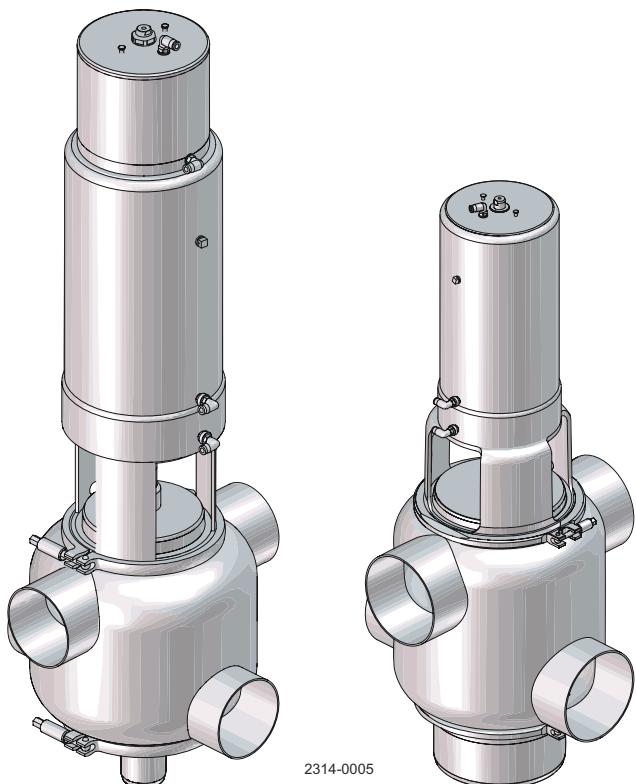


Unique Mixproof Large Particle (LP and LP-F)

Double seat valves



Lit. Code

200008005-1-EN-GB

Instruction Manual

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
+45 79 32 22 00

The original instructions are in English

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1 Declarations of Conformity

1.1 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

1181354 to 9999999

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive (PED) 2014/68/EU *category 1 and subjected to assessment procedure Module A. Diameters \geq DN125 may not be used for fluids Group 1.*

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

Vice President BU Hygienic Fluid Handling

Head of Product Management

Mikkel Nordkvist

Title

Name

Kolding, Denmark

2025-11-01



Place

Date (YYYY-MM-DD)

Signature

DoC Revision_01_112025 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01



1.2 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

1181354 to 9999999

Serial number

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.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Mikkel Nordkvist

Title

Name

Kolding, Denmark

2025-11-01



Place

Date (YYYY-MM-DD)

Signature

DoC Revision_ 02_112025

UK
CA



2 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **Safety, Installation and Operating** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter **Safety** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter **Technical Data** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

2.1 Safety Signs

Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs

	General warning.
	Transportation with forklift truck or other industrial vehicles if heavy.
	Hot surface and burning danger.
	Cutting danger.
	Corrosive substance.
	Crushing of hands.

2.2 Safety Precautions

All warnings in the Instruction Manual are summarised on these pages. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.

General

	<p>To prevent unexpected start and contact with electrical live and moving parts.</p> <p>Always disconnect the power supply and air supply safely:</p> <ul style="list-style-type: none"> • The power supply disconnecting device and air supply must be disconnected (in off position) and locked.
-----------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Transportation and Lifting

  	<p>Never lift or elevate in any way other than described in this manual.</p> <p>Always use the original packaging or similar during transportation.</p> <p>Always ensure that personnel must have experience with lifting operations.</p> <p>Always ensure that all connections are disconnected before attempting to remove the valve from the installation.</p> <p>Always ensure that no leakage of lubricants can occur.</p> <p>Always drain liquid out of the valves before transportation.</p> <p>Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used.</p> <p>Always ensure that compressed air is released.</p>
	<p>Always use designated lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product.</p> <p>Always ensure that the unit is securely fixed during transportation.</p> <p>Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary.</p> <p>Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p> <p>Always keep an eye on the load and stay clear during the lifting operation.</p>

Installation

	<p>If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the valve is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them.</p> <p>Always release compressed air after use.</p> <p>Always assemble the valve completely before startup and make sure everything is in place and correctly tightened.</p>
	<p>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.</p> <p>Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.</p> <p>Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before installation, inspection, assembly, or dismantling of the valve.</p> <p>Never touch the supplied product or the pipelines when processing hot liquids or sterilizing.</p> <p>Never stick your fingers through the valve ports if the actuator is supplied with compressed air..</p>

Operation

	<p>Always read Technical Data thoroughly.</p> <p>Never operate the valve unless a correct installation has been verified.</p> <p>Never dismantle the valve during operation or when pressurized.</p> <p>Necessary precautions must be taken if leakage occurs as this can lead to hazardous situations.</p> <p>Never pressurise air connections (AC1, AC3) simultaneously as both valve plugs can be lifted (can cause mixing).</p> <p>Never throttle the leakage outlet.</p> <p>Never throttle the CIP outlet, if supplied.</p> <p>Never throttle the outlet of the detecting valve.</p> <p>Always keep the cleaning pressure lower than the product pressure.</p> <p>Never dismantle or touch the actuator for force opening if supplied with compressed air.</p>
	<p>Never touch the valve or pipelines when hot.</p> <p>Never touch the supplied product or the pipelines when processing hot liquids or sterilizing.</p>
	<p>Always rinse well with clean water after the cleaning.</p> <p>Always handle lye and acid with great care.</p> <p>Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.</p>
	<p>Never touch moving parts during operation.</p> <p>Always release compressed air after use.</p> <p>Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.</p> <p>Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.</p> <p>Never touch the moving parts if the actuator is supplied with compressed air.</p>
	<p>Do NOT attempt to disassemble or by other means open the actuator due to spring under load danger!</p>

Maintenance

	<p>In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance includes:</p> <ul style="list-style-type: none"> • Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation • Preventive maintenance: visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts • Repairs: unscheduled break down of a component, often causing the system to stop. Damaged components must be replaced • Stock of Alfa Laval genuine spare parts: Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing downtime in case of unplanned break downs <p>Always fit the seals correctly.</p> <p>Always remove the CIP connections, if supplied, before service.</p> <p>Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.</p>
	<p>Always use Alfa Laval genuine spare parts.</p> <p>Always release compressed air after use.</p> <p>Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.</p> <p>Never stick your fingers through the valve ports if the actuator is supplied with compressed air.</p> <p>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.</p> <p>Never put your fingers between the valve and actuator for force opening.</p> <p>Never touch the moving parts if the actuator for force opening is supplied with compressed air.</p> <p>Never service the valve when it is hot.</p>
	<p>Do NOT attempt to disassemble or by other means open the actuator due to spring under load danger!</p> <p>Never service the valve with valve and pipelines under pressure unless specifically prescribed.</p>

Storage

	<p>Alfa Laval recommend:</p> <ul style="list-style-type: none"> • Store the supplied Alfa Laval product as supplied in original packaging • Port opening(s) should be protected against any ingress • Bare steel (not stainless) should be lightly oiled/greased • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5 °C to +40 °C (23 °F - 104 °F) • Relative humidity less than 60% • No exposure to corrosive substances (including contained air)
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Noise

	<p>Under certain operating conditions, the supplied Alfa Laval product and/or the systems in which they are installed can produce high sound pressure levels. Appropriate noise protection measures should be taken when necessary and in accordance with local legislation.</p>
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Hazards

 	<p>Burn Hazard</p> <ul style="list-style-type: none"> • Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves
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  	<p>Corrosive Hazard</p> <ul style="list-style-type: none"> • Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids • When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.
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 	<p>Cut Hazard</p> <ul style="list-style-type: none"> • Sharp edges, especially on threads, can cause cuts. Wear protective gloves
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------

 	<p>Crushing Hazard</p> <ul style="list-style-type: none">Avoid placing hands into valve orifice pinch points
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Safety check

	<p>A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.</p> <p>Inspection acceptance criteria:</p> <ul style="list-style-type: none">It should not be possible to reach moving parts originally protected by a protective deviceThe protective device must be securely mountedEnsure that screws for the protective device are securely tightened <p>Procedure in case of non-acceptance:</p> <ul style="list-style-type: none">Fix and/or replace the protective device
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.



Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scraping

At end of use, the equipment must be recycled in accordance with 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.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

3 Introduction

LP

The Alfa Laval Unique Mixproof Large Particle (LP) Valve is a versatile, highly flexible double block-and-bleed valve for the safe and efficient management of fluids at intersection points in matrix piped systems. The valve enables the simultaneous flow of two different products or fluids through the same valve without the risk of cross-contamination.

Modular design and a wide variety of options enable the valve to be customized to meet any process requirement—whether higher demands on cleanability, the ability to withstand high pressure by means of balanced plugs. The valve is designed for gentle handling of products containing large particulates up to 1 $\frac{3}{4}$ " (45 mm) or products with high viscosity.

LP-F

The Alfa Laval Unique Mixproof Large Particle-Flush (LP-F) Valve is a versatile, highly flexible double block-and-bleed valve for the safe and efficient management of fluids at intersection points in matrix piped systems. The valve enables the simultaneous flow of two different products or fluids with large particles through the same valve without the risk of cross-contamination.

Modular design and a wide variety of options enable the valve to be customized to meet any process requirement—whether higher demands on cleanability, the ability to withstand high pressure. The valve is designed for gentle handling of products containing large particles up to 1 $\frac{3}{4}$ " (45 mm) or products with high viscosity.

Unlike the Unique Mixproof LP Valve, the Unique Mixproof LP-F Valve is equipped with a lower flush for 100% cleanability of the lip seal in the lower sealing element through seat-lift cleaning alone. It also reduces the need for additional utility installations for external Cleaning-in-Place.

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4 Installation

4.1 Unpacking/intermediate storage

! NOTE

Study the instructions carefully.

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

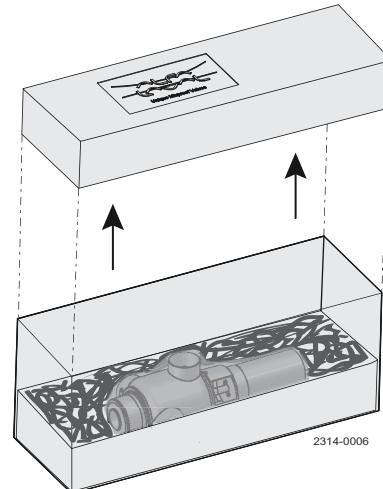
! CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Complete valve
2. Delivery note
3. Warning label

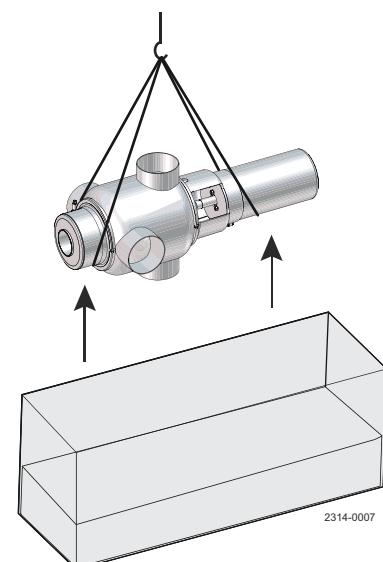
1 Remove upper support.



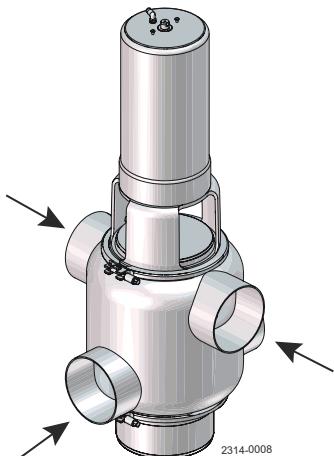
2 Lift out the valve.

! NOTE

Please note weight of valve as printed on box.

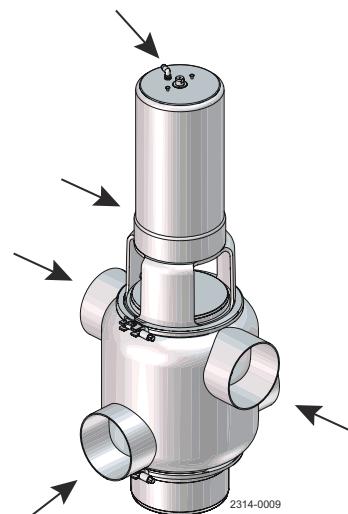


3 Remove possible packing materials from the valve ports.

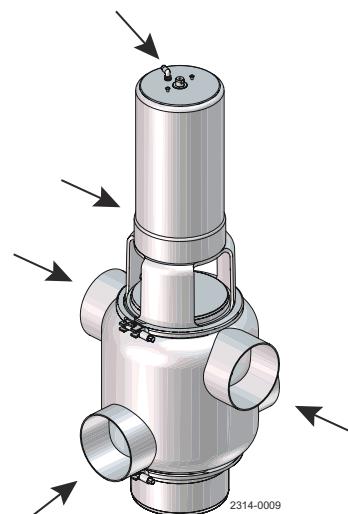


4 **Inspection!**

Inspect the valve for visible transport damage.



