

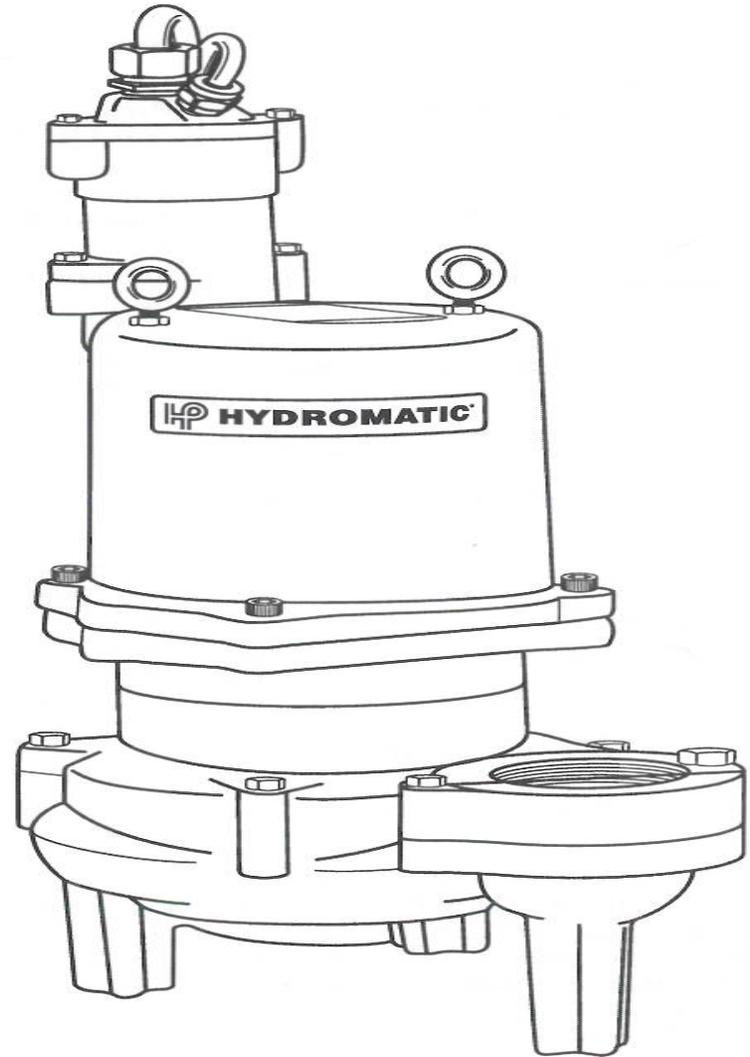
• HYDROMATIC®

S3HX

Explosion Proof Submersible

(Class I, Division 1, Group D): UL

(Class I, Division 1, Group C & D): FM



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

General Information

Thank you for purchasing your HYDROMATIC Pump. To help insure 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.

Pump:

The explosion proof submersible pump family was designed in accordance with requirements for hazardous locations. These pumps, connected properly, will provide years of trouble free service. If servicing is required, the repair should be done by a HYDROMATIC approved service center.

Pumps In Storage Or Not Operating:

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 startup.

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 startup.

Seal Failure Probes:

All explosion proof 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 (UL listed system has a continuity test circuit). This is supplied in a HYDROMATIC built control panel.

NOTE: Failure to install such a device negates all warranties by HYDROMATIC pumps.

Heat Sensors:

All motors in this family have heat sensors on or embedded in the motor winding to detect excessive heat. This prevents damage to the motor. If sensor trips due to excessive winding temperature, starter in panel breaks power to the pump. Once sensor resets, the starter is to be (manually reset for UL; automatic reset for FM) for continued operation of the pump. This circuitry is supplied in a HYDROMATIC control panel.

The sensors are set to trip at 120°C (248°F).

NOTE: Failure to install such circuitry would negate UL and FM approvals and all warranties by HYDROMATIC pumps.

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 N.E.C. 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.

Single phase pumps with capacitor start have a run and a start winding each drawing a different current. To adequately protect these windings with the appropriate heaters, consult the factory.

NOTE: Red lead is always start winding of pump using single phase.

Pump Installation

Installing Sump Level Control Float Controls:

In either simplex, duplex or triplex systems the lower or turn-off control is to be set to maintain a minimum level in the sump. This level shall be no more than 3/4" from the top of the motor housing down to the surface of the sewage.

The second or turn-on control is set above the lower turn-off control. The exact distance between the two floats must be a compromise between a frequent pumping cycle (10 starts per hour max.) to control septicity, solids and a slower cycle for energy economy. This distance should be determined by the engineer or consulting engineer depending on the conditions of the application.

For installation of HYDROMATIC supplied level controls refer to your systems installation and service manual.

Installing Pump In Sump:

Before installing pump in sump lay it on side and rotate impeller. 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. The impeller should turn freely. *Do*

not connect the power until after this test.

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 is highly recommended. This valve should be installed on the discharge side of the check valve so if necessary to service the check valve the line pressure can be cut off. Single pump systems are sometimes installed without a check valve where it is desirable to self-drain the discharge line to prevent freezing. This can be done only with short discharge lines; otherwise water will return to the sump and cause short cycling of the pump.

