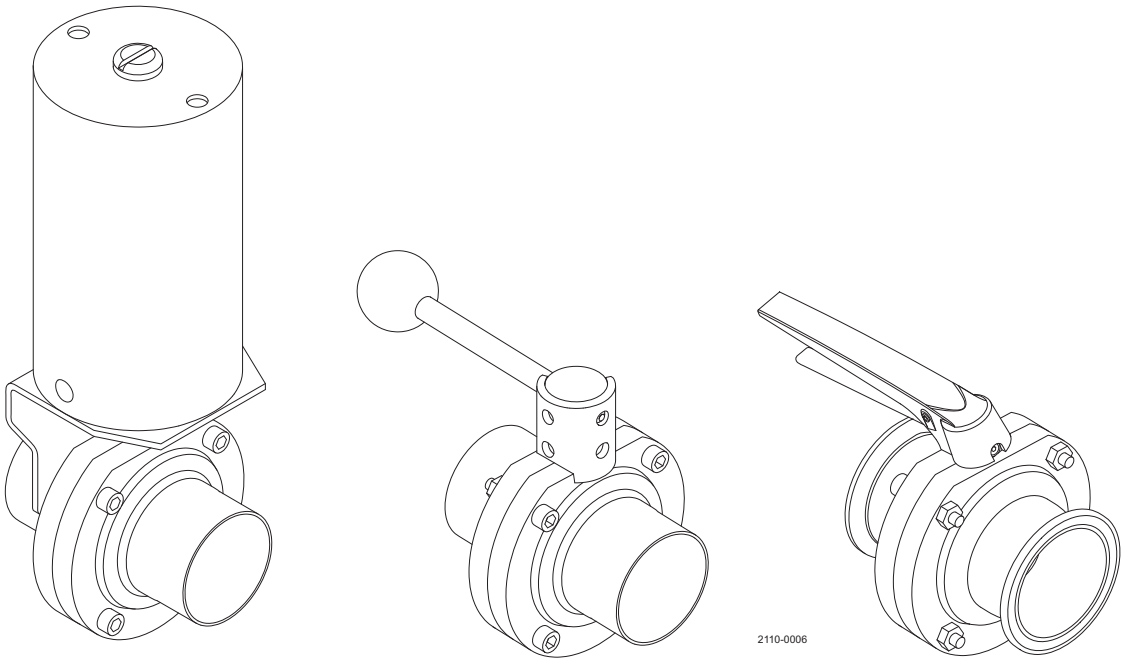
Alfa Laval LKB UltraPure automatic or manual butterfly valve

Butterfly valves



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Instruction Manual

British English

Published by
Alfa Laval Kolding A/S
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The original instructions are in English

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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 actuator

Designation

LKLA NC, LKLA NO, LKLA A/A, LKLA-T NO, LKLA-T NC, LKLA-T A/A

Type

AAB000000001-AAB999999999, 100700000001-100799999999

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2024-05-01
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_052024 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01

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 actuator

Designation

LKLA NC, LKLA NO, LKLA A/A, LKLA-T NO, LKLA-T NC, LKLA-T A/A

Type

AAB000000001-AAB999999999, 100700000001-100799999999

Serial number

is in conformity with the following directives with amendments:

- Regulation (EU) 2023/1230 on machinery

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

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2027-01-20
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_02_012027

CE

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 actuator

Designation

LKLA NC, LKLA NO, LKLA A/A, LKLA-T NO, LKLA-T NC, LKLA-T A/A

Type

AAB000000001-AAB999999999, 100700000001-100799999999

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008

Signed on behalf of: Alfa Laval Kolding A/S.

Vice President Business Unit Hygienic Fluid Handling and Heat Transfer Technologies, Head of Product Management	Mikkel Nordkvist
Title	Name
Kolding, Denmark	2024-05-01
Place	Date (YYYY-MM-DD)

Signature

DoC Revison_02_052024

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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 Burn Hazard.
	Cutting danger.
	Corrosive substance.
	Crushing of hands.
	Danger of injury (lasermarked on the actuator). Do **not** attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is blocked).
	Danger of injury (lasermarked on the actuator). Do **not** attempt to cut open actuator due to spring under load danger! (The lock wire opening is blocked).
	Danger of injury (label marked on actuator). Do **not** attempt to cut the actuator open due to spring under load (the lock wire opening is locked).

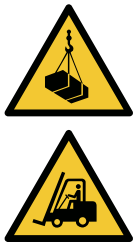
2.2 Safety Precautions

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

	To prevent unexpected start and contact with electrical live and moving parts. **Always** disconnect the power supply and air supply safely: • The power supply disconnecting device and air supply must be disconnected (in off position) and locked.

Transportation and Lifting

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

Installation

	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. **Always** release compressed air after use. **Always** assemble the valve completely before startup and make sure everything is in place and correctly tightened.
   	Never work on the valve or touch moving parts if the actuator is supplied with compressed air. **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. **Never** touch the supplied product or the pipelines when processing hot liquids or sterilizing.
       	Do **NOT** attempt to disassemble or by other means open the actuator due to spring under load danger!

Operation

	Never operate the valve unless a correct installation has been verified. **Never** dismantle the valve during operation or when pressurized. **Necessary** precautions must be taken if leakage occurs as this can lead to hazardous situations. **Never** dismantle or touch the actuator for force opening if supplied with compressed air.
	Never touch the valve or pipelines when hot. **Never** touch the supplied product or the pipelines when processing hot liquids or sterilizing.
	Always rinse well with clean water after the cleaning. **Always** handle lye and acid with great care. **Always** follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.
	Never touch moving parts during operation. **Always** release compressed air after use. **Never** touch the moving parts if the actuator is supplied with compressed air.

Maintenance

In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance includes:

- 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

Always use Alfa Laval genuine spare parts.

Always release compressed air after use.

Always ensure that the valve and pipelines are depressurized, emptied, and cooled down to ambient temperature before dismantling the valve.

Never work on the valve or touch moving parts if the actuator is supplied with compressed air.

Do **NOT** attempt to disassemble or by other means open the actuator due to spring under load danger!

Never pressurize the valve/actuator when the valve is serviced **unless specifically prescribed.**

Never service the valve with valve and pipelines under pressure **unless specifically prescribed.**

Storage

Alfa Laval recommend:

- 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)

Noise

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.

Hazards

Burn Hazard

- Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves

Corrosive Hazard

- 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.

Cut Hazard

- Sharp edges, especially on threads, can cause cuts. Wear protective gloves

Crushing Hazard

- Avoid placing hands into valve orifice pinch points

Health Hazard

Danger of injury: (an extra yellow label marked on the actuator from June 2016). Do **NOT** attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).

Danger of injury (laser marked on the actuator). Do **NOT** attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is locked).

Danger of injury (label marked on actuator). Do **NOT** attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).

Safety check

	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. **Inspection acceptance criteria:** • It should not be possible to reach moving parts originally protected by a protective device • The protective device must be securely mounted • Ensure that screws for the protective device are securely tightened **Procedure in case of non-acceptance:** • 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.

DANGER

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

WARNING

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

CAUTION

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

NOTE

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

WARNING

If the actuator is marked with one of the below warnings, do NOT attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!

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

Scrapping

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.

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3 Introduction

The Alfa Laval Leakage Detection Butterfly Valve is a hygienic in-line valve for routing low and medium-viscosity liquids in stainless steel pipe systems. The Leakage Detection Butterfly Valve is available with a standard handle with spring-locking action for straightforward manual operation or with a pneumatic actuator for pneumatic operation.

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4 Installation

4.1 Unpacking/Delivery

NOTE

The instruction manual is part of the delivery.

Study the instructions carefully.

The items refer to *Parts lists and exploded views* on page 51.

The valve is preassembled before delivery.

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

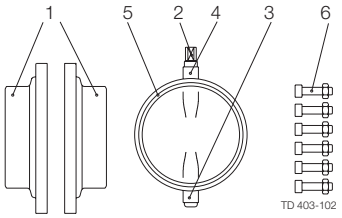
Check the delivery:

1. Complete valve.
2. Complete actuator, if supplied.
3. Bracket for actuator, if supplied.
4. Complete handle, if supplied.
5. Delivery note.

Standard delivery of valve parts:

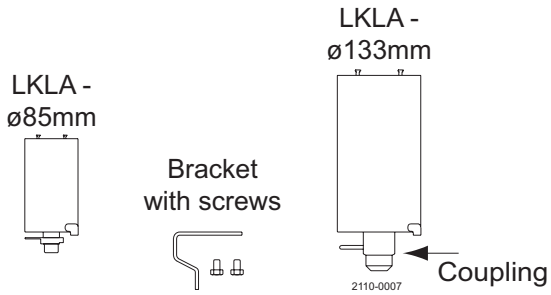
1. Two valve body halves (1).
2. Valve disc (2) fitted in seal ring (5).
3. Two bushes (3, 4) fitted on the disc stem.
4. A set of screws and nuts (6).
5. Two flanges (7) and two flange seal rings (8), (LKB-F).

LKB UltraPure



Delivery of actuator and bracket:

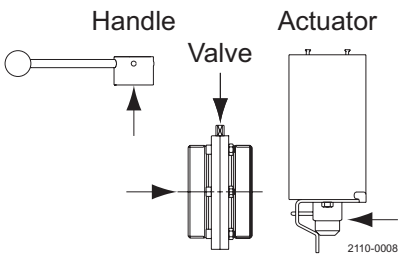
1. Complete actuator with coupling and activating ring (Ø85 mm) or indication pin (Ø133 mm).
2. Bracket with screws for the actuator.
3. Water rejector (if not mounted).



1 **Remove packing materials!**

a) Clean the valve/valve parts for possible packing materials.

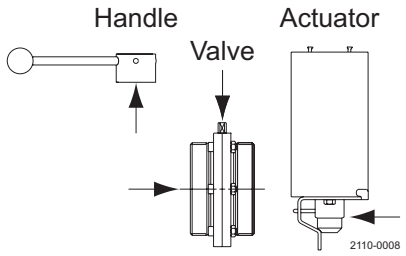
b) Clean the handle or the actuator, if supplied.



2 **Inspection!**

a) Inspect the valve/valve parts for visible transport damage.

b) Inspect the handle or the actuator, if supplied.



CAUTION

Avoid damaging the valve/valve parts.

Avoid damaging the handle or the actuator, if supplied.

4.2 General installation

NOTE

Study the instructions carefully.

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

NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

Always read the *Technical Data* on page 47 thoroughly.

NOTE

For EHEDG approved valves, use connection in compliance with the EHEDG position paper "Easy cleanable Pipe couplings and Process connections.

For EHEDG compliance during cleaning a minimum velocity of 1.5 m/s is required.

Ensure the valves are installed in a self-drainable pipeinstallation.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

WARNING

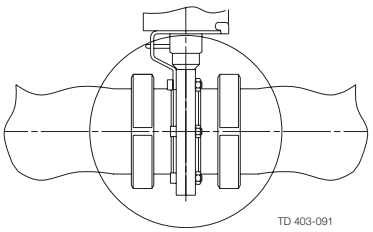
Always release compressed air after use.

Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.

1 Avoid stressing the valve.

Pay special attention to:
- Vibrations
- Thermal expansion of the tubes
- Excessive welding
- Overloading of the pipelines

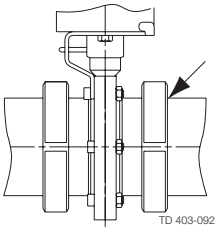
Risk of damage!



2 **Fittings:**

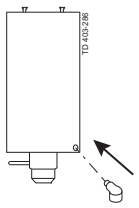
Ensure that the connections are tight.

Remember seal rings!

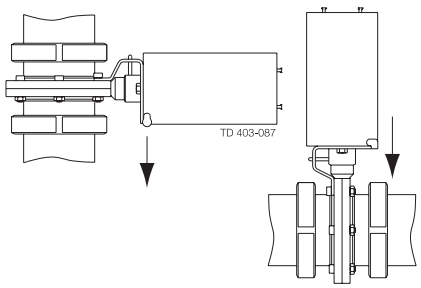


3 **Position of actuator:**

Position the water rejector on the actuator correctly. (The actuator can be installed in any position).



