

Alfa Laval DuraCirc

Circumferential Piston Pump



Introduction

The Alfa Laval DuraCirc delivers the perfect balance of durability, reliability, high efficiency and superior hygienic performance. Combined with design features enabling simple service, the DuraCirc keeps process running. In addition to a class leading range of flow and pressure capabilities, DuraCirc comes with globally recognized hygienic certification. The innovative design also includes features that make cleaning and maintenance faster, easier and more dependable.

Applications

Designed for Cleaning-in-Place (CIP), the Alfa Laval DuraCirc is ideal for hygienic applications within the dairy, food, beverage, home and personal care industries. The highly efficient design is particularly suited to applications that are low in viscosity with medium to high discharge pressures and require equipment that can be cleaned in place.

The DuraCirc Circumferential Piston Pump is available with 13 different pump head displacements to handle flow rates up to 149 m³/h and differential pressures up to 40 bar.

Benefits

- High volumetric efficiency performance allowing for optimized pump selection, reducing capital cost, whilst improving process yield.
- Certified to both EHEDG and 3A, reducing both process cross contamination risk and CIP cycle time, maintaining process yield as well as cutting cleaning costs.
- Truly front-loading single seal, full component interchangeability without complicated maintenance procedures, long life bearing operation and one single long-life lubricant making service faster and easier, increasing process uptime.
- Robust, durable design via strong gearcase incorporating increased diameter shafts and optimally positioned heavy-duty bearings, minimizes risk of pump head contact, reducing service requirement, maintaining process continuity.
- DuraCirc Uni-Fit port option allows easy direct replacement of both Alfa Laval SSCP range and also other major brands into existing process systems, without changing pipework.

Standard design

Twin-wing piston rotors made of special non-galling alloy are standard. All other media contacting steel components, like



the rotor case, front cover and rotor nuts are in W. 1.4404 (AISI 316L). With stainless steel gear case and feet, the DuraCirc pump has an all stainless steel exterior, making it exceptional corrosion resistant.

The gearbox is as standard designed with duplex shafts and a strong, long life bearing arrangement. This provides for a very robust and rigid shaft assembly design – a prerequisite for the very high volumetric efficiency achieved.

With profiled defined compression elastomers and an optimised shaft seal location, the DuraCirc is designed according to the most stringent hygienic design standards and with verified and effective CIP cleanability.

The pump features a front-loading single mechanical seal, which allows quick and easy inspection or replacement without the need to disassemble pipework. Single flushed and double mechanical shaft seals as well as O-ring seals are available as options.

The Alfa Laval DuraCirc can be supplied either as a bare shaft pump or mounted on a base plate complete with coupling, guard, gear motor and shroud for easy, plug-and-play installation.

Working principle

The rotor pistons rotate around the circumference of the channel in the pump casing. This continuously generates a partial vacuum at the suction port as the rotors unmesh,

causing fluid to enter the pump. The fluid is transported around the channel by the rotor pistons, and is displaced as the rotor pistons re-mesh, generating pressure at the discharge port. The direction of flow is reversible.

Technical data

Standard specification	
Piston rotors:	Non-Galling Alloy
Other product wetted steel parts:	W. 1.4404 (316L)
Inside surface finish:	Mech Ra ≤ 0.8
Shafts:	Duplex 1.4460 (329)
Gear box:	Stainless steel
Base plate:	Stainless steel
Coupling guard:	Stainless steel
Product wetted elastomers:	EPDM
Other elastomers:	FPM
Shaft seal:	Single mechanical
Rotary seal face:	Silicon Carbide
Stationary seal face:	Carbon

Shaft seals

Single mechanical, single mechanical with flush, double mechanical and single and flushed O-ring seal available.

Max process pressure, mechanical seal, SiC/Car:	15 bar
Max process pressure, mechanical seal, SiC/SiC:	Max pressure of pump
Max flush pressure, single flush:	0.5 bar
Max flush pressure, double mechanical seal, SiC/Car:	16 bar
Max flush pressure, double mechanical seal, SiC/SiC:	20 bar
Max process pressure, O-ring seal:	7 bar
Max flush pressure, O-ring seal:	0.5 bar
Flush water consumption:	30 l/hr
Flush connections, DuraCirc 32-43:	BSP/G 1/8" or NPT 1/8"
Flush connections, DuraCirc 52-74:	BSP/G 1/4" or NPT 1/4"

Temperature

Max process and CIP temperature:	150°C
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Motors

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 DuraCirc pumps. The warranty covers all non wear parts on the condition that genuine Alfa Laval Spare Parts are used.

