



A Member of the
COLFAX PUMP GROUP

LPQ

Screw pump series

Product description



Flow volume: 1 300–7 500 l/min
Max differential pressure: 16 bar
Applications: Circulation, lubrication, cooling
and transfer of viscous liquids

Applications

The LPQ pump are used for a number of different fluids:
Lubrication oil, fuel oil, vegetable oil, hydraulic oil and other hydraulic fluids, glycols, polymers, emulsions, and any non-aggressive fluid with some lubricating properties.

Typical applications are:

- Lubrication and cooling of diesel engines.
- Lubrication of steam- and hydro turbines.
- Transfer of oil onboard ships, in power-plants, oil factories, refineries, tank farms etc.
- Loading/unloading of ships, railcars etc.

Technical data

Discharge pressure

Maximum discharge pressure is 16 bar

Differential pressure

Maximum differential pressure is 16 bar but is reduced at low viscosities as shown in the table below.

Viscosity, mm ² /s (cSt)	2	7	12	20	37	75	100	180
Max. diff. pressure, lub. oil (bar)	4	6	8	9	11	14	16	16
Max. diff. pressure, fuel. oil (bar)	2	3	4	4.5	5.5	7	8	10

Standard factory test up to 10 bar. For data and/or certificates above 10 bar, please consult IMO AB.

Inlet pressure

Max. inlet pressure is 3 bar.

Min. inlet pressure (suction capability) is dependent on fluid viscosity and rotation speed, see the selection guide. It increases with decreasing viscosity and decreasing speed.

Information about min. inlet pressure for each individual duty case can be obtained from IMO AB.

Displacement dm³/r

Size and lead

100N	110L	110N	125L	125J	125N	140N	140P
1.79	2.10	2.38	2.80	3.15	3.49	4.91	5.41

Pressure relief valve

The pump is equipped with an integral pressure relief valve with internal return, limiting the differential pressure across the

pump and protecting the pump, should the discharge line be blocked. The valve is adjustable for different opening pressures up to 16 bar.

The value of the pressure limit can be set at the factory and should be adjusted at installation (see Installation & Start-up instruction for low pressure pumps).

The maximum pressure accumulation varies with pump size, speed and viscosity, but will normally not exceed 5 bar. The characteristic of the valve allows the valve to be used as pressure regulating valve when not too high demands on pressure modulation are required.

Drive

The LPQ -pump is designed primarily for direct drive through a flexible shaft coupling.

Speed

The maximum speed is 1800 rpm. Max. operating speed may be reduced depending on inlet conditions. Please consult the selection guide to find a corresponding speed limit in order to avoid cavitation problems.

Rotation

The LPQ pump is designed to operate in one rotational direction only, as standard clockwise when facing the shaft end.

For shorter periods of time, a few minutes for emptying a discharge line, the pump may be operated in reverse direction, provided the back pressure is limited to 3 bar.

Fluid viscosity

2-800 mm²/s. Viscosity up to 5000 mm²/s with approval from IMO AB.

Pumping temperature

Limited from -20°C to 90°C.

Material and design

Pump body	Grey cast iron
Power rotor	Carbon steel
Idler rotors	Carbon steel
Shaft seal	Carbon/Ni-resist. Nitrile elastomers
Bearing	Standard deep groove ball bearing
Seal cover	Aluminium alloy

For handling of fluids which may be aggressive to above materials consult IMO AB.

Sound level

Typical pump sound levels referred to free field conditions at a distance of 1 m. from the pump. Noise of driver excluded in the quoted figures. The sound levels are measured at a differential pressure of 4 bar, speed 1450 rpm, viscosity 37 mm²/s.

Size

	100	110	125	140
Sound level, dB (A)	74	76	78	84

Units

The following units are frequently used for specification of pumps:

	SI-unit	IMO units	USA units	conversion
Pressure	Pa (MPa)	bar	psi	1 bar = 14.5 psi = 0.1 MPa
Speed	r/s	rpm	rpm	1 rpm = 0.016667 r/s
Viscosity	mm ² /s	cSt	SSU	see table
Temperature	°C	°C	°F	°C = (°F-32)/1.8
Length	m	mm	inch	1 mm = 0.0394 inch
Flow rate	m ³ /s	lit/min	GPM	1 lit/min = 0.264 GPM