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

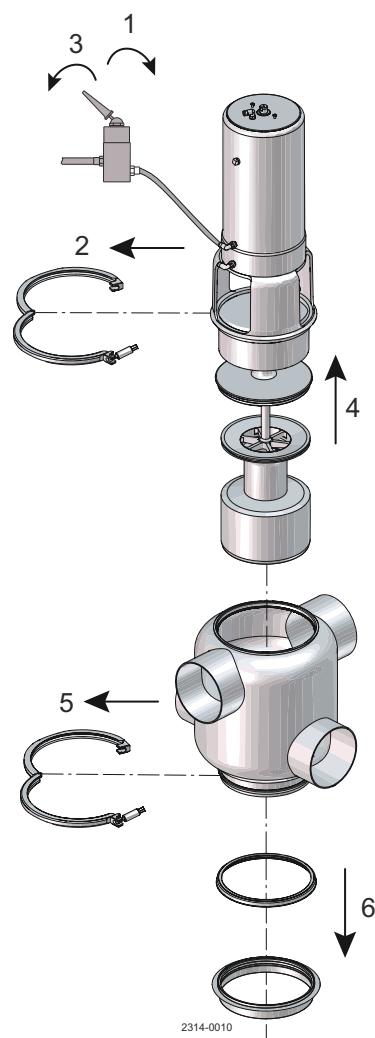


6 Disassemble according to illustrations 1 to 6
(please also see *Dismantling of valve* on page 42).

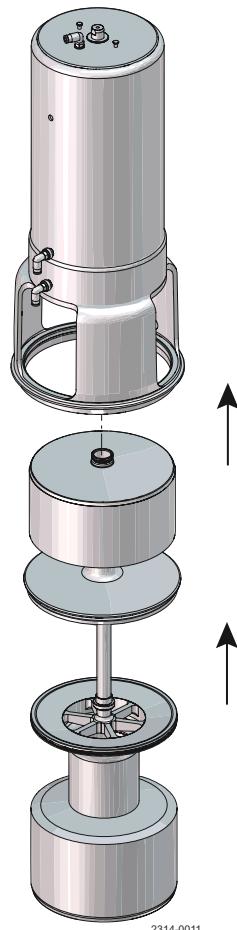
- a) Supply compressed air.
- b) Remove upper clamp.
- c) Release compressed air.
- d) Lift out actuator with plugs.
- e) Remove lower clamp.
- f) Take away lower sealing element.

1 = off

3 = on



7 Mount sealing element on valve.



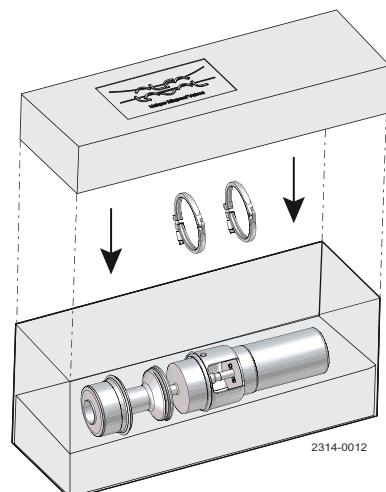
8

- a) Place actuator part in the box.
- b) Add supports.
- c) Close box and store.

! NOTE

Advise!

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



4.2 General information

NOTE

Study the instructions carefully and pay special attention to the warnings!

Always read the *Technical Data* on page 61 thoroughly.

The valve has ends for welding as standard but can also be supplied with fittings.

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).

Always install the valve vertically.

The leakage outlet must be turned downwards!

CAUTION

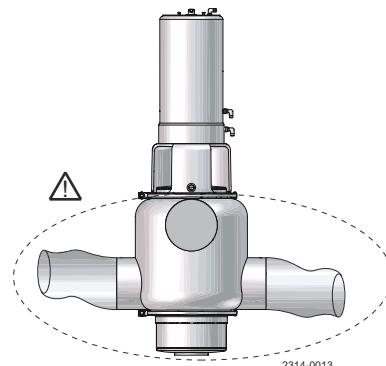
Alfa Laval cannot be held responsible for incorrect installation.

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

- 1 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:

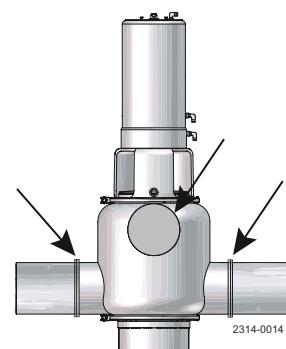
- Vibrations
- Thermal expansion of the tubes
- Excessive welding
- Overloading of the pipelines



Risk of damage!

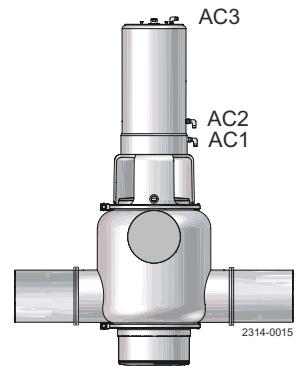
- 2 Fittings: Ensure that the connections are tight.

Remember seal rings!



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

- a) Cleaning of upper seat.
- b) Open valve.
- c) Cleaning of lower seat.



4.3 Welding

NOTE

Study the instructions carefully and pay special attention to the warnings!

The valve has ends for welding as standard.

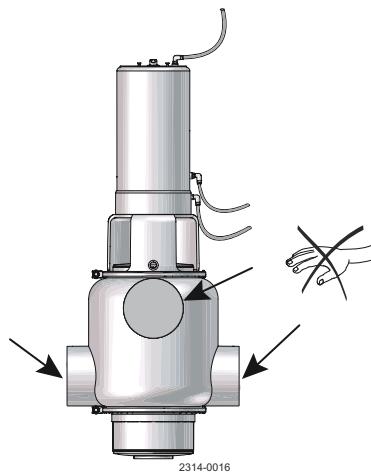
Weld carefully/aim for stressless welding to avoid deformation on sealing areas.

Check the valve for smooth operation after welding.



DANGER Cutting danger!

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

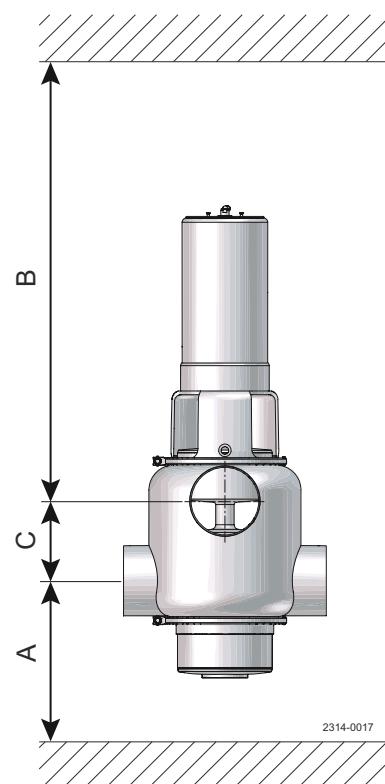


- 1 Dismantle the valve in accordance with step 1, *Dismantling of valve* on page 42.

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

CAUTION

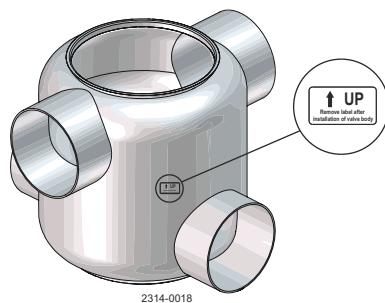
If there is a risk of foot damage, Alfa Laval recommends to leaving a distance of 120 mm below the valve (look at the specific built-in conditions).



3 **UP** Remove label after installation of valve body.

WARNING

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



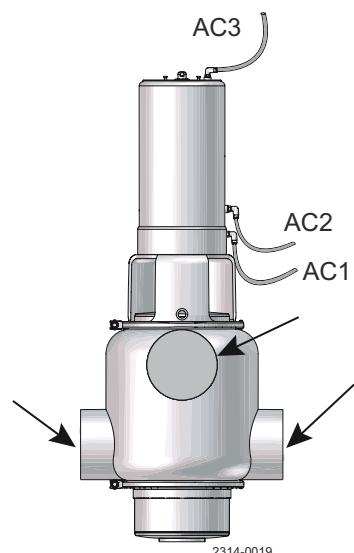
4 Assemble the valve in accordance with [Valve assembly](#) on page 50 after welding.

Pay special attention to the warnings!

5 Pre-use check:

- Supply compressed air to AC1, AC2 and AC3 one by one
- Operate the valve several times to ensure that it runs smoothly

Pay special attention to the warnings!



NOTE

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

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

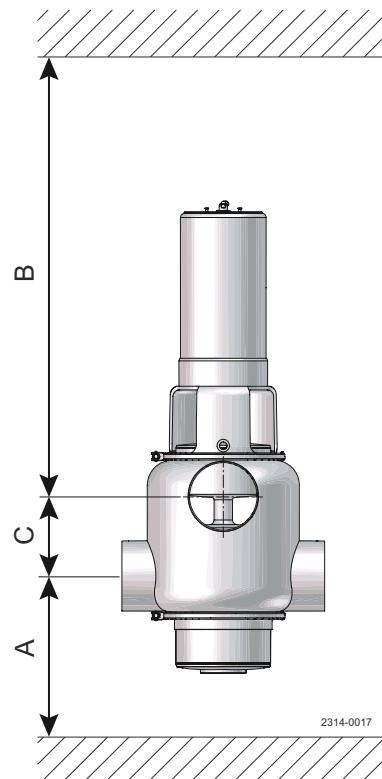


Table 1: Dimensions - all measures in mm

Size	4"		6"	
	LP	LP-F	LP	LP-F
A	352	274	436	342
B	1201	1201	1193	1193
C ¹	123.6	123.6	172.7	172.7

¹ The measurement C can always be calculated by the formula $C = \frac{1}{2}ID_{upper} + \frac{1}{2}ID_{lower} + 1"$.

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5 Operation

5.1 Operation

NOTE

Study the instructions carefully and pay special attention to the warnings!

Pay attention to possible faults.

The items refer to *Parts Lists and Exploded Views* on page 67.

Always read the *Technical Data* on page 61 thoroughly.

The valve is adjusted and tested before delivery.

CAUTION

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).

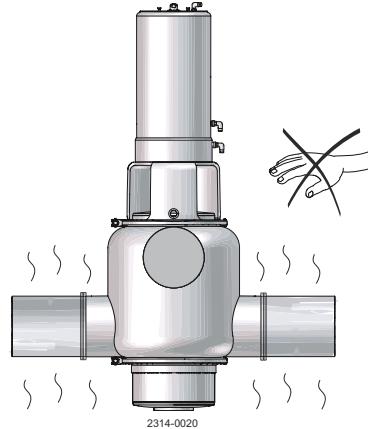
CAUTION

Alfa Laval cannot be held responsible for incorrect operation.

DANGER

Burning danger!

Never touch the supplied product or the pipelines when processing hot liquids or sterilizing.



5.2 Troubleshooting and repair

! NOTE

Study the instructions carefully and pay special attention to the warnings!

The items refer to [Parts Lists and Exploded Views](#) on page 67.

The valve is adjusted and tested before delivery.

Pay attention to possible faults.

Study the maintenance instructions carefully before replacing worn parts.

Problem	Cause/result	Remedy
Leakage between sealing element (79) and lower plug (75)	Worn/damaged O-rings/ lip seal (76/77/78)	<ul style="list-style-type: none"> Replace the O-rings/lip seal Change rubber grade Lubricate correctly
Leakage at the leakage outlet	<ul style="list-style-type: none"> Particles between valve seats and plug seals (56/74) Worn/damaged plug seal rings (56/74) Plug not assembled correctly 	<ul style="list-style-type: none"> Remove the particles Check the plug seals Replace the plug seals Change rubber grade Assemble plug, see step 2, Valve assembly on page 50
Leakage at sealing element (48)/ upper plug (55)	Worn/product affected O-rings/lip seal (38/39/46/49)	<ul style="list-style-type: none"> Replace the O-rings/lip seal Change rubber grade Clean and if necessary replace guide ring (45)
Leakage at clamp (64)	<ul style="list-style-type: none"> O-rings (76 and 47) too old/ damaged (and 52 if clamped valve body) Loose clamp (64) 	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> Replace the O-ring Replace the plug seals Change rubber grade
Lower plug not returning to closed position	<ul style="list-style-type: none"> Wrong rubber grade Wrongly fitted gasket Mounted incorrectly (see Safety Precautions on page 10) 	<ul style="list-style-type: none"> Change rubber grade Fit new gasket correctly Correct installation
Plug returns with uneven movements (slip/stick effect)	<ul style="list-style-type: none"> Wrong rubber grade Wrongly fitted gasket Mounted incorrectly (see Safety Precautions on page 10) 	<ul style="list-style-type: none"> Change rubber grade Fit new gasket correctly Correct installation

5.3 Recommended Cleaning

WARNING

Risk of burns!

Never touch the supplied product or the pipelines when sterilizing.



CAUTION

Always handle lye and acid with great care.



NOTE

The supplied product is designed for cleaning in place (CIP).

NaOH = Caustic soda.

HNO₃ = Nitric acid.

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

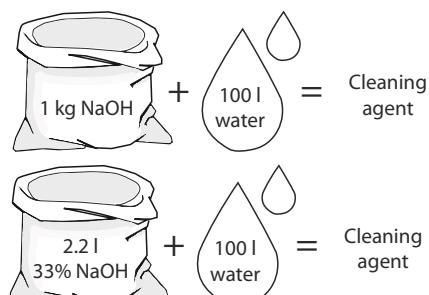
Examples of cleaning agents

NOTE

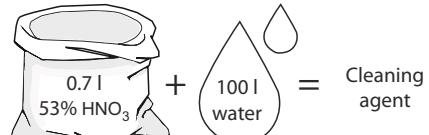
Use clean water free from chlorides.

