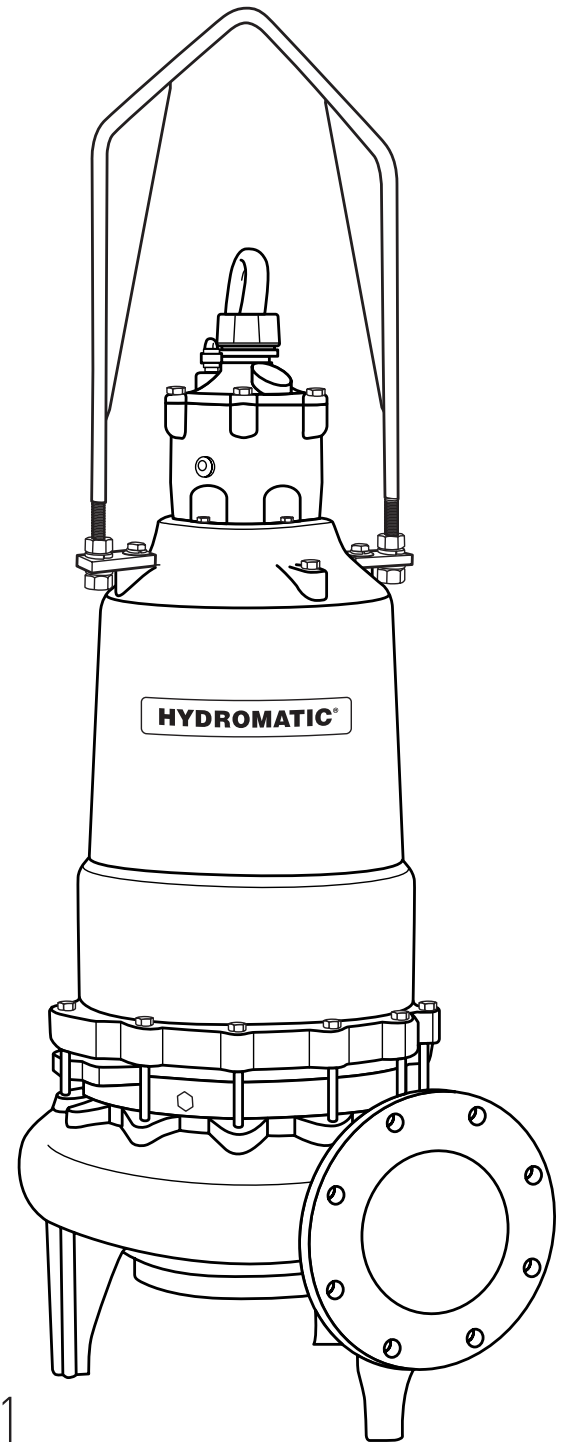




**HYDROMATIC®**



MODELS  
S4T(X\*), S8L(X\*),  
S8LA(X\*) and S12L(X\*)

\*Used in Hazardous Locations Class I, Division 1

# **SUBMERSIBLE SOLIDS HANDLING PUMP**

## **INSTALLATION AND SERVICE MANUAL**

**For use with product built with USEM motor.**

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

(\*Hazardous Location  
Motor End)



# General Information

## Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often.

Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

## Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

**WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.**

## The Pump

**IMPORTANT—Read all the directions before replacing any parts.**

## CALIFORNIA PROPOSITION 65 WARNING:

**▲WARNING** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## Pumps Not Operating or in Storage:

Pumps with carbon ceramic seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3

months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

## Pump:

The submersible pumps are supplied for three phase only and for 460 and 575 volts. Power cable is supplied with ground. Be sure ground wire is connected to a water pipe or ground stake.

## Power Cords:

The power cord and heat sensor seal failure cord are potted into the connection box cap. The cords must not be spliced.

**NOTE: Each cable has a green lead. This is the ground wire and must be grounded properly per NEC and/or local codes. Cords should be inspected for abnormal wear and replaced accordingly.**

## Overload Heaters:

If the Hydromatic electrical panel is not used, starters with 3 leg overload relay must be supplied on 3 phase pumps. Each leg is to have an identical heater sized in accordance with the nameplate amps on the motor housing. The amp draw on these submersible motors is slightly higher than a corresponding horsepower surface motor, so heaters must be sized by the nameplate rating. To adequately protect these windings with the appropriate heaters, consult the factory.

## Seal Failure Probes:

All hazardous location submersible pumps have two factory installed moisture detectors (seal failure probes). They are in a normally open series circuit, in the seal chamber. Under normal operating conditions, the

circuit remains open. If the lower seal leaks and moisture enters this chamber, the moisture would settle to the bottom of the chamber and will complete the circuit between the moisture detectors.

This circuit must be connected to a sensing unit and signaling device. This is supplied in a Hydromatic built control panel.

**NOTE: Failure to install such a device negates all warranties by Hydromatic.**

## Seal Failure:

An electrode probe is installed in the seal chamber so if any water enters the chamber through the first seal the electrode will be energized and a signal will be transmitted to the sensing unit at ground surface causing a red light to turn on. The electrode probe is installed in all units but the sensing unit is supplied at extra cost and must be ordered.

In operation the seal failure unit indicates only that there is some water in the seal chamber. The pump will continue to operate without damage but the seal should be checked immediately after failure is indicated.

The sensing unit is recommended on all installations as good insurance against motor failure.

## Heat Sensors —

### Standard Equipment:

All motors have heat sensor units embedded in the motor winding to detect excessive heat. The sensors automatically reset when motor cools to safe temperature.

The sensors are connected in series with the motor starter coil so that the starter is tripped if the heat sensor opens. The motor starter is equipped with overload heaters so all normal overloads are protected by the starter.

## Sump Level Control:

Sump level is controlled by Hydromatic float switch controls.

The float is held in position in the sump by a weight attached to the power cord above the float. The cord supports the float and is adjusted for height from the surface.

Duplex systems use three controls: one set at turn-off, one set at turn-on for one pump, and one set for turn-on for two pumps. Pumps alternate operation on each successive cycle.

Two pumps operate together only if sump level rises to the third or override control. The override control also brings on the second pump in case of failure of the first pump. The extra float is for alarm.

Triplex systems use four controls: one set at turn-off, one set at turn-on for one pump, one set at turn-on for two pumps, and one set at turn-on for three pumps. Pumps alternate each successive cycle.

Three pumps operate together only if sump level rises to the fourth control (second override). This control also brings on the third pump in case of failure of either or both of the first two pumps.

### **Alarm Controls:**

The alarm level is usually set above the override level so the alarm will signal only if the override level is exceeded. However, some engineers prefer to have the alarm level set below the override level as it is possible for one pump to fail and the other pump to operate on the override level with the sump level never reaching the alarm level. This is particularly true in cases of low inflow capacity.

### **Electrical Control Panel:**

Hydromatic electrical equipment is installed in a weatherproof NEMA 3R enclosure. The electrical equipment includes a main circuit breaker for each pump, a magnetic starter with overload protection for each

pump, an H-O-A switch and run light for each pump, an electric alternator and a transformer to provide appropriate control for control and circuit and alarms.

## **Installation Instructions**

### **Installing Pump in Sump:**

Before installing pump in sump, lay it on side and turn impeller manually. Impeller may be slightly stuck due to factory test water, so it must be broken loose with small bar or screwdriver in edge of vanes. After breaking loose, the impeller should turn freely.

Clean all trash and sticks from sump and connect pump to piping.

A check valve must be installed on each pump. A gate or plug valve in each pump discharge line is also recommended. This valve should be installed on the discharge side of the check valve so if it is necessary to service the check valve, the line pressure can be shut off.

### **NEMA IV Junction Box: (Optional)**

This must be used with 60 and above horsepower pumps and with all systems if the electrical control panel is to be set remote from the pumps. The Hydromatic NEMA 4 junction box is provided with compression connectors for sealing all wires. No sealing compound is needed to make connections waterproof.

Wiring diagrams are provided with the panel for making connections. The size wire to use from panel to sump depends on motor size and distance in feet.

Be sure each wire is checked so that a wrong connection will not be made. An ohmmeter or Megger can be used to check wire continuity.

### **Installing Float Switch Controls:**

The controls are supported by a mounting bracket that is attached to sump wall, cover, or to the NEMA 4 junction box. Cord snubbers are used to hold the cord in place. Control level can be changed at any time by loosening the snubber and readjusting cord height.

In either duplex or triplex systems, the bottom of the lower or turn-off control is set just above the top of volute, so that the volute will always be submerged during the pumping cycle. The second, or turn-on control, is set about 24 inches above the lower turn-off control.

More distance between turn-on and turn-off controls can be used, but sewage may become septic, and excessive solids may collect for the pump to handle. A frequent pumping cycle is recommended for best operation.

In a duplex system the third or override control is usually set about 6 inches above the one pump turn-on control.

In a triplex system the third or override control is usually set 24 inches above the one pump turn-on control, and the fourth or second override control is 24 inches higher.

If an alarm system is used, this control is usually set about 6 inches above the override control.

### **Making Electrical Connections:**

All electrical wiring must be in accordance with local codes, and only competent electricians should make the installations. Complete wiring diagrams are glued to the inside cover of the panel. All wires should be checked for grounds with an ohmmeter or Megger after the connections are made. *This is important, as one grounded wire can cause considerable trouble.*

## Heat Sensors and Seal Failure Connections:

Be sure heat sensor wires are connected in series with the starter coil. Connections are provided on the terminal strip.

## Pump Operations

### Starting System:

1. Turn H-O-A switch to Off position and then turn on main circuit breakers.
2. Open all discharge valves and allow water to rise in sump.
3. Turn H-O-A switch to Hand position on one pump and notice operation. If pump is noisy and vibrates, rotation is wrong. To change rotation, interchange any two line leads to motor 3 $\phi$  only. *Do not interchange main incoming lines.* If duplex system, check second pump in same manner.
4. Now set both H-O-A switches to Auto position and allow water to rise in sump until one pump starts. Allow pump to operate until level drops to turn-off point.
5. Allow sump level to rise to start other pump. Notice run lights on panel. Pumps should alternate on each successive cycle of operation.
6. Turn both H-O-A switches to Off position and allow sump to fill to the override control level.
7. Turn both switches to Auto position and both pumps should start and operate together until level drops to turn-off point.
8. Repeat this operation cycle several times before leaving job.
9. Check voltage when pumps are operating and check the amp draw of each pump. Check amps on each wire, as sometimes a high leg

will exist. One leg can be somewhat higher (5 to 10%) without causing trouble. For excessive amp draw on one leg, the power company should be consulted.

## Pump Maintenance

### Field Service on Hydromatic Hazardous Location Pumps:

If a Hydromatic hazardous location pump is used in a hazardous location, or if the pump is still in warranty, the pump must be returned to the factory for service or repaired at an authorized Factory Mutual Hydromatic service center. Charges will not be allowed if in warranty pump is not taken to an authorized Factory Mutual Hydromatic service center. This will ensure the integrity of the hazardous location rating of the pump and comply with our warranty requirements.

### Disconnecting Pump Cords:

If a Hydromatic hazardous location pump is to be removed from its location, the pump cords may be disconnected at control panel (on sump mounted control panels) and cord assembly taken with pump.

**CAUTION: If cord openings from sump to control panel are open, gases from sump could enter panel and an explosive condition could exist.**

### Replacing Cords:

The power cord and heat sensor - seal failure cord is potted into the connection box cap, forming the cord and cap assembly.

If cords require replacement due to damage or cords being too short, cord and cap assembly must be replaced as a complete assembly available from factory.

