamp	1 inch clamp	105 / 4.1	463.4 / 18.2	44 / 1.7	30.1 / 1.9	71.1 / 2.8	71.5 / 2.8	4.5 / 9.9



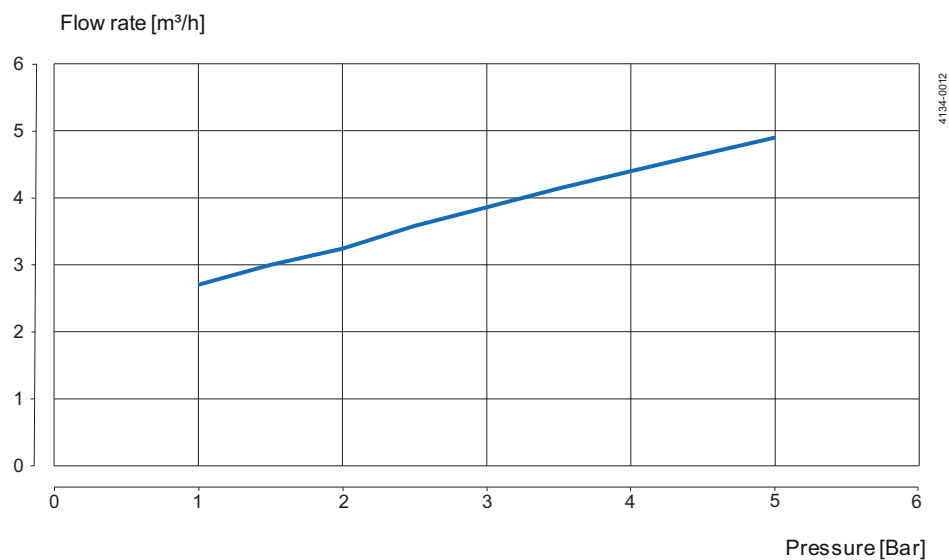
Tank connection	Inlet connection	Dimension (mm / inch)						Weight
F	G	A	B	C	D1	D2	E	Kg / lb
3 inch RJT	1 inch clamp	105 / 4.1	467.8 / 18.4	48.4 / 1.9	26.0 / 1.0	66.7 / 2.6	71.5 / 2.8	5.9 / 13.0
DN80			464.3 / 18.3	44.9 / 1.8	29.5 / 1.2	70.2 / 2.8		5.3 / 11.9
3 inch clamp			470.8 / 18.5	51.4 / 2.0	23.0 / 0.9	63.7 / 2.5		5.1 / 11.2

7.1.4 Performance data

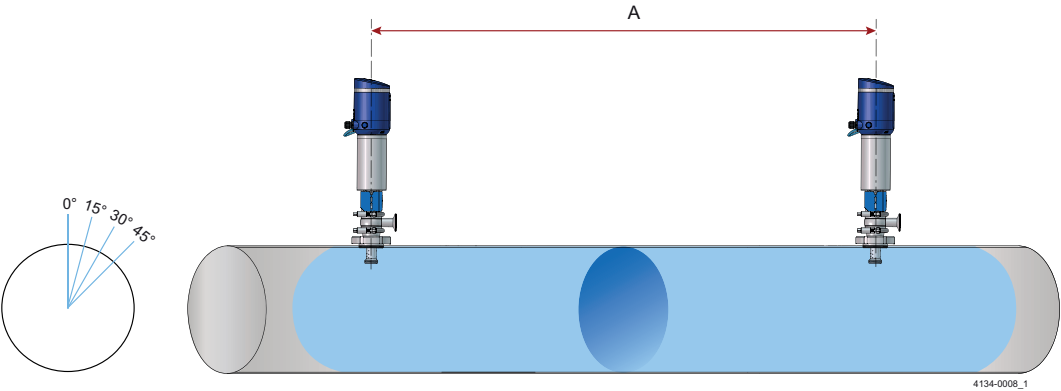
! NOTE

The inlet pressure has been taken 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.

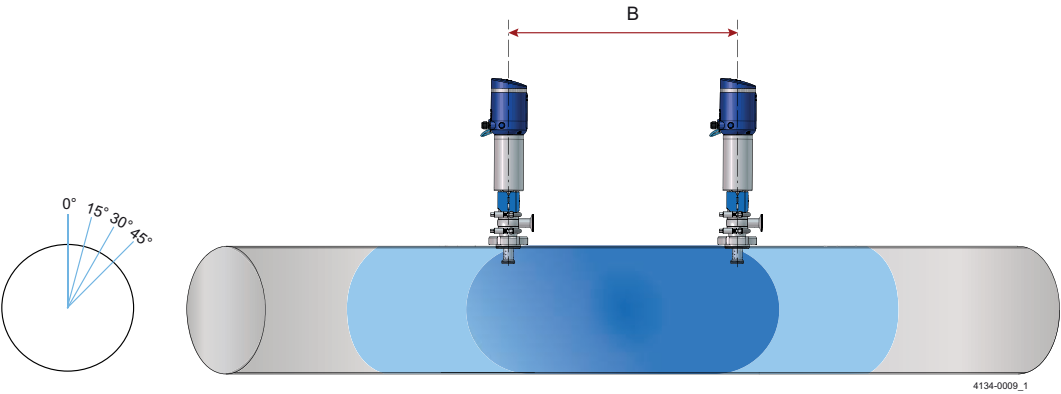
7.1.4.1 Flow rate



7.1.4.2 Cleaning distance



A (mm / feet)			
Overlapping cleaning distance at 2 bar / 29 psi			
Cleaning retractor installed in a $\varnothing 1250$ mm / 4.1 feet duct/pipe			
0°	15°	30°	45°
2200 / 7.2	2400 / 7.9	3200 / 10.5	3700 / 12.1



B (mm / feet)			
Distance to reach next cleaning retractor at 2 bar / 29 psi			
Cleaning retractor installed in a $\varnothing 1250$ mm / 4.1 feet duct/pipe			
0°	15°	30°	45°
1000 / 3.3	1600 / 5.2	2000 / 7.2	2600 / 8.5

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8 Product programme

Please go to <https://hygienicfluidhandling-catalogue.alfalaval.com> for possible configurations and item numbers.

