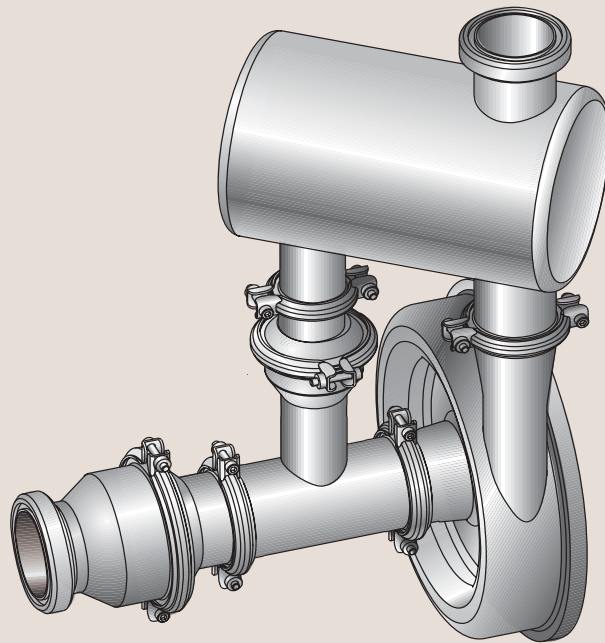




Operating Manual

LKHSP Self-Priming Centrifugal Pump



NOTE!

This is an appendix to Operating Manual IM 70737 for LKH Centrifugal pump.
The appendix must be used in connection with IM 70737 to ensure correct installation, operation and maintenance of the self-priming unit.
Non-specified information is identical with the data for the standard LKH pump.

Declaration of Conformity

The designating company

Alfa Laval

Company Name

6000 Kolding

Address

+45 79 32 22 00

Phone No.

hereby declare that

SELF-PRIMING CENTRIFUGAL PUMP

Denomination

LKHSP

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

Name

Vice President, R & D

Title

Alfa Laval

Company

B. Søndergaard

Signature

Designation

CE

Table of contents

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

Description

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Maintenance

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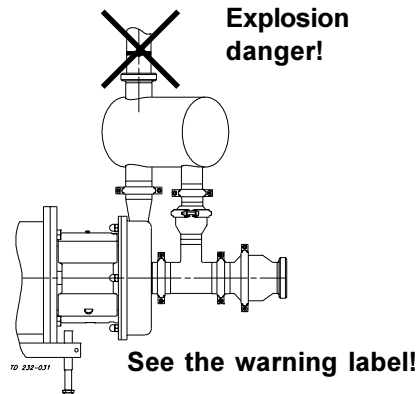
Appendix


Spare parts

Description

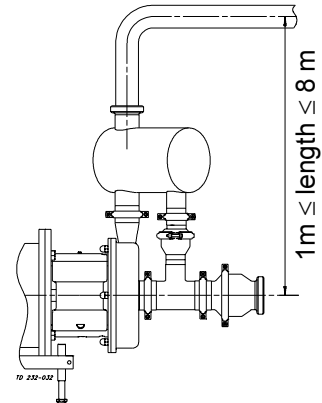
2

1. Operation



 Never run the pump with the pressure side blocked.

2. Installation



At least 1 m, and no more than 8 m of vertical pipe above the pump.

3. Technical data

Pump data

Max. inlet pressure: 1000 kPa (10 bar)
Temperature range: -10°C to +100°C
Noise level (at 1 m): 60 - 80 dB (A)
Max. static pressure at the outlet 80 kPa (0.8 bar)

NB! If higher, the LKC-2 (spec.) cannot work properly

Flushed seal

Water pressure: Normally atmospheric (max. 1 bar)
Water consumption: 0.25 - 0.5 l/min

Double mechanical seal

Water pressure: max. 10 bar
Water consumption: 0.25 - 0.5 l/min

4. Working principle

When the air or gas percentage exceeds 50-60% the standard LKH pump can no longer uphold the liquid column and will therefore stop operating.

With the self-priming unit fitted on the LKH centrifugal pump it is possible to pump liquids containing air or gas as the pump will now operate as follows:

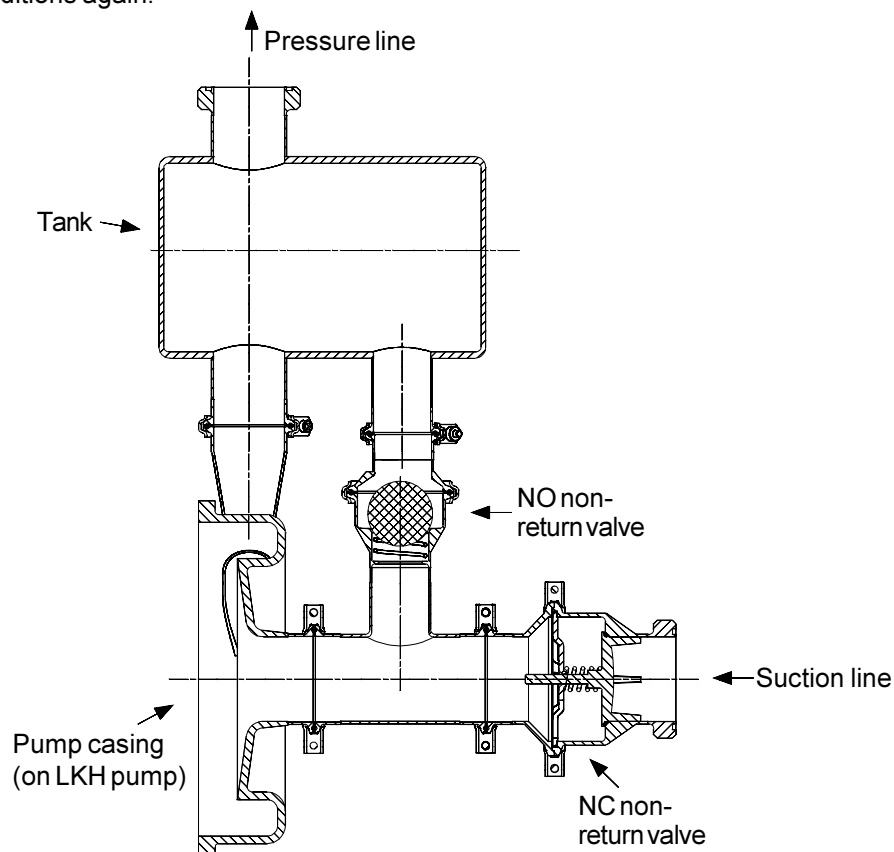
Normal operation:

During normal operation the NC non-return valve in the suction line is open due to the pressure difference over the valve. The pump raises the pressure level, and causes a high pressure in the pressure line and also in the tank. The pressure in the tank ensures that the NO non-return valve in the return line is closed. Because of the valve there is no bypass and therefore the pump almost has the same performance as a normal LKH pump.

Air in the suction line:

At some point the pump stops pumping and the pressure difference over the NC non-return valve in the suction line disappears which means the valve closes. When the pump stops pumping there is no longer a high pressure in the tank and the NO non-return valve in the return line will therefore open and thereby make way for the product to flow into the tee and the pump casing. The pump starts circulating the product and creates a vacuum.

When the vacuum is sufficiently high the NC non-return valve in the suction line opens and the pump sucks a mixture of air and product. This continues until all air is evacuated and the pump starts pumping at normal conditions again.



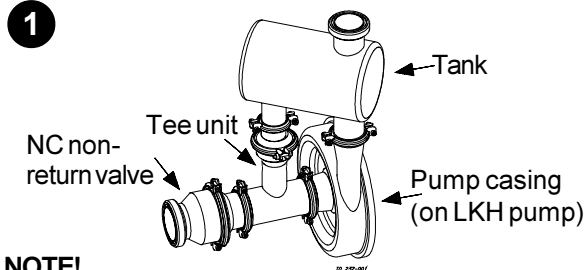
Maintenance

Study the instructions carefully.
The items refer to the drawing and the parts list on the pages 6-9.

Handle scrap correctly.

4

1. Dismantling of self-priming unit

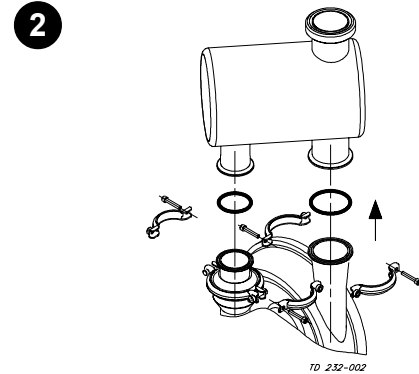


NOTE!

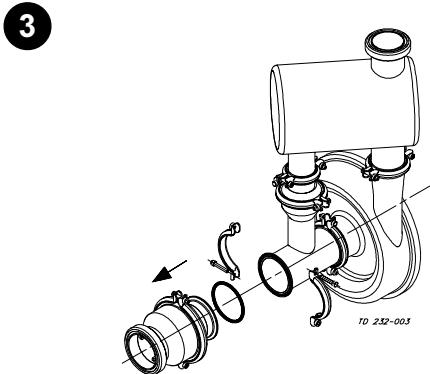
The self-priming unit consisting of the following main parts:

- Tank
- NC non-return valve
- Tee with NO non-return valve

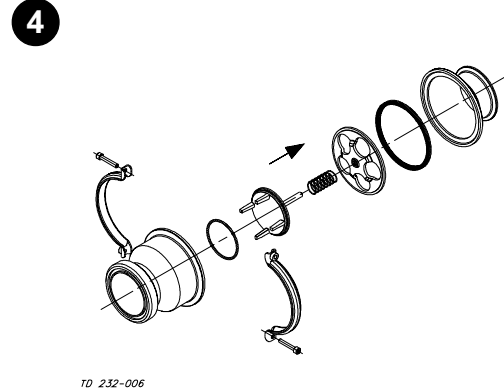
is mounted on the pump casing on a standard LKH centrifugal pump, sizes -10, -20, -25, -35, 40. The dismantling instructions for the LKH pump can be seen in instruction manual IM 70737.