Metric System

1. 1% by weight NaOH at 70°C

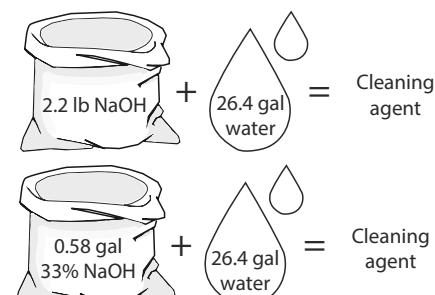


2. 0.5% by weight HNO₃ at 70°C

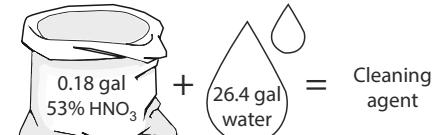


Imperial System

1. 1% by weight NaOH at 158°F



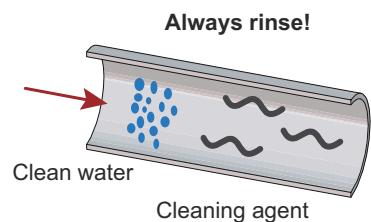
2. 0.5% by weight HNO₃ at 158°F



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

CAUTION

Always rinse well with clean water after the cleaning.



5.3.1 Cleaning procedure

NOTE

Study the instructions carefully and pay special attention to the warnings!

Internal leakage in the valve is externally visible by means of the leakage outlet.

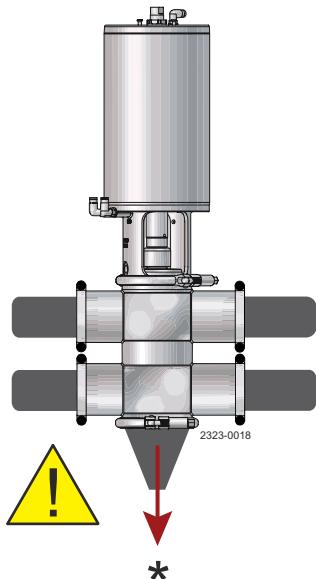


WARNING

Never throttle the leakage indicator.

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

* Leakage/CIP out



1 Valve pneumatic operation during cleaning in place.

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 21 psi / 1.5 bar CIP pressure. It is recommended to do seat lift/push in the middle of each step in the CIP sequence.

2

CIP event @ length per valve	Valve function	ThinkTop solenoid valve no.	ThinkTop solenoid valve mode	PLC timer seat lift/push time ¹	Burst seat clean time ²	Number of lifts/push in each CIP step ³
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 10 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1
@ 3 minutes	Upper seat lift	2	Energized	2 sec.	<1 sec.	1-2
	Lower seat lift	3	Energized	2 sec.	<1 sec.	1-2
	Leakage chamber flush	-	-	5 sec.	-	1
	Spiral clean stem/balancer	-	-	5 sec.	-	1

¹ Value depends on valve size, CIP pressure, product type, fat and sugar content. PLC timer is a recommended value

² Is a position based seat lift/push, value is with 6 bar air pressure. Feedback signal high for min. 2 sec.

³ Value depends on sufficient CIP liquid pressure, product type, fat and sugar content

Validation of cleanliness is mandatory to ensure product safety.

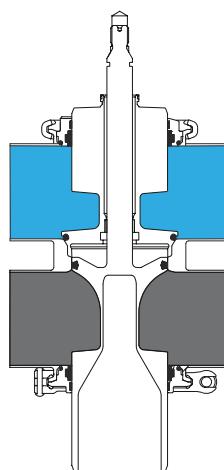
Variations caused by compressed air are typically:

- Long air supply hoses
- Small inner diameter on air supply hoses
- Limited availability of compressed air

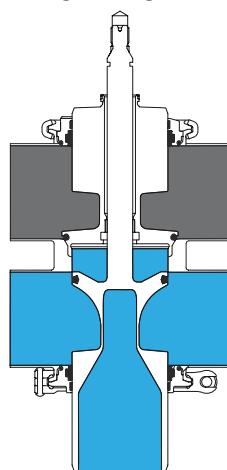
3 Seat-cleaning cycles:

Pay special attention to the warnings!

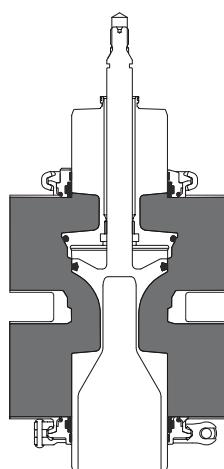
Closed valve



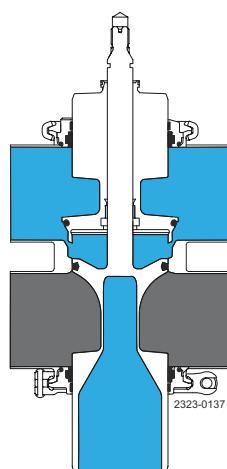
Cleaning through lower line



Open valve



Cleaning through upper line



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6 Maintenance

6.1 General maintenance

NOTE

Study the instructions carefully and pay special attention to the warnings!

The items refer to *Parts Lists and Exploded Views* on page 67.

Always read the *Technical Data* on page 61 thoroughly.

All scrap must be stored/disposed of in accordance with current regulations and directives.

Maintain the valve/actuator regularly.

Always keep spare rubber seals and guide rings in stock.

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.

Always fit the seals correctly (risk of mixing).

Always release compressed air after use.

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

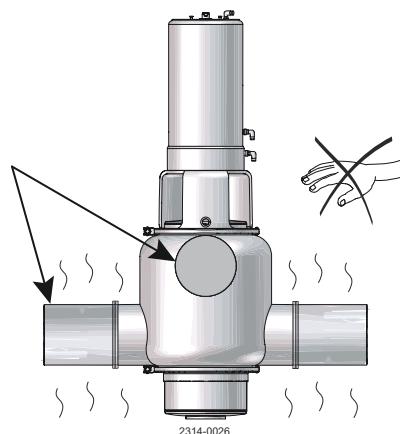


DANGER **Burning danger!**

Never service the valve when it is hot.

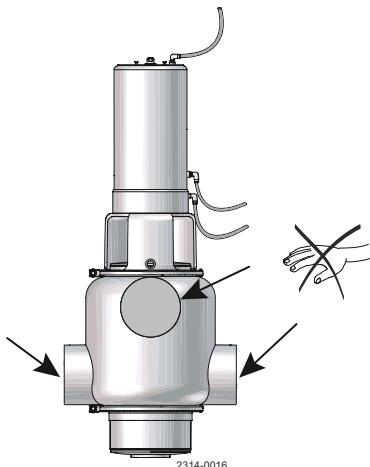
Never service the supplied product or the pipelines under pressure.

*Atmospheric pressure required!



**DANGER** Cutting danger!

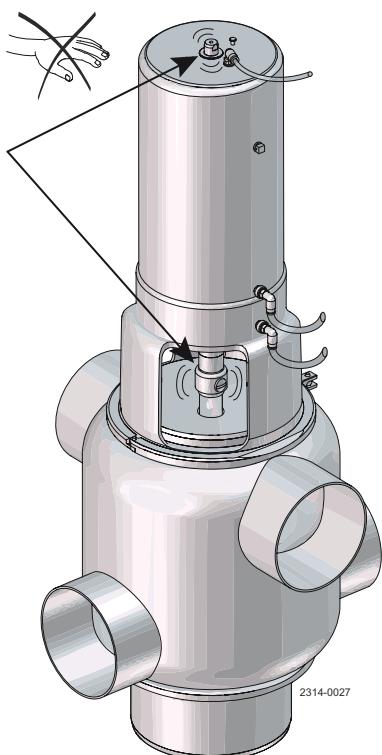
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



2314-0016

**WARNING** Moving parts!

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



2314-0027

	Valve rubber seals	Valve plug seals	Valve guide rings
Preventive maintenance	Replace after 12 months ¹	Replace after 12 months ¹	Replace when required
Maintenance after leakage (leakage normally starts slowly)	Replace after production cycle	Replace after production cycle	
Planned maintenance	<ul style="list-style-type: none"> Regular inspection for leakage and smooth operation Keep a record of the valve Use the statistics for inspection planning 	<ul style="list-style-type: none"> 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 ² (suitable for EPDM)	When assembling Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease ² (suitable for EPDM)	None

¹ Depending on working conditions! Please contact Alfa Laval.

² All products wetted seals.

NOTE

Lubricate thread in valve plug parts with Klüber Paste UH1 84-201 or similar.

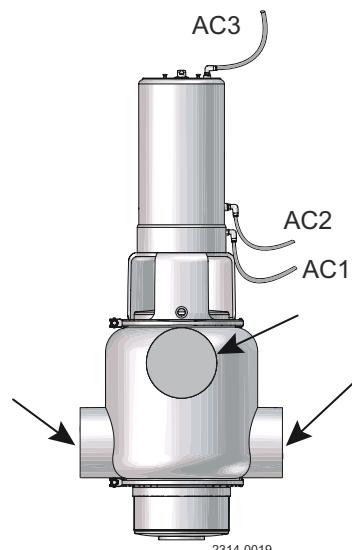
Repairing of actuator

- 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.

Pre-use check

- Supply compressed air to AC1, AC2 and AC3 one by one
- Operate the valve several times to ensure that it operates smoothly

Pay special attention to the warnings!



6.2 Dismantling of valve

! NOTE

Study the instructions carefully.

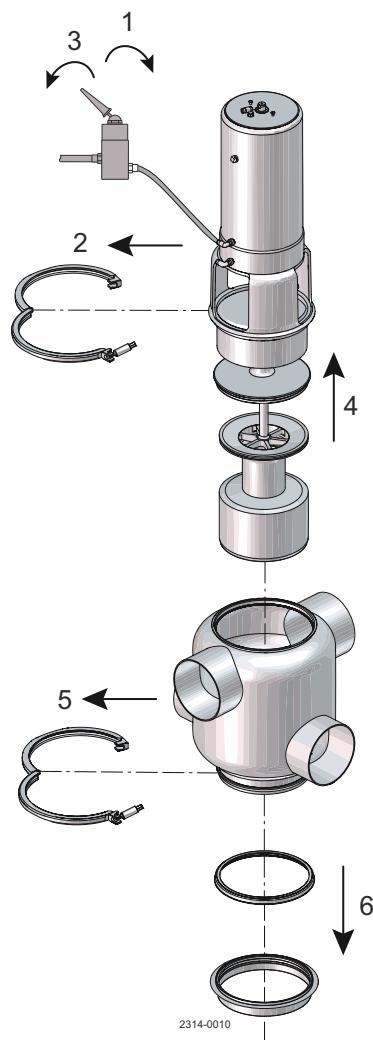
The items refer to *Parts Lists and Exploded Views* on page 67.

All scrap must be stored/disposed of in accordance with current regulations and directives.

Replace seals if necessary.

1 Disassemble valve acc. to illustrations (1 to 6).

- Supply compressed air to A2.
- Loosen and remove upper clamp (64).
- Release compressed air.
- Lift out the actuator together with the internal valve parts from valve body (50).
- Loosen and remove lower clamp (64).
- Remove lower sealing element (79).



! NOTE

Release compressed air.

LP-F IS SHOWN!

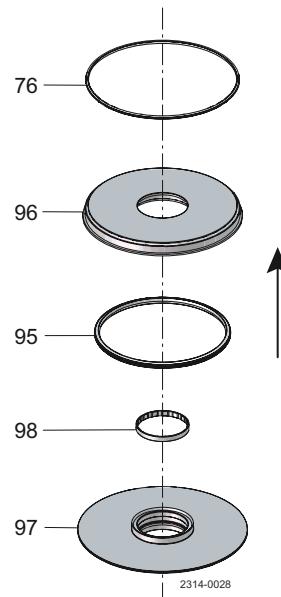
2 Dismantling of lower sealing element:

Unique LP

Pull out O-ring (76) and lip seal (77).

Unique LP-F

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



3

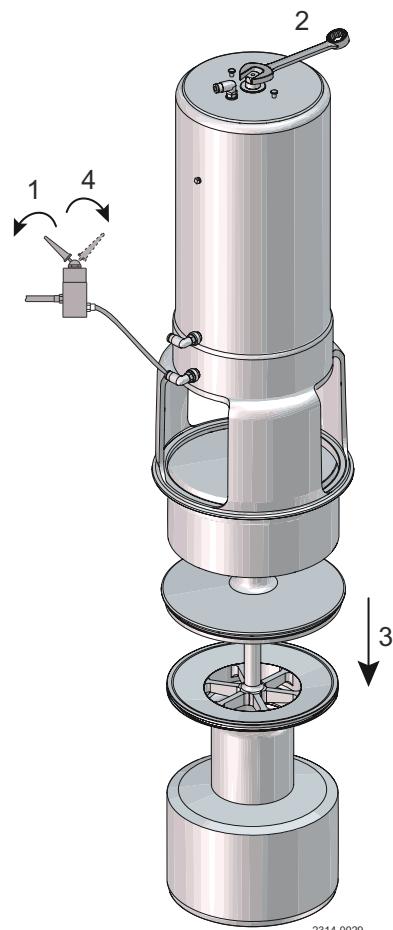
- Supply compressed air for air connection AC1.
- Loosen lower plug (75) while counterholding upper stem (1).
- Remove the plug.
- Release compressed air.

! NOTE

For replacement of seal ring (74), please see *Recommended Cleaning* on page 33.