8.1 Qualification documentation

Documentation specification

Standard version

ATEX/ IECEX	ATEX/IECEX approved machine for use in explosive atmospheres INSIDE MACHINE: Category 1 for installation in zone 0/20 OUTSIDE MACHINE: Safe area only II 1G/- Ex h IIC T6...220°C Ga/- II 1D/- Ex h IIC T85°C...T166°C Da/-
----------------	---

Q-doc	Equipment Documentation includes: • EN 1935/2004 DoC • EN 10204 type 3.1 Certificate and DoC • FDA DoC • GMP EC 2023/2006 DoC • EU 10/2011 DoC • ADI DoC • QC DoC • China GB-4806 DoC • Japan Article 18(3) DoC • EU national rubber regulation
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UltraPure version

ATEX/ IECEX	ATEX/IECEX approved machine for use in explosive atmospheres INSIDE MACHINE: Category 1 for installation in zone 0/20 OUTSIDE MACHINE: Safe area only II 1G/- Ex h IIC T6...220°C Ga/- II 1D/- Ex h IIC T85°C...T166°C Da/-
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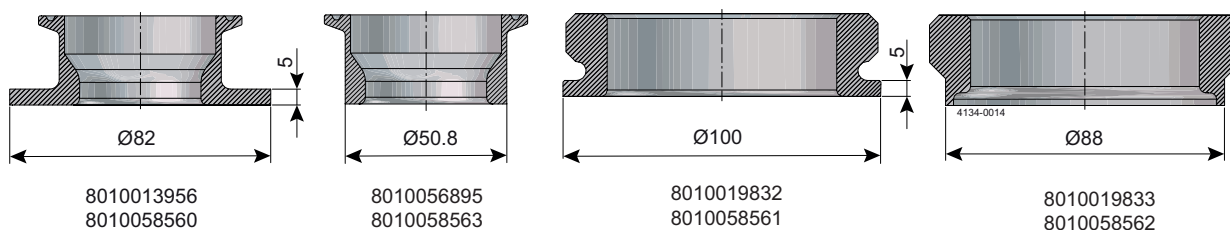
Q-doc	Equipment Documentation includes: • EN 1935/2004 DoC • EN 10204 type 3.1 Certificate and DoC • FDA DoC • GMP EC 2023/2006 DoC • EU 10/2011 DoC • ADI DoC • QC DoC • China GB-4806 DoC • Japan Article 18(3) DoC • USP 87 or 88 Class VI (or the equivalent ISO 10993) • EU national rubber regulation
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8.2 Accessories

8.2.1 Weld plates

Process connections

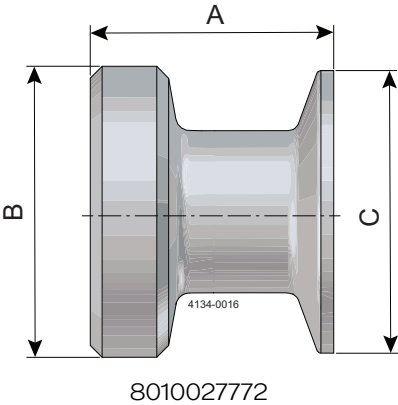
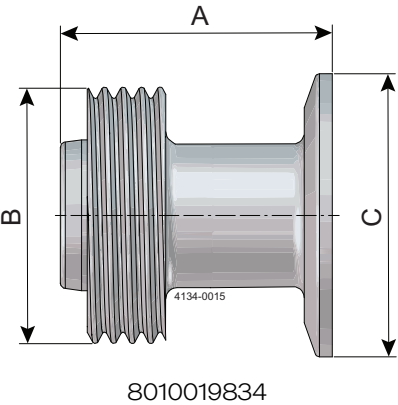
Item no:	Denomination
8010013956	2 inch Clamp weld adaptor
8010056895	2 inch Clamp weld adaptor (small ducts)
8010019832	3 inch RJT weld adaptor, for hole in duct
8010019833	3 inch RJT weld adaptor, for pull out on duct
8010058560	2 inch Clamp weld adaptor - Q-doc
8010058563	2 inch Clamp weld adaptor (small ducts) - Q-doc
8010058561	3 inch RJT weld adaptor, for hole in duct - Q-doc
8010058562	3 inch RJT weld adaptor, for pull out on duct - Q-doc



8.2.2 Inlet connection adaptors

Item number	A mm	B male part	C
8010019834	48	1" RJT	1" clamp ¹
8010027772	43.5	DN25 DIN 11851 (thread 52)	1" clamp ¹

¹ISO 2852



8.2.3 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
8010056638	Retractor service tool
Commodity	Rubber Mallet
Commodity	M10 fork/ring key or similar
Commodity	Nose-pliers
Commodity	Small flat headed screwdriver

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
9611991362	Gasket for 3" Clamp ISO 2852
211056	Clamp for 3" ISO 2852
9611992821	Gasket for 1" RJT
9611991269	Gasket for DN25 DIN11851

Installation kits

Item no.	Denomination
8010055618	CIP inlet, 1" Clamp ISO 2852
8010055619	CIP inlet, 1" RJT
8010055620	CIP inlet, DN25 Clamp DIN11851
8010055621	Process connection, 2" Clamp ISO 2852
8010055622	Process connection, 3" Clamp ISO 2852
8010055623	Process connection, DN80 Clamp DIN11866

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.

