Alfa Laval LKH

Centrifugal Pumps

Introduction

The Alfa Laval LKH Centrifugal Pump is a premium pump for use in hygienic applications. To increase process productivity, it is distinguished by high efficiency, gentle product treatment, chemical resistance, and a wide range of flow rates, pressures and options.

Precision-engineered, the LKH pump delivers greater energy efficiency than similar pumps. Its optimized design, premium motor, tight tolerances and advanced impeller design minimize recirculation and reduce energy consumption.

Application

Designed for Cleaning-in-Place (CIP), the Alfa Laval LKH is ideal for hygienic applications within the dairy, food, beverage and personal care industries that require gentle product treatment and reliable operation.

The LKH pump is available in 13 sizes to handle capacities up to 500 m^3 /hour and differential pressures up to 11 bar at 50 Hz.

Benefits

- Energy efficient: superior efficiency resulting in reduced energy consumption and CO2 footprint.
- Hygienic: designed according to the most stringent hygienic design standards and with verified, effective CIP cleanability.
- Wide performance envelope: reduce need for parallel and serial pump installations and ensure pump operating with high efficiency.
- Maximized uptime and reduced maintenance costs: robust mechanical design and ease of maintenance with modular front-loading seals.

Standard design

All media contacting steel components like pump casing, impeller, impeller nut and backplate are in W. 1.4404 (AISI 316L). A stainless steel shroud protects the motor and four adjustable stainless steel legs support the complete unit.

A compression coupling securely attaches the stub shaft to the motor shaft with precision alignment, and the semi-open impeller with a special vane design ensures efficient and gentle handling of the product as it moves through the pump.

As standard, the LKH pump is equipped with a single mechanical shaft seal but is also available with a single flushed or a double mechanical shaft seal. The front-loading shaft seal, with the spring and washers mounted on the atmospheric side, makes maintenance fast, easy and inexpensive. It takes just a few minutes to replace the shaft seal. In addition, the balanced design minimizes the risk of seal opening during unforeseen pressure shock.

TECHNICAL DATA

Regarding the materials used in the LKH pump, the product wetted steel parts are made of W. 1.4404 (316L), other steel parts are stainless steel, the inside surface finish is standard blasted, the product wetted elastomers are EPDM, the rotary seal face is carbon, and the stationary seal face is Silicon Carbide .

Motor

The LKH pump is equipped with a foot-flanged motor that complies with the IEC metric standard. For the motor's pole and speed specifications, 2-pole motors operate at 3000 rpm when the frequency is 50 Hz and 3600 rpm when the frequency is 60 Hz, while 4-pole motors run at 1500 rpm at 50 Hz and 1800 rpm at 60 Hz. The motor has an IP 55 protection class, which includes a drain hole with a labyrinth plug, and an insulation class of F .

In terms of motor sizes, both at 50 Hz and 60 Hz, the motor power ranges from 0.75 kW to 110 kW .

When it comes to the minimum and maximum motor speeds, for 2-pole motors with power ranging from 0.75 kW to 45 kW, the speed range is 900 rpm to 4000 rpm; for 2-pole motors with power from 55 kW to 110 kW, the speed range is 900 rpm to 3600 rpm; and for 4-pole motors with power between 0.75 kW and 75 kW, the speed range is 900 rpm to 2200 rpm .

The LKH pumps come with an extended 3-year warranty. This warranty covers all non-wear parts, but it is conditional on the use of genuine Alfa Laval Spare Parts .

OPERATING DATA

For the maximum inlet pressure of the LKH pump, the LKH-5 model has a maximum inlet pressure of 600 kPa (6 bar), the LKH-10 to LKH-70 models have a maximum inlet pressure of 1000 kPa (10 bar), the LKH-70 model at 60 Hz has a maximum inlet pressure of 500 kPa (5 bar), and the LKH-85 to LKH-90 models have a maximum inlet pressure of 500 kPa (5 bar) .

Temperature

The temperature range of the LKH pump is from -10.5 ° C to +147 ° C when using EPDM elastomers . The maximum temperature for the flush media is 77.5° C . When the pump is not in operation, the maximum temperature for flush housing sterilization is 125° C .

Flushed shaft seal

For the flushed shaft seal of the LKH pump, the maximum water pressure inlet is 1 bar , and the water consumption ranges from 0.25 l/min to 0.5 l/min .

Double mechanical shaft seal

In terms of the double mechanical shaft seal, for the LKH-5 to LKH-60 models, the maximum water pressure inlet is 500 kPa (5 bar) , and for the LKH-70 to LKH-90 models, the maximum water pressure inlet is 300 kPa (3 bar) . The water consumption for the double mechanical shaft seal is the same as that of the flushed shaft seal, ranging from 0.25 l/min to 0.5 l/min .

Connections for flushed and double mechanical shaft seal

When it comes to the connections for the flushed and double mechanical shaft seal, the LKH-5 to LKH-70 and LKH-90 models use a 1/8" G connection, while the LKH-85 model uses a Ø6 tube connection .

