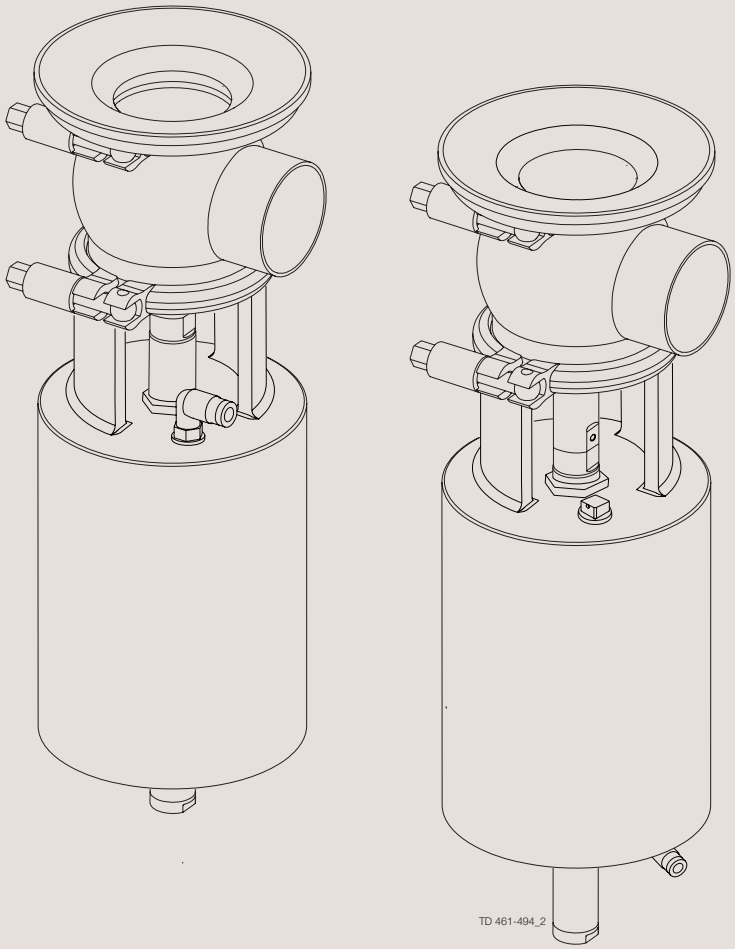
Instruction Manual

Unique Single Seat Valve - Tank Outlet



ESE00364-EN5 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	Tank Outlet	
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

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.

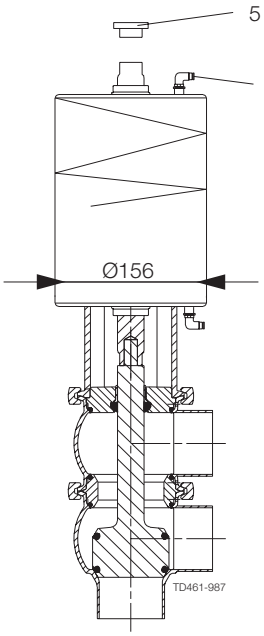
2.3 Safety precautions

⚠
WARNING!

When using “support air” on spring side in all the Unique SSV actuators, the pressure must **NOT** exceed 3 bar.

When using Unique SSV actuators with OD156mm with support air, **always** use the “steel adapter” (pos. 5). Tighten the “steel adapter” with torque of 30 Nm and use Loctite 243.

The actuator with OD156mm is mainly used on valves ISO76/DN80 – ISO101/DN100. The outer actuator diameter = 156 mm.



Max. 3 bar “support air” on spring side.

Installation

Always read the technical data thoroughly. ⚠

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. ⚠

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.

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.

Maintenance

Always read the technical data thoroughly.

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.

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.

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.

