AirFlow
PUMP CORP.

Manufactures of Boiler Feed units, Condensate units and Pressure Boosting systems. Exclusive Reps for Tsurumi Pump, Grundfos, Berkeley & Sta-Rite Pumps.

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KEEP THESE INSTRUCTIONS NEAR THE PUMP FOR USE OF MAINTENANCE PERSONNEL

*****First connection to stainless steel receiver must be Brass*****

INSTALLATION INSTRUCTIONS

Locating Pump: Install the pump in a clean, dry, well ventilated and drained location. The top of the pump receiver should be below the lowest return since it is best to keep the return lines dry. If receiver inlet is above the lowest return line, the return will be wet and the system will not free itself of air, as well as noises will occur.

Piping: Connect returns to inlet of receiver with a gate valve in each return and a union or flange joint next to receiver. Connect discharge of pump to boiler using a union, spring loaded check valve and gate valve; with the spring loaded check valve as close to pump as possible. If discharge line is longer than 50 feet, use pipe one size larger. Piping must be of proper length and size to prevent any strain upon the unit.

Wiring: The electrical connections between the motor, float switch and automatic starter (if furnished) are made at the factory. Connect the electric service to the float switch or automatic starter using conduit and wire sizes as required by local power companies. Provide a fused main line switch in motor circuit. CAUTION: The motor is wired and connected at the factory to operate on the voltage specified. If voltage is other than originally specified, consult motor manufacturer's instructions accompanying unit for proper wiring. Where a polyphase motor is furnished with only a float switch. **IT WILL BE NECESSARY TO INSTALL A SUITABLE PHASE PROCTECTORSWITCH IN THE MOTOR CIRCUIT TO PREVENT MOTOR BURNOUTS SHOULD A SINGLE PHASE CONDITION OCCUR.**

Fuses: Be sure fuses are installed which comply in size with National Electrical Code recommendations. When a fuse blows out, it indicates that something is wrong either in the motor, pump, switch, fuse rating or electric service. Do not replace fuse until the cause for its blow out has been determined. If thermal cut-out is used, and element with a maximum tripping current rating 50% greater than a motor nameplate Amps. may be selected. Condensate boiler feed pumps are only operating intermittently and therefore it is permissible.

OPERATING INSTRUCTIONS

CAUTION: New or repaired heating systems should be operated several days with the returns open to sewer until water appears clear, in order to thoroughly flush and clean the lines and prevent clogging of the pump when it is put in operation. This may take a few days to two weeks. This pump is equipped with a mechanical seal instead of the conventional type of packing. BE sure that pump receiver is filled with condensate before starting because the mechanical seal will be damaged in run dry.

LUBRICATION: None required from pump proper. However the vertical motor is ball bearing type with

pre-sealed and lubricated bearing, and no immediate lubrication is necessary. Required lubrication depends upon what service pump is subjected to and cleanliness of location. When motor bearings become noisy, lubrication or replacement of ball bearing becomes necessary.

BEFORE YOU START, MAKE SURE

1. Check motor shaft and be sure it rotates freely. If shaft is tight, inspect pump end and motor for foreign matter clogging pump or lodging in motor.
2. Check voltage supply and be sure it is the same as motor on pump, or same as wiring connections made at factory.
3. Be sure piping connections to pump have been made as per instructions and that air vent pipe from receiver is open to atmosphere.
4. Be sure that the engineering characteristics of the complete pump are identical to the capacity discharge pressure and other requirement of the system.
5. Be sure that the float in the receiver is free to operate float switch.

Starting: Open valves in discharge and return lines, close valves in drain lines and close fused knife switch. If an automatic starter with selector switch is installed, be sure selector switch button is in "Auto" position.

