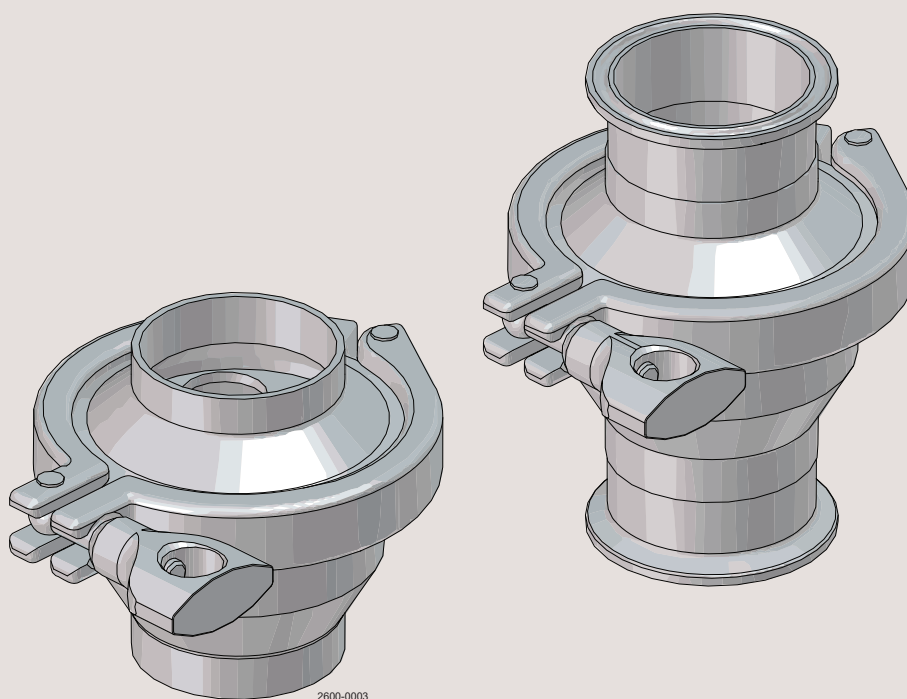




Instruction Manual

Alfa Laval LKC-2 Non-return Valve



ESE03497-EN1

2017-12

Original manual

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

| | |
|---------------------------------------|-----------|
| 1. Safety | 4 |
| 1.1. Important information | 4 |
| 1.2. Warning signs | 4 |
| 1.3. Safety precautions | 5 |
| 2. Installation | 6 |
| 2.1. Unpacking/delivery | 6 |
| 2.2. General installation | 7 |
| 2.3. Welding | 8 |
| 2.4. Recycling information | 8 |
| 3. Operation | 9 |
| 3.1. Troubleshooting | 9 |
| 3.2. Recommended cleaning | 9 |
| 4. Maintenance | 11 |
| 4.1. General maintenance | 11 |
| 4.2. Dismantling of valve | 12 |
| 4.3. Assembly of valve | 12 |
| 5. Technical data | 13 |
| 5.1. Technical data | 13 |
| 6. Parts list and service kits | 14 |
| 6.1. LKC-2, ISO | 14 |
| 6.2. LKC-2, DIN | 16 |

1 Safety

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

1.1 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.

1.2 Warning signs

General warning:



Caustic agents:



All warnings in the manual are summarised on this page.

Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

1.3 Safety precautions

Installation

Always read the technical data thoroughly (See chapter 5 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 5 Technical data).

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



Always handle lye and acid with great care.



Maintenance

Always observe the technical data thoroughly (see chapter 5 Technical data)

Never service the valve when it is hot.

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



Transportation

Always ensure that all connections are disconnected before attempting to remove the valve from the installation.

Always drain liquid out of valves before transportation.

