Alfa Laval MaxiLobe UltraPure

Rotary lobe pumps

Introduction

Maximize performance, reliability, yield and compliance with advanced Alfa Laval MaxiLobe® UltraPure rotary lobe pumps. Tailor-made for biotech and pharmaceutical processing lines, they ensure consistent process flows, safeguards product integrity, and support cost-effective production with minimal downtime. High volumetric efficiency and a wide performance envelope enable smaller pumps to be sized closer to actual process requirements while achieving the same duty at lower operating speeds, reducing energy consumption, wear, and product shear.

Applications

Designed for efficient fluid transfer in high-purity processes, the Alfa Laval MaxiLobe UltraPure is ideal for biotech and pharmaceutical applications. Its gentle, low-shear pumping action is particularly well suited for shear-sensitive media – all types of cell cultures and organic solids in suspension – and higher discharge pressures.

By minimizing shear, MaxiLobe UltraPure helps maintain cell viability and productivity throughout the seed train and improves harvesting efficiency. It also delivers reliable performance at higher discharge pressures and is suitable for both CIP and SIP processes.

The MaxiLobe UltraPure rotary lobe pump is available with 12 different pump head displacements to handle flow rates up to 112 m^3/h and differential pressures up to 16 bar.

Benefits

- Reduce capital costs and simplify system design with smaller, optimally sized pumps that deliver high capacity without compromising product quality
- Increase process efficiency and yield through high volumetric efficiency and a wide performance envelope
- Safeguard product integrity and simplify process validation with pharma-grade design, validated materials, factory-tested performance



- Simplify maintenance and maximize uptime with front-loading seal, fully interchangeable spare parts and easy-to-set pump clearances
- Replace selected Alfa Laval rotary lobe pumps with minimal pipework modifications

Standard design

MaxiLobe UltraPure features tri-lobe rotors rated to 150 °C, facilitating use in both CIP and SIP processes. All product-wetted metal components – including the rotor case, front cover, rotors, and rotor nuts – are manufactured in EN 1.4404 (AISI 316L) stainless steel. Electropolished surface finishes are Ra ≤ 0.38 µm.

An all-stainless-steel exterior, including the gearbox housing and feet, provides exceptional corrosion resistance for demanding high-purity production environments.

A robust gearbox with duplex shafts, rigid shaft assembly design, and heavy-duty bearings ensures accurate rotor timing, supporting high volumetric efficiency and long service life

The pump is equipped with a front-loading single mechanical seal, enabling quick, easy inspection or replacement without

removing the pump or disconnecting pipework. Single flushed and double mechanical shaft seals are available as options.

Precision-profiled elastomer seals and an optimized shaft seal location enhance high-purity design, verified cleanability and compliance with the most stringent hygienic standards.

MaxiLobe UltraPure is supplied as standard with the comprehensive Alfa Laval Q-doc™ documentation package, supporting full traceability and validation.

Working principle

Alfa Laval MaxiLobe UltraPure rotary lobe pumps operate on the positive displacement principle, providing smooth, reliable transfer of low- to high-viscosity products in high-purity applications while maintaining product integrity.

Inside the pump head, precision-machined tri-lobe rotors rotate in opposite directions without contacting each other or the pump casing. A robust timing gearbox synchronizes the rotors to maintain accurate clearances throughout operation.

As the counter-rotating rotors revolve, expanding cavities form between the rotor lobes and the pump casing, creating a partial vacuum that draws product into the pump. The product is then gently carried around the outside of the rotors within these cavities. As the rotor lobes mesh on the discharge side, the cavities decrease in size, displacing the product through the outlet at a consistent flow rate.

Because there is no metal-to-metal contact in the pump head, MaxiLobe UltraPure minimizes product shear and equipment wear, ensuring efficient fluid transfer. Its gentle pumping action makes the pump ideal for handling shear-sensitive, high-value products in pharmaceutical and biotechnology applications.

