

# Alfa Laval LKHex Prime

## Centrifugal pumps

### Introduction

The Alfa Laval LKHex Prime Centrifugal Pump is a versatile, highly efficient self-priming pump for use in hygienic applications, which must meet the requirements of the ATEX directive 2014/34/EU group II, category 2G, temperature class T3 and T4. 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 LKHex Prime pump is engineered for use in potentially explosive environments and conforms to the provisions of the ATEX directive 2014/34/EU group II, category 2G, temperature class T3 and T4. It is ideal for tank emptying and CIP return applications. However, LKHex Prime cannot be used for pumping flammable media.

The LKHex Prime is available in three sizes to handle capacities up to 100 m<sup>3</sup>/h and differential pressures up to 7.5 bar at 50 Hz.

### Benefits

- Energy efficient: superior efficiency resulting in reduced energy consumption and CO<sub>2</sub> 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.
- Conforms to the provisions of ATEX directive: can be used in potentially explosive environments.

### 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 LKHex 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.

## TECHNICAL DATA

Materials	
Product wetted steel parts:	W. 1.4404 (316L)
Other steel parts:	Stainless steel
Inside surface finish:	Standard blasted
Product wetted elastomers:	EPDM
Rotary seal face:	Silicon Carbide
Stationary seal face:	Silicon Carbide

Motor
Foot-flanged ATEX approved motor according to the IEC metric standard, 2 poles = 3000/3600 rpm. at 50/60 Hz.

Motor sizes	
50Hz:	1.5 - 45 kW
60Hz:	1.8 - 45 kW

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

Warranty
Extended 3-years warranty on LKHex Prime pumps. The warranty covers all non wear parts on the condition that genuine Alfa Laval Spare Parts are used.

## OPERATING DATA

Max. inlet pressure	
LKHex Prime 10 - 40:	500 kPa (5 bar)

Air release time	
LKHex Prime 10 - 40:	Max. 15 min.

Temperature, Class T4	
Product temperature, NBR:	-10 °C to +80 °C
Product temperature, EPDM, FPM:	-10 °C to +100 °C
Ambient temperature, without shroud:	-20 °C to +40 °C
Ambient temperature, with shroud (<18.5kW):	-20 °C to +35 °C

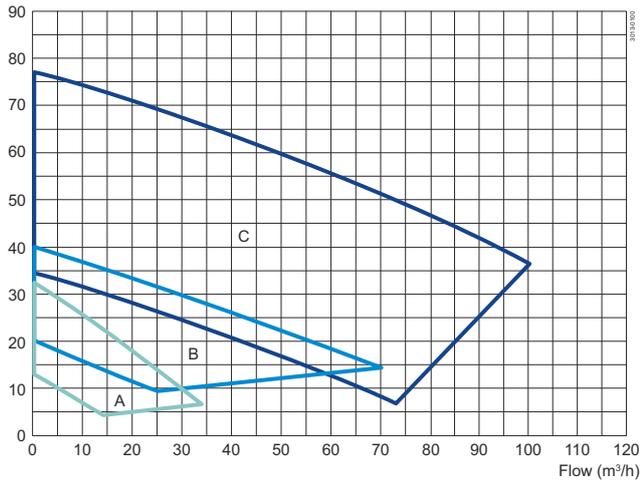
Temperature, Class T3	
Product temperature, NBR:	-10 °C to +80 °C
Product temperature, EPDM:	-10 °C to +130 °C
Product temperature, FPM:	-10 °C to +140 °C
Ambient temperature:	-20 °C to +40 °C

Double mechanical shaft seal	
Water pressure inlet, LKHex Prime 10 - 40:	Max. 500 kPa (5 bar)
Water consumption:	Min. 0.5 l/min

Flush connections for double mechanical shaft seal	
LKH Prime 10 - 40:	1/8" G

## Flow chart

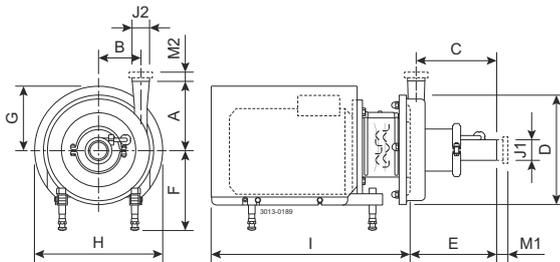
Head (m)



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

Figure 1. Frequency: 50Hz - Speed (synchr): 3000 rpm

## Dimensions (mm)



## Pump specific measures

Pump Model	LKHEx Prime 10	LKHEx Prime 20	LKHEx Prime 40
A	182	194	259
B	85	92	126
C	222	248	271
D	247	253	329
E	245	280	301

## Motor specific measures Exeb

Motor IEC	IEC90	IEC100	IEC112	IEC132	IEC160	IEC180	IEC200
Motor kW	1.85kW	2.5kW	3.3kW	4.6-5.5kW	7.5-12.5kW	15kW	20-24kW
F(max) <sup>1</sup>	262	282	285	304	332	352	372
G	243	242	208	248	305	321	429
H	365	383	360	425	510	553	670
I	492	550	540	629	791	836	983

<sup>1</sup> Possible to reduce dimension F by min. 59 mm for all pump models. For smaller models it will be possible to reduce dimension F even further.

## Motor specific measures Exdbeb

Motor IEC	IEC90	IEC100	IEC112	IEC132	IEC160	IEC180	IEC200
Motor kW	1.5-2.2 kW	3kW	4kW	5.5-7.5kW	11-18.5kW	22kW	30-37kW
F(max) <sup>1</sup>	262	282	285	304	332	352	372
G	243	242	261	298	390	402	429
H	365	383	412	465	610	625	670
I	492	550	574	636	827	862	983

<sup>1</sup> Possible to reduce dimension F by min. 59 mm for all pump models. For smaller models it will be possible to reduce dimension F even further.

## Motor overview Exeb

Pump Model	LKHEx Prime-10	LKHEx Prime -20	LKHEx prime-40
Motor range (IEC)	IEC90-IEC112	IEC100-IEC160	IEC132-IEC200

Dimensional data are based on 2 pole, WEG motors.

## Motor overview Exdbee

Pump Model	LKHex Prime-10	LKHex Prime -20	LKHex prime-40
Motor range (IEC)	IEC90-IEC100	IEC100-IEC160	IEC132-IEC200

Dimensional data are based on 2 pole,WEG motors.

## Connections

Pump Model		LKHex Prime 10	LKHex Prime 20	LKHex Prime 40
Clamp ISO 2037	M1	21	21	21
	M2	21	21	12
Union ISO(IDF)	M1	21	21	21
	M2	21	21	21
Union DIN/ISO	M1	22	25	30
	M2	22	22	27
Union SMS	M1	20	24	24
	M2	20	20	24
Union (BS)RJT	M1	27	27	27
	M2	27	27	22
Union DS	M1	20	24	24
	M2	20	20	21
Union DIN/DIN	M1	22	25	30
	M2	22	22	27
J1*		51 / 2"	63.5 / 2.5"	76.1 / 3"
J2*		51 / 2"	51 / 2"	63.5 / 2.5"

## Options

- Impeller with reduced diameter.
- Double mechanical shaft seal.
- Product wetted elastomers NBR or FPM.
- ½" vertical drain connections (two connections).
- Product wetted surface finish mechanically polished to  $Ra \leq 0.8 \mu m$ .
- Adjustable pads.

## 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.

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