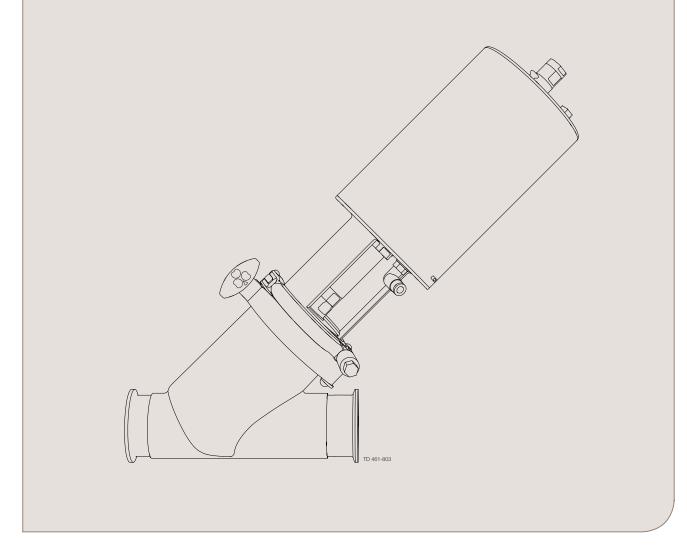


Instruction Manual

Unique Single Seat Valve Y-body



ESE00691-EN6

2018-12

Original manual





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

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1 EC Declaration of Conformity

Revision of Declaration of Conformity 2009-	-12-29				
The Designated Company					
Alfa Laval Kolding A/S Company Name					
Albuen 31, DK-6000 Kolding, Denmark Address					
+45 79 32 22 00 Phone No.					
hereby declare that					
Valve Designation					
Unique SSV LS PN10					
Type					
From serial number 1000000 to 700000000	000				
is in conformity with the following directive with amendments:					
 Machinery Directive 2006/42/EC Pressure Equipment Directive 2014/68/EU category 1 and subjected to assessment procedure Module A. 					
The person authorised to compile the techn	nical file is the signer of this document				
Global Product Qual Pumps, Valves, Fittings and		Lars Kruse Andersen			
Title		Name			
Kolding	0040 04 04	41			
Kolding Place	2018-04-01 Date	Signature			





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

Important information 2.1

Always read the manual before using the valve!

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

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

NOTE

Indicates important information to simplify or clarify procedures.

2.2 Warning signs



General warning



Caustic agents



Danger of injury: (an extra yellow label marked on the actuator from June 2016) Do NOT attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).



Danger of injury (lasermarked on the actuator) Do NOT attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is locked)

2 Safety

All warnings in the manual are summarised on this page.

Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

Actuators

If support air is utilised:



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

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

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

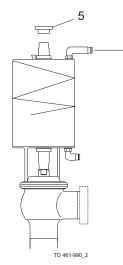


Pos. no. 5



Pos. no. 5

For actuators, manufactured year 2019 --> with serial number from 6000000 to 7000000 and from 6000000000 to 7000000000 always use steel adapter (pos 5) = 9615374701 Tighten torque = 15 Nm



Alfa Laval recommends max. 3 bar support air.

Always use the "3 bar air relief fittings" on support air.

Alfa Laval article number = 9611995903

All warnings in the manual are summarised on this page.

Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

INSTALLATION

Always read the technical data thoroughly (see section 6 Technical data)

Always release compressed air after use

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

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

Never dismantle the valve with valve and pipelines under pressure

Never dismantle the valve when it is hot

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

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





OPERATION

Never dismantle the valve with valve and pipelines under pressure

Never dismantle the valve when it is hot

Always read the technical data thoroughly (see section 6 Technical data)

Always release compressed air after use

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

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

Always rinse well with clean water after cleaning

Always handle lye and acid with great care





MAINTENANCE

Always read the technical data thoroughly (see section 6 Technical data)

Always release compressed air after use

Never service the valve when it is hot

Never service the valve with valve and pipelines under pressure

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

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

Always use Alfa Laval genuine spare parts

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



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

TRANSPORTATION

Always ensure that compressed air is released

Always ensure that all connections are disconnected before attempting to remove the valve from the installation

Alwavs drain liquid out of valves before transportation

Always use predesigned lifting points if defined

Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used

Installation

The instruction manual is part of the delivery. Study the instructions carefully.