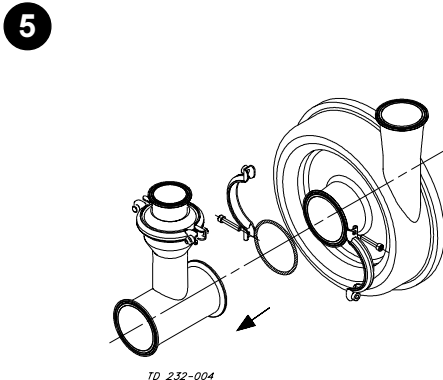
1. Unscrew clamp rings (3, 16) connecting tank (1) to the pump outlet and tee with NO non-return valve.
2. Remove the tank.
3. Remove seal rings (2, 15).



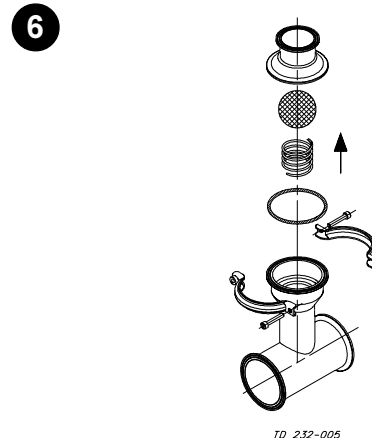
1. Unscrew clamp ring (4) connecting the NC non-return valve and tee with NO non-return valve.
2. Remove the NC non-return valve.
3. Remove seal ring (3).



1. Loosen and remove clamp ring (14).
2. Separate valve body (13), liner (7), valve cone (11), guide plate (9), seal ring (8), O-ring (12) and spring (10) as shown above.



1. Unscrew clamp ring (4) connecting the tee with NO non-return valve and pump inlet.
2. Remove the Tee unit.
3. Remove seal ring (5).



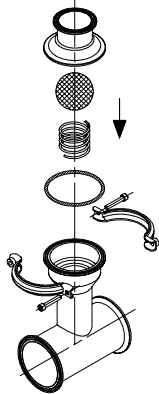
1. Loosen and remove clamp ring (21).
2. Separate ball (18), spring (19) and tee (6) as shown above.

Study the instructions carefully.
The items refer to the drawing and the parts list on the pages 6-9.

Lubricate the rubber seals before fitting them.

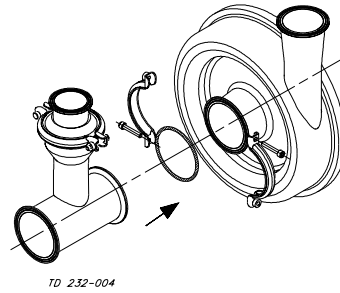
2. Reassembly of self-priming unit

1



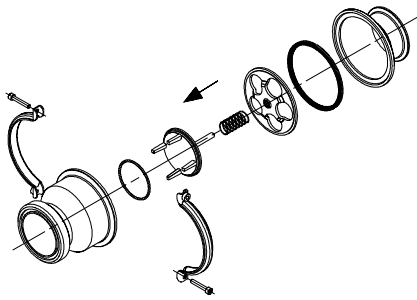
1. Fit ball (18), spring (19) and tee (6) together as shown above.
2. Fit and tighten clamp ring (21).

2



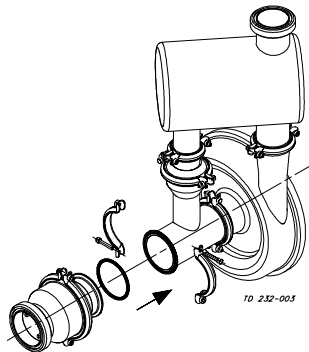
1. Fit seal ring (5).
2. Fit and tighten clamp ring (4) connecting the tee with NO non-return valve and pump inlet.

3



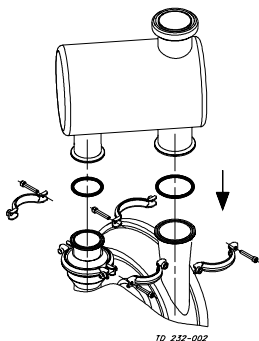
1. Fit valve body (13), liner (7), valve cone (11), guide plate (9), seal ring (8), O-ring (12) and spring (10) together as shown above.
2. Fit and tighten clamp ring (14).

