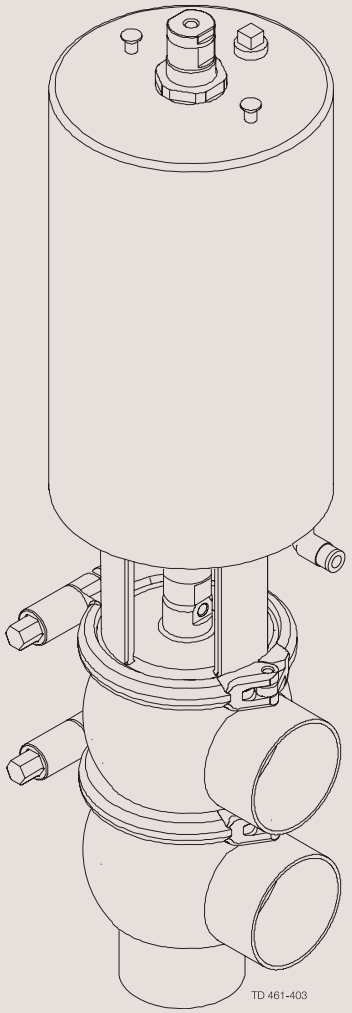
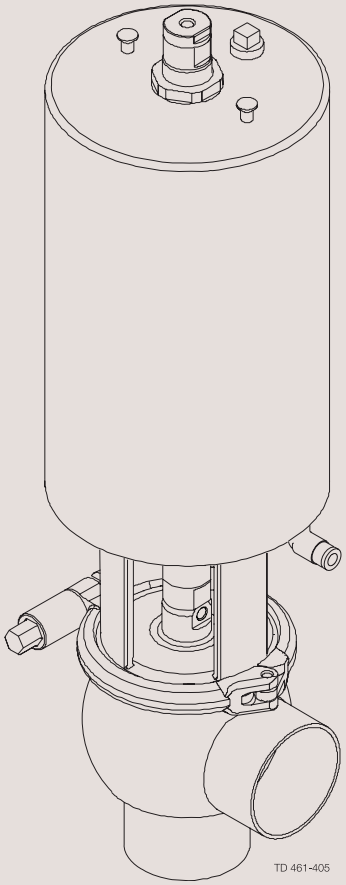
Instruction Manual

Unique Single Seat Valve - Long Stroke





ESE00222-EN3 2011-05

Original manual

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

1 EC Declaration of Conformity

The designating company

Alfa Laval
Company Name

Albuen 31, DK-6000 Kolding, Denmark
Address

+45 79 32 22 00
Phone No.

hereby declare that

Unique Single Seat Valve	Long Stroke	
Denomination	Type	Year

is in conformity with the following directives:
- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 97/23/EC category 1 and subjected to assessment procedure Module A.

Manager, Product Centres, Compact Heat Exchangers & Fluid Handling	Bjarne Søndergaard
Title	Name
Alfa Laval Kolding	
Company	Signature

Designation

CE

2 Safety

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

2.1 Important information

Always read the manual before using the valve!

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

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

NOTE
Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:

Caustic agents:

2 Safety

All warnings in the manual are summarized 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

Installation:

Always read the technical data thoroughly (See chapter 6 Technical data)
Always release compressed air after use
Never touch the moving parts if the actuator is supplied with compressed air
Never touch the valve or the pipelines when processing hot liquids or when sterilizing
Never dismantle the valve with valve and pipelines under pressure
Never dismantle the valve when it is hot

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 chapter 6 Technical data)
Always release compressed air after use
Never touch the valve or the pipelines when processing hot liquids or when sterilizing
Never touch the moving parts if the actuator is supplied with compressed air
Always rinse well with clean water after the cleaning

Always handle lye and acid with great care

Maintenance:

Always read the technical data thoroughly (See chapter 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 the moving parts if the actuator is supplied with compressed air

Transportation:

Always secure that compressed air is released
Always secure that all connections is disconnected before attemt to remove the valve from the installation
Always drain liquid out of valves before transportation
Always used predesigned lifting points if defined
Always secure sufficient fixing of the valve during transportation - if special designed packaging material is available it must be used

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 supplied as separate parts as standard (for welding).
The valve is assembled before delivery, if it is supplied with fittings.

