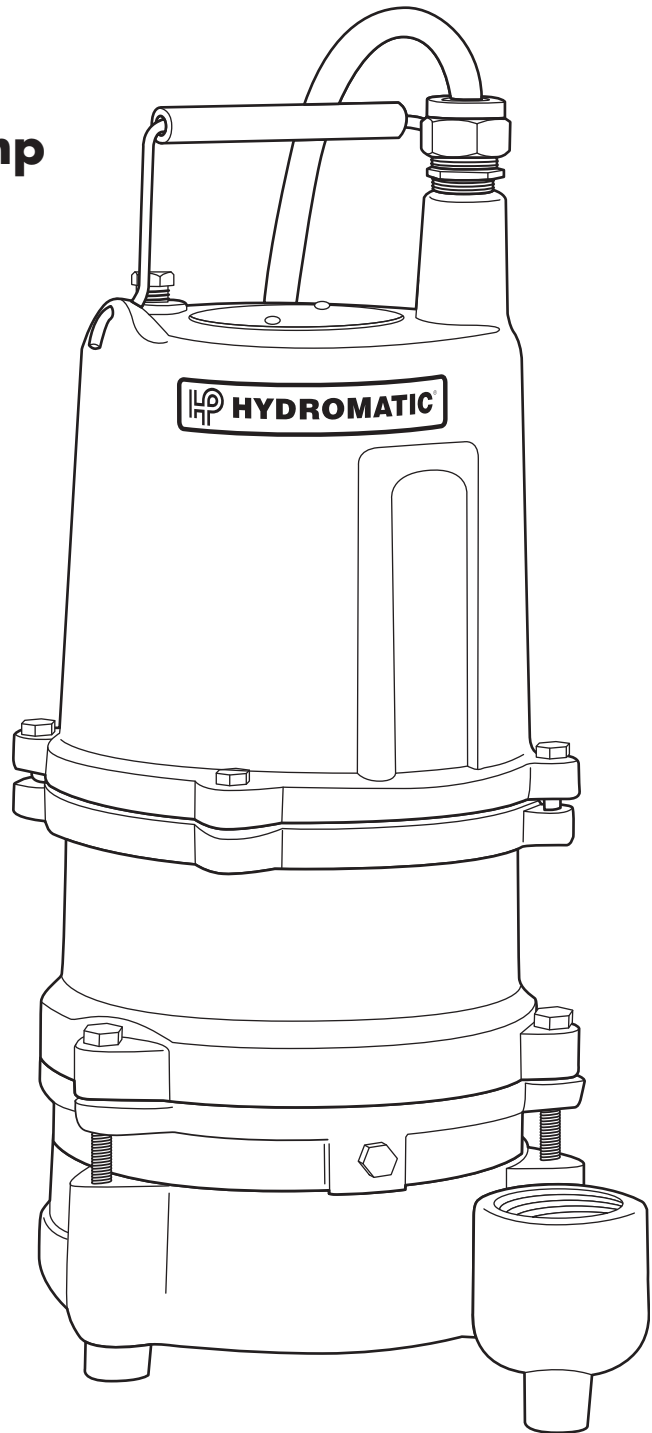




HYDROMATIC®

SKHD 150

Submersible Effluent Pump



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.



**Pentair
Water™**

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.

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 Warning

To reduce risk of electrical shock:

1. Risk of Electrical Shock:

This pump has not been investigated for use in swimming pool areas.

2. Risk of Electrical Shock:

Connect only to a properly grounded receptacle.

Septic tank to be vented in accordance with local plumbing codes.

Do not smoke or use sparkable electrical devices or flame in a septic (gaseous) or possible septic sump.

If a septic sump condition exists and if entry into sump is necessary, then (1) provide proper safety precautions per OSHA requirements and (2) do not enter sump until these precautions are strictly adhered to.

Do not install pump in location classified as hazardous per N.E.C., ANSI/NFPA 70 - 1999.

Failure to heed above cautions could result in injury or death.

Pump Installation

These important instructions must be followed for satisfactory performance of your pump. Before installation, check your local electrical and plumbing codes.

1. Provide proper basin or tank size to ensure pump operates without restriction. A two to five minute run time is recommended.
2. Make sure sump is free of string, cloth, nails, gravel, etc. before installing pump.
3. Do not set pump directly on the bottom of sump pit if it is not solid. Raise the pump by placing bricks or concrete blocks underneath it.
4. Use steel or plastic pipe for all connecting lines between pump and sewer outlet.

