Form 3644A

In-Line Centrifugal Pump
Type "RP" Series

Installation, Operation and Maintenance Instructions

NOMENCLATURE

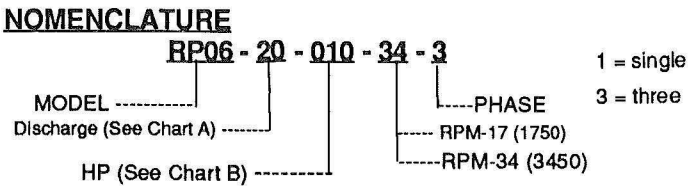

CHART A

15	=	1-1/2"
20	=	2"
25	=	2-1/2"
30	=	3"

CHART B

010	=	1 HP
015	=	1-1/2 HP
020	=	2 HP
030	=	3 HP
050	=	5 HP
075	=	7-1/2 HP
100	=	10 HP
150	=	15 HP
200	=	20 HP
250	=	25 HP
300	=	30 HP
400	=	40 HP
500	=	50 HP
600	=	60 HP

INTRODUCTION

The MEPCO Type RP are radially split, single stage, in-line centrifugal pumps. These pumps are supplied with an end face mechanical shaft seal installed, which is especially selected for reliability and life on the particular pump application. All pumps are supplied as complete units including motor.

SECTION 1 - PUMP INSTALLATION

A) RECEIVING

1. Check pump for shortage and damage immediately after arrival. Prompt reporting to the carrier's agent, with notations made on the freight bill, will expedite satisfactory adjustment by the carrier.

2. Unload and handle the unit by lifting around the motor frame. Do not lift by pump casing or flanges.

3. Pumps are shipped from the factory ready to be installed on a solid base. They are painted with one finish coat. Required accessories are packaged in a separate container and shipped with the pump.

4. TEMPORARY STORAGE - If the pump is not to be installed and operated soon after arrival, store it in a clean dry place having slow moderate change in ambient temperature. Rotate the shaft weekly to retard oxidation and corrosion. Follow motor storage recommendations.

B) LOCATION

1. Install vertically or horizontally making sure pump is supported properly.

2. Adequate head room should be provided for the use of installing equipment.

3. Adequate space should be allowed for inspection during pump operation.

4. In **NO** case should any part of motor be covered with insulation.

C) PIPING

1. Both suction and discharge piping should be as short and as direct as possible. There should be as few fittings and bends as possible. Bends, where used should be of the long radius variety.

2. Piping should be supported near the pump to prevent strains from being transmitted to the pump, and piping at the pump suction and discharge should be as large or larger than the openings in the pump.

3. Gate valves and pressure gauges should be installed in both the suction and discharge line to facilitate pump maintenance and performance checks.

D) DISCHARGE PIPING

1. On some installations, a check valve and balancing cock in addition to a gate valve may be required in the discharge piping. The check valve would be used to prevent liquid from running back through the pump in case of failure of the motor. The balancing cock is used to control the pumps' operating capacity by providing a changeable control in the piping system. The gate valve would be used in priming, starting and shutting down the pump.

2. When valves are required in the discharge line, they should be located as near as possible to the pump.

3. In some applications when the pump may be operated with zero flow, provisions should be made for recirculating a portion of the liquid from the discharge to the suction of the pump to reduce the possibility of overheating.

E) PIPING FOR SPARE PUMPS

1. Spare pumps in high temperature service should be piped so that hot liquid from the discharge of the operating pump circulates continuously through a by-pass to the spare pump and back to the suction of the operating pump. This can greatly reduce thermal shock when the spare pump is started.

F) INSTALLING PUMP

1. Make up the piping to the suction and discharge connections of the pump. All piping must be properly supported by hangers and not by the pump.

2. Wire the pump motor for the voltage required as specified on the wiring diagram located on the motor nameplate, or in cover of the motor terminal box. All wiring must be in accordance with local regulations. If the motor is damaged due to improper wiring, the guarantee is void.

SECTION 2 - PUMP OPERATION

A) Starting Pump

1) Check wiring of motor before starting to make sure that connections are wired properly for the voltage in use. Over voltage can burn out motor windings. Check heater element in magnetic starter to see that it is rated the same as the motor.

2) Before attempting to check out rotation of pump, fill pump with water to provide lubrication of the seal. Do Not Operate Pump Dry For Motor Check-out.

3) Next throw the switch and see if direction of rotation corresponds with arrows on frame of pump. The direction of rotation is counterclockwise facing the suction end of pump. Direction of rotation of three phase motors can be easily reversed by interchanging two of the three wires at the terminal board of the motor.

4) Reversing of single phase motors is done by interchanging some internal wires or clamps. Instructions for reversing are found either on the motor nameplate or inside the motor terminal cover.

B) PUMP START-UP

1) Open the suction and discharge valves at the pump. These pumps have a mechanical seal and must NOT be run dry. Open the cock at the top of the pump case to vent out any air.

a) If the pump is above the level of the liquid to be pumped, close the discharge valve. If the pump is below the level of the liquid, open the discharge valve 1-1/2 to 2 turns.

b) Prime the pump. All air and vapor must be removed. The pump case and suction pipe must be filled with liquid before the pump is started.

2) Rotate the pump shaft by hand (if possible) to be sure the pump is not binding. On some models the end of the motor shaft has a screwdriver slot. It may be used to turn the shaft. A check for sticking of the shaft should also be made after a prolonged pump shutdown. Close discharge valve, then open slightly.