Important!



Turn the ventilation opening downwards!

Air connection of actuator:

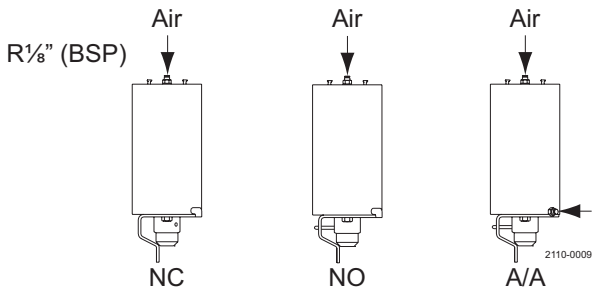
Connect compressed air correctly.

Pay special attention to the warnings!

Pre-use check:

Open and close the valve several times to ensure that the valve disc moves smoothly against the seal ring.

Pay special attention to the warnings!



4.3 Welding

> **NOTE**
>
> Study the instructions carefully.
>
> The valve is supplied as separate parts to facilitate the welding.
>
> LKB UltraPure: for ISO, DIN and ASME tubes.

LKB UltraPure

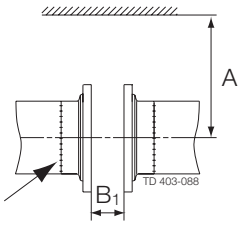
1. Weld the valve body halves into the pipelines.
2. Maintain the minimum clearance (A) so that the actuator can be removed.
3. If welding both valve body halves, ensure that they can be moved axially **B1 mm**, so that the valve parts can be removed.
4. After welding assemble the valve in accordance with *Valve assembly — LKB UltraPure* on page 41.

Pre-use check

Open and close the valve several times to ensure that the valve disc moves smoothly against the seal ring.

Pay special attention to the warnings!

LKB UltraPure



	A (mm)				B_1 (mm)
	Ø85		Ø133		
Size	LKLA	LKLA-T	LKLA	LKLA-T	
25 mm / 1"	245	172 mm (incl. top unit)		172 mm (incl. top unit)	20
38 mm / 1½"	245				20
51 mm / 2"	255				20
63.5 mm / 2½"	265				24
76.1 mm / 3"	265				24
101.6 mm / 4"	290		420		37
DN25	245				20
DN32	245				20
DN40	250				20
DN50	260				20
DN65	270				24
DN80	275				27
DN100	290		420		27

4.4 Fitting Actuator/Bracket/Handle on the Valve (Optional Extras)

NOTE

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

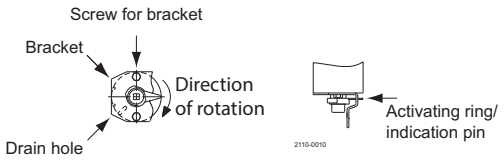
NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

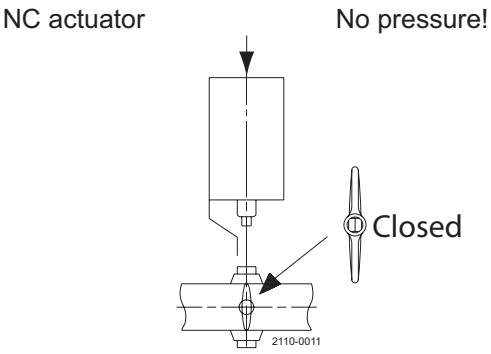
Bracket/indication

1. Fit the bracket as shown.
2. Fit and tighten the screws.
3. Fit the activating ring/indication pin as shown.



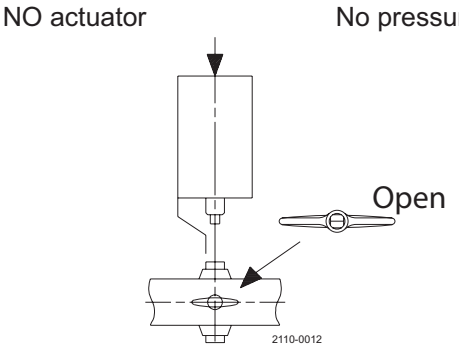
Actuator/bracket - NC

1. Ensure that the valve is closed by checking the position of the groove of the disc stem top.
2. Fit the actuator/bracket in accordance with *Valve Assembly, Step 3*.



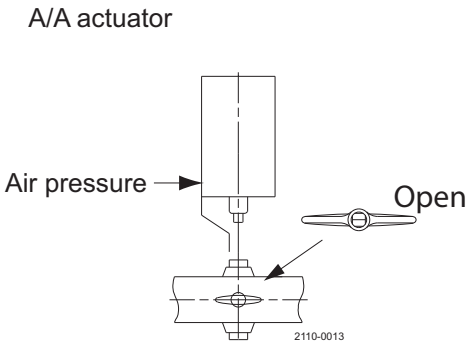
Actuator/bracket - NO

1. Ensure that the valve is open by checking the position of the groove of the disc stem top.
2. Fit the actuator/bracket in accordance with *Valve Assembly, Step 3*.



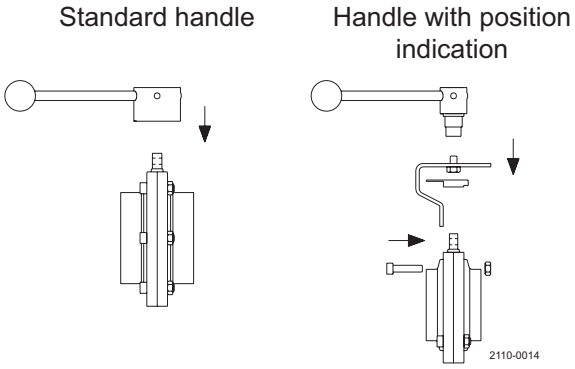
Actuator/bracket - A/A

1. Ensure that the valve is open by checking the position of the groove of the disc stem top.
2. Supply compressed air to the actuator.
3. Fit the actuator/bracket in accordance with *Valve Assembly, Step 3*.



Handle/indication

1. Fit the standard handle on the valve so that the screw can enter the hole in the disc connection.
2. Fit the handle with position indication as shown and in accordance with *Valve Assembly, Step 3*.



Pre-use check

> **NOTE**
>
> Pay special attention to the warnings!

Open and close the valve several times to ensure that it operates smoothly.

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5 Operation

5.1 Operation

NOTE

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

The valve is automatically or manually operated by means of an actuator or a handle.

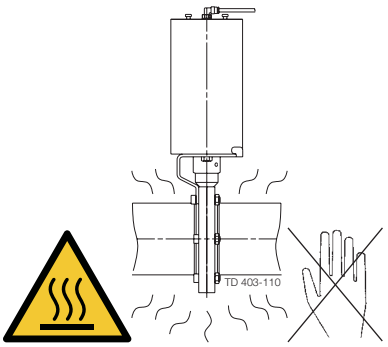
Always read the technical data carefully.

CAUTION

Alfa Laval cannot be held responsible for incorrect operation.

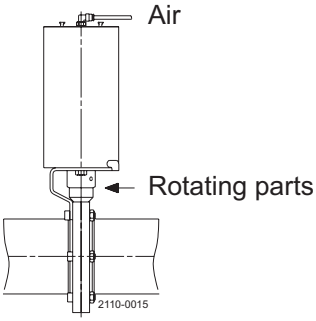
DANGER **Burning danger**

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



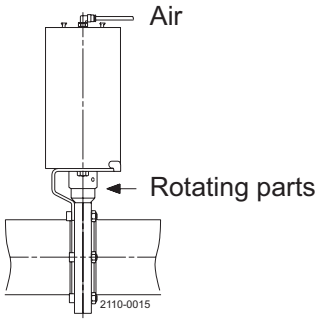
DANGER

Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.



1 Operation by means of actuator:

Automatic on/off operation by means of compressed air.



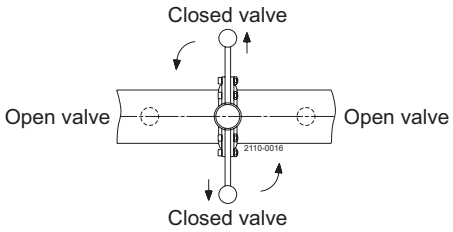
2 Operation by means of standard handle:

a) Manual on/off operation.

b) Pull the handle outwards while rotating it.

NOTE

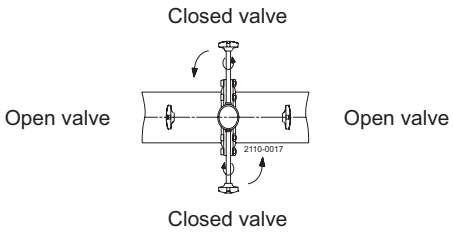
This also applies for the Lockable Multiposition Handle.



3 Operation by means of regulating handle:

a) Manual flow regulation because of infinite locking positions.

b) Loosen the handle, rotate it and tighten again.



5.2 Troubleshooting

NOTE

Pay attention to possible break-down.

Study the instructions carefully.

NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

NOTE

Study the maintenance instructions carefully before replacing worn parts. - See *General maintenance* on page 37.

Problem	Cause/result	Repair
• External leakage • Internal leakage by closed valve (normal wear)	• Worn seal ring • Worn flange seal ring (LKB-F)	Replace the seal ring and the bushes
• External leakage • Internal leakage by closed valve (too early)	• High pressure • High temperature • Aggressive liquids • Many activations	• Change rubber grade • Change the operation conditions
• Difficult to open/close • Damage of disc connection (high torque)	Incorrect seal ring (swelling)	Replace by a seal ring of a different rubber grade
Difficult to open/close	• 90° displacement of the actuator • Incorrect actuator function (NC,NO) • Worn actuator bearings • Dirt penetration into the actuator	• Fit correctly (see *Fitting Actuator/Bracket/Handle on the Valve (Optional Extras)* on page 28) • Change from NC to NO or vice versa • Replace the bearings • Service the actuator

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.

HNO_3 = Nitric acid.

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

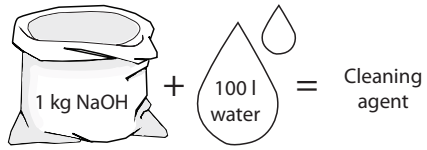
Examples of cleaning agents

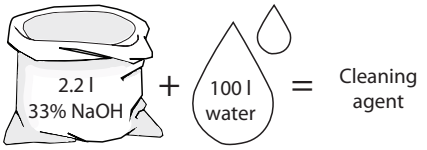
NOTE

Use clean water free from chlorides.

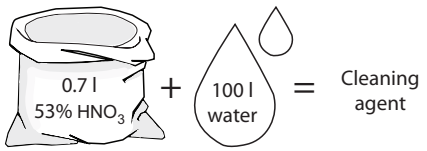
Metric System

1. 1% by weight NaOH at 70°C



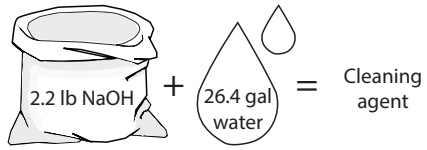


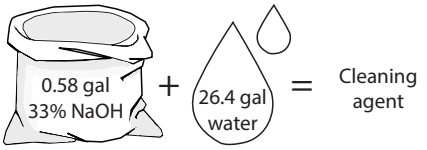
2. 0.5% by weight HNO_3 at 70°C



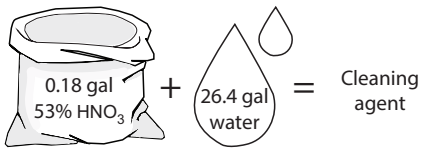
Imperial System

1. 1% by weight NaOH at 158°F



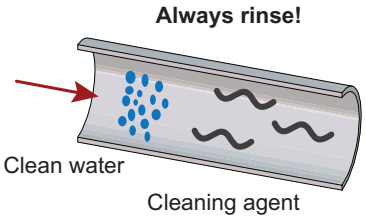


2. 0.5% by weight HNO_3 at 158°F



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.



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6 Maintenance

6.1 General maintenance

NOTE

Always read the *Technical Data* on page 47 thoroughly.

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

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

Maintain the valve and the regulator carefully.

