

INSTRUCTIONS for OPERATION and MAINTENANCE**Graymills
LV SERIES PUMPS****I DESCRIPTION AND OPERATING CHARACTERISTICS**

- a) LV series pumps are of centrifugal type designed for liquids of light viscosity. Standard pumps are made to operate at viscosities no higher than 400 SSU. Special models may operate at a higher viscosity.
- b) Liquid is drawn in through the bottom intake and discharged at relatively low pressure. Because of the low pressure, restrictions such as small I.D. tubing and heavy viscosity will reduce flow drastically.
- c) Do not run dry, the bushing may be damaged.

II MAXIMUM VISCOSITY RANGE FOR "SAFE" OPERATION

- a) Standard LV Series pumps can operate with liquids having a maximum viscosity of 400 SSU without overloading the motor. For heavier viscosities a motor of the next larger horsepower is generally used. Check this specification as it may or may not have been considered in ordering.
- b) Rotary air motors cannot be overloaded or injured by heavy viscosity or binding. They will merely stop turning.
- c) The pump will deliver less flow as the viscosity increases. Temperature may affect viscosity. The viscosity of a 100 SSU oil, for example, may increase substantially as it gets colder. If the liquids are too heavy, the motor will slow down and stall. Overload protection is recommended.

III ABRASIVE RESISTANCE OF MATERIALS

- a) LV pumps in shorter lengths have a labyrinth and there is no metal to metal or bearing contact. Such models can be used with abrasive slurries and pigments. Longer models have a carbon throttle-bushing above the impeller to give support to the shaft. The bushing and shaft sleeve may wear considerably without materially affecting the pump performance even though some liquid will leak through the bushing area.

IV CHEMICAL RESISTANCE OF PLASTICS USED IN CONSTRUCTION

- a) The pump bodies, impeller and impeller nut are made in GM2GY, and GM2GG which are a thermoplastic combining high mechanical strength, stiffness and stability through a broad range of temperatures. It has excellent chemical resistance, but not complete chemical resistance. It can be used for water, many solvents such as benzine and toluene, chlorinated hydrocarbons, ketones, water and detergent solutions, brine and many inorganic chemicals used in cleaning or processing.
- b) The pump column is made of No. 316 or No. 302 stainless steel. Chemical resistance should be determined by the customer in consultation with Graymills.
- c) Consult the factory on specific applications of the LV pump with chemicals which may have an effect on materials of construction. Our chemical resistance information is based upon data supplied by the basic plastic manufacturers and/or Graymills tests. The user should conduct his own test where there is any question about the suitability of plastics or metals, strength, etc.

V EFFECT OF TEMPERATURE ON CHEMICAL RESISTANCE

- a) Pumps should not be used continuously with temperatures exceeding 155°F without consultation with the factory. (Actual maximum temperature for GM2GY is substantially higher; however, pumping some liquids at elevated temperatures for long periods may cause gradual deterioration of the plastic, brittleness or crazing or loss of strength in wall thickness.) GM2GY may be used with water up to 170°F.
- b) Example: A pump made of GM2GY plastic was operated for 1400 hours in oil at a temperature of 194°F. No malfunction or leaks were evident but the plastic parts had decreased in thickness. The same type of pump operated in 150°F. oil showed absolutely no loss. Obviously, if a user were to operate occasionally at the higher temperature and then remove the pump or permit the oil to cool, many years of service could be expected before the breakdown point was reached.

VI EFFECT OF TEMPERATURE ON VISCOSITY

- a) The viscosity of some liquids like oil will change with the temperature. This will affect the flow. The thicker the liquid, the less the flow. The effect is much more noticeable when small piping or tubing is used. If delivery is critical, make sure that the tests are conducted with liquids at the temperatures at which they will normally be operating or within the range in which they may operate.

VII ELECTRICAL CONNECTIONS

- a) Check your electric current with the voltage, cycle and phase of the motor. LV pumps should rotate in a clockwise direction when looking at the intake end of a pump (with motor away from you). 3-Phase motors can be wired to run in either direction. Make sure the motor is running in the right direction. When running backwards the pump will deliver at reduced flow but no harm will be done. Grounding the motor is recommended. Overload protection is recommended.

