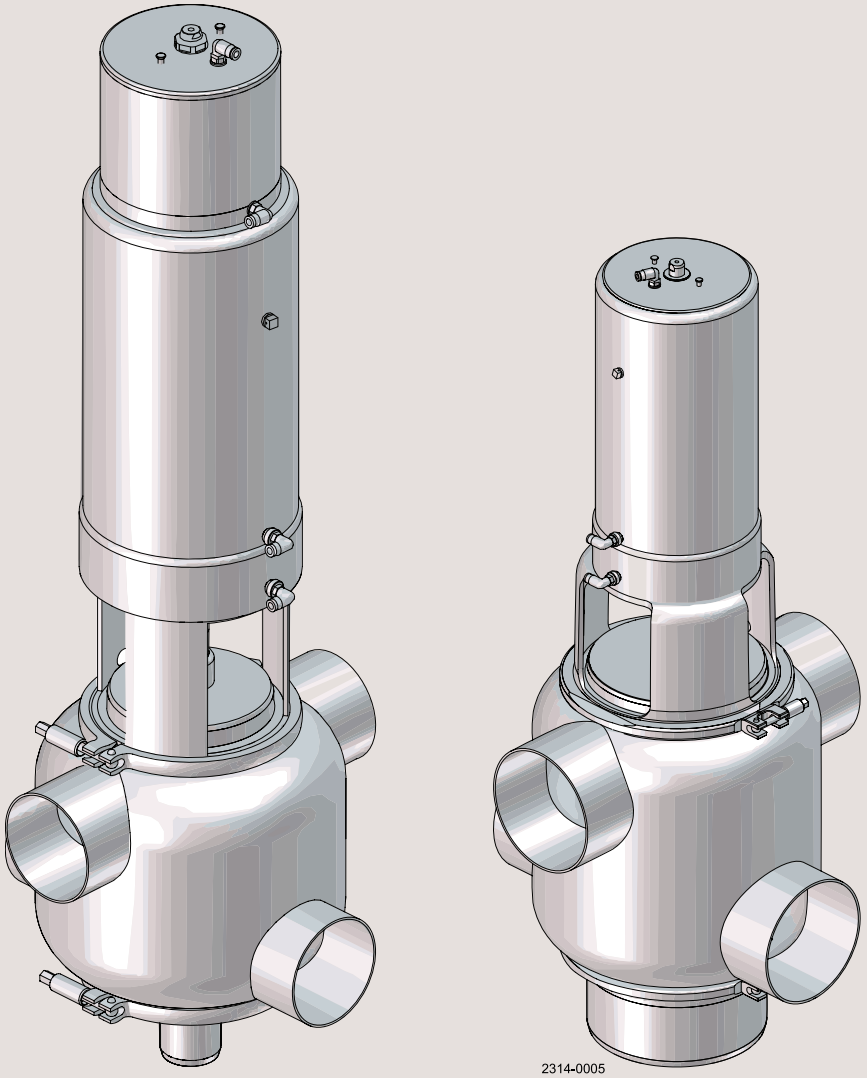
Instruction Manual

Unique Sanitary Mixproof LP and LP-F Valve



ESE02021-EN4 2022-10

Original manual

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

1 Declarations of Conformity

EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Valve
Designation

Unique LP, Unique LP-F
Type

Serial number from 1181354 to 9999999

is in conformity with the following directives with amendments:
- Machinery Directive 2006/42/EC
- The valve is in compliance with the Pressure Equipment Directive 2014/68/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.

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–10–01	
Place	Date (YYYY-MM-DD)	Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2017-03-01

UK Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Valve
Designation

Unique LP, Unique LP-F
Type

Serial number from 1181354 to 9999999

is in conformity with the following directives with amendments:
- The Supply of Machinery (Safety) Regulations 2008
- The Pressure Equipment (Safety) Regulations 2016 category 1 and subjected to assessment procedure Module A.
Diameters ≥ DN125 may not be used for fluids group 1

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–10–01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_01_102022

2 Safety

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

2.1 Important information

Always read the manual before using the valve!

WARNING
Indicates that special procedures must be followed to avoid serious personal injury.

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

NOTE
Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:

Caustic agents:

All warnings in the manual are summarised on this page.
Pay special attention to the instructions below so that serious personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

Installation

Always read the technical data thoroughly.

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 stick your fingers through the valve ports if the actuator is supplied with compressed air.

Operation

Always read the technical data thoroughly.

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).

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.

Always fit the seals correctly (risk of mixing).

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 the warning label).

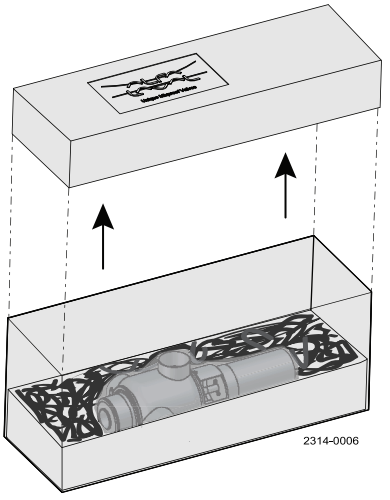
3 Installation

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.

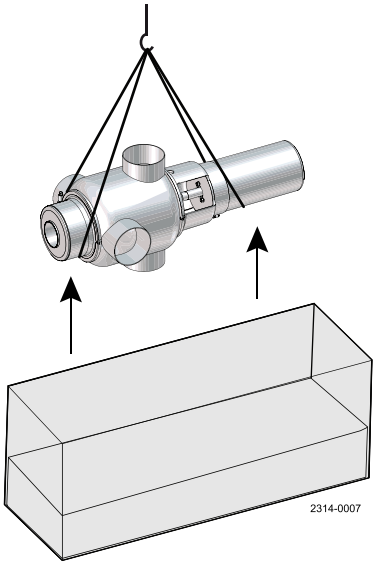
3.1 Unpacking/intermediate storage

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.

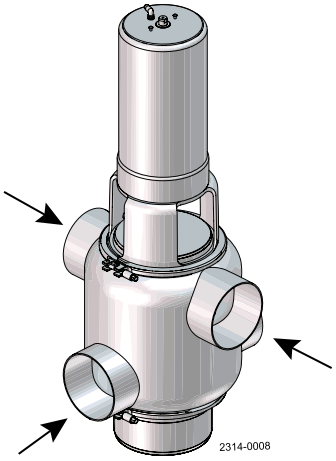


Step 3
Lift out the valve.
NOTE!
Please note weight of valve as printed on box.

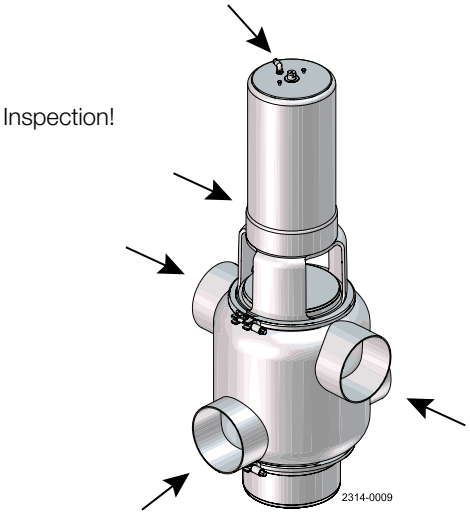


The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is clearly visible.

Step 4
Remove possible packing materials from the valve ports.



Step 5
Inspect the valve for visible transport damage.

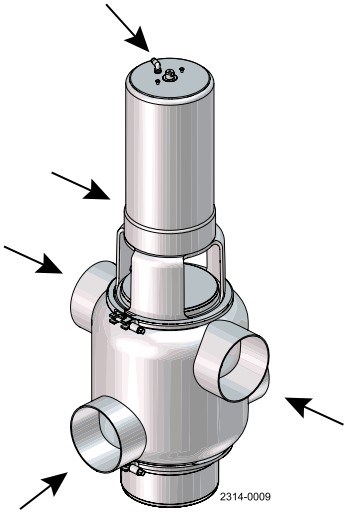


3 Installation

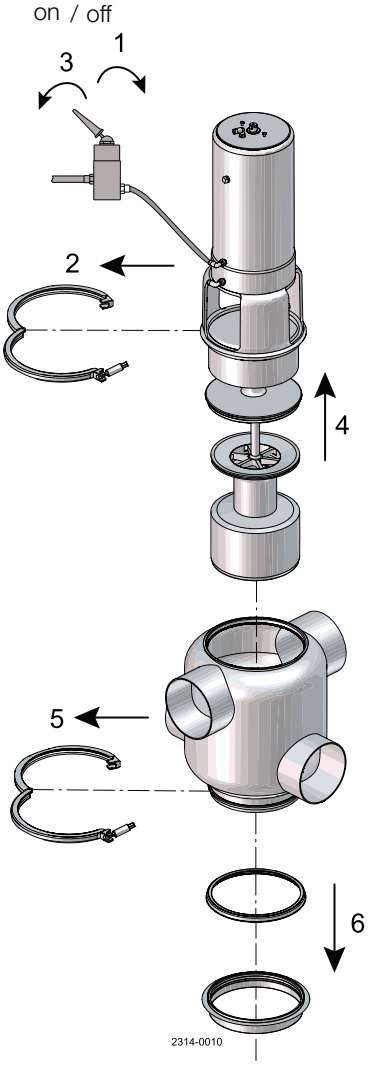
The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is clearly visible.

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

Caution!

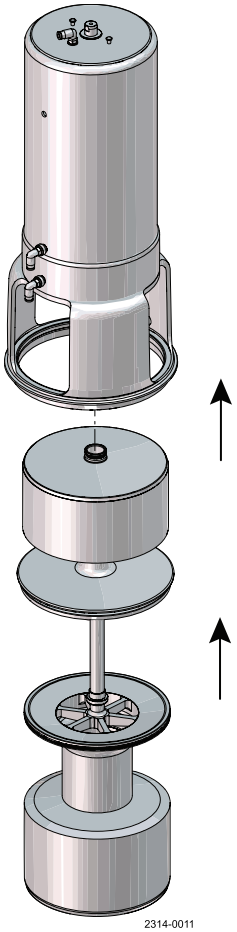


Step 7
Disassemble according to illustrations 1 to 6 (please also see 5.2 Dismantling of valve).
1. Supply compressed air.
2. Remove upper clamp.
3. Release compressed air.
4. Lift out actuator with plugs.
5. Remove lower clamp.
6. Take away lower sealing element.



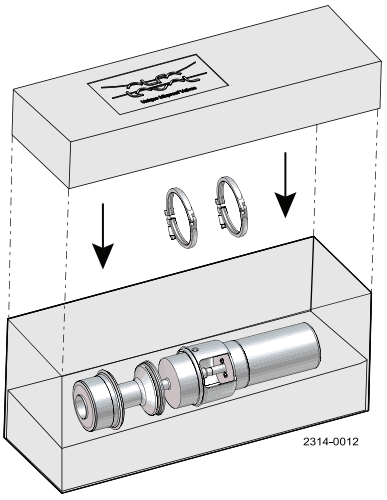
The instruction manual is part of the delivery.
Study the instructions carefully.
Fit the warning label supplied on the valve after installation so that it is clearly visible.

Step 8
Mount sealing element on valve.



Step 9
1. Place actuator part in the box.
2. Add supports.
3. Close box and store.

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



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.

3.2 General information

Step 1

Always read the technical data thoroughly.

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).

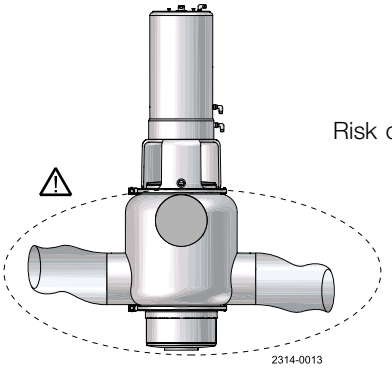
CAUTION
Fit the supplied warning label on the valve so that it is clearly visible.

CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

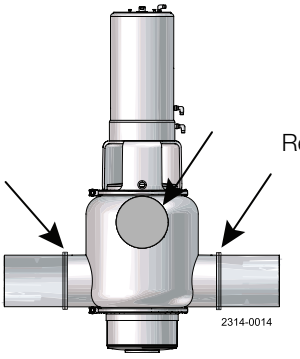
NOTE
Always install the valve vertically.

NOTE
The leakage outlet must be turned downwards!

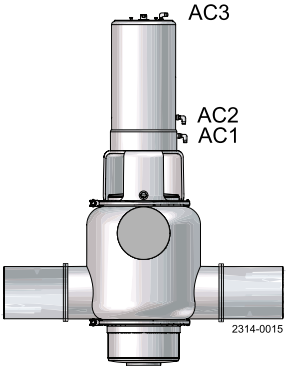
Step 2
Avoid stresses to the valve as this can result in deformation of the sealing area and malfunction of the valve (leakage or faulty indication).
Pay special attention to:
- Vibrations.
- Thermal expansion of the tubes.
- Excessive welding.
- Overloading of the pipelines.



Step 3
Fittings: Ensure that the connections are tight.