Dimensions

Pump specific measures (mm)

The LKH pump has various models, each with specific dimensions. For the LKH-5 model, dimension A is 158 mm, dimension B is 70 mm, dimension C is 22 mm, and dimension D is 189 mm, with dimension E being 42 mm. The LKH-10 model has dimension A of 142 mm, dimension B of 87 mm, dimension C of 23 mm, dimension D of 247 mm, and dimension E of 51 mm. For the LKH-15 model, dimension A is 166 mm, dimension B is 66 mm, dimension C is 43 mm, dimension D is 247 mm, and dimension E is 87 mm. The LKH-20 model features dimension A of 180 mm, dimension B of 88 mm, dimension C of 27 mm, dimension D of 253 mm, and dimension E of 63 mm. For the LKH-25 model, dimension A is 193 mm, dimension B is 106 mm, dimension C is 32 mm, dimension D is 303 mm, and dimension E is 69 mm. The LKH-35 model has dimension A of 193 mm, dimension B of 119 mm, dimension C of 23 mm, dimension D of 303 mm, and dimension E of 54 mm. For the LKH-40 model, dimension A is 212 mm, dimension B is 126 mm, dimension C is 28 mm, dimension D is 329 mm, and dimension E is 64 mm. The LKH-45 model features dimension A of 193 mm, dimension B of 97 mm, dimension C of 41 mm, dimension D of 329 mm, and dimension E of 64 mm. For the LKH-50 model, dimension A is 205 mm, dimension B is 118 mm, dimension C is 35 mm, dimension D is 329 mm, and dimension E is 77 mm. The LKH-60 model has dimension A of 261 mm, dimension B of 102 mm, dimension C of 62 mm, dimension D of 329 mm, and dimension E of 106 mm. For the LKH-70 model, dimension A is 254 mm, dimension B is 147 mm, dimension C is 25 mm, dimension D is 408 mm, and dimension E is 76 mm. The LKH-85 model features dimension A of 229 mm, dimension B of 220 mm, dimension C of 65 mm, dimension D of 438 mm, and dimension E of 97 mm. Finally, the LKH-90 model has dimension A of 310 mm, dimension B of 250 mm, dimension C of 65 mm, dimension D of 504 mm, and dimension E of 95 mm .

Motor specific measures (mm)

The motor of the LKH pump also has specific dimensions corresponding to different IEC standards. For the IEC80 motor, which has a power of 0.75/1.1 kW, dimension F(max)1 is 262 mm, dimension G is 125 mm, dimension H is 250 mm, and for the LKH-5 pump model, dimension I is 400 mm. The IEC90 motor, with a power of 1.5/2.2 kW, has dimension F(max)1 of 262 mm, dimension G of 157 mm, dimension H of 288 mm, for the LKH-5 pump model, dimension I is 441 mm, and for the LKH-10 to LKH-60 pump models, dimension I is 434 mm. For the IEC100 motor with a power of 3.0 kW, dimension F(max)1 is 282 mm, dimension G is 185 mm, dimension H is 325 mm, and for the LKH-10 to LKH-60 pump models, dimension I is 516 mm. The IEC112 motor, which has a power of 4.0 kW, has dimension F(max)1 of 285 mm, dimension G of 198 mm, dimension H of 359 mm, and for the LKH-10 to LKH-60 pump models, dimension I is 497 mm. For the IEC132 motor with a power of 5.5/7.5 kW, dimension F(max)1 is 304 mm, dimension G is 196 mm, dimension H is 383 mm, and for the LKH-10 to LKH-60 pump models, dimension I is 597 mm. The IEC160 motor, with a power of 11/15/18.5 kW, has dimension F(max)1 of 332 mm, dimension

G of 262 mm, dimension H of 485 mm, for the LKH-10 to LKH-60 pump models, dimension I is 791 mm, and for the LKH-70 to LKH-90 pump models, dimension I is 804 mm. For the IEC180 motor with a power of 22 kW, dimension F(max)1 is 352 mm, dimension G is 286 mm, dimension H is 533 mm, for the LKH-10 to LKH-60 pump models, dimension I is 842 mm, and for the LKH-70 to LKH-90 pump models, dimension I is 855 mm. The IEC200 motor, which has a power of 30/37/45 kW, has dimension F(max)1 of 372 mm, dimension G of 399 mm, dimension H of 670 mm, for the LKH-10 to LKH-60 pump models, dimension I is 980 mm, and for the LKH-70 to LKH-90 pump models, dimension I is 993 mm. For the IEC250 motor with a power of 55/75 kW, dimension F(max)1 is 446 mm, dimension G is 394 mm, dimension H is 738 mm, and for the LKH-70 to LKH-90 pump models, dimension I is 1051 mm. Finally, the IEC280 motor, with a power of 90/110 kW, has dimension F(max)1 of 496 mm, dimension G of 584 mm, dimension H of 960 mm, and for the LKH-70 to LKH-90 pump models, dimension I is 1271 mm .
It is possible to reduce dimension F by a minimum of 59 mm for all pump models, and for smaller models, it is possible to reduce dimension F even further .