9.3 Warranty - Definition



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

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

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



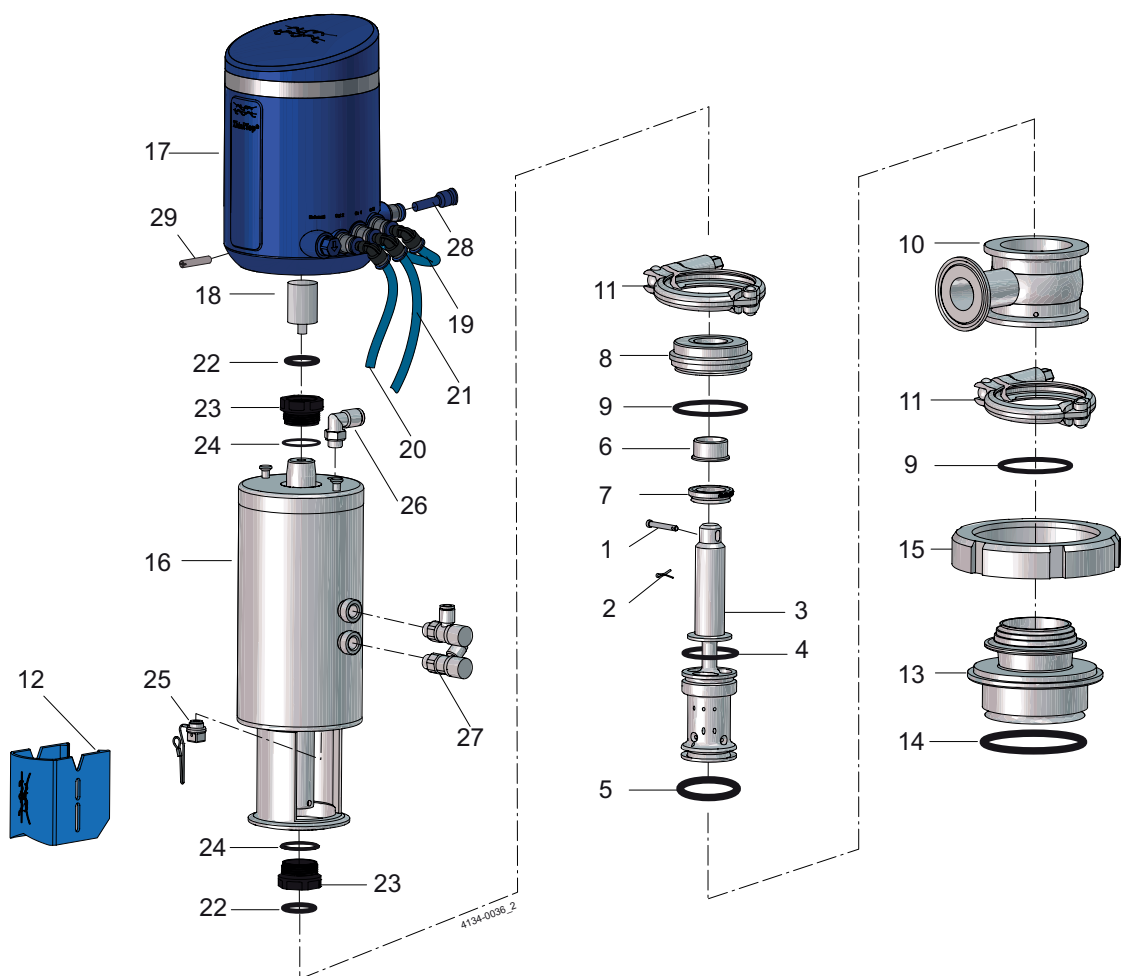
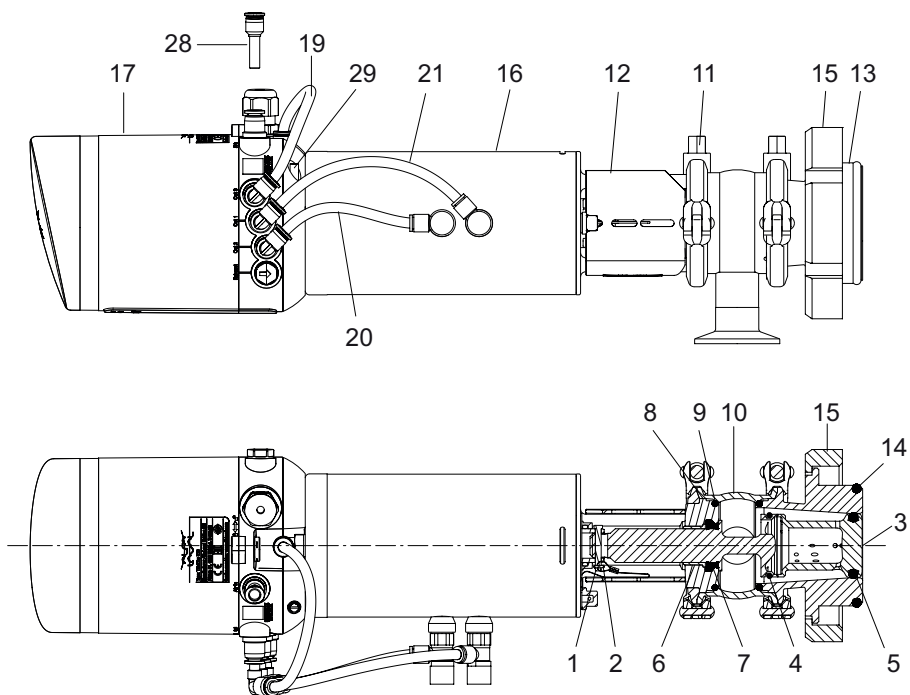
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorized persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 11)
- 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.