Check pump for proper rotation before returning to normal service.

### Motor:

As the motors are oil filled, no lubrication or other maintenance

is required.

Generally, these pumps give very reliable service, and can be expected to operate for many years on normal sewage pumping without failure.

### Field Service on Motor:

All submersible motors out of warranty can be serviced in the field by any reliable motor service shop. Any pump in warranty must be returned to the factory for service or repaired at an authorized Hydromatic service center. Charges will not be allowed if in warranty pump is not taken to an authorized Hydromatic service center.

When field service is performed on a pump, these instructions should be carefully followed.

### Replacing Stator:

1. If stator only is damaged, it may not be necessary to completely dismantle pump as stator and housing can be lifted from pump without disturbing seals or bearings.
2. Drain all oil from upper housing, remove drain plug in bottom of stator housing and remove plug in top of housing to allow air to enter.
3. After chamber is drained, remove hold-down bolts and lift off. Use care in lifting as the seal failure connecting wire must be disconnected before housing is completely removed.
4. Set assembly on bench and remove connection box. When box is lifted off, connection wires to motor will be exposed. These wires will probably be burned, but each wire is tagged with a metal marker giving wire number. Cut the wires.

If the leads to the connection box are burned, a complete new connection box with new wire must be used. The wires

are potted in with sealing compound and a new unit must be obtained from the factory.

5. The stator is held in the housing with a bolted-in retaining ring and prevented from rotating by a key.
6. Remove the retaining ring and socket head cap screw.
7. After ring is removed, turn housing upright and bump on hardwood blocks. This should jar the stator loose and allow it to drop out.
8. Thoroughly clean housing before replacing new stator. Replace stator and make all wire connections to the connection box before replacing housing on pump. This is important as leads must be tucked behind the windings by using hands up through rotor core.

**Do not tape leads as oil will deteriorate the tape and cause damage to stator and bearings.**

9. Check top bearing. If clean and does not turn rough, bearings can be reused and it is not necessary to completely dismantle pump to change bearings. If bearings are damaged with dirt or heat, they must be replaced.
10. Replace stator housing onto seal chamber and bolt in place. *Be sure seal failure wire is connected before housing is assembled.* Be sure back-off screws have been loosened so that parts can come metal to metal. Be sure O-ring seal has been replaced. If O-ring is nicked or cut, replace with new ones. This applies to all O-rings used in assembly.
11. After all leads are reconnected in the connection box, make a high voltage ground test on each wire. The only wire that should show ground is the green power lead and the

ground lead in the auxiliary control cable.

12. For safety, complete pump should be air checked under water for leaks. Lay pump on side for this oil filling with oil fill hole upright. Do not completely fill; leave oil about 1 inch below plug hole. Use only Hydromatic submersible oil in this chamber. Replace plug; use Permatex on threads. Install air valve in top plug opening of motor housing and charge housing with about 10 psi of air. Be sure air is dry. Do not use air line where water may be trapped in the line. Submerge complete unit under water and check for leaks.
13. Refill motor chamber with oil. Use Hydromatic special submersible oil. Fill chamber until oil covers top of the windings. Leave air space in the top for expansion. Use Permatex on plug threads.

#### **Replacing Seals and Bearings:**

1. Drain all oil from motor chamber and seal chamber as described.
2. Remove motor housing as described.
3. Remove bolts that hold seal chamber to pump housing. Use back-off screws to break loose. With hardwood block, tape end of impeller to loosen from shaft. When free, remove impeller from shaft.
4. Lift rotating assembly from pump case and place on bench.
5. **Impeller Removal:** Hold rotor and remove bolt and washer from impeller end of shaft, then thread bolt back into shaft. The impeller is keyed to the shaft, so by using a screwdriver on opposite sides behind the impeller, apply force then tap on the end of the bolt to break impeller loose from taper shaft. Remove impeller.

6. Remove key and pry on each side of shoulder of shaft sleeve to remove. Seal should come off with sleeve. If sleeve is not free, leave in place and push off when seal plate is removed.
  7. To remove seal plate take out socket head flat screws and using screws in back-off holes, pry plate loose. This will also force seal off if not already removed.
  8. Remove snap ring that holds upper seal. Pull seal if it is free. If not free, it can be forced off when shaft is removed.
  9. Set seal housing assembly in upright position and bump end of shaft on hardwood block. This will push the bearing from the housing and will force upper seal from shaft.
  10. Use bearing puller to remove bearings. Replace with new bearings. Press only on inner face of bearing when replacing. Pressing on outer face can damage the bearing.
- IMPORTANT** — *Do not use any of the old seal parts. Replace with all new seals.*
11. Thoroughly clean all castings before replacing seals. One grain of dirt between the seal faces can cause failure.
  12. Examine all O-Rings for nicks before reusing.
  13. Be sure key is in place in notch of shaft sleeve to prevent sleeve from turning.
  14. Use Loctite® on socket head locking screw in end of shaft.
  15. Before refilling chamber with oil, air test as described above and refill both chambers with oil.
  16. Always check all leads with high voltage or with Megger for grounds before operating the pump.

# Pump Troubleshooting

The following is a list of common problems and their probable causes.

## Pump will not start.

1. No power to the motor. Check for blown fuse or open circuit breaker.
2. Selector switch may be in the Off position.
3. Control circuit transformer fuse may be blown.
4. Overload heater on starter may be tripped. Push to reset.

## Pump will not start and overload heaters trip.

1. Turn off power and check motor leads with Megger or ohmmeter for possible ground.
2. Check resistance of motor windings. All 3 phases should show the same reading.
3. If no grounds exist and the motor windings check OK, remove pump from sump and check for clogged or blocked impeller.

## Pump operates with selector switch in Hand position but will not operate in Auto position.

1. This indicates trouble in the level control or the alternator relay.
2. Check control panel for trouble.

## Pump runs but will not shut off.

1. Pump may be air locked. Turn pump off and let set for several minutes, then restart.
2. Lower float control may be hung-up in the closed position. Check in sump to be sure control is free.
3. Selector switch may be in the Hand position.

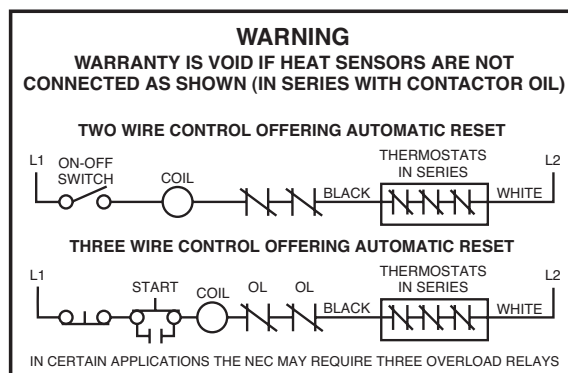
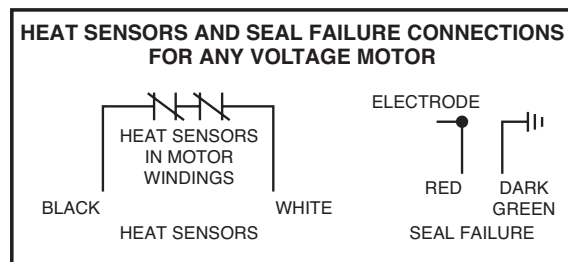
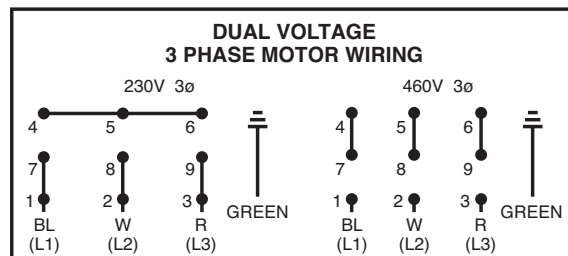
## Pump does not deliver proper capacity.

1. Discharge gate valve may be partially closed or partially clogged.
2. Check valve may be partially clogged. Raise the level up and down to clear.
3. Pump may be running in wrong direction. Low speed pumps can operate in reverse direction without much noise or vibration.
4. Discharge head may be too high. Check total head with gauge when pump is operating. Total head is discharge gauge pressure converted to feet plus vertical height from water level in sump to center line of pressure gauge in discharge line. Gauge should be installed on pump side of all valves. Multiply gauge pressure in pounds by 2.31 to get head in feet.

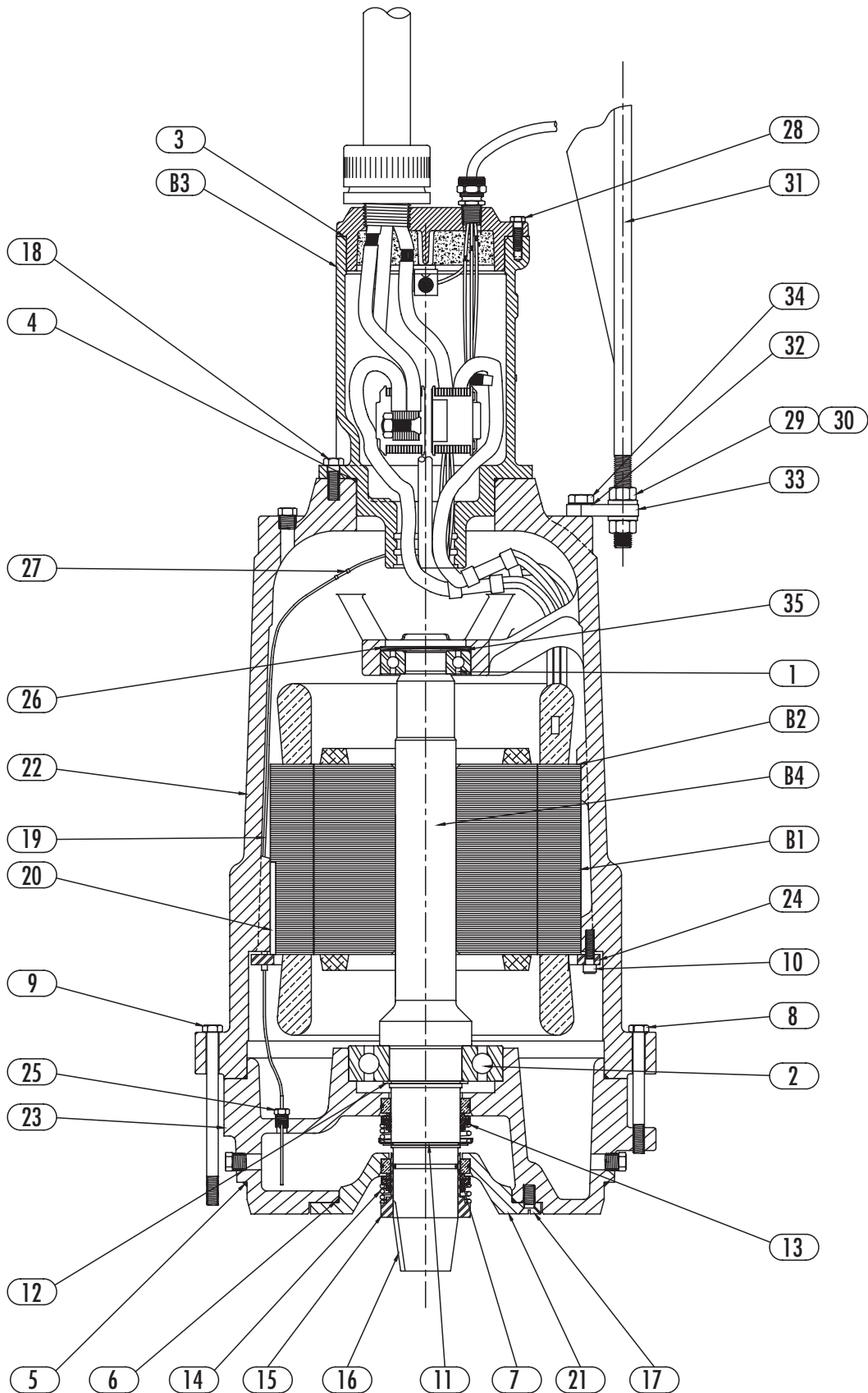
5. If pump has been in service for some time and capacity falls off, remove pump and check for wear or clogged impeller.

