

Installation, Operation and Maintenance Instructions

Model LC



Owner's Information	
Model Number:	_____
Serial Number:	_____
Dealer:	_____
Date of Purchase:	_____ Date of Delivery: _____

DESCRIPTION and SPECIFICATIONS

The Model LC is a close-coupled, end suction, two stage centrifugal for general liquid transfer service, booster applications, etc. Liquid-end construction is all AISI Type 304 stainless steel, stamped and welded. Impellers are fully enclosed, non-trimable to intermediate diameters. Casings are fitted with diffusers for efficiency and for negligible radial shaft loading.

All units have NEMA 48Y and 56Y motors with square flange mounting and threaded shaft extension.

1. Important

- 1.1 Inspect unit for damage. Report any damage to carrier/dealer immediately.
- 1.2 Electrical supply must be a separate branch circuit with fuses or circuit breakers, wire sizes, etc., in compliance with National and Local electrical codes. Install an all-leg disconnect switch near pump.

CAUTION: ALWAYS DISCONNECT ELECTRICAL POWER WHEN HANDLING PUMP OR CONTROLS.

- 1.3 Motors must be wired for proper voltage. Motor wiring diagram is on motor nameplate. Wire size must limit maximum voltage drop to 10% of nameplate voltage at motor terminals, or motor life and pump performance will be lowered.
- 1.4 Always use horsepower-rated switches, contactor and starters.
- 1.5 **Motor protection:**
 - 1.5.1 Single-phase: Thermal protection for single-phase units is sometimes built in (check nameplate). If no built-in protection is provided, use a contactor with a proper overload. Fusing is permissible.
 - 1.5.2 Three-phase: Provide three-leg protection with properly sized magnetic starter and thermal overloads.
- 1.6 **Maximum Operating Limits:**
 - Liquid Temperature: 220°F (110°C)
 - Working Pressure: 125 PSI
 - Starts per Hour: 20, evenly distributed.
- 1.7 Regular inspection and maintenance will increase service life. Base schedule on operating time. Refer to Section 8.

2. Installation

- 2.1 Locate pump as near liquid source as possible (below level of liquid for automatic operation).
- 2.2 Protect from freezing or flooding.
- 2.3 Allow adequate space for servicing and ventilation.
- 2.4 All piping must be supported independently of the pump, and must “line-up” naturally.

CAUTION: NEVER DRAW PIPING INTO PLACE BY FORCING THE PUMP SUCTION AND DISCHARGE CONNECTIONS.

- 2.5 Avoid unnecessary fittings. Select sizes to keep friction losses to a minimum.
- 2.6 Units may be installed horizontally, inclined or vertically.

CAUTION: DO NOT INSTALL WITH MOTOR BELOW PUMP. ANY LEAKAGE OR CONDENSATION WILL AFFECT THE MOTOR.

- 2.7 Foundation must be flat and substantial to eliminate strain when tightening bolts. Use rubber mounts to minimize noise and vibration.
- 2.8 Tighten motor hold-down bolts before connecting piping to pump.

3. Suction Piping

- 3.1 Low static suction lift and short, direct, suction piping is desired. Consult pump performance curve for *Net Positive Suction Head Required*.
- 3.2 Suction pipe must be at least as large as the suction connection of the pump. Smaller size will degrade performance.
- 3.3 If larger pipe is required, an eccentric pipe reducer (with straight side up) must be installed at the pump.
- 3.4 Installation with pump below source of supply:
 - 3.4.1 Install full flow isolation valve in piping for inspection and maintenance.

CAUTION: DO NOT USE SUCTION ISOLATION VALVE TO THROTTLE PUMP.

- 3.5 Installation with pump above source of supply:
 - 3.5.1 Avoid air pockets. No part of piping should be higher than pump suction connection. Slope piping upward from liquid source.
 - 3.5.2 All joints must be airtight.
 - 3.5.3 Foot valve to be used only if necessary for priming, or to hold prime on intermittent service.
 - 3.5.4 Suction strainer open area must be at least triple the pipe area.
- 3.6 Size of inlet from liquid source, and minimum submergence over inlet, must be sufficient to prevent air entering pump through vortexing. See Figures 1-4.
- 3.7 Use 3-4 wraps of Teflon tape to seal threaded connections.