Making Electrical Connections:

All electrical wiring must be in accordance with local code, and only qualified electricians should make the installations. Complete wiring diagrams are included for use in making the installation. All wires should be checked for shorts to ground 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, HYDROMATIC warranty is void. See Page 5/6.

Heat Sensor And Seal Failure Connections:

If a HYDROMATIC control panel is used, terminal blocks are provided for heat sensor, seal failure connections (See Panel Schematic). If a control panel is supplied by others, it must allow heat sensor and seal failure terminations.

Pump Operations

Starting System:

1. Double check all wire connections.
2. Turn pumps to "off" position on H.O.A. switches.
3. Turn on breakers.
- 4A. When using single phase pumps make sure red pump lead is connected to capacitor circuit, connect amprobe to pump power cord and turn pump on. Pump will show high amp draw momentarily, then as pump comes off start wirings, amps will drop to normal nameplate amps.
- 4B. When using three phase pumps (230/460/575).
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 pump. Do not interchange main incoming lines. Check rotation of all pumps in this same manner.
5. 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.
6. Allow sump level to rise to start other pump(s). Notice run lights to panel. Pumps should alternate on each successive cycle of operation.
7. Turn both H-O-A switches to "off" position and allow sump to fill to the override control level(s).
8. Turn switches to auto position, and pumps should start and operate together until level

Pump Operations

drops to turn-off point.

9. Repeat this operation cycle several times before leaving job.
10. 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 by 5 to 10 percent without causing trouble. For excessive amp draw on one leg, the electric utility company should be consulted.

Pump Maintenance

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

If the heat sensor and seal failure are hooked up properly, no attention is necessary as long as the seal failure indicator light doesn't come on. To insure continuity of the seal sensor leads, a test light is provided on intrinsically safe HYDROMATIC panels as standard equipment.

Pump should be checked every quarter for corrosion and wear.

Servicing Instructions:

IMPORTANT: Read all directions before replacing any parts.

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.

Field Service On Hydromatic Explosion Proof Pumps:

If a HYDROMATIC explosion proof 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 in an authorized HYDROMATIC Service Center. Charges will not be allowed if (in warranty) pump is taken to a motor repair shop that is not an authorized HYDROMATIC Service Center. This will insure the integrity of the hazardous location rating of the pump and comply with our warranty requirements. Pumps out of warranty and not used in a hazardous location can be field serviced by any reputable serviceman. When any field servicing is performed on a pump, the following instructions should be followed carefully.

Disconnecting Pump Cords:

If a HYDROMATIC explosion proof pump is to be removed from its location, one of two ways may be used to disconnect the pump cords from the rest of the system.

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 explosion condition could exist.

Pump cords may be disconnected at pump by removing the cord and cap assembly, unplugging sensor wires, and removing wire nuts.

After removal from pump, reinstall wire nuts in cord and cap assembly and install protective cover. (HYDROMATIC Kit 11159-000-1)

CAUTION: Do not reconnect power to a cord and cap assembly while removing from pump.

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.

1. Remove cord and cap assembly from connection box.
2. Disconnect wires taking note of color/number coding.
3. Connect wires of new cord and cap assembly in same manner as old one was removed.
4. Check for moisture and dryout.
5. Reinstall cord and cap assembly on connection box taking care not to pinch wires.
6. Check pump for proper rotation before returning to normal service.

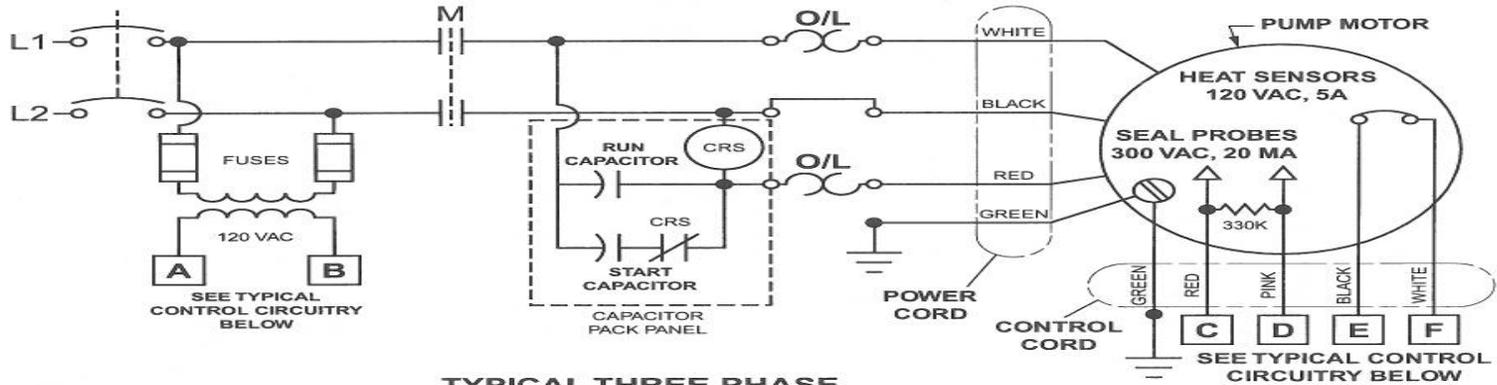
Replacing Stator:

If motor winding is burned or shorted, it can be rewound or replaced with new factory wound stator. Refer to sectional drawing of pump and motor, and use the following steps to remove and replace stator.