Always keep spare seal rings, rubber seals, bushes and actuator bearings in stock.

Always use Alfa Laval genuine spare parts.

"Mushrooms" = Fastening connections on the end cap.

CAUTION

Always release compressed air after use.

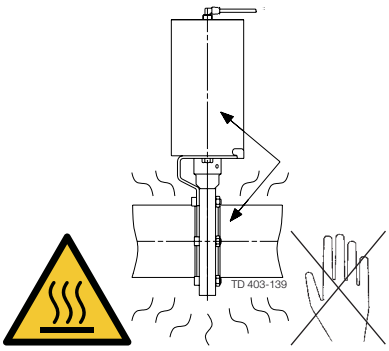
DANGER **Burning danger!**

Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.

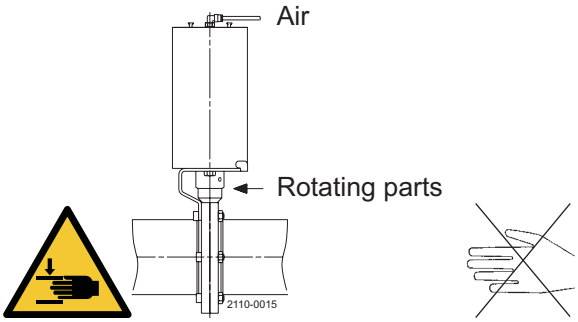
The valve/actuator and the pipelines must **never** be pressurised when servicing the valve/actuator.

Atmospheric pressure required!



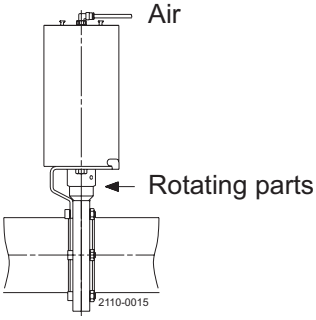
DANGER **Crushing danger!**

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



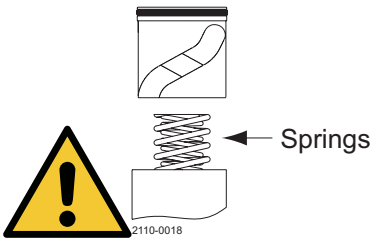
DANGER

Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.



CAUTION

Actuator size Ø85 mm (NC/NO):The actuator springs are **not** caged.

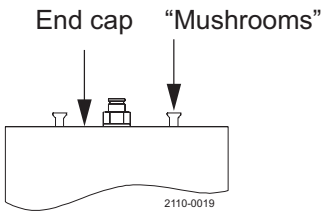


WARNING

End cap of actuator:

Never remove the end cap by using compressed air.

Always fit the end cap with the "mushrooms" turned outwards and position it correctly before supplying compressed air to the actuator.



	Valve seal rings	Valve bushes	Actuator rubber seals	Actuator bearings
Preventive maintenance	Replace after 12 months	Replace when replacing the valve seal rings	Replace after 5 years	
Maintenance after leakage (leakage normally starts slowly)	Replace by the end of the day	Replace when replacing the valve seal rings	Replace when possible	
Planned maintenance	• Regular inspection for leakage and smooth operation • Keep a record of the valve • Use the statistics for planning of inspections	Replace when replacing the valve seal rings	• Regular inspection for leakage and smooth operation • Keep a record of the actuator • Use the statistics for planning of inspections	Replace when they become worn
	Replace after leakage		Replace after air leakage	
Lubrication	**Before fitting** (use USDA-H1 approved) • Unisilcon L641(*) • Alfa Laval Silicone based Food-grade Lubricant • Molycote 111(D)	None	**Before fitting** • Molycote Long term 2 Plus (Δ) • Molycote 1132(Δ) (for aggressive environment)	**When replacing actuator rubber seals** • Molycote Long term Plus (Δ) • Molycote 1132(Δ) (for aggressive environment)

6.2 Dismantling the valve — LKB UltraPure

NOTE

Study the instructions carefully.

The items refer to *Parts lists and exploded views* on page 51.

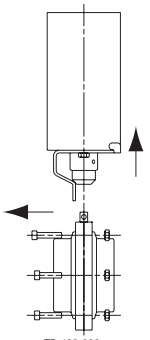
All scrap must be stored/disposed of in accordance with current regulations and directives.

LKB UltraPure: for ISO, DIN and ASME tubes.

1 **Valve with actuator:**

a) Remove screws and nuts (6).

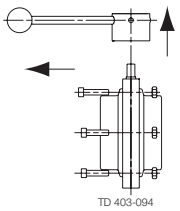
b) Remove the bracket with the actuator.



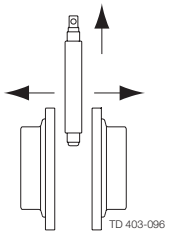
Valve with handle:

a) Remove the complete handle.

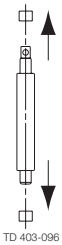
b) Remove screws and nuts (6).



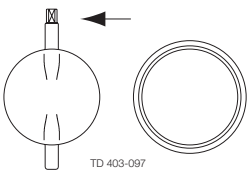
2 Remove seal ring (5) together with valve disc (2).



3 Remove bushes (3, 4) from the disc stems.



4 Remove valve disc (2) from seal ring (5).



6.3 Valve assembly — LKB UltraPure

NOTE

Study the instructions carefully.

The items refer to *Parts lists and exploded views* on page 51.

LKB UltraPure: for ISO, DIN and ASME tubes.

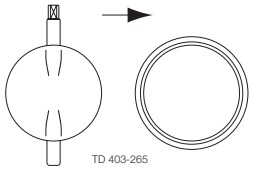
Lubricate the seal ring before fitting it.

Lubricate the disc stem before fitting the bushes.

1

a) Lubricate the pin holes in seal ring (5), (important for Silicone and Viton).

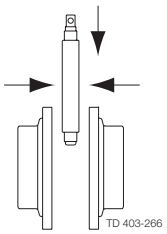
b) Fit valve disc (2) in the seal ring (5).



2

a) Fit bushes (3,4) on the disc stem.

b) Fit seal ring (5) together with valve disc (2) between the two valve body halves (1).



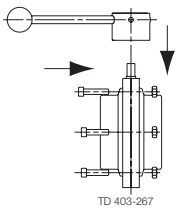
CAUTION

Rotate the valve disc so that the valve is open before tightening screws and nuts (6).

3 **Valve with handle:**

a) Fit screws and nuts (6) and torque tighten in accordance with the requirements (see *Table below*).

b) Fit the complete handle on the disc connection and tighten the screw on the handle.

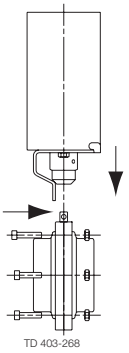


> **NOTE**
>
> This also applies for the Lockable Multiposition Handle.
>
> Bolts and nuts must be cleaned from old grease and dirt before tighten.
>
> To avoid seizing the bolts have to be lubricated with Molykote TP-42 Paste or similar Anti-seize lubricant.

Valve with actuator:

a) Fit the actuator with the bracket so that the disc connection enters the coupling (see *Fitting Actuator/Bracket/Handle on the Valve (Optional Extras)* on page 28).

b) Fit screws and nuts (6) and torque tighten in accordance with the requirements so that the bracket is fixed to the valve (see *Table below*).



4 **Pre-use check:**

Check that the valve disc moves smoothly against the seal ring.

Pay special attention to the warnings!

Tools/torque values for assembly of the valve body halves:

Valve size	1" 25 mm DN 25	DN32	1½" 38 mm DN40	2" 51 mm DN50	2½" 63.5 mm DN65	3" 76 mm DN80	4" 101.6 mm DN100	DN125	DN150
Allen Key	5 mm (0.2")	5 mm (0.2")	5 mm (0.2")	6 mm (0.24")	6 mm (0.24")	6 mm (0.24")	8 mm (0.3")	8 mm (0.3")	8 mm (0.3")
Recommended Torque	9 Nm (7 lbf-ft)	9 Nm (7 lbf-ft)	9 Nm (7 lbf-ft)	20 Nm (15 lbf-ft)	20 Nm (15 lbf-ft)	20 Nm (15 lbf-ft)	38 Nm (28 lbf-ft)	38 Nm (28 lbf-ft)	38 Nm (28 lbf-ft)

6.4 Dismantling of Actuator

NOTE

Study the instructions carefully.

The items refer to *Parts lists and exploded views* on page 51.

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

NC = Normally closed.

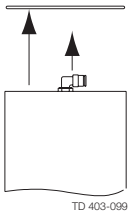
NO = Normally open.

A/A = Air/air activated.

1 a) Press end cap (5) into air cylinder (1).

b) Remove retaining ring (6).

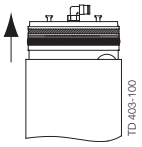
Use a press or special tool (item no. 9611416791).



2 **NC/NO actuator:**

Release the pressure on end cap (5) carefully and remove the end cap.

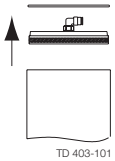
Pay special attention to the warning!



A/A actuator:

Remove end cap (5) by hand.

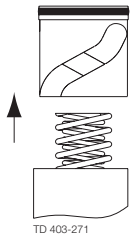
Pay special attention to the warning!



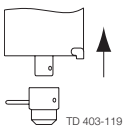
3 Remove piston (3) and the springs.

NOTE

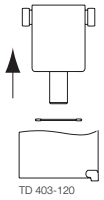
- **The actuator size Ø133 mm has a caged spring assembly.**
- **The air/air actuator has no springs.**



4 Remove connex pin (16) and coupling (17) from rotating cylinder stem (2).



5 Remove rotating cylinder (2) and the remaining internal parts from air cylinder (1).



6.5 Assembly of Actuator

NOTE

Study the instructions carefully.

NC = Normally closed.

NO = Normally open.

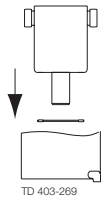
A/A = Air/air activated.

Lubricate the rubber seals before fitting them.

Lubricate the bearings.

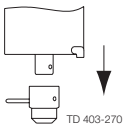
Clean the piston before assembly.

1. Fit rotating cylinder (2) in air cylinder (1).

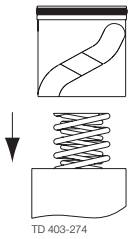


2. Fit coupling (17) on rotating cylinder stem (2) and fit connex pin (16).

   Fit the connex pin correctly!



3. Fit the springs in rotating cylinder (2) and fit piston (3) carefully.



CAUTION

Fit the piston correctly in relation to the bearings.

NOTE

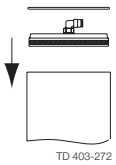
The air/air actuator has no springs.

4 **A/A actuator:**

a) Fit end cap (5) sufficiently into air cylinder (1) so that retaining ring (6) can be fitted in the air cylinder.

b) Position the end cap correctly by hand.

Pay special attention to the warning!

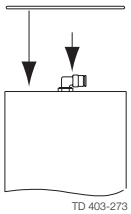

TD 403-272

NC/NO actuator:

a) Fit end cap (5) in air cylinder (1) and press sufficiently down so that retaining ring (6) can be fitted in the air cylinder.

b) Release the pressure on the end cap.

Pay special attention to the warning!


TD 403-273

Use a press or special tool (item no. 9611416791).

5 **Pre-use check:**

a) Supply compressed air to the actuator.

b) Activate the actuator several times to ensure that it operates smoothly.

Pay special attention to the warnings!