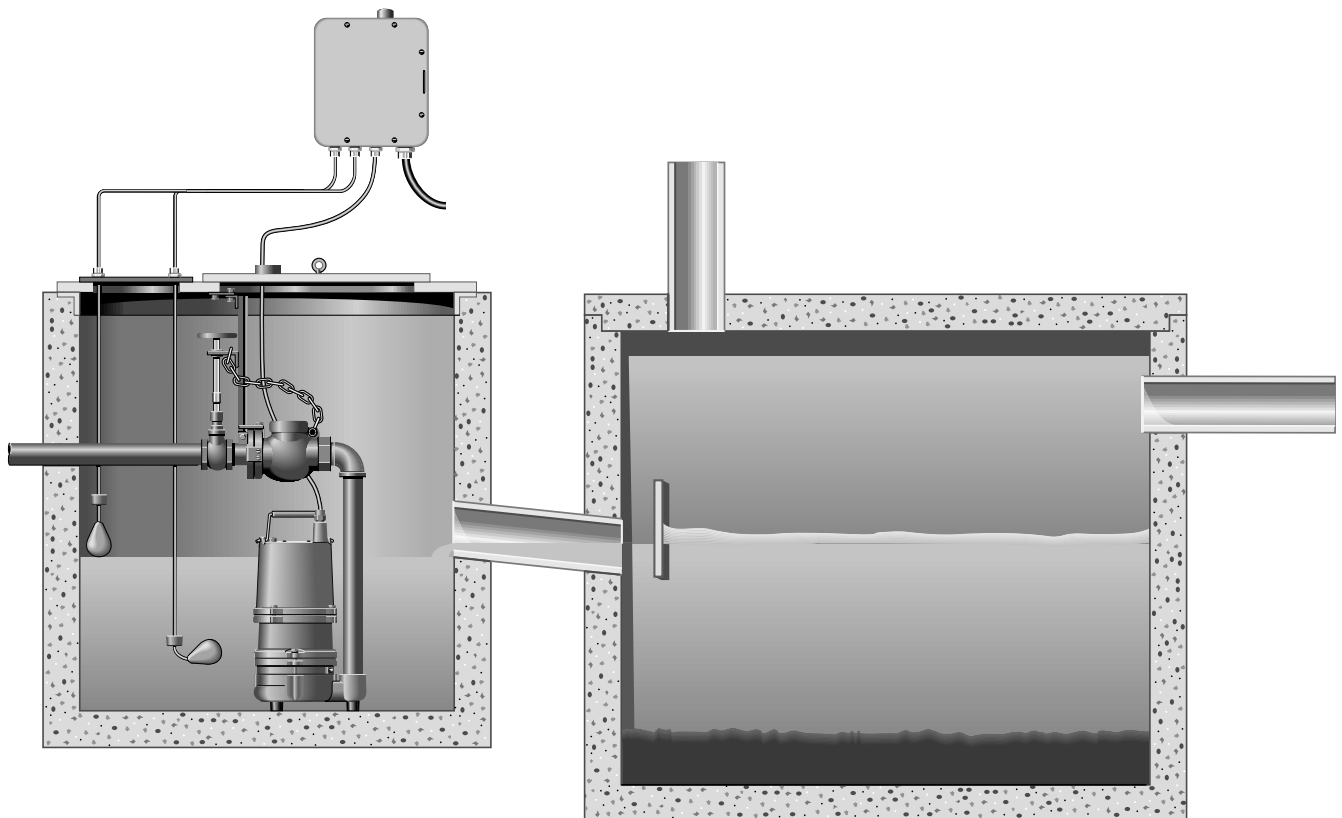
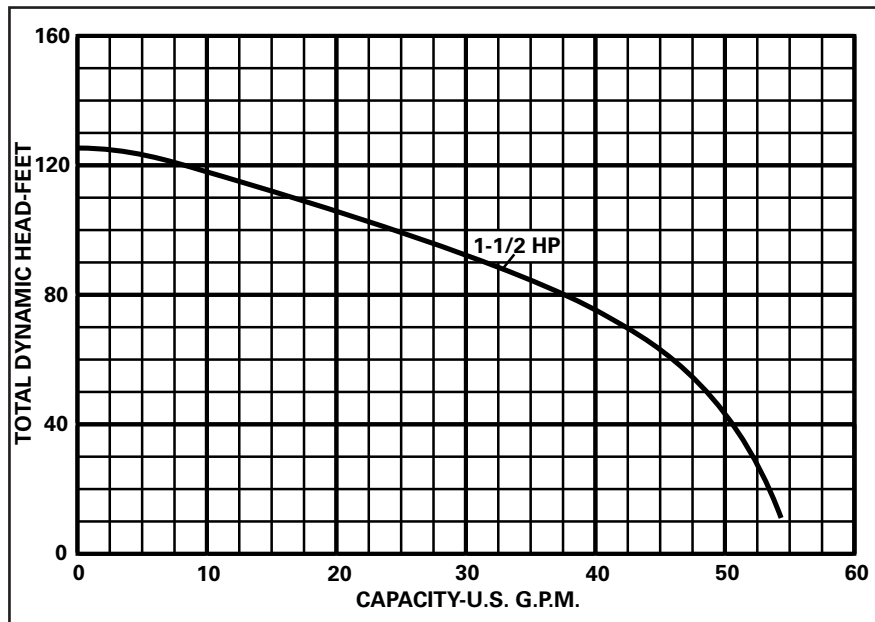
Note: Some city regulations do not allow installing a pump with plastic pipe. Check local regulations.