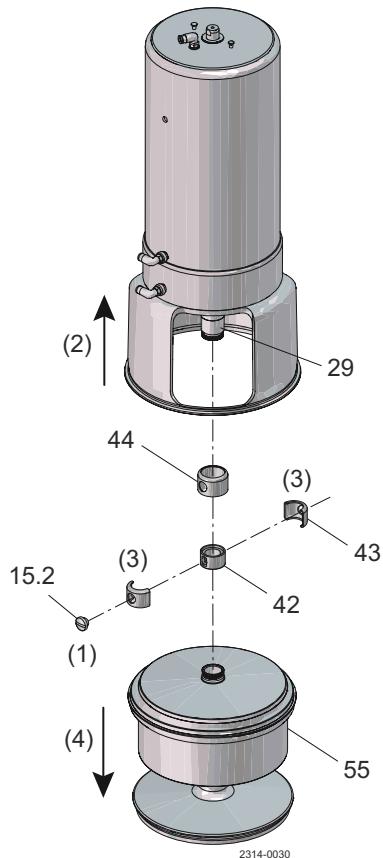
1 = on

4 = off



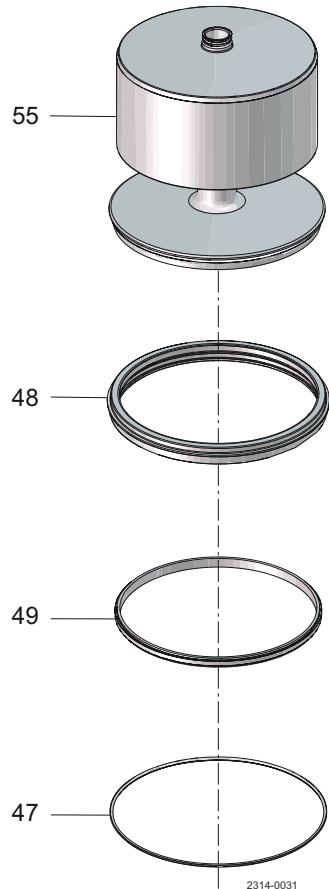
4 Remove coupling system and upper plug according to illustrations (1 to 4).

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

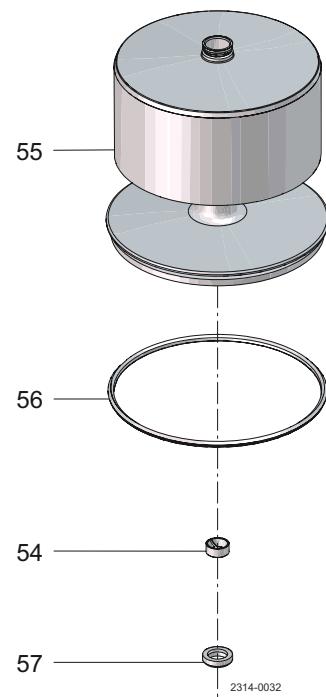


5 a) Remove upper sealing element (48) from upper plug (55).

b) Pull out O-ring (47) and lip seal (49) from upper sealing element.



6 Remove lip seal (57) and guide ring (54). For removal and replacement of seal ring (56), please see *Lower plug, replacement of radial seal* on page 46.



6.3 Lower plug, replacement of radial seal

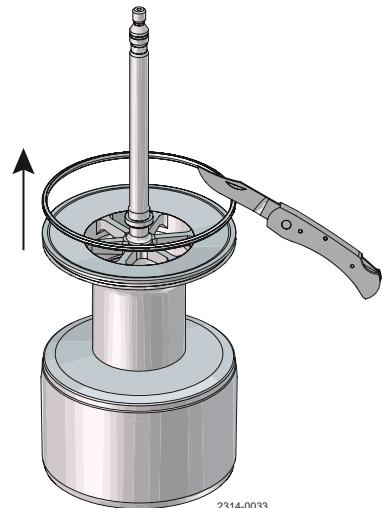
! NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

All scrap must be stored/disposed of in accordance with current regulations and directives.

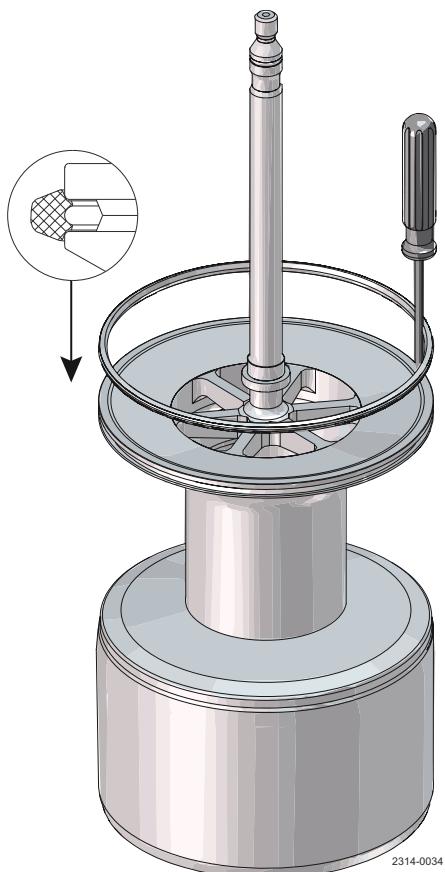
- 1 Cut and remove old seal ring (74) using a knife, screwdriver or similar. Be careful not to scratch the plug.



- 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.



3 Tool for radial sealing, lower plug

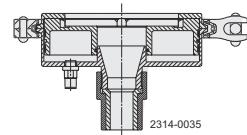
Item No.

Seat ø143.9

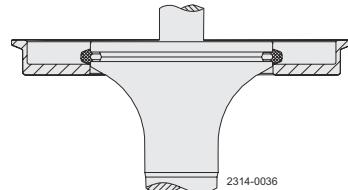
9613-4260-09

Seat ø206.1

9613-4260-10

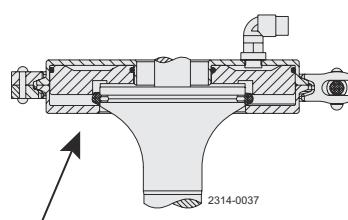


4 Place lower tool part.



5 a) Place upper tool part including piston.

b) Clamp the two tool parts together.



Tool marked with item number.

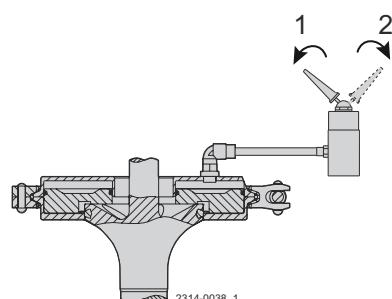
6 a) Supply compressed air.

b) Release compressed air.

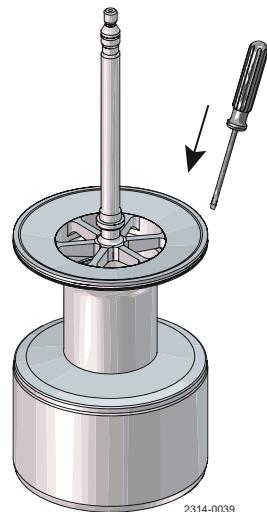
c) Remove tool parts.

1 = on

2 = off



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



6.4 Upper plug, replacement of axial seal

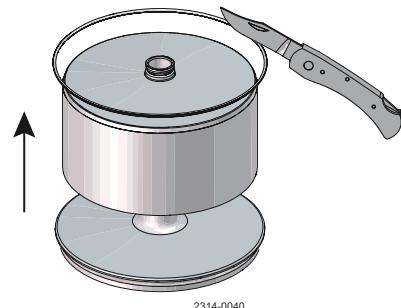
! NOTE

Study the instructions carefully.

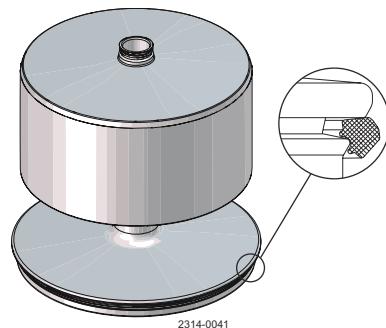
The items refer to *Parts Lists and Exploded Views* on page 67.

All scrap must be stored/disposed of in accordance with current regulations and directives.

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



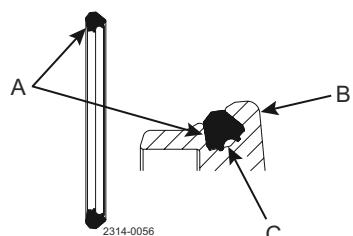
- 2 Pre-mount seal ring as shown on drawing.



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.

- 3 Tool for axial sealing, upper plug

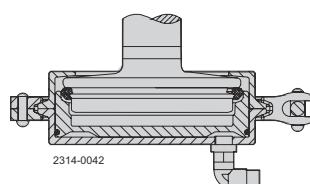
Item No.

Seat ø143.9

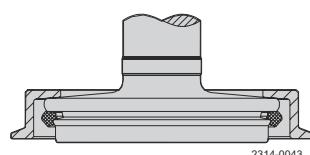
Seat ø206.1

9613-0505-07

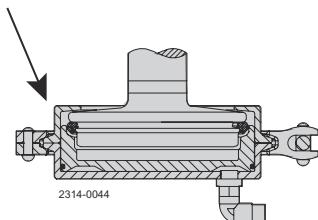
9613-0505-10



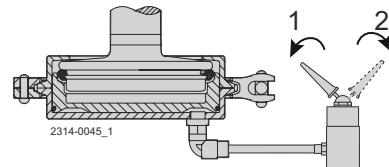
- 4 Place tool part 1.



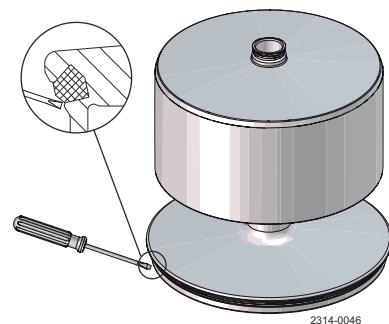
5 a) Place tool part 2 including piston.
b) Clamp the two tool parts together.
Tooling marked with item number



6 a) Supply compressed air.
b) Release compressed air.
c) Rotate the tool 45° in relation to the plug.
d) Supply compressed air.
e) Release compressed air and remove tool.



7 a) Inspect the seal.
b) Release air at 3 different positions of the circumference.



6.5 Valve assembly

! NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

All scrap must be stored/disposed of in accordance with current regulations and directives.

Replace seals if necessary.

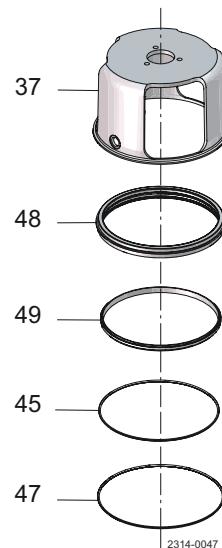
1

a) 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.

b) Fit upper sealing element in intermediate piece (37).



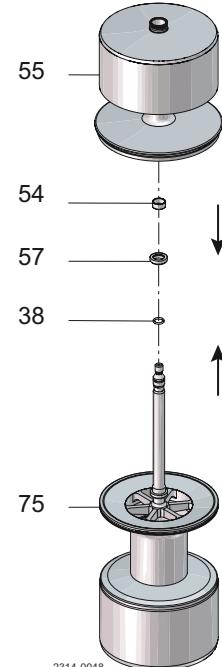
2

a) Place lip seal (57) and guide ring (54) in upper plug and the O-ring (38) in the lower plug.

b) Press lower plug (75) rapidly into upper plug (55) through the lip seal.

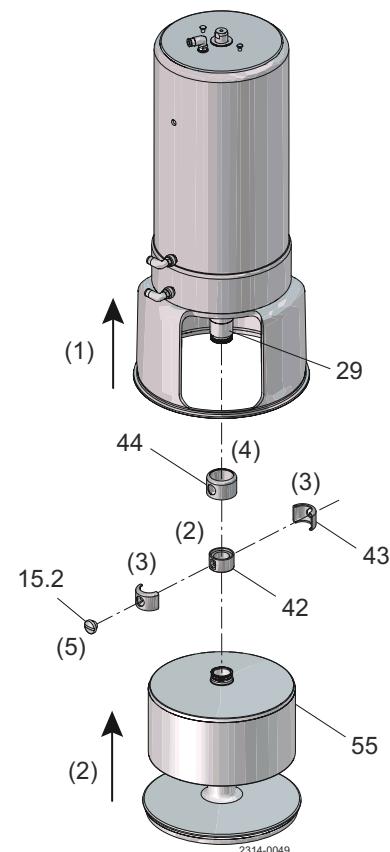
! NOTE

Do not damage the lips when lower plug (75) with O-ring (38) passes the lip seal.



3 Place coupling system and upper plug according to illustrations.

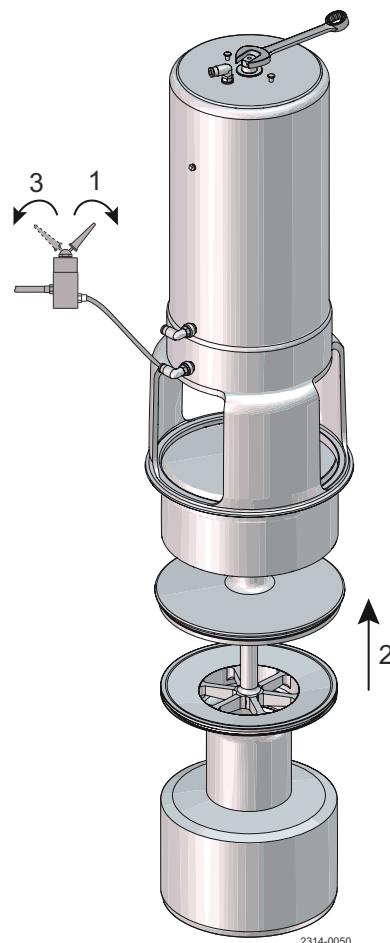
- Push lock (44) up over piston rod (29).
- Place spindle liner (42) on piston rod. Fit upper plug (55).
- Mount clamps (43) on spindle liner (42).
- Fit lock (44).
- Fit plug (15).



4 a) Supply compressed air for air connection AC1.

- Insert lower plug (75) and tighten.
- Release compressed air.