Process data

Pump Model	Displacement			Inlet/Outlet		Diff. Pressure		Max speed
	Litres/rev	Imp gall/100 rev	US gall/100 rev	mm	inch	Bar	PSI	rpm
32	0,03	0.66	0.79	25	1	25	362	1000
33	0,06	1.32	1.58	40	1½	25	362	1000
34	0,12	2.64	3.17	50	2	16	232	1000
42	0,23	5.06	6.07	50	2	20	290	750
43	0,29	6.38	7.66	50	2	13	188	750
52	0,38	8.36	10.03	50	2	37	536	750
53	0,59	12.97	15.57	65	2½	25	362	750
54	0,96	21.12	25.3	80	3	16	232	750
62	1,44	31.67	38.04	80	3	37	536	600
63	1,97	43.33	52.03	100	4	25	362	600
72	1,92	42.23	50.7	100	4	40	580	600
73	2,86	62.91	75.55	150	6	25	362	600
74	4,14	91.1	109.4	150	6	16	232	600

Dimensions

(mm)

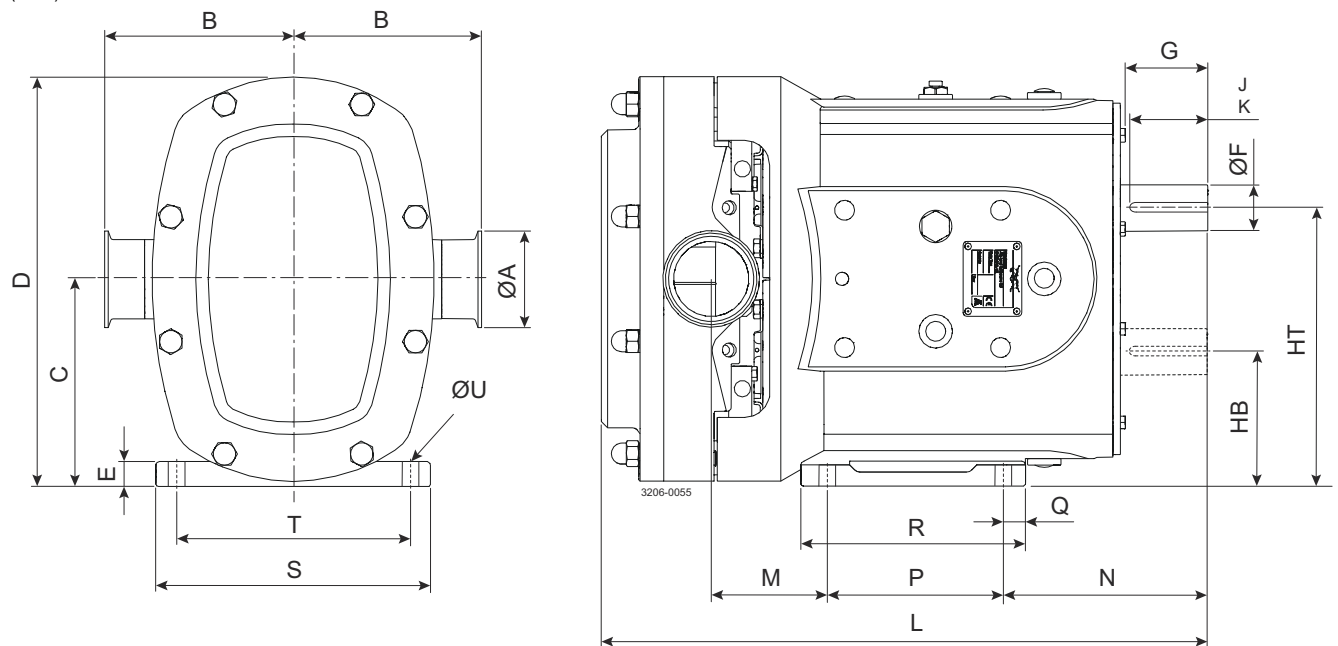


Figure 1. Horizontally ported

ØU = 4 Holes

J = Key Length

K = Key Width

DuraCirc Uni-Fit dimensions

Pump Model	A	B	C	D	E	F	G	HB	HT	J	K	L	M	N	P	Q	R	S	T	U
32	25	89	107	212	12	22	42	73	141	32	6	330	52	124	100	25	140	150	124	12
33	40	89	107	212	12	22	42	73	141	32	6	336	52	124	100	25	140	150	124	12
34	40	89	107	212	12	22	42	73	141	32	6	354	60	124	100	25	140	150	124	12
42	40	108	132	262	10	28	56	88	176	40	8	414	72	139	125	16	158	185	154	14
43	50	109	132	262	10	28	56	88	176	40	8	422	81	139	125	16	158	185	154	14
52	50	136	186	348	40	38	66	129	243	63	10	473	84	168	140	22	180	220	190	14
53	65	136	186	348	40	38	66	129	243	63	10	486	90	168	140	22	180	220	190	14
54	80	136	186	348	40	38	66	129	243	63	10	513	111	168	140	22	180	220	190	14
62	80	168	238	436	59	45	85	163	313	70	14	586	118	199	160	25	223	250	216	14