The items refer to parts list and service kits section.

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

Unpacking/delivery 3.1

Step 1 CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

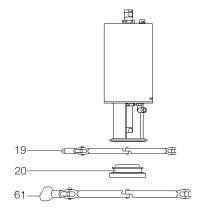
Check the delivery for:

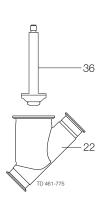
- 1. Complete valve.
- 2. Delivery note.
- 3. Instruction Manual

Step 2

Complete actuator: 1. Bonnet (20).

- Upper clamp (19).
 Valve plug (36).
- 4. Valve body (22).
- 5. Lower clamp (61)





Step 3

Remove possible packing materials from the valve/valve parts.

Inspect the valve/valve parts for visible transport damage.

Avoid damaging the valve/valve parts.

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

3.2 General installation

Step 1

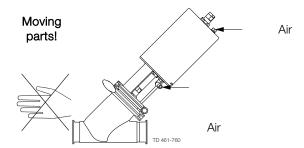


- CAUTION
- Alfa Laval cannot be held responsible for incorrect installation. **Always** release compressed air after use. **Always** read the technical data thoroughly.

See section 6 Technical data.

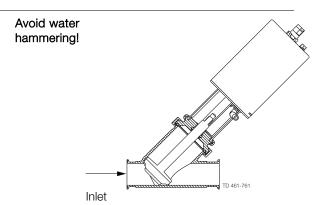
Step 2

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



Step 3

It is recommended to install the valve so that the flow is against the closing direction to avoid water hammering.

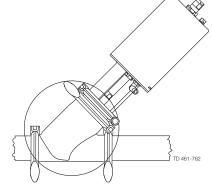


Avoid stressing the valve.

Pay special attention to:

- Vibrations.
- Thermal expansion of the pipelines.
- Overloading of the pipelines.





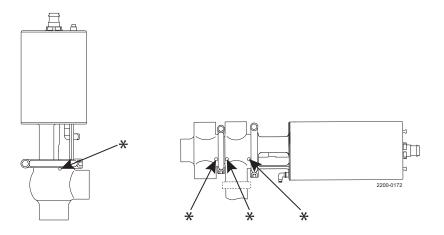
Installation

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

Step 5

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

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



* = Leakage detection hole

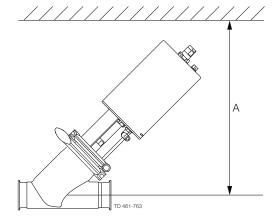
Study the instructions carefully.

The items refer to the parts list and service kits section.

3.3 Welding

Step 1

Valve size	A (mm)
DN50/51 mm	478
DN65/63.5 mm	490
DN80/76.1 mm	564
DN100/101.6 mm	605

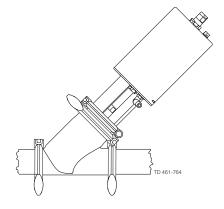


A = Incl. top unit

Step 2

Assemble the valve in accordance with the steps in section 5.4 Valve assembly.

Pay special attention to the warnings!

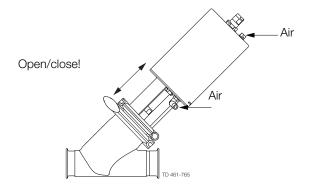


Step 3

Pre-use check:

- 1. Supply compressed air to the actuator.
- 2. Open and close the valve several times to ensure that it operates smoothly.

Pay special attention to the warnings!



3 Installation

Study the instructions carefully.

The items refer to the parts list and service kits section.

3.4 Recycling information

Unpacking

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps
- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

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

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



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



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

Study the instructions carefully and pay special attention to the warnings! Ensure that the valve operates smoothly.

The items refer to the parts list and service kits section.