Step 4
Air connection: R 1/8" (BSP).
1: Cleaning of upper seat.
2: Open valve.
3: Cleaning of lower seat.



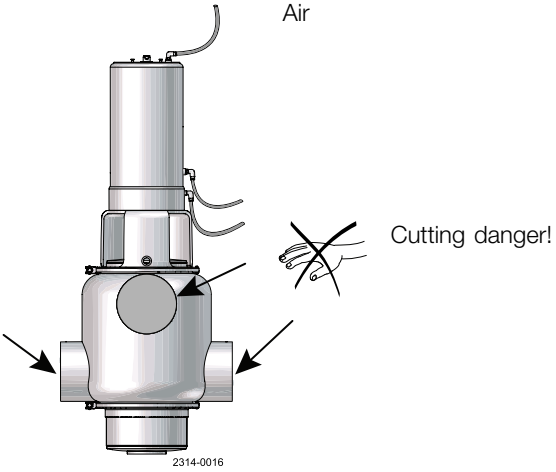
Study the instructions carefully and pay special attention to the warnings!
The valve has ends for welding as standard.
Weld carefully/aim for stressless welding to avoid deformation on sealing areas.
Check the valve for smooth operation after welding.

3.3 Welding

Step 1

⚠

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



Step 2

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

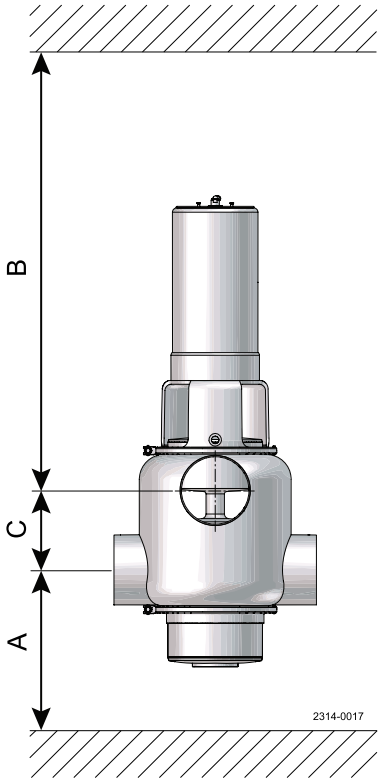
Step 3

NOTE

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

⚠

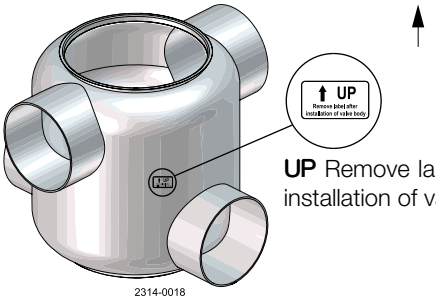
If there is a risk of foot damage, Alfa Laval recommends to leaving a distance of 120 mm below the valve (look at the specific built-in conditions).



3 Installation

Study the instructions carefully and pay special attention to the warnings!
The valve has ends for welding as standard.
Weld carefully/aim for 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.

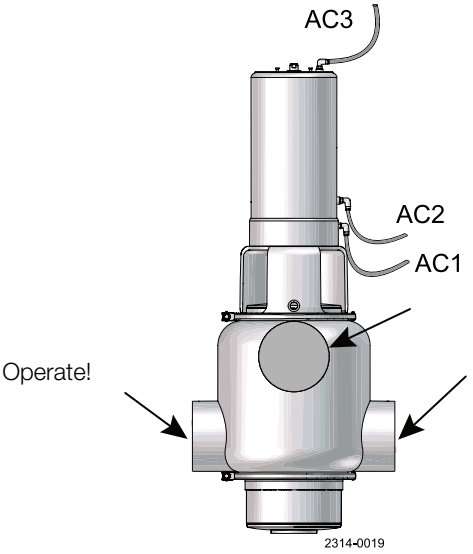


UP Remove label after installation of valve body

Step 5
Assemble the valve in accordance with section 5.5 Valve assembly after welding.
Pay special attention to the warnings!

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!



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

NOTE!
If ThinkTop® is mounted, add 180 mm to B measurement.

A. Lower sealing element can be removed without removing actuator and internal valve parts.
B. Actuator and internal valve parts can be lifted out of the valve body.

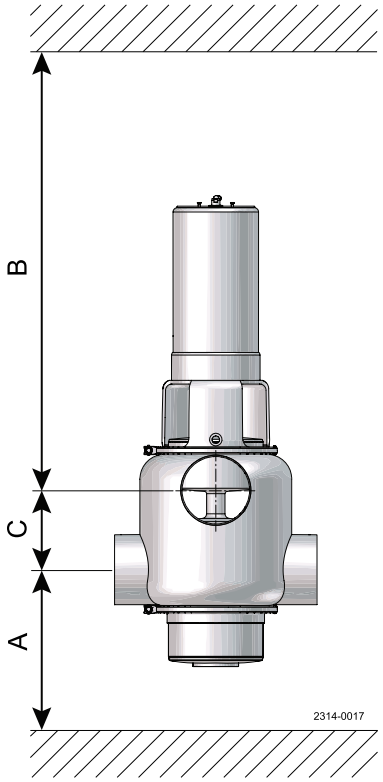


Table 1. Dimensions - all measures in mm

Size	4"		6"	
	LP	LP-F	LP	LP-F
A	352	274	436	342
B	1201	1201	1193	1193
**C	123.6	123.6	172.7	172.7

NOTE!
**The measurement C can always be calculated by the formula
$C = ½ID\text{-}_{upper} + ½ID\text{-}_{lower} + 1"$.

4 Operation

The valve is adjusted and 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.

Always release compressed air after use.

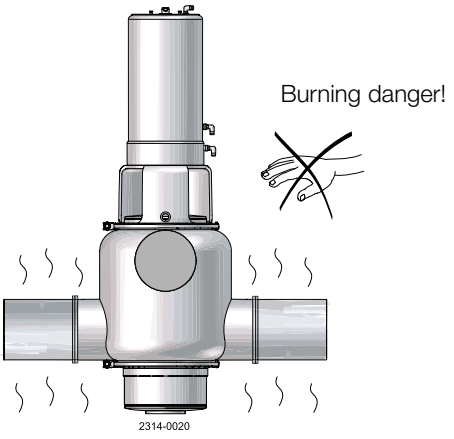
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air (see the warning label).

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.



The valve is adjusted and 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.

4.2 Troubleshooting and repair

NOTE
Study the maintenance instructions carefully before replacing worn parts.

Problem	Cause/r esult	Remedy
Leakage between sealing element (79) and lower plug (75)	Worn/damaged O-rings/ lip seal (76/77/78)	- 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/damaged 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 2, section 5.5 Valve assembly
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)	- O-rings (76 and 47) too old/damaged (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)	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 2.3)	- 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 2.3)	- 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

⚠

Never touch the valve or the pipelines when sterilising.

Caustic danger!

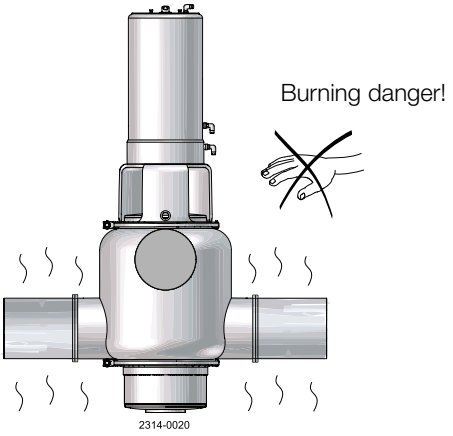
Always use rubber gloves!

Always use protective goggles!

Step 2

⚠

Never touch the valve or the pipelines when sterilising.



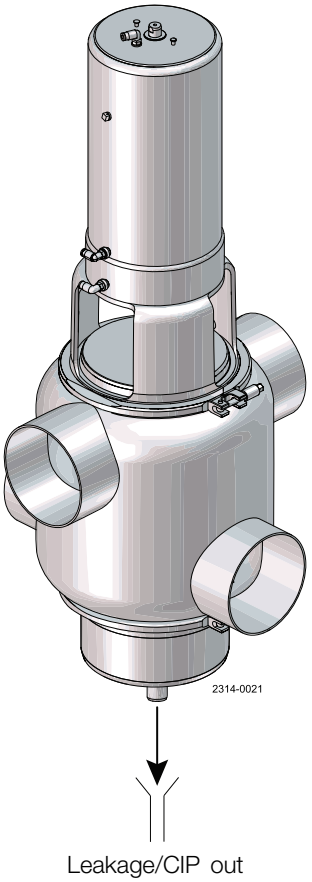
Step 3

⚠

Never throttle the leakage outlet.

⚠

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



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 4
Examples of cleaning agents:
Use clean water, free from chlorides.

1. 1% by weight NaOH at 70° C

1 kg NaOH	+	100 l water	=	Cleaning agent.
2.2 l 33%NaOH	+	100 l water	=	Cleaning agent.

2. 0.5% by weight HNO_3 at 70° C

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

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

Step 6
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 21psi (1.5 bar) 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	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Hot alkaline wash @ 10 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold post wash @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2
Cold acidified rinse @ 3 minutes	Upper seat lift	3	Energized	*0.5 sec	3
	Lower seat lift	2	Energized	*0.5 sec	3
	SpiralClean vent	-	-	*0.5 sec	3
	OD cleaning	-	-	*5 sec	2

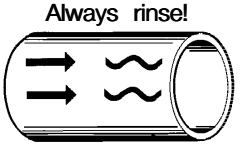
*Time stated is the actual opening time for the valve. Programmed duration is depended on the access to compressed air and response time from PLC.
Variations caused by compressed air are typically:

- Long compressed air supply hoses.
- Small ID on air supply hoses.
- Limited availability of compressed air.

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 7
Always rinse well with clean water after cleaning.

Always rinse!



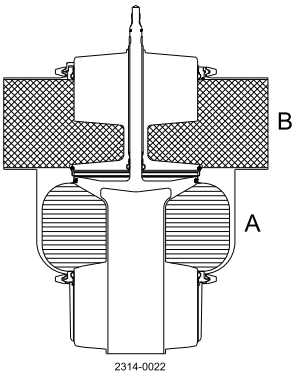
Clean water Cleaning agents

Step 8
NOTE
The cleaning agents must be stored/disposed of in accordance with current regulations/directives.

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.

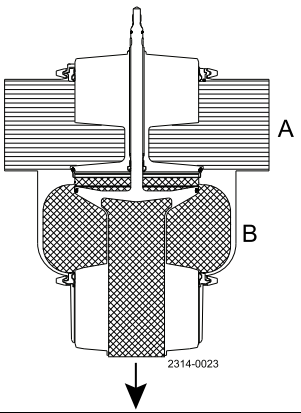
Seat-cleaning cycles:
Pay special attention to the warnings!
1. Closed valve

A. Product
B. CIP



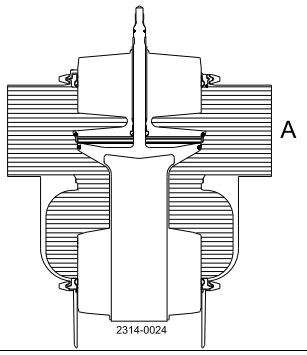
2. Cleaning through lower line

A. Product
B. CIP



3. Open valve

A. Product

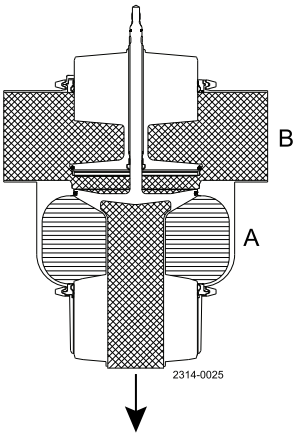


4 Operation

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. Cleaning through upper line

A. Product
B. CIP



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. The items refer to the parts list and service kits section.
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible. Check the valve for smooth operation after service.

5.1 General maintenance

Step 1

Always read the technical data thoroughly.

Always fit the seals correctly (risk of mixing).

Always release compressed air after use.

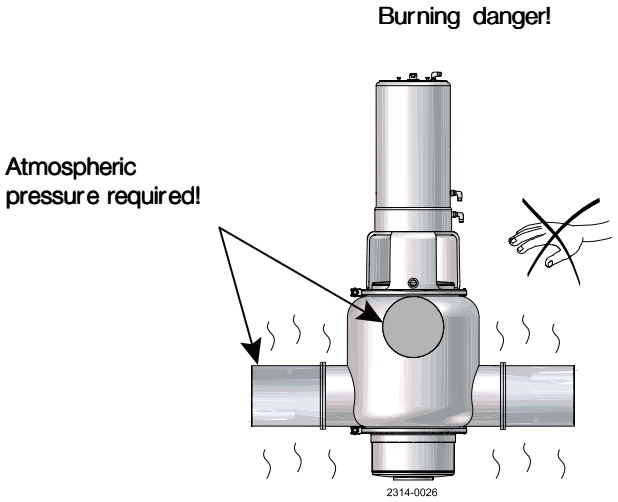
Always remove the CIP connections, if supplied, before service.