Motor overview

Different LKH pump models are compatible with specific ranges of IEC motors. The LKH-5 model is compatible with IEC motors ranging from IEC80 to IEC90. The LKH-10, LKH-15, LKH-20, LKH-25, LKH-35, LKH-40, LKH-45, LKH-50, and LKH-60 models are compatible with IEC motors from IEC90 to IEC160, IEC90 to IEC160, IEC90 to IEC160, IEC90 to IEC200, IEC90 to IEC180, IEC90 to IEC200, IEC100 to IEC180, IEC100 to IEC200, and IEC112 to IEC200 respectively. The LKH-70 model is compatible with IEC motors from IEC160 to IEC250, the LKH-85 model with IEC motors from IEC200 to IEC280, and the LKH-90 model with IEC motors from IEC180 to IEC250 .
From the LKH-5 to LKH-85 models, the dimensional data are based on 2-pole ABB motors, while for the LKH-90 model, the dimensional data are based on 4-pole ABB motors .

Connections (mm)

The LKH pump has various connection types with specific dimensions for different models. For the Clamp ISO 2037 connection type, both M1 and M2 have a dimension of 21 mm for most models, except there is no applicable dimension for the LKH-90 model, and for M2 of a certain unspecified model within the range, the dimension is 12 mm. In the case of the Union ISO (IDF) connection, M1 and M2 both have a dimension of 21 mm for relevant models, with no dimension for the LKH-90 model. For the Union DIN/ISO connection, M1 has dimensions of 22 mm, 25 mm, 30 mm, 30 mm, 30 mm, 30 mm for different models in sequence, and M2 has dimensions of 22 mm, 22 mm, 30 mm, 25 mm, 27 mm, 30 mm respectively, with no dimension for the LKH-90 model. When it comes to the Union SMS connection, M1 has dimensions of 20 mm, 24 mm, 35 mm, 24 mm, 24 mm, 35 mm for the corresponding models, M2 has dimensions of 20 mm, 20 mm, 24 mm, 24 mm, 24 mm, 35 mm, and there is no dimension for the LKH-90 model. For the Union (BS)RJT connection, M1 has dimensions of 27 mm, 27 mm, 32 mm, 27 mm, 27 mm, 32 mm for the relevant models, M2 has dimensions of 27 mm, 27 mm, 27 mm, 27 mm, 22 mm, 32 mm, and no dimension for the LKH-90 model. In the Union DS connection type, M1 has a dimension of 24 mm for most applicable models, with M1 of the first model being 20 mm, and M2 has dimensions of 20 mm, 20 mm, 24 mm, 24 mm, 21 mm, 24 mm for the corresponding models, with no dimension for the LKH-90 model. For the Union DIN/DIN connection, M1 has dimensions of 22

mm, 25 mm, 30 mm, 30 mm, 30 mm, 30 mm for the relevant models and 50 mm for the LKH-90 model, M2 has dimensions of 22 mm, 22 mm, 30 mm, 25 mm, 27 mm, 30 mm for the applicable models and 50 mm for the LKH-90 model. When it comes to the Clamp ASME BPE connection, there is no dimension for M1 of most models except the LKH-90 model which has a dimension of 38 mm, and M2 has a dimension of 38 mm for the LKH-90 model with no dimension for other models. For J1, the dimensions are 51 mm (2"), 63.5 mm (2.5"), 101.6 mm (4"), 76.1 mm (3"), 76.1 mm (3"), 101.6 mm (4"), and 152.5 mm (6") for the respective models. For J2, the dimensions are 38 mm (1.5"), 51 mm (2"), 76.1 mm (3"), 63.5 mm (2.5"), 63.5 mm (2.5"), 101.6 mm (4"), and 152.5 mm (6") for the corresponding models .
Other dimensions for J1 and J2 are available upon request .

Flow chart

The flow chart of the LKH pump is based on a frequency of 50 Hz and a synchronous speed of 3000 rpm. In the flow chart, the vertical axis represents the head H (in meters) and the horizontal axis represents the flow rate Q (in m^3 /h). Different LKH pump models are marked on the chart: A corresponds to LKH-70, B to LKH-85, C to LKH-40, M to LKH-15, J to LKH-20, K to LKH-10, L to LKH-5, G to LKH-50, H to LKH-45, I to LKH-90, D to LKH-35, E to LKH-60, and F to LKH-25 .

Options

- Impeller with reduced diameter.
- Flushed shaft seal.
- Double mechanical shaft seal.
- Rotating seal face of Silicon Carbide.
- Product wetted elastomers NBR, FPM or FEP.
- ½" vertical drain connection.
- Product wetted surface finish mechanically polished to Ra (Ra ≤0.8 μm)
- Surface finish measurement with certificate (Ra (Ra ≤0.8 μm)
- Inducer (LKH-10 to -50).
- Adjustable pads.
- Motor for other voltage and/or frequency.
- Half speed motor.
- Motor with increased safety/flame proof motor.
- ATEX approved execution (LKHex).

Ordering

Please state the following when ordering:

- Pump size.
- Connections.
- Impeller diameter.
- Motor size.
- Voltage and frequency.
- Flow, pressure and temperature.
- Density and viscosity of the product.
- Options.

Note! For further details, see also ESE00698.

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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