

Operating  
and  
Maintenance  
Instructions  
for

# ACE CENTRIFUGAL PUMPS



CENTRIFUGAL PUMPS • DIAPHRAGM PUMPS • HIGH VACUUM PUMPS • NYLON ROLLER PUMPS • WATER SYSTEMS



# Operating and Maintenance Instructions for Ace Centrifugal Pumps

## INSTALLATION INSTRUCTIONS

A. Motor base should be anchored to Mounting Pad.

1. Location - The pump should be located as near as possible to the source of supply, particularly when operating with a suction lift. Maximum suction lift should not exceed 15 feet, including friction losses.

The pump may be installed in any position provided the motor is not below the pump. The discharge outlet is normally furnished in a vertical position, but it can be rotated to any 90 degree position.

2. Piping - All piping should be supported independently of the pump. Care should be used in making up unions, etc., to not place a strain on the volute. All suction and discharge piping should be made as short and direct as possible in order to reduce the friction head.

- a. Suction Piping - Always place the end of the suction pipe at least 3 feet below the surface of the water to prevent air from being drawn into the pump, as air leaks will cause the pump to loose prime. Horizontal runs of suction piping should slope downward from the pump to eliminate air pockets.

Provide strainer to prevent foreign matter from entering the pump. The net area should be at least 2 to 3 times the area of the suction pipe.

- b. Discharge Piping - It is advisable to install a gate valve and a check valve in the discharge line close to the pump. The gate valve can be used to control the capacity of the pump, or to shut off the discharge line while repairs are being made. The check valve prevents back flow which might damage the pump on shut down.

3. Wiring - All wiring to motors should be of ample size to carry the load involved. Three phase motors should be connected to starters with heater coils suitable for the load. Do not connect directly to a three phase fused service switch. All single phase motors are equipped with KLIX-ON thermal overload protectors, but should be connected to a box with fuses of sufficient size to carry the load.

**CAUTION:** Make all wiring connections according to diagrams furnished with the motor.

## OPERATING INSTRUCTIONS

1. Priming - **DO NOT START PUMP BEFORE PRIMING.** The pump and suction piping must be filled with liquid and the air removed from the casing before starting, by unscrewing the pipe plug in the top of the volute.

After the pump has been filled, turn the shaft a few times by inserting a screwdriver in the screwdriver slot in the rear of the motor shaft to allow all air to escape. Add more water if required. The gate valve in the discharge line should be kept closed until the pump is running at full speed and then gradually opened. If the pump does not build up pressure as the speed increases, it is not properly primed and should be shut down and primed again.

Do not attempt to prime a pump while it is running by letting water run into it through its discharge pipe.

2. Starting a New Pump - Insure freedom of rotation by rotating impeller several revolutions with a screwdriver inserted in the screwdriver slot in the rear of the motor shaft.

Direction of rotation should be checked by observing the screwdriver slot in the shaft. Rotation should be as shown by the arrow on the volute. In the event that rotation is incorrect, refer to the motor instruction plate. Lubrication of new units is not necessary before starting.

Each Ace pump is tested before shipment and no leakage should be evident from the seal. If leakage is noticed, the pump should be run for a few hours and in most cases, leakage will stop as the seal faces "run in".

After the pump has operated a short time all pressure bolting should be gone over for tightness.

## MAINTENANCE INSTRUCTIONS

1. General - Periodically, the pump volute, impeller and seal assembly should be inspected and all foreign matter should be removed. If excessive vibration or heating is experienced, inspect the pump impeller vanes. A clogged impeller may cause both.
2. Lubrication - Fractional horsepower (Frame 56) motors are equipped with permanently sealed cartridge type ball bearings. They cannot be cleaned and relubricated; however, they are readily available from local bearing sources and new bearings can be installed quite inexpensively when necessary.





Integral horsepower (Frame 182 and up) motors are equipped with sealed ball bearings that can be cleaned and relubricated. When these bearings are disassembled they should be thoroughly cleaned with hot (180 degree F.) light oil. A final rinsing should be given with naphtha or gasoline. Then place a small amount of a good grade soda soap grease in the bearings and reassemble. Be sure that the grease is clean and that an excessive supply is not forced into the bearings. Bearing chambers should be no more than half full.

3. Mechanical Seal Replacement - Ace pumps are equipped with Type 6 John Crane Company shaft seals. Should this

seal require replacement, proceed as follows:

Remove cap screws that hold volute to motor bracket. Insert screwdriver in slot located in the rear end of the motor shaft and unscrew the lock nut and impeller. Remove motor bracket from motor. The seal assembly will come off with the bracket. Push seal seat out of bracket cavity. Rotating member and spring of a Crane seal are in one piece and can be slipped on the shaft without greasing or aid of tools. Coat outside of neoprene jacketed ceramic seat with oil and insert in bracket cavity. After replacing the bracket on the motor, slip rotating member and spring over shaft, replace impeller and volute.

### Trouble Symptoms and Causes

1. No Liquid Delivered.
    - a. Pump not primed.
    - b. Speed too low---check voltage and frequency.
    - c. Air leak in suction.
    - d. Discharge head too high.
    - e. Suction lift too high.
    - f. Impeller plugged.
    - g. Wrong direction of rotation.
  2. Not Enough Liquid Delivered.
    - a. Air leaks in suction.
    - b. Speed too low---check voltage and frequency.
    - c. Discharge head too high.
    - d. Suction lift too high.
    - e. Impeller partially plugged.
    - f. Not enough suction head for hot liquid.
    - g. Impeller or volute damaged.
    - h. Suction not submerged enough.
  3. Not Enough Pressure.
    - a. Speed too low---check voltage and frequency.
    - b. Air or gas in liquid or leaks in suction.
    - c. Impeller damaged or partially plugged.
  4. Pump Works for a While then Loses Suction.
    - a. Leaky suction line.
    - b. Suction lift too high.
    - c. End of suction line uncovered.
    - d. Air or gas in liquid.
    - e. Air leaks in suction.
  5. Motor Runs Hot.
    - a. Pump taking too much power.
      1. Speed too high.
      2. Head lower than rating allowing pump to handle too much liquid.
      3. Liquid heavier and more viscous than rating.
    - b. Seal binding.
    - c. Rotor binding.
  6. Seal Leaks.
    - a. Improper assembly.
    - b. Worn seal faces.
      1. Corrosion due to character of liquid pumped.
      2. Excessive amounts of abrasive material in liquid causing an accumulation around the rotating assembly which results in faces opening up and allowing grit between them.
      3. Seal running dry.
- Electrical defects.
  1. Voltage and frequency lower than rating.
  2. Defects in motor.

### RECOMMENDED SPARES

1. For light duty where interruptions in service are not important:
  - a. Mechanical Seal Assembly
  - b. Gasket - Volute to Motor Bracket
2. For heavy duty where minimum loss of service is essential:
  - a. Mechanical seal assembly
  - b. Gasket - Volute to Motor Bracket
  - c. Impeller
  - d. Motor ball bearing - Pump End
  - e. Motor ball bearing - Opposite Pump End

### ORDERING INSTRUCTIONS

1. When ordering pump parts, always give pump serial and model numbers, motor horsepower rating, motor speed in RPM, and suction and discharge openings.
2. When ordering motor parts, always give motor serial and model numbers, Frame size and speed in RPM.

NOTE: Motor parts can be obtained from the Ace Pump Corporation or local electrical supply centers.



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