10 Parts lists and exploded views

10.1 Standard version - RJT connection



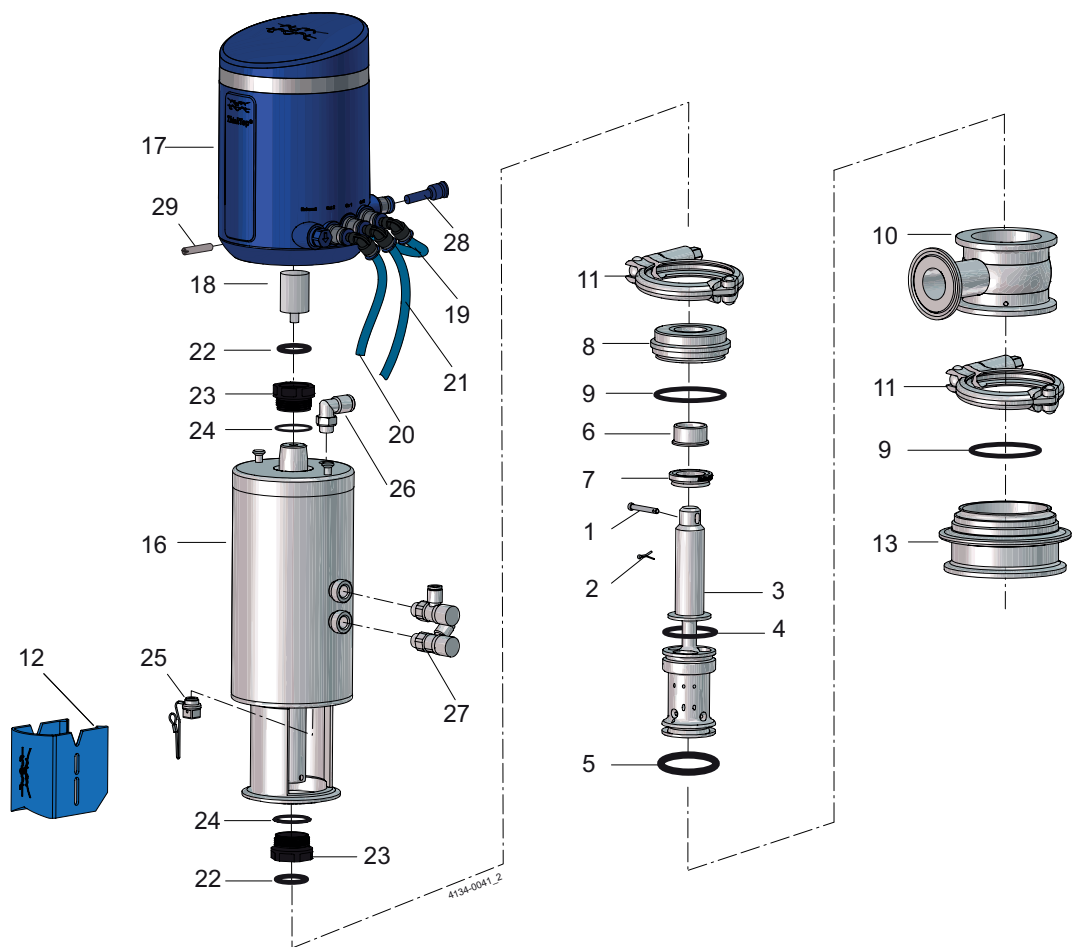
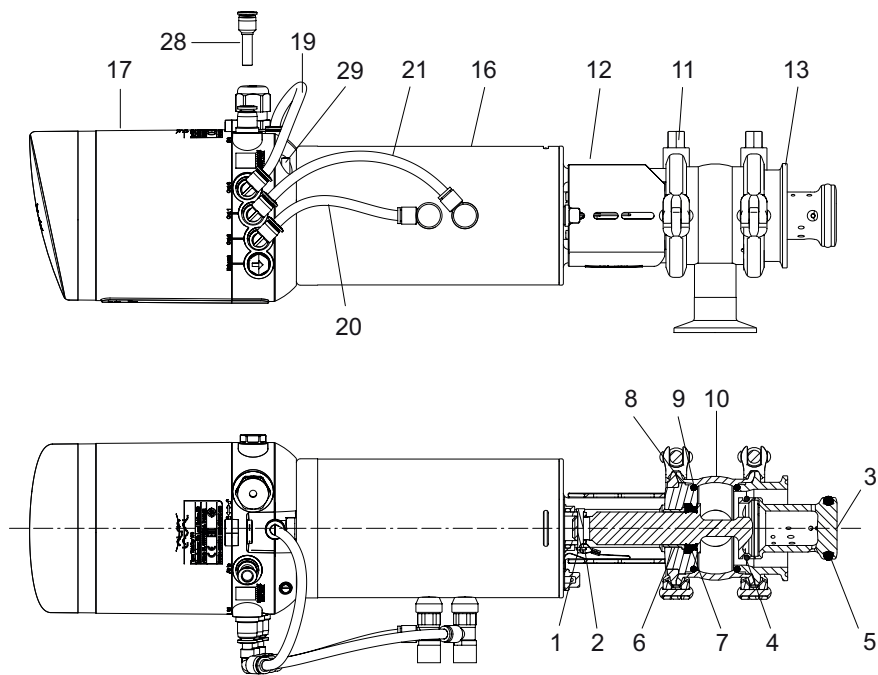
Pos.	Qty.	Denomination
1	1	Clip-on part
2	1	Pin
3	1	Spray part
4	1	O-ring
5	1	Plug seal
6	1	Bushing
7	1	Lip seal
8	1	Sealing element
9	2	O-ring
10	1	Inlet house
11	2	Clamp
12	1	Shield
13	1	Process adaptor
14	1	O-ring
15	1	Nut

Pos.	Qty.	Denomination
16	1	Actuator complete
17	1	ThinkTop
18	1	ThinkTop target
19	1	Air hose
20	1	Air hose
21	1	Air hose
22	2	O-ring
23	2	Bushing
24	2	O-ring
25	1	Plug with grounding wire
26	1	Air fitting
27	2	Air fitting
28	1	Air fitting
29	2	Screw for ThinkTop mounting

NOTE

Find unique item numbers and item numbers for Spare part and Service kits in the Spare part manual available from the on-line [Alfa Laval product catalogue Anytime](#) or in the [Close at hand spare part catalogue](#).