NOTE
All scrap must be stored/disposed off in accordance with current regulations/directives.

Step 2

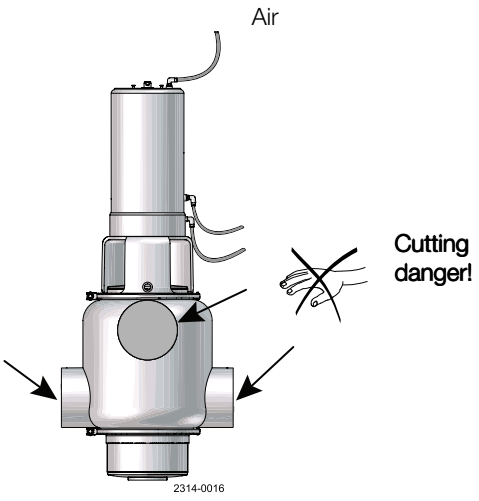
Never service the valve when it is hot.

Never service the valve with valve/actuator under pressure.



Step 3

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



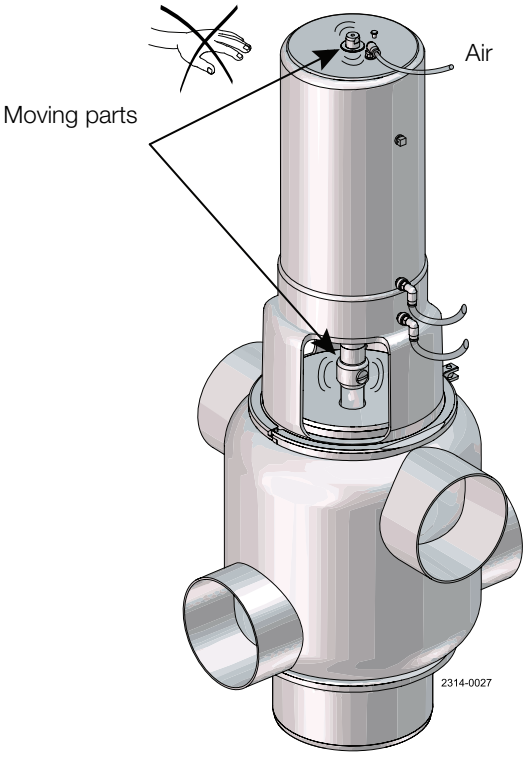
5 Maintenance

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. The items refer to the parts list and service kits section.
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible. Check the valve for smooth operation after service.

Step 4

⚠

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



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. The items refer to the parts list and service kits section.
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible. Check the valve for smooth operation after service.

Recommended spare parts: Service kits

Order service kits from the service kits section

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**	
Planned maintenance	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for inspection planning	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for inspection planning	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 Klüberplex BE31.
- To avoid possible black marks on pos. 1 and 29, Alfa Laval recommends Klüber Paraliq GTE703 (white) for these two positions.

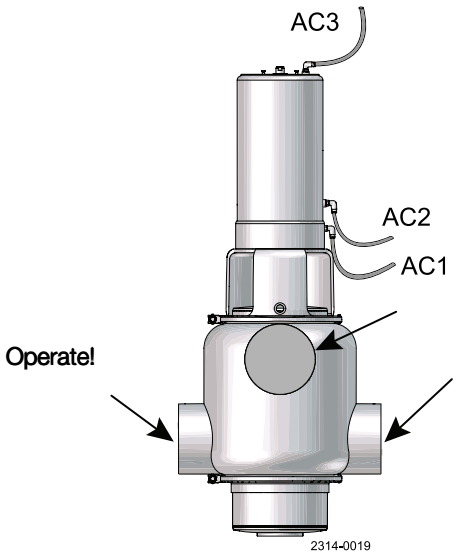
5 Maintenance

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. The items refer to the parts list and service kits section.
The valve is designed so that internal leakages do not result in the products becoming mixed.
Internal leakage in the valve is externally visible. Check the valve for smooth operation after service.

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!



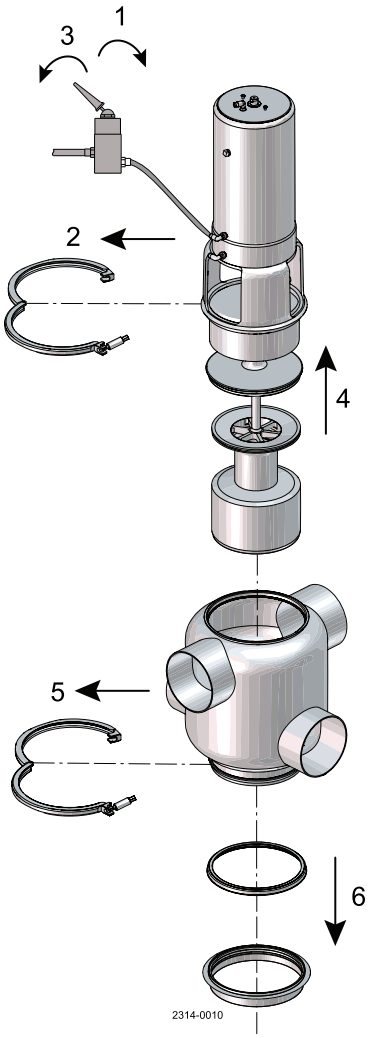
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

5.2 Dismantling of valve

(NOTE: LP-F IS SHOWN!)

Step 1
Disassemble valve acc. to illustrations (1 to 6).
1. Supply compressed air to A2.
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 lower clamp (64).
6. Remove lower sealing element (79).

NOTE
Release compressed air.

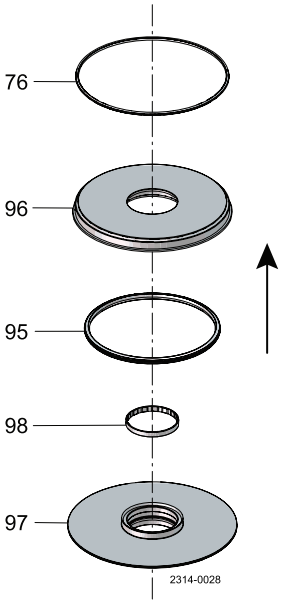


5 Maintenance

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

Step 2
Unique LP
Dismantling of lower sealing element:
1. Pull out O-ring (76) and lip seal (77).

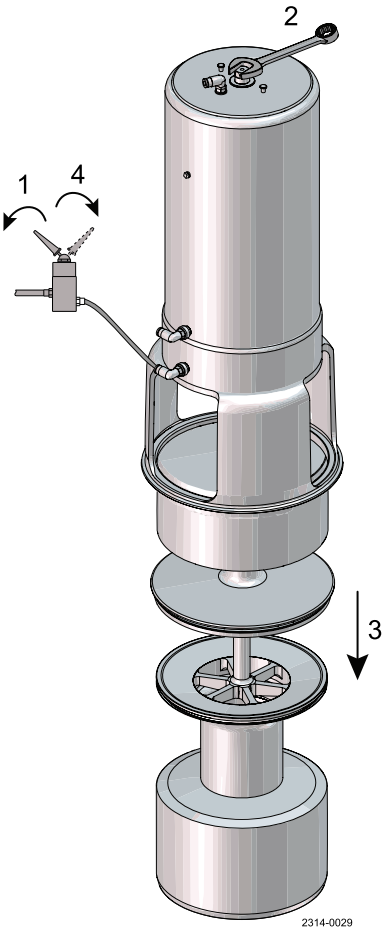
Unique LP-F
1. Pull out O-ring (76), lip seal (95) and guide ring (98) from sealing element (96+97)



Step 3
1. Supply compressed air for air connection AC1.
2. Loosen lower plug (75) while counterholding upper stem (1).
3. Remove the plug.
4. Release compressed air.

Note: For replacement of seal ring (74), please see section 4.3.

1 = on
4 = off

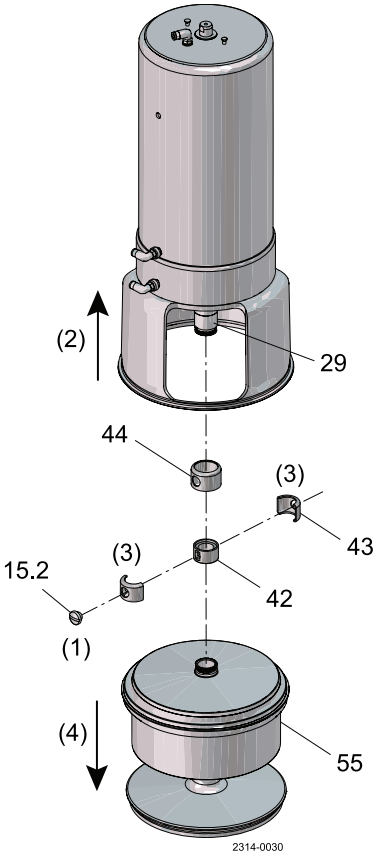


Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

Step 4

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

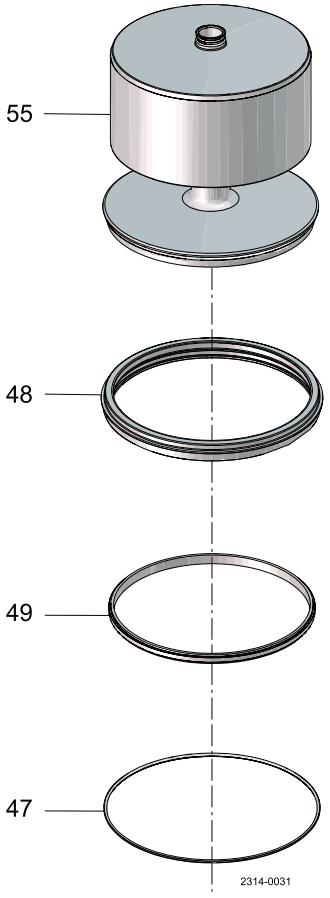
1. Unscrew plug (15)
2. Pull up lock (44) over piston rod (29).
3. Pull away clamps (43) from spindle liner (42).
4. Pull out upper plug (55). Make sure spindle liner is free of both piston rod and upper plug.



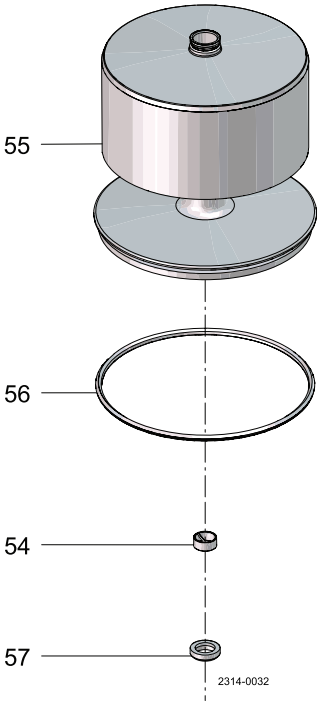
5 Maintenance

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

Step 5
1. Remove upper sealing element (48) from upper plug (55).
2. Pull out O-ring (47) and lip seal (49) from upper sealing element.



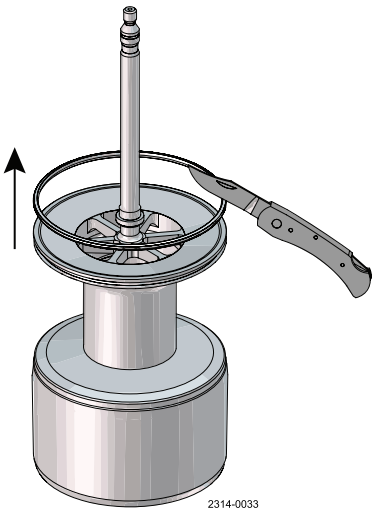
Step 6
Remove lip seal (57) and guide ring (54). For removal and replacement of seal ring (56), please see section 5.3 Lower plug, replacement of radial seal.



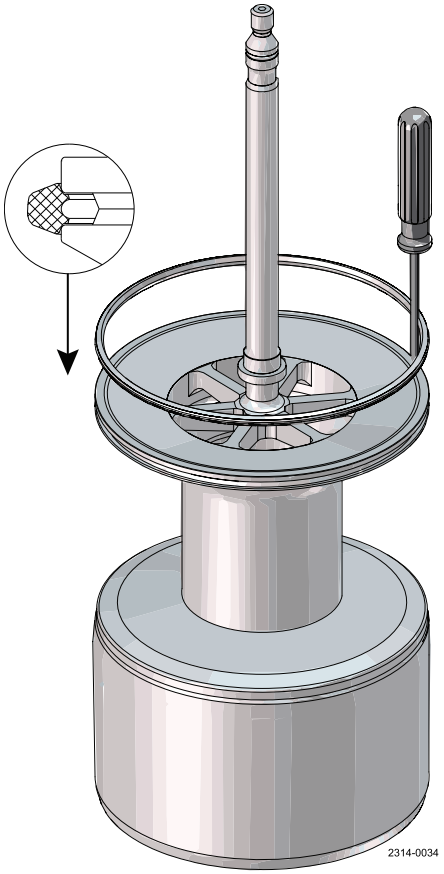
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.