## Motor stops and then restarts after short period but overload heaters in starter do not trip.

1. This indicates heat sensors in the motor are tripping due to excessive heat. Impeller may be partially clogged, giving a sustained overload but not high enough to trip overload heater switch.
2. Motor may be operating out of liquid due to a failed level control.
3. Pump may be operating on a short cycle due to sump being too small or from water returning to sump due to a leaking check valve.



# Standard Location S4T, S8L, S8LA, S12L Motor End Components



# Standard Location S4T, S8L, S8LA, S12L Motor End Parts List

For use with product built with USEM motor.

Ref. No.	Part No.	Part Description	Qty.
1	08565A026	BEARING – BALL (UPPER)	1
2	000650231	BEARING – BALL (LOWER)	1
3	001500191	O-RING	1
4	001500321	O-RING	SC 1
5	001500381	O-RING	2
6	001500571	O-RING	1
7	001501081	O-RING (VITON®)	SC 1
8	002390351	SCREW – HHC 1/2-13 x 5-1/4	4
9	002390381	SCREW – HHC 1/2-13 x 7-1/4	12
10	005560071	SCREW – CAP (HEX SOC.)	6
11	009750141	RING – RETAINING	1
12	009750101	RING – RETAINING	1
13	037180051	SEAL Carbon Ceramic / Viton®	S 1

Ref. No.	Part No.	Part Description	Qty.
14	037180051	SEAL Carbon Ceramic / Viton®	S 1
	037180021	SEAL Tungsten Carbide / Viton®	C Optional
15	023100093	SLEEVE – SHAFT	SC 1
16	028550011	KEY – SQUARE 3/8	1
17	029210011	SCREW – CAP (FL. HD SOC)	4
18	19103A052	SCREW – CAP HEX SST 1/2	6
19	060000111	WIRE W/TERMINAL 14 GA. RED	1
20	065790021	KEY – SQUARE 1/4	1
21	073980002	HOUSING – SEAL	1
22	074000042	HOUSING – MOTOR	1
23	074011002	HOUSING – BEARING	1
24	083540003	RING – RETAINING STATOR	1
25	084720025	SEAL FAILURE ASS'Y	1

Ref. No.	Part No.	Part Description	Qty.
26	110650023	SCREEN 3.81 DIA.	1
27	12672A002	CONNECTOR – BUTT	3
28	19101A017	SCREW – CAP HEX SST 3/8	6
29	19109A080	NUT – HEX SST 3/4	4
30	05454A030	WASHER – LOCK 3/4	4
31	151753001	BAIL – LIFTING	1
32	05454A027	WASHER – LOCK 5/8	2
33	151740001	BRACKET – MOUNTING	2
34	19105A033	SCREW – CAP HEX SST 5/8	2
35	000640051	SPRING-BEARING 100 hp AND BELOW	2
		SPRING-BEARING 125 hp AND ABOVE	3
	517000687	Seal Kit	S
	517003687	Carbide Seal Kit	C

Notes: S – Parts in Seal Kit C – Parts in Carbide Seal Kit

Amount of oil required will vary between 8 and 10.5 gal. depending on stator size, fill to above motor windings.

hp	VOLTAGE/ ph/RPM	B1 STATOR	B2 RING – SPACER	B3 BOX – CONNECTION	B4 ROTOR/ SHAFT
15–20	200/3/870	141632031	086620121	137690035	141630125
15–20	230/3/870	141630031	086620121	137690065	141630125
15–20	460/3/870	141630031	086620121	137690075	141630125
15–20	575/3/870	141636031	086620121	137690045	141630125
25	200/3/870	141622031	086620091	137690025	141620125
25	230/3/870	141620031	086620091	137690055	141620125
25	460/3/870	141620031	086620091	137690075	141620125
25	575/3/870	141626031	086620091	137690045	141620125
30	200/3/870	141622031	086620091	137690015	141620125
30	230/3/870	141620031	086620091	137690055	141620125
30	460/3/870	141620031	086620091	137690075	141620125
30	575/3/870	141626031	086620091	137690045	141620125
30	200/3/1150	141612031	086620111	137690015	141610125
30	230/3/1150	141610031	086620111	137690055	141610125
30	460/3/1150	141610031	086620111	137690065	141610125
30	575/3/1150	141616031	086620111	137690035	141610125
40	200/3/1150	141612031	086620111	137690015	141610125
40	230/3/1150	141610031	086620111	137690015	141610125
40	460/3/1150	141610031	086620111	137690065	141610125
40	575/3/1150	141616031	086620111	137690035	141610125
50	230/3/1150	141600031	086620041	137690015	141600125
50	460/3/1150	141600031	086620041	137690055	141600125
50	575/3/1150	141606031	086620041	137690035	141600125
60	460/3/1150	141590031	086620031	137690025	141590125
60	575/3/1150	141596031	086620031	137690025	141590125
75	460/3/1150	141590031	086620031	137690015	141590125
75	575/3/1150	141596031	086620031	137690025	141590125
50	460/3/1750	141580031	086620031	137690025	141570125
50	575/3/1750	141586031	086620031	137690035	141570125
60	460/3/1750	141580031	086620031	137690025	141570125
60	575/3/1750	141586031	086620031	137690025	141570125
75	460/3/1750	141580031	086620031	137690015	141570125
75	575/3/1750	141586031	086620031	137690025	141570125
100	460/3/1750	141570031	086620031	137690015	141570125
100	575/3/1750	141576031	086620031	137690015	141570125
125	460/3/1750	141560031	—	137690015	141560125
125	575/3/1750	141566031	—	137690015	141560125
150	460/3/1750	141560031	—	137690085	141560125
150	575/3/1750	141566031	—	137690015	141560125



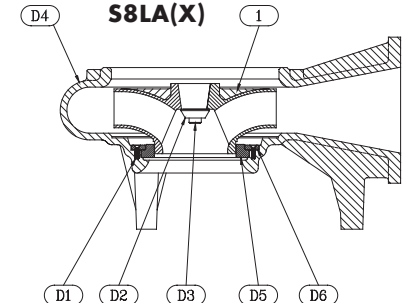
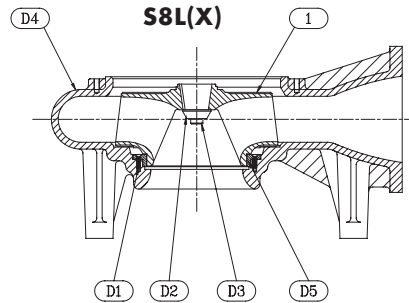
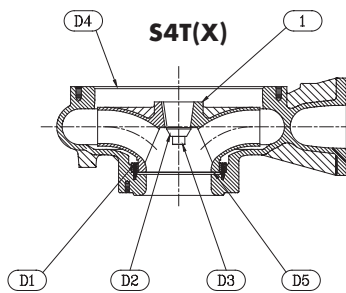
# Impeller Parts List / Cord Cap

For use with product built with USEM motor.

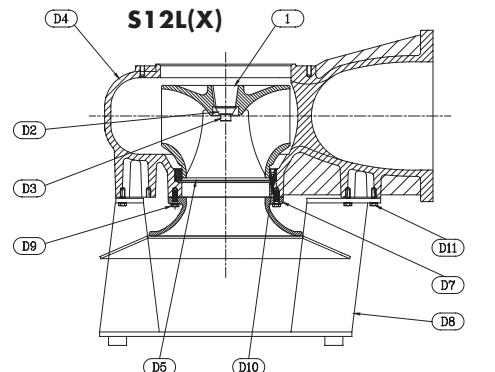
Description	hp	Volt/ph	Trim	Impeller	Cord Cap	Haz. Loc. Cord Cap
<b>S4T(X)</b>						
<b>1750 RPM</b>						
S4T7500M4-4	75	460/3	13	135321092	152760355	152790355
S4T7500M5-4	75	575/3	13	135321092	152760345	152790345
S4T10000M4-4	100	460/3	14	135321052	152760365	152790365
S4T10000M5-4	100	575/3	14	135321052	152760355	152790355
S4T12500M4-4	125	460/3	15	135321012	152760375	152790375
S4T12500M5-4	125	575/3	15	135321012	152760365	152790365
S4T15000M4-4	150	460/3	15.13	135321262	152760375	—
<b>S8L(X)</b>						
<b>1750 RPM</b>						
S8L7500M4-4	75	460/3	12.12x11.12	25252D559	152760355	152790355
S8L7500M5-4	75	575/3	12.12x11.12	25252D559	152760345	152790345
S8L10000M4-4	100	460/3	13x12	25252D558	152760365	152790365
S8L10000M5-4	100	575/3	13x12	25252D558	152760355	152790355
S8L12500M4-4	125	460/3	13.75x12.75	25252D556	152760375	152790375
S8L12500M5-4	125	275/3	13.75x12.75	25252D556	152760375	—
S8L15000M4-4	150	460/3	15x14	25252D551	152760375	—
S8L15000M5-4	150	575/3	15x14	25252D551	152760365	—
<b>1150 RPM</b>						
S8L3000M6-6	30	200/3	13x12	25252D558	152760355	152790355
S8L3000M3-6	30	230/3	13x12	25252D558	152760355	152790355
S8L3000M4-6	30	460/3	13x12	25252D558	152760325	152790325
S8L3000M5-6	30	575/3	13x12	25252D558	152760325	152790325
S8L4000M6-6	40	200/3	14.25x13.25	25252D553	152760365	152790365
S8L4000M3-6	40	230/3	14.25x13.25	25252D553	152760355	152790355
S8L4000M4-6	40	460/3	14.25x13.25	25252D553	152760335	152790335
S8L4000M5-6	40	575/3	14.25x13.25	25252D553	152760325	152790325
S8L5000M3-6	50	230/3	15x15	25252D551	152760365	—
S8L5000M4-6	50	460/3	15x15	25252D551	152760345	152790345
S8L5000M5-6	50	575/3	15x15	25252D551	152760335	152790335
S8L6000M4-6	60	460/3	15x15	25252D550	152760345	152790345
S8L6000M5-6	60	575/3	15x15	25252D550	152760335	152790335
<b>870 RPM</b>						
S8L1500M6-8	15	200/3	13.38x12.38	25252D557	152760335	152790335
S8L1500M3-8	15	230/3	13.38x12.38	25252D557	152760325	152790325
S8L1500M4-8	15	460/3	13.38x12.38	25252D557	152760315	152790315
S8L1500M5-8	15	575/3	13.38x12.38	25252D557	152760305	152790305
S8L2000M6-8	20	200/3	14.85x13.85	25252D552	152760335	152790335
S8L2000M3-8	20	230/3	14.85x13.85	25252D552	152760335	152790335
S8L2000M4-8	20	460/3	14.85x13.85	25252D552	152760325	152790325
S8L2000M5-8	20	575/3	14.85x13.85	25252D552	152760315	152790315
S8L2500M6-8	25	200/3	15x14	25252D550	152760345	152790345
S8L2500M3-8	25	230/3	15x14	25252D550	152760345	152790345
S8L2500M4-8	25	460/3	15x14	25252D550	152760325	152790325
S8L2500M5-8	25	575/3	15x14	25252D550	152760325	152790325
S8L3000M4-8	30	460/3	15x14	25252D550	152760325	—

