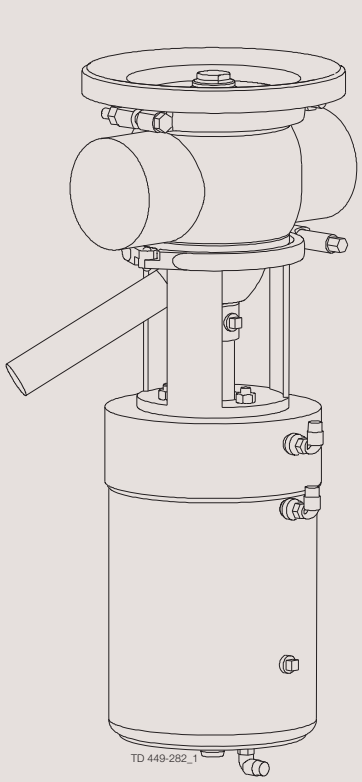
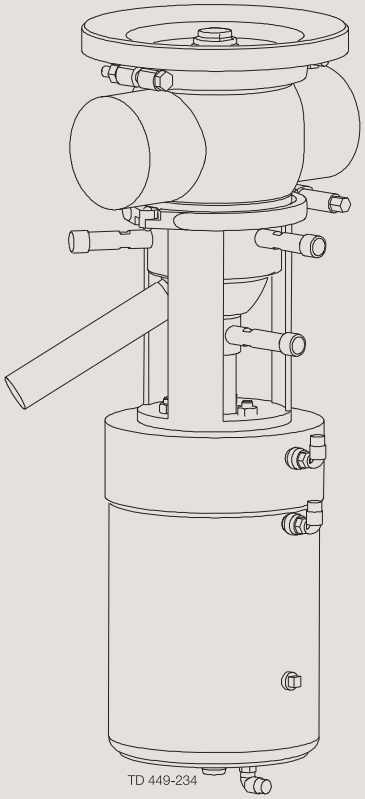
Instruction Manual

Unique-TO Mixproof Tank Outlet Valve





ESE00156-EN4 2015-04

Original manual

Table of contents

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

1 EC Declaration of Conformity

Revision of Declaration of Conformity 2009-12-29

The Designated Company

Alfa Laval Kolding A/S
Company Name

Albuen 31, DK-6000 Kolding, Denmark
Address

+45 79 32 22 00
Phone No.

hereby declare that

Valve
Designation

Unique TO
Type

From serial number 1181354 - 9999999

is in conformity with the following directive with amendments:

- Machinery Directive 2006/42/EC
- Regulation (EC) No 1935/2004
- The valve is in compliance with the Pressure Equipment Directive 97/23/EC and was subjected to the following assessment procedure Module A. Diameters ≥ DN125 may not be used for fluids group 1.

The person authorised to compile the technical file is the signer of this document

QHSE Manager, Quality, Health and safety & Environment
Title

Annie Dahl
Name

Kolding
Place

2013-12-03
Date


Signature

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

2.1 Important information

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: 

Cutting danger: 

2 Safety

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

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 clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see warning label)
Never stick your fingers through the valve ports if the actuator is supplied with compressed air

Operation:

Always read the technical data thoroughly (see chapter 6 Technical data)
Never touch the clip assembly or the actuator piston rod when the actuator is supplied with compressed air (see warning label)
Never pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing)

Never touch the valve or the pipelines when processing hot liquids or when sterilizing.
Never throttle the leakage outlet
Never throttle the CIP outlet, if supplied

Always handle lye and acid with great care

Maintenance:

Always read the technical data thoroughly (see chapter 6 Technical data)
Always fit the seals correctly
Always release compressed air after use
Always remove the CIP connections, if supplied, before service
Never service the valve when it is hot
Never pressurise the valve/actuator when the valve is serviced
Never stick your fingers through the valve ports if the actuator is supplied with compressed air
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see warning label)
Never service the valve with valve and pipelines under pressure

Transportation:

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

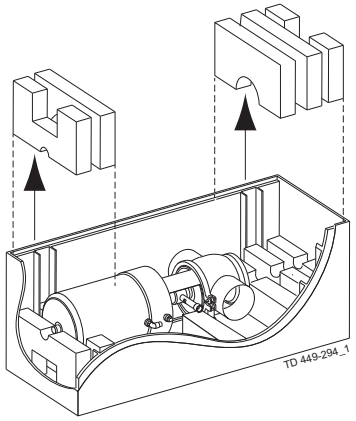
The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is normally visible.

3.1 Unpacking/intermediate storage

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

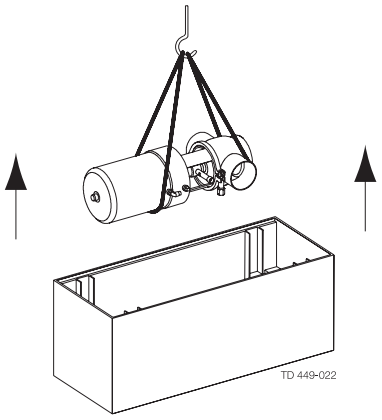
Check the delivery for:
1. Complete valve
2. Delivery note
3. Warning label

Step 2
Remove upper support



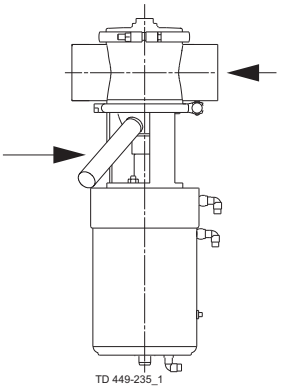
Step 3
Lift out the valve.

NOTE!
Please note weight of valve as printed on box.



Step 4
Remove possible packing materials from the valve ports.

NOTE!
Remember to fit leakage detection pipe

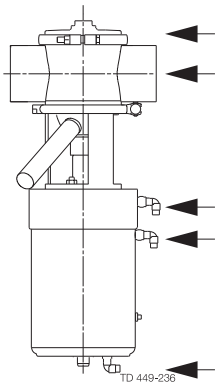


.

3 Installation

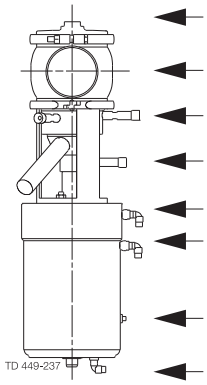
The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is normally visible.

Step 5
Inspect the valve for visible transport damages.



Inspection!

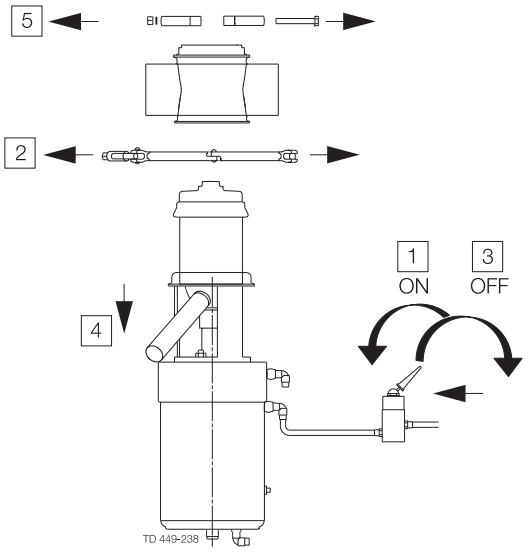
Step 6
Avoid damaging the air connections, the leakage outlet, the valve ports and the CIP connections, if supplied.



Caution!

Step 7
Disassemble according to illustrations 1 to 5
(please also see 5.2 Dismantling of valve).

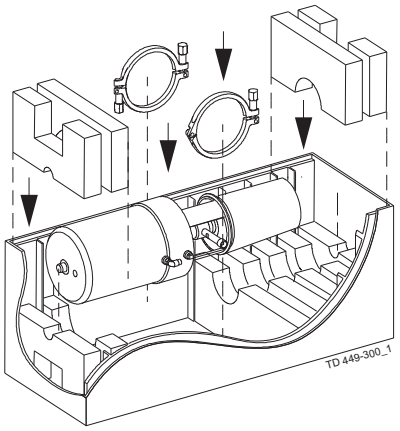
1. Supply compressed air.
2. Remove clamp
3. Release compressed air.
4. Lift out actuator with plugs.
5. Remove clamp.



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

Step 8
While valve body is welded, it is recommended to store the valve safely in the box together with valve parts.
1. Place actuator and valve parts in the box.
2. Add supports.
3. Close, re-tape and store the box.

ADVISE!
Mark the valve body and box with the same number before intermediate storage.



3.2 Recycling information

• Unpacking

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

• Maintenance

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

• Scrapping

- At end of use, the equipment must be recycled according to the relevant, local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company

3.3 General installation

Step 1

- Always read the technical data thoroughly (see 6 Technical data).
- Always release compressed air after use.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label)

CAUTION!
- Fit the supplied warning label on the valve so that it is normally visible.
- Alfa Laval cannot be held responsible for incorrect installation

NOTE!
- The leakage outlet must be turned downwards!

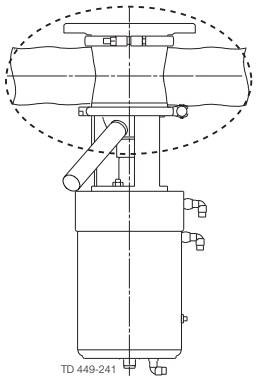
3 Installation

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

Step 2
Avoid stressing the valve as this can result in deformation of the sealing area and misfunction of the valve (leakage or faulty indication).

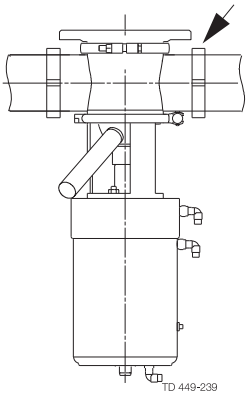
Pay special attention to:
- Vibrations
- Thermal expansion of the tubes (especially at long tube lengths)
- Excessive welding
- Overloading of the pipelines

NOTE!
Please follow Alfa Laval installation guidelines (literature code ESE00040).



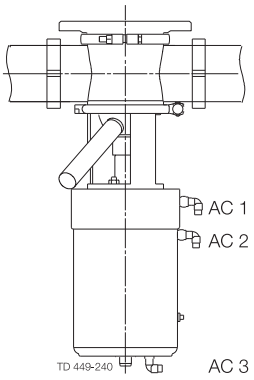
Risk of damage!

Step 3
Fittings:
Ensure that the connections are tight.



Remember seal rings!

Step 4
Air connection: R 1/8" (BSP).
AC1: Cleaning of tank plug.
AC2: Open valve.
AC3: Cleaning of balanced plug.

