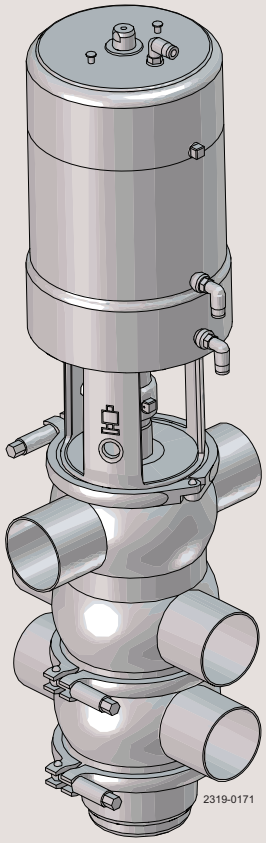
Instruction Manual

Unique Mixproof 3-body



100000711-EN1 2018-12

Original manual

www.sks-online.com

Table of contents

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

1 Introduction

Thank you for purchasing an Alfa Laval product.

This manual has been provided to instruct you in how to operate and service this product correctly and safely. Make sure that you follow all directions and instructions; failure to do so could result in personal injury or equipment damage.

This manual should be considered part of this product and should remain with it at all times for reference. (If you sell it, please be sure to include this manual with it.) Warranty is provided as part of Alfa Laval's commitment to our customers who operate and maintain their equipment as this manual dictates. Failure to do so may result in loss of warranty.

Where defects appear on the product during the warranty period, Alfa Laval will take back the product and correct the problem. Should the equipment be modified or not kept in the manner prescribed within this manual, the warranty will become null and void.

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

2.3 Safety precautions

Installation:

Always read the technical data thoroughly (see section 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 section 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 sterilising.
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 section 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:

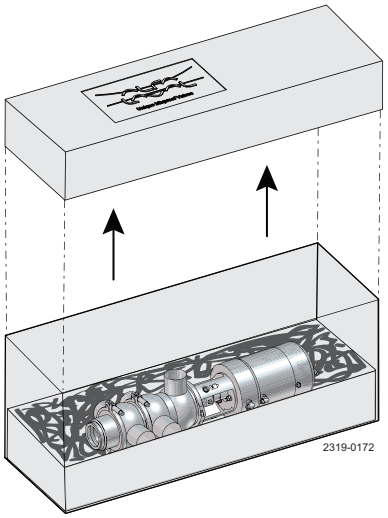
Always ensure that compressed air are released
Always ensure that all connections is disconnected before attempting to remove the valve from the installation
Always drain liquid from valves before transportation
Always used predesigned lifting points if defined
Always ensure sufficient fixing of the 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 clearly visible.

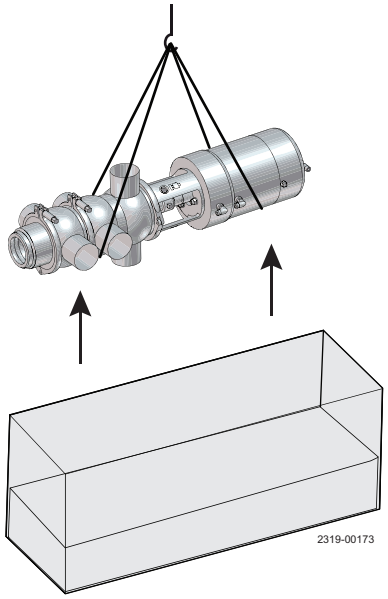
3.1 Unpacking/intermediate storage

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



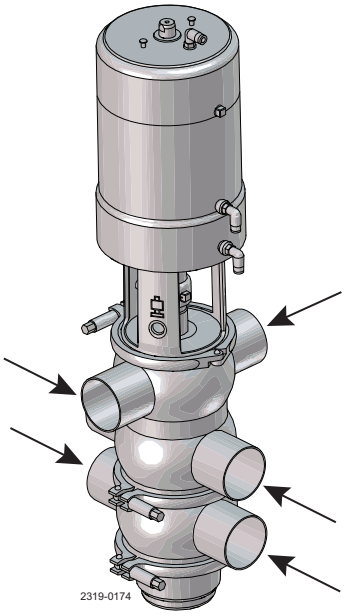
Step 3
Lift out the valve.
NOTE!
Please note weight of valve as printed on box.



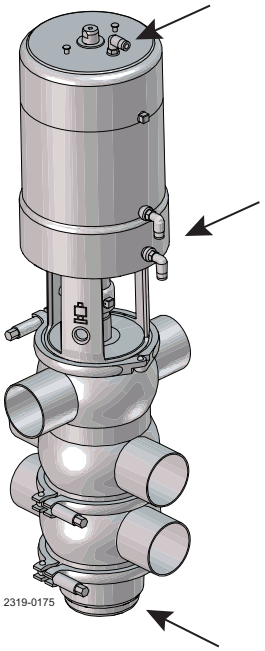
3 Installation

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 clearly visible.

Step 4
Remove possible packing materials from the valve ports.

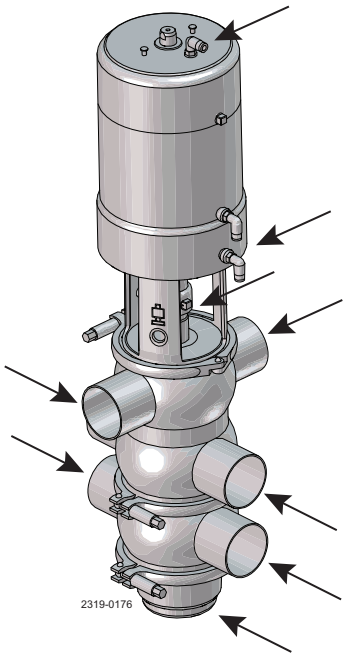


Step 5
Inspect the valve for visible transport damage.

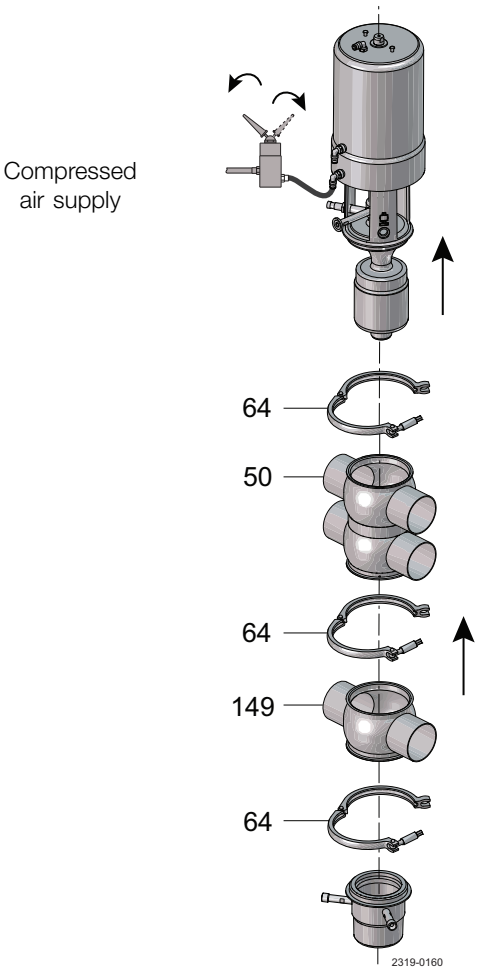


The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is clearly visible.

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

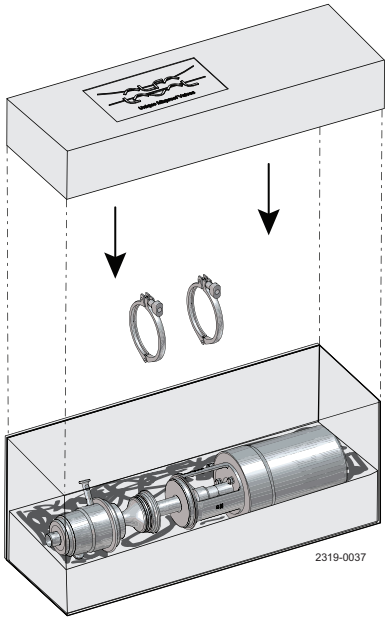


Step 7
Disassemble according to illustrations
(please also see 5.2 Dismantling of valve).
1. Supply compressed air.
2. Remove upper clamp (64).
3. Release compressed air.
4. Lift out actuator with plugs.



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.

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



3.2 Recycling

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 accordance with local regulations

Scrapping

- At the 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

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.

3.3 General installation

Step 1

- Always read the technical data thoroughly (see section 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)

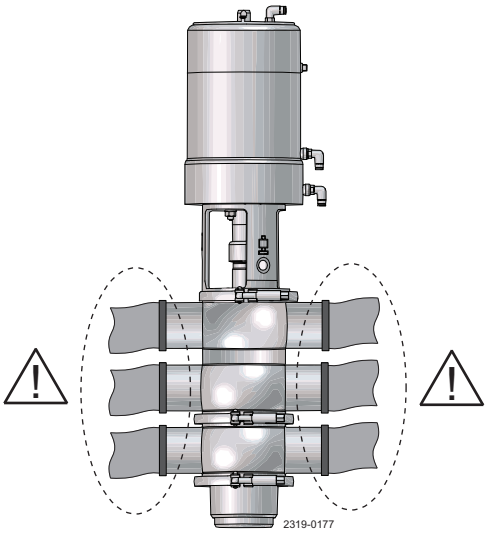
CAUTION!
- Fit the supplied warning label on the valve so that it is clearly visible.
- Alfa Laval cannot be held responsible for incorrect installation

NOTE!
- Mount valves vertically, or as close to vertical as possible having the leakage outlet turned downwards.

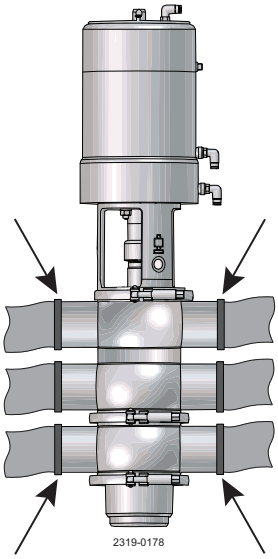
Step 2
Avoid stresses to the valve as this can result in deformation of the sealing area and misfunction of the valve (leakage or faulty indication).

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).



Step 3
Fittings
Ensure that the connections are tight.

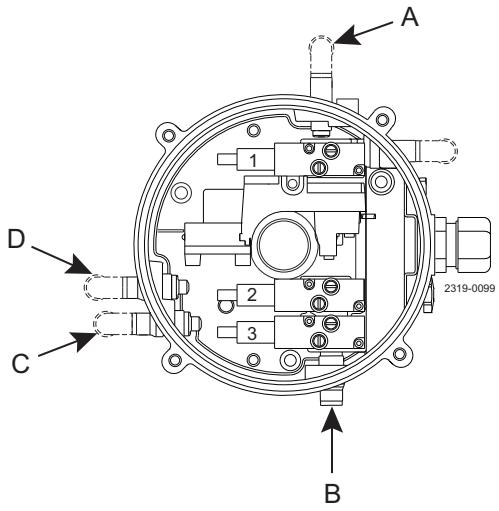


Remember seal rings!

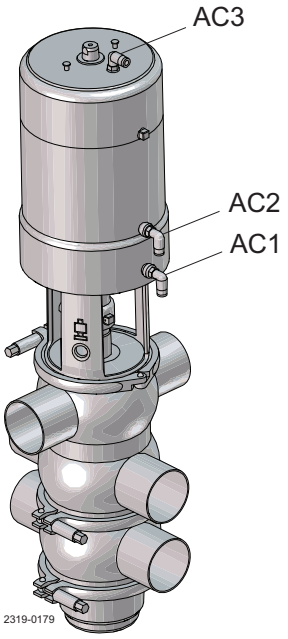
3 Installation

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 4



A = Air out 1A
B = Air in
C = Air out 3
D = Air out 2

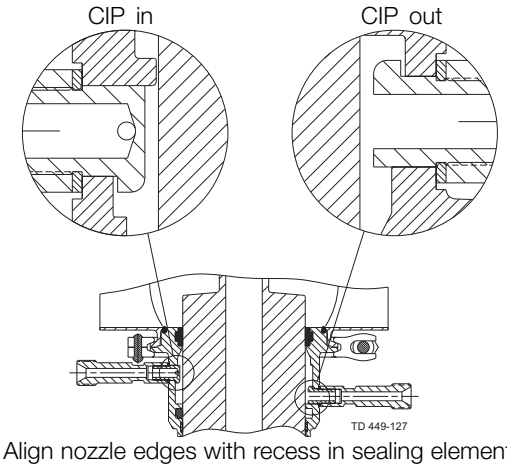


AC1 = Air connection 1 upper seat push
AC2 = Air connection 2 open/close
AC3 = Air connection 3 lower seat push

Valve Pneumatic Connections	
ThinkTop Fitting ID	Actuator Fitting ID
Out 1A	Air connection 2
Out 2	Air connection 3
Out 3	Air connection 1

Air connection: R 1/8" (BSP).

Step 5
It is important to connect CIP inlet to the small inlet nozzle to avoid built-up pressure in the cleaning chamber.



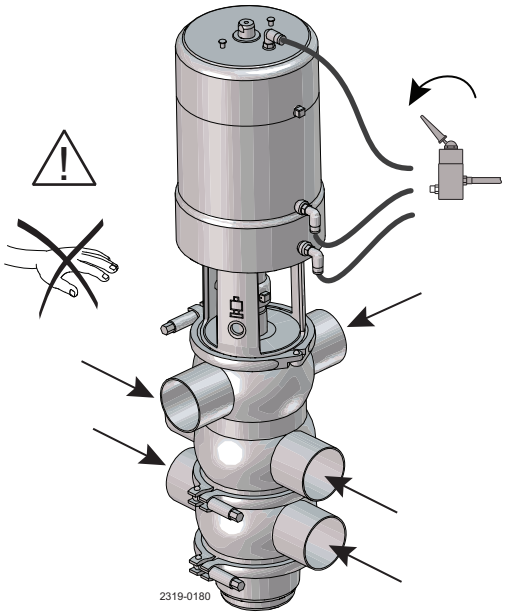
Align nozzle edges with recess in sealing element.

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.

3.4 Welding

Step 1

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



Step 2
Dismantle the valve in accordance with the description of dismantling the valve, see 5.2 Dismantling of valve

Step 3

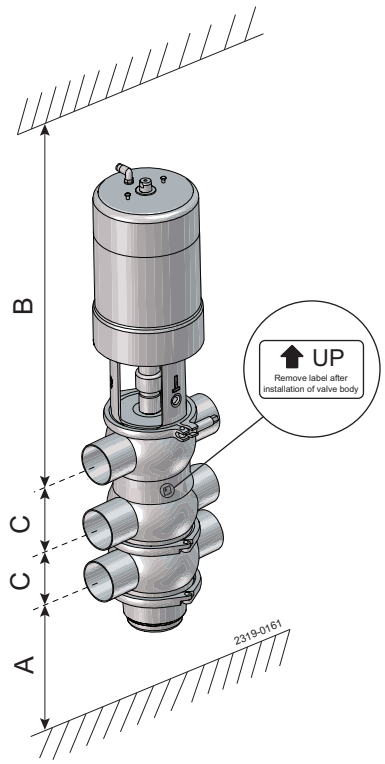
Before welding the valve into the pipe line please note:

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

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

Size	ISO				DIN			
	DN/OD 51	DN/OD 63.5	DN/OD 76.1	DN/OD 101.6	DN 50	DN 65	DN 80	DN 100
A	265	300	300	360	265	290	270	350
B*	835	970	980	1175	835	970	980	1175
C	73.8	86.3	96.9	123.6	76	92	107	126

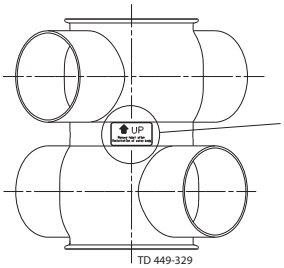
NOTE! If ThinkTop® is mounted, add 180 mm (7,1") to B measure.
(All measures in mm) (1 mm = 0.0394”)



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 4
WARNING
Make sure to turn the valve body correctly - conical valve seat upwards.



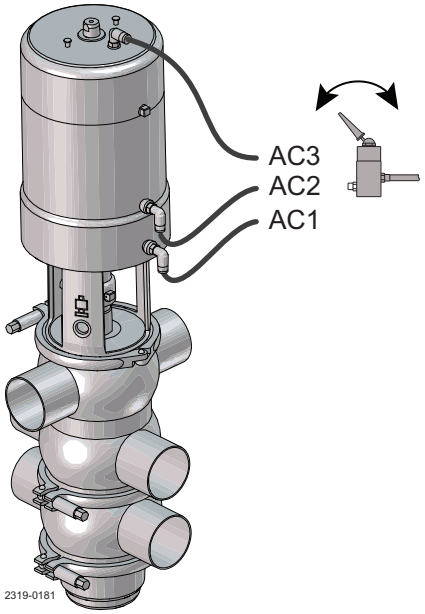
UP
Remove label after installation of valve body

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

Step 6
Pre-use check:
1. Supply compressed air to air connection 1, 2 and 3 one by one.
2. Operate the valve several times to ensure that it runs smoothly.

