

QL Series Vertical, Double-Suction, Twin-Volute Pumps (QL, QLQ, QLC and QLQC)

► Maintenance Checklist

⚠ DANGER

Read User Instructions **before** installing, operating or maintaining this pump.
Copies available from Flowserve pump representatives.

Operating Limits¹

Pumped Liquid Temperature Limits ²	-45°C to 200°C (-50°F to 400°F)
Maximum Ambient Temperature ²	Up to 40°C (104°F)
Maximum Pump Speed	Refer to the nameplate

1. Subject to written agreement from Flowserve.
2. Special designs and materials may be available for pumps operating above or below these specified limits. Contact Flowserve for upgrade options available for your specific application.

Impeller Clearance^{3, 4, 5}

Nominal Column Diameter, in	Clearance, mm (in)
12 to 18	4 to 5 (0.15 to 0.20)
20 and above	7 to 8 (0.27 to 0.31)

3. Shafts elongate due to the hydraulic thrust of the pump and impellers must be adjusted to compensate for this elongation.
4. Shaft elongation varies for each model depending upon the size, shaft length, shaft diameter, impeller weight and number of stages.
5. Please see the documentation supplied along with the pump for exact impeller setting value matched for the specific pump that you have purchased.

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Recommended Bolt Torques

Bolt Size, in	Bolt Torque, kg m (lb-ft)	
	Group 1 ⁶	Group 2 ⁷
3/8-16 UNC	3.3 (24.0)	2.2 (15.9)
1/2-13 UNC	8.4 (60.6)	5.6 (40.5)
5/8-11 UNC	16.8 (121.2)	11.0 (79.6)
3/4-10 UNC	28.2 (204.0)	21.0 (151.9)
7/8-9 UNC	44.8 (324.0)	34.5 (249.5)
1-8 UNC	68.6 (496.0)	52.0 (376.1)
1 1/8-8 UN	98.9 (715.0)	80.0 (578.6)
1 1/4-8 UN	139.4 (1008.0)	111.0 (802.9)
1 3/8-8 UN	189.1 (1368.0)	155.0 (1121.1)
1 1/2-8 UN	250.0 (1808.3)	210.0 (1518.9)
1 5/8-8 UN	320.0 (2314.6)	280.0 (2025.2)
1 3/4-8 UN	418.9 (3030.0)	350.0 (2531.6)
1 7/8-8 UN	555.8 (4020.0)	438.3 (3170.0)
2-8 UN	613.9 (4440.0)	540.0 (3905.8)
2 1/4-8 UN	900.0 (6509.7)	800.0 (5786.4)

6. Group 1 = A193 B7; B865 N05500 (Monel® K 500)
7. Group 2 = A193 B8M Class 2; A449 Grade 5; A182 F51 (Duplex); A276 S32760 (Super Duplex); B446 N06625 (Inconel® 625)

For sales and product information, go to www.flowserve.com

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QL pumps are manufactured in: Coslada (Spain), Desio (Italy), Rio de Janeiro (Brazil) and Taneytown, MD (USA).

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Shaft Data

Diameter, mm (in)			
Shaft	Sleeve	Sleeve Tolerances	
		Min.	Max.
25.000 (0.984)	32.000 (1.260)	31.979 (1.259)	32.000 (1.260)
32.000 (1.260)	40.000 (1.575)	39.975 (1.574)	40.000 (1.575)
38.000 (1.496)	48.000 (1.890)	47.975 (1.889)	48.000 (1.890)
45.000 (1.772)	55.000 (2.165)	54.975 (2.164)	55.000 (2.165)
50.000 (1.969)	60.000 (2.362)	59.975 (2.361)	60.000 (2.362)
57.000 (2.244)	65.000 (2.559)	64.970 (2.558)	65.000 (2.559)
64.000 (2.520)	75.000 (2.953)	74.970 (2.952)	75.000 (2.953)
70.000 (2.756)	80.000 (3.150)	79.970 (3.148)	80.000 (3.150)
76.000 (2.992)	85.000 (3.346)	84.970 (3.345)	85.000 (3.346)
83.000 (3.268)	95.000 (3.740)	94.965 (3.739)	95.000 (3.740)
90.000 (3.543)	100.000 (3.937)	99.965 (3.936)	100.000 (3.937)
95.000 (3.740)	105.000 (4.134)	104.965 (4.132)	105.000 (4.134)
102.000 (4.016)	112.000 (4.409)	111.965 (4.408)	112.000 (4.409)
110.000 (4.331)	120.000 (4.724)	119.965 (4.723)	120.000 (4.724)
120.000 (4.724)	130.000 (5.118)	129.965 (5.117)	130.000 (5.118)
127.000 (5.000)	137.000 (5.394)	136.960 (5.392)	137.000 (5.394)
140.000 (5.512)	150.000 (5.906)	149.960 (5.904)	150.000 (5.906)
150.000 (5.906)	160.000 (6.299)	159.960 (6.298)	160.000 (6.299)
170.000 (6.693)	180.000 (7.087)	179.960 (7.085)	180.000 (7.087)

