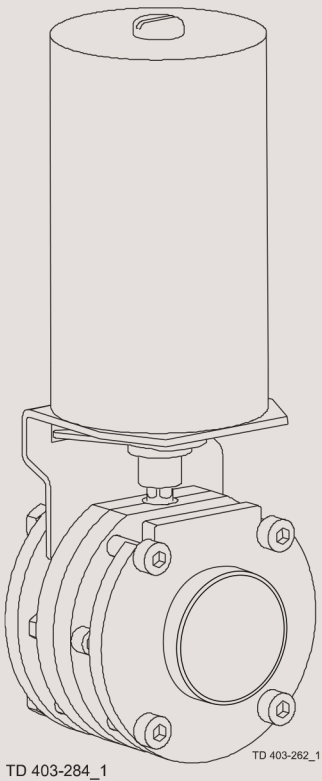
LKB, LKB-2, LKB-F, LKB-LP Automatic Butterfly Valve



TD 403-284_1

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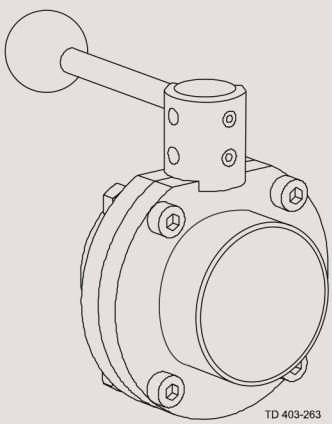

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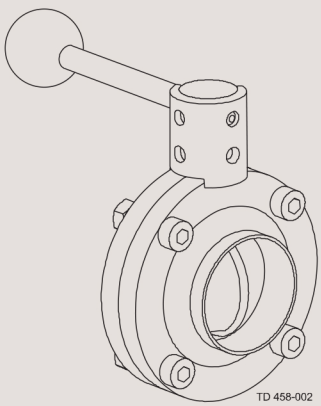


TD 458-002

Table of contents

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

Table of contents

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

1 CE Declaration of Incorporation for Machinery

Revision of Declaration of Conformity 2013-12-03

The Designated Company

Alfa Laval Kolding A/S
Company Name

Albuen 31, DK-6000 Kolding, Denmark
Address

+45 79 32 22 00
Phone No.

hereby declare that

Valve actuator
Designation

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

is in conformity with the following directive with amendments:

- Machinery Directive 2006/42/EC

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

Global Product Quality Manager Pumps, Valves, Fittings and Tank Equipment		Lars Kruse Andersen
Title		Name
Kolding	2016-06-01	
Place	Date	Signature

2 Safety

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

2.1 Important information

Always read the manual before using the valve!

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

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

NOTE
Indicates important information to simplify or clarify procedures.

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

The user shall always read the safety section first. Hereafter the user can skip to the relevant section for the task to be carried out or for the information needed.

This is the complete manual for the supplied product.

Operators
The operators shall read and understand the instruction manual for the supplied product.

Maintenance personnel
The maintenance personnel shall read and understand the 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 product.

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.

2.2 Warning signs

General warning:

Caustic agents:

All warnings in the manual are summarised on this page.
"Mushrooms" = Fastening connections on the end cap.
Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

Installation

Always read the technical data thoroughly (See chapter 6 Technical data).
Always release compressed air after use.
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.

Operation

Always read the technical data thoroughly (See chapter 6 Technical data).
Never touch the valve or the pipelines when processing hot liquids or when sterilising.
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.

Always handle lye and acid with great care.

Maintenance

Always observe the technical data thoroughly (See chapter 6 Technical data)
Always release compressed air after use.
Never service the valve when it is hot.
The valve/actuator and the pipelines must **never** be pressurised when servicing the valve/actuator.

Never stick your fingers through the valve ports if the actuator is supplied with compressed air.
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.
The actuator springs are **not** caged (ø85 mm, NC/NO).

Never use compressed air for removing the end caps of the actuator.
Always fit the end cap with the "mushrooms" turned outwards and position it correctly before supplying compressed air to the actuator.
Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on the use of Alfa Laval genuine spare parts.

Transportation

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

STORAGE
Ideally, as a guide Alfa Laval recommend:

- Store supplied product as supplied in original packaging
- Port opening 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 to 40°C
- Relative humidity less than 60%
- No exposure to corrosive substances (also air contained).

3 Installation

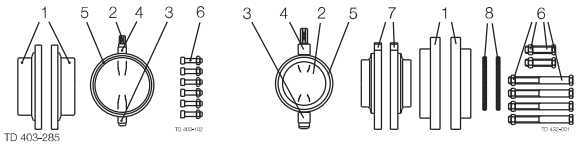
The instruction manual is part of the delivery. Read the instructions carefully.
The items refer to parts list and service kits sections.
The valve is supplied as separate parts as standard (for welding)
The valve is assembled before delivery, if it is supplied with fittings (LKB/LKB-2)

3.1 Unpacking/delivery

Step 1
CAUTION
Alfa Laval cannot be held responsible for incorrect unpacking.
Check the delivery:
1. Complete valve (see Step 2).
2. Complete actuator, if supplied (see Step 3).
3. Bracket for actuator, if supplied (see Step 3).
4. Complete handle, if supplied.
5. Delivery note.
6. Instruction manual.

Step 2
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).

Separate parts for welding

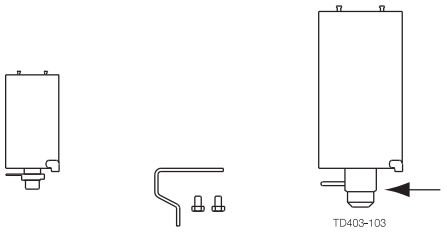


LKB/LKB-2 LKB-F (only for welding)

Step 3
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. Mount the water rejector in the actuator

LKLA ø85mm | Bracket with screws | LKLA ø133mm

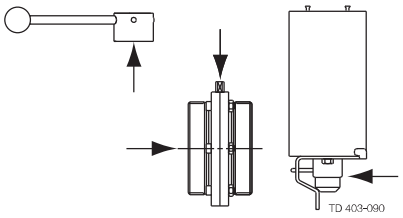
Water rejector



Coupling

Step 4
1. Clean the valve/valve parts for possible packing materials.
2. Clean the handle or the actuator, if supplied.

Handle Valve Actuator

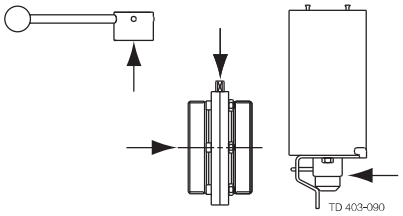


Remove packing materials!

Step 5
Inspection!
1. Inspect the valve/valve parts for visible transport damage.
2. Inspect the handle or the actuator, if supplied.

Caution!
Avoid damaging the valve/valve parts.
Avoid damaging the handle or the actuator, if supplied.

Handle Valve Actuator



Read the instructions carefully. The valve has welding ends as standard but can also be supplied with fittings (not LKB-F).
NC = Normally closed.
NO = Normally open.
A/A = Air/air activated.

3.2 General installation

Step 1

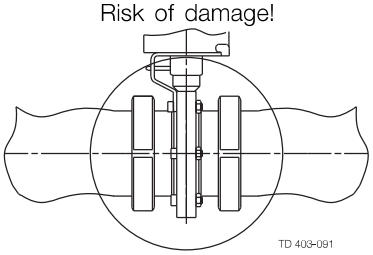
Always read the technical data thoroughly.
See chapter 6 Technical data

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.

CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

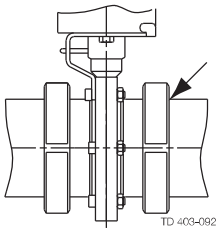
Step 2
Avoid stressing the valve.
Pay special attention to:
- Vibrations
- Thermal expansion of the tubes
- Excessive welding
- Overloading of the pipelines

Risk of damage!



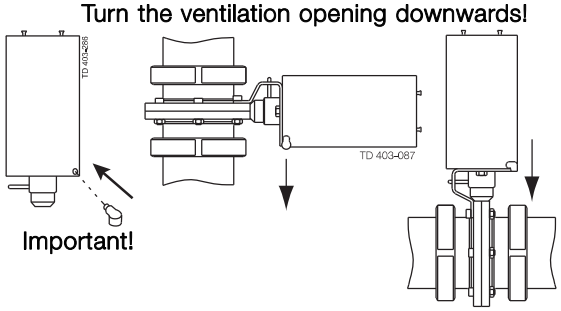
Step 3
Fittings:
Ensure that the connections are tight.

Remember seal rings!



Step 4
Position of actuator:
Position the water rejector on the actuator correctly.
(The actuator can be installed in any position).

Turn the ventilation opening downwards!

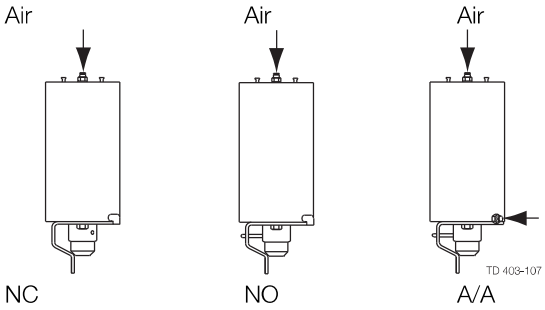


3 Installation

Read the instructions carefully. The valve has welding ends as standard but can also be supplied with fittings (not LKB-F).
NC = Normally closed.
NO = Normally open.
A/A = Air/air activated.

Air connection of actuator:
Connect compressed air correctly.
Pay special attention to the warnings!

R⅛" (BSP)



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!

Note:
Removal of transportation bracket on A/A actuators, pos. 22 + 23 (Section 7.11)

Read the instructions carefully. The valve is supplied as separate parts to facilitate welding.
LKB: for ISO tubes.
LKB-2: for DIN tubes.
LKB-F: with flange connection.

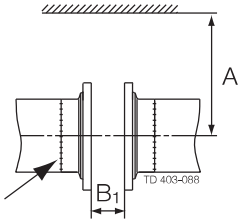
3.3 Welding

Step 1
LKB/LKB-2
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 according to steps 1-5, chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP

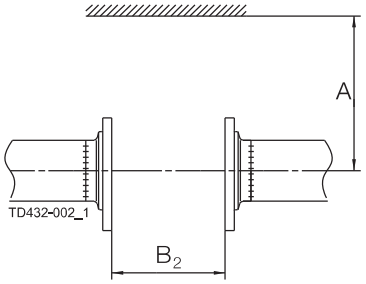
LKB-F
1. Weld the flanges into the pipelines.
2. Maintain the minimum clearances (A and B2) so that the actuator and the valve parts can be removed.
3. After welding, assemble the valve according to steps 1-5, chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP

Pre-use check - LKB/LKB-2/LKB-F
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



LKB-F



Caution!

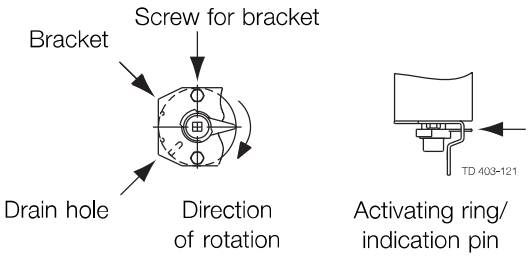
Size	A (mm)				B_1 (mm)	B_2 (mm)
	Ø85		Ø133			
	LKLA	LKLA-T	LKLA	LKLA-T		
1”	245	+ 172 (incl. top unit)		+ 172 (incl. top unit)	20	43
1½”	245				20	43
2”	255				20	47
2½”	265				24	46
3”	265				24	59
4”	290		420		37	59
DN25	245				20	43
DN32	245				20	43
DN40	250				20	43
DN50	260				20	47
DN65	270				24	59
DN80	275				27	59
DN100	290		420		27	59
DN125	315		440		30	63
DN250	325		445		41	79

3 Installation

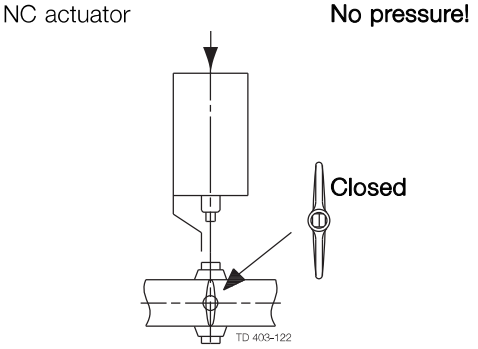
Read the instructions carefully and pay special attention to the warnings!
NC = Normally closed.
NO = Normally open.
A/A = Air/air activated.

3.4 Fitting actuator/bracket/handle on the valve (optional extras)

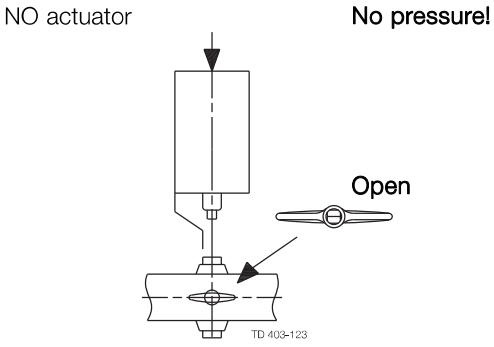
Step 1
Bracket/indication:
1. Fit the bracket as shown.
2. Fit and tighten the screws.
3. Fit the activating ring/indication pin as shown.



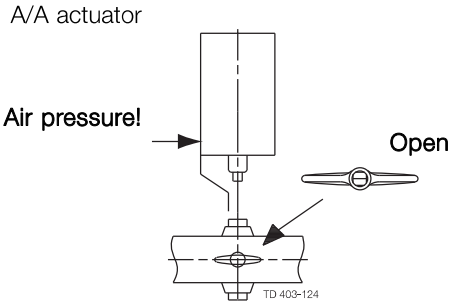
Step 2
Actuator/bracket - NC:
1. Ensure that the valve is closed by checking the position of the groove of the disc stem top.
2. Fit the actuator/bracket in accordance with chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP, Step 4.



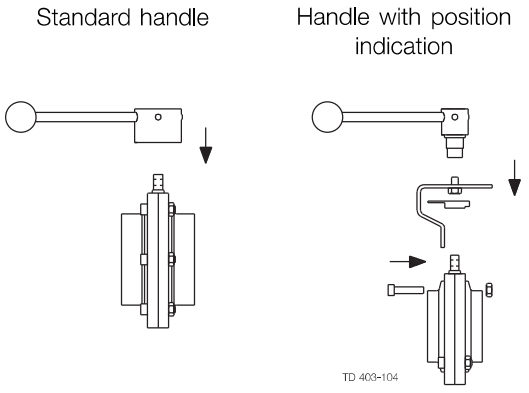
Step 3
Actuator/bracket - NO:
1. Ensure that the valve is open by checking the position of the groove of the disc stem top.
2. Fit the actuator/bracket in accordance with chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP, Step 4.



Step 4
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 chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP, Step 4.



Step 5
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 chapter 5.3 Assembly of valve - LKB/LKB-2/LKB-LP, Step 3 + Step 4.



Pre-use check:
Open and close the valve several times to ensure that it operates smoothly.
Pay special attention to the warnings!

3.5 Recycling information

• Unpacking

- Packing material consists 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 and wear parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non-metal wear parts must be disposed of in accordance with local regulations

• Scrapping

- At end of use, the equipment must be recycled according to the relevant local regulations. Beside 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

4 Operation

Read 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.

4.1 Operation

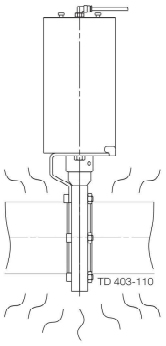
Step 1

Always read the technical data thoroughly.
See chapter 6 Technical data

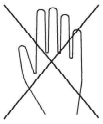
CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

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

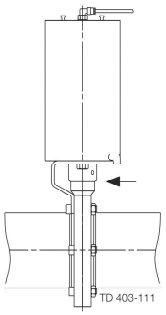


Danger of burns!



Step 3

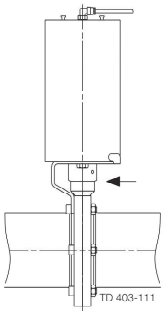
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.



Air

Rotating parts

Step 4
Operation by means of actuator:
Automatic on/off operation by means of compressed air.



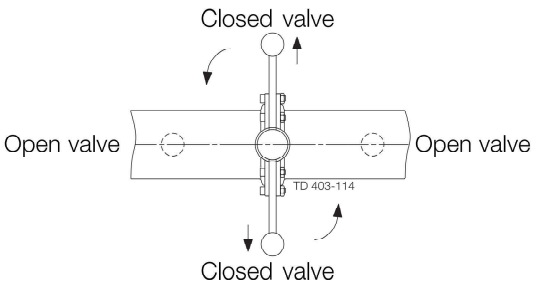
Air

Rotating parts

Step 5
Operation by means of standard handle:

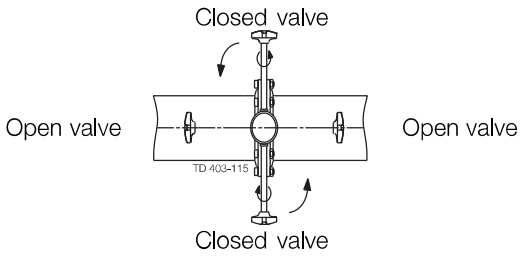
1. Manual on/off operation.
2. Pull the handle outwards while rotating it.

NOTE!
This also applies for the Lockable Multiposition Handle.



Pay attention to possible breakdown.
Read the instructions carefully.
LKB-F: With flange connection.
NC = Normally closed. NO = Normally open. A/A = Air/air activated.

Step 6
Operation by means of regulating handle:
1. Manual flow regulation because of infinite locking positions.
2. Loosen the handle, rotate it and tighten again.



4.2 Troubleshooting

Step 1
NOTE!
Read the maintenance instructions carefully before replacing worn parts. - See chapter 5.1 General maintenance

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 operating conditions
- Difficult to open/close - Damage to 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 chapter 3.4 Fitting actuator/bracket/handle on the valve (optional extras)) - Change from NC to NO or vice versa - Replace the bearings - Service the actuator

4 Operation

The valve is designed for Cleaning In Place (= CIP).
Read the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda.
HNO_3 = Nitric acid.

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

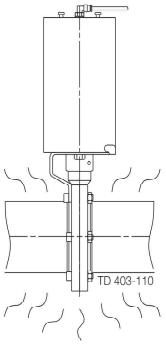
Caustic danger!

Always use rubber gloves!

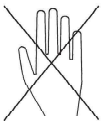
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilising.



Danger of burns!



Step 3

Examples of cleaning agents:

Use clean water, free from chlorides.

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

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

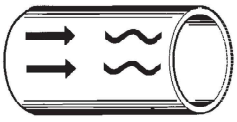
2. 0.5% by weight HNO_3 at 70° C (158° F)

0.7 l (0.2 gal) 53% HNO_3	+	100 l (26.4 gal) water	= Cleaning agent.

Step 4

1. Avoid excessive concentration of the cleaning agent.
   ⇒ Dose gradually
2. Adjust the cleaning flow to the process.
   ⇒ Sterilisation of milk/viscous liquids
   ⇒ Increase the cleaning flow
3. **Always** rinse well with clean water after the cleaning.

Always rinse!



Clean water Cleaning agents

Step 5

NOTE

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

Maintain the valve and the regulator carefully. Read the instructions carefully and pay special attention to the warnings!
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.

5.1 General maintenance

Step 1

Always read the technical data thoroughly.
See section 6 Technical data

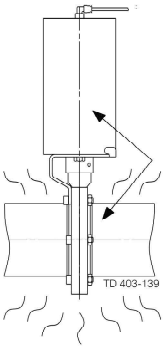
Always release compressed air after use.

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

Step 2

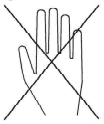
Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.



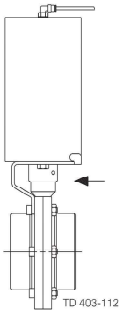
Atmospheric pressure required!

Danger of burns!



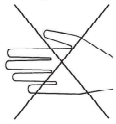
Step 3

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



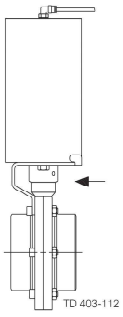
Air

Cutting danger!



Step 4

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

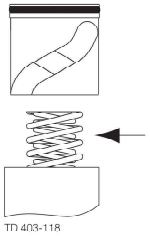


Air

Rotating parts

Step 5

Actuator size ø85 mm (NC/NO):
The actuator springs are **not** caged.



Springs
Caution!

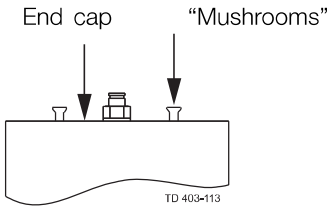
5 Maintenance

Maintain the valve and the regulator carefully. Read the instructions carefully and pay special attention to the warnings! 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.

Step 6

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.

Caution!



Recommended spare parts: Service kits (see chapter 7 Parts list and service kits).
Order service kits from the service kits list (see chapter 7 Parts list and service kits)

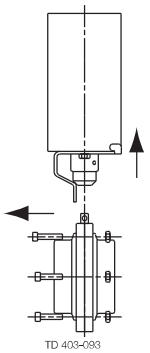
Ordering spare parts
Contact the Sales Department.

	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 inspection planning **Replace after leakage**	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 after air leakage**	Replace when they become worn
Lubrication	**Before fitting** (use USDA-H1 approved) - Unisilcon L641(*) - Paraliq(*) GTE 703 - 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 2 Plus (Δ) - Molycote 1132 (Δ) (for aggressive environment)

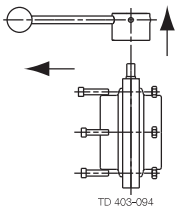
Read the instructions carefully. The items refer to the parts list and service kits section.
Handle scrap correctly.
LKB: for ISO tubes.
LKB-2: for DIN tubes.

5.2 Dismantling of valve - LKB/LKB-2/LKB-LP

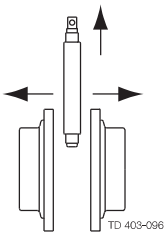
Step 1
Valve with actuator:
1. Remove screws and nuts (6).
2. Remove the bracket with the actuator.



Step 2
Valve with handle:
1. Remove the complete handle.
2. Remove screws and nuts (6).

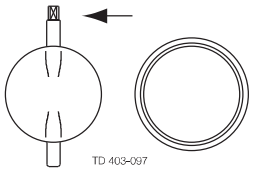


Step 3
Remove seal ring (5) together with valve disc (2).



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

Step 5
Remove valve disc (2) from seal ring (5).
NOTE!
For valve sizes 25-38 mm and DN25-40, it is recommended to remove the valve disc by using a special service tool (item no. 9611981090).



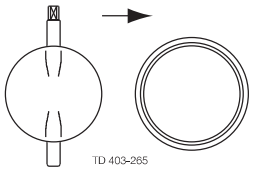
5 Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.
LKB: for ISO tubes. LKB-2: for DIN tubes.
Lubricate the seal ring before fitting it.
Lubricate the disc stem before fitting the bushes.

5.3 Assembly of valve - LKB/LKB-2/LKB-LP

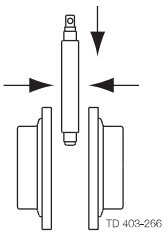
Step 1
1. Lubricate the pin holes in seal ring (5), (important for Silicone and Viton).
2. Fit valve disc (2) in the seal ring (5).

NOTE!
For the valve sizes 25-38 mm and DN25-40, it is recommended to fit the valve disc by using a special service tool (item no. 9611981090).



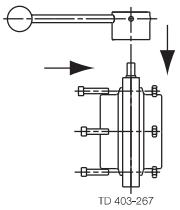
Step 2
1. Fit bushes (3,4) on the disc stem.
2. Fit seal ring (5) together with valve disc (2) between the two valve body halves (1).

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

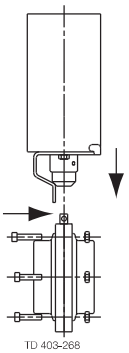


Step 3
Valve with handle:
1. Fit screws and nuts (6) and torque tighten in accordance with the requirements (see Step 5).
2. Fit the complete handle on the disc connection and tighten the screw on the handle.

NOTE!
This also applies for the Lockable Multiposition Handle.
To avoid seizing the bolts have to be lubricated with Molykote TP-42 Paste or similar Anti-seize lubricant.



Step 4
Valve with actuator:
1. Fit the actuator with the bracket so that the disc connection enters the coupling (see Chapter 3.4 Fitting actuator/bracket/handle on the valve (optional extras)).
2. Fit screws and nuts (6) and torque tighten in accordance with the requirements so that the bracket is fixed to the valve (see Step 5).



Fit correctly!
See chapter 3.4 Fitting actuator/bracket/handle on the valve (optional extras)

Read the instructions carefully. The items refer to the parts list and service kits section.
LKB: for ISO tubes. LKB-2: for DIN tubes.
Lubricate the seal ring before fitting it.
Lubricate the disc stem before fitting the bushes.

Step 5
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:

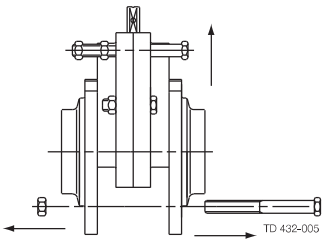
Valve size	25 mm DN 25	DN32	38 mm DN40	51 mm DN50	63.5 mm DN65	76 mm DN80	101.6 mm DN100	DN 125	DN150
Allen Key	5 mm (0.2”)	5 mm (0.2”)	5 mm (0.2”)	6 mm (0.24”)	6 mm (0.24”)	6 mm (0.24”)	8 mm (0.3”)	8 mm (0.3”)	8 mm (0.3”)
Recomm. Torque	18 Nm (13 lbf-ft)	18 Nm (13 lbf-ft)	18 Nm (13 lbf-ft)	20 Nm (15 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)

5 Maintenance

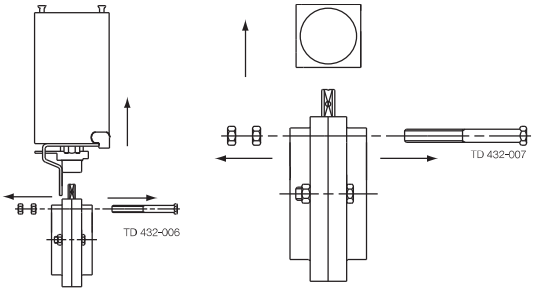
Read the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
LKB-F: with flange connection.

5.4 Dismantling of valve - LKB-F

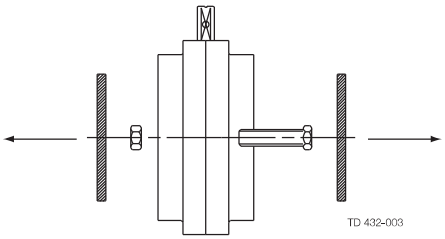
Step 1
1. Loosen the two upper screws and nuts (6).
2. Loosen and remove the two lower screws and nuts (6).
3. Remove the valve unit from flanges (7).



Step 2
1. Remove the two upper screws and nuts (6), (4 nuts).
2. If supplied, remove the actuator from the valve body unit.
3. If supplied, loosen the screw and remove the handle from the valve body unit.

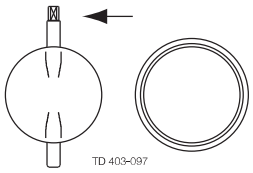


Step 3
1. Loosen and remove the two centre screws and nuts (6).
2. Remove seal ring (5) together with valve disc (2).
3. Remove flange seal rings (8).



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

Step 5
Remove valve disc (2) from seal ring (5).
NOTE!
For valve sizes 25-38 mm and DN25-40, it is recommended to remove the valve disc by using a special service tool (item no. 9611981090).

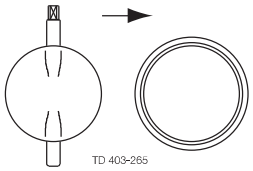


Read the instructions carefully. The items refer to the parts list and service kits section.
LKB-F: With flange connection.
Lubricate the seal rings before fitting them.
Lubricate the disc stem before fitting the bushes.

