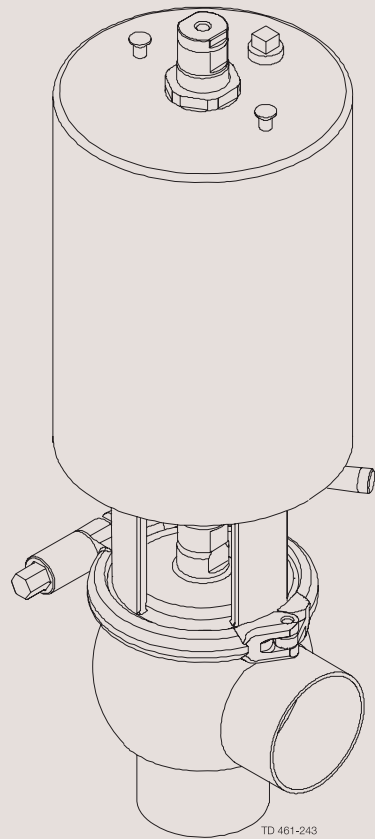
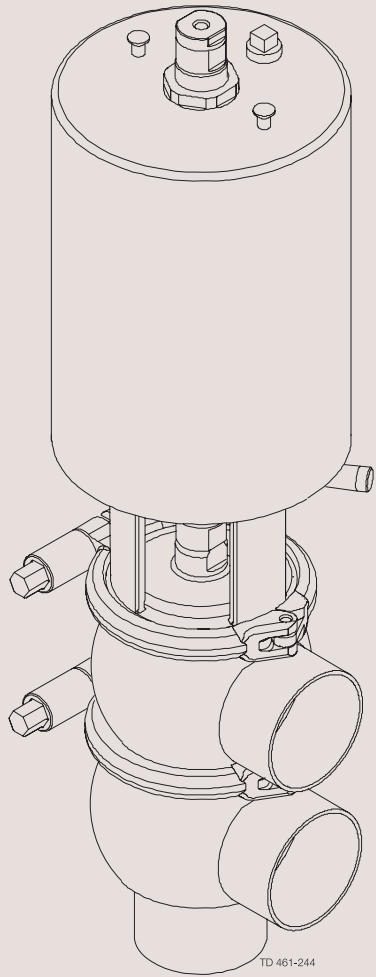




Instruction Manual

Unique Single Seat Valve - Aseptic



ESE00529-EN5

2011-05

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

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

Denomination

Aseptic

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

Title

Bjarne Søndergaard

Name

Alfa Laval Kolding
Company

Signature



Designation



*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

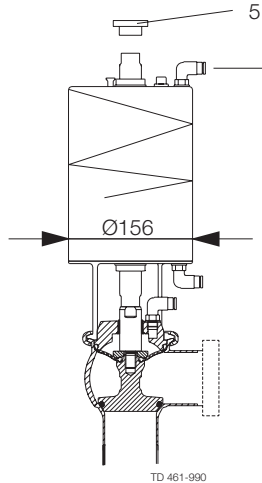


WARNING!

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 (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 check if the diaphragm is tight - it can be dangerous if it leaks steam/CIP

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 attempt to remove the valve from the installation

Always drain liquid out of valves before transportation

Always used predesigned lifting points if defined

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.

Always secure sufficient fixing of the valve during transportation - if special designed packaging material is available it must be used

3 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 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:

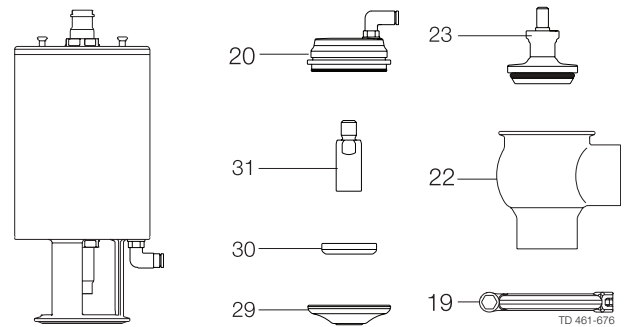
1. Complete valve, shut off valve or change-over valve (see steps 2a and 2b).
2. Delivery note.

Step 2

2a

Shut-off valve:

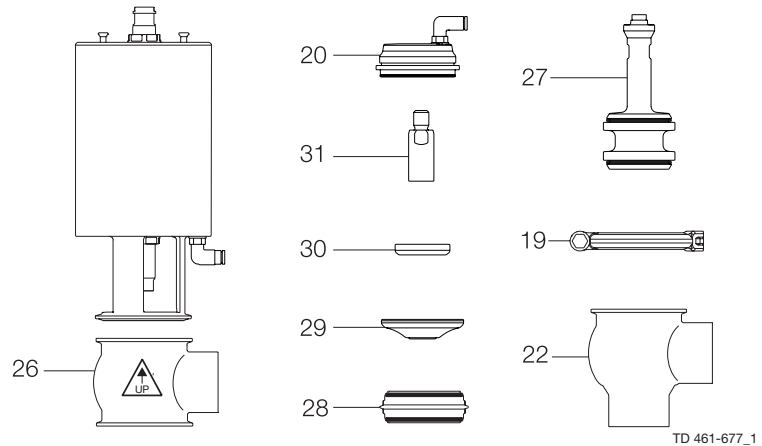
1. Complete actuator.
2. Bonnet (20).
3. Clamp (19).
4. Valve plug (23).
5. Valve body (22).
6. Diaphragm (29).
7. Disc for diaphragm (30).
8. Upper spindle (31).