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

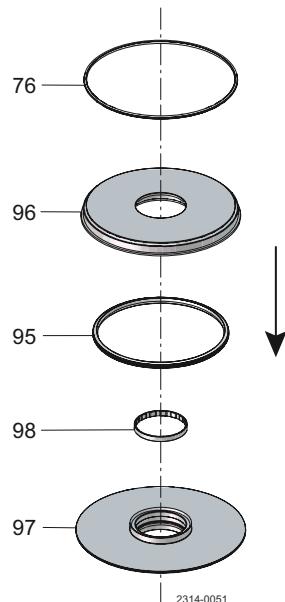


5 Unique LP

a) 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

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



6

! NOTE

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

Always supply compressed air, before demounting the valve.

- Fit lower sealing element (79).
- Fit and tighten lower clamp (64).
- Supply compressed air (AC2) and mount the actuator together with the internal valve parts in valve body (50).
- Fit and tighten upper clamp (64). Greasing of clamp and clamp nut recommended!

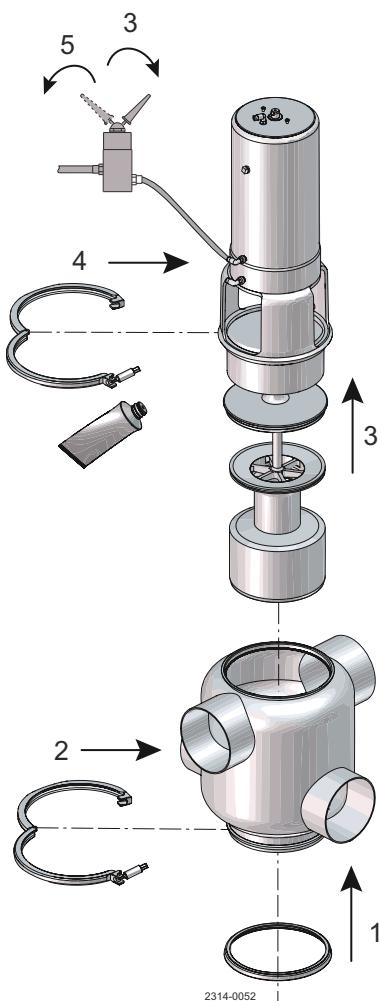
(Maximum torque for clamp nut: 10 Nm)

- Release compressed air.

Supply compressed air before demounting the valve.

3 = off

5 = on



6.6 Dismantling of actuator - 4"

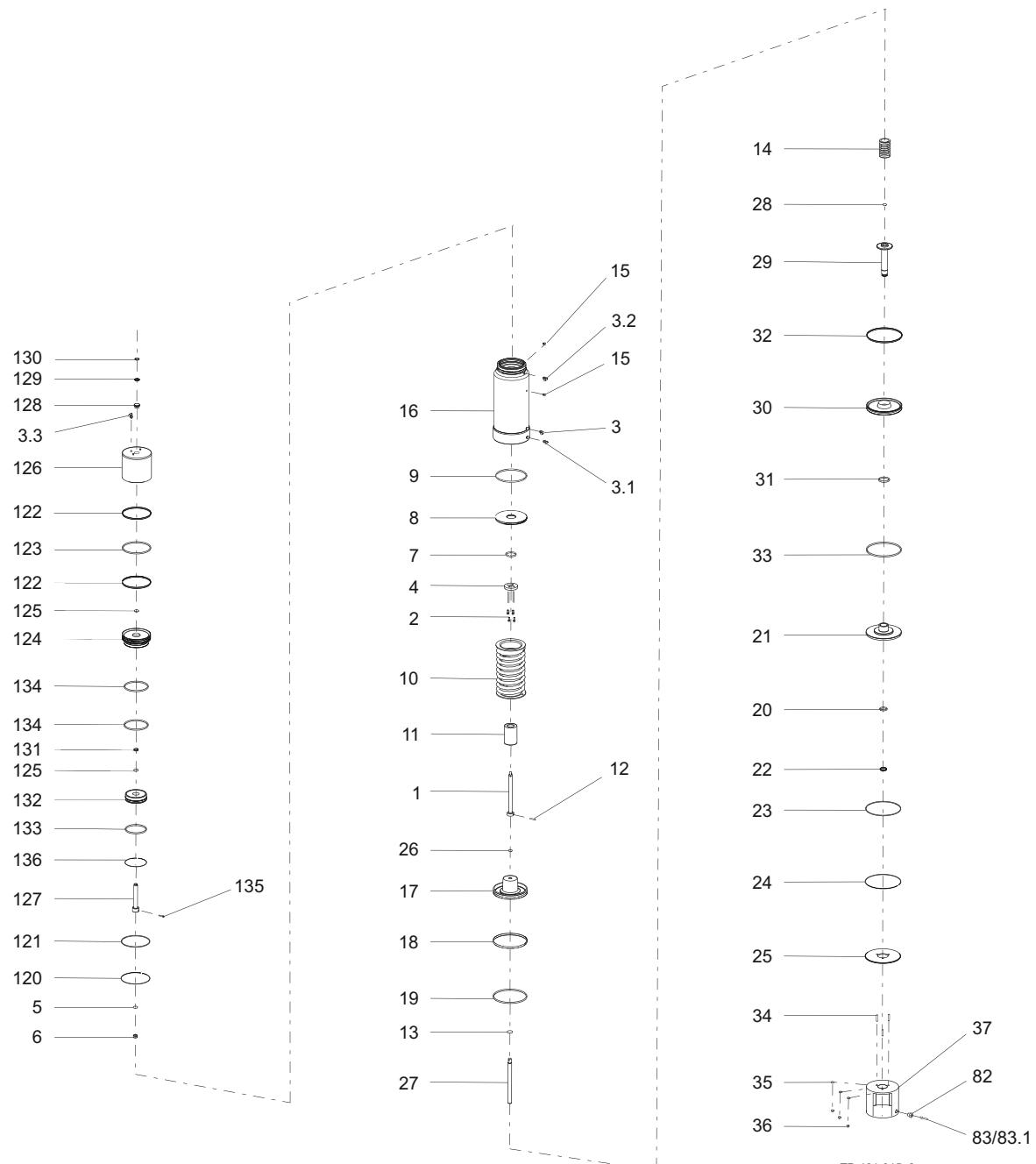
NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

All scrap must be stored/disposed of in accordance with current regulations and directives.

Replace seals if necessary.



TD 481-015_2

1 Dismantle the valve in accordance with instructions in *Dismantling of valve* on page 42.

Pay special attention to the warnings!

! NOTE

The actuator is maintenance-free but repairable.

2 a) Place the actuator with intermediate piece in a vice.

b) Remove booster cylinder (126) by turning the cylinder. Turn the cylinder until the lock ring (120) is fully removed through the groove in the cylinder and remove the cylinder.

c) Remove the bushing (128) with O-rings (129 & 130).

d) Remove the pistons (124 & 132).

e) Remove the lock ring (136) and separate the two pistons. Remove all O-rings and bearings (122, 123, 125, 134, 131 & 133).

f) Activate main stroke (Air fitting Position 3).

g) Remove screw (135) and pull out booster spindle (127).

h) Deactivate main stroke and remove actuator from vice.

3 a) Remove nuts (36) and washers (35).

b) Pull out intermediate piece (37) from the actuator.

c) Remove cover disk (25).

d) Remove retaining ring (24).

4 a) Remove piston rod (29), bottom (21) and lower piston (30).

b) Separate the three parts.

c) 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.

d) Remove spring assembly (14).

5 a) Remove inner stem (27), main piston (17) and distance spacer (11). Remove guide ring (18) and O-ring (19).

b) Remove spring assembly (10).

6 a) Unscrew screws (2) (glued!).

b) Remove stop (4).

c) Remove upper piston (8). Remove O-rings (7 and 9).

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

6.7 Assembly of actuator - 4"

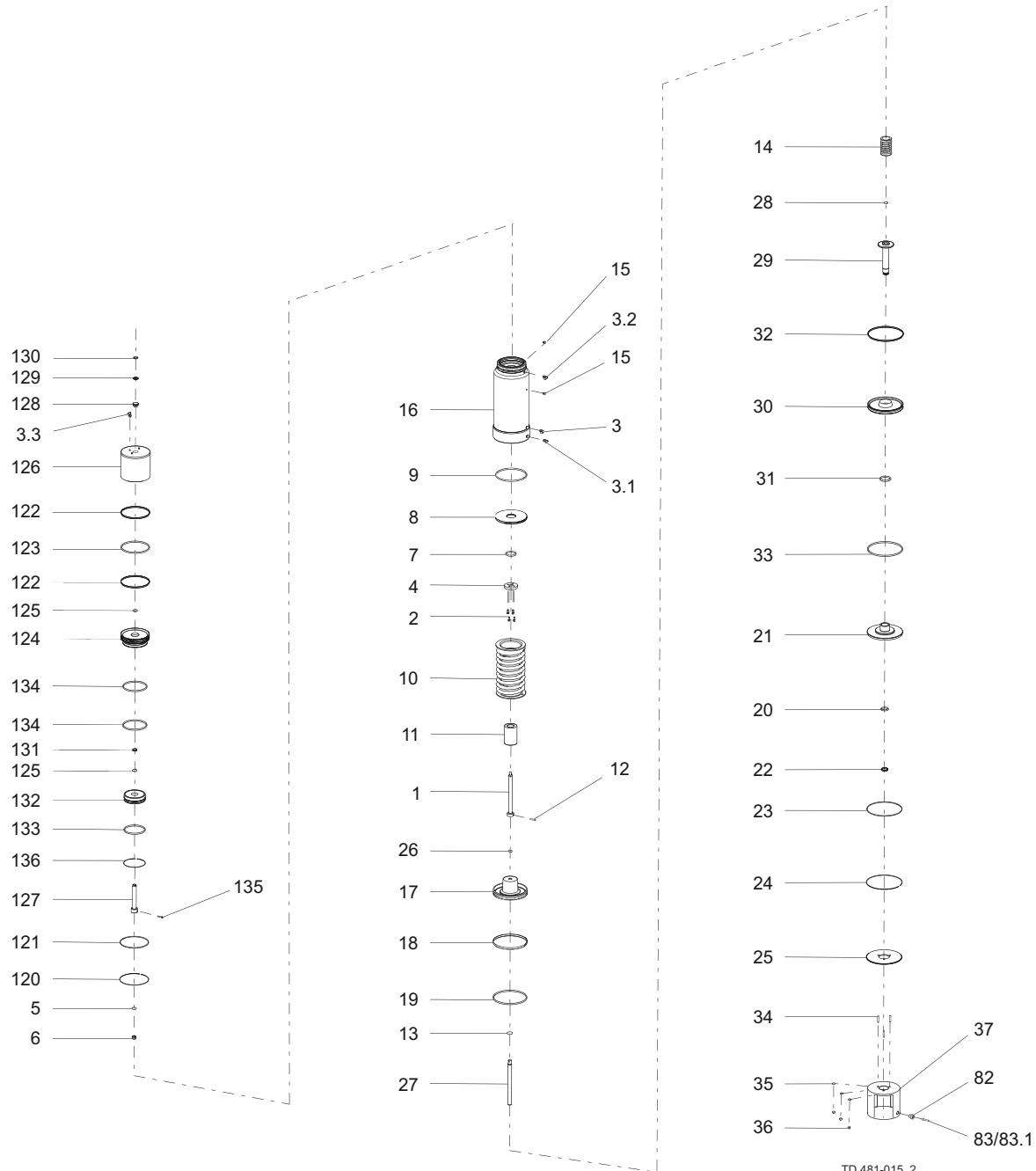
! NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

Replace seals if necessary.

Lubricate the rubber seals before fitting them.



! NOTE

The actuator is maintenance-free but repairable.

1

- a) Fit guide ring (6) and O-ring (5).
- b) Fit O-rings (7 and 9). Place upper piston (8).
- c) Fit stop (4).
- d) Tighten screws (2). (Secure with glue).

2

- a) Place spring assembly (10).
- b) Fit O-ring (19) and guide ring (18). Mount distance spacer (11), main piston (17) and inner stem (27).

3

- a) Fit spring assembly (14).
- b) 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.
- c) Fit piston rod (29), lower piston (30) and bottom (21).
- d) Mount the three parts.

4

- a) Fit retaining ring (24).
- b) Fit cover disk (25).
- c) Mount intermediate piece (37) on actuator.
- d) Fit and tighten nuts (36) and washers (35).

5

- a) Place the actuator with the intermediate in a vice.
- b) Activate main stroke (air fitting position 3).
- c) Mount upper stem (127) and secure it with the screw (135).
- d) Deactivate main stroke.

6

- a) Mount O-ring and guide ring (133, 125 & 131) on inner piston (132).
- b) Mount O-ring and guide rings (125, 122, 134 & 123) on piston (124).
- c) Insert the inner piston in the piston and secure the inner piston with the lock ring (136).
- d) Mount the pistons onto the upper stem (127).

7

- a) Mount bushing (128) and O-rings (129 & 130) on the top of the cylinder.
- b) 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.
- c) Insert the lock ring (120) in the pin hole and turn the cylinder until the complete lock ring has wandered through the slot.
- d) Remove the actuator from the vice.