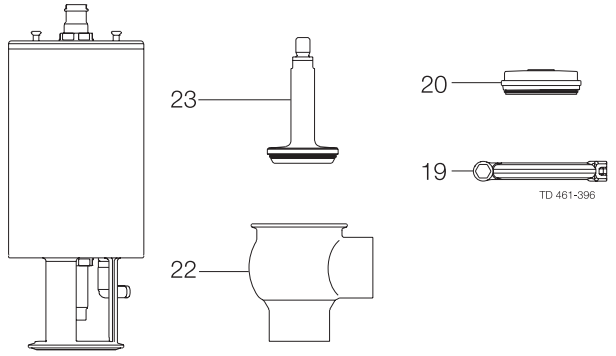
3.1 Unpacking/delivery

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

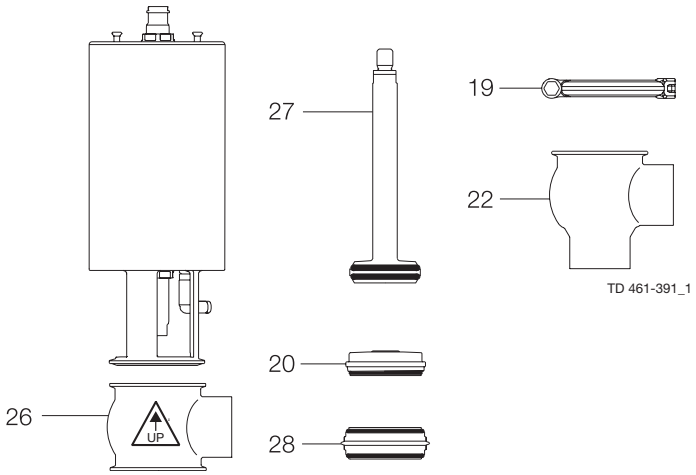
Check the delivery for:
1. Complete valve, shut off valve or change-over valve (see steps 2a and 2b).
2. Delivery note.

Step 2

2a
Shut-off valve:
1. Complete actuator.
2. Bonnet (20).
3. Clamp (19).
4. Valve plug (23).
5. Valve body (22).



2b
Change-over valve:
1. Complete actuator.
2. Bonnet (20).
3. 2 x clamp (19).
4. Valve plug (27).
5. Lower valve body (22).
6. Valve seat (28).
7. Upper valve body (26).



Step 3
Remove possible packing materials from the valve/valve parts.
Inspect the valve/valve parts for visible transport damages.
Avoid damaging the valve/valve parts.

3 Installation

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

3.2 General installation

Step 1

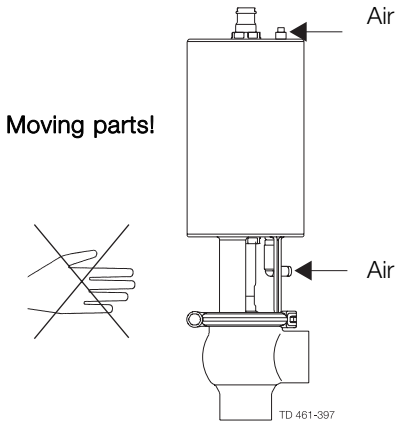
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

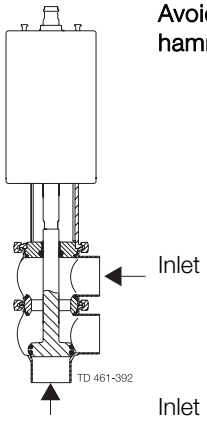
Step 2

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

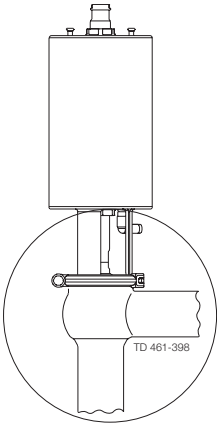


Step 3
It is recommended to install the valve so that the flow is against the closing direction to avoid water hammer.

Shock in the actuator must **never** occur.



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



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

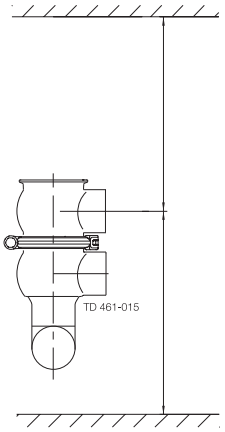
3.3 Welding

Step 1

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

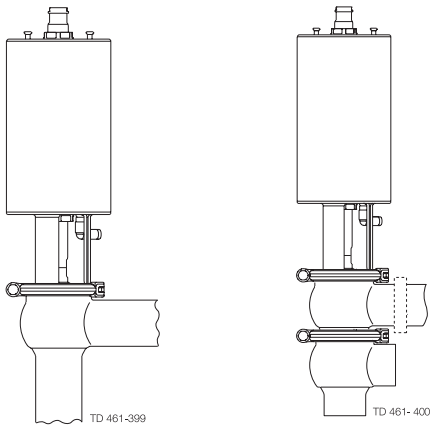
Valve size	A (mm)	B (mm)
DN25/25 mm	*	630
DN40/38 mm	*	700
DN50/51 mm	*	750
DN65/63.5 mm	*	740
DN80/76 mm	*	800
DN100/101.6 mm	*	790

* Depending on body combination and piping solution.