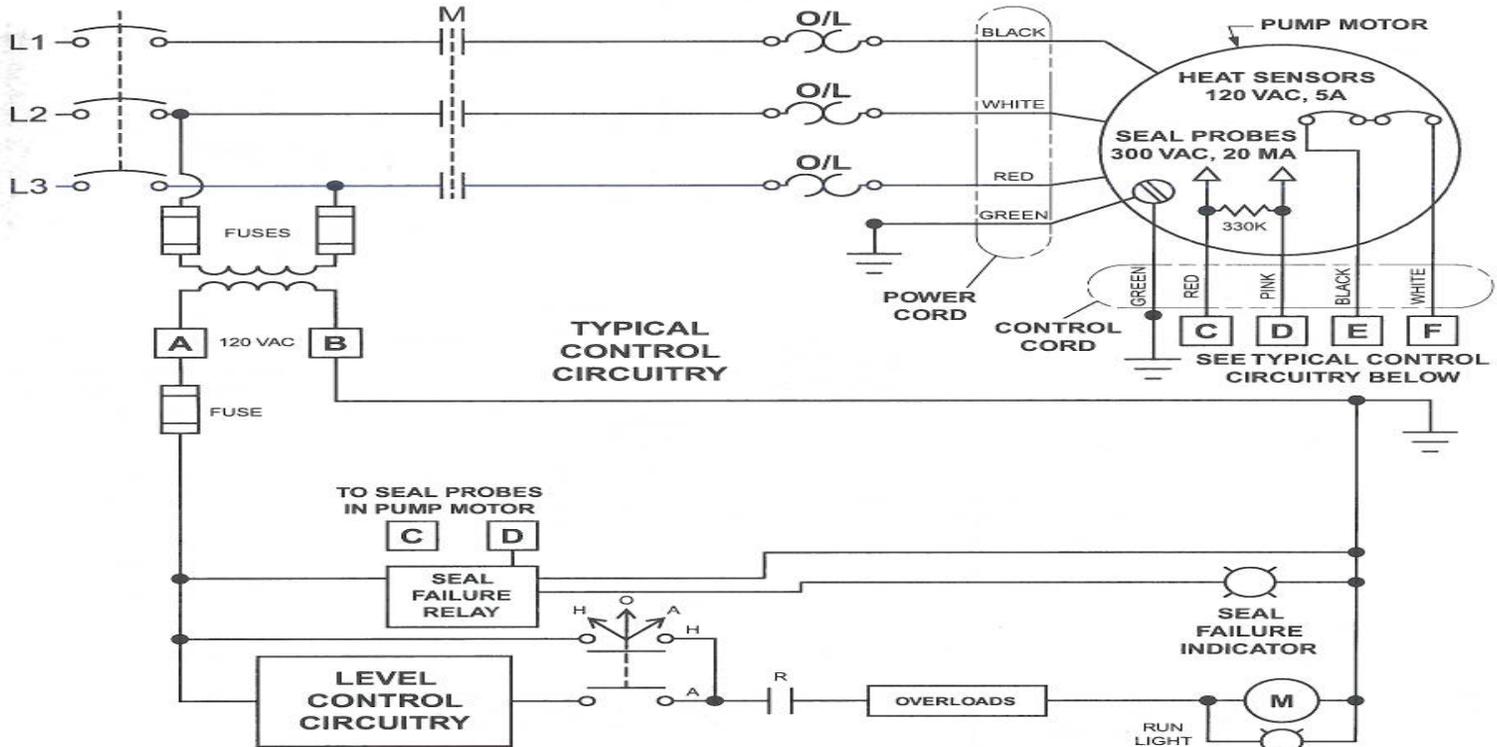
1. If only the stator is damaged, it may not be necessary to completely dismantle pump as stator and housing can be