2b

Change-over valve:

1. Complete actuator.
2. Bonnet (20).
3. Clamp (19).
4. Valve plug (27).
5. Lower valve body (22).
6. Valve seat (28).
7. Upper valve body (26).
8. Diaphragm (29).
9. Disc for diaphragm (30).
10. Upper spindle (31).



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.

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.

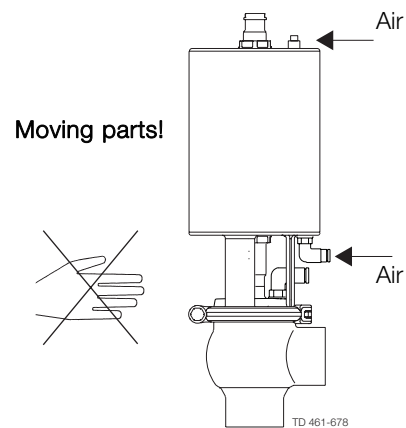
CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

Step 2



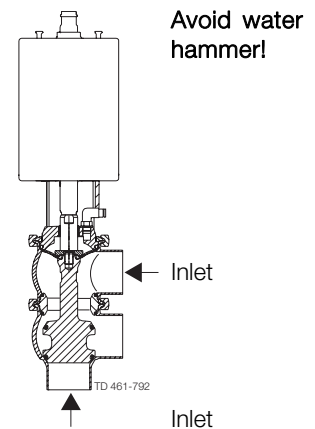
Never touch the moving parts if the actuator is supplied with compressed air.



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.



3 Installation

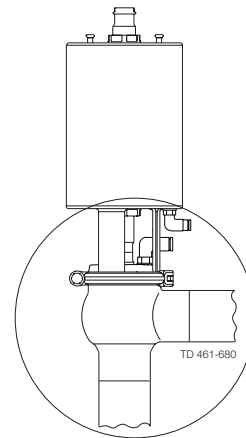
Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard but can also be supplied with fittings.

Step 4

Avoid stressing the valve.

Pay special attention to:

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

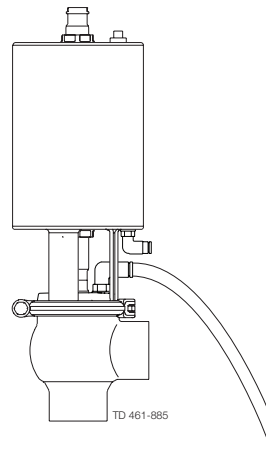


Risk of damage!

Step 5



Always check if the diaphragm is tight - it can be dangerous if it leaks steam/CIP.
The hose must be a 4 mm hose for $\varnothing 25/38$ mm and DN25/40 and a 6 mm hose for larger valve types.



To avoid all danger, the hose must reach the drain!

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.

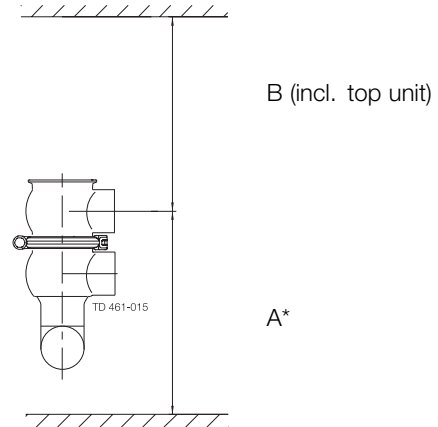
3.3 Welding

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.

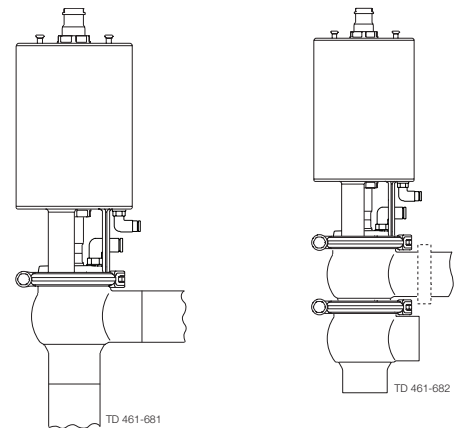
Valve size	A (mm)	B (mm)
DN25/25 mm	*	630
DN40/38 mm	*	700
DN50/51 mm	*	750
DN65/63.5 mm	*	740
DN80/76 mm	*	800
DN100/101.6 mm	*	790

* Depending on body combination and piping solution.



Step 2

Assemble the valve in accordance with the steps on page 22.
Pay special attention to the warnings!

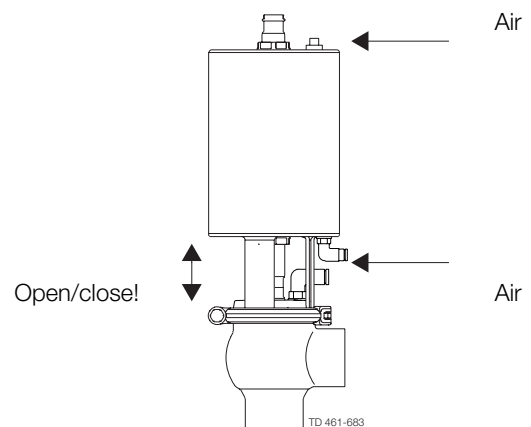


Step 3

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.