4



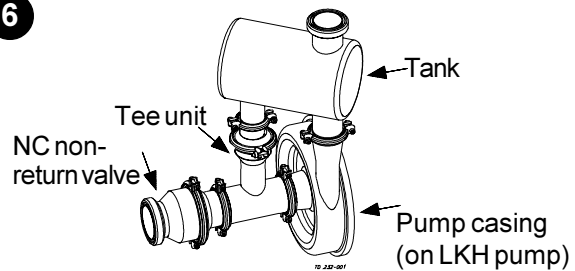
1. Fit seal ring (5).
2. Fit the NC non-return valve.
3. Fit and tighten clamp ring (4) connecting the NC non-return valve and tee with NO non-return valve.

5



1. Fit seal rings (2, 15).
2. Fit the tank on the NO non-return valve and the pump outlet. The welding liner (17) can be turned to fit the tank.
3. Fit and tighten clamp rings (3, 16) connecting tank (1) to the pump outlet and NO non-return valve.

6



NOTE!

The self-priming unit consisting of the following main parts:

- Tank
- NC non-return valve
- Tee with NO non-return valve

is mounted on the pump casing on a standard LKH centrifugal pump, sizes -10, -20, -25, -35, 40. The reassembly instructions for the LKH pump can be seen in instruction manual IM 70737.

Drawing/Parts list

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.