TYPICAL FM ONLY SCHEMATICS

TYPICAL SINGLE PHASE MOTOR CONNECTIONS



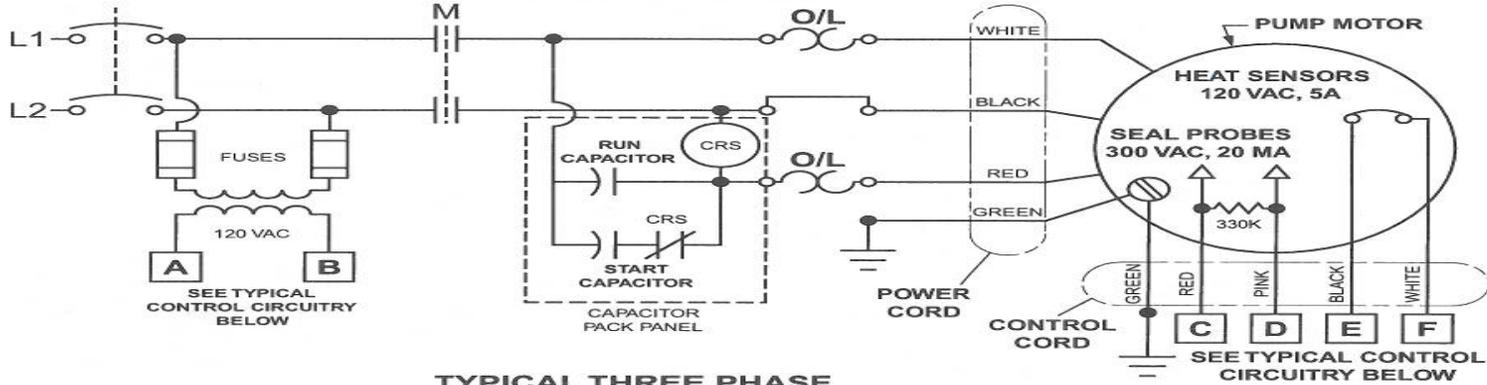
TYPICAL THREE PHASE MOTOR CONNECTIONS



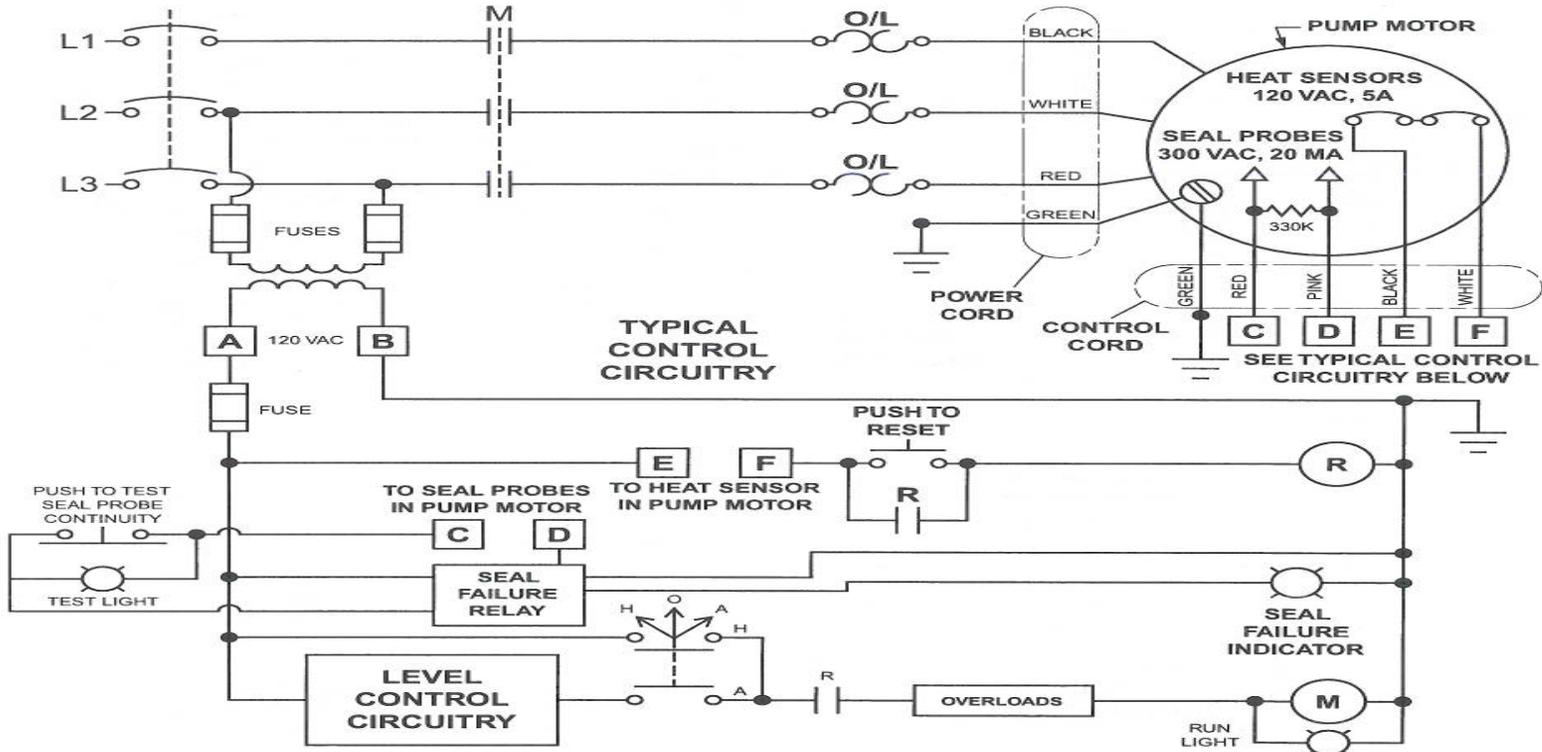
NOTE: CAPACITORS AND/OR CONTROLS SHOULD BE LOCATED OUTSIDE HAZARDOUS AREA AND ENCLOSED IN AN APPROPRIATE ENCLOSURE.