10.2 Standard version - 2 inch clamp connection



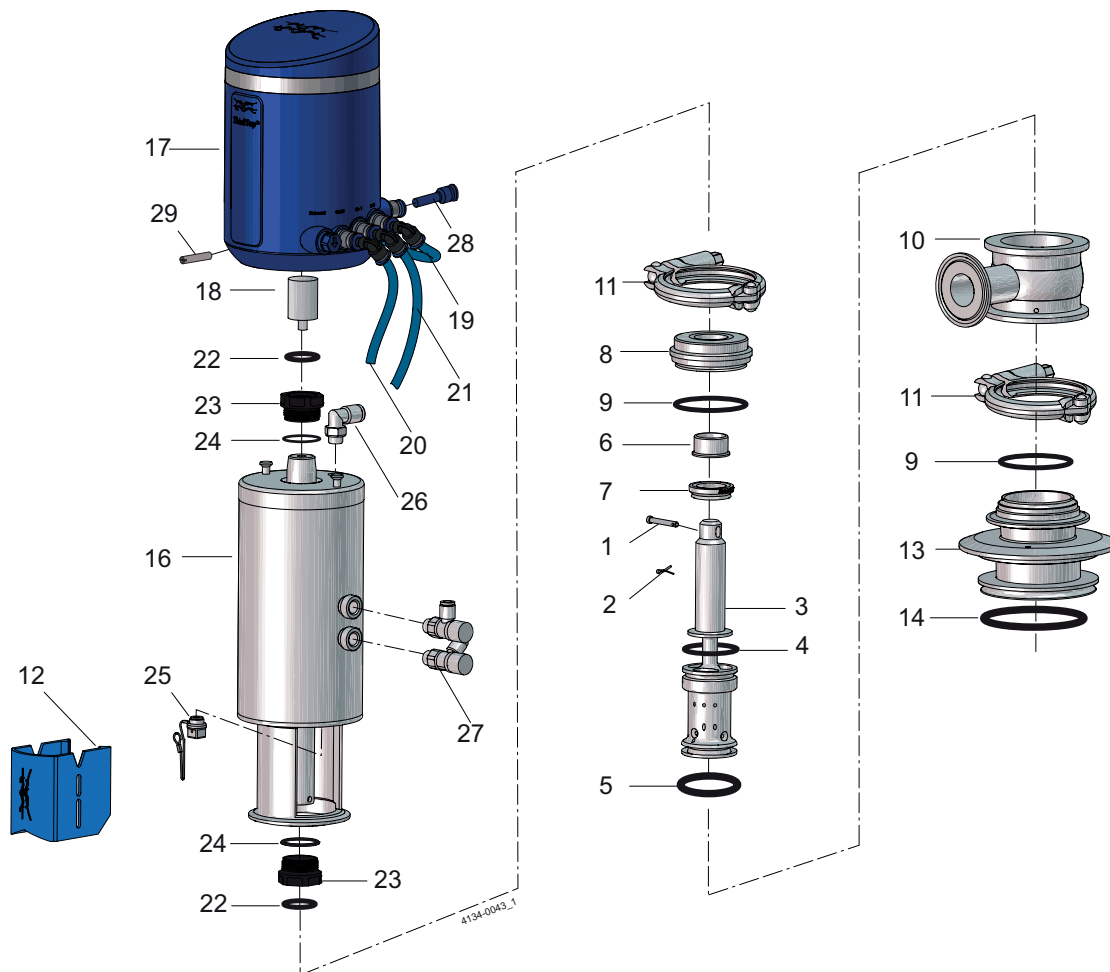
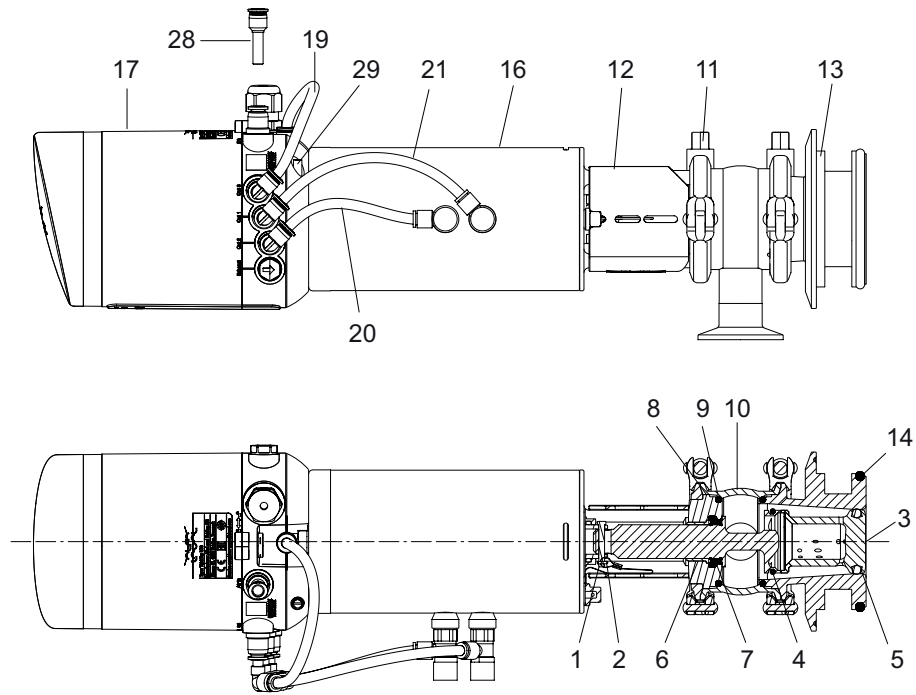
Pos.	Qty.	Denomination
1	1	Clip-on part
2	1	Pin
3	1	Spray part
4	1	O-ring
5	1	Plug seal
6	1	Bushing
7	1	Lip seal
8	1	Sealing element
9	2	O-ring
10	1	Inlet house
11	2	Clamp
12	1	Shield
13	1	Process adaptor
16	1	Actuator complete

Pos.	Qty.	Denomination
17	1	ThinkTop
18	1	ThinkTop target
19	1	Air hose
20	1	Air hose
21	1	Air hose
22	2	O-ring
23	2	Bushing
24	2	O-ring
25	1	Plug with grounding wire
26	1	Air fitting
27	2	Air fitting
28	1	Air fitting
29	2	Screw for ThinkTop mounting



Find unique item numbers and item numbers for Spare part and Service kits in the Spare part manual available from the on-line [Alfa Laval product catalogue Anytime](#) or in the [Close at hand spare part catalogue](#).

