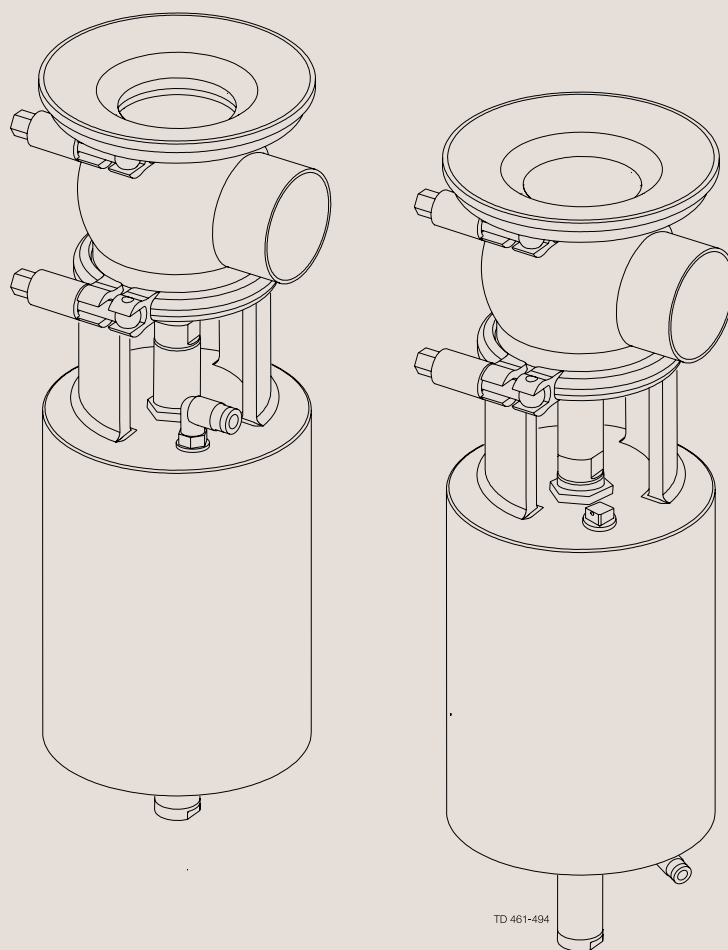




Instruction Manual

Unique Single Seat Tank Outlet Valve



TD 461-494

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

Tank Outlet

Type

2009

Year

is in conformity with the following directive:

- Machinery Directive 98/37/EEC
- 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



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

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1.1 Important information

1.2 Warning signs

1. Safety

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

Always read the manual before using the valve!

WARNING!

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

CAUTION!

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

NOTE!

Indicates important information to simplify or clarify practices.

General warning:



Caustic agents:



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.

Installation

- **Always** read the technical data thoroughly (see chapter 5).
- **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 5).
- **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 5).
- **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.



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.

Step 1**CAUTION!**

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

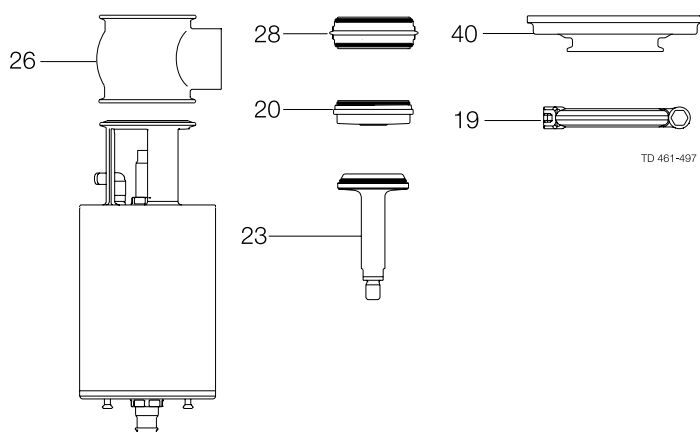
Complete valve, Standard valve or Reverse Acting valve (RA) (see steps 2a and 2b).

Delivery note.