5.3 Lower 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.



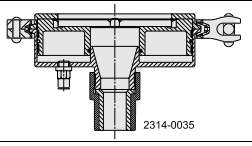
Step 2
Pre-mount seal ring as shown on drawing.
Rotate along circumference to fix gasket as shown in the picture.
Carefully lubricate sealings with suitable soap or lubricant, before pre-mounting.



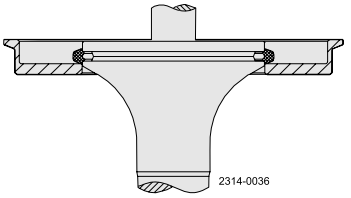
5 Maintenance

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

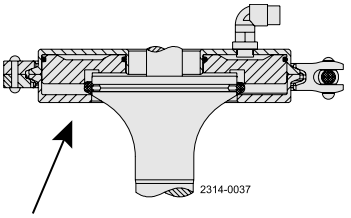
Step 3

Item No.		
Seat ø143.9	Seat ø206.1	Tool for radial sealing, lower plug
9613-4260-09	9613-4260-10	 2314-0035

Step 4
Place lower tool part.

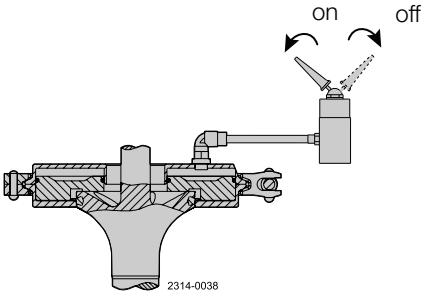

2314-0036

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


2314-0037

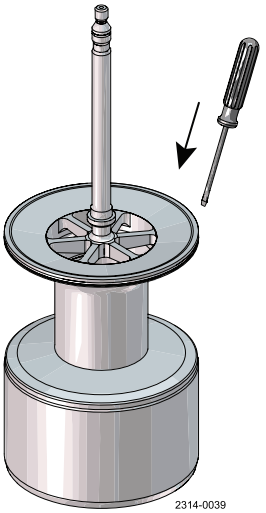
Tool marked with item number.

Step 6
1. Supply compressed air.
2. Release compressed air.
3. Remove tool parts.



2314-0038

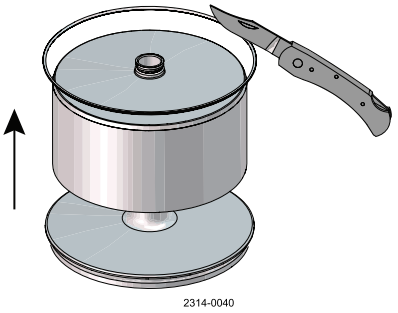
Step 7
Inspect the seal to ensure it does not twist in the groove, and press in the 4 outsticking points with a screwdriver!


2314-0039

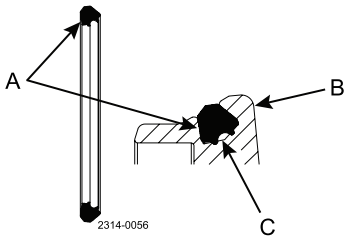
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly

5.4 Upper plug, replacement of axial seal

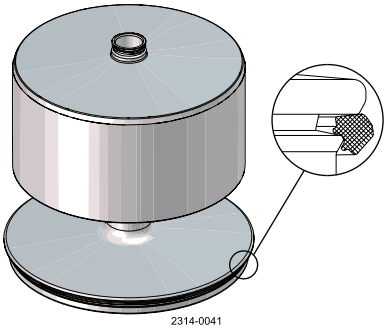
Step 1
Remove old seal ring (56) using a knife, screwdriver or similar. Be careful not to scratch the plug.



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

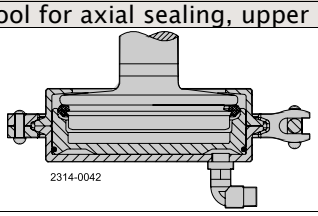


A = Flat side of the sealing
B = Balanced plug
C = Do not lubricate behind the sealing

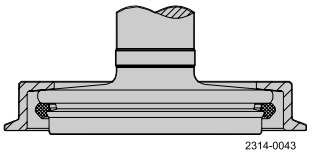


Carefully lubricate sealings with suitable soap or lubricant, before pre-mounting.

Step 3

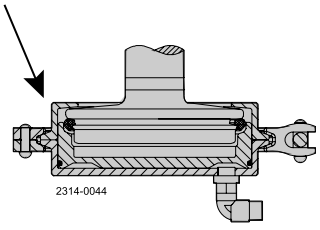
Item No.		
Seat ø143.9	Seat ø206.1	Tool for axial sealing, upper plug
9613-0505-07	9613-0505-10	

Step 4
Place tool part 1.



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

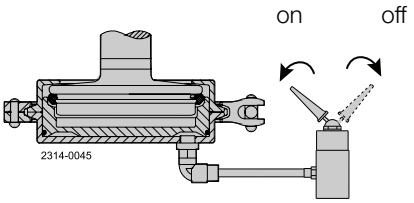
Tooling marked with item number



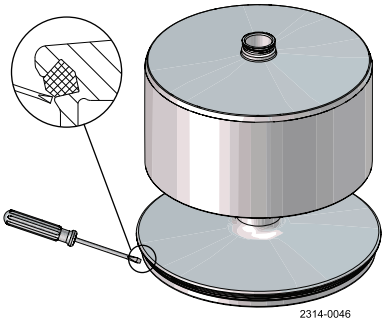
5 Maintenance

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

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.



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

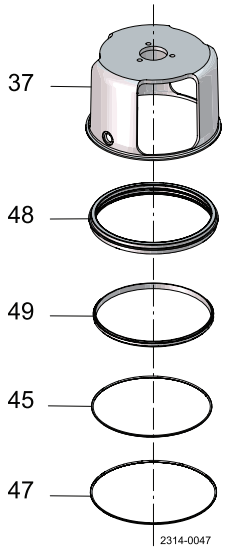


Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

5.5 Valve assembly

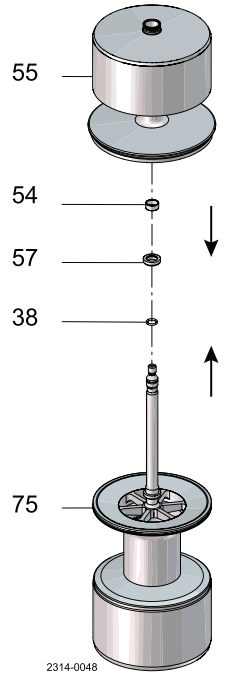
Step 1

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



Step 2

1. Place lip seal (57) and guide ring (54) in upper plug and the O-ring (38) in the lower plug.
2. Press lower plug (75) rapidly into upper plug (55) through the lip seal.
   Note: Do not damage the lips when lower plug (75) with O-ring (38) passes the lip seal.

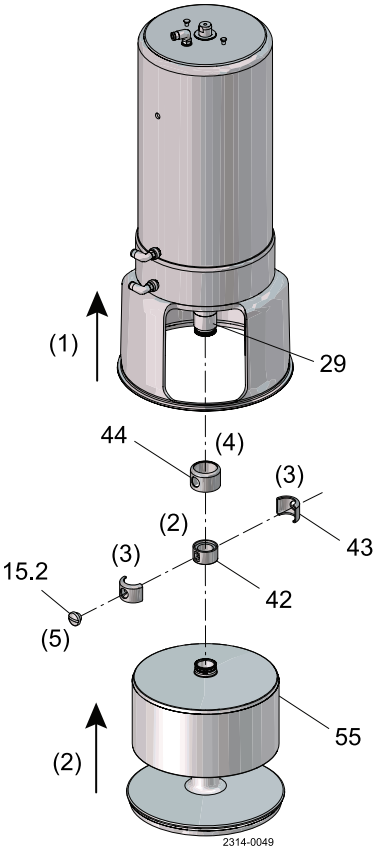


Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
Replace seals if necessary.

Step 3

Place coupling system and upper plug according to illustrations.

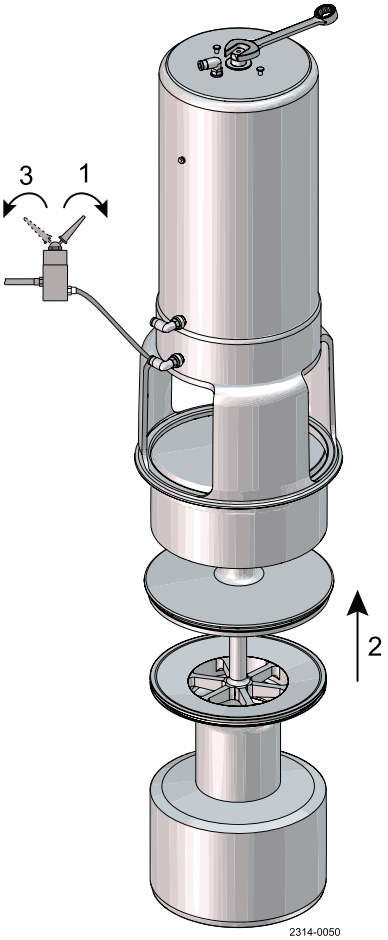
1. Push lock (44) up over piston rod (29).
2. Place spindle liner (42) on piston rod. Fit upper plug (55).
3. Mount clamps (43) on spindle liner (42).
4. Fit lock (44).
5. Fit plug (15).



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

Step 4
1. Supply compressed air for air connection AC1
2. Insert lower plug (75) and tighten
3. Release compressed air

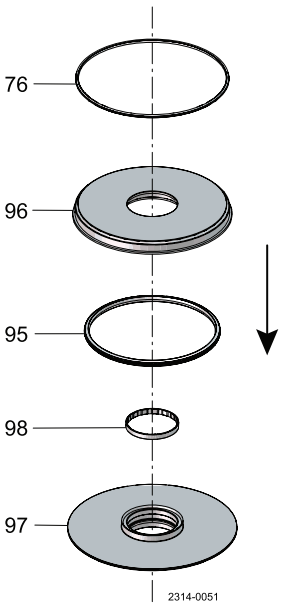
Recommended torque for fitting upper and lower plug parts: 20 Nm



Step 5

Unique LP
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 Paralique GT703)

Unique LP-F
1. Fit O-ring (76), lip seal (95) and guide ring (98) into sealing element (96+97)



5 Maintenance

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

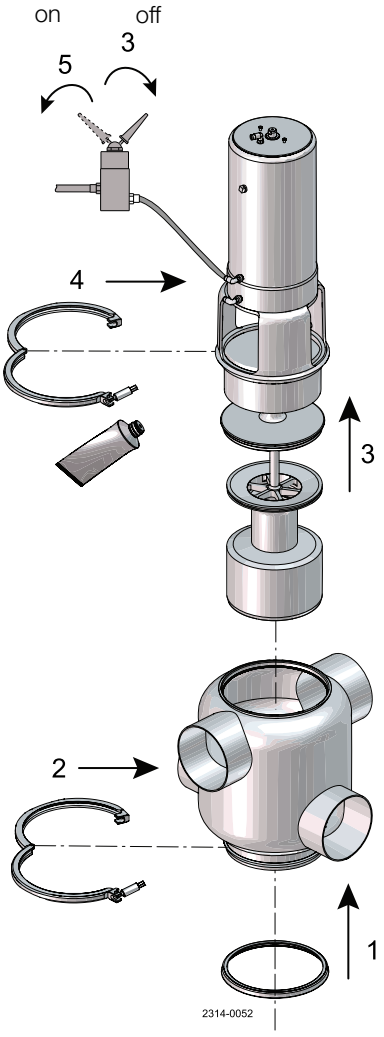
Step 6

- **Never** stick your 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 (79).
2. Fit and tighten lower clamp (64).
3. Supply compressed air (AC2) and mount the actuator together with the internal valve parts in valve body (50).
4. Fit and tighten upper clamp (64). Greasing of clamp and clamp nut recommended!
   (Maximum torque for clamp nut: 10 Nm)
5. Release compressed air.

