



Product Description



Flow volume: 1450 -Max differential pressure: 16 bar Applications: Circula

1450 - 8100 l/min 16 bar Circulation, lubrication and transfer

1. Applications

1.1 Functionality

The LPQ pumps are used for a number of different fluids:

Lubrication oil, fuel oil, vegetable oil, hydraulic oil and other hydraulic fluids, glycol, polymers, emulsions and any non-aggressive fluid with sufficient lubricating properties.

If requested, the LPQ pump may be certified according to any of following classification societies: DNV, BV, LRS, ABS, RS, GL, RINA, KR, NK, RMR or CCS.

1.2 Applications

Typical applications are:

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

1.3 Installation

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

The pump can be installed both horizontally and vertically but due to size, vertical installation is recommended.

As standard, the pump is delivered without counter flanges (DIN type) but can be included if requested.

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

2. Pump model code

| Size | LPQ |
|-------|--|
| JIZC | Power rotor diameter [mm] 100, 110, 125, 140 |
| Lead | |
| | J and L = Low lead N = Normal lead |
| | P = High lead |
| | |
| Gene | ration |
| | Design generation 1 |
| | |
| Mate | rial in pump body I = Cast iron |
| | N = Nodular cast iron |
| | |
| Shaf | t seal design |
| | R = Carbon/Silicon Carbide with elastomers in Nitrile |
| | T = Silicon Carbide/Silicon Carbide with elastomers in Viton |
| | |
| Μοιιι | nting |
| | Y = Foot for vertical mounting (standard) |
| | |
| | |
| Valvo | P = Internal pressure relief valve with spring for max. 16 bar |
| vaiv | |

Special design _____ Code group omitted for standard design (A-number)

3.1 Pressure Information

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. 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 4 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. The valve has a maximum set pressure of 16 bar.

Inlet pressure

Minimum inlet pressure (suction capability) is dependent on fluid viscosity and rotation speed. It increases with decreasing viscosity and decreasing speed. Information about minimum inlet pressure for each individual duty case can be obtained from IMO AB or pump selection software WinPump.

Maximum inlet pressure is 3 bar.

Discharge pressure

Maximum discharge pressure is 16 bar.

Differential pressure

Maximum differential pressure is 10 bar but reduced at low viscosities according to table below.

| Viscosity [cSt] | 2 | 20 | 100 | 180 |
|-------------------------------------|-------|-------|-------------------|-------|
| Lub. Oil, max. diff. pressure [bar] | 4 | 9 | 10 | 10 |
| Fuel oil, max. diff. pressure [bar] | 2 | 4,6 | 8,2 | 10 |
| Contact IMO or use the pump sele | ction | softy | ware ^v | WinPu |

Contact IMO or use the pump selection software WinPump to determine the exact operating limits.

3.2 Driver information

Driver type

The pump is designed to be connected to an electrical motor by a flexible shaft coupling.

Speed

The maximum speed is 1800 rpm (1500 rpm for sizes LPQ 140N and LPQ 140P). Max. operating speed may be reduced depending on inlet conditions. Contact IMO or use the pump selection software WinPump to find a corresponding speed limit in order to avoid cavitation problems.

Rotation

The 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.

3. Technical Data

3.3 Sound level

Typical pump sound levels refer 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 discharge pressure of 4 bar, speed 1450 rpm and viscosity 37 cSt.

Size 100 110 125 140 Sound level dB [A] 74 76 78 84

3.4 Moment of Inertia

Moment of intertia [10-3 kgm²]Size100110125140Value29,338,458,8101

3.5 Fluid viscosity

2 – 800 cSt. Viscosity up to 5000 cSt after approval from IMO AB.

3.6 Fluid temperature

-20 – +90 °C for all types of seal and material.

4. Design

4.1 Ball bearing

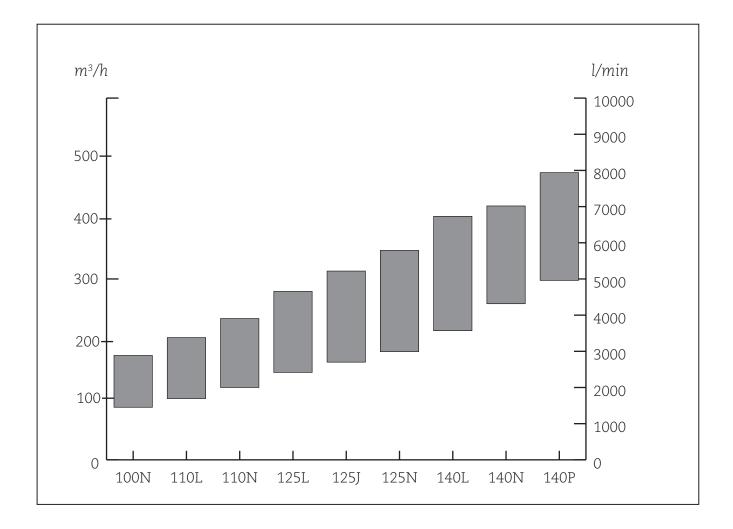
The pump is fitted with internal ball bearing which continuously is being greased by the handling media.