Description	hp	Volt/ph	Trim	Impeller	Cord Cap	Haz. Loc. Cord Cap
<b>S8LA(X)</b>						
<b>1750 RPM</b>						
S8LA7500M4-4	75	460/3	13	135320052	152760355	152790355
S8LA7500M5-4	75	575/3	13	135320052	152760345	152790345
S8LA10000M4-4	100	460/3	14	135320012	152760365	152790365
S8LA10000M5-4	100	575/3	14	135320012	152760355	152790355
S8LA12500M4-4	125	460/3	15	135320092	152760375	152790375
S8LA12500M5-4	125	575/3	15	135320092	152760365	152790365
<b>S12L(X)</b>						
<b>1750 RPM</b>						
S12L7500M4-4	75	460/3	11x10	25456E562	152760355	152790355
S12L7500M5-4	75	575/3	11x10	25456E562	152760345	152790345
S12L10000M4-4	100	460/3	11.5x11	25456E563	152760365	152790365
S12L10000M5-4	100	575/3	11.5x11	25456E563	152760355	152790355
S12L12500M4-4	125	460/3	12.5x11	25456E564	152760375	152790375
S12L12500M5-4	125	275/3	12.5x11	25456E564	152760365	—
S12L15000M4-4	150	460/3	13x11	25456E565	152760375	—
S12L15000M5-4	150	575/3	13x11	25456E565	152760365	—
<b>1150 RPM</b>						
S12L4000M3-6	40	230/3	12.31	25456E560	152760355	152790355
S12L4000M4-6	40	460/3	12.31	25456E560	152760335	152790335
S12L4000M5-6	40	575/3	12.31	25456E560	152760325	152790325
S12L5000M3-6	50	230/3	13.06	25456E560	152760365	—
S12L5000M4-6	50	460/3	13.06	25456E555	152760345	152790345
S12L5000M5-6	50	575/3	13.06	25456E555	152760335	152790335
S12L6000M4-6	60	460/3	13.63	25456E553	152760345	152790345
S12L6000M5-6	60	575/3	13.63	25456E553	152760335	152790335
S12L7500M4-6	75	460/3	14	25456E552	152760355	152790355
S12L7500M5-6	75	575/3	14	25456E552	152760345	152790345
<b>870 RPM</b>						
S12L1500M6-8	15	200/3	12.25	25456E561	152760335	152790335
S12L1500M3-8	15	230/3	12.25	25456E561	152760325	152790325
S12L1500M4-8	15	460/3	12.25	25456E561	152760315	152790315
S12L1500M5-8	15	575/3	12.25	25456E561	152760305	152790305
S12L2000M6-8	20	200/3	13	25456E556	152760335	152790335
S12L2000M3-8	20	230/3	13	25456E556	152760335	152790335
S12L2000M4-8	20	460/3	13	25456E556	152760325	152790325
S12L2000M5-8	20	575/3	13	25456E556	152760315	152790315
S12L2500M6-8	25	200/3	13.5	25456E554	152760345	152790345
S12L2500M3-8	25	230/3	13.5	25456E554	152760345	152790345
S12L2500M4-8	25	460/3	13.5	25456E554	152760325	152790325
S12L2500M5-8	25	575/3	13.5	25456E554	152760325	152790325
S12L3000M6-8	30	200/3	14	25456E552	152760355	152790355
S12L3000M3-8	30	230/3	14	25456E552	152760345	152790345
S12L3000M4-8	30	460/3	14	25456E552	152760325	152790325
S12L3000M5-8	30	575/3	14	25456E552	152760325	152790325

## Wet End Components

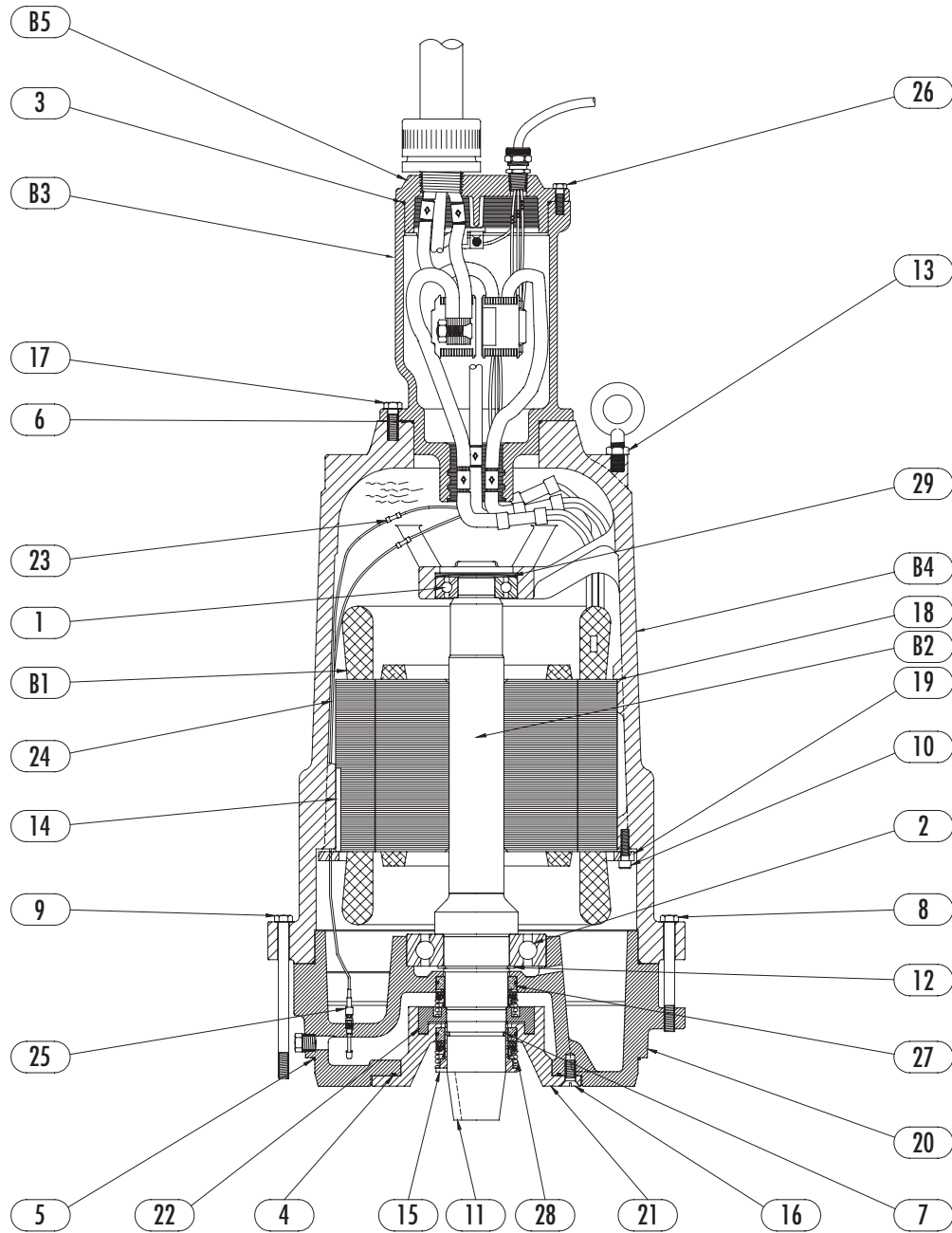


Item Number	Description	Part Number	S4T(X)	S8L(X)	S12L(X)	S8LA(X)
D1	SCREW – CAP	CHARTED	048200111 (4)	001780011 (4)	—	07597A021 (4)
D2	WASHER – IMPELLER HOLD	019450013	1	1	1	1
D3	SCREW – CAP	038790021	1	1	1	1
D4	CASE – VOLUTE	CHARTED	136880002	073942002	25457F200	073940002
D5	RING – WEAR	CHARTED	136950003	083450002	25458D000	135350003
D6	RING – CLAMP	CHARTED	—	—	—	135360003
D7	BELL – SUCTION	105871002	—	—	1	—
D8	STAND – PUMP S12L	106270005	—	—	1	—
D9	SCREW – CAP	19106A017	—	—	8	—
D10	SCREW – CAP SKT HD 1/4-20	06106A045	—	—	4	—
D11	SCREW – CAP SST	19103A043	—	—	8	—

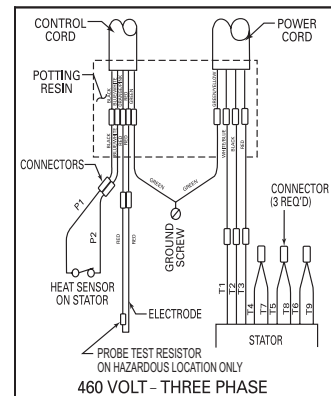
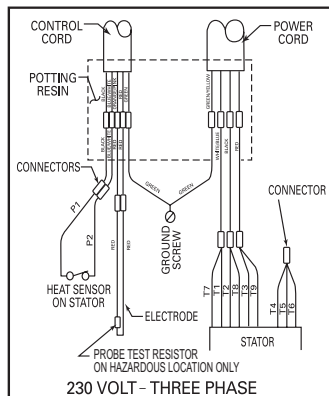
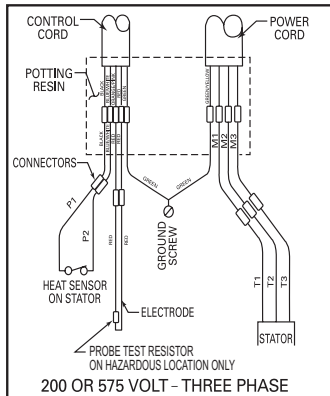


# Hazardous Location

## S4TX, S8LX, S8LAX, S12LX Motor End Components



### Wiring Diagrams



# Hazardous Location S4TX, S8LX, S8LAX, S12LX Motor End Parts List

For use with product built with USEM motor.

Ref. No.	Part No.	Part Description	Qty.
1	08565A026	BEARING-BALL (UPPER)	1
2	000650231	BEARING-BALL (LOWER)	1
3	001500191	O-RING 6.734 I.D.	1
4	001500211	O-RING 7.734 I.D.	1
5	001500381	O-RING 14.984 I.D.	2
6	001500421	O-RING 5.359 I.D.	1
7	001501081	O-RING 2.484 I.D.	1
8	002390241	SCREW-HHC 1/2-13	4
9	002390261	SCREW-HHC 1/2-13	12
10	005560071	SCREW-HEX SOC. 3/8 x 1-1/2	6
11	028550011	KEY-SQUARE 3/8	1

Ref. No.	Part No.	Part Description	Qty.
12	009750141	RING-RETAINING	1
13	011240021	NUT-HEX 5/8 (JAM)	2
14	065790021	KEY-SQUARE .250 SQ. x 3.88	1
15	023100103	SLEEVE-SHAFT SEAL	1
16	029210011	SCREW-CAP 1/2-13 x 1-1/4	4
17	19103A043	SCREW-CAP 1/2-13 x 1-1/2	6
18	074000042	HOUSING-MOTOR	1
19	083540003	RING-RETAINING STATOR	1
20	107460002	HOUSING-BEARING 100 hp AND BELOW	1
	107461002	HOUSING-BEARING 125 hp AND ABOVE	1
21	107560002	PLATE-SEAL	1

Ref. No.	Part No.	Part Description	Qty.
22	107820013	RING-LABYRINTH	1
23	108980001	CONNECTOR-BUTT	4
24	109000045	SEAL SENSOR ASS'Y	1
25	109010001	PROBE-SEAL FAILURE	1
26	19101A017	SCREW-CAP 3/8-16 x 1-1/4	6
27	037180051	SEAL Carbon Ceramic / Viton®	1
	037180021	SEAL Tungsten Carbide / Viton®	Optional
28	037180051	SEAL Carbon Ceramic / Viton®	1
	037180021	SEAL Tungsten Carbide / Viton®	Optional
29	000640051	SPRING-BEARING 100 hp AND BELOW	2
		SPRING-BEARING 125 hp AND ABOVE	3

Note: Amount of oil required will vary between 8 and 10-1/2 gals. depending on stator size, fill to above motor windings.