Pay special attention to the warnings!

AC1 = Air connection 1 upper seat push
AC2 = Air connection 2 open/close
AC3 = Air connection 3 lower seat push



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

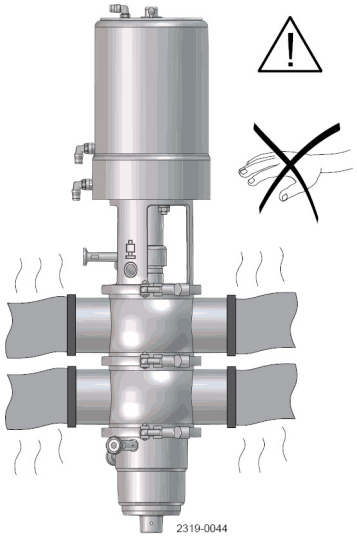
Step 1

- **Always** read the technical data thoroughly (see section 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 sterilising.



4.2 Recommended cleaning

Step 1

Always handle lye and acid with great care.

Caustic danger!

Always use rubber gloves!

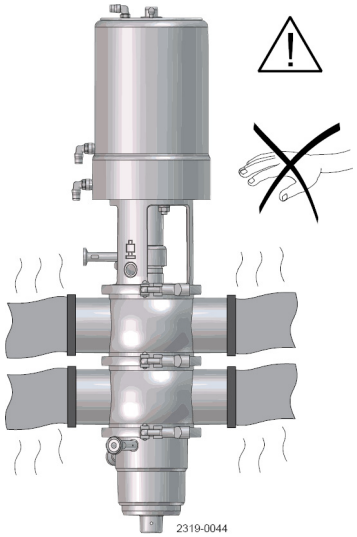
Always use protective goggles!

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.

Step 2

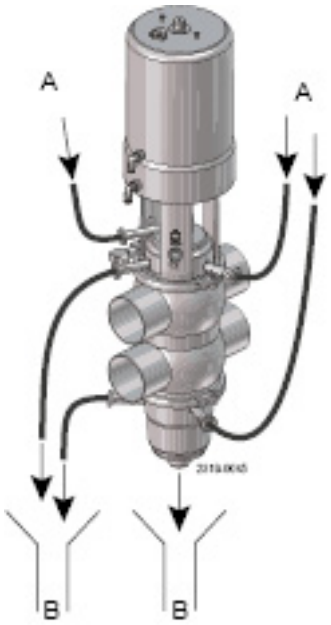
Never touch the valve or the pipelines when sterilising.



Step 3

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

A = CIP in
B = CIP out



Step 4

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

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.

Step 5
Recommended cleaning - general
Each mixproof valve shall be properly operated, including seat lifting, during CIP cleaning to assure exposure to product contact surfaces.
Alfa Laval offers the option of cleaning the leakage chamber by utilizing the SpiralClean nozzle during the CIP Cleaning.
The SpiralClean nozzle is accessed through the external inlet located at the Intermediate piece.
The CIP through the SpiralClean nozzle can be controlled by an external valve. Minimum recommended CIP pressure 2 bar (29 psi).

Alfa Laval offers the option of cleaning the OD of the upper and lower valve plug shaft(s) by utilizing the CIP sealing elements.
The CIP of the valve shaft(s) has an external inlet and outlet positioned on the sealing elements. Minimum recommended CIP pressure 2 bar (29 psi).
The CIP through the SpiralClean nozzle can be controlled by an external valve(s).
Alfa Laval recommends that OD cleaning of the valve plug shafts is only performed during CIP of the valve. For example: If only the upper portion of the valve body is cleaned while there is product present in the lower portion of the valve body. OD cleaning should only be performed on the upper plug.

Step 6
Recommended cleaning - specific
The chart below provides reference to cleaning solution agents, temperature and exposure times necessary during circulation to achieve good cleaning results.
All data shown is required for each valve during cleaning. Use clean water, free from chlorides, for mixing with chemical cleaning agents.

CIP event	Exposure time	Temperature	Agent	Concentration
Warm pre-rinse	3 minutes continuous	38-43 °C (100 – 110 °F)	None	None
Hot alkaline wash	10 minutes continuous	71 °C (160 °F)	NaOH (Sodium hydroxide)	1%
Cold post wash	3 minutes continuous	Cold	None	None
Cold acidified rinse	3 minutes continuous	Cold	$EHNO_3$(Nitric acid)	0.006%

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.

Step 7
Valve pneumatic operation during in-place cleaning
Each valve seat shall be lifted during the length of the cleaning cycle.
Seat lift durations shall not exceed 10 seconds.

These pneumatic functions include:

1. Upper valve seat lift (takes place during cleaning of upper valve body)
2. Lower valve seat push (takes place during cleaning of lower valve body)

The following chart presents an overview of these functions together with the recommended time durations at 1.5 bar (21psi) CIP pressure. It is recommended to do seat lift/push in the middle of each step in the CIP sequence.

CIP event @ length	Valve function	Valve solenoid no.	Solenoid mode	Actual opening time	Number of lifts/push in each CIP step
Warm pre-rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	1
	Lower seat lift	2	Energized	*0.5 sec	1
	SpiralClean vent	-	-	*5 sec	3
	OD cleaning	-	-	*5 sec	2
Hot alkaline wash @ 10 minutes	Upper seat lift	3	Energized	*0.5 sec	2
	Lower seat lift	2	Energized	*0.5 sec	2
	SpiralClean vent	-	-	*5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold post wash @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	1
	Lower seat lift	2	Energized	*0.5 sec	1
	SpiralClean vent	-	-	*5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold acidified rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	1
	Lower seat lift	2	Energized	*0.5 sec	1
	SpiralClean vent	-	-	*5 sec	3
	OD cleaning	-	-	*5 sec	2
Final rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	1
	Lower seat lift	2	Energized	*0.5 sec	1
	SpiralClean vent	-	-	*5 sec	3
	OD cleaning	-	-	*5 sec	2

*Time stated is the actual opening time for the valve. Programmed duration is depended on the access to compressed air and response time from PLC.
Variations caused by compressed air are typically:

- Long compressed air supply hoses.
- Small ID on air supply hoses.
- Limited availability of compressed air.
- Some products may require additional number of seat lifts/pushes.
- Duration of seat lift/push depend on available CIP pressure.

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.

Step 8
Consumption cleaning fluids
The table below approximates the flow of cleaning solution through the valve vent tube during seat lift functions, SpiralClean of vent and CIP of OD valve plug shafts at a CIP pressure of 1.5 bar (21 psi).

Valve size DN/OD / DN	Seat lift seat push	K_V (m^3/h)	Litre pr. min. (1.5 bar/ 21psi)	Duration	Activations during each CIP event
51/DN50	Seat lift Seat push	1.8 1.3	2.69 1.83	0.5 sec	3
63.-76.1 / DN65-80	Seat lift Seat push	2.4 2.1	3.38 2.95	0.5 sec	3
101.6 / DN100	Seat lift Seat push	3.4 2.6	4.76 3.67	0.5 sec	3
SpiralClean 51-101.6 / DN50-100	-	0.14	0.16	0.5 sec	3
CIP OD valve plug 51-63.5 / DN50-65	-	0.29	0.32	5 sec	2
CIP OD valve plug 76.1-101.6 / DN80-100	-	0.34	0.40	5 sec	2

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

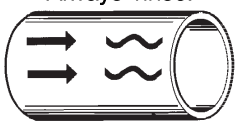
$$Q = Kv \cdot \sqrt{\Delta\ p}$$

Q = CIP - flow (m^3/h).
K_V value from the table above.
Δp = CIP pressure (bar).
Assumption: density = 1

Step 9
Guide rings cleaning
When the valves are removed for replacement of wetted parts and / or sealing elastomers, it is important to remove, and hand clean, the PTFE guide rings (positions 45, 54, 80 and 98) and their seating groves before placing the valves back into service.
See section 5.5 Assembly of valve

Step 10
Always rinse well with clean water after cleaning.
NOTE!
The cleaning agents must be stored/disposed of in accordance with current regulations/directives.

Always rinse!



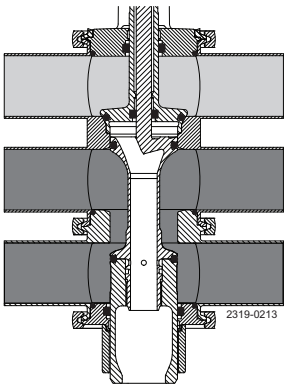
Clean water Cleaning agents

4 Operation

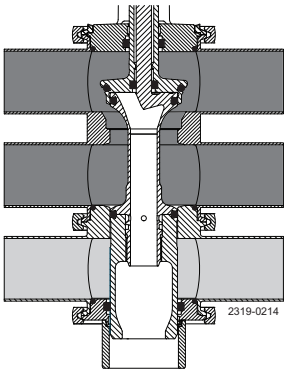
The valve is designed for cleaning in place (CIP).
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic soda.
HNO_3 = Nitric acid.

Step 11

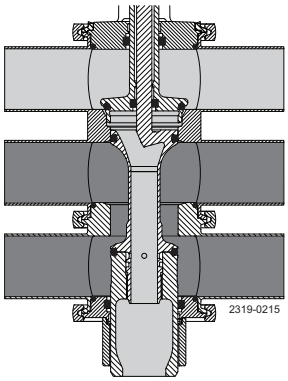
Seat-cleaning cycles:
Pay special attention to the warnings!
1. Closed valve



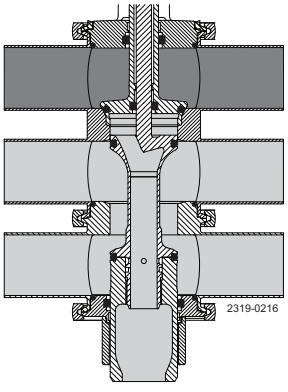
2. Open valve



3. Cleaning through upper line



4. Cleaning through lower line



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

4.3 Troubleshooting and repair

Problem	Cause/result	Repair
Leakage between sealing element (79 or 96/97) and lower plug (75)	Worn/product affected o-rings/ lip seal (76/77/78/95)	- Replace the o-rings/lip seal - Change rubber grade - Lubricate correctly
Leakage at the leakage outlet	- 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 section 5.3 Lower plug, replacement of radial seals and section 5.4 Upper plug, replacement of axial seal
Leakage at sealing element (48)/upper plug (55)	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)	- Too old/product affected o-rings (76 and 47) (and 52 if clamped valve body) - Loose clamp (64)	- Replace the o-rings - Change rubber grade - Tighten the clamp
CIP leakage	Worn o-rings (40/67/71/144/145)	Replace the o-rings
Leakage at spindle clamp (43)	Damaged o-ring (39) Worn/product affected lip seal (57) or spray nozzle (58)	- Replace the o-ring - Replace the plug seals - Change rubber grade
Lower plug not returning to closed position	- Wrong rubber grade - Wrongly fitted gasket - Mounted incorrectly (see section 5.3 Lower plug, replacement of radial seals)	- 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 section 5.3 Lower plug, replacement of radial seals)	- Change rubber grade - Fit new gasket correctly - Correct installation

5 Maintenance

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.

5.1 General maintenance

Recommended spare parts: service kits (see 7 Parts list and service kits)
Order service kits from the service kits section, see 7 Parts list and service kits
Ordering spare parts: contact the sales department.

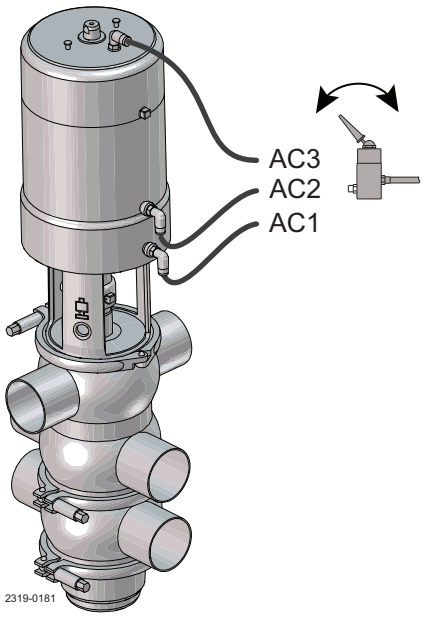
	Valve rubber seals	Valve plug seals	Valve guide rings
Preventive maintenance	**Replace after 12 months**(*)	**Replace after 12 months** (*)	Replace when required
Maintenance after leakage (leakage normally starts slowly)	**Replace after production cycle**	**Replace after production cycle**	Replace when required
Planned maintenance	- regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statestics for planning of inspections	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for planning of inspections	
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 product 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 Klüberplex BE31
- To avoid possible black remains on position number 1 and 29. Alfa Laval recommends Klüber Paraliq GTE 703 (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!



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.

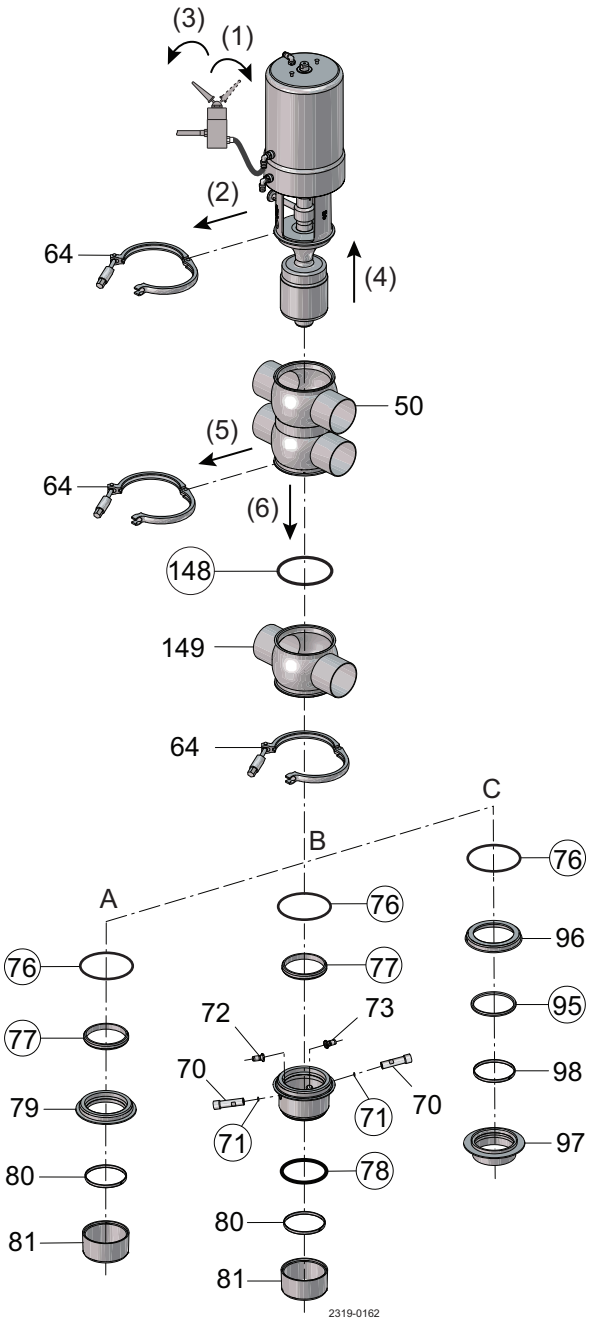
5.2 Dismantling of valve

Step 1

Disassemble valve acc. to illustrations (1 to 6)

1. Supply compressed air to AC2.
2. Loosen and remove upper clamp (64).
3. Release compressed air.
4. Lift out the actuator together with the internal valve parts from valve body (50).
5. Loosen and remove middle clamp (64) and remove valve body (149) and o-ring (148) from valve body (149).
6. Loosen and remove lower clamp (64).
7. Take away lower sealing element (A, B or C).

Note!
Release compressed air.



A
Dismantling of lower sealing element
1. Pull out o-ring (76) and lip seal (77).
2. Remove guide ring (80).

B
Dismantling of lower sealing element, balanced with CIP OD balancer
1. Pull out o-ring (76) and lip seal (77).
2. Remove o-ring (78).
3. Remove guide ring (80).
4. Screw out flushing tubes (70).
5. Remove o-rings (71).
6. Remove nozzles (72 + 73).

C
Dismantling of lower sealing element, flush OD balancer
1. Remove upper part of sealing element (96)
2. Pull out o-ring (76) and lip seal (95).
3. Remove guide ring (98) from lower part of sealing element (97).