Parts list

Self-priming unit for LKHSP-10, -20, -25, -35, -40

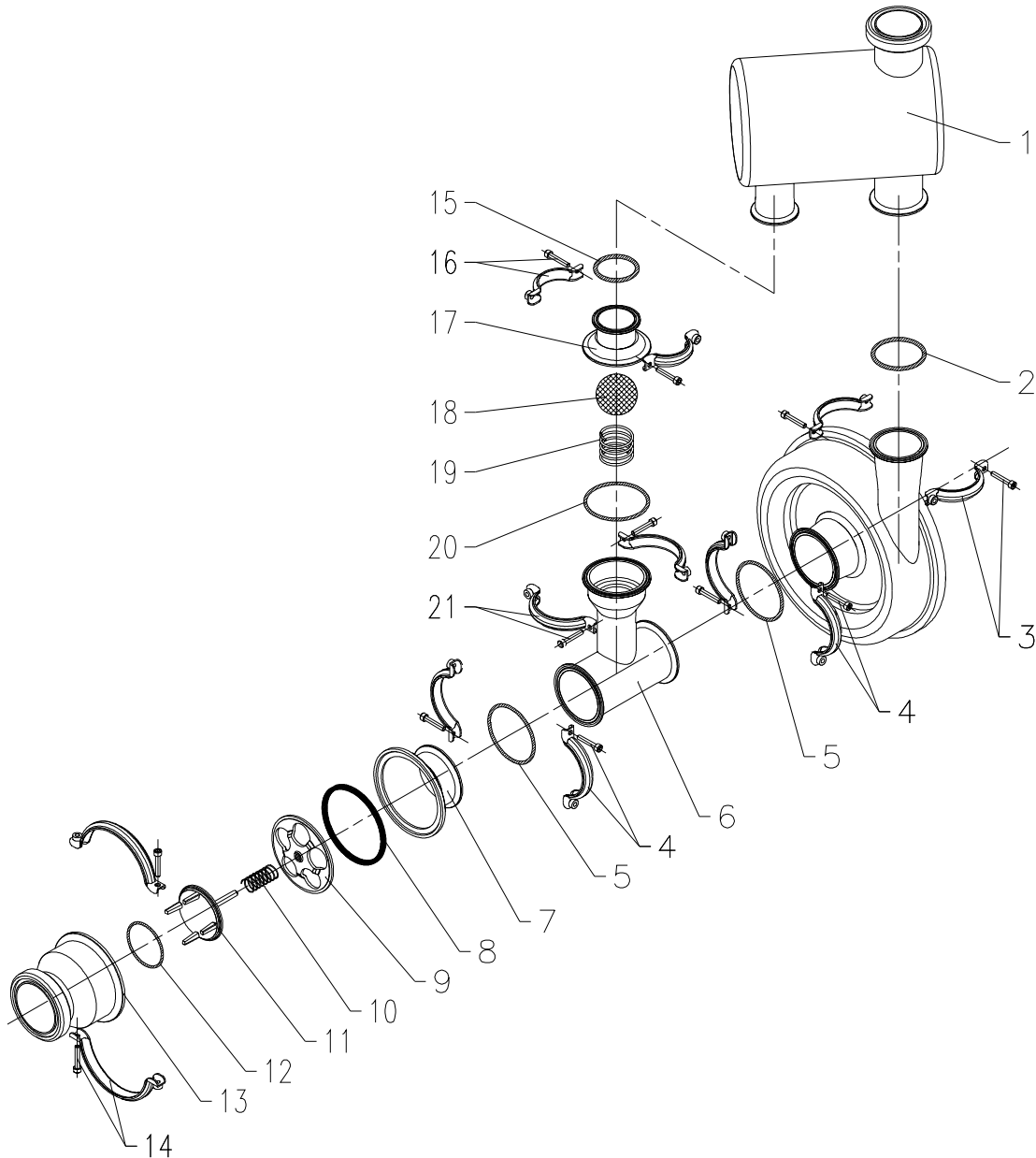
6

Pos.	Qty.	Denomination
1	1	Tank
2	1	Seal ring
3	1	Clamp ring
4	1	Clamp ring
5	1	Seal ring
6	1	Tee
7	1	Liner
8	1	Seal ring
9	1	Guide plate
10	1	Spring
11	1	Valve cone
12	1	O-ring
13	1	Valve body
14	1	Clamp ring
15	1	Seal ring
16	1	Clamp ring
17	1	Welding liner
18	1	Ball
19	1	Spring
20	1	Seal ring
21	1	Clamp ring

This page shows an exploded drawing of LKHSP self-priming unit.

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

Exploded drawing



Drawing/Parts list

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.

Parts list

Self-priming unit for LKHSP-10, -20, -25, -35, -40

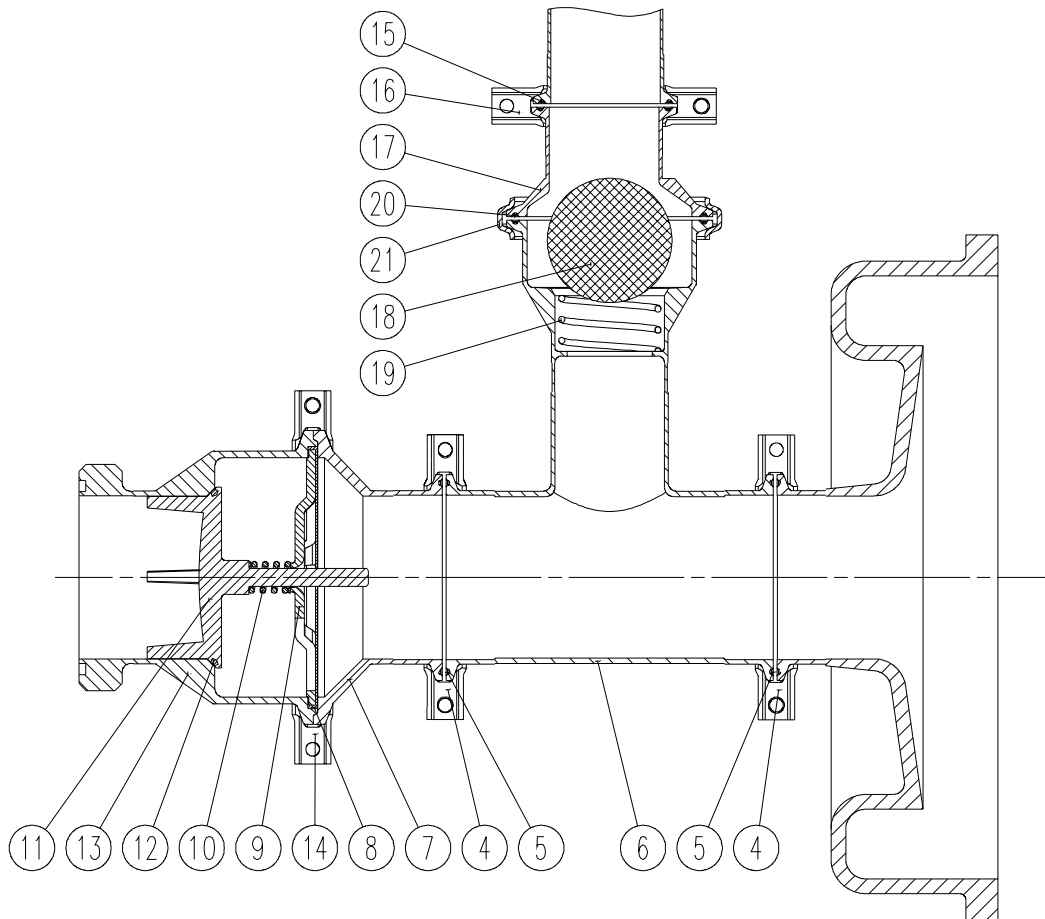
8

Pos.	Qty.	Denomination
1	1	Tank
2	1	Seal ring
3	1	Clamp ring
4	1	Clamp ring
5	1	Seal ring
6	1	Tee
7	1	Liner
8	1	Seal ring
9	1	Guide plate
10	1	Spring
11	1	Valve cone
12	1	O-ring
13	1	Valve body
14	1	Clamp ring
15	1	Seal ring
16	1	Clamp ring
17	1	Welding liner
18	1	Ball
19	1	Spring
20	1	Seal ring
21	1	Clamp ring