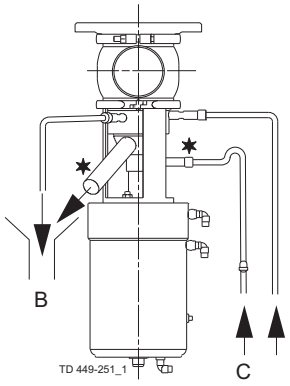


Step 5
CIP connection (optional extra):
1. See description of cleaning - 4.3 Recommended cleaning.
2. Connect CIP correctly

NOTE!
* = Moving parts

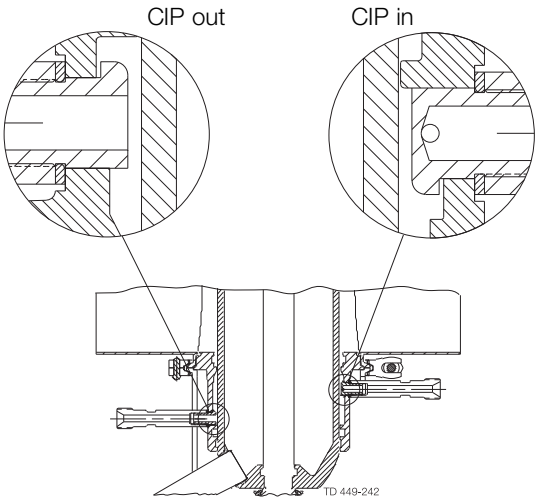
Must be open for inspection!

B = CIP out
C = CIP in



Study the instructions carefully and pay special attention to the warnings!
The valve has ends for welding as standard.
Weld carefully/aim at stressless welding to avoid deformation on sealing areas.
Check the valve for smooth operation after welding.

Step 6
It is important to connect CIP inlet to the small inlet nozzle to avoid built-up pressure in the cleaning chamber

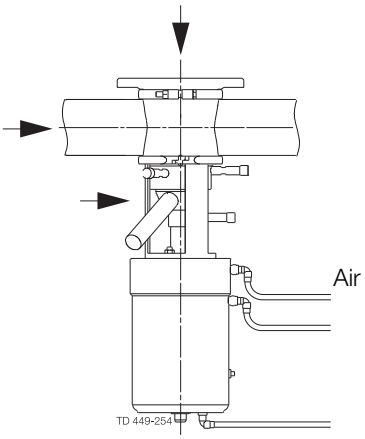


Align nozzle edges with recess in sealing element.

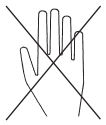
3.4 Welding

Step 1

Never stick your fingers in the operating parts of the valve if the actuator is supplied with compressed air.



Cutting danger!



Step 2
Dismantle the valve in accordance with step 1, section 5.2 Dismantling of valve

3 Installation

Study the instructions carefully and pay special attention to the warnings!
The valve has ends for welding as standard.
Weld carefully/aim at stressless welding to avoid deformation on sealing areas.
Check the valve for smooth operation after welding.

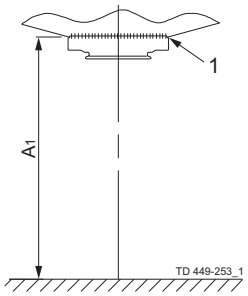
Step 3

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!

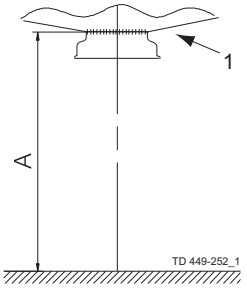
If there is a risk of foot damage, Alfa Laval recommends to leave a distance of 120 mm (4.7") below the valve (look at the specific built-in conditions).

Bottom of tank
Tank flange (standard)



1 = Caution

Bottom of tank
Stub flange (option)



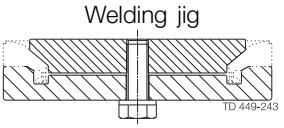
1 = Caution

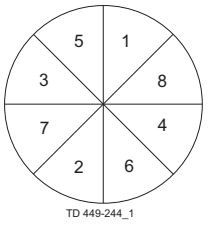
Min. dimension Unique TO (all measures in mm) (1mm = 0.0394")

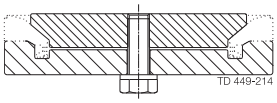
Size	DN/OD				DN						Longstroke			
											DN/OD		DN	
	2"	2½"	3"	4"							2½"	3"		
	51	63.5	76.1	101.6	50	65	80	100	125	150	63.5	76.1	63	80
with tank flange (A_1)	579	646	659	753	577	652	667	755	805	890	700	713	706	721
with external cleaning and tank flange (A_1)	616	686	699	813	614	692	707	815	865	N/A	740	753	746	761
with stub flange (A)	588	655	668	762	586	661	676	764	814	899	709	722	715	730
with external cleaning and stub flange (A)	625	695	708	822	623	701	716	824	874	N/A	749	762	755	770

If ThinkTop is mounted, add 180 mm (7.1") to dimension
N/A = Not available

2. **Always** use welding jig (can be ordered separately at Alfa Laval) to ensure precision of flange after welding.
   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.
   Remember **NOT** to dismount welding jig before flange is cold.



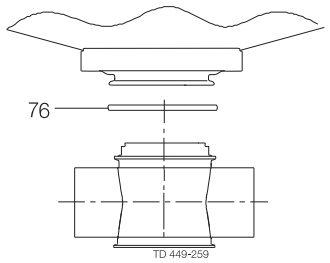


Item no.	Size		Welding tool for tank flange
9613-0999-01	2" 51 mm	DN50	
9613-0999-02	2½" - 3 " 63.5 - 76.1 mm	DN65 - DN80	
9613-0999-036	4" 101.6 mm	DN100 - DN150	

Study the instructions carefully and pay special attention to the warnings!
The valve has ends for welding as standard.
Weld carefully/aim at stressless welding to avoid deformation on sealing areas.
Check the valve for smooth operation after welding.

Step 4
Warning!
Make sure to turn the valve body correctly - conical seat downwards before welding.

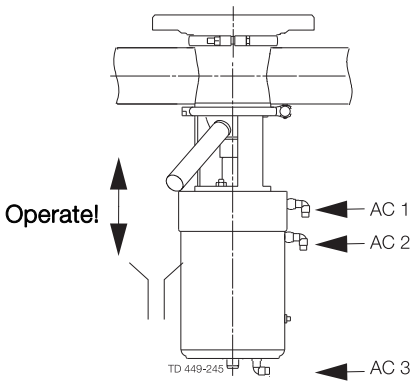
NOTE!
Always weld the valve body into the pipeline, so that the seal ring (76) can be replaced.



Step 5
Assemble the valve in accordance with 5.5 Assembly of valve after welding.
Pay special attention to the warnings and clamp torque (see 5.5 Assembly of valve).

Step 6
Pre-use check:
1. Supply compressed air to AC1, AC2 and AC3 one by one.
2. Operate the valve several times to ensure that it runs smoothly.

Pay special attention to the warnings!



4 Operation

The valve is tested before delivery.
Study the instructions carefully and pay special attention to the warnings!
Pay attention to possible faults.
The items refer to the parts list and service kits section.

4.1 Operation

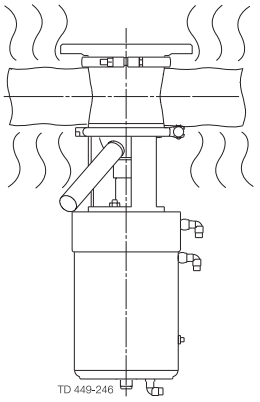
Step 1

- **Always** read the technical data thoroughly (see 6 Technical data).
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).
- **Never** pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing).

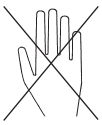
CAUTION!
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

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



Burning danger!



Study the maintenance instructions carefully before replacing worn parts. - See 5.1 General maintenance

4.2 Fault finding and repair

Problem	Cause/result	Repair
Leakage at the leakage detection pipe (88)	- Particles between valve seats and plug seals (56/74) - Worn/product affected plug seal rings (56/74) - Plug not assembled correctly	- Remove the particles - Check the plug seals - Replace the plug seals - Change rubber grade - Assemble plug, see step 3, section 5.5 Assembly of valve
Leakage at sealing element (48)/ upper plug (94)	Worn/product affected o-rings/lip seal (38/39/46/49)	- Replace the o-rings/lip seal - Change rubber grade - Clean and if necessary replace guide ring (45)
Leakage at clamp (64) and (65)	- Too old/product affected o-rings (76 and 47) valve body - Loose clamp (64) or (65)	- Replace the o-rings - Change rubber grade - Tighten the clamp (max. 10 Nm)
CIP leakage Leakage at spindle clamp (43)	Worn o-rings (40/67) Damaged o-ring (39) Worn/product affected lip seal (57)	Replace the o-rings - Replace the o-ring - Replace the plug seals - Change rubber grade
Tank plug not returning to closed position	- Wrong rubber grade - Wrongly fitted gasket - Mounted incorrectly (see 3.4 Welding)	- Change rubber grade - Fit new gasket correctly - Correct installation
Plug returns with uneven movements (slip/stick effect)	- Wrong rubber grade - Wrongly fitted gasket - Mounted incorrectly (see 3.4 Welding)	- Change rubber grade - Fit new gasket correctly - Correct installation

4 Operation

The valve is designed for cleaning in place (= CIP).
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda. HNO_3 = Nitric acid.
Internal leakage in the valve is externally visible by means of the leakage outlet.

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

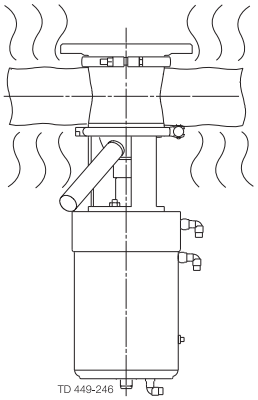
Caustic danger!

Always use rubber gloves!

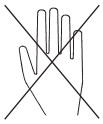
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.



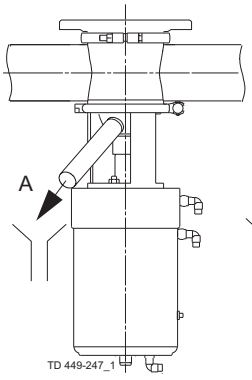
Burning danger!

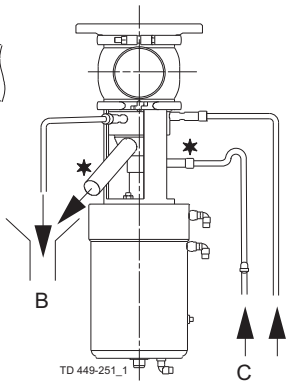


Step 3

- Never throttle the leakage outlet
- Never throttle the CIP outlet, if supplied. Risk of mixing due to overpressure).

