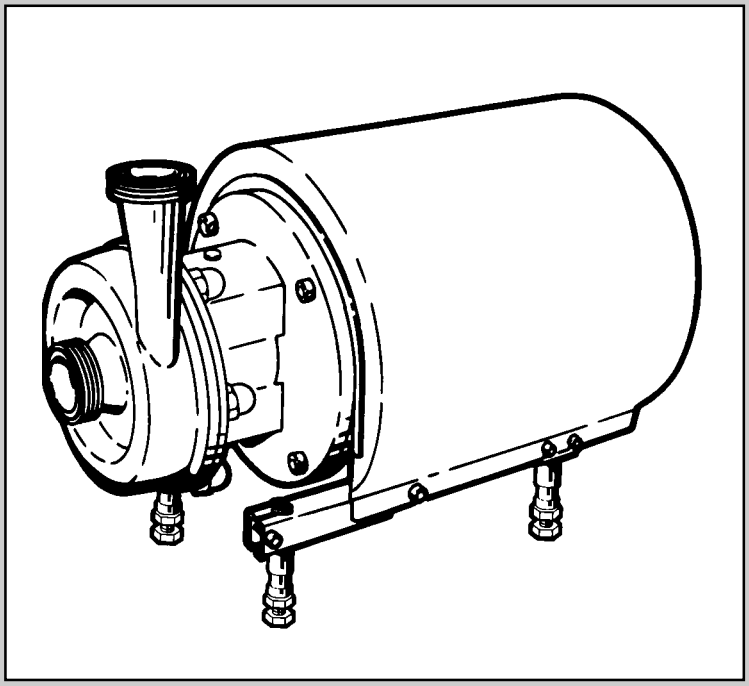
IM70737-GB7
9904

Operating Manual

LKH Centrifugal Pump



Alfa Laval

Declaration of Conformity

The designating company

Alfa Laval
Company Name

6000 Kolding
Address

+45 79 32 22 00
Phone No.

hereby declare that

CENTRIFUGAL PUMP	**LKH**	
Denomination	Type	Year

is in conformity with the following directives with amendments:

- **Low Voltage Directive 73/23/EEC**
- **EMC Directive 89/336/EEC**
- **Machinery Directive 89/392/EEC**

Bjarne Søndergaard	**Vice President, R & D**
Name	Title
Alfa Laval	B. Søndergaard
Company	Signature

Designation

CE

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Table of contents

This manual is divided into main sections. - See below.

Please note that the drawings on pages 25, 27 and 29 can be unfolded and support the reading of the manual.

Unsafe practices and other important information are emphasized in this manual.

Warnings are emphasized by means of special signs.

1. Important information

Always read the manual before using the pump!

WARNING! : Indicates that special procedures **must** be followed to avoid severe personal injury.

CAUTION! : Indicates that special procedures **must** be followed to avoid damage to the pump.

NOTE! : Indicates important information to simplify practices or to make them clearer.

2. Warning signs

: General warning.

: Dangerous electrical voltage.

: Caustic agents.

All warnings in the manual are summarized on this page.

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

3. Safety precautions

Installation:

: **Always** read the technical data thoroughly (see page 22).

: **Always** use a lifting crane when handling the pump.

: **Always** have the pump electrically connected by authorized personnel (see the motor instructions).

: **Pump without impeller screw:**
- **Always** remove the impeller before checking the direction of rotation.
- **Never** start the pump if the impeller is fitted and the pump casing is removed.

Pump with impeller screw:
- **Never** start in the wrong direction of rotation with liquid in the pump.

Operation:

: **Always** read the technical data thoroughly (see page 22).

: **Never** touch the pump or the pipelines when pumping hot liquids or when sterilizing.

: **Never** run the pump with both the suction side and the pressure side blocked.

: **Always** handle lye and acid with great care.

Maintenance:

: **Always** read the technical data thoroughly (see page 22).

: **Always** disconnect the power supply when servicing the pump.

: - **Never** service the pump when it is hot.
- **Never** service the pump with pump and pipe-lines under pressure.

: **Motors with grease nipples:**
Remember lubrication according to information plate/label on the motor.

The instruction manual is part of the delivery.
Study the instructions carefully.
The standard delivery does not include the test certificate. This can be supplied on request.

The large pump sizes are very heavy.
Alfa Laval therefore recommends the use of a lifting crane when handling the pump.

1. Unpacking/Delivery

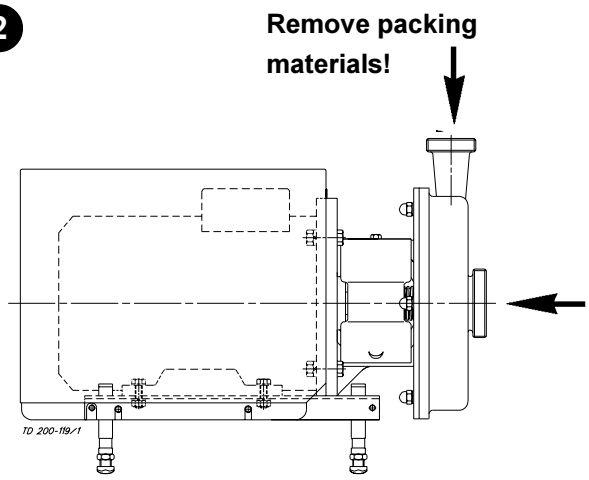
1

⚠ **Always** use a lifting crane when handling the pump (see technical data).

CAUTION!
We cannot be held responsible for incorrect unpacking.

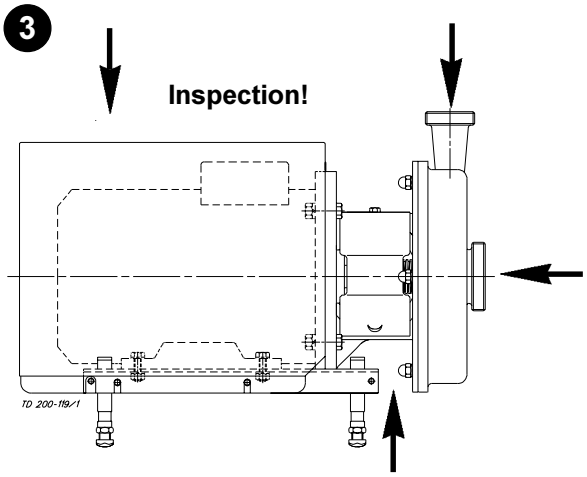
Check the delivery for:
1. Complete pump.
2. Delivery note.
3. Motor instructions.
4. Test certificate, IF ORDERED!I

2



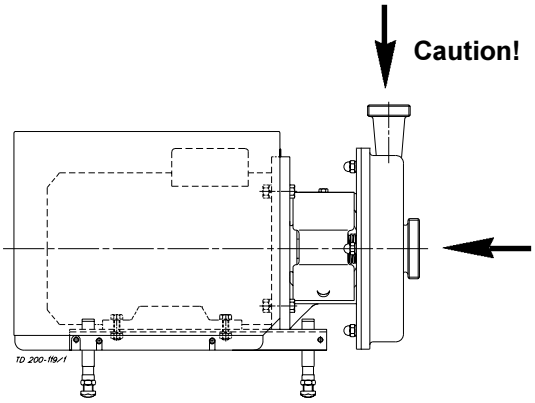
Remove possible packing materials from the inlet and the outlet.

3



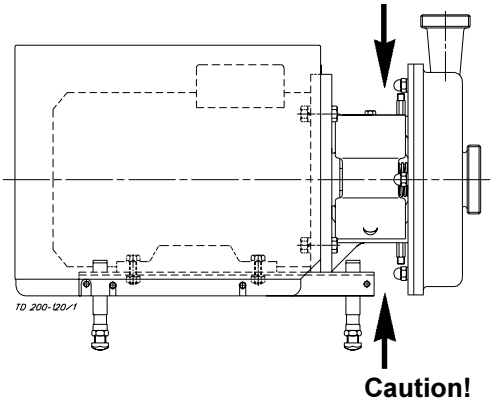
Inspect the pump for visible transport damages.

4



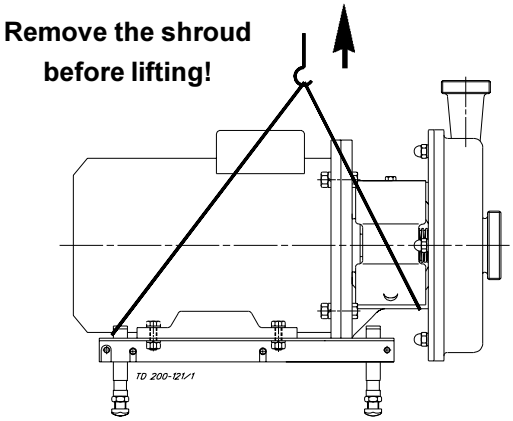
Avoid damaging the inlet and the outlet.

5



Avoid damaging the connections for flushing liquid, if supplied.

6



Always remove the shroud, if fitted, before lifting the pump.

Study the instructions carefully and pay special attention to the warnings!
Always check the pump before operation.
- See pre-use check on page 6.

The large pump sizes are very heavy.
Alfa Laval therefore recommends the use of a lifting crane when handling the pump.

2. Installation

1

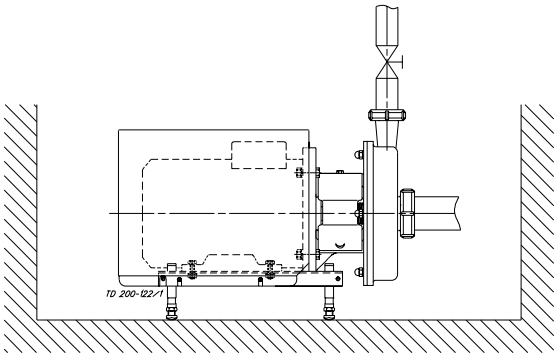
Always read the technical data thoroughly (see page 22).

Always use a lifting crane when handling the pump (see technical data).

Always have the pump electrically connected by authorized personnel (see the motor instructions).

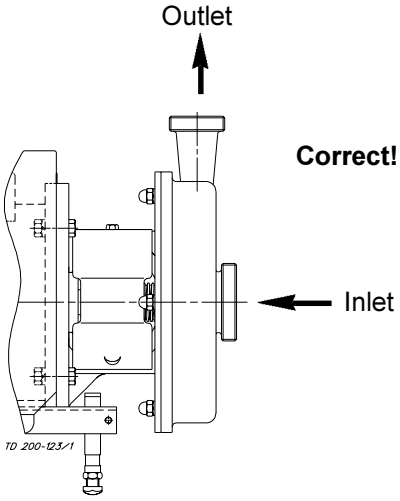
CAUTION!
We cannot be held responsible for incorrect installation.

2



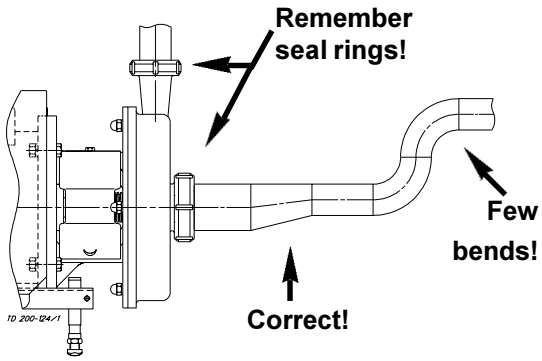
Ensure that there is sufficient clearance around the pump (min. 0.5 m).

3



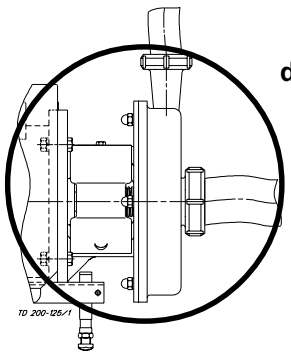
Check that the flow direction is correct.

4



1. Ensure that the pipelines are routed correctly.
2. Ensure that the connections are tight.

5



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

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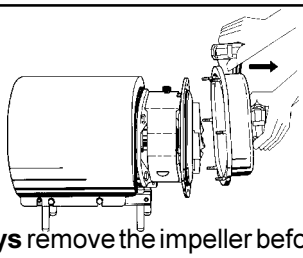
Study the instructions carefully and pay special attention to the warnings!
LKH-5 to -60 is without impeller screw as standard but can be supplied with one.

Check the direction of rotation of the impeller before operation.
- See the indication label on the pump.