2 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 assembled before delivery.*

2.1 Unpacking/delivery

Step 1

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

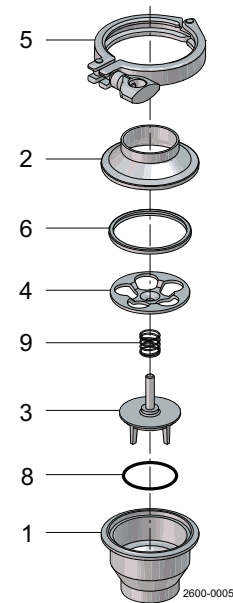
Check the delivery:

1. Complete valve (see Step 2).
2. Instruction manual.

Step 2

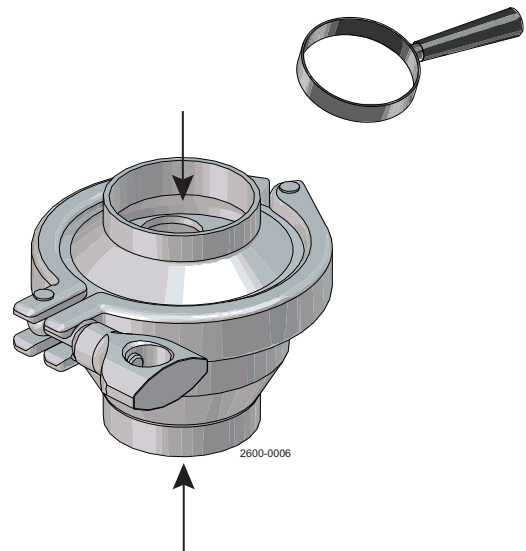
Standard delivery of valve parts:

1. Valve body
2. Welding liner
3. Valve cone
4. Guide plate
5. Clamp ring
6. Seal ring
7. O-ring
8. Spring



Step 3

1. Clean the valve/valve parts for possible packing materials.



Read the instructions carefully. The valve has welding ends as standard but can also be supplied with fittings.

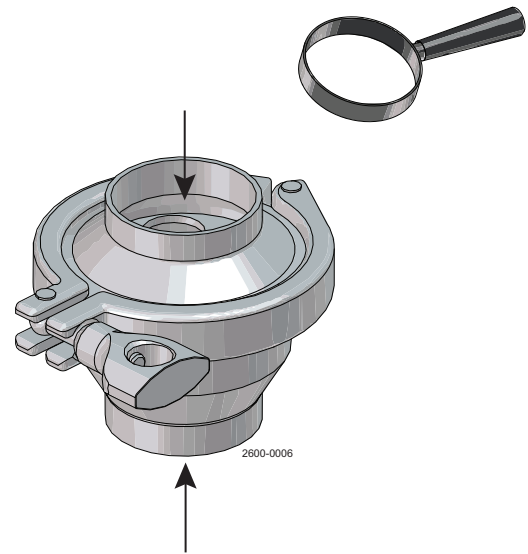
Step 4

Inspection!

1. Inspect the valve/valve parts for visible transport damage.

Caution!

Avoid damaging the valve/valve parts.



2.2 General installation

Step 1



Always read the technical data thoroughly.
See chapter 5 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

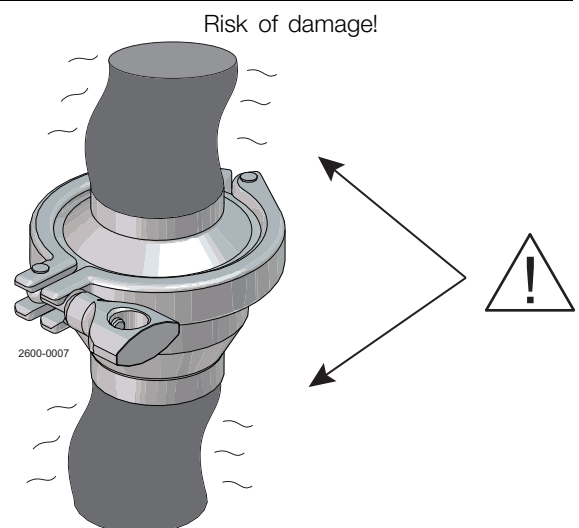
Alfa Laval cannot be held responsible for incorrect installation.