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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 Technical Data

Valve	
Max. product pressure:	1000 kPa (145 PSI) (10 bar)
Min. product pressure:	Full vacuum
Temperature range:	-10 °C to + 140 °C (14 °F to +284 °F) (EPDM) However max. 95 °C (203 °F) when operating the valve (All seals)
Product acc. to PED 97/23/EC	Fluids group 2

Actuator	
Max. air pressure:	600 kPa (87 PSI) (6 bar)
Min. air pressure, NC and NO:	400 kPa (58 PSI) (4 bar)
Temperature range:	-25 °C to +90 °C (-13 °F to +194 °F)
Air consumption (litres free air):	
- ø85 mm:	0.24 x p (bar)
- ø133 mm:	0.95 x p (bar)
Weight:	
- ø85 mm:	3 kg (6.6 lb)
- ø133 mm:	12 kg (26.5 lb)

ATEX	
Classification:	II 2 G D[1]

[1] This equipment is outside the scope of the directive 2014/34/EU and must not carry a separate CE marking according to the directive as the equipment has no own ignition source

Weight

Size	**25 mm**	**38 mm**	**51 mm**	**63.5 mm**	**76.1 mm**	**101.6 mm**	**DN 25**	**DN 32**	**DN 40**	**DN 50**	**DN 65**	**DN 80**	**DN 100**
kg	1.2	1.0	1.5	2.1	3.0	4.7	1.2	1.1	1.3	1.8	3.1	3.5	5.1

Size	**1"**	**1½"**	**2"**	**2½"**	**3"**	**4"**
lb	2.65	2.20	3.31	4.63	6.61	10.36

7.2 Physical Data — LKB UltraPure

Materials		
Product wetted steel part:		1.4404 (AISI 316L) acc. to EN 10088
ASME BPE weld end		AISI 316L (low sulfur)
Other steel parts:		1.4301 (AISI 304) acc. to EN 10088
Rubber grades		Q, EPDM, Viton (FPM), HNBR[1], PFA[2]
Bushings for valve disc:		PVDF
Outside finish		Semi bright, RA 3.2 µm
Inside finish (wetted parts)	- ISO/DIN	SF1, RA 0.5µm (ASME BPE table SF-3)
	- ASME BPE	SF1, RA 0.5µm (ASME BPE table SF-3)
		SF4, RA 0.38µm (ASME BPE table SF-3)

[1] LKB-F (DIN) with HNBR are supplied with EPDM flange seal.
[2] LKB-F (DIN & ISO) with PFA are supplied with EPDM flange seal.

Elastomers	
Product wetted seals:	EPDM acc. to FDA and USP Class VI

Connections	
Weld ends:[1]	Matching tubes and fittings: ISO 2037 / DIN / ASME BPE Acc. to ISO, DIN or ASME BPE
Clamp ends:	Matching tubes and fittings: ISO 2037 / DIN / ASME BPE Acc. to ISO, DIN or ASME BPE

[1] Weld ends on ASME BPE valves are according to ASME BPE 2009 316L Table DT-3 with low sulfur and suitable for orbital welding

Actuator	
Actuator body:	1.4307 (304L)
Piston:	Light alloy Air/air version (for ø85 mm: Bronze)
Seals:	NBR
Housing for switches:	PPO
Finish	Semi bright

7.3 Noise

One metre / 3 ft away from and 1.6 metres / 5 ft above the exhaust, the noise level of a valve actuator will be approximately 77 dB(A) without noise damper and approximately 72 dB(A) with damper - measured at 7 bar air-pressure.

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:

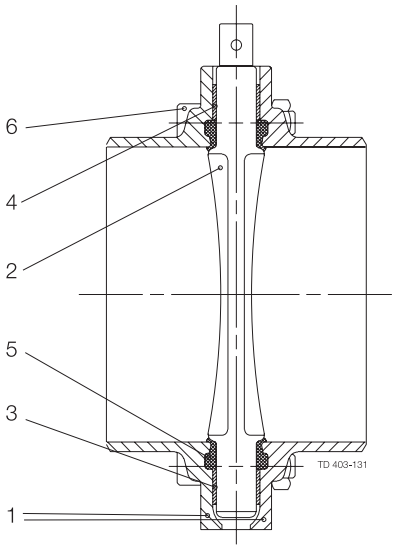
- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied 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 9)
- 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.

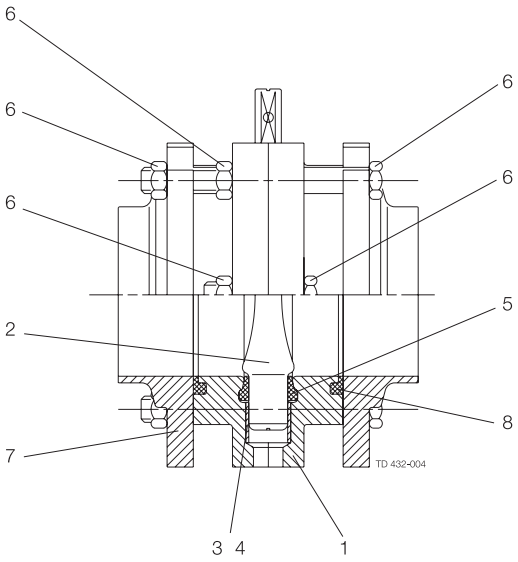
9 Parts lists and exploded views

9.1 Drawings

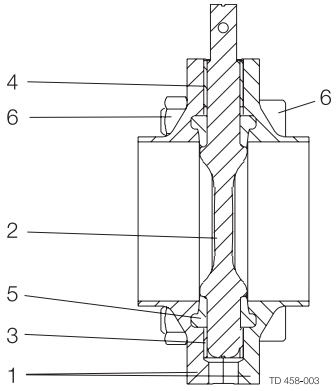
LKB UltraPure



LKB-F

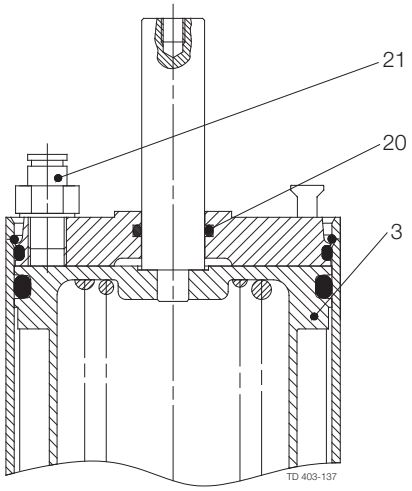


LKB-LP

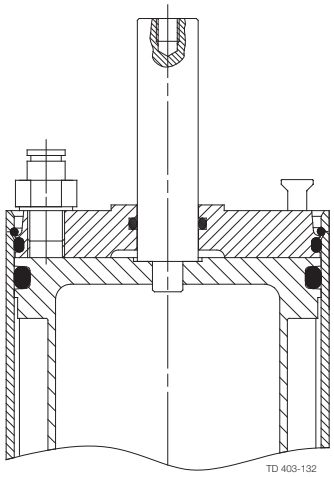


LKLA and LKLA-T actuators Ø85 mm

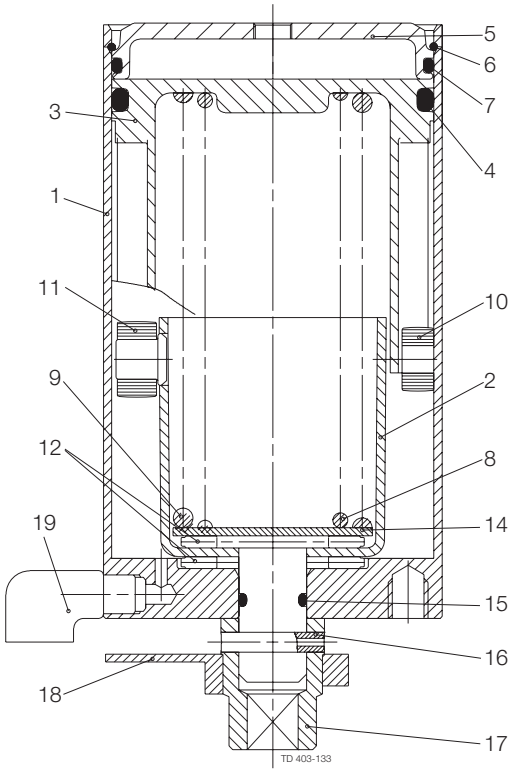
LKLA-T (NC-NO)



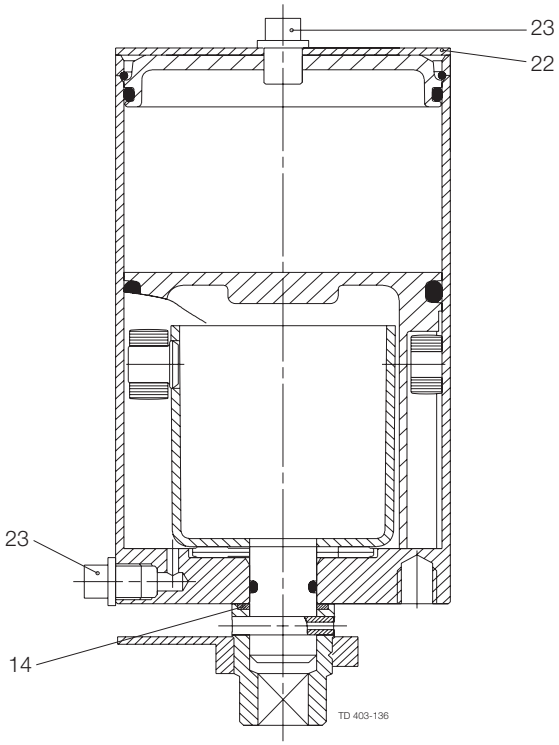
LKLA-T (A/A)



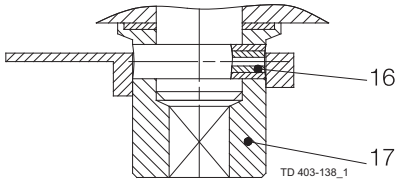
LKLA (NC-NO)



LKLA (A/A)

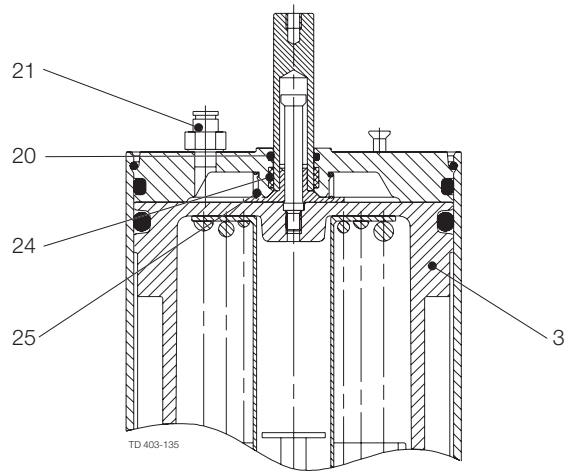


DN 125-150 (A/A)

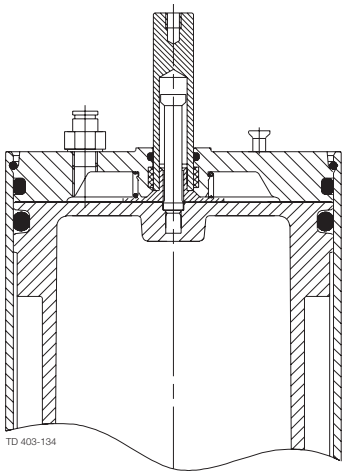


LKLA and LKLA-T actuators Ø133 mm

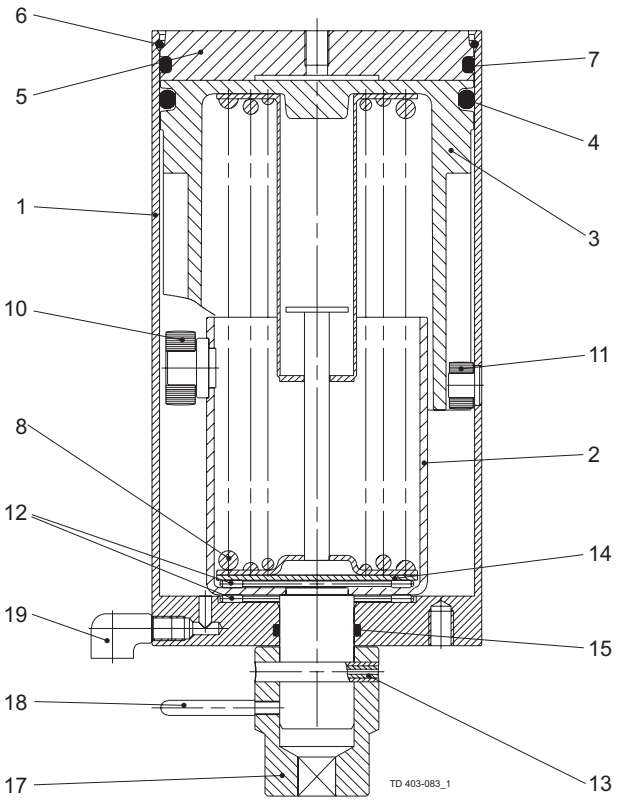
LKLA-T (NC-NO)