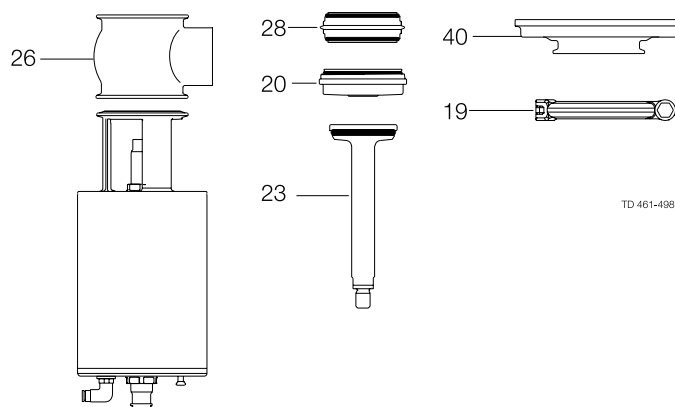
Instruction Manual.

Step 2a**Standard:**

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).

**Step 2b****Reverse Acting:**

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.

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 1

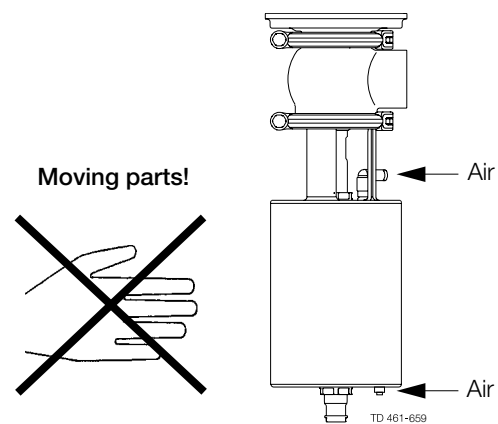
- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release compressed air after use.

CAUTION!

Alfa Laval cannot be held responsible for incorrect installation.

Step 2

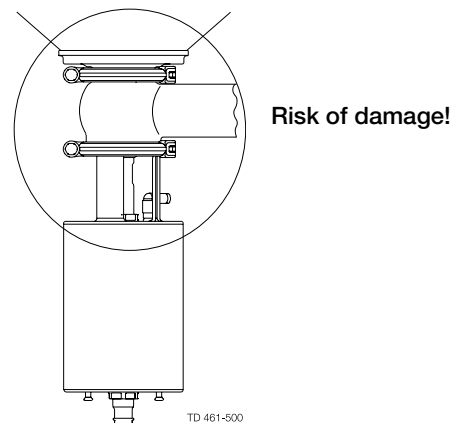
Never touch the moving parts if the actuator is supplied with compressed air.

**Step 3**

Avoid stressing the valve.

Pay special attention to:

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



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 1

Before welding the flange into the tank please note:

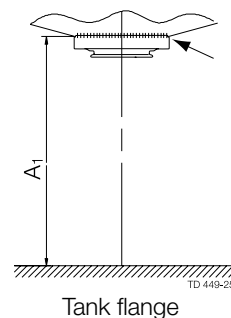
1. Maintain the minimum clearances "A" so that the actuator with the internal valve parts can be removed - please see later this section!

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).

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

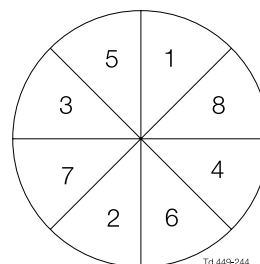
A₁ = Min. installation measure to allow that valve can be lifted out of the tank flange/valve body (if long stroke actuator or/and indication unit is mounted, height must be added).



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.

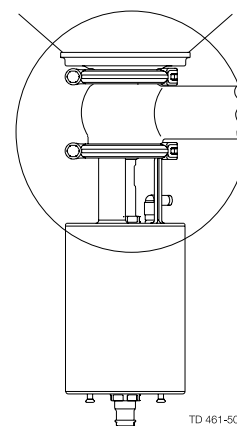
Welding of the final run must be done in 8 segments to avoid crack.



Step 2

Assemble the valve in accordance with the steps in section 4.4.

Pay special attention to the warnings!