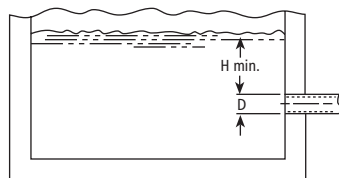


Figure 1

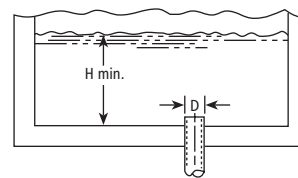


Figure 2

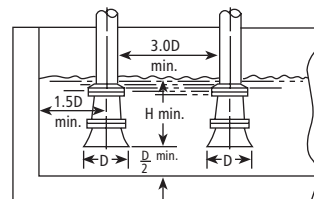


Figure 3

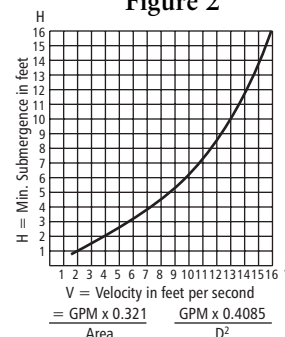


Figure 4

4. Discharge Piping

- 4.1 Allowance should be made for disconnecting discharge piping near casing to allow for pump disassembly.
- 4.2 Arrangement must include a check valve located between a gate valve and the pump. The gate valve is for regulation of capacity, or for inspection of the pump or check valve.
- 4.3 If an increaser is required, place between check valve and pump.
- 4.4 Use 3-4 wraps of Teflon tape to seal threaded connections.

5. Rotation

- 5.1 Correct rotation is right-hand (clockwise when viewed from the motor end). Switch power on and off quickly. Observe shaft rotation. To change rotation:
 - 5.1.1 Single-phase motor: Non-reversible
 - 5.1.2 Three-phase motor: Interchange any two power supply leads.

6. Operation

- 6.1 Before starting, pump must be primed (free of air and suction pipe full of liquid) and discharge valve partially open.
- 6.2 Make complete check after unit is run under operating conditions and temperature has stabilized. Check for expansion of piping.

7. Maintenance

- 7.1 Ball bearings are located in and are part of the motor. They are permanently lubricated. No greasing required.
- CAUTION: PUMPED LIQUID PROVIDES LUBRICATION. IF PUMP IS RUN DRY, ROTATING PARTS WILL SEIZE AND MECHANICAL SEAL WILL BE DAMAGED. DO NOT OPERATE AT OR NEAR ZERO FLOW. ENERGY IMPARTED TO THE LIQUID IS CONVERTED INTO HEAT. LIQUID MAY FLASH TO VAPOR. ROTATING PARTS REQUIRE LIQUID TO PREVENT SCORING OR SEIZING.**

8. Disassembly

- 8.1 Complete disassembly of the unit will be described. Proceed only as for as required to perform the maintenance work required.
- 8.1.1 Turn off power.
 - 8.1.2 Drain system and flush if necessary.
 - 8.1.3 Disconnect discharge pipe from pump.
 - 8.1.4 Remove motor hold-down bolts.
- 8.2 Disassembly of Liquid End
- 8.2.1 Remove casing screws and nuts (1, 25).
 - 8.2.2 Remove back pull-out assembly from casing (2).
 - 8.2.3 Remove the first stage diffuser cover (4) and casing o-ring (3).
 - 8.2.4 Remove motor fan cover (24) to expose wrench flats or slot on shaft end.
 - 8.2.5 Hold shaft at flats to resist rotation, and remove impeller nut and washer (6, 7).

CAUTION: DO NOT INSERT SCREWDRIVER BETWEEN THE FAN BLADES TO PREVENT ROTATION.

NOTE: Notice the location of anti-rotation tabs and holes on items 10,11, 12 and 13 these must be aligned and engaged for reassembly.

- 8.2.6 Remove the first stage impeller (8), impeller spacer (9), intermediate diffuser (10) and last stage diffuser cover (11).
- 8.2.7 Remove the last stage impeller (8) and last stage diffuser (12).

NOTE: Further disassembly will require removal of the mechanical seal. It is recommended that a new mechanical seal be installed at reassembly.