5. In applications where the pump may sit idle for months at a time, it is recommended that the pump(s) be cycled every month to ensure the pumping system is working properly when needed.
6. A check valve should be installed in discharge pipe.
7. An audible alarm system, such as the Q Alert, for high water conditions should be installed for greater protection.

Note: The Q Alert is for indoor use only. Contact your Hydromatic distributor for additional control and alarm panels applications.

8. Use pump partially or completely submerged for pumping waterlike liquids (temperature to 140° F). The SKHD150 will pump solid materials up to 3/4" (spherical) in diameter.
9. **Caution:** Do not pump flammable liquids, strong chemicals or salt water.
10. For added protection an optional seal failure probe is available as well as the control and alarm panel. Contact your Hydromatic distributor or the factory for more information.

Performance Data



Pump Maintenance

Read the following instructions carefully before replacing any parts. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation. Only competent electrician should make the installations.

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.

Before removing the pump from its installation for repairs, check first to see if the trouble is caused by:

1. Miswiring of the pump into the terminal block.
2. Miswiring of the float level controls into the panel.
3. Miswiring inside the control panel.
4. Tripped circuit breaker. If the breaker is manually reset and then trips off again, the problem could be:
 - a. short circuit in motor or control panel
 - b. water in the motor housing
 - c. insufficient amp capacity of wiring or breakers
 - d. improper panel wiring
5. Tripped overload. If overload is manually reset and then trips off again, the problem could be:
 - a. pump or piping clogged
 - b. pump motor or bearings may be defective

- c. start capacitor in motor may have failed
 - d. pump may be miswired to terminal block
 - e. head lower than rating, pumping too much liquid
6. Air locked pump. A sump pump is said to be air locked if air traps in the pump and it cannot get out, thus preventing pump from operating.

As a precaution, a 1/8" hole should be drilled in the discharge pipe below the check valve. The check valve should be 12 to 18 inches above pump discharge. Do not install check valve directly into pump discharge opening.

Note: In sumps where the pump is operating daily, air locking rarely occurs.

7. Wrong impeller rotation. Rotation should be counterclockwise when looking at the impeller. Correct improper rotation on three phase pumps by reversing any two line leads. Rotation check is not necessary on single phase pumps.
8. Closed discharge gate valve.
9. Plugged impeller or pipeline.
10. Discharge head may be too high. Check elevation against design point of pump.
11. Floats not hanging free in the sump.
12. Malfunctioning floats.

Checking Power Cord:

To be sure wires are not burned off or broken in cord, use ohmmeter for check. Set ohmmeter scale pointer to R X 1 scale and attach one meter lead to white cord wire and one meter

lead to black cord wire, then place a screwdriver blade across terminals of plug. If cord is O.K., meter needle will go to zero and stay there. If meter needle does not move, this will indicate an open wire and cord must be replaced.

Repair – Motor:

Warning: Be certain power to pump is off! Disconnect pump power cord from terminals and remove pump from sump pit.

1. Clean any dirt or trash from the outside of the pump before dismantling.
2. If motor does not run when the pump is tested, the capacitor and/or stator must be checked. See Step 5. Remove plug (#9) from top of housing (#2) and pour oil into container, preferably glass, so that oil can be observed.
3. If oil is clear, it will indicate motor is not burned and there has been no water leak into the motor. If oil is cloudy, it will indicate water in motor, or, if oil is black, it will indicate a burned stator. If water is in the oil, all seals should be replaced.
4. After draining oil, carefully loosen the power cord assembly from the motor housing. With power cord loose, remove the four screws (#6) and carefully lift off the motor housing (#2) exposing the capacitor (single phase [1Ø] only) and the motor assembly.
5. On single phase units, check capacitor (#3) using ohmmeter. With ohmmeter scale set at R X 1000, attach meter leads to capacitor. The meter needle should go to zero and come

back slowly. If it does not, the capacitor should be replaced.

- To check motor stator, remove power cord leads from terminal bushings on top of motor. If stator is visibly burned, motor assembly must be replaced.
- Ground check** on stator should be performed using ohmmeter with scale set at R X 100 and checking meter by putting both meter leads together and adjusting the needle knob until meter reads zero. If meter cannot be adjusted to zero, it will indicate that batteries in meter must be replaced. Always make this test with the meter when scale pointer is set to a new scale before making any checks on the motor.

