Form 3641A

MEPCO

Base Mounted Centrifugal Pump
Type RB06, RB07, RB09 & RB12

Installation, Operation and Maintenance Instructions

NOMENCLATURE

RB06 - 15 - 010 - 34 - 3

- MODEL
- Discharge (See Chart A)
- HP (See Chart B)
- RPM-34 (3450)
- RPM-17 (1750)
- PHASE

CHART A	CHART B
10 = 1"	010 = 1 HP
12 = 1-1/4"	015 = 1-1/2 HP
15 = 1-1/2"	020 = 2 HP
20 = 2"	030 = 3 HP
25 = 2-1/2"	050 = 5 HP
30 = 3"	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 RB06, RB07, RB09 and RB12 are radially split, single stage, base mounted 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 mount 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. Locate pump in an easily accessible place with sufficient space around it for maintenance and servicing. On larger pumps allow head room for the use of hoists or overhead cranes. Locate pump on a dry and clean place so that motor will be protected from moisture and dust.

2. On closed heating systems place expansion tank at the suction side of the pump. When pump head is less than 20 feet, it is permissible to connect expansion tank to discharge side of the pump.

3. On open systems, install pump close to liquid supply and make suction piping as short and as straight as possible.

C) FOUNDATION

1. The foundation serves to carry the pump weight and to absorb vibration. Normally, the foundation is made of concrete block, preferably tied in with the floor or ground. Make the foundation block about 4" longer and 4" wider than the base of the frame. Height of the block may vary from 2/3 to 1 times the width of the foundation. When foundation is poured, provide a hole near each of the four (4) corners. To simplify installation and maintenance use lead Anchors. Place the front Anchor about 2" from the edge of the foundation to clear overhanging casings (Fig. 1).

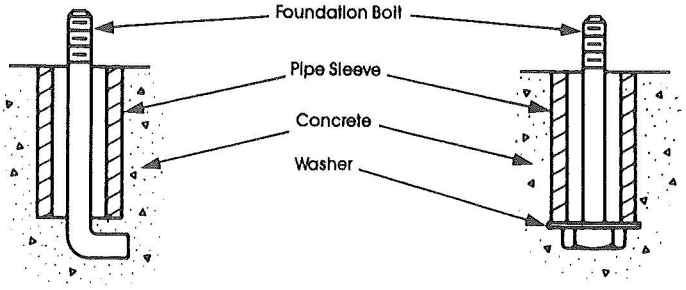


FIGURE (1) ANCHOR BOLTS

D) PUMP SETTING

1. When pump is set on its foundation, make sure to have it properly leveled. Place base plate over foundation bolts. Place shims at corners of base plate when required and level with a spirit gauge. Check also level of suction and discharge flanges.

E) COUPLING ALIGNMENT

1. Proper alignment of pump and driver will assure trouble free operation and long life of the pump. Misalignment will cause rapid wear of seals, couplings, and bearings. All pumps are carefully aligned before leaving the factory. However, experience indicates that alignment invariably changes in shipping and handling. Therefore, it is of utmost importance that alignment be checked at various steps of the installation process; i.e., after leveling, after piping, and after first few weeks of operation.

2. Check alignment by placing a slotted straight edge across the coupling halves at tip, bottom, and at the sides. If any light is seen between the straight edge and one of the coupling flanges, it means the unit is out of alignment. (Fig. 2).

3. If light is seen at top and bottom position of the straight edge, alignment is out of height. Usually shims are placed under the motor feet. Loosen the four motor bolts, remove or add shims as required to correct proper height. Tighten the motor bolts and check to make sure alignment was corrected properly.

4. If alignment is out on the sides of the coupling, loosen the four motor bolts and lightly tap the motor in the direction required. Tighten the four motor bolts and check to make sure alignment was corrected properly.