5.5 Assembly of valve - LKB-F

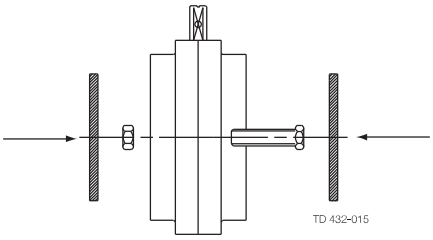
Step 1
1. Lubricate the pin holes in seal ring (5), (important for Silicone and Viton).
2. Fit valve disc (2) on seal ring (5).
3. Fit bushes (3,4) in the disc stem.

NOTE!
For valve size 25-38 mm and DN25-40, it is recommended to fit the valve disc by using a special service tool (item no. 9611981090).

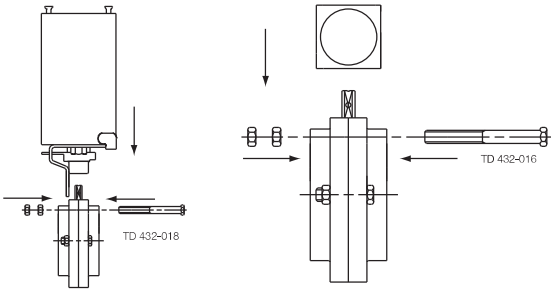


Step 2
1. Lubricate flange seal rings (8) with water and fit them.
2. Fit seal ring (5) together with valve disc (2) between the valve body halves (1).
3. Fit and tighten the two centre screws and nuts (6).

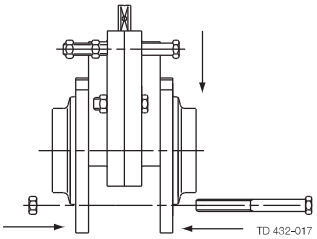
CAUTION!
Rotate the valve disc so that the valve is open before tightening screws and nuts (6).



Step 3
1. If supplied, fit the handle and tighten the screw.
2. If supplied, fit the actuator.
3. Fit the two upper screws and nuts (6), (4 nuts).



Step 4
1. Fit the valve unit between flanges (7).
2. Fit and tighten the two lower screws and nuts (6).
3. Tighten the two upper screws and nuts (6).



Step 5
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	25 mm DN 25	DN32	38 mm DN40	51 mm DN50	63.5 mm DN65	76 mm DN80	101.6 mm DN100	DN 125	DN150
Spanner flats	10 mm (0.4”)	10 mm (0.4”)	10 mm (0.4”)	13 mm (0.5”)	13 mm (0.5”)	13 mm (0.5”)	17 mm (0.67”)	17 mm (0.67”)	17 mm (0.67”)
Recomm. torque	18 Nm (13 lbf-ft)	18 Nm (13 lbf-ft)	18 Nm (13 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)

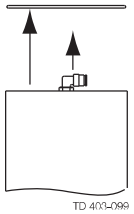
5 Maintenance

Read the instructions carefully. The items refer to the parts list and service kits section.
Handle scrap correctly.
NC = Normally closed. NO = Normally open. A/A = Air/air activated.

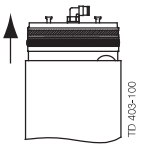
5.6 Dismantling of actuator

Step 1
1. Press end cap (5) into air cylinder (1).
2. Remove retaining ring (6).

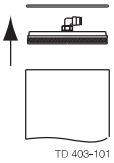
Use a press or special tool (item no. 9611416791).



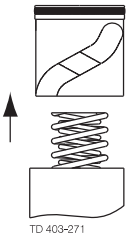
Step 2
NC/NO actuator:
Release the pressure on end cap (5) carefully and remove the end cap.
Pay special attention to the warning!



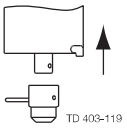
Step 3
A/A actuator:
Remove end cap (5) by hand.
Pay special attention to the warning!



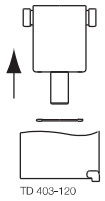
Step 4
Remove piston (3) and the springs.
NOTE!
- The actuator size ø133 mm has a caged spring assembly.
- The air/air actuator has no springs.



Step 5
Remove connex pin (16) and coupling (17) from rotating cylinder stem (2).



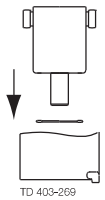
Step 6
Remove rotating cylinder (2) and the remaining internal parts from air cylinder (1).



Read 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.

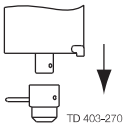
5.7 Assembly of actuator

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

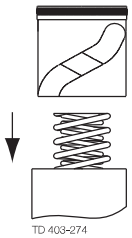


Step 2
Fit coupling (17) on rotating cylinder stem (2) and fit connex pin (16).

Fit the connex pin correctly!

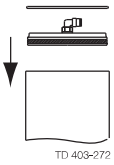


Step 3
Fit the springs in rotating cylinder (2) and fit piston (3) carefully.
CAUTION!
Fit the piston correctly in relation to the bearings.
NOTE!
The air/air actuator has no springs.



Fit correctly!

Step 4
A/A actuator:
1. Fit end cap (5) sufficiently into air cylinder (1) so that retaining ring (6) can be fitted in the air cylinder.
2. Position the end cap correctly by hand.
   Pay special attention to the warning!

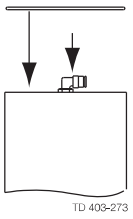


Step 5
1. Fit end cap (5) in air cylinder (1) and press down sufficiently so that retaining ring (6) can be fitted in the air cylinder.
2. Release the pressure on the end cap.
   Pay special attention to the warning!

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

Use a press!

NC/NO actuator



Step 6
Pre-use check:
1. Supply compressed air to the actuator.
2. Activate the actuator several times to ensure that it operates smoothly.
   Pay special attention to the warnings!

6 Technical data

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.
NC = Normally closed. NO = Normally open. A/A = Air/air activated.

6.1 Technical data

LKB is a sanitary automatically or manually operated butterfly valve for use in stainless steel pipe systems.

LKB is either remote-controlled by means of an actuator or manually operated by means of a handle.
The actuator is made in three standard versions, normally closed (NC), normally open (NO) and air/air activated (A/A).

The actuator is designed so that an axial movement of a piston is transformed into a 90° rotation of a shaft. The torque of the actuator is increased when the valve disc contacts the seal ring of the butterfly valve.

The handle for manual operation mechanically locks the valve in its open or closed position. The handles for the valve sizes DN125 and DN150, which are designed for locking in two intermediate positions, enable adjusting of the valve, so that the flow rate can be regulated.

Valve - data		
Max. product pressure		1000 kPa (10 bar) (145 psi)
Min. product pressure		Full vacuum
Temperature range		-10° C to +140° C* (EPDM)
		However max. 95° C when operating the valve
Product acc. to PED 97/23/EC		Fluids group 2
Valve - materials		
Product wetted steel parts		AISI 304 or AISI 316L
Other steel parts		AISI 304
Rubber grades		EPDM, Silicone (Q), Viton (FPM), HNBR, PFA
Bushes for valve disc		PVDF
Finish		Semi-bright
Inside surface finish		≤Ra 0.8 µm
Actuator - data		
Max. air pressure		600 kPa (6 bar) (87 psi)
Min. air pressure, NC or NO		400 kPa (4 bar) (58 psi)
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)
Actuator - materials		
Actuator body		AISI 304
Piston		Light alloy, bronze for ø85 mm A/A
Seals		Nitrile (NBR)
Housing for switches		Noryl (PPO)
Finish		Semi bright

6 Technical data

It is important to observe the technical data during installation, operation and maintenance.
Inform personnel about the technical data.
NC = Normally closed. NO = Normally open. A/A = Air/air activated.

Weight (kg)

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	DN 125	DN 150
Weight LKB-F with welding ends and handle	1.6	1.3	2.1	2.9	5.0	7.9	1.6	1.6	1.7	2.6	4.7	5.8	7.9	11.7	12.3
Weight LKB/LKB-2 with welding ends and handle	1.2	1.0	1.5	2.1	3.0	4.7	1.2	1.1	1.3	1.8	3.0	3.5	5.1	7.5	9.0
Weight LKB-F with welding ends and LKLA/LKLA-T ø85	4.3	4.0	4.8	5.6	7.6	19.5	4.3	4.3	4.4	5.3	7.3	8.4	19.5	23.3	23.9
Weight LKB/LKB-2 with welding ends and LKLA/LKLA-T ø133	3.9	3.7	4.2	4.8	5.6	16.3	3.8	3.8	4.0	4.5	5.6	6.1	16.7	19.1	20.6

Noise
One metre away from - and 1.6 metre above the exhaust, the noise level of a valve actuator will be approximately 77dB(A) without noise damper and approximately 72 dB(A) with noise damper - Measured at 7 bars air pressure.

Safety check
A visual inspection of any protective device (shield, guard, cover or other) on the supplied 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:

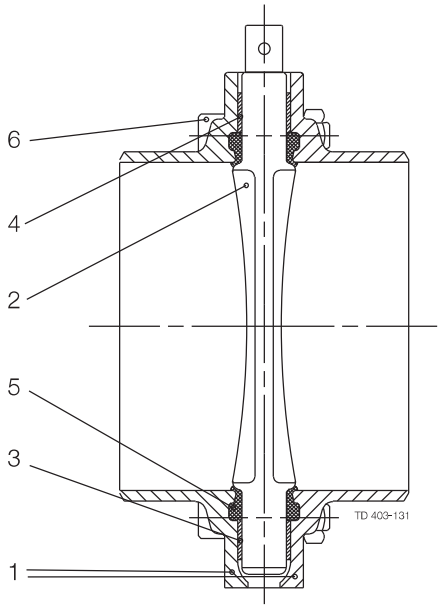
- Fix and/or replace the protective device.

7 Parts list and service kits

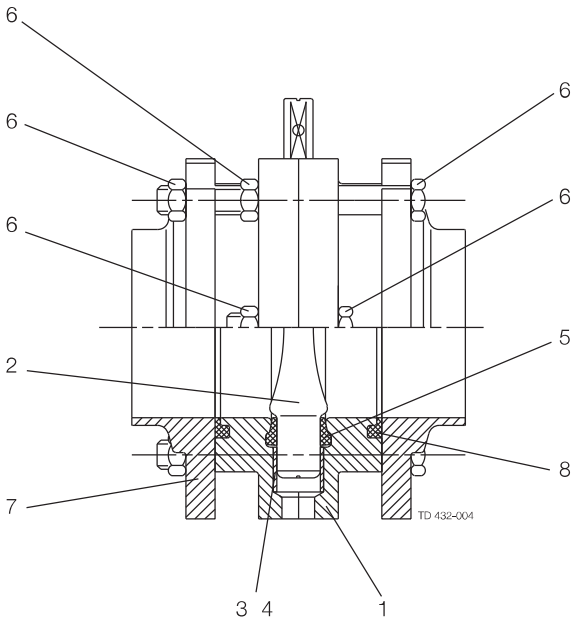
The drawings include all parts of the valves. For the parts list, please see chapters 7.5 LKB Butterfly valve, ISO, 7.6 LKB-F Butterfly valves, ISO, 7.7 LKB-F Butterfly valves, DIN, 7.8 LKB-2 Butterfly valves
Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on the use of Alfa Laval genuine spare parts.

7.1 LKB, LKB-2, LKB-F Butterfly valves, drawings

LKB/LKB-2

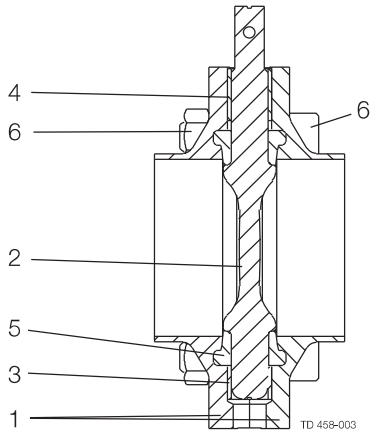


LKB-F



The drawings include all parts of the actuators.
For the parts list, please see chapter 7.9 LKB-LP Butterfly valve

7.2 LKB-LP Butterfly valve, drawing

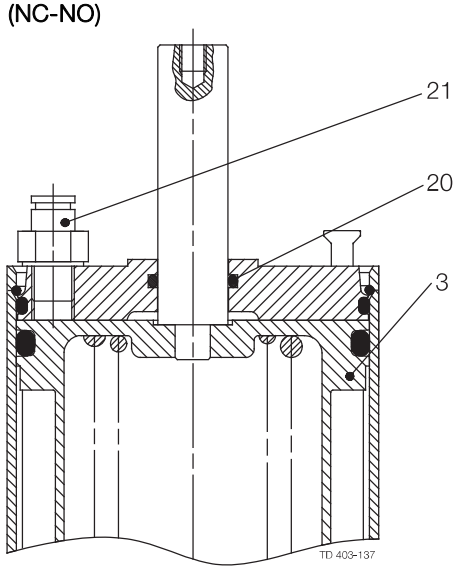


7 Parts list and service kits

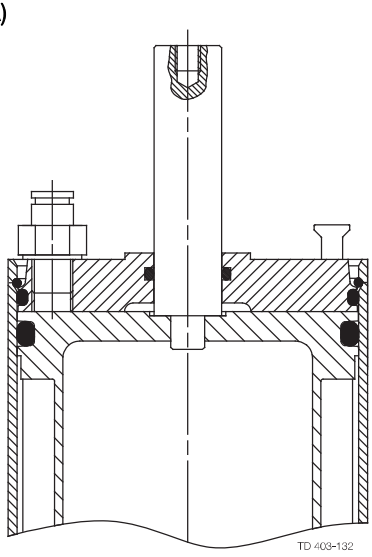
The drawings include all parts of the actuators.
For the parts list, please see chapters 7.10 LKLA ø85 mm (NO/NC) - 7.19 LKLA-T ø133 mm (A/A).

7.3 LKLA and LKLA-T actuators Ø85 mm, drawings

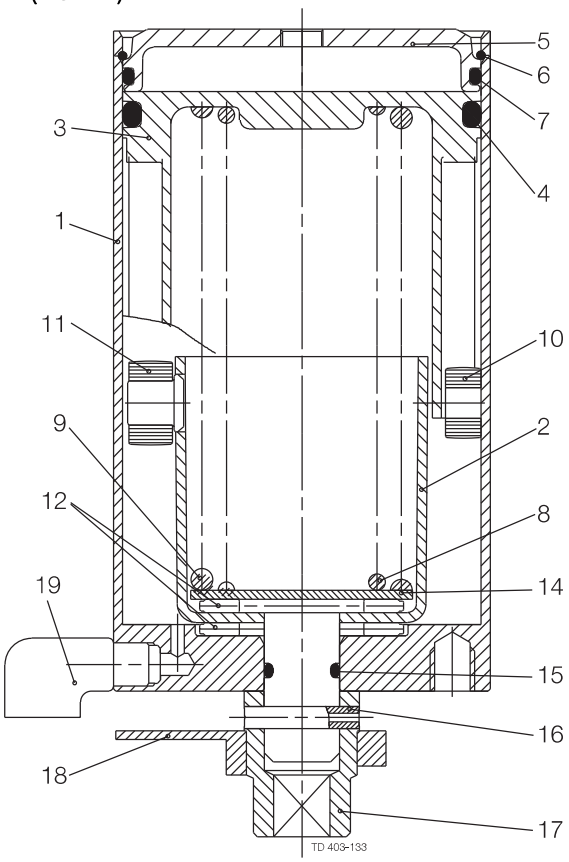
LKLA-T (NC-NO)



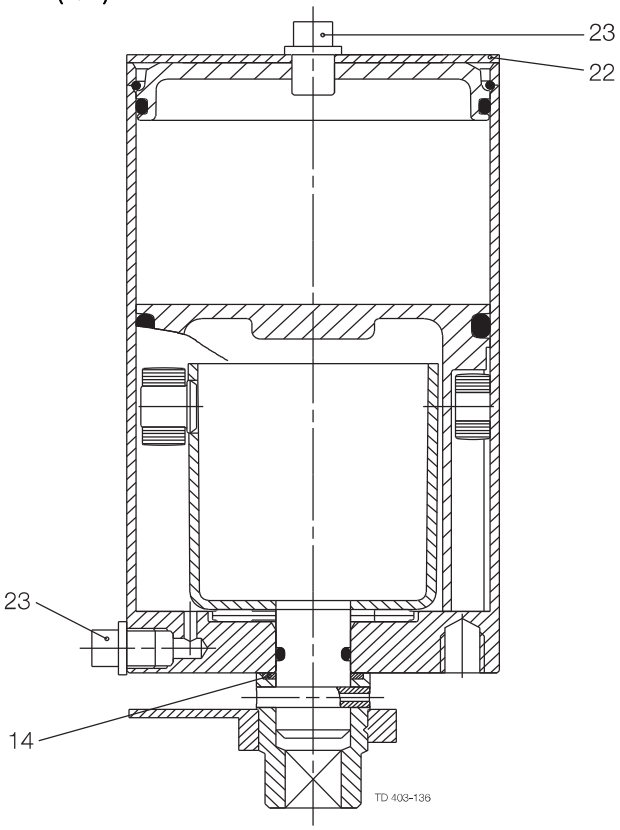
LKLA-T (A/A)



LKLA (NC-NO)

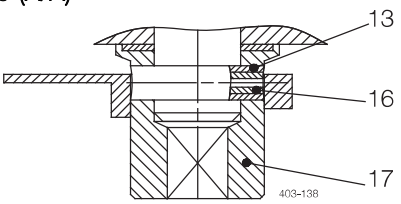


LKLA (A/A)



The drawings include all parts of the actuators.
For the parts list, please see chapters 7.10 LKLA ø85 mm (NO/NC) - 7.19 LKLA-T ø133 mm (A/A).

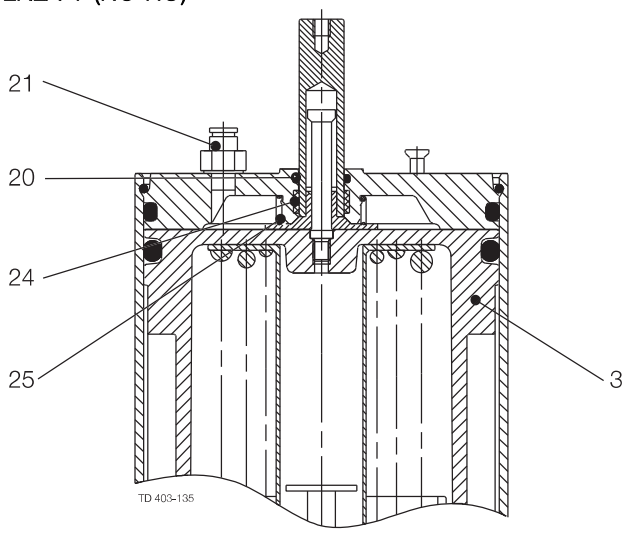
DN 125-150 (A/A)



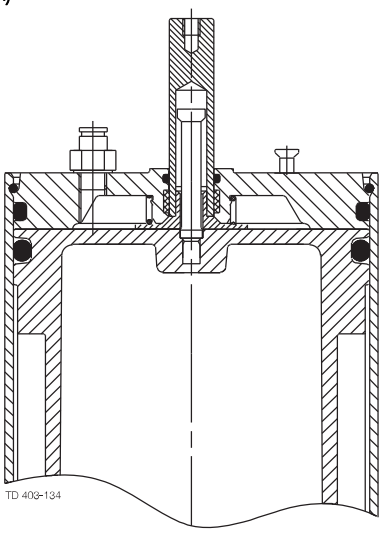
The drawings include all parts of the actuators.
For the parts list, please see chapters 7.10 LKLA ø85 mm (NO/NC) - 7.19 LKLA-T ø133 mm (A/A).

7.4 LKLA and LKLA-T actuators Ø133 mm, drawings

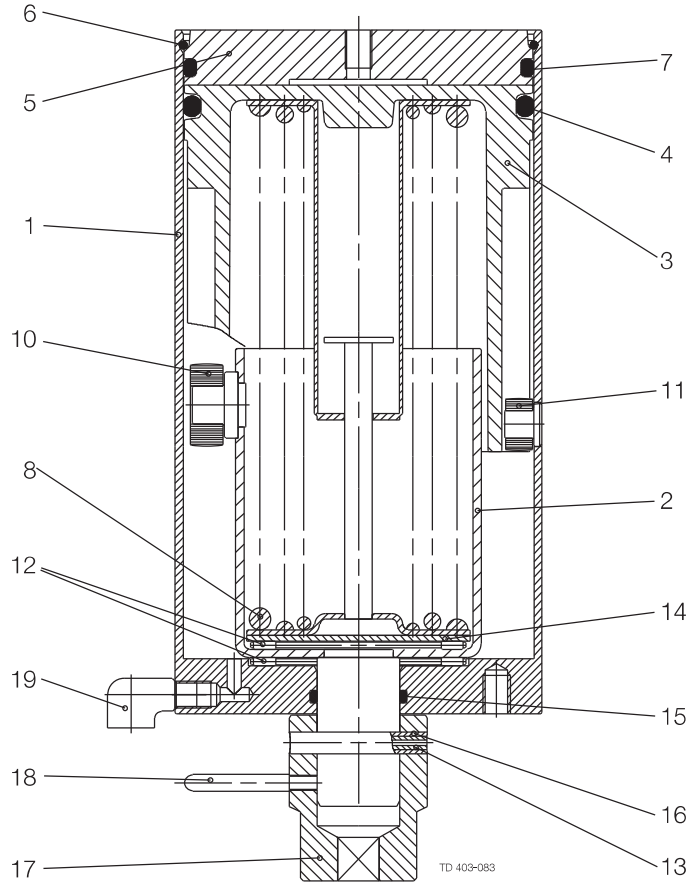
LKLA-T (NC-NO)



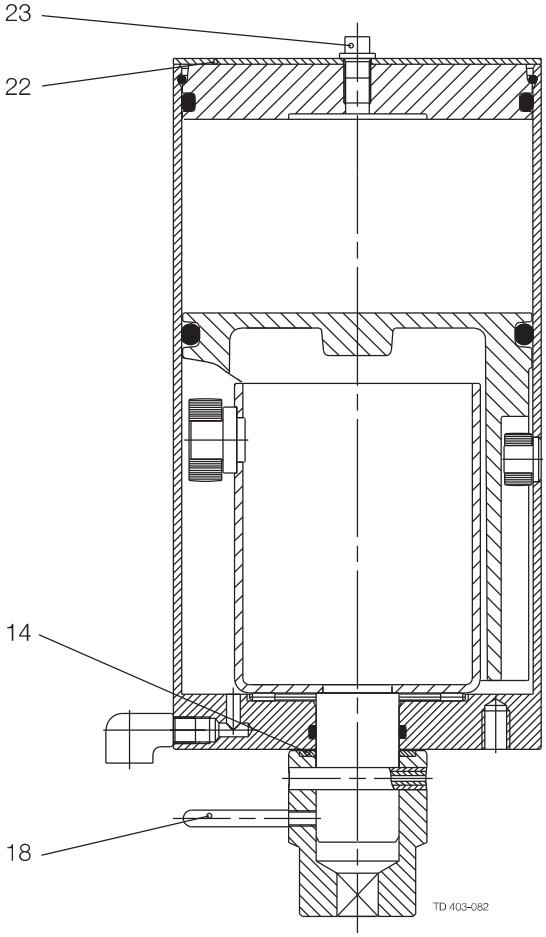
LKLA-T (A/A)



LKLA (NC-NO)



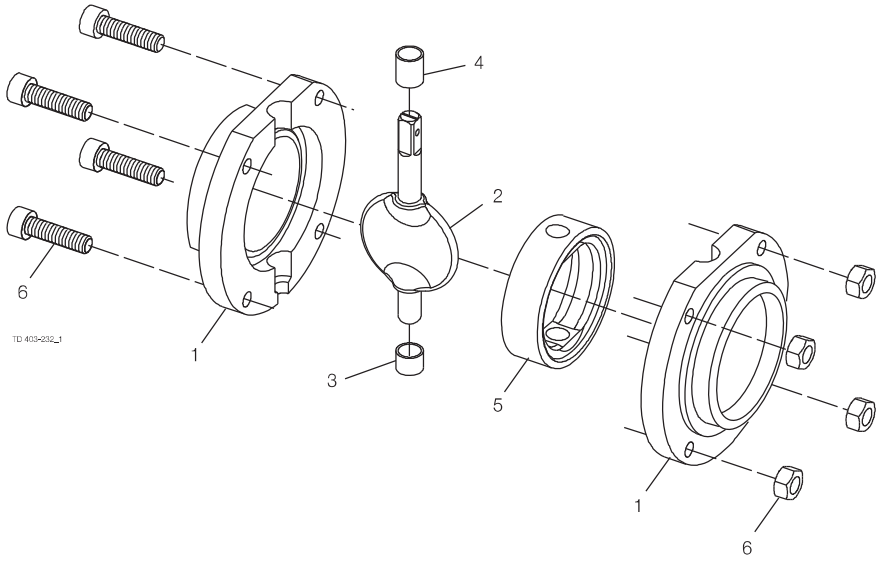
LKLA (A/A)



7 Parts list and service kits

The drawing and parts list include all items of the valve.

7.5 LKB Butterfly valve, ISO



The drawing and parts list include all items of the valve.

Parts list

Pos.		Qty	Denomination
1		2	Valve body half
2		1	Disc
3	□	1	Bush
		1	Bush, set (10 pcs.)
4	□	1	Bush
		1	Bush, set (10 pcs.)
5	□	1	Seal ring
6		1	Set of screws

Service kits

	Denomination	25 mm Disc □ 8	38 mm Disc □ 8	51 mm Disc □ 8	63.5 mm Disc □ 8
Service kits for product wetted parts					
□	Service kit EPDM	9611923028	9611923029	9611923030	9611923031
□	Service kit Q	9611923034	9611923035	9611923036	9611923037
□	Service kit FPM	9611923040	9611923041	9611923042	9611923043
□	Service kit HNBR	9611923160	9611923161	9611923162	9611923163
□	Service kit PFA		9611923183	9611923184	9611923185

Service kits

	Denomination	76mm Disc □ 10	101.6mm Disc □ 10	101.6mm Disc □ 12	152mm Disc □ 15
Service kits for product wetted parts					
□	Service kit EPDM	9611923032	9611923033	9611923033	9611923046
□	Service kit Q	9611923038	9611923039	9611923039	9611923047
□	Service kit FPM	9611923044	9611923045	9611923045	9611923048
□	Service kit HNBR	9611923164	9611923165	9611923165	9611923197
□	Service kit PFA	9611923186	9611923187	9611923187	

NB: * Disc connection □ 10 for 101.6 mm and DN100 is no longer available. Please rebuild the air actuator or/and handle to: disc connection □ 12 Reg. 2.14.1 9805 / Intro. 8001

NOTE! Lubricate the pin holes in the seal (5) with Klüber Paraliq GTE 703 or similar. Very important for Q and FPM.