Now connect one meter lead to one terminal of stator and touch and other meter lead to motor stator shell. If needle on ohmmeter goes completely to zero, the motor probably has a wire touching the stator at some point and the motor assembly will have to be replaced.

- Winding Resistance Test:** should be performed if the ground test is satisfactory. Use ohmmeter with scale pointer set on R X 1 scale. On this scale, meter reads directly on ohms. Always check the meter with leads together as described above under Ground Check Test before making a reading of the winding.

Connect one motor lead to the white wire terminal and the other meter lead to the black wire terminal. This reading is for the main winding (1 \emptyset). If the readings obtained do not agree with those given below, the stator is defective and the motor assembly must be replaced.

Resistance:

1 \emptyset Main 1 \emptyset Start 3 \emptyset Bal.

230V	1.78	3.53	6.65
460V	—	—	6.65
200V	—	—	3.4
575V	—	—	27.97

- For three phase pumps, remove the power cord assembly (#27) by cutting the butt connections and removing the power cord from the pump.
- Twist the three leads of one end of the power cord together. Then at the other end, with an ohmmeter, check any two leads. Also check the third lead with either of the first two. If a zero reading is indicated for any wire, the wire is broken and a new power cord assembly must be installed.

Seal Housing:

The pump is equipped with two mechanical seals mounted in tandem. The lower seal (#20) and the upper seal (#8) consist of a ceramic stationary seat and a carbon rotating ring.

As noted, if water is detected in the motor housing, inspect the power cord connection, pipe plug connections, O-rings, the motor housing itself, and the two mechanical seals.

There are two quarts of oil in the motor housing. This is a paraffinic "SE-40" process oil. The same oil is used in the seal housing (#13) between the two mechanical seals. To check the seals, remove the lower housing pipe plug (#11) and pour the oil out into a clean, preferably glass, container. Look for the milky color as noted previously.

If the oil is clear, the lower seal is still good. If this seal is damaged, water will seep in and continue to

stain the oil, changing it from clear, to slightly discolored, to cloudy, and finally to a milky white.

Except for very rare instances, the motor will continue to be protected by the upper mechanical seal. If seal probe is used the pump will not shut off when water in the oil is sensed. However, if connected to a control panel, an alarm or light will be activated. The panel alarm will show failure. The lower seal and oil must be replaced.

Lower Seal:

If water is found in the seal chamber, the lower seal must be replaced. Separate the volute by removing the three cap screws (#7) holding the volute case (#10) to the upper volute.

Insert a large screwdriver in the slotted pump shaft and strike the impeller sharply with a plastic or rubber headed hammer. The impeller should spin free. The impeller holds the rotation carbon ring of the lower mechanical seal against the stationary ceramic seat by compressing a stainless steel spring.

When the impeller is removed, the spring will relax, allowing the carbon ring to be removed. There is a rubber sleeve (bellows) inside the spring which grips the pump shaft. This often restricts the spring and must be pried or pulled loose.

With the carbon ring, spring, and rubber sleeve removed, wedge the ceramic seat out of the housing. Be sure not to scratch or mar the pump shaft.

Upper Seal:

- To remove and replace the upper mechanical seal (#8), the

Pump Maintenance

base (#10), impeller (#16), lower mechanical seal (#20), and volute must be removed first. Drain the seal oil from the housing by removing pipe plug (#11).

2. The rotating carbon ring and stainless steel spring are held in place by a snap ring (#21) and washer (#15). Remove these.
3. Remove the four hex head stator bolts(#32) and lift the stator (#5) from the seal plate (#14). A screwdriver can be inserted under the stator shell in order to remove the stator.
4. Bump the end of the shaft with a plastic hammer. This will push the rotating half of the mechanical seal from the shaft and also push the lower bearing from the seal plate. Now remove the shaft, rotor, and bearing assembly from the seal plate.
5. If water was found in the oil, the rotating and stationary halves of the mechanical seal must be replaced. Remove the stationary seal half by inserting a screwdriver into seal plate from the top and tapping lightly with a hammer.
6. Turning the bearing(#33, #34) by hand: if it feels rough when turned or looks rusted, it should be replaced. Obtain a bearing puller to remove the bearing. If a puller cannot be replaced over the bearing, remove the outer face by cracking in a vise. Now the outer face and balls can be removed, allowing the inner face to be pulled.

