

# Graymills

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## VP Series Centrifugal Pumps

### Operations and Maintenance Instructions



#### WARNINGS/CAUTIONS

Read all these **SAFETY INSTRUCTIONS BEFORE** installing or using this equipment. Keep this manual handy for reference/training.

- Pump may be heavy. Take appropriate precautions when lifting.
- Motor must be grounded and suitable for the environment in which it is used. Only explosion-proof motors can be used in a flammable environment.
- Proper installation of electrical junction boxes is extremely important to the electrical integrity of the motor and electrical system. Never use the junction box or any other part of the wiring/electrical system to lift or move the equipment. **This could cause a failure of the electrical system, resulting in severe shock or death.**
- Do not allow liquids to come into contact with the motor or any electrical components.
- Do not attempt service work while the unit is connected to any electrical power source.
- Use caution around rotating parts of pump.
- Air motor must have filtered and lubricated air. An air regulator is also recommended. Order Graymills Part Number FRL-1.
  - For proper operation, maintain proper air pressure.
  - Remove air supply line before doing any service on pump or motor.
  - Do not hit or attempt to straighten shaft on air motor.
  - Always use the proper muffler.
- When working around pump, be aware of what liquid is/has been pumped. If liquid is potentially harmful, take appropriate precautions.
- Do not operate this pump or allow others to operate until the instructions and warnings have been read and are understood by all users.

**Never work with equipment you feel may be unsafe.  
Contact your Supervisor immediately.**

#### DESCRIPTION AND OPERATING CHARACTERISTICS

- a. VP Series pumps are of centrifugal type designed for liquids of light viscosity. Standard pumps are made to operate at viscosities no higher than 250 SSU, except the VP 50 which can handle up to 400 SSU.
- 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.

#### MAXIMUM VISCOSITY RANGE FOR "SAFE" OPERATION

- a. Series VP 1/15 H.P. 3000 R.P.M. or 1/25 H.P. 1500 R.P.M. motors can operate with liquids having a maximum viscosity of 250 SSU (oil).
- b. Series VP with Air motors cannot be overloaded but a reasonable maximum viscosity is 400 SSU. Rotary air motors cannot be overloaded 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 liquids are too heavy, the motor will slow down and stall. 3000 R.P.M. motors have thermal-overload that automatically prevents burn out by cutting out the motor. The motor will start up again when it cools but will cut out again until the condition causing the overload is eliminated. Continued overloading is to be avoided.
- d. 1500 R.P.M. motors do not have thermal-overload protection and, if stalled, will burn out.

#### CHEMICAL RESISTANCE OF PLASTICS

Graymills VP pumps are made of high strength plastics suitable for many liquids. Celcon is identified by the black color and may be used with water, detergents, oil, brine, coolants and a wide range of other liquids. Refer to the Graymills catalog or other data for more specific information on chemical resistance of plastics.

Consult the factory on specific applications of these pumps with chemicals that may have an effect on materials of construction. Our chemical resistant information is based upon data supplied by the basic plastic manufacturer and/or Graymills tests. The user should conduct tests where there is any question about the suitability of plastics or metals.

#### TEMPERATURE LIMITATION

- a. Pumps should not be used continuously with temperatures exceeding 150°F. 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.

*Where chemical and/or temperature resistance is not definitely known, Graymills will supply a sample plastic part for customer's evaluation*
- b. While VP Pump uses high-impact strength plastic, care should be exercised in making hose or tubing connections. A flexible type of connection is advisable. Reducing hose or tubing sizes will greatly reduce the flow from these centrifugal pumps. Keep the tubing size as large as possible as close as possible to the point of application. If reduction must be made do so at the end of hose or pipe where the liquid is discharged.

## **MOUNTING: IMPELLER MUST BE COVERED WITH LIQUID**

- a. Some pumps will be shipped with a plastic shaft protector that should be removed and discarded. The in-take screen can then be attached by the screws provided.
- b. The bottom of the pump must be immersed in at least 1" of liquid to operate properly.

## **ELECTRICAL CONNECTIONS**

- a. Pump motor must be grounded.
- b. Check the name plate on the pump motor and be sure that it corresponds to the electrical current being used. These pumps will operate on 50 cycle current at a reduced flow. Do not operate 115 V. motors on 230 volt. If a 1/8 H.P. 3 phase motor is used, make sure it is wired to run in a counter clockwise direction looking down on the top of the motor. Motor will run backward, but flow will be greatly reduced.