10.3 Standard version - DN80 clamp connection



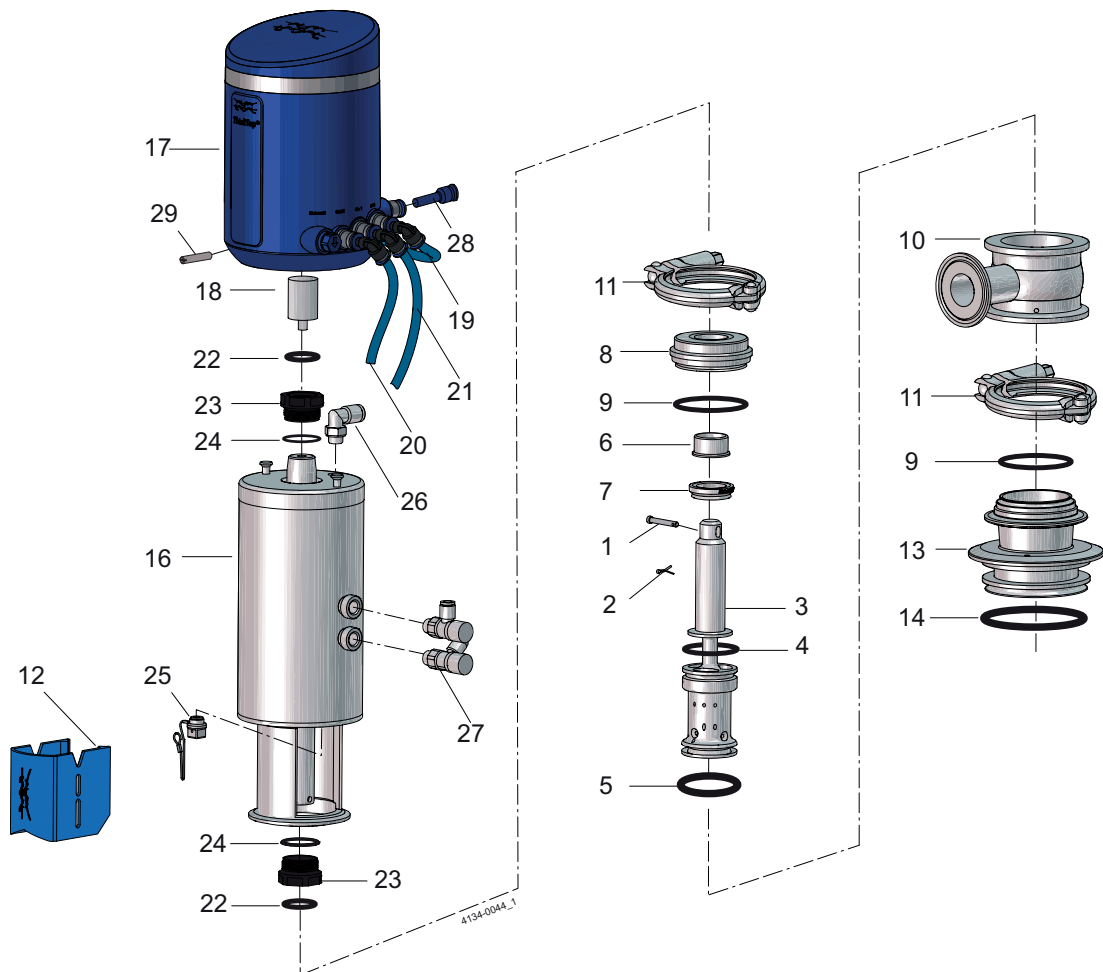
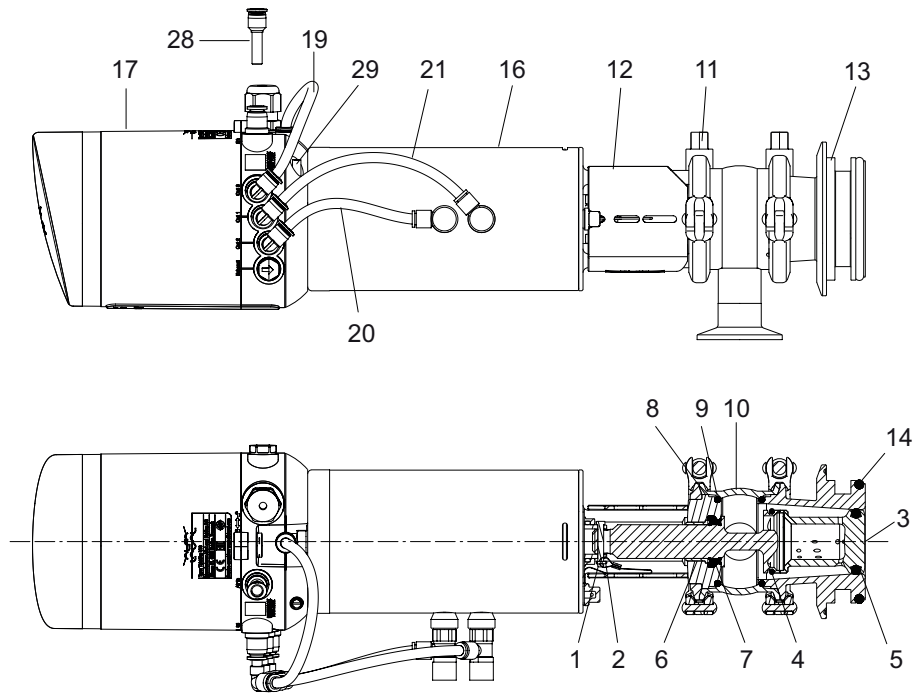
Pos.	Qty.	Denomination
1	1	Clip-on part
2	1	Pin
3	1	Spray part
4	1	O-ring
5	1	Plug seal
6	1	Bushing
7	1	Lip seal
8	1	Sealing element
9	2	O-ring
10	1	Inlet house
11	2	Clamp
12	1	Shield
13	1	Process adaptor
14	1	O-ring

Pos.	Qty.	Denomination
16	1	Actuator complete
17	1	ThinkTop
18	1	ThinkTop target
19	1	Air hose
20	1	Air hose
21	1	Air hose
22	2	O-ring
23	2	Bushing
24	2	O-ring
25	1	Plug with grounding wire
26	1	Air fitting
27	2	Air fitting
28	1	Air fitting
29	2	Screw for ThinkTop mounting



Find unique item numbers and item numbers for Spare part and Service kits in the Spare part manual available from the on-line [Alfa Laval product catalogue Anytime](#) or in the [Close at hand spare part catalogue](#).

