SERIES 'EH'
PLASTIC SUMP PUMP

OPERATION AND
SERVICE GUIDE
O-900F
JAN. 1996

Refer to Bulletin P-301 and Parts List P-8801

⚠ SAFETY PRECAUTIONS

BEFORE STARTING PUMP

1. Read operating instructions and instructions supplied with chemicals to be used.
2. Refer to Chemical Resistance Data Chart for compatibility of materials in pump with solution to be used.
3. Note temperature and pressure limitations.
4. Personnel operating pump should always wear suitable protective clothing: face mask or goggles, apron, gloves.
5. All piping must be supported and aligned independently.
6. Always close valves slowly to avoid hydraulic shock.
7. Ensure that all fittings and connections are properly tightened.

BEFORE CHANGING APPLICATION OR PERFORMING MAINTENANCE

1. Wear protective clothing as described in Item 4 above.
2. Flush pump thoroughly with a neutralizing solution to prevent possible harm to personnel.
3. Shut off power to motor at disconnect switch.

⚠ IMPORTANT

1. The pump is constructed of CPVC, polypropylene or PVDF as ordered. Fasteners are stainless steel and protected by plastic and 'O'-rings. Polypropylene and PVDF models have titanium fasteners in solution. Pump shaft is made from stainless steel and protected by a plastic sleeve. The plastic should be chemically compatible with the solution being pumped, and care should be taken to protect the pump components against unnecessary wear and physical abuse.

2. Record all model and serial numbers for future reference. Always specify model number and serial number when ordering parts.

3. Pump flow curves are based upon pumping water. Increased motor horsepower may be necessary for pumping other liquids, or reduced motor horsepower may be permissible when pumping at higher discharge head/low flow rates. Refer to Pump Curve.

4. Impellers are designed to offer maximum pump output and the motors are sized for non-overloading at maximum flow conditions. Impellers may be trimmed to reduce flow and discharge head, if desired. See Parts List P-8801 for impellers of various diameters.

5. Vertical discharge piping from the pump should be supported so that the pump does not take the forces generated by the weight of the pipe and the liquid being pumped.

6. Plastic piping has a high thermal expansion and should be considered when attaching discharge piping. Refer to Bulletin A-207 for pipe, pipe fittings etc.

7. If position of discharge is not suitable it can be rotated in 60° increments to other positions. See section under Pump Service.

8. With suction extension (Optional) installed and motor energized continuously, the pump will discharge liquid once solution level is above casing. Discharge flow will continue until solution level reaches bottom of extension. Flow will cease until solution level again rises to casing. If transfer or out of tank pumping, be sure to install a siphon break.

PRE START-UP

1. Verify that operating temperature is not in excess of pump design temperature. See Bulletin P-301.

2. Connect electrical supply to motor starter. If starter is furnished, verify that starter and motor are wired for the correct operating voltage and correct overload heaters. It is recommended that a motor starter be installed for overload protection if one was not provided with the pump assembly.

3. Secure pump to corner of tank or sump and complete discharge piping. If pump is above a hot (160°F) liquid, it is recommended to support mounting plate on all four sides. When using pump in tanks with an operating temperature over 100 - 160°F the pump mounting plate must be supported on at least 2 sides to avoid warping of mounting plate.

4. Pump rotation is counterclockwise when looking at the pump suction, or clockwise when looking down on the motor fan. (Check rotation arrow.) For 3-phase motors, it is necessary to verify correct direction of rotation by momentarily "jogging" the motor. An instantaneous "ON-OFF" of the starter is ample to check rotation. To change direction of rotation, interchange any two of lines, L1, L2, or L3.

CAUTION: Extended running in reverse will cause the impeller to unscrew and pump damage will occur. To avoid possible problems we recommend checking rotation without liquid to the pump. This

MINIMUM SOLUTION LEVEL AT START-UP

eliminates torque to the impeller. This pump can run dry for extended time without damage.

5. All units are factory tested to meet published or specified flow rates and to confirm that the pump and motor functioned properly at time of shipment. See Technical Bulletin TP-113 for all info and suction tension data.

6. With pump running, listen for any unusual noise, vibration or other abnormal condition which could influence pump performance. Suction casing must be flooded to the level indicated for pump to prime. See sticker on pump column, or drawing on following page to identify minimum solution level.

7. Check correct operation of level control. Make necessary adjustments for establishing high level and low level.

8. At maximum flow conditions, measure amperage on all lines. If in excess of motor nameplate ratings, stop pump and consult factory.

PUMP SERVICE TO REPLACE SUCTION CASING OR "O"-RING SEAL

1. Remove the six cap nuts and cap nut studs holding the suction casing to the support casing and column. 'O'-ring can be removed from groove in support casing. 'O'-rings in cap nuts and cap nut studs should be replaced also. When replacing, be sure to lubricate casing 'O'-ring Item No.13 on Parts List.
2. Replace cap nuts (do not overtighten) and cap nut studs - tighten alternately to avoid cracking the suction casing.