## **MAINTENANCE: KEEP PUMP CLEAN**

- a. If the pump is used with liquids like adhesives, abrasive slurries, polishing compounds or ink, flush thoroughly after use to prevent sticking. Keep solvents or cleaners away from the motor and wiring.

Electric motors require no lubrication. Air ports ventilating the motor, however, should not be closed off or blocked in any way.

Most VP pumps have no bearings other than those in the motor. Some long models have an extended shaft that runs in a small bushing mounted in a retainer at the bottom of the pump.

## **WHAT TO CHECK IF FLOW IS REDUCED BELOW RATED OUTPUT**

- a. Check the intake and screen to make sure nothing is blocking the entrance of liquid into the pump.
- b. Check hoses to make sure there is no crimping or unusual restriction. Check viscosity of the liquid.
- c. Check voltage and cycle. (Low voltage will cause a reduction in R.P.M.)
- d. Check direction of rotation if 3 phase motor is used.
- e. Make sure pump impeller section is immersed in the liquid.
- f. Check for binding within the body caused by rags, string or chips.
- g. Make sure pump intake is not in sludge, slurry or directly on the bottom of the container.

## **DISASSEMBLY**

- a. Remove bottom bushing housing if this is included.
- b. Remove bottom plate, gasket and filter screen.
- c. Through the screen hole at the bottom of the pump column, loosen the set screw and remove the impeller.

After set screw is withdrawn part way and clear of the shaft, use the allen wrench in the set screw to pry the impeller loose so it can be grasped by hand and completely removed.

Pump will now be completely disassembled.

## **ASSEMBLY**

- a. In reassembling, tighten motor bolts holding pump to the motor with care to avoid stripping threads. Excess tightening will distort the lower motor housing and cause the bearing to bind. Minor alignment adjustments may be necessary so shaft is in the direct center of impeller housing.
- b. On 1500 R.P.M. motors, replace impeller snugly—but don't force—against the pump housing and tighten set screw. A slight play in the shaft will permit the impeller to drop very slightly providing the clearance between the top of the impeller and the pump

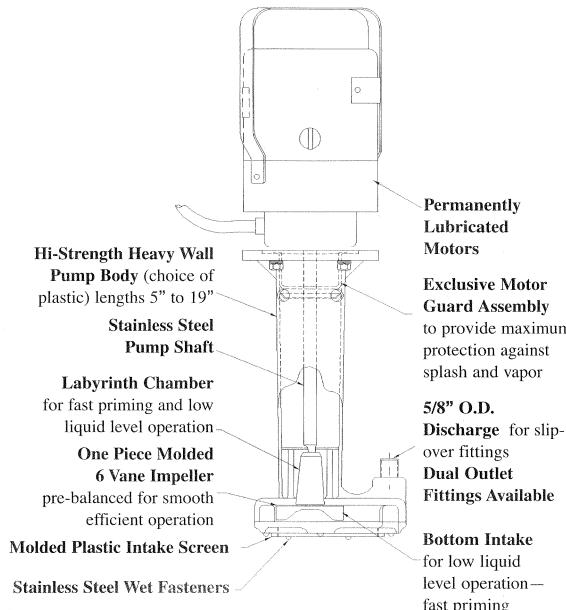
housing which is desirable for "no contact" operation. When replacing impeller on 3000 and 3450 R.P.M. motors, it must be installed with a 1/32" clearance between the upper side of impeller and the pump body.

- c. Replace the bottom plate, gasket and filter screen. Use care in tightening screws into the plastic housing.
- d. If the pump has a bottom bushing, replace if necessary, and reassemble.
- e. Now run the pump to make sure impeller is not rubbing.

## **HOW TO ORDER PARTS:**

Give model number of pump. If model number cannot be determined, the motor serial number, horsepower, speed and type will help. Approximate date of purchase will also help.

Give serial or lot number of pump.



## **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, adaptation, or installation.

Warranty does not apply to damages or defects caused by shipping, operator carelessness, mis-use, improper application or installation, abnormal use, use of add-on parts 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 materials 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 OF 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 that 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 pre-paid or shipment will be refused. Graymills will promptly examine the material and determine if it is defective and within the Warranty period.