Operation 4.1

Step 1

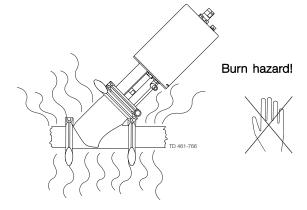


- CAUTION
 - Alfa Laval cannot be held responsible for incorrect installation. **Always** release compressed air after use. **Always** read the technical data thoroughly.

- See section 6 Technical data. Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

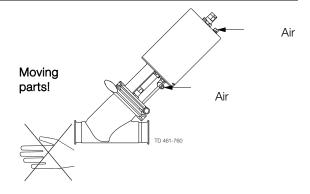
Step 2

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



Step 3 ۱,

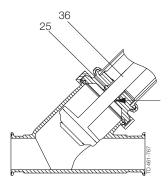
Never touch moving parts if the actuator is supplied with compressed air.



Step 4

Lubrication of valves:

- 1. Ensure smooth movement between lip seal (25) and plug stem (367).
- 2. Lubricate the lip seal with Klüber Paraliq GTE 703 if necessary (see section 4.1).



Operation

Study the instructions carefully and pay special attention to the warnings! Ensure that the valve operates smoothly.

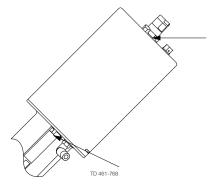
The items refer to the parts list and service kits section.

Step 5

Lubrication of actuator

- 1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery).

 2. Lubricate all seals with Molykote Longterm 2 plus if necessary.



Pay attention to possible faults. Study the instructions carefully. The items refer to the parts list and service kits section.

4.2 Troubleshooting

NOTE!

Study the maintenance instructions carefully before replacing worn parts. - See section 4.11

Problem	Cause/result	Repair		
External product leakage	Worn or damaged lip seal and/or O-ring	Replace the sealsReplace with seals of a different rubber grade		
Internal product leakage	 Worn or product affected plug seal Product deposits on the seat and/or plug Product pressure exceeds actuator specification 	 Replace the seal Replace with a seal of a different rubber grade Frequent cleaning Replace with a high pressure actuator Use auxiliary air on the spring side (do not exceed 3 bar). Alfa Laval article number = 9611995903. See section and section , Reduce product pressure 		
Water hammer	The flow direction is the same as the closing direction	 The flow direction should be against the closing direction. See section , Throttle air release of solenoid in top unit 		
The valve does not open/close	Product pressure exceeds actuator specification	 Replace with a high pressure actuator Reduce product pressure Use auxiliary air on the spring side. Always use the pressure relief fittings (3 bar) on support side. Alfa Laval article number = 9611995903 		

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



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



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

4 Operation

The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place. Study the instructions carefully and pay special attention to the warnings! NaOH = Caustic Soda.

$HNO_3 = Nitric \ acid.$

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

Caustic danger!



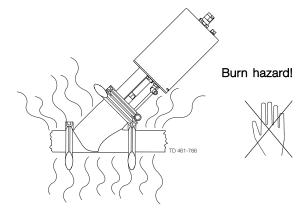
Always use rubber gloves!



Always use protective goggles!

Step 2

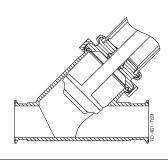
Never touch the valve or the pipelines when sterilising.



Step 3

Clean the plug and the seats correctly.

Pay special attention to the warnings! Lift and lower valve plug momentarily!



Step 4

Examples of cleaning agents:

Use clean water, free from clorides.

1. 1% by weight NaOH at 70° C

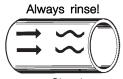
1 kg NaOH + 100 I water = Cleaning agent.

2. 0.5% by weight HNO $_3$ at 70° C

0.7 I + 100 I = Cleaning agent.

Step 5

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



Clean water Cleaning agents

The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place. Study the instructions carefully and pay special attention to the warnings! NaOH = Caustic Soda. $HNO_3 = Nitric acid$.

Step 6 NOTE

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

Maintain the valve regularly.

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

Always keep spare rubber seals and lip seals in stock.