10.4 Standard version - 3 inch clamp connection



Pos.	Qty.	Denomination
1	1	Clip-on part
2	1	Pin
3	1	Spray part
4	1	O-ring
5	1	Plug seal
6	1	Bushing
7	1	Lip seal
8	1	Sealing element
9	2	O-ring
10	1	Inlet house
11	2	Clamp
12	1	Shield
13	1	Process adaptor
14	1	O-ring

Pos.	Qty.	Denomination
16	1	Actuator complete
17	1	ThinkTop
18	1	ThinkTop target
19	1	Air hose
20	1	Air hose
21	1	Air hose
22	2	O-ring
23	2	Bushing
24	2	O-ring
25	1	Plug with grounding wire
26	1	Air fitting
27	2	Air fitting
28	1	Air fitting
29	2	Screw for ThinkTop mounting



Find unique item numbers and item numbers for Spare part and Service kits in the Spare part manual available from the on-line [Alfa Laval product catalogue Anytime](#) or in the [Close at hand spare part catalogue](#).

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.

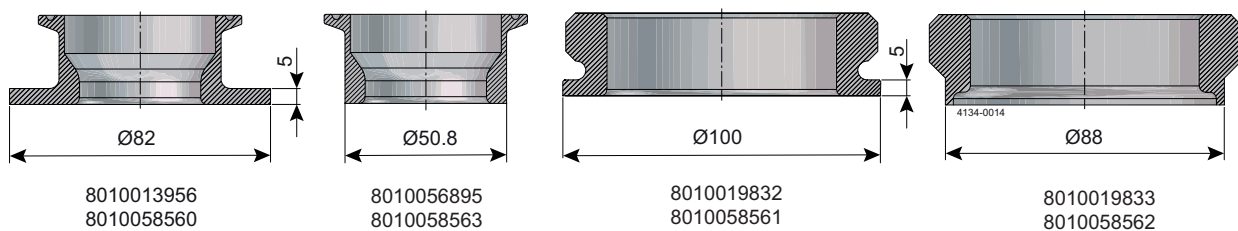
Only use qualified technical personnel to install the weld plate. They shall have read and understood the Instruction manual!

NOTE

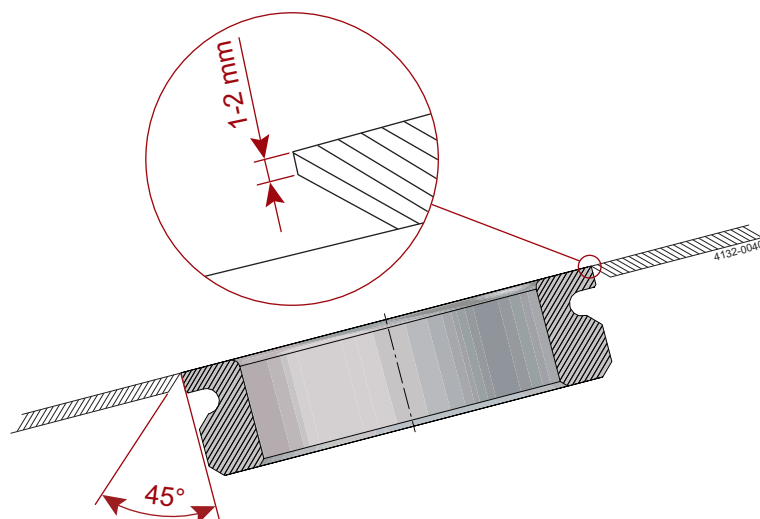
To ensure a hygienic weld (avoid or remove discoloration) it is recommended to use either shielding gas or post-treatment of the welding zone.

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 tank 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 tank.



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

4. Using appropriate filler, tack weld the weld plate to the tank in positions 1 and 2 from inside of the tank 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 tank 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 tank, 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. For installations to be 3-A compliant, the welding should be treated to Ra 0.8 and should not provide imperfections to the surfaces.
11. If grinding and polishing is performed, the area should be allowed to cool between grinding and polishing.

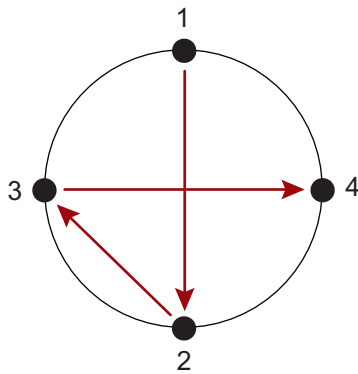


Image 1

From inside the
tank if possible

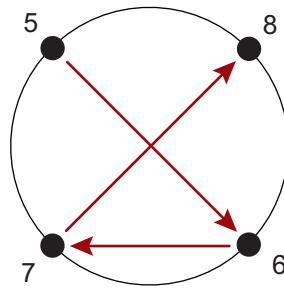


Image 2

From inside the
tank if possible

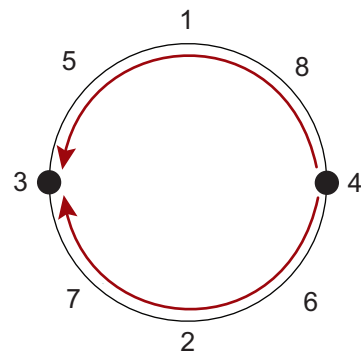


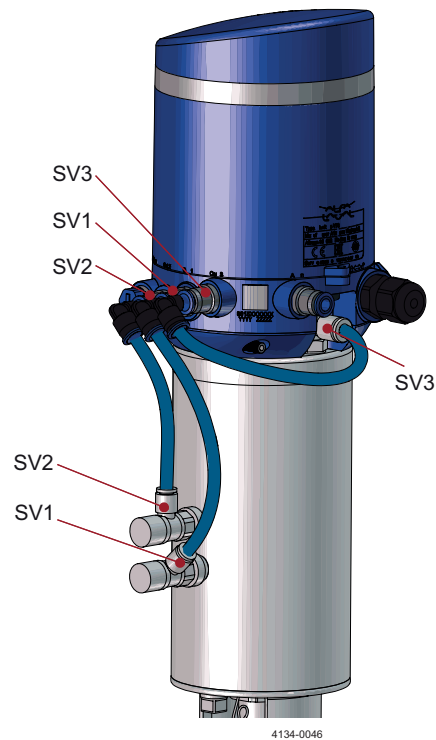
Image 3

First from outside the
tank if possible

4132-0041

11.2 Appendix B - ThinkTop setup

The ThinkTop V70 must be mounted correctly and all air hoses connected to the proper air fittings on the CRR.