3. Pre-use check - Pump without impeller screw

1



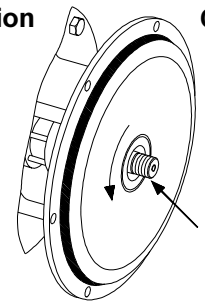
⚠ - **Always** remove the impeller before checking the direction of rotation.
- **Never** start the pump if the impeller is fitted and the pump casing is removed.

1a. LKH-5: Remove screws (56), spring washers (56a), clamps (55+55a) and pump casing (29).
1b. LKH-10 to -80: Remove cap nuts (24), washers (24a) and pump casing (29).
2. Remove impeller (27) (see also instruction 4 on page 12).

2

See the indication label!

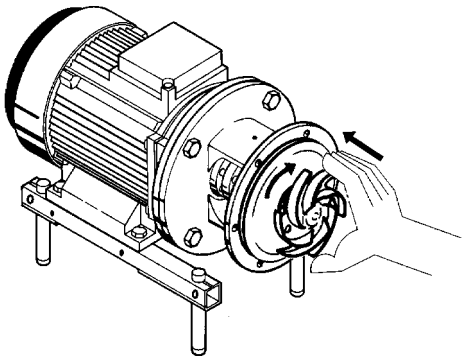
Correct!



Stub shaft

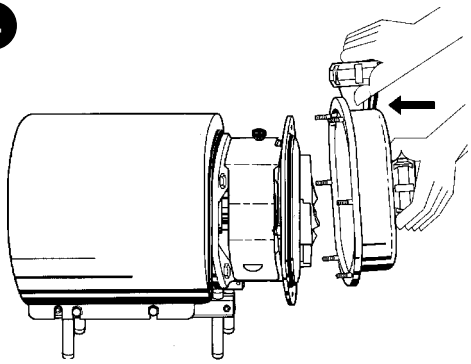
1. Start and stop the motor momentarily.
2. Ensure that the direction of rotation of the stub shaft (7) is **anticlockwise** as viewed from the inlet side.

3



Fit and tighten impeller (27).

4



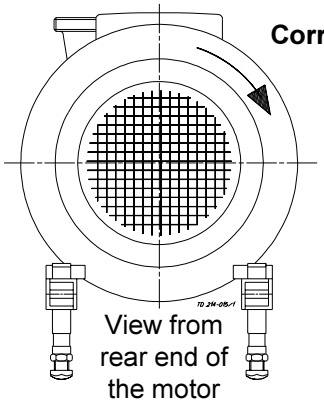
1. Fit pump casing (29).
2a. LKH-5: Fit clamps (55+55a), spring washers (56a) and tighten screws (56).
2b. LKH-10 to -80: Fit washers (24a) and tighten cap nuts (24).

3. Pre-use check - Pump with impeller screw

⚠ **Never** start in the wrong direction of rotation with liquid in the pump.

1. Start and stop the motor momentarily.
2. Ensure that the direction of rotation of the motor fan is **clockwise** as viewed from the rear end of the motor.

Correct!



View from rear end of the motor

See the indication label!

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

The pump is fitted with a warning label indicating correct throttling.

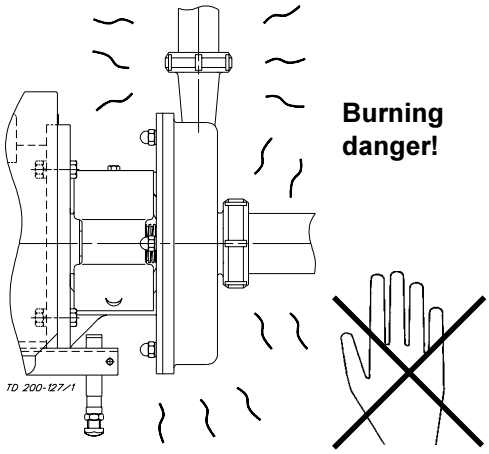
1. Operation/Control

1

⚠ **Always** read the technical data thoroughly (see page 22).

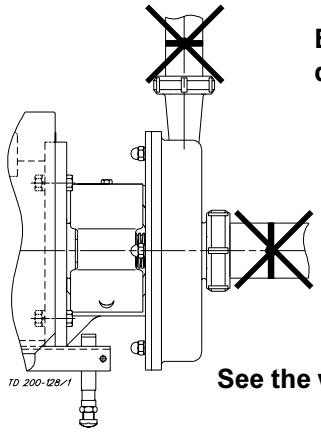
CAUTION!
We cannot be held responsible for incorrect operation/control.

2



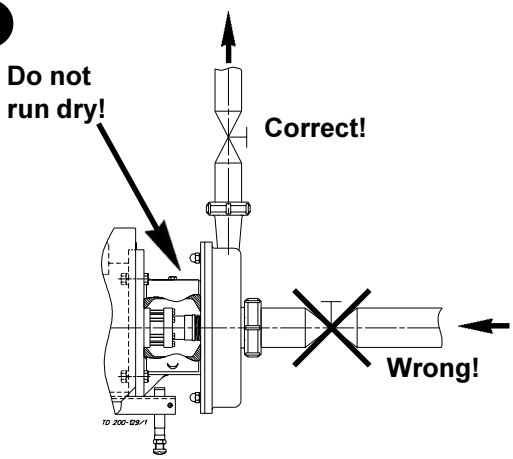
⚠ **Never** touch the pump or the pipelines when pumping hot liquids or when sterilizing.

3



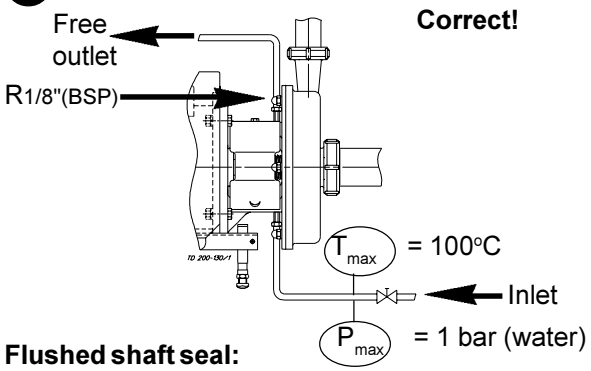
⚠ **Never** run the pump with both the suction side and the pressure side blocked.

4



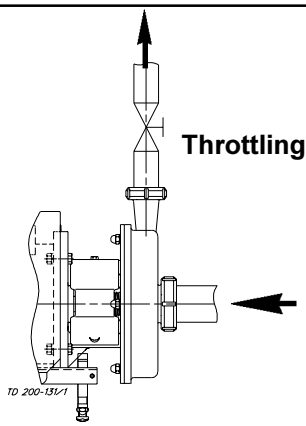
CAUTION!
- The shaft seal must **not** run dry.
- **Never** throttle the inlet side.

5



Flushed shaft seal:
1. Connect the inlet of the flushing liquid correctly.
2. Regulate the water and steam supply correctly.
3. Observe the steam data.

6



Control:
Reduce the capacity and the power consumption by means of:
- Throttling the pressure side of the pump.
- Reducing the impeller diameter.
- Reducing the speed of the motor.

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Pay attention to possible faults.

Study the instructions carefully.

2. Fault finding

NOTE!
Study the maintenance instructions carefully before replacing worn parts. - See page 10!

Problem	Cause/result	Remedy
Overloaded motor	- Pumping of viscous liquids - Pumping of liquids with high density - Low outlet pressure (counter pressure) - Lamination of precipitates from the liquid	- Larger motor or smaller impeller - Higher counter pressure (throttling) - Frequent cleaning
Cavitation: - Damage - Pressure reduction (sometimes to zero) - Increasing of the noise level	- Low inlet pressure - High liquid temperature	- Increase the inlet pressure - Reduce the liquid temperature - Reduce the pressure drop before the pump - Reduce speed
Leaking shaft seal	- Dry run (See page 7) - Incorrect rubber grade - Abrasive particles in the liquid	**Replace:** All wearing parts (See page 10) **If necessary:** - Select a different rubber grade - Select stationary and rotating seal ring in Silicon Carbide/ Silicon Carbide
Leaking seals	Incorrect rubber grade	Replace with seals of a different rubber grade

The pump is designed for cleaning in place (CIP).
CIP = Cleaning In Place.

Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda.
HNO_3 = Nitric acid.

3. Recommended cleaning

1

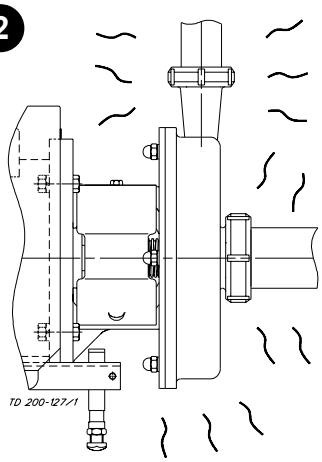
Caustic danger!

Always use rubber gloves!

Always use protective goggles!

Always handle lye and acid with great care.

2



Burning danger!

Never touch the pump or the pipelines when sterilizing.

3

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

1. 1% by weight NaOH at 70°C.

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

2. 0.5% by weight HNO_3 at 70°C.

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

4

1. Avoid excessive concentration of the cleaning agent

   ⇒ **Dose gradually!**

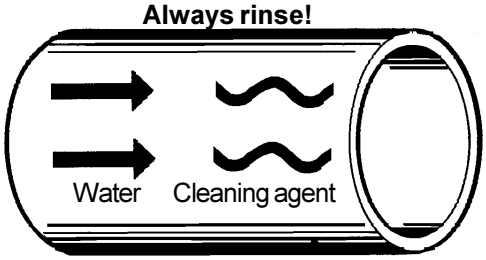
2. Adjust the cleaning flow to the process

   Sterilization of milk/viscous liquids

   ⇒ **Increase the cleaning flow!**

5

Always rinse!



Always rinse well with clean water after the cleaning.

6

NOTE!
The cleaning agents must be stored/disposed of in accordance with current rules/directives.

Maintenance

Maintain the pump carefully.
Study the instructions carefully and pay special attention to the warnings!

Always keep spare shaft seals and rubber seals in stock.
See separate motor instructions.

1. General maintenance

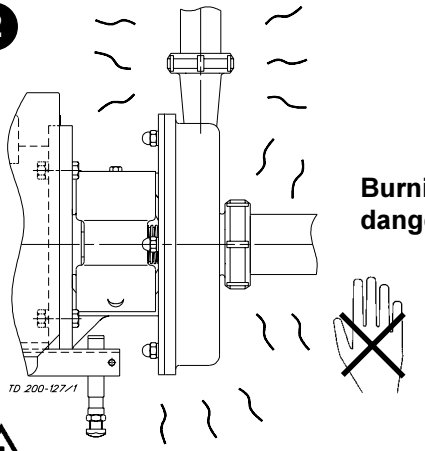
1

Always read the technical data thoroughly (see page 22).

Always disconnect the power supply when servicing the pump.

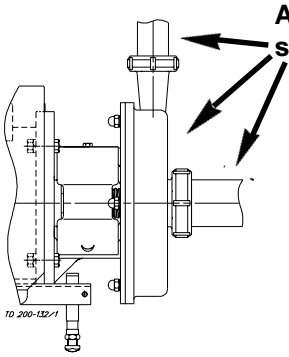
NOTE!
All scrap must be stored/disposed of in accordance with current rules/directives.

2



Never service the pump when it is hot.

3



Never service the pump with pump and pipelines under pressure.

4

CAUTION!
Fit the electrical connections correctly if they have been removed from the motor during service (see pre-use check on page 6).

Pay special attention to the warnings!

Ordering spare parts

- Contact the Sales Department.
- Order from the Spare Parts List.

Recommended spare parts: Service kits (see Spare Parts List).

Maintain the pump carefully.
Study the instructions carefully.
Always keep spare shaft seals and rubber seals in stock.

See separate motor instructions.
Check the pump for smooth operation after service.

1. General maintenance

	Shaft seal	Rubber seals	Motor bearings
Preventive maintenance	**Replace after 12 months:** (one-shift) Complete shaft seal	Replace when replacing the shaft seal	
Maintenance after leakage (leakage normally starts slowly)	**Replace at the end of the day:** Complete shaft seal	Replace when replacing the shaft seal	
Planned maintenance	- Regular inspection for leakage and smooth operation - Keep a record of the pump - Use the statistics for planning of inspections **Replace after leakage:** Complete shaft seal	Replace when replacing the shaft seal	Yearly inspection is recommended - Replace complete bearing if worn - Ensure that the bearing is axially locked (See motor instructions)
Lubrication	**Before fitting** Lubricate the O-rings with silicone grease or silicone oil	**Before fitting** Silicone grease or silicone oil	See below (*)

Pre-use check

CAUTION!
Fit the electrical connections correctly if they have been removed from the motor during service.
(See pre-use check on page 6).
Pay special attention to the warnings!
1. Start and stop the motor momentarily.
2. Ensure that the pump operates smoothly.