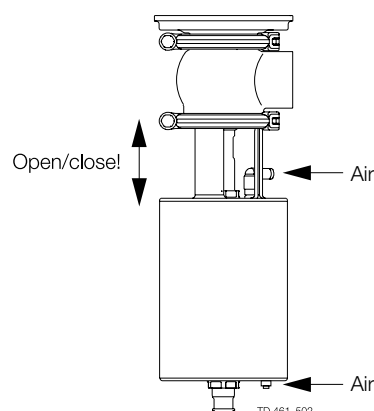


Step 3

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!



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 1

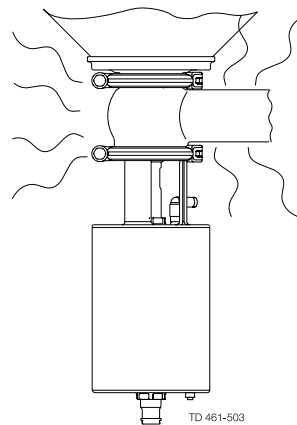
- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release compressed air after use.

CAUTION!

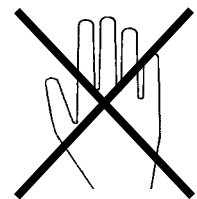
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

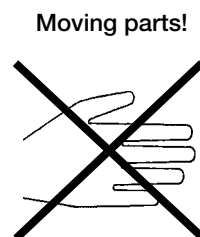
Never touch the valve or the pipelines when processing hot liquids or when sterilizing.



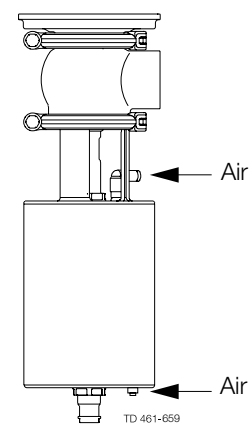
Burning danger!

**Step 3**

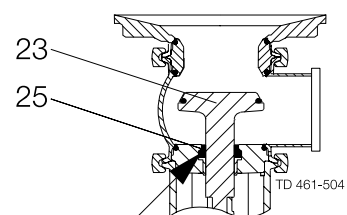
Never touch the moving parts if the actuator is supplied with compressed air.



Moving parts!

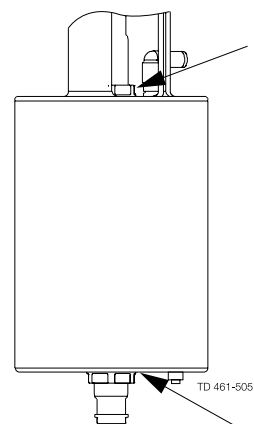
**Step 4****Lubrication of valves:**

1. Ensure smooth movement between lip seal (25) and plug stem (23).
2. Lubricate with Klüber Paraliq GTE 703 if necessary. (see section 4.1)



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

NOTE!

Study the maintenance instructions carefully before
replacing worn parts. - See section 4.1!

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 - 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

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 1

Always handle lye and acid with great care.

Caustic danger!



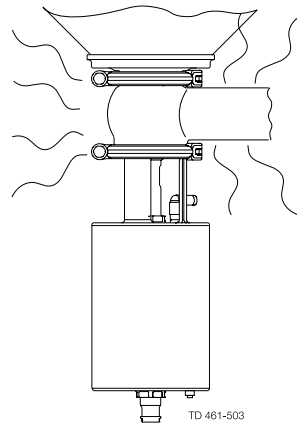
Always use
rubber gloves!



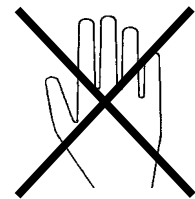
Always use
protective goggles!

Step 2

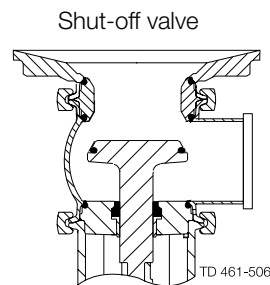
Never touch the valve or the pipelines when sterilizing.