INSPECTION AFTER STARTING

1. With vent pipe open to atmosphere, air and vapor can escape as fast as condensation flows into receiver. If vent is not open, or restricted, receiver will not fill.
2. Be sure pump and motor rotate in proper direction. Correct direction of rotation is CLOCKWISE when looking at top of motor. (if rotation is reversed, refer to motor instruction card and change proper leads.)
3. Check motor bearing for overhearing.
4. Check float switch to see that it starts and stops motor as receiver fills and empties.
5. Check all piping connections for leaks.
6. Observe operation of unit closely for several hours after first starting and at regular intervals for several days. A new unit is frequently stiff and bearings are tight and therefore should be watched to check performance.

SERVICE AND CARE OF UNIT

1. Inspection: To insure best operation of unit, make a systematic inspection at least once a week.
2. Cleanliness: Keep the interior and exterior of motor and automatic switches free from moisture, oil and dirt. If necessary, use compressed air for blowing out dirt. Occasionally drain and flush pump receiver to remove sediment and pipe scale.
3. Automatic Switches: Occasionally examine contacts of automatic switches and see that they make a full firm contact and break the circuit quickly. Be sure all terminal connections are tight and not corroded.
4. Mechanical Shaft Seal: Occasionally examine water slinger on motor shaft and look for water leakage. Any leakage will also be visibly on seal plate. Leakage in dictates that the seal surfaces are worn and need replacement. (For proper procedure in replacing these parts, refer to instructions under Disassembly of Pump.) CAUTION NEVER OPERATE PUMP WHEN RECEIVER IS EMPTY, BECAUSE THE SEAL WILL BE DAMAGED IF RUN DRY.
5. Shutting Down: At end of heating season open main switch, close valves in return line and discharge piping and drain receiver and pump. If necessary, cover electric motor and automatic switches to protect them against dirt, oil and moisture.
6. Caution: Never operate pump when receiver is empty or expose it to freezing temperature when filled with water.

DISASSEMBLY OF PUMP

TO REMOVE PUMP AND MOTOR ASSEMBLY:

1 - Remove top fitting on pump vent line.

2 - Disconnect wires and flexible conduit at motor terminal box or at float switch, whichever is more convenient.
3 - Remove motor bracket nuts.
4 - Lift motor & pump unit from pump housing.

DISMANTLING PUMP AND MOTOR UNIT

1 - Remove drip cover from top end of motor. Note slot or two (2) flat spots on motor shaft. Use screwdriver to open end wrench to hold motor shaft securely.
2 - Remove Impeller lock screw (on 3 phase model only), turning lock screw CLOCKWISE. Omit the operation on a single phase model.
3 - Remove Impeller by turning COUNTER-CLOCKWISE. Impeller hub is threaded and screws into motor shaft.
4 - Remove Rotating seal assembly by sliding along motor shaft.

REPLACING MECHANICAL SHAFT SEAL AND REASSEMBLING PUMP

1 - Pump and motor unit must be completely dismantled as indicated on page 3 in steps 1 to 4 inclusive.
2 - Remove ceramic stationary seal seat and vibration ring plate.
3 - Be sure to counter-bore in plate is perfectly clean before inserting new ceramic seat and ring.
4 - Attach pate to motor.
5 - Use a light oil on the entire diameter of vibration ring and press it together with the ceramic seat into the machined bore of plate. Press as far as it will go and be sure it is in proper place with the seat surface at a perfect 90o angle with respect to respect to motor shaft. Use caution so as NOT to SCRATCH or MAR lapped surfaces of ceramic seat.
6 - Oil lower end of motor shaft and slip rotating seal assembly on motor shaft as far as it will go. Again use caution so as not to SCRATCH or MAR lapped surface of carbon ring.
7 - Hold top end or motor shaft with screwdriver or open end wrench and screw Impeller CLOCKWISE onto motor shaft until tight.
8 - Replace lockscrew (on 3 phase model only) and turn COUNTER-CLOCKWISE until tight.
9 - Replace gasket and set pump and motor assembly over studs and onto pump housing. Tighten stud nuts.
10 -Reconnect wiring and flexible conduit from motor to switch.
11 -NEVER RUN PUMP WITH RECEIVER EMPTY, BECAUSE BOTH ELEMENTS OF MECHANICAL SHAFT SEAL WILL BE DAMAGED.

