PENTAIR

INSTALLATION, OPERATION & PARTS MANUAL

SHEF45
Submersible Effluent Pump

HYDROMATIC®



SAFETY INFORMATION

Carefully read and follow all safety instructions in this manual or on pump.

⚠ **This is the safety alert symbol.** When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury!

⚠ DANGER warns about hazards that **will** cause serious personal injury, death or major property damage if ignored.

⚠ WARNING warns about hazards that **can** cause serious personal injury, death or major property damage if ignored.

⚠ CAUTION warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.

The word **NOTICE** indicates special instructions which are important but not related to hazards.

1. **Read these rules and instructions carefully.** Failure to follow them could cause serious bodily injury and/or property damage.
2. Check your local codes before installing. You must comply with their rules.
3. Vent sewage or septic tank according to local codes.
4. Do not install pump in any location classified as hazardous by National Electrical Code, ANSI/NFPA 80-1984 or the Canadian Electrical Code.

   ⚠ WARNING Hazardous voltage. Can shock, burn, or kill. During operation the pump is in water. To avoid fatal shocks, proceed as follows if pump needs servicing:

Do not smoke or use devices that can generate sparks in a septic (gaseous) environment.

5A. Disconnect power to outlet box before unplugging pump.

5B. Take extreme care when changing fuses. Do not stand in water or put your finger in the fuse socket.

5C. Do not modify the cord and plug. When using the cord and plug, plug into a grounded outlet only. When wiring to a system control, connect the pump ground lead to the system ground.

6. Be sure that construction and access to septic sumps conform with all OSHA requirements.
7. Do not run the pump dry. Dry running can overheat the pump, (causing burns to anyone handling it) and will void the warranty.
8. The pump normally runs hot. To avoid burns when servicing pump, allow it to cool for 20 minutes after shutdown before handling it.
9. The pump is permanently lubricated. No oiling or greasing is required in normal operation. for overhaul, see instructions under “Service”.

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.

DESCRIPTION

This submersible effluent pump is designed for effluent and wastewater removal, sump drainage, dewatering and flood control. Units have built in thermal overload protection with automatic reset. The mechanical seal and ball bearings on the motor shaft are permanently lubricated. Stainless steel hardware and a heavy duty lift out handle allow for easy disassembly after extended use.

NOTICE: This unit is not designed for applications involving salt water or brine! Use with salt water or brine will void warranty.

SPECIFICATIONS

Power supply required.....See “Motor and Cord Specifications” chart below
Motor duty.....Intermittent
Discharge Adapter .....2" NPT

MOTOR & CORD SPECIFICATIONS

Model Number	Motor HP	Voltage	Motor Full Load Amps	Individual Branch Circuit Required (Amps)	Cord Length* in ft. (m)	Discharge Adapter Size
SHEF45M1	1/2	115/1	9.0	15	20 (6.1)	2"
SHEF45M2	1/2	230/1	4.5	15	20 (6.1)	2"

*30' cord optional.

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INSTALLATION

⚠WARNING Hazardous voltage. Can shock, burn or kill.
Do not lift pump by the power cord. See “Cord Lift Warning” below.

NOTICE: Install the pump on a hard, level surface (cement, asphalt, etc.). Never place the pump directly on earth, clay or gravel surfaces. Install the pump in a sump basin with a minimum diameter of 18" (46cm).

Piping

Piping must not be smaller than pump discharge.

The pump is designed to operate partially or completely submerged in effluent liquids and pump semi-solid fluids up to 3/4" (51mm) in diameter.

When installed in an **effluent** system, the pipe must be capable of handling semi-solids of at least **3/4"** (19mm) in diameter.

The rate of flow in the discharge pipe must keep any solids present in suspension in the fluid. To meet minimum flow requirements (2 feet per second in the discharge line), size the pipe as follows:

A Pipe Size Of:	Will Handle a Flow Rate Of:
2" (51mm)	21 GPM
2-1/2"(64mm)	30 GPM
3"(76mm)	48 GPM

In an effluent system use a **2"** (51mm) check valve in pump discharge to prevent backflow of liquid into sump basin. The check valve should be a free flow valve that will easily pass solids. Be sure check valve installation complies with local codes.

If you use a tethered float switch with this pump, be sure that it hangs freely. It should not be able to come in contact with the sides or bottom of the sump pit.

Make sure the sump pit is free of any debris that could obstruct the intake volute or switch.

Use plumbing materials that are approved by local building codes when connecting pipes between pump and sewer outlet.

NOTICE: For critical indoor installations where additional high water protection is desired, install a “Q-Alert” audible alarm system in the sump pit. For outdoor installations, confer with your Hydromatic distributor.

Connect the power cord to a 3-prong grounded AC receptacle.

⚠WARNING Hazardous voltage. Can shock, burn or kill.
DO NOT remove the grounding pin from the power cord. Avoid using extension cords or 2-prong adapter plugs.

Purchase separately an MWAPS-1-20 tethered float switch for use with this pump.

Insert the piggyback plug that comes from the wide-angle float switch directly into the power receptacle.

Insert the pump power cord directly into the back of the piggyback receptacle.

Test the pump installation by filling the sump basin with enough water to activate the pump and repeat this cycle until satisfied with pump operation.

NOTICE: For best performance of check valve when handling solids, do not install it with the discharge more than 45° above the horizontal. Do not install the check valve in a vertical position as solids may settle in the valve and prevent it from opening on startup.

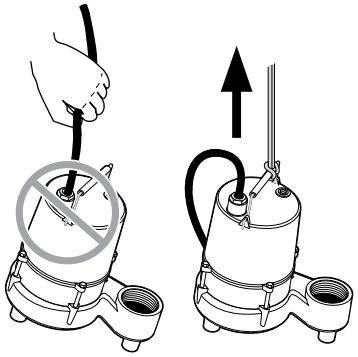
Drill a 1/8" (3mm) hole in the discharge pipe about 1–2" (25-51 mm) above the pump discharge connection (but below check valve) to prevent airlocking the pump.

⚠ WARNING



Risk of electrical shock.
Can burn or kill.
Do not lift pump by power cord.

CORD LIFT WARNING



1. Attempting to lift or support pump by power cord can damage cord and cord connections.
2. Cord may pull apart, exposing bare wires with possibility of fire or electrical shock.
3. Lifting or supporting pump by power cord will void warranty.
4. Use lifting ring or handle on top of pump for all lifting/lowering of pump. Disconnect power to pump before doing any work on pump or attempting to remove pump from sump.

ELECTRICAL

⚠WARNING Hazardous voltage. Can shock, burn, or kill. When installing, operating, or servicing this pump, follow the safety instructions listed below.

1. **DO NOT** splice the electrical power cord.
2. **DO NOT** allow the plug on the end of the electrical cord to be submerged.
3. **DO NOT** use extension cords. They are a fire hazard and can reduce voltage sufficiently to prevent pumping and/or damage motor.
4. **DO NOT** handle or service the pump while it is connected to the power supply.
5. **DO NOT** remove the grounding prong from the plug or modify the plug. To protect against electrical shock, the power cord is a three-wire conductor and includes a 3-prong grounded plug. Plug the pump into a 3-wire, grounded, grounding-type receptacle. Connect the pump according to the NEC or CEC and local codes.