Alfa Laval LKH Prime

Centrifugal pumps

Introduction

Based on the market-leading Alfa Laval LKH pump, the Alfa Laval LKH Prime Centrifugal Pump is a versatile, highly efficient self-priming pump for use in hygienic applications, especially tank emptying and CIP return applications. With its combination of air-screw technology and advanced design, the pump can remove air from the suction pipe.

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

Application

The LKH Prime pump is designed to meet the stringent hygienic requirements across the food, dairy, beverage, and home-personal care industries. It is ideal for tank emptying and CIP return applications. With verified and effective CIP cleanability, the LKH Prime can be used as a product pump as well.

The LKH Prime is available in three sizes to handle capacities up to 100 m3/h and differential pressures up to 7.5 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 and effective CIP cleanability.
- Quiet: operates very quietly compared to other self-priming pumps improving the working environment.
- Reduced capital investment: designed for Cleaning-in-Place (CIP) duties containing entrained air but can also pump product reducing need for additional pump.

Standard design

All media contacting steel components like pump casing, impeller, airscrew, front cover, recirculation pipe 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 handling of the product as it moves through the pump.

As standard, the LKH prime pump is equipped with a single mechanical shaft seal but is also available with 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.

Working principle

On applications where the pumped media contains a mixture of air and liquid in the suction line, airscrew rotation causes

the formation of a continuous liquid ring within the canister. Due to the eccentric position of the canister relative to the airscrew, an air chamber forms between the liquid ring and the airscrew, which separates into air pockets between the air-screw vanes.

The continuous rotation of the air-screw forces air pockets through the canister into the suction stage of the impeller which are then pumped out via the discharge.

Liquid is returned from the discharge via the recirculation pipe into the canister to ensure the liquid ring is maintained at all times. When there is no air present, the canister and recirculation loop have no function and are fully filled with liquid. The liquid passes through the canister into the suction stage of the impeller, allowing the pump to act as a traditional centrifugal pump.

Certificates

Authorized to carry the 3A symbol

TECHNICAL DATA

Standard materials	
Product wetted steel parts:	W. 1.4404 (316L)
Other steel parts:	Stainless steel
Inside surface finish:	Mech Ra ≤ 32
Product wetted elastomers:	EPDM

Motor
Standard C-faced, foot mounted motor according to NEMA standard. 3500 RPM. Premium efficiency, Class F. Note different frame sizes.

Connections	
Connections for double mechanical shaft seal	1/8" NPT

Min/Max speed	
Air evacuation:	2800 - 3600 rpm.
Pumping product (no air):	900 - 3600 rpm.

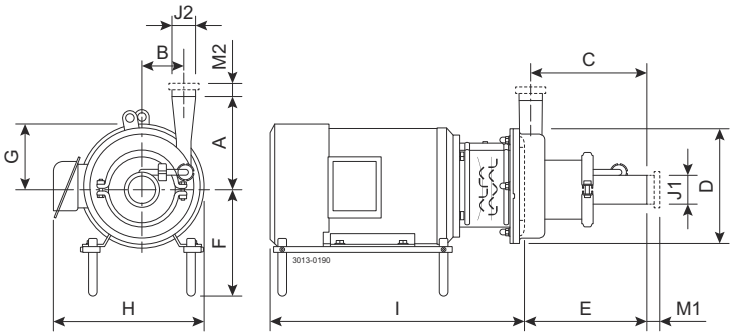
OPERATING DATA

Pressure	
Max. inlet pressure:	72.5 PSI (5 bar)

Temperature	
Temperature range:	14 °F to 284 °F (EPDM)

Double mechanical shaft seal	
Water pressure inlet:	Max. 72.5 PSI (5 bar)
Water consumption:	4-8 US gph.

Dimensions (inch)



Pump specific measures

Pump Model	LKH Prime 10	LKH Prime 20	LKH Prime 40
A	6.85	7.36	10.20
B	3.35	3.62	4.96
C	8.74	9.76	10.67
D	9.72	9.96	12.95
E	9.64	11.02	11.85

Motor specific measures

Motor TC/TSC	182TC	184TC	213TC	215TC	254TC	256TC	284TSC	286TSC	324TSC	326TSC	364TSC
Motor HP	**3.0**	**5.0**	**7.5**	**10.0**	**15.0**	**20.0**	**25.0**	**30.0**	**40.0**	**50.0**	**60.0**
F(max.)[1]	9.09	9.09	9.84	9.84	10.87	10.87	11.61	11.61	12.60	12.60	13.62
G	4.49	4.49	5.39	5.39	6.77	6.77	7.68	7.68	8.43	8.50	9.33
H	11.10	11.10	13.07	13.07	17.80	17.80	20.94	20.94	23.35	23.35	26.81
I	17.99	18.15	21.02	21.02	26.06	27.83	28.58	30.04	33.07	34.65	34.45

[1] Possible to reduce dimension F by min. 2.32 inches for all pump models. For smaller models it will be possible to reduce dimension F even further.

Motor overview

Pump Model	LKH Prime 10	LKH Prime 20	LKH Prime 40
Motor range (TC/TSC)	182TC-215TC	182TC-256TC	254TC-286TSC

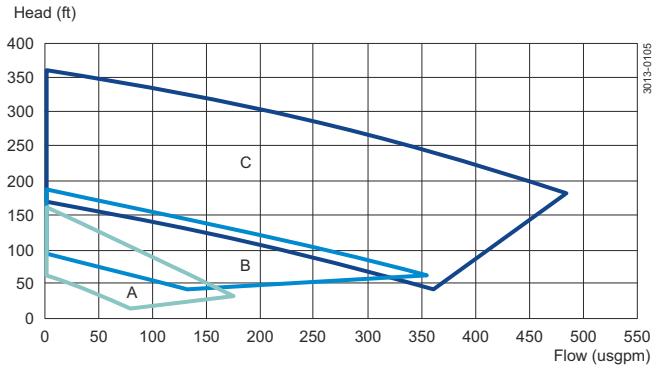
Note! Dimensional data are based on 2 pole, Sterling motors.

Connections

Pump Model		LKH Prime 10	LKH Prime 20	LKH Prime 40
TRI-Clamp	M1	1.13	1.13	1.13
	M2	1.13	1.13	1.13
J1[1]		2.00"	2.50"	3.00"
J2[1]		2.00"	2.00"	2.50"

[1] Other dimensions available on request.

Flow chart



A = LKH Prime 10
B = LKH Prime 20
C = LKH Prime 40

Figure 1. Frequency: 60Hz - Speed (synchr): 3600 rpm

Options

- Impeller with reduced diameter.
- Motor enclosures: washdown, TEFC, explosion proof, inverter duty and others upon request.
- Double mechanical shaft seal.
- Product wetted surface finish Ra ≤ 20.
- Product wetted elastomers of Nitrile (NBR) or Fluorinated rubber (FPM).
- Rotating seal ring of Silicon Carbide.
- 1/2" or 3/4" tri clamp drain connections (two connections)

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.

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