Viscosity table

cSt	2	4	8	20	37	75	200	400	800	1500
SSU	33	39	52	99	174	346	927	1850	3700	6940

Selection guide 50 Hz

Size & Lead	Visc. (cSt)	Speed: 960 rpm							Speed: 1450 rpm						
		Qeff (lit/min)			Pe (kW)			Min. inlet (bar)*	Qeff (lit/min)			Pe (kW)			Min. inlet (bar)*
		Diff. pressure (bar)			Diff. pressure (bar)				Diff. pressure (bar)			Diff. pressure (bar)			
		4	6	8	4	6	8	4	6	8	4	6	8		
100N	20	1466	1409	1361	13.4	19.1	24.8	-0.85	2343	2286	2238	20.8	29.5	38.1	-0.70
	37	1532	1491	1455	14.1	19.8	25.5	-0.85	2410	2368	2333	22.1	30.8	39.4	-0.68
	75	1588	1559	1534	15.1	20.9	26.6	-0.84	2465	2436	2411	24.2	32.8	41.5	-0.66
	400	1662	1649	1638	20.0	25.7	31.4	-0.68	2539	2526	2516	33.1	41.8	50.4	-0.40
110L	20	1709	1638	1579	15.9	22.6	29.4	-0.85	2741	2670	2611	24.9	35.0	45.2	-0.71
	37	1792	1740	1696	16.8	23.5	30.3	-0.85	2824	2772	2728	26.5	36.7	46.8	-0.70
	75	1860	1824	1793	18.2	24.9	31.7	-0.85	2892	2856	2825	29.1	39.3	49.4	-0.67
	400	1952	1936	1923	24.3	31.1	37.8	-0.69	2984	2968	2955	40.5	50.7	60.9	-0.43
110N	20	2018	1958	1907	17.8	25.4	33.0	-0.84	3186	3125	3074	27.7	39.2	50.8	-0.63
	37	2089	2045	2008	18.7	26.3	33.9	-0.83	3257	3212	3175	29.4	40.9	52.5	-0.62
	75	2148	2117	2091	20.2	27.8	35.4	-0.81	3315	3284	3258	32.1	43.7	55.2	-0.59
	400	2227	2213	2202	26.6	34.2	41.8	-0.63	3394	3380	3369	44.1	55.6	67.1	-0.31
125L	20	2440	2385	2338	21.1	30.1	39.0	-0.85	3811	3756	3709	33.0	46.6	60.1	-0.69
	37	2505	2465	2430	22.3	31.3	40.2	-0.85	3876	3836	3801	35.2	48.7	62.2	-0.68
	75	2559	2531	2506	24.2	33.1	42.1	-0.83	3930	3902	3877	38.6	52.2	65.7	-0.64
	400	2631	2619	2608	32.3	41.3	50.2	-0.61	4002	3990	3979	53.8	67.4	80.9	-0.30
125J	20	2726	2660	2604	23.6	33.7	43.8	-0.83	4268	4202	4146	36.9	52.1	67.3	-0.61
	37	2804	2755	2714	24.9	35.0	45.0	-0.82	4346	4297	4256	39.2	54.4	69.7	-0.59
	75	2869	2834	2806	26.9	37.0	47.0	-0.79	4411	4376	4348	43.0	58.2	73.4	-0.55
	400	2955	2940	2928	35.7	45.8	55.9	-0.54	4497	4482	4470	59.4	74.6	89.8	-0.17
125N	20	3021	2945	2882	26.1	37.3	48.5	-0.79	4734	4658	4595	40.7	57.6	74.5	-0.52
	37	3110	3054	3007	27.4	38.6	49.8	-0.78	4823	4767	4720	43.2	60.1	77.0	-0.50
	75	3183	3144	3111	29.6	40.8	52.0	-0.74	4896	4857	4824	47.2	64.1	81.0	-0.45
	400	3281	3264	3250	39.0	50.2	61.4	-0.47	-	-	-	-	-	-	-
140N	20	4358	4277	4210	36.7	52.4	68.1	-0.74	6765	6684	6616	57.2	80.9	104.7	-0.40
	37	4452	4393	4344	38.6	54.3	70.0	-0.72	6859	6800	6750	60.7	84.4	108.2	-0.37
	75	4531	4489	4454	41.6	57.3	73.0	-0.68	6938	6896	6861	66.3	90.0	113.8	-0.32
	400	4636	4618	4602	54.8	70.5	86.3	-0.37	-	-	-	-	-	-	-
140P	20	4750	4650	4565	40.4	57.7	75.1	-0.68	7403	7303	7218	63.0	89.2	115.4	-0.27
	37	4869	4795	4732	42.5	59.8	77.1	-0.66	7522	7448	7385	66.9	93.1	119.2	-0.24
	75	4966	4915	4871	45.8	63.1	80.5	-0.62	7619	7567	7524	73.1	99.2	125.4	-0.18
	400	5097	5075	5056	60.4	77.7	95.1	-0.28	-	-	-	-	-	-	-

* Valid for liquids free from unresolved air or gas.