Reassembly

1. Thoroughly clean the seal plate, particularly the seal and bearing pockets. All sand and dirt must be removed.
2. If the stationary seal half was removed, use a plastic pusher to press it into the housing. Make sure the rubber ring goes in first. Do not use any sharp objects that may damage the seal.
3. When installing a replacement bearing press only on the inner face and make sure the bearing is flush against the snap ring. If a press is not available, the bearing can be tapped onto the shaft using a sleeve that bears only on the inner face. Pressing on the outer face will ruin the bearing.
4. Push the shaft, rotor and ball bearing assembly into the seal plate, being careful not to chip the ceramic of the stationary seal half.
5. Replace the stator if it is visibly burned or if the ground resistance test or the winding resistance test has failed. Note that the replacement stator must be of the same manufacture as the existing rotor, or vice versa. Replace the four stator bolts (#32).
6. Remove the old O-ring (#24), regardless of condition, and replace. Place the new O-ring over the seal plate shoulder.
7. Clean the motor housing (#2) thoroughly, then position it onto the seal plate.
8. Press the rotating seal half (#13) onto the shaft with the rubber ring facing the impeller.

Caution: Mixing old and new seal parts will cause immediate seal failure. When replacing

seal, replace both the rotational and the stationary seal halves.

9. Reassemble the lower seal as described.

Note: If seal probe is used, go to Step 16.

10. Add a drop of Loctite 277* to the impeller threads and screw the impeller (#16) on hand tight. The impeller will force the rotating seal half (#20) into position.
11. Set the seal housing and motor housing assembly into the volute case (#10) and secure with four hex head screws (#7).
12. To replace the power cord on single phase pumps, as determined on page 5, first slip the stator lead wires through the holes in the wire seal assembly. Coat the cord grip threads with pipe dope or apply teflon tape and screw the new power cord assembly into the motor housing. Referring to wiring diagrams in this manual, secure wires together.

Note: Do not tape leads together as the hot oil will deteriorate the tape and cause failure.

13. Before filling the motor housing with oil, an air test should be performed. Apply 7 to 8 pounds of air pressure in the 1/4" NPT tap (#9) on the top of the motor cover and seal chamber. (**Note:** Too much pressure will damage the seal.) Then submerge the pump in water and check for leaks. If a leak occurs, isolate where it is coming from and correct the problem by replacing the

sealing part. If there are no leaks, fill the motor and seal housing with high grade transformer oil, such as Factopure SE40 or equivalent, to at least one inch below top of housing.

Do not fill the motor housing completely – allow air space for expansion. Replace oil plug (#9).

14. Check for proper sealing of lower seal assembly by adding 7–8 lbs. air pressure at (#11) tap oil fill hole.

Note: Too much pressure will cause seal failure. Seal would have to be replaced.

Submerge in water. If air bubbles appear, isolate the source of the leak and correct the problem. If there are no leaks fill lower seal chamber with high grade transformer oil. Lay pump on side and fill to ½" below fill plug. Replace plug (#11).

15. Connect power cord wires to terminals, connect power, and check pump running. Motor should run smoothly and be free of vibration.

16. To check seal probe, use an ohmmeter to measure resistance and check continuity. If meter reads zero then replace probe (#23). Check probe sensor wire (#22) for opens using the ohmmeter. If reading is zero the wire is OK. For shorts place lead on the motor housing, making sure bare metal surface is used. Place the other lead on the bared end (#26) of the probe lead (#22). Reading should be infinity (∞). If reading is zero then replace seal probe lead. Return to Step 10.

Pump Troubleshooting

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.

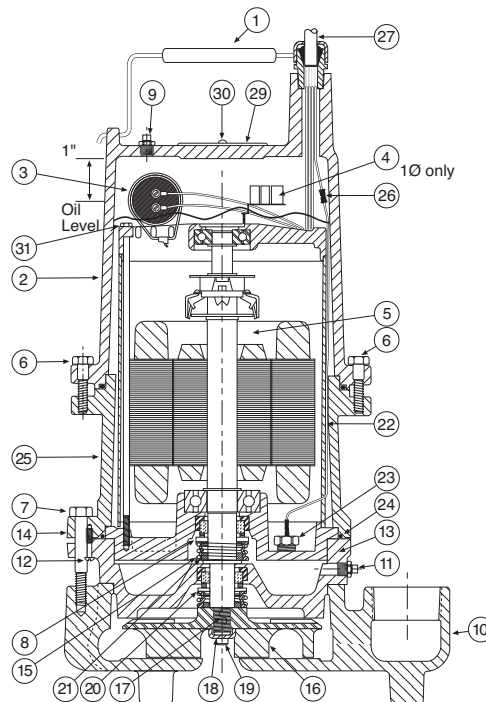
Pump does not run or hum.

1. Check line voltage for proper power.
2. Line circuit breaker may be off, or fuse may be blown or loose.
3. Water level in sump may be too low. Run in more water to activate switch. It will turn on when 90° has been achieved.
4. Pump cord plug may not be making contact in receptacle.
5. If pump is using the series cord plug, the two plugs may not be plugged tight together.

6. Float may be stuck. Be sure float operates freely in basin.
7. If all symptoms check OK, motor winding may be open; take pump to an authorized service center.