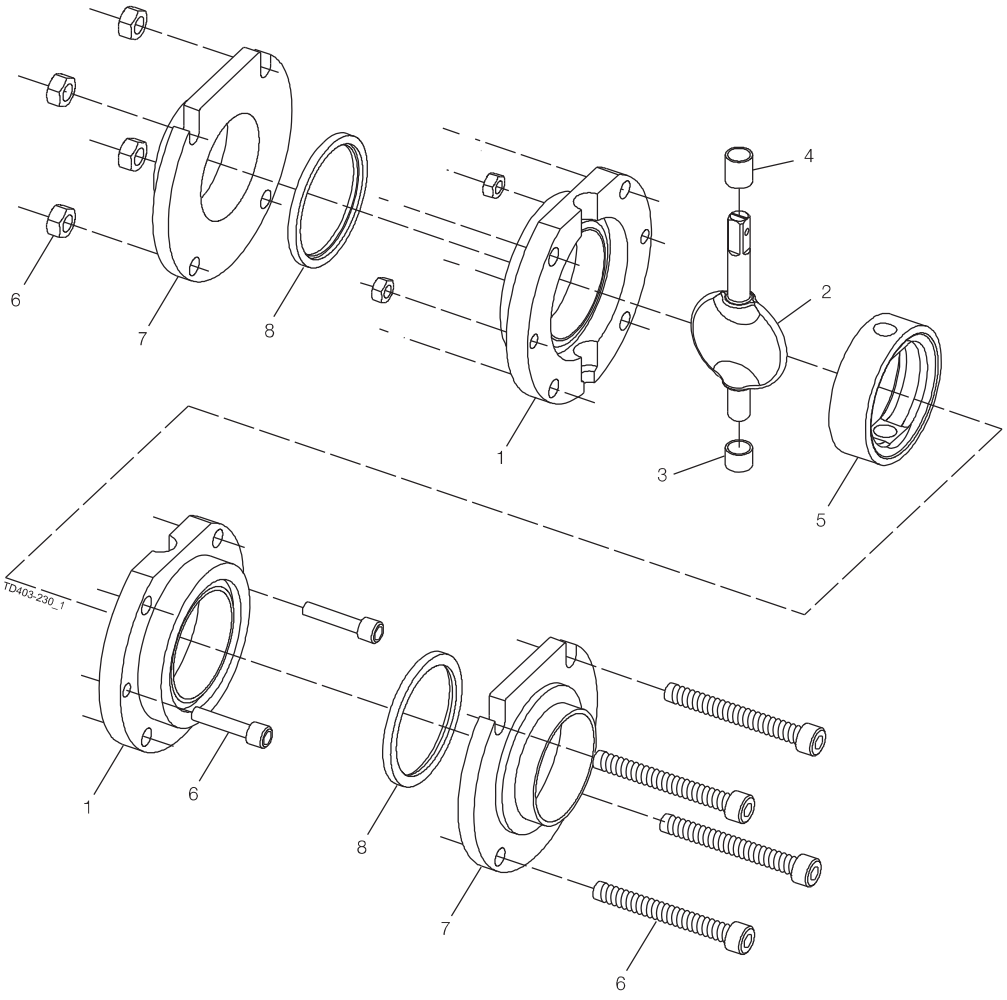
Parts marked with □ are included in the service kits. Recommended spare parts: Service kits.

900069/4

7 Parts list and service kits

The drawing and parts list include all items of the valve.

7.6 LKB-F Butterfly valves, ISO



The drawing and parts list include all items of the valve.

Parts list

Pos.		Qty	Denomination
1		2	Valve body half
2		1	Disc
3	□	1	Bush
		1	Bush set (10 pcs.)
4	□	1	Bush
		1	Bush set (10 pcs.)
5	□	1	Seal ring
6		1	Set of screws and nuts
7		2	Flange
8	□	2	Seal ring

Service kits

	Denomination	25 mm Disc □ 8	38 mm Disc □ 8	51 mm Disc □ 8	63.5 mm Disc □ 8	76 mm Disc □ 10	101.6 mm Disc □ 12
Service kits for product wetted parts							
□	Service kit, EPDM	9611923058	9611923059	9611923060	9611923061	9611923062	9611923063
□	Service kit, Silicone (Q)	9611923064	9611923065	9611923066	9611923067	9611923068	9611923069
□	Service kit, FPM	9611923070	9611923071	9611923072	9611923073	9611923074	9611923099
□	Service kit, HNBR	9611923310	9611923311	9611923312	9611923313	9611923314	9611923315
□	Service kit, PFA**						

Parts marked with □ are included in the service kits.
Recommended spare parts: Service kits.

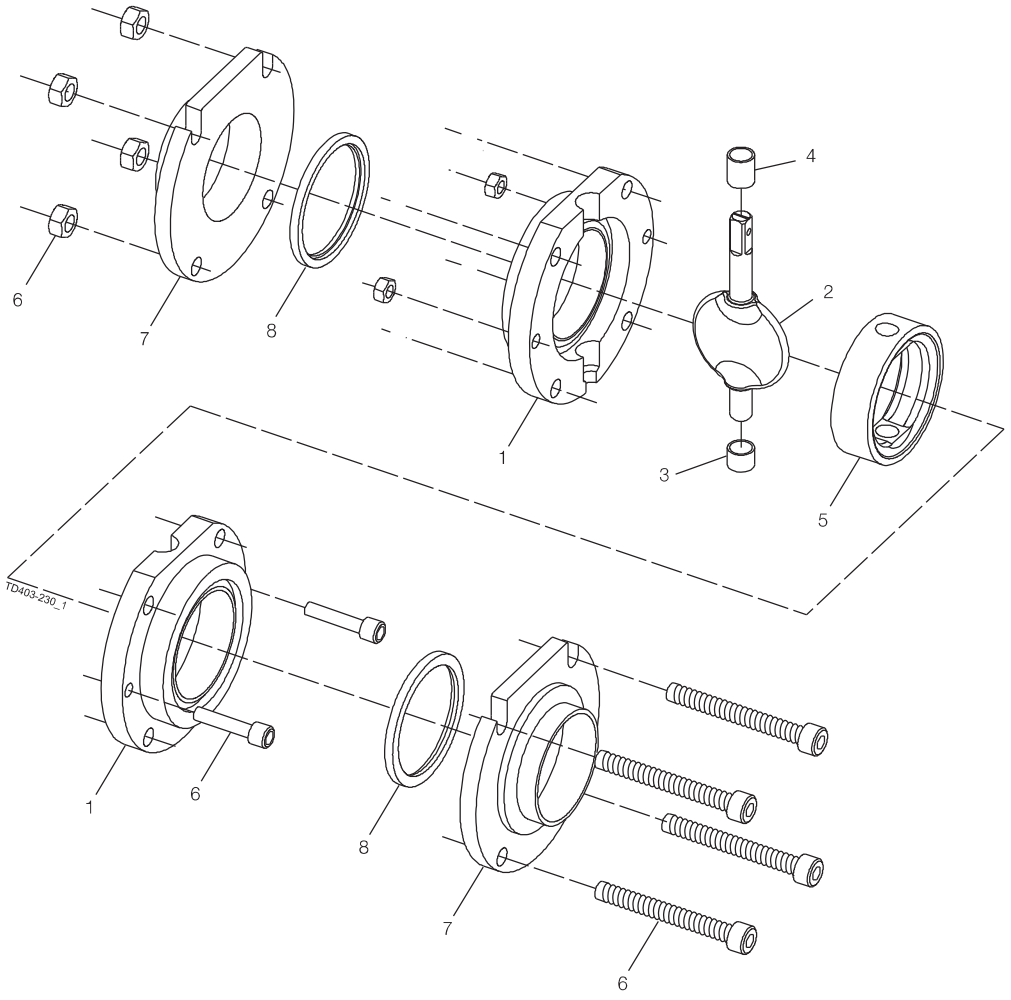
NB:
* Disc connection □ 10 for 101.6 mm and DN 100 is no longer available. Please rebuild the air-actuator or/and handle to: disc connection □ 12
** Service kits for PFA are delivered with EPDM flange seals.

900529/4

7 Parts list and service kits

The drawing and parts list include all items.

7.7 LKB-F Butterfly valves, DIN



The drawing and parts list include all items.

Parts list

Pos.		Qty	Denomination
1		2	Valve body half
2		1	Disc
3	□	1	Bush
		1	Bush set (10 pcs.)
		1	Bush set (10 pcs)
		1	Bush set (10 pcs)
4	□	1	Bush
		1	Bush set (10 pcs.)
5	□	1	Seal ring
		1	Seal ring
		1	Seal ring
6		1	Set of screws and nuts
7		2	Flange
8	□	2	Seal ring

Service kits

	Denomination	DN 25 Disc □ 8	DN 32 Disc □ 8	DN 40 Disc □ 8	DN 50 Disc □ 8
Service kits for product wetted parts					
□	Service kit, EPDM	9611923100	9611923101	9611923102	9611923103
□	Service kit, Silicone (Q)	9611923109	9611923110	9611923111	9611923112
□	Service kit, FPM	9611923118	9611923119	9611923120	9611923121
	Service kit, HNBR				
	Service kit, PFA				

Service kits

	Denomination	DN 65 Disc □ 10	DN 80 Disc □ 10	DN 100 Disc □ 12	DN 125 Disc □ 14	DN 150 Disc □ 15
□	Service kit, EPDM	9611923104	9611923105	9611923106	9611923107	9611923108
□	Service kit, Silicone (Q)	9611923113	9611923114	9611923115	9611923116	9611923117
□	Service kit, FPM	9611923122	9611923123	9611923124	9611923125	9611923126
	Service kit, HNBR					
	Service kit, PFA					

Parts marked with □ are included in the service kits.
Recommended spare parts: Service kits.

[1]) Seal ring is delivered assembled with disc.

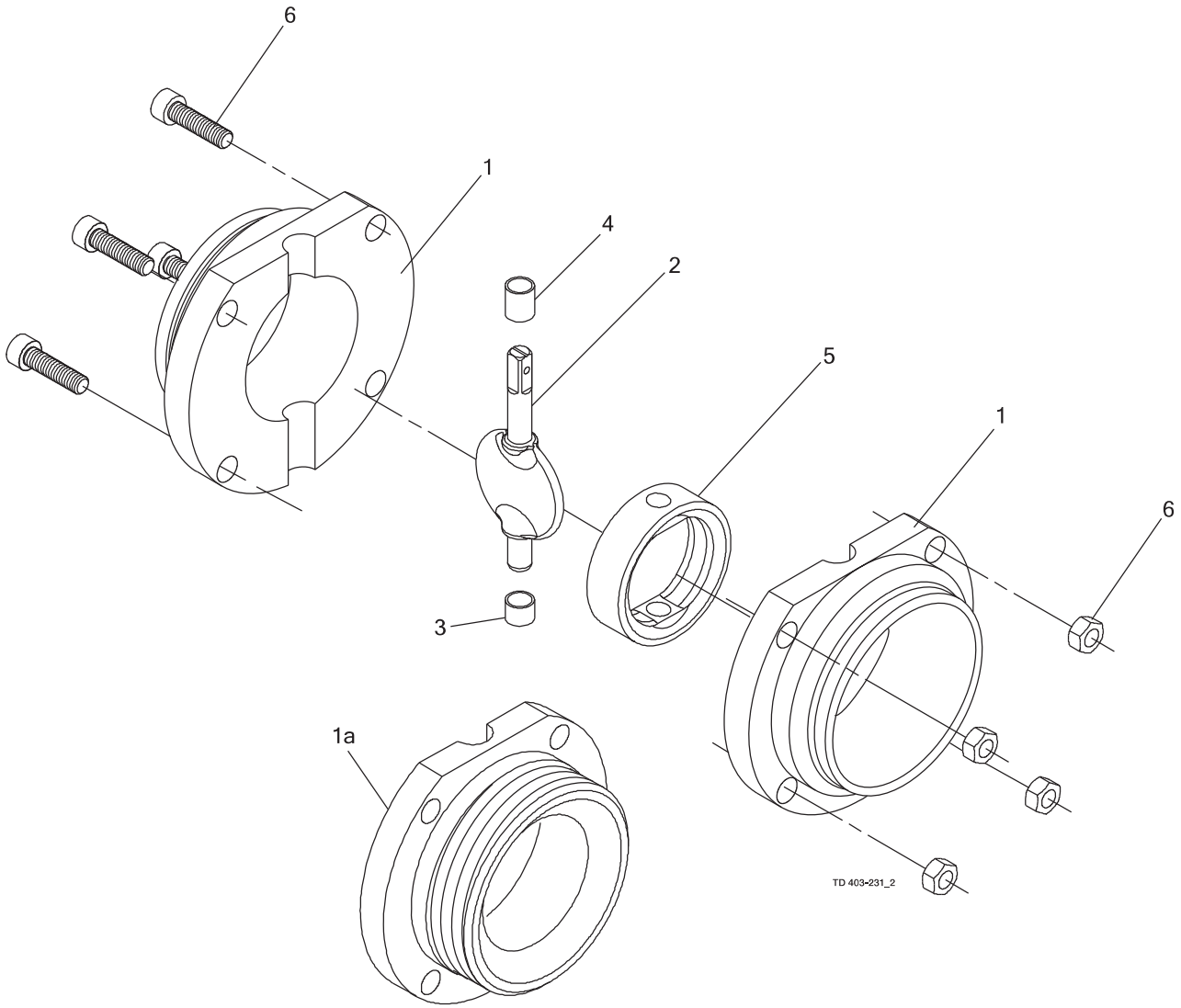
NB: * Service kits for HNBR and PFA are delivered with EPDM flange seals.

900529/4

7 Parts list and service kits

The drawing and parts list include all items.

7.8 LKB-2 Butterfly valves



The drawing and parts list include all items.

Parts list

Pos.		Qty	Denomination
1a		2	Valve body half
1		2	Valve body half
2		1	Disc
3	□	1	Bush
		1	Bush, set (10 pcs.)
4	□	1	Bush
		1	Bush, set (10 pcs.)
		1	Bush, set (10 pcs.)
5	□	1	Seal ring
6		1	Set screw

Service kits

	Denomination	DN25 Disc □ 8	DN32 Disc □ 8	DN40 Disc □ 8	DN50 Disc □ 8
Service kits for product wetted parts					
□	Service kit, EPDM	9611923075	9611923076	9611923077	9611923078
□	Service kit, Q	9611923083	9611923084	9611923085	9611923086
□	Service kit, FPM	9611923091	9611923092	9611923093	9611923094
□	Service kit, HNBR	9611923210	9611923211	9611923212	9611923213
□	Service kit, PFA			96119231911)	9611923192

Service kits

	Denomination	DN65 Disc □ 10	DN80 Disc □ 10	DN100 Disc □ 12	DN125 Disc □ 14	DN 150
Service kits for product wetted parts						
□	Service kit, EPDM	9611923079	9611923080	9611923081	9611923082	9611923046
□	Service kit, Q	9611923087	9611923088	9611923089	9611923090	9611923047
□	Service kit, FPM	9611923095	9611923096	9611923097	9611923098	9611923048
□	Service kit, HNBR	9611923214	9611923215	9611923216	9611923217	9611923197
□	Service kit, PFA	9611923193	9611923194	9611923195		

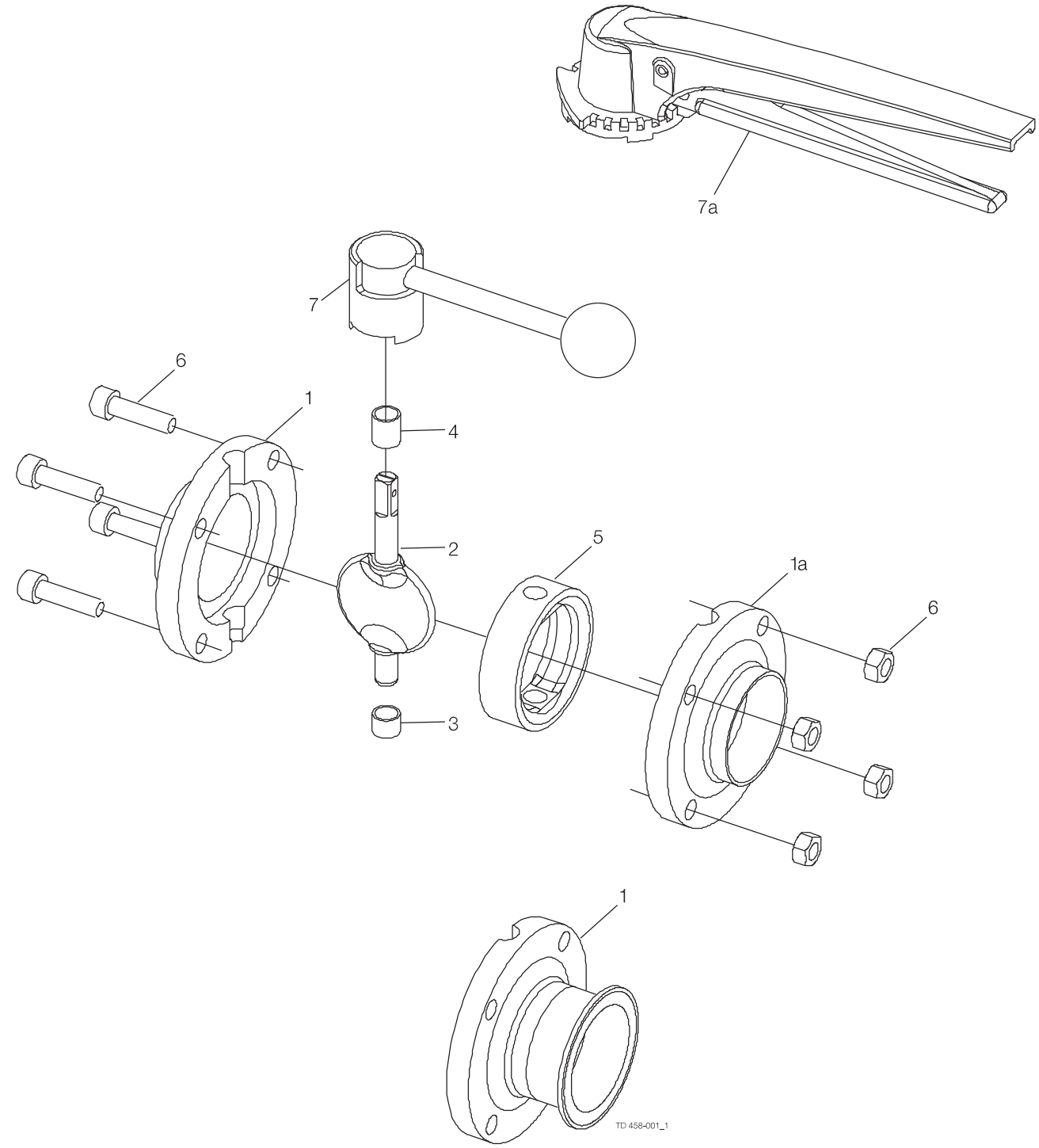
NB:1) In the service kit the seal ring is delivered assembled with disc.
NOTE!! Lubricate the pin holes in the seal (5) with Klüber Paraliq GTE 703 or similar. Very important for Q and FPM.
Parts marked with □ are included in the service kits. Recommended spare parts: Service kits.

900245/4

7 Parts list and service kits

The drawing and parts list include all items.

7.9 LKB-LP Butterfly valve



The drawing and parts list include all items.

Parts list

Pos.		Qty	Denomination
1		2	Valve body half
2		1	Disc
3	□	1	Bush
		1	Bush, set (10 pcs.)
4	□	1	Bush
		1	Bush, set (10 pcs.)
5	□	1	Seal ring
6		1	Set screw
7		1	Handle
7a		1	Lockable multiposition handle (only ISO)

Service kits

	Denomination	25 mm	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm
Service Kits for product wetted parts, ISO							
□	Service kit EPDM	9611923028	9611923204	9611923205	9611923031	9611923032	9611923033

Service kits

	Denomination	DN25	DN40	DN50	DN65	DN80	DN100
Service Kits for product wetted parts, DIN							
□	Service kit EPDM	9611923206	9611923207	9611923208	9611923079	9611923209	9611923218

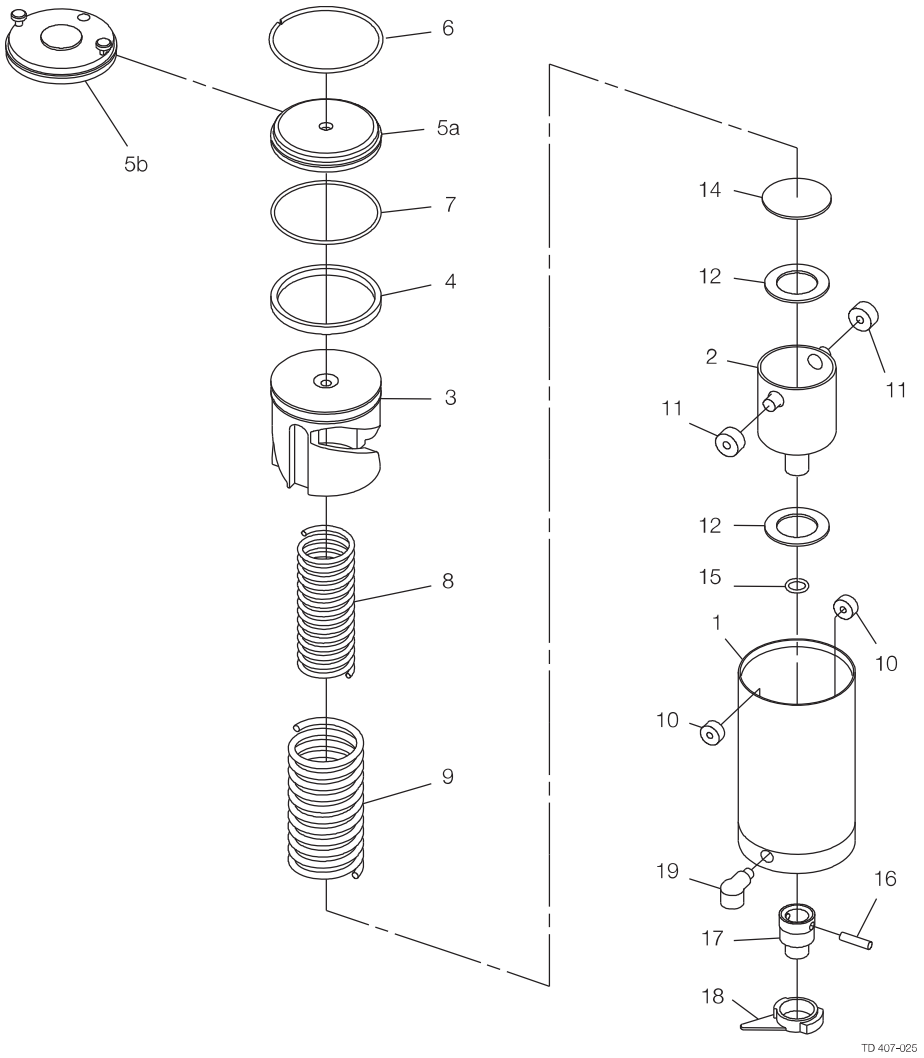
Parts marked with □ are included in the service kits.
Recommended spare parts: Service kits.

TD 900-204/4

7 Parts list and service kits

The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

7.10 LKLA ø85 mm (NO/NC)



The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

Parts list

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
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-)

Note:
Butterfly valve 101.6 mm / DN100 sold before 8906 = □ 10 mm
Butterfly valve DN 65 (ISO) sold before 8910 = □ 8 mm
Please check the square size of the disc when ordering spares.

Parts marked with □ are included in the service kit.
Recommended spare parts: Service kit.

900128/2

Service kits

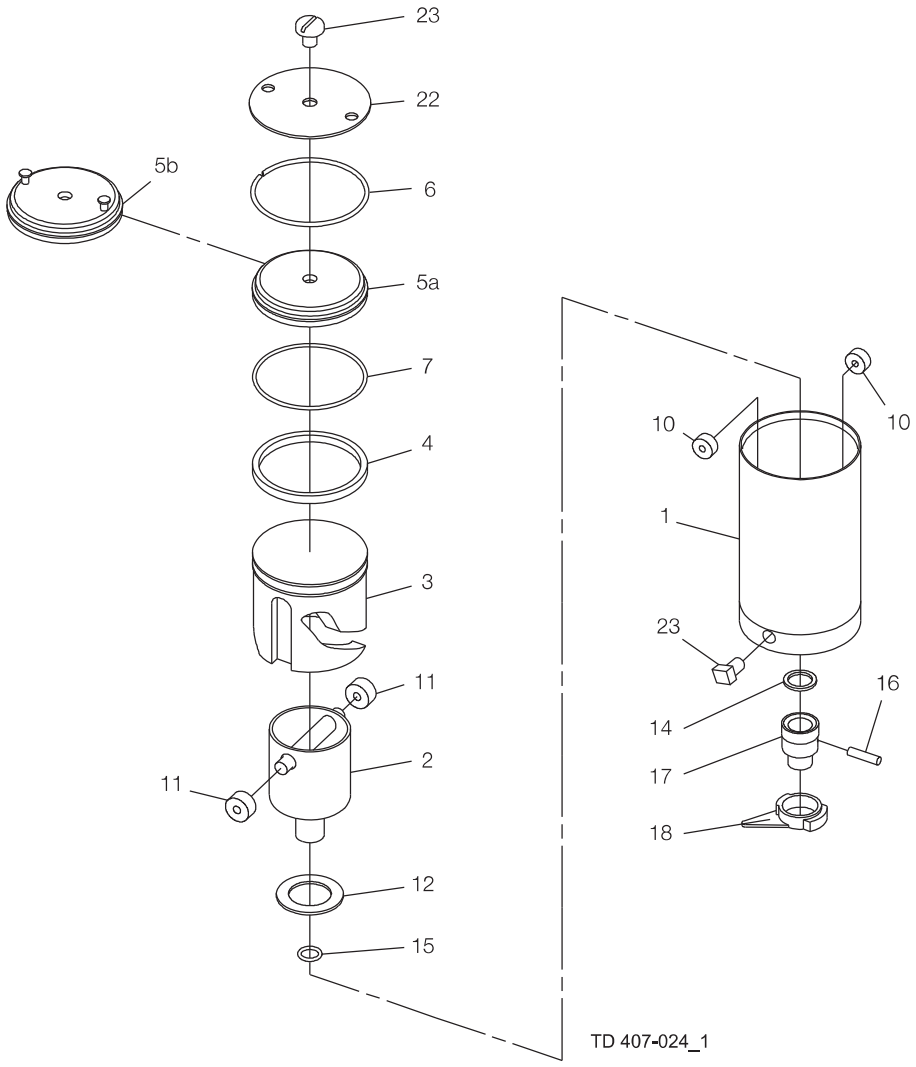
Service kit for actuator

Service kits, air/spring 9611923010

7 Parts list and service kits

The drawing and the parts list include all items.

7.11 LKLA ø85 mm (A/A)



The drawing and the parts list include all items.

Parts list

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
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

Note:
*** Up to 8910 supplied without holes, not available anymore
Butterfly valve 101.6 mm / DN100 sold before 8906 = □ 10 mm
Butterfly valve DN 65 (ISO) sold before 8910 = □ 8 mm
Please check the square size of the disc when ordering spares.

Parts marked with □ are included in the service kit.
Recommended spare parts: Service kit.

900129/1

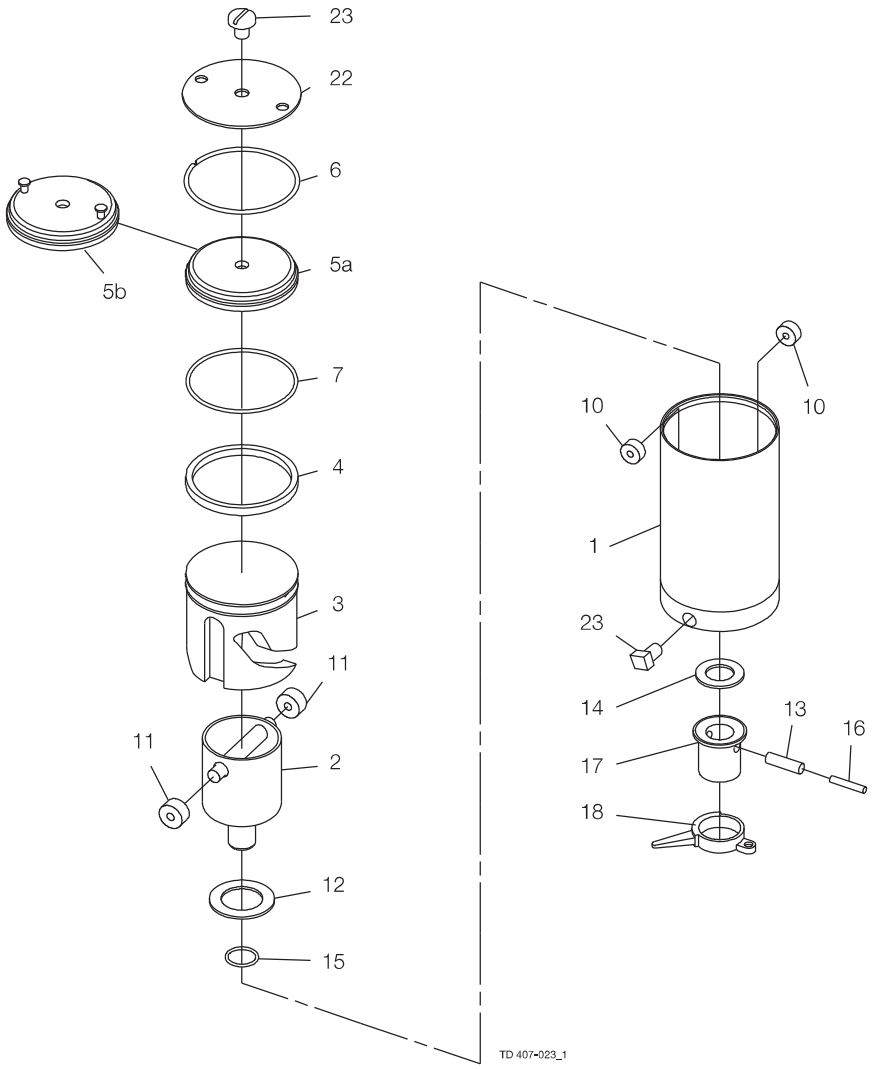
Service kits

Service kits, air/air 9611923011

7 Parts list and service kits

The drawing and the parts list include all items

7.12 LKLA DN 125-150 ø85 mm (A/A)



The drawing and the parts list include all items

Parts list

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
11	□	2	Needle bearing
12	□	1	Thrust bearing
13		1	Connex pin
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

*** Up to 8910 supplied without holes, not available anymore
Parts marked with □ are included in the service kit.
Recommended spare parts: Service kit.