TROUBLE CHART

Should trouble develop with the unit, the information given below may enable the operator to locate it and correct it without the aid of a factory service man.

NO CONDENSATE DISCHARGE

1 - Not enough condensate in tank to prime pump.
2 - Speed too low.
3 - Discharge head too high.
4 - Impeller loose on shaft, plugged or worn.
5 - Wrong direction of rotation.

EXCESSIVE POWER CONSUMPTION

1 - Speed too high.
2 - Loose wiring connections.
3 - Mechanical defects:
    (a) Motor shaft bent.
    (b) Rotating element binds.
    (c) Foreign elements between impeller and wearing ring.

INSUFFICIENT CONDENSATE DISCHARGE

1 - Air or water leak at Mech. shaft seal or gasket.
2 - Plugged pump vent line.
3 - Speed too low.
4 - Discharge head higher than anticipated.
5 - Impeller loose on shaft, plugged or worn.
6 - Wearing Rings worn.
7 - Wrong direction to rotation.

PUMP DOES NOT START

1 - Motor lead connections may be wired wrong.
2 - Blown fuses in disconnect switch.
3 - Bad coil in starter
4 - Loose connection in disconnect switch, starter, float switch or motor leads.
5 - Overload protection in starter or motor damaged or not Re-set.
6 - Rotating assembly bound. Try turning motor shaft from top side of motor with screw driver or open end wrench.

PUMP IS NOISY

1 - Bearings are bad (these are sealed ball bearings in motor.)
2 - Pump may be operating at a low enough head to be in cavitation range. Cavitation sounds like pebbles rattling in a pail. Throttle discharge valve to correct pressure and lock. (If cavitation noise disappears it may be wise to install a smaller diameter impeller, reduce speed, or install on orifice or venture on discharge).
3 - Pump is operating too near shut-off head. Check discharge piping to lower the head. If this cannot be accomplished, contact factory.
4 - Internal parts rubbing.
5 - Motor has magnetic hum or high windage noises. Check with motor manufacturer.

LOSS OF SUCTION FOLLOWING PERIOD OF SATISFACTORY OPERATION

1 - Air leak at mechanical shaft seal or pump gasket.
2 - Pump vent line plugged
3 - Air or gasses in condensate or condensate too hot.

SERVICE

PUMP SERVICE

This centrifugal pump requires little or no service other than reasonable care and periodic cleaning. Occasionally, however, a shaft seal may become damaged and must be replaced. The procedure as outlined below will enable you to replace the seal.

NOTICE: Pumps use mechanical seals with a rubber seat ring or a sealing O-Ring. THESE SEALS ARE COMPLETELY INTERCHANGEABLE.

NOTICE: The highly polished and lapped faces of this seal are easily damaged. Read instructions and handle the seal with care.

Some models are equipped with an impeller screw, which has a left hand thread. Before unscrewing the impeller, remove the impeller screw.