Pump runs but does not deliver water.

1. Check valve may be installed backwards. Arrow in valve points in direction of flow.
2. Discharge gate valve, if used, may be closed.
3. Pump may be air locked. Start and stop several times by plugging and unplugging cord. Check vent hole in pump case for plugging.
4. Pump head may be too high. Pump cannot deliver water over 100 ft. vertical. Horizontal distance does not affect pumping, except loss due to friction.
5. Inlet in pump base may be clogged. Remove pump and clean out openings.



Pump Troubleshooting

6. Impeller or volute openings may be plugged or partially plugged. Remove pump and clean per maintenance instructions.

Pump runs and pumps out sump but does not stop.

1. Float is stuck in up position. Be sure float operates freely in basin.

Pump runs but delivers only small amount of water.

1. Pump may be air locked. Start and stop several times.
2. Pump head may be too high. Pump cannot deliver water over 100 ft. vertical. Horizontal distance does not affect pumping, except loss due to friction.
3. Inlet in pump base may be clogged. Remove pump and clean out openings.
4. Impeller or volute openings may be plugged or partially plugged. Remove pump and clean per maintenance instructions.
5. Pump impeller may be partially clogged causing motor to run slow, resulting in motor overload. Clear obstruction from volute and impeller.

Fuse blows or circuit breaker trips when pump starts.

1. Inlet in pump base may be clogged. Remove pump and clean out openings.
2. Impeller or volute openings may be plugged or partially plugged. Remove

pump and clean per maintenance instructions.

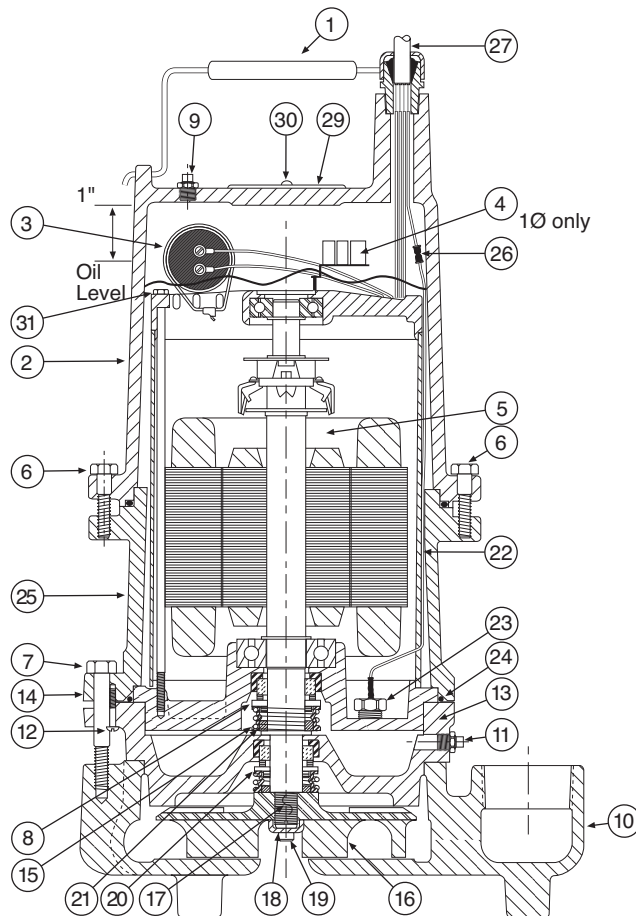
3. Pump impeller may be partially clogged causing motor to run slow, resulting in motor overload. Clear obstruction from volute and impeller.
4. Fuse size or circuit breaker is too small.
5. Defective motor stator: return to Hydromatic service center for verification of failure.

Motor runs for short time then stops. Then after short period starts again. Indicates tripping overload caused by symptom shown.