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Service kits

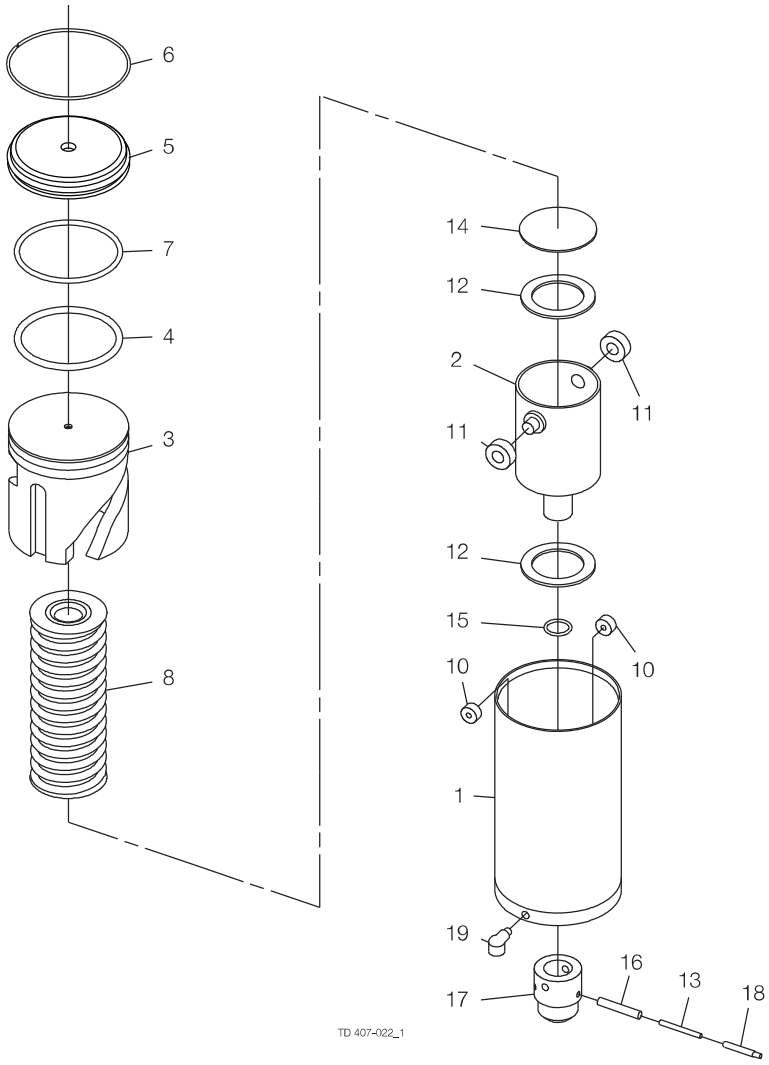
Service kits for actuator

Service kits, air/air 9611923012

7 Parts list and service kits

The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

7.13 LKLA ø133 mm (NO/NC)



The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

Parts list

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
13		1	Connex pin
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

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900131/1

Service kits

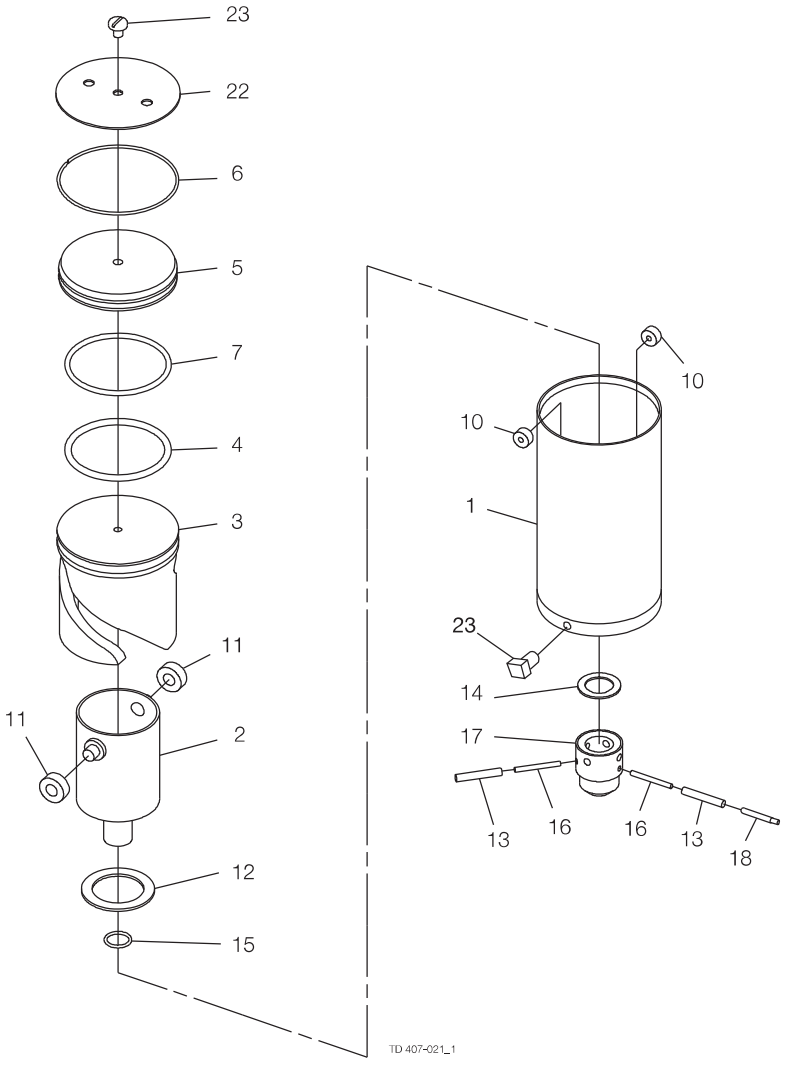
Service kits for actuator

Service kits, air/spring 9611923020

7 Parts list and service kits

The drawing and the parts list include all items.

7.14 LKLA ø133 mm (A/A)



The drawing and the parts list include all items.

Parts list

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
13		2	Connex pin
14		1	Thrust plate
15	□	1	O-ring
16		2	Connex pin
17		1	Coupling
18		1	Indication pin
22		1	Retaining plate
23		1	Threaded plug

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900132/1

Service kits

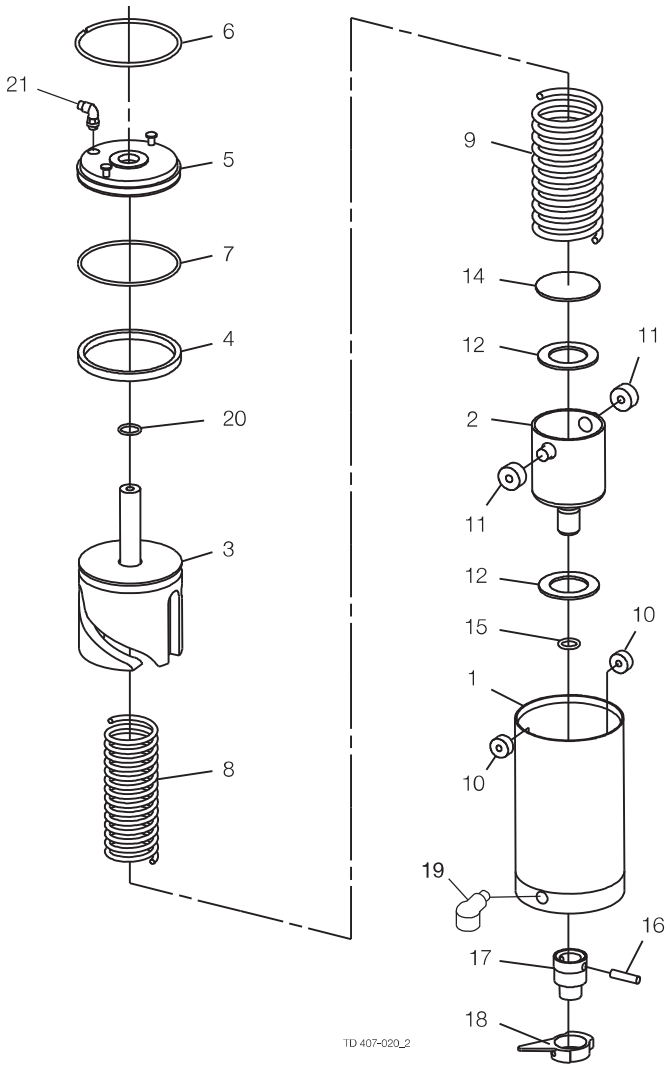
Service kits for actuator

Service kits, air/air 9611923022

7 Parts list and service kits

The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

7.15 LKLA-T ø85 mm (NO/NC)



The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

Parts list

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
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

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900133/1

Service kits

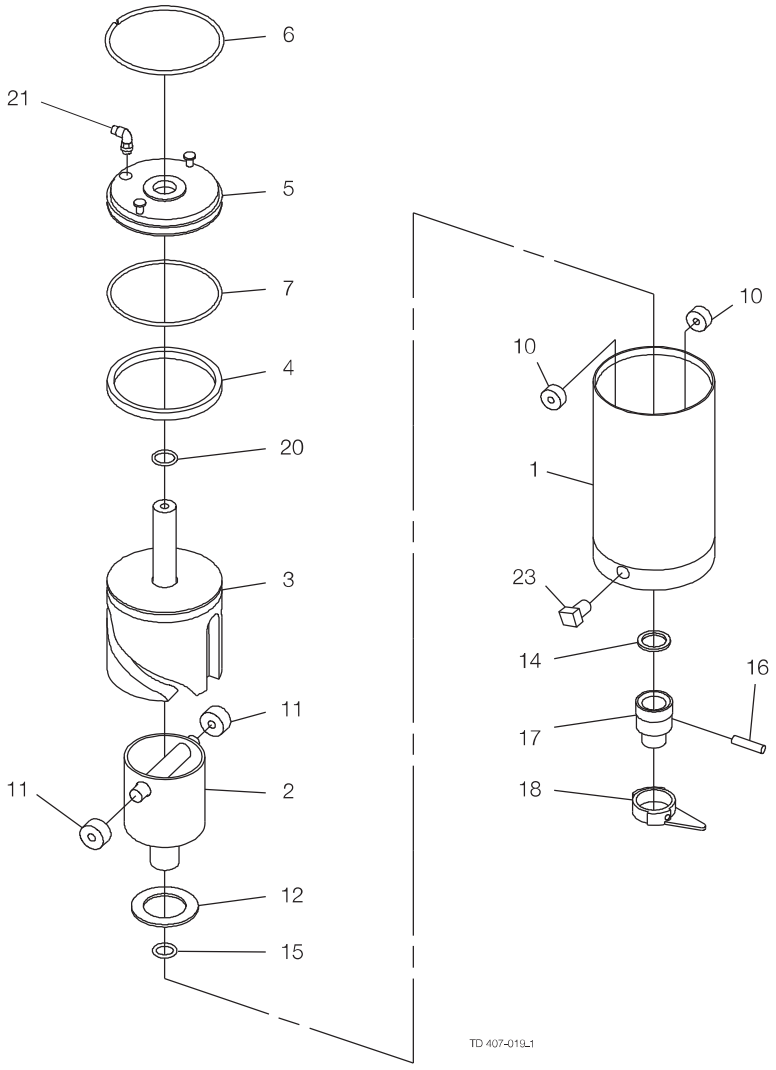
Service kits for actuator

Service kits, air/spring 9611923021

7 Parts list and service kits

The drawing and the parts list include all items.

7.16 LKLA-T ø85 mm (A/A)



The drawing and the parts list include all items.

Parts list

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
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

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900134/1

Service kits

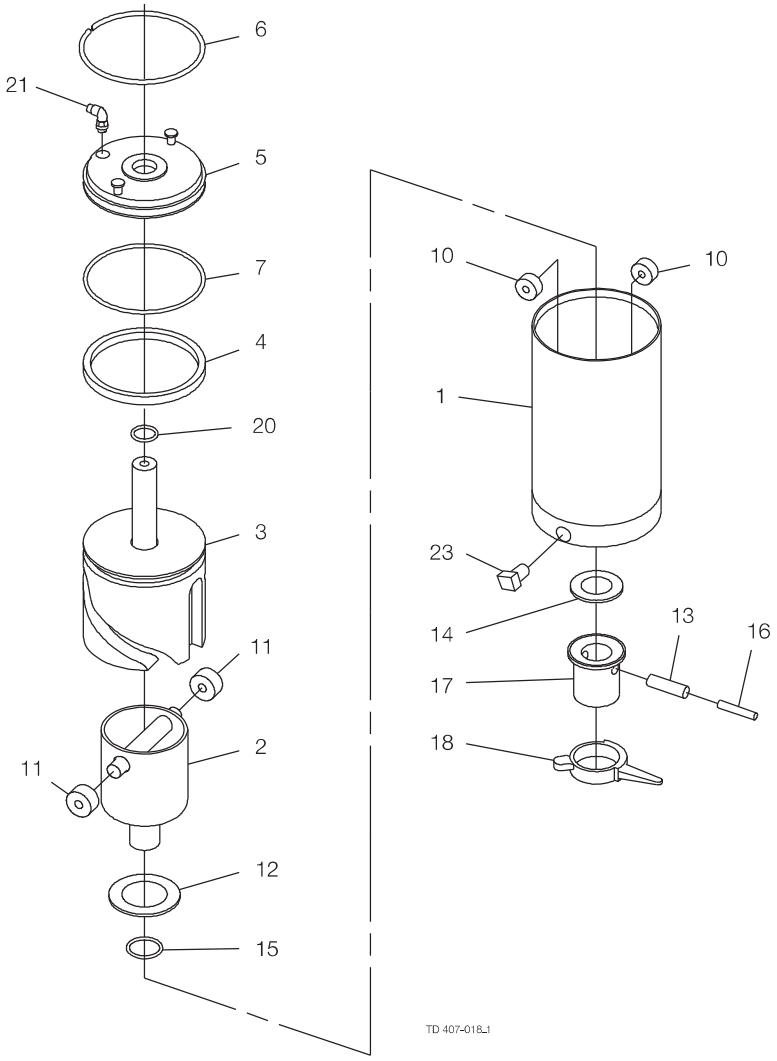
Service kits for actuator

Service kits, air/air 9611923023

7 Parts list and service kits

The drawing and the parts list include all items.

7.17 LKLA-T DN 125-150 ø85 mm (A/A)



The drawing and the parts list include all items.

Parts list

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
13		1	Connex pin
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

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900135/1

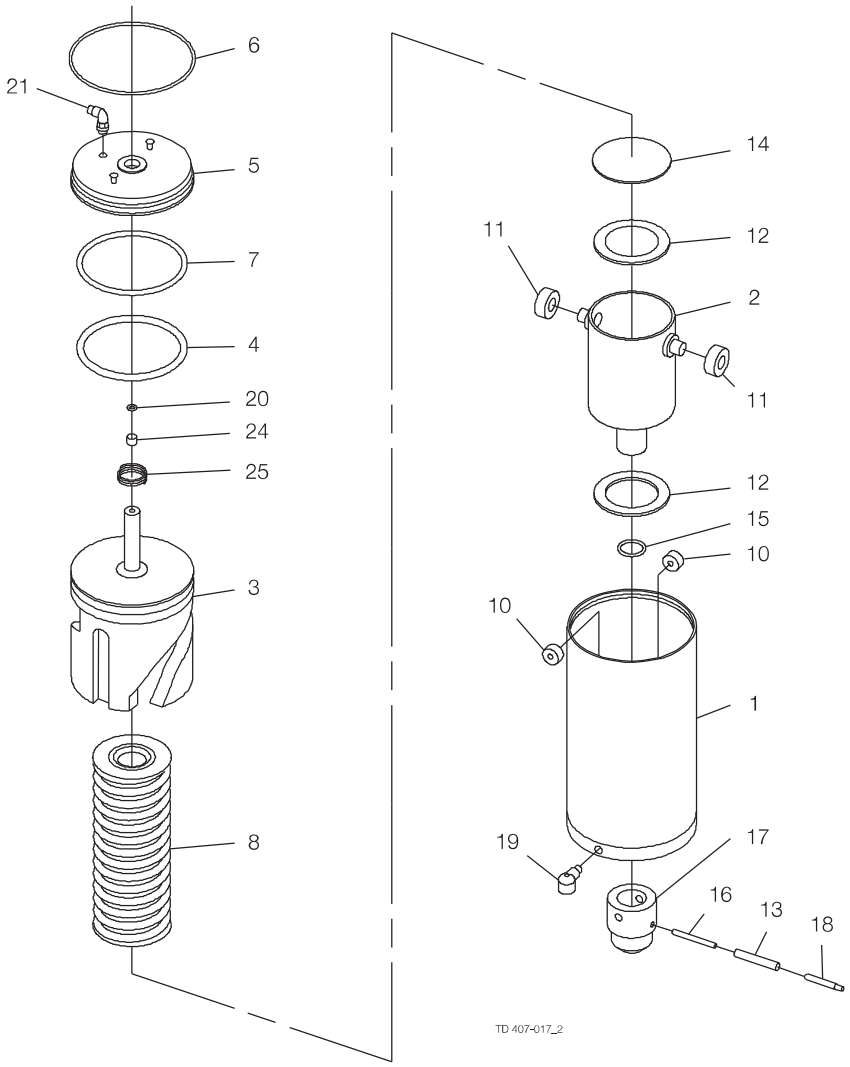
Service kits

Service kits, air/air 9611923024

7 Parts list and service kits

The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

7.18 LKLA-T ø133 mm (NO/NC)



The drawing and the parts list include all items.
NO = Normally open.
NC = Normally closed.

Parts list

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
13		1	Connex pin
14		1	Thrust plate
15	□	1	O-ring
16		1	Connex pin
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

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

900136

Service kits

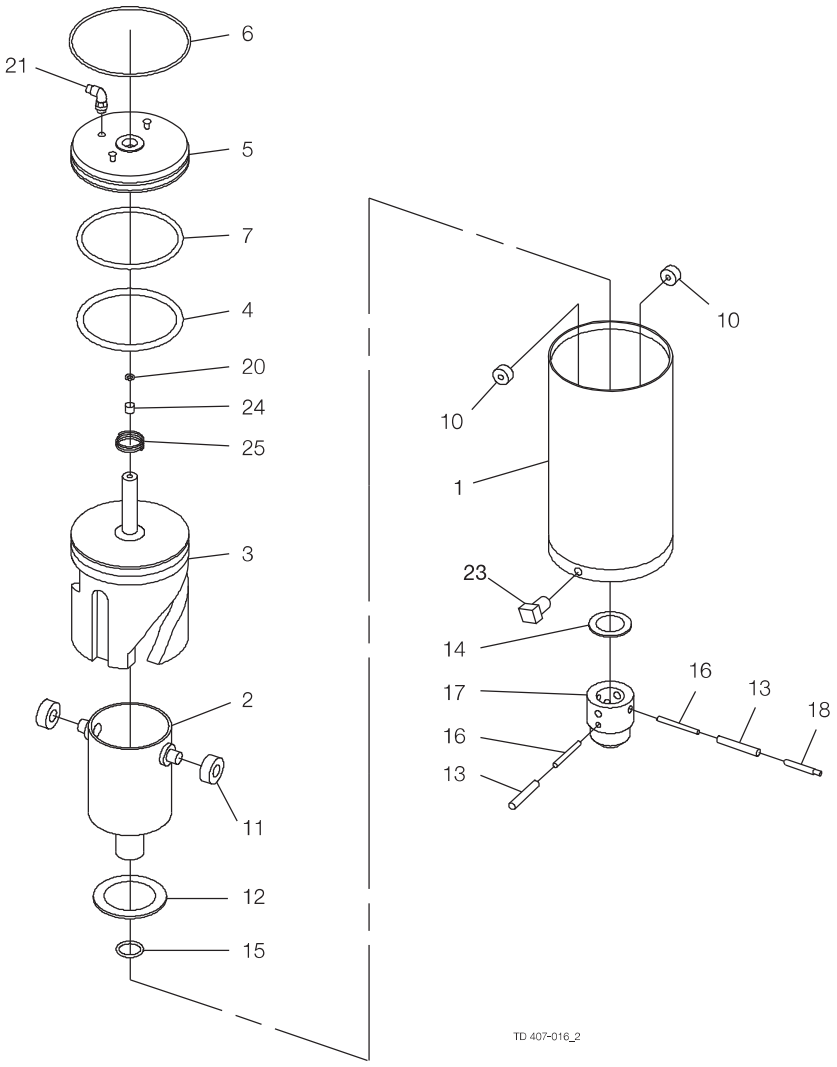
Service kits for actuator

Service kits, air/spring 9611923056

7 Parts list and service kits

The drawing and the parts list include all items.

7.19 LKLA-T ø133 mm (A/A)



The drawing and the parts list include all items.

Parts list

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
13		2	Connex pin
14		1	Thrust plate
15	□	1	O-ring
16		2	Connex pin
17		1	Coupling
18		1	Indication pin
20	□	1	O-ring
21		1	Air fitting
23		1	Threaded plug
24	□	1	Guiding band
25		1	Spring

Parts marked with □ are included in the service kit.
Recommended spare parts: service kit.

190137/1

Service kits

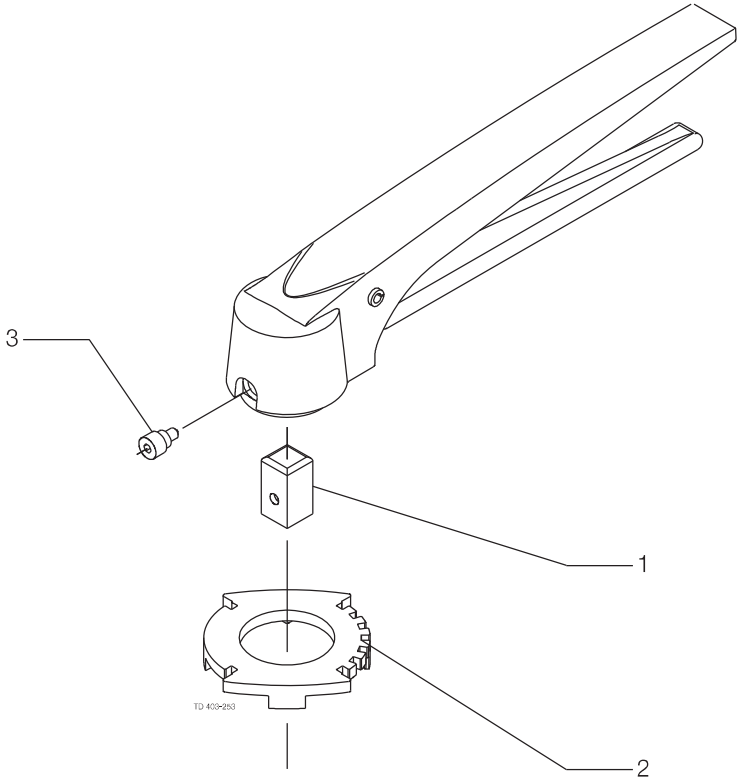
Service kits for actuator

Service kits, air/air 9611923057

7 Parts list and service kits

The drawing and the parts list include all items.

7.20 LKB lockable multiposition handle for valve



The drawing and the parts list include all items.

Parts list

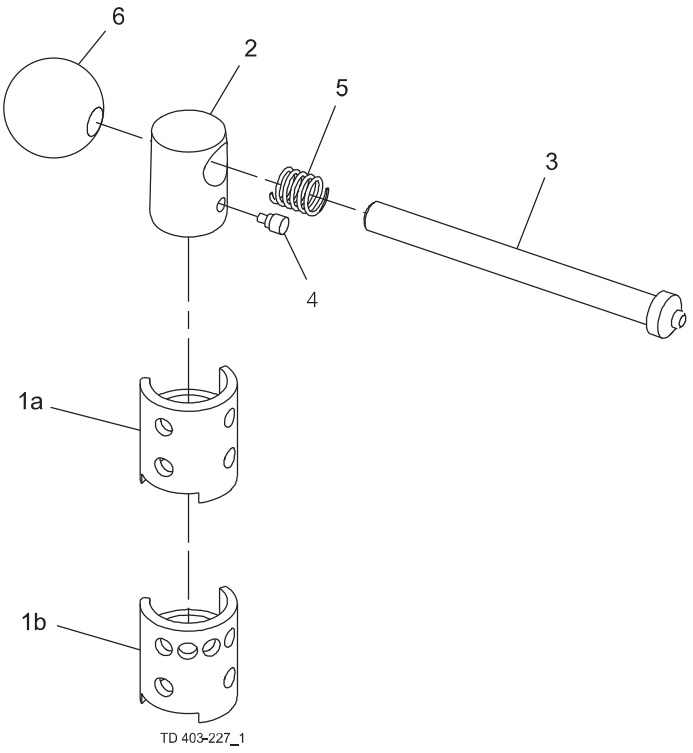
Pos.	Qty	Denomination
1	1	Insert
2	1	Positioning cap
3	1	Screw

7 Parts list and service kits

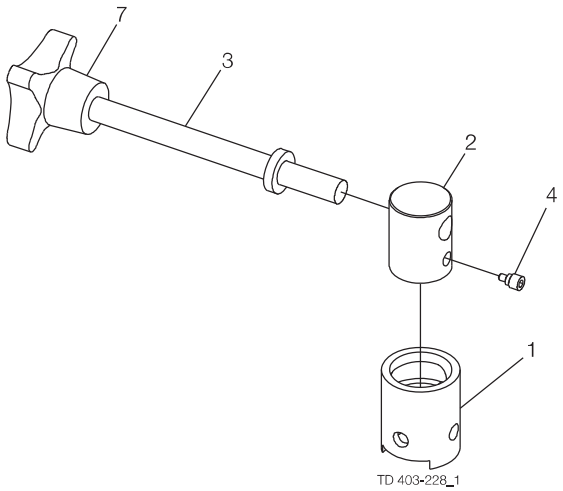
The drawing and the parts list include all items.

7.21 LKB handle 1.1 for butterfly valve

Handle 1.1 for LKB butterfly valve



Handle 1.1 with infinite positions for LKB Butterfly valve



The drawing and the parts list include all items.