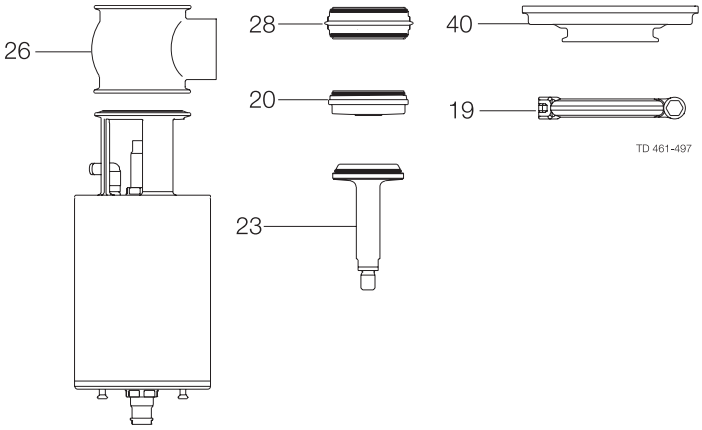
3.1 Unpacking/delivery

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

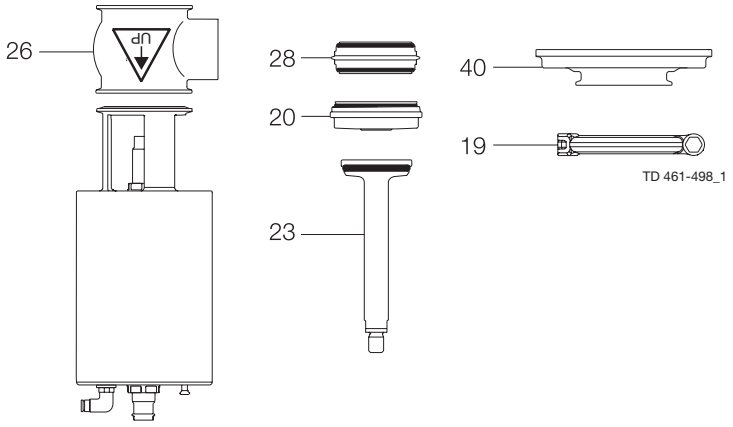
Check the delivery for:
1. Complete valve, standard valve or Reverse Acting valve (RA) (see steps 2a and 2b).
2. Delivery note.

Step 2

2a
Standard valve:
1. Complete actuator.
2. Bonnet (20).
3. 2 x Clamp (19).
4. Valve plug (23).
5. Tank flange (40).
6. Valve seat (28).
7. Valve body (26).



2b
Reverse Acting valve:
1. Complete actuator.
2. Bonnet (20).
3. 2 x clamp (19).
4. Valve plug (23).
5. Valve body (26).
6. Valve seat (28).
7. Tank flange (40).



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

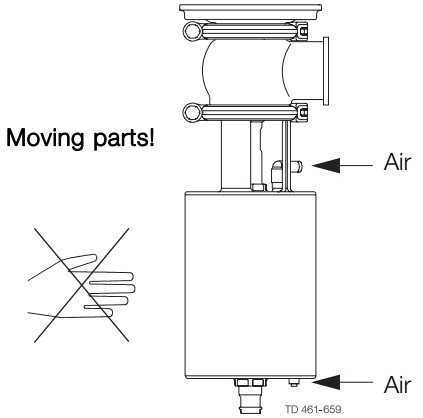
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

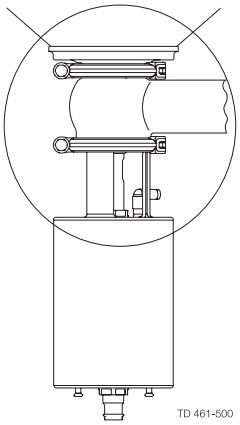
CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

Step 2

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



Step 3
Avoid stressing the valve.
Pay special attention to:
- Vibrations.
- Thermal expansion of the pipelines.
- Excessive welding.
- Overloading of the pipelines.



Risk of damage!

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.

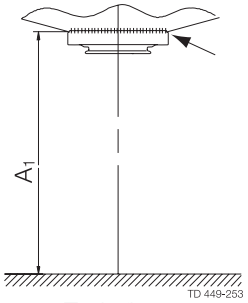
3.3 Welding

Step 1

Before welding the flange into the tank please note:

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

   If there is a risk of foot damage, Alfa Laval recommends to leave a distance of 120 mm (4.7”) below the valve (lowest point of actuator spindle).



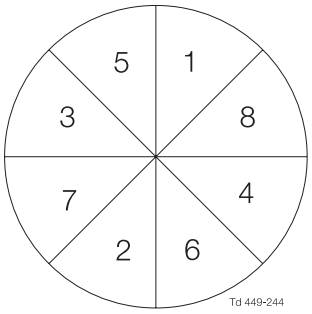
Tank flange

Min. dimension

Size	DN/OD				DN			
	51	63.5	76.1	101.6	50	65	80	100
A[1]	426	439	479	503	429	445	487	506

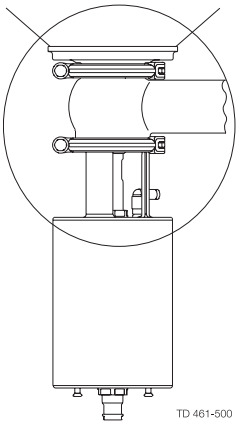
A1 = Min. installation measure to allow that valve can be lifted out of the tank flange/valve body (if long stroke actuator or/and indication unit is mounted, height must be added).