A. = Leakage/CIP out
B. = CIP out
C. = CIP in





Step 4

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

1. 1% by weight NaOH at 70° C (158° F)

1 kg (2.2 lb) NaOH	+	100 l (26.4 gal) water	=	Cleaning agent.
2.2 l (0.6 gal) 33% NaOH	+	100 l (26.4 gal) water	=	Cleaning agent.

2. 0.5% by weight HNO_3 at 70° C (158° F)

0.7 l 53% HNO_3	+	100 l (26.4 gal) water	=	Cleaning agent.

The valve is designed for cleaning in place (= CIP).
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda. HNO_3 = Nitric acid.
Internal leakage in the valve is externally visible by means of the leakage outlet.

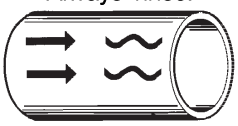
Step 5
1. Avoid excessive concentration of the cleaning agent
   ⇒ **Dose gradually!**
2. Adjust the cleaning flow to the process
   Milk sterilization/viscous liquids
   ⇒ **Increase the cleaning flow!**

Step 6
Advisory seat lift cleaning periods
Cleaning periods of 1-2 seconds per CIP sequence.

Product	Periods
Milk	1-2
Yoghurt	3-5
Beer	2-5
Cold wort	5-10

Step 7
Always rinse well with clean water after the cleaning.
NOTE!
The cleaning agents must be stored/disposed of in accordance with current rules/directives.

Always rinse!

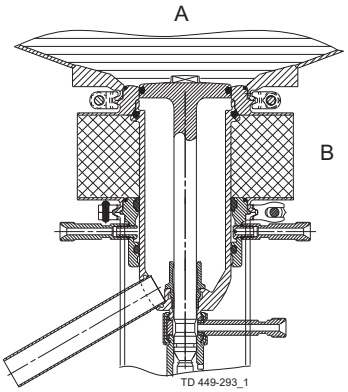


Clean water Cleaning agents

Pay special attention to spillage of hot cleaning fluid/water.

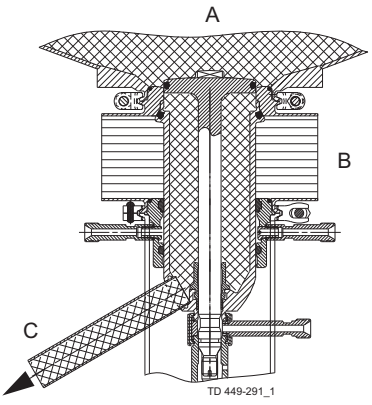
Step 8
1. Closed valve

A = Product
B= CIP



Step 9
2. Seat lift cleaning with tank plug (optional)
(see step 6 page 19)

A = CIP
B = Product
C = CIP out

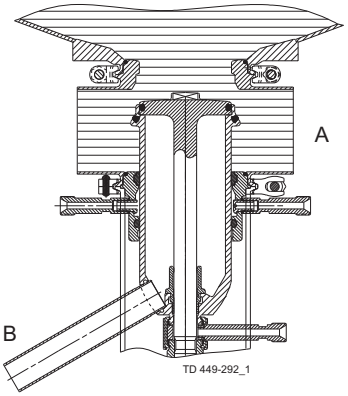


4 Operation

The valve is designed for cleaning in place (= CIP).
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda. HNO_3 = Nitric acid.
Internal leakage in the valve is externally visible by means of the leakage outlet.

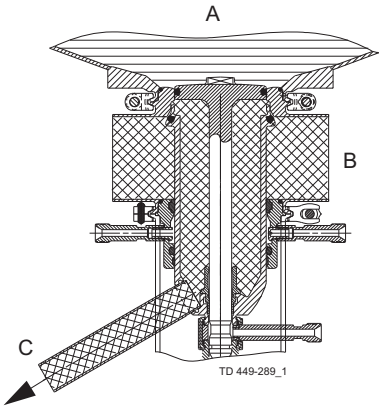
Step 10
3. Open valve

A = Product
B = Leakage detecting



Step 11
4. Seat lift cleaning with balanced plug
(seeStep 6,)

A = Product
B = CIP
C = CIP out



Maintain the valve/actuator regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.
The items refer to the parts list and service kits section.

5.1 General maintenance

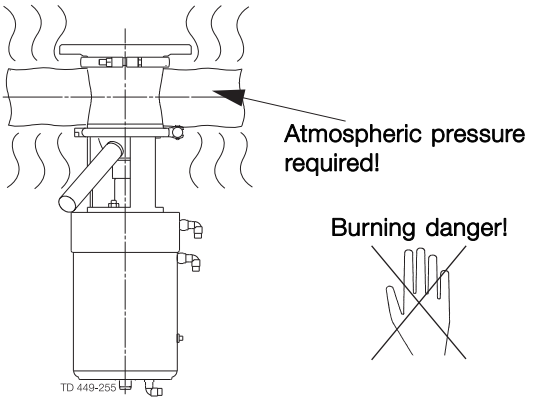
Step 1

- **Always** read the technical data thoroughly (see 6 Technical data).
- **Always** fit the seals correctly (risk of mixing).
- **Always** release the compressed air after use.
- **Always** remove the CIP connections, if supplied, before service.

NOTE!
All scrap must be stored/disposed of in accordance with current rules/directives.

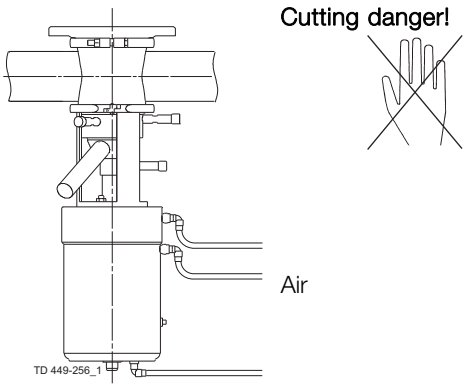
Step 2

- **Never** service the valve when it is hot.
- **Never** service the valve with valve/actuator under pressure
- **Never** service the valve with fluid in the tank.



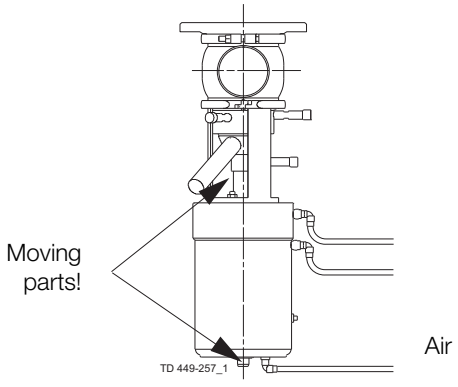
Step 3

Never stick your fingers in operating parts of the valve if the actuator is supplied with compressed air.



Step 4

Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).



5 Maintenance

Maintain the valve/actuator regularly.
Study the instructions carefully and pay special attention to the warnings!
Always keep spare rubber seals and guide rings in stock. Store seals in closed bag.
The items refer to the parts list and service kits section.

Recommended spare parts: Service kits (see 6 Technical data)
Order service kits from the service kits section (see 6 Technical data)
Ordering spare parts: Contact the Sales Department.

The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible. Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

	Valve rubber seals	Valve plug seals	Valve guide rings
Preventive maintenance	**Replace after 12 months(*)**	**Replace after 12 months(*)**	Replace when required
Maintenance after leakage (leakage normally starts slowly)	**Replace after production cycle**	**Replace after production cycle**	
Planned maintenance	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for planning of inspections	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for planning of inspections	Replace when required
Lubrication	**When assembling** Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease (**) (suitable for EPDM)	**When assembling** Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease (**) (suitable for EPDM)	**None**

NOTE!
Lubricate thread in valve plug parts with Klüber Paste UH1 84-201 or similar.
(*) Depending on working conditions! Please contact Alfa Laval.
(**) All products wetted seals.

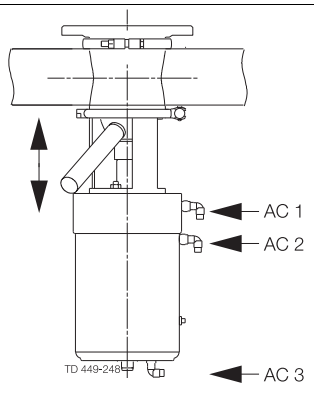
Repairing of actuator:

- The actuator is maintenance-free but repairable.
- If repair is required, replacing all actuator rubber seals is recommended.
- Lubricate seals with Molykote Longterm 2 (black).
- To avoid possible black remains on pos. 1 and 29, Alfa Laval recommends Klüber Paraliq GTE703 (white) for these two positions.

Pre-use check
1. Supply compressed air to AC1, AC2 and AC3 one by one.
2. Operate the valve several times to ensure that it operates smoothly.

Pay special attention to the warnings!

Operate!



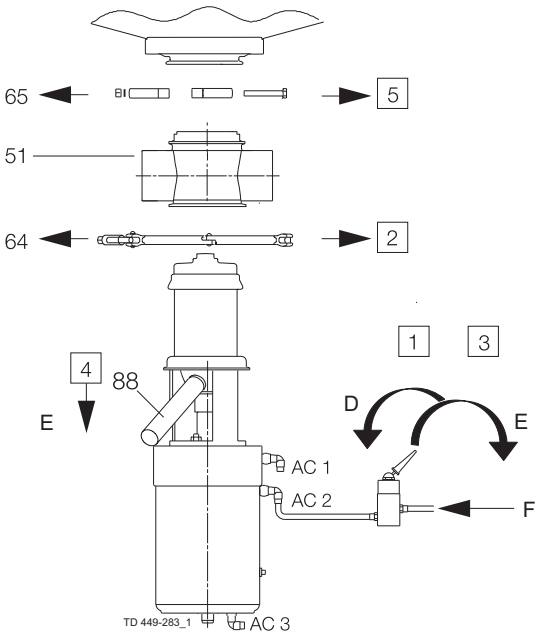
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

5.2 Dismantling of valve

Step 1
Disassemble valve acc. to illustrations (1 to 5).

1. Supply compressed air to AC2.
2. Loosen and remove clamp (64).
3. Release compressed air.
4. Lift out the actuator together with the internal valve parts from valve body (51).
5. Loosen and remove clamp (65) and valve body (51).
6. Pull out tube (88) from balanced plug (94) and remove o-ring (89) from tube.
7. When tank flange:
   Pull out o-ring (76) from valve body (51).
   When stub flange:
   Pull out o-ring (91) from stub flange (92).