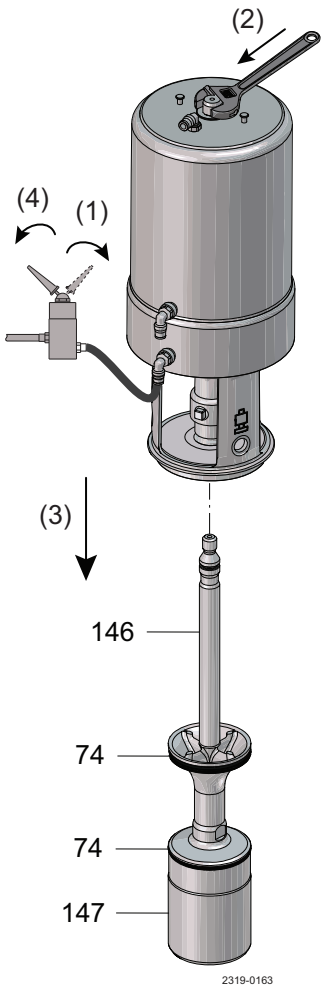
5 Maintenance

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.

Step 2
1. Supply compressed air for air connection AC1.
2. Loosen lower plug (146 + 147) while counterholding upper stem (1).
3. Remove the plug.
4. Release compressed air.

Note: For replacement of seal ring (74), please see section 5.3 Lower plug, replacement of radial seals.

1 = on
4 = off

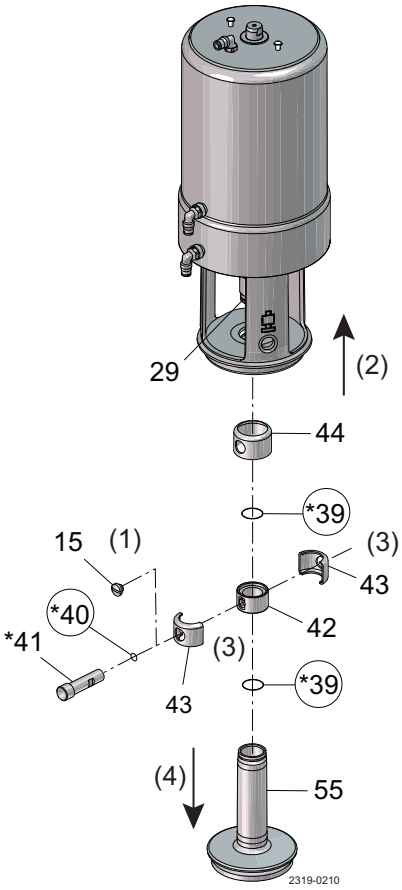


The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

Step 3

Remove coupling system and upper plug according to illustrations (1-4)

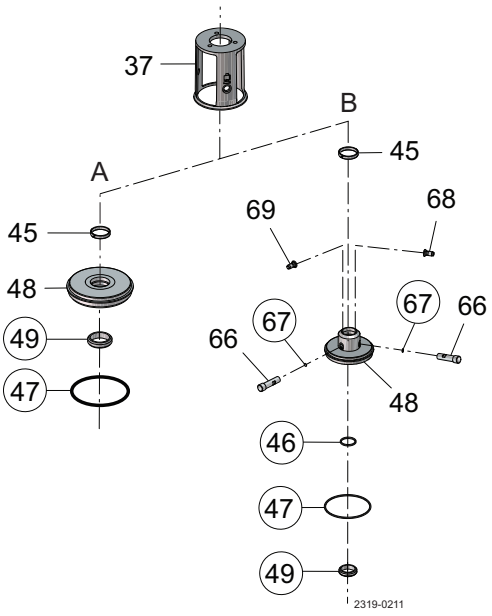
1. No SpiralClean in leakage chamber:
   A. Unscrew plug (15)
   SpiralClean in leakage chamber:
   A. Unscrew flushing tube (41).
   B. Remove o-ring (40)
2. Pull up lock (44) over piston rod (29)
3. Pull away clamps (43) from spindle liner (42)
4. Pull out upper plug (55). Make sure spindle liner (42) is free of both piston rod and upper plug.
   SpiralClean in leakage chamber: Remove both o-rings (39) on valve plug (55) and piston rod (29)



Step 4

A
Dismantling of upper sealing element

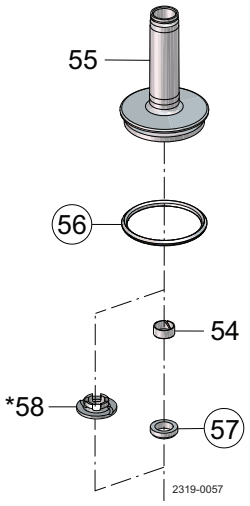
1. Remove sealing element (48) from intermediate piece (37).
2. Pull out o-ring (47) and lip seal (49) from sealing element (48)
3. Remove guide ring (45).



5 Maintenance

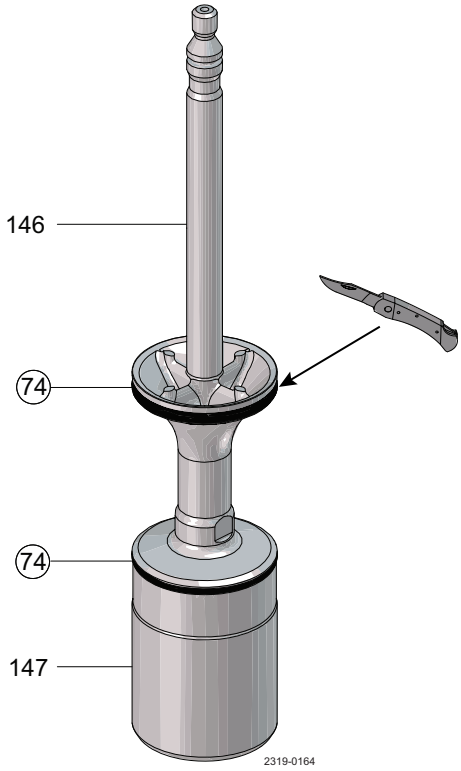
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

Step 5
Remove lip seal (57) and guide ring (54) (or spray nozzle (58) if valve is supplied with SpiralClean in leakage chamber. For removal and replacement of seal ring (56), please see section 5.4 Upper plug, replacement of axial seal



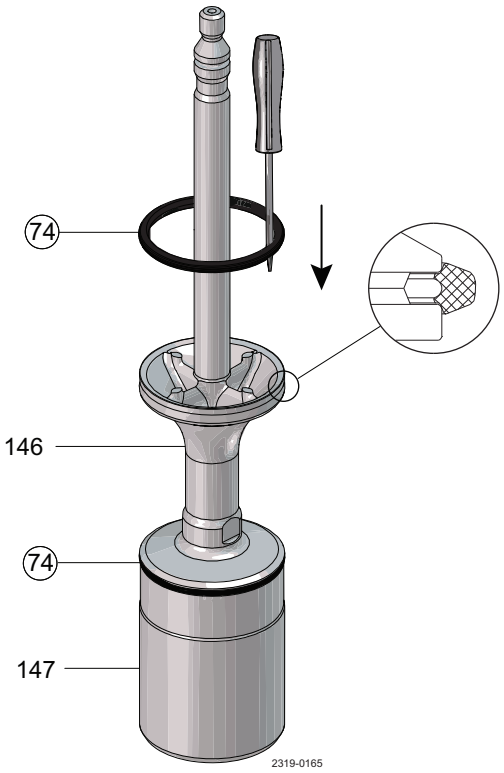
5.3 Lower plug, replacement of radial seals

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

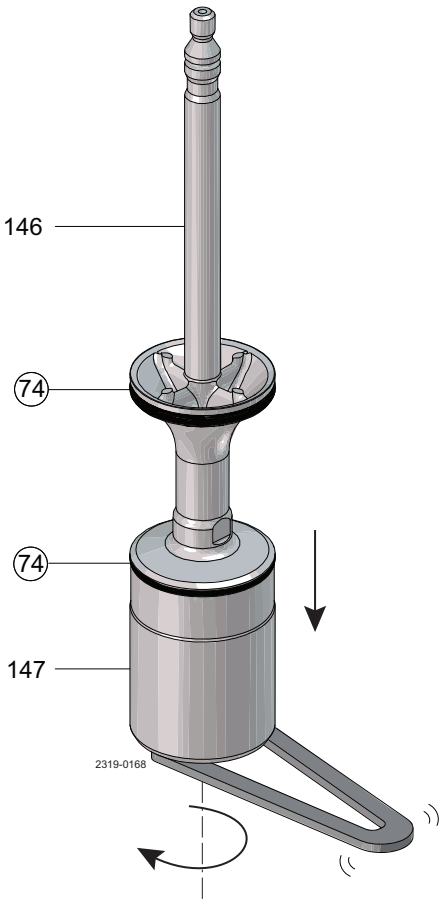


The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

Step 2
Pre-mount seal ring as shown on drawing.
Rotate along circumference to fix sealing as shown in the picture.
Carefully lubricate sealings with suitable soap or lubricant (Klüber Paraliq GT 703), before pre-mounting.



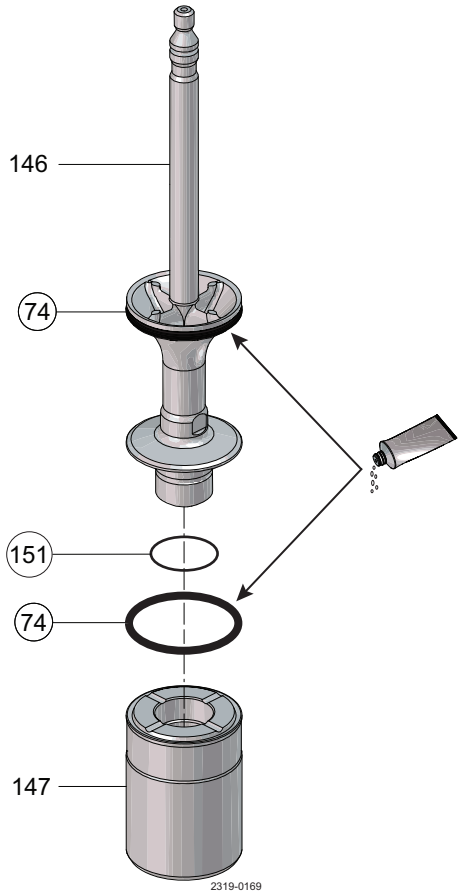
Step 3
Unscrew the lower piece of the plug (147) from the top piece (146) with a hook spanner at the bottom.



5 Maintenance

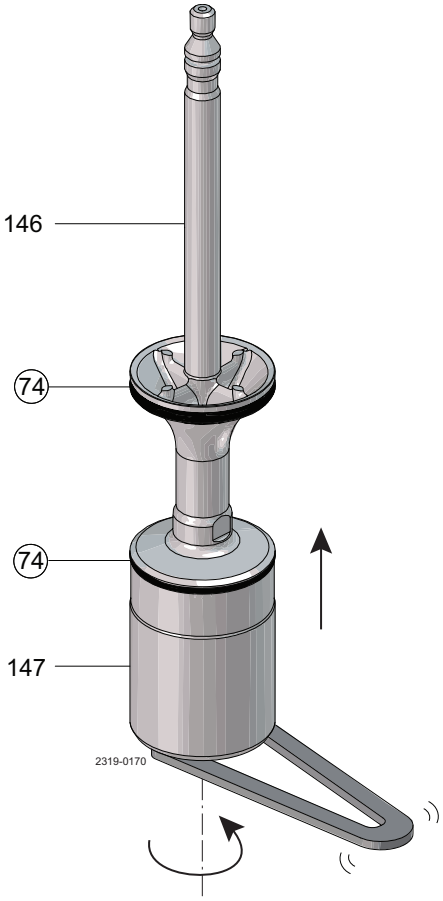
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

Step 4
Remove the seal ring (74) that are placed between the two pieces and the o-ring (151) on the upper plug part.
Before pre-mouting the new seal ring remember to lubricate the seal ring with suitable soap or lubricant (Klüber Paraliq GT 703)
Fit o-ring (151) in the upper plug part (146).
Now pre-mount the new seal ring the the groove on the upper plug part(146)

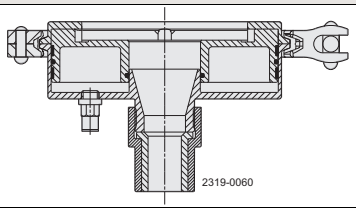


The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

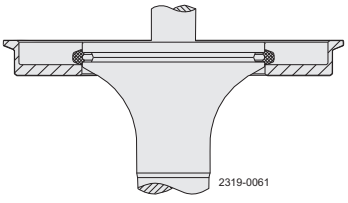
Step 5
Reassemble the two plug pieces wth the hook spanner. Be careful when tightning the two parts.
(Maximum torque for hook spanner 20 Nm/ 14.8 lbf-ft)



Step 6

Item no.	Item no.	Item no.	
Seat ø53	Seat ø81	Seat ø100	Tool for radial sealing, lower plug
9613426001	9316426002	9613426003	

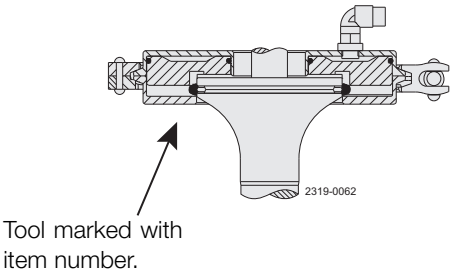
Step 7
Place lower tool part.



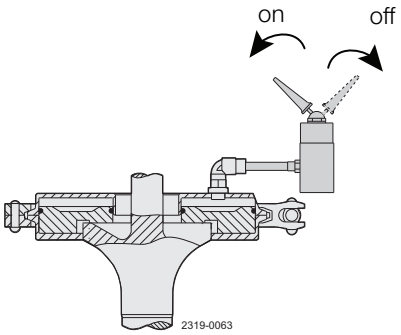
5 Maintenance

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.

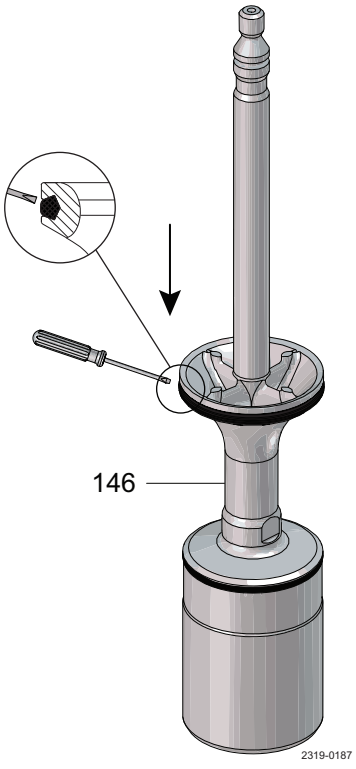
Step 8
1. Place upper tool part including piston.
2. Clamp the two tool parts together.



Step 9
1. Supply compressed air.
2. Release compressed air.
3. Remove tool parts.



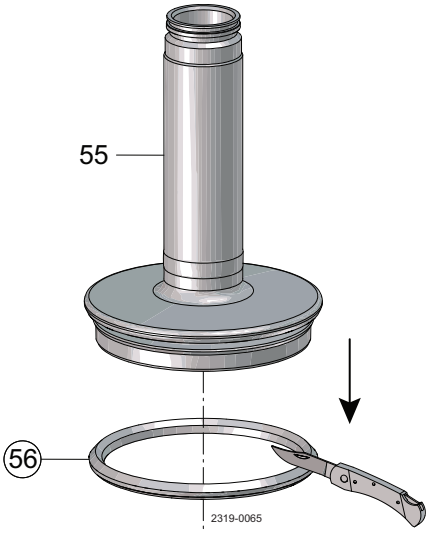
Step 10
Inspect the seal to ensure it does not twist in the groove, and press in the 4 outsticking points with a screwdriver



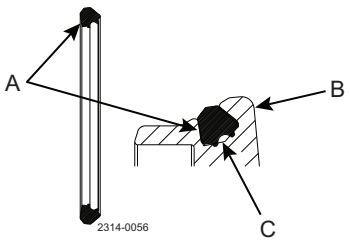
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Study the instructions carefully.
Always keep spare rubber seals and guide rings in stock. Check the valve for smooth operation after service.