## 4-Pole 1750 RPM

Item	4-Pole 1750RPM Description	75hp 460/3/1750	75hp 575/3/1750	100hp 460/3/1750	100hp 575/3/1750	125hp 460/3/1750	125hp 575/3/1750
B1	Stator	141580031	141586031	141570031	141576031	141560031	141566031
B2	Rotor/Shaft Assembly	141580145	141580145	141580145	141580145	141560145	141560145
B3	Box-Connection	114110105	114110045	114110105	114110105	114110105	114110105
B5	Cord Cap	152790355	152790345	152790365	152790355	152790375	152790365

## 6-Pole 1150 RPM

Item	6-Pole 1150RPM Description	30hp 200/3/1150	30hp 230/3/1150	30hp 460/3/1150	30hp 575/3/1150	40hp 200/3/1150	40hp 230/3/1150	40hp 460/3/1150	40hp 575/3/1150	50hp 460/3/1150	50hp 575/3/1150	60hp 460/3/1150	60hp 575/3/1150	75hp 460/3/1150	75hp 575/3/1150
B1	Stator	141612031	141610031	141610031	141616031	141612031	141610031	141610031	141616031	141600031	141606031	141590031	141596031	141590031	141596031
B2	Rotor/Shaft Assembly	141610145	141610145	141610145	141610145	141610145	141610145	141610145	141610145	141600145	141600145	141590145	141590145	141590145	141590145
B3	Box-Connection	114110105	114110055	114110035	114110025	114110105	114110035	114110025	114110055	114110025	114110025	114110045	114110045	114110105	114110045
B4	Ring-Spacer	086620101	086620101	086620101	086620101	086620101	086620101	086620101	086620071	086620071	---	---	---	---	---
B5	Cord Cap	152790355	152790355	152790325	152790325	152790365	152790355	152790335	152790325	152790345	152790335	152790345	152790335	152790355	152790345

## 8-Pole 870 RPM

Item	8-Pole 870RPM Description	15hp 200/3/870	15hp 230/3/870	15hp 460/3/870	15hp 575/3/870	20hp 200/3/870	20hp 230/3/870	20hp 460/3/870	20hp 575/3/870	25hp 200/3/870	25hp 230/3/870	25hp 460/3/870	25hp 575/3/870
B1	Stator	141632031	141630031	141630031	141636031	141632031	141630031	141630031	141636031	141622031	141620031	141620031	141626031
B2	Rotor/Shaft Assembly	141630145	141630145	141630145	141630145	141630145	141630145	141630145	141630145	141620145	141620145	141620145	141620145
B3	Box-Connection	114110025	114110035	114110015	114110005	114110025	114110035	114110015	114110005	114110045	114110055	114110015	114110005
B4	Ring-Spacer	086620091	086620091	086620091	086620091	086620091	086620091	086620091	086620091	086620021	086620021	086620021	086620021
B5	Cord Cap	152790335	152790325	152790315	152790305	152790335	152790335	152790325	152790315	152790345	152790345	152790325	152790325

Item	8-Pole 870RPM Description	30hp 200/3/870	30hp 230/3/870	30hp 460/3/870	30hp 575/3/870
B1	Stator	141622031	141620031	141620031	141626031
B2	Rotor/Shaft Assembly	141620145	141620145	141620145	141620145
B3	Box-Connection	114110105	114110055	114110015	114110005
B4	Ring-Spacer	086620021	086620021	086620021	086620021
B5	Cord Cap	152790355	152790345	152790325	152790325

# STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

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Some states do not permit some or all of the above warranty limitations or the exclusion or limitation of incidental or consequential damages and therefore such limitations may not apply to you. No warranties or representations at any time made by any representatives of Pentair Hydromatic shall vary or expand the provision hereof.



## HYDROMATIC®

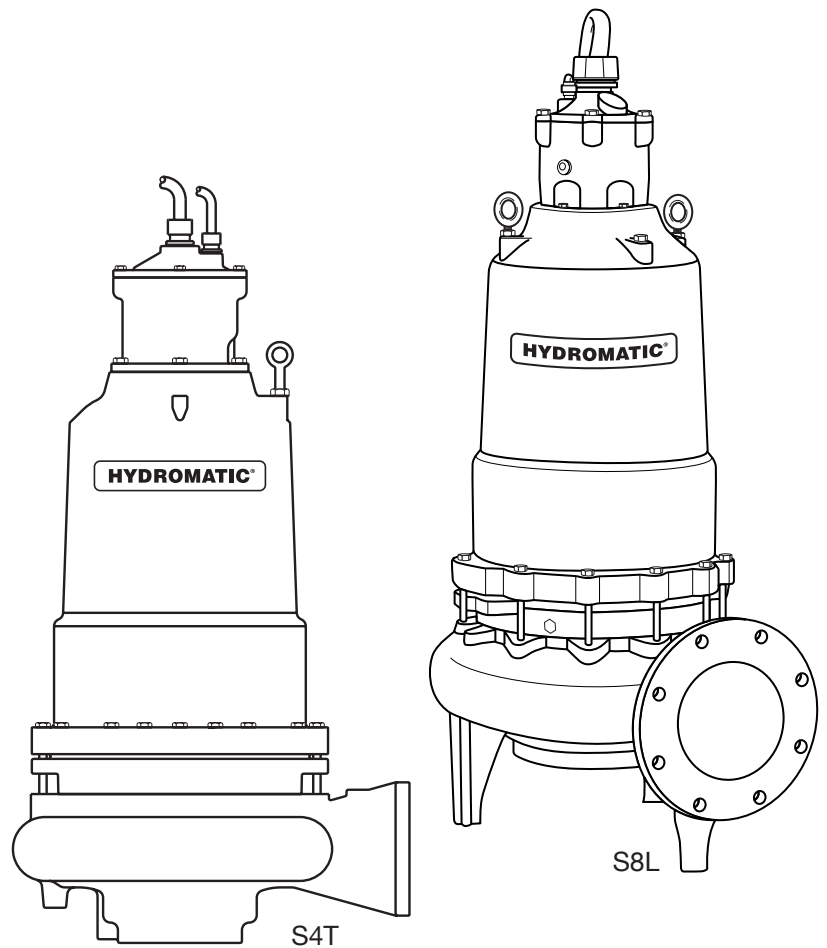
740 EAST 9TH STREET  
ASHLAND, OHIO, USA 44805  
419-289-1144

490 PINEBUSH ROAD, UNIT #4  
CAMBRIDGE, ONTARIO, CANADA N1T 0A5  
800-363-PUMP

[WWW.HYDROMATIC.COM](http://WWW.HYDROMATIC.COM)



**HYDROMATIC®**



# MODELS S4T, S8L, S8LA and S12L **SUBMERSIBLE SOLIDS HANDLING PUMPS**

## **INSTALLATION AND SERVICE MANUAL**

**For use with product built with GE® motor.**



NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

## General Information

Thank you for purchasing your Hydromatic® pump. To help ensure years of trouble-free operation, please read the following manual carefully.

### Before Operation:

Read the following instructions carefully. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

### Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often.

### Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

**WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.**

## CALIFORNIA PROPOSITION 65 WARNING:

**▲WARNING** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

### Pumps Not Operating or in Storage:

Pumps with carbon ceramic seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

### Pump:

The submersible pumps are supplied for three phase only and for 230, 460 or 575 volts. Power cable is supplied with ground. Be sure ground wire is connected to a water pipe or ground stake.

### Seal Failure:

An electrode probe is installed in the seal chamber so if any water enters the chamber through the first seal the electrode will be energized and a signal will be transmitted to the sensing unit at ground surface causing a red light to turn on. The electrode probe is installed in all units but the sensing unit is supplied at extra cost and must be ordered.

In operation the seal failure unit indicates only that there is some water in the seal chamber. The pump will continue to operate without damage but the seal should be checked immediately after failure is indicated.

The sensing unit is recommended on all installations as good insurance against motor failure.

### Heat Sensors— Standard Equipment:

All motors have heat sensor units embedded in the motor winding to detect excessive heat. The heat sensors are set to trip at 105°C, so will not operate unless dangerous heat occurs. The sensors automatically reset when motor cools to safe temperature.

The sensors are connected in series with the motor starter coil so that the starter is tripped if heat sensor opens. The motor starter is equipped with overload heaters so all normal overloads are protected by the starter.

### Sump Level Control:

Sump level is controlled by Hydromatic float switch controls. The float is held in position in the sump by a weight attached to the power cord above the float. The cord supports the float and is adjusted for height from the surface.

Duplex systems use three controls: one set at turn-off, one set at turn-on for one pump, and one set for turn-on for two pumps. Pumps alternate operation on each successive cycle.

Two pumps operate together only if sump level rises to the third or override control. The override control also brings on the second pump in case of failure of the first pump. The extra float is for alarm.

Triplex systems use four controls: one set at turn-off, one set at turn-on for one pump, one set at turn-on for two pumps, and one set at turn-on for three pumps. Pumps alternate each successive cycle.

Three pumps operate together only if sump level rises to the fourth control (second override). This control also brings on the third pump in case of failure of either or both of the first two pumps.

### **Alarm Controls:**

The alarm level is usually set above the override level so the alarm will signal only if the override level is exceeded. However, some engineers prefer to have the alarm level set below the override level as it is possible for one pump to fail and the other pump to operate on the override level with the sump level never reaching the alarm level. This is particularly true in cases of low inflow capacity.

### **Electrical Control Panel:**

Hydromatic electrical equipment is installed in a weatherproof NEMA 3R enclosure. The electrical equipment includes a main circuit breaker for each pump, a magnetic starter with overload protection for each pump, an H-O-A switch and run light for each pump, an electric alternator and a transformer to provide appropriate control for control and circuit and alarms.

## **Installation Instructions**

### **Installing Pump in Sump:**

Before installing pump in sump, lay it on side and turn impeller manually. Impeller may be slightly stuck due to factory test water, so it must be broken loose with small bar or screwdriver

in edge of vanes. After breaking loose, the impeller should turn freely.

Clean all trash and sticks from sump and connect pump to piping.

A check valve must be installed on each pump. A gate or plug valve in each pump discharge line is also recommended. This valve should be installed on the discharge side of the check valve so if it is necessary to service the check valve, the line pressure can be shut off.

### **NEMA IV Junction Box: (optional)**

This must be used with 60 and above horsepower pumps and with all systems if the electrical control panel is to be set remote from the pumps. The Hydromatic NEMA 4 junction box is provided with compression connectors for sealing all wires. No sealing compound is needed to make connections waterproof.

Wiring diagrams are provided with the panel for making connections. The size wire to use from panel to sump depends on motor size and distance in feet.

Be sure each wire is checked so that a wrong connection will not be made. An ohmmeter or Megger can be used to check wire continuity.