5.1 General maintenance

Step 1



CAUTION

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

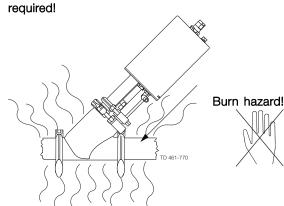
See section 6 Technical data. Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

Step 2

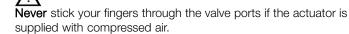
Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.

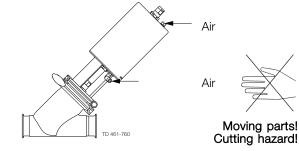
Atmospheric pressure



Step 3



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



Maintain the valve regularly.

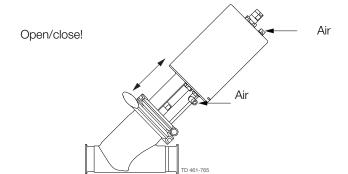
Study the instructions carefully and pay special attention to the warnings! Always keep spare rubber seals and lip seals in stock.

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

	Product wetted seals Actuator bushings complete		
Preventive maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions	
Maintenance after leakage (leakage normally starts slowly)	Replace at the end of the day	Replace when possible	
Planned maintenance	 Regular inspection for leakage and smooth operation Keep a record of the valve Use the statistics for inspection planning Replace after leakage 	 Regular inspection for leakage and smooth operation Keep a record of the actuator Use the statistics for inspection planning Replace after leakage 	
Lubrication	Before fitting Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease	Before fitting Molykote Longterm 2 plus	

Pre-use check:

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



Recommended spare parts

Service kits (see chapter 6).

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.

NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

5.2 Dismantling the valve

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



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



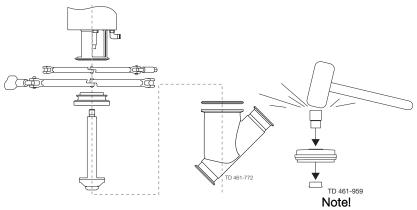
Do **NOT** attempt to cut the actuator open due to spring under load danger!

Step 1

1 Shut-off valve:

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

Pay special attention to the warnings!

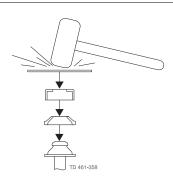


Be careful not to damage the bushing.

Note! For plug seal replacement please see section 5.3 TR2 seal ring replacement

5.3 TR2 seal ring replacement

- 1. Place the plug element on a firm support.
- using a utility knife, partially AND CAREFULLY cut through the upper ring portion of the TR2 plug avoiding contact with stainless steel stem.
- 3. Force apart both cut ends of the plug for removal from stem).
- 4. TR2 plugs are installed by applying uniform pressure on all sides.
 - (Pressure can be applied by using the seal assembly tool).
- 5. Using a piece of metal and a rubber mallet, place a precise tap to madke the TR2 plug snap on to the stem. Reverse the tool and tap again to secure proper fit.
- Examine seal assembly to be sure the TR2 plug is properly mounted, holding the seal assembly in one hand - rotate the TR2 plug.
 - (For proper CIP cleaning the TR2 plug should turn freely on the stem.)



Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.

NC = Normally closed. NO = Normally open.

 $A/A = Air/air \ activated.$

For more explicit instructions, please refer to the maintenance video.

Study the instructions carefully.

The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

Service tool: See Spare Parts.

5.4 Valve assembly

Reverse order of 5.2 Dismantling the valve.

Lubricate O-ring (21) and lip seal (25) with Klüber Paraliq GTE 703.

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

- Change-over plug tighten torque = 30 Nm
- Shut-off plug tighten torque = 20 Nm

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

The clamps' thread must be lubricated before tightening - max. torque for the clamps is 10-12 Nm.



Pay special attention to the warnings.

5.5 Actuator types

- 1. Unscrew and remove top and bottom bushings with O-rings.
- 2. Lubricate O-rings with Molykote Longterm 2 plus before fitting.
- 3. Fit bushings and O-rings. Tighten bushing to a torque of 10Nm. Be careful not to overtighten.



Study the instructions carefully.

The items refer to the parts list and service kits section. Handle scrap correctly.

 $A/A = Air/air \ activated.$

Service tool: see spare parts.