5.4 Upper plug, replacement of axial seal

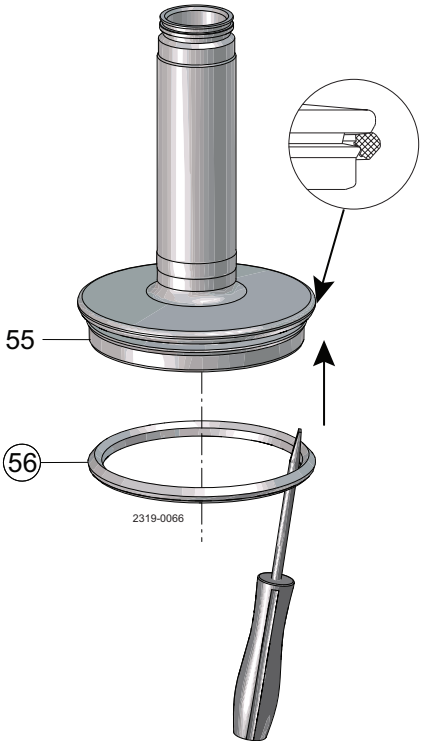
Step 1
Remove old seal ring (56) using a knife, screwdriver or similar. Be careful not to scratch the plug.



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

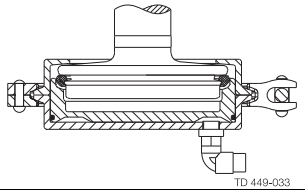


Carefully lubricate sealings with suitable soap or lubricant (Klüber Paraliq GT 703), before pre-mounting.

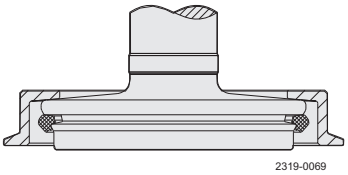
5 Maintenance

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.

Step 3

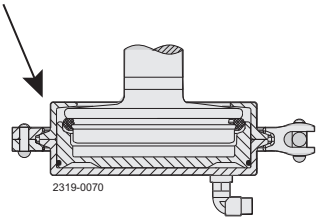
Item no.	Item no.	Item no.	
Seat ø53	Seat ø81	Seat ø100	Tool for axial sealing, upper plug
9613050501	9613050502	9613050508	 TD 449-033

Step 4
Place tool part 1.

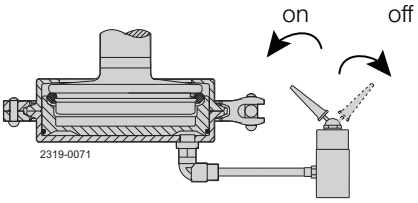

2319-0069

Step 5
1. Place tool part 2 including piston.
2. Clamp the two tool parts together.

Tooling marked with item number

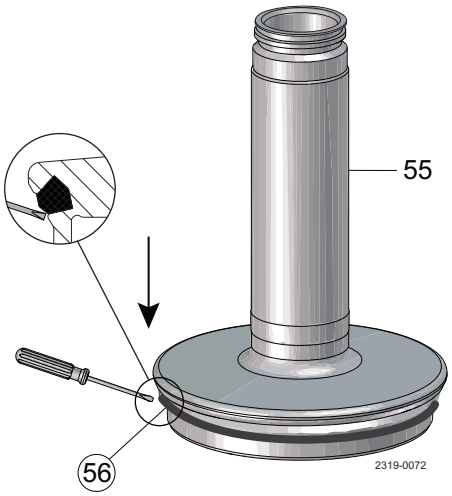

2319-0070

Step 6
1. Supply compressed air.
2. Release compressed air.
3. Rotate the tool 45° in relation to the plug.
4. Supply compressed air.
5. Release compressed air and remove tool.



2319-0071

Step 7
1. Inspect the seal.
2. Release air at 3 different positions of the circumference.



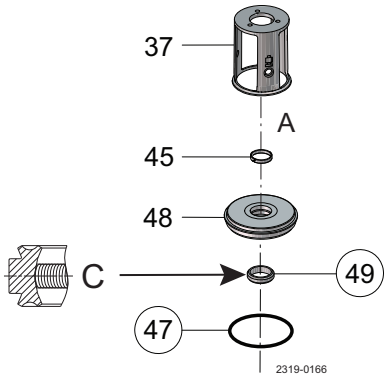
2319-0072

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.

5.5 Assembly of valve

Step 1
A
Assembly of upper sealing element

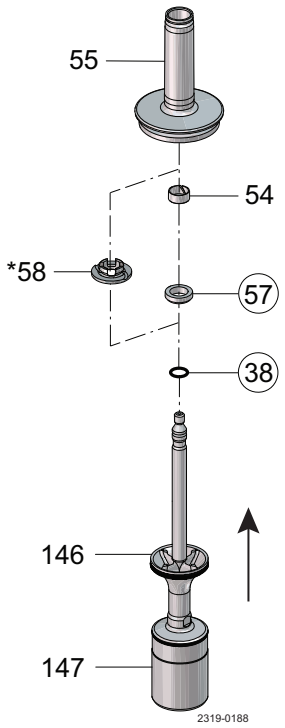
1. Fit o-ring (47) (do not twist), and lip seal (49) in upper sealing element (48) (Lubricate with Klüber Paraliq GT 703).
   NOTE: The o-ring should be gently pressed into the groove.
2. Fit guide ring (45) in upper sealing element.
3. Fit upper sealing element in intermediate piece (37).



C = Lubricate with Klüber Paraliq GT 703 on ID

Step 2

1. Place guide ring (54) and lip seal (57) in upper plug or nozzle (58) by SpiralClean in leakage chamber.
2. Mount o-ring (38) in lower plug.
3. Press lower plug (146 + 147) rapidly into upper plug (55) through the lip seal.
   Note: Do not damage the lips when lower plug (146 + 147) with o-ring (38) passes the lip seal.



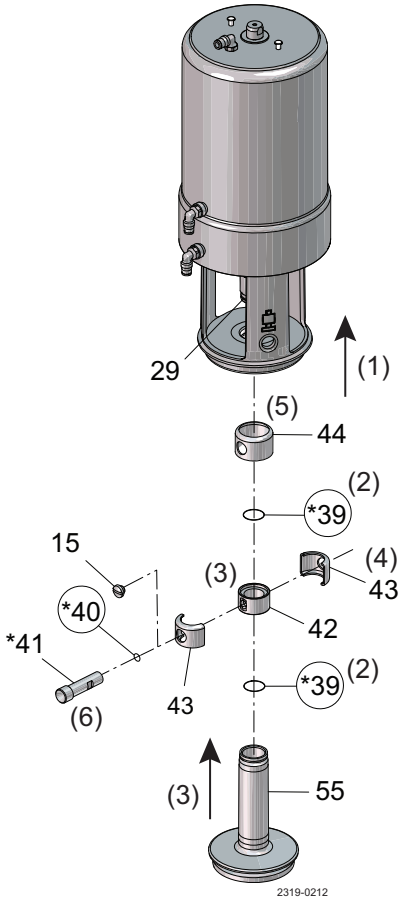
5 Maintenance

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.

Step 3

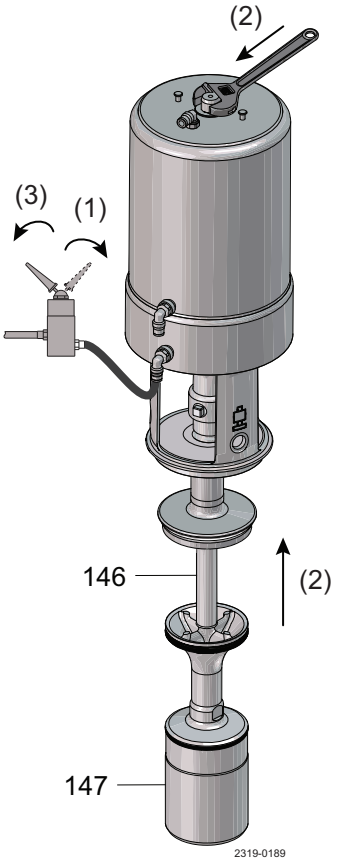
Place coupling system and upper plug according to illustrations.

1. Push lock (44) up over piston rod (29).
2. If SpiralClean in leakage chamber: place o-rings (39) in groove on upper plug (55) and piston rod (29).
3. Place spindle liner (42) on piston rod (29). Fit upper plug (55).
4. Mount clamps (43) on spindle liner (42).
5. Fit lock (44).
6. Fit plug (15) or flushing tube (41) and o-ring (40) if SpiralClean in leakage chamber.



Step 4

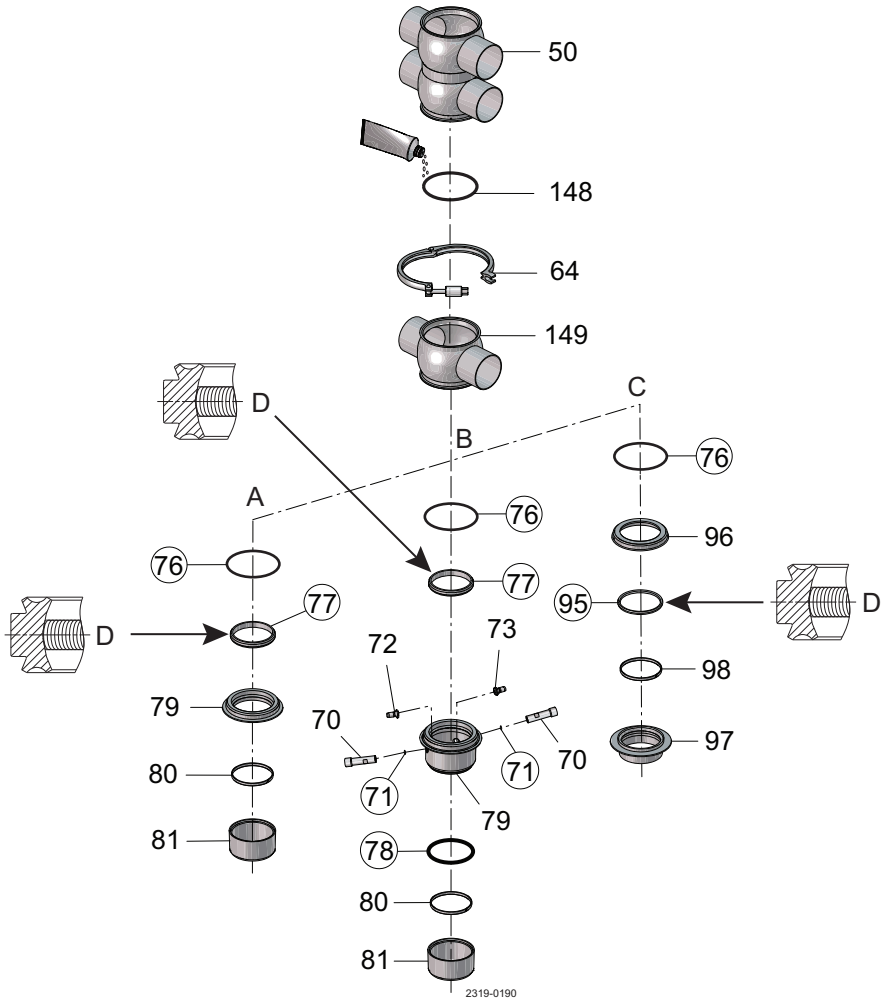
1. Supply compressed air for air connection AC1
2. Insert lower plug (146 + 147) and tighten
3. Release compressed air



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.

Step 5

1. Fit o-ring (148) (do not twist the o-ring) and press it gently into the groove in valve body (149) (lubricate with Klüber Paraliq GT 703)
2. Fit and tighten middle clamp (64) on valve body (149) Lubricating of clamp and clamp nut recommended! (Maximum torque for clamp nut: 10Nm/7.4 lbf-ft)



D = Lubricate with Klüber Paraliq GT 703

A - Assembly of lower sealing element

1. Fit lip seal (77) and o-ring (76) (do not twist the o-ring) and press it gently into the groove (lubricate with Klüber Paraliq GT 703)
2. Fit guide ring (80) into sealing element (79)

B - Assembly of lower sealing element with CIP OD balancer

1. Fit o-ring (76) (do not twist), lip seal (77) and o-ring (78) in lower sealing element (lubricate with Klüber Paraliq GT 703).
   Note! The o-ring (76) should be gently pressed into the groove.
2. Fit guide ring (80) in lower sealing element.
3. Place o-rings (71) and mount flushing tubes (70). Be sure to align nozzles (72 + 73) towards recess.

C - Assembly lower sealing element with flush OD balancer

1. Fit o-ring (76) (do not twist the o-ring) in upper part of sealing element (lubricate with Klüber Paraliq GT 703).
   Note! The o-ring should be gently pressed into the groove.
2. Place guide ring (98) in lower part of sealing element (97).
3. Fit lip seal (95) in sealing element (97).
4. Place upper part of sealing element (96) on top of lower part of sealing element (97).

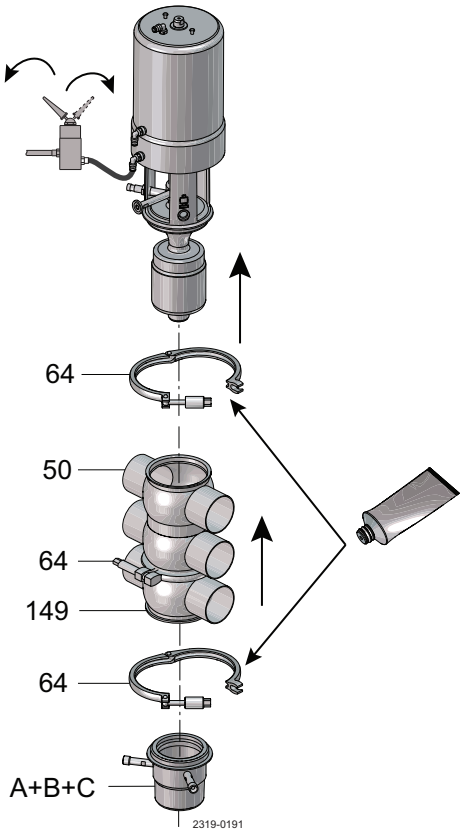
5 Maintenance

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.

Step 6
- **Never** stick tour fingers through the valve ports if the actuator is supplied with compressed air.
- **Always** supply compressed air, before demounting the valve.

1. Fit lower sealing element (A, B or C)
2. Fit and tighten lower clamp (64)
3. Supply compressed air and mount the actuator together with the internal valve parts from valve body (50)
4. Fit and tighten upper clamp (64). Lubricating of clamp and clamp nut recommended!
   (Maximum torque for clamp nut: 10Nm/7.4 lbf-ft)
5. Release compressed air.

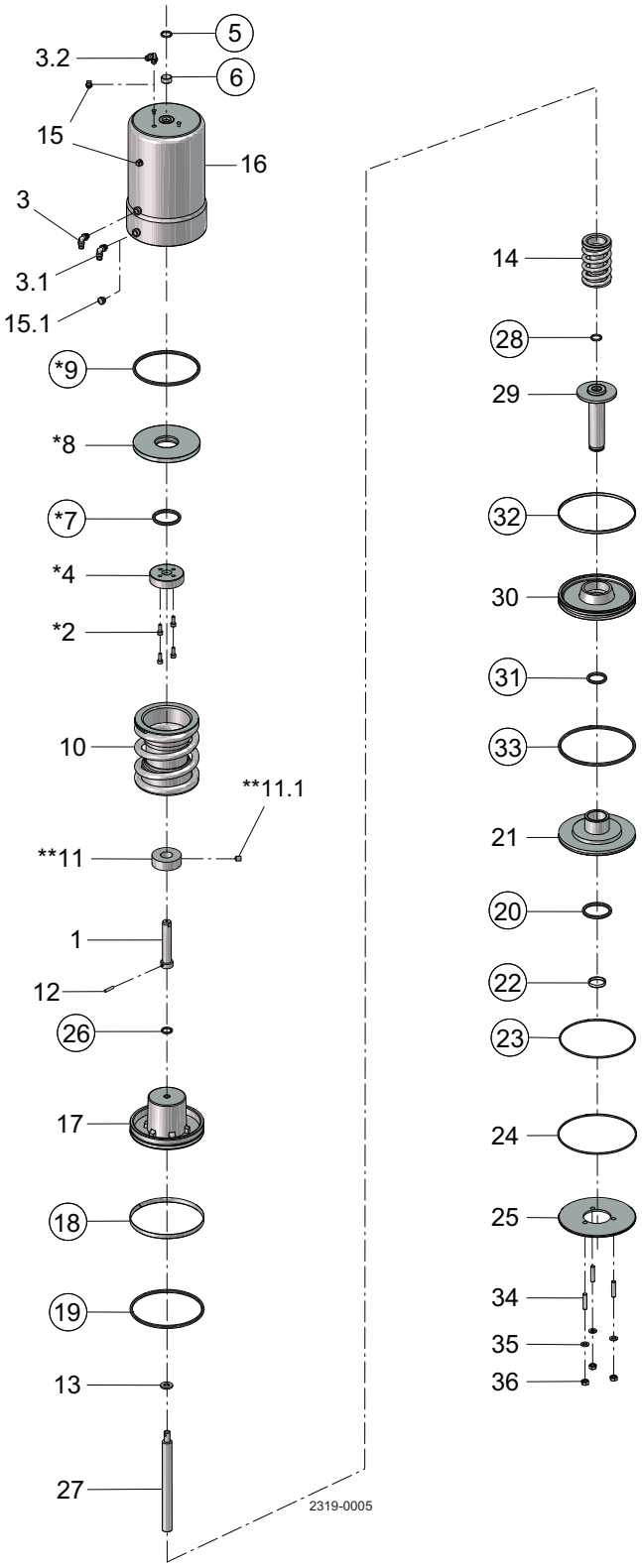
Note!
Supply compressed air before mounting the valve.