(*) Lubrication - motor bearings:

Motors without grease nipples are permanently lubricated and do therefore not need any lubrication.

Lubrication intervals for motors with grease nipples are shown on the information plate on the motor. The lubrication intervals are based upon 80°C bearing temperature. The values should be halved for every 15°C increase in the bearing temperature.

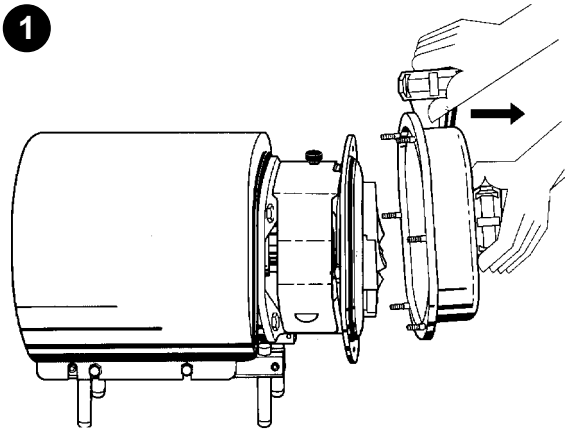
Note! Motors with grease nipples should be lubricated before operating the first time!

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Handle scrap correctly.
✸ *: Relates to the shaft seal.*

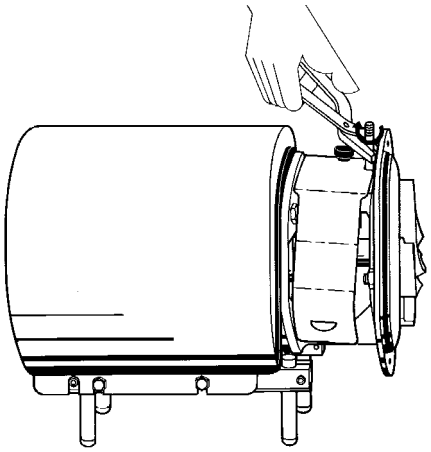
2. Dismantling of pump/shaft seals

1



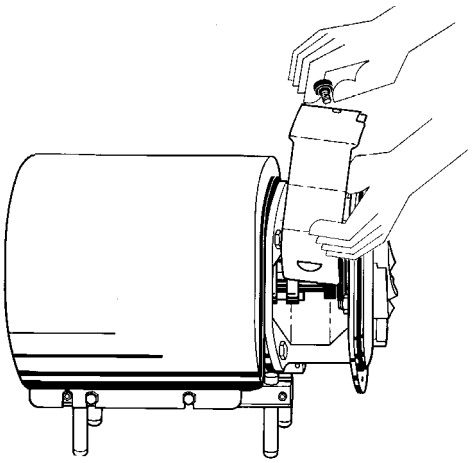
1a. LKH-5: Remove screws (56), spring washers (56a), clamps (55+55a) and pump casing (29).
1b. LKH-10 to -80: Unscrew cap nuts (24) and remove washers (24a) and pump casing (29).

2 ✸



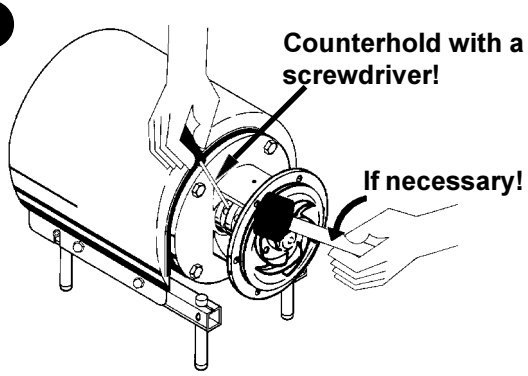
Flushed / Double mechanical shaft seal:
Unscrew tubes (42) using a spanner.

3



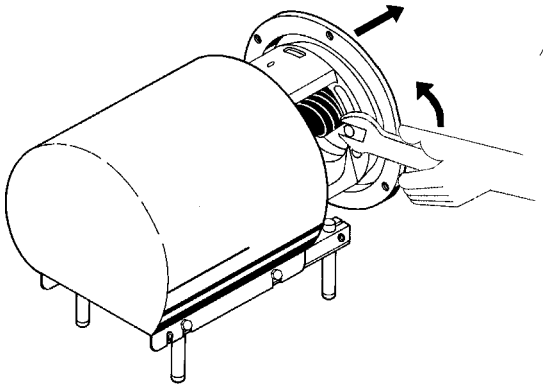
Remove screw (23) and safety guard (22).

4



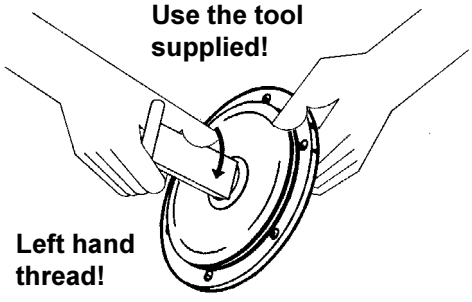
1. Remove impeller screw (36), if fitted.
2. Remove impeller (27). If necessary, loosen the impeller by knocking gently on the impeller vanes.
3. Remove the O-ring (38) from the impeller, if fitted.

5



1. Pull off the O-ring (26) from back plate (25).
2. Unscrew nuts (20) and remove washers (21) and the back plate.

6 ✸



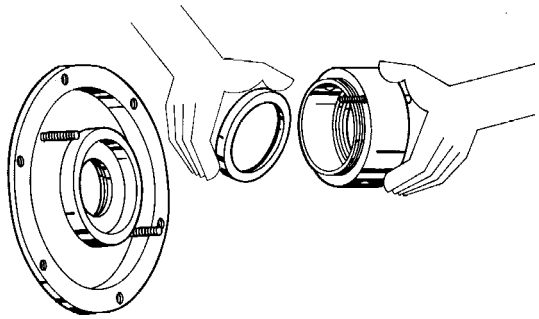
1. Remove the stationary seal ring (11).
2. Remove the O-ring (12) from back plate (25).

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Handle scrap correctly.
✸ *: Relates to the shaft seal.*

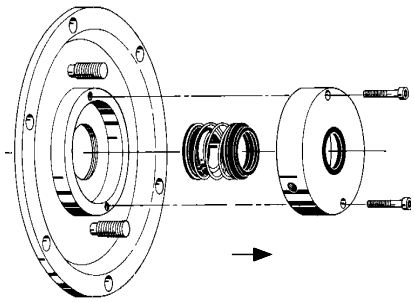
2. Dismantling of pump/shaft seals

7 ✸



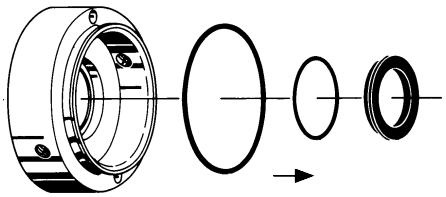
Flushed shaft seal:
1. Remove screws (41) and seal housing (40).
2. Pull out lip seal (43) from the seal housing.

8 ✸



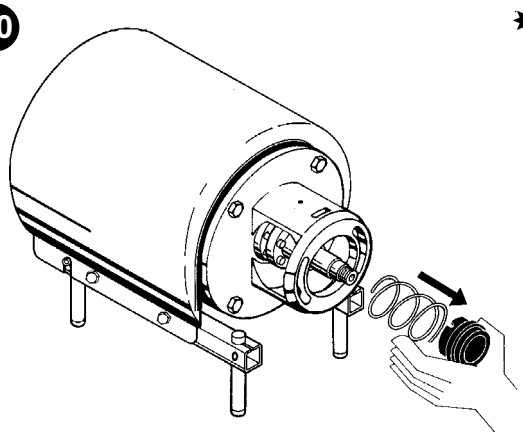
Double mechanical shaft seal:
1. Remove screws (41) and seal housing (40a).
2. Remove rotating seal rings (14) and drive ring (52) from spring (13).
3. Remove O-rings (15) from rotating seal rings (14).

9 ✸



Double mechanical shaft seal:
1. Remove stationary seal ring (51) from seal housing (40a).
2. Remove O-ring (50) from stationary seal ring (51).
3. Remove O-ring (44) from seal housing (40a).

10 ✸



1. Remove the complete shaft seal from stub shaft (7).
2. Remove spring (13) and rotating seal ring (14) from the drive ring (10).

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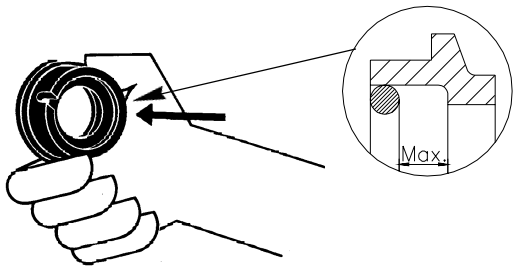
Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Handle scrap correctly.
✸ *: Relates to the shaft seal.*

3. Reassembly of pump/single shaft seal

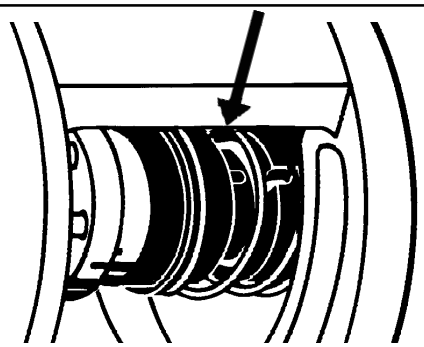
1 ✸



Remove spring (13).

NOTE!
Make sure that O-ring (15) has max. clearance from the sealing surface.

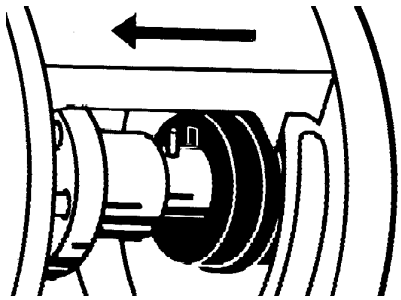
2 ✸



1. Refit spring (13) on rotating seal ring (14).
2. Fit the spring and the rotating seal ring on drive ring (10).

CAUTION!
Ensure that the driver on the drive ring enters the notch in the rotating seal ring.

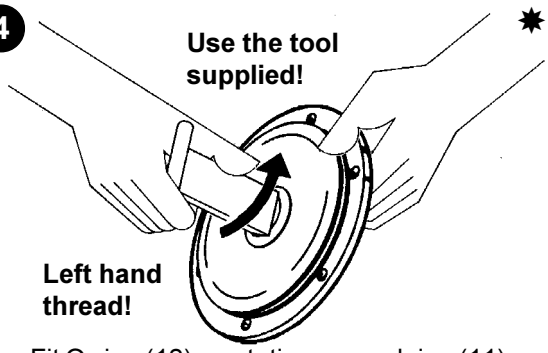
3 ✸



Fit the complete shaft seal on stub shaft (7).

NOTE!
Make sure that connex pin (8) on the stub shaft enters the notch in drive ring (10).

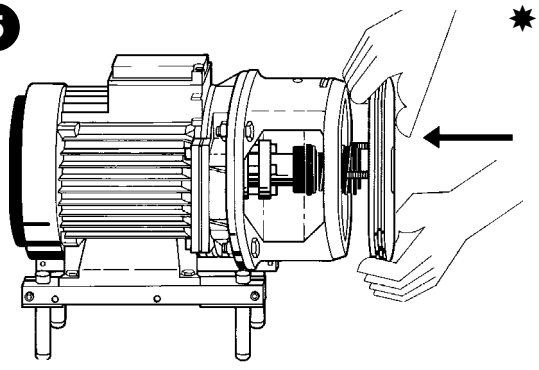
4 ✸



1. Fit O-ring (12) on stationary seal ring (11) and lubricate.
2. Screw the stationary seal ring into back plate (25).

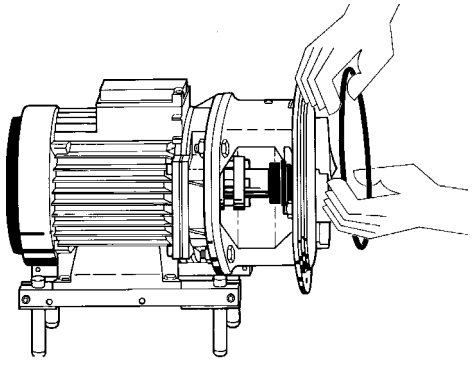
CAUTION!
Only tighten by hand to avoid deforming the stationary seal ring.