2. Only use pulsed arc welding and remember no gap between flange and tank plate.
   Tack weld **always** on the opposite side (8 segments with filler metal). Weld root if possible without filler metal.
   Welding of the final run must be done in 8 segments to avoid crack.



Step 2

Assemble the valve in accordance with the steps on page 21
Pay special attention to the warnings!.

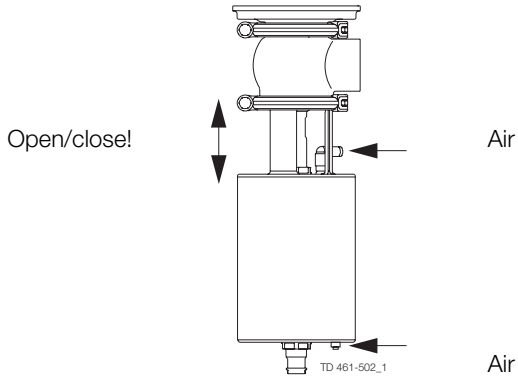


3 Installation

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.

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!



3.4 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

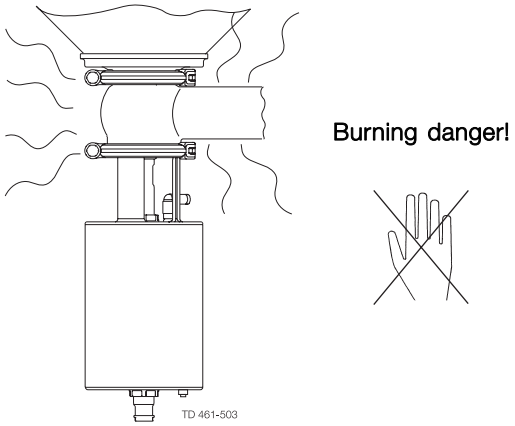
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

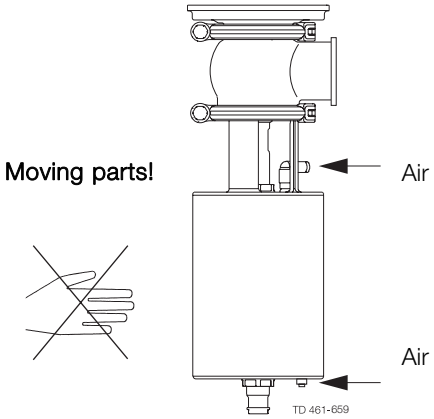
Step 2

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



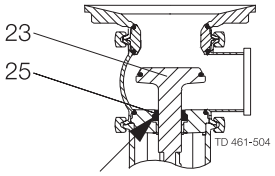
Step 3

Never touch the 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 (23).
2. Lubricate with Klüber Paraliq GTE 703 if necessary (see page 18).

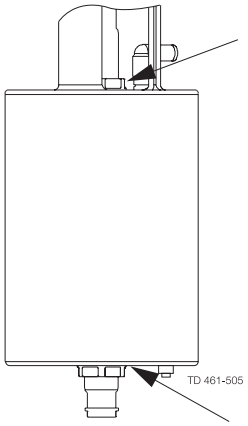


4 Operation

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 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 18!

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.

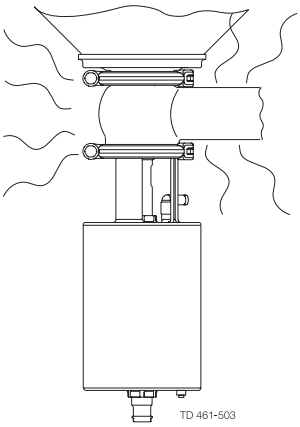
Caustic danger!

Always use rubber gloves!

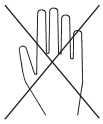
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.



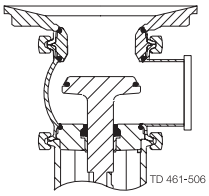
Burning danger!