Step 2

Assemble the valve in accordance with the steps on page 19.
Pay special attention to the warnings!

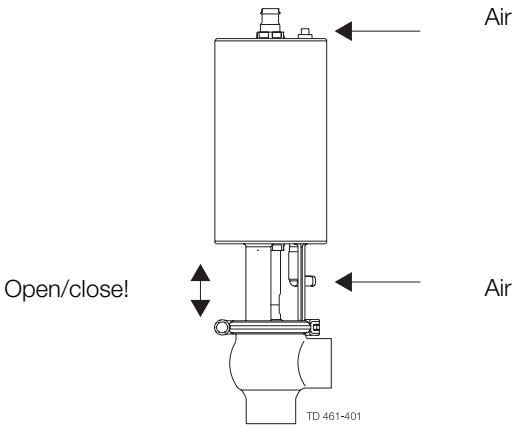


Step 3

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

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 wear parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non metal wear parts must be taken care of in agreement with local regulations

• Scrapping

- At end of use, the equipment shall be recycled according to relevant, local regulations. Beside 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 the local Alfa Laval sales company

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

4.1 Operation

Step 1

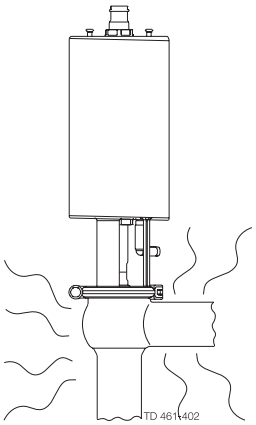
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

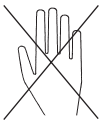
CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

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



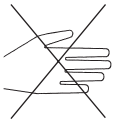
Burning danger!

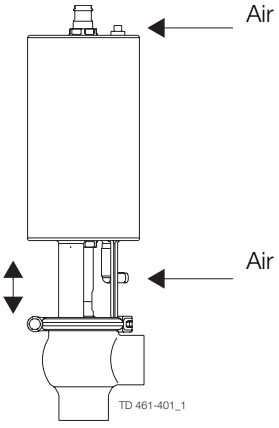


Step 3

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

Moving parts!

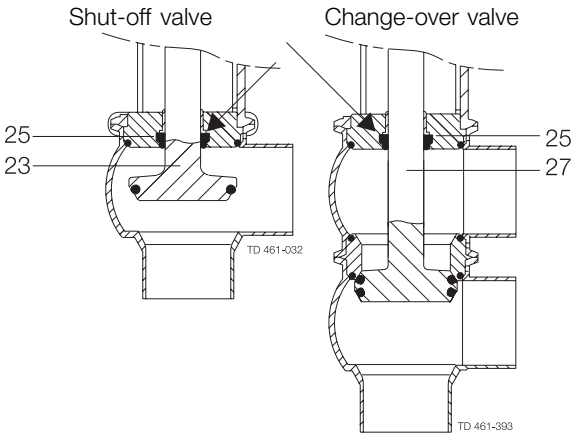




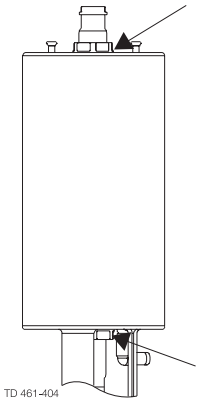
4 Operation

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

Step 4
Lubrication of valves:
1. Ensure smooth movement between lip seal (25) and plug stem (23, 27).
2. Lubricate with Klüber Paraliq GTE 703 if necessary (see page 16).



Step 5
Lubrication of actuator
1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery).
2. Lubricate 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 page 16!

Problem	Cause/result	Repair
External product leakage	Worn or product affected lip seal and/or O-ring	- Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	- Worn or product affected plug seal	- Replace the seal - Replace with a seal of a different rubber grade
	- Product deposits on the seat and/or plug	- Frequent cleaning
	- Product pressure exceeds actuator specification	- Replace with a high pressure actuator - Use auxiliary air on the spring side (do not exceed 3 bar) - Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	- The flow direction should be against the closing direction - 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 - Use auxiliary air on the spring side - Reduce product pressure

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.

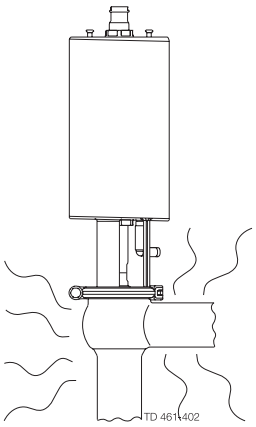
Caustic danger!