5 ✸



1. Clean the sealing surfaces with contact cleaner before fitting back plate (25).
2. Carefully guide the back plate onto adaptor (16).
3. Fit washers (21) and nuts (20).

6



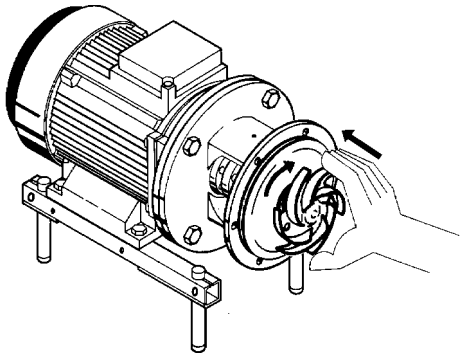
Lubricate O-ring (26) and slide it onto back plate (25).

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.

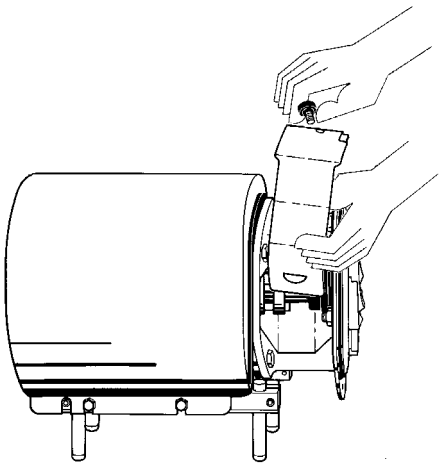
3. Reassembly of pump/single shaft seal

7



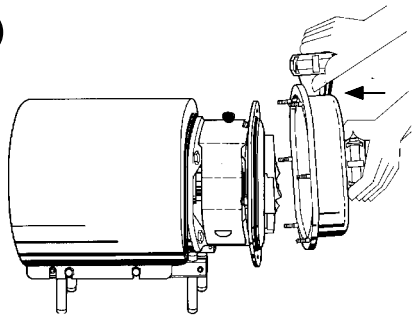
1. Lubricate O-ring (38) and fit it in impeller (37), if impeller screw is used.
2. Lubricate the impeller hub with silicone grease or oil.
3. Screw the impeller onto stub shaft (7).
4. Fit impeller screw (36) and tighten, if used.

8



Fit safety guard (22) and screw (23) and tighten.

9



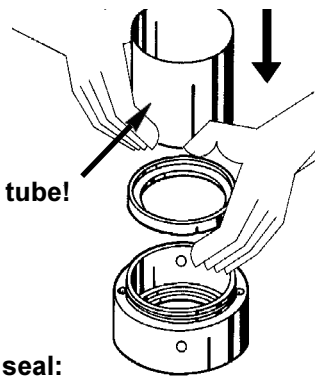
1a. LKH-5: Fit pump casing (29), clamps (55+55a), spring washers (56a) and screws (56).
1b. LKH-10 to-80: Fit pump casing (29), washers (24a) and cap nuts (24).
2. Adjust pump casing to the right position.
3a. LKH-5: Tighten nuts (20) for back plate (25) and tighten screws (56).
3b. LKH-10 to -80: Tighten nuts (20) for back plate (25) and tighten cap nuts (24).

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

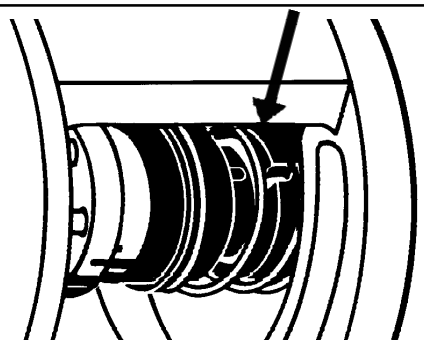
4. Reassembly of pump/flushed shaft seal

1 ✸



Flushed shaft seal:
1. Fit lip seal (43) in seal housing (40).
2. Lubricate O-ring (44) and slide onto the seal housing (40).
3. Fit the seal housing on back plate (25) and tighten screws (41).

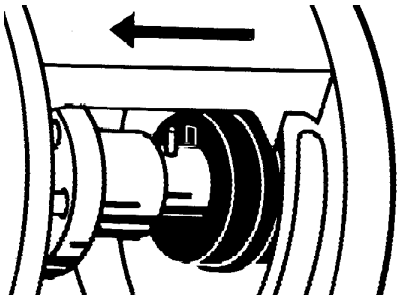
2 ✸



1. Lubricate O-ring (45) and fit it in drive ring (10).
2. Fit spring (13) and rotating seal ring (14) on the drive ring.

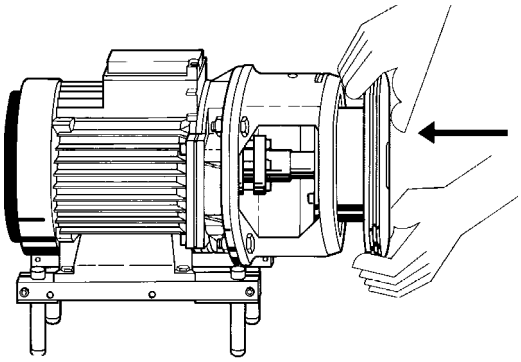
CAUTION!
Make sure that the driver on the drive ring enters the notch in the rotating seal ring.

3 ✸



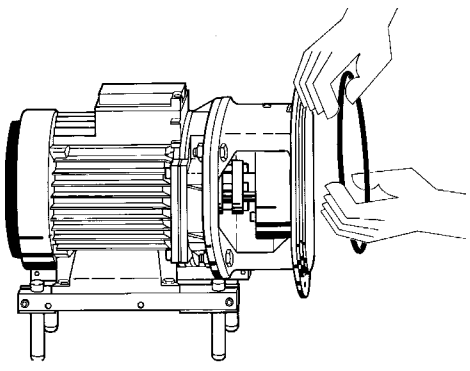
Fit complete shaft seal on stub shaft (7) so that connex pin (8) on the stub shaft enters the notch in drive ring (10).

4



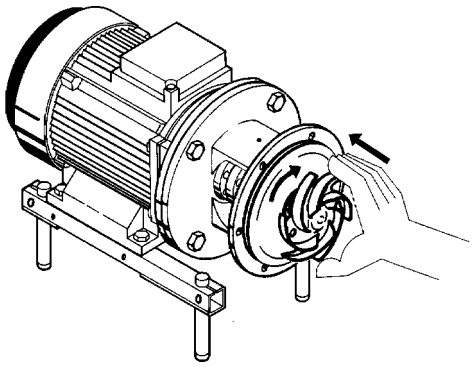
1. Carefully guide back plate (25) onto adaptor (16).
2. Fit washers (21) and nuts (20).

5



Lubricate O-ring (26) and slide it onto back plate (25).

6



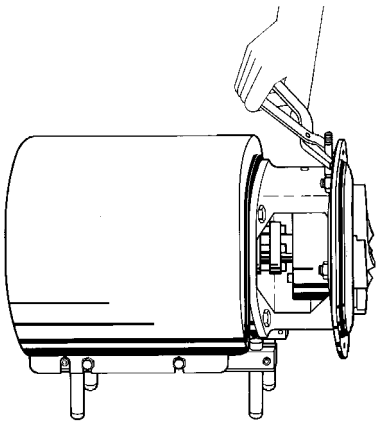
1. Lubricate O-ring (38) and fit it in impeller (37), if impeller screw is used.
2. Lubricate the impeller hub with silicone grease or oil.
3. Screw impeller (27) onto stub shaft (7).
4. Fit impeller screw (36) and tighten, if used.

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

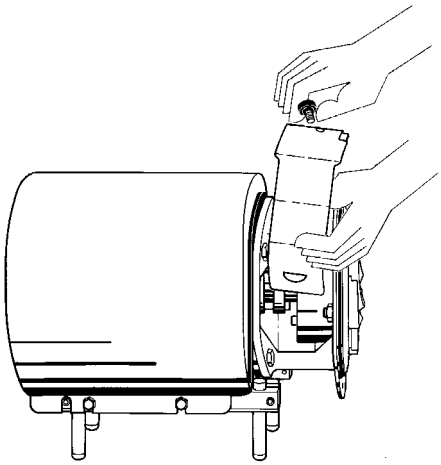
4. Reassembly of pump/flushed shaft seal

7 ✸



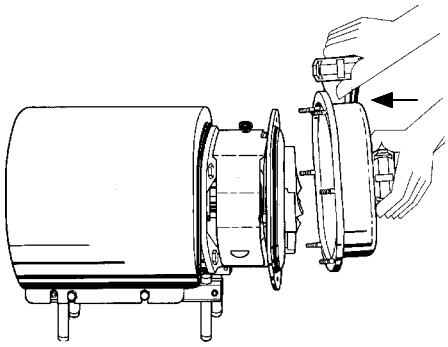
1. Screw tubes (42) into seal housing (40).
2. Tighten with a spanner.

8



Fit safety guard (22) and screw (23) and tighten.

9



1a. LKH-5: Fit pump casing (29), clamps (55+55a), spring washers (56a) and screws (56).
1b. LKH-10 to -80: Fit pump casing (29).
2. Tighten nuts (20) for back plate (25).
3a. LKH-5: Tighten nuts (20) for back plate (25) and tighten screws (56).
3b. LKH-10 to -80: Fit washers (24a) and cap nuts (24) and tighten.

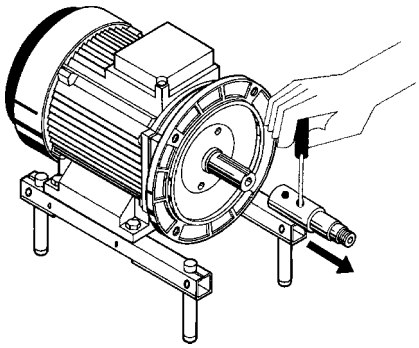
Alfa Laval

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

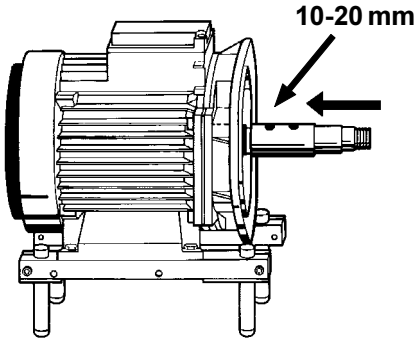
5. Adjustment of shaft (LKH-5)

1



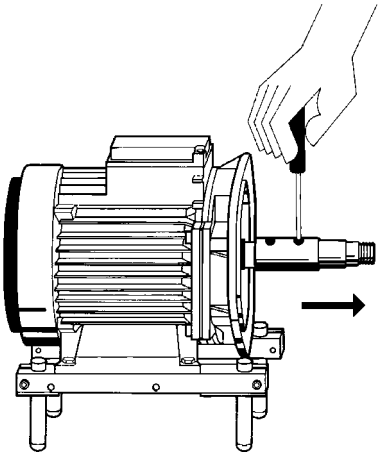
1. Loosen screws (4).
2. Pull off stub shaft (7).

2



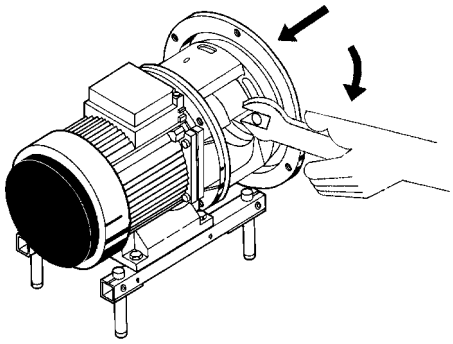
1. Push stub shaft (7) onto the motor shaft. Screws (4) must fit in keyway on the motor shaft.
2. Check that the clearance between the end of the stub shaft and the motor flange is 10-20 mm.