Step 2

Avoid stressing the valve.

Pay special attention to:

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



2 Installation

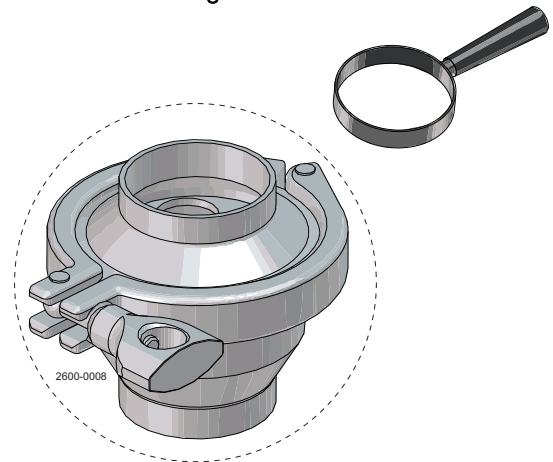
Read the instructions carefully.

Step 3

Fittings:

If the valve is delivered with connections ensure that the connections are tight.

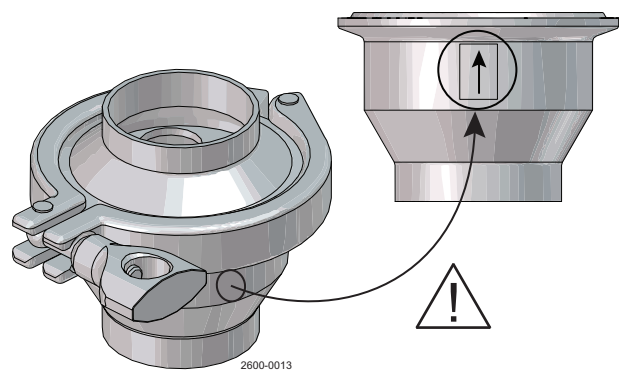
Remember seal rings!



2.3 Welding

Step 1

1. Disassemble the valve according to steps in chapter 4.2
Dismantling of valve
2. Maintain the minimum clearance so that the actuator can be removed.
3. Pay special attention to the flow direction marked on the valve body - see drawing.
4. If welding both valve body halves, ensure that they can be moved axially (min. 5 mm), so that the valve parts can be separated.
5. After welding, assemble the valve according to chapter 4.3
Assembly of valve, steps 1-6



2.4 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, wear parts in the valve are replaced
- All metal parts should be sent for material recycling
- 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

Pay attention to possible breakdown.
Read the instructions carefully.

3.1 Troubleshooting

Step 1

NOTE!

Read the maintenance instructions carefully before replacing worn parts - see chapter 4.1 General maintenance

| Problem | Cause/result | Repair |
|--|---|--|
| <ul style="list-style-type: none"> - External leakage - Internal leakage by closed valve (normal wear) | <ul style="list-style-type: none"> - Worn seal ring at guide plate - Worn plug seal ring (LKB-F) | <ul style="list-style-type: none"> - Replace the seal ring. |
| <ul style="list-style-type: none"> - External leakage - Internal leakage by closed valve (too early) | <ul style="list-style-type: none"> - High pressure - High temperature - Aggressive liquids - Many activations | <ul style="list-style-type: none"> - Change rubber grade - Change the operating conditions |
| <ul style="list-style-type: none"> - Obstructed flow | <ul style="list-style-type: none"> - Check flow direction | <ul style="list-style-type: none"> - Reverse the installation |

3.2 Recommended cleaning

Step 1



Always handle lye and acid with great care.

Caustic danger!



Always use rubber gloves!