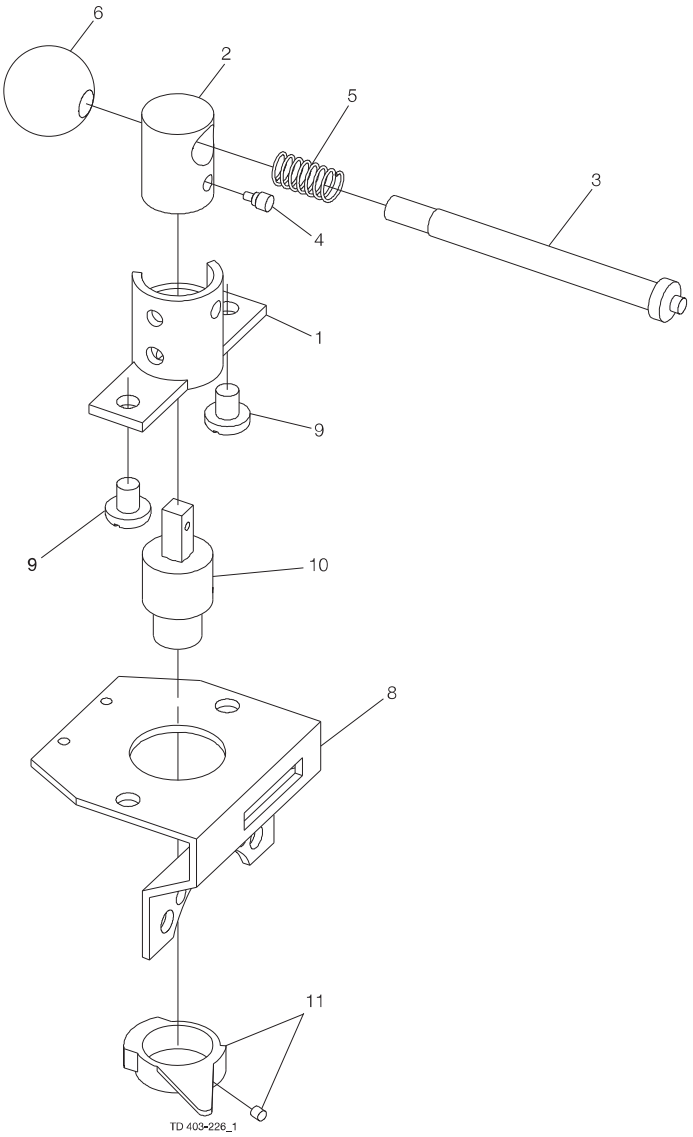
Parts list

Pos.	Qty	Denomination
2	1	Transfer block
3	1	Handle
4	1	Screw with pin
5	1	Spring
6	1	Ball

7 Parts list and service kits

The drawing and the parts list include all items.

7.22 Handle 1.1 for indication unit



The drawing and the parts list include all items.

Parts list

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
6	1	Ball
8	1	Bracket
9	2	Screw
10	1	Coupling
11	1	Activating ring with screw

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.

Alfa Laval ThinkTop V50 and V70

Sensing and control

Introduction

ThinkTop V50 and V70 takes valve control to a new level and all these new features are available on any Alfa Laval diaphragm, butterfly, single-seat and mixproof valves. While helping to increase production performance and secure traceability, ThinkTop V50 and V70 provide real-time information on the valve's operating status 24/7.

Both ThinkTop V50 and V70 are interchangeable with prior ThinkTop versions, and the appropriate variant is selected based on the number of solenoid valves. With only one sensor target and included adapter, ThinkTop V50 and V70 are easily retrofittable to existing Alfa Laval valves.

ThinkTop V50 and V70 come fitted with features such as Auto Setup, Live Setup and Flex Setup that streamline the setup process, making it quick and easy. Auto Setup and Live Setup recognise the valve based on its DNA profile and can complete the valve setup without any manual interaction.

The burst seat clean function is available on ThinkTop V70 and pulse seat clean function available on both ThinkTop V50 and V70. These valve position-based functions controls the optimum seat clean sequence of the valve, making it possible to save CIP time and achieve up to 95% CIP liquid savings for each seat clean.

Application

ThinkTop V50 and V70 are designed for use in the dairy, food, beverage, and biopharma industries.

Benefits

- Auto setup
- Automatic valve recognition
- Automatic selection of tolerance band
- Fast, Live and Flex Setup
- 360-degree LED indication
- Burst seat clean
- Pulse seat clean
- Exchangeable (threaded) air-fittings
- Interchangeable with ThinkTop classics

Certificates

A selection of the essential certificates available on ThinkTop

Working principles

The control unit offers a single sensor solution for diaphragm, butterfly, single-seat and mixproof valves and it can be fitted with up to three solenoid valves. ThinkTop converts the electrical PLC output signals into mechanical energy to energise, or de-energise, the air-operated valve, using the physical sensor target mounted on the valve stem.

Installation with Auto Setup or Live Setup is intuitive and fast. To initiate Auto Setup, simply press the “SELECT” button and then the “ENTER” button to begin the setup sequence. The ThinkTop automatically recognizes the type of valve and completes the programming sequence fast and efficiently. Alternatively, the ThinkTop can be set up, without dismantling the control head, using the built-in Live Setup feature for remote-configuration.

Dimensions

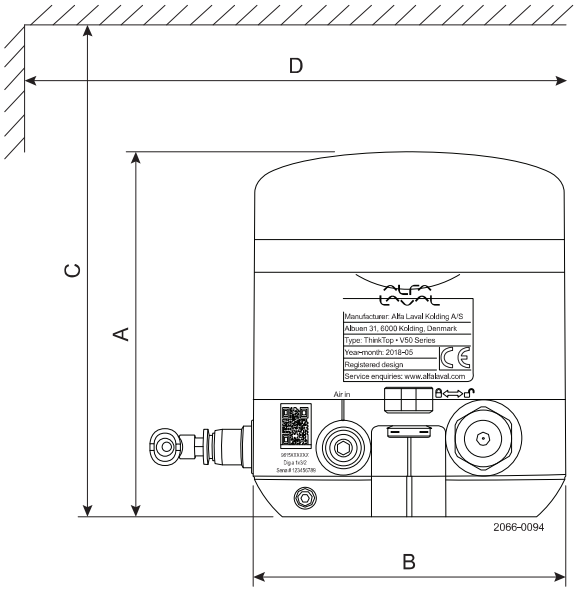


Figure 1. ThinkTop V 50

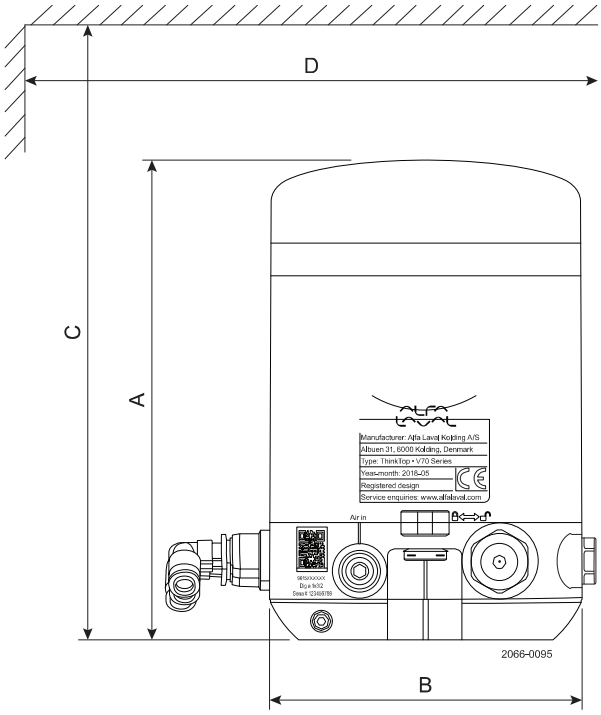


Figure 2. ThinkTop V 70

ThinkTop V 50			ThinkTop V 70		
	mm	Inch		mm	Inch
A	123	4.84	A	164	6.45
B	105	4.13	B	105	4.13
C	200	7.87	C	250	9.84
D	150	5.91	D	170	6.69

TECHNICAL DATA

Material	
Plastic parts	Nylon PA 12
Steel parts	1.4301 / 304
Gaskets	Nitril / NBR
Air fittings	Nickel plated / Nylon PA6
M12 chassis connector	Stainless steel / Gold plated pins

Environment	
Working temperature	-10°C to +60°C
Protection class (IP)	IP69K
Protection class (NEMA)	4, 4X and 6
Hazardous area	ATEX and IECEx in preperation

Control board	
Communication	See interfaces section
Sensor accuracy	± 0,1 mm
V50 – Valve stem length	Below < 65 mm
V70 – Valve stem length	Above > 65 mm
Mean Time To Failure (MTTF)	224 years
Approvals	UL/CSA Certificate: E174191

Solenoid valve	
Supply voltage	24 VDC ± 10%
Nominal power	0,3 W
Air supply	300-800 kPa (3-8 bar)
Type of solenoids	3/2-ways or 5/2-way
Number of solenoids	0-3
Manual hold override	Yes
Air quality	Class 3,3,3 acc. DIN ISO 8573-1
Air pressure	6-8 bar

Solenoid valve	
B10 data	5 million cycles
Recommendation	Operate once a month to prevent dry-out

Note!
Throughout this leaflet, SV is used as an abbreviation for a soleniod valve

Air fitting	
Threaded air fitting G1/8	ø6 mm (Rim blue) or 1/4" (Rim Grey)
Elbow push-in fittings	ø6 mm (Rim blue) or 1/4" (Rim Grey)

Cable connection	
Main cable gland entry Digital	M16 (ø4 - ø10 mm^2) (0,16" - 0,39")
Main cable gland entry AS-I	M16 (ø2 - ø7 mm^2) (0,08" - 0,28")
Seat lift sensor cable gland entry	M12 (ø3,5 - ø7 mm^2) (0,14" - 0,28")
Max wire diameter	0,75 mm^2 (AWG20)

M12 chassis connector	
AS-Interface V50/V70	2 wire, 4-pin series
IO-Link interface V50/V70	3 wire, 4-pin series
Digital interface V50	6 wire, 8-pin series
Digital interface V70	10 wire, 12-pin series

Vibration	
Vibration	18 Hz-1kHz @ 7,54g RMS
Shock	100g

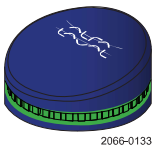
Humidity	
Constant humidity	+40°C, 21 days, 93% R.H.
Cyclic humidity	-25°C/+55°C, 12 cycles
Working	93% R.H.

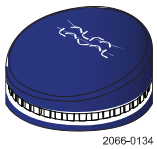
Accessories by functionality	
Upper seat lift surveillance	Kit
Valve “opening” speed reduction	0-100%. Outlet air fitting on ThinkTop
Valve “closing” speed reduction	0-100%. Inlet air fitting on actuator
Valve closing speed increase	Quick air exhaust, ø6 mm

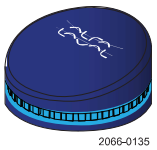
OPERATIONAL DATA

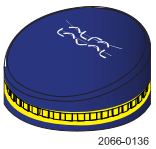
ThinkTop LED indication

ThinkTop features a 360-degree light guide. When the sensor target is within the respective setup position band, the corresponding colour lights up.


2066-0133


2066-0134


2066-0135


2066-0136

Valve position						
	Actuator	All De-energised	Main valve open Energised	Upper seat lift Energised	Lower seat push Energised	Between
ThinkTop Mode	Factory setting	Green flashing	White flashing	Blue flashing	Yellow flashing	Off
	Operation	Green	White	Blue	Yellow	Off
	Not OK	Green/red flashing	White/red flashing	Blue/red flashing	Yellow/red flashing	Red flashing

Auto and Live setup

Auto Setup is a rule-based function. If one of these rules are not present, Flex Setup must be used.

By default, ThinkTop V50 and V70 uses the de-Energised/Energised paradigm for valve positions feedback.

Parameter	Auto Setup/Live Setup	Flex Setup (retrofit mode)
Status feedback (OK or error)	Valve state (Fail safe signal)	Status error
Seat cleaning function	Enabled	Disabled
Valve operation monitor	Enabled	Disabled
Ext. sensor operation monitor	Enabled	Disabled
Interlock	Enabled	Disabled
Output (AS-i master input)	Special	Special
External sensor masking	Enabled	Disabled

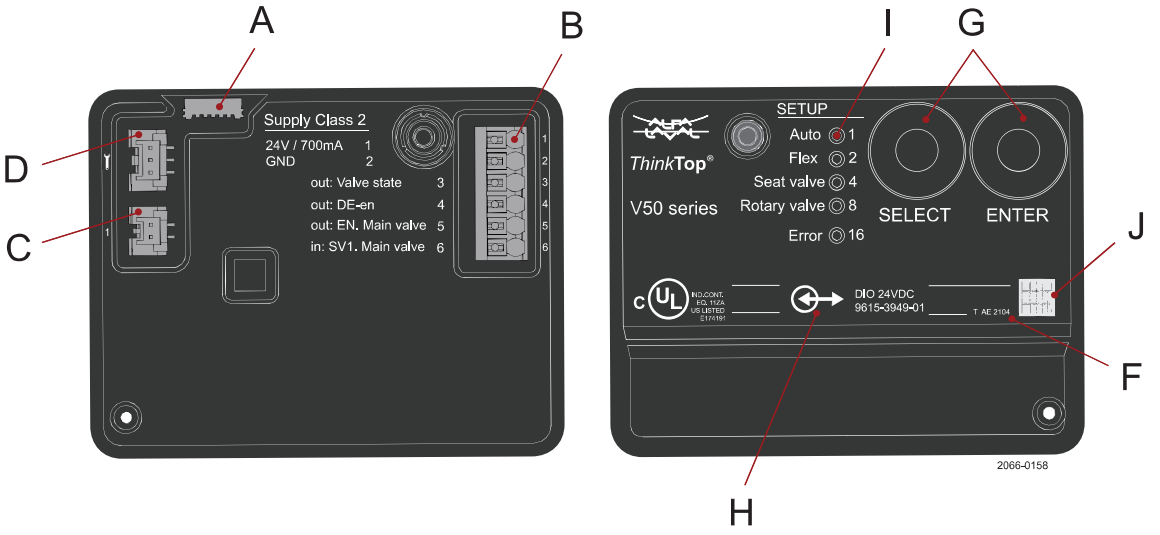
Note!
The "Fail safe signal" is always high for idle operation of ThinkTop and the valve

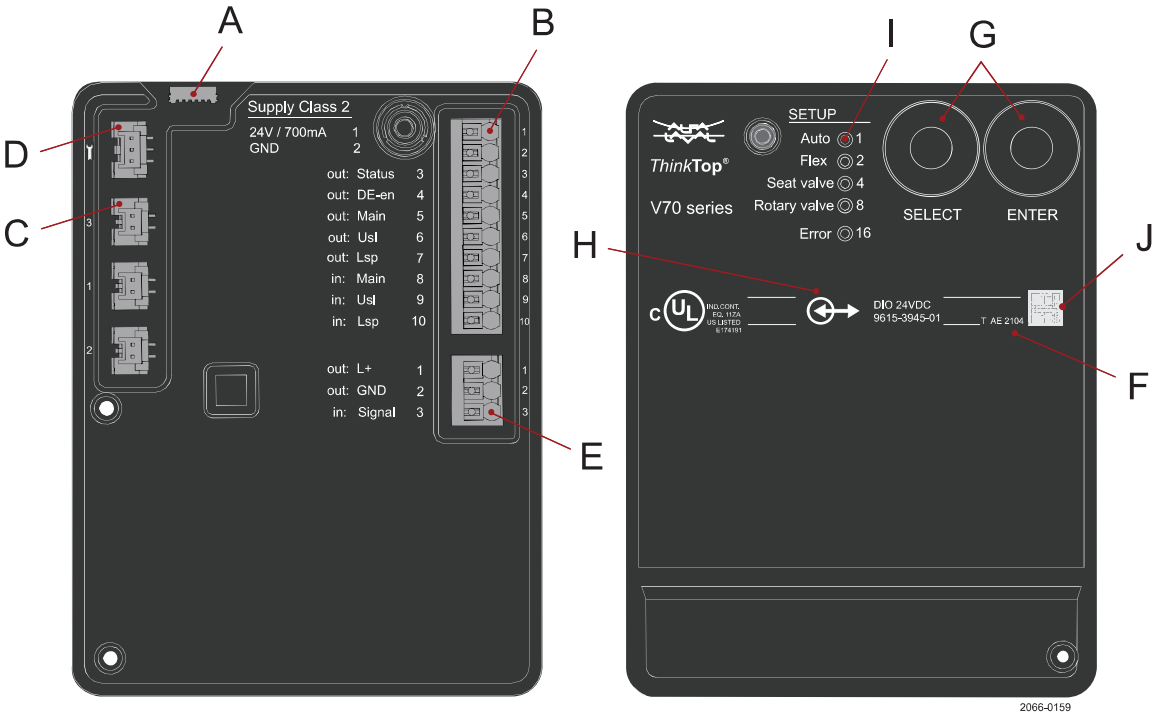
Valve compatibility chart

Use Anytime configurator for correct selection of ThinkTop V50 and V70 on different valve size and types

	Common applications (Auto / Live Setup)	Special applications (Flex Setup)	Incompatible valves
ThinkTop V50	Single Seat valves Small Single Seat valve Butterfly valves Diaphragm valves Ball valves Shutter valves Double seat valves Double seal valve	• ThinkTop classic retrofit mode or alternative setup with no restrictions • Feedback structure such as the open/closed valve feedback • All SSV (1/2" - 4") NO, shut off, maintainable, need to be setup as a rotary valve • Application with no solenoid valve, feedback indication only • One control unit to control multiple valves-actuators • SMP-BC where using 2 solenoid valves to operate main valve and pilot leak-detect valves independently	• Valves without actuator stem and mushrooms • Koltek Type 633 three position actuator, valve size 1" – 3" • Regulating valves • Safety valves • Sample valves • SMP-EC • 700 series • Other valve brands
ThinkTop V70	In addition to the ThinkTop V50 valves Double seat valves Double seal valve Long stroke single seat valves Diaphragm valves Air/Air valves		

Overview of control board V50 and V70





A: LED indication lamp
B: Spring loaded terminals
C: Solenoid valve connectors
D: Diagnostic port (Alfa Laval)
E: Upper seat lift sensor terminal
F: Control board - Firmware version
G: Push buttons "Select" and "Enter"
H: Symbol for electrical interface
I: LEDs for unit status display
J: Non-public QR code

ThinkTop and automated valve-seat cleaning

The standard features Burst seat clean and Pulse seat clean makes it easy to optimize the water consumption during CIP cleaning of the gaskets in Mixproof valves and drain valves.

Information on how to handle pulse seat clean and burst seat clean can be found in the instruction manual, AS-Interface table and in the IO-Link IODD interface description.

Feature availability table

This table shows in which ThinkTop configurations the features are available and if they can be controlled from the PLC.

ThinkTop	Interface	Feature	Availability
V50 and V70	Digital	Pulse clean	Feature not available
V70		Burst clean	2 or 3 solenoid valves - Manual setup
V50 and V70	AS-Interface	Pulse clean	1 solenoid valve - PLC controlled function
V70		Burst clean	2 or 3 solenoid valves - Manual setup or PLC controlled mode
V50 and V70	IO-Link	Pulse clean	1 solenoid valve – PLC controlled function
V70		Burst clean	2 or 3 solenoid valves - Manual setup or PLC controlled mode

ThinkTop pulse seat clean

Intended for high CIP flow pressure and for single seat valves or butterfly valves used as drain valves. No setup required, pulse seat clean is a standard and ready to perform feature in ThinkTop V50 and V70 with one solenoid valve.

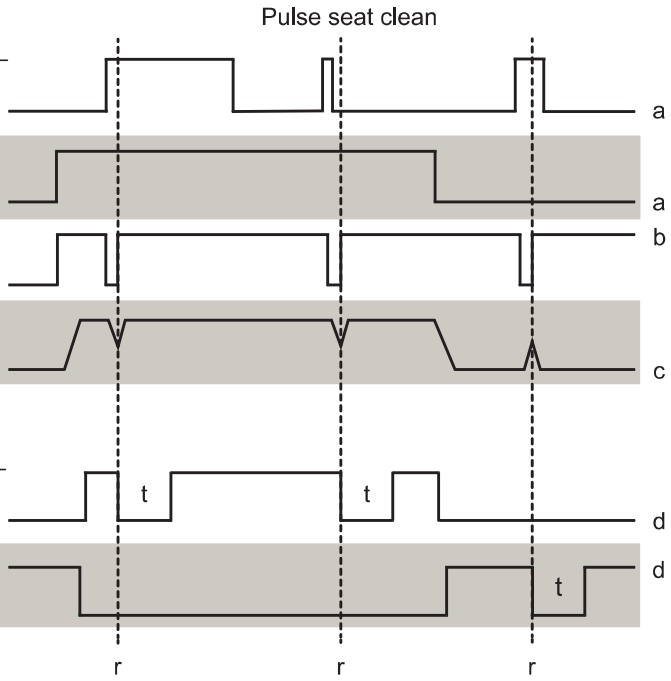
How to PLC control the pulse cleaning function, please set up and follow the function diagram. The PLC input duration (a) to the ThinkTop must be at least 500 ms.

Output table

Bit assignment	AS-I	IO-Link
Trigger signal	O0	O2
Solenoid valve	O1	O4
Solenoid valve state		
Main single seat valve position		

Input table

Bit assignment	AS-I	IO-Link
Main valve energized	I1	I1
Main valve de-energized	I0	I0



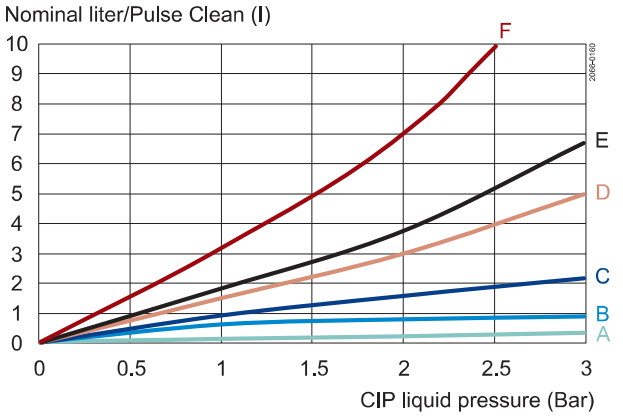
2066-0156

a: Electrical signal from PLC
b: Air output from ThinkTop
c: Physical valve movement
d: Visual LED and electrical signal to PLC
r: Valve position reached
t: 2 sec.

When the valve-position is reached, the pulse seat clean function is released, and the valve returns to the starting position. After which then ready again after 2 seconds to perform another pulse seat clean. A two-second (t) electrical signal and visual feedback (d) is provided as a handshake for successful completion of a pulse seat clean.

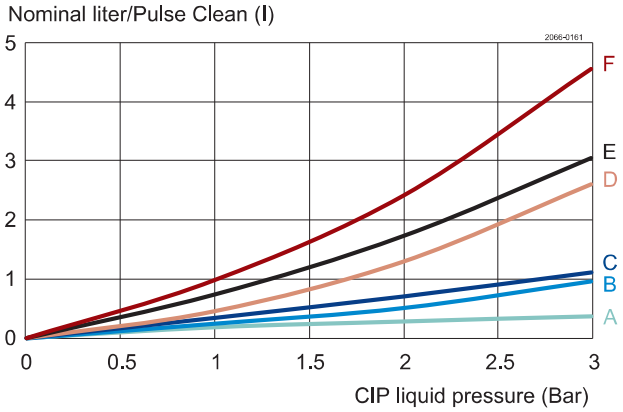
Pulse water consumption graph

ThinkTop V50 and V70 CIP water consumption during pulse seat clean on different sizes of drain valves, provided with 6 bar air pressure to the actuator:



A = 1” - DN25
B = 1.5” - DN40
C = 2” - DN50
D = 2.5” - DN65
E = 3” - DN80
F = 4” - DN100

Figure 1. LKAT-T ø85 and Butterfly valves
1" DN25 to 4" DN100
Air pressure 6 bar



A = 1” - DN25
B = 1.5” - DN40
C = 2” - DN50
D = 2.5” - DN65
E = 3” - DN80
F = 4” - DN100

Figure 2. Unique SSV valves
1" DN25 to 4" DN100
Air pressure 6 bar

ThinkTop burst seat clean

For efficient cleaning of the gaskets in a Mixproof valve during pressurized CIP flow. The burst clean mode is disabled as default and can be enabled either locally on the ThinkTop or remotely from the control system. The feature is available in ThinkTops configured with two or three solenoid valves.

For manual push-button setup, burst seat clean feature can be enabled or disabled on the ThinkTop V70 control board by doing the following. Press "SELECT" (4 times) until LED # 4 flashes, then press 'ENTER' to activate or deactivate the function.

For remotely PLC control of the burst clean mode please refer to the bit table of AS-Interface and IO-Link or the function diagram. With PLC control, the burst clean mode can easily alternate between high CIP flow pressure or CIP gravity cleaning.

When the PLC burst clean mode bit goes **“high”**, the burst seat clean function is enabled, leaving the setting locked and cannot be switched locally or from the HMI system. When the PLC burst clean mode bit goes “low” the function is disabled. While the PLC input is low the mode can be toggled locally on the ThinkTop.

If ThinkTop V70 is set up using Auto Setup without the upper seat lift sensor, the function uses the stored setup stroke time for “Lower seat push” plus 1 second extra for when the solenoid valve is deactivated.

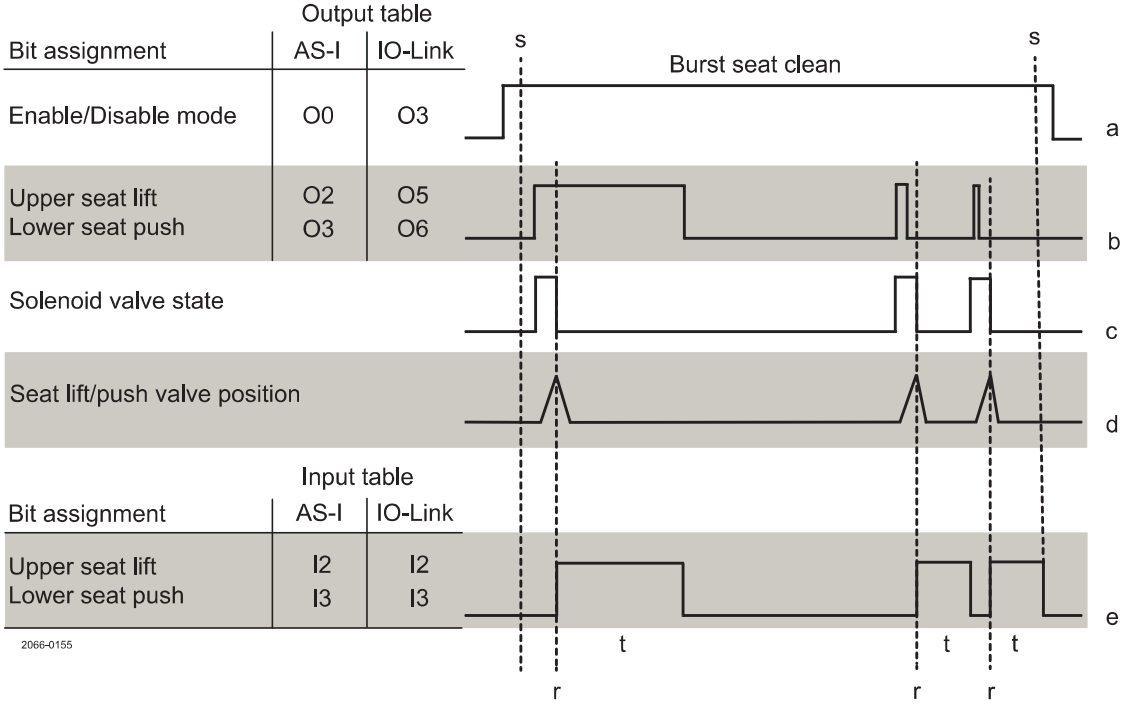
How to control the burst cleaning function, please set up and follow the function diagram. The PLC input duration (b) to ThinkTop must be at least 500 ms.