3



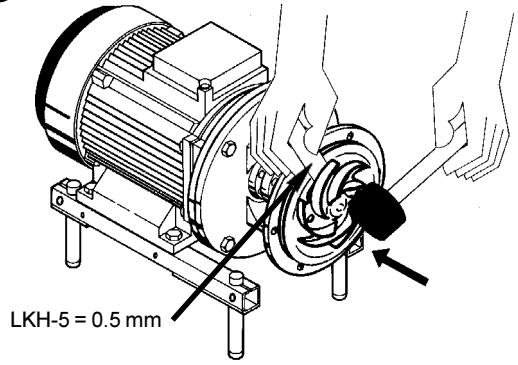
1. Tighten screws (4) lightly and evenly.
2. Ensure that stub shaft (7) can be moved on the motor shaft.

4 ✸



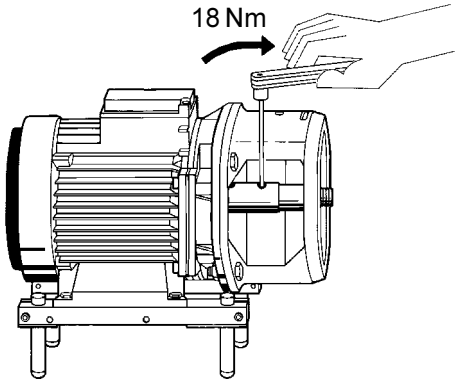
1. **For double mechanical shaft seal:** Fit drive ring (52) on stub shaft (7).
2. Fit back plate (25), washers (21) and nuts (20) and tighten.

5



1. Fit impeller (27) on stub shaft (7).
2. Ensure that the clearance between the impeller and back plate (25) is correct: 0.5 mm for LKH-5.

6



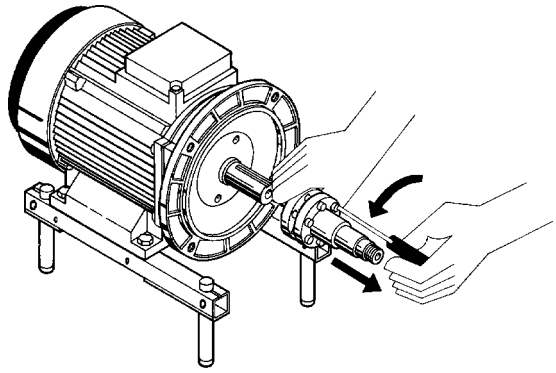
1. Remove impeller (27), back plate (25) and drive ring (52).
2. Tighten screws (4) evenly to 18 Nm.

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

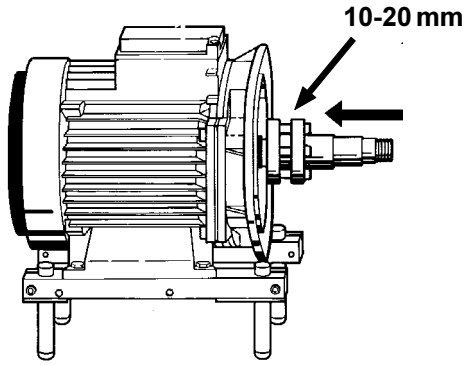
5. Adjustment of shaft (LKH-10 to -80)

1



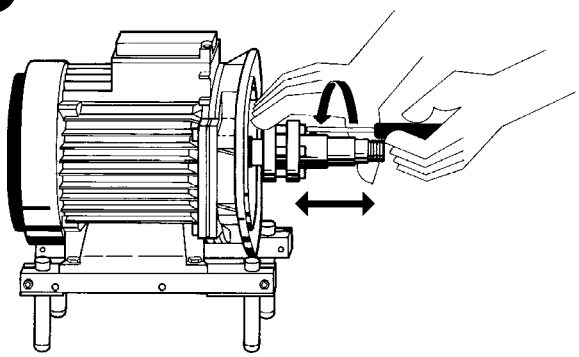
1. Loosen screws (6).
2. Pull off stub shaft (7) together with compression rings (5a, 5b).

2



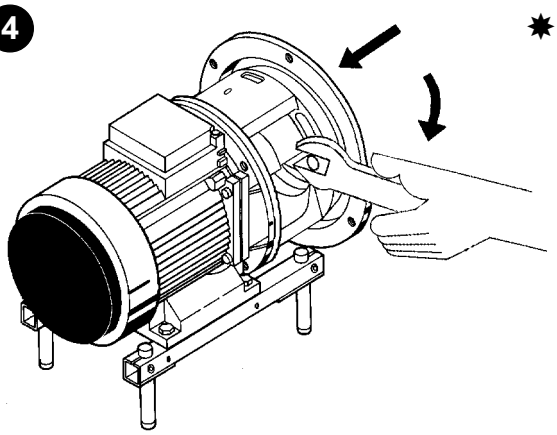
1. Push stub shaft (7) together with compression rings (5a, 5b) onto the motor shaft.
2. Check that the clearance between the end of the stub shaft and the motor flange is 10-20 mm.

3



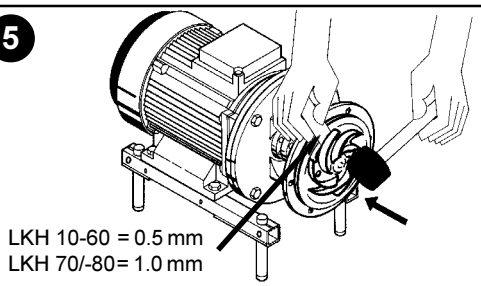
1. Tighten screws (6) lightly and evenly.
2. Ensure that stub shaft (7) can be moved on the motor shaft.

4



1. **For double mechanical shaft seal:** Fit drive ring (52) on stub shaft (7).
2. Fit back plate (25), washers (21) and nuts (20) and tighten.

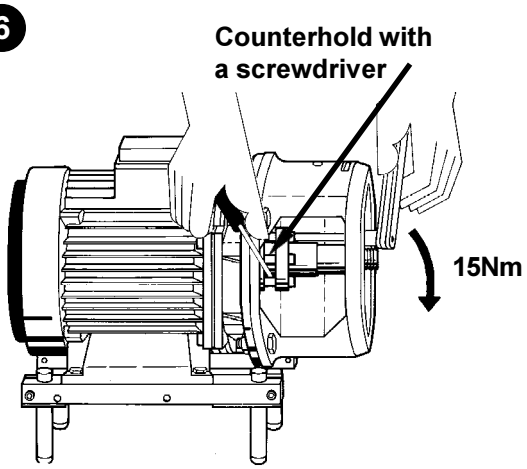
5



1. Fit impeller (27) on stub shaft (7).
2. Ensure that the clearance between the impeller and back plate (25) is correct: 0.5mm for LKH-10-60 and 1.0 mm for LKH-70/-80.

NOTE!
If pump has been ordered with increased clearence between impeller and backplate this additional clearence must be taken into account when adjusting the shaft.

6



1. Remove impeller (27), back plate (25) and drive ring (52).
2. Tighten screws (6) evenly to 15 Nm.

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

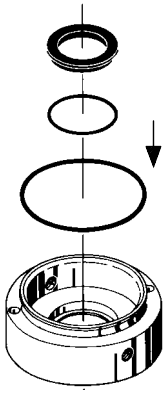
Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

6. Reassembly of pump/double mechanical shaft seal

1 ✸

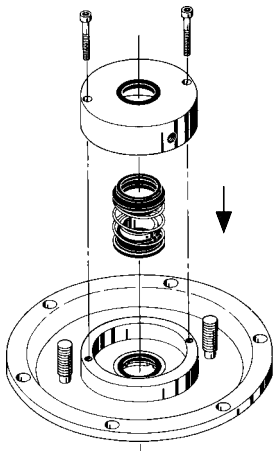
1. Fit O-rings (15) in rotating seal rings (14).
2. Fit spring (13) on one of the rotating seal rings (14) and place the drive ring (52) in between.
3. Fit the second rotating seal ring (14) on the other end of the spring.
   NOTE:
   Ensure that both drive pins on the drive ring enters the notches in rotating seal rings.
4. Place the parts on the stationary seal ring fitted in back plate (25).

2 ✸



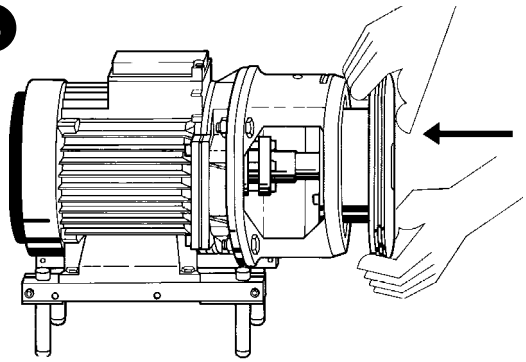
1. Lubricate O-ring (44) and slide onto seal housing (40a).
2. Lubricate O-ring (50) and fit on stationary seal ring (51) and fit this in the seal housing.

3 ✸



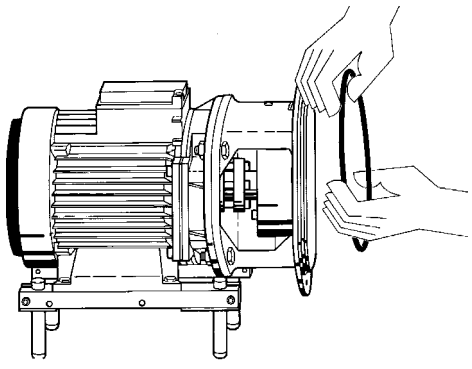
1. Clean the sealing surfaces with contact cleaner.
2. Fit seal housing (40a) on the back plate (25) and tighten screws (41).

4



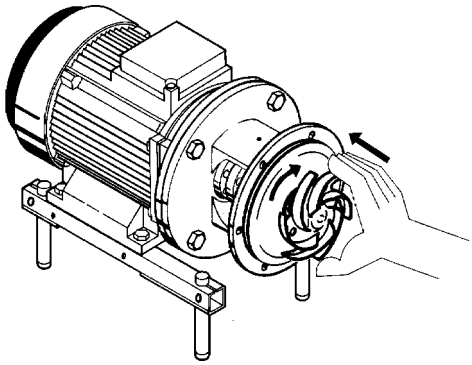
1. To enable fitting back plate (25) with the shaft seal remove connex pin (8) from stub shaft (7) (if fitted).
2. Carefully guide the back plate onto adaptor (16).
3. Fit washers (21) and nuts (20).

5



Lubricate O-ring (26) and slide it onto back plate (25).

6



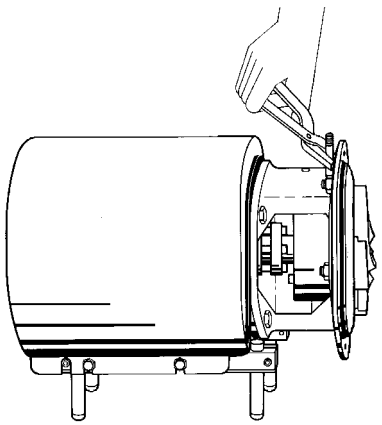
1. Lubricate O-ring (38) and fit it in impeller (37), if impeller screw is used.
2. Lubricate the impeller hub with silicone grease or oil.
3. Screw impeller (27) onto stub shaft (7).
4. Fit impeller screw (36) and tighten, if used.

Study the instructions carefully.
The items refer to the drawings and the parts list on the pages 24-29.

Lubricate the rubber seals before fitting them.
✸ *: Relates to the shaft seal.*

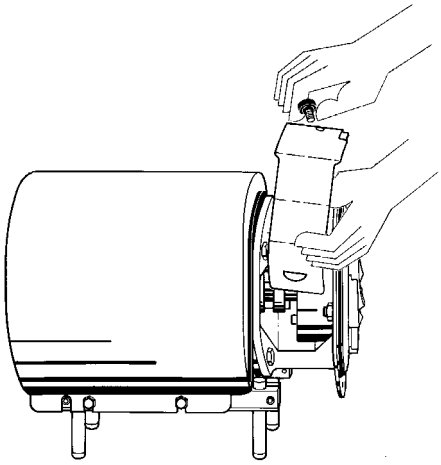
6. Reassembly of pump/double mechanical shaft seal

7 ✸



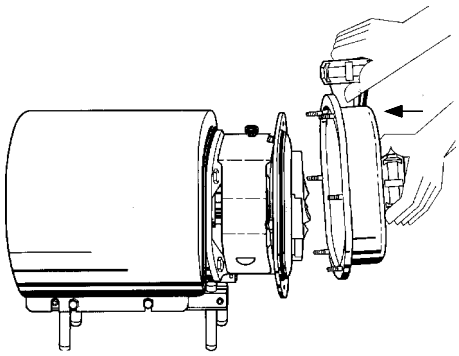
1. Screw tubes (42) into seal housing (40a).
2. Tighten with a spanner.