5.6 Actuator types

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



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



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

Step 1 Introduction

- The actuator service kit contains two bushings and four o-rings.
- Mount the thick O-ring inside and the thin O-ring outside the bushing.
- Always lubricate the spindle and o-rings thoroughly with "Molykote Longterm 2 Plus" before mounting the new bushings.



Study the instructions carefully.

The items refer to the parts list and service kits section. Handle scrap correctly.

 $A/A = Air/air \ activated.$

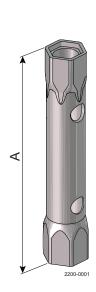
Service tool: see spare parts.

Step 2

Introduction - Standard socket wrench

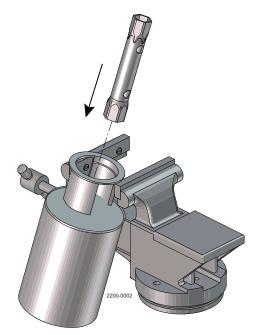
Use a 27 mm socket wrench to mount the bushings, as the space in the yoke is limited.

A socket wrench 24x27 (length = 185 mm) is a standard tool, which can be purchased from all tool shops.



A = 185 mm

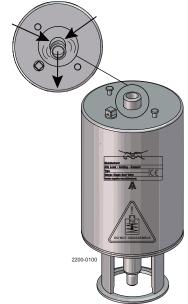
Example: Socket wrench - 24x27 mm Supplier: Gedore Tool EAN4010886621264

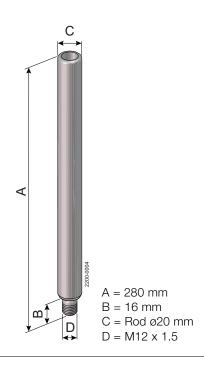


Step 3 Introduction - Aligning spindle

The actuator spindle can in some cases be forced off centre by the internal spring, see drawing below. In these cases, the alignment spindle shown below, together with the socket wrench, is a great help and ensures a reliable mounting of the bushing. The spindle can either be purchased from Alfa Laval together with the socket wrench (9614198401) or it can be manufactured locally using the below dimensions.

Spindle forced off centre by spring inside actuator





Study the instructions carefully.

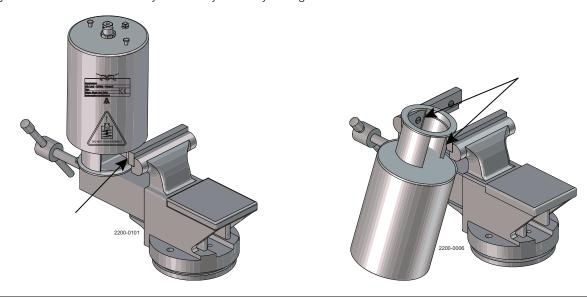
The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

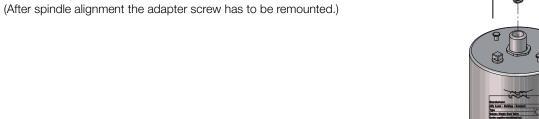
Service tool: see spare parts.

Step 4

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



Step 5
Remove adapter screw.





Study the instructions carefully.

The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

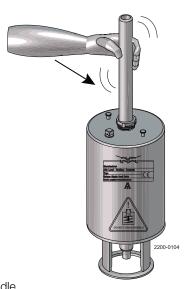
Service tool: see spare parts.

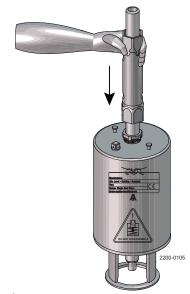
Step 6

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



Step 7 Fit the aligning spindle to the actuator spindle, and then mount the socket wrench.





Aligning spindle

Socket wrench

Study the instructions carefully.

The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

Service tool: see spare parts.

Step 8

Now pull the aligning spindle to centre the actuator spindle. In this position rotate the **bushing** 180° backwards and then begin to fasten the bushing. Make sure that the thread catches evenly!

The bushing must only be tightened with a torque of 10 Nm (7 lb-ft) which can be done by turning "hard" by hand.