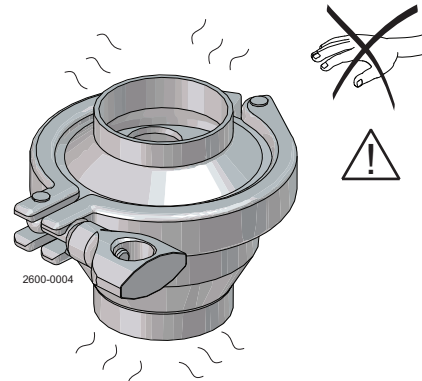


Always use protective goggles!

Step 2



Never touch the valve or the pipelines when sterilising.



3 Operation

The valve is designed for Cleaning In Place (= CIP).

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

NaOH = Caustic Soda.

HNO₃ = Nitric acid.

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. |
|------------------------|---|---------------------------|---|-----------------|

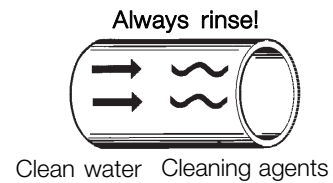
2. 0.5% by weight HNO₃ at 70° C (158° F)

| | | | | |
|---|---|---------------------------|---|-----------------|
| 0.7 l (0.2 gal) 53% HNO ₃ | + | 100 l (26.4 gal) water | = | Cleaning agent. |
|---|---|---------------------------|---|-----------------|

| | | | | |
|-----------------------------|---|---------------------------|---|-----------------|
| 2.2 l (0.6 gal) 33% NaOH | + | 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.



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.

4.1 General maintenance

Step 1



Always read the technical data thoroughly.
See section 5 Technical data



Always release compressed air after use.

NOTE

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

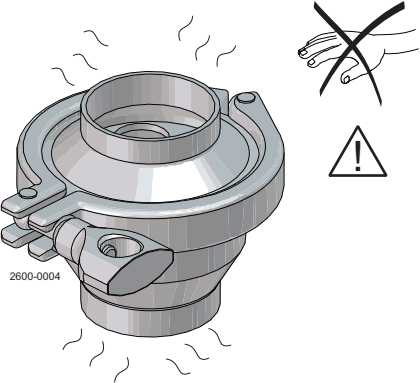
Step 2



Never service the valve when it is hot.



Never service the valve with valve and pipelines under pressure.



Recommended spare parts: Service kits (see chapter 6 Parts list and service kits).
Order service kits from the service kits list (see chapter 6 Parts list and service kits)

Ordering spare parts

Contact the Sales Department.

| Valve seal rings | |
|--|---|
| Preventive maintenance | Replace after 12 months |
| Maintenance after leakage (leakage normally starts slowly) | Replace by the end of the day |
| Planned maintenance | <ul style="list-style-type: none">- Regular inspection for leakage and smooth operation- Keep a record of the valve- Use the statistics for inspection planning Replace after leakage |
| Lubrication | Before fitting (use USDA-H1 approved) <ul style="list-style-type: none">- Unisilcon L641(*)- Paraliq(*) GTE 703- Molycote 111(D) |

4 Maintenance

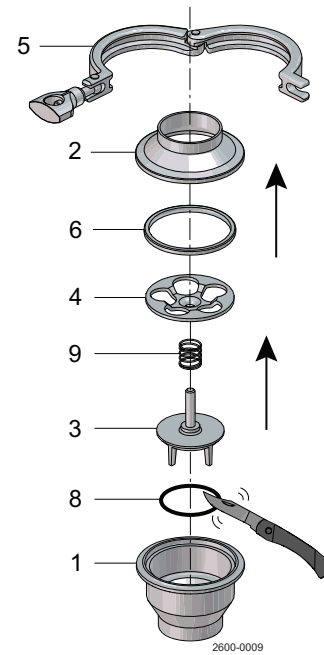
Read the instructions carefully.

The items refer to the parts list and service kits section.