Certificates

Authorized to carry the 3A symbol

Technical data

Standard specification	
Product wetted steel parts:	EN 1.4404 (AISI 316L)
Inside surface finish:	Mech Ra ≤ 0.8 µm / 32 µin
Shafts:	Duplex EN 1.4460 (AISI 329)
Gear box:	Stainless steel
Base plate:	Stainless steel
Coupling guard:	Stainless steel
Product wetted elastomers:	EPDM, with USP compliance
Other, non-wetted elastomers:	FPM
Shaft seal:	Single mechanical
Rotary seal face:	Silicon Carbide
Stationary seal face:	Silicon Carbide

Shaft seals	
Single mechanical, single mechanical with flush and double mechanical.	
Max. flush pressure, single mechanical with flush:	0.5 bar / 7.25 psi
Max. flush pressure, double mechanical:	16 bar / 232 psi
Water consumption, single flush:	30 l/hr / 7 gallon/hour
Flush connections, MaxiLobe UltraPure 22-43:	BSP/G 1/8" or NPT 1/8"
Flush connections, MaxiLobe UltraPure 52-73:	BSP/G 1/4" or NPT 1/4"

Motor
Gear motor, 4 poles, to IEC metric standard, 50/60 Hz, suitable for frequency conversion, IP55, insulation class F.

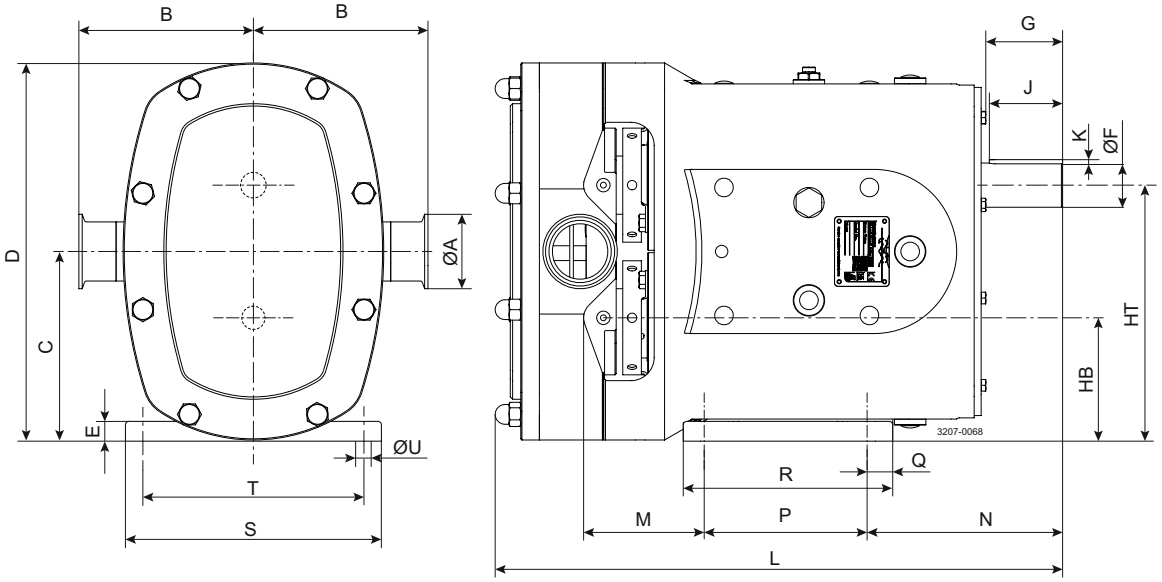
Warranty
Extended 3-years warranty on MaxiLobe UltraPure pumps. The warranty covers all non wear parts on the condition that genuine Alfa Laval Spare Parts are used.

Process data

Model	Displacement			Port Size		Differential Pressure		Max. Speed
	litres/rev	Imp gal / 100 rev	US gal/ 100 rev	mm	inch	bar	psi	rev/min
22	0.06	1.32	1.59	25	1	16	232	1000
23	0.09	1.98	2.38	25 / 40	1 / 1.5	16	232	1000
32	0.14	3.08	3.7	25 / 40	1 / 1.5	16	232	1000
33	0.19	4.18	5.02	40	1.5	16	232	1000
42	0.29	6.38	7.66	40 / 50	1.5 / 2	16	232	1000
43	0.4	8.8	10.57	50	2	16	232	1000
52	0.59	12.98	15.59	50	2	16	232	1000
53	0.84	18.48	22.19	65 / 80	2.5 / 3	16	232	1000
62	1.22	26.84	32.23	65 / 80	2.5 / 3	16	232	600
63	1.78	39.16	47.03	80 / 100	3 / 4	16	232	600
72	2.78	61.15	73.45	100	4	16	232	500
73	3.72	81.83	98.28	100 / 150	4 / 6	16	232	500