Selection guide 60 Hz

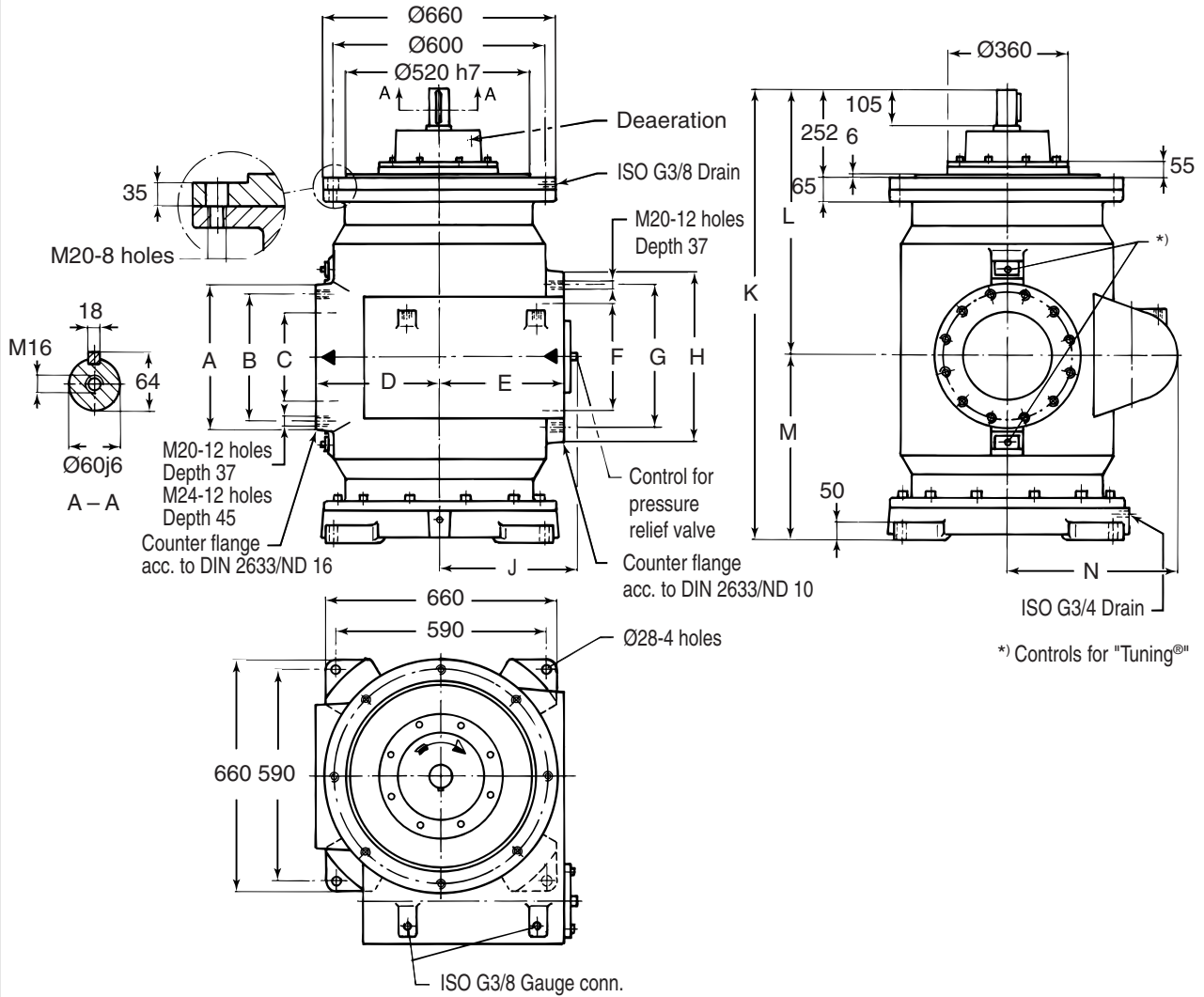
Size & Lead	Visc. (cSt)	Speed:1150 rpm							Speed: 1750 rpm						
		Qeff (lit/min)			Pe (kW)			Min. inlet (bar)*	Qeff (lit/min)			Pe (kW)			Min. inlet (bar)*
		Diff. pressure (bar)			Diff. pressure (bar)				Diff. pressure (bar)			Diff. pressure (bar)			
		4	6	8	4	6	8	4	6	8	4	6	8		
100N	20	1806	1749	1701	16.2	23.1	29.9	-0.81	2880	2823	2775	25.6	36.0	46.5	-0.56
	37	1873	1831	1796	17.1	24.0	30.8	-0.80	2947	2905	2870	27.3	37.7	48.1	-0.54
	75	1928	1899	1874	18.6	25.4	32.3	-0.78	3002	2973	2948	30.0	40.4	50.9	-0.51
	400	2002	1989	1979	24.9	31.8	38.6	-0.58	3076	3063	3053	41.9	52.3	62.7	-0.20
110L	20	2109	2038	1979	19.3	27.4	35.5	-0.82	3372	3302	3243	30.6	42.8	55.1	-0.58
	37	2192	2140	2096	20.5	28.6	36.6	-0.81	3455	3404	3360	32.7	45.0	57.3	-0.57
	75	2260	2224	2193	22.3	30.4	38.5	-0.79	3524	3488	3457	36.1	48.4	60.7	-0.53
	400	2352	2336	2323	30.4	38.4	46.5	-0.60	3616	3600	3587	51.3	63.6	75.9	-0.24
110N	20	2471	2411	2360	21.6	30.7	39.9	-0.77	3900	3840	3789	34.0	47.9	61.8	-0.46
	37	2542	2498	2460	22.8	31.9	41.0	-0.76	3971	3927	3890	36.3	50.2	64.1	-0.45
	75	2601	2570	2543	24.7	33.8	43.0	-0.73	4030	3999	3973	39.9	53.8	67.7	-0.41
	400	2679	2666	2654	33.1	42.3	51.4	-0.51	-	-	-	-	-	-	-
125L	20	2972	2916	2870	25.7	36.4	47.1	-0.81	4651	4595	4549	40.6	56.9	73.2	-0.55