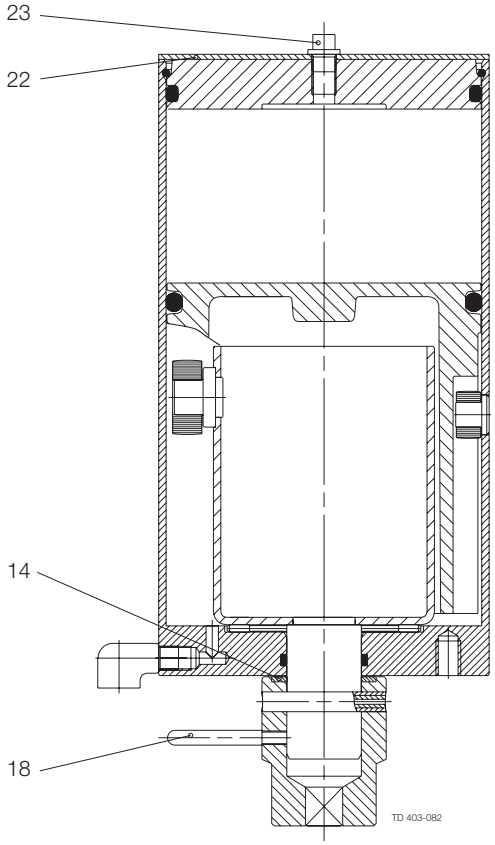
LKLA-T (A/A)



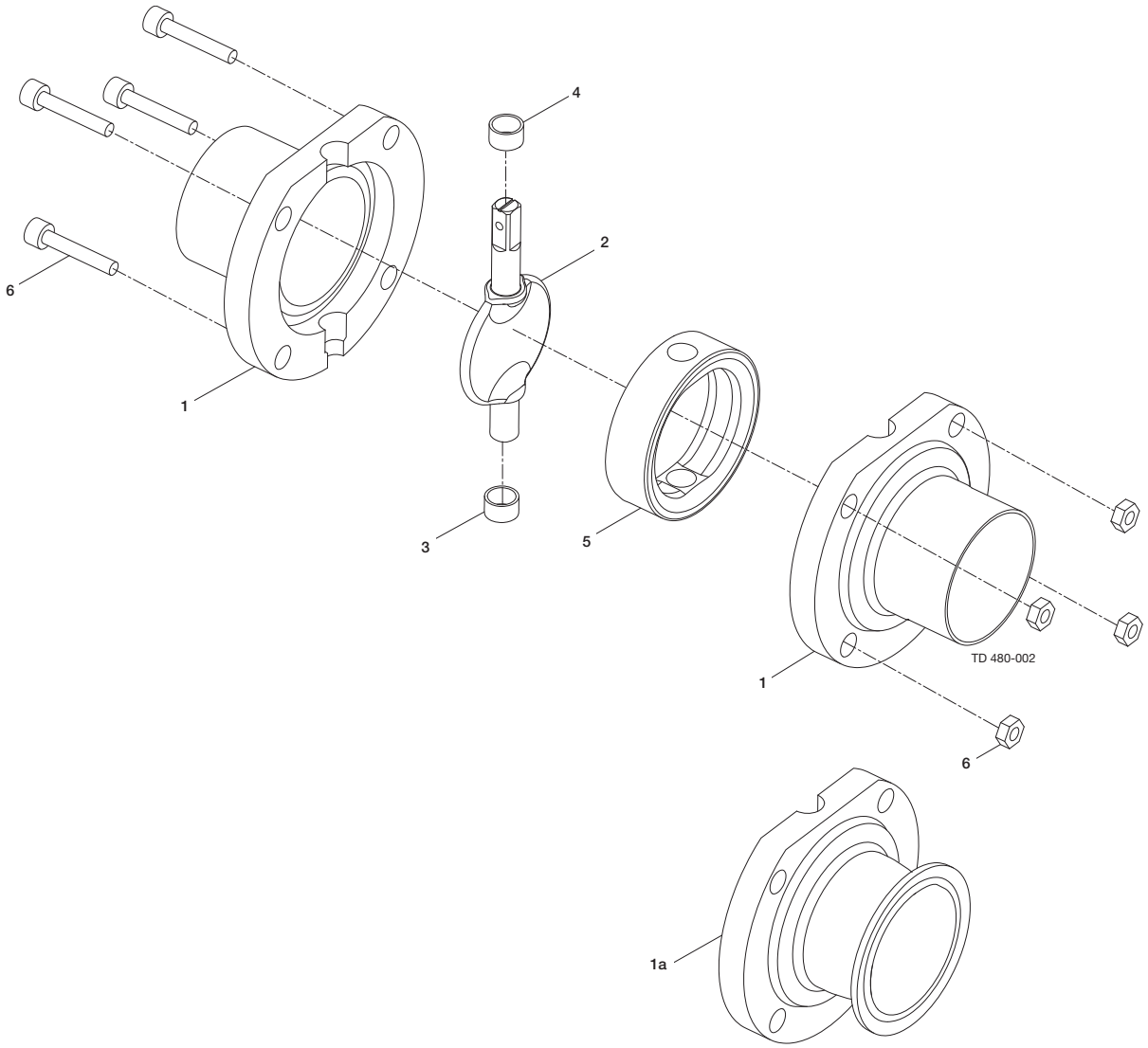
LKLA (NC-NO)



LKLA (A/A)



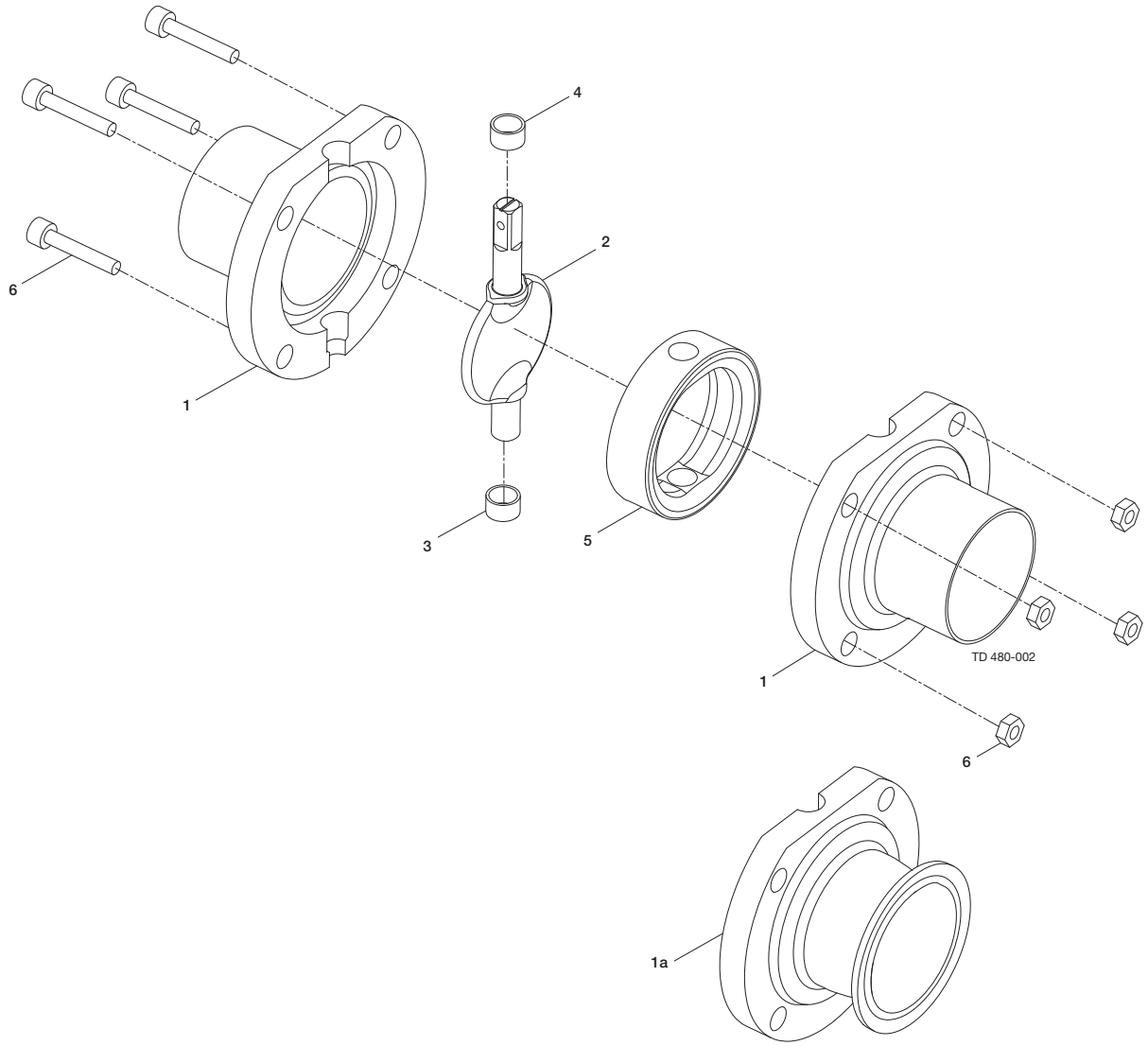
9.2 LKB UltraPure Butterfly Valve, ISO



Pos.	Qty.	Denomination
		Alfa Laval Q-doc service kit
1	2	Valve body half, welding ends
1a	2	Valve body half, clamp ferrule
2	1	Disc

Pos.	Qty.	Denomination
3	1	Bush
4	1	Bush
5	1	Seal ring
6	1	Set screw + nut

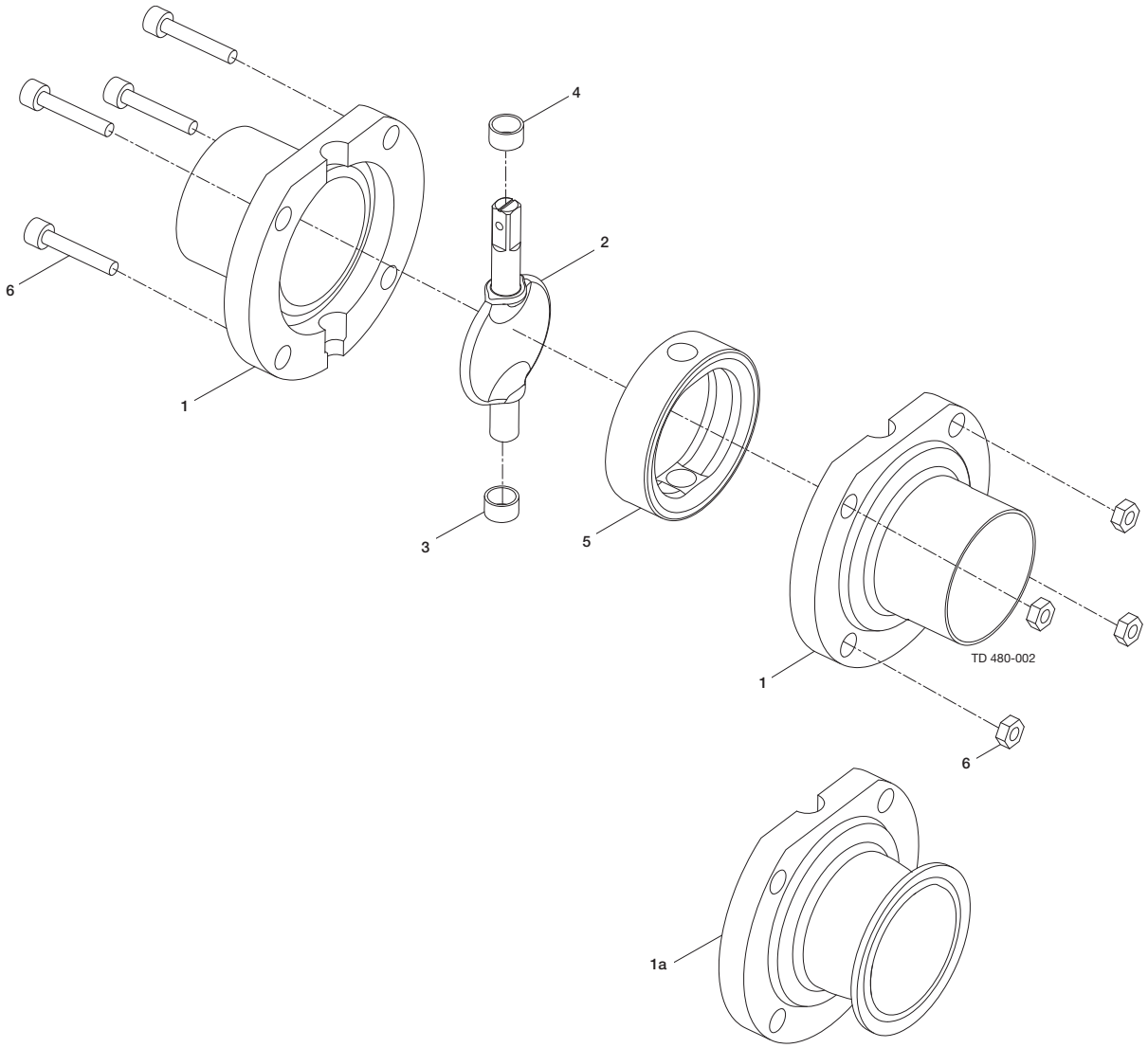
9.3 LKB UltraPure Butterfly Valve, ASME



Pos.	Qty.	Denomination
	1	Alfa Laval Q-doc service kit
1	2	Valve body half, welding ends
1a	2	Valve body half, clamp ferrule
2	1	Disc