REMOVAL OF OLD SEAL

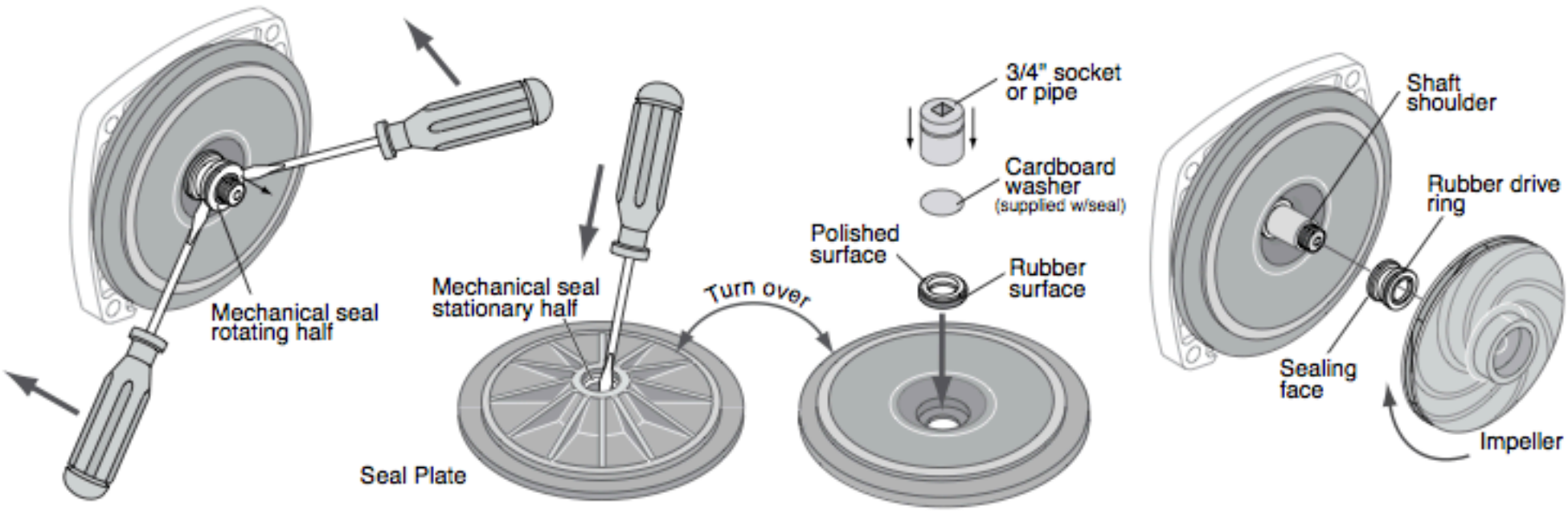
1. After unscrewing impeller, carefully remove rotating part of seal by prying up on sealing washer, using two screwdrivers (see Figure 5A). Use care not to scratch motor shaft.
2. Remove seal plate from motor and place on flat surface, face down. Use a screwdriver to push ceramic seat out from seal cavity (see Figure 5B).

INSTALLATION OF FLOATING SEAT (Figure 5C)

1. Clean polished surface of floating seat with clean cloth.
2. Turn seal plate over so seal cavity is up, clean cavity thoroughly.
3. Lubricate outside rubber surface of ceramic seat with soapy water and press firmly into seal cavity with finger pressure. If seat will not locate properly in this manner, place cardboard washer over polished face of seat and press into seal cavity using a 3/4" socket or 3/4" piece of standard pipe.
4. **DISPOSE OF CARDBOARD WASHER**. Be sure polished surface of seat is free of dirt and has not been damaged by insertion. Remove excess soapy water.

INSTALLATION OF ROTATING PART OF SEAL UNIT (Figure 5D)

1. Reinstall seal plate using extreme caution not to hit ceramic portion of seal on motor shaft.
2. Inspect shaft to make sure that it is clean.
3. Clean face of sealing washer with clean cloth.
4. Lubricate inside diameter and outer face of rubber drive ring with soapy water and slide assembly on motor shaft (sealing face first) until rubber drive ring hits shaft shoulder.
5. Screw impeller on shaft until impeller hub hits shaft shoulder. This will automatically locate seal in place and move the sealing washer face up against seat facing. Reinstall impeller screw (if used).



A-Seal removal-rotating half **B**-Seal removal-stationary half **C**-Stationary half installation **D**-Rotating half installation