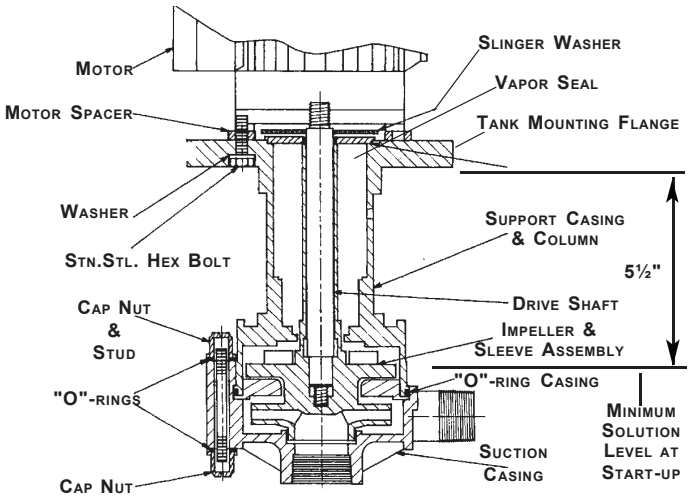
TO REPLACE IMPELLER

1. Remove suction casing as previously described.
2. Remove motor fan cover and fan.
3. Grip end of motor shaft with vise grips.
4. Remove impeller by turning counterclockwise using a strap wrench.
5. Replace and tighten impeller using above method. Use "Locktite Thread Lock" on shaft threads. Replace fan (heat fan in hot water to avoid cracking) and fan cover. Insure fan does not rub.
6. Replace suction casing as described.

TO REPLACE SUPPORT CASING & COLUMN

1. Remove suction casing and impeller as described.
2. Remove the four 3/8-16-1½" hex head machine bolts holding the mounting plate to the motor "C" face. Support casing and column can be removed. Do not misplace CPVC spacers located between motor and mounting plate, or modify in any way as this changes column height and can cause impeller damage.
3. Replace with new support casing and column.
4. When tightening down the four bolts check that shaft is centered in column at impeller end of column.

TO REPLACE PUMP SHAFT (when separate item)



1. Remove suction casing, impeller and support casing and column as described.
2. Attach vise grips to fan end of motor shaft and use a pipe wrench on shaft. Remove pump shaft by turning counterclockwise.
3. Insert new shaft and use "Locktite Thread Lock" on threads. Tighten pump shaft until it hits against motor shaft.
4. Check run-out (eccentricity) of shaft by turning shaft and measuring at extreme end. It must be less than .005 TIR. Straighten shaft by pressing down on that area of the shaft where maximum run-out occurs.
5. Reassemble support casing and column, impeller and suction casing.

POSITIONING OF DISCHARGE PORT

Remove the six cap nuts and cap nut studs that hold the suction casing to the support casing. Rotate suction casing until discharge is at position desired.

TO REPLACE MOTOR

Review instructions as outlined above.

TROUBLE SHOOTING

1. Motor Stops - Check for correct voltage, wiring and motor direction. See that starter has correct overload heaters. Take an amp meter reading at operating conditions and compare to value on motor nameplate. Measured value should be equal to or less than rated value. Check for friction-free rotation by turning motor fan with power disconnected.
2. Pump does not deliver correct flow Check suction strainer or pump inlet for debris. Compare required flow conditions to original specifications and pump curve. Check motor rotation.
3. Pumps up column at start-up- Check for low liquid level at start-up. Refer to drawing above.
4. Back flows up column at shut-down - Check for large volume of liquid in pump discharge lines. If liquid is surging up the column, install a check valve in the discharge. Many different types of check valves exist. Each type has benefits and drawbacks which can adversely affect the pump. Check on water for proper operation.

The check valve and its location may affect the pump's automatic level control feature.

NOTE: Maintain an inventory of replacement parts for minimum downtime of pumps.

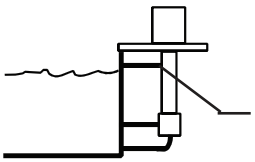
PUMPING TIPS

1. When discharging overhead where there may be a considerable volume of liquid in the piping, it is recommended that a check valve be installed in the pump discharge. This will prevent unnecessary back syphoning which could cause cycling of automatic level control, or flood the motor.
2. Pumps provided with suction extensions must be started with liquid above the impeller.
3. Verify proper operation of level controls.
4. Check amperage and fuse size if motor cutout occurs.
5. Review parts list and maintain an inventory of recommended spare parts for emergency replacement. This will assure that the pump is returned to operation with minimum delay.

For some applications or when in-tank space is not available it may be necessary to mount the pump on the outside of the tank. The pump will operate in this manner, but some inconvenience may be encountered when attempting to initially prime the pump. Below are several suggested methods of priming for out-of tank operation. Necessary valves, pipe, fittings and hose not furnished with the assembly may be purchased from stock. If the pump is to be operated near or at shut-off (0 GPM), the relief port in the pump body should be provided with a gravity drain to the tank. Elevation to the port must be above top of tank or connected to side opening in the tank per sketch "A". IMPORTANT: For out-of-tank installations the relief port never can be below liquid level.

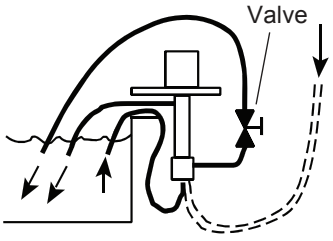
A. SIDE OPENING IN TANK REQUIRES EMPTY TANK FOR INSTALLATION

1. Position pump such that relief port is above maximum liquid level.
2. Relief port is factory tapped 1/2" NPT.
3. Using hose or pipe, complete connections to tank wall as shown for suction, relief port and discharge (if not to discharge over top or tank).
4. Pump will prime itself immediately at start-up.



B. SUCTION OVER SIDE OF TANK WITH DISCHARGE VALVE

1. Install straight or elbow hose adapter to pump suction and relief port. Attach proper size and lengthof hose to each. Mount pump so relief drain connection is ABOVE top of tank.
2. Install control valve and set in closed position.
3. With gloved hand, hold suction hose in position shown by double line. Open end of hose is up and at elevation equal to relief drain.
4. Fill suction hose to very top using liquid from tank.
5. With a cupped gloved hand held over end of the hose, immerse in tank and energize motor.
6. After a few moments, SLOWLY open valve to achieve full prime and flow.
7. Set valve position at the desired flow if less than maximum is required.



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