Alfa Laval LKH UltraPure

Centrifugal pumps

Introduction

The Alfa Laval LKH UltraPure Centrifugal Pump is designed for use in high-purity applications where high efficiency, exceptional cleanability, contamination safety, robust design and low maintenance are of paramount importance. With verified cleanability, these pumps provide unobstructed product flow, very low NPSH requirements and excellent hydraulic efficiency.

Precision-engineered, the LKH UltraPure 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.

Applications

The Alfa Laval LKH UltraPure pump is designed to meet the stringent demands and regulations of high-purity applications across the biotechnology and pharmaceutical industries which require equipment with the highest material integrity.

All pumps are delivered with a complete Alfa Laval Q-doc package. Q-doc provides easier validation, proof of origin and compliance for inspection according to Good Manufacturing Practice (GMP) and ASME BPE requirements.

The LKH UltraPure pump is available in eight sizes to handle capacities up to 1300 USGPM and differential pressures up to 500 feet at 60 Hz.

Benefits

- Energy efficient: superior efficiency resulting in reduced energy consumption and CO2 footprint.
- Maximized uptime and reduced maintenance costs: robust mechanical design and ease of maintenance with modular front-loading seals.
- Low contamination risk: comes with full material traceability and USP Class VI elastomers to reduce risk of process contamination from extractables.
- Smooth qualification, validation and process control: material traceability, and pump supplied with the Alfa Laval Q-doc package in line with Good Documentation Practice (GDP).

Standard design

All media contacting steel components like pump casing, impeller, impeller nut and backplate are in AISI 316L with material traceability 3.1 according to EN 10204. Product wetted elastomers are specified to USP Class VI, 249.8°F,

Chapter 88 and Chapter 87. 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 UltraPure 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.

Certificates

Authorized to carry the 3A symbol

TECHNICAL DATA

Materials	
Product wetted steel parts:	AISI 316L and 329L with material traceability 3.1 according to EN 10204 (Mill test reports)
Other steel parts:	Stainless steel
Inside surface finish:	Electropolished Ra ≤ 15 µin
External finish:	Ra 32 µin
Product wetted elastomers:	EPDM - USP Class VI, 249.8°F. Chapter 88, and Chapter 87
Rotary seal face:	Silicon Carbide
Stationary seal face:	Silicon Carbide

Motor
Standard C-faced, foot mounted motor according to NEMA standard. 3 phase, 60 HZ, 230/460V. 3500 RPM or 1750 RPM. Premium efficiency, Class F.

Motor sizes	
60Hz:	2 - 100 Hp

OPERATING DATA

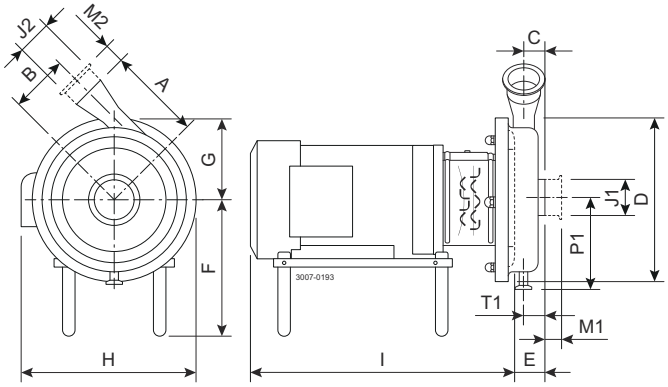
Max. inlet pressure	
LKH UltraPure 10 - 60:	145 PSI (10 bar)
LKH UltraPure 70	72.5 PSI (5 bar)

Temperature	
Temperature range:	14°F to +284°F (EPDM)
Flush media:	Max. 158°F
Flush housing sterilization (pump not in operation):	Max. 257°F

Double mechanical shaft seal	
Water pressure inlet, LKH UltraPure 10 - 60:	Max. 72.5 PSI (5 bar)
Water pressure inlet, LKH UltraPure 70:	Max. 43.5 PSI (3 bar)
Water consumption:	4 - 8 USGPH

Connections for double mechanical shaft seal	
LKH UltraPure 10 - 70:	1/8" G

Dimensions (inch)