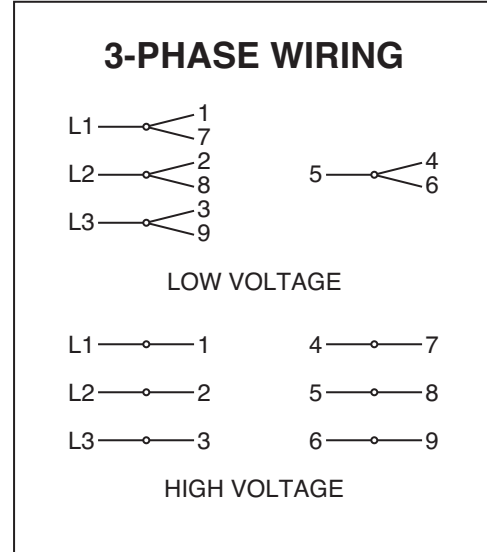
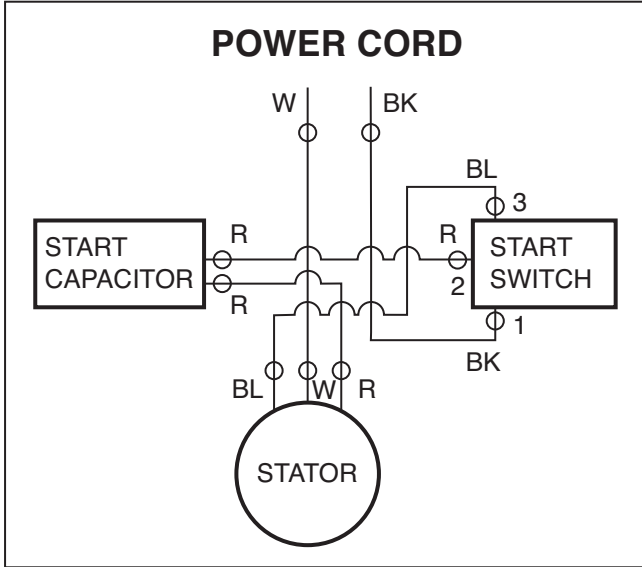
1. Inlet in pump base may be clogged. Remove pump and clean out openings.

2. Impeller or volute openings may be plugged or partially plugged. Remove pump and clean per maintenance instructions.
3. Pump impeller may be partially clogged causing motor to run slow, resulting in motor overload. Clear obstruction from volute and impeller.
4. Defective motor stator: return to Hydromatic service center for verification of failure.

If symptom not found call Hydromatic distributor or repair center for assistance.