6.8 Dismantling of actuator - 6"

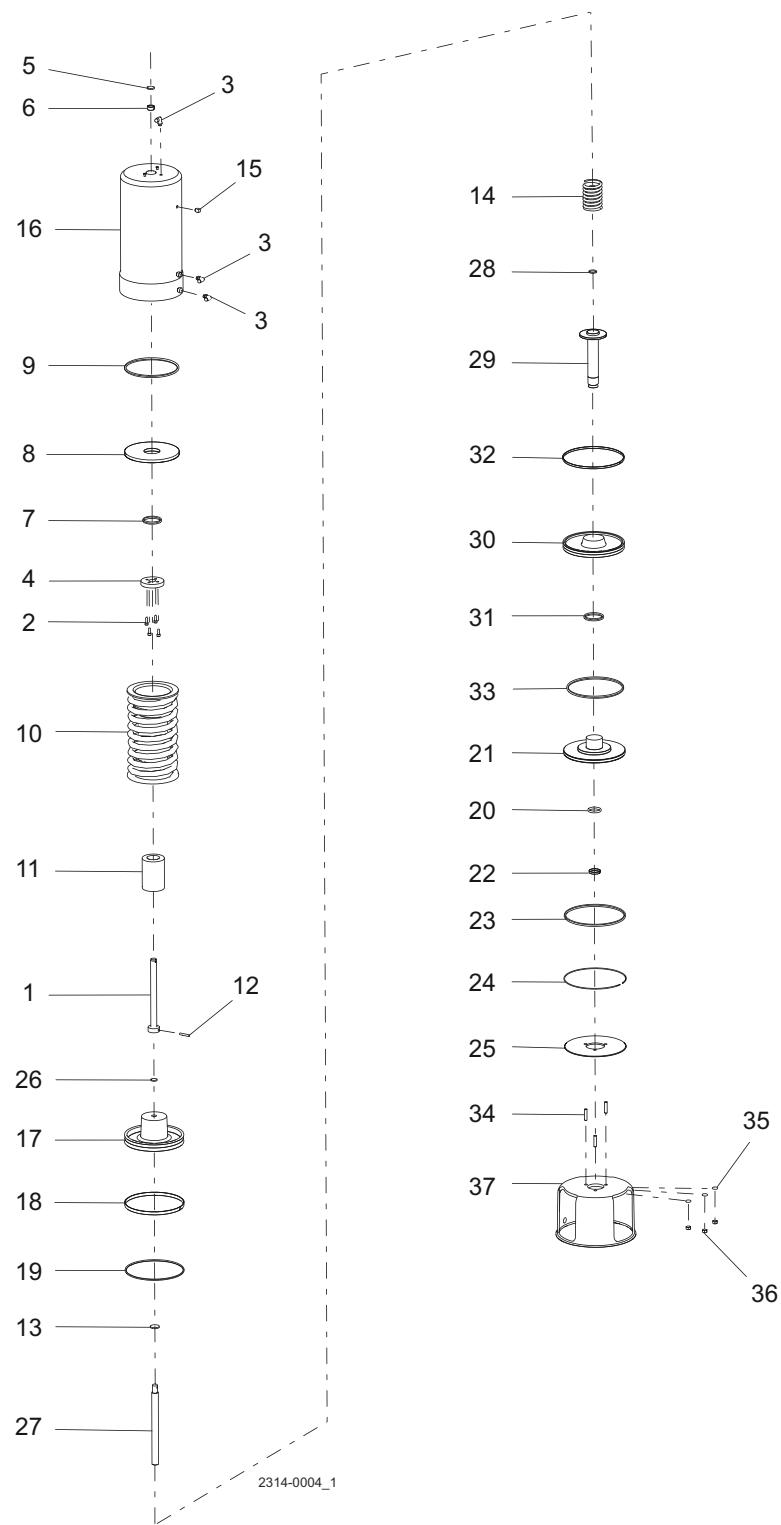
NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

Handle scrap correctly.

Replace seals if necessary.



1 Dismantle the valve in accordance with instructions in *Troubleshooting and repair* on page 32.

Pay special attention to the warnings!

! NOTE

The actuator is maintenance-free but repairable.

2 a) Remove nuts (36) and washers (35).

b) Pull out intermediate piece (37) from the actuator.

c) Remove cover disk (25).

d) Remove retaining ring (24).

3 a) Remove piston rod (29), bottom (21) and lower piston (30).

b) Separate the three parts.

c) 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.

d) Remove spring assembly (14).

4 a) Remove inner stem (27), main piston (17) and distance spacer (11). Remove guide ring (18) and O-ring (19).

b) Remove spring assembly (10).

5 a) Unscrew screws (2) (glued!).

b) Remove stop (4).

c) Remove upper piston (8). Remove O-rings (7 and 9).

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

6.9 Assembly of actuator - 6"

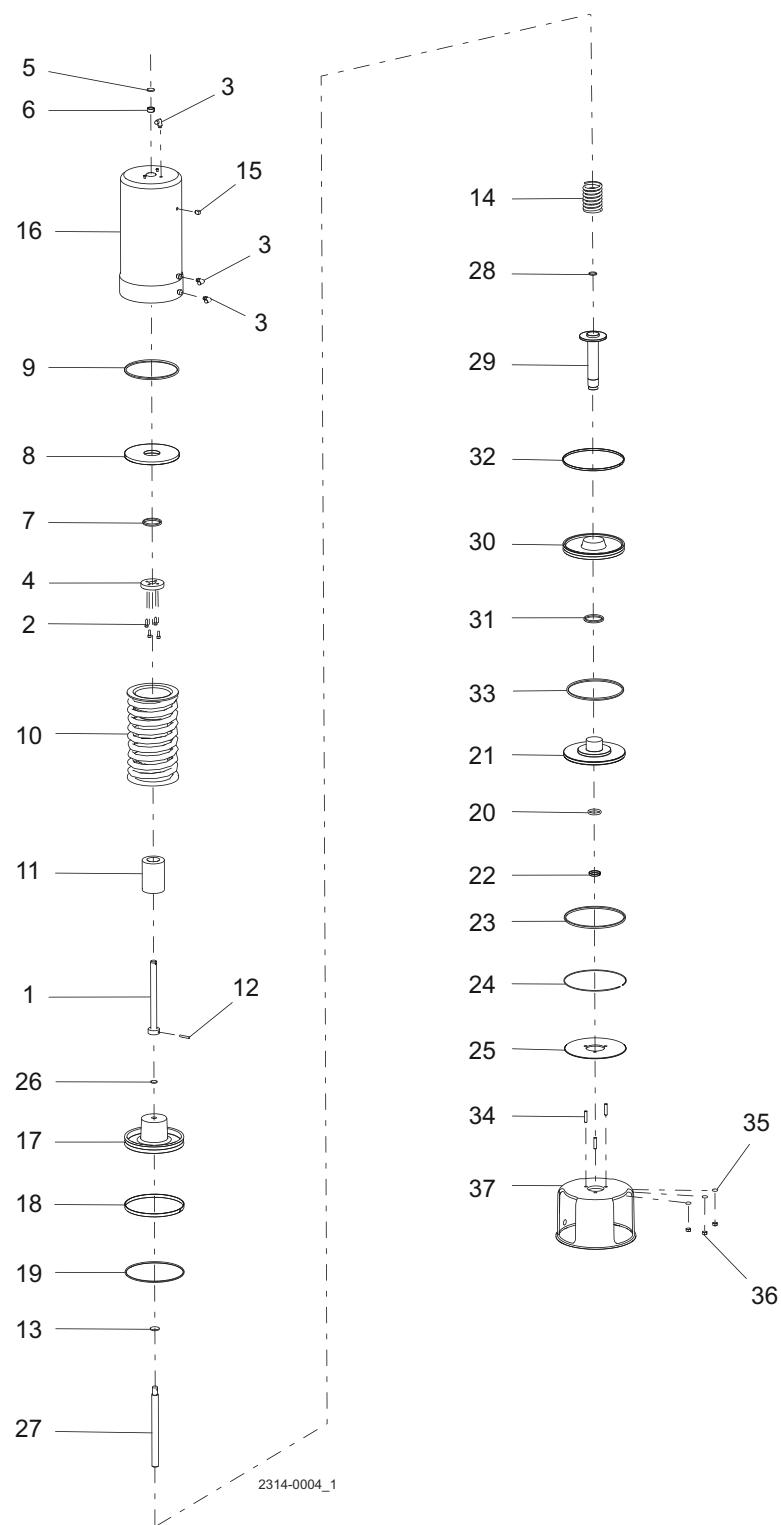
NOTE

Study the instructions carefully.

The items refer to *Parts Lists and Exploded Views* on page 67.

Replace seals if necessary.

Lubricate the rubber seals before fitting them.



**NOTE**

The actuator is maintenance-free but repairable.

- 1 a) Fit guide ring (6) and O-ring (5).
b) Fit O-rings (7 and 9). Place upper piston (8).
c) Fit stop (4).
d) Tighten screws (2). (Secure with glue).
- 2 a) Place spring assembly (10).
b) Fit O-ring (19) and guide ring (18). Mount distance spacer (11), main piston (17) and inner stem (27).
- 3 a) Fit spring assembly (14).
b) 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.
c) Fit piston rod (29), lower piston (30) and bottom (21).
d) Mount the three parts.
- 4 a) Fit retaining ring (24).
b) Fit cover disk (25).
c) Mount intermediate piece (37) on actuator.
d) Fit and tighten nuts (36) and washers (35).

7 Technical Data

! NOTE

Technical data must be observed during installation, operation and maintenance.

All personnel should be informed about the technical data.

7.1 LP

7.1.1 Technical Data

Pressure

Max. product pressure:	1000 kPa / 145 psi / 10 bar
Min. product pressure:	Full vacuum
Air pressure:	Max. 8 bar / 116 psi
Products acc. to PED 97/23/EC	Category I, Fluids group 1, DN \geq 6" Fluids group 2

Temperature

Temperature range:	-5 °C to +125 °C / -23 °F to +257 °F (Depending on elastomer type)
--------------------	--------------------------------------------------------------------

7.1.2 Air and CIP consumption

metric

Size		4"	6"
Kv-value Upper Seat-lift	[m³/h]	3.2	7.1
Kv-value Lower Seat-lift	[m³/h]	2.9	6.0
Air consumption Upper Seat-lift	[n litre] ¹	0.62	0.62
Air consumption Lower Seat-lift	[n litre] ¹	0.21	0.21
Air consumption Main Movement	[n litre] ¹	3.54	3.54

¹ [n litre] = volume at atmospheric pressure

imperial

Size		4"	6"
Cv-value Upper Seat-lift	[gpm/psi]	5.5	12.1
Cv-value Lower Seat-lift	[gpm/psi]	4.9	10.2
Air consumption Upper Seat-lift	[in³] ¹	38	38
Air consumption Lower Seat-lift	[in³] ¹	13	13
Air consumption Main Movement	[in³] ¹	216	216

¹ [cubic inches]= volume at atmospheric pressure

7.1.3 Physical Data

Metric

Materials	
Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)
External surface finish:	Semi-bright (blasted)

Materials

Internal surface finish: Bright (polished), Ra < 0.8 µm

Product wetted parts: EPDM

Other seals:

CIP seals: EPDM

Actuator seals: NBR

Guide strips: PTFE

Imperial

Materials

Product wetted steel parts: Acid-resistant steel AISI 316L

Other steel parts: Stainless steel AISI 304

Surface finish: External bright/internal polished, Ra < 32 µin

Product wetted parts: EPDM (std.) NBR, HNBR or FPM

Other seals:

CIP seals: EPDM

Actuator seals: NBR

Guide strips: PTFE

7.2 LP-F

7.2.1 Technical Data

Pressure

Max. product pressure: 1000 kPa / 145 psi / 10 bar

Min. product pressure: Full vacuum

Air pressure: Max. 8 bar / 116 psi

Products acc. to PED 97/23/EC Category I, Fluids group 1, DN ≥ 6" Fluids group 2

Temperature

Temperature range: -5 °C to +125 °C / -23 °F to +257 °F (Depending on elastomer type)

7.2.2 Air and CIP consumption

metric

Size		4"	6"
Kv-value Upper Seat-lift	[m³/h]	3.2	7.1
Kv-value Lower Seat-lift	[m³/h]	3.9	8.9
Air consumption Upper Seat-lift	[n litre] ¹	0.62	0.62
Air consumption Lower Seat-lift	[n litre] ¹	0.21	0.21
Air consumption Main Movement	[n litre] ¹	3.54	3.54

¹ [n litre] = volume at atmospheric pressure

imperial

Size	4"	6"
Cv-value Upper Seat-lift	[gpm/psi]	5.3
Cv-value Lower Seat-lift	[gpm/psi]	6.7
Air consumption Upper Seat-lift	[in³] ¹	38
Air consumption Lower Seat-lift	[in³] ¹	13
Air consumption Main Movement	[in³] ¹	216

¹ [cubic inches]= volume at atmospheric pressure

7.2.3 Physical Data

Metric

Materials	
Product wetted steel parts:	1.4404 (316L)
Other steel parts:	1.4301 (304)
External surface finish:	Semi-bright (blasted)
Internal surface finish:	Bright (polished), Ra < 0.8 µm
Product wetted parts:	EPDM
Other seals:	
CIP seals:	EPDM
Actuator seals:	NBR
Guide strips	PTFE

Imperial

Materials	
Product wetted steel parts:	Acid-resistant steel AISI 316L
Other steel parts:	Stainless steel AISI 304
External surface finish:	Semi-bright (blasted)
Internal surface finish:	External bright/internal polished Ra<32 µin
Product wetted parts:	EPDM (std.) NBR, HNBR or FPM
Other seals:	
CIP seals:	EPDM
Actuator seals:	NBR
Guide strips	PTFE

7.3 Weight

Size	4"	6"
kg	64.90	86.20
lbs	143	190

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8 Spare Parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