4.2 Material & design

| Model | Material pump | Material rotor | Material idler | Material seal | Material Elastomers |
|--------|----------------------|---------------------|---------------------|-------------------------------------|---------------------|
| LPQ IR | Cast iron | Structural steel | Structural steel | Carbon/Silicon Carbide | Nitrile |
| LPQ IT | Cast iron | Structural steel | Structural steel | Silicon Carbide/ Silicon Carbide | Viton |
| LPQ NR | Nodular cast iron | Structural steel | Structural steel | Carbon/Silicon Carbide | Nitrile |
| LPQ NT | Nodular cast iron | Structural steel | Structural steel | Silicon Carbide/ Silicon Carbide | Viton |

5. Performance Guide

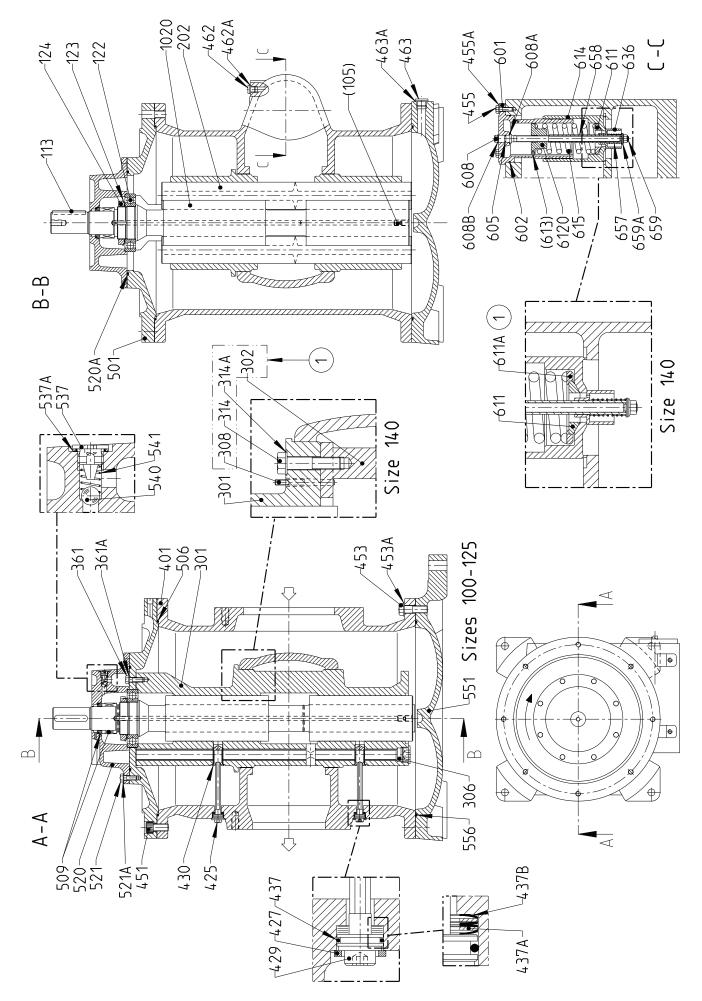
Typical performance values at 5 bar Flow calculated at 26 cSt, power at 260 cSt.



| <u>rpm</u> | 100N l/min kW | 110L l/min kW | 110N l/min kW |
|------------|------------------|------------------|------------------|
| 950 | 1 453 20,9 | 1 694 25,3 | 2 000 27,9 |
| 1150 | 1 811 26,2 | 2 115 31,7 | 2 476 34,8 |
| 1450 | 2 348 34,4 | 2 747 41,7 | 3 191 45,7 |
| 1750 | 2 885 43,0 | 3 379 52,3 | 3 905 57,2 |
| | 125L | 125J | 125N |
| rpm | l/min kW | l/min kW | l/min kW |
| 950 | 2 417 33,6 | 2 700 37,3 | 2 992 40,9 |
| 1150 | 2 977 42,1 | 3 330 46,6 | 3 692 51,1 |
| 1450 | 3 816 55,4 | 4 274 61,4 | 4 740 67,1 |
| 1750 | 4 655 69,4 | 5 218 76,9 | 5 789 84,0 |
| | 140 L | 140N | 140P |
| rpm | l/min kW | l/min kW | l/min kW |
| 950 | 3 571 46,2 | 4 316 57,4 | 4 691 63,3 |
| 1150 | 4 361 57,7 | 5 298 71,8 | 6 044 79,1 |
| 1450 | 5 46 75,9 | 6 772 94,3 | 7 668 104 |
| 1500 | 6 731 94,9 | 7 017* 98,2 | 7 939* 108 |

* Calculated at max speed 1500 rpm.