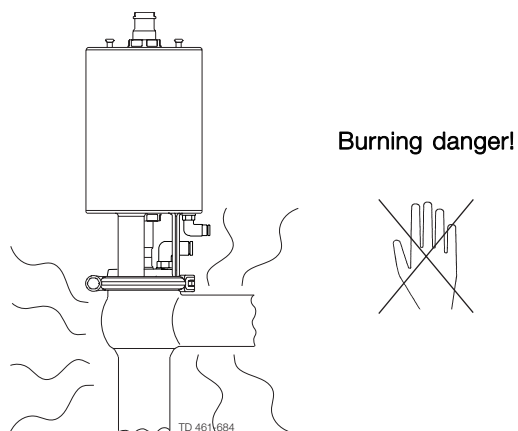
CAUTION

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.

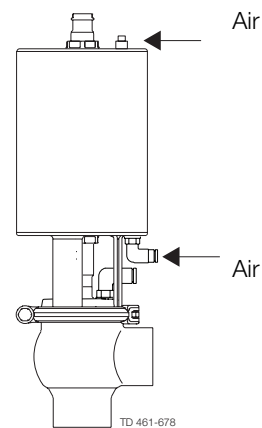


Step 3



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

Moving parts!



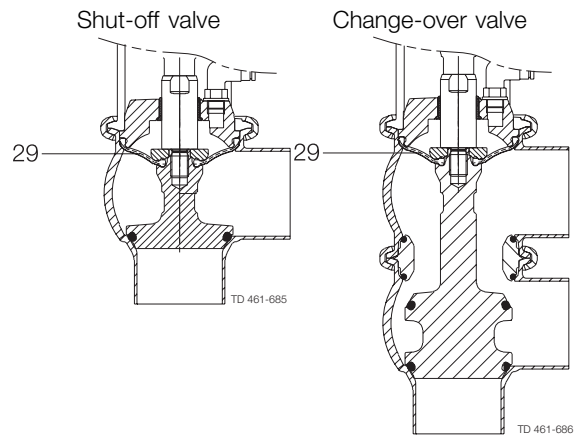
4 Operation

*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

CAUTION:

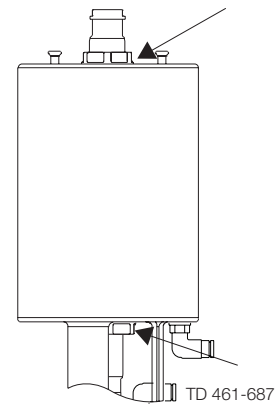
It is recommended not to re-use diaphragm (position 29) after dismantling (risk of damage and leakage).



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	<ul style="list-style-type: none"> - Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	<ul style="list-style-type: none"> - Worn or product affected plug seal - Product deposits on the seat and/or plug - Product pressure exceeds actuator specification 	<ul style="list-style-type: none"> - 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) - Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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.
 HNO₃ = Nitric acid.

4.3 Recommended cleaning

Step 1



Always handle lye and acid with great care.

Caustic danger!



Always use rubber gloves!

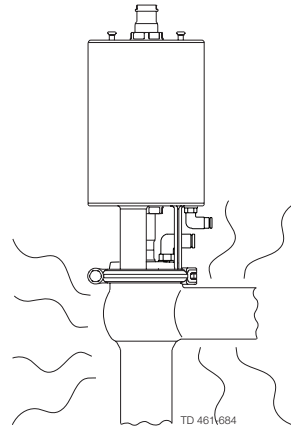


Always use protective goggles!

Step 2



Never touch the valve or the pipelines when sterilizing.



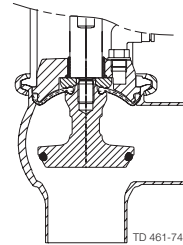
Burning danger!



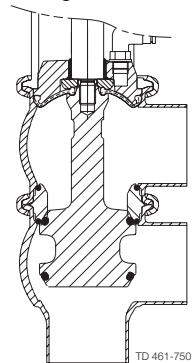
Step 3

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 chlorides.

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.

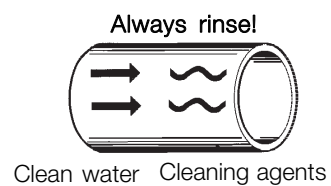
2. 0.5% by weight HNO₃ at 70° C

0.7 l 53% HNO₃ + 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.
HNO₃ = 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.

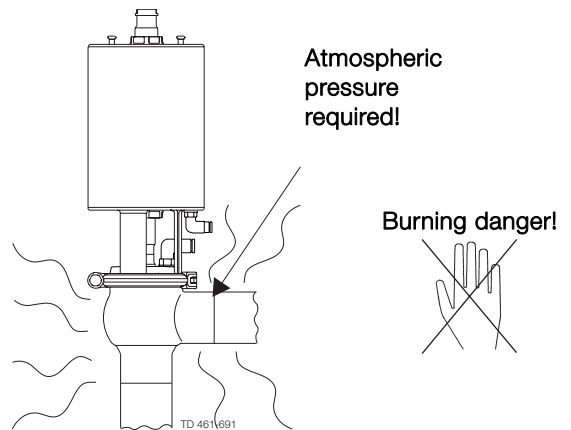
Step 2



Never service the valve when it is hot.