Always use rubber gloves!

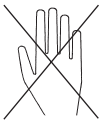
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.



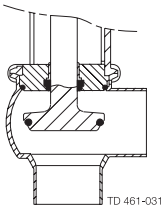
Burning danger!



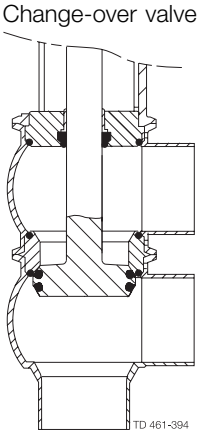
Step 3

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

Shut-off valve



Change-over valve



Step 4

Examples of cleaning agents:
Use clean water, free from clorides.

1. 1% by weight NaOH at 70° C

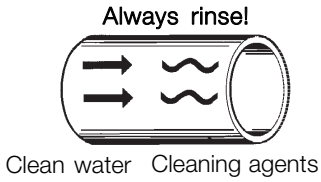
1 kg NaOH	+	100 l water	=	Cleaning agent.
2.2 l 33% NaOH	+	100 l water	=	Cleaning agent.

2. 0.5% by weight HNO_3 at 70° C

0.7 l 53% HNO_3	+	100 l water	=	Cleaning agent.

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 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.



Step 6
NOTE
The cleaning agents must be stored/disposed of in accordance with current regulations/directives.

5 Maintenance

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

Always read the technical data thoroughly.
See chapter 6 Technical data

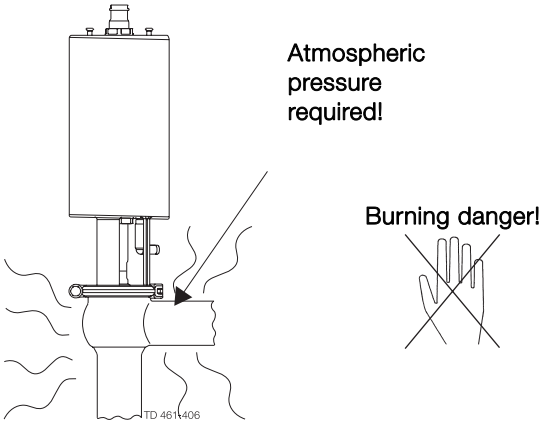
Always release compressed air after use.

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

Step 2

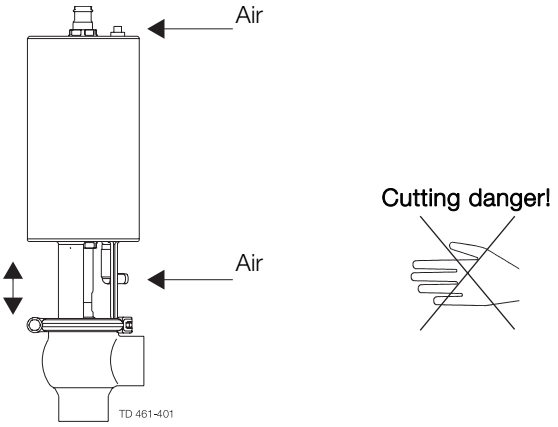
Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.



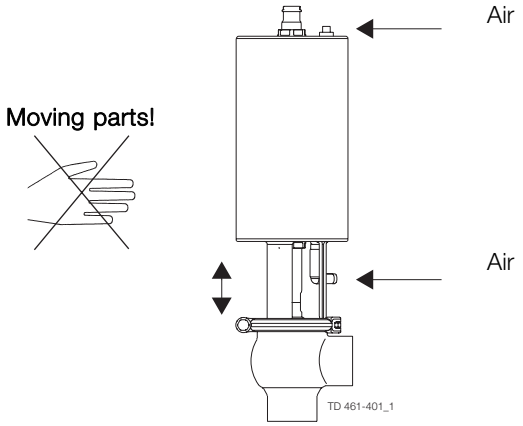
Step 3

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



Step 4

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



5 Maintenance

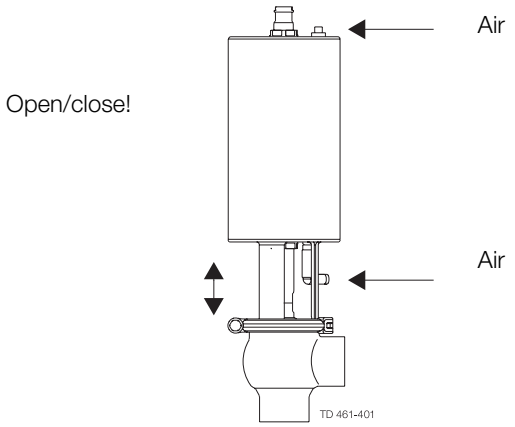
Maintain the valve regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and lip seals in stock.