3) Start the pump and check for correct rotation according to the arrow on the case. If it is running in the wrong direction on three phase current, change any two leads to the motor. You must disconnect the power before changing the wiring.

4) Lack of capacity and head may indicate the passageways of the pump impeller have become clogged with foreign matter or that the motor speed is low. If speed of the motor is low, the wiring connections at the motor should be checked for miswiring or looseness. If the pump is wired for 460 volt current, but is actually operating on 230 volt current, the motor will never come up to proper speed and may burn out. If low voltage occurs, notify local power company. Slugging of air is another cause of low capacity and head on a closed system. Be sure the system is properly vented of all air - see further notes under Trouble Shooting - Section 4.

WARNING - DO NOT ATTEMPT TO OPERATE PUMP WITH SUCTION VALVE CLOSED!

5) As soon as the pump is up to full speed, slowly open the discharge valve until it is completely open. Do not let the pump run with the discharge valve closed.

6) Check the pressure gauges on each side of the strainer in the suction line. A pressure drop across the strainer indicates it is becoming clogged with dirt or scale. In this case, the pump should be shut down and the strainer screen cleaned or replaced. A clogged strainer can cause damage to the pump.

7) Shut the pump down if motor bearings overheat, if there is undue vibration or noise, or if it fails to develop its rated discharge pressure at operating speed.

C) OPERATING AT REDUCED CAPACITY

1) If the pump is connected to a constant speed driver or motor, capacity of the pump can be reduced by throttling the discharge, a connection may be used to by-pass sufficient liquid back to the suction inlet to prevent overheating.

D) OPERATING ROUTINE

1) Check the bearing temperatures periodically. If there is overheating, check the motor to insure adequate lubrication. Normal inspection consists of periodic check of motor lubrication.

2) Lubricating the pump motor should be done in accordance with manufacturer's recommendations.

3) Check all seals for leakage.

4) Check the suction and discharge pressure gauges. If the differential pressure drops critically, shut down the pump at once.

E) STOPPING

1) The pump should be shut down rapidly to keep liquid in the pump and to prevent the parts from seizing. After stopping the driver, close the discharge valve and then the inlet valve, in that order. Sometimes it is necessary to close the discharge valve immediately after stopping the driver to prevent reverse rotation. If the pumps are to remain idle under freezing conditions, precautions, such as draining the case, should be taken to avoid damage.

SECTION 3 - MAINTENANCE

Routine inspections should be made on a regular basis. Inspections made while pump is running should reveal potential failures.

1) Inspect motor bearings for any sign of temperature rise. Temperature rise may indicate the early stages of bearing problems.

2) Listen for any unusual noise. Air trapped in pump or hydraulic noise.

3) Check suction gauge reading and confirm that it is normal.

4) Check discharge gauge reading and confirm that is normal. If gauge readings are abnormal find out why.

SECTION 4 - TROUBLE SHOOTING

A) NO DISCHARGE PRESSURE

1. Pump not primed.

2. Speed too low (when direct connected to electric motor, determine whether or not motor is across the line and receives full voltage).

3. System head too high.

4. Suction lift higher than that for which pump is designed.

5. Impeller completely plugged.

6. Wrong direction of rotation.

7. Air leak in the suction line.

8. Air leak through seal.

B) INSUFFICIENT DISCHARGE

1. Air leaks in suction line.

2. Speed too low (when direct connected to electric motor, determine whether or not motor is across the line and receives full voltage).

3. System head higher than anticipated.

4. Insufficient NPSH (net positive suction head): Suction lift too high. Check with gauges. Check also for clogged suction line or screen.

5. Not enough suction head for hot or volatile liquids.

6. Foot valve too small.

7. Impeller partially plugged.

8. Mechanical defects: clearances worn, impeller damaged, foot valve or suction opening not submerged enough, wrong direction of rotation.

C) INSUFFICIENT PRESSURE

1. Speed too low (when direct connected to electric motor, determine whether or not motor is across the line and receives full voltage).

2. System head less than anticipated.

3. Air or gas in liquid.

4. Mechanical defects: clearances worn, impeller damaged, impeller diameter too small, wrong direction of rotation.

D) LOSS OF SUCTION FOLLOWING PERIOD OF SATISFACTORY OPERATION

1. Leaky suction line.

2. Water seal plugged.

3. Suction lift too high or insufficient NPSH.

4. Air or gas in liquid.

5. Casing gasket defective.

6. Clogging of strainer.

E) EXCESSIVE POWER CONSUMPTION

1. Speed too high.

2. System head lower than rating, pumps to much liquid.

3. Specific gravity or viscosity of liquid is too high.

4. Mechanical defects; shaft bent, rotating element binds, clearances worn.

F) VIBRATION

1. Air or vapor in suction line.

2. Air or gas in liquid.

3. Impeller partially plugged.

4. Mechanical defects: damaged impeller, misalignment of pump and driver, bearing worn, rotor out of balance, shaft bent.

5. Foundation not rigid.

G) MOTOR RUNS HOT

1. Speed too high.

2. Specific gravity or viscosity of liquid pumped is too high.

3. Mechanical defects: shaft bent, rotating elements binds, defects in motor, voltage and/or frequency lower than rating, misalignment of pump and driver.