6. Sectional view

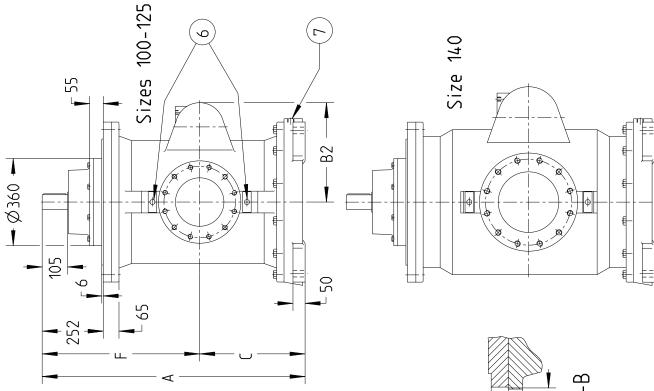


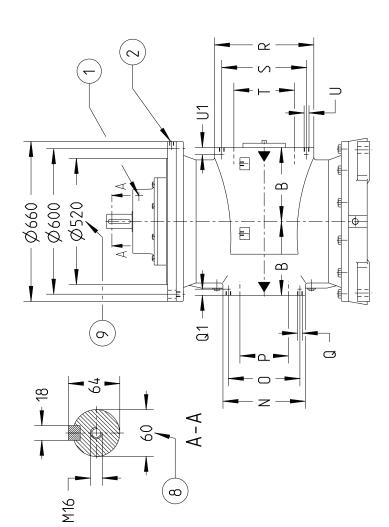
LPQ 1104.02 GB

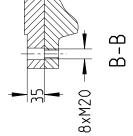
7. List of Components

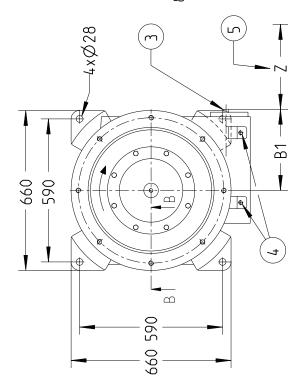
| Pos No Denomination | nomination | Pos No | Denomination | Pos No | Pos No Denomination |
|--|--|---|--|---|--|
| 1020Comple1020Comple(105)Screw113Key123Locking124Ball be123Locking202Idler rc301Sleeve302Sleeve303Guide J304Washe361AWashe361AWashe361AWashe361AWashe361AWashe373Screw401Pump b427Tuning430Tuning437O-ring | Complete power rotor Screw Key Ball bearing Locking washer Bearing nut Idler rotor Sleeve Sleeve Plug Guide pin Screw Washer Pump body Screw Washer Pump pody Screw Tuning cover Spindle Tuning piston O-ring | 437A 437A 451 453 453 455 453 462 463 462 463 463 500 501 506 501 520 521 521 537 537 537 537 | Washer Cup spring Screw Screw Washer Washer Plug T-ring Drain plug T-ring Shaft seal Shaft seal Seal cover O-ring Screw Washer Deaeration plug T-ring Ball | 541 551 556 601 602 608 608 608 611 611 611 614 614 615 614 615 659 659 659 | Spring Foot O-ring Valve cover O-ring Valve spindle Support ring Retaining ring Washer Washer Washer Complete regulating nut Pin Valve piston Valve spring Damping bush Spring Damping bush Spring Distance sleeve Locking nut Support ring |
| Drawing remarks: (1) Applicable for size 140 | ize 140 | | | Notes: - Components with Pos No | stes: Components with Pos No within parenthesis are parts of subassembly |