### **Installing Float Switch Controls:**

The controls are supported by a mounting bracket that is attached to sump wall, cover, or to the NEMA 4 junction box. Cord snubbers are used to hold the cord in place. Control level can be changed at any time by loosening the snubber and readjusting cord height.

In either duplex or triplex systems, the bottom of the lower or turn-off control is set just above the top of volute, so that the volute will always be submerged during the pumping cycle. The second, or turn-on control, is set about 24 inches above the lower turn-off control.

More distance between turn-on and turn-off controls can be used, but sewage may become septic, and excessive solids may collect for the pump to handle. A frequent pumping cycle is recommended for best operation.

In a duplex system the third or override control is usually set about 6 inches above the one pump turn-on control.

In a triplex system the third or override control is usually set 24 inches above the one pump turn-on control, and the fourth or second override control is 24 inches higher.

If an alarm system is used, this control is usually set about 6 inches above the override control.

### **Making Electrical Connections:**

All electrical wiring must be in accordance with local codes, and only competent electricians should make the installations. Complete wiring diagrams are glued to the inside cover of the panel. All wires should be checked for grounds with an ohmmeter or Megger after the connections are made. *This is important, as one grounded wire can cause considerable trouble.*

**IMPORTANT: If equipment is not properly wired and protected as recommended, the warranty is void.**

# Installation Instructions

## Heat Sensors and Seal Failure Connections:

Be sure heat sensor wires are connected in series with the starter coil. Connections are provided on the terminal strip.

# Pump Operations

## Starting System:

1. Turn H-O-A switch to Off position and then turn on main circuit breakers.
2. Open all discharge valves and allow water to rise in sump.
3. Turn H-O-A switch to Hand position on one pump and notice operation. If pump is noisy and vibrates, rotation is wrong. To change rotation, interchange any two line leads to motor 3Ø only. Do not interchange main incoming lines. If duplex system, check second pump in same manner.
4. Now set both H-O-A switches to Auto position and allow water to rise in sump until one pump starts. Allow pump to operate until level drops to turn-off point.
5. Allow sump level to rise to start other pump. Notice run lights on panel. Pumps should alternate on each successive cycle of operation.
6. Turn both H-O-A switches to Off position and allow

sump to fill to the override control level.

7. Turn both switches to Auto position and both pumps should start and operate together until level drops to turn-off point.
8. Repeat this operation cycle several times before leaving the job.
9. Check voltage when pumps are operating and check the amp draw of each pump. Check amps on each wire, as sometimes a high leg will exist. One leg can be somewhat higher (5 to 10%) without causing trouble. For excessive amp draw on one leg, the power company should be consulted.

As the motors are oil filled, no lubrication or other maintenance is required.

Generally, these pumps give very reliable service, and can be expected to operate for many years on normal sewage pumping without failure.

## Field Service on Motor:

Submersible motors out of warranty can be serviced in the field by any reliable motor service shop. Any pump in warranty must be returned to the factory for service or repaired at an authorized Hydromatic service center. Charges will not be allowed if in warranty pump is not

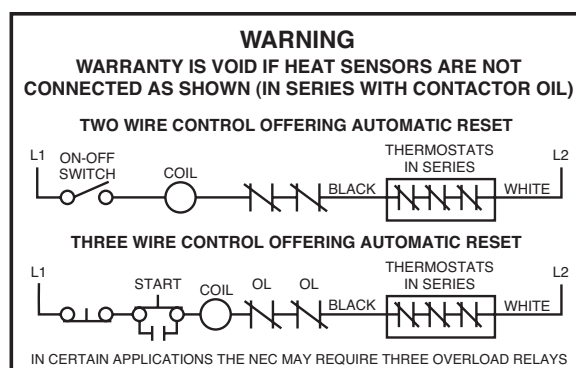
taken to an authorized Hydromatic service center.

When field service is performed on a pump, these instructions should be carefully followed.

## Replacing Stator:

1. If stator only is damaged, it may not be necessary to completely dismantle pump as stator and housing can be lifted from pump without disturbing seals or bearings.
2. Drain all oil from upper housing, remove drain plug in bottom of stator housing and remove plug in top of housing to allow air to enter.
3. After chamber is drained, remove hold-down bolts and lift off. Use care in lifting as the seal failure connecting wire must be disconnected before housing is completely removed.
4. Set assembly on bench and remove connection box. When box is lifted off, connection wires to motor will be exposed. These wires will probably be burned, but each wire is tagged with a metal marker giving wire number. Cut the wires.

If the leads to the connection box are burned, a complete new connection box with new wire must be used. The wires are potted in with sealing





compound and a new unit must be obtained from the factory.

5. The stator is held in the housing with a bolted-in retaining ring and prevented from rotating by a key.
6. Remove the retaining ring and socket head cap screw.
7. After ring is removed, turn housing upright and bump on hardwood blocks. This should jar the stator loose and allow it to drop out.
8. Thoroughly clean housing before replacing new stator. Replace stator and make all wire connections to connection box before replacing housing on pump. This is important as leads must be tucked behind the windings by using hands up through rotor core.

**Do not tape leads as oil will deteriorate the tape and cause damage to stator and bearings.**

9. Check top bearing. If clean and does not turn rough, bearings can be reused and it is not necessary to completely dismantle pump to change bearings. If bearings are damaged with dirt or heat, they must be replaced.
10. Replace stator housing onto seal chamber and bolt in place. Be sure seal failure wire is connected before housing is assembled. Be sure back-off screws have been loosened so that parts can come metal to metal. Be sure O-ring seal has been replaced. If O-ring is nicked or cut, replace with new ones. This applies to all O-rings used in assembly.
11. After all leads are reconnected in the connection box, make a high voltage ground test

on each wire. The only wire that should show ground is the green power lead and the ground lead in the auxiliary control cable.

12. For safety, complete pump should be air checked under water for leaks. Lay pump on side for this oil filling with oil fill hole upright. Do not completely fill; leave oil about 1 inch below plug hole. Use only Hydromatic submersible oil in this chamber. Replace plug; use Permatex on threads. Install air valve in top plug opening of motor housing and charge housing with about 10 psi of air. Be sure air is dry. Do not use air line where water may be trapped in the line. Submerge complete unit under water and check for leaks.
13. Refill motor chamber with oil. Use Hydromatic special submersible oil. Fill chamber until oil covers top of the windings. Leave air space in the top for expansion. Use Permatex on plug threads.

#### **Replacing Seals and Bearings:**

1. Drain all oil from motor chamber and seal chamber as described.
2. Remove motor housing as described.
3. Remove bolts that hold seal chamber to pump housing. Use back-off screws to break loose. With hardwood block, tape end of impeller to loosen from shaft. When free, remove impeller from shaft.
4. Lift rotating assembly from pump case and place on bench.
5. Impeller Removal: Hold rotor and remove bolt and washer from impeller end of shaft, then thread bolt back into shaft.

The impeller is keyed to the shaft, so by using a screwdriver on opposite sides behind the impeller, apply force then tap on the end of the bolt to break impeller loose from taper shaft. Remove impeller.

6. Remove key and pry on each side of shoulder of shaft sleeve to remove. Seal should come off with sleeve. If sleeve is not free, leave in place and push off when seal plate is removed.
7. To remove seal plate take out socket head flat screws and using screws in back-off holes pry plate loose. This will also force seal off if not already removed.
8. Remove snap ring that holds upper seal. Pull seal if it is free. If not free, it can be forced off when shaft is removed.
9. Set seal housing assembly in upright position and bump end of shaft on hardwood block. This will push the bearing from the housing and will force upper seal from shaft.
10. Use bearing puller to remove bearings. Replace with new bearings. Press only on the inner face of bearing when replacing. Pressing on outer face can damage the bearing.

**IMPORTANT—Do not use any of the old seal parts. Replace with all new seals.**

11. Thoroughly clean all castings before replacing seals. One grain of dirt between the seal faces can cause failure.
12. Examine all O-Rings for nicks before reusing.
13. Be sure key is in place in notch of shaft sleeve to prevent sleeve from turning.
14. Use Loctite® on socket head locking screw in end of shaft.

15. Before refilling chamber with oil, air test as described above and refill both chambers with oil.
16. Always check all leads with high voltage or with Megger for grounds before operating the pump.

## Pump Troubleshooting

Below is a list of common problems and the probable causes:

### Pump will not start.

1. No power to the motor. Check for blown fuse or open circuit breaker.
2. Selector switch may be in the Off position.
3. Control circuit transformer fuse may be blown.
4. Overload heater on starter may be tripped. Push to reset.

### Pump will not start and overload heaters trip.

1. Turn off power and check motor leads with Megger or ohmmeter for possible ground.
2. Check resistance of motor windings. All 3 phases should show the same reading.
3. If no grounds exist and the motor windings check OK, remove pump from sump and check for clogged or blocked impeller.

### Pump operates with selector switch in Hand position but will not operate in Auto position.

1. This indicates trouble in the level control or the alternator relay.
2. Check control panel for trouble.

### Pump runs but will not shut off.

1. Pump may be air locked. Turn pump off and let set for several minutes, then restart.
2. Lower float control may be hung-up in the closed position. Check in sump to be sure control is free.
3. Selector switch may be in the Hand position.

### Pump does not deliver proper capacity.

1. Discharge gate valve may be partially closed or partially clogged.
2. Check valve may be partially clogged. Raise level up and down to clear.
3. Pump may be running in wrong direction. Low speed pumps can operate in reverse direction without much noise or vibration.
4. Discharge head may be too high. Check total head with gauge when pump is operating. Total head is discharge gauge pressure converted to feet plus vertical height from water level in sump to center line of pressure gauge in discharge line. Gauge should be installed on pump side of all valves. Multiply gauge pressure in pounds by 2.31 to get head in feet.
5. If pump has been in service for some time and capacity falls off, remove pump and check for wear or clogged impeller.

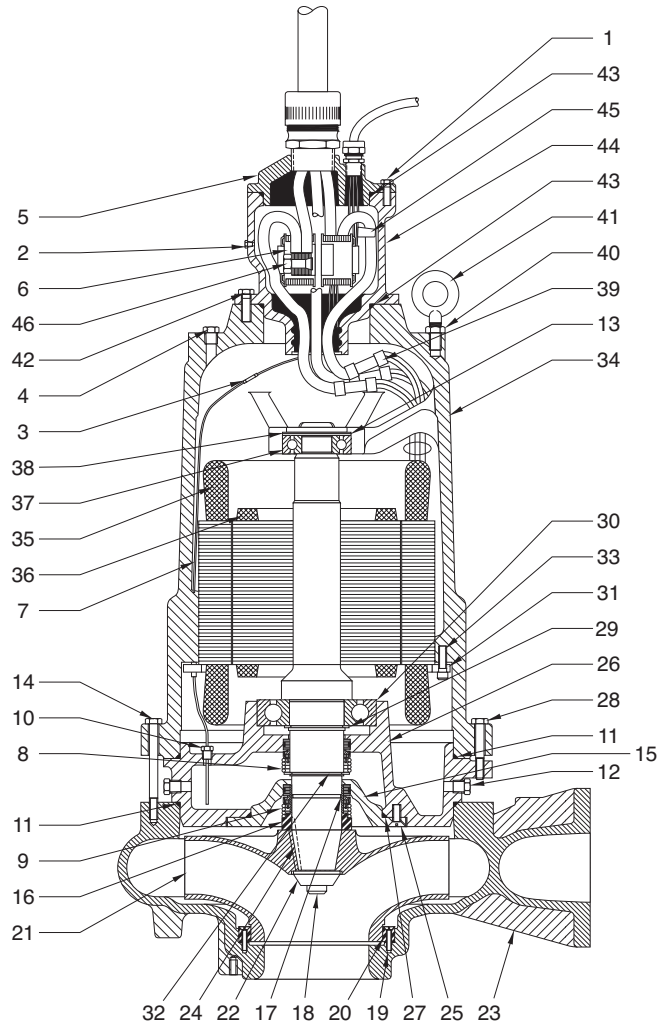
### Motor stops and then restarts after short period but overload heaters in starter do not trip.