Output table

Bit assignment	AS-I	IO-Link
Enable/Disable mode	O0	O3
Upper seat lift	O2	O5
Lower seat push	O3	O6

Input table

Bit assignment	AS-I	IO-Link
Upper seat lift	I2	I2
Lower seat push	I3	I3

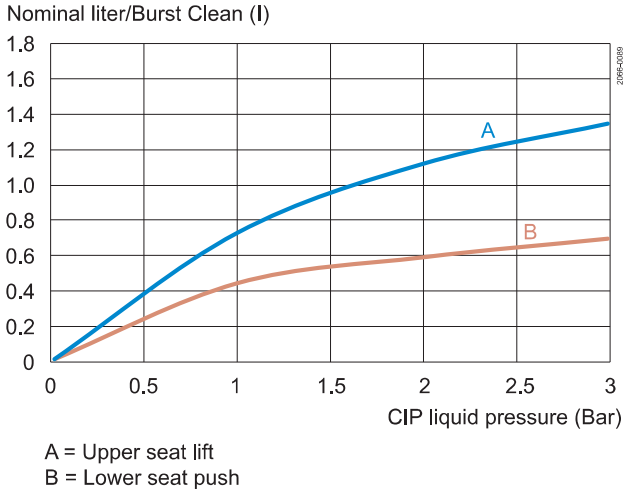


a: Push button or electrical signal from PLC
b: Electrical signal from PLC
c: Electrical activation inside ThinkTop
d: Physical valve movement
e: Visual LED and electrical signal to PLC
r: Valve position reached
s: Signal high during Burst seat cleaning
t: Min. 2 sec.

When the valve-position is reached, the burst seat clean function is released, and the valve returns to the starting position. After which then ready again after 2 seconds to perform another burst cleaning. A minimum two-second (t) electrical signal and visual feedback (e) is provided as a handshake for successful completion of a burst seat clean.

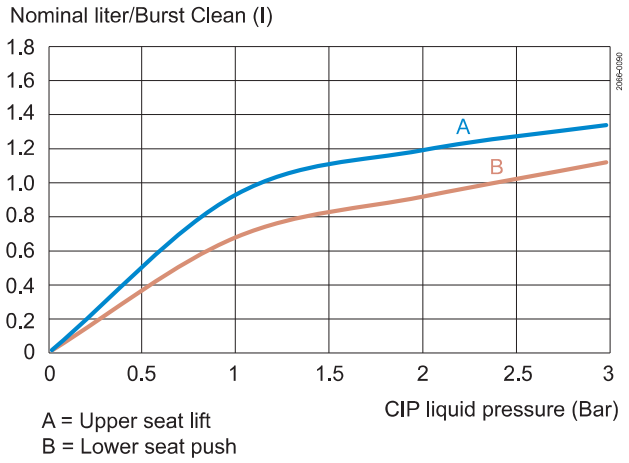
Burst water consumption graph

ThinkTop V70 CIP water consumption during Burst seat clean on different Mixproof valves, provided with 6 bar air pressure:



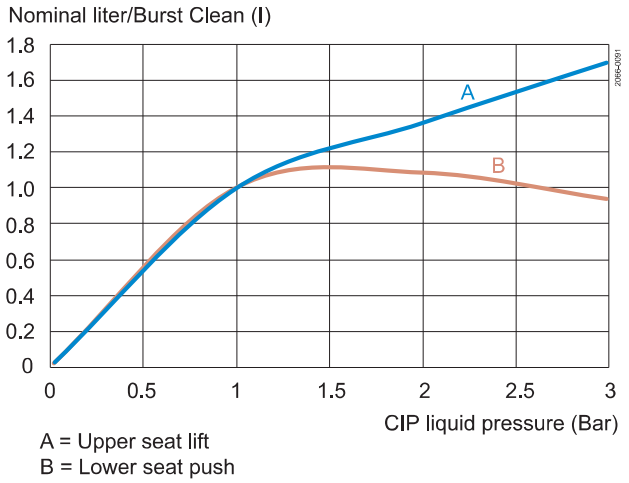
A = Upper seat lift
B = Lower seat push

Figure 3. Unique Mixproof valve / Unique CP-3 Mixproof valve
1.5” DN 40 and 2” DN50
Air pressure 6 bar



A = Upper seat lift
B = Lower seat push

Figure 4. Unique Mixproof valve / Unique CP-3 Mixproof valve
2.5” DN65 and 3” DN80
Air pressure 6 bar



A = Upper seat lift
B = Lower seat push

Figure 5. Unique Mixproof valve / Unique CP-3 Mixproof valve
Figure 5. 4” DN100
Air pressure 6 bar

Compatible valve actuators

List of compatible valve actuators where pulse seat clean and burst seat clean can be applied

ThinkTop V50 and V70	Valve actuators	Applicable
Pulse seat clean	iSeries	Yes
	Single Seat Valves	Yes
	Butterfly Valves - LKLA-T ø85	Yes
	Butterfly Valves - LKLA-T ø133	No
	Diaphragm valves	No
	Ball valves	No
	Shutter valves	No
	Small Single Seat Valves	No
	Safety and Sample valves	No

ThinkTop 70	Valve actuators	Applicable
Burst seat clean	Air/Air valves	Yes
	700 series	No
	2 Step valves	No
	Long stroke valves	Yes
	Double seat valves	Yes
	Double seal valves	No

Valve state – Fail safe signal

The following table gives an overview of behaviour per Error condition where the valve state signal goes low. Further description of the various Error conditions can be found in the ThinkTop Instruction Manual, section 5,2

Valve state is a decentralized functionality, available for all ThinkTop variants and a feature that can be used for monitoring process issues or to ease and simplify the PLC programming of a valve surveillance.

		ThinkTop Digital Valve state	ThinkTop AS-Interface Valve state not available	ThinkTop IO-Link Valve state
Error Code #	Error description	Main valve FAIL SAFE SIGNAL DE-ENERGIZED SIGNAL behaviour	Main valve not available DE-ENERGIZED SIGNAL behaviour	Main valve FAIL SAFE SIGNAL DE-ENERGIZED SIGNAL behaviour
15	Key lock active	na	na	na
16	Sensor target missing	Drops low	Drops low	Drops low
17	Setup prerequisite issue Missing peripherals	Not connected	Not connected	Not connected
18	Pneumatic part issue	Not connected	Not connected	Not connected
19	Seat lift sensor issue	Drops low	Drops low	Drops low
20	Position not reached	Drops low	Drops low	Drops low
21	Unexpected valve movement	Drops low	Drops low	Drops low
22	Seat-lift sensor missing	Drops low	Drops low	Drops low
23	Solenoid valve 1 missing	Drops low	Not connected	Drops low
24	Solenoid valve 2 missing	Drops low	Not connected	Drops low
25	Solenoid valve 3 missing	Drops low	Not connected	Drops low
26	Interlock warning	Drops low	Not connected	Drops low
27	Output short circuit (Digital)	Drops low	Not connected	Not connected
28	Setup aborted	Not connected	Not connected	Not connected
29	Blocked button	Drops low	Not connected	Drops low
30	Voltage Low (Digital)	Drops low	Not connected	Not connected
30	Communication failure (IO-Link)	Not connected	Not connected	Drops low
31	Safety stop	Drops low	Drops low	Drops low
32[1]	Pressure shock event	Not connected	Not connected	Not connected

[1] This event is not treated as an error

Default bitmapping

The default settings apply to both Digital, AS-Interface and IO-Link

ThinkTop V50 truth signal table: default factory setting

	DE-EN (I0) close	MAIN (I1) open	Valve state (Fail safe signal)
DE-EN (No active SV)	1	0	1
MAIN SV1 active (O1)	0	1	1

ThinkTop V70 truth signal table: default factory setting

	DE-EN (I0) all closed	MAIN (I1) open	USL (I2) open	LSP (I3) open	Valve state (Fail safe signal)
DE-EN (No active SV) Both seats closed Lower seat in closed position Upper seat in closed position	1	0	0	0	1
MAIN SV1 active (O1) Lower seat in open valve position Upper seat not closed	0	1	0	0	1
USL SV2 active (O2) Upper seat not close Lower seat in closed position	0	0	1	0	1
LSP SV3 active (O3) Lower seat in seat push position Upper seat in closed position	0	0	0	1	1

USA compliance option

Available to all ThinkTop V70 variants. The USA compliance option refers to a bit mapping interface used in the USA on Mixproof valves, fitted with 3 solenoid valves. This USA bitmapping can be enabled after or before auto setup.

US regulations require independent closed position feedback signals for upper seat lift and lower seat push in a Mixproof valve application

The USA bitmapping are enabled or disabled on the ThinkTop V70 control board. Press "SELECT" (5 times) until LED no 8 flashes, and then press 'ENTER" to enable or disable. This option is also available as an adjustable IO-Link parameter.

The USA compliance option is from factory disabled by default. However, if it is enabled and there is a manual reset to factory default, the USA compliance option remains enabled.

2066-0097

USA bitmapping

The information in the table is based on the following setup:

- ThinkTop V70 with 3 solenoid valves
- IFT series seat lift sensor of type NO or NC
- Mixproof valve with both seats installed (balanced or unbalanced upper plug)
- Any combination of above valve type and sensor type

	DE-EN (I0) Both closed	MAIN (I1) open	USL (I2) closed	LSP (I3) closed	Valve state (Fail safe signal)
DE-EN (No active SV) Both seats closed Lower seat in closed position Upper seat in closed position	1	0	1	1	1
MAIN SV1 active (O1) Lower seat in open valve position Upper seat not closed	0	1	0	0	1
USL SV2 active (O2) Upper seat not closed Lower seat in closed position	0	0	0	1	1
LSP SV3 active (O3) Lower seat in seat push position Upper seat in closed position	0	0	1	0	1

Digital interface

ThinkTop Digital 24V DC

Device name	ThinkTop V50 24V Digital ThinkTop V70 24V Digital
Voltage supply	• 24 VDC ± 10%; according to EN 61131-2
Protection	• Reverse polarity (24 VDC ± 10%); EN 61131-2 • Voltage interruption and brown-out; EN61131 • Short circuit; EN 61131
Current consumption	• Nominal 30mA (Idle)
Outputs to PLC	• Max 100mA (solenoid valve and seat lift sensor active)
PLC input card	• Max rated 24V/100A
UL supply	• Class 2 according to cULus
Voltage-drop	• Typical 3V at 50 mA
Terminal type	• Spring force push-in technology • Supports nominal wire cross-section between 1.0 mm2 [17AWG] and 0.30 mm2 [22AWG] • Supports wire and ferrules for wire cross-section of 0.75 mm2 [18AWG] with pin length 12 mm

Electrical connections

ThinkTop V50

Terminals	Control board	Colour code wires
1	24V	BN (brown)
2	GND	BU (blue)
3	out: Status	WH (white)
4	out: DE-EN	BK (black)
5	out: EN. Main valve	GY (grey)
6	in: SV1. Main valve	PK (pink)

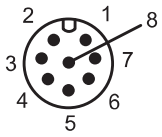
ThinkTop V70

Terminals	Control board	Colour code wires
1	24V	BN (brown)
2	GND	BU (blue)
3	out: Status	WH (white)
4	out: DE-EN	BK (black)
5	out: EN. Main valve	GY (grey)
6	out: USL. Upper seat lift	PK (pink)
7	out: LSP. Lower seat push	VT (violet)
8	in SV1. Main valve	YE (yellow)
9	in SV2. Upper seat lift	GN (green)
10	in SV3. Lower seat push	RD (red)
	Seat lift sensor	
E1	L+	BN (brown)
E2	GND	BU (blue)
E3	Signal	BK (black)

ThinkTop V50

M12 option (8-pin A-coded plug)

Pin numbers and terminal numbers are aligned

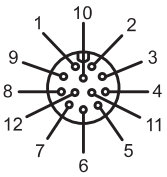
M12 Chassis plug connector	Control board Terminal numbers	M12 pin numbers wire colors
	**Solenoid valve**	**0 or 1x3/2-way**
	1: 24V	Pin 1: BN (brown)
	2: GND[1]	Pin 3: BU (blue)
	3: out: Valve state (Valve state) [1]	Pin 2: WH (white)
	4: out: DE-EN	Pin 4: BK (black)
	5: out: EN. Main valve	Pin 5: GY (grey)
	6: in SV1. Main valve	Pin 6: PK (pink)
	7: nc	-
	8: nc	-

[1] Please be mindful of the difference between the number sequence of the control board terminal and the M12 plug pins

ThinkTop V70

M12 option (12-pin A-coded plug)

Pin numbers and terminal numbers are aligned

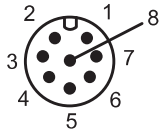
M12 Chassis plug connector	Control board Terminal numbers	M12 pin numbers wire colors
	**Solenoid valves**	**0, 1, 2 and 3x3/2-way or 1x5/2-way**
	1: 24V	Pin 1: BN (brown)
	2: GND[1]	Pin 3: BU (blue)
	3: out: Status (Valve state)[1]	Pin 2: WH (white)
	4: out: DE-EN	Pin 4: BK (black)
	5: out: EN. Main valve	Pin 5: GY (grey)
	6: out: USL Upper seat lift	Pin 6: PK (pink)
	7: out: LSP Lower seat push	Pin 7: VT (violet)
	8: in SV1. Main valve	Pin 8: YE (yellow)
	9: in SV2. Upper seat lift	Pin 9: GN (green)
	10: in SV3. Lower seat push	Pin 10: RD (red)
	11: nc	-
	12: nc	-

[1] Please be mindful of the difference between the number sequence of the control board terminal and the M12 plug pins

ThinkTop V70

M12 accessory (8-pin A-coded plug)

Suggestions for alignment of M12 pin numbers and terminal numbers

M12 Chassis plug connector	Control board Terminal numbers	M12 pin numbers wire colors		
	**Solenoid valve**	**0, 1x3/2 or 5/2-way**	**2x3/2-way**	**3x3/2-way**
	1: 24V	Pin 1: BN (brown)	Pin 1: BN (brown)	Pin 1: BN (brown)
	2: GND [1]	Pin 3: BU (blue)	Pin 3: BU (blue)	Pin 3: BU (blue)
	3: out: Status (Valve state) *1	Pin 2: WH (white)	Pin 2: WH (white)	Pin 2: WH (white)
	4: out: DE-EN	Pin 4: BK (black)	Pin 4: BK (black)	Pin 4: BK (black)
	5: out: EN. Main valve	Pin 5: GY (grey)	Pin 5: GY (grey)	Pin 5: GY (grey)
	6: out: USL Upper seat lift	Pin 6: PK (pink)	Pin 6: PK (pink)	_
	7: out: LSP Lower seat push	Pin 7: VT (violet)	_	_
	8: in SV1. Main valve	Pin 8: YE (yellow)	Pin 8: YE (yellow)	Pin 8: YE (yellow)
	9: in SV2. Upper seat lift [1]	_	Pin 7: VT (violet)	Pin 6: PK (pink)
	10: in SV3. Lower seat push [1]	_	_	Pin 7: VT (violet)

[1] Please be mindful of the difference between the number sequence of the control board terminal and the M12 plug pins

ThinkTop AS-Interface

Device name	ThinkTop V50 ASI2 & ThinkTop V50 ASI3 ThinkTop V70 ASI2 & ThinkTop V70 ASI3
Supply voltage	• AS-Interface 29.5 – 31.6 VDC
Protection	• Reverse polarity (24 VDC ± 10%); EN 61131-2 • Voltage interruption and brown-out; EN 61131 • Short circuit; EN 61131
Current consumption	• Nominal: 30 mA (idle) • Max 100 mA (solenoid valve and seat lift sensor active)
Terminal type	• Spring force push-in technology • Supports nominal wire cross-section between 1.0 mm^2 [17AWG] and 0.30 mm^2 [22AWG] • Supports wire and ferrules for wire cross-section of 0.75 mm^2 [18AWG] with pin length 12 mm
AS-I specification v2.11	• Supports standard addressing and are compatible with M0-M4 AS-I master profiles, allows up to 31 nodes on an AS-I network • **Slave profile = 7FFF**
AS-I specification v3.0	• Supports extended A/B addressing and is compatible with M4 AS-I master profile, allows up to 62 nodes on an AS-I network • **Slave profile = 7A77**
AS-I addressing	• Default slave address (Node) is = **0** • Address (Node) changes with a standard handheld AS-I addressing device or via AS-I Master Gateway

AS-Interface bit table

For the AS-Interface versions, the following bit assignment will be used

PLC system / Gateway Output table	ThinkTop V50	PLC system / Gateway Output table	ThinkTop V70
Pulse clean trigger (1 solenoid valve)	O0	Pulse clean trigger (1 solenoid valve) Burst clean mode (2 or 3 solenoid valves)	O0
SV1. Main valve	O1		O1
SV2. Upper seat lift	nc		O2
SV3. Lower seat push	nc		O3

PLC system / Gateway Input table	ThinkTop V50	PLC system / Gateway Input table	ThinkTop V70
DE-EN	I0		I0
EN. Main valve	I1		I1
Upper seat lift	nc		I2
Lower seat push	nc		I3

Electrical connections

ThinkTop V50

Terminal	Control board	Colour code wires
1	AS-i +	BN (brown)
2	AS-i -	BU (blue)

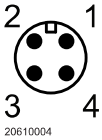
ThinkTop V70

Terminal	Control board	Colour code wires
1	AS-i +	BN (brown)
2	AS-i -	BU (blue)
	Seat lift sensor	
E1	L+	BN (brown)
E2	GND	BU (blue)
E3	Signal	BK (black)

ThinkTop V50 and ThinkTop V70

M12 option (4-pin A-coded plug)

Pin numbers and terminal numbers are aligned

M12 Chassis plug connector	Control board Terminal numbers Functions	M12 pin assignments wire colours
	1: AS-i +	Pin 1: BN (brown)
	2: nc	-
	3: AS-i -	Pin 3: BU (blue)
	4: nc	-

IO-Link interface

ThinkTop IO-Link

In addition to process indication and control, the IO-Link variant enables diagnostic information and features additional functionality that is unique to ThinkTop.

If new functionality is implemented in ThinkTopV50 and V70, then a new IODD and interface description is generated. Both the new and old IODD will be included in the revision of the “ThinkTop IO-Link zip-file”.

It's recommended to just add them all to the preferred IO-Link configuration tool. The configuration tool will automatically match the correct IODD with the connected ThinkTop.

Device name	ThinkTop V50 IOL ThinkTop V70 IOL
IO-Link supply voltage	• 24 VDC ± 10%; according to EN 61131-2
Protection	• Reverse polarity (24 VDC ± 10%); EN 61131-2 • Voltage interruption and brown-out; EN61131 • Short circuit; EN 61131
Current consumption	• Nominal: 30 mA (idle) • Max 100 mA (solenoid valve and seat lift sensor active)
Terminal type	• Spring force push-in technology • Supports nominal wire cross-section between 1.0 mm2 [17AWG] and 0.30 mm2 [22AWG] • Supports wire and ferrules for wire cross-section of 0.75 mm2 [18AWG] with pin length 12 mm
ThinkTop control board revisions	• The interface description " **Before** Dec. 2021" match ThinkTop control boards of revisions AA to AD • The interface description marked " **After** Dec. 2021" match ThinkTop control boards of revision AE or later
Download of IO-Link files	• Alfa Laval Anytime and ThinkTop configurator • Go to www.alfalaval.com ThinkTop and documentation • Go to www.io-link.com Click IODD finder and key ThinkTop
IO-Link interface tool	• IFM E30390 IO-Link Interface / USB IO-Link master • IFM LR Device – Line recorder
ThinkTop V50	• " **Before** Dec. 2021" match Device ID 1 " **After** Dec. 2021" match Device ID 9
ThinkTop V70	• " **Before** Dec. 2021" match Device ID 2 " **After** Dec. 2021" match Device ID 10
Cable length to IO-Link master	• Max 20 meters
Transmission rate	• COM 2 (38.4 kBaud)
Minimum cycle time	• 5 ms
Data storage	• yes
Profiles	• na
SIO mode	• no
Port class	• A

IO-Link data table

For the IO-Link version, the bit assignment and diagnostic data can be found in the manual "IO-Link Interface Description" for ThinkTop V50 and ThinkTop V70 respectively. Go to www.alfalaval.com ThinkTop V and documentation

On ThinkTop V50 and ThinkTop V70 control board, using the IO-Link interface tool from IFM, all parameter settings and visualisation data are available through the diagnostic connection port

From the "IO-Link Interface Description" the table below shows an overview of the data storage parameters. When replacing a ThinkTop V-series on a process plant, some data are re-stored, included in the new ThinkTop V-series, and other data must be reassigned again, excluded in the new ThinkTop V-series.

Please note that data storage is a feature that must be actively selected in the PLC's hardware configuration when setting up the IO-link master.

Included	Excluded
Customization • Application Specific Tag • Error modifier timeout • Function Tag • Location Tag • Power save • Button lock • RGB colour • Seat valve pulse • Rotary valve pulse • USA bit mapping	Control board ID • Vendor Name • Vendor Text • Product Name • Product ID • Product Text • Serial Number • Hardware Version • Firmware Version • Prod Date
	Setup data • Setup positions • Setup state
	Diagnostics • SV-activations • SV-ON_time • PV-SetupStrokeEn • PV-SetupStrokeDeEn • PressureShockCnt • Temp • Log

Electrical connections

ThinkTop V50

Terminal	Control board	Colour code wires
1	L +24V	BN (brown)
2	L -GND	BU (blue)
3	IO-Link signal	BK (black)

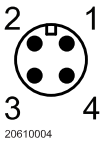
ThinkTop V70

Terminal	Control board	Colour code wires
1	L +24V	BN (brown)
2	L -GND	BU (blue)
3	IO-Link signal	BK (black)
	Seat lift sensor	
E1	L+	BN (brown)
E2	GND	BU (blue)
E3	Signal	BK (black)

ThinkTop V50 and V70

M12 option (4-pin A-coded plug)

Pin numbers and terminal numbers are aligned

M12 Chassis plug connector	Control board Terminal numbers	M12 pin assignments wire colours
	1: L +	Pin 1: BN (brown)
	2: nc	-
	3: L -	Pin 3: BU (blue)
	4: Out1	Pin 4: BK (black)

200006074-1-EN-GB

How to contact Alfa Laval

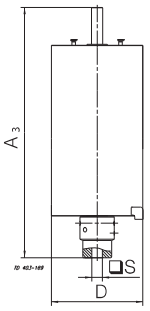
Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

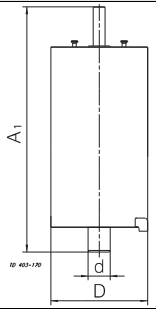
Ordering Leaflet

Alfa Laval Air Actuator LKLA-T

Actuators ø85 and ø133 for LKB, LKB-2 and LKB-F valves
Product code: 5228

Item No.	PPL EUR	Size		Function	Dimension (mm)				
1.4301 (304)		mm	DN		A_3	D	d	S	With coupling
9612194002		25-63.5	25-50	NC	236.1	85		8	
9612194003		76.1	65-80	NC	234.1	85		10	
9612194007		101.6	100	NC	234.1	85		12	
9612374906		101.6	100	NC	363.5	133		12	
9612374911			125	NC	363.5	133		14	
9612374916		152	150	NC	363.5	133		15	
9612194005		25-63.5	25-50	NO	236.1	85		8	
9612194006		76.1	65-80	NO	234.1	85		10	
9612194008		101.6	100	NO	234.1	85		12	
9612374907		101.6	100	NO	363.5	133		12	
9612374912			125	NO	363.5	133		14	
9612374917		152	150	NO	363.5	133		15	
9612194102		25-63.5	25-50	A/A	236.1	85		8	
9612194103		76.1	65-80	A/A	234.1	85		10	
9612194104		101.6	100	A/A	234.1	85		12	
9612194202			125	A/A	237.1	85		14	
9612194201		152	150	A/A	237.1	85		15	
9612374908		101.6	100	A/A	363.5	133		12	
9612374913			125	A/A	363.5	133		14	
9612374918		152	150	A/A	363.5	133		15	
					A_1	D	d	S	Without coupling
9612194001				NC	217.1	85	17		
9612374901				NC	337	133	30		
9612194004				NO	217.1	85	17		
9612374902				NO	337	133	30		
9612194101				A/A	217.1	85	17		
9612194203				A/A	217.1	85	20		
9612374903				A/A	337	133	30		





* NOTE! Sold before 890601 - LKB 101.6: Square S = 10 mm.

Alfa Laval recommends actuator size for ø133 ≥ 101.6/DN100

ESE01162en 2101

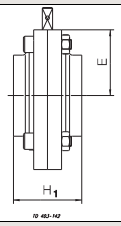
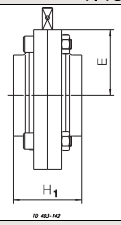
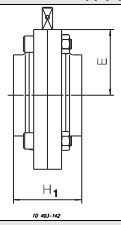
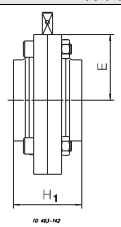
How to contact Alfa Laval
Contact details for all countries
are continually updated on our website.
Please visit www.alfalaval.com to
access the information direct.