Burning danger!

**Step 3**

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

**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
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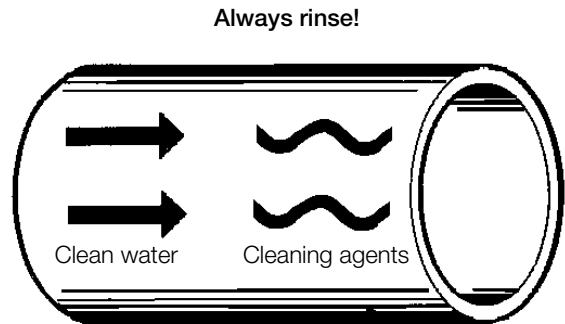
2.2 l 33% NaOH	+	100 l water	= Cleaning agent
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2. 0.5% by weight HNO₃ at 70° C

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.



Step 6**NOTE!**

The cleaning agents must be stored/disposed of in accordance with current rules/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.

Step 1



- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release the compressed air after use.

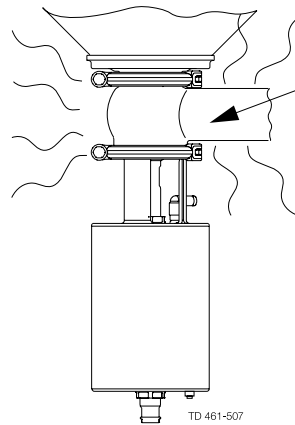
CAUTION!

All scrap must be stored/disposed of 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.



Atmospheric pressure required!

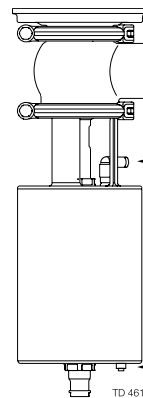
Burning danger!



Step 3

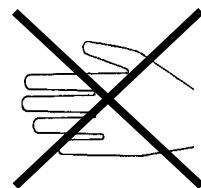


Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



Air

Cutting danger!



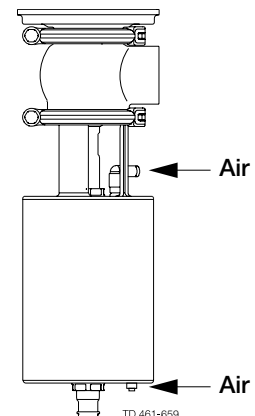
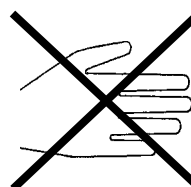
Air

Step 4



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

Moving parts!



Air

Air

Maintain the valve regularly.
 Study the instructions carefully.
 Always keep spare rubber seals and lip seals stock.
 Check the valve for smooth operation after service.

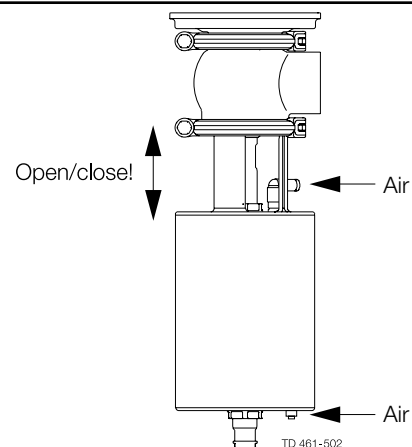
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	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	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the valve - 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!



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.

Step 1a

Standard:

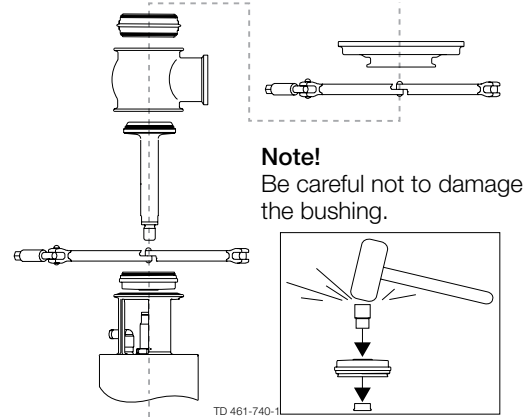
1. Supply compressed air to the actuator (only NC).
2. Loosen and remove lower clamp.
3. Lift away the actuator.
4. Release compressed air (only NC).
5. Unscrew and remove valve plug.
6. Remove O-ring, lip seal and bushing in bonnet.
(Use bushing tool and rubber mallet. See drawing).