D = On
E = Off
F = Air
E = **Note!** release compressed air



5 Maintenance

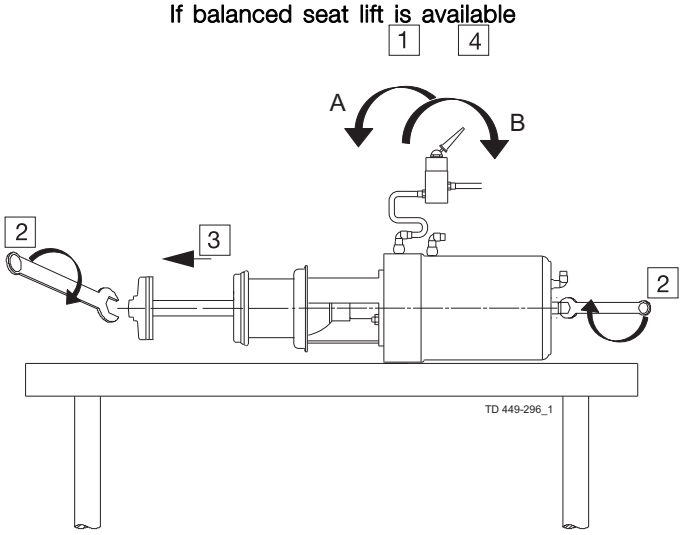
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

Step 2

2A:
If air fitting AC1 is present, supply compressed air and follow procedure 2A.
1. Supply compressed air for AC1.
2. Loosen tank plug (93) while counterholding upper stem (1).
3. Remove the tank plug.
4. Release compressed air.
5. Replace o-ring (38).

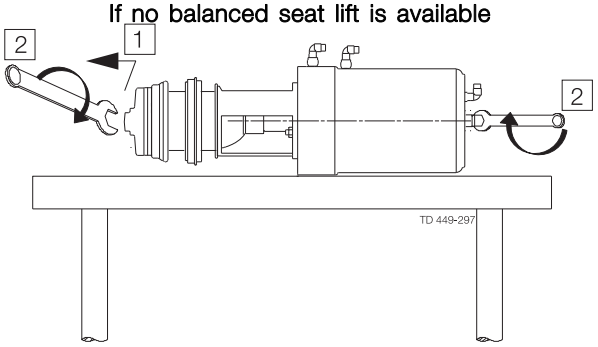
A = On
B = Off

If balanced seat lift is available



2B:
If no air fitting AC1 is present, follow procedure 2B.
1. Push sealing element (48) free of intermediate piece (37).
2. Loosen tank plug while counterholding upper stem.
3. Remove the tank plug (93).
4. Replace o-ring (38).

If no balanced seat lift is available



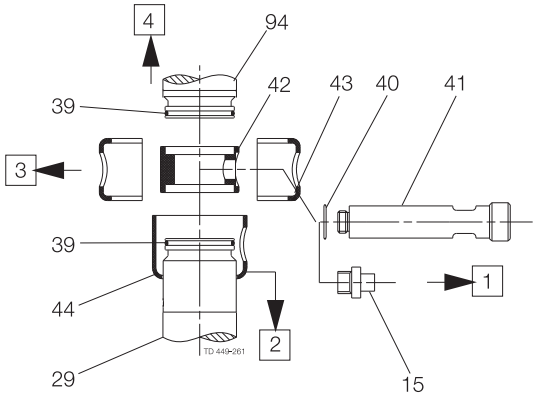
NOTE!
For replacement of seal ring (74), please see 5.3 Tank plug, replacement of radial seal

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

Step 3

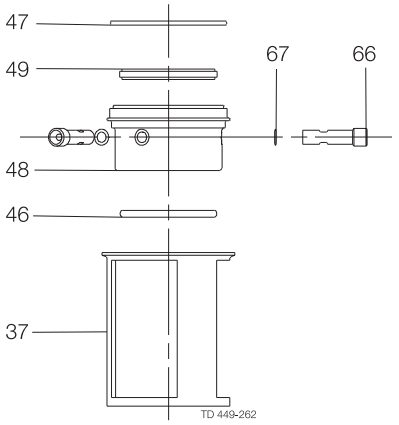
Remove coupling system and balanced plug according to illustrations (1 to 4).

1. Unscrew flushing tube (41) (or plug (15) if no CIP). Remove o-ring (40).
2. Pull down lock (44) over piston rod (29).
3. Pull away clamps (43) from spindle liner (42).
4. Pull out balanced plug (94). Make sure spindle liner is free of both piston rod and balanced plug. If external CIP to leakage chamber: Remove o-rings (39).



Step 4

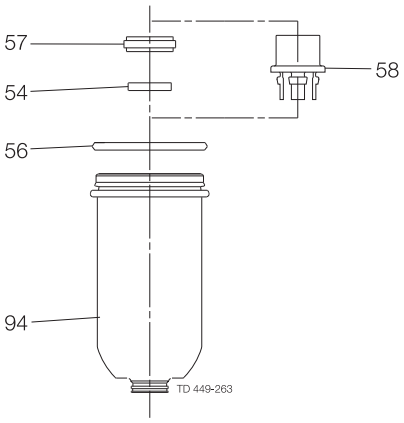
1. If present, unscrew flushing tubes (66) and remove o-rings (67) and nozzles (68 + 69).
2. Pull out sealing element (48) from intermediate piece (37).
3. Pull out o-ring (47), lip seal (49) and o-ring (46) from sealing element

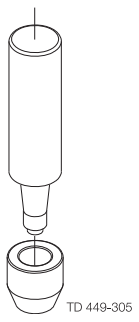


Step 5

Remove lip seal (57) (or spray nozzle (58) if valve is supplied with Spiral-Clean). For removal and replacement of seal ring (56), please see 5.3 Tank plug, replacement of radial seal

NOTE!
For valve size DN/OD51 & DN50:
Lip seal (57) can only be mounted with special tool, please contact Alfa Laval.





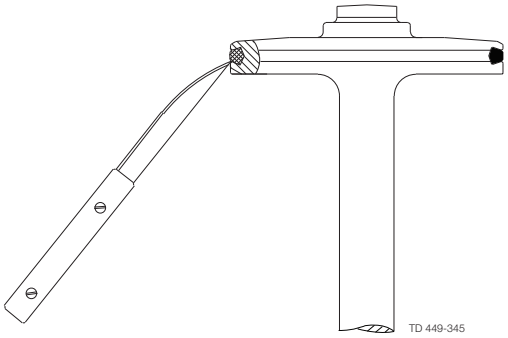
Mounting tool for lip seal (Item no. 9613-0040-01)

5 Maintenance

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

5.3 Tank plug, replacement of radial seal

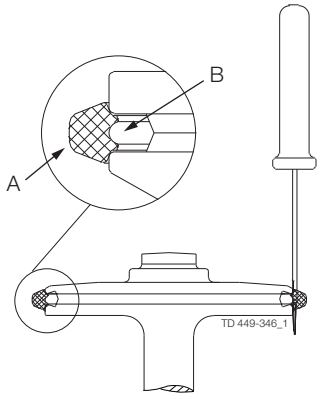
Step 1
Cut and remove old seal ring (74) using a knife, screwdriver or similar.
Be careful not to scratch the plug.



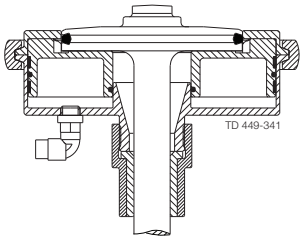
Step 2
Pre-mount seal ring as shown on drawing.

Rotate along circumference to fix gasket as shown in the picture

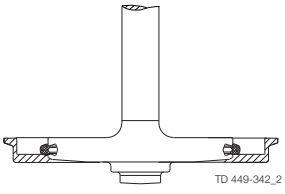
A. Carefully lubricate sealings with acceptable lubricant, before pre-mounting
B. Do not lubricate behind the sealing



Item numbers for radial tool			
Seat ø53.3	Seat ø81.3	Seat ø100.3	Seat ø115.3
9613-4260-01	9613-4260-02	9613-4260-03	9613-4260-04

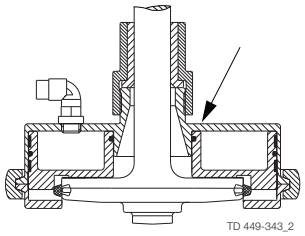


Step 3
Place lower tool part.



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

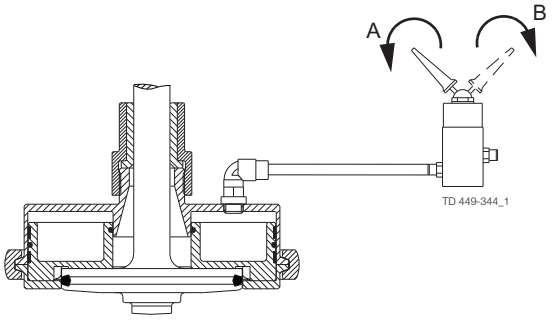
Step 4
1. Place upper tool part including piston.
2. Clamp the two tool parts together.



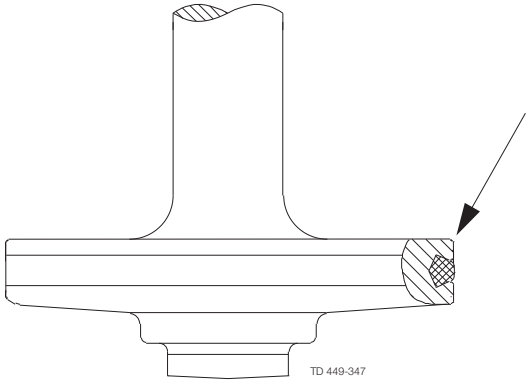
Tool marked with item number

Step 5
1. Supply compressed air.
2. Release compressed air.
3. Remove tool parts.

A = On
B = Off

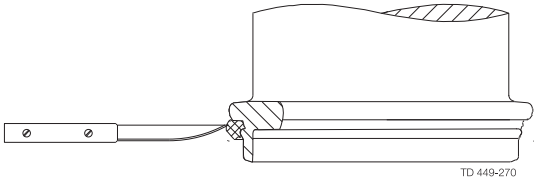


Step 6
Inspect the seal to ensure it does not twist in the groove, and press in the 4 outsticking points with a screwdriver!



5.4 Balanced plug, replacement of axial seal

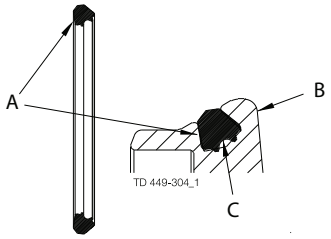
Step 1
Remove old seal ring (56) using a knife, screwdriver or similar. Be careful not to scratch the plug.