4.2 Dismantling of valve

Step 1

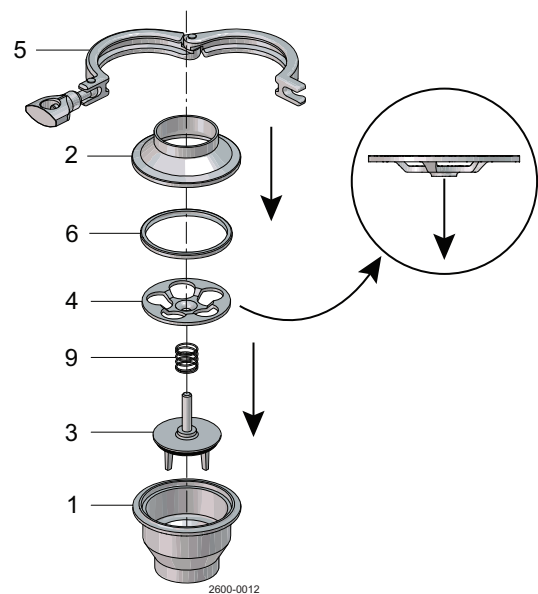
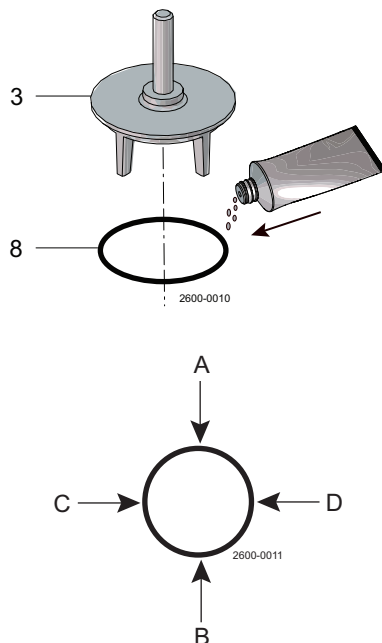
1. Loosen and remove one of the clamp screws. Remove clamp.
2. Remove welding liner.
3. Remove guide plate with seal ring.
4. Remove seal ring from guide plate.
5. Remove spring and valve cone.
6. Remove seal ring from valve cone by cutting the seal ring and remove.



4.3 Assembly of valve

Step 1

1. Insert seal ring in valve cone. Lubricate O-ring prior to assemble.
Press in the gasket at four points spaced 90° (from A to B, from C to D - see drawing).
Press in 4 new points spaced equally to first ones.
Continue with the same procedure until complete seal ring is inserted.
2. Mount seal ring onto guide plate.
3. Insert valve cone and spring in valve body.
4. Mount guide plate with "dent" oriented towards the valve body.
5. Mount welding liner.
6. Mount clamp and tighten screws (torque max. 10Nm).



5 Technical data

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

5.1 Technical data

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

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.

| Valve - data | |
|----------------------------|-------------------------------------|
| Max. product pressure | 1000 kPa (10 bar) (145 psi) |
| Min. product pressure | Full vacuum |
| Temperature range | -10° C to +140° C* (14°F to 284°F) |
| Valve - materials | |
| Product wetted steel parts | AISI 304 or AISI 316L |
| Rubber grades | EPDM, FPM, NBR |
| Finish | Semi bright, RA 3.2 µm |

Weight (kg)