	37	3037	2996	2962	27.2	37.9	48.7	-0.79	4716	4675	4641	43.4	59.8	76.1	-0.53
	75	3091	3062	3038	29.6	40.4	51.1	-0.76	4769	4741	4717	48.0	64.3	80.7	-0.48
	400	3163	3150	3140	40.4	51.1	61.8	-0.50	-	-	-	-	-	-	-
125J	20	3324	3258	3202	28.7	40.8	52.8	-0.76	5212	5146	5090	45.3	63.7	82.0	-0.43
	37	3402	3353	3312	30.4	42.4	54.5	-0.74	5290	5241	5200	48.4	66.8	85.1	-0.41
	75	3467	3432	3403	33.0	45.1	57.1	-0.71	5355	5321	5292	53.3	71.7	90.1	-0.36
	400	3553	3538	3526	44.6	56.7	68.7	-0.41	-	-	-	-	-	-	-
125N	20	3685	3610	3546	31.7	45.1	58.5	-0.70	5783	5707	5644	49.9	70.3	90.7	-0.30
	37	3774	3718	3672	33.4	46.8	60.2	-0.68	5871	5816	5769	53.2	73.6	94.0	-0.27
	75	3847	3808	3775	36.3	49.7	63.1	-0.64	5945	5906	5873	58.5	78.9	99.3	-0.21
	400	3945	3929	3914	48.6	62.0	75.4	-0.31	-	-	-	-	-	-	-
140N	20	5291	5211	5143	44.5	63.3	82.2	-0.62	8238	8158	8090	70.2	98.8	127.5	-0.12
	37	5386	5327	5277	47.0	65.8	84.6	-0.60	-	-	-	-	-	-	-
	75	5464	5423	5388	50.9	69.8	88.6	-0.56	-	-	-	-	-	-	-
	400	5569	5551	5536	68.3	87.1	106.0	-0.19	-	-	-	-	-	-	-
140P	20	5590	5447	5326	49.1	69.8	90.6	-0.54	-	-	-	-	-	-	-
	37	5758	5653	5564	51.8	72.5	93.3	-0.52	-	-	-	-	-	-	-
	75	5897	5824	5761	56.1	76.9	97.6	-0.47	-	-	-	-	-	-	-
	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Valid for liquids free from unresolved air or gas.