Dimensions (mm)

Horizontally ported

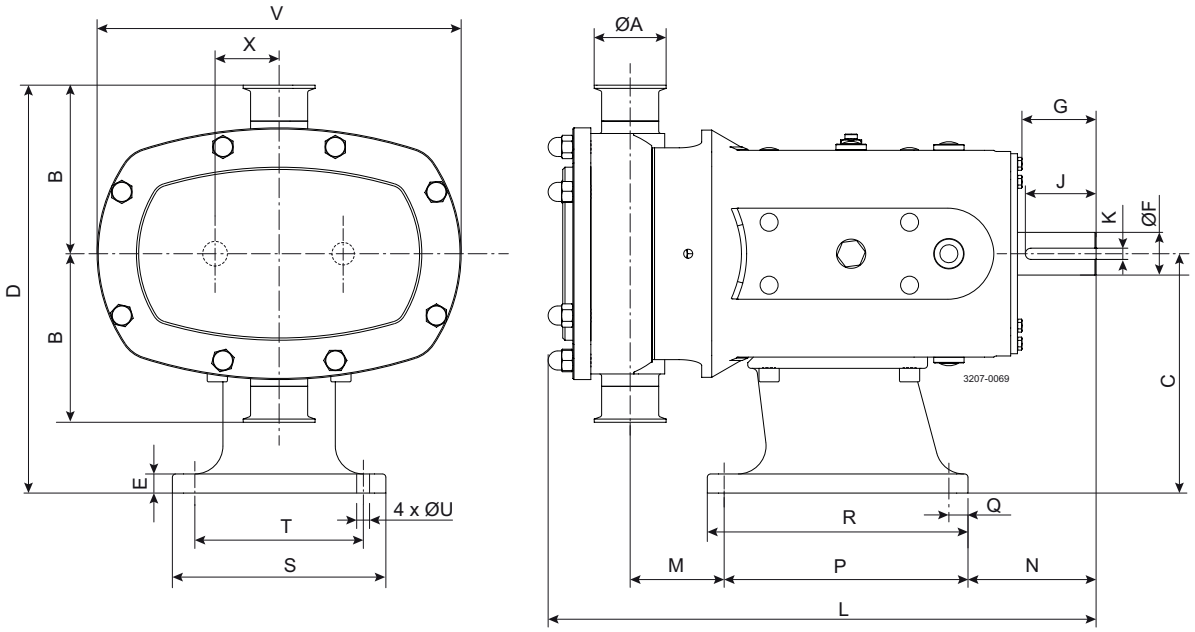


Pump Model	A1[1]	A2[2]	B	C	D	E	F	G	HB	HT	J	K	L	M1	M2	N	P	Q	R	S	T	U
22	25	N/A	95	91	181	8	16	36	63	119	30	5	272	58.5	N/A	90	80	13	105	130	100	10
23	25	40	95	91	181	8	16	36	63	119	30	5	281	65.5	63.5	90	80	13	105	130	100	10
32	25	40	105	115	220	12	22	41	81	149	32	6	345	73	69	124	100	25	140	150	124	12
33	40	50	105	115	220	12	22	41	81	149	32	6	356	78	73	124	100	25	140	150	124	12
42	40	50	125	137.5	267	15	28	56	93.5	181.5	40	8	412	89	84	139	125	16	158	185	154	14
43	50	65	125	137.5	267	15	28	56	93.5	181.5	40	8	424	97	97	139	125	16	158	185	154	14
52	50	65	150	163	325	17	38	66	106	220	63	10	488	107	107	168	140	22	180	220	190	14
53	65	80	150	163	325	17	38	66	106	220	63	10	505	119	116	168	140	22	180	220	190	14
62	65	80	175	195	387	18	45	85	120	270	70	14	558	113	113	199	160	28	221	250	216	14
63	80	100	175	195	387	18	45	85	120	270	70	14	575	130	120	199	160	28	221	250	216	14
72	100	N/A	190	242	480	22	60	105	153	331	90	18	697	150	N/A	246	215	30	276	280	246	14
73	100	150	190	242	480	22	60	105	153	331	90	18	720	176	166	246	215	30	276	280	246	14

[1] For A1 port size option use M1 distance from foot.