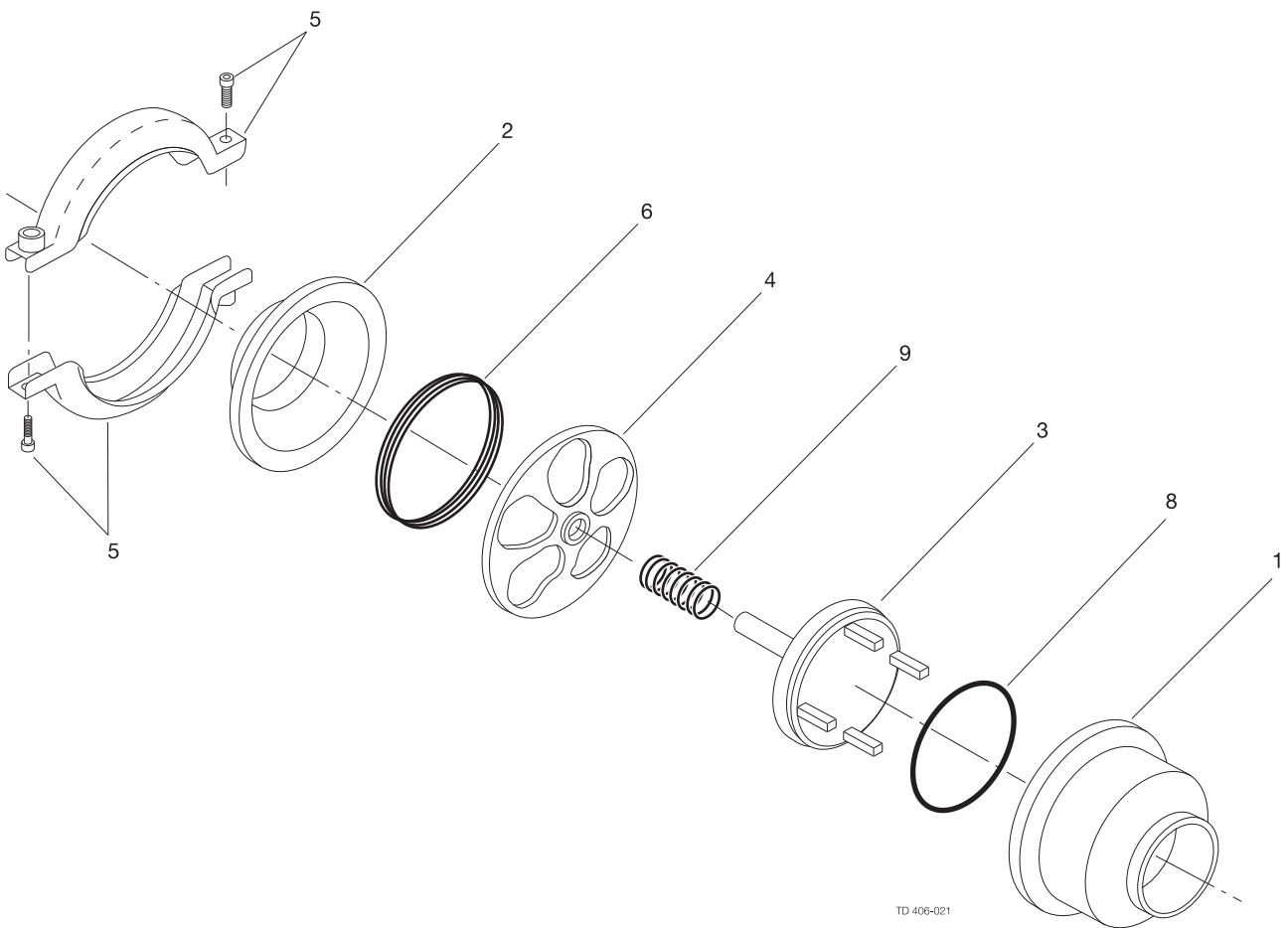
| Size | 25 mm | 38 mm | 51 mm | 63.5 mm | 76.1 mm | 101.6 mm | DN 25 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|------------|----------|----------|----------|------------|------------|-------------|----------|----------|----------|----------|----------|-----------|
| Weight LKC | 0.5 | 0.7 | 1.0 | 1.8 | 2.4 | 5.9 | 0.5 | 0.7 | 1.0 | 1.8 | 2.4 | 5.9 |

6 Parts list and service kits

Always use Alfa Laval genuine spare parts.