Pump dimensions

Pump LPQ

Dimensions in mm (The counter flanges are accessories)



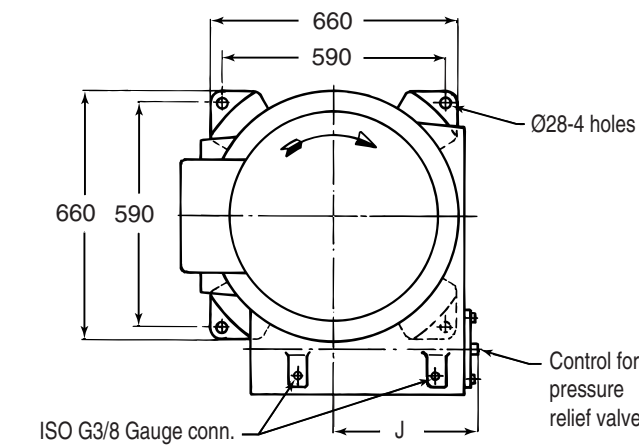
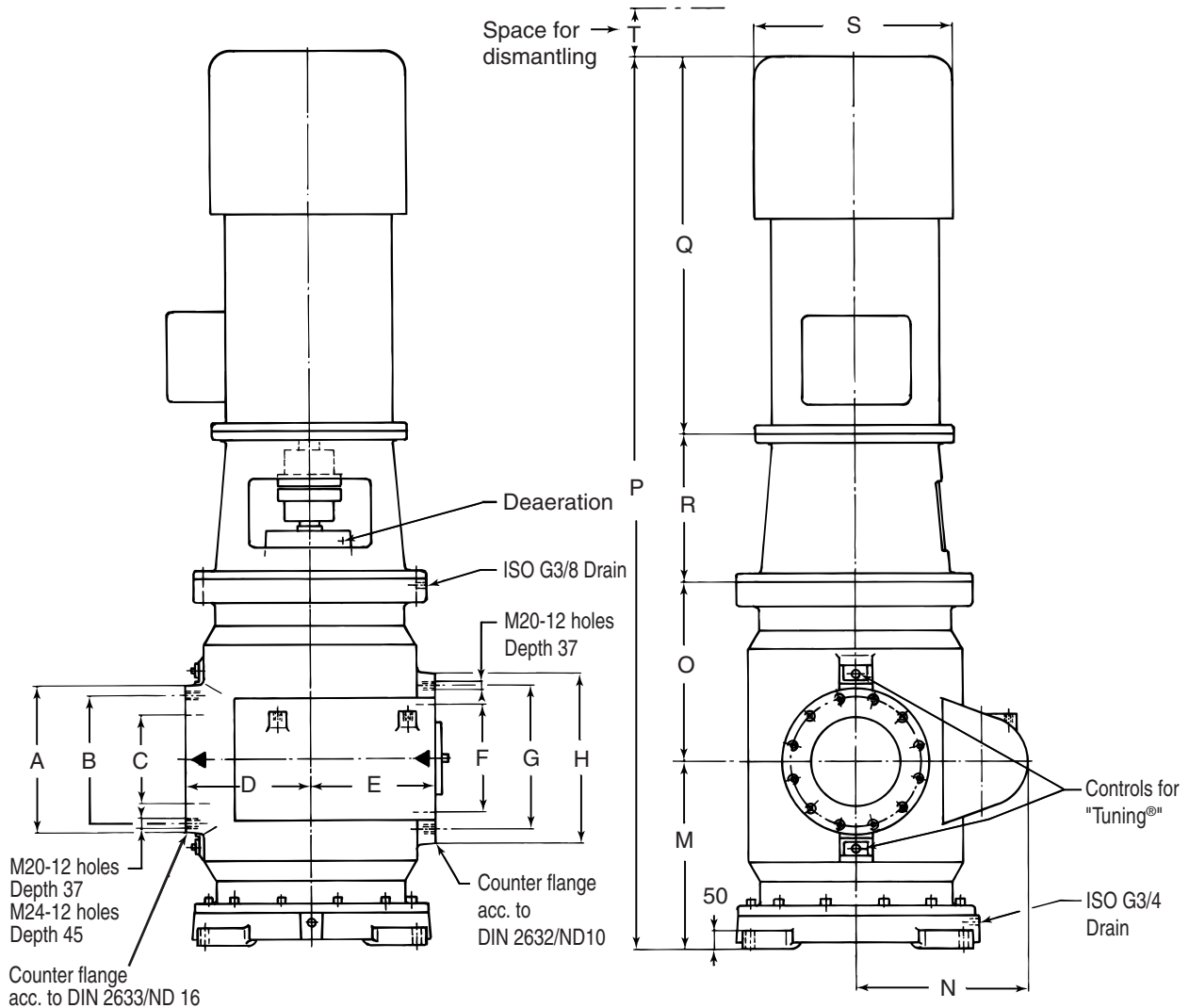
Pump size	A	B	C	D	E	F	G	H	J	K	L	M	N
100-125	340	295	200	305	305	250	350	410	335	1085	650	435	410
140	405	355	250	350	350	300	400	480	390	1271	752	519	475

Fig. 1

Pump dimensions

Pump unit LPQ

Dimensions in mm (With standard electric motor)



Pump unit size	A	B	C	D	E	F	G	H	J	M	N	O
100-125	340	295	200	305	305	250	350	410	335	435	410	398
140	405	355	250	350	350	300	400	480	390	519	475	500

Frame	Motor size	Pump size 100-125 P	Pump size 140 P	Q	R	S	T
F350	200L	1838		640	365	422	135
F400	225S	2133		885	415	446	185
F400	225M	2178		930	415	446	185
F500	250M	2278	2464	1030	415	496	185
F500	280S	2308	2494	1060	415	556	185
F500	280M	2373	2559	1125	415	556	185
F600	315S	2428	2614	1170	425	626	195
F600	315M	2478	2664	1220	425	626	195
F600	315L	2578	2764	1320	425	626	195