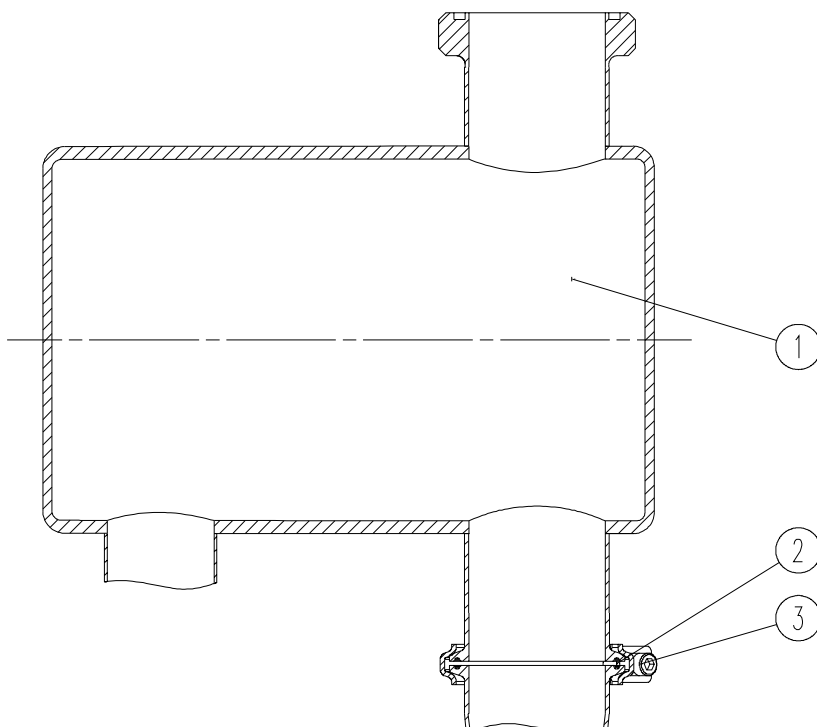
The drawing shows LKHSP, self-priming unit.

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

Drawings

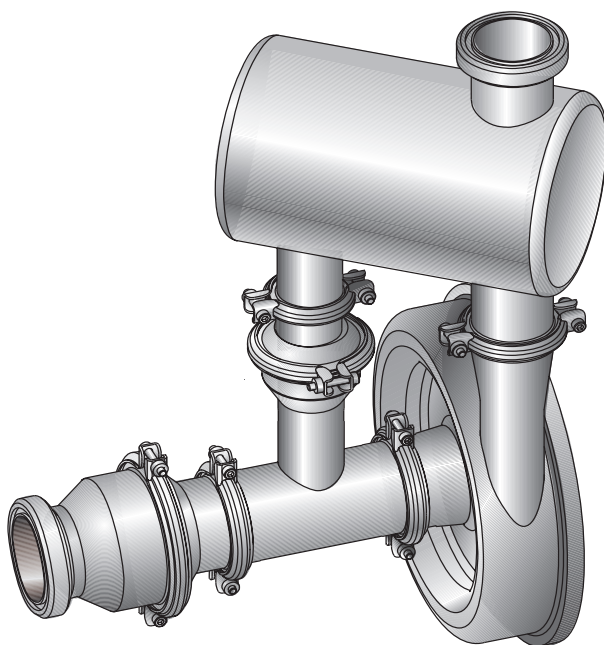


TD 232-020



Spare Parts (Appendix)

LKHSP Self-Priming Centrifugal Pump



NOTE!