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 section 4.3.



Step 1b

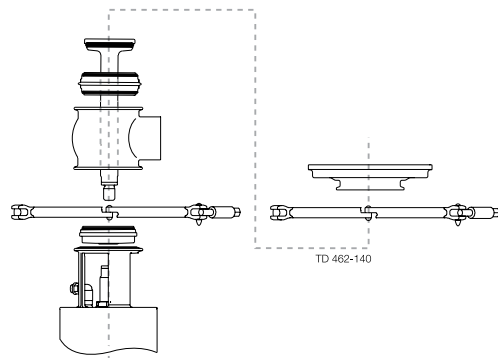
Reverse Acting:

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 section 4.3.



4.3 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.

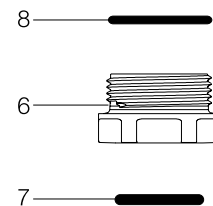
Note! For plug seal replacement please read instruction in service kit.

4.4 Assembly of valve

Reverse order of 4.2, Dismantling of valve.
Lubricate O-ring (21) and lip seal (25) with Klüber Paraliq GTE 703.

4.5 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. Be careful not to overtighten.

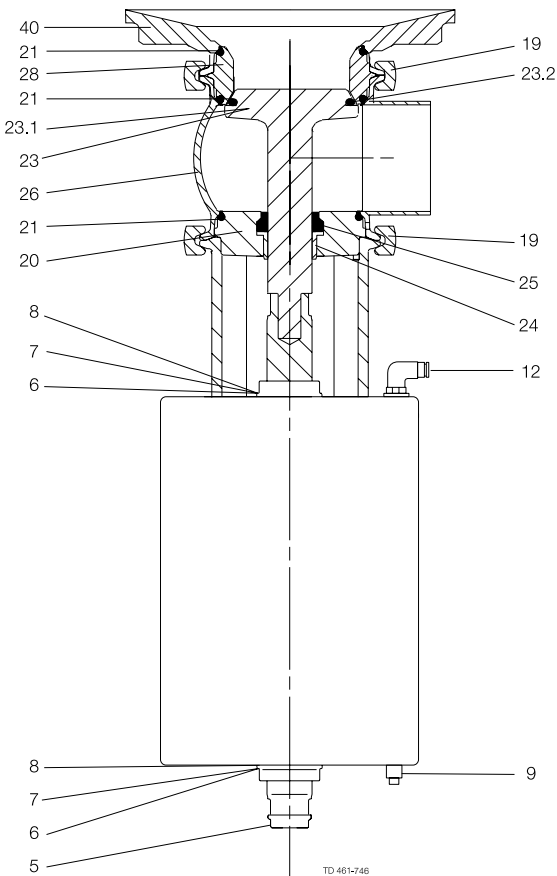