5. As alignment in one direction may alter the alignment in another, be sure to check all alignments made.

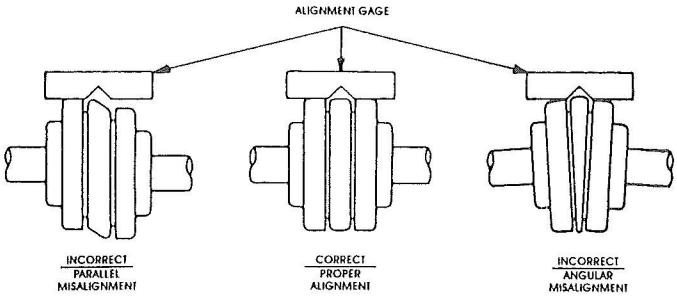


FIGURE (2) COUPLING ALIGNMENT

F) GROUTING

1. When alignment is correct, the foundation bolt should be tightened evenly, but not too firmly. The base plate can then be completely filled with grout, encasing the leveling shims or wedges. Foundation bolts should not be fully tightened until the grout is fully hardened, approximately 48 hours after pouring. Recheck alignment as outlined on the previous page.

G) PIPING

1. Correct piping is of prime importance for the proper operation and long life of the pump. Stresses induced by piping will cause excessive wear of seals, bearings, and couplings that could ultimately destroy these elements.

2. Both suction and discharge piping should be suspended close to the pump connections, so that no pipe weight rests on the pump. Pipe flanges and pump flanges should align perfectly before connections are made, piping should never be drawn by force into place.

3. Thermal expansion of piping requires special attention on heating installations. If no room is provided for pipe expansion, stresses are induced in the piping

that will exert a load on the pump. Forces created by pipe stresses can exceed by far the load exerted through pipe and water weight. Stress forces can distort pump, bend shafts, wear out seals, and impeller wear rings, and ultimately burn out bearings. To protect pump from thermal pipe stresses, provide spring hangers and flexible connectors that are suitable to compensate for pipe expansion. (see Fig. 4).

4. Install gate valves on both suction and discharge side of the pump to allow servicing without draining the system.

5. Install isolation valves on both suction and discharge side of the pump to allow servicing without draining the system.

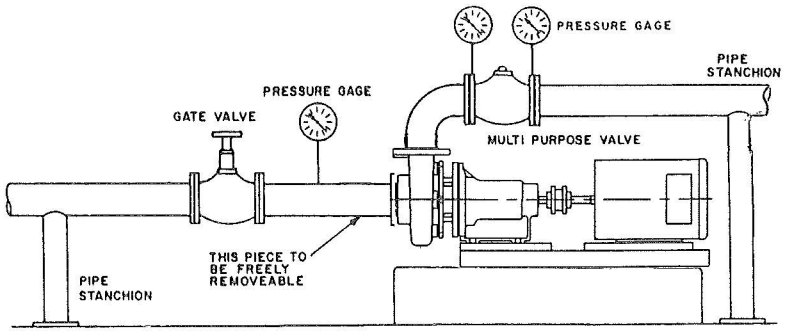


FIGURE (3) Typical Installation-horizontal Piping

6. On open pumping systems drawing water from a level below the pump (suction lift) install a foot valve with strainer.

7. On open systems where the pump is located below the suction water level (suction head) install a check valve in the discharge line close to the pump.

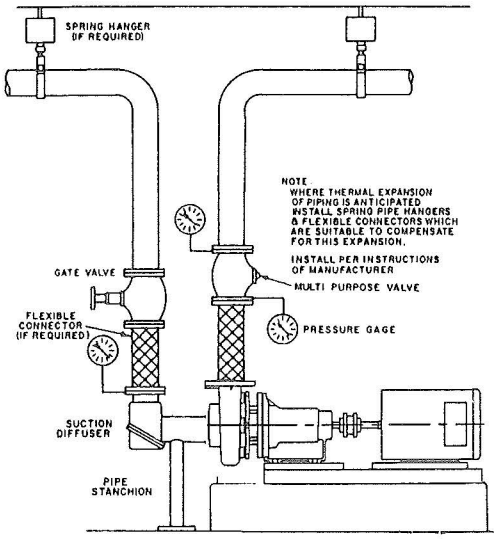
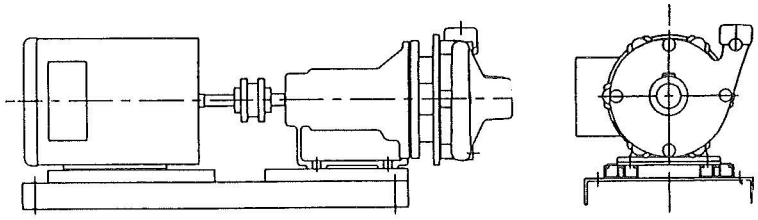