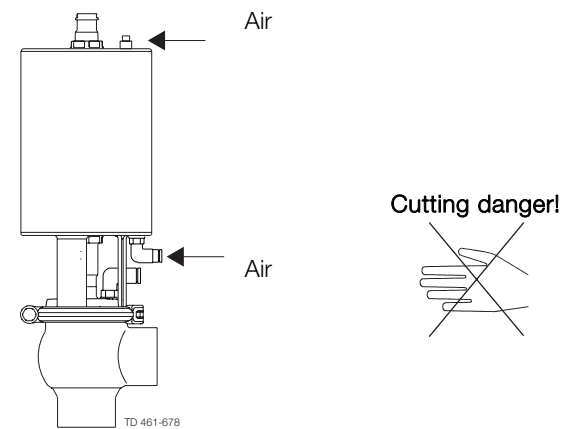
Never service the valve with valve and pipelines under pressure.



Step 3



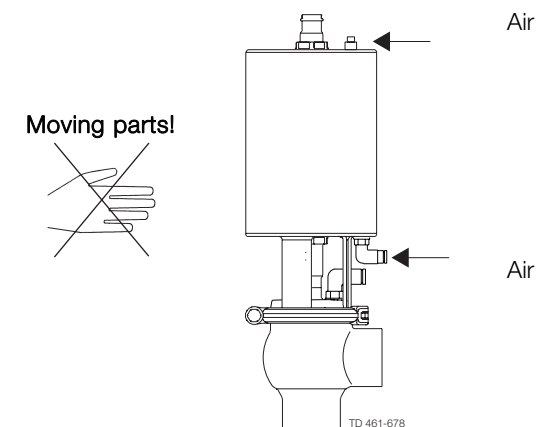
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



Step 4



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



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.

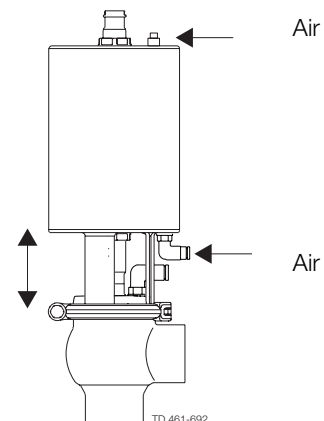
	Product wetted seals	Actuator bushings complete
Preventive maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions
Maintenance after leakage (leakage normally starts slowly)	Replace at the end of the day	Replace when possible
Planned maintenance	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections Replace after leakage	<ul style="list-style-type: none"> - 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!

Open/close!



Recommended spare parts

Service kits (see page 25)

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

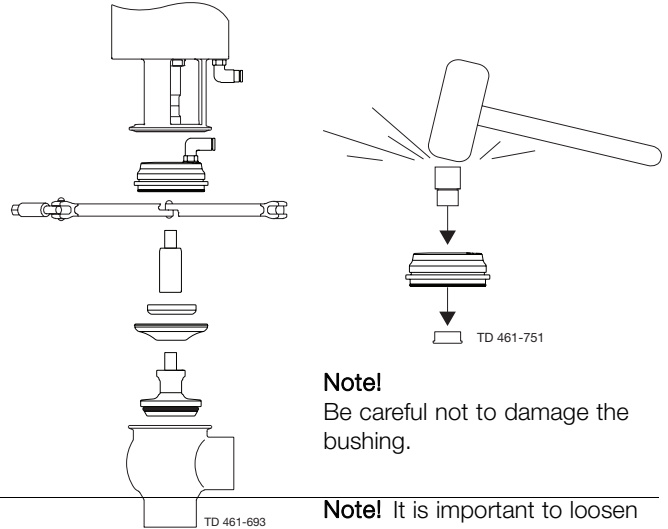
Shut-off valve:

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 diaphragm from bonnet.
7. Remove diaphragm disc 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 22.



1b

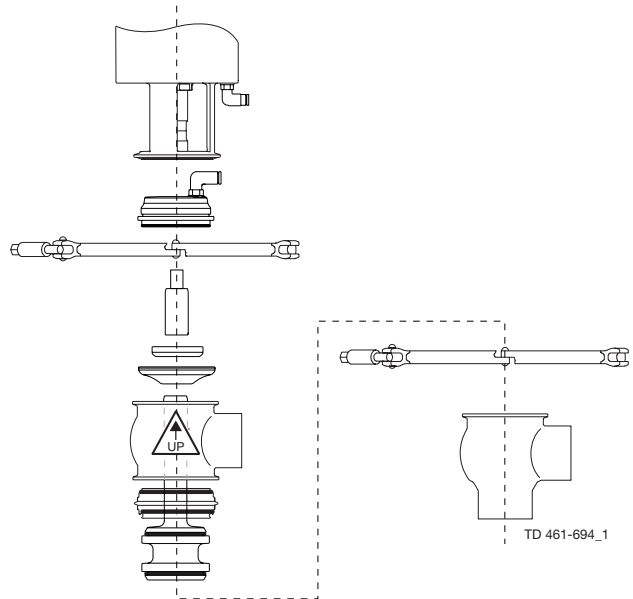
Change-over valve:

1. Supply compressed air to the actuator (only NC).
2. Loosen and remove upper clamp.
3. Release compressed air (only NC).
4. Loosen and remove lower clamp.
5. Lift away the actuator and upper valve body.
6. Supply compressed air to the actuator (only NO).
7. Unscrew and remove valve plug.
8. Release compressed air (only NO).
9. Remove seat and O-rings.
10. Remove upper valve body.
11. Remove diaphragm from bonnet.
12. Remove diaphragm disc 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!

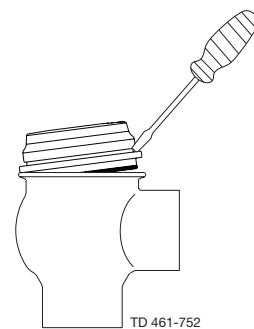
Note! For plug seal replacement please see page 22.



Step 2

NOTE!

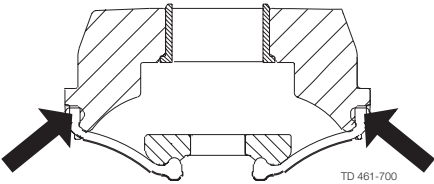
Please use a screw driver if the bonnet is difficult to dismantle from the valve body.



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.

Step 3
NOTE!

Make sure that the diaphragm is securely mounted on the bonnet before installing the complete diaphragm/stem into the valve body.



5 Maintenance

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

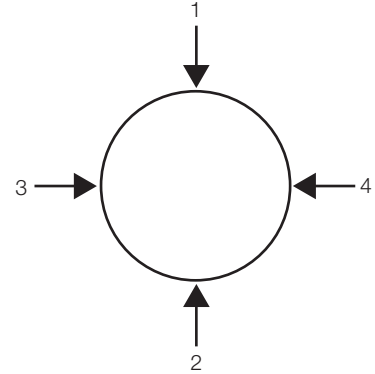
NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

5.3 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.



5.4 Assembly of valve

Reverse order of 5.2, Dismantling of valve.

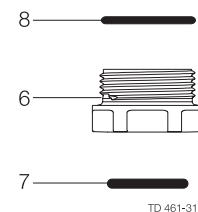
Lubricate O-ring (21) and lip seal (25) with Klüber Paraliq GTE 703.

Remember to tighten spindle and plug with a torque $M = 30\text{Nm}$. (Use two 17mm spanners).

If there are vibrations in the pipeline Alfa Laval recommend 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.



TD 461-310

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

NC = Normally closed.

NO = Normally open.

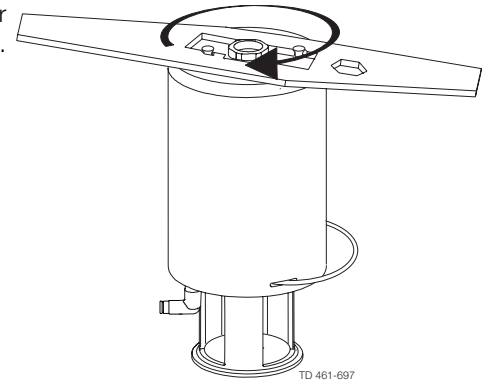
A/A = Air/air activated.

5.6 Dismantling of optional maintainable actuator

1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Unscrew nuts and remove yoke.
4. Unscrew top and bottom bushings.
5. Remove piston with O-ring and spring assembly
6. Remove O-rings and support disc.

Note! The A/A actuator has no spring assembly.

Rotate cylinder
with service tool.



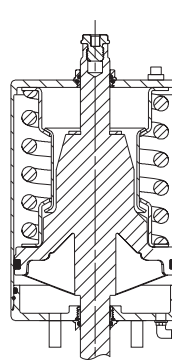
5.7 Use

Reverse order of 5.6 Dismantling of optional maintainable actuator.

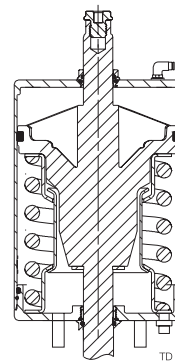
Lubricate O-ring (3, 7, 11) with Molykote Longterm 2 plus before fitting.

5.8 Additional equipment

1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Reverse piston and spring assembly.
4. Reverse adapter, air fitting and plug to opposite end.
5. Re-assemble in reverse order (3 to 1).



Pneumatic movement upwards NC



Pneumatic movement downwards NO

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	800 kPa (8 bar).
Min. product pressure	Full vacuum.
Max. sterilisation temperature (steam - short time)	150° C to -380 kPa (3.8 bar)
Temperature range	-10° C to + 140° C (standard EPDM seal).
Air pressure, actuator	500 to 700 kPa (5 to 7 bar).

Note: Vacuum is not recommended in aseptic applications.