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 actuator - Use the statistics for planning of inspections **Replace after leakage**	- Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections **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.
2. 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 page 21)

5 Maintenance

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

5.2 Dismantling of valve

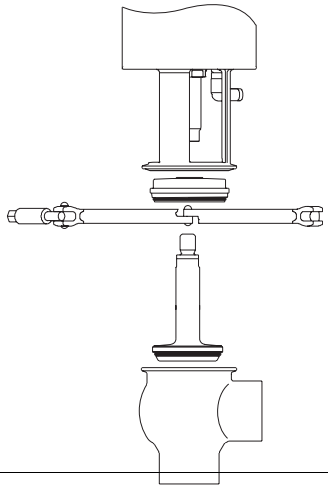
Step 1

1a
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. Unscrew and remove valve plug.
6. Remove O-ring, lip seal and bushing in bonnet. (Use bushing tool and rubber mallet).

Note! Be careful not to damage the bushing.

Pay special attention to the warnings!

Note! For plug seal replacement please see page 18.



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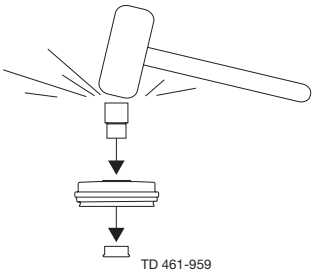

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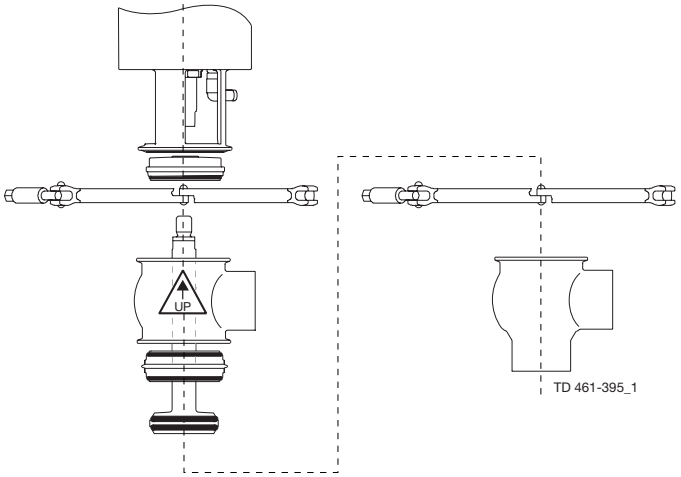
Note!
Be careful not to damage the bushing.

1b
Change-over valve:
1. Supply compressed air to the actuator (only NC).
2. Loosen and remove lower clamp.
3. Release compressed air (only NC).
4. Lift away the actuator and upper valve body.
5. Supply compressed air to the actuator (only NO).
6. Unscrew and remove valve plug.
7. Release compressed air (only NO).
8. Remove seat and O-rings.
9. Loosen and remove upper clamp.
10. Remove upper valve body.
11. Remove O-ring, lip seal and bushing in bonnet. (Use bushing tool and rubber mallet. See drawing, step 1a).

Note! Be careful not to damage the bushing.

Pay special attention to the warnings!

Note! For plug seal replacement please see page 18.



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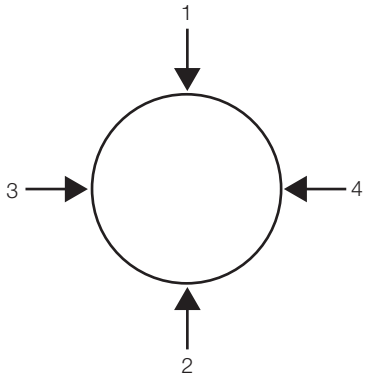
5.3 Plug seal replacement

1. Remove old seal ring using a knife, screwdriver or similar. Be careful not to damage metal parts.
2. Pre-mount plug seal without pressing it into the groove.
3. Squeeze plug seal into the groove using opposite pressure points.
4. Release compressed air behind plug seal.



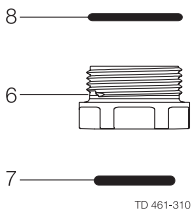
Study the instructions carefully.
The items refer to the parts list and service kits section. Handle scrap correctly.

5.4 Assembly of valve

Reverse order of 4.2, Dismantling of valve.
Lubricate O-ring (21) and lip seal (25) with Klüber Paraliq GTE 703.
Remember to tighten spindle and plug with a torque M = 30Nm (Use two 17mm spanners)
If there are vibrations in the pipeline Alfa Laval recommended to use locitite no. 243.