TYPICAL UL ONLY SCHEMATICS

TYPICAL SINGLE PHASE MOTOR CONNECTIONS



TYPICAL THREE PHASE MOTOR CONNECTIONS



NOTE: CAPACITORS AND/OR CONTROLS SHOULD BE LOCATED OUTSIDE HAZARDOUS AREA AND ENCLOSED IN AN APPROPRIATE ENCLOSURE.

Pump Maintenance

1. lifted from pump without disturbing seals or bearings.
2. Drain all oil from upper housing. Remove drain plug in bottom of bearing housing, and remove connection box to allow air to enter.
3. When connection box is lifted off, connection wires to motor will be exposed. These wires are tagged with a metal marker giving wire number. Disconnect wires and remove connection box.
4. After chamber is drained, remove hold-down bolts on motor housing and lift off. Use care in lifting as the seal failure connecting wire must be disconnected before housing is completely removed. See sectional drawing.
5. The stator is held in the housing with a bolted in retaining ring and prevented from rotating by a roll pin.
6. Remove the retaining ring and socket head cap screw.
7. After ring is removed, turn housing upright and bump on hardwood block. 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. See motor lead connection drawing. This is important as leads must be tucked behind the windings by using hands up through rotor core.

IMPORTANT: Use only butt connections on the wires.

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

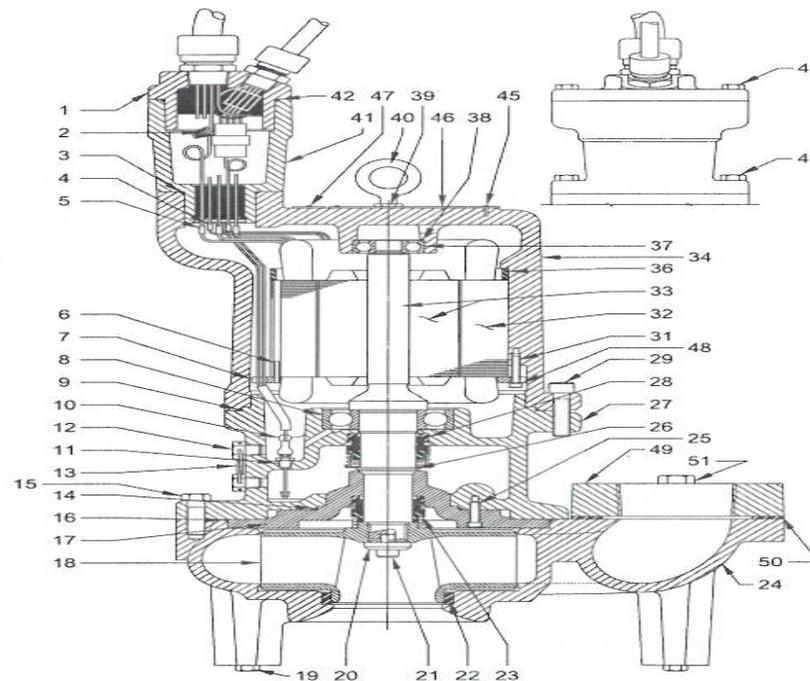
9. Check top bearing. If the bearing is clean and does not turn rough, bearings can be reused. If bearings are damaged with dirt or heat, they must be replaced. See additional instructions on replacing seals and bearings.
10. Replace stator housing onto seal chamber and bolt in place. Be sure seal failure wires are connected before housing is assembled.

Be sure O-ring seal has been replaced. If O-ring is nicked or cut, replace with new ring. 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 head in the auxiliary control cable.

12. For safety, complete pump should be air checked under water for leaks.

If seals were okay, refill seal chamber with oil. Lay pump on side for this oil filling with oil fill hole upright. Do not completely fill, leave oil about 1" below plug hole. Use only HYDROMATIC submersible oil or high grade transformer oil in this chamber. Replace plug, use Permatex on threads. Install air valve in plug opening of motor housing and charge housing with about 10 psi of air. Be sure air is dry. Do



Pump Maintenance

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 through connection box opening. Use high grade, non-synthetic transformer oil or HYDROMATIC special submersible oil. Fill housing until oil covers top of windings. Leave air space in top for expansion.

NOTE: Oil must cover top of stator.

Replacing Seals And Bearings:

1. Drain all oil from motor chamber and seal chamber as described.
2. Remove motor housing as described in replacing stator.
3. Remove bolts that hold bearing housing to volute. Lift bearing housing and rotating unit off and set assembly on its side. Remove socket head screw and washer at the impeller end of the shaft. Holding the shaft stationary, unscrew the impeller from the shaft by tapping the end of the impeller blades.
4. To remove seal plate take out socket head screws and using pry screws in back-off holes pry plate loose. This will also force seal off if not already removed.
5. Remove snap ring. Pull seal if it is free. If not free, it can be forced off when shaft is removed.
6. Set seal housing 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.

7. 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. Bearings are standard size that can be obtained from any bearing supply house or can be obtained from HYDROMATIC factory.
8. **Important:** Do not use any of the old seal parts. Replace with all new seals.