NOTE

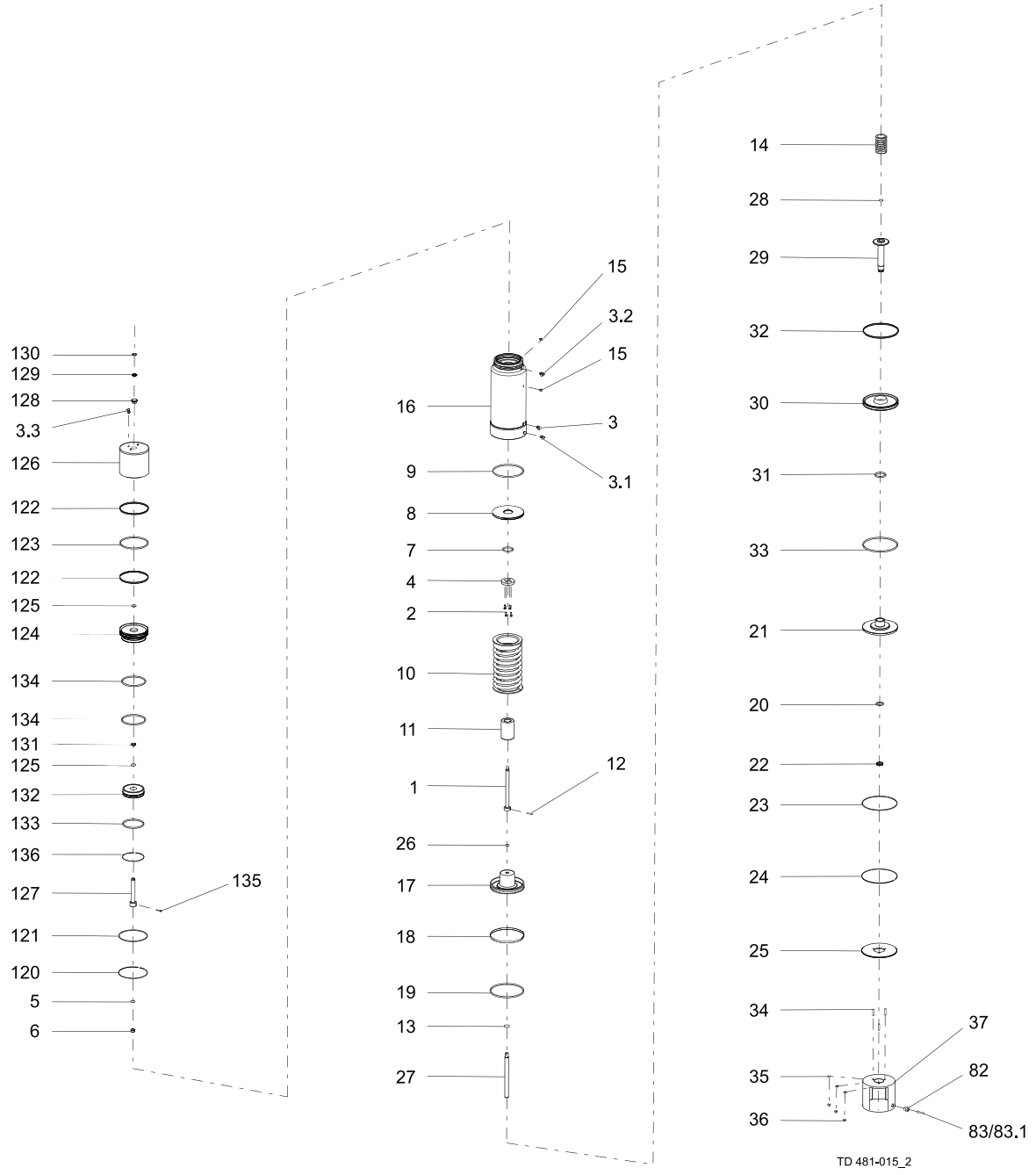
Supply compressed air before demounting the valve.



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 actuator - 4”



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

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.
   Note! The actuator is maintenance-free but repairable.

Step 2
1. Place the actuator with intermediate piece in a vice.
2. Remove booster cylinder (126) by turning the cylinder.
   Turn the cylinder until the lock ring (120) is fully removed though the groove in the cylinder and remove the cylinder.
3. Remove the bushing (128) with O-rings (129 & 130).
4. Remove the pistons (124 & 132).
5. Remove the lock ring (136) and separate the two pistons.
   Remove all O-rings and bearings (122, 123, 125, 134, 131 &133)
6. Activate main stroke (Air fitting Position 3).
7. Remove screw (135) and pull out booster spindle (127).
8. Deactivate main stroke and remove actuator from vice.

Step 3
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 4
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 5
1. Remove inner stem (27), main piston (17) and distance spacer (11). Remove guide ring (18) and O-ring (19)
2. Remove spring assembly (10).

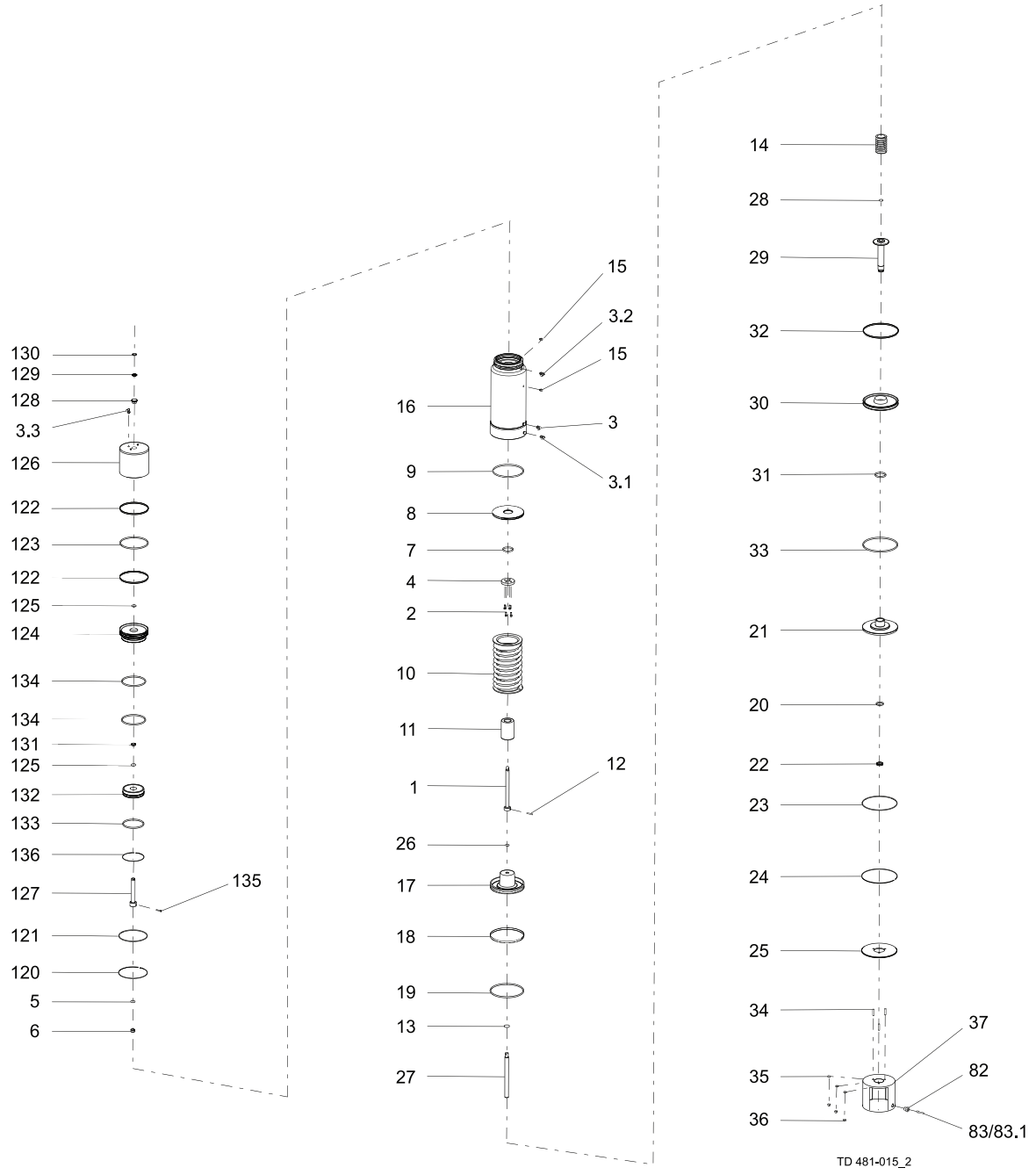
Step 6
1. Unscrew screws (2) (glued!).
2. Remove stop (4).
3. Remove upper piston (8). Remove O-rings (7 and 9).

Step 7
1. Remove O-ring (5) and guide ring (6).

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 - 4”



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.

Step 1
Please see drawing when reassembling according to steps 2 to 5 on this page.
Note! The actuator is maintenance-free but repairable.

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

Step 6
1. Place the actuator with the intermediate in a vice.
2. Activate main stroke (air fitting position 3).
3. Mount upper stem (127) and secure it with the screw (135).
4. Deactivate main stroke.

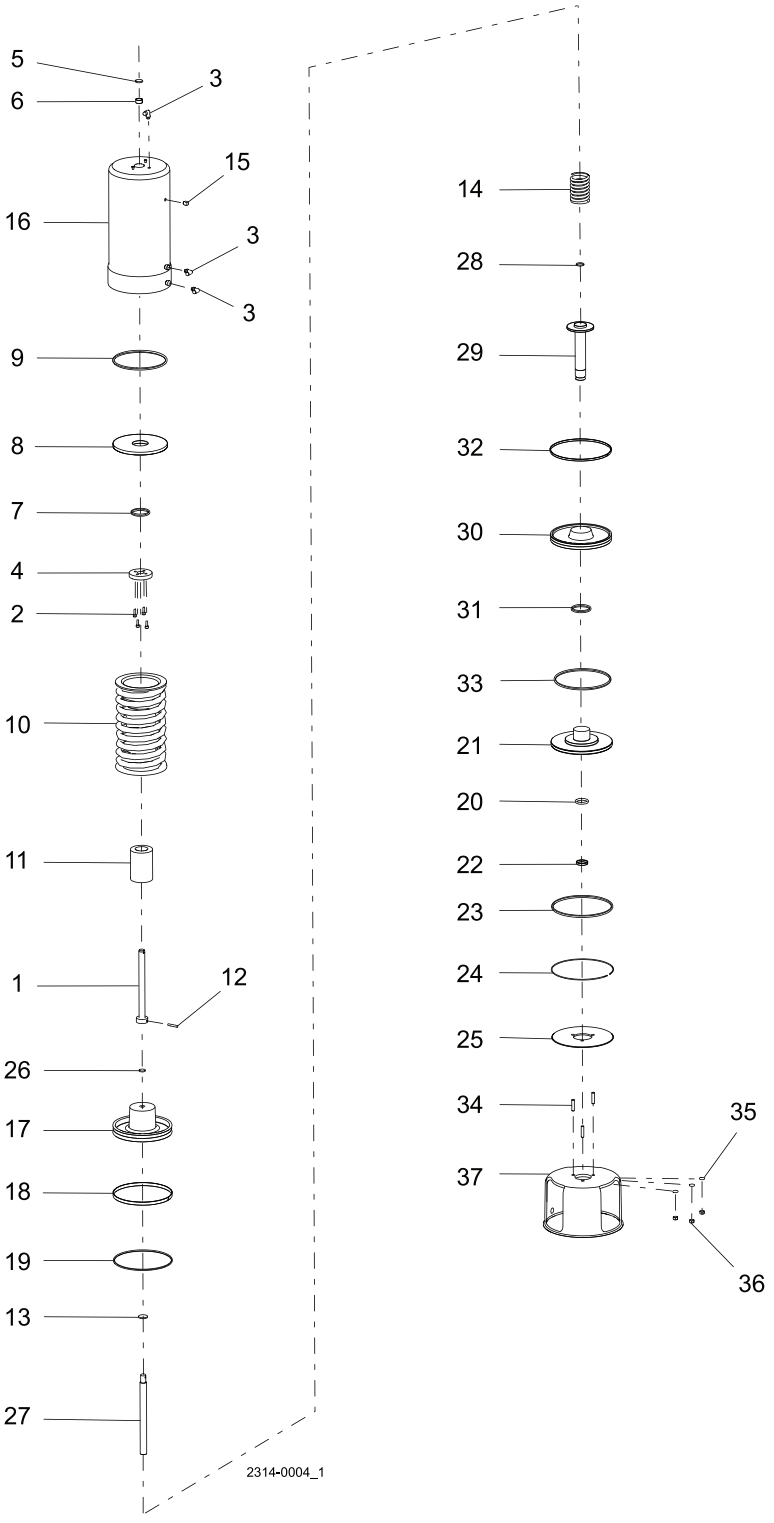
Step 7
1. Mount O-ring and guide ring (133, 125 & 131) on inner piston (132).
2. Mount O-ring and guide rings (125, 122, 134 & 123) on piston (124).
3. Insert the inner piston in the piston and secure the inner piston with the lock ring (136).
4. Mount the pistons onto the upper stem (127).

Step 8
1. Mount bushing (128) and O-rings (129 & 130) on the top of the cylinder.
2. Mount the cylinder onto the cylinder (16). Rotate the cylinder until the pin hole for the lock ring (120) can be seen through the slot on the side of the cylinder.
3. Insert the lock ring (120) in the pin hole and turn the cylinder until the complete lock ring has wandered through the slot.
4. Remove the actuator from the vice.

5 Maintenance

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

5.8 Dismantling of actuator - 6”



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

Step 1
1. Dismantle the valve in accordance with instructions in section 4.2
   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 (11). Remove guide ring (18) and O-ring (19).
2. Remove spring assembly (10).