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FIGURE 5

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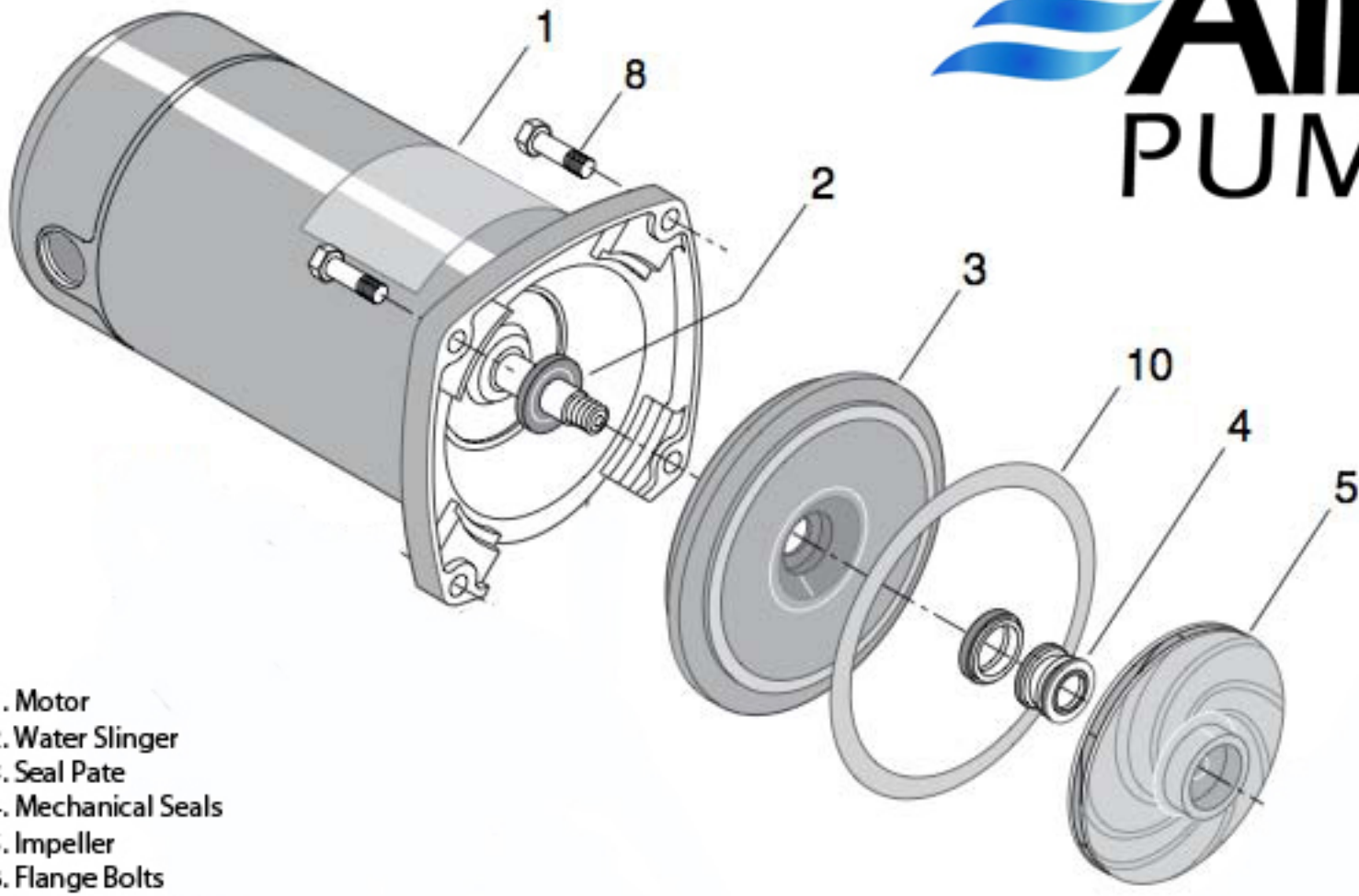
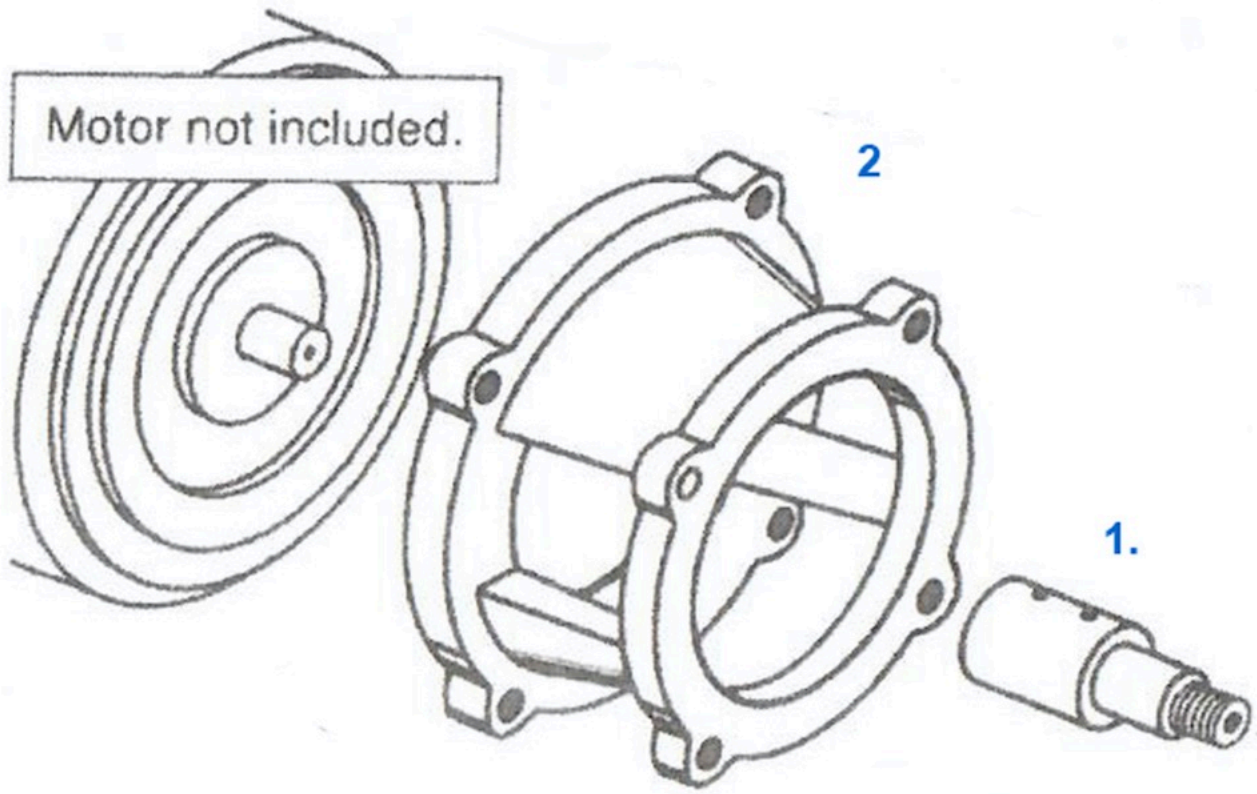