Pos.	Qty.	Denomination
3	1	Bush
4	1	Bush
5	1	Seal ring

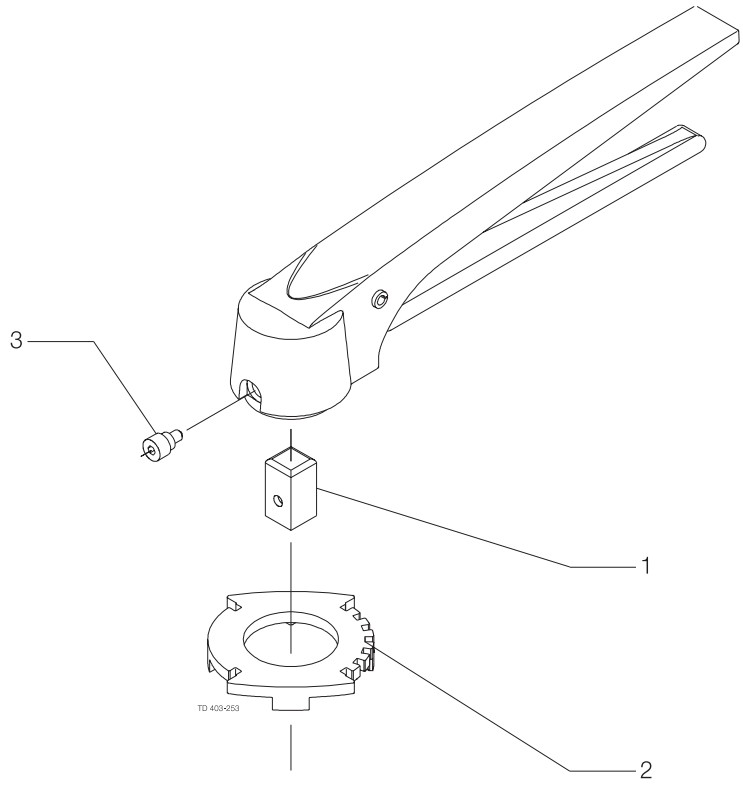
9.4 LKB UltraPure Butterfly Valve, DIN



Pos.	Qty.	Denomination
	1	Alfa Laval Q-doc service kit
1a	2	Valve body half, clamp ferrule
1	2	Valve body half, welding ends
2	1	Disc

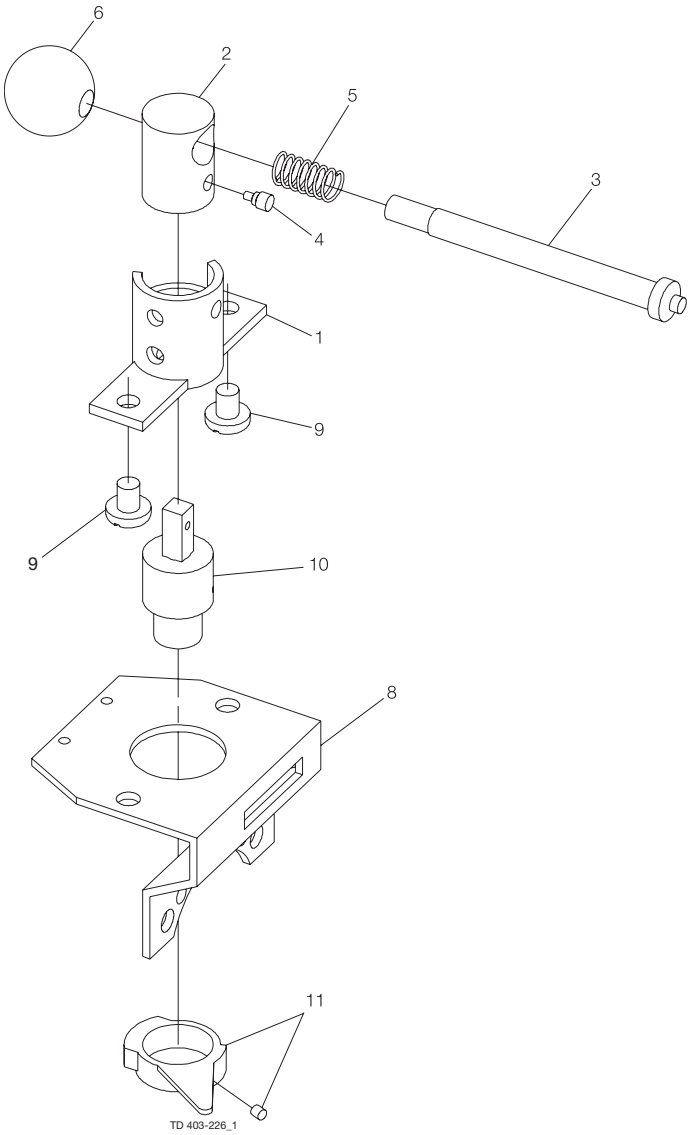
Pos.	Qty.	Denomination
3	1	Bush
4	1	Bush
5	1	Seal ring
6	1	Set screw + nut

9.5 LKB lockable multiposition handle for valve



Pos.	Qty.	Denomination
1	1	Insert
2	1	Positioning cap
3	1	Screw

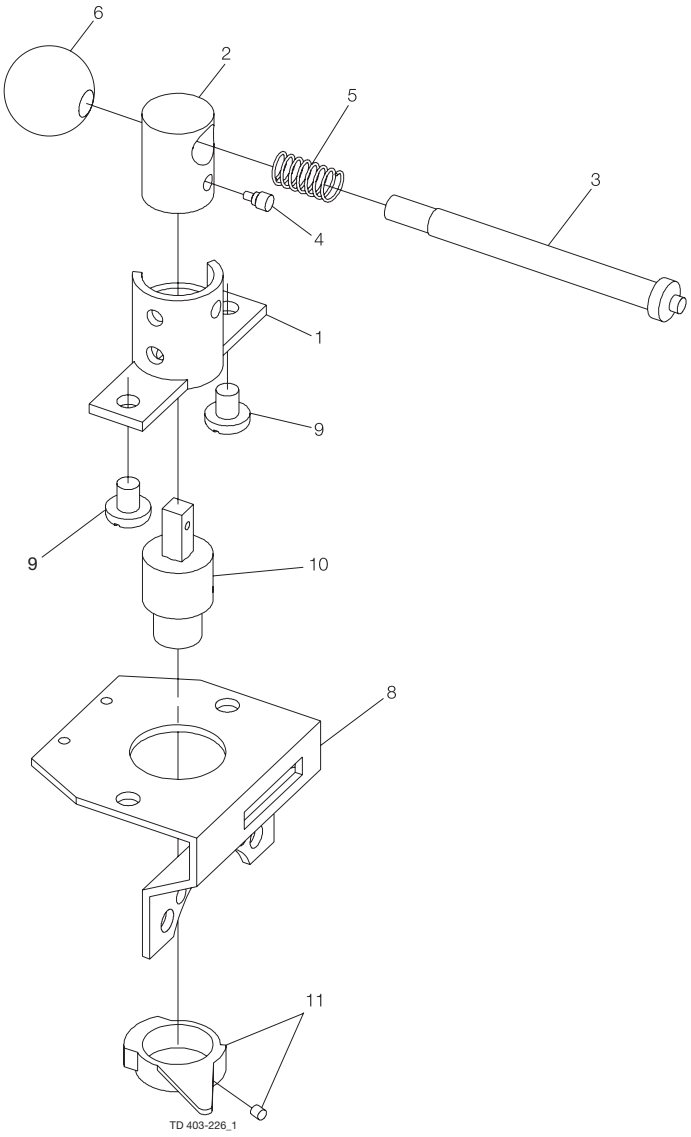
9.6 LKB handle 1.1 for Butterfly Valve



Pos.	Qty.	Denomination
1	1	Location cap with 2 pos.
2	1	Transfer block
3	1	Handle
4	1	Screw with pin
5	1	Spring

Pos.	Qty.	Denomination
6	1	Ball
8	1	Bracket
9	2	Screw
10	1	Coupling
11	1	Activating ring with screw

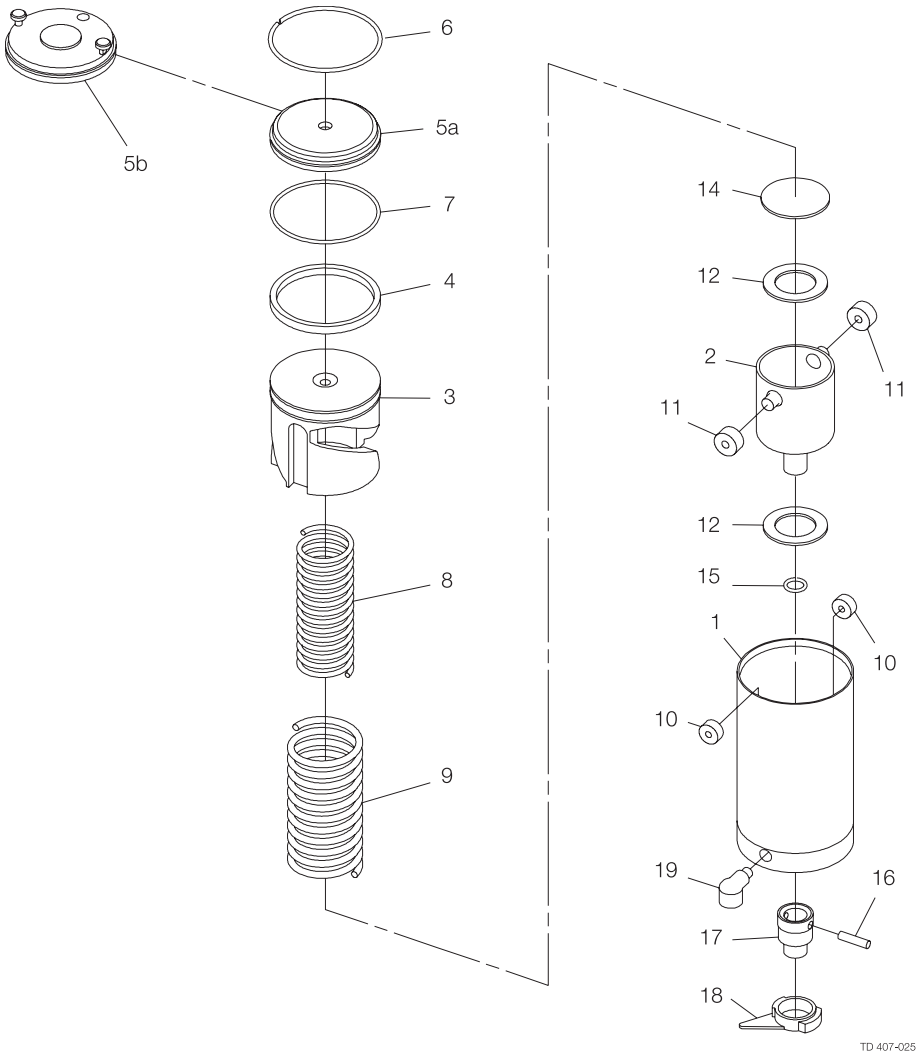
9.7 Handle 1.1 for indication unit



Pos.	Qty.	Denomination
1	1	Location cap with 2 pos.
2	1	Transfer block
3	1	Handle
4	1	Screw with pin
5	1	Spring