Fig. 2

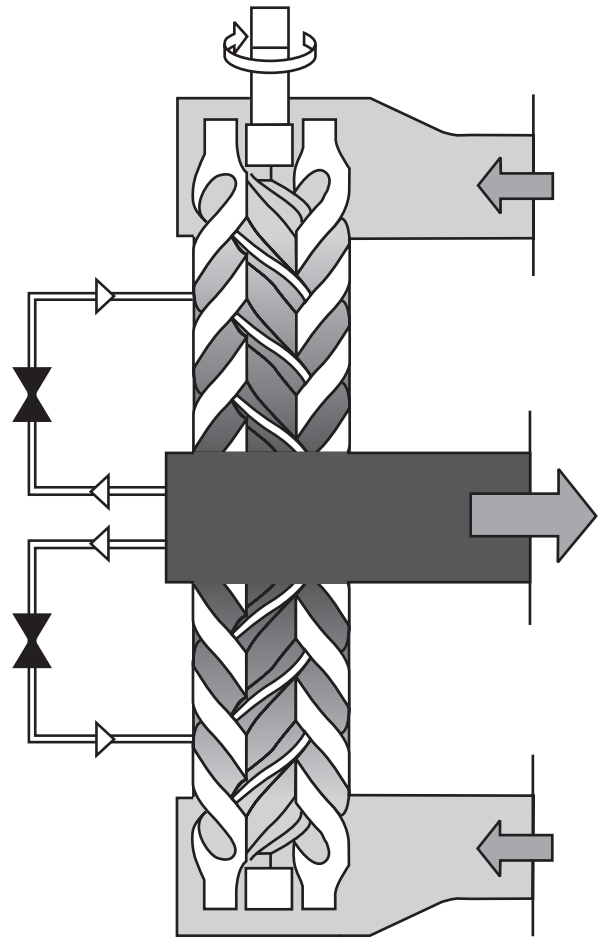
IMO Tuning®

The tuning® valves, which are standard on the LPQ series, make it possible to pump oil containing free air, with a minimum of disturbing vibration noise.

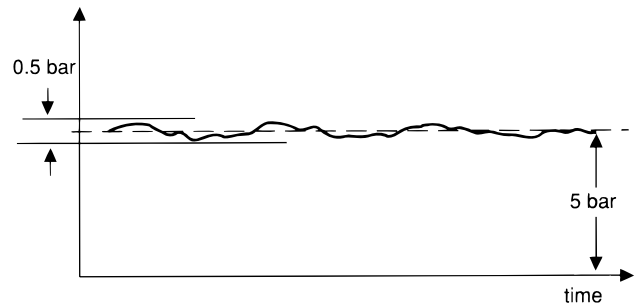
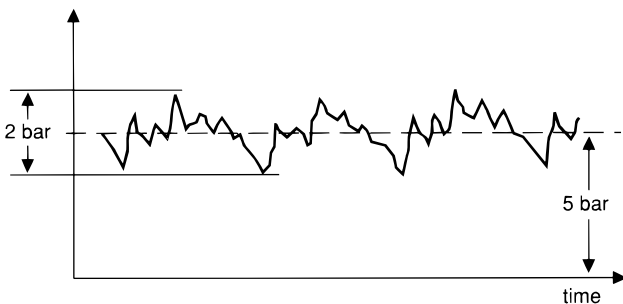
Low volume lube oil systems and additives that prolong deaeration time are the main reasons for having an excessive amount of free air in the oil. Free air is the main source of vibration and noise in pump systems as the air entrained oil is compressible and air bubbles expands and decreases in size very rapidly.

By throttling the tuning® valve, the correct amount of fluid, depending on air content and pressure, is fed from the pressure side into the rotor bores.

The effect this has on the air bubbles is that they will gradually decrease in size rather than collapse when exposed to the full pressure on the discharge side.

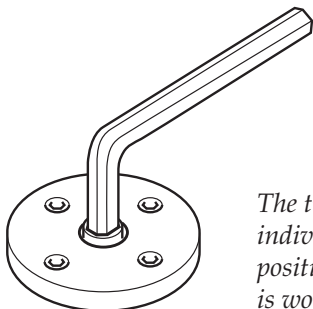


Effect of tuning® Pressure fluctuations



Without tuning®

Pressure fluctuations are rapid and cover a wide band which produces a loud rattling noise.



With tuning®

Pressure fluctuations are highly reduced in speed and magnitude leading to low noise level.

Diagrams refer to tests at 1800 rpm, delivery pressure 5 bar, inlet pressure -0,5 bar, viscosity 75 cSt and 6% free air.

The two tuning® valves on a LPQ-pump are easily adjusted individually (by turning the tuning spindles with an Allen key to a position where the noise level comes to a minimum) while the pump is working under normal operating conditions.

Accessories

A bare shaft pump (Fig. 3) can be ordered with the accessories in fig. 4-7.



Fig. 3 Bare shaft pump



Fig. 4 Electric motor



Fig. 5 Connecting frame



Fig. 6 Two sets of counter flanges



Fig. 7 Shaft coupling

Installation

The LPQ-pump is designed to be flange-mounted vertically to its electric motor via a connecting frame and a flexible shaft coupling.