- 8.2.8 Lubricate the shaft with a 50/50 solution of glycerin and water. Remove the rotary portion of the mechanical seal (13).
- 8.2.9 Remove the pump body and motor adapter assembly (16 and 17) from the motor.
- 8.2.10 Remove the stationary portion of the mechanical seal (13) from the pump body (16).
- 8.2.11 Remove the motor adapter (17) from the pump body (16).
- 8.2.12 To remove the pump shaft (19) from the motor (24). Heat must be applied to the pump shaft at the largest diameter. This is required to break the bond of the Loctite 271 between the pump and motor shafts.

9. Reassembly

- 9.1 All parts should be cleaned before reassembly.
- 9.2 Refer to parts list to identify required replacement items. Specify pump index or catalog number when ordering parts.
- 9.3 Reassembly is the reverse of disassembly.
- Observe the following when reassembling the pump:**
- 9.4 Check the shaft runout. Maximum permissible is .010" TIR at the end of the shaft.
- 9.5 Apply Loctite 'PrimerN' and Loctite #271 to motor shaft, thread pump shaft (19) in place and torque to 30 lb. Of torque.
- 9.6 Lubricate pump shaft (19) and pump body stationary seat holder (16) with a 50/50 glycerin and water solution prior to installation of mechanical seal components.

- 9.7 Inspect casing o-ring (3) and impeller o-rings (5) for damage or wear and replace if necessary.
- 9.8 O-rings may be lubricated with glycerin and water solution or petroleum jelly to ease assembly.
- 9.9 Tighten casing screws (1) to 10 lb.ft. of torque using a star pattern to prevent o-ring binding.

10. Troubleshooting Chart

MOTOR NOT RUNNING

(See causes 1 through 6)

LITTLE OR NO LIQUID DELIVERED

(See causes 7 through 17)

POWER CONSUMPTION TOO HIGH

(See causes 4, 17, 18, 19, 22)

EXCESSIVE NOISE AND VIBRATION

(See causes 4, 6, 9, 13, 15, 16, 18, 20, 21, 22)

PROBABLE CAUSE

1. Tripped thermal protector
2. Open circuit breaker
3. Blown fuse
4. Rotating parts binding
5. Motor wired improperly
6. Defective motor
7. Not primed
8. Discharge plugged or valve closed
9. Incorrect rotation
10. Foot valve too small, suction not submerged, inlet screen plugged
11. Low voltage
12. Phase loss (3-phase only)
13. Air or gasses in liquid
14. System head too high
15. NPSHA too low:
Suction lift too high or suction losses excessive
Check with vacuum gauge
16. Impeller worn or plugged
17. Incorrect impeller diameter
18. Head too low, causing excessive flow rate
19. Viscosity or specific too high
20. Worn bearings
21. Pump or piping loose
22. Pump and motor misaligned