1. This indicates heat sensors in the motor are tripping due to excessive heat. Impeller may be partially clogged giving a sustained overload but not high enough to trip overload heater switch.
2. Motor may be operating out of liquid due to a failed level control.
3. Pump may be operating on a short cycle due to sump being too small or from water returning to sump due to a leaking check valve.

# S4T Parts List

For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	00238-006-1	Capscrew	6
2	00087-004-1	1/8" Pipe Plug	1
3	00282-001-1	Wire Connector	3
4	01664-002-1	1/8" Pipe Plug Brz	1
5	RTF	Cord Assy.	1
6	02498-008-1	Split Bolt Connector	3
7	06000-011-1	Seal Failure Conn Wire	1
8	03718-005-1	Upper Seal	S 1
9	03718-005-1	Lower Seal, ceramic (std)	S 1
	03718-002-1	Lower Seal, carbide (opt)	C 1
10	08472-002-5	Seal Failure Probe	1
11	00150-038-1	O-Ring	SC 2
12	00924-003-1	1/2 Pipe Plug, brz	2
13	11065-002-3	Bearing Plate Screen	1
14	00239-035-1	1/2 Hex Hd Capscrew	12
15	07398-000-2	Seal Housing	1
16	02310-004-3	Seal Sleeve	SC 1
17	00150-108-1	O-Ring	SC 1
18	03879-002-1	Soc Hd Capscrew	1
19	00829-009-1	Machine Screw	4
20	13695-000-3	Wear Ring	1
21	13532-101-2	Impeller 15" Dia	1
	13532-105-2	Impeller 14" Dia	1
	13532-109-2	Impeller 13" Dia	1
22	01945-001-3	Impeller Washer	1
23	13688-000-2	Volute	1
24	02855-001-1	Impeller Key	1
25	02921-001-1	Flt Hd Soc Capscrew	4
26	07401-000-2	Bearing Housing	1
27	00150-057-1	O-Ring	SC 1
28	00239-024-1	Hex Hd. Capscrew	4
29	00975-014-1	Snap Ring	1
30	00065-023-1	Lower Bearing	1
31	08354-000-3	Stator Retaining Ring	1
32	00975-010-1	Snap Ring	1
33	00556-007-1	Soc. Hd Capscrew	6
34	07400-000-2	Motor Housing	1
35	RTF	Stator	1
36	RTF	Rotor w/shaft	1
37	00065-006-1	Upper Bearing	1
38	00064-005-1	Load Spring	2
39	11667-000-1	Connector	3
40	01124-002-1	5/8" Jam Nut	2
41	00589-004-1	5/8" Eyebolt	2
42	00239-005-1	Hex Hd Capscrew	6
43	00150-032-1	O-Ring	SC 2
44	08372-000-5	Conn Box	1
45	00557-000-1	Connector	3
46	08675-000-1	Insulator (split bolt)	3
	51700-068-7	Seal Kit	S 1
	51700-368-7	Carbide Seal Kit	C 1

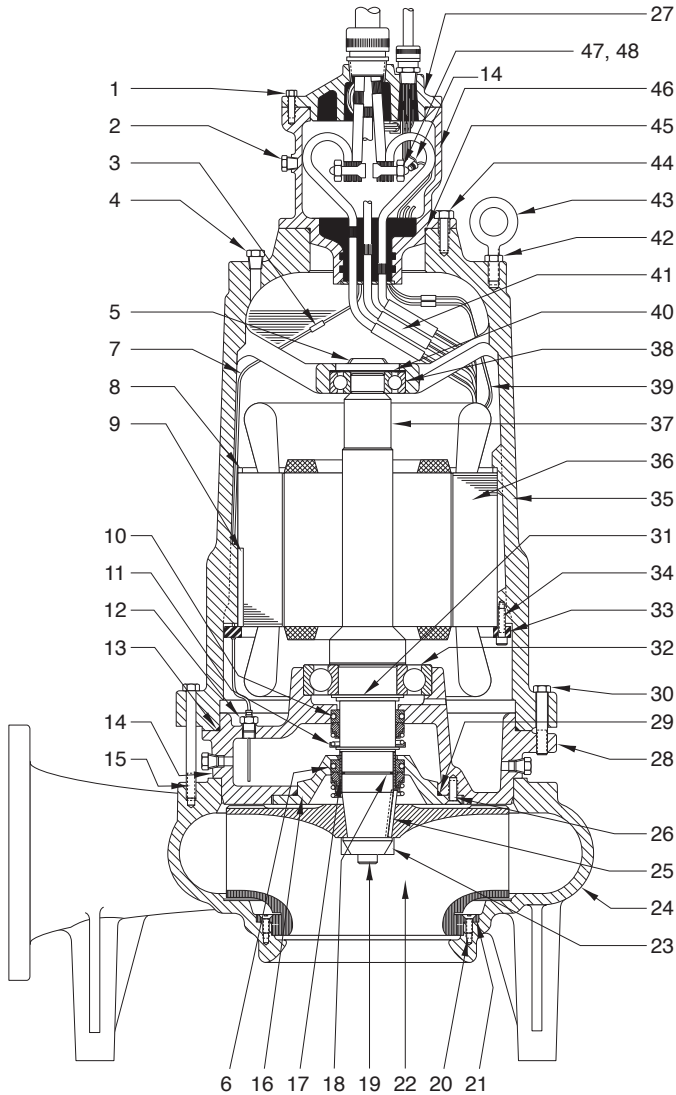


Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory  
 — Fill Oil to above the Motor Windings

# S8L Parts List

For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	00238-006-1	Hex Head Mach. Screw	6
2	14981-001-1	1/4" Pipe Plug	1
3	00282-001-1	Wire Connector	3
4	01664-008-1	3/8" Pipe Plug Br.	3
5	11065-002-3	Bearing Plate Screen	1
6	03718-005-1	(Carbon/Ceramic) Viton®	1
7	06000-011-1	Seal Failure Conn. Wire	1
8	08662-006-1	75 HP Spacer Ring	1
	08662-010-1	40 HP Spacer Ring	1
	08662-009-1	20 & 25 HP Spacer Ring	1
9	06579-002-1	Stator Locking Key	1
10	3718-005-1	Upper Seal	1
11	00975-010-1	Snap Ring	1
12	08472-002-5	Seal Failure Probe	1
13	00150-038-1	O-Ring	SC 2
14	00073-001-1	Wire Connector	3
15	00239-026-1	1/2" Hex Hd. Cap Screw	10
16	07398-000-2	Seal Housing	1
17	02310-002-3	Seal Sleeve	SC 1
18	00150-108-1	O-Ring	SC 1
19	03879-002-1	Soc. Hd. Capscrew	1
20	07597A021	Flt. Hd. Capscrew	4
21	08345-000-2	Wear Ring	1
22	07395-000-2	Impeller 15" x 15" Dia.	1
	07395-001-2	Impeller 15" x 14" Dia.	1
	07395-008-2	Impeller 14.85" x 13.85" Dia.	1
	07395-014-2	Impeller 14.25" x 13.25" Dia.	1
	07395-010-2	Impeller 13.75" x 12.75" Dia.	1
	07395-018-2	Impeller 13.37" x 12.37" Dia.	1
	07395-005-2	Impeller 13" x 12" Dia.	1
	07395-012-2	Impeller 12.13" x 11.13" Dia.	1
23	01945-001-3	Imp. Washer	1
24	07394-000-2	Volute Case	1
25	02855-001-1	Imp. Key	1
26	02921-001-1	Flt. Hd. Soc. Capscrew	4
27	RTF	Cord Assy.	1
28	07401-000-2	Bearing Housing	1
29	00150-057-1	O-Ring	SC 1
30	00239-024-1	Hex Hd. Capscrew	4
31	00975-014-1	Snap Ring	1
32	00065-023-1	Lower Bearing	1
33	08354-000-3	Stator Retaining Ring	1
34	00556-007-1	Soc. Hd. Capscrew	6
35	07400-000-2	Motor Housing	1
36	RTF	Stator	1
37	RTF	Rotor w/Shaft	1
38	00065-006-1	Upper Bearing	1
39	09176-000-1	Wire Sleeve	3 Ft.
40	00064-005-1	Load Spring	2
41	11667-000-1	Elec. Conn. 30-125 HP	3
	01006-001-1	Elec. Conn. 15-25 HP 575V	3
42	01124-002-1	5/8" Jam Nut	2
43	00589-004-1	5/8" Eye Bolt	2
44	00239-005-1	Hex Hd. Capscrew	6
45	00150-032-1	O-Ring	SC 2



Ref. No.	Part No.	Part Description	Qty.
46	08372-000-5	Conn. Box Assy. 60-125 HP & 30 HP 230V	1
	08372-001-5	Conn. Box Assy. 30-40 HP & 50 HP 575V	1
	08372-002-5	Conn. Box Assy. 15-25 HP 575V	1
	08372-003-5	Conn. Box Assy. 15-25 HP 230/460V	1
	08372-004-5	Conn. Box Assy. 50 HP 230/460V	1
47	02494-000-1	Cord Nut 20-25 HP 460/575V	3
	00853-000-1	Cord Nut 15 HP 460V	6
	00853-000-1	Cord Nut 15 HP 575V 20-25 HP 460V	3

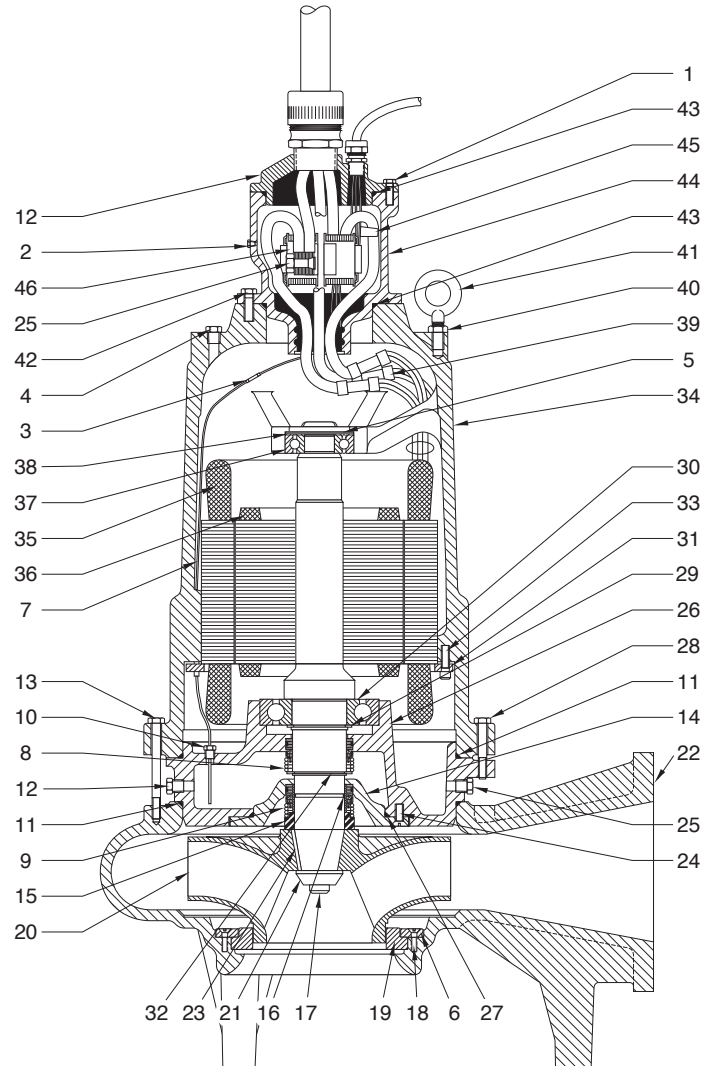
Ref. No.	Part No.	Part Description	Qty.
	02494-000-1	Cord Nut 15-25 HP 230V	4
	02498-008-1	Split Bolt Conn. 100-125 HP 30 HP 200V	3
	02498-007-1	Split Bolt Conn. 60-75 HP 30 HP 230V	3
	02498-005-1	Split Bolt Conn. 30-50 HP 460/575V	3
48	08675-000-1	Insulator (Split Bolt)	3
	03718-002-1	Lower Seal (Carbide) Optional	C 1
	51700-020-7	Seal Kit	
	51700-320-7	Carbide Seal Kit	