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

6.1 LKC-2, ISO



6 Parts list and service kits

Always use Alfa Laval genuine spare parts.

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

Parts list

| Pos. | Qty | Denomination |
|----------------------------|-----|--------------|
| 1 | 1 | Valve body |
| 3 | 1 | Valve cone |
| 4 | 1 | Guide plate |
| 5 | 1 | Clamp ring |
| 6 <input type="checkbox"/> | 1 | Seal ring |
| 8 <input type="checkbox"/> | 1 | O-ring |
| 9 <input type="checkbox"/> | 1 | Spring |

Service kits

| Denomination | | DN/OD 25 DN25 | DN/OD 38 DN40 | DN/OD 51 DN50 | DN/OD 63.5 DN65 | DN/OD 76.1 DN80 | DN/OD 101.6 DN100 |
|---|------------------------|------------------|------------------|------------------|--------------------|--------------------|----------------------|
| Service kit for product wetted parts | | | | | | | |
| <input type="checkbox"/> | Service kit EPDM | 9611924005 | 9611924006 | 9611924007 | 9611924008 | 9611924009 | 9611924010 |
| <input type="checkbox"/> | Service kit NBR | 9611924011 | 9611924012 | 9611924013 | 9611924014 | 9611924015 | 9611924016 |
| <input type="checkbox"/> | Service kit FPM | 9611924017 | 9611924018 | 9611924019 | 9611924020 | 9611924021 | 9611924022 |

Parts marked with ☐ are included in the service kit.

NB: Following parts from LKC-2 are interchangeable with LKC-1 for size 25 mm to 76 mm.

Pos. 3 Valve cone

Pos. 4 Guide plate

Recommended spare parts: Service kits.