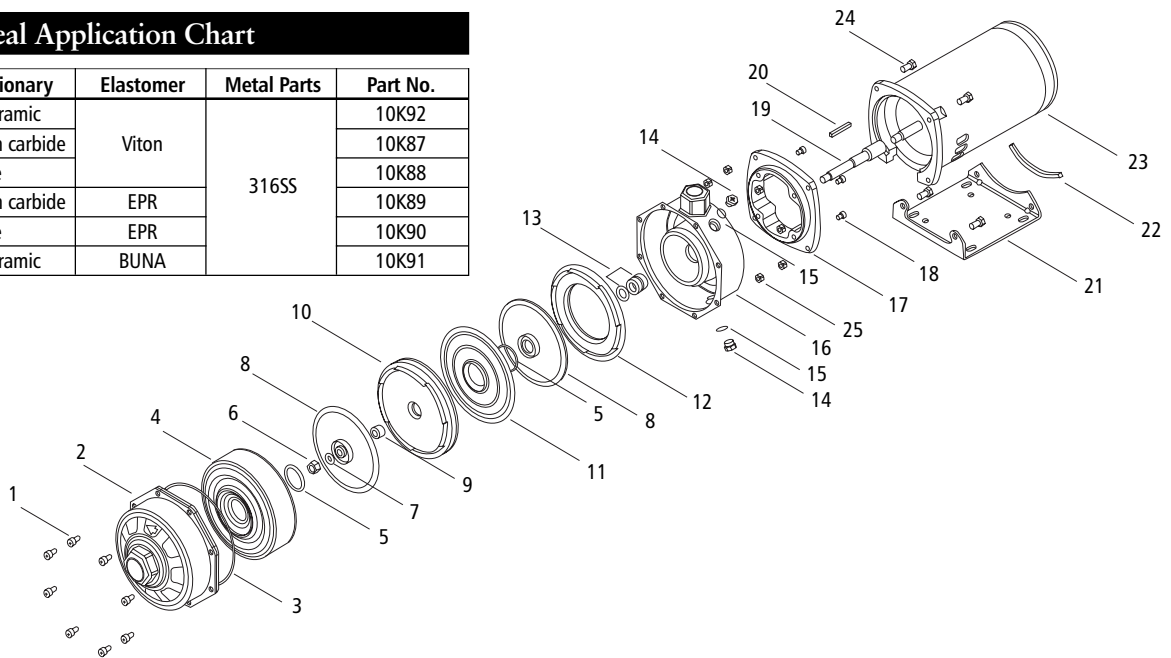
Part List

Item No.	Description	Materials
1	Screw, casing	304SS
2	Pump casing, suction	304SS
3	O-ring, casing	Viton Optional EPR Optional BUNA
4	Diffuser cover, first stage	304SS
5	O-ring, impeller	Viton Optional EPR Optional BUNA
6	Impeller nut	304SS
7	Impeller lock washer	400SS
8	Impeller	304SS
9	Impeller spacer	304SS
10	Diffuser, intermediate	304SS
11	Diffuser cover, last stage	304SS
12	Diffuser, last stage	304SS

Item No.	Description	Materials
13	Mechanical seal	Varies
14	Fill and drain plug	304SS
15	O-ring, fill and drain plug	Viton
16	Pump body with plug	304SS
17	Motor adapter	Cast iron
18	Screw, motor adapter to pump	Steel
19	Shaft, pump	304SS
20	Key, impeller	304SS
21	Foot, pump	Steel
22	Spacer	Rubber
23	Screw, motor adapter to pump	Steel
24	Motor, 3 phase ODP Motor, 1 phase ODP Motor, 3 phase TEFC Motor, 1 phase TEFC	303SS
25	Nut, casing screw	304SS

Mechanical Seal Application Chart

Rotary	Stationary	Elastomer	Metal Parts	Part No.
Carbon	Ceramic	Viton	316SS	10K92
	Silicon carbide			10K87
	Silicon carbide			10K88
Carbon	Silicon carbide	EPR		10K89
	Silicon carbide	EPR		10K90
Carbon	Ceramic	BUNA		10K91



GOULDS PUMPS LIMITED WARRANTY

This warranty applies to all water systems pumps manufactured by Goulds Pumps.

Any part or parts found to be defective within the warranty period shall be replaced at no charge to the dealer during the warranty period. The warranty period shall exist for a period of twelve (12) months from date of installation or eighteen (18) months from date of manufacture, whichever period is shorter.

A dealer who believes that a warranty claim exists must contact the authorized Goulds Pumps distributor from whom the pump was purchased and furnish complete details regarding the claim. The distributor is authorized to adjust any warranty claims utilizing the Goulds Pumps Customer Service Department.

The warranty excludes:

- (a) Labor, transportation and related costs incurred by the dealer;
- (b) Reinstallation costs of repaired equipment;
- (c) Reinstallation costs of replacement equipment;
- (d) Consequential damages of any kind; and,
- (e) Reimbursement for loss caused by interruption of service.

For purposes of this warranty, the following terms have these definitions:

- (1) "Distributor" means any individual, partnership, corporation, association, or other legal relationship that stands between Goulds Pumps and the dealer in purchases, consignments or contracts for sale of the subject pumps.
- (2) "Dealer" means any individual, partnership, corporation, association, or other legal relationship which engages in the business of selling or leasing pumps to customers.
- (3) "Customer" means any entity who buys or leases the subject pumps from a dealer. The "customer" may mean an individual, partnership, corporation, limited liability company, association or other legal entity which may engage in any type of business.

THIS WARRANTY EXTENDS TO THE DEALER ONLY.

Goulds Pumps