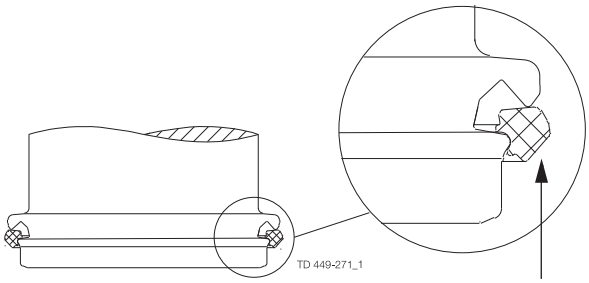
5 Maintenance

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

Step 2
Pre-mount seal ring as shown on drawing.

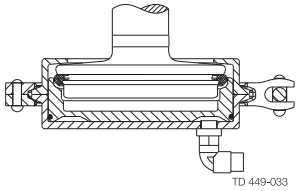


A = Flat side of the sealing
B = Balanced plug
C = Do not lubricate behind the sealing

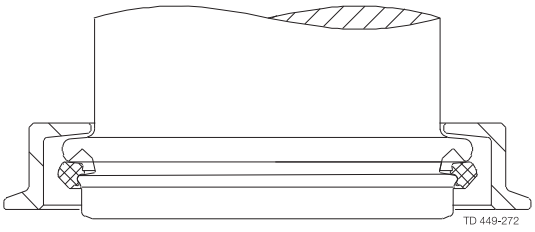


Carefully lubricate sealings with acceptable lubricant, before pre-mounting.

Item no. for tool for axial sealing, upper plug			
Seat ø53.3	Seat ø81.3	Seat ø101.3	Seat ø115.3
9613-0505-01	9613-0505-02	9613-0505-08	9613-0505-03

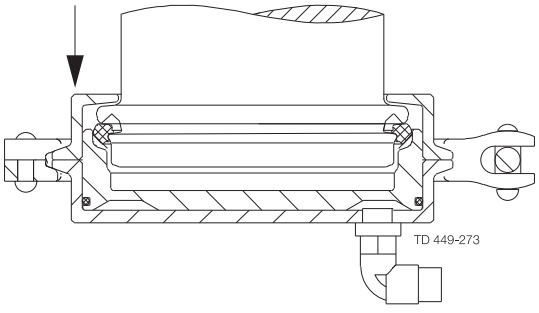


Step 3
Place tool part 1.

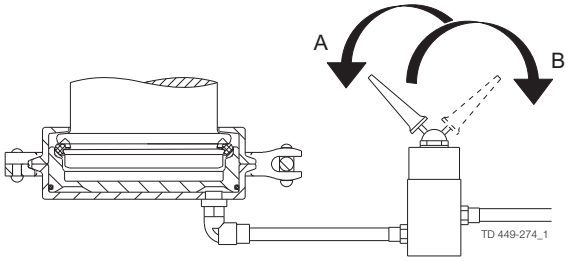


Step 4
1. Place tool part 2 including piston.
2. Clamp the two tool parts together.

Tooling marked with item number



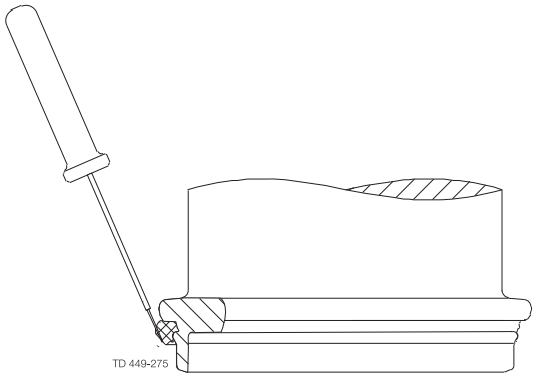
Step 5
1. Supply compressed air.
2. Release compressed air.
3. Rotate the tool 45° with regards to the plug.
4. Supply compressed air.
5. Release compressed air and remove tool.



A = On
B = Off

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

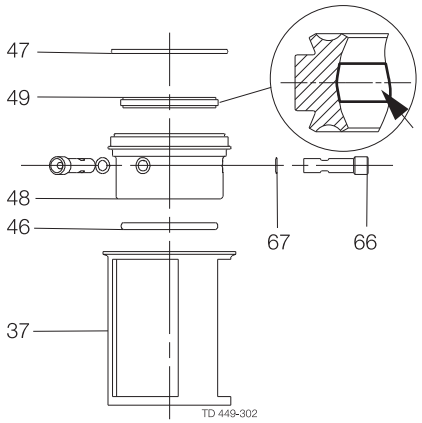
Step 6
1. Inspect the seal.
2. Release air at 3 different positions of the circumference.



5.5 Assembly of valve

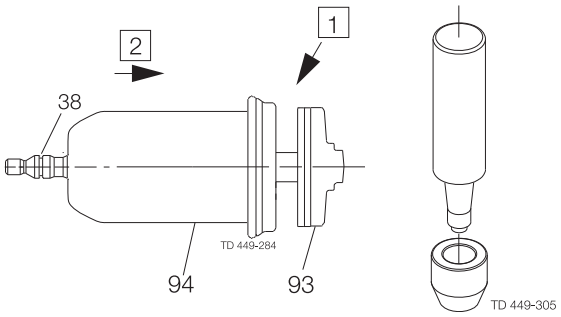
Step 1
1. Fit o-ring (47) (do not twist), lip seal (49) and o-ring (46) in sealing element (48) (Lubricate with Klüber Paralique GT 703).
   NOTE:
   The o-ring should be gently pressed into the groove
2. Fit sealing element in intermediate piece (37).
3. Place o-rings (67) and mount flushing tubes (66). Be sure to align nozzles (68 + 69) towards recess.

Lightly lubricate inner grove with Klüber Paralique GT 703



Step 2
1. Place lip seal (57) in upper plug (or spray nozzle if the valve has SpiralClean) and the o-ring (38) in the lower plug.
2. Press tank plug (93) rapidly into balanced plug (94) through the lip seal.
   NOTE:
   Do not damage the lips when tank plug (93) with o-ring (38) passes the lip seal.

NOTE!
For valve size DN/OD51 & DN50:
Lip seal (57) can only be mounted with special tool, please contact Alfa Laval.



Mounting tool for lip seal (Item no. 9613-0040-01)

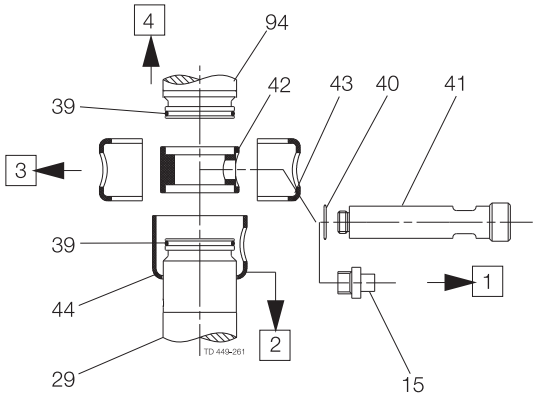
5 Maintenance

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

Step 3

Place coupling system and balanced plug according to illustrations (1 to 4).

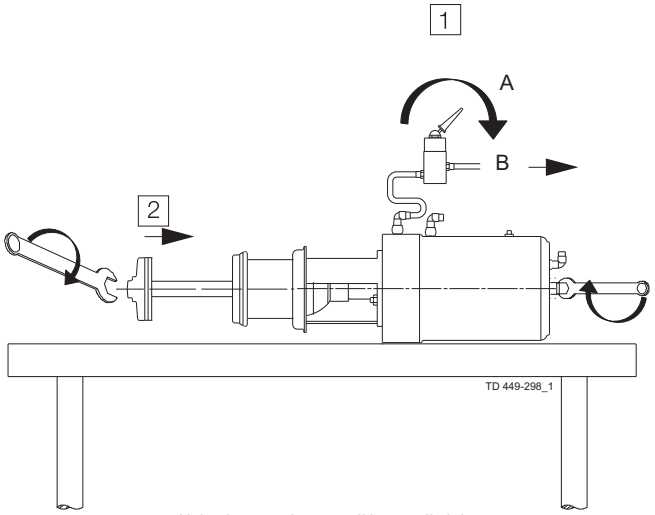
1. Push lock (44) up over piston rod (29).
2. If external CIP to leakage chamber: Place o-rings (39).
3. Place spindle liner (42) on piston rod. Fit balanced plug (94).
4. Mount clamps (43) on spindle liner (42).
5. Fit lock (44).
6. Fit o-ring (40). Fit flushing tube (41) (or plug (15) if no CIP).



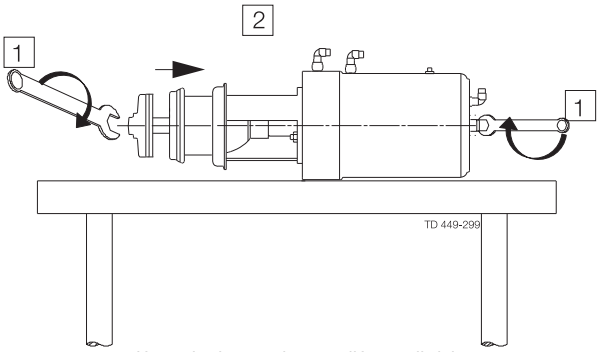
Step 4

Recommended torque values for fitting balanced and tank plug parts

Dimension	Torque (Nm)/(lbf-ft)
51 mm/2"/DN 50	5/(3.7)
All others	20/(14.8)



If balanced seat lift available



If no balanced seat lift available

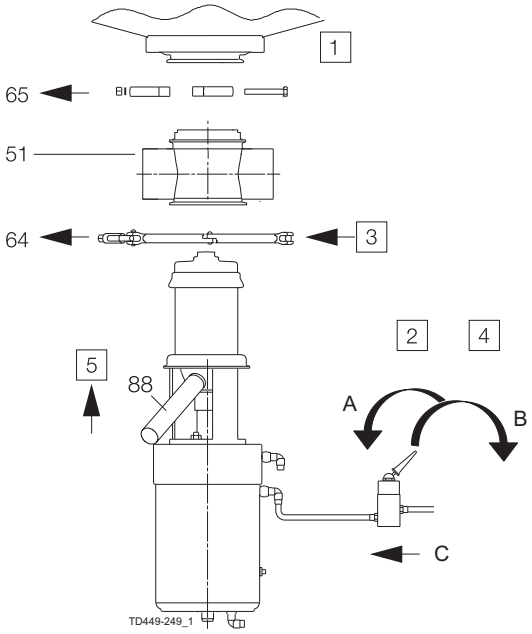
A = Off
B= Air

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

Step 5
- **Never** stick your fingers through the valve ports if the actuator is supplied with compressed air.
- **Always** supply compressed air, before demounting the valve.