Step 3

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

Shut-off valve



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.

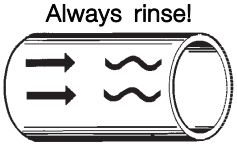
2. 0.5% by weight HNO_3 at 70° C

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

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.

Always rinse!



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 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.
Check the valve for smooth operation after service.

5.1 General maintenance

Step 1

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

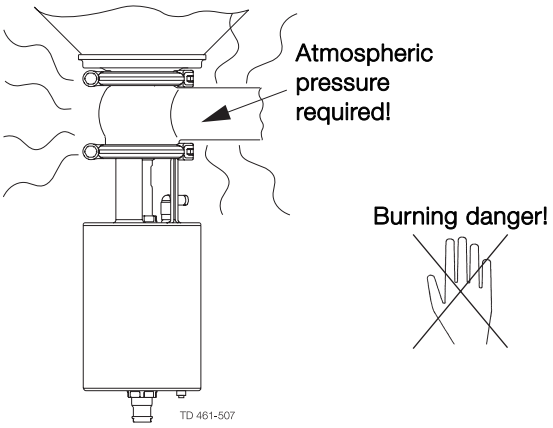
Always release compressed air after use.

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

Step 2

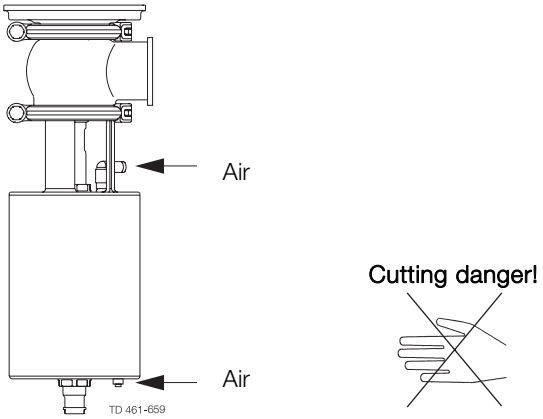
Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.



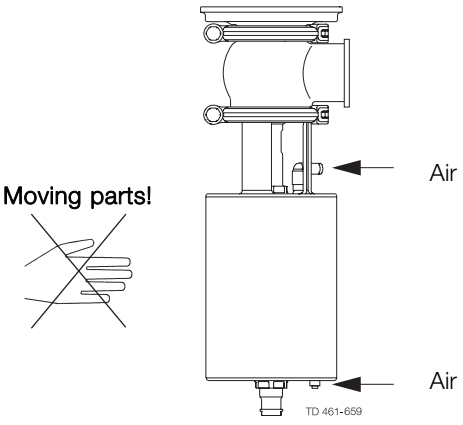
Step 3

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

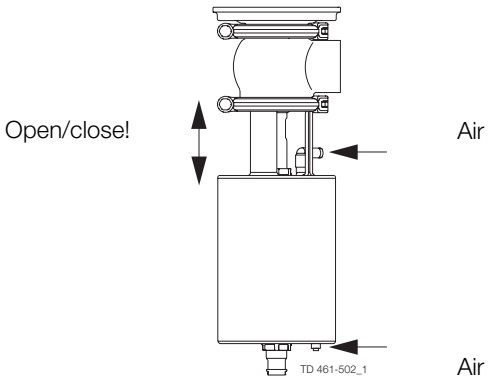
Maintain the valve regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and lip seals in stock.
Check the valve for smooth operation after service.

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 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 23)

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

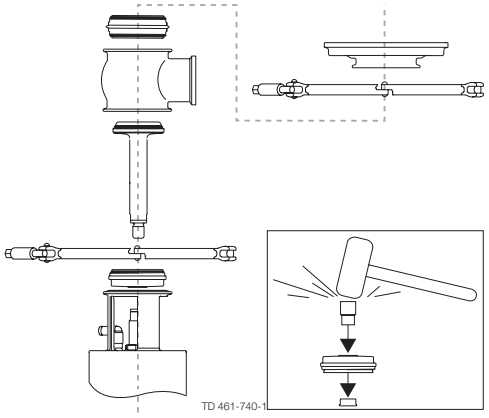
1a
Standard:
1. Supply compressed air to the actuator (only NC).
2. Loosen and remove lower clamp.
3. Lift away the actuator.
4. Release compressed air (only NC).
5. Unscrew and remove valve plug.
6. Remove O-ring, lip seal and bushing in bonnet.
   (Use bushing tool and rubber mallet. See drawing).