8.1 Ordering Spare Parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

8.2 Alfa Laval Service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

8.3 Warranty - Definition



WARNING

The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



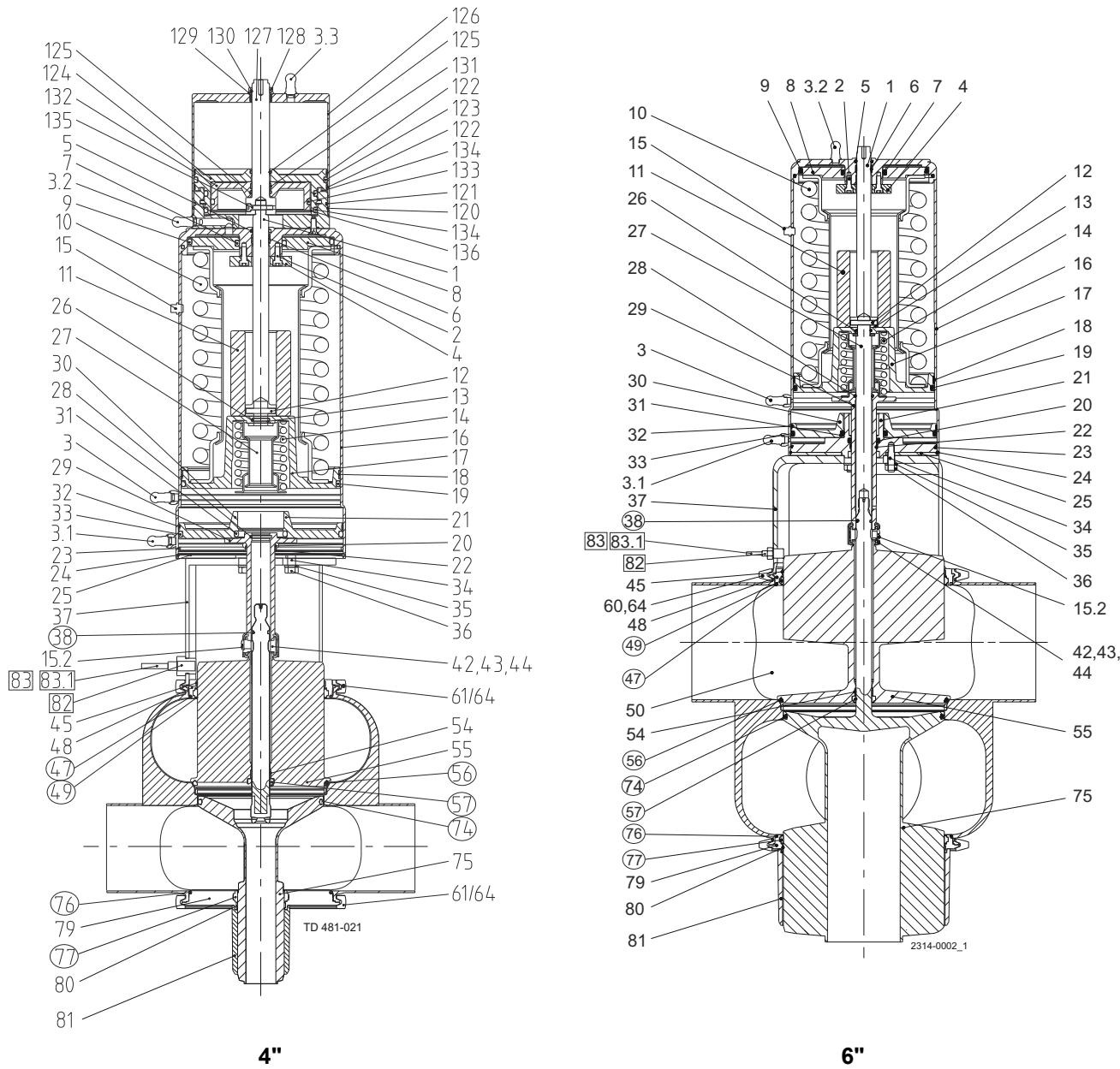
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 7)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

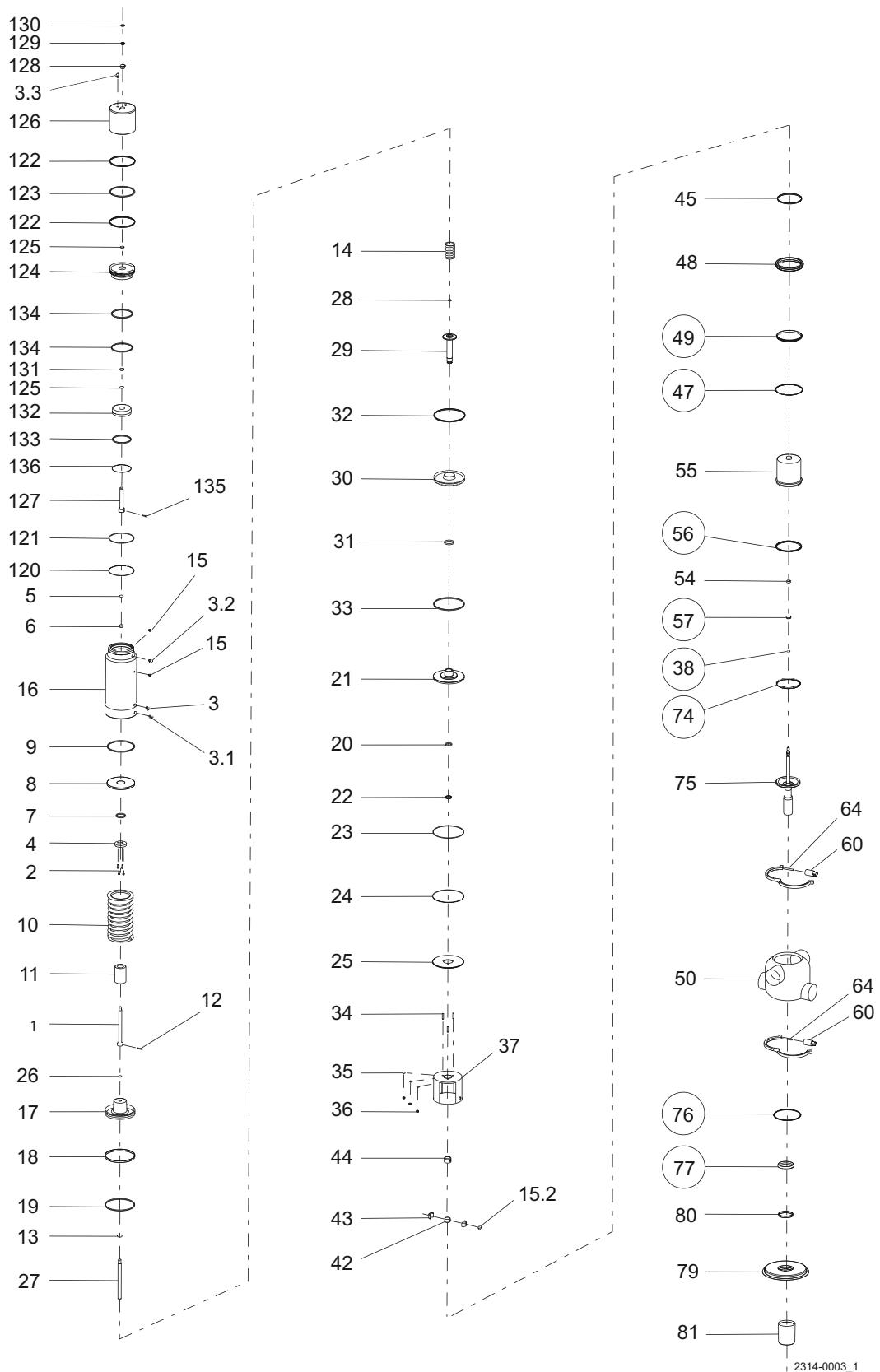
9 Parts Lists and Exploded Views

9.1 Unique Mixproof LP Valve - wear parts 4" and 6"



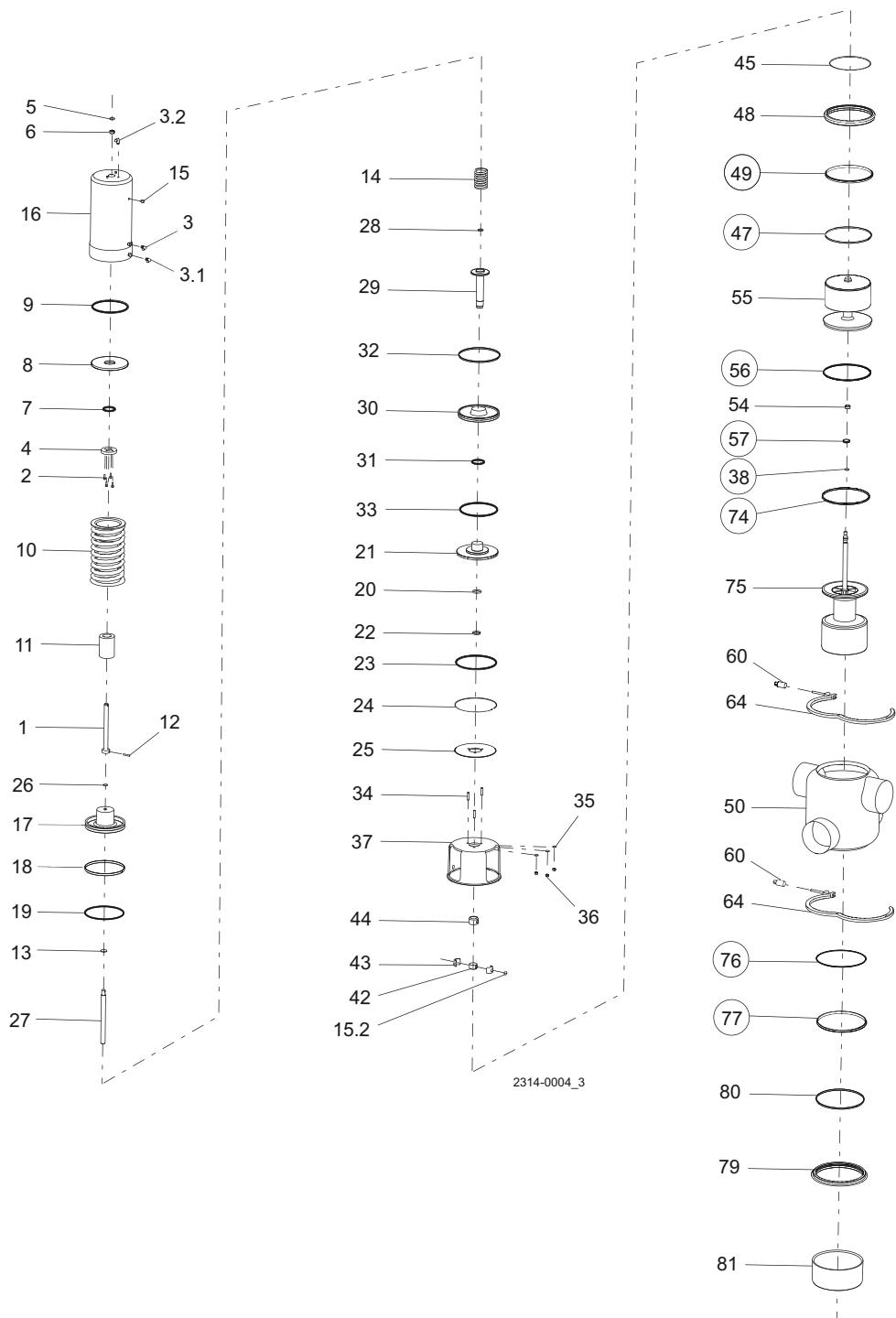
Pos.	Qty.	Denomination
38	1	O-ring
47	1	O-ring
49	1	Lip seal
56	1	Seal ring
57	1	Lip seal
74	1	Seal ring
76	1	O-ring
77	1	Lip seal