8. Pump Dimensions







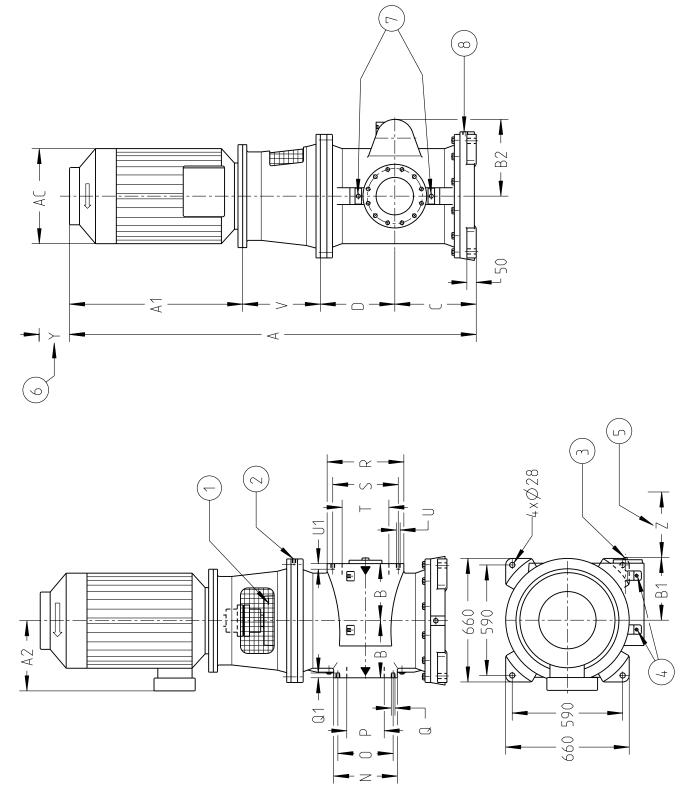


LPQ 1104.02 GB

| ght | _ | 0 | 0 | ſ | 0 | | | | |
|-----------------|-------------|-------|---|------|---|--|--|--|--|
| W e i | ج ح | 620 | 640 | 675 | 006 | | | | |
| Dism. Weight | Z | 350 Z | | | | | | | |
| | ۲U | | 37 | | | | | | |
| ÷ | U U1 | | 340 295 200 12×M20 37 410 350 250 12×M20 37 | | 2 405 355 250 12×M24 45 480 400 300 12×M20 37 | | | | |
| Inlet | F | | 250 | | 300 | | | | |
| | S | | 350 | | 400 | | | | |
| | æ | | 4 10 | | 480 | | | | |
| | ß | | 37 | | 45 | | | | |
| et | a ai r s t | | 12×M20 | | 12×M24 | | | | |
| Outlet | م | | 200 | | 250 | | | | |
| | Ч 0 И | | 295 | | 355 | | | | |
| | z | | 340 | | 405 | | | | |
| | ш | | 650 | | 752 | | | | |
| ions | | | 435 | | | | | | |
| nens | B2 | | 475 | | | | | | |
| Main dimensions | B B1 B2 C | | 390 | | | | | | |
| Mair | -00 | | 350 | | | | | | |
| | A | | | 1271 | | | | | |
| dm d | SIZe | 100 | 110 1085 305 335 410 435 65 | 125 | 14.0 1271 350 390 475 519 75 | | | | |

| Notes: | - Dimensions in mm | Counter flange for Outlet is according to DIN2633/ND16 | Counter flange for Inlet is according to DIN2632/ND10 | - Weight is an approximate value |
|--|---------------------------|--|---|----------------------------------|
| (5) Space for dismantling relief valve | (6) Controls for "Tuning" | (7) Drain. ISO G3/4 | (8)Tolerances ISO j6 | (9)Tolerances ISO h7 |
| Drawing remarks | (1) Deaeration | (2) Drain. ISO G3/8 | (3) Control for relief value | (4) Gauge connection. ISO G3/8 |
| | | | | 11 |