Note! Be careful not to damage the bushing.

7. Loosen and remove upper clamp.
8. Remove valve body.
9. Remove seat and O-rings.

Pay special attention to the warnings!

Note! For plug seal replacement please see page 20.



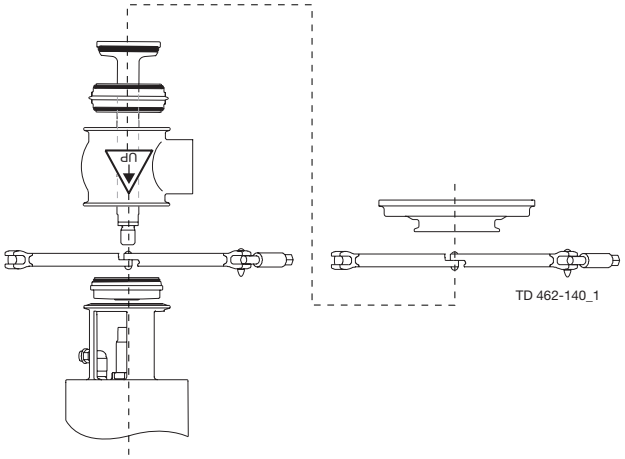
Note!
Be careful not to damage the bushing.

1b
Reverse Acting:
1. Loosen and remove upper clamp.
2. Lift away the actuator and valve body.
3. Supply compressed air to the actuator (only NC).
4. Unscrew and remove valve plug.
5. Release compressed air (only NC).
6. Remove seat and O-rings.
7. Loosen and remove lower clamp.
8. Remove valve body.
9. 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 20.



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 air behind plug seal.

Note! For plug seal replacement please read instruction in service kit.

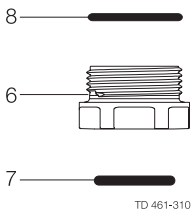
Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.
NC = Normally closed.
NO = Normally open.
A/A = Air/air activated.

5.4 Assembly of valve

Reverse order of 5.2, 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 recommend to use loctite 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.