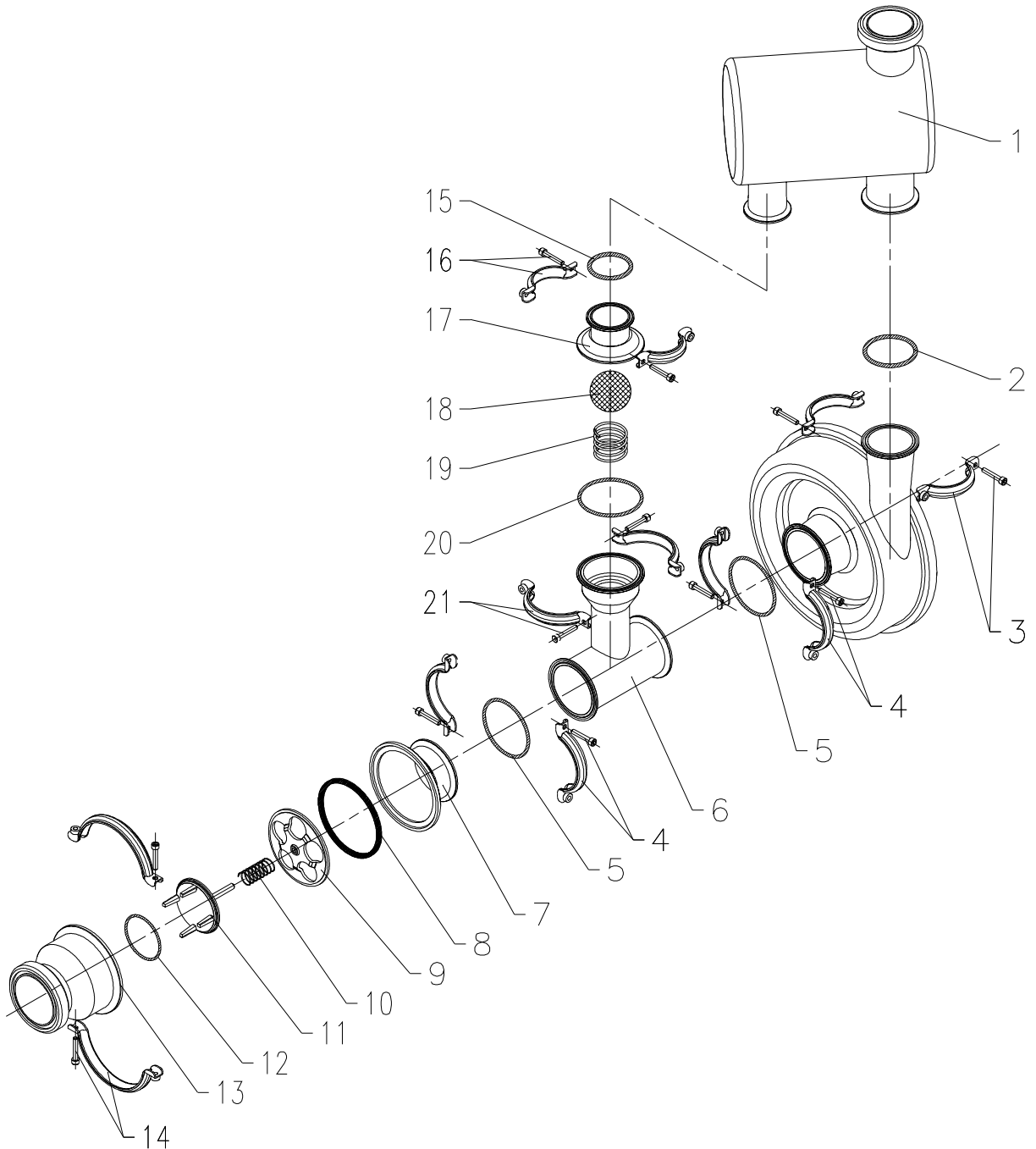
This is an appendix to Spare Parts SP 70737 for LKH Centrifugal pump.

The appendix must be used in connection with SP 70737 to ensure correct installation, operation and maintenance of the self-priming unit.

Non-specified information is identical with the data for the standard LKH pump.