5.5 Actuator bushing replacement

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 brushing with a torque = 10Nm.
   Be careful not to overtighten.



6 Technical data

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

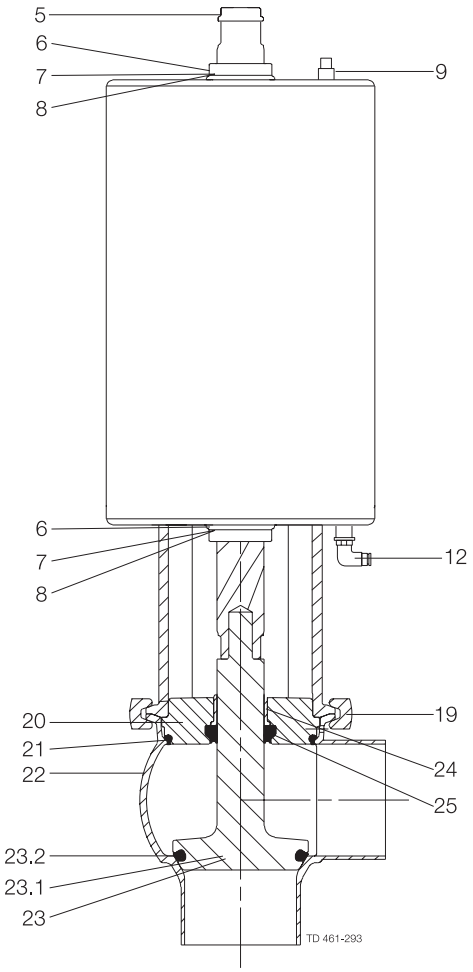
6.1 Technical data

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	
Product wetted steel parts	1.4404 (316L) (internal Ra < 0.8 µm).
Other steel parts	1.4301 (304).
Optional plug seal	PTFE (TR2).
Product wetted seals	EPDM (standard).
Optional product wetted seals	HNBR and FPM.
Other seals	NBR.

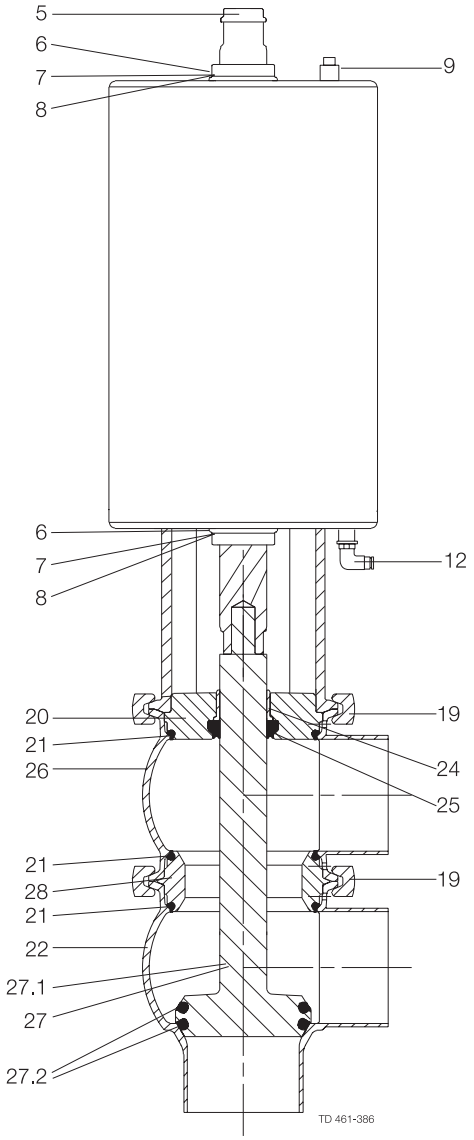
Noise
One meter away from - and 1.6 meter above the exhaust the noise level of a valve actuator will be approximately 77db(A) without noise damper and approximately 72 db(A) with damper - Measured at 7 bars air-pressure.