NOTE: Anytime seal is disturbed replace seal.

9. Thoroughly clean all castings before replacing seals. One grain of dirt between the seal faces can cause failure.

10. Examine all O-rings for nicks before reusing.

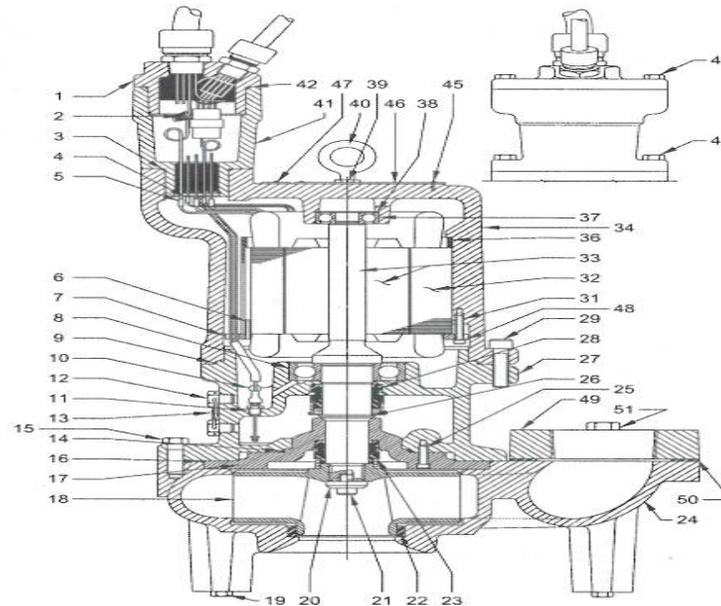
11. Use Loctite (red) on socket head locking screw in end of shaft.

12. Before refilling chamber with oil air test as described in replacing stator.

13. Refill both chambers with oil as described in replacing stator.

14. Always check all leads with high voltage or with megger for grounds before operating the pump.

15. Check pump for proper rotation before returning to normal service.



S3HX Parts List

ORDERING REPLACEMENT PARTS: Product improvements are made from time to time. The latest part design will be furnished as long as it is interchangeable with the old part. When ordering replacement parts, always furnish the following information: (1) pump serial number, (2) pump model and size, (3) part description, (4) part number, (5) impeller diameter (if ordering impeller), (6) quantity required, and (7) shipping instructions.