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory  
 — Fill Oil to above the Top of Motor Windings

# S8LA Parts List

For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	00238-006-1	Capscrew	6
2	14891-001-1	1/4" Pipe Plug	1
3	00282-001-1	Wire Connector	3
4	01664-008-1	3/8" Pipe Plug Brz	3
5	11065-002-3	Bearing Plate Screen	2
6	13536-000-3	Clamp Ring	1
7	06000-011-5	Seal Failure Conn Wire	1
8	03718-000-1	Upper Seal	S 1
9	03718-000-1	Lower Seal, ceramic (std)	S 1
	03718-001-1	Lower Seal, carbide (opt)	C 1
10	08472-002-5	Seal Failure Probe	1
11	00150-038-1	O-Ring	SC 2
12	RTF	Cord Assy.	1
13	00239-035-1	1/2 Hex Hd Capscrew	12
14	07398-000-2	Seal Housing	1
15	02310-004-3	Seal Sleeve	SC 1
16	00150-108-1	O-Ring	SC 1
17	03879-002-1	Soc Hd Capscrew	1
18	04756-005-1	Machine Screw	4
19	13535-000-3	Wear Ring	1
20	13532-009-2	Impeller 15" Dia	1
	13532-001-2	Impeller 14" Dia	1
	13532-005-2	Impeller 13" Dia	1
21	01945-001-3	Impeller Washer	1
22	07394-000-2	Volute	1
23	02855-001-1	Impeller Key	1
24	02921-001-1	Flt Hd Soc Capscrew	4
25	02498-008-1	Split Bolt Connector	3
26	07401-000-2	Bearing Housing	1
27	00150-057-1	O-Ring	SC 1
28	00239-024-1	Hex Hd. Capscrew	4
29	00975-014-1	Snap Ring	1
30	00065-023-1	Lower Bearing	1
31	08354-000-3	Stator Retaining Ring	1
32	00975-010-1	Snap Ring	1
33	00556-007-1	Soc. Hd Capscrew	6
34	07400-000-2	Motor Housing	1
35	RTF	Stator	1
36	RTF	Rotor w/shaft	1
37	00065-006-1	Upper Bearing	1
38	00064-005-1	Load Spring	2
39	11667-000-1	Connector	3
40	01124-002-1	5/8" Jam Nut	2
41	00589-004-1	5/8" Eyebolt	2
42	00239-005-1	Hex Hd Capscrew	6
43	00150-032-1	O-Ring	2
44	08372-000-5	Conn Box	1
45	00557-000-1	Connector	3
46	08675-000-1	Insulator (split bolt)	3
	51700-068-7	Seal Kit	S 1
	51700-368-7	Carbide Seal Kit	C 1

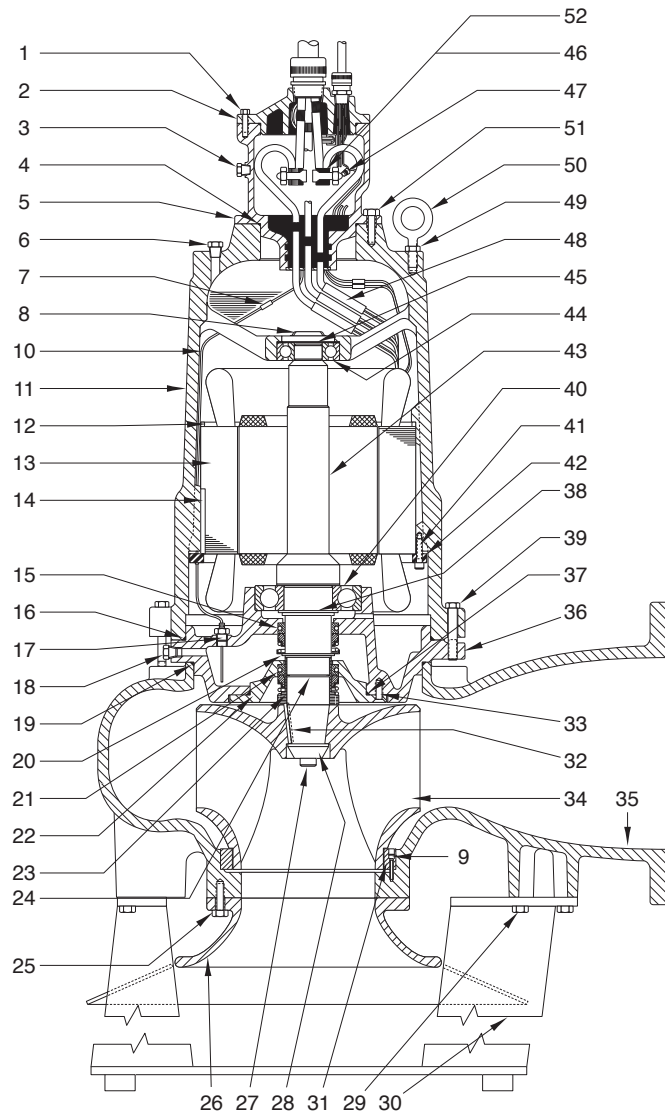


Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory  
 — Fill Oil to above the Top of Motor Windings

# S12L Parts List

For use with product built with GE® motor.

Ref. No.	Part No.	Part Description	Qty.
1	00238-006-1	Hex Head Cap Screw	6
2	RTF	Cord Cap Assy.	1
3	14981-001-1	Pipe Plug	1
4	00150-001-1	O-Ring	SC 2
5	08372-000-5	Conn. Box Assy. 60-80 HP 460 & 575V	1
	08372-004-5	Conn. Box Assy. 5-30 HP 230/460V 50 HP 460V	1
	08372-001-5	Conn. Box Assy. 30-40 HP 460V 35HP 230V 40-50 HP 575V	1
	08372-002-5	Conn. Box Assy. 15-30 HP 575V	1
	08372-003-5	Conn. Box Assy. 15-20 HP 230/460V	1
6	01664-002-1	Pipe Plug	3
7	00282-001-1	Wire Connector	3
8	11065-002-3	Bearing Screen	1
9	00517-010-1	Capscrew	3
10	06000-011-1	Wire w/Terminal	1
11	07400-000-2	Motor Housing	1
12	08662-009-1	Spacer Ring 15-20 HP	1
	08662-002-1	Spacer Ring 25-35 HP	1
	08662-010-1	Spacer Ring 40 HP	1
	08662-007-1	Spacer Ring 50 HP	1
13	RTF	Stator	1
14	06579-002-1	Stator Locking Key	1
15	03718-005-1	Shaft Seal (Carbon - Ceramic)	SC 1
16	00150-038-1	O-Ring	SC 1
17	08472-002-5	Seal Failure Assy.	1
18	00239-023-1	Capscrew	10
19	00150-028-1	O-Ring	SC 1
20	00975-010-1	Snap Ring	1
21	03718-005-1	Shaft Seal (Carbon - Ceramic)	SC 1
	03718-002-1	Shaft Seal (Carbide) Optional	C 1
22	07398-000-2	Seal Housing	1
23	02310-004-3	Shaft Sleeve	SC 1
24	00150-108-1	O-Ring	SC 1
25	00239-007-1	Capscrew	8
26	10587-000-2	Suction Bell	1
27	03879-002-1	Capscrew	1
28	01945-001-3	Impeller Washer	1
29	00239-016-1	Capscrew	8
30	10627-000-5	Pump Stand	1
31	10260-001-3	Wear Ring	1
32	02855-001-1	Impeller Key	1
33	02921-001-1	Flat Head Screw	4
34	10161-005-2	Impeller 14" Dia.	1
	10161-008-2	Impeller 13.63" Dia.	1
	10161-002-2	Impeller 13.50" Dia.	1
	10161-007-2	Impeller 13.06" Dia.	1
	10161-003-2	Impeller 13" Dia.	1
	10161-014-2	Impeller 12.31" Dia.	1
	10161-004-2	Impeller 12.25" Dia.	1
35	10160-001-5	Volute w/Wear Ring	1
36	10159-000-2	Bearing Housing	1
37	00150-057-1	O-Ring	SC 1
38	00975-014-1	Snap Ring	1



Ref. No.	Part No.	Part Description	Qty.
39	00239-024-1	Capscrew	4
40	00065-023-1	Lower Bearing	1
41	00556-007-1	Capscrew	6
42	08354-000-3	Stator Retaining Ring	1
43	RTF	Rotor w/Shaft	1
44	00065-006-1	Bearing	1
45	00064-005-1	Bearing Load Spring	2
46	08675-000-1	Split Bolt Insulator	3
47	00073-001-1	Wire Connector	3
48	01006-001-1	Splice Connector 15-20 HP	9
	11667-000-1	Splice Connector 25-80 HP	3

Ref. No.	Part No.	Part Description	Qty.
49	01124-002-1	Jam Nut	2
50	00589-004-1	Eye Bolt	2
51	00239-005-1	Capscrew	6
52	02494-000-1	Wire Connector 15-25 HP	4
	02498-005-1	Split Bolt Conn. 30-40 HP	3
	02498-007-1	Split Bolt Conn. 50-60 HP	3
	02498-008-1	Split Bolt Conn. 75-80 HP	3
	51700-021-7	Seal Kit	
	51700-321-7	Carbide Seal Kit	
	RTF	Impeller Kit	
	RTF	Rebuild Kit	

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit RTF — Refer To Factory  
 — Fill Oil to above the Top of Motor Windings

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## STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

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**Liability Limitation: IN NO EVENT SHALL PENTAIR HYDROMATIC BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY PENTAIR HYDROMATIC PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. PENTAIR HYDROMATIC DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION. PENTAIR HYDROMATIC RECOMMENDS INSTALLATION BY PROFESSIONALS.**

Some states do not permit some or all of the above warranty limitations or the exclusion or limitation of incidental or consequential damages and therefore such limitations may not apply to you. No warranties or representations at any time made by any representatives of Pentair Hydromatic shall vary or expand the provision hereof.



### HYDROMATIC®

740 EAST 9TH STREET  
ASHLAND, OHIO, USA 44805  
419-289-1144

490 PINEBUSH ROAD, UNIT #4  
CAMBRIDGE, ONTARIO, CANADA N1T 0A5  
800-363-PUMP

[WWW.HYDROMATIC.COM](http://WWW.HYDROMATIC.COM)