Reassemble valve according to illustration (1 - 5).

1. **If tank flange**:
   Fit o-ring (76) on valve body (51) and mount valve body in tank flange and tighten clamp (65)
   (Maximum torque for clamp bolts:17 Nm/13 lbf ft).
   OR if stub flange
   Fit o-ring (91) in stub flange (92) and mount valve body (51) in stub flange and tighten clamp (65).
   (Maximum torque for clamp bolts:17 Nm/13 lbf ft).
2. Supply compressed air and mount the actuator together with the internal valve parts.
3. Fit and tighten clamp (64).
   (Maximum torque for clamp nut: 10Nm/7.4 lbf-ft).
4. Release compressed air.
5. Fit o-ring (89) on tube (88) and mount tube (88) in balanced plug (94).



A = On B = Off C = Air

5 Maintenance

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

5.6 Dismantling of acutator

Step 1
1. Dismantle the valve in accordance with instructions in section 5.2 Dismantling of valve . Pay special attention to the warnings!
2. The actuator is now ready for service. Please see drawing when dismantling according to steps 2 to 6 on this page.

Step 2
1. Remove nuts (36) and washers (35).
2. Pull out intermediate piece (37) from the actuator.
3. Remove cover disk (25).
4. Remove plug (86) with o-rings (85 & 87) from intermediate piece (37).

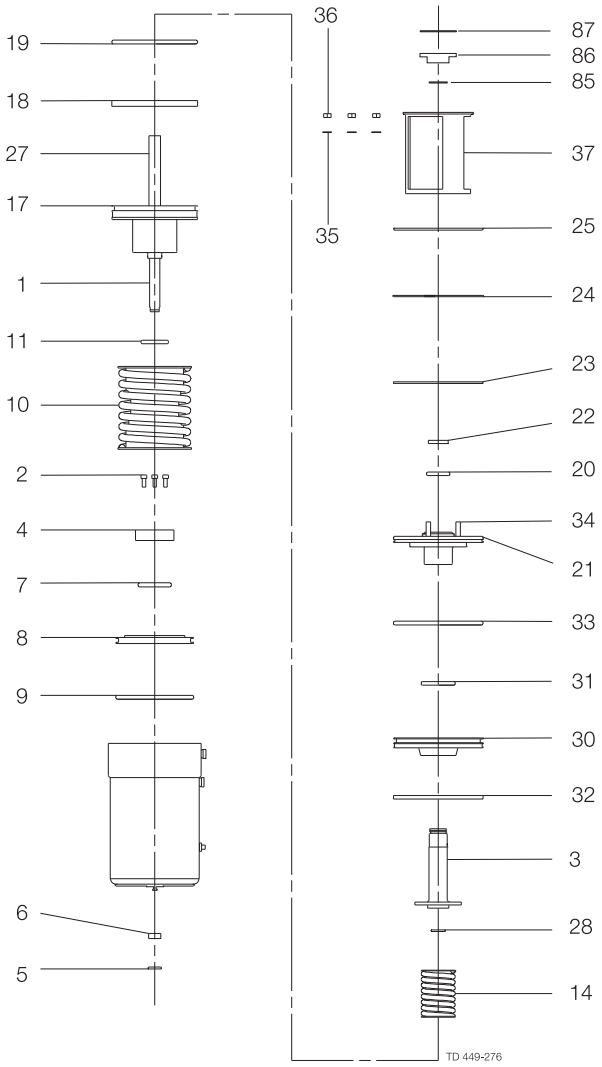
Step 3
1. Remove piston rod (29), bottom (21) and lower piston (30).
2. Separate the three parts.
3. Remove o-rings (20, 22 and 23) from bottom, o-rings (33 and 31) and guide ring (32) from lower piston as well as o-ring (28) from piston rod.
4. Remove spring assembly (14).

Step 4
1. Remove inner stem (27), main piston (17) and distance spacer (11) if present. Remove guide ring (18) and o-ring (19).
2. Remove spring assembly (10).

Step 5
NOTE!
Not on actuator 3.
1. Unscrew screws (2) (are glued!).
2. Remove stop (4).
3. Remove upper piston (8). Remove o-rings (7 and 9).

Step 6
1. Remove o-ring (5) and guide ring (6).

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



5 Maintenance

Study the instructions carefully.
The items refer to the parts list and service kits section.
Replace seals if necessary.
Lubricate the rubber seals before fitting them.

5.7 Assembly of actuator

Step 1
Please see drawing when reassembling according to steps 2 to 5 on this page.

Step 2
1. Fit guide ring (6) and o-ring (5).

NOTE!
Not on actuator 3:

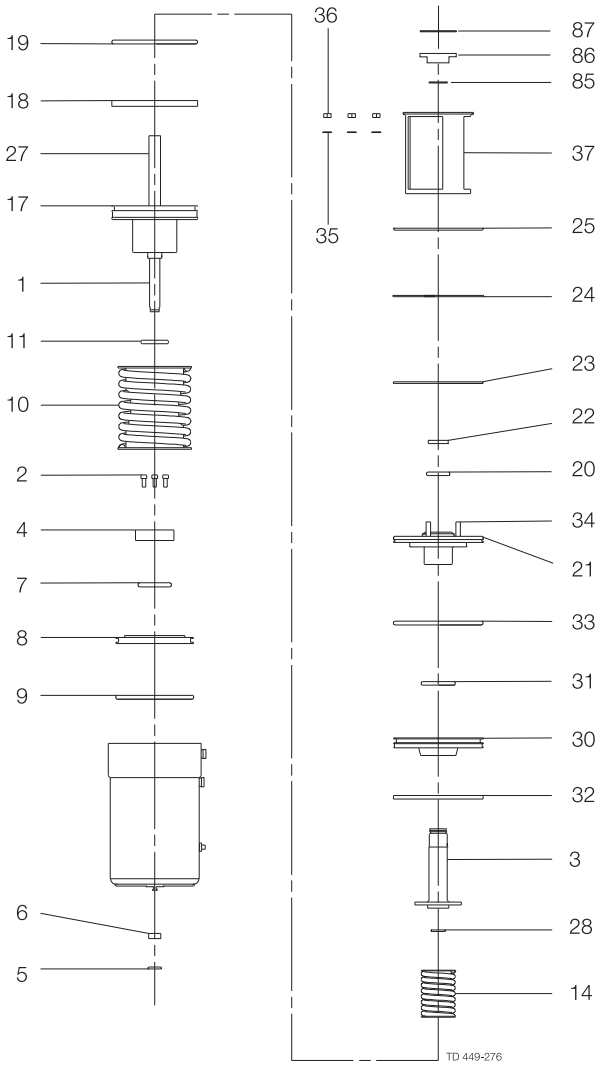
2. Fit o-rings (7 and 9). Place upper piston (8).
3. Fit stop (4).
4. Tighten screws (2).(Secure with glue).

Step 3
1. Place spring assembly (10).
2. Fit o-ring (19) and guide ring (18). Mount distance spacer (11), main piston (17) and inner stem (27).

Step 4
1. Fit spring assembly (14).
2. Fit o-ring (28) in piston rod, fit o-rings (33 and 31) and guide ring (32) in lower piston and fit o-rings (20, 22 and 23) in bottom.
3. Fit piston rod (29), lower piston (30) and bottom (21).
4. Mount the three parts.

Step 5
1. Fit retaining ring (24).
2. Fit cover disk (25).
3. Mount intermediate piece (37) on actuator.
4. Fit and tighten nuts (36) and washers (35).
5. Fit o-rings (85 & 87) in plug (86) and fit plug (86) in intermediate piece (37).

Study the instructions carefully.
The items refer to the parts list and service kits section.
Replace seals if necessary.
Lubricate the rubber seals before fitting them.



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

Unique is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve.

The valve has two independent plug seals, forming a leakage chamber. In the leakage chamber there is only atmospheric pressure during every working condition. In case of rare accidental leaking of product, this will flow into the leakage chamber and be discharged through the leakage outlet.
When the valve is open, the leakage chamber is closed. The product can then flow from tank to pipeline.

Technical data		
Max. product pressure		1000 kPa (10 bar) (145 psi)
Min. product pressure		Full vacuum
Recommended min. pressure for SpiralClean		2 bar (29 psi) - max. 8 bar (116 psi)
Temperature range		-5°C to +125°C (23°F to 257°F) - NBR only up to 85°C (175°F)
Air pressure		Max. 800 kPa (8 bar) (116 psi)
Products acc. to PED 97/23/EC		Category I, Fluids group 1, DN ≥ 125 only Fluids group 2
Materials		
Product wetted steel parts	Acid resistant steel AISI 316L	
Other steel parts	Stainless steel AISI 304	
Product wetted seals	EPDM, HNBR, NBR or FPM	
Other seals	CIP seals: EPDM	
Actuator seals	NBR	
Surface finish	Standard	Internal/external Ra < 1.6 (64 µ")
	Optional	Internal bright/external standard Ra < 0.8 (32 µ")
	3A (US standard version)	Internal/external bright (internal polished) Ra < 0.8 (32 µ")

NOTE! The Ra-values are only for the internal surface.

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.