63	100	168	238	436	59	45	85	163	313	70	14	606	125	199	160	25	223	250	216	14
72	100	187	264	502	44	60	105	175	353	90	18	700	109	246	215	20	276	280	246	14
73	150	203	264	502	44	60	105	175	353	90	18	725	122	246	215	20	276	280	246	14
74	150	216	264	502	44	60	105	175	353	90	18	759	144	246	215	20	276	280	246	14



Note! DuraCirc Uni-Fit is an option to meet port to port and port height dimensions of equivalent SCPP bare shaft pump model.

DuraCirc standard dimensions

Pump Model	A	B	C	D	E	F	G	HB	HT	J	K	L	M	N	P	Q	R	S	T	U
32	25	105	115	220	12	22	42	81	149	32	6	330	52	124	100	25	140	150	124	12
33	40	105	115	220	12	22	42	81	149	32	6	336	52	124	100	25	140	150	124	12
34	50	105	115	220	12	22	42	81	149	32	6	354	60	124	100	25	140	150	124	12
42	50	125	132	262	10	28	56	88	176	40	8	414	72	139	125	16	158	185	154	14
43	50	125	132	262	10	28	56	88	176	40	8	422	81	139	125	16	158	185	154	14
52	50	151	163	325	17	38	66	106	220	63	10	473	84	168	140	22	180	220	190	14
53	65	151	163	325	17	38	66	106	220	63	10	486	90	168	140	22	180	220	190	14
54	80	159	163	325	17	38	66	106	220	63	10	513	111	168	140	22	180	220	190	14
62	80	185	200	398	21	45	85	125	275	70	14	586	118	199	160	25	223	250	216	14
63	100	185	200	398	21	45	85	125	275	70	14	606	125	199	160	25	223	250	216	14
72	100	203	242	480	22	60	105	153	331	90	18	700	109	246	215	20	276	280	246	14
73	150	203	242	480	22	60	105	153	331	90	18	725	122	246	215	20	276	280	246	14
74	150	203	242	480	22	60	105	153	331	90	18	759	144	246	215	20	276	280	246	14