Bearing Data

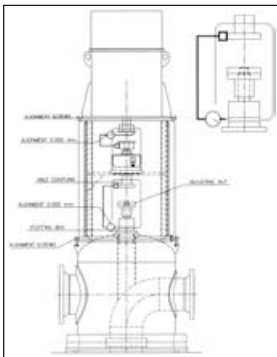
Clearances, mm (in)					
Bronze		Metal/Rubber		Carbon Filled	
Min.	Max.	Min.	Max.	Min.	Max.
0.200 (0.008)	0.321 (0.013)	0.200 (0.008)	0.421 (0.017)	0.200 (0.008)	0.271 (0.011)
0.200 (0.008)	0.325 (0.013)	0.200 (0.008)	0.425 (0.017)	0.200 (0.008)	0.275 (0.011)
0.200 (0.008)	0.325 (0.013)	0.200 (0.008)	0.425 (0.017)	0.200 (0.008)	0.275 (0.011)
0.200 (0.008)	0.325 (0.013)	0.200 (0.008)	0.425 (0.017)	0.200 (0.008)	0.275 (0.011)
0.200 (0.008)	0.330 (0.013)	0.200 (0.008)	0.480 (0.019)	0.200 (0.008)	0.280 (0.011)
0.200 (0.008)	0.330 (0.013)	0.200 (0.008)	0.480 (0.019)	0.200 (0.008)	0.280 (0.011)
0.200 (0.008)	0.330 (0.013)	0.200 (0.008)	0.480 (0.019)	0.200 (0.008)	0.280 (0.011)
0.200 (0.008)	0.330 (0.013)	0.200 (0.008)	0.480 (0.019)	0.200 (0.008)	0.280 (0.011)
0.200 (0.008)	0.330 (0.013)	0.200 (0.008)	0.530 (0.021)	0.200 (0.008)	0.280 (0.011)
0.200 (0.008)	0.335 (0.013)	0.200 (0.008)	0.535 (0.021)	0.200 (0.008)	0.285 (0.011)
0.200 (0.008)	0.335 (0.013)	0.200 (0.008)	0.535 (0.021)	0.200 (0.008)	0.285 (0.011)
0.200 (0.008)	0.335 (0.013)	0.200 (0.008)	0.535 (0.021)	0.200 (0.008)	0.285 (0.011)
0.200 (0.008)	0.335 (0.013)	0.200 (0.008)	0.535 (0.021)	0.200 (0.008)	0.285 (0.011)
0.200 (0.008)	0.340 (0.013)	0.200 (0.008)	0.540 (0.021)	0.200 (0.008)	0.290 (0.011)
0.200 (0.008)	0.340 (0.013)	0.200 (0.008)	0.540 (0.021)	0.200 (0.008)	0.290 (0.011)
0.200 (0.008)	0.340 (0.013)	0.200 (0.008)	0.540 (0.021)	0.200 (0.008)	0.290 (0.011)
0.200 (0.008)	0.340 (0.013)	0.300 (0.012)	0.540 (0.021)	0.200 (0.008)	0.290 (0.011)

Leveling

The pump discharge head and mounting surface shall be leveled within 0.025 mm/m (0.003 in/ft). The level shall not exceed 0.125 mm (0.005 in) between any two points.

Alignment

Refer to the sketch below. Applicable to both rigid and flexible coupling installations.



Enclosed Lineshaft – Water Lubricated

Amount	1-1.5 m ³ /h (4.4-6.6 gpm) at 2-3 bar (29-44 psi)
Type	Clean city water
Prelubrication	10-15 minutes prior to start-up

Enclosed Lineshaft – Oil Lubricated^{8, 9, 10}

	Manufacturer	Trade Name
Non-Food Grade	Conoco Inc.	Conoco Diamond Class Turbine Oil ISO 32
	Exxon Company	Teressitic GT 32
	Mobil Oil Company	Mobile DTE 797 Grade 32
	Shell Oil Company	Tellus 32, Tellus 37 or Turbo Oil T 32
	Chevron Lubricants	Chevron Turbine Oil TR 32
	BP	Energol HL-C 32
Food Grade	Texaco Inc.	Texaco Regal R&O 32
	Exxon Company	Exxon DTE FM 32
	Mobil Oil Company	Mobile DTE FM Grade 32
	Shell Oil Company	Cassida HF 32

- Viscosity: 30-37 cSt
- Amount: 3 drops per minute, not to exceed 5 drops per minute
- Prelubrication: 45 minutes prior to pump start-up