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

Size	DN/OD				DN						Longstroke			
											DN/OD		DN	
ISO-DIN	51	63.5	76.1	101.6	50	65	80	100	125	150	63.5	76.1	65	80
Air consumption for Balanced Seat-lift Litre = volume at atmosphere pressure Gallons = volume at atmosphere pressure	0.20 0.05	0.40 0.11	0.40 0.11	0.62 0.16	0.20 0.05	0.40 0.11	0.40 0.11	0.62 0.16	0.62 0.16	0.62 0.16	0.40 0.11	0.40 0.11	0.40 0.11	0.40 0.11
Air consumption for Tank Seat-lift Litre = volume at atmosphere pressure Gallons = volume at atmosphere pressure	1.10 0.29	0.13 0.03	0.13 0.03	0.21 0.06	1.10 0.29	0.13 0.03	0.13 0.03	0.21 0.06	0.21 0.06	0.21 0.06	0.13 0.03	0.13 0.03	0.13 0.03	0.13 0.03
Air consumption for Main Movement Litre = volume at atmosphere pressure Gallons = volume at atmosphere pressure	0.86 0.23	1.63 0.43	1.63 0.43	2.79 0.74	0.86 0.23	1.62 0.43	1.62 0.43	2.79 0.74	2.79 0.74	2.79 0.74	1.63 0.43	1.63 0.43	1.62 0.43	1.62 0.43
Kv-value for Balanced CIP Seat-lift [m^3/h] CV-value for Balanced CIP Seat-lift [GPM]	1.50 6.60	2.50 11.0	2.50 11.0	1.90 8.36	1.50 6.6	2.50 11.0	2.50 11.0	1.90 8.36	3.70 16.3	3.70 16.3	2.50 11.0	2.50 11.0	2.50 11.0	2.50 11.0
Kv-value for Tank Seat-lift [m^3/h] CV-value for Balanced Tank Seat-lift [GPM]	0.90 3.96	1.90 8.36	1.90 8.36	1.40 6.16	0.90 3.96	1.90 8.36	1.90 8.36	1.40 6.16	3.10 13.7	3.10 13.7	1.90 8.36	1.90 8.36	1.90 8.36	1.90 8.36
Kv-value for SpiralClean Spindle CIP [m^3/h] CV-value for SpiralClean Spindle CIP [GPM]	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53	0.12 0.53
Kv-value for SpiralClean External CIP in leakage chamber [m^3/h]	0.25	0.29	0.29	0.29	0.25	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
CV-value for SpiralClean External CIP in leakage chamber [GPM]	1.10	1.28	1.28	1.28	1.10	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28

NOTE!
Formula to estimate CIP flow during seat lift (for liquids with comparable viscosity and density to water):

Q =	Cv • √ Δ p
Q =	CIP - flow (m^3/h).
Kv =	Kv value from the above table
Δ P =	CIP pressure (bar)
Cv =	1.163 x Kv gpm
1 bar =	14.5 psi

(US measurements)

Q =	Cv • √ Δ p
Q =	CIP - flow (gpm)
Cv =	Cv value from the above table
Δ P =	CIP pressure (psi).
Cv =	1.163 x Kv gpm
1 bar =	14.5 psi

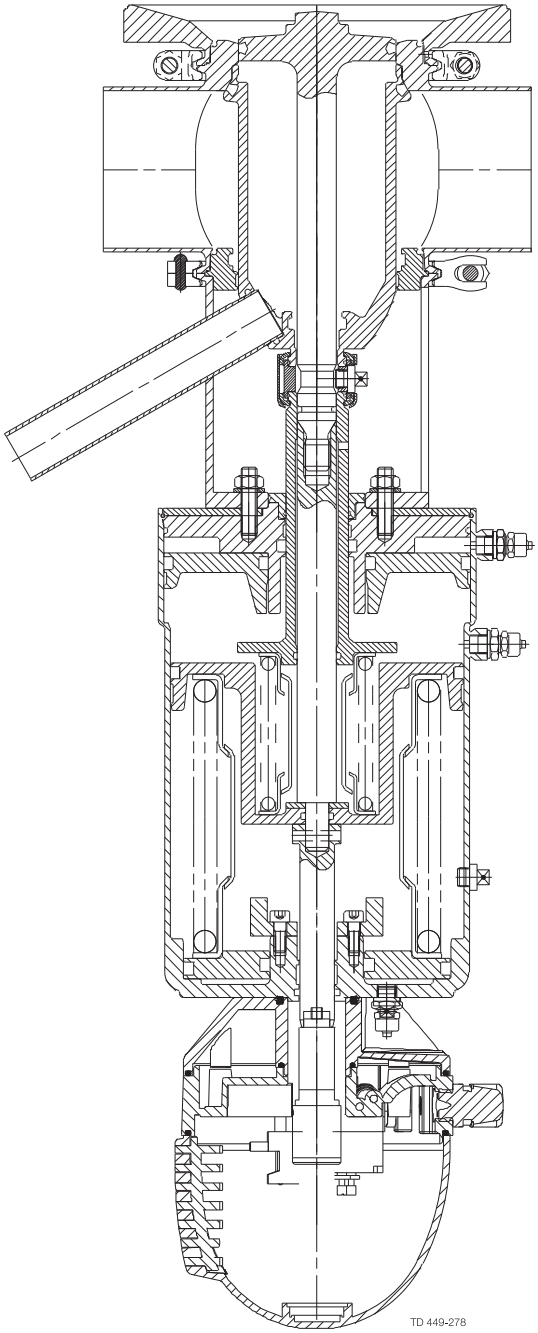
Weight (kg)

Size	DN/OD				DN						Longstroke			
											DN/OD		DN	
ISO-DIN	51	63.5	76.1	101.6	50	65	80	100	125	150	63.5	76.1	65	80
Weight (kg)* Unique TO	12.5	22.5	22.5	33	12.5	22.5	22.5	33	36	38	28	28	28	28
Weight (kg)* Unique TO with external cleaning	13	23.5	23.5	34	13	23.5	23.5	34	37	- - -	29	29	29	29

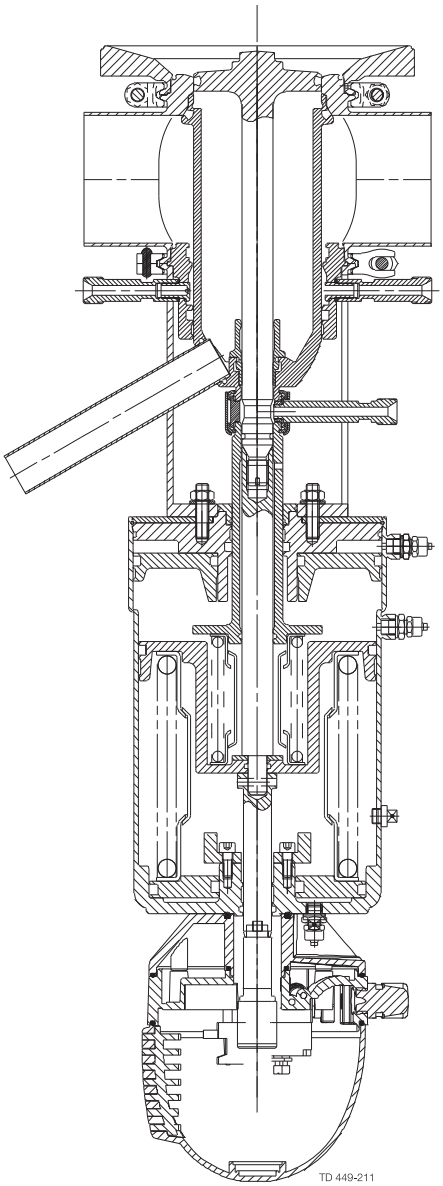
*= without tank flange

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

7.1 Configuration examples



Unique -TO



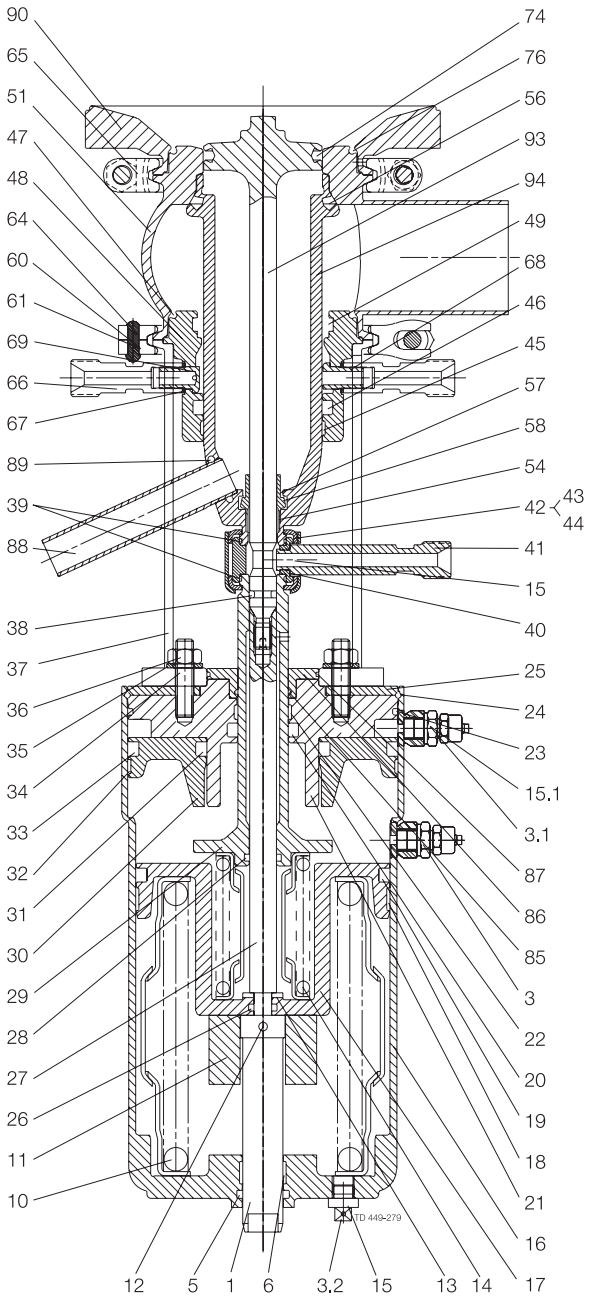
Unique-TO with external cleaning

7 Parts list and service kits

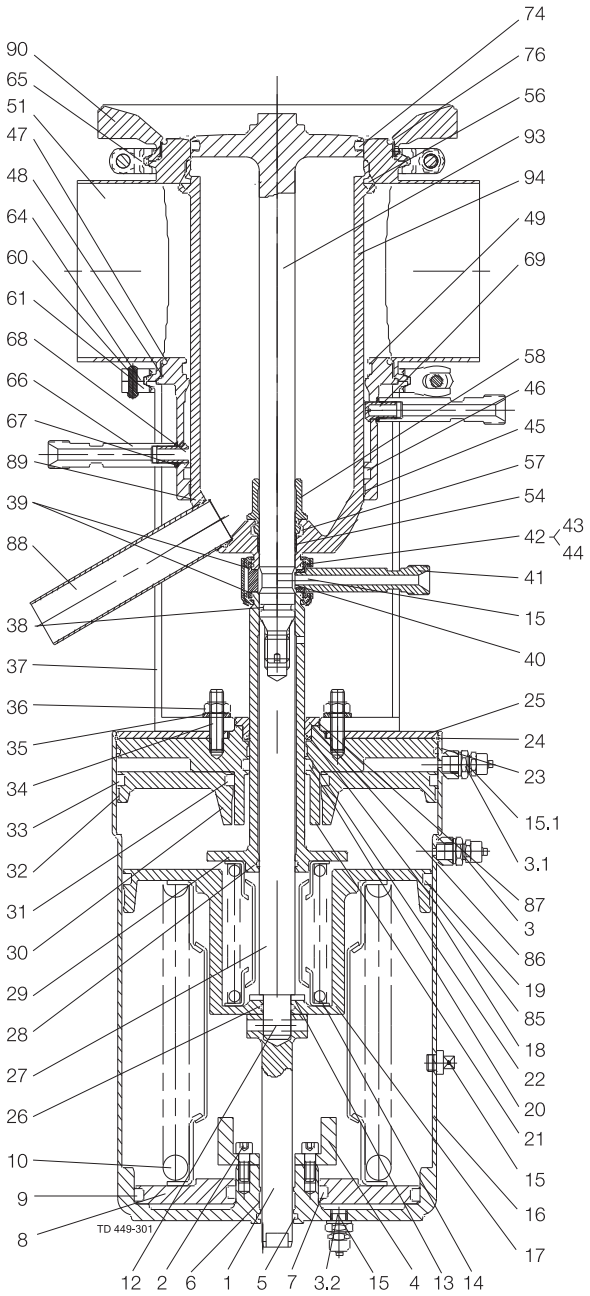
It is important to observe the technical data during installation, operation and maintenance. Inform the personnel about the technical data.