Materials - valve/actuator

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

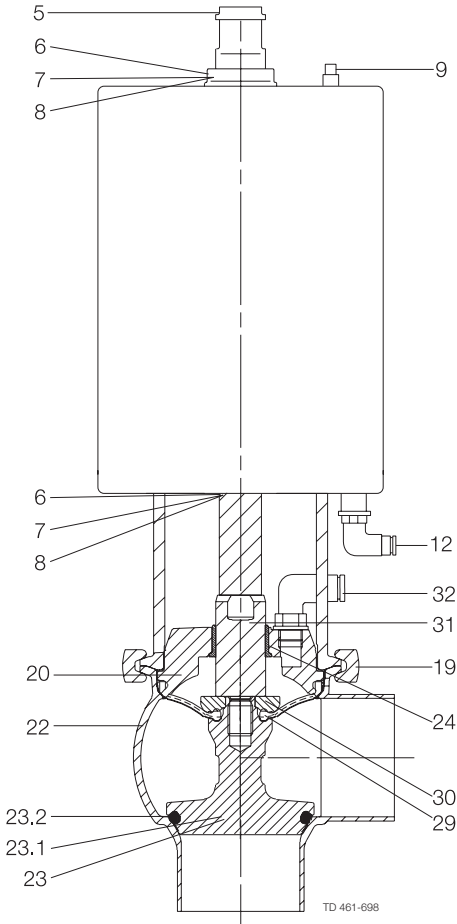
Noise

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.