The drawing shows Unique Single Seat Valve - Long Stroke.
The items refer to the parts lists in the following sections

7.1 Drawing



Shut-off valve

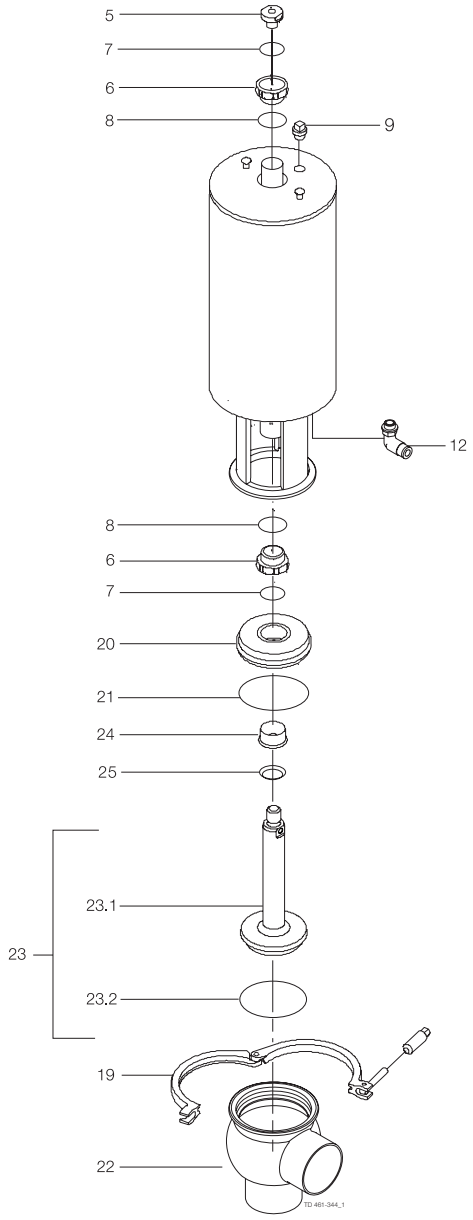


Change-over valve

7 Parts list and Service Kits

The drawing shows Unique Single Seat Valve - Long Stroke, Shut-off.
The items refer to the parts lists in the following sections.

7.2 Unique Single Seat Valve - Long stroke Shut-off Valve



The drawing shows Unique Single Seat Valve - Long Stroke, Shut-off.
The items refer to the parts lists in the following sections.

Parts list

Pos.		Qty	Denomination
			Actuator
			O-ring set (10 pcs.) EPDM
			O-ring set (10 pcs.) HNBR
			O-ring set (10 pcs.) FPM
			Lip seal set (10 pcs.) EPDM
			Lip seal set (10 pcs.) HNBR
			Lip seal set (10 pcs.) FPM
			Plug seal set (10 pcs.) EPDM
			Plug seal set (10 pcs.) HNBR
			Plug seal set (10 pcs.) FPM
5		1	Adapter
6	□	2	Bushing
7	□	2	O-ring
8	□	2	O-ring
9		1	Plug
12		1(2)	Air fitting
19		1	Clamp
20		1	Bonnet
21	◆	1	O-ring
22		1	Valve body
23		1	Plug
23.1		1	Plug, shut off, ISO/DIN
23.2	◆	1	Plug seal
24		1	Bushing
25	◆	1	Lip seal

Service kits

	Denomination	DN 40 38 mm	DN 50 51 mm	DN 65 63.5 mm	DN 80 76.1 mm	DN 100 101.6 mm
Service kit for Actuator						
□	**Service kit**	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500
Service kit for Product wetted parts, standard						
◆	**Service kit, EPDM**	9611-92-6502	9611-92-6503	9611-92-6504	9611-92-6505	9611-92-6506
◆	**Service kit, HNBR**	9611-92-6508	9611-92-6509	9611-92-6510	9611-92-6511	9611-92-6512
◆	**Service kit, FPM**	9611-92-6514	9611-92-6515	9611-92-6516	9611-92-6517	9611-92-6518

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

Recommended spare parts: Service kits.