Ordering Leaflet

Alfa Laval LKB Automatic or Manual Butterfly Valve

Product code: 5204

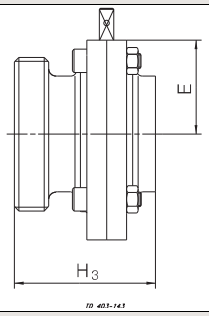
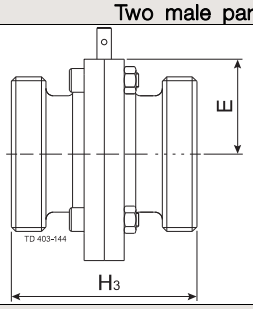
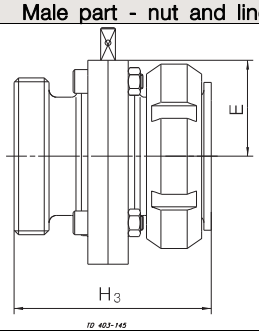
Material: See below
Connection: ISO Welding ends
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_1	1.4307 (304L)
9611440300		9611444500		9611444580		25	32.5	47	
9611440250		9611444510		9611444590		38	32.5	47	
9611440260		9611444520		9611444600		51	42.0	52	
9611440270		9611444530		9611444610		63.5	52.0	54	
9611440280		9611444540		9611444620		76.1	57.0	62	
9611410290		9611414550		9611414630		101.6	77.0	80	
9612935201		9611414571		9611414651		152.0	104.0	80	
HNBR		PFA							1.4307 (304L)
9612650200		Not available				25	32.5	47	
9612650201		9612943202				38	32.5	47	
9612650202		9612943203				51	42.0	52	
9612650203		9612943204				63.5	52.0	54	
9612650204		9612943205				76.1	57.0	62	
9612650205		9612943206				101.6	77.0	80	
9612935203		Not available				152	104.0	80	
Silicone (Q)		EPDM		FPM					1.4404 (316L)
9611442191		9611444501		9611444581		25	32.5	47	
9611442211		9611444511		9611444591		38	32.5	47	
9611442221		9611444521		9611444601		51	42.0	52	
9611442231		9611444531		9611444611		63.5	52.0	54	
9611442241		9611444541		9611444621		76.1	57.0	62	
9611412261		9611414551		9611414631		101.6	77.0	80	
9612935202		9611414572		9611414652		152.0	104.0	80	
HNBR		PFA							1.4404 (316L)
9612650206		Not available				25	32.5	47	
9612650207		9612943214				38	32.5	47	
9612650208		9612943215				51	42.0	52	
9612650209		9612943216				63.5	52.0	54	
9612650210		9612943217				76.1	57.0	62	
9612650211		9612943218				101.6	77.0	80	
9612935204		Not available				152	104.0	80	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

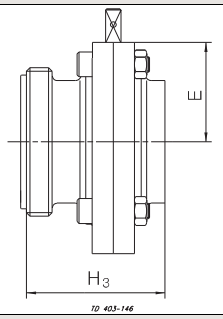
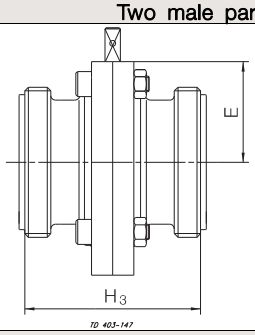
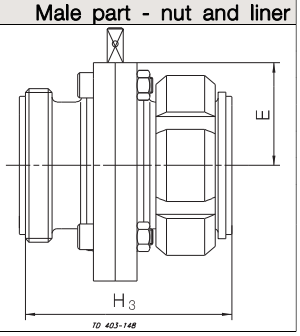
Material: 1.4404 (316L)
Connection: SMS
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611442401		9611445061		9611445791		25	32.5	62	
9611442411		9611445071		9611445801		38	32.5	67	
9611442421		9611445081		9611445811		51	42.0	72	
9611442431		9611445091		9611445821		63.5	52.0	78	
9611442441		9611445101		9611445831		76.1	57.0	86	
9611412451		9611415111		9611415841		101.6	77.0	115	
									Two male parts
9611442471		9611445151		9611445871		25	32.5	77	
9611442481		9611445161		9611445881		38	32.5	87	
9611442491		9611445171		9611445891		51	42.0	92	
9611442501		9611445181		9611445901		63.5	52.0	102	
9611442511		9611445191		9611445911		76.1	57.0	110	
9611412521		9611415201		9611415921		101.6	77.0	150	
									Male part - nut and liner
9611442541		9611445231		9611445951		25	32.5	89.5	
9611442551		9611445241		9611445961		38	32.5	96.0	
9611442561		9611445251		9611445971		51	42.0	101.0	
9611442571		9611445261		9611445981		63.5	52.0	107.0	
9611442581		9611445271		9611445991		76.1	57.0	116.0	
9611412591		9611415281		9611416001		101.6	77.0	147.0	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

Material: 1.4307 (304L)
Connection: ISO (IDF)
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611440332		9611444822		9611445552		25	32.5	65.5	
9611440202		9611444832		9611445562		38	32.5	65.5	
9611440212		9611444842		9611445572		51	42.0	70.5	
9611440222		9611444852		9611445582		63.5	52.0	72.5	
9611440232		9611444862		9611445592		76.1	57.0	80.5	
9611410242		9611414872		9611415602		101.6	77.0	98.5	
									Two male parts
9611440362		9611444902		9611445632		25	32.5	84	
9611440102		9611444912		9611445642		38	32.5	84	
9611440112		9611444922		9611445652		51	42.0	89	
9611440122		9611444932		9611445662		63.5	52.0	91	
9611440132		9611444942		9611445672		76.1	57.0	99	
9611410142		9611414952		9611415682		101.6	77.0	117	
									Male part - nut and liner
9611440392		9611444982		9611445712		25	32.5	97.5	
9611440152		9611444992		9611445722		38	32.5	97.5	
9611440162		9611445002		9611445732		51	42.0	102.5	
9611440172		9611445012		9611445742		63.5	52.0	104.5	
9611440182		9611445022		9611445752		76.1	52.0	112.5	
9611410192		9611415032		9611415762		101.6	77.0	140.0	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

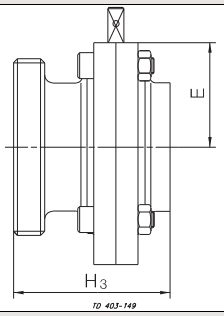
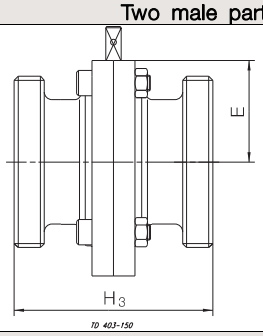
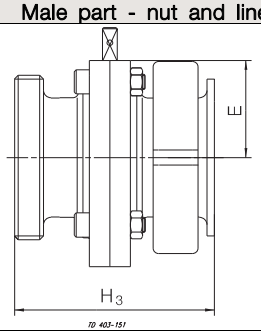
Material: 1.4404 (316L)
Connection: ISO (IDF)
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611442402		9611445062		9611445792		25	32.5	65.5	
9611442412		9611445072		9611445802		38	32.5	65.5	
9611442422		9611445082		9611445812		51	42.0	70.5	
9611442432		9611445092		9611445822		63.5	52.0	72.5	
9611442442		9611445102		9611445832		76.1	57.0	80.5	
9611412452		9611415112		9611415842		101.6	77.0	98.5	
									Two male parts
9611442472		9611445152		9611445872		25	32.5	84	
9611442482		9611445162		9611445882		38	32.5	84	
9611442492		9611445172		9611445892		51	42.0	89	
9611442502		9611445182		9611445902		63.5	52.0	91	
9611442512		9611445192		9611445912		76.1	57.0	99	
9611412522		9611415202		9611415922		101.6	77.0	117	
									Male part - nut and liner
9611442542		9611445232		9611445952		25	32.5	97.5	
9611442552		9611445242		9611445962		38	32.5	97.5	
9611442562		9611445252		9611445972		51	42.0	102.5	
9611442572		9611445262		9611445982		63.5	52.0	104.5	
9611442582		9611445272		9611445992		76.1	57.0	112.5	
9611412592		9611415282		9611416002		101.6	77.0	140.0	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

Material: 1.4307 (304L)
Connection: DS
Inside surface finish: Ra ≤ 0.8 µm

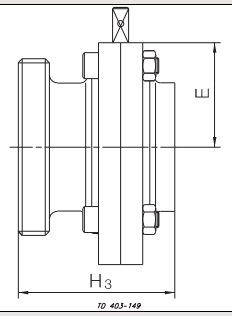
Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611440330		9611444820		9611445550		25	32.5	65.5	
9611440200		9611444830		9611445560		38	32.5	67	
9611440210		9611444840		9611445570		51	42.0	72	
9611440220		9611444850		9611445580		63.5	52.0	78	
9611440230		9611444860		9611445590		76.1	57.0	86	
9611410240		9611414870		9611415600		101.6	77.0	104	
									Two male parts
9611440360		9611444900		9611445630		25	32.5	84	
9611440100		9611444910		9611445640		38	32.5	87	
9611440110		9611444920		9611445650		51	42.0	92	
9611440120		9611444930		9611445660		63.5	52.0	102	
9611440130		9611444940		9611445670		76.1	57.0	110	
9611410140		9611414950		9611415680		101.6	77.0	128	
									Male part - nut and liner
9611440390		9611444980		9611445710		25	32.5	96.5	
9611440150		9611444990		9611445720		38	32.5	98.0	
9611440160		9611445000		9611445730		51	42.0	103.0	
9611440170		9611445010		9611445740		63.5	52.0	110.0	
9611440180		9611445020		9611445750		76.1	57.0	118.0	
9611410190		9611415030		9611415760		101.6	77.0	136.0	

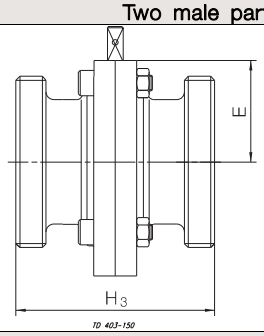
NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

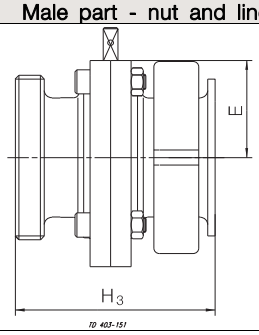
Product code: 5207

Material: 1.4404 (316L)
Connection: DS
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611442400		9611445060		9611445790		25	32.5	65.5	
9611442410		9611445070		9611445800		38	32.5	67.0	
9611442420		9611445080		9611445810		51	42.0	72.0	
9611442430		9611445090		9611445820		63.5	52.0	78.0	
9611442440		9611445100		9611445830		76.1	57.0	86.0	
9611412450		9611415110		9611415840		101.6	77.0	104.0	
									Two male parts
9611442470		9611445150		9611445870		25	32.5	84	
9611442480		9611445160		9611445880		38	32.5	87	
9611442490		9611445170		9611445890		51	42.0	92	
9611442500		9611445180		9611445900		63.5	52.0	102	
9611442510		9611445190		9611445910		76.1	57.0	110	
9611412520		9611415200		9611415920		101.6	77.0	128	
									Male part - nut and liner
9611442540		9611445230		9611445950		25	32.5	96.5	
9611442550		9611445240		9611445960		38	32.5	98.0	
9611442560		9611445250		9611445970		51	42.0	103.0	
9611442570		9611445260		9611445980		63.5	52.0	110.0	
9611442580		9611445270		9611445990		76.1	57.0	118.0	
9611412590		9611415280		9611416000		101.6	77.0	136.0	



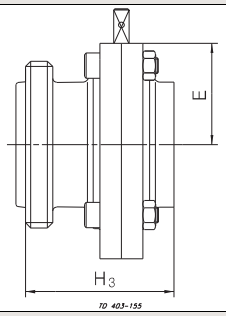
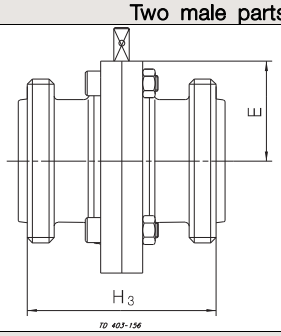
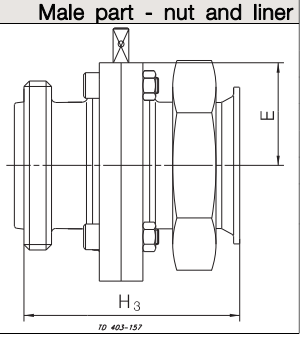




NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

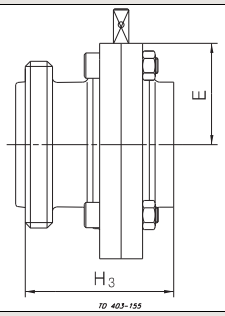
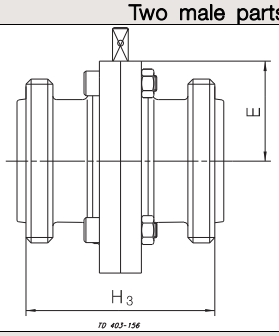
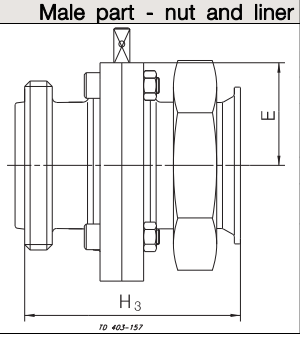
Material: 1.4307 (304L)
Connection: BS
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611440333		9611444823		9611445553		25	32.5	69.2	
9611440203		9611444833		9611445563		38	32.5	69.2	
9611440213		9611444843		9611445573		51	42.0	74.2	
9611440223		9611444853		9611445583		63.5	52.0	76.2	
9611440233		9611444863		9611445593		76.1	57.0	84.2	
9611410243		9611414873		9611415603		101.6	77.0	107.0	
									Two male parts
9611440363		9611444903		9611445633		25	32.5	91.4	
9611440103		9611444913		9611445643		38	32.5	91.4	
9611440113		9611444923		9611445653		51	42.0	96.4	
9611440123		9611444933		9611445663		63.5	52.0	98.4	
9611440133		9611444943		9611445673		76.1	57.0	106.4	
9611410143		9611414953		9611415683		101.6	77.0	134.0	
									Male part - nut and liner
9611440393		9611444983		9611445713		25	32.5	101.9	
9611440153		9611444993		9611445723		38	32.5	101.9	
9611440163		9611445003		9611445733		51	42.0	106.9	
9611440173		9611445013		9611445743		63.5	52.0	108.9	
9611440183		9611445023		9611445753		76.1	57.0	116.9	
9611410193		9611415033		9611415763		101.6	77.0	139.7	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

Product code: 5207

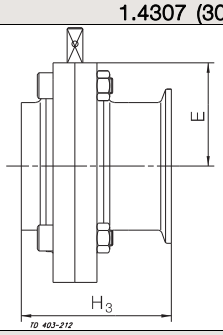
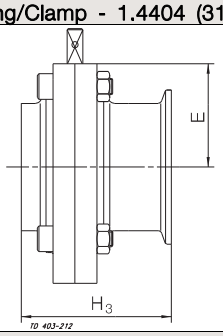
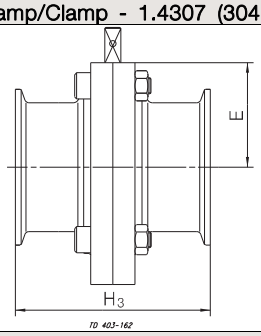
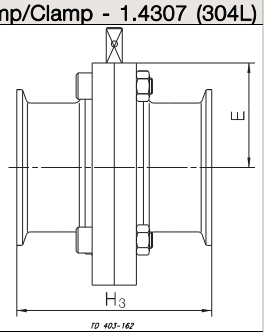
Material: 1.4404 (316L)
Connection: BS
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Male part/Welding ends
9611442403		9611445063		9611445793		25	32.5	69.2	
9611442413		9611445073		9611445803		38	32.5	69.2	
9611442423		9611445083		9611445813		51	42	74.2	
9611442433		9611445093		9611445823		63.5	52	76.2	
9611442443		9611445103		9611445833		76.1	57	84.2	
9611412453		9611415113		9611415843		101.6	77	107.0	
									Two male parts
9611442473		9611445153		9611445873		25	32.5	91.4	
9611442483		9611445163		9611445883		38	32.5	91.4	
9611442493		9611445173		9611445893		51	42	96.4	
9611442503		9611445183		9611445903		63.5	52	98.4	
9611442513		9611445193		9611445913		76.1	57	106.4	
9611412523		9611415203		9611415923		101.6	77	134.0	
									Male part - nut and liner
9611442543		9611445233		9611445953		25	32.5	102.2	
9611442553		9611445243		9611445963		38	32.5	102.2	
9611442563		9611445253		9611445973		51	42	107.2	
9611442573		9611445263		9611445983		63.5	52	109.2	
9611442583		9611445273		9611445993		76.1	57	117.2	
9611412593		9611415283		9611416003		101.6	77	152.4	

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

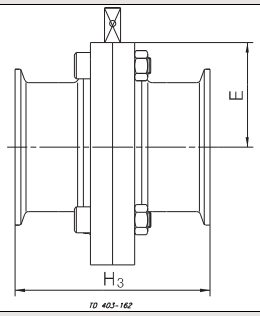
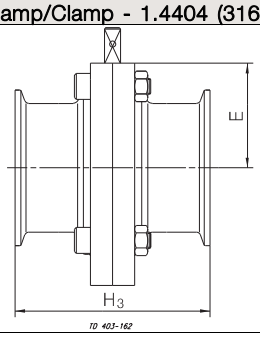
Product code: 5207

Material: See below
Connection: ISO Clamp
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	E	H_3	Welding/Clamp 1.4307 (304L)
9612924001		9612924007		9612924013		25	32.5	68.5	
9612924002		9612924008		9612924014		38	32.5	68.5	
9612924003		9612924009		9612924015		51	42.0	73.5	
9612924004		9612924010		9612924016		63.5	52.0	75.5	
9612924005		9612924011		9612924017		76.1	57.0	83.5	
9612924006		9612924012		9612924018		101.6	77.0	101.5	
									Welding/Clamp - 1.4404 (316L)
9612924019		9612924025		9612924031		25	32.5	68.5	
9612924020		9612924026		9612924032		38	32.5	68.5	
9612924021		9612924027		9612924033		51	42.0	73.5	
9612924022		9612924028		9612924034		63.5	52.0	75.5	
9612924023		9612924029		9612924035		76.1	57.0	83.5	
9612924024		9612924030		9612924036		101.6	77.0	101.5	
									Clamp/Clamp - 1.4307 (304L)
9611440365		9611444905		9611445635		25	32.5	90	
9611440105		9611444915		9611445645		38	32.5	90	
9611440115		9611444925		9611445655		51	42.0	95	
9611440125		9611444935		9611445665		63.5	52.0	97	
9611440135		9611444945		9611445675		76.1	57.0	105	
9611410145		9611414955		9611415685		101.6	77.0	123	
9613434440		9613434441		9613434442		152.0	104.0	156.2	
HNBR		PFA							Clamp/Clamp - 1.4307 (304L)
9613434401		Not available				25	32.5	90	
9613434402		9613434412				38	32.5	90	
9613434403		9613434413				51	42.0	95	
9613434404		9613434414				63.5	52.0	97	
9613434405		9613434415				76.1	57.0	105	
9613434406		9613434416				101.6	77.0	123	
9613434407		Not available				152	104.0	156.2	

Product code: 5207

Material: See below
Connection: ISO Clamp
Inside surface finish: Ra ≤ 0.8 µm

Item No.	PPL EUR	Item No.	PPL EUR	Item No.	PPL EUR	Size	Dimension (mm)		
Silicone (Q)		EPDM		FPM		ISO DN/OD	Clamp/Clamp - 1.4404 (316L)		
9611442475		9611445155		9611445875		25	32.5	90	
9611442485		9611445165		9611445885		38	32.5	90	
9611442495		9611445175		9611445895		51	42.0	95	
9611442505		9611445185		9611445905		63.5	52.0	97	
9611442515		9611445195		9611445915		76.1	57.0	105	
9611412525		9611415205		9611415925		101.6	77.0	123	
9613434443		9613434444		9613434445		152.0	104.0	156.2	
HNBR		PFA							Clamp/Clamp - 1.4404 (316L)
9613434421		Not available				25	32.5	90	
9613434422		9613434432				38	32.5	90	
9613434423		9613434433				51	42.0	95	
9613434424		9613434434				63.5	52.0	97	
9613434425		9613434435				76.1	57.0	105	
9613434426		9613434436				101.6	77.0	123	
9613434427		Not available				152.0	104.0	156.2	

* = On request

NOTE! Other combinations on request. Operating parts, handles and actuators please see later this chapter.

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Alfa Laval LKB and LKB-F

Butterfly valves

Introduction

The Alfa Laval LKB Butterfly Valve is a reliable, hygienic in-line valve for routing low and medium-viscosity liquids in stainless steel pipe systems due to its substantial opening area and low flow resistance. The LKB is available with a standard handle with spring-locking action for straightforward manual operation or with a pneumatic actuator for pneumatic operation.

Application

This hygienic valve is designed for on-off duties with low to medium-viscosity liquids in hygienic applications across the dairy, food, beverage, brewery and many other industries.

Benefits

- Versatile, highly modular, hygienic design
- Reliable, cost-effective performance
- Easy to configure in either a manual version or a pneumatic version

Standard design

The LKB Butterfly Valve consists of two valve body halves, valve disc, and bushings for the disc stem and a seal ring. These components are assembled by means of screws and nuts. The valve comes with standard weld ends but can also be supplied with fittings. The valve can also be fitted with the Alfa Laval ThinkTop® V50 and V70 for sensing and control of the valve.

The valve is available in these dimension standards: the LKB for ISO and the LKB-2 for DIN tubes. The LKB is also available in a flange version, the LKB-F, with two flanges and two flange seal rings for easy removal of the valve body without dismantling further piping setups.

The actuator is available in two versions, the LKLA and the LKLA-T (T for mounting of an indication or control unit on the actuator) and in two sizes, ø85 mm and ø133 mm, to cover all valve requirements. The actuator is fitted onto the valve using a bracket and screws. A handle for manual operation is fitted onto the valve by means of a cap/block system and a screw.

Working principle

The Alfa Laval LKB Butterfly Valve can be operated either by means of a pneumatic actuator from a remote location or manually operated by means of a handle. The actuator comes

in three standard versions: normally closed (NC); normally open (NO); and, air/air activated (A/A).

For pneumatic operation, an actuator converts axial piston motion into a 90° rotation of the shaft. The actuator torque increases as the valve disc comes into contact with the seal ring of the butterfly valve to secure proper closing of the valve seat.

For manual operation, a handle mechanically locks the valve in open or closed position. Two-position, four-position, regulating 90°-position, and multi-position handles are available. Manual valves can also be mounted with indication units for feedback on the valve position (open/closed).

TECHNICAL DATA

Valve	
Max. product pressure:	1000 kPa (10 bar)
Min. product pressure:	Full vacuum
Temperature range:	-10°C to + 140°C (EPDM) However max. 95°C when operating the valve (All seals)

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

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

PHYSICAL DATA

Valve bodies	
Product wetted steel parts:	1.4307 (304L) or 1.4404 (316L)
Disc:	1.4301 (304) or 1.4404 (316L)
Other steel parts:	1.4301 (304)
Rubber grades:	Q, EPDM, FPM, HNBR[1] or PFA[1]
Bushes for valve disc:	PVDF
Finish:	Semi-bright
Inside surface finish:	≤ Ra 0.8 µm

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

Actuator	
Actuator body:	1.4307 (304L)
Piston:	Light alloy (for ø85 mm: Bronze) Air/air version
Seals:	NBR

Options

- Male parts or clamp liners in accordance with required standard.
- ThinkTop® for control and indication.[1]
- Indication unit with micro switches.[1]
- Indication unit with inductive proximity switches.[1]
- Indication unit with Hall proximity switches.[1]
- Explosion proof indication unit with inductive proximity switches.[1]
- Bracket for actuator. (Also for ball valves).
- Handle with two or four positions (standard on DN125 and DN150).
- Handle for electrical position indication.
- Handle with infinite intermediate positions (not for DN125 and DN150).
- Multipositioning handle[2].
- Lockable Multiposition Handle. Padlock can be mounted as shown in fig. 3.**Note!** Padlock is not delivered.
- Special cap for 90° turned handle position.
- Service tool for actuator.
- Service tool for fitting 25-38 mm (DN25 - DN40) valve discs.

Note! For further details, see also ESE02446.

[1] For further information see Product Catalogue chapter "Control & Indication".

[2] **Note!** A padlock can be mounted on the Lockable Multiposition. Handle as shown in the opposite figure. Padlock is not delivered.

LKB Handle Options

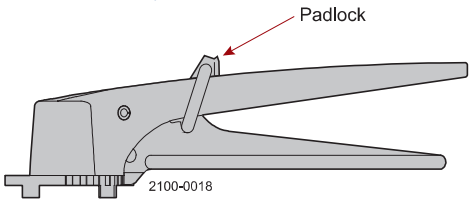


Figure 1. Lockable Multiposition Handle with padlock

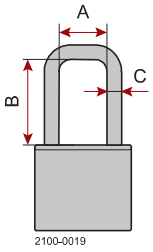


Figure 2. Dimensions - padlock

A. Min. 20 mm

B. Min. 35 mm

C. ø6 mm

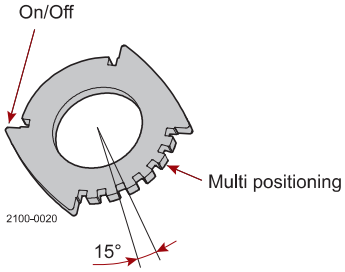


Figure 3. Positioning cap

Capacity/Pressure drop diagrams

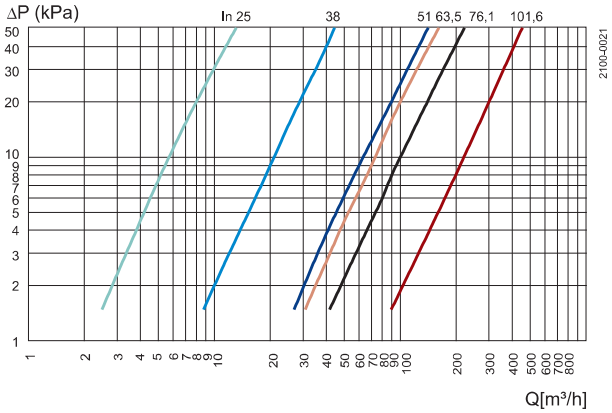


Figure 4. LKB and LKB-F fully open

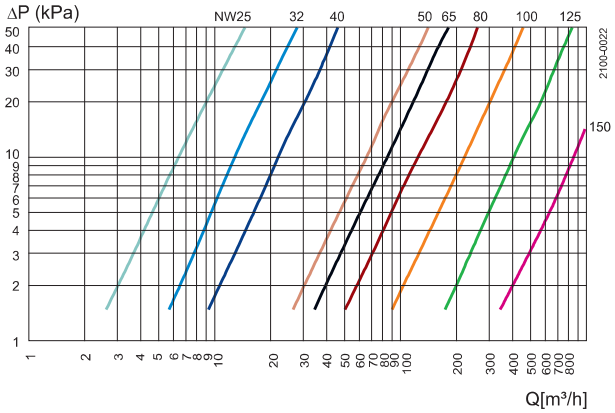


Figure 5. LKB-2 and LKB-F fully open

Note! For the diagrams the following applies:
Medium: Water (20°C).
Measurement: In accordance with VDI 2173.