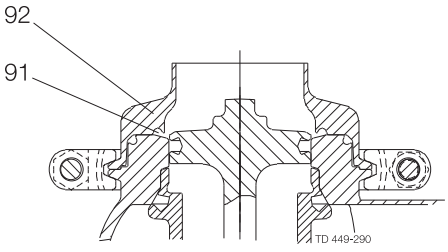
7.2 Wear parts

ø120



ø157/ø186





7 Parts list and service kits

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

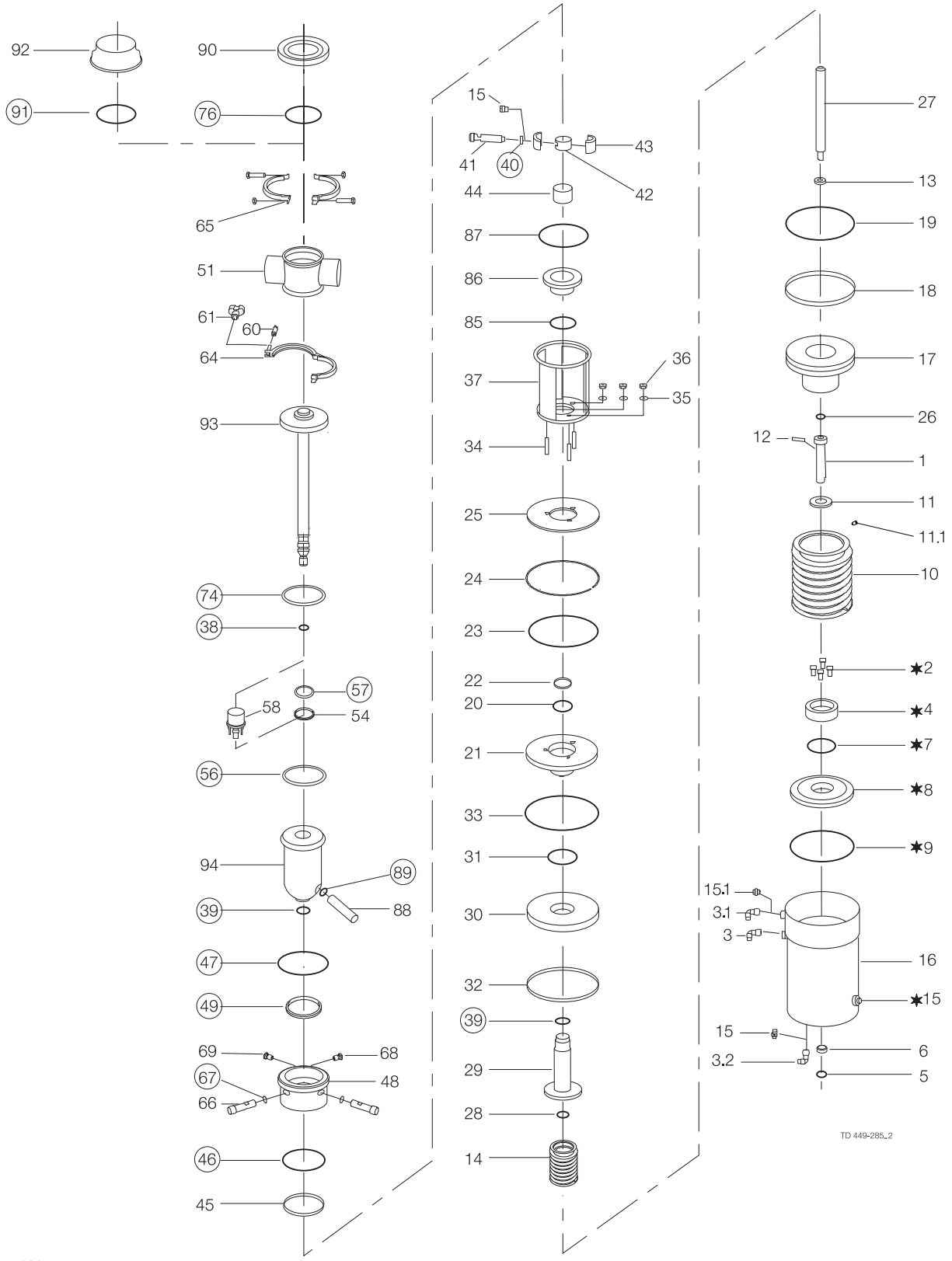
Parts list

Pos.	Qty	Denomination
38	1	O-ring
39	2	O-ring
40	1	O-ring
46	1	O-ring
47	1	O-ring
49	1	Lip seal
56	1	Seal ring
57	1	Lip seal
67	2	O-ring
74	1	Seal ring
76	1	O-ring
89	1	O-ring
91	1	O-ring

7 Parts list and service kits

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

7.3 Parts



O = Wear parts
• = Positions not present on actuator ø120

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

Parts list

Pos.	Qty	Denomination
1	1	Upper stem
2	4	Screw
3	1.2.3	Air fitting
4	1	Stop for upper piston
5	1	O-ring
6	1	Guide ring, Turcite
7	1	O-ring
8	1	Upper piston
9	1	O-ring
10	1	Spring assembly
11	1	Distance spacer
11.1	1	Screw
12	1	Pin
13	1	Washer
14	1	Spring assembly
15	1.2.3	Plug
15.1	1	Plug
16	1	Cylinder
17	1	Main piston
18	1	Guide ring, Turcite
19	1	O-ring
20	1	O-ring
21	1	Bottom
22	1	Guide ring, Turcite
23	1	O-ring
24	1	Retaining ring
25	1	Cover disk
26	1	O-ring
27	1	Inner stem
28	1	O-ring
29	1	Piston rod
30	1	Lower piston
31	1	O-ring
32	1	Guide ring, Turcite
33	1	O-ring
34	3	Bolt
35	3	Washer
36	3	Nut
41	1	Flushing tube
42	1	Spindle liner
43	2	Clamp
44	1	Lock
45	1	Guide ring
48	1	Sealing element
54	1	Guide ring
58	1	Spray nozzle
60	1	Hexnut
61	1	Wingnut USA
64	1	Clamp without nut
65	1	Clamp
66	2	Flushing tube
68	1	Drain
69	1	Nozzle
85	1	O-ring
86	1	Prop
87	1	O-ring
88	1	Pipe for balance plug
93	1	Tank plug
94	1	Balance plug

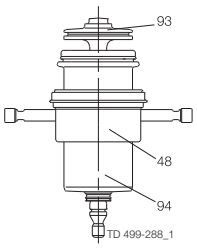
7 Parts list and service kits

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

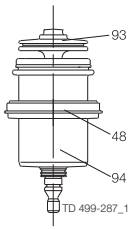
7.4 Service kits

Service Kits for Product Wetted Parts

Plug set-up 6



Plug set-up 12



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

Parts list

Pos.	Qty	Denomination
37	1	Intermediate piece
51	1	Valve body

Parts list

Pos.	Qty	Denomination
90	1	Tank flange
92	1	Pipe flange

Service kits

Denomination	Item number Plug Set-up 12	Item number Plug Set-up 6
DN/OD 51/DN 50		
Service kit, EPDM	9611-92-6433	9611-92-6449
Service kit, NBR	9611-92-6434	9611-92-6450
Service kit, FPM	9611-92-6435	9611-92-6451
Service kit, HNBR	9611-92-6436	9611-92-6452
DN/OD 63.5 - 76.1/DN 65 - 80		
Service kit, EPDM	9611-92-6437	9611-92-6453
Service kit, NBR	9611-92-6438	9611-92-6454
Service kit, FPM	9611-92-6439	9611-92-6455
Service kit, HNBR	9611-92-6440	9611-92-6456
DN/OD 101.6/DN 100		
Service kit, EPDM	9611-92-6441	9611-92-6457
Service kit, NBR	9611-92-6442	9611-92-6458
Service kit, FPM	9611-92-6443	9611-92-6459
Service kit, HNBR	9611-92-6444	9611-92-6460
DN 125/DN 150		
Service kit, EPDM	9611-92-6445	9611-92-6461
Service kit, NBR	9611-92-6446	9611-92-6462
Service kit, FPM	9611-92-6447	9611-92-6463
Service kit, HNBR	9611-92-6448	9611-92-6464
Stub Flange		
DN/OD 51/DN 50		
Service kit, EPDM	9611-92-6465	9611-92-6481
Service kit, NBR	9611-92-6466	9611-92-6482
Service kit, FPM	9611-92-6467	9611-92-6483
Service kit, HNBR	9611-92-6468	9611-92-6484
DN/OD 63.5 - 76.1/DN 65 - 80		
Service kit, EPDM	9611-92-6469	9611-92-6485
Service kit, NBR	9611-92-6470	9611-92-6486
Service kit, FPM	9611-92-6471	9611-92-6487
Service kit, HNBR	9611-92-6472	9611-92-6488
DN/OD 101.6/DN 100		
Service kit, EPDM	9611-92-6473	9611-92-6489
Service kit, NBR	9611-92-6474	9611-92-6490
Service kit, FPM	9611-92-6475	9611-92-6491
Service kit, HNBR	9611-92-6476	9611-92-6492
DN 125/DN 150		
Service kit, EPDM	9611-92-6477	9611-92-6493
Service kit, NBR	9611-92-6478	9611-92-6494
Service kit, FPM	9611-92-6479	9611-92-6495
Service kit, HNBR	9611-92-6480	9611-92-6496

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.