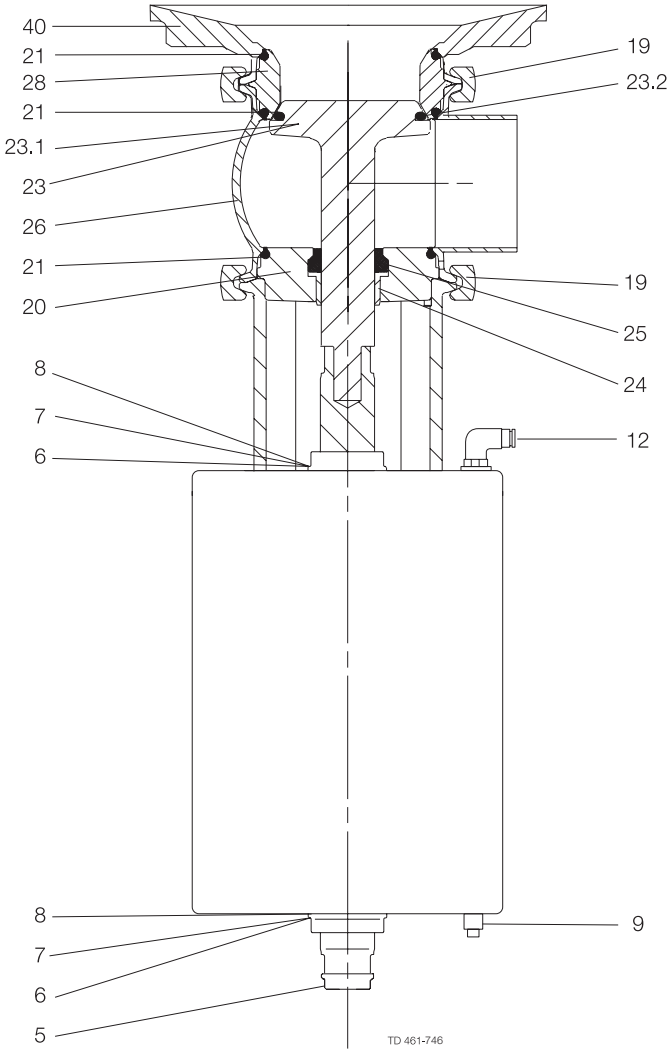
6.1 Technical data

Data - valve/actuator	
Max. product pressure in pipeline (depends on valve specifications)	1000 kPa (10 bar).
Max. product pressure in tank (depends on valve specifications and temperature)	1000 kPa (10 bar) max. 20° C.
	850 kPa (8.5 bar) max. 100° C.
	750 kPa (7.5 bar) max. 150° C.
Min. product pressure	Full vacuum.
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).
Plug seal	EPDM.
Optional plug seal	PTFE (TR2).
Other 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 - Tank Outlet.
The items refer to the parts lists in the following sections