FIGURE (4) Typical Installation-vertical Piping

H) CONNECTING PIPING

1. Piping may now be connected to pump. Make sure that pump and pipe flanges are strictly parallel and properly spaced for the gasket that will be used. Also check that pipes are supported properly and do not rest on pump flanges. Never draw pipes by force to pump flanges. Recheck alignment after piping connections are made. If misalignment was caused by piping, it is a sign that pipe stresses distorted the pump. Correct piping to relieve stresses.

SECTION 2 - PUMP START-UP & OPERATION



Before starting up pump for the first time several items are to be checked to avoid damaging pump.

A) MOTOR WIRING & ROTATION

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) After you have checked lubrication and wiring you are ready to start the pump.

2) Open the isolation valve in the suction side and close the valve on the discharge side. Start motor, wait until unit has come to full speed and then open discharge valve slowly. Do not run pump for more than a few minutes with completely shut valves. If system conditions call for part-time operation against shut valves, install a bypass line from discharge to suction.

C) OPERATION BEFORE STARTING

The pump is ready for starting when:

a) The unit base plate is grouted and bolted to the foundation.

b) Motor is correctly wired to starter switch, ensuring correct rotation.

c) Pump and driver are correctly aligned.

d) Bearing lubrication is provided.

e) Stuffing box has been packed or a mechanical seal has been fitted.

f) All rotating parts are found to be free when turned by hand.

g) Pump is primed. Never run the unit dry. The liquid in the pump serves as a lubrication for close running fits within the pump and the pump may be damaged if operated dry. The pump may be primed by using an ejector, exhauster or vacuum pump. If a foot valve is used in the suction line, the pump may be primed by venting and filling the casing with liquid.

D) MECHANICAL SEAL

Mechanical seals are the most delicate component of the pump. Special care has to be given to them to assure trouble-free operation.

The sealing element of a mechanical seal consists of a carbon washer rotating against a stationary metallic or ceramic ring.

Surfaces of both are highly lapped to assure sealing. Any dirt that penetrates between the two mating parts will cause a rapid wear of the seal faces and will ultimately result in seal leakage.

New heating systems are usually contaminated by various materials such as construction debris, welding slugs, pipe joint compound, mill scale, etc. It is of utmost importance that such systems be cleaned out thoroughly before putting pump into continuous operation.

Cleaning of a heating system is simple and easy. First flush out system with cold water at city pressure to remove all loose foreign matter that penetrated into the system. Afterwards boil out system with chemicals to remove dirt adhering to pipes.

Chemicals most commonly used for this procedure are sodium triphosphate, sodium carbonate, or caustic soda, but any nonfoaming detergents as used in dishwashers can be applied.

Fill system with clean water, add cleaning chemicals (1) lb. for every 40 to 50 gallons of water, (or manufactures instructions) start pump and heat up system. Let system run for a few hours, then drain and refill with fresh water. Your pumps are now ready for continuous duty.

SECTION 3 - TROUBLE SHOOTING

Operating troubles and their probable causes are as follows:

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 or stuffing box

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

H) PUMP BEARINGS OVERHEAT

1. Contaminated lubricant

2. Mechanical defects: shaft bent, rotor out of balance, misalignment of pump and driver

NOTES

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