Torque diagrams - Actuator

LKLA ø85 mm:

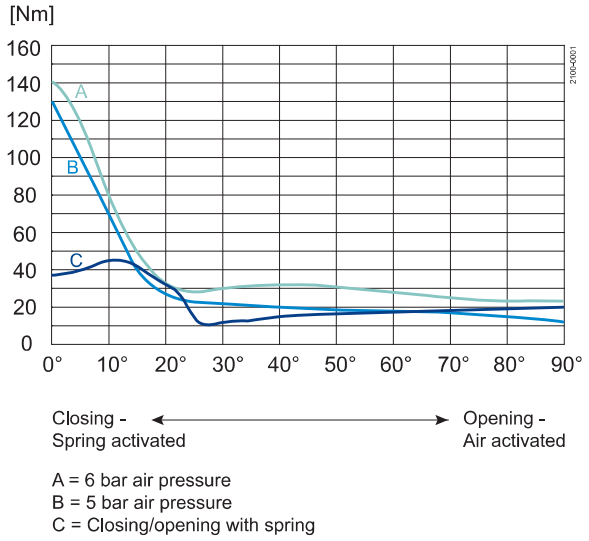


Figure 6. NC

LKLA ø133 mm:

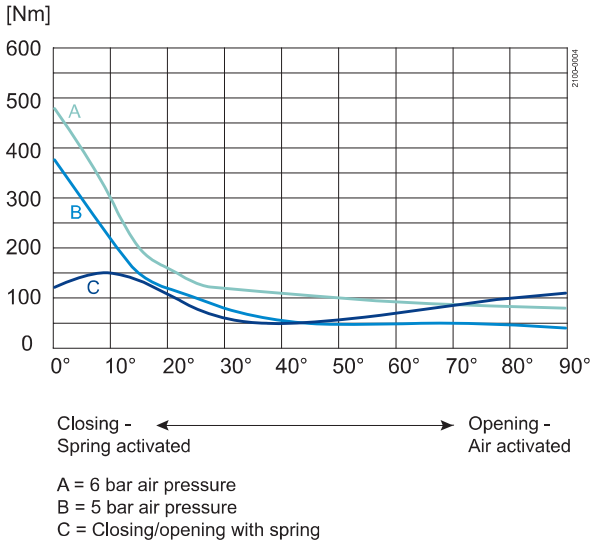


Figure 7. NC

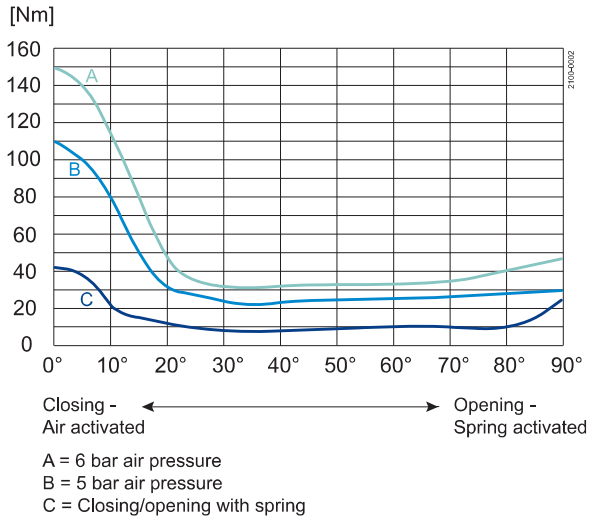


Figure 8. NO

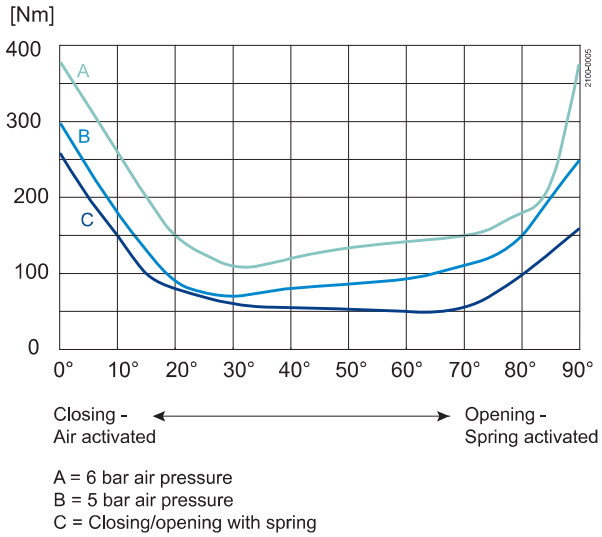


Figure 9. NO

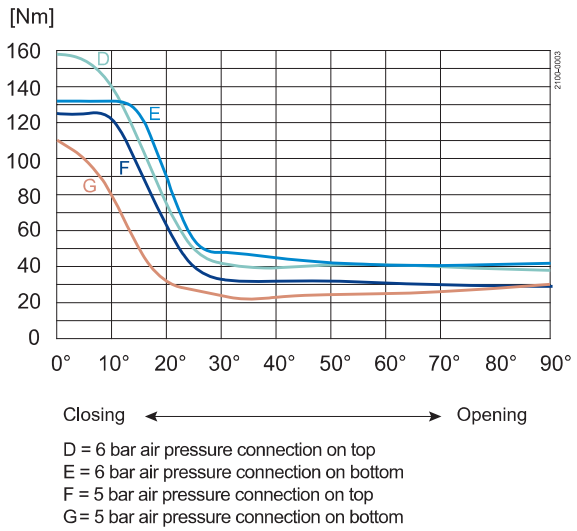


Figure 10. A/A

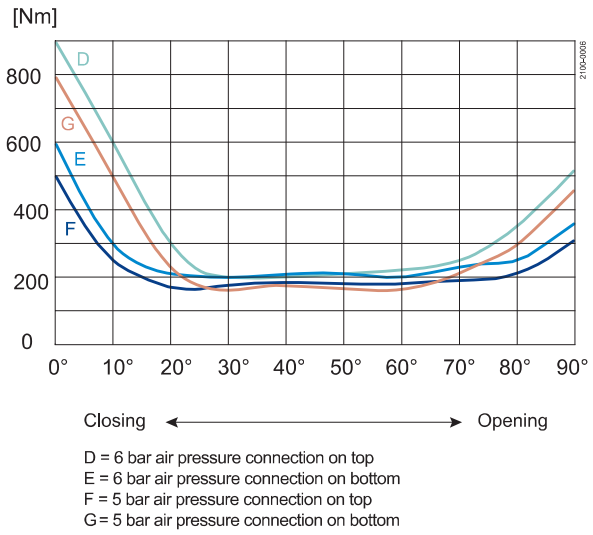


Figure 11. A/A

Alfa Laval recommends actuator size ø133 for ≥ 101.6/DN100

Torque values (for rotating the valve disc in a dry seal ring)

Size	Max. Nm
25mm/DN25	15
DN32	15
38mm/DN40	15
51mm/DN50	20
63.5mm/DN65	25
76mm/DN80	30
101.6mm/DN100	35
DN125	50
DN150	120

Valve Dimensions (mm)

Dimensions - valve

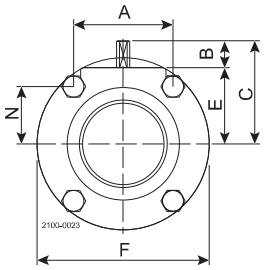


Figure 12. a. LKB-F.

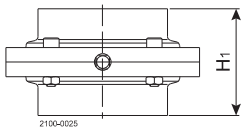


Figure 13. b. LKB with welding ends.

Note! LKB sizes DN 125 and 150 are with six screws.

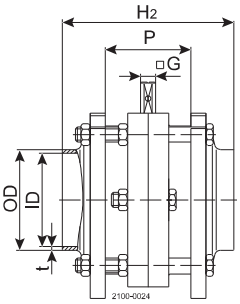


Figure 14. c. LKB with male part/nut and liner.

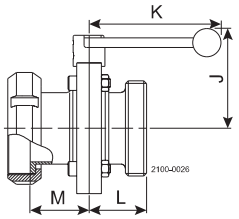


Figure 15. c. LKB with male part/nut and liner.

Dimensions - actuator

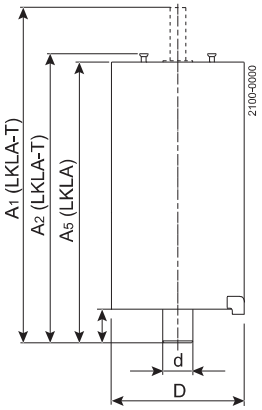


Figure 16. a. Without coupling.

a1 = d

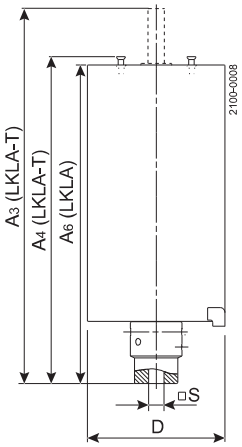


Figure 17. b. With coupling.

b1 =□S

Dimensions (mm) - Valve LKB, LKB-2, LKB-F:

Size	25	38	51	63.5	76.1	101.6	152	DN	DN	DN	DN	DN	DN	DN	DN	DN
	mm	mm	mm	mm	mm	mm	mm	25	32	40	50	65	80	100	125	150
A	42.0	42.0	61.0	61.0	79.5	106.0	98.0	42.0	42.0	42.0	61.0	61.0	79.0	106.0	106.0	98.0
B	15.5	16.7	16.6	17.5	16.6	16.0	18.0	14.7	15.9	16.7	16.6	17.5	16.0	16.0	18.0	18.0
C	49.0	49.0	58.5	69.5	73.5	93.0	122.0	48.0	49.0	54.0	63.0	75.0	79.0	93.0	115.0	122.0
OD	25.6	38.6	51.6	64.1	76.6	102.2	152.7	30.0	36.0	42.0	54.0	70.0	85.0	104.0	129.0	154.0
ID	22.5	35.5	48.5	60.5	72.0	97.6	146.9	26.0	32.0	38.0	50.0	66.0	81.0	100.0	125.0	150.0
t	1.55	1.55	1.55	1.8	2.3	2.3	2.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
E	32.5	32.5	42.0	52.0	57.0	77.0	104.0	33.3	33.3	37.7	46.6	57.3	63.0	77.0	96.7	104.0
F	78.0	78.0	99.0	117.0	132.0	169.0	216.0	79.0	79.0	86.5	105.7	125.0	143.0	169.0	199.0	216.0
G	8.0	8.0	8.0	8.0	10.0	12.0	15.0	8.0	8.0	8.0	8.0	10.0	10.0	12.0	14.0	15.0
H_1	47.0	47.0	52.0	54.0	62.0	80.0	80.0	47.0	47.0	47.0	52.0	62.0	64.0	80.0	110.0	80.0
H_2	83.0	83.0	92.0	92.0	114.0	132.0	-	83.0	83.0	83.0	92.0	114.0	116.0	132.0	136.0	152.0
J	82.0	82.0	92.0	102.0	107.0	127.0	161.0	74.0	74.0	78.0	88.0	98.0	104.0	118.0	150.0	161.0
K	120.0	120.0	120.0	120.0	162.0	162.0	338.0	120.0	120.0	120.0	120.0	162.0	162.0	162.0	223.0	338.0

Size	25	38	51	63.5	76.1	101.6	152	DN	DN	DN	DN	DN	DN	DN	DN	DN
	mm	mm	mm	mm	mm	mm	mm	25	32	40	50	65	80	100	125	150
L IDF/ISO	45.0	45.0	47.5	48.5	52.5	61.5	-	-	-	-	-	-	-	-	-	-
M IDF/ISO	55.5	55.5	58.0	59.0	63.0	81.5	-	-	-	-	-	-	-	-	-	-
L DS	42.0	43.5	46.0	51.0	55.0	64.0	-	-	-	-	-	-	-	-	-	-
M DS	54.5	54.5	57.0	59.0	63.0	72.0	-	-	-	-	-	-	-	-	-	-
L SMS	38.5	43.5	46.0	51.0	55.0	75.0	-	-	-	-	-	-	-	-	-	-
M SMS	51.0	52.5	55.0	56.0	61.0	72.0	-	-	-	-	-	-	-	-	-	-
L BS	45.7	45.7	48.2	49.2	53.2	67.0	-	-	-	-	-	-	-	-	-	-
M BS	50.5	50.5	53.0	54.0	58.0	71.8	-	-	-	-	-	-	-	-	-	-
L DIN	45.5	45.5	48.0	52.0	61.0	70.0	-	40.0	40.0	37.0	37.0	43.0	48.0	51.0	55.0	115.0
M DIN	61.5	61.5	66.0	67.0	71.0	83.0	-	45.5	48.5	49.5	54.0	63.0	69.0	84.0	89.0	77.0
L Clamp	45.0	45.0	47.5	48.5	52.5	61.5	78.1	45.0	45.0	45.0	47.5	59.0	60.0	68.0	83.0	68.0
N	26.5	26.5	30.5	40.5	43.5	53.0	85.0	27.3	27.3	31.7	35.1	45.8	49.5	53.0	72.7	85.0
P	42.0	42.0	46.0	46.0	58.0	58.0	-	42.0	42.0	42.0	46.0	58.0	58.0	58.0	62.0	78.0
Weight LKB-F (kg)	1.6	1.3	2.1	2.9	5.0	7.9	-	1.6	1.6	1.7	2.6	4.7	5.8	7.9	11.7	12.3
Weight LKB/ LKB-2 (kg)	1.2	1.0	1.5	2.1	3.0	4.7	9.9	1.2	1.1	1.3	1.8	3.0	3.5	5.1	7.5	9.0

Note! Weights are for valves with welding ends and handles.

Dimensions (mm) - Actuator

LKLA and LKLA-T:

Valve	25-63.5	76.1	101.6	101.6				
size	DN25-50	DN65-80	DN100	DN100	DN125	DN125	DN150	DN150
A_1	217.1	217.1	217.1	337	217.1	337	217.1	337
A_2	173.5	173.5	173.5	290	173.5	290	173.5	290
A_3	236.1	234.1	234.1	363.5	237.1	363.5	237.1	363.5
A_4	192.5	190.5	190.5	316.5	193.5	316.5	193.5	316.5
A_5	165.5	165.5	165.5	282	165.5	282	165.5	282
A_6	184.5	182.5	182.5	308.5	185.5	308.5	185.5	308.5
D	85	85	85	133	85	133	85	133
d	17	17	17	30	20	30	20	30
l	16.5	16.5	16.5	34	16.5	34	16.5	34
S	8	10	12	12	14	14	15	15
Function	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A	NC,NO,A/A	A/A	NC,NO,A/A	A/A	NC,NO,A/A

Connections

Compressed air

R1/8" (BSP), internal thread.

2.3 Control / Check valves

The non-return valve LKC-2 is designed for use in hygienic installations to prevent reverse product flow.

Product leaflets

Price lists

2.3

The Safe Choice

Alfa Laval LKC-2 Non-return Valve

Concept
Non-return valve LKC-2 is designed for use in stainless steel pipe installations to prevent reverse flow.

Working principle
LKC-2 opens when the pressure below the valve plug exceeds the pressure above the plug and the spring force.
The valve closes when pressure equalization has been achieved. A higher counter pressure will press the valve plug against the seat.

Standard Design
The valve body is in two parts, assembled by means of a clamp ring and hygienically sealed with a special seal ring. A guide disc and four legs guide the spring loaded valve plug with an O-ring seal.

The valve is available with welding ends for tubes according to ISO and DIN 11850.

TECHNICAL DATA

Temperature
Max. temperature: . . . . . 140°C (EPDM)
Min. temperature: . . . . . 10°C

Pressure
Max. product pressure: . . . . . 1000 kPa (10 bar)

Mechanical
Required differential pressure for opening the valve when fitted in a vertical pipe, as shown in fig. 3, is approx. 6 kPa (0.06 bar)

Options
Product wetted seal rings of Nitrile (NBR) or Fluorinated rubber (FPM).

Authorized to carry the 3A symbol

PHYSICAL DATA

Materials
Product wetted steel parts: . . . . . 1.4301 (304) / 1.4404 (316L)
External surface finish . . . . . Bright (Machined Ra 1.6)
Internal surface finish . . . . . Bright (polished), Ra < 0.8 µm
Product wetted seals: . . . . . EPDM rubber

Pressure drop/capacity diagram

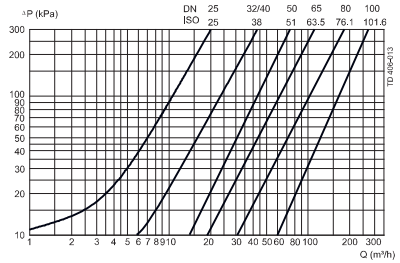


Fig. 1. **Notel**
For the diagram the following applies:
Medium: Water (20°C).
Measurement: In accordance with VDI 2173.

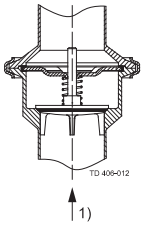


Fig. 2 = Flow direction.
Shows the optimal built-in situation. Other positions possible are e.g. horizontal. The four guide legs of the valve cone ensure good alignment.
90° rotation.

Dimensions (mm)

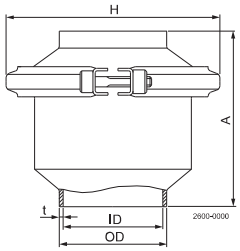


Fig. 3. Dimensions

Table 1. Dimensions.

	ISO						DIN						
Size	**25**	**38**	**51**	**63.5**	**76.1**	**101.6**	**25**	**32**	**40**	**50**	**65**	**80**	**100**
A	62.5	75.0	87.5	95.0	115	155	62.5	75.0	75.0	87.5	95.0	115	155
OD	25.4	38.4	51.4	63.9	76.4	102	30.0	36.0	42.0	54.0	70.0	85.0	104
ID	22.5	35.5	48.5	60.5	72.0	97.6	26.0	32.0	38.0	50.0	66.0	81.0	100
t	1.45	1.45	1.45	1.7	2.2	2.2	2	2	2	2	2	2	2
H	72.0	85.5	99	127	138	164	72.0	85.5	85.5	99	127	138	164
Weight (kg)	0.5	0.7	1.0	1.7	2.4	4.3	0.5	0.7	0.7	1.0	1.7	2.4	4.3

2.3

The Safe Choice For High Purity Applications

Alfa Laval LKC UltraPure Non-return Valve

Concept
LKC is a non-return valve preventing reverse flow in a system. The UltraPure execution is designed and documented to meet the demand in industries like BioPharm and Personal Care.

Working principle
The spring acts on the valve plug and keeps the valve closed until the force from the pressure in the inlet exceeds the force of the spring. If a reverse flow should occur the spring force and the pressure from the outlet will keep the valve closed.

Standard Design
The valve body is made in two parts that are assembled with a clamp ring. A guide disc and four legs guide the spring loaded valve plug in the valve body.

TECHNICAL DATA

Max. product pressure: . . . . . 1000 kPa (10 bar)
Required differential pressure for opening the valve when fitted in a vertical pipe, as shown in fig. 2, is approx. 6 kPa (0.06 bar).

Surface specification (Product wetted steel parts)
Alfa Laval designation: 7
Internal: . . . . . Ra < 0.8 µm
ASME BPE designation: SF3
External: . . . . . Ra < 0.8 µm

Alfa Laval designation: PL
Internal: . . . . . Ra < 0.5 µm
ASME BPE designation: SF1
External: . . . . . Ra < 0.8 µm

PHYSICAL DATA

Product wetted steel part	1.4404 (316L)
	Acc. to EN 10088 or equal (AISI 316L)
Other steel parts	1.4301 (304)
	Acc. to AISI 304
Spring	Electropolished

Elastomers

Product wetted elastomer	EPDM
	Acc. to FDA and USP Class VI
	Temperature: 10°C - 140°C
Product wetted elastomer	FPM
	Acc. to FDA
	Temperature: 10°C - 180°C

Connections

Weld ends	Matching tubes and fittings: ISO 2037 / Series A/DIN
	Acc. to ISO or DIN
Clamp ends	Matching tubes and fittings: ISO 2037 / Series A/DIN
	Acc. to ISO or DIN

Pressure drop/capacity diagram

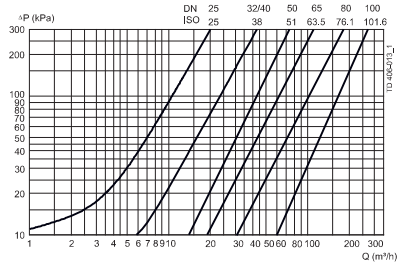


Fig.1. **Note!**
For the diagram the following applies:
Medium: Water (20°C).
Measurement: In accordance with VDI 2173.

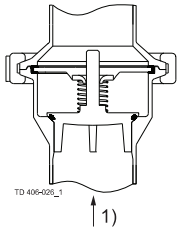


Fig.2.
1 = Flow direction.
Shows the optimal built-in situation to make sure the valve is drainable. The four guide legs of the valve cone ensure good alignment.
90° rotation.

Dimensions (mm)

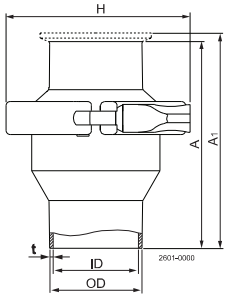


Table 1. Dimensions.

	ISO						DIN						
Size	**25**	**38**	**51**	**63.5**	**76.1**	**101.6**	**25**	**32**	**40**	**50**	**65**	**80**	**100**
A	62.5	75.0	87.5	95.0	115.0	155.0	62.5	75.0	75.0	87.5	95.0	115.0	155.0
A_1	105.5	118.0	130.5	138.0	158.0	198.0	105.5	118.0	118.0	130.5	151.0	171.0	211.0
OD	25.4	38.4	51.4	63.9	76.4	102.0	30.0	36.0	42.0	54.0	70.0	85.0	104.0
ID	22.5	35.5	48.5	60.5	72.0	97.6	26.0	32.0	38.0	50.0	66.0	81.0	100.0
t	1.45	1.45	1.45	1.7	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0
H	77.4	90.4	103.6	132.6	144.0	164.0	77.4	90.4	90.4	103.6	132.6	144.0	164.0
Weight (kg):													
Welding ends	0.7	1.0	1.3	2.1	2.9	4.3	0.7	1.0	1.0	1.3	2.1	2.9	4.3
Clamp ends	0.9	1.1	1.4	2.5	3.4	4.7	0.9	1.1	1.1	1.4	2.5	3.4	4.7

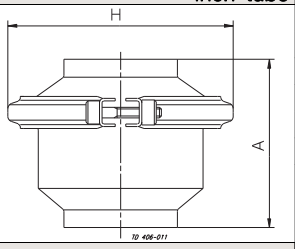
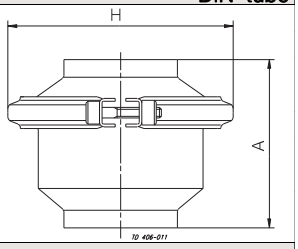
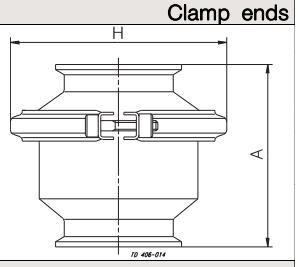
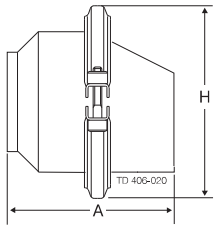
TD 900-563

Ordering Leaflet

Alfa Laval LKC-2 / LKC-H

Non-return valves
Product code: 5280

Connection: Welding ends/clamp ends
Seals: EPDM
Inside surface finish: Ra ≤ 0.8 µm

Material Item No.	PPL EUR	Material Item No.	PPL EUR	Size		Dimension (mm)		
1.4301 (304)		1.4404 (316L)		mm	DN	A	H	Inch tube
9612220001		9612220007		25		62.5	72.0	
9612220002		9612220008		38		75.0	85.5	
9612220003		9612220009		51		87.5	99.0	
9612220004		9612220010		63.5		95.0	127.0	
9612220005		9612220011		76.1		115.0	138.0	
9612220006		9612220012		101.6		155.0	164.0	
								DIN tube
9612220040		9612220047			25.0	62.5	72.0	
9612220041		9612220048			32.0	75.0	85.5	
9612220042		9612220049			40.0	75.0	85.5	
9612220043		9612220050			50.0	87.5	99.0	
9612220044		9612220051			65.0	95.0	127.0	
9612220045		9612220052			80.0	115.0	138.0	
9612220046		9612220053			100.0	155.0	164.0	
								Clamp ends
9612650179		9612650105		25		105.5	72.0	
9612650180		9612650106		38		118.0	85.5	
9612650102		9612650107		51		130.5	99.0	
9612650100		9612650164		63.5		138.0	127.0	
9612650101		9612650165		76		158.0	138.0	
9612650181		9612650182		101.6		198.0	164.0	
								LKC-H Inch tube
		9612220030		25		95.5	72.0	
		9612220031		38		86.4	85.5	
		9612220032		51		104.1	99.0	
		9612220033		63.5		119.4	127.0	
		9612220034		76		147.3	138.0	

NOTE! Seal rings of Nitrile (NBR) or Fluorinated rubber are also available.

ESE01211en 2101

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 direct.

Alfa Laval LKC Non-return Valve

Control/Check valves

Introduction

The Alfa Laval LKC Non-return Valve is a hygienic one-way check valve for use in various processes across the hygienic industries to prevent reverse flow. It is easy to install, ensuring safety and high product quality. It is available in two versions: the LKC-2 for vertical flow and the LKC-H for horizontal flow.

Application

The LKC Non-return Valve is widely used for single directional product flow through hygienic process lines across the dairy, food, beverage, brewery and many other industries.

Benefits

- Highly reliable, self-acting valve
- Easy to install
- Protects process equipment
- Prevents reverse flow

Standard design

The Alfa Laval LKC Non-return Valve consists of a valve body in two parts, valve plug and spring, assembled by means of a clamp ring and hygienically sealed with a special seal ring. A guide disc with four legs ensure alignment of the spring-loaded valve plug with an o-ring seal. The valve is available with weld and clamp ends for ISO and DIN tubing connections.

Working principle

The Alfa Laval LKC Non-return Valve opens and closes depending on the pressure. The spring acts on the valve plug and keeps the valve closed until the force from the pressure in the inlet exceeds the force of the spring. If a reverse flow should occur, the spring force and the pressure from the outlet will keep the valve closed. Required differential pressure for opening the valve when fitted in a vertical pipe is approximately 6 kPa (0.06 bar).

TECHNICAL DATA

Temperature	
Max. temperature:	140°C (EPDM)
Min. temperature:	-10°C

Pressure	
Max. product pressure:	1000 kPa (10 bar)

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

Mechanical

Required differential pressure for opening the valve when fitted in a vertical pipe, as shown in fig. 3, is approx. 6 kPa (0.06 bar).

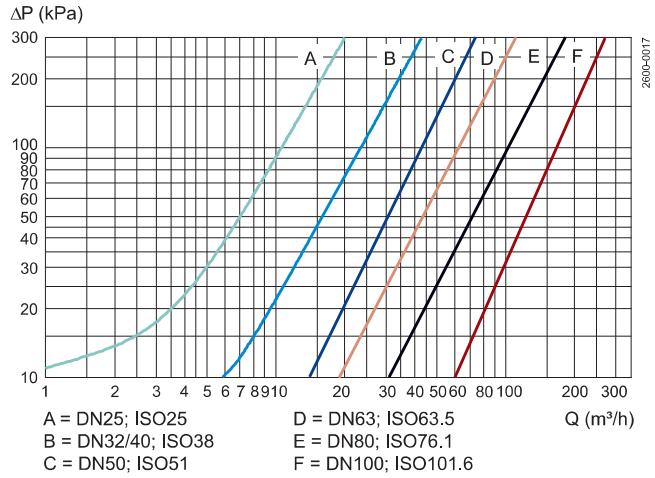
Options

Product wetted seal rings of Nitrile (NBR) or Fluorinated rubber (FPM).

PHYSICAL DATA

Materials	
Product wetted steel parts:	1.4301 (304) / 1.4404 (316L)
External surface finish:	Bright (Machined Ra 1.6)
Internal surface finish:	Ra < 0.8 µm
Product wetted seals:	EPDM rubber

Pressure drop/capacity diagram



Note! For the diagram the following applies:
Medium: Water (20°C)
Measurement: In accordance with VDI 2173.

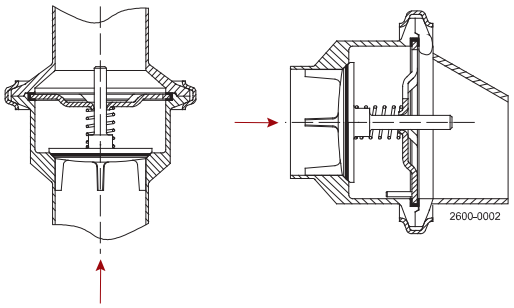


Figure 1. Flow direction.

Shows the optimal built-in situation. Other positions possible are e.g. horizontal. The four guide legs of the valve cone ensure good alignment.

90° rotation.

Dimensions (mm)

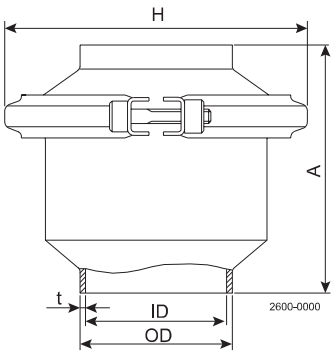


Figure 2. Vertical mounted

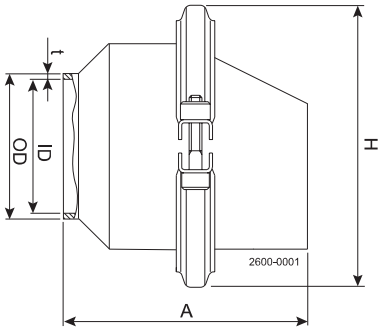


Figure 3. Horizontal mounted

Table 1. Dimensions - Vertical mounted

	ISO						DIN						
Size	**25**	**38**	**51**	**63.5**	**76.1**	**101.6**	**DN**	**DN**	**DN**	**DN**	**DN**	**DN**	**DN**
	mm	**mm**	**mm**	**mm**	**mm**	**mm**	**25**	**32**	**40**	**50**	**65**	**80**	**100**
A	62.5	75.0	87.5	95.0	115	155	62.5	75.0	75.0	87.5	95.0	115	155
OD	25.4	38.4	51.4	63.9	76.4	102	30.0	36.0	42.0	54.0	70.0	85.0	104
ID	22.5	35.5	48.5	60.5	72.0	97.6	26.0	32.0	38.0	50.0	66.0	81.0	100
t	1.45	1.45	1.45	1.7	2.2	2.2	2	2	2	2	2	2	2
H	72.0	85.5	99	127	138	164	72.0	85.5	85.5	99	127	138	164
Weight (kg)	0.5	0.7	1.0	1.7	2.4	4.3	0.5	0.7	0.7	1.0	1.7	2.4	4.3

Table 2. Dimensions - Horizontal mounted

	ISO				
Size	**25**	**38**	**51**	**63.5**	**76.1**
	mm	**mm**	**mm**	**mm**	**mm**
A	95.5	86.4	104.1	119.4	139.7
OD	25.4	38.4	51.4	63.9	76.4
ID	22.5	35.5	48.5	60.5	72.0
t	1.45	1.45	1.45	1.7	2.2
H	72.0	85.5	99.0	127.0	138.0
Weight (kg)	0.5	0.7	1.0	1.7	2.4

200002788-1-EN-GB

How to contact Alfa Laval

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