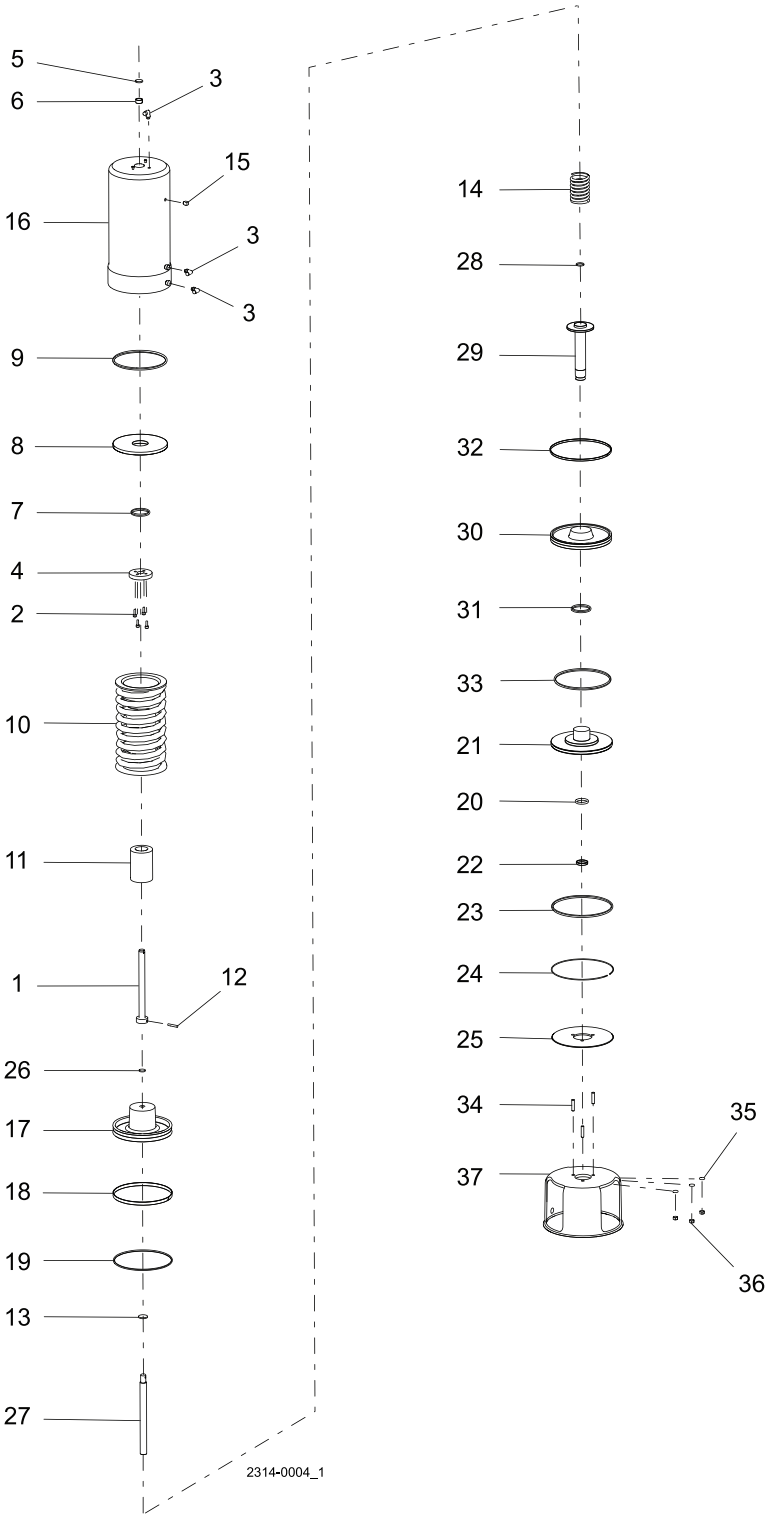
Step 5
1. Unscrew screws (2) (glued!).
2. Remove stop (4).
3. Remove upper piston (8). Remove O-rings (7 and 9).

Step 6
Remove O-ring (5) and guide ring (6).

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.

5.9 Assembly of actuator - 6”



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.

Step 1
Please see drawing when reassembling according to steps 2 to 5 on this page.
Note! The actuator is maintenance-free but repairable.

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

6 Technical data

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

6.1 Technical data

Unique Mixproof LP-F is remote-controlled by means of compressed air.

The valve is a normally closed (NC) valve. It is as standard supplied seat lift, which enables handling of two different products at the same time, or safe handling of one product while seat-lift cleaning operations are being conducted in the other portion of the valve – all without any risk of cross-contamination.

The 6" valve is as standard also equipped with balanced lower plug to protect against the effects of high pressure and water hammer.
The 4" valve is, in order to accommodate 45mm particles, not supplied with balanced lower plug.

Data	
Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Temperature range:	-5°C to +125°C (depending on rubber quality)
Air pressure:	Max. 800 kPa (8 bar)
Products acc. to PED 97/23/EC	Category I, Fluids group 1, DN ≥ 6" Fluids group 2

Size		Unique LP OD		Unique LP-F OD	
		4"	6"	4"	6"
Cv-value Upper Seat-lift	[m^3/h]	3.2	7.1	3.2	7.1
Cv-value Lower Seat-lift	[m^3/h]]	2.9	6.0	3.9	8.9
Air consumption Upper Seat-lift	[n litre]	0.62	0.62	0.62	0.62
Air consumption Lower Seat-lift	[n litre]	0.21	0.21	0.21	0.21
Air consumption Main Movement	[n litre]	3.54	3.54	3.54	3.54

Note! * [n litre] = volume at atmospheric pressure.

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

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

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

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

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 µm Internal bright (polished) Ra < 0.8 µm Internal/external bright (internal polished) Ra < 0.8 µm

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

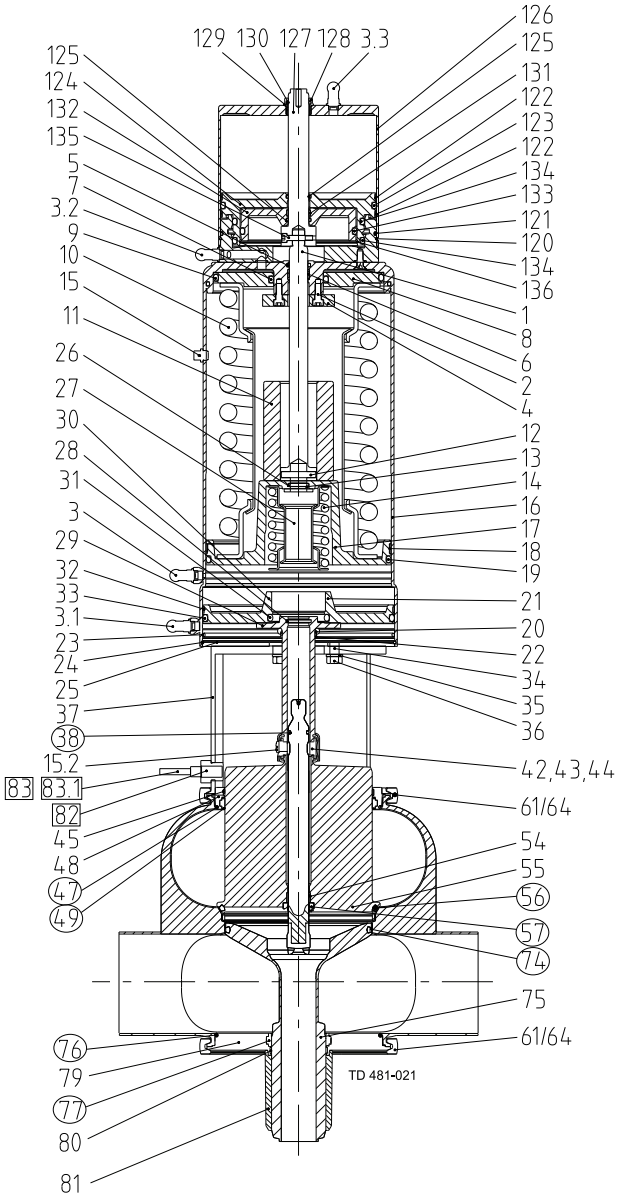
Weight (kg)

Size	4”	6”
Weight (kg)	64.90	86.20

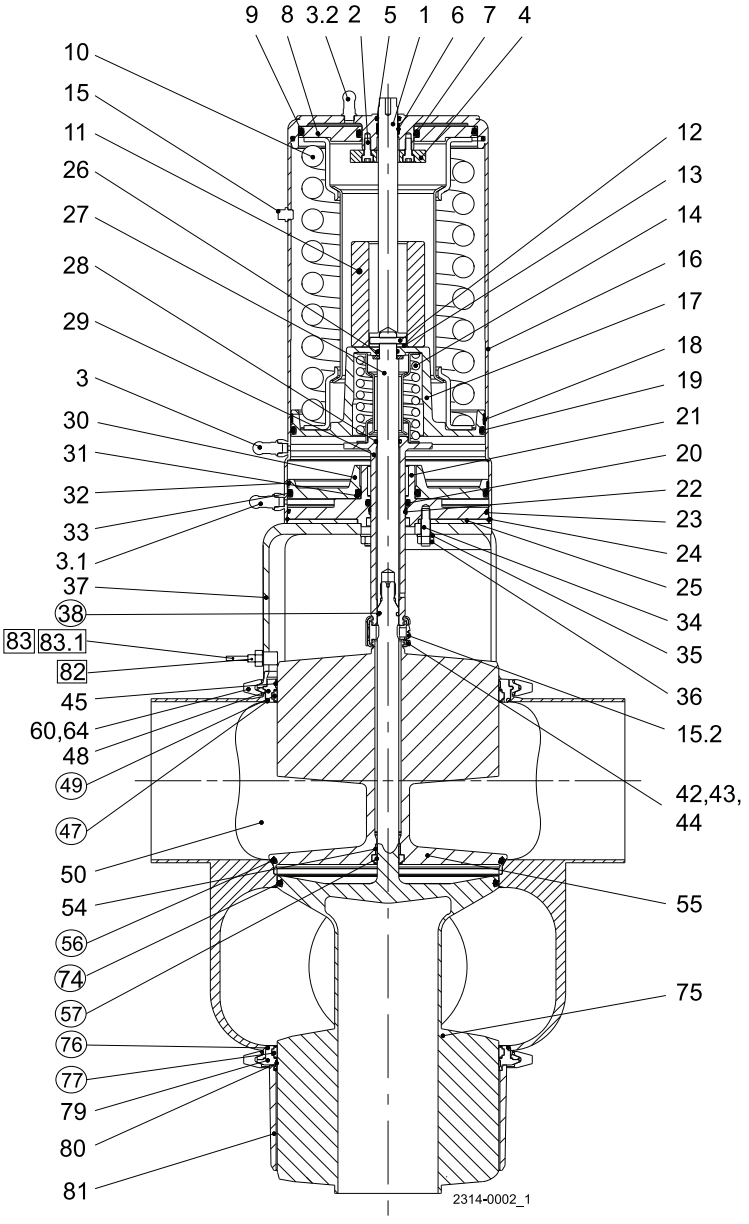
7 Parts list and service kits

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

7.1 Unique Mixproof LP Valve – wear parts 4" and 6"



4”



6”

□ = Sensor kit
◯ = Wear parts

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

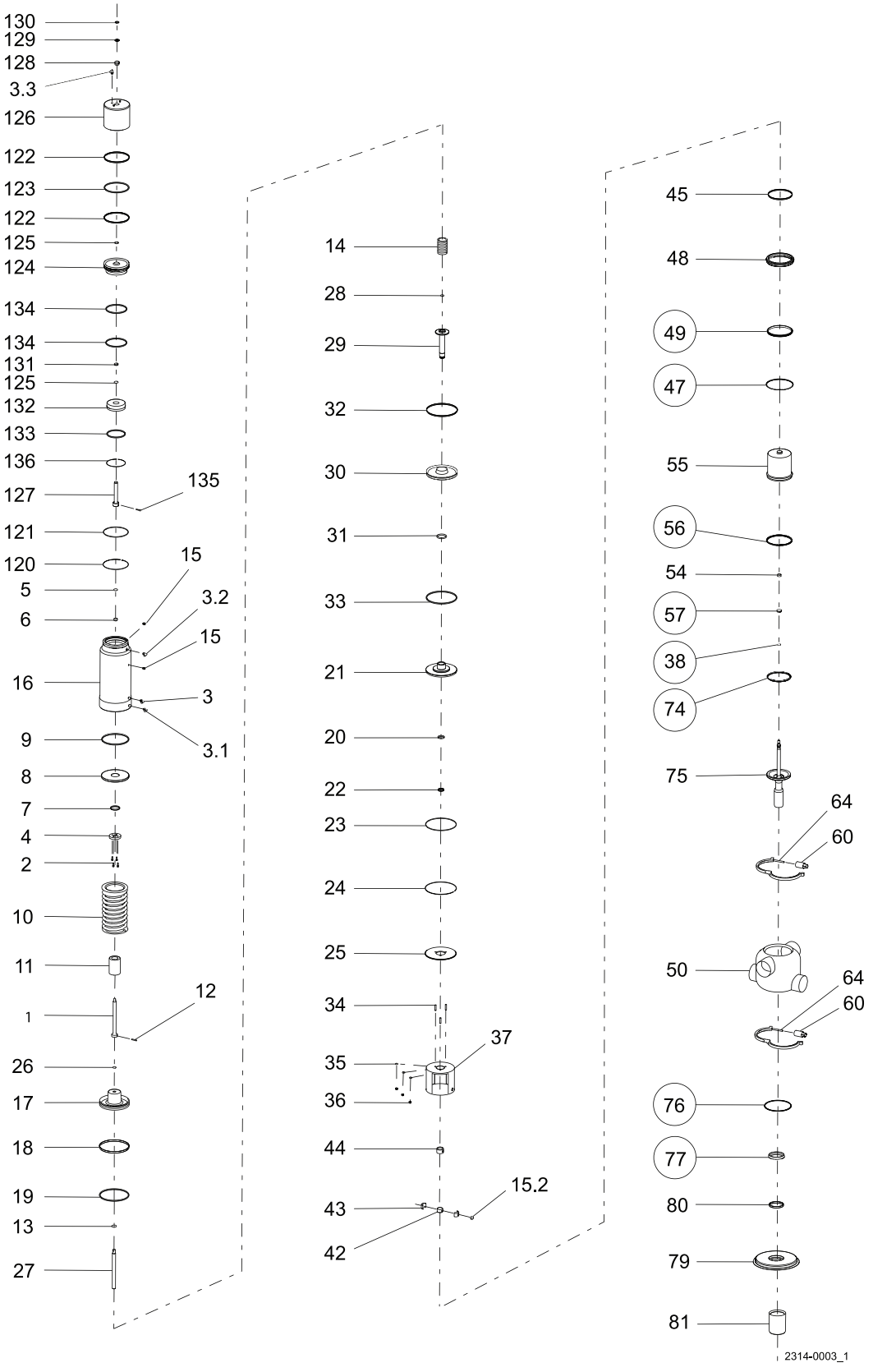
Parts list

Pos.	Qty	Denomination
38	1	O-ring
47	1	O-ring
49	1	Lip seal
56	1	Seal ring
57	1	Lip seal
74	1	Seal ring
76	1	O-ring
77	1	Lip seal