Pos.	Qty.	Denomination
6	1	Ball
8	1	Bracket
9	2	Screw
10	1	Coupling
11	1	Activating ring with screw

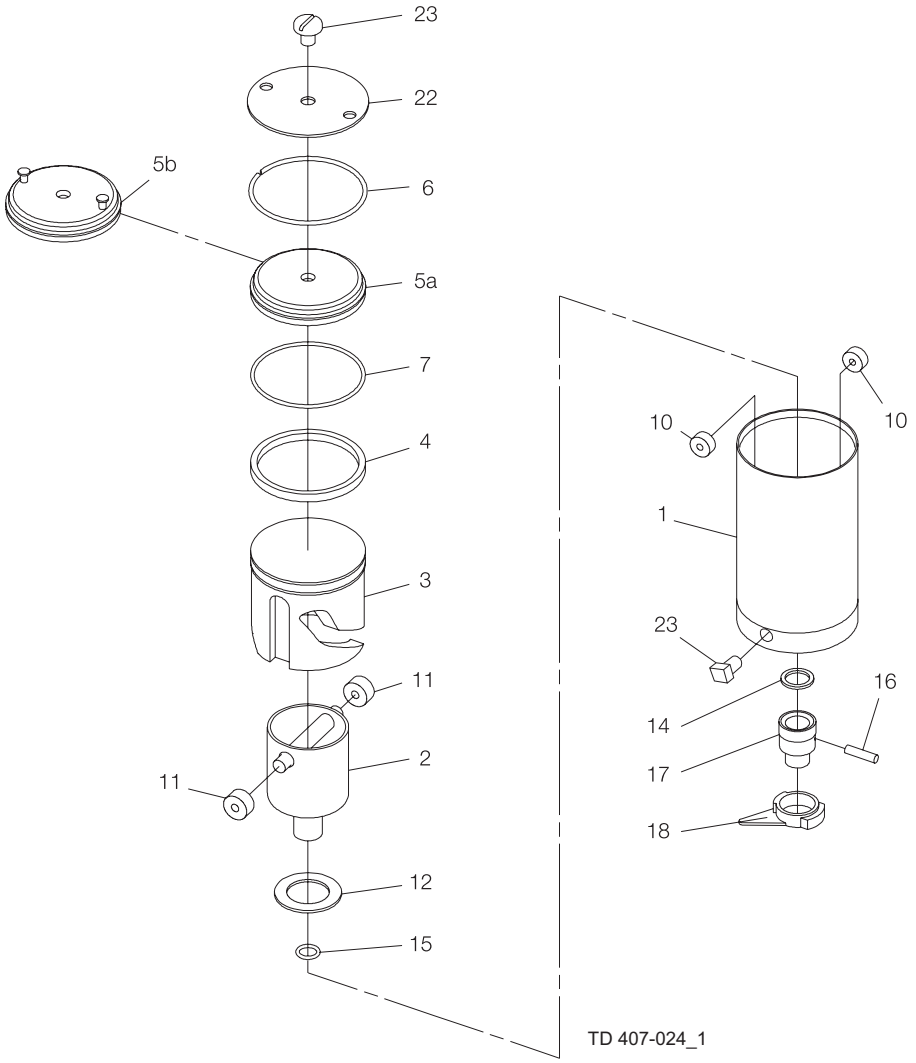
9.8 LKLA actuator air/spring (NC-NO) Ø85



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5a	1	End cap
5b	1	End cap, Mark III
6	1	Retaining ring
7	1	O-ring
8	1	Inner spring
9	1	Outer spring

Pos.	Qty.	Denomination
10	2	Needle bearing
11	2	Needle bearing
12	2	Thrust bearing
14	1	Thrust plate
15	1	O-ring
16	1	Connex pin
17	1	Coupling
18	1	Activating ring, Noryl with screw
19	1	Water rejector (period 8310-)

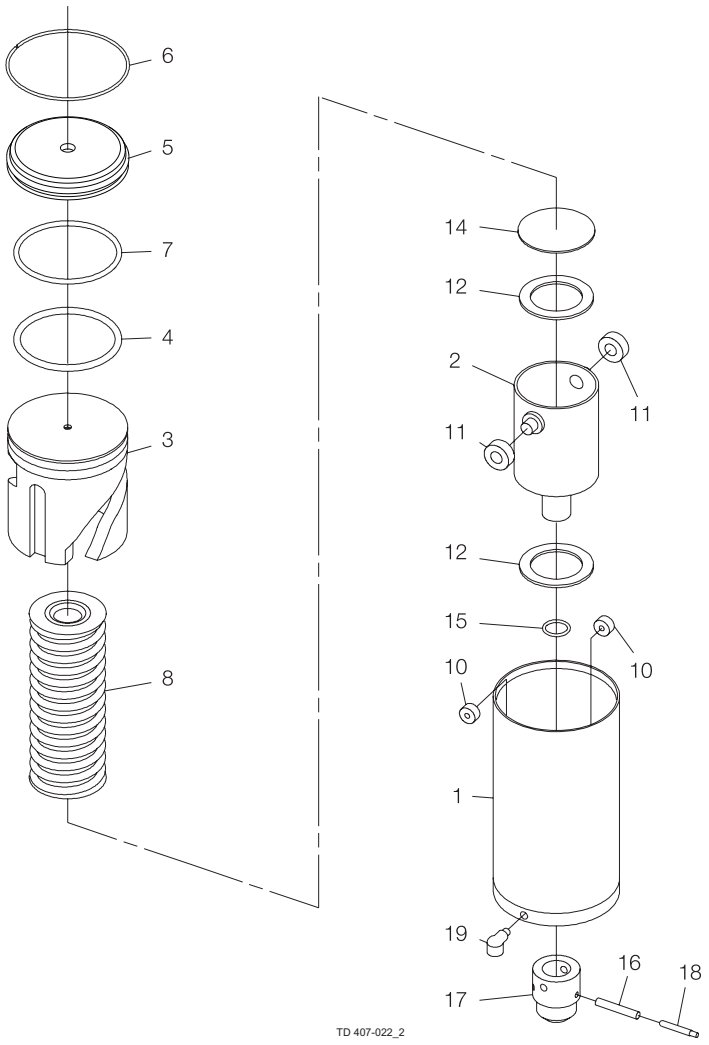
9.9 LKLA actuator air/air Ø85



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5a	1	End cap
5b	1	End cap, Mark III
6	1	Retaining ring
7	1	O-ring
10	2	Needle bearing

Pos.	Qty.	Denomination
11	2	Needle bearing
12	1	Thrust bearing
14	1	Thrust plate
15	1	O-ring
16	1	Connex pin
17	1	Coupling
18	1	Activating ring with screw
22	1	Retaining plate
23	2	Threaded plug

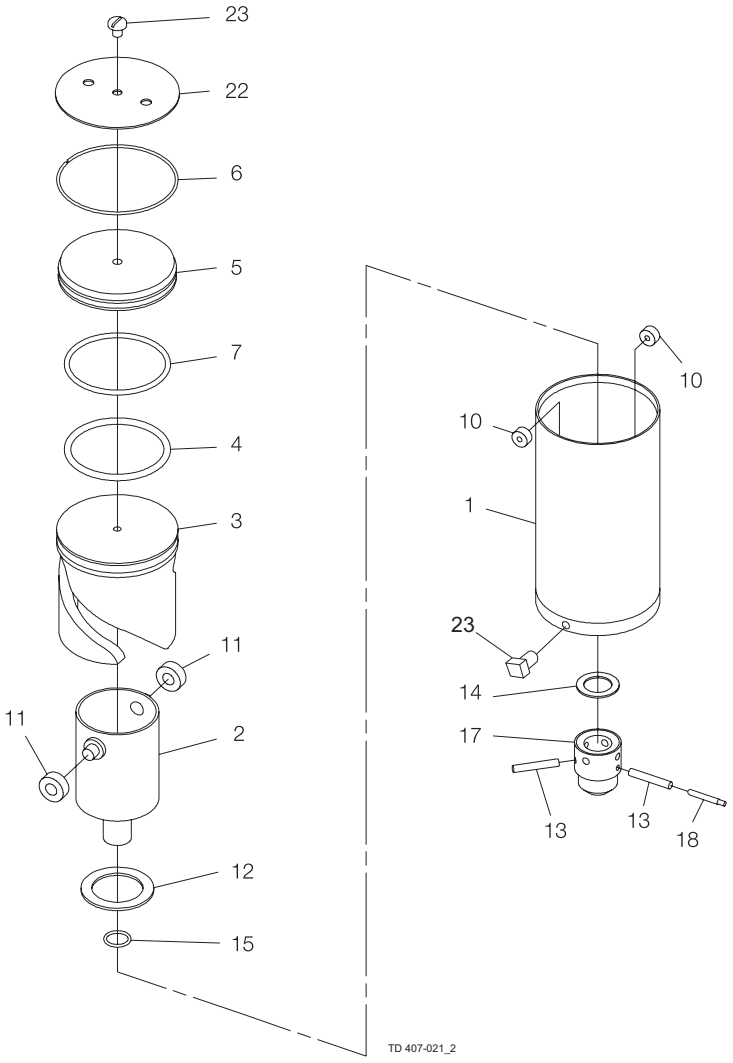
9.10 LKLA actuator air/spring (NC-NO) Ø133



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
8	1	Spring assembly
10	2	Needle bearing

Pos.	Qty.	Denomination
11	2	Needle bearing
12	2	Thrust bearing
14	1	Thrust plate
15	1	O-ring
16	1	Connex pin
17	1	Coupling
18	1	Indication pin
19	1	Water rejector
21	1	Air fitting

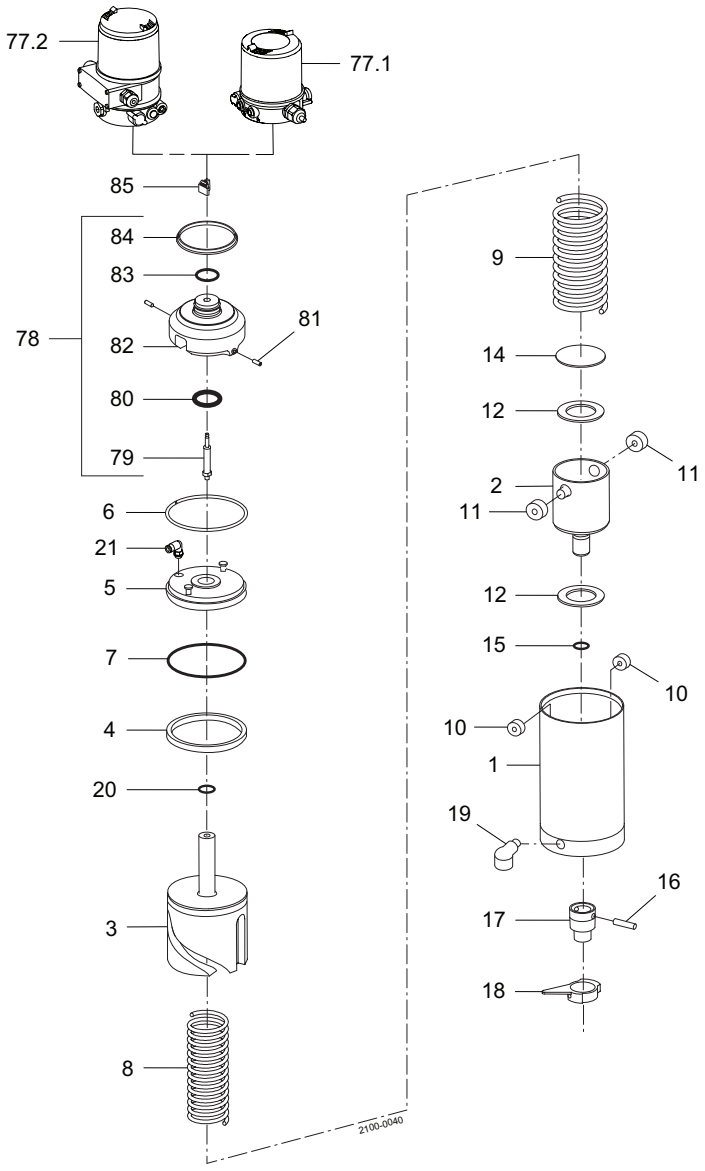
9.11 LKLA actuator air/air Ø133



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
10	2	Needle bearing
11	2	Needle bearing