6 Technical data

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

6.1 Technical data

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

Standard design The valve is designed to deliver years of reliability and performance as can be expected from all Alfa Laval products.

Data - valve/actuator						
Max. product pressure	1000 kPa (10 bar).					
Min. product pressure	Full vacuum (depending on product specifications).					
Temperature range	-10° C to +140° C (standard EPDM seal).					
Air pressure, actuator	500 to 700 kPa (5 to 7 bar).					
Materials - valve/actuator	Materials - valve/actuator					
Product wetted steel parts	1.4404 (316L) (internal Ra < 0.8 μm).					
Other steel parts	1.4301 (304).					
Plug seal	EPDM / PTFE (TR2).					
Other product wetted seals	EPDM (standard).					
Optional product wetted seals	HNBR and FPM.					
Other seals	NBR.					

Weight (kg)

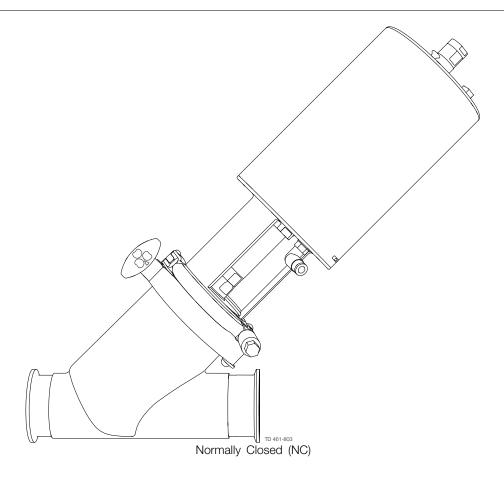
	Nominal Size			
	DN/OD 51 mm	DN/OD 63.5	DN/OD 76 mm	DN/OD 101.6 mm
Weight (kg)	8.6	11.1	18.6	27.1

Noise

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

The drawing shows Unique Single Seat Valve - Y-body. The items refer to the parts list in the following sections

7.1 Drawing



7 Parts list and Service Kits

For parts lists please see section 6.1. The drawings include all items.

7.2 Unique Single Seat Valve - Y-body

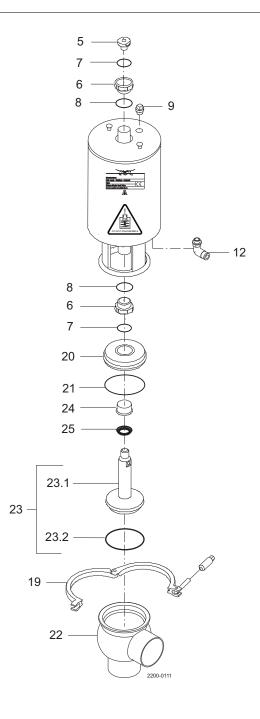
If the actuator is marked with a danger warning do NOT attempt to cut the actuator open.



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



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



For parts lists please see section 6.1. The drawings include all items.

Parts list

Pos.	Qty	Denomination				
5 6	1 2 2 2 1 1(2) 1 1 1 1 1 1 1 1 1 1 1 1	Actuator Lip seal set (10 pcs.) EPDM Lip seal set (10 pcs.) HNBR Lip seal set (10 pcs.) FPM Adapter Bushing O-ring O-ring Plug Air fitting Clamp Bonnet Valve body Bushing Lip seal Plug, complete Plug Plug seal, PTFE Clamp, body Gasket				

Service kits

		2"	21/2"	3"	4"
	Denomination	51 mm	63.5 mm	76.1 mm	101.6 mm
Servi	ce kit for Actuator				
	Service kit	9611926500	9611926500	9611926500	9611926500
Servi	ce kit for Product wetted parts, standard				
•	Service kit, EPDM	9611926815	9611926816	9611926817	9611926818
•	Service kit, HNBR/NBR	9611926819	9611926820	9611926821	9611926822
•	Service kit, FPM	9611926823	9611926824	9611926825	9611926826

Parts marked with □+ are included in the service kits.

Recommended spare parts: Service kits.

TD-900-480/1

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