TD 461-310

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

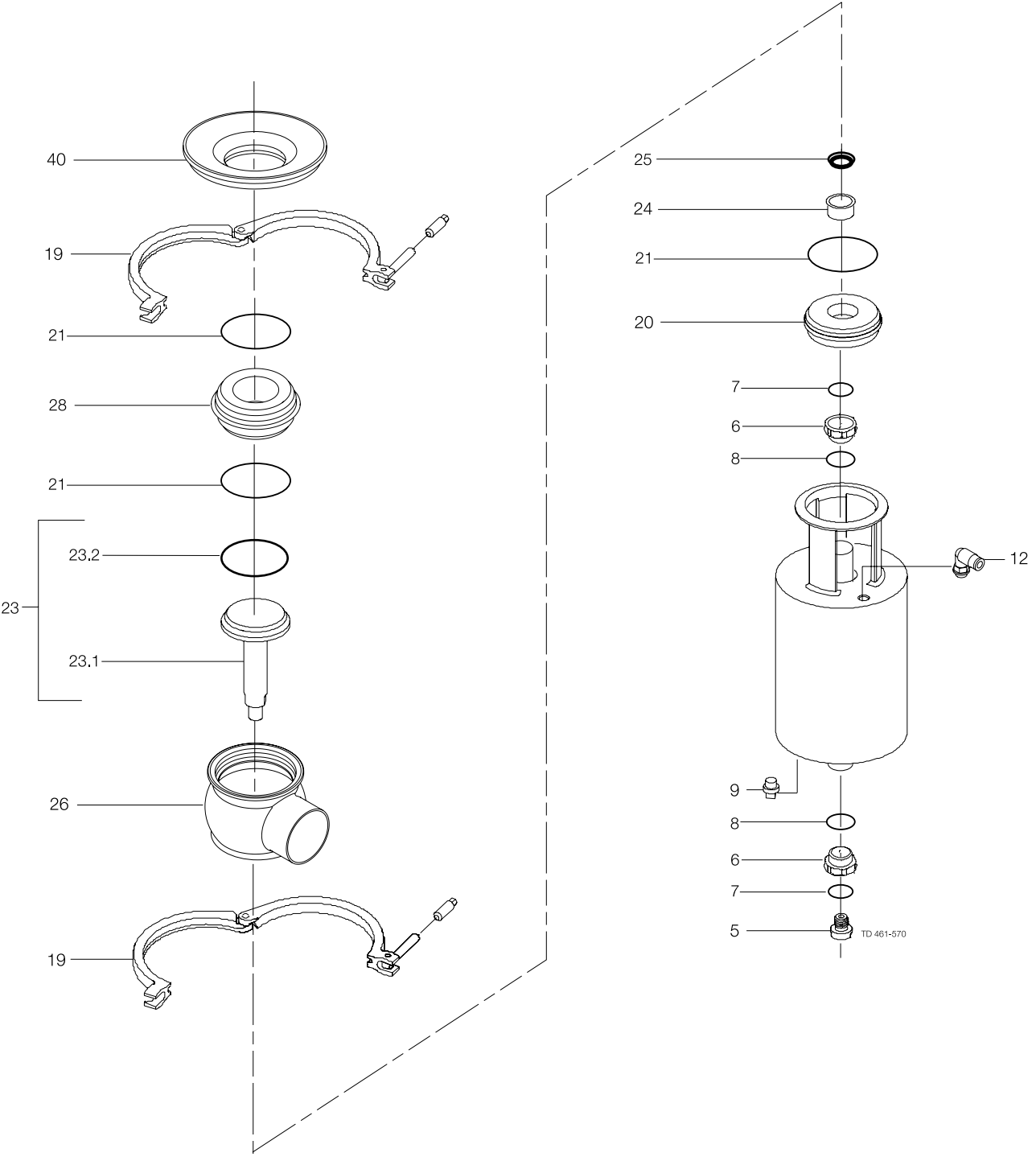
Data - valve/actuator	
Max. product pressure in pipeline (depends on valve specifications):	1000 kPa (10 bar)
Max. product pressure in tank (depends on valve specifications and temperature):	1000 kPa (10 bar)max. 20°C
	850 kPa (8.5 bar) max. 100°C
	750 kPa (7.5 bar) max. 150°C
Min. product pressure.....	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

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



Standard

This page shows an exploded drawing of Unique Single Seat Tank Outlet Valve.



The parts list includes all items.