9.2 Unique Mixproof LP Valve - parts 4"



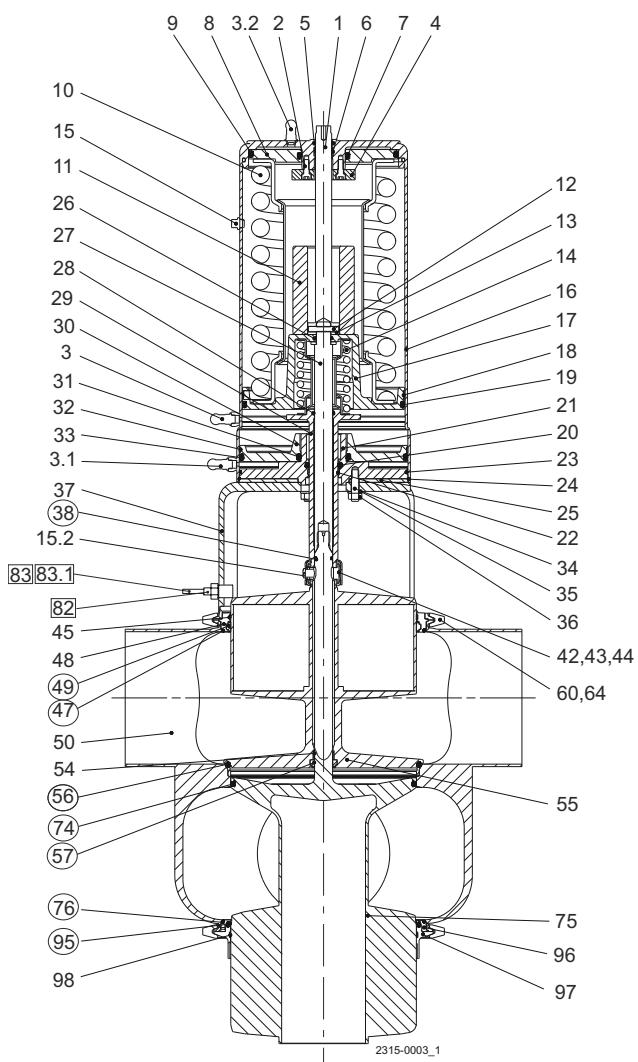
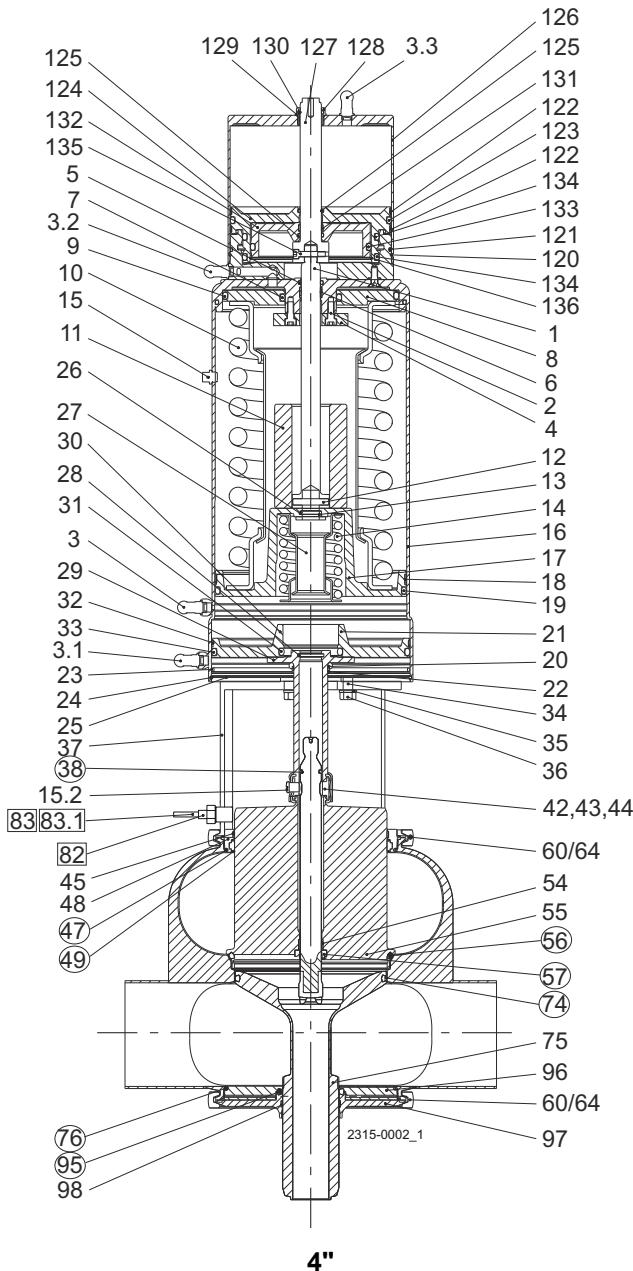
Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
		Cpl. Actuator	32	1	Guide ring, Turcite
1	1	Upper stem	33	1	O-ring, NBR
2	4	Screw	34	3	Bolt
3	1	Air fitting	35	3	Washer
3.1	1	Air fitting	36	3	Nut
3.2	1	Air fitting	42	1	Spindle liner
3.3	1	Air fitting	43	2	Clamp
4	1	Stop for upper piston	44	1	Lock
5	1	O-ring, NBR	45	1	Guide ring, PTFE
6	1	Guide ring, Turcite	48	1	Upper sealing element
7	1	O-ring, NBR	54	1	Guide ring, PTFE
8	1	Upper piston	55	1	Upper plug
9	1	O-ring, NBR	60	2	Hexnut
10	1	Spring assembly	64	2	Clamp without nut
11	1	Distance spacer	75	1	Lower plug
12	1	Pin	79	1	Lower sealing element
13	1	Washer	80	1	Guide ring, PTFE
14	1	Spring assembly	81	1	Cover for Plug
15	3	Plug	120	1	Lock ring
16	1	Cylinder	121	1	O-ring, NBR
17	1	Main piston	122	2	Guide ring
18	1	Guide ring, Turcite	123	1	O-ring, NBR
19	1	O-ring, NBR	124	1	Piston
20	1	O-ring, NBR	125	2	O-ring, NBR
21	1	Bottom	126	1	Cylinder
22	1	Guide ring, Turcite	127	1	Upper stem, cpl.
23	1	O-ring, NBR	128	1	Bushing
24	1	Retaining ring	129	1	O-ring
25	1	Cover disk	130	1	O-ring
26	1	O-ring, NBR	131	1	Guide ring, Turcite
27	1	Inner stem	132	1	Inner piston
28	1	O-ring	133	1	O-ring
29	1	Piston rod	134	2	O-ring
30	1	Lower piston	135	1	Screw
31	1	O-ring, NBR	136	1	Lock ring

9.3 Unique Mixproof LP Valve - parts 6"



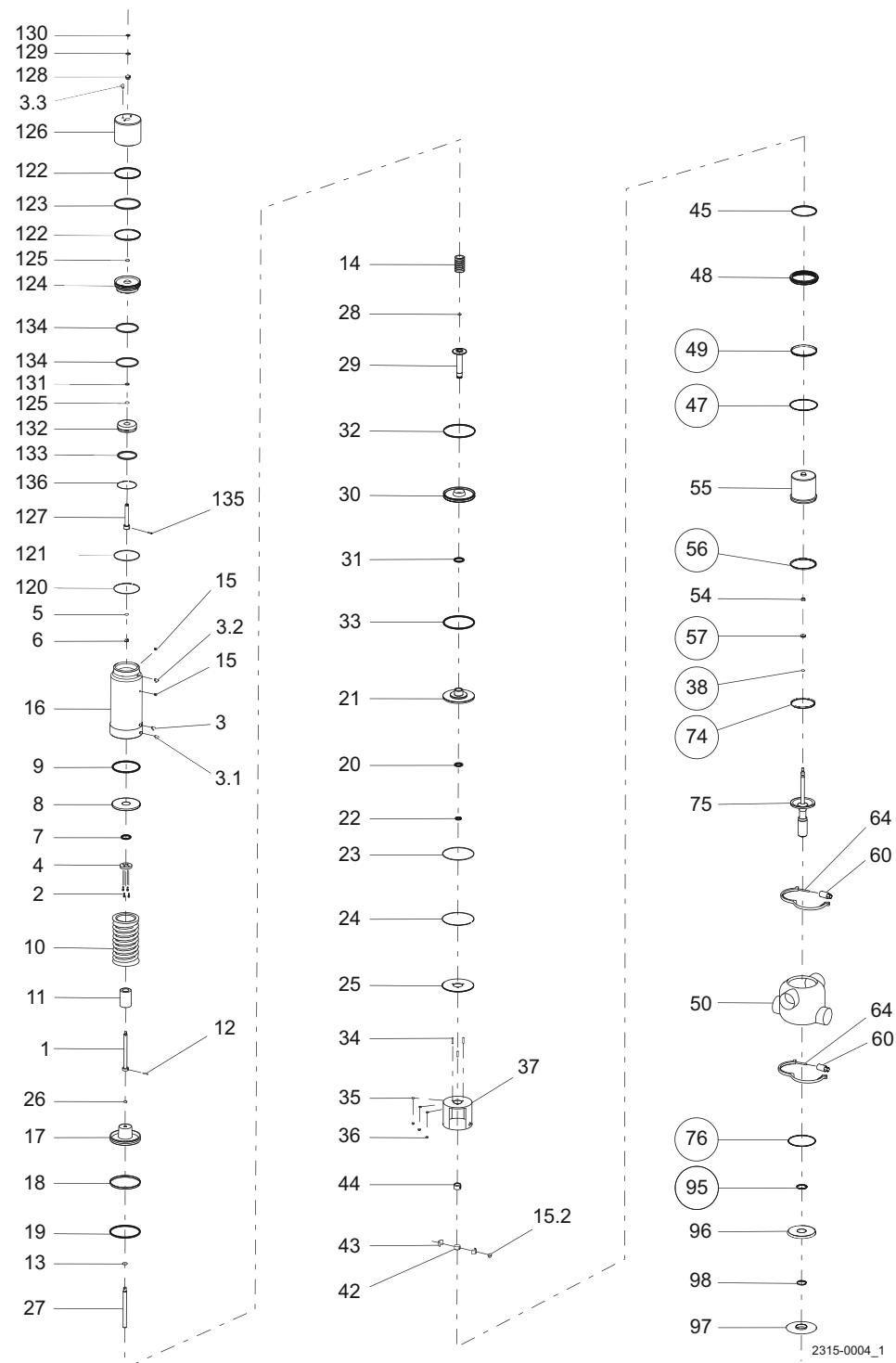
Pos.	Qty.	Denomination	Pos.	Qty.	Denomination
		Cpl. Actuator	24	1	Retaining ring
1	1	Upper stem	25	1	Cover disk
2	4	Screw	26	1	O-ring, NBR
3	1	Air fitting	27	1	Inner stem
3.1	1	Air fitting	28	1	O-ring
3.2	1	Air fitting	29	1	Piston rod
4	1	Stop for upper piston	30	1	Lower piston
5	1	O-ring, NBR	31	1	O-ring, NBR
6	1	Guide ring, Turcite	32	1	Guide ring, Turcite
7	1	O-ring, NBR	33	1	O-ring, NBR
8	1	Upper piston	34	3	Bolt
9	1	O-ring, NBR	35	3	Washer
10	1	Spring assembly	36	3	Nut
11	1	Distance spacer	42	1	Spindle liner
12	1	Pin	43	2	Clamp
13	1	Washer	44	1	Lock
14	1	Spring assembly	45	1	Guide ring, PTFE
15	2	Plug	48	1	Upper sealing element
16	1	Cylinder	54	1	Guide ring, PTFE
17	1	Main piston	55	1	Upper plug
18	1	Guide ring, Turcite	60	2	Hexnut
19	1	O-ring, NBR	64	2	Clamp without nut
20	1	O-ring, NBR	75	1	Lower plug
21	1	Bottom	79	1	Lower sealing element
22	1	Guide ring, Turcite	80	1	Guide ring, PTFE
23	1	O-ring, NBR	81	1	Cover for Plug

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



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

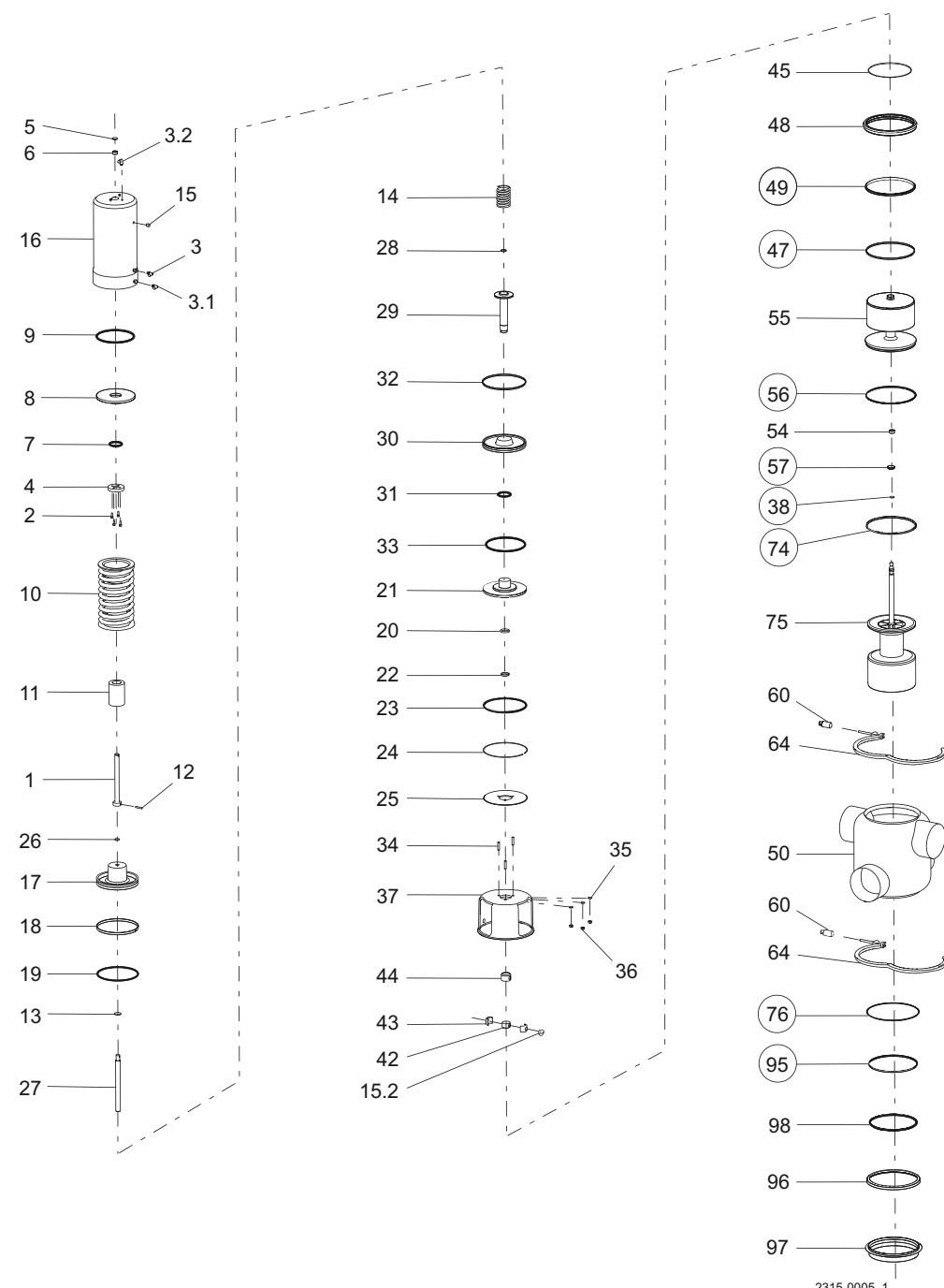
9.5 Unique Mixproof LP-F Valve - parts - 4"



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

Pos.	Qty.	Denomination
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

9.6 Unique Mixproof LP-F Valve - parts 6"



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

Pos.	Qty.	Denomination
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