Pump specific measures

Pump Model	LKH UltraPure-10	LKH UltraPure-20	LKH UltraPure-25	LKH UltraPure-35	LKH UltraPure-40	LKH UltraPure-45	LKH UltraPure-60	LKH UltraPure-70
A	5.591	7.087	7.598	7.598	8.346	8.346	10.276	10.000
B	3.425	3.465	4.173	4.685	4.961	4.961	4.016	5.787
C	0.906	1.063	1.260	0.906	1.102	1.102	2.441	0.984
D	9.724	9.961	11.929	11.929	12.953	12.953	12.953	16.063
E	2.008	2.480	2.717	2.126	2.520	2.520	4.173	2.992
P1	5.283	5.516	6.388	6.604	7.071	5.335	6.878	8.598
T1	0.803	1.219	1.441	0.850	1.262	1.992	0.953	1.453

Motor specific measures

Motor TC/TSC	143TC	145TC	182TC	184TC	213TC	215TC	254TC	256TC	284TSC	286TSC	324TSC	326TSC	364TSC	365TSC
Motor HP	**1.0-1.5**	**2.0**	**3.0**	**5.0**	**7.5**	**10.0**	**15.0**	**20.0**	**25.0**	**30.0**	**40.0**	**50.0**	**60.0**	**75.0**
F(max.)[1]	8.110	8.110	9.094	9.094	9.843	9.843	10.866	10.866	11.614	11.614	12.598	12.598	13.622	13.622
G	3.504	3.543	4.488	4.488	5.394	5.394	6.772	6.772	7.677	7.677	8.425	8.504	9.331	9.331
H	9.094	9.094	11.102	11.102	13.071	13.071	17.795	17.795	20.945	20.945	23.346	23.346	26.811	26.811
I (LKH-10 to LKH-60)	14.843	15.118	17.992	18.150	21.024	21.024	26.063	27.835	28.583	30.039	33.071	34.646	34.449	-
I (LKH-70)	-	-	-	-	21.811	21.811	26.575	28.346	29.094	30.551	33.583	35.157	34.961	38.346

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

Frame overview

Pump Model	LKH UltraPure-10	LKH UltraPure-20	LKH UltraPure-25	LKH UltraPure-35	LKH UltraPure-40	LKH UltraPure-45	LKH UltraPure-60	LKH UltraPure-70
Moter range (TC/TSC)	143TC-256TC	143TC-256TC	143TC-364TSC	143TC-364TSC	143TC-364TSC	143TC-364TSC	143TC-364TSC	215TC-405 TSC

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

Drain diameter

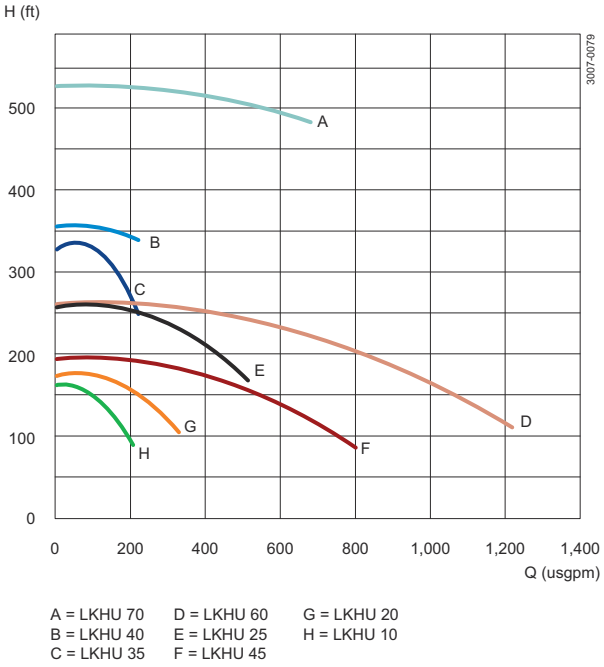
	TC Clamp
1/2"	1/2”

Note! Dimensions are for guidance only. For exact measures of specific pump specifications, please refer to Anytime Configurator.

Connections

Pump Model		LKH UltraPure-10 LKH UltraPure-20 LKH UltraPure-35	LKH UltraPure-25	LKH UltraPure-40	LKH UltraPure-45 LKH UltraPure-70	LKH UltraPure-60
TRI-Clamp	M1	1.13	1.13	1.13	1.13	1.13
	M2	1.13	1.13	1.13	1.13	1.13
J1		2,50"	3,00"	3,00"	4,00"	4,00"
J2		2,00"	2,50"	2,00"	3,00"	4,00"

Flow chart



A = LKHU 70 D = LKHU 60 G = LKHU 20
B = LKHU 40 E = LKHU 25 H = LKHU 10
C = LKHU 35 F = LKHU 45

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

Q-doc

Standard documentation package:

- Declaration of compliance to EN 10204 type 3.1 (MTR).
- Declaration of compliance to the U.S. Food & Drug Administration CFR 21 (non-metallic parts).
- Declaration of compliance to the U.S. Pharmacopeia (Elastomers and polymers).
- TSE (Transmissible Spongiform Encephalopathy) / ADI (Animal Derivative Ingredient) declaration.
- Declaration of surface finish compliance.
- Declaration of passivation and electro polishing (if specified).
- 3.1 certification in accordance to EN10204.
- Pump performance test certificate.