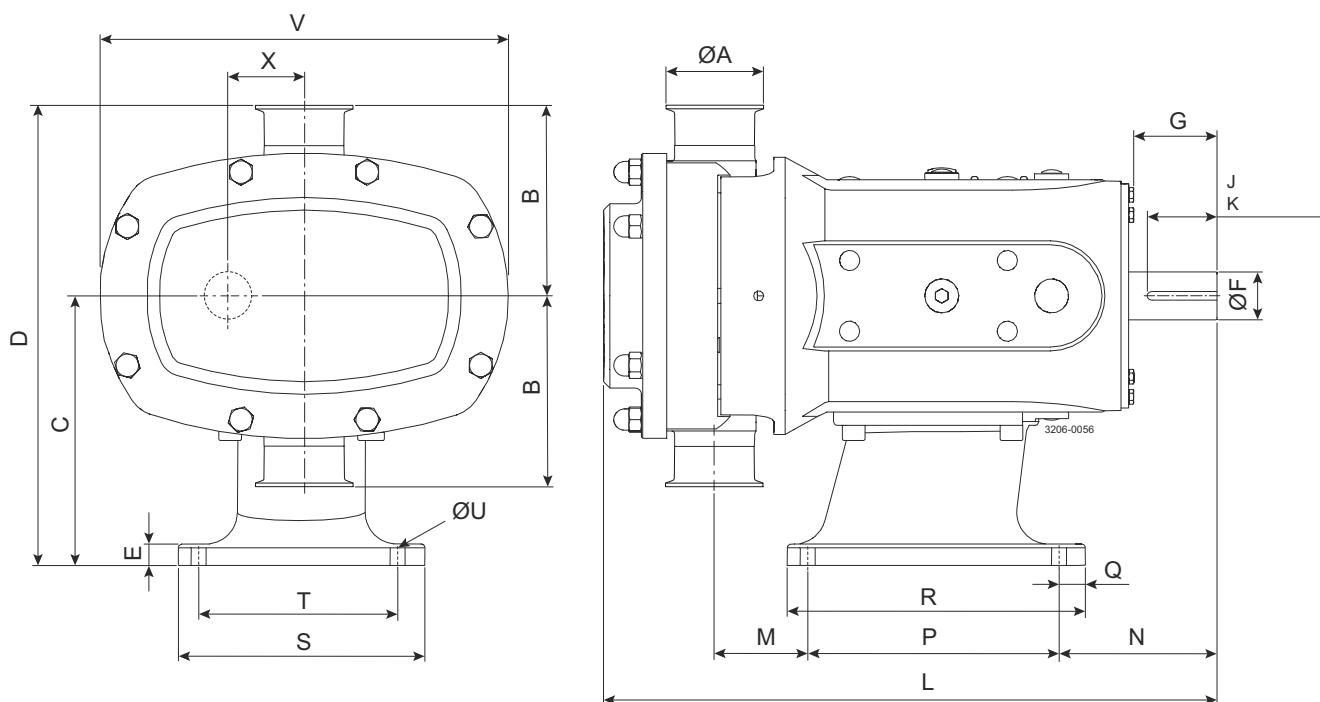


Figure 2. Vertically ported

ØU = 4 Holes

J = Key Length

K = Key Width

DuraCirc standard dimensions

Pump Model	A	B	C	D	E	F	G	J	K	L	M	N	P	Q	R	S	T	U	V	X
32	25	105	147	252	12	22	42	32	6	330	52	124	100	41	160	130	100	12	204	34
33	40	105	147	252	12	22	42	32	6	336	52	124	100	41	160	130	100	12	204	34
34	50	105	147	252	12	22	42	32	6	354	60	124	100	41	160	130	100	12	204	34
42	50	125	175	300	15	28	56	40	8	414	51	130	155	48	220	160	125	14	254	44
43	50	125	175	300	15	28	56	40	8	422	60	130	155	48	220	160	125	14	254	44
52	50	151	213	364	17	38	66	63	10	473	61	131	200	17	232	190	150	14	324	57
53	65	151	213	364	17	38	66	63	10	486	67	131	200	17	232	190	150	14	324	57
54	80	159	213	372	17	38	66	63	10	513	88	131	200	17	232	190	150	14	324	57
62	80	185	257	442	18	45	85	70	14	586	85	192	200	43	260	220	180	14	396	75
63	100	185	257	442	18	45	85	70	14	606	92	192	200	43	260	220	180	14	396	75
72	100	203	294	497	20	60	105	90	18	700	97	213	260	30	310	250	210	14	476	89
73	150	203	294	497	20	60	105	90	18	725	110	213	260	30	310	250	210	14	476	89
74	150	203	294	497	20	60	105	90	18	759	132	213	260	30	310	250	210	14	476	89

Options

- Silicon Carbide/Silicon Carbide mechanical seal faces.
- Single mechanical shaft seal with flush.
- Double mechanical shaft seal.
- EDPM or FPM O-ring seal, single and flushed.
- Product wetted elastomers in FPM or FFPM.
- Horizontal or vertical porting.
- DuraCirc Uni-Fit dimensions for retrofit port option.
- Heating and cooling jacket.
- Rectangular inlet.
- Aseptic option (see separate data sheet)
- Stainless steel shroud covering coupling and motor.
- Baseplate fitted with adjustable stainless steel ball feet.



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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