7.1 Drawing

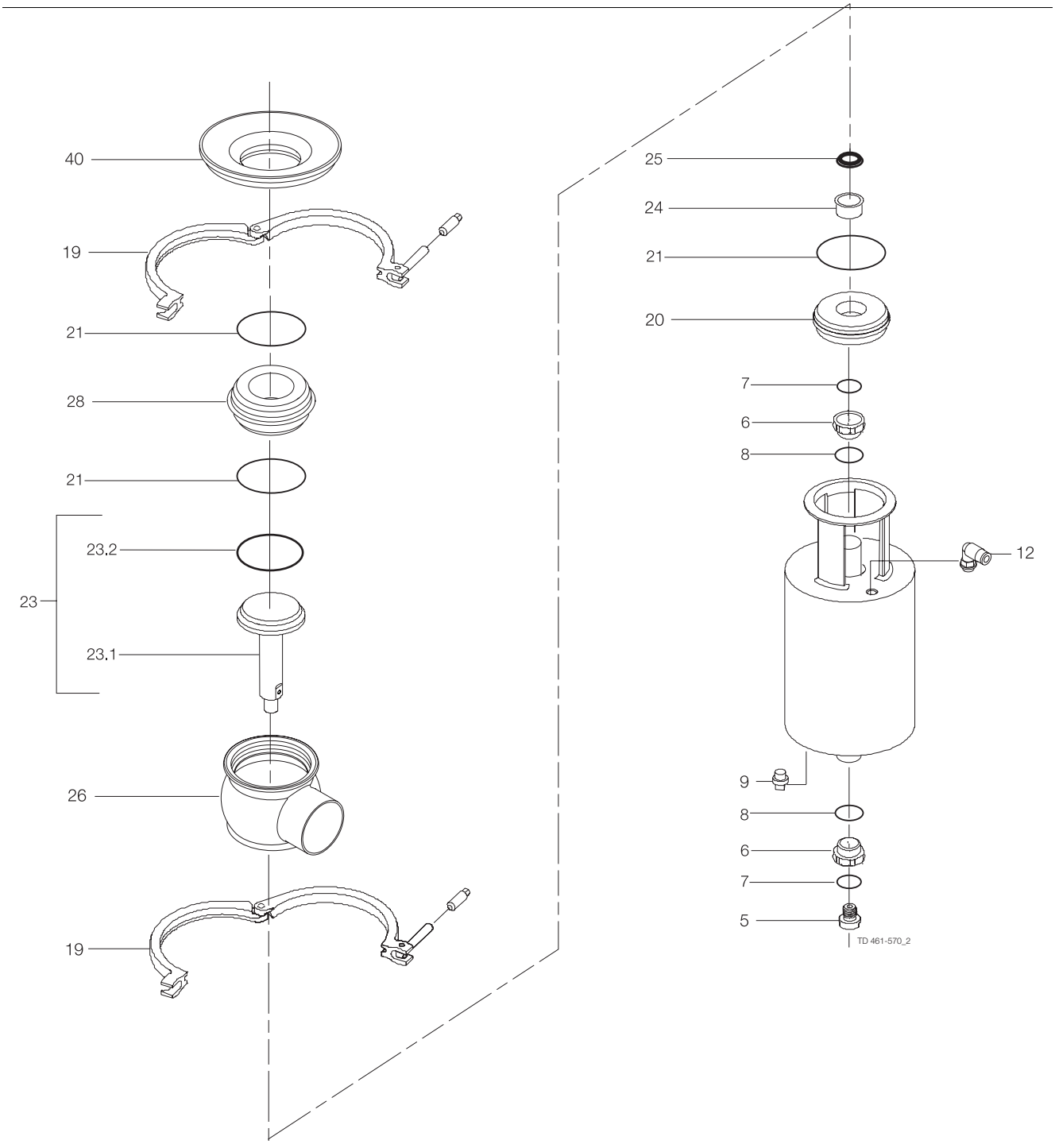


Standard

7 Parts list and Service Kits

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

7.2 Unique Single Seat Valve - Tank Outlet



The drawing shows Unique Single Seat Valve - Tank Outlet.
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		2	Clamp
20		1	Bonnet
21	◆	3	O-ring
23		1	Plug
23.1		1	Plug
23.2	◆	1	Plug seal
24		1	Bushing
25	◆	1	Lip seal
26		1	Valve body
28		1	Seat
40		1	Tank flange

Service kits

	Denomination	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
Service kit for Product wetted parts, standard					
◆	Service kit, EPDM	9611-92-6701	9611-92-6702	9611-92-6703	9611-92-6704
◆	Service kit, HNBR	9611-92-6705	9611-92-6706	9611-92-6707	9611-92-6708
◆	Service kit, FPM	9611-92-6709	9611-92-6710	9611-92-6711	9611-92-6712

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

Recommended spare parts: Service kits.

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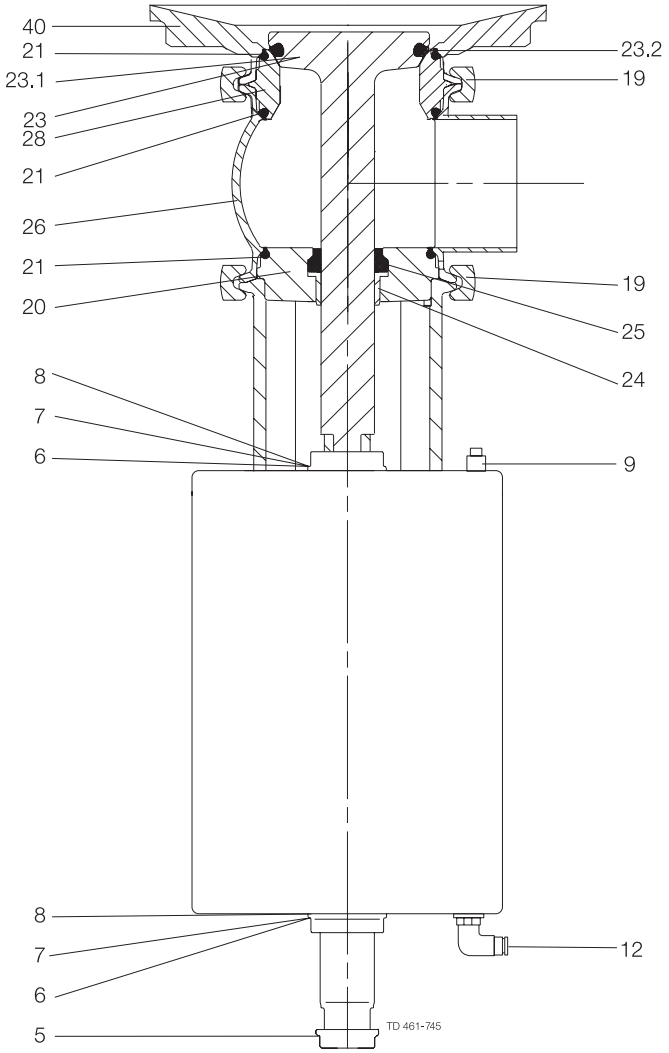
The drawing shows Unique Single Seat Valve - Tank Outlet - Reverse Acting.
The items refer to the parts lists in the following sections