Parts List			Service Kits/Product wetted parts	
Pos.		Qty. Denomination	Denomination	Item number
5		1 Actuator, complete	Service kit, actuator.....	9611-92-6500
6	●	2 Adapter	DN/OD 51 mm / DN 50	
7	●	2 Bushing	EPDM.....	9611-92-6701
8	●	2 O-ring	HNBR.....	9611-92-6705
9		1 O-ring	FPM	9611-92-6709
12		1(2) Plug	DN/OD 63.5 mm / DN 65	
19		2 Air fitting	EPDM.....	9611-92-6702
20		2 Clamp	HNBR.....	9611-92-6706
21	Δ	1 Bonnet	FPM	9611-92-6710
23		1 O-ring	DN/OD 76.1 mm / DN 80	
23.1		1 Plug, complete	EPDM.....	9611-92-6703
23.2	Δ	1 Plug	HNBR.....	9611-92-6707
24		1 Plug seal	FPM	9611-92-6711
25	Δ	1 Bushing	DN/OD 101.6 mm / DN 100	
26		1 Lip seal	EPDM.....	9611-92-6704
28		1 Valve body	HNBR.....	9611-92-6708
40		1 Seat	FPM	9611-92-6712
		1 Tank flange		

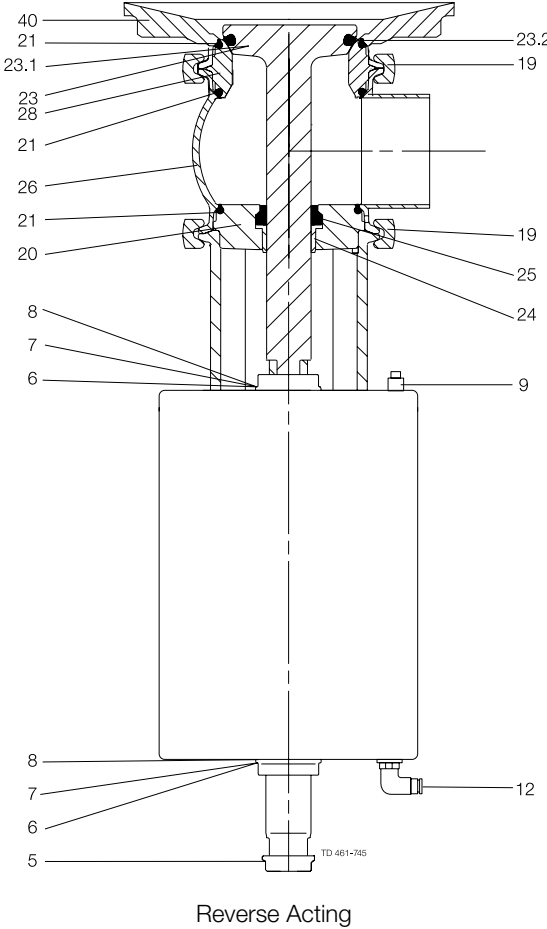
●: Service kit - Actuator

Δ: Service kit - EPDM

Δ: Service kit - HNBR

Δ: Service kit - FPM

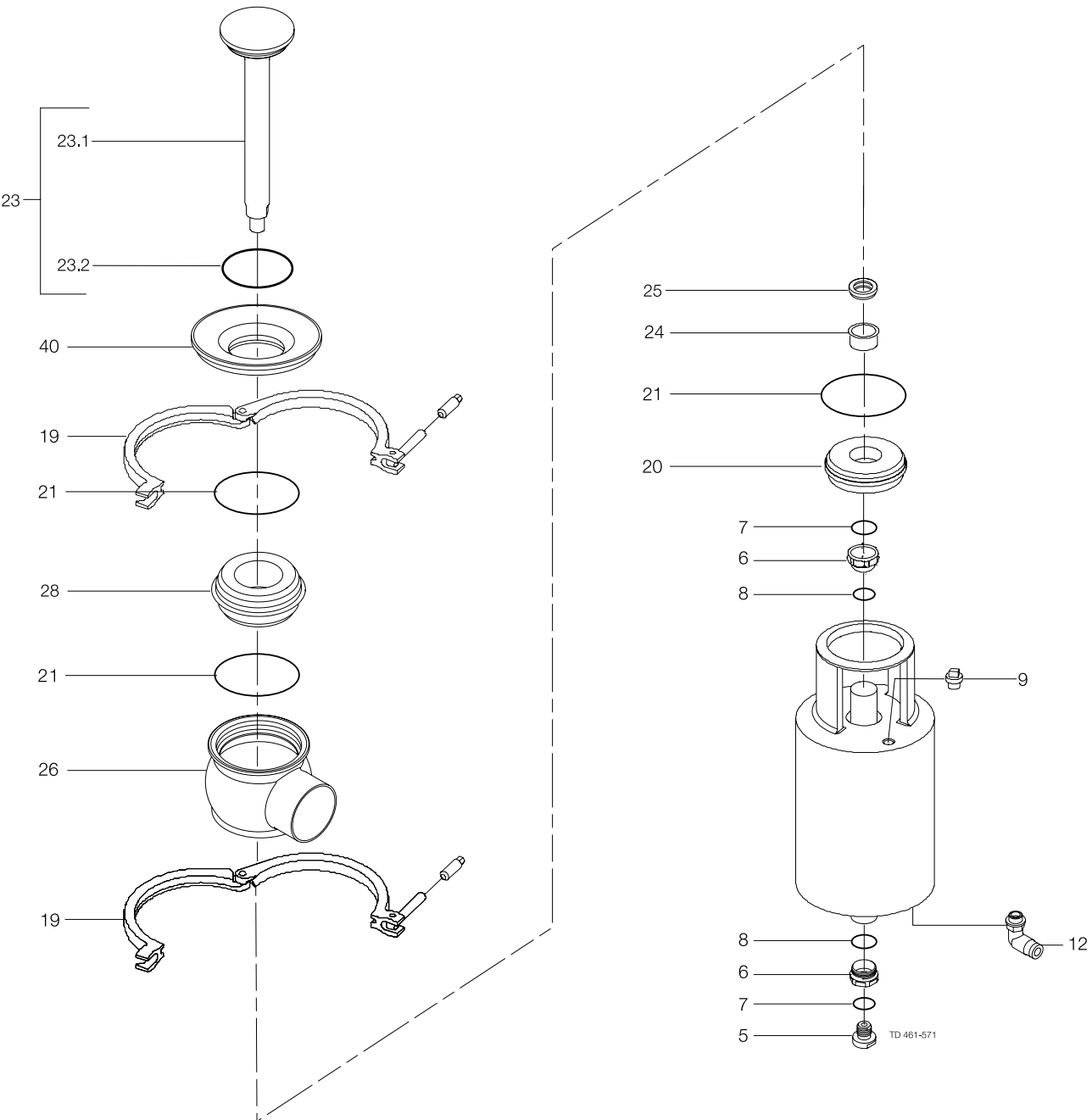
For parts lists please see section 6.1. The drawings include all items.



6.2 Unique Single Seat Tank Outlet Valve
- Reverse Acting