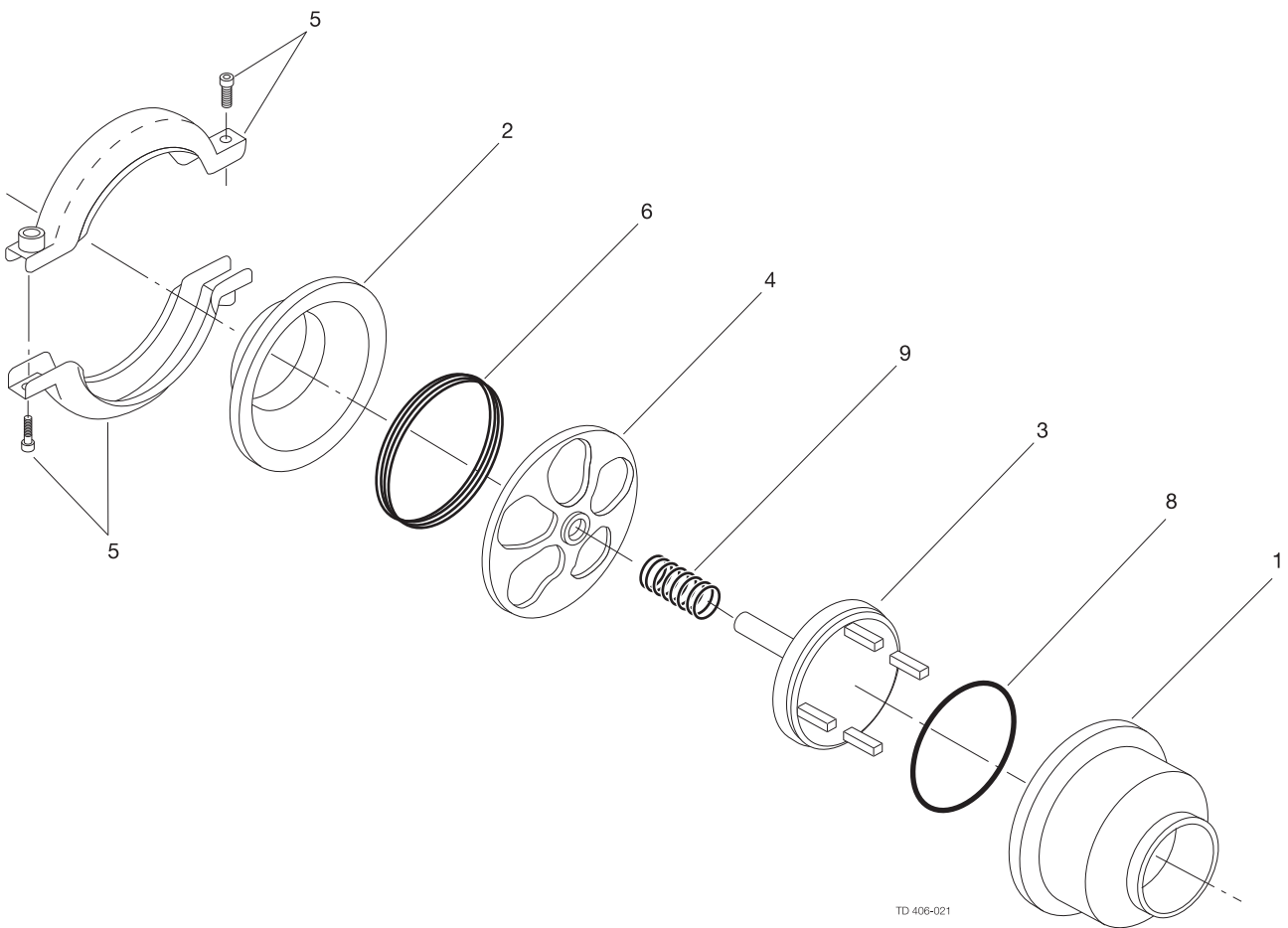
TD 900-203/2

6 Parts list and service kits

Always use Alfa Laval genuine spare parts.

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

6.2 LKC-2, DIN



6 Parts list and service kits

Always use Alfa Laval genuine spare parts.

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

Parts list

| Pos. | Qty | Denomination |
|----------------------------|-----|---------------|
| 1 | 1 | Valve body |
| 2 | 1 | Welding liner |
| 3 | 1 | Valve cone |
| 4 | 1 | Guide plate |
| 5 | 1 | Clamp ring |
| 6 <input type="checkbox"/> | 1 | Seal ring |
| 8 <input type="checkbox"/> | 1 | O-ring |
| 9 <input type="checkbox"/> | 1 | Spring |

Service kits

| Denomination | DN 25 | DN 32 | DN 40 | DN 50 | DN 65 | DN 80 | DN 100 |
|--|------------|------------|------------|------------|------------|------------|------------|
| <input type="checkbox"/> Service kit EPDM | 9611924005 | 9611924006 | 9611924006 | 9611924007 | 9611924008 | 9611924009 | 9611924010 |
| <input type="checkbox"/> Service kit NBR | 9611924011 | 9611924012 | 9611924012 | 9611924013 | 9611924014 | 9611924015 | 9611924016 |
| <input type="checkbox"/> Service kit FPM | 9611924017 | 9611924018 | 9611924018 | 9611924019 | 9611924020 | 9611924021 | 9611924022 |

Parts marked with ☐ are included in the service kit.

NB: Following parts from LKC-2 are interchangeable with LKC-1 for size DN 25 to DN 80.

Pos. 3 Valve cone

Pos. 4 Guide plate

Recommended spare parts: Service kits.

TD 900-203/2

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 Corporate AB

This document and its contents is owned by Alfa Laval Corporate AB and protected by laws governing intellectual property and thereto related rights. It is the responsibility of the user of this document to comply with all applicable intellectual property laws. Without limiting any rights related to this document, no part of this document may be copied, reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the expressed permission of Alfa Laval Corporate AB. Alfa Laval Corporate AB will enforce its rights related to this document to the fullest extent of the law, including the seeking of criminal prosecution.