7.3 Drawing

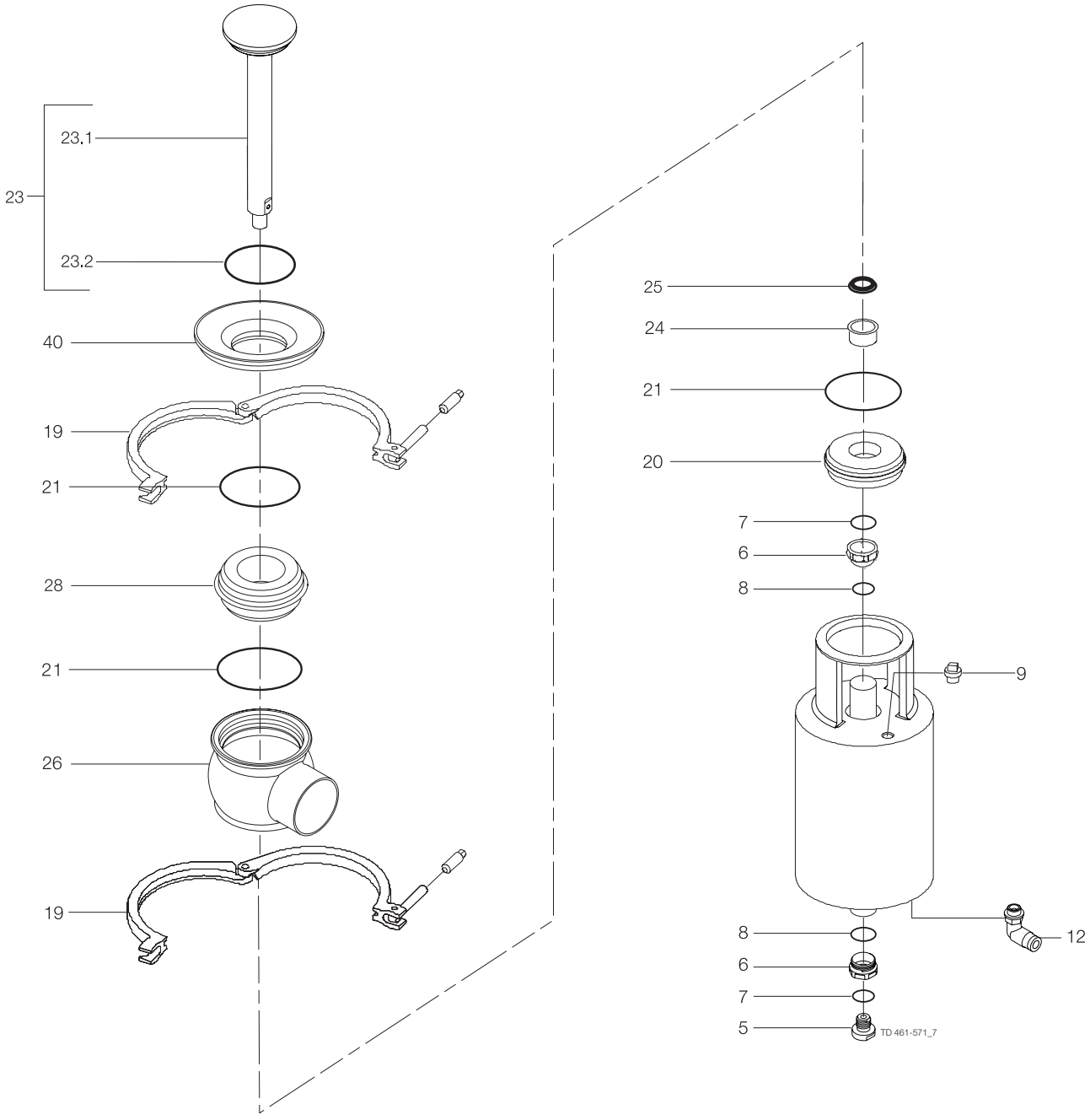


Reverse Acting

7 Parts list and Service Kits

The drawing shows Unique Single Seat Valve - Tank Outlet - Reverse Acting.
The items refer to the parts lists in the following sections

7.4 Unique Single Seat Valve - Tank Outlet - Reverse Acting



The drawing shows Unique Single Seat Valve - Tank Outlet - Reverse Acting.
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		2	Clamp
20		1	Bonnet
21	◆	3	O-ring
23		1	Plug
23.1		1	Plug
23.2	◆	1	Plug seal
24		1	Bushing
25	◆	1	Lip seal
26		1	Valve body
28		1	Seat
40		1	Tank flange

Service kits

	Denomination	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
Service kit for Product wetted parts, standard					
◆	Service kit, EPDM	9611-92-6701	9611-92-6702	9611-92-6703	9611-92-6704
◆	Service kit, HNBR	9611-92-6705	9611-92-6706	9611-92-6707	9611-92-6708
◆	Service kit, FPM	9611-92-6709	9611-92-6710	9611-92-6711	9611-92-6712

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

Recommended spare parts: Service kits.

TD 900-398/1

How to contact Alfa Laval
Contact details for all countries are
continually updated on our website.
Please visit www.alfalaval.com to access the information directly.