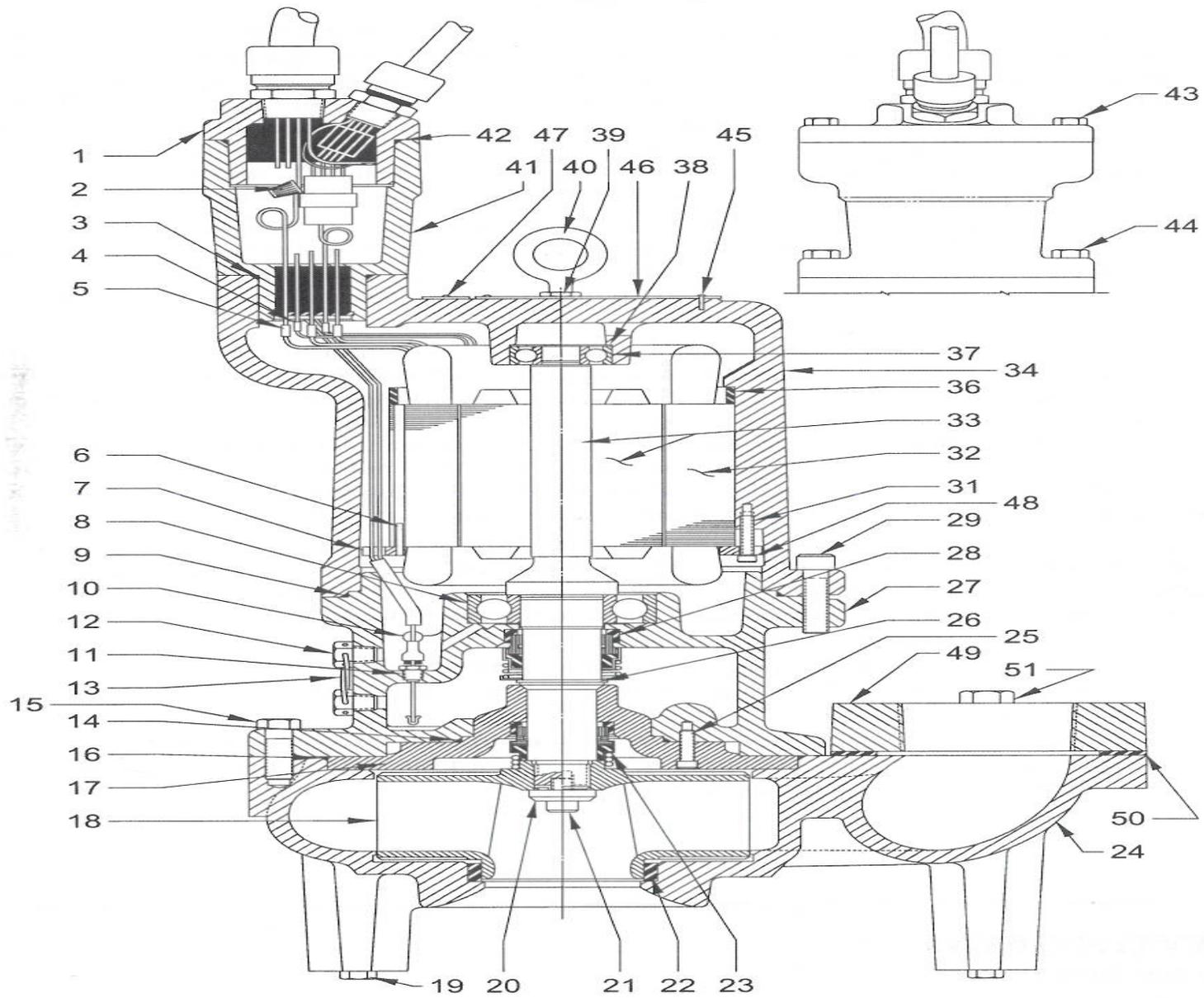
Ref. No.	Part No.	Part Description	Qty.
1	10894-003-5	Cord Cap Assy. 30' dual 10/4	1
	10894-005-5	Cord Cap Assy. 50' dual 10/4	1
2	00557-000-1	Wire Connector 200/230/1/60, 200/575/3/60	3
	00853-000-1	Wire Connector 230/3/60	4
	00557-000-1	Wire Connector 460/3/60	6
3	00834-008-1	O-Ring	SC 1
4	10898-000-1	Wire Connector	4
5	10899-000-1	Wire Connector 230/460/3/60	9
	10899-000-1	Wire Connector 200/230/1/60	3
	10899-000-1	Wire Connector 200/575/3/60	3
6	05454-001-1	Roll Pin	1
7	00299-002-1	Stator Holding Ring	1
8	00065-020-1	Bearing (lower)	R 1
9	00150-020-1	O-Ring	SC 1
10	10900-001-5	Seal Sensor Assy	1
11	10901-000-1	Seal Failure, Terminal	2
12	00119-016-1	Pipe Plug	2
13	10902-000-1	Safety Wire	1
14	00150-011-1	O-Ring	SC 1
15	00239-007-1	Capscrew	4
16	00150-023-1	O-Ring	SC 1
17	10753-000-2	Seal Plate	1
18	00296-026-2	Impeller 6.65" dia.	I 1
	00296-028-2	Impeller 6.41" dia.	I 1
	00296-027-2	Impeller 6.08" dia.	I 1
	00296-029-2	Impeller 5.83" dia.	I 1
	00296-030-2	Impeller 5.41" dia.	I 1
	00296-032-2	Impeller 4.83" dia.	I 1
	00296-033-2	Impeller 4.51" dia.	I 1
19	00238-006-1	Capscrew, S/S (non UL)	3
	00238-028-1	Capscrew Bronze (UL)	3
20	08422-001-1	Impeller Washer	I 1
21	00556-003-1	Impeller Bolt	I 1
22	05031-000-3	Wear Ring	1
23	04916-000-1	Lower Seal (ceramic) Std.	S 1
	04916-001-1	Lower Seal (carbide) Opt.	C 1

Ref. No.	Part No.	Part Description	Qty.
24	10742-001-5	Volute w/Wearing Ring	1
25	00517-007-1	Capscrew	3
26	00975-003-1	Retainer Ring	1
27	10743-000-2	Bearing Housing	1
28	00920-001-1	Upper Seal	SC 1
29	00568-007-1	Bolt	4
31	00517-008-1	Capscrew	4
32	14715-003-1	Stator 3/4-1HP 230/1/60 1150 RPM R	1
	14715-203-1	Stator 3/4-1HP 200/1/60 1150 RPM R	1
	14716-203-1	Stator 3/4-1HP 200/3/60 1150 RPM R	1
	14716-603-1	Stator 3/4-1HP 575/3/60 1150 RPM R	1
	14716-003-1	Stator 3/4-1HP 230/460/3/60 1150 RPM R	1
	14694-003-1	Stator 3/4-1HP 230/1/60 1750 RPM R	1
	14694-203-1	Stator 3/4-1HP 200/1/60 1750 RPM R	1
	14695-003-1	Stator 3/4-1HP 230/460/3/60 1750 RPM R	1
	14695-203-1	Stator 3/4-1HP 200/3/60 1750 RPM R	1
32	14695-603-1	Stator 3/4-1HP 575/3/60 1750 RPM R	1
	14696-003-1	Stator 1 1/2-2 HP 230/1/60 1750 RPM R	1
	14696-203-1	Stator 1 1/2-2HP 200/1/60 1750 RPM R	1
	14697-003-1	Stator 1 1/2-2HP 230/460/3/60 1750 RPM R	1
	14697-203-1	Stator 1 1/2-2HP 200/3/60 1750 RPM R	1
	14697-603-1	Stator 1 1/2-2HP 575/3/60 1750 RPM R	1
	14698-003-1	Stator 3HP 230/1/60 1750 RPM R	1
	14698-203-3	Stator 3HP 200/1/60 1750 RPM R	1
	14699-003-1	Stator 3HP 230/460/3/60 1750 RPM R	1
	14699-603-1	Stator 3HP 575/3/60 1750 RPM R	1
33	07774-014-5	Rotor & Shaft 3/4-1HP 200/230/1/60 1150 RPM	1
	07773-014-5	Rotor & Shaft 3/4-1HP 200/230/460/575/3/60 1150 RPM	1
	00738-012-5	Rotor & Shaft 3/4-1HP 200/230/1/60 1750 RPM	1
	00739-012-5	Rotor & Shaft 3/4-1HP 200/230/460/575/3/60 1750 RPM	1