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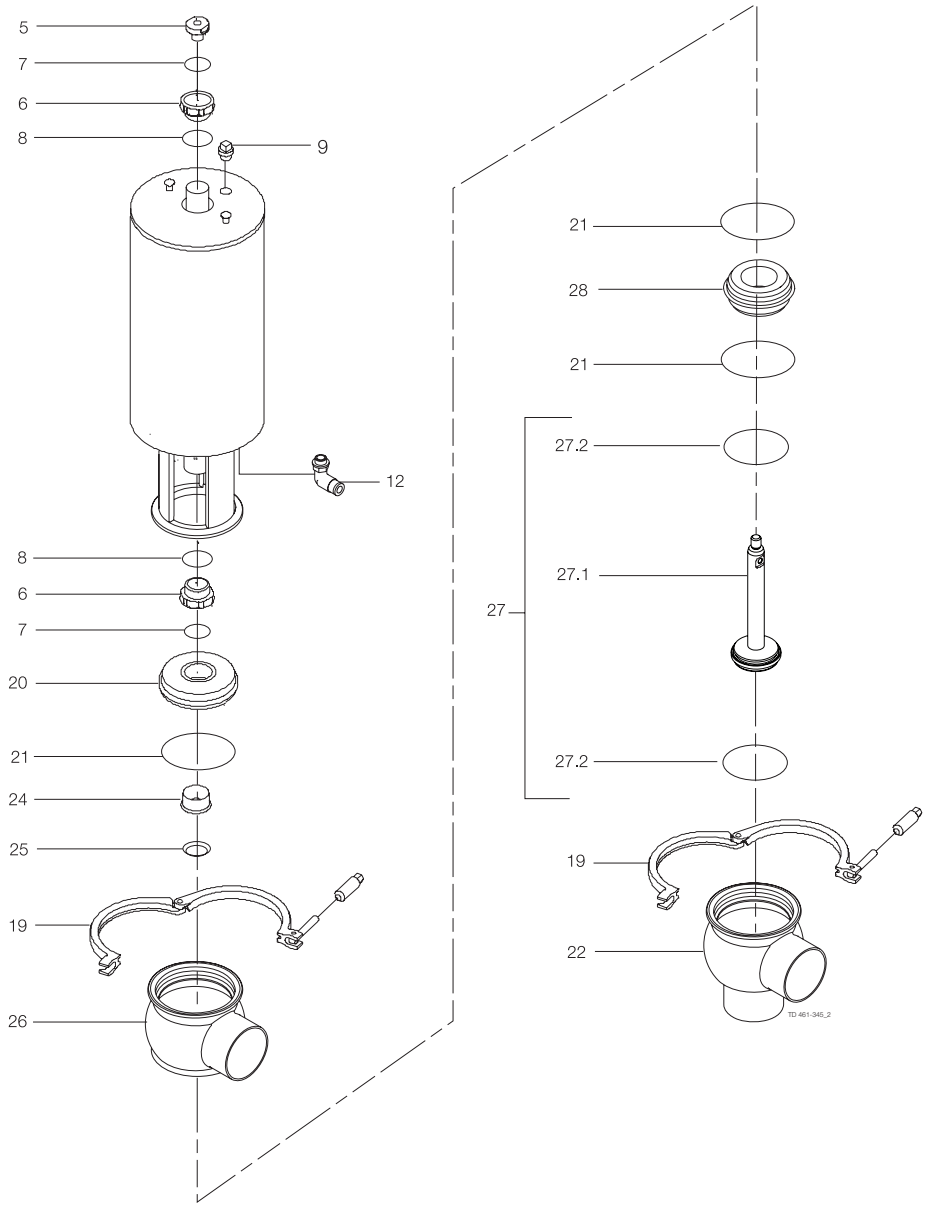
7 Parts list and Service Kits

The drawing shows Unique Single Seat Valve - Long Stroke, Change-over.
The items refer to the parts lists in the following sections.

7.3 Unique Single Seat Valve - Long Stroke Change-over Valve



The drawing shows Unique Single Seat Valve - Long Stroke, Change-over.
The items refer to the parts lists in the following sections.

Parts list

Pos.		Qty	Denomination
			Actuator
			O-ring set (10 pcs.) EPDM
			O-ring set (10 pcs.) HNBR
			O-ring set (10 pcs.) FPM
			Lip seal set (10 pcs.) EPDM
			Lip seal set (10 pcs.) HNBR
			Lip seal set (10 pcs.) FPM
			Plug seal set (10 pcs.) EDPM
			Plug seal set (10 pcs.) HNBR
			Plug seal set (10 pcs.) FPM
5		1	Adapter
6	□	2	Bushing
7	□	2	O-ring
8	□	2	O-ring
9		1	Plug
12		1(2)	Air fitting
19		2	Clamp
20		1	Bonnet
21	◆	3	O-ring
22		1	Valve body
24		1	Bushing
25	◆	1	Lip seal
26		1	Valve body
27		1	Plug
27.1		1	Plug, change over, ISO/DIN
27.2	◆	2	Plug seal
28		1	Seat

Service kits

	Denomination	DN 40 38 mm	DN 50 51 mm	DN 65 63.5 mm	DN 80 76.1 mm	DN 100 101.6 mm
Service kit for Actuator						
□	Service kit	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500
Service kit for Product wetted parts, standard						
◆	Service kit, EPDM	9611-92-6580	9611-92-6581	9611-92-6582	9611-92-6583	9611-92-6584
◆	Service kit, HNBR	9611-92-6586	9611-92-6587	9611-92-6588	9611-92-6589	9611-92-6590
◆	Service kit, FPM	9611-92-6592	9611-92-6593	9611-92-6594	9611-92-6595	9611-92-6596

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

Recommended spare parts: Service kits.

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How to contact Alfa Laval
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Please visit www.alfalaval.com to access the information directly.