6. Parts list and Service Kits

This page shows an exploded drawing of Unique Single Seat Tank Outlet Valve - Reverse Acting.



The parts list includes all items.

Parts List			Service Kits/Product wetted parts	
Pos.	Qty	Denomination	Denomination	Item number
5	1	Actuator, complete	Service kit, actuator.....	9611-92-6500
6 ●	2	Adapter	DN/OD 51 mm / DN 50	
7 ●	2	Bushing	EPDM.....	9611-92-6701
8 ●	2	O-ring	HNBR.....	9611-92-6705
9	1	Plug	FPM	9611-92-6709
12	1(2)	Air fitting	DN/OD 63.5 mm / DN 65	
19	2	Clamp	EPDM.....	9611-92-6702
20	1	Bonnet	HNBR.....	9611-92-6706
21 Δ	3	O-ring	FPM	9611-92-6710
23	1	Plug, shut off	DN/OD 76.1 mm / DN 80	
23.1	1	Plug, shut off	EPDM.....	9611-92-6703
23.2Δ	1	Plug seal	HNBR.....	9611-92-6707
24	1	Bushing	FPM	9611-92-6711
25 Δ	1	Lip seal	DN/OD 101.6 mm / DN 100	
26	1	Valve body, upper	EPDM.....	9611-92-6704
28	1	Seat	HNBR.....	9611-92-6708
40	1	Tank flange	FPM	9611-92-6712

- Service kit - Actuator
- Δ Service kit - EPDM
- Δ Service kit - HNBR
- Δ Service kit - FPM

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 direct.