Ref. No.	Part No.	Part Description	Qty.
	00740-017-5	Rotor & Shaft 1 1/2-2HP 200/230/1/60 1750 RPM	1
	00741-012-5	Rotor & Shaft 1 1/2-2HP 200/230/460/575/3/60 1750 RPM	1
	01329-017-5	Rotor & Shaft 3HP 200/230/460/1/60 1750 RPM	1
	01329-017-5	Rotor & Shaft 3HP 200/230/460/575/3/60 1750 RPM	1
34	10765-002-2	Motor Housing 3/4-2HP 3 Phase 1750 RPM	1
	10765-003-2	Motor Housing — all others	1
36	00736-001-1	Spacer Ring 1/2"	1
	00736-002-1	Spacer Ring 1"	1
37	00065-021-1	Bearing Upper	R 1
38	00064-003-1	Load Spring	1
39	01032-002-1	Nut	2
40	00589-002-1	Bolt	2
41	10895-000-1	Conn. Box 230/460/3/60	1
	10895-001-5	Conn. Box 200/230/1/60 - 200/575/3/60	1
42	00834-013-1	O-Ring	SC 1
43	00101-007-1	Bolt	2
44	00238-006-1	Bolt	2
45	04580-001-1	Drive Screw	3
46	13425-034-1	Nameplate	1
47	13425-030-1	Nameplate (UL)	1
	13425-033-1	Nameplate (FM)	1
48	00995-008-1	Lockwasher	4
49	00356-000-2	Flange, discharge 3"	1
	00356-004-2	Flange, discharge 4"	1
50	01054-000-1	Gasket	1
51	00570-015-1	Bolt	2
	51700-057-7	Seal Kit	R
	51700-357-7	Carbide Seal Kit	R
	-	Impeller Kit	
	-	Rebuild Kit	

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit I — Parts in Impeller Kit R — Parts in Rebuild Kit *Consult Factory

S3HX



WARRANTY

Hydromatic Pumps, Inc. warrants to the original purchaser of each Hydromatic product(s) that any part thereof which proves to be defective in material or workmanship within one year from date of installation or 18 months from manufacture date, whichever comes first, will be replaced at no charge with a new or remanufactured part, F.O.B. factory. Purchaser shall assume all responsibility and expense from removal, reinstallation and freight. Any item(s) designated as manufactured by others shall be covered only by the express warranty of the manufacturer thereof. This warranty does not apply to damage resulting from accident, alteration, design, misuse or abuse. The pump must be installed, operated and maintained in accordance with the published instructions of the appropriate Installation & Service Manual.

All dual seal non-clogs and 3–5 HP grinders must have seal failure and heat sensors attached and functional for Warranty to be in effect. If a seal failure should occur, Hydromatic Pumps will cover only the lower seal and labor thereof. Labor based on Authorized Service Center contract allowance. If the heat sensor is not attached and functional, Warranty is void. If the seal failure sensor is not attached and functional, Warranty is void.

If the material furnished to the Buyer shall fail to conform to this contract or to any of the terms of this written warranty, Hydromatic Pumps, Inc. shall replace such nonconforming material at the original point of delivery and shall furnish instruction for its disposition. Any transportation charges involved in such disposition shall be for the Buyer's account. The Buyer's exclusive and sole remedy on account or in respect of the furnishing of material that does not conform to this contract or to this written warranty, shall be to secure replacement thereof as aforesaid. Hydromatic Pumps, Inc. shall not in any event be liable for the cost of any labor expended on any such material or for any incidental or consequential damages to anyone by reason of the fact that such material does not conform to this contract or to this written warranty.

ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE SAME EXTENT AS THE EXPRESS WARRANTY CONTAINED HEREIN. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

MANUFACTURER EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ARISING IN CONNECTION WITH THIS PRODUCT, INCLUDING WITHOUT LIMITATION, WHETHER IN TORT, NEGLIGENCE, STRICT LIABILITY CONTRACT OR OTHERWISE. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



HYDROMATIC®
Pentair Pump Group

USA

1840 Baney Road Ashland, Ohio 44805
Tel: 419-289-3042 Fax: 419-281-4087

www.hydromatic.com

– Your Authorized Local Distributor –

CANADA

269 Trillium Drive Kitchener, Ontario, Canada N2G 4W5
Tel: 519-896-2163 Fax: 519-896-6337