8



Fit safety guard (22) and screw (23) and tighten.

9



1. Fit pump casing (29).
2. Tighten nuts (20) for back plate (25).

3a. LKH-5: Fit clamps (55+55a), spring washers (56a) and screws (56) and tighten.

3b. LKH-10 to 80: Fit washers (24a) and cap nuts (24) and tighten.

Alfa Laval

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

Inform the personnel about the technical data.

1. Technical data

Data

Max. inlet pressure	LKH-5:	600 kPa (6 bar)
	LKH-10 to -80:	1000 kPa (10 bar)
Temperature range		-10°C to +140°C (EPDM)
Noise level		60-80 dB (A)

Materials

Product wetted steel parts	AISI 316L
Other steel parts	AISI 304
Finish	Semi-bright
Product wetted seals	EPDM (standard)
Other O-rings	EPDM
Alternative seals	Nitrile (NBR), Fluorinated rubber (FPM) and FEP

Shaft seal

Seal types	External single, flushed or double mechanical seal *(Double mechanical seal NOT valid for LKH-70/-80)*
Max. water pressure (flushed seal)	Normally atmospheric (max. 1 bar)
Water consumption (flushed seal)	0.25 - 0.5 l/min.
Max. water pressure (double mechanical seal)	Normally atmospheric (max. 10 bar)
Water consumption (double mechanical seal)	0.25-0.5 l/min.
Material, stationary seal ring	Acid resistent steel with sealing surface of Silicon Carbide
Material, rotating seal ring	Carbon (standard) or Silicon Carbide
Material, O-rings	EPDM (standard)
Alternative material, O-rings	Nitrile (NBR), Fluorinated rubber (FPM) and FEP

Motor

Foot-flanged motor acc. to IEC metric standard
2 poles = 3000/3600 rpm. at 50/60 Hz
IP55 (drain hole with labyrinth plug), insulation class F

Voltage and frequency (standard)	3~, 50 Hz, 220-240VΔ/380-420VY	≤ 4 kW
	3~, 60 Hz, 250-280VΔ/440-480VY	≤ 4.6 kW
	3~, 50 Hz, 380-420VΔ/660-690VY	≥ 5.5 kW
	3~, 60 Hz, 440-480VΔ	≥ 6.3 kW

Motor sizes (kW), 50 Hz	0.75, 1.1, 1.5, 2.2, 3.0, 4.0, 5.5, 7.5, 11.0, 15.0, 18.5, 22.0, 30.0, 37.0, 45.0, 55.0, 75.0
Motor sizes (kW), 60 Hz	0.9, 1.3, 1.75, 2.5, 3.5, 4.6, 6.3, 8.6, 12.5, 17.0, 21.0, 25.0, 35.0, 43.0, 52.0, 63.0, 86.0

Max. weight for LKH-pumps	LKH-5: 33 kg, LKH-10: 57 kg, LKH-15: 79 kg, LKH-20: 77 kg, LKH-25: 134 kg, LKH-35: 134 kg, LKH-40: 174 kg, LKH-45: 136 kg, LKH-50: 174 kg, LKH-60: 327 kg, LKH-70: 570 kg, LKH-80: 581kg.

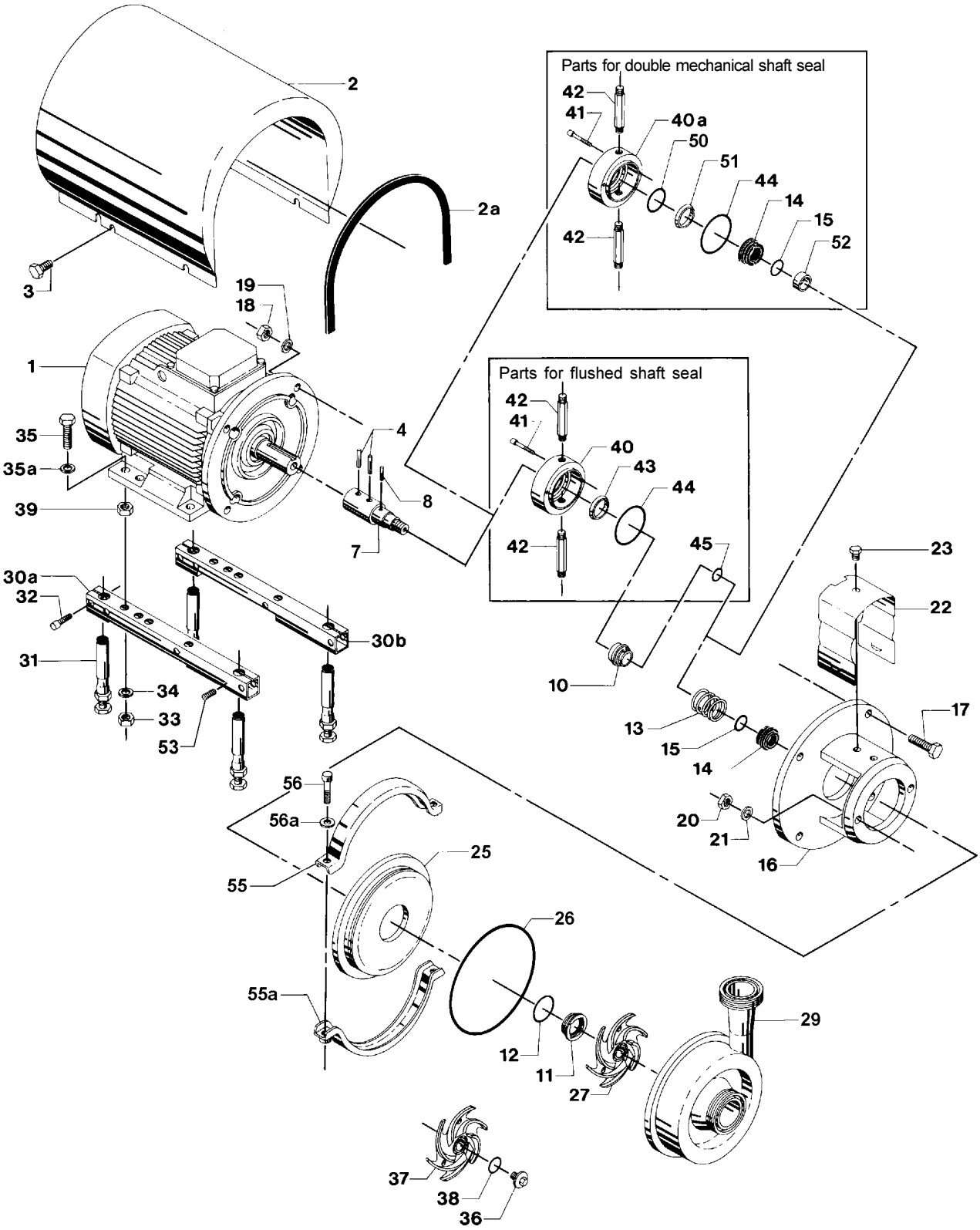
For further information - see PD-sheet.

Exploded drawing

This page shows an exploded drawing of LKH, sanitary version.

The drawing includes all items of the pump. They are identical with the items in the Spare Parts List.

LKH-5, Sanitary version



Click here to Order Parts

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

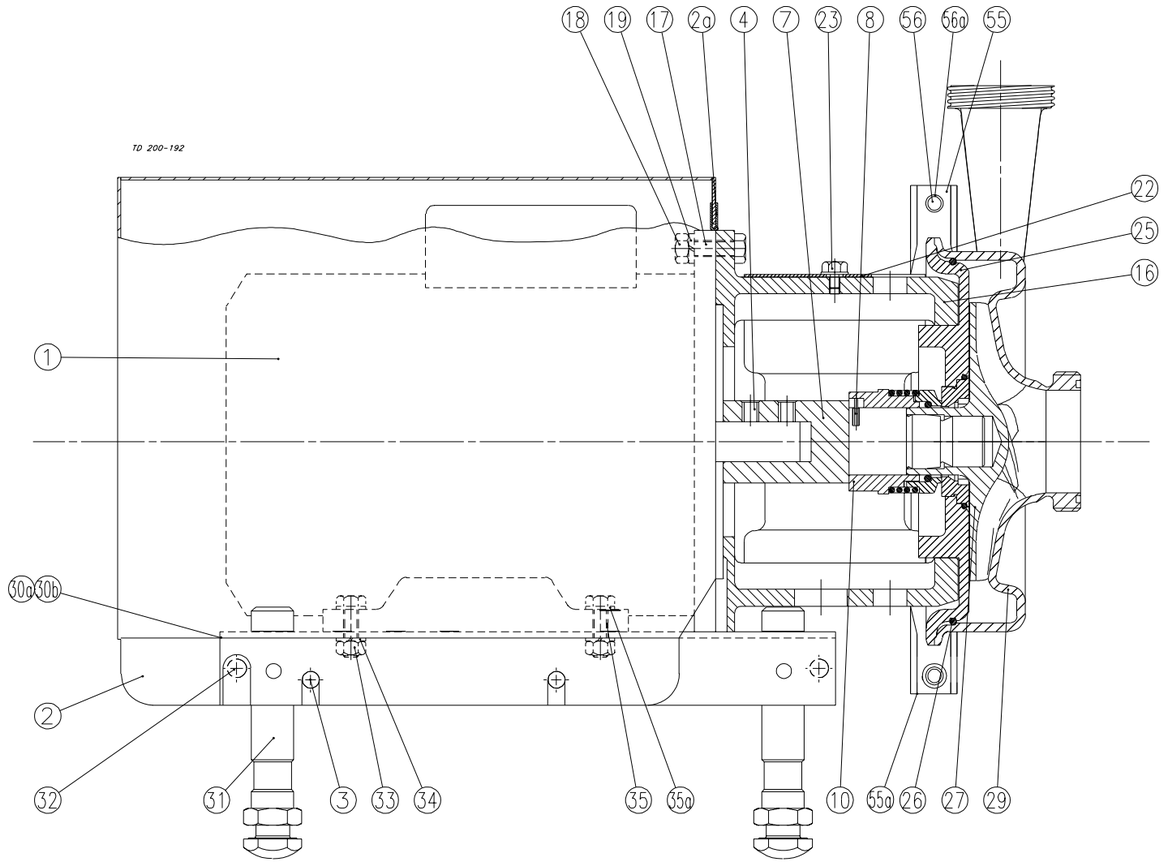
The items are identical with the items in the Spare Parts List.
When ordering spare parts, please, use the Spare Parts List.

The drawing shows LKH, sanitary version.

The items refer to the parts list on the opposite part of the page.

Parts list

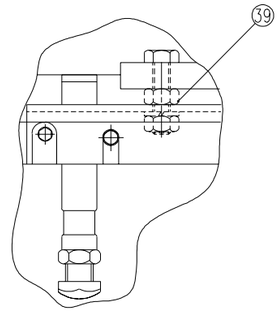
Pos.	Qty.	Denomination	
1	1	Motor	
2	1	Shroud	
2a	1	Edge list	
3	4	Screw	
4	2	Screw	
7	1	Shaft	
8	1	Connex pin	
10	1	Drive ring	
11	1	Stationary seal ring	
12	1	O-ring	
13	1	Spring	
14	1	Rotating seal ring	■
	2	Rotating seal ring	●
15	1	O-ring	■
	2	O-ring	●
16	1	Adaptor	
17	4	Screw for adaptor	
18	4	Nut for adaptor	
19	4	Washer for adaptor	
20	2	Nut	
21	2	Washer	
22	1	Safety guard	
23	1	Screw for safety guard	
25	1	Back plate	
26Δ	1	O-ring	
27	1	Impeller	
29	1	Pump casing	
30a	1	Support bar, right	
30b	1	Support bar, left	
31	4	Leg	
32	4	Screw	
33	4	Nut	
34	4	Spring washer	
35	4	Screw	
35a	4	Washer	
36	1	Impeller screw	
37	1	Impeller for impeller screw	
38	1	O-ring	
39	4	Nut	
40	1	Seal housing	■
40a	1	Seal housing	●
41	2	Screw for seal housing	■ ●
42	2	Tube	■ ●
43Δ	1	Lip seal	■
44Δ	1	O-ring for seal housing	■ ●
45Δ	1	O-ring for drive ring	■
50Δ	1	O-ring	●
51	1	Sec. stationary seal ring	●
52	1	Drive ring	●
55	1	Upper clamp	
55a	1	Lower clamp	
56	2	Screw	
56a	2	Spring washer	



Δ : Service kit - EPDM, NBR, FPM, FEP (see spare parts list).