5 Maintenance

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.

5.6 Dismantling of actuator



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.

Step 1
1. Dismantle the valve in accordance with instructions in section 5.1 General maintenance
   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.
   Note! The actuator is maintenance free but repairable.

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 retaining ring (24).

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 and screw (11/11.1) (only size 51mm/DN50). Remove guide ring (18) and o-ring (19)
2. Remove spring assembly (10).

Step 5
Note! Not on actuator size 51mm/DN50

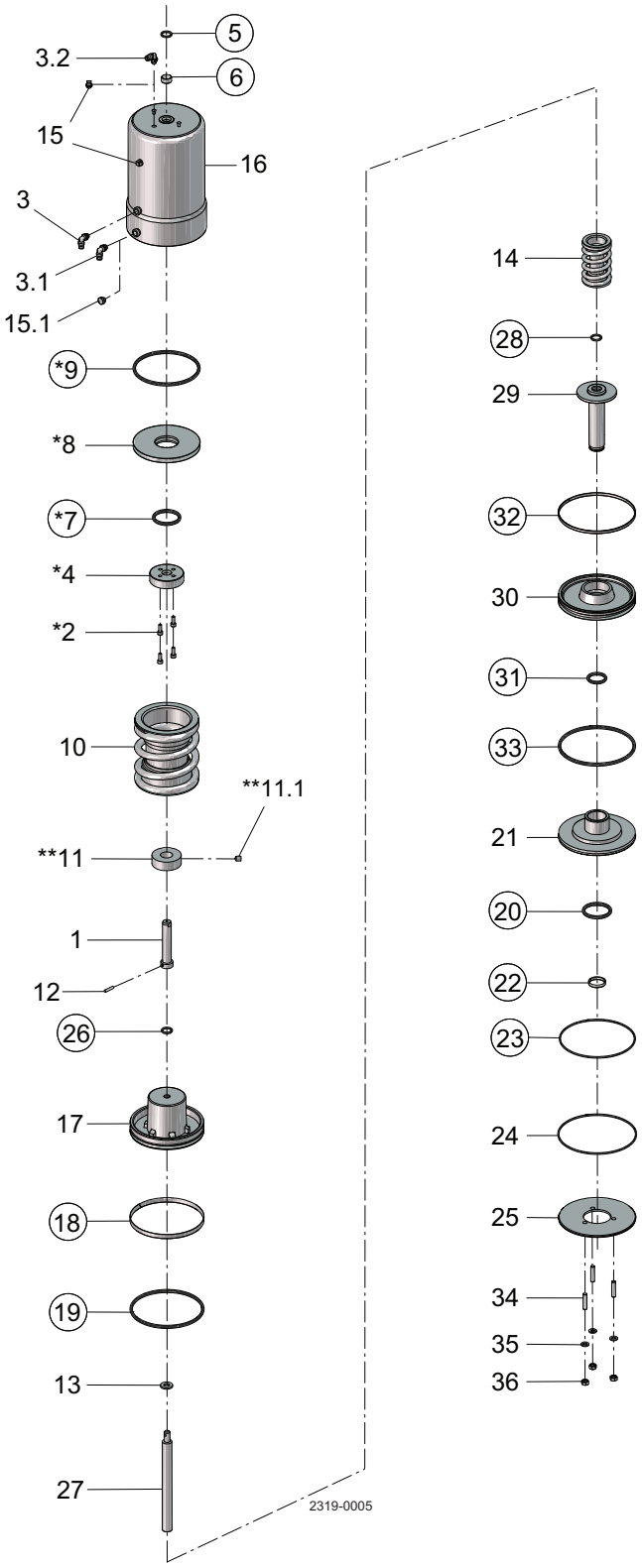
1. Unscrew screws (2) (are glued!).
2. Remove stop (4).
3. Remove upper piston (8). Remove o-rings (7 and 9).

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

5 Maintenance

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.

5.7 Assembly of actuator



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.

Step 1
Please see drawing when reassembling according to steps 2 to 6 on this page.
Note! The actuator is maintenance free but repairable.

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

Step 3
Note! Not on actuator size 51mm/DN50
1. Fit o-rings (7 and 9). Place upper piston (8).
2. Fit stop (4).
3. Tighten screws (2). (Secure with glue)

Step 4
1. Place spring assembly (10).
2. Fit o-ring (19) and guide ring (18). Mount distance spacer (11) and screw (11.1) (only for size 51mm/DN50), main piston (17) and inner stem (27).

Step 5
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 6
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).

6 Technical data

6.1 Technical data

Data	
Max. product pressure	1000 kPa (10 bar) (145 psi)
Min. product pressure	Full vacuum
Recommended min. pressure for SpiralClean	2 bar (29 psi)
Temperature range	-5°C to +125°C (23°F - 257°F) (depending on rubber quality)
Air pressure	Max. 800 kPa (8 bar) (116 psi)
Materials	
Product wetted steel parts	Acid-resistant steel AISI 316L
Other steel parts	Stainless steel AISI 304
Product wetted parts	EPDM, HNBR, NBR or FPM
Other seals	CIP seals: EPDM
Actuator seals	NBR
Surface finish	Internal/external matt (blasted) Ra < 1.6 (64 µ") Internal bright (polished) Ra < 0.8 (32µ") Internal/external bright (internal polished) Ra < 0.8 (32 µ")

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

Recommended minimum pressure for SpiralClean: 2 bar/flow rate 1.15 m^3/h.

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

$Q = Kv \cdot \sqrt{\Delta p}$

Q = CIP - flow (m^3/h)
Kv = Kv value from the below table
Δp = CIP pressure (bar)
Assumption: density = 1
Cv = 1.163 x Kv gpm
1 bar = 14.5 psi

Size	DN/OD				DN			
	51	63.5	76.1	101.6	50	65	80	100
Kv-value - upper seat-lift [m^3/h]	1.8	2.4	2.4	3.4	1.8	2.4	2.4	3.4
Kv-value - lower seat-lift [m^3/h]	1.3	2.1	2.1	2.6	1.3	2.1	2.1	2.6
Air consumption - upper seat-lift *[n litre]	0.2.	0.4	0.4	0.62	0.2	0.4	0.4	0.62
Air consumption - lower seat-lift *[n litre]	1.1	0.13	0.13	0.21	1.1	0.13	0.13	0.21
Air consumption - main movement *[n litre]	0.86	1.63	1.63	2.79	0.86	1.63	1.63	2.79

For further information concerning cleaning of the valve, please see section 4.2 Recommended cleaning, step 5, 6, 7 & 8.

Noise
1.6 m (5 1/4 Ft) 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 7.6 bar (102 psi) air-pressure.

For spare parts please refer to spare parts catalogue.

7.1 Introduction

Due to the modular design of the Unique Mixproof valve this spare part document is divided into 4 main categories: actuator, plug setup (product wetted parts), valve bodies, and installation tools.

1. Actuator, covers the spare parts for all size actuators with an exploded view of the actuator and detailed spare part listing. Service kits are available for the actuator wear parts and the components included in the kits are denoted with a circle around the position number on the exploded view. A table for completed actuators by size and function is also shown for replacement or spare actuators

2. Plug setup, is broken into two sections: plug setup overview and product wetted parts. The plug setup overview enables the customer to easily find the plug setup of the purchased valve and lists the page number of the components for the given plug setup. All of the product wetted parts are shown in an exploded view and listed by valve size. Mixed sized valves are not included in the plug setup section. For more information on the mixed valves please use configurator in Alfa Laval Anytime or contact your local Authorized Alfa Laval Distributor. Service kits for wear parts are available per size for all types of valves including mixed sized valves and the components in the kit are denoted with a circle around the position number in the exploded view.

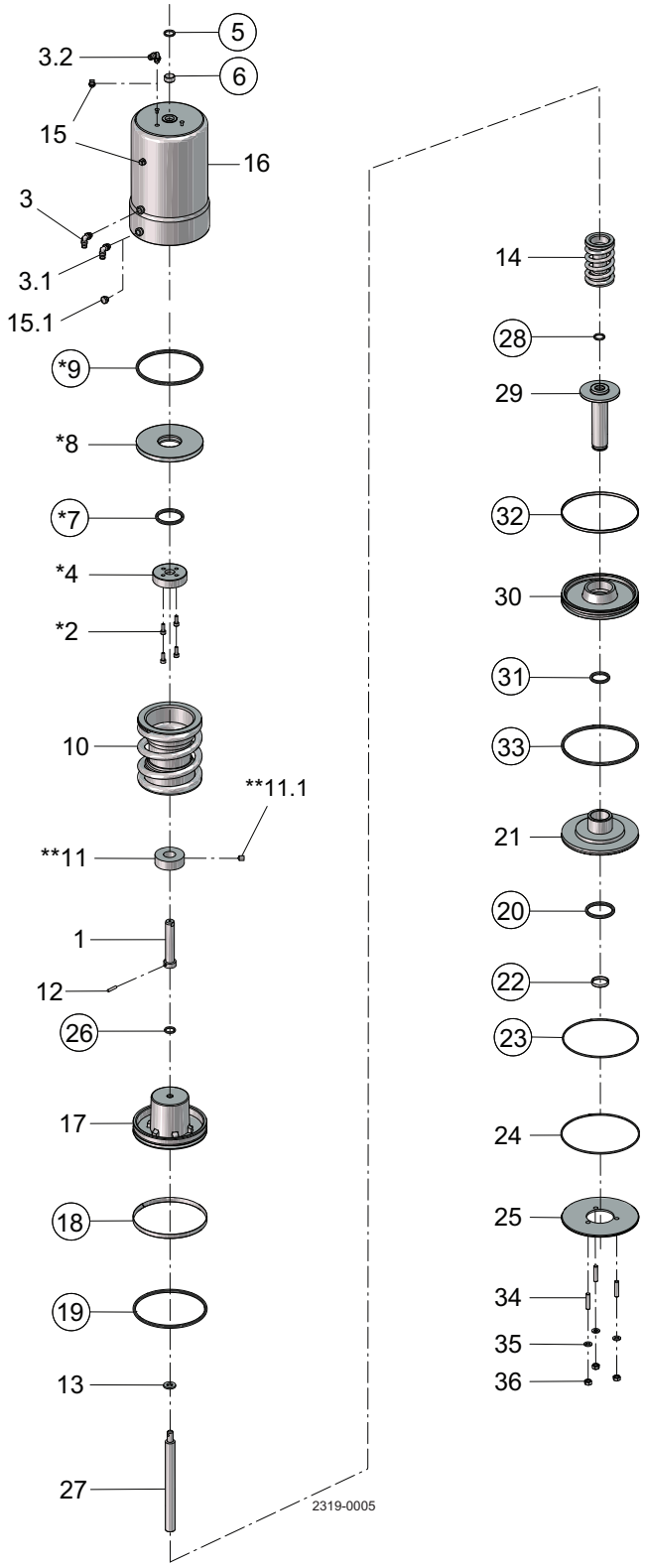
3. Valve bodies, lists the part numbers for replacement housings. Mixed sized housings are not included in the valve bodies section. For more information on the mixed housings please use configurator in Alfa Laval Anytime or contact your local Authorized Alfa Laval Distributor. You will also find the intermediate pieces in this section.

4. Installation tools, lists the part numbers for the seat installation tools. These tools enable the customer to install the plug seat seals in an efficient and effortless manner by use of compressed air. For more information regarding the use of the tools please refer to the instruction manual or contact your local Authorized Alfa Laval Distributor.

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.2 Actuator



◯ = acuator service kit
* = not used in actuator 2”
** = not used in actuator 2½”, 3” and 4”

For spare parts please refer to spare parts catalogue.

Parts list

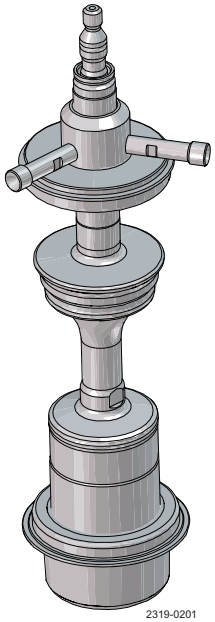
Pos.		Qty	Denomination
	□		Actuator service kits
1		1	Upper stem
2		4	Screw
3		1	Air fitting
3.1		1	Air fitting
3.2		1	Air fitting
4		1	Stop for upper piston
5	□	1	O-ring, NBR
6	□	1	Guide ring, Turcite
7	□	1	O-ring, NBR
8		1	Upper piston
9	□	1	O-ring, NBR
10		1	Spring assembly
11		1	Distance spacer
12		1	Pin
13		1	Washer
14		1	Spring assembly
15		1	Plug
15.1		1	Plug
17		1	Main piston
18	□	1	Guide ring, Turcite
19	□	1	O-ring, NBR
20	□	1	O-ring, NBR
21		1	Bottom
22	□	1	Guide ring, Turcite
23	□	1	O-ring, NBR
24		1	Retaining ring
25		1	Cover disk
26	□	1	O-ring, NBR
27		1	Inner stem
28	□	1	O-ring
29		1	Piston rod
30		1	Lower piston
31	□	1	O-ring, NBR
32	□	1	Guide ring, Turcite
33	□	1	O-ring, NBR
34		3	Bolt
35		3	Washer
36		3	Nut
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

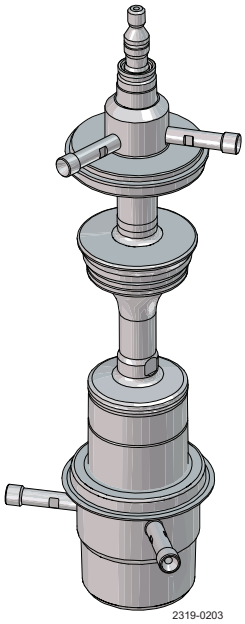
7.3 Plug setup overview

Plug setup 23



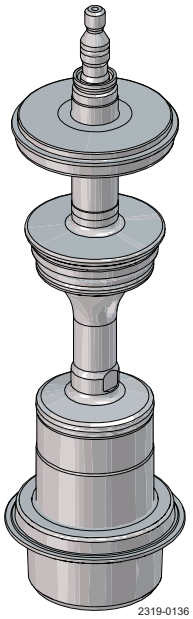
Upper: Unbalanced with CIP OD spindle
Lower: Balanced (blue bottom)
See page 48

Plug setup 25



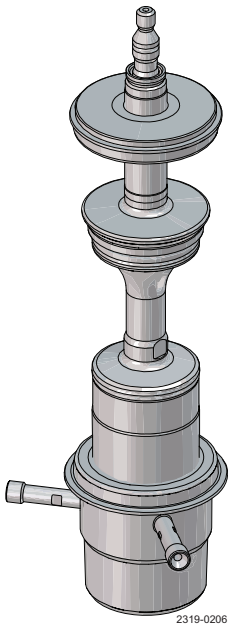
Upper: Unbalanced with CIP OD spindle
Lower: Balanced with CIP OD balancer (blue bottom)
See page 50

Plug setup 31



Upper: Unbalanced
Lower: Balanced (blue bottom)
See page 52

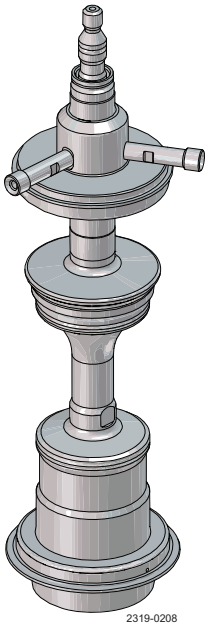
Plug setup 33



Upper: Unbalanced
Lower: Balanced with CIP OD balancer (blue bottom)
See page 54

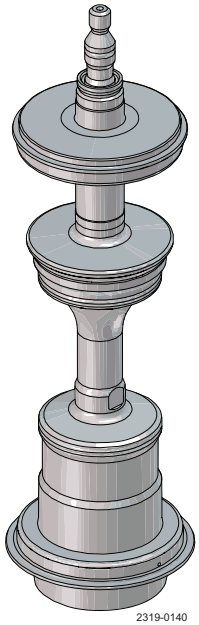
For spare parts please refer to spare parts catalogue.