9. Pump Unit dimensions



9. Pump Unit dimensions

| W eight | بر م | 985 | 1095 | 1150 | 1390 | 1005 | 1115 | 1170 | 14 10 | 1040 | 1150 | 1210 | 1450 | 2100 | 1430 | 1670 | 2340 | | | |
|------------|-----------|------|-----------------------|----------------|-------|-------|-------------|---------------|-------|------|-------|----------------|-------|-------|------------|---------------|-------|---|--|---|
| E | \succ | 140 | | 185 | | 140 | | 185 | | 140 | | 185 | | 195 | а Ц | | 195 | - | | |
| Dism. | Ζ | | | | | | | | | | I | 350 185 | | | | rn 00t | | - | | UDF |
| | 11 | | Ľ | | | | L C | | | | | 37 | | | | 27 | | | | e WP-i |
| | \supset | | 10 × M 20 | | | | | | | | | 250 12×M20 | | | | 12×M20 | | | | tes: Dimensions in mm Dimensions valid for Brook Crompton motors type WP-UDF Weight is an approximate value |
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| | Q1 P | | , 7 LC | | | | . ۲ ۲ | | | | | 37 4. | | | | 45 48 | | - | | tes: Dimensions in mm Dimensions valid fe Weight is an appro |
| - | Ø | | | | | | | | | | | | | | | | | - | | nsions nsions nt is ar |
| Outlet | Ø | | 000 10×M00 | 71.1771 | | | | 71.1771 | | | | 295 200 12×M20 | | | | 250 12×M24 | | - | | Notes: - Dime - Dime - Weigi |
| | ٩ | | | 7007 | | | \sim | 700 | | | | 200 | | | | | | - | | |
| | 0 | | л О Г | | | | л С С | 「 た ろ | | | | 295 | | | | 355 | | | | |
| | Z | | 0 / m |) 1 1 | | | | 7 7 7 | | | | 340 | | | | 405 | | | | |
| | > | 365 | | 4 15 | | 365 | | 4 15 | | 365 | | 4 15 | | 425 | , 15 15 | <u>ר</u> ד | 425 | | | |
| | | | מטב | 270 | | | a U c | 071 | | | | 398 | | | | 500 | | | | |
| - | U | | בר י | 1 1 1 | | | ЦС 7 | | | | | 435 | | | | 519 | | | | |
| ក | Β2 | | (10 | | | | 10 | 2 | | | | 410 | | | | 475 | | - | | ð |
| Isior | B1 | | נו ה ה | | | | Ц С С | | | | | 335 | | | | 390 | | - | | ief valı |
| dimensions | В | | | | | | | | | | | 305 | | | | 350 | | - | | ing reli ing 1g" |
| Main d | AC | 381 | 448 | 448 | 508 | 381 | 448 | 448 | 508 | 381 | 448 | 448 | 508 | 640 | 448 | 508 | 640 | | | smanti smanti "Tunii G3/4 |
| Σ | A2 / | 301 | 345 4 | 345 4 | 375 5 | 301 3 | 345 4 | 345 4 | ഗ | 301 | 345 4 | 345 4 | 375 5 | 560 6 | 345 4 | 375 5 | 560 6 | _ | | e for di e for di rols for 1. ISO |
| - | | 7 | | | | | | | 0 37 | | | | | | | | | - | | (5) Space for dismantling relief value (6) Space for dismantling (7) Controls for "Tuning" (8) Drain. ISO G3/4 |
| - | A1 | 67 | 775 | 845 | 930 | | 775 | 845 | 930 | 677 | 775 | 845 | 930 | 1145 | 845 | 930 | 1145 | - | | |
| | A | 1875 | 2023 | 2093 | 2178 | 1875 | 2023 | 2093 | 2178 | 1875 | 2023 | 2093 | 2178 | 2403 | 2279 | 2364 | 2589 | | | G3/8 |
| Frame | | F350 | F400 | | | F350 | F400 | | | F350 | F400 | | | F600 | | | F600 | | | s 3/8 ief valve tion. ISO |
| Motor | | 200 | 225 | 250 | 280 | 200 | 225 | 250 | 280 | 200 | 225 | 250 | 280 | 315 | 250 | 280 | 315 | | | Drawing remarks (1) Deaeration (2) Drain. ISO G3/8 (3) Control for relief valve (4) Gauge connection. ISO G3/8 |
| Pump | Size | | 001 | | | | 110 | 2 | | | | 125 | | | | 140 | | | | Drawir (1) Dea (2) Dra (3) Con (4) Gau |
| | | | | | | | | | | | | wv | хw | .im | lO.S | е | | | | 13 |

10. Accessories

A bare shaft pump (Fig. 1) can be ordered with the accessories in fig. 2-5.



Fig. 1 Bare shaft pump





Fig. 2 Two sets of counter flanges Fig. 3 Connecting frame



Fig. 4 Shaft coupling



Fig. 5 Electric motor

11. Maintenance and Service

Spare parts for these pumps are easily available from stock. For detailed information and know-how about service, see the Maintenance & Service Instruction for LPQ pumps or contact IMO AB.

12. IMO Tuning®

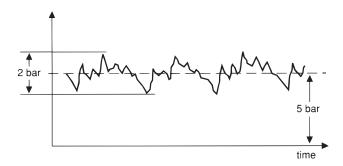
The tuning® valves, which are standard on the LPQ series, make it possible to pump oil containing free air, with a minimum of disturbing vibration noise.

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.

12.1 Effect of tuning® Pressure fluctuations

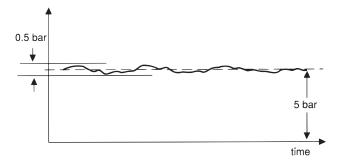
Without tuning

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



With tuning

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

For latest updates, check: www.imo.se