■ : Flushed shaft seal.

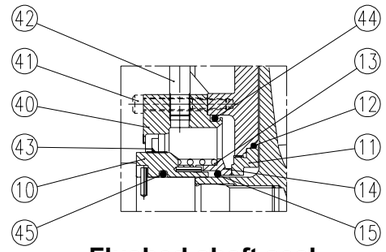
● : Double mechanical shaft seal.



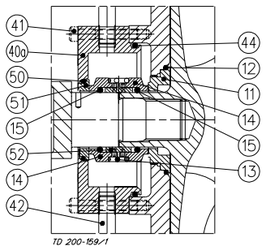
Only used for 0.75 and 1.1 kW

Fitting of legs

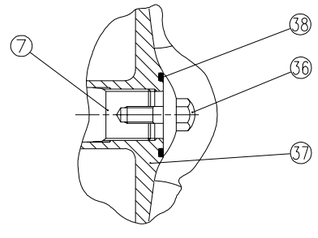
LKH-5, Sanitary version



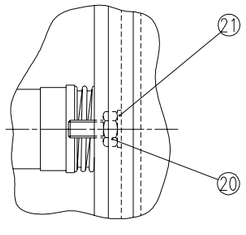
Flushed shaft seal



Double mechanical shaft seal



Impeller screw



Fitting of back plate

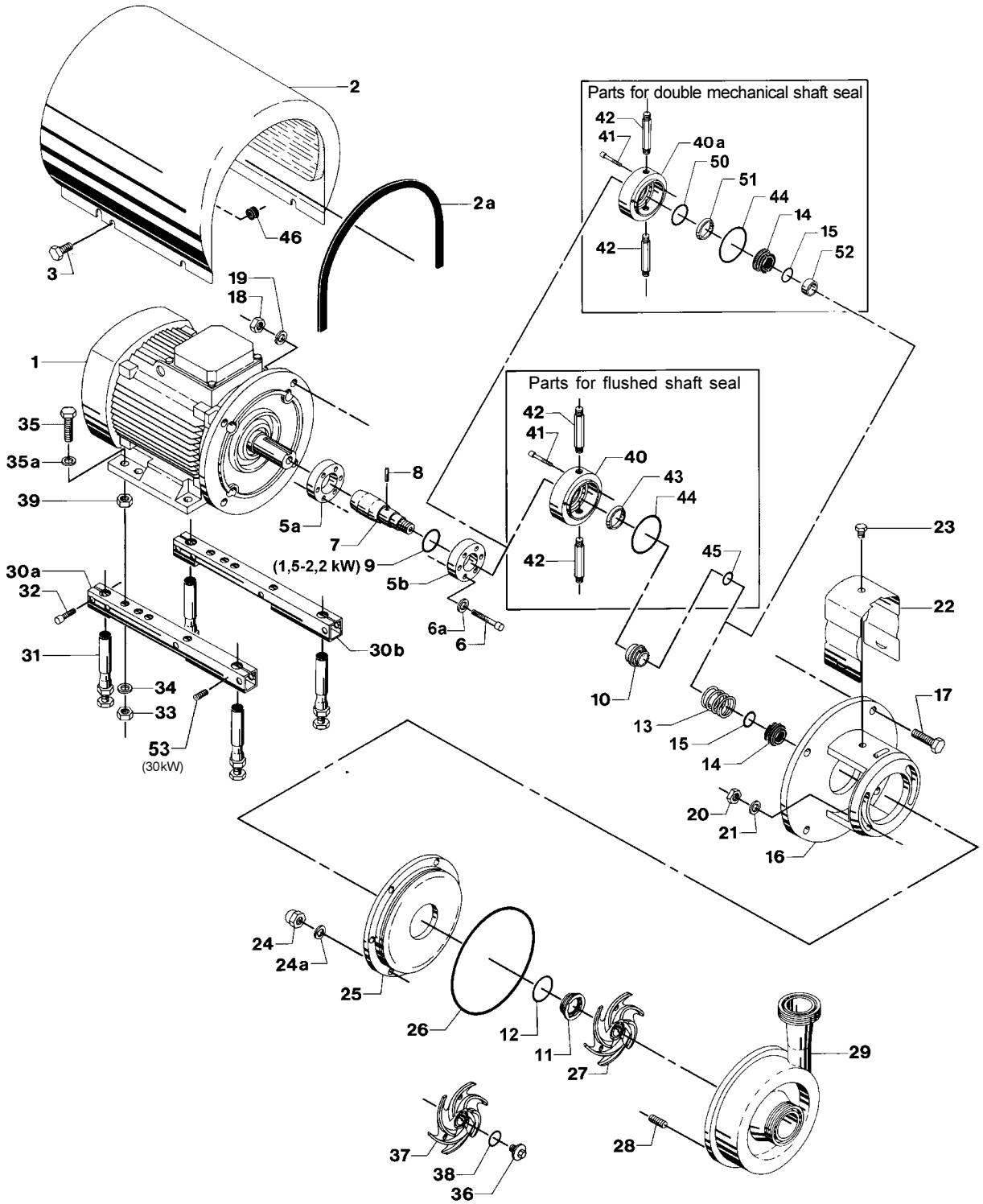
Alfa Laval

Exploded drawing

This page shows an exploded drawing of LKH, sanitary version.

The drawing includes all items of the pump. They are identical with the items in the Spare Parts List.

LKH-10, -15, -20, -25, -35, -40, -45, -50, -60, Sanitary version



Click here to Order Parts

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

The items are identical with the items in the Spare Parts List.
When ordering spare parts, please, use the Spare Parts List.

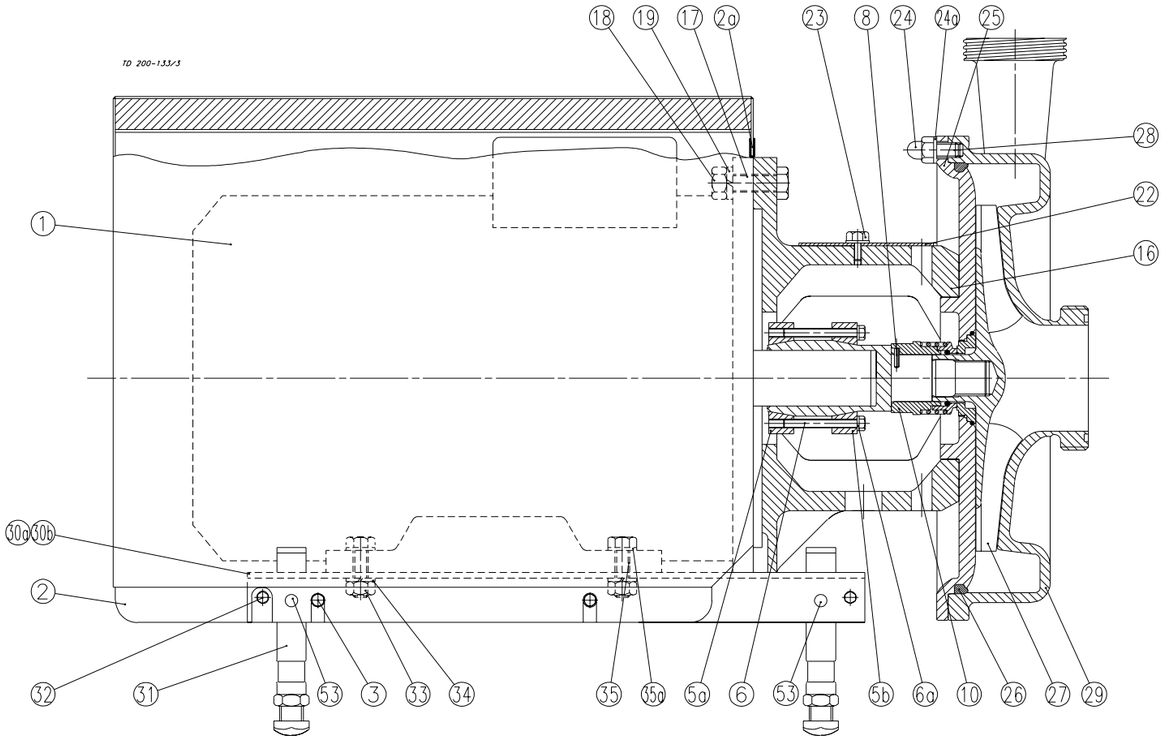
The drawing shows LKH, sanitary version.

The items refer to the parts list on the opposite part of the page.

Parts list

Pos.	Qty.	Denomination	
1	1	Motor	
2	1	Shroud	
2a	1	Edge list	
3	4	Screw	
5a	1	Compression ring with thread	
5b	1	Compression ring without thread	
6	6	Screw	
6a	6	Washer	
7	1	Shaft	
8	1	Connex pin	
9	1	Retaining ring	
10	1	Drive ring	
11	1	Stationary seal ring	
12	1	O-ring	
13	1	Spring	
14	1	Rotating seal ring	■
	2	Rotating seal ring	●
15	1	O-ring	■
	2	O-ring	●
16	1	Adaptor	
17	4	Screw for adaptor	
18	4	Nut for adaptor	
19	4	Washer for adaptor	
20	2	Nut	
21	2	Washer	
22	1	Safety guard	
23	1	Screw for safety guard	
24	6	Cap nut	
24a	6	Washer	
25	1	Back plate	
26Δ	1	O-ring	
27	1	Impeller	
28	6	Stud bolt	
29	1	Pump casing	
30a	1	Support bar, right	
30b	1	Support bar, left	
31	4	Leg	
32	4	Screw	
33	4	Nut	
34	4	Spring washer	
35	4	Screw	
35a	4	Washer	
36	1	Impeller screw	
37	1	Impeller for impeller screw	
38	1	O-ring	
39	4	Nut	
40	1	Seal housing	■
40a	1	Seal housing	●
41	2	Screw for seal housing	■ ●
42	2	Tube	■ ●
43Δ	1	Lip seal	■
44Δ	1	O-ring for seal housing	■ ●
45Δ	1	O-ring for drive ring	■
46	4	Distance sleeve	
50Δ	1	O-ring	●
51	1	Sec. stationary seal ring	●
52	1	Drive ring	●
53	4	Centre screw (30 kW only)	

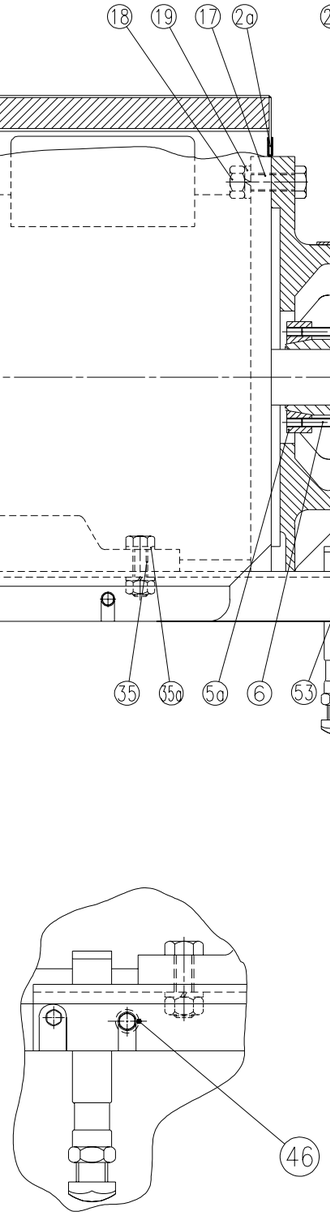
LKH-10, -15, -20, -25, -35, -40, -45, -50, -60, Sanitary version



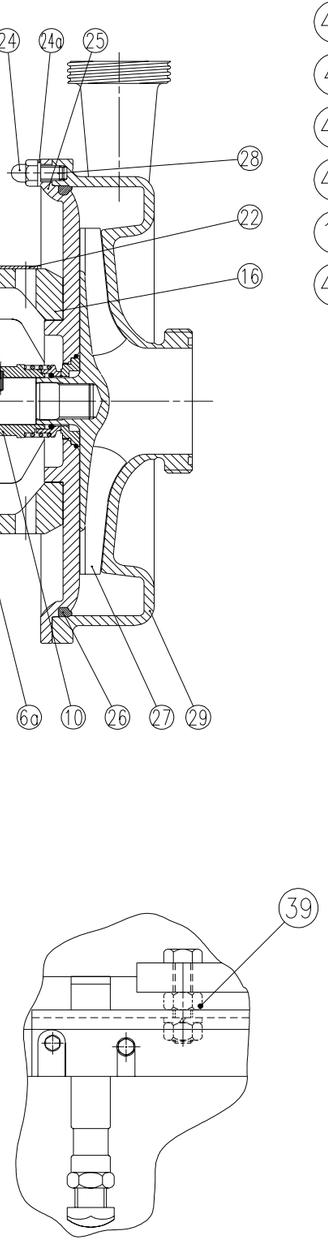
Δ : Service kit - EPDM, NBR, FPM, FEP (see spare parts list).