LKHSP Self-priming Centrifugal Pump

2



LKHSP Self-priming Centrifugal Pump

Pos.	Qty.	Denomination	LKHSP-10	LKHSP-20	LKHSP-25	LKHSP-35	LKHSP-40
1	1	Tank complete, SMS	9612-5360-01	9612-5360-07	9612-5363-01	9612-5360-13	9612-5363-07
	1	Tank complete, IDF	9612-5360-02	9612-5360-08	9612-5363-02	9612-5360-14	9612-5363-08
	1	Tank complete, BS	9612-5360-03	9612-5360-09	9612-5363-03	9612-5360-15	9612-5363-09
	1	Tank complete, DIN	9612-5360-04	9612-5360-10	9612-5363-04	9612-5360-16	9612-5363-10
	1	Tank complete, ISO-clamp	9612-5360-05	9612-5360-11	9612-5363-05	9612-5360-17	9612-5363-11
	1	Tank complete, DS	9612-5360-06	9612-5360-12	9612-5363-06	9612-5360-18	9612-5363-12
2 Δ	1	Seal ring, ISO-clamp, EPDM (standard) ..	9611-99-1360	9611-99-1360	9611-99-1361	9611-99-1360	9611-99-1361
	1	Seal ring, ISO-clamp, NBR	9611-99-0767	9611-99-0767	9611-99-0768	9611-99-0767	9611-99-0768
	1	Seal ring, ISO-clamp, FPM	9611-99-1892	9611-99-1892	9611-99-1893	9611-99-1892	9611-99-1893
3	1	Clamp ring complete	9611-31-105-2	9611-31-105-2	9611-31-105-3	9611-31-105-3	9611-31-105-3
4	2	Clamp ring complete	9611-31-105-3	9611-31-105-3	9611-31-105-4	9611-31-105-3	9611-31-105-4
5 Δ	2	Seal ring, ISO-clamp, EPDM (standard) ..	9611-99-1361	9611-99-1361	9611-99-1362	9611-99-1361	9611-99-1362
	2	Seal ring, ISO-clamp, NBR	9611-99-0768	9611-99-0768	9611-99-0769	9611-99-0768	9611-99-0769
	2	Seal ring, ISO-clamp, FPM	9611-99-1893	9611-99-1893	9611-99-1894	9611-99-1893	9611-99-1894
6	1	Tee, ISO-clamp	9612-5584-05	9612-5584-11	9612-5584-17	9612-5584-23	9612-5584-29
7	1	Liner, ISO-clamp	9612-5583-05	9612-5583-05	9612-5583-11	9612-5583-05	9612-5583-11
8 Δ	1	Seal ring, EPDM (standard)	9611-25-315-3	9611-25-315-3	9611-25-315-4	9611-25-315-3	9611-25-315-4
	1	Seal ring, NBR	9611-25-381-3	9611-25-381-3	9611-25-381-4	9611-25-381-3	9611-25-381-4
	1	Seal ring, FPM	9611-25-382-3	9611-25-382-3	9611-25-382-4	9611-25-382-3	9611-25-382-4
9	1	Guide plate	9612-2208-04	9612-2208-04	9612-2208-05	9612-2208-04	9612-2208-05
10	1	Spring	9611-99-1680	9611-99-1680	9611-99-1681	9611-99-1680	9611-99-1681
11	1	Valve cone	9612-2207-04	9612-2207-04	9612-2207-05	9612-2207-04	9612-2207-05
12 Δ	1	O-ring, EPDM (standard)	9611-99-0065	9611-99-0065	9611-99-0066	9611-99-0065	9611-99-0066
	1	O-ring, NBR	9611-99-1413	9611-99-1413	9611-99-1414	9611-99-1413	9611-99-1414
	1	O-ring, FPM	9611-99-1420	9611-99-1420	9611-99-1421	9611-99-1420	9611-99-1421
13	1	Valve body, SMS	9612-5582-01	9612-5582-01	9612-5582-07	9612-5582-01	9612-5582-07
	1	Valve body, IDF	9612-5582-02	9612-5582-02	9612-5582-08	9612-5582-02	9612-5582-08
	1	Valve body, BS	9612-5582-03	9612-5582-03	9612-5582-09	9612-5582-03	9612-5582-09
	1	Valve body, DIN	9612-5582-04	9612-5582-04	9612-5582-10	9612-5582-04	9612-5582-10
	1	Valve body, ISO-clamp	9612-5582-05	9612-5582-05	9612-5582-11	9612-5582-05	9612-5582-11
	1	Valve body, DS	9612-5582-06	9612-5582-06	9612-5582-12	9612-5582-06	9612-5582-12
14	1	Clamp ring complete	9611-31-105-5	9611-31-105-5	9611-31-105-6	9611-31-105-5	9611-31-105-6
15 Δ	1	Seal ring, ISO-clamp, EPDM (standard) ..	9611-99-1360	9611-99-1360	9611-99-1360	9611-99-1360	9611-99-1360
	1	Seal ring, ISO-clamp, NBR	9611-99-0767	9611-99-0767	9611-99-0767	9611-99-0767	9611-99-0767
	1	Seal ring, ISO-clamp, FPM	9611-99-1892	9611-99-1892	9611-99-1892	9611-99-1892	9611-99-1892
16	1	Clamp complete	9611-31-105-2	9611-31-105-2	9611-31-105-2	9611-31-105-2	9611-31-105-2
17	1	Welding liner, ISO-clamp	9612-5412-05	9612-5412-05	9612-5412-05	9612-5412-05	9612-5412-05
18	1	Ball, PP	9612-5413-01	9612-5413-01	9612-5413-01	9612-5413-01	9612-5413-01
19	1	Spring	9612-5354-01	9612-5354-01	9612-5354-01	9612-5354-01	9612-5354-01
20	1	Seal ring, EPDM (standard)	9611-99-1362	9611-99-1362	9611-99-1362	9611-99-1362	9611-99-1362
	1	Seal ring, NBR	9611-99-0769	9611-99-0769	9611-99-0769	9611-99-0769	9611-99-0769
	1	Seal ring, FPM	9611-99-1894	9611-99-1894	9611-99-1894	9611-99-1894	9611-99-1894
21	2	Clamp ring complete	9611-31-105-4	9611-31-105-4	9611-31-105-4	9611-31-105-4	9611-31-105-4
Δ		Service kit, EPDM	9611-92-2248	9611-92-2248	9611-92-2251	9611-92-2248	9611-92-2251
Δ		Service kit, NBR	9611-92-2249	9611-92-2249	9611-92-2252	9611-92-2249	9611-92-2252
Δ		Service kit, FPM	9611-92-2250	9611-92-2250	9611-92-2253	9611-92-2250	9611-92-2253

Recommended Spare Parts: Service kits.
900001/1

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.