

# SERIES 'D' MAGNETIC COUPLED SEAL-LESS PUMP & MOTOR

OPERATION AND  
SERVICE GUIDE  
O-190E  
NOV. 1998

1 x 3/4  
1 1/2 x 1

Refer to Bulletin P-800

MODEL NUMBER	PUMP HOUSING	LINER	IMPELLER MAGNET ASSEMBLY	BUSHING	MAX. INLET PRESSURE PSI (BAR)
1 x 3/4 MRGR 1 x 3/4 MKGC	GLASS FILLED RYTON CARBON FILLED PVDF	GLASS FILLED RYTON® CARBON FILLED PVDF	POLYPROPYLENE PVDF	RYTON CARBON	50 (3.5)
1 1/2 x 1 MPGR 1 1/2 x 1 SMPGR	GLASS FILLED POLYPROPYLENE	GLASS FILLED RYTON	*TALC FILLED POLYPROPYLENE WITH RYTON BUSHING	RYTON	50 (3.5)
1 1/2 x 1 MSGR	316SS	316SS	*316SS w/RYTON BUSHING	RYTON	200 (13.8)
1 1/2 x 1 MKGC 1 1/2 x 1 SMKGC	CARBON FILLED PVDF	CARBON FILLED PVDF	CARBON FILLED PVDF	CARBON	75 (5.2)

REFER TO BULLETIN P-504.  
SEE PARTS LISTS P-800, P-815 AND P-4100 FOR OTHER  
MATERIALS.  
ALL PUMPS ARE STANDARD WITH VITON® 'O'-RINGS.

\* **NOTE:** Carbon and Chemic bushings are available  
as an option.

## SAFETY PRECAUTIONS BEFORE STARTING PUMP

1. Read operating instructions and instructions supplied with chemicals to be used.
2. **Refer to a chemical resistance 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 and gloves.**
5. All piping must be supported and aligned independently of the pump.
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 of Safety Precautions above.**
2. Flush pump thoroughly with a neutralizing solution to prevent possible harm to personnel.
3. Verify compatibility of materials as stated in Item 2 of Safety Precautions above.
4. Shut off power to motor at disconnect switch.

## ELECTRICAL CONNECTIONS AND DRY RUNNING

The only moving parts inside the pump volute are the impeller magnet assembly and bushing which rotates on the porcelain shaft. If the pump is run dry with no liquid inside the volute, it will damage the bushing and possibly the impeller. Short runs of 15 seconds or less will not damage the pump. This will allow you to check your electrical hook-up. The electrical wiring diagram is located inside the cover of the motor conduit box. The motor fan must rotate in a counterclockwise direction when viewed through the fan cover of the motor. The motor is rated for continuous duty. Single phase motors are capacitor start and are equipped with automatic thermal overload protector.



**CAUTION:** Automatic overload will allow motor to restart automatically.

Temperature limitations: Ryton 150°F (65°C)  
PVDF 220°F (104°C)  
Stainless steel  
250°F (121°C)

## START-UP

1. A suction strainer is recommended if the solution contains debris which may damage the pump or reduce flow.
2. Unless pump is installed with a flooded suction, it will be necessary to prime the pump. Priming may be performed with the process liquid or with water if it is acceptable to the process.
3. To prime, hold the ends of both hoses and pour liquid into the suction hose until it appears in the discharge hose. Agitate both hoses to disperse air that may be trapped in the pump.
4. With the end of each hose facing upward, lower suction hose until the liquid overflows. Place hand over the end of hose before releasing your hand.
5. Depending upon conditions, the pump will usually prime with less effort than described above but by following this procedure, instant priming is assured.



**CAUTION:** Do not pump liquids that contain suspended iron fines which will be attracted to the strong magnetic fields of the impeller magnet, and thus damage internals. Also solutions with heavy concentrations of salts should not be allowed to stand in pump for extended time. Flush out.

Keep away from metallic particles.  
Make sure drive magnets are free of metal chips.

## OPERATING TIPS

### 1. PIPING

Support piping near pump to minimize strain on pump casings.

To minimize head loss from friction:

Increase pipe size 1 diameter

Use minimal number of bends

Keep bends a minimum of 10 pipe diameters away from suction.

Poor NPSH available will cause premature bushing wear.

Position pump as close to liquid source as possible.

Maintain flooded suction whenever possible.

Ensure that piping is leak-free.

For units in suction lift system, install appropriate piping in discharge to allow for priming of pump. Use discharge valve to regulate flow. Do not use suction valve for throttling pump.