Pos.	Qty.	Denomination
12	1	Thrust bearing
13	2	Connex pin
14	1	Thrust plate
15	1	O-ring
17	1	Coupling
18	1	Indication pin
22	1	Retaining plate
23	1	Threaded plug

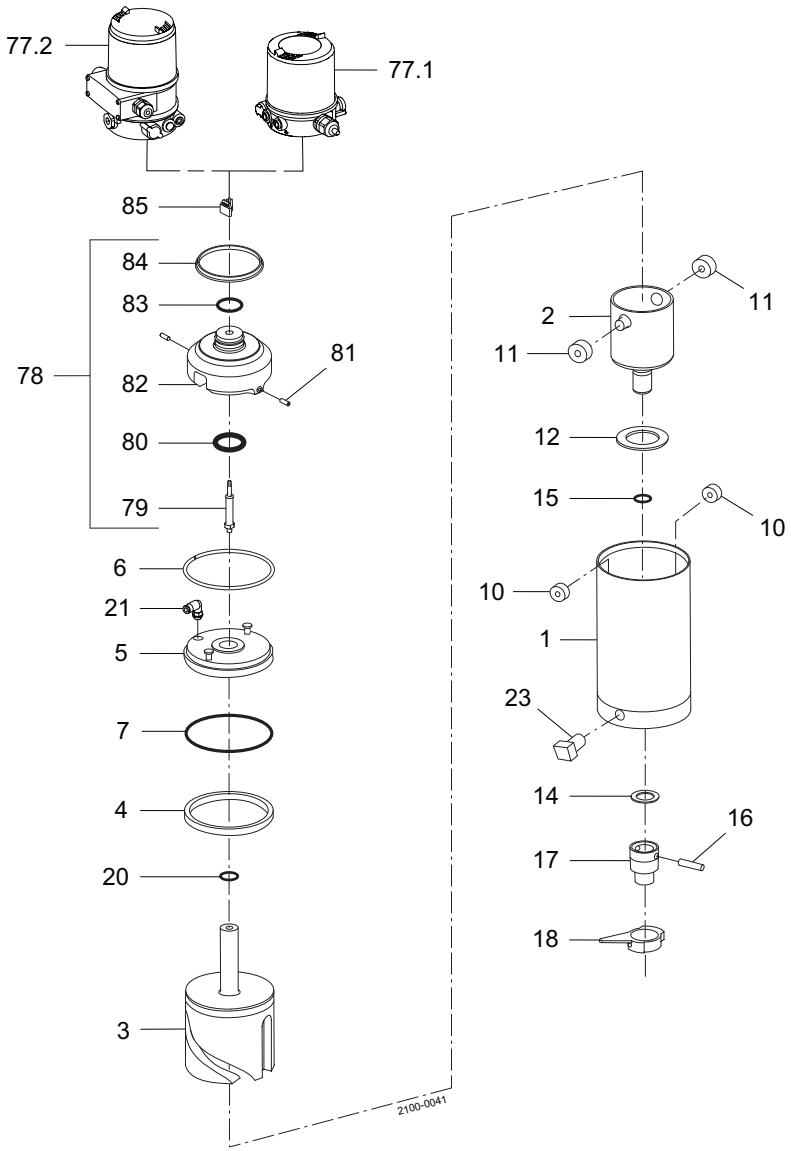
9.12 LKLA-T actuator air/spring (NC-NO) Ø85



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
8	1	Inner spring
9	1	Outer spring
10	2	Needle bearing

Pos.	Qty.	Denomination
11	2	Needle bearing
12	2	Thrust bearing
14	1	Thrust plate
15	1	O-ring
16	1	Connex pin
17	1	Coupling
18	1	Activating ring with screw
19	1	Water rejector (period 8310-)
20	1	O-ring
21	1	Air fitting

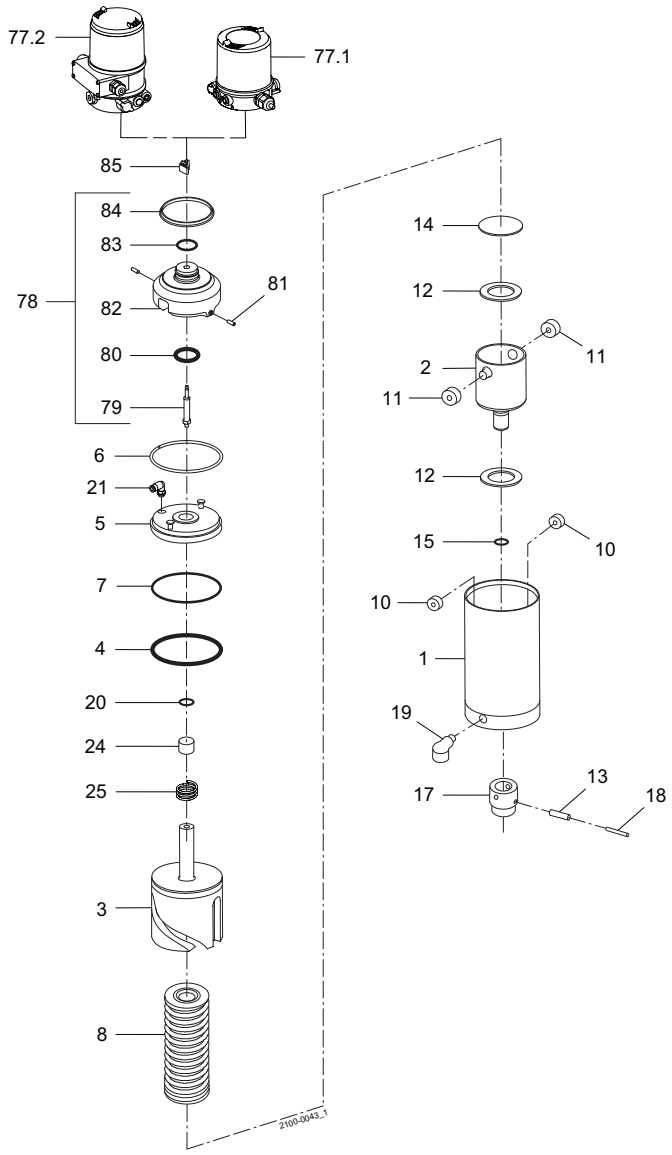
9.13 LKLA-T actuator air/air Ø85



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
10	2	Needle bearing
11	2	Needle bearing

Pos.	Qty.	Denomination
12	1	Thrust bearing
14	1	Thrust plate
15	1	O-ring
16	1	Connex pin
17	1	Coupling
18	1	Activating ring with screw
20	1	O-ring
21	1	Air fitting
23	1	Threaded plug

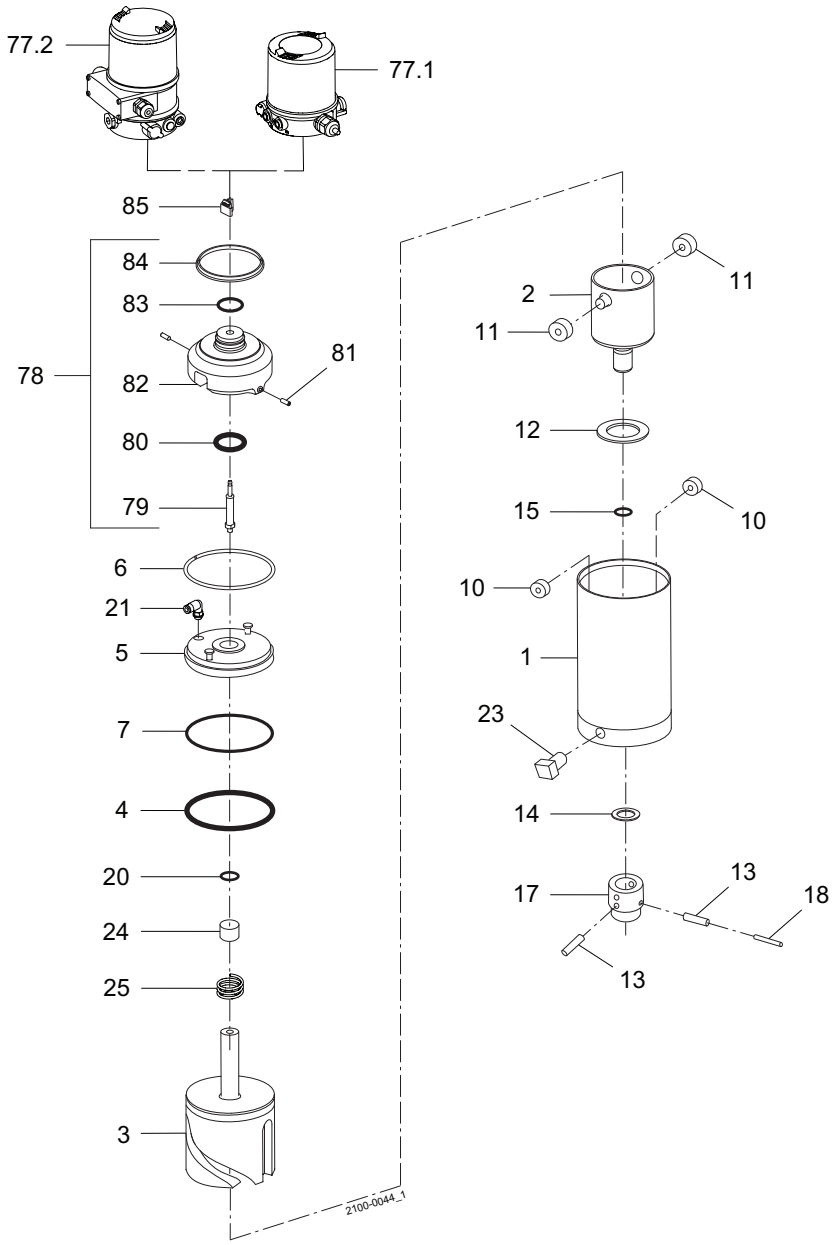
9.14 LKLA-T actuator air/spring (NC-NO) Ø133



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
8	1	Spring assembly
10	2	Needle bearing
11	2	Needle bearing
12	2	Thrust bearing

Pos.	Qty.	Denomination
13	1	Connex pin
14	1	Thrust plate
15	1	O-ring
17	1	Coupling
18	1	Indication pin
19	1	Water rejector (period 8310-)
20	1	O-ring
21	1	Air fitting
24	1	Guiding ring
25	1	Spring

9.15 LKLA-T actuator air/air Ø133



Pos.	Qty.	Denomination
1	1	Air cylinder
2	1	Rotating cylinder
3	1	Piston
4	1	O-ring
5	1	End cap
6	1	Retaining ring
7	1	O-ring
10	2	Needle bearing
11	2	Needle bearing
12	1	Thrust bearing

Pos.	Qty.	Denomination
13	2	Connex pin
14	1	Thrust plate
15	1	O-ring
17	1	Coupling
18	1	Indication pin
20	1	O-ring
21	1	Air fitting
23	1	Threaded plug
24	1	Guiding ring
25	1	Spring