1. Motor
2. Water Slinger
3. Seal Pate
4. Mechanical Seals
5. Impeller
8. Flange Bolts
10. Seal Plate Gasket

Air Flow Pump 56C Adopter Plate Components (TEFC, Washdown & Explosion Proof):

1. Shaft Stub.
2. Seal Plate Adopter Plate.



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Serving the industry since 1973

Line Card

Manufacturing:

A. Boiler feed units: Ranging from 10 gallons - 1000 gallon systems
B. Condensate units: Ranging from 10 gallons - 1000 gallon systems
C. Constant running pressure systems.
D. Stainless steel weighted float balls.

Exclusive Manufacturers Reps:

A. **Sta-Rite Industries**: Pressure, effluent, high temperature submersible, sewage, and pool pumps.

B. **Berkeley**: Centrifugal, self priming, gas engine well (shallow and deep) stainless steel multi stage, and end suction pumps 2 H.P. through 250 H.P., 1"to 12" discharge, capacities 20-3000 GPM.

C. **Tsurumi**: Sewage ejector pumps, cutter pumps, grinder pumps, effluent pumps, dewatering pumps, high temperature submersibles, gas engine generators, gas engine trash, mud pumps, water features and pond pumps. Capacity 40-20000 GPM.

Electrical supply:

A. **Square D Co.**: Control panels, float and pressure switches

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