7 Parts list and service kits

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

7.2 Unique Mixproof LP Valve - parts - 4”



○ = Wear parts

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

Parts list

Pos.		Qty	Denomination
			Cpl. Actuator
1		1	Upper stem
2		4	Screw
3		1	Air fitting
3.1		1	Air fitting
3.2		1	Air fitting
3.3		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		3	Plug
16		1	Cylinder
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
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring, PTFE
48		1	Upper sealing element
54		1	Guide ring, PTFE
55		1	Upper plug
60		2	Hexnut
64		2	Clamp without nut
75		1	Lower plug
79		1	Lower sealing element
80		1	Guide ring, PTFE
81		1	Cover for Plug
120		1	Lock ring
121	●	1	O-ring, NBR
122	●	2	Guide ring
123	●	1	O-ring, NBR
124		1	Piston
125	●	2	O-ring, NBR
126		1	Cylinder
127		1	Upper stem, cpl.
128	●	1	Bushing
129	●	1	O-ring
130	●	1	O-ring
131	●	1	Guide ring, Turcite
132		1	Inner piston
133	●	1	O-ring
134	●	2	O-ring
135		1	Screw
136		1	Lock ring

7 Parts list and service kits

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

Service kits

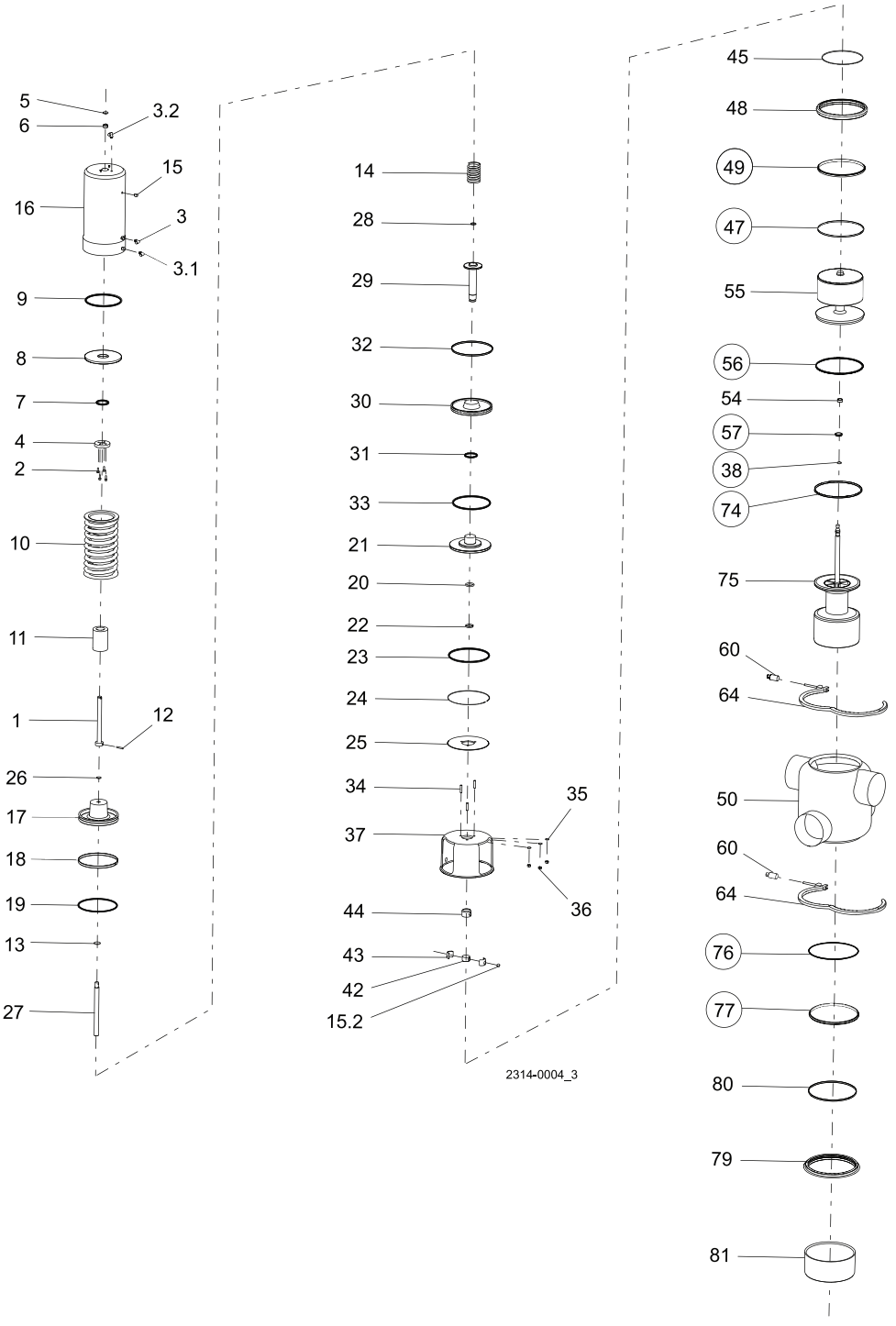
	Denomination	4" Seat ø143.9
•	Actuator service kit	9611926990

Parts marked with • are included in the service kit.

7 Parts list and service kits

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

7.3 Unique Mixproof LP Valve - parts - 6”



◯ = Wear parts

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

Parts list

Pos.		Qty	Denomination
			Cpl. Actuator
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		2	Plug
16		1	Cylinder
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
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring, PTFE
48		1	Upper sealing element
54		1	Guide ring, PTFE
55		1	Upper plug
60		2	Hexnut
64		2	Clamp without nut
75		1	Lower plug
79		1	Lower sealing element
80		1	Guide ring, PTFE
81		1	Cover for Plug

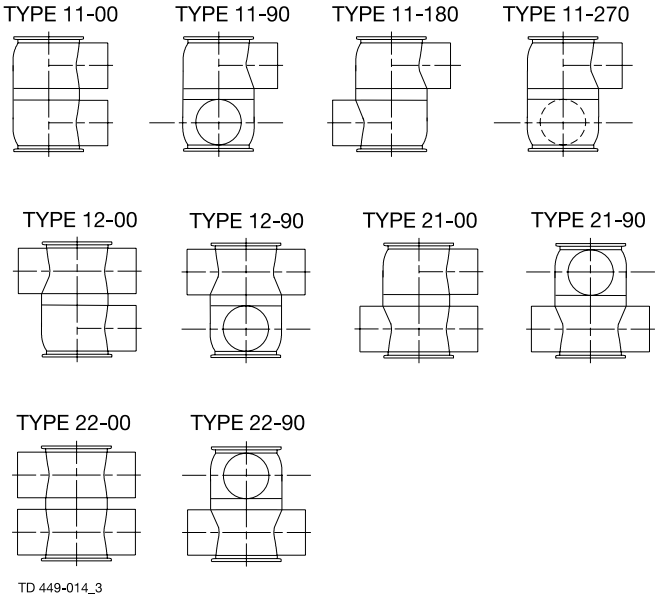
Service kits

	Denomination	6" Seat ø206.1
•	**Actuator service kit**	**9611926416**

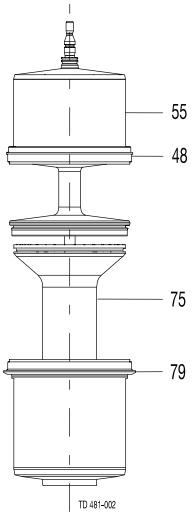
7 Parts list and service kits

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

7.4 Unique Mixproof LP Valve - service kits - 4" and 6"



Service kits



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

Parts list

Pos.	Qty	Denomination
37	1	Intermediate piece
50	1	Valve body

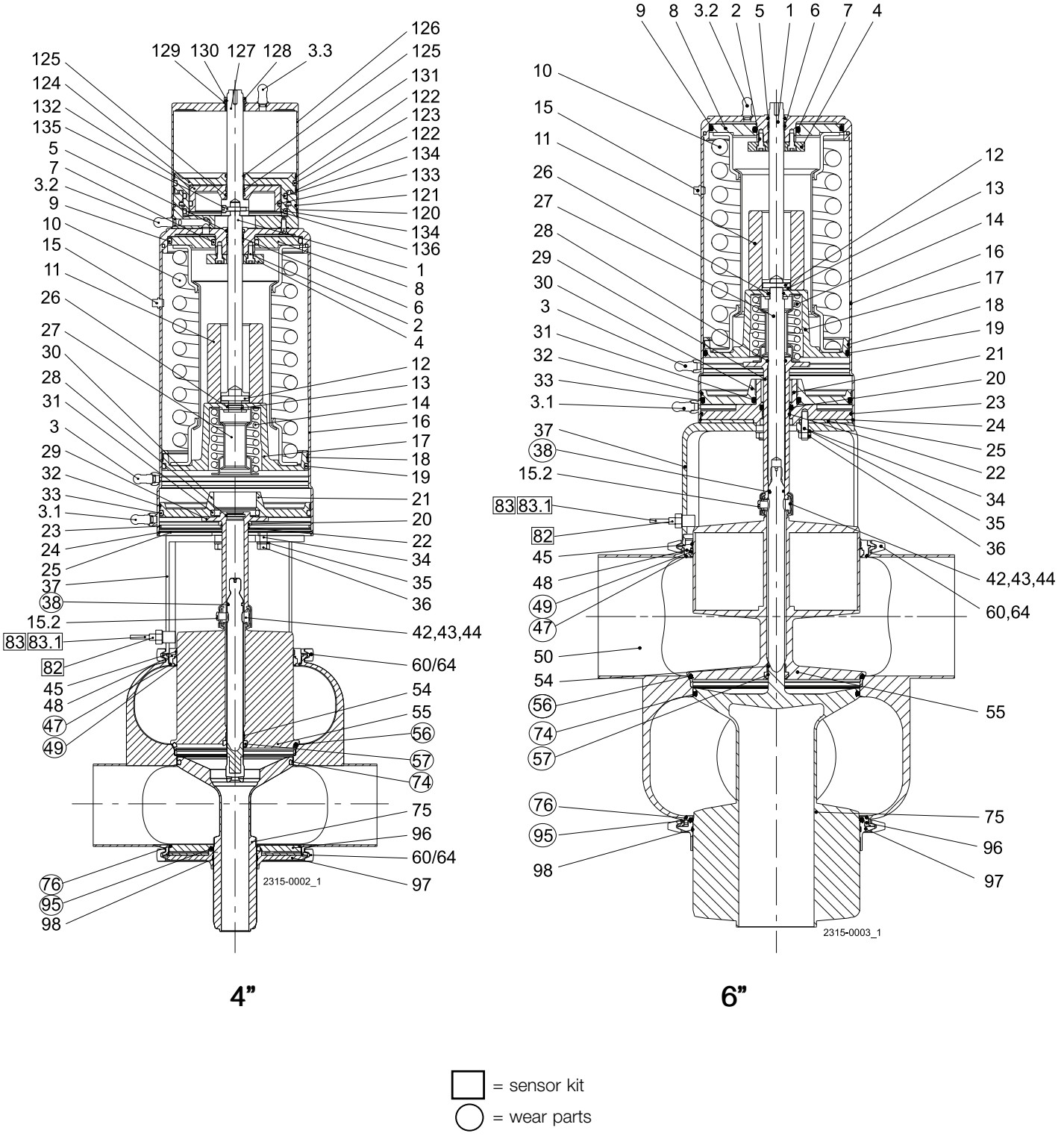
Service kits

	Denomination	4"	6"
□	**Service kit, NBR**	9611926861	9611926849
□	**Service kit, EPDM**	9611926862	9611926850
□	**Service kit, HNBR**	9611926863	9611926851
□	**Service kit, FPM**	9611926864	9611926852