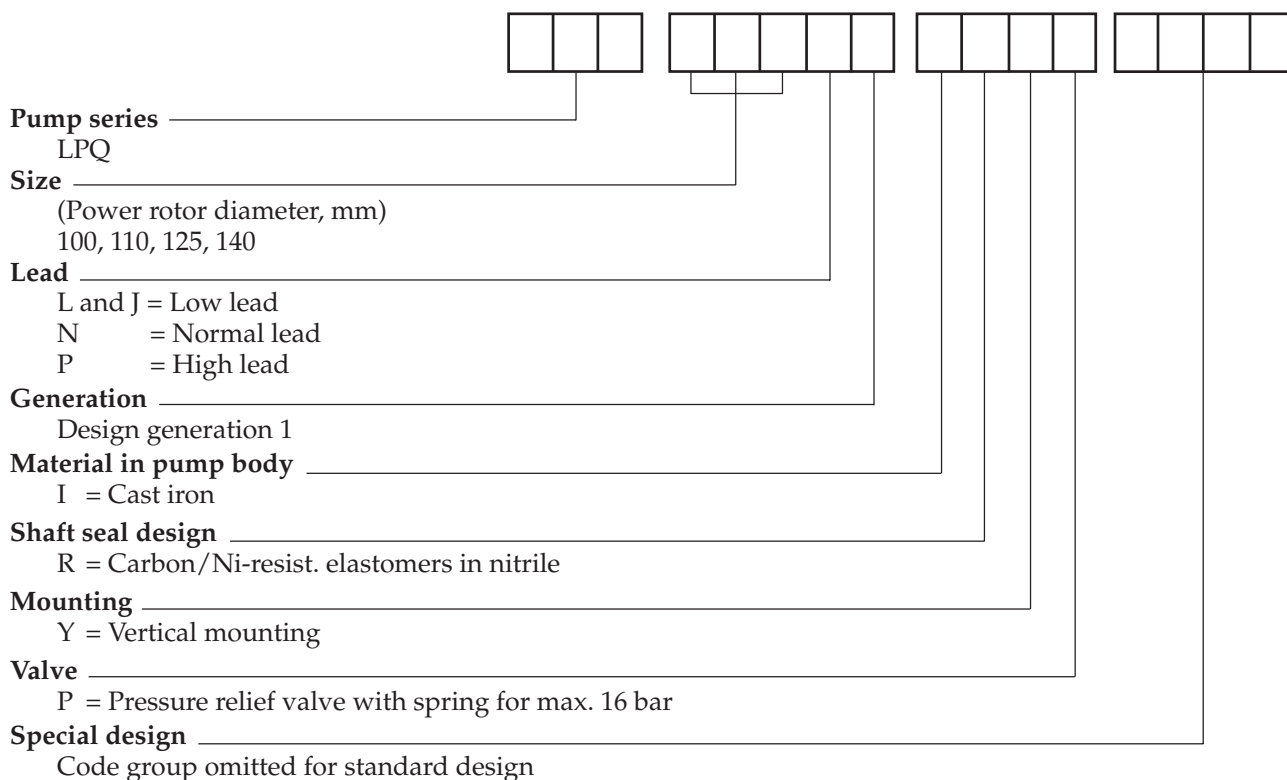
For more information about installation read the Installation and Start-up instruction for low pressure pumps.

Maintenance and Service

Spare parts for these pumps are easily available from stock. For detailed information and know-how about service read the

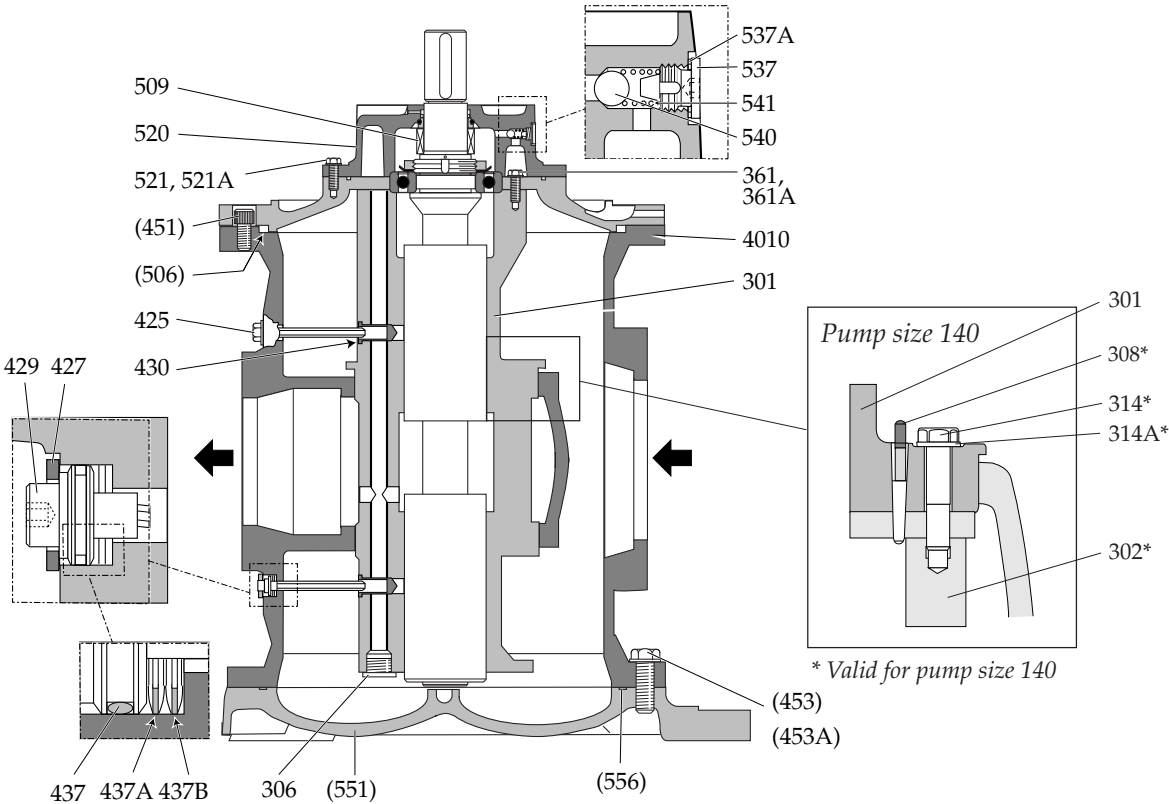
Maintenance and Service instruction for LPQ-pumps or contact IMO AB.