Optional documentation:

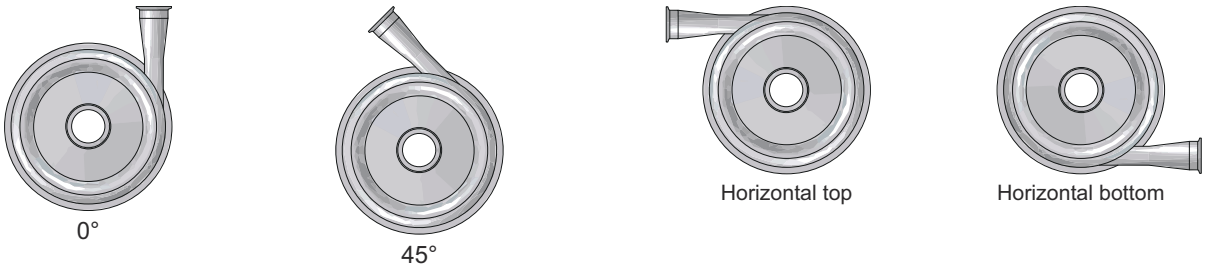
- Hydrostatic test certificate.
- Surface measurement report.
- Delta ferrite report (impeller).

Options

- Impeller with reduced diameter.
- Impeller with delta ferrite max. 1%.
- Motor for other voltage and/or frequency.
- 1800 rpm. motor
- Motor with increased safety/flame proof motor.
- Double mechanical shaft seal.
- Pump with legs.

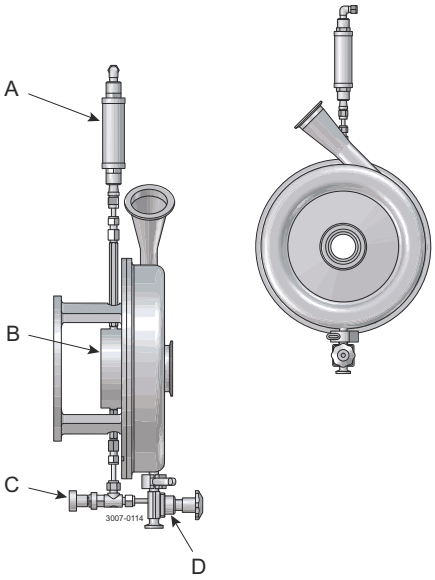
- 3/4" drain connection.
- Horizontal drain connection, see illustration below.
- Special flush arrangement with 1/2" Alfa Laval Unique DVST UltraPure diaphragm valve, needle valve and flow meter, see illustration below.
- No drain.
- Product wetted surface finish mechanically polished to Ra ≤ 20 µin.
- Passivated surface.
- Product wetted elastomers FPM or FEP to USP Class VI, 121°C Chapter 88, and Chapter 87.
- Hydrostatic testing with certificate.
- Surface finish measurement with certificate.
- Horizontal top, 90° or horizontal bottom outlet, see illustration below.

Available outlet positions



Flush arrangement

With the flush kit arrangement some process fluid is passing through the flush housing of the double mechanical seal, creating a barrier from the atmosphere to avoid potential process contamination across the seal face.



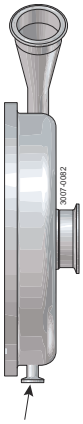
A = Flow meter

B = Flush Housing

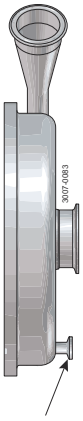
C = Flow control needle valve

D = Alfa Laval Unique DVST UltraPure valve

Available drain connections



½" or ¾" vertical drain:
- Tri-clamp for ASME.



½" or ¾" horizontal drain:
- Tri-clamp for ASME.

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 Instruction manual ESE01703. This product has EHEDG certificate.

200006084-1-EN-US

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