[2] For A2 port size, use dimension M2 from foot.

Vertically ported



Pump Model	A1[1]	A2[2]	B	C	D	E	F	G	J	K	L	M1	M2	N	P	Q	R	S	T	U	V	X
22	25	N/A	95	113	208	8	16	36	30	5	272	56.5	N/A	92	80	10	100	100	80	10	170	28
23	25	40	95	113	208	9	16	36	30	5	281	63.5	61.5	92	80	10	100	100	80	10	170	28
32	25	40	105	147	252	12	22	41	32	6	345	73	69	123.5	100	41	160	130	100	12	204	34
33	40	50	105	147	252	12	22	41	32	6	356	78	73	123.5	100	41	160	130	100	12	204	34
42	40	50	125	175	300	15	28	56	40	8	409	65	60	130	155	48	220	160	125	14	254	44
43	50	65	125	175	300	15	28	56	40	8	472	75	75	130	155	48	220	160	125	14	254	44
52	50	65	150	213	363	17	38	66	63	10	488	84	84	131	200	17	232	190	150	14	324	57
53	65	80	150	213	363	17	38	66	63	10	505	96	93	131	200	17	232	190	150	14	324	57
62	65	80	175	257	432	18	45	85	70	14	558	80	80	192	200	43	260	220	180	14	385	75
63	80	100	175	257	432	18	45	85	70	14	575	97	87	192	200	43	260	220	180	14	385	75
72	100	N/A	190	294	484	20	60	105	90	14	697	121	N/A	213	260	30	310	250	210	14	476	89
73	100	150	190	294	484	20	60	105	90	14	722	146	136	213	260	30	310	250	210	14	476	89

[1] For A1 port size option use M1 distance from foot.

[2] For A2 port size, use dimension M2 from foot.

Options

- Product wetted surface finish electropolished to Ra ≤ 0.38 µm.
- Single mechanical shaft seal with flush.
- Double mechanical shaft seal.
- Product wetted elastomers in FPM or FFPM with USP compliance.
- Horizontal or vertical porting.
- Heating and cooling jacket.
- Product wetted steel parts made of EN 1.4529 material (very similar to AL-6XN).
- Product wetted steel parts made of EN 1.4435 material (delta ferrite < 3%).
- Stainless steel shroud covering coupling and motor.
- Baseplate fitted with adjustable stainless steel ball feet or pads.
- ATEX approval.
- Alfa Laval Clariot VX sensor.

Q-doc

Standard documentation package:

- Declaration of compliance with EN 10204 type 3.1 (MTR).
- Declaration of compliance with the U.S. Food & Drug Administration CFR 21.
- Declaration of compliance with the U.S. Pharmacopeia (non-metallic parts).
- Declaration of compliance with non-Animal Derived Ingredient (ADI).
- Declaration of surface finish compliance.
- Declaration of compliance with Regulation (EC) No.: 1935/2004.
- Declaration of compliance with GMP for food contact materials and articles.
- 3.1 certification in accordance with EN10204.
- Pump performance test certificate.

Optional documentation:

- Surface measurement report.
- Hydrostatic test certificate.
- Certificate of electropolished finish.
- Welding documentation.
- Delta ferrite measurement report (with material EN 1.4435).

Pump sizing

In order to correctly size a circumferential piston pump some essential information is required. Provision of this information listed below enables our Technical Support personnel to obtain the optimum pump selection.

Product/Fluid Data

- Fluid to be pumped
- Viscosity
- Pumping temperature, minimum, normal and maximum
- Cleaning in Place temperature(s), minimum, normal and maximum

Performance Data

- Flow rate, minimum, normal and maximum
- Discharge head/pressure (closest to pump outlet)
- Suction condition

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