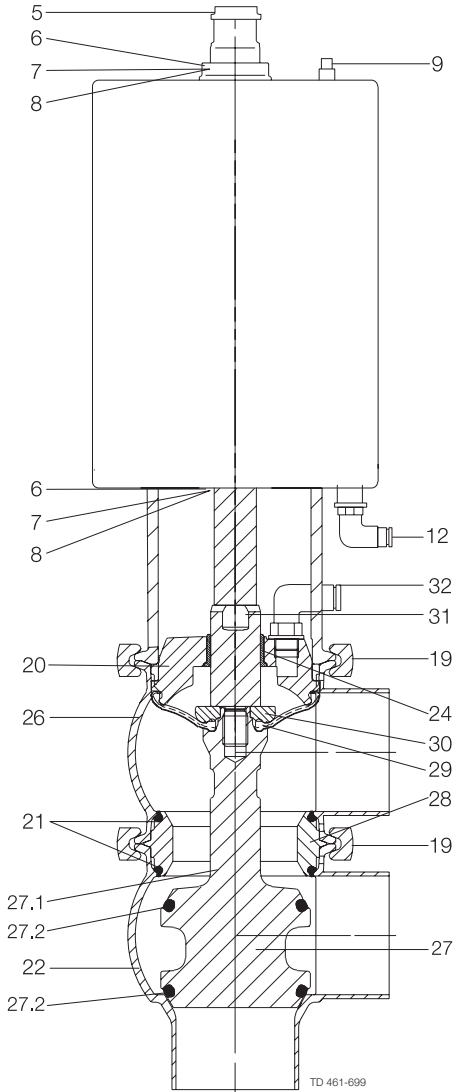
7 Parts list and Service Kits

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

7.1 Drawing



Shut-off valve

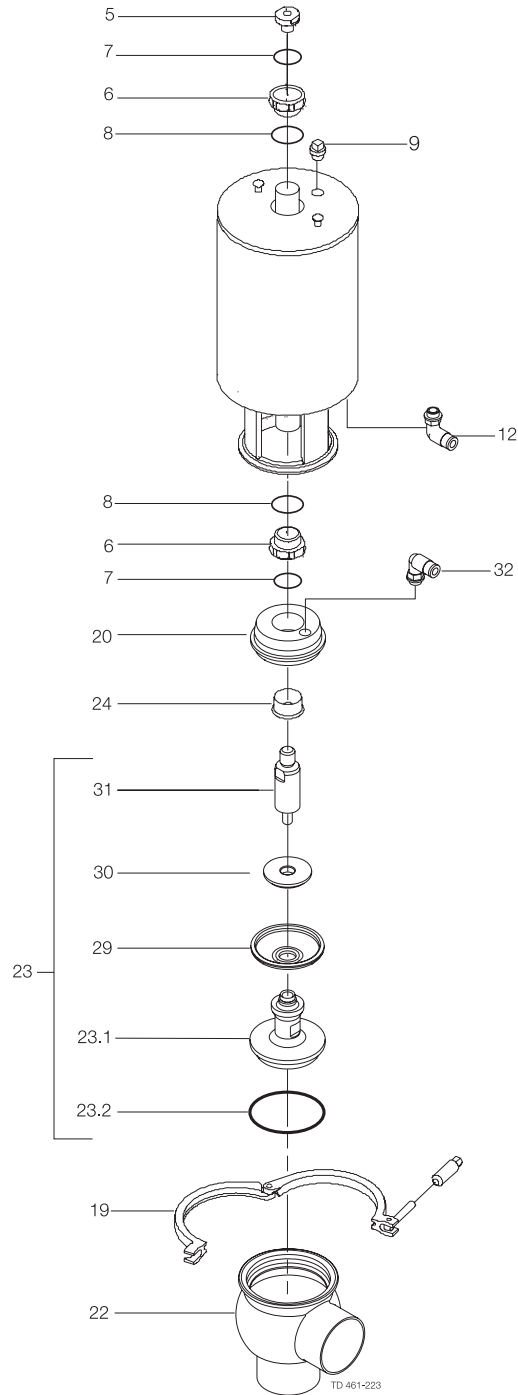


Change-over valve

7 Parts list and Service Kits

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

7.2 Unique Single Seat Valve - Aseptic Shut-off Valve



7 Parts list and Service Kits

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

Parts list

Pos.	Qty	Denomination
		Actuator
		Plug seal set (10 pcs.) EPDM
		Plug seal set (10 pcs.) HNBR
		Plug seal set (10 pcs.) FPM
		Diaphragm set (10 pcs.)
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
22	1	Valve body
23	1	Plug
23.1	1	Plug
23.2 ♦	1	Plug seal
24	1	Bushing
29 ♦	1	Diaphragm
30	1	Disc for diaphragm
31	1	Upper spindle
32	1	Air fitting

Service kits

Denomination	DN 25 25 mm	DN 40 38 mm	DN 50 51 mm	DN 65 63.5 mm	DN 80 76.1 mm	DN 100 101.6 mm
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Service kit for Actuator

□ Service kit	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500
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Service kit for Product wetted parts, standard

♦ Service kit, EPDM	9611-92-6543	9611-92-6544	9611-92-6545	9611-92-6546	9611-92-6547	9611-92-6548
♦ Service kit, HNBR	9611-92-6549	9611-92-6550	9611-92-6551	9611-92-6552	9611-92-6553	9611-92-6554
♦ Service kit, FPM	9611-92-6555	9611-92-6556	9611-92-6557	9611-92-6558	9611-92-6559	9611-92-6560

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

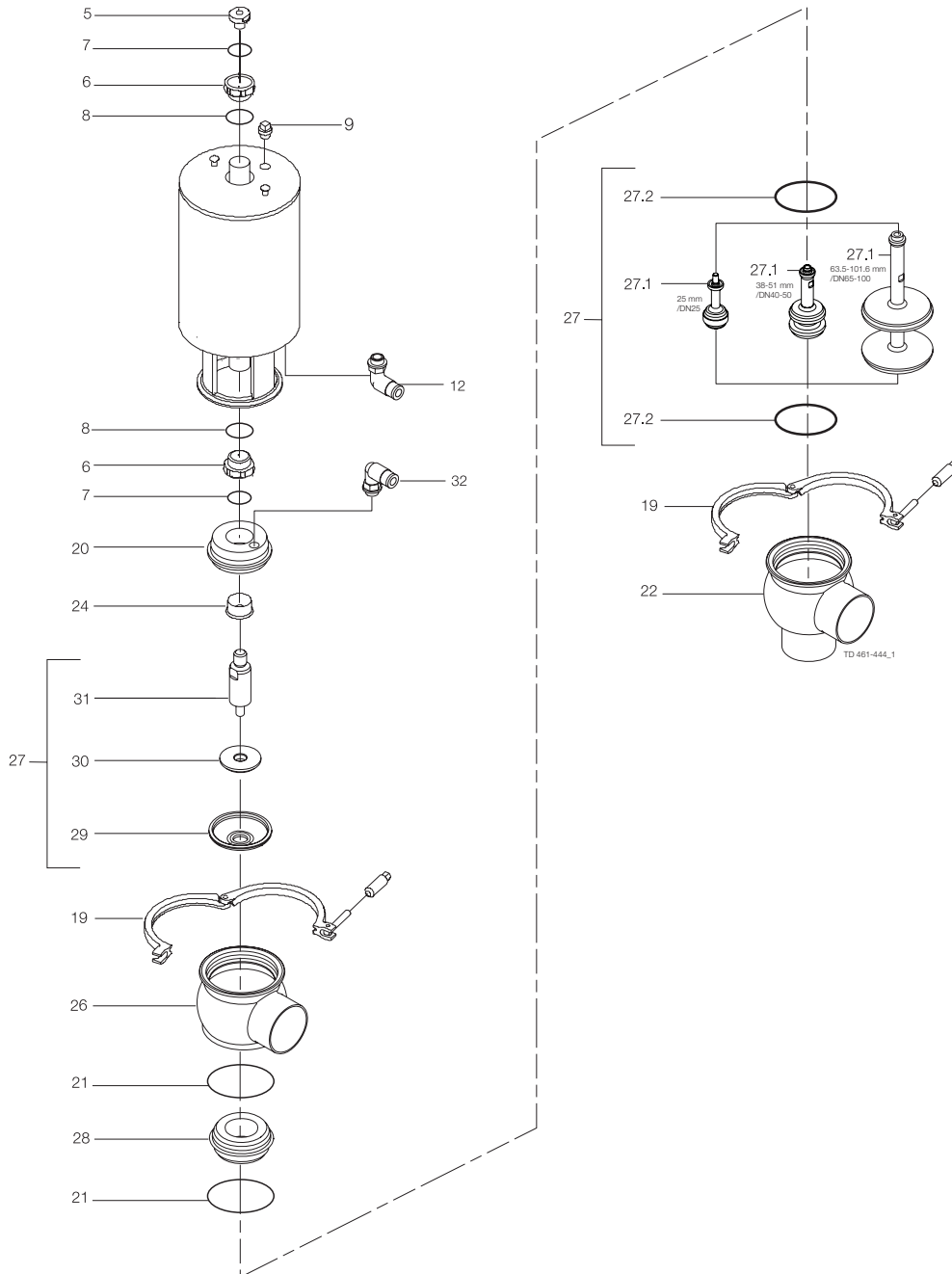
Recommended spare parts: Service kits.