Plug setup 37



Upper: Unbalanced with CIP OD spindle
Lower: Flush OD Balancer (steel bottom)
See page 56

Plug setup 39

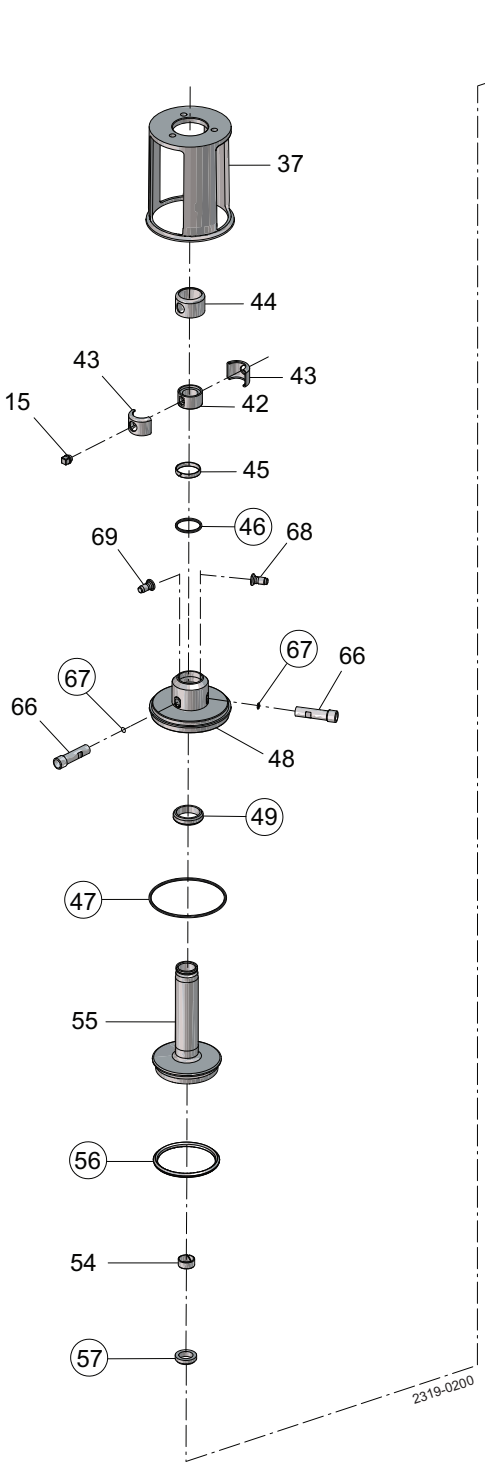


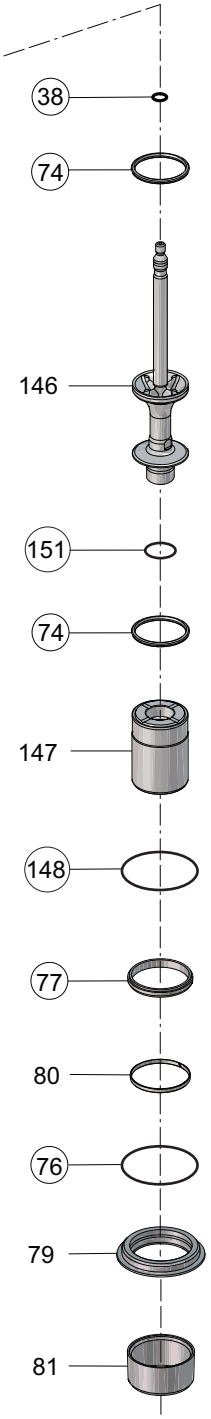
Upper: Unbalanced
Lower: Flush OD Balancer (steel bottom)
See page 58

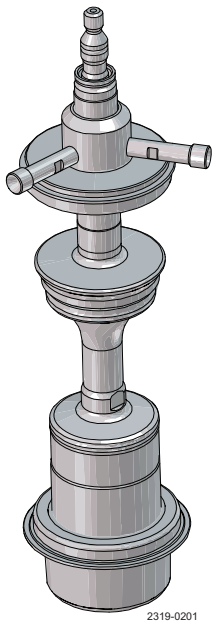
7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.4 Plug setup 23







◯ = wear parts

Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38	□	1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
46	□	1	O-ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal, EPDM
58		1	Spray nozzle
66		2	Flushing tube
67	□	2	O-ring
68		1	Drain
69		1	Nozzle
74	□	2	Seal ring
76	□	1	O-ring
77	□	1	Lip seal
79		1	Lower sealing element
80		1	Guide ring, PTFE
81		1	Cover
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring

Service kits

	Denomination	DN/OD 51 DN 50 seat ø53.3	DN/OD 63.5 DN 65 seat ø81.3	DN/OD 76.1 seat ø81.3	DN 80 seat ø81.3	DN/OD 101.6 DN 100 seat ø100.3
Service kits						
□	Service kit, EPDM	9611928381	9611928382	9611928382	9611928382	9611928383
□	Service kit, NBR	9611928384	9611928385	9611928385	9611928385	9611928386
□	Service kit, FPM	9611928387	9611928388	9611928388	9611928388	9611928389
□	Service kit, HNBR	9611928390	9611928391	9611928391	9611928391	9611928392

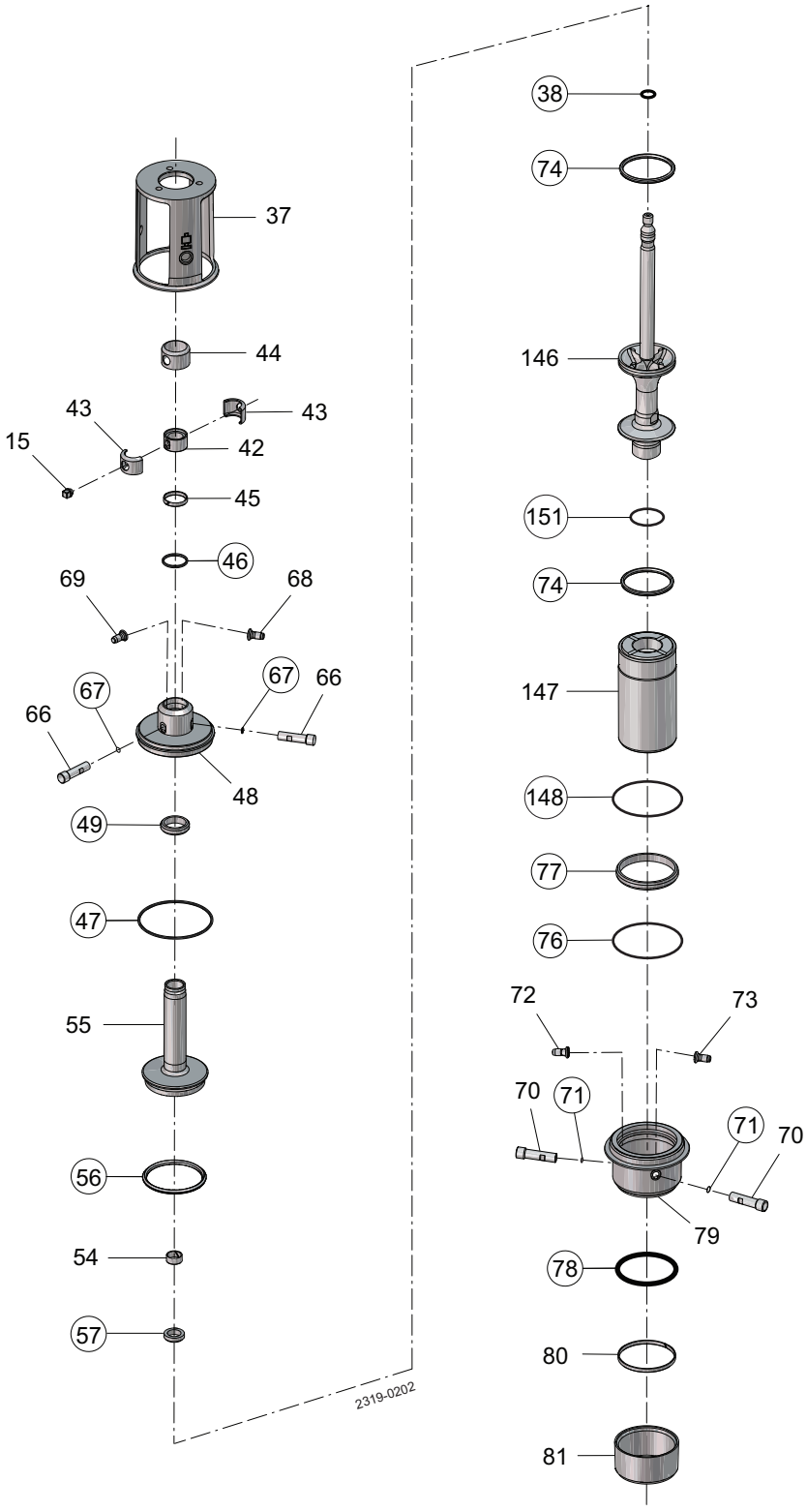
Parts marked with □ are included in the service kit.

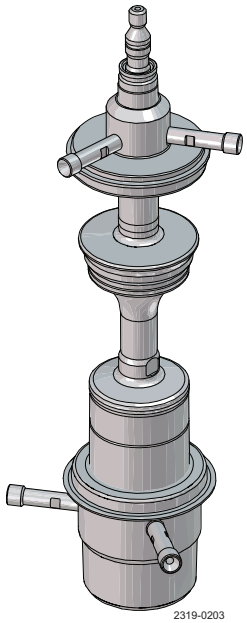
NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74.

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.5 Plug setup 25





◯ = wear parts

Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38	□	1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
46	□	1	O-ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal
58		1	Spray nozzle, PVDF
66		2	Flushing tube
67	□	2	O-ring
68		1	Drain
69		1	Nozzle
70		2	Flushing tube
71	□	2	O-ring
72		1	Drain
73		1	Nozzle
74		2	Seal ring
76	□	1	O-ring
77	□	1	Lip seal
78	□	1	O-ring
79		1	Lower sealing element
80		1	Guide ring
81		1	Cover
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring

Service kits

	Denomination	DN/OD 51 DN 50 seat ø53.3	DN/OD63.5 DN65 seat ø81.3	DN/OD 76.1 seat ø81.3	DN 80 seat ø81.3	DN/OD 101.6 DN 100 seat ø100.3
Service kits						
□	**Service kit, EPDM**	9611928405	9611928406	9611928406	9611928406	9611928407
□	**Service kit, NBR**	9611928408	9611928409	9611928409	9611928409	9611928410
□	**Service kit, FPM**	9611928411	9611928412	9611928412	9611928412	9611928413
□	**Service kit, HNBR**	9611928414	9611928415	9611928415	9611928415	9611928416

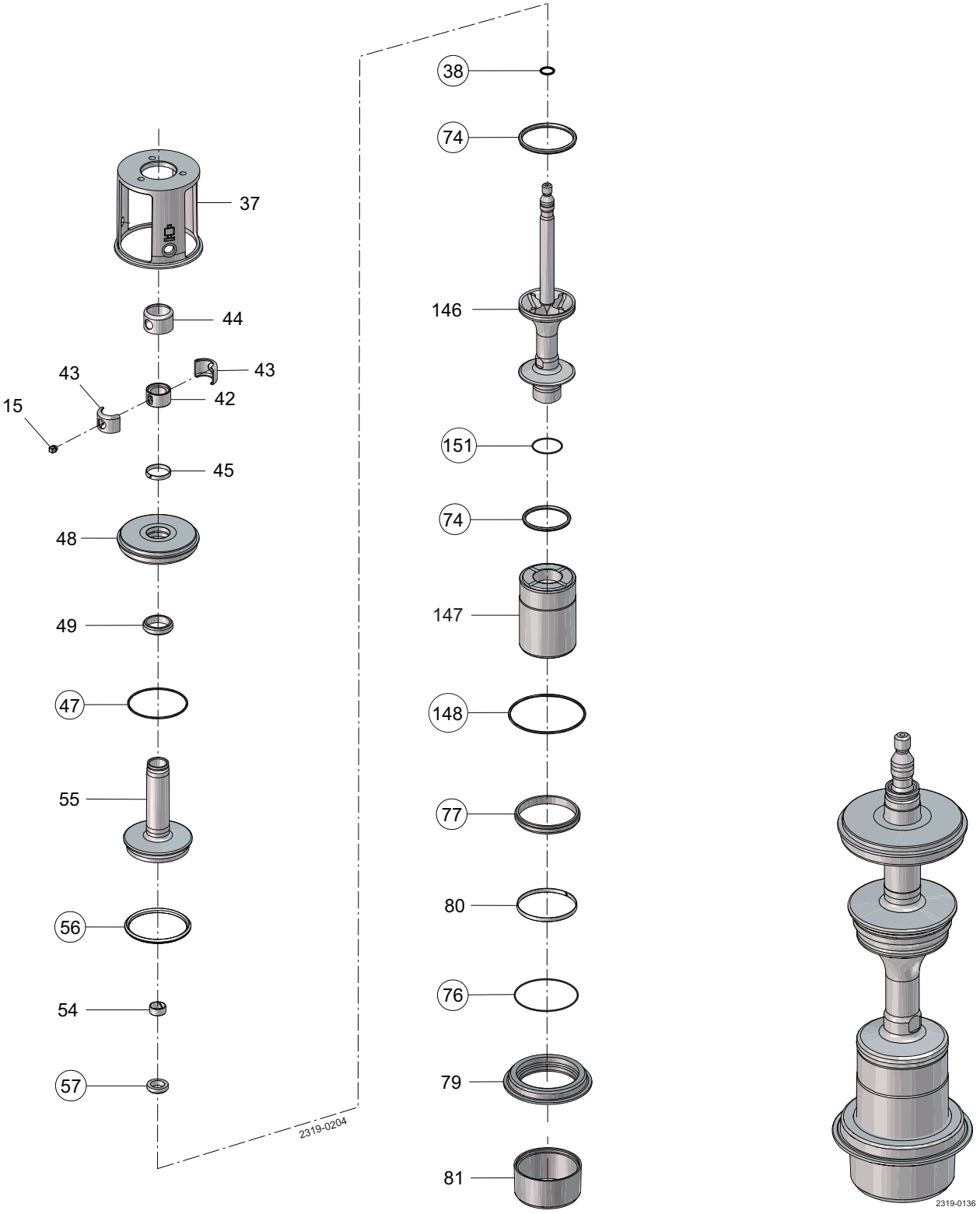
Parts marked with □ are included in the service kit.

NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74.