Pump model code

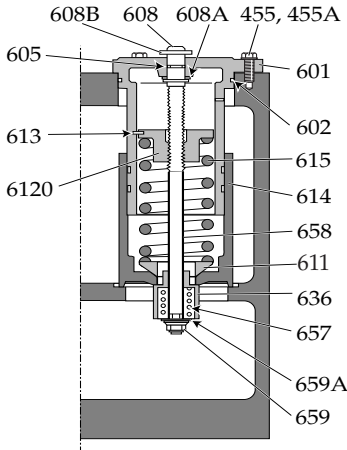


Sectional view

LPQ all models



Size 100-125



Size 140

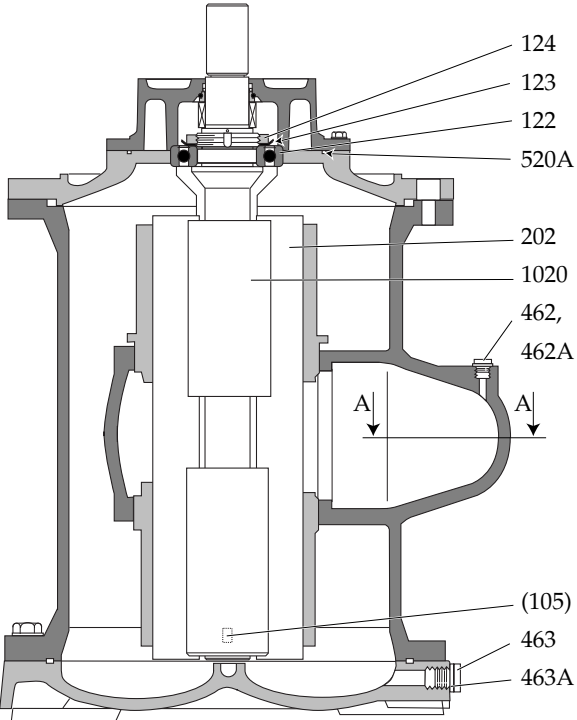
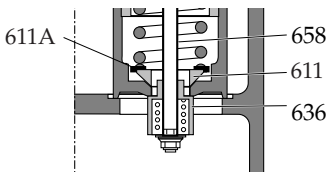


Fig. 8

List of components

Pos No	Denomination	Pos No	Denomination	Pos No	Denomination
102	Power rotor	437B	Cup spring	541	Spring
113	Key	451	Screw	551	Foot
122	Ball bearing	453	Screw	556	O-ring
123	Locking washer	453A	Washer	601	Valve cover
124	Bearing nut	455	Screw	602	O-ring
202	Idler rotor	455A	Washer	605	O-ring
301	Sleeve	462	Plug	608	Valve spindle
302	Sleeve	462A	T-ring	608A	Support ring
306	Plug	463	Drain plug	608B	Retaining ring
308	Guide pin	463A	T-ring	611	Washer
314	Screw	501	Top cover	611A	Washer
314A	Washer	506	O-ring	6120	Regulating nut
361	Screw	509	Shaft seal	613	Pin
361A	Washer	520	Seal cover	614	Valve piston
401	Pump body	520A	O-ring	615	Spring
425	Screw	521	Screw	636	Damping bushing
427	Tuning cover	521A	Washer	657	Spring
429	Spindle	537	Deaeration plug	658	Distance sleeve
430	Tuning piston	537A	T-ring	659	Locking nut
437	O-ring	540	Ball	659A	Support ring
437A	Washer				



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