VIII MOUNTING

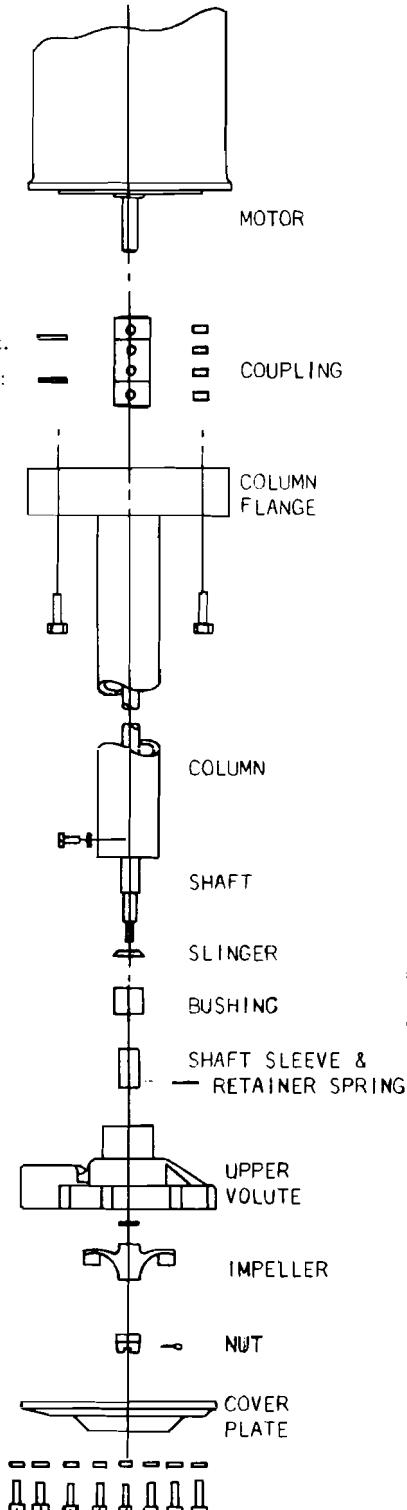
- a) Use care in making connections. LV Series pumps are of strong construction. The wall thickness of the plastic is such that there is excellent shock and impact resistance, however, care should be used in handling. The discharge is 3/4" standard pipe thread.
- b) Tapered pipe threads should be carefully tightened to avoid fracturing plastic. Pipe sealing compounds are not generally required because of the excellent sealing of the metal pipe thread to the plastic.
- c) Pump should be mounted vertically with the impeller covered by liquid. Do not block the intake by resting the pump too close to the bottom.
- d) To get the greatest possible flow, use the maximum size pipe, hose or tubing. Use Gate valves and not Globe valves. Avoid fittings which tend to offer restrictions, even though they may appear to be of adequate size externally.

IX WHAT TO CHECK IF FLOW IS REDUCED BELOW RATED OUTPUT

- a) Is pump running in the right direction? (3 phase only)
- b) Are there any unusual restrictions in the piping such as crimped hose, excess fittings, small tubing, etc.?
- c) Is the motor running on the correct voltage, cycle, and phase?
- d) Is the liquid too heavy or did temperature decrease make it so? Some liquids will also get thicker when pumped. Some will be thicker when quiet and will thin out when pumped.
- e) Is the pump intake starved or is the pump above liquid level and not priming?
- f) If a long pump is used in a deep tank the lift is determined by the distance from the top of the liquid to point of delivery. As liquid is pumped down the lift will be greater and less flow will result.
- g) Check for binding within the body of the pump caused by rags, strings or chips.
- h) Make sure pump intake is not in the sludge, slurry, or is not directly on the bottom of the container which will restrict the intake.

X DISASSEMBLY, or TO REPLACE BUSHING OR SHAFT SLEEVE

- a) Remove the screws holding the volute cover plate to the body and remove cover plate with gasket.
- b) Remove the cotter pin and then the impeller retaining nut.
- c) Withdraw the impeller.
- d) The shaft sleeve is now accessible and may be inspected or removed by releasing the spring which holds it to the shaft.
- e) The bushing can now be inspected. To remove the bushing:
- f) Take out the screws holding the upper volute to the pump column, then pull the volute from the column.
- g) Push the bushing from the volute.
- h) The pump column can be removed from motor as one unit by removing motor bolts and dropping the column. (This will not be necessary for bushing or sleeve replacement.)
- i) If it is necessary to remove the shaft from the motor, take out the set screws and carefully support the coupling then drive out the pin. DO NOT DISTURB THE ALIGNMENT OF THE SHAFT.



XI REASSEMBLY

- a) Reverse the procedure in X. Make sure the shaft is running true.

XII LABYRINTH

- a) Labyrinth used in place of bushing and sleeve on certain models.
- b) The 1/4" thick slinger is pressed on shaft with two teflon washers sandwiched between slinger and upper half of labyrinth.

WARRANTY

Graymills Corporation warrants that the equipment manufactured and delivered, when properly installed and maintained, shall be free from defects in workmanship and will function as quoted in the published specification. **Graymills** does not warrant process performance, nor assume any liability for equipment selection, adaption, or installation.

Warranty does not apply to damages or defects caused by shipping, operator carelessness, misuse, improper application or equipment which damages or impairs the proper function of the unit, and modifications made to the Unit. Warranty does not apply to expendable parts needing replacement periodically due to normal wear and tear.

A new Warranty period shall not be established for repaired or replaced materials or products. Such items shall remain under Warranty for only the remainder of the Warranty period of the original material or product.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, WHETHER ORAL, WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. **GRAYMILLS CORPORATION** MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, ALL IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY **GRAYMILLS CORPORATION** AND EXCLUDED FROM THIS SALE. **Graymills** warranty obligations and Buyer remedies (except to title), are solely and exclusively stated herein. In no case will **Graymills** be liable for consequential damages, loss of production, or any other loss incurred due to interruption of service.

Graymills' obligation under this Warranty shall be limited to:

- (a) Repairing or replacing (at **Graymills** sole discretion) any non-conforming or defective component within one year from the date of shipment from **Graymills**.
- (b) Repairing or replacing (at **Graymills** sole discretion), components supplied by, but not manufactured by **Graymills**, to the extent of the warranty given by the original manufacturer.

Buyer must give **Graymills** prompt notice of any defect or failure.

If you believe you have a Warranty claim, contact **Graymills** at (773) 248-6825. Any return material must have an RMA number on the outside of the package and shipping prepaid or shipment will be refused. **Graymills** will promptly examine the material and determine if it is defective and within the Warranty period.

Graymills

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