■ : Flushed shaft seal.

● : Double mechanical shaft seal.

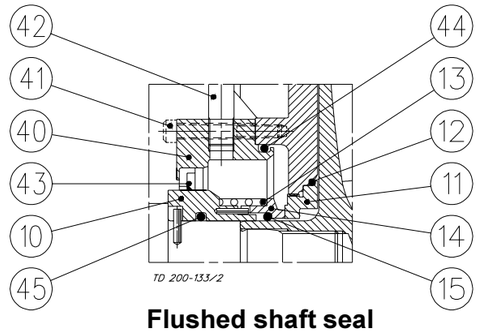


Only used for 5.5 - 30 kW

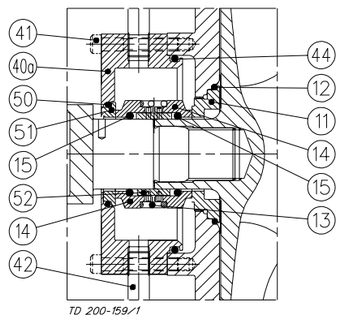


Only used for 3 kW

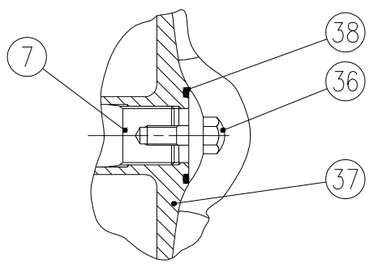
Fitting of legs



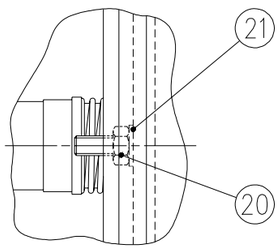
Flushed shaft seal



Double mechanical shaft seal



Impeller screw



Fitting of back plate

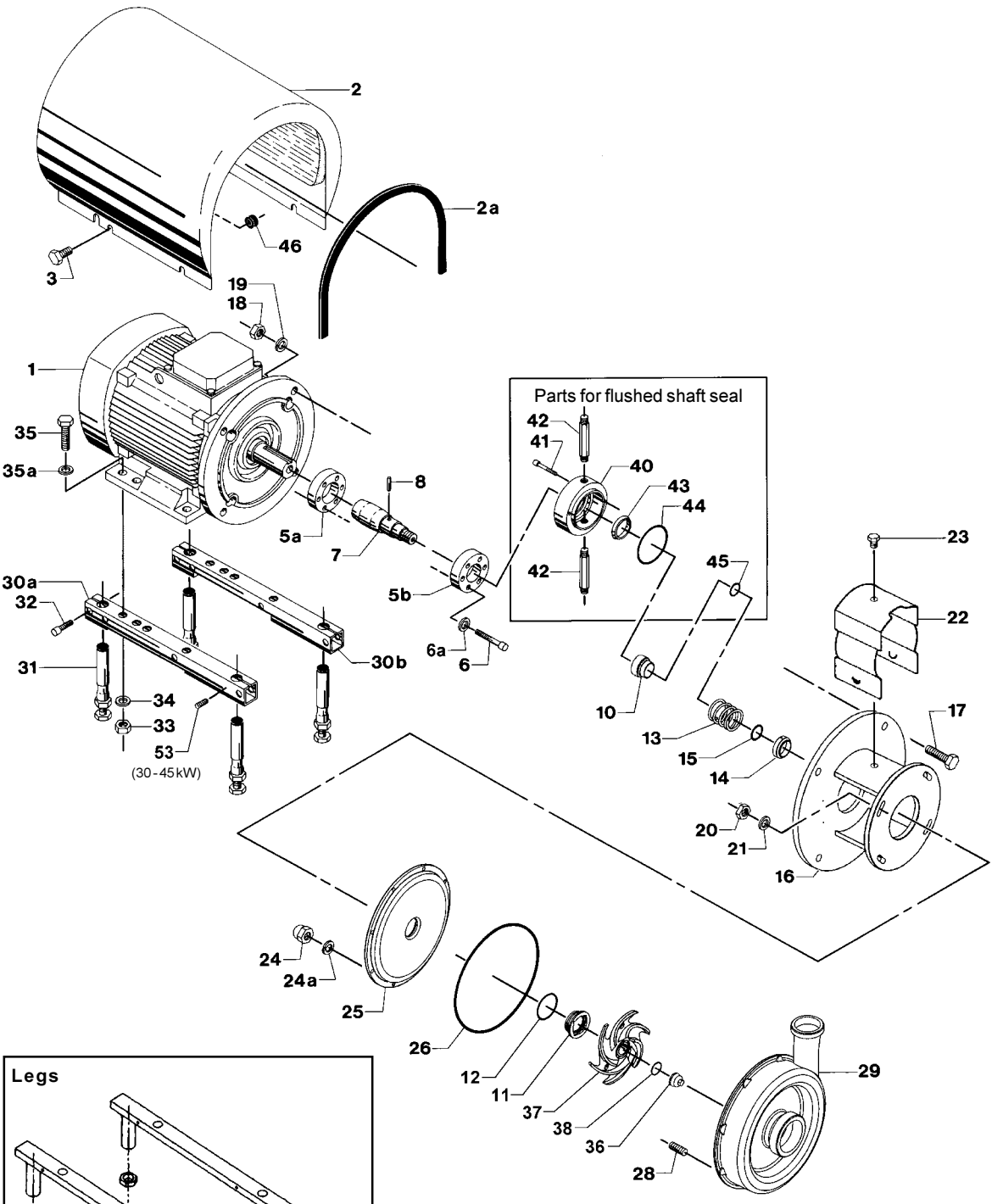
Alfa Laval

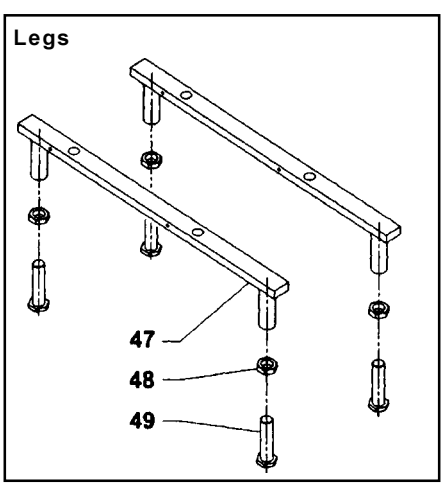
Exploded drawing

This page shows an exploded drawing of LKH, sanitary version.

The drawing includes all items of the pump. They are identical with the items in the Spare Parts List.

LKH-70, -80, Sanitary version





Click here to Order Parts

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

The items are identical with the items in the Spare Parts List.
When ordering spare parts, please, use the Spare Parts List.

The drawing shows LKH, sanitary version.

The items refer to the parts list on the opposite part of the page.

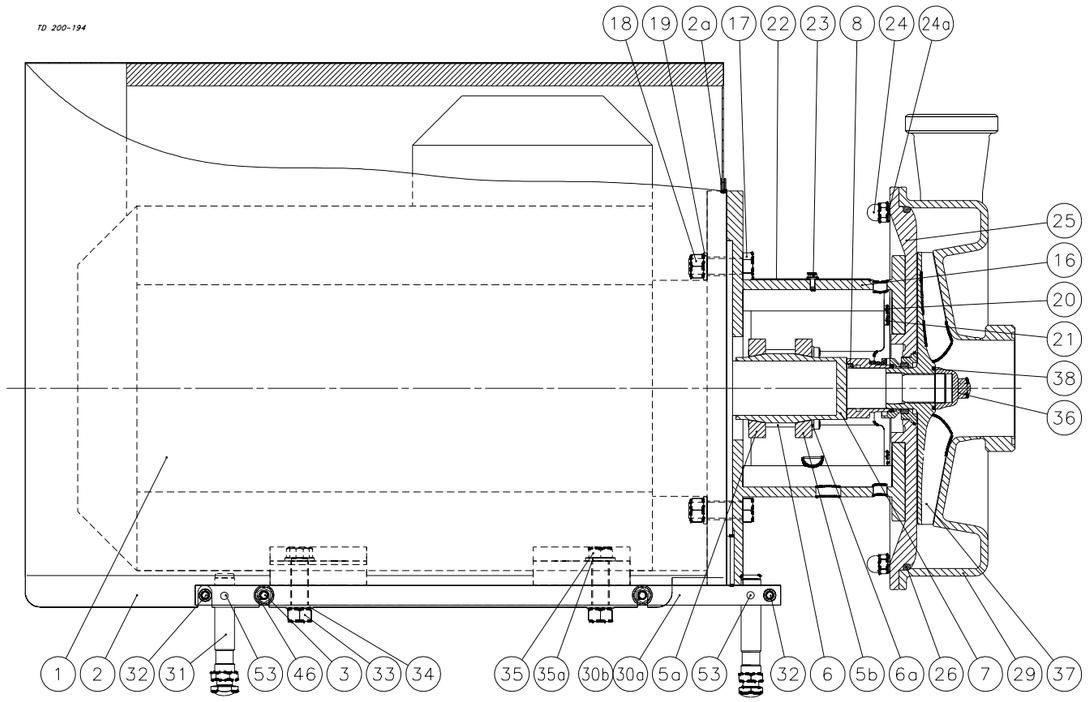
Parts list

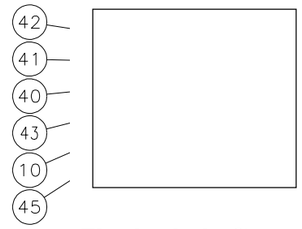
LKH-70, -80, Sanitary version

Pos.	Qty.	Denomination	
1	1	Motor	
2	1	Shroud	
2a	1	Edge list	
3	4	Screw	
5a	1	Compression ring with thread	
5b	1	Compression ring without thread	
6	6	Screw	
6a	6	Washer	
7	1	Shaft	
8	1	Connex pin	
10	1	Drive ring	
11	1	Stationary seal ring	
12	1	O-ring	
13	1	Spring	
14	1	Rotating seal ring	
15	1	O-ring	
16	1	Adaptor	
17	4	Screw for adaptor	
18	4	Nut for adaptor	
19	4	Washer for adaptor	
20	4	Nut	
21	4	Washer	
22	1	Safety guard	
23	1	Screw for safety guard	
24	8	Cap nut	
24a	8	Washer	
25	1	Back plate	
26Δ	1	O-ring	
28	8	Stud bolt	
29	1	Pump casing	
30a	1	Support bar, right	
30b	1	Support bar, left	
31	4	Leg	
32	4	Screw	
33	4	Nut	
34	4	Spring washer	
35	4	Screw	
35a	4	Washer	
36	1	Impeller nut	
37	1	Impeller	
38	1	O-ring	
40	1	Seal housing	■
41	2	Screw for seal housing	■
42	2	Tube	■
43Δ	1	Lip seal	■
44Δ	1	O-ring for seal housing	■
45Δ	1	O-ring for drive ring	■
46	4	Distance sleeve	
47	2	Leg bracket	
48	4	Nut for leg bracket	
49	4	Screw for leg	
53	4	Centre screw (30-45 kW)	

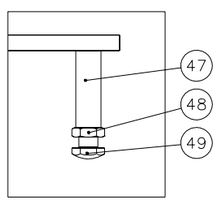
Δ : Service kit - EPDM, NBR, FPM
(see spare parts list)

■ : Flushed shaft seal





Flushed shaft seal



Fitting of legs
55 - 75 kW

Fitting of back plate

Alfa Laval