Solenoid valves

Valve name and definition	Function
Solenoid valve 1: SV1	Rotate spray part in counterclockwise (CCW) direction
Solenoid valve 2: SV2	Rotate spray part in clockwise (CW) direction
Solenoid valve 3: SV3	Open and close retractor

Ensure that the correct version of the Thinktop is used:

- AS-i v 3.0
- AS-i v 2.11
- Digital 24VDC
- IO-link

11.2.1 Start-up

- 1 The Controlled Rotating Retractor (CRR) is delivered with the ThinkTop preprogrammed with auto setup. And will be ready to use from the box.

The following can be done to check that all is in order or if modifications are required.

1. Check that the Controlled Rotating Retractor module is active on the ThinkTop.
 - a. If the correct module is active, the light indicators on the ThinkTop will look like this:
 - b. If not set to retractor mode, this can be done by pressing the "ENTER" 6 times, followed by "SELECT".



11.2.2 Auto setup

- 1 Once the Retractor mode is selected the auto setup can be utilized.

This will automatically set the target positions.

Press "ENTER" and then "SELECT" to initiate "Auto".

NOTE

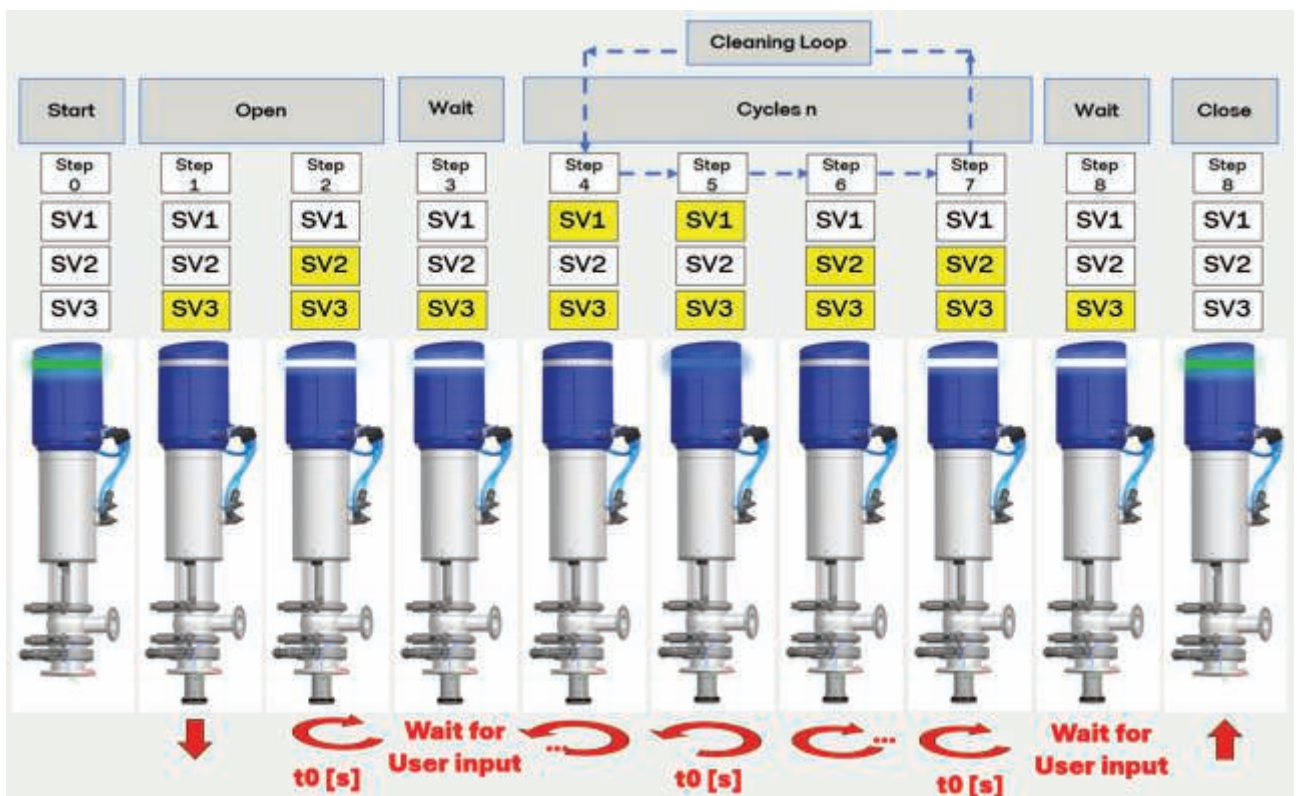
The throttle valves must be set properly for the auto setup to work as intended. If the throttle valves are set at too low a setting it may result in faulty positioning.

If all settings are correct and the air hoses properly connected the retractor will open and then rotate clockwise and counterclockwise. And then return to the closed position.

11.2.3 Flex setup

- 1 It is possible to use the controlled rotating retractor using the flex setup outside of the CRR module.
 1. To exit the retractor module and enter the main module of the Thinktop press "ENTER" until no lights are active and then press "SELECT".

Using flex setup will require PLC programming, which will not be part of this document. However, the following diagram will state the recommended logic.



11.2.4 Troubleshooting

- 1 If the unit is unresponsive.
 - Remove the cap from the thinktop.
 - Manually activate SV3 and SV1 using a flathead screwdriver until the white light is active on the Thinktop.
 - Deactivate all solenoid valves.
The unit should indicate green light.
 - Execute autosetup.

This will make the unit operational again.

If nothing happens when toggling the solenoid valves it could be because the throttle valves are set too low.

11.2.5 Use

To operate the CRR, only two commands are required:

- A. Open/close retractor
- B. Start/stop cleaning cycle