2. Cavitation for any reason is detrimental to the pump, therefore, the use of a priming chamber to assure flooded suction is desirable. Be sure inlet is not restricted in any way, either by the use of a valve or abnormal hose size in relation to the discharge flow. Make certain air used to agitate solutions is prevented from entering the pump in sufficient quantity to cause cavitation. Cavitation is evidenced by pulsing flow or spurts and indicated on a pressure gauge by accelerated highs and lows. Look for wear on the thrust washer and bushing in the impeller magnet. Replace worn parts immediately, otherwise impeller magnet assembly will not remain in line and wear to the raised boss in the liner will take place where the porcelain shaft is located. Be sure, in disassembling the pump, after the six wing nuts are removed, to pull the pump casing straight out until the end of the porcelain shaft is clearly in view. This will eliminate the chance of the porcelain shaft being broken.
3. Since some particles are present in virtually all solutions, it is likely that some wear will be taking place at all times. Inspect the thrust washer, bushing or raised boss in the liner, for signs of wear and replace these parts as often as necessary. Consult the Application Engineering Department for parts made of other materials of construction if wear seems to be excessively fast.

## TROUBLESHOOTING

### NO DISCHARGE

1. Pump not primed.
2. Discharge head too high. Insufficient NPSHA.
3. Suction lift too high.
4. Closed valve.
5. Viscosity too high (magnets uncoupled).

### INSUFFICIENT DISCHARGE

1. Air leaks in suction piping.
2. Discharge head higher than anticipated.
3. Suction lift too high or insufficient NPSHA. Check also for clogged suction line or clogged foot valve.

### INSUFFICIENT PRESSURE

1. Air or gasses in liquid.
2. Impeller diameter too small.
3. Discharge head higher than anticipated.

### LOSS OF PRIME

1. Leaking suction line.
2. Suction lift too high or insufficient NPSHA.
3. Air or gasses in liquid.
4. Foreign matter in impeller.

### EXCESSIVE POWER CONSUMPTION

1. Head lower than rating. Pumps too much liquid.
2. Specific gravity or viscosity of liquid pumped is too high or higher than that defined in application.

### VIBRATION

1. Excess bearing wear.
2. Magnet drive uncoupled.
3. Loose magnet.

## REPLACEMENT PARTS

See Parts Lists - P-800 and P-4100.

## MOTOR SERVICE AND DRIVE MAGNET REPLACEMENT

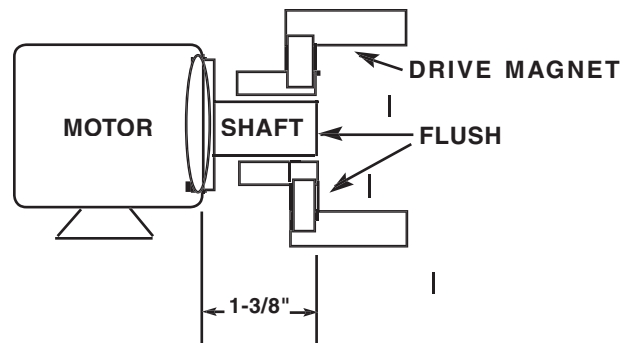
Remove four motor screws, pull off motor-pump connecting bracket. Loosen driver magnet with Allen head key. Replace new driver magnet or motor. Adjust driver magnet on shaft so that inside surface of drive magnet is flush/even with the end of the motor shaft. Tighten set screw. Be sure set screw is against the flat portion of the motor shaft.



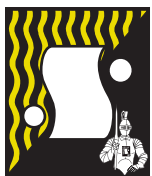
**CAUTION:** Magnets are extremely strong. To avoid damage and personal injury, make sure you have a tight hold of assembly, keeping fingers from between motor adapter and wet end assembly.

## PUMP SERVICE-Inspect all parts and replace as necessary

1. Drain liquid from the pump and adjacent hose or pipe.
2. To disassemble the pump, simply remove the six wing nuts. The entire assembly up to the motor and drive magnet assembly will now slide apart. The impeller magnet assembly will slide off the shaft. The shaft is a light press fit into the pump housing and can be pulled out by hand. Clean all parts as necessary and replace any worn or damaged parts before reassembling.
3. Replace impeller magnet assembly in pump housing.
4. Inspect 'O'-ring and replace when necessary.
5. Replace cover and tighten 6 wing nuts until secure. The 'O'-ring seal in the impeller magnet housing is designed to keep the pump chamber pressure tight.



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2900 MacArthur Blvd. 847-509-2900  
Northbrook, IL 60062-2005 U.S.A. 800-323-5431  
e-mail: sales@serfilco.com FAX: 847-559-1995  
www.serfilco.com

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