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.6 Plug setup 31



◯ = wear parts
Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38	□	1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal
58		1	Spray nozzle
74	□	2	Seal ring
76	□	1	O-ring
77	□	1	Lip seal
79		1	Lower sealing element
80		1	Guide ring
81		1	Cover
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring

Service kits

	Denomination	DN/OD 51 DN 50 seat ø53.3	DN/OD 63.5 DN 65 seat ø81.3	DN/OD 76.1 seat ø81.3	DN 80 seat ø81.3	DN/OD 101.6 DN 100 seat ø100.3
Service kits						
□	Service kit, EPDM	9611928453	9611928454	9611928454	9611928454	9611928455
□	Service kit, NBR	9611928456	9611928457	9611928457	9611928457	9611928458
□	Service kit, FPM	9611928354	9611928355	9611928355	9611928355	9611928356
□	Service kit, HNBR	9611928459	9611928460	9611928460	9611928460	9611928461

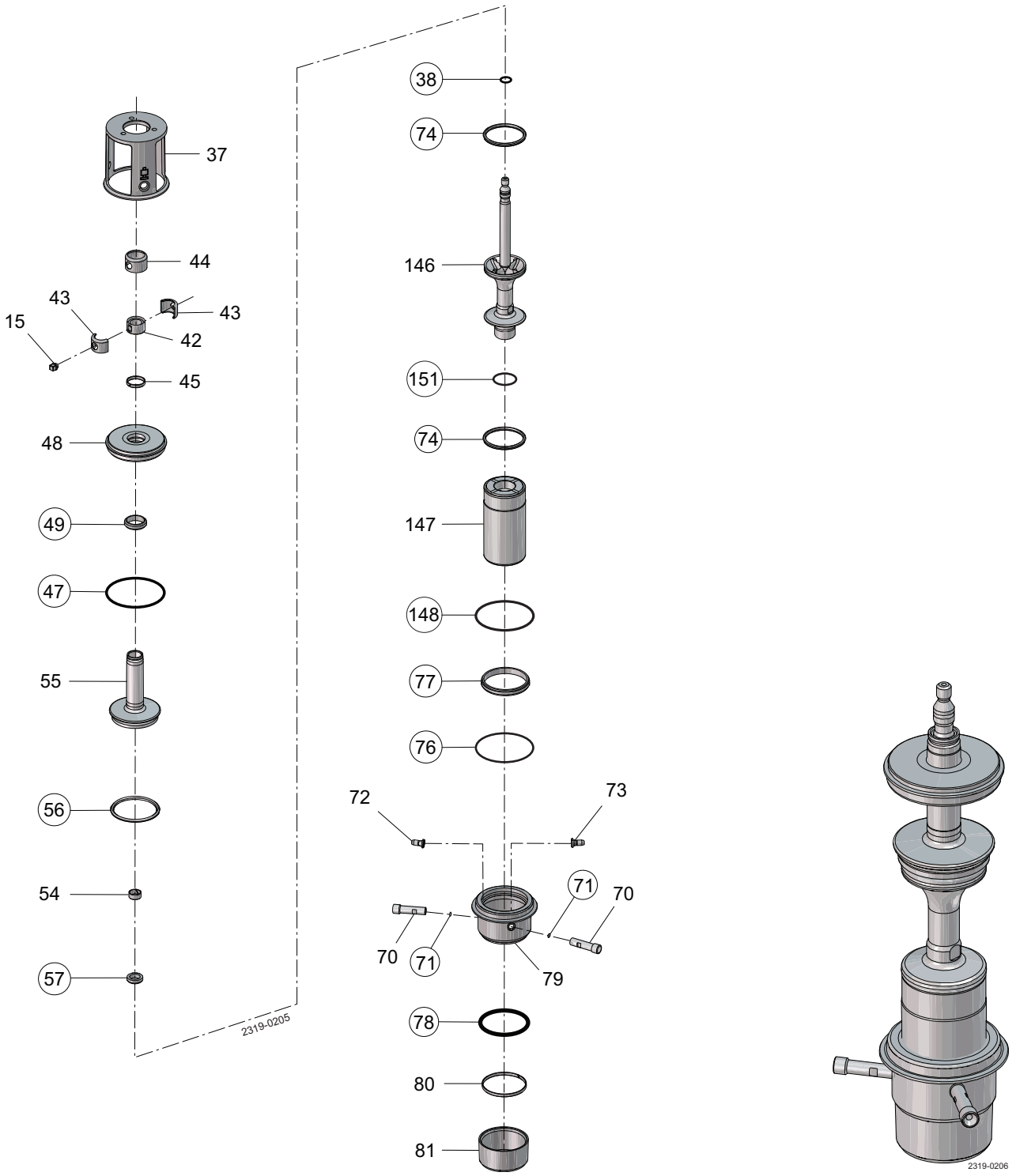
Parts marked with □ are included in the service kit.

NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.7 Plug setup 33



◯ = wear parts

Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38	□	1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal
58		1	Spray nozzle
70		2	Flushing tube
71	□	2	O-ring
72		1	Drain
73		1	Nozzle
74	□	2	Seal ring
76	□	1	O-ring
77	□	1	Lip seal
78	□	1	O-ring
79		1	Lower sealing element
80		1	Guide ring
81		1	Cover
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring

Service kits

	Denomination	DN/OD 51 DN 50 seat ø53.3	DN/OD 63.5 DN 65 seat ø81.3	DN/OD 76.1 seat ø81.3	DN 80 seat ø81.3	DN/OD 101.6 DN 100 seat ø100.3
Service kits						
□	Service kit, EPDM	9611928369	9611928370	9611928370	9611928370	9611928371
□	Service kit, NBR	9611928372	9611928373	9611928373	9611928373	9611928374
□	Service kit, FPM	9611928375	9611928376	9611928376	9611928376	9611928377
□	Service kit, HNBR	9611928378	9611928379	9611928379	9611928379	9611928380

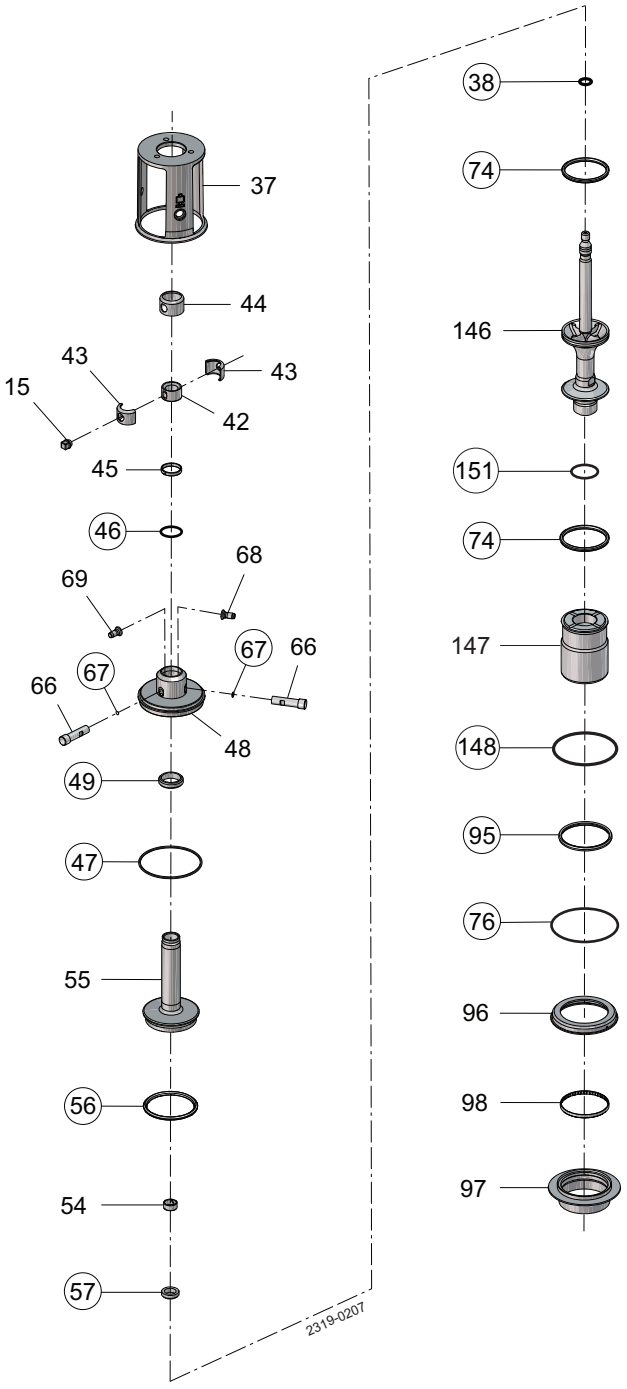
Parts marked with □ are included in the service kit.

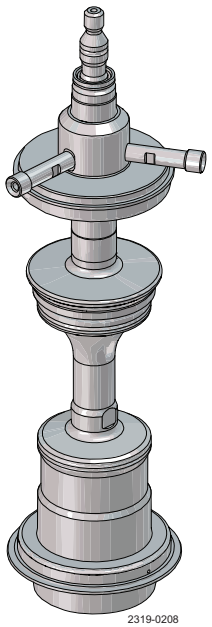
NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.8 Plug setup 37





◯ = wear parts

Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38		1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
46	□	1	O-ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal

Parts list

Pos.		Qty	Denomination
58		1	Spray nozzle
66		2	Flushing tube
67	□	2	O-ring
68		1	Drain
69		1	Nozzle
74	□	2	Seal ring
76	□	1	O-ring
95	□	1	Special lip seal
96		1	Lower sealing element, upper part
97		1	Lower sealing element, lower part
98		1	Guide ring, Turcite
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring,

Service kits

	Denomination	DN/OD 51 seat ø53.3	DN 50 seat ø53.3	DN/OD 63.5 seat ø81.3
Service kits				
□	Service kit, EPDM	9611928474	9611928474	9611928475
□	Service kit, NBR	9611928477	9611928477	9611928478
□	Service kit, FPM	9611928480	9611928480	9611928481
□	Service kit, HNBR	9611928483	9611928483	9611928484

Service kits

	Denomination	DN/OD 76.1 seat ø81.3	DN80 seat ø81.3	DN/OD 101.6 seat ø100.3	DN 100 seat ø100.3
Service kits					
□	**Service kit, EPDM**	9611928475	9611928475	9611928476	9611928476
□	**Service kit, NBR**	9611928478	9611928478	9611928479	9611928479
□	**Service kit, FPM**	9611928481	9611928481	9611928482	9611928482
□	**Service kit, HNBR**	9611928484	9611928484	9611928485	9611928485

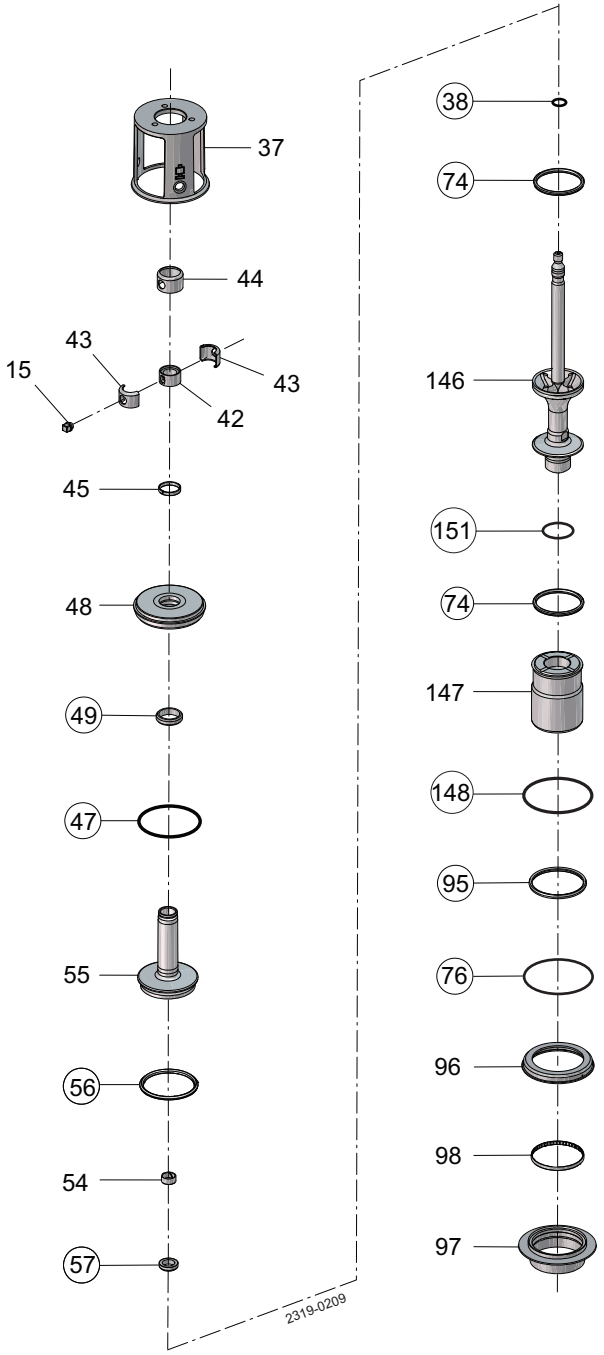
Parts marked with □ are included in the service kit.

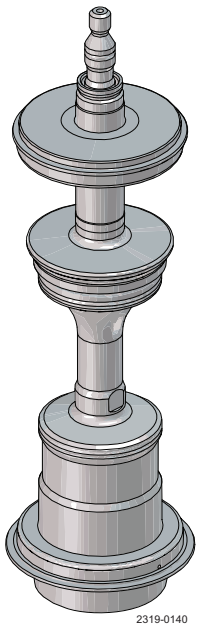
NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74.

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.9 Plug setup 39





◯ = wear parts

Pos. 37, see section 7.10 Valve bodies
See note below service kits.

For spare parts please refer to spare parts catalogue.

Parts list

Pos.		Qty	Denomination
15		1	Plug
38	□	1	O-ring
39		2	O-ring
40		1	O-ring
41		1	Flushing tube
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring
47	□	1	O-ring
48		1	Upper sealing element
49	□	1	Lip seal
54		1	Guide ring
55		1	Upper plug
56	□	1	Seal ring
57	□	1	Lip seal
58		1	Spray nozzle
74	□	2	Seal ring
76	□	1	O-ring
95	□	1	Special lip seal
96		1	Lower sealing element, upper part
97		1	Lower sealing element, lower part
98		1	Guide ring, Turcite
146		1	Lower plug, upper part
147		1	Balancer
148	□	1	O-ring
150		1	Lower plug, complete
151	□	1	O-ring
		1	O-ring

Service kits

	Denomination	DN/OD 51 seat ø53.3	DN 50 seat ø53.3	DN/OD 63.5 seat ø81.3	DN 65 seat ø81.3
Service kits					
□	Service kit, EPDM	9611928498	9611928498	9611928499	9611928499
□	Service kit, NBR	9611928501	9611928501	9611928502	9611928502
□	Service kit, FPM	9611928504	9611928504	9611928505	9611928505
□	Service kit, HNBR	9611928507	9611928507	9611928508	9611928508

Service kits

	Denomination	DN/OD 76.1 seat ø81.3	DN80 seat ø81.3	DN/OD 101.6 seat ø100.3	DN 100 seat ø100.3
Service kits					
□	Service kit, EPDM	9611928499	9611928499	9611928500	9611928500
□	Service kit, NBR	9611928502	9611928502	9611928503	9611928503
□	Service kit, FPM	9611928505	9611928505	9611928506	9611928506
□	Service kit, HNBR	9611928508	9611928508	9611928509	9611928509

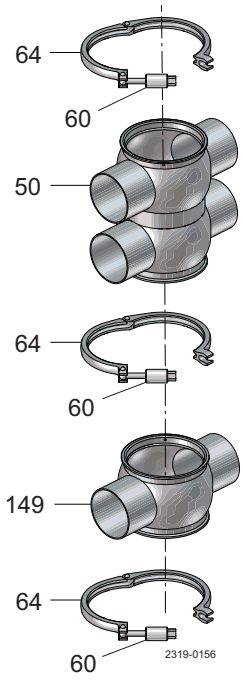
Parts marked with □ are included in the service kit.

NOTE!
If SpiralClean in leakage chamber extra O-rings (2 x pos. 39 and 1 x pos. 40) is required.
All FPM service kits are supplied with EPDM seal ring, pos. 74.

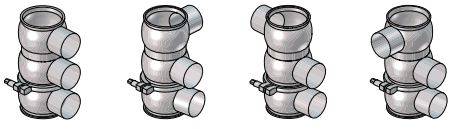
7 Parts list and service kits

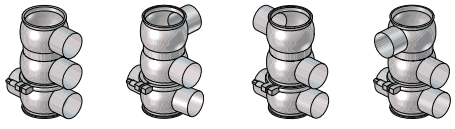
For spare parts please refer to spare parts catalogue.

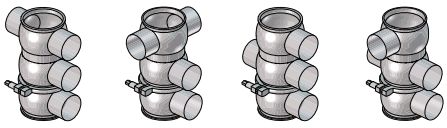
7.10 Valve bodies

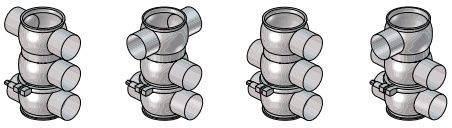


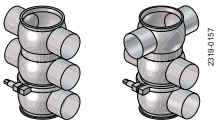
Body combinations - welded bodies

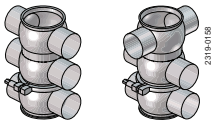












For spare parts please refer to spare parts catalogue.

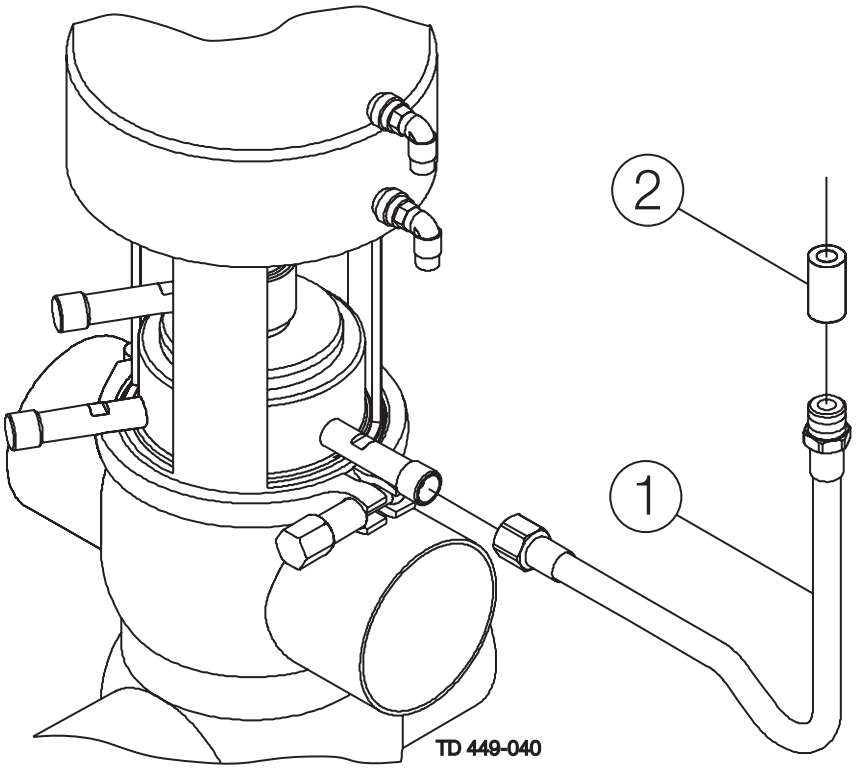
Parts list

Pos.	Qty	Denomination
37	1	Yoke
50	1	Valve body
60	3	Hexnut
64	3	Clamp without nut
149	1	Valve body

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.11 Installation kit B



For spare parts please refer to spare parts catalogue.

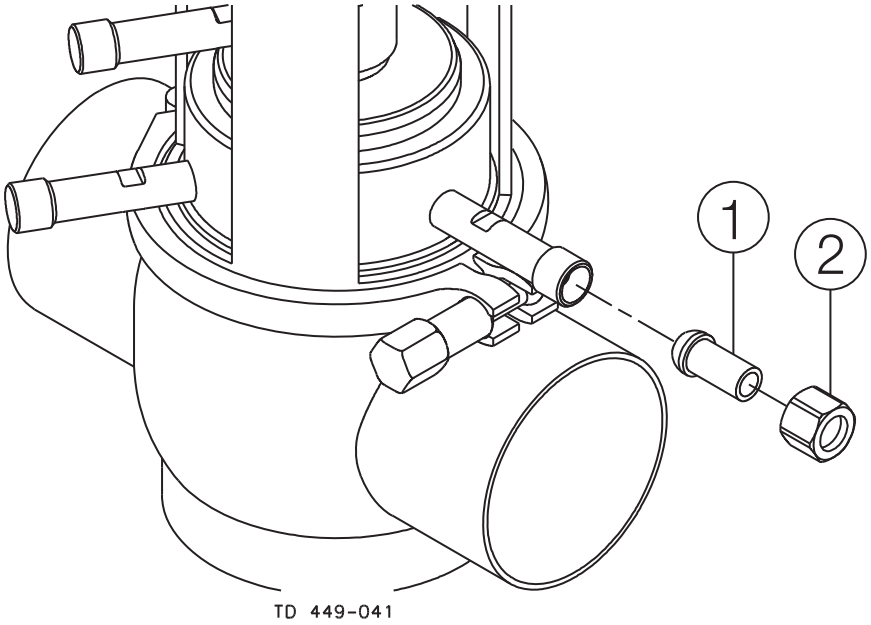
Parts list

Pos.	Qty	Denomination
1	1	Hose PTFE w. s.s. weave
2	1	Welding socket

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.12 Installation kit C



For spare parts please refer to spare parts catalogue.

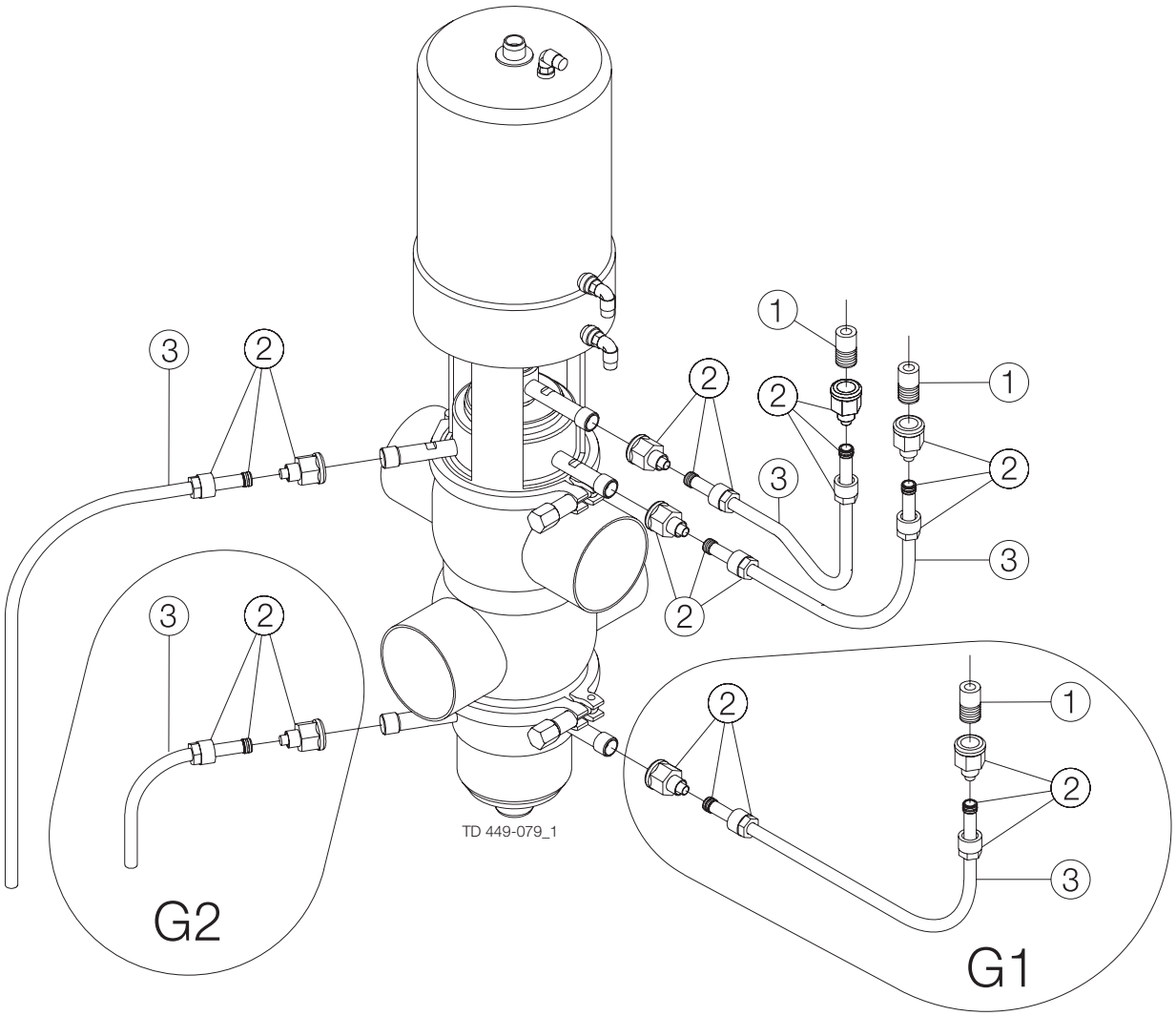
Parts list

Pos.	Qty	Denomination
1	1	Welding liner
2	1	Nut

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.13 Installation kit G



For spare parts please refer to spare parts catalogue.

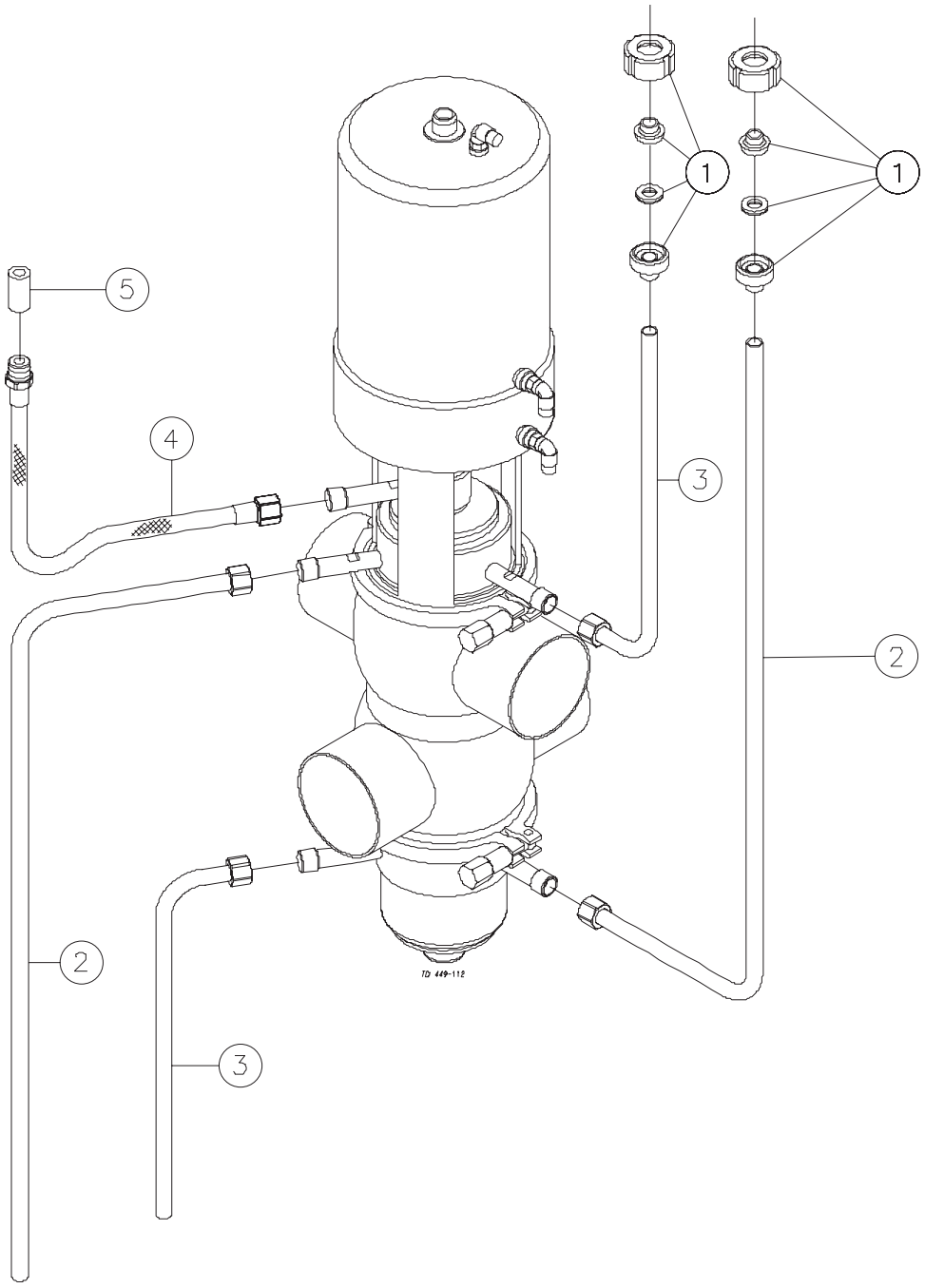
Parts list

Pos.	Qty	Denomination
1	1	Welding male part, AISI 316
2	2	3/8" 10 mm Female PVDF
	1	3/8" 10 mm Female PVDF
3	1	10 mm PVDF hose, 1m
	1	10 mm PVDF hose, 1m

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.14 Installation kit H + B



For spare parts please refer to spare parts catalogue.

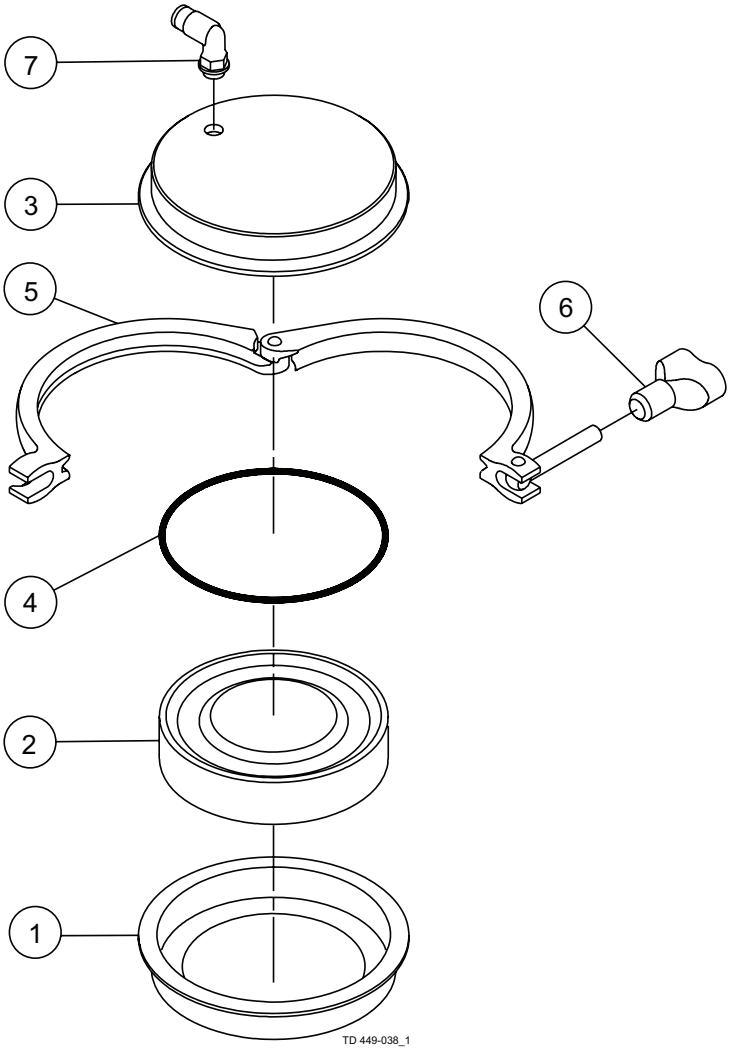
Parts list

Pos.	Qty	Denomination
1	1	DIN union DN10
	1	Nut, DN10
	1	Welding liner DIN, DN10
	1	Packing NBR, DN10
	1	Male part DIN, DN10
2	1	12 mm CIP pipe long
3	1	12 mm CIP pipe
4	1	Hose PTFE w. s.s. weave
5	1	Welding socket

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.15 Axial installation tool



For spare parts please refer to spare parts catalogue.

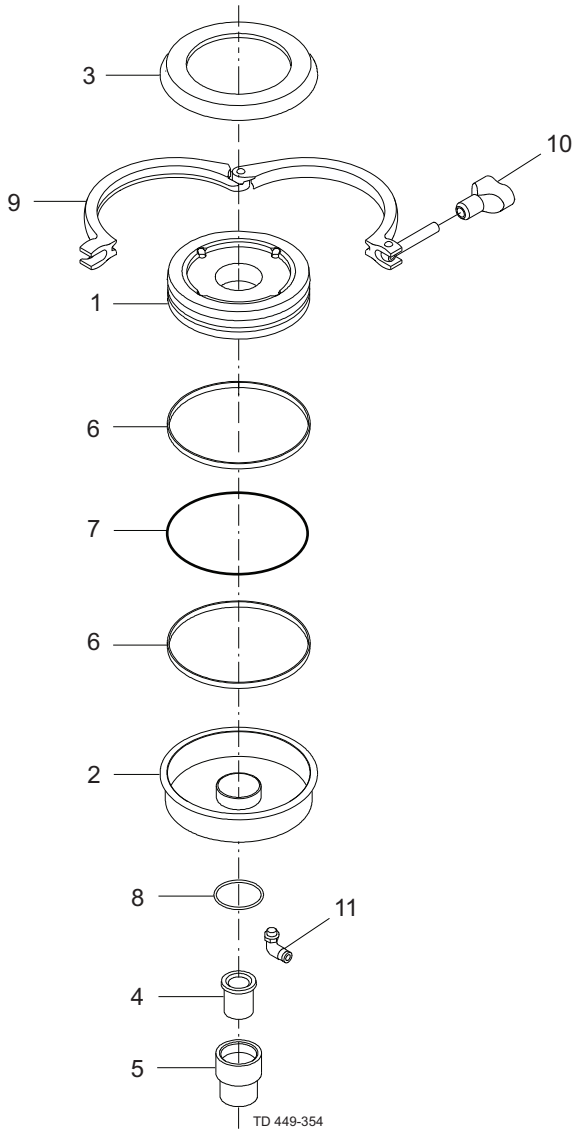
Parts list

Pos.	Qty	Denomination
1	1	Lower Part
2	1	Piston
3	1	Upper Part
4	1	O-ring, NBR
5	1	Clamp
6	1	Wingnut
7	1	Air fitting

7 Parts list and service kits

For spare parts please refer to spare parts catalogue.

7.16 Radial installation tool



For spare parts please refer to spare parts catalogue.

Parts list

Pos.	Qty	Denomination
1	1	Piston
2	1	Lower Part
3	1	Upper Part
4	1	Bushing
5	1	Guide
6	2	Guide ring
7	1	O-ring, NBR
8	1	O-ring, NBR
9	1	Clamp
10	1	Wingnut
11	1	Air fitting

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