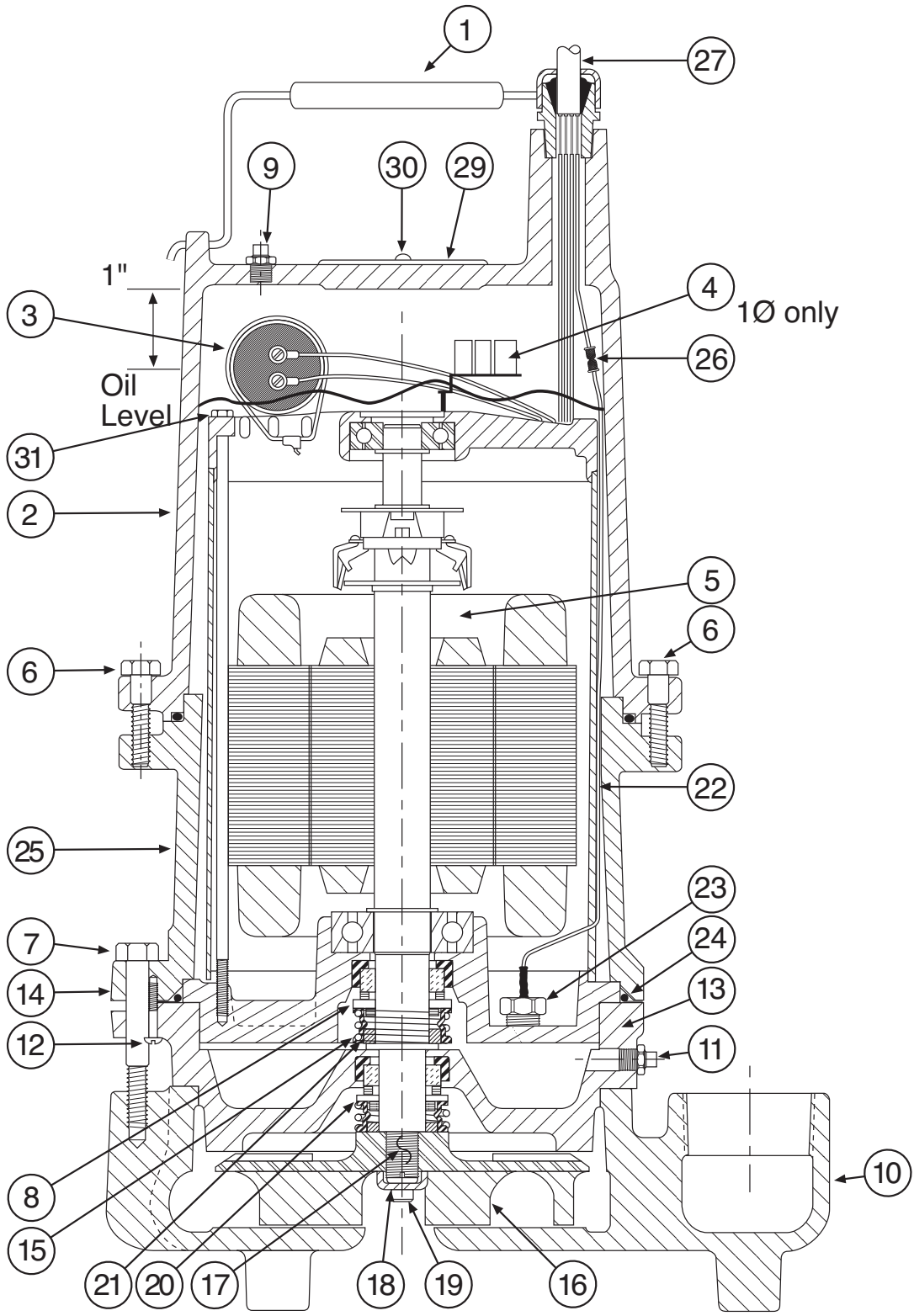


SKHD150 Parts List



Ref. No.	Part No. 1 Phase 230V	Part No. 3 Phase 230/460V	Description	Qty.	Ref. No.	Part No. 1 Phase 230V	Part No. 3 Phase 230/460V	Description	Qty.
1	60-000-5	60-000-5	Handle	1	20	83-002-1	83-002-1	Shaft Seal-lower	1
2	56-023-2	56-023-2	Housing, Motor	1	20	83-007-1	83-007-1	Shaft Seal-lower	1
3	13208-001-1	n/a	Capacitor (1ø, 230V)	1	21	975-001-1	975-001-1	Snap Ring	1
4	13209-003-1	n/a	Solid State Switch (1ø, 230V)	1	22	6000-056-1	6000-056-1	Wire Terminal Assembly	1
5	12690-000-1	12691-000-1	Motor Assembly	1	23	8472-006-5	8472-006-5	Seal Failure Sensor	1
6	19100A012	19100A012	Screw, Hex Hd.	4	24	77-003-1	77-003-1	O-Ring	2
7	101-015-1	101-015-1	Screw, Hex Hd.	3	25	12709-000-2	12709-000-2	Adapter	1
8	17048-000-1	17048-000-1	Shaft Seal-Upper	1	26	12672A001	12672A001	Splice Connector	1
9	14981-001-1	14981-001-1	Pipe Plug, 1/4 NPT	1	27	13216-022-5	n/a	Power Cord Assembly, 20' w/plug, 1ø only	1
10	9641-000-2	9641-000-2	Volute Case	1	27	11644-089-5	11644-018-5	Power Cord Assembly, 20' w/S.F.	1
11	87-004-1	87-004-1	Pipe Plug, 1/8 NPT	1	28	n/a	73-001-1	Connector (3ø 230V/460V)	4
12	25-016-1	25-016-1	Screw Rd. Hd.	3	29	13425-069-1	13425-069-1	Nameplate	1
13	7579-001-2	7579-001-2	Housing, Bearing/Seal	1	30	4580-001-1	4580-001-1	Drive Screw	2
14	6846-004-2	6846-004-2	Plate, Bearing/Seal	1	31	*	*	Oil	1
15	156-052-1	156-052-1	Washer	1					
16	9640-000-3	9640-000-3	Impeller	1					
17	*	*	Locktite Sealant	1					
18	n/a	518-001-1	Washer, Impeller (3ø only)	1					
19	n/a	111-008-1	Screw, Impeller (3ø only)	1					

SKHD150



LIMITED WARRANTY

HYDROMATIC warrants to the original consumer purchaser ("Purchaser" or "You") of HYDROMATIC Sump Pumps, Effluent Pumps, Sewage Pumps (other than 2-1/2"), and Package Systems, that they will be free from defects in material and workmanship for the Warranty Period of 36 months from date of manufacture.

Our warranty will not apply to any product that, in our sole judgement, has been subject to negligence, misapplication, improper installation, or improper maintenance. Without limiting the foregoing, operating a three phase motor with single phase power through a phase converter will void the warranty. Note also that three phase motors must be protected by three-leg, ambient compensated, extra-quick trip overload relays of the recommended size or the warranty is void.

Your only remedy, and HYDROMATIC's only duty, is that HYDROMATIC repair or replace defective products (at HYDROMATIC's choice). You must pay all labor and shipping charges associated with this warranty and must request warranty service through the installing dealer as soon as a problem is discovered. No request for service will be accepted if received after the Warranty Period has expired. This warranty is not transferable.

EXCEPTIONS: Hydromatic Special Application Pumps, Battery Back-Up Sump Pumps, Filtered Effluent Pumps, Grinder Pumps, and 2-1/2" Sewage Pumps are warranted for a period of 12 months from date of purchase or 18 months from date of manufacture, whichever comes first.

HYDROMATIC SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING WARRANTIES SHALL NOT EXTEND BEYOND THE DURATION EXPRESSLY PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on the duration of an implied warranty, so the above limitations or exclusions 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.

This warranty supersedes and replaces all previous warranty publications.

HYDROMATIC

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