TD 900-354/3

7 Parts list and Service Kits

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

7.3 Unique Single Seat Valve - Aseptic Change-over Valve



7 Parts list and Service Kits

The drawing shows Unique Single Seat Valve - Aseptic.
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
		Plug seal set (10 pcs.) EPDM
		Plug seal set (10 pcs.) HNBR
		Plug seal set (10 pcs.) EPDM
		Diaphragm set (10 pcs.)
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 ◆	2	O-ring
22	1	Valve body
24	1	Bushing
26	1	Valve body
27	1	Plug
27.1	1	Plug
27.2 ◆	2	Plug seal
28	1	Seat
29 ◆	1	Diaphragm
30	1	Disc for diaphragm
31	1	Upper spindle
32	1	Air fitting

Service kits

Denomination	DN 25 25 mm	DN 40 38 mm	DN 50 51 mm	DN 65 63.5 mm	DN 80 76.1 mm	DN 100 101.6 mm
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Service kit for Actuator

□ Service kit	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500	9611-92-6500
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Service kit for Product wetted parts, standard

◆ Service kit, EPDM	9611-92-6615	9611-92-6616	9611-92-6617	9611-92-6618	9611-92-6619	9611-92-6620
◆ Service kit, HNBR	9611-92-6621	9611-92-6622	9611-92-6623	9611-92-6624	9611-92-6625	9611-92-6626
◆ Service kit, FPM	9611-92-6627	9611-92-6628	9611-92-6629	9611-92-6630	9611-92-6631	9611-92-6632

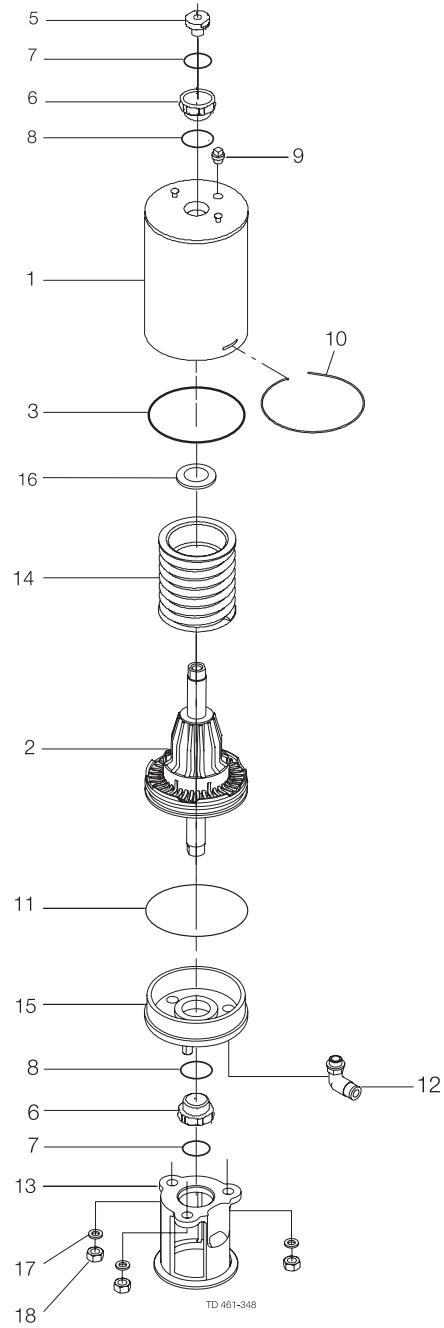
Parts marked with □◆ are included in the service kits. Recommended spare parts: Service kits.

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7 Parts list and Service Kits

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

7.4 Maintainable actuator



7 Parts list and Service Kits

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

Parts list

Pos.	Qty	Denomination
1	1	Actuator
2	1	Cylinder
3	1	Piston
3	1	O-ring
5	1	Adapter
6	2	Bushing
7	2	O-ring
8	2	O-ring
9	1	Plug
10	1	Lock wire
11	1	O-ring
12	1(2)	Air fitting (only 2 for A/A)
13	1	Yoke
14	1	Spring assembly
15	1	Bottom
16	1(2)	Support disc (only 2 for A/A)
17	3	Washer
18	3	Nut

Service kits

Denomination	DN 25 25 mm	DN 40 38 mm	DN 50 51 mm	DN 65 63.5 mm	DN 80 76.1 mm	DN 100 101.6 mm
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Service kit for Actuator

□	Service kit, NO , NC	9611-92-6497	9611-92-6497	9611-92-6498	9611-92-6498	9611-92-6499	9611-92-6499
◆	Service kit, A/A	9611-92-6519	9611-92-6519	9611-92-6520	9611-92-6520	9611-92-6521	9611-92-6521

Parts marked with □◆ are included in the service kits (actuator)

Recommended spare parts: Service kits.

TD900-361/1

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