7 Parts list and service kits

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

7.5 Unique Mixproof LP-F Valve - wear parts 4" and 6"



4” **6”**

= sensor kit
= wear parts

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

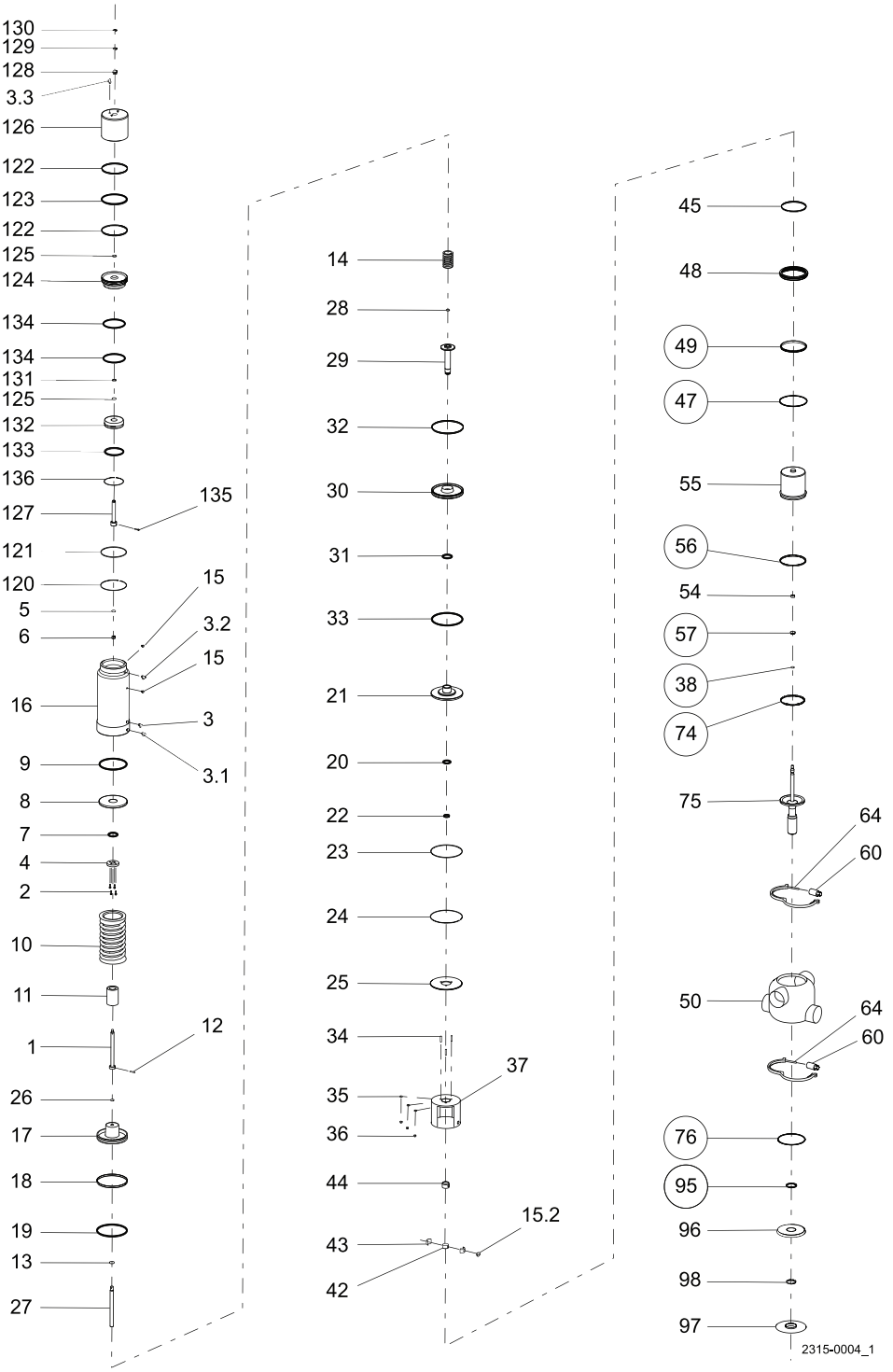
Parts list

Pos.	Qty	Denomination
38	1	O-ring
47	1	O-ring
49	1	Lip seal,
56	1	Seal ring
57	1	Lip seal
74	1	Seal ring
76	1	O-ring
95	1	Special lip seal

7 Parts list and service kits

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

7.6 Unique Mixproof LP-F Valve - parts - 4”



◯ = Wear parts

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

Parts list

Pos.		Qty	Denomination
			Cpl. Actuator
1		1	Upper stem
2		4	Screw
3		1	Air fitting
3.1		1	Air fitting
3.2		1	Air fitting
3.3		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		3	Plug
16		1	Cylinder
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
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring, PTFE
48		1	Upper sealing element
54		1	Guide ring, PTFE
55		1	Upper plug
60		2	Hexnut
64		2	Clamp without nut
75		1	Lower plug
96		1	Lower sealing element, upper part
97		1	Lower sealing element, lower part
98		1	Guide ring, Turcite
120		1	Lock ring
121	●	1	O-ring, NBR
122	●	2	Guide ring
123	●	1	O-ring, NBR
124		1	Piston
125	●	2	O-ring, NBR
126		1	Cylinder
127		1	Upper stem, cpl.
128	●	1	Bushing
129	●	1	O-ring
130	●	1	O-ring
131	●	1	Guide ring, Turcite
132		1	Inner piston
133	●	1	O-ring
134	●	2	O-ring
135		1	Screw
136		1	Lock ring

7 Parts list and service kits

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

Service kits

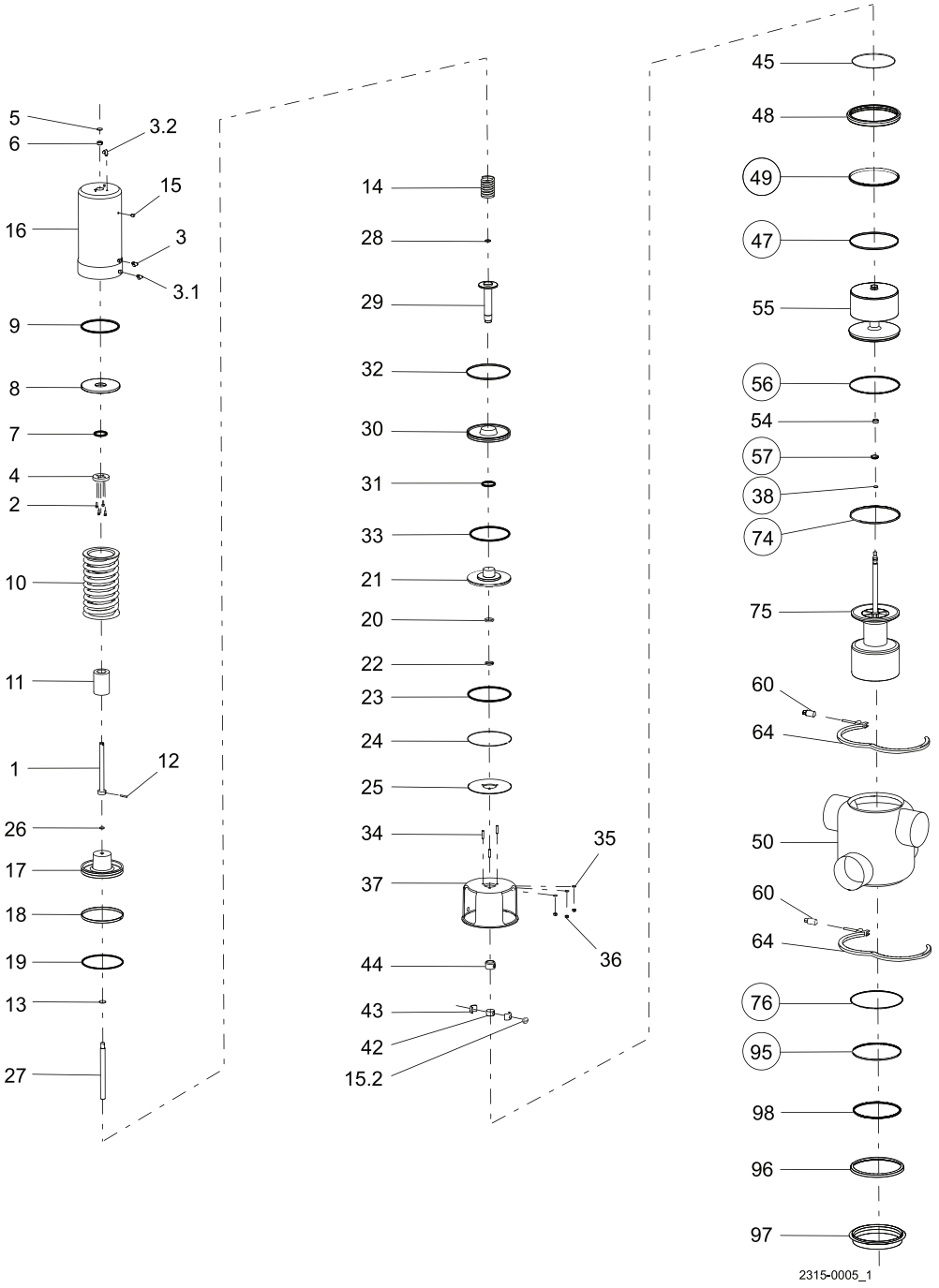
	Denomination	4" Seat ø143.9
•	Actuator service kit	9611926990

Parts marked with • are included in the service kit.

7 Parts list and service kits

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

7.7 Unique Mixproof LP-F Valve - parts - 6”



◯ = Wear parts

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

Parts list

Pos.		Qty	Denomination
			Cpl. Actuator
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		2	Plug
16		1	Cylinder
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
42		1	Spindle liner
43		2	Clamp
44		1	Lock
45		1	Guide ring, PTFE
48		1	Upper sealing element
54		1	Guide ring, PTFE
55		1	Upper plug
60		2	Hexnut
64		2	Clamp without nut
75		1	Lower plug
96		1	Lower sealing element, upper part
97		1	Lower sealing element, lower part
98		1	Guide ring, Turcite

Service kits

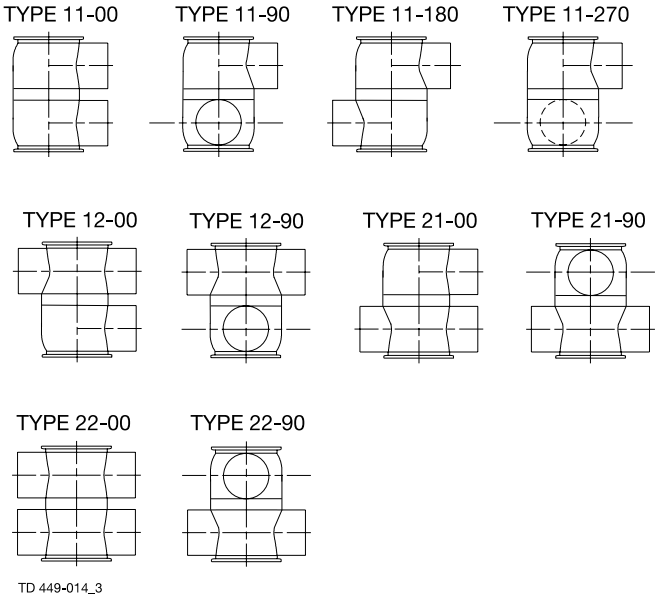
	Denomination	6" Seat 206.1
•	**Actuator service kit**	**9611926416**

Parts marked with • are included in the service kit.

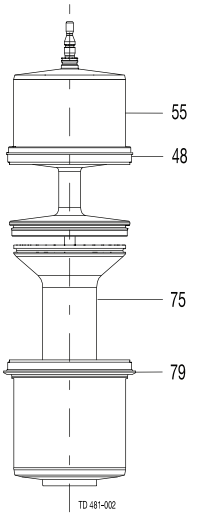
7 Parts list and service kits

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

7.8 Unique Mixproof LP-F Valve - service kits - 4" and 6"



Service Kits



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

Parts list

Pos.	Qty	Denomination
37	1	Intermediate piece
50	1	Valve body

Service kits

	Denomination	
4”		
□	**Service kit, NBR**	**9611926865**
□	**Service kit, EPDM**	**9611926866**
□	**Service kit, HNBR**	**9611926867**
□	**Service kit, FPM**	**9611926868**
6”		
□	**Service kit, NBR**	**9611926857**
□	**Service kit, EPDM**	**9611926858**
□	**Service kit, HNBR**	**9611926859**
□	**Service kit, FPM**	**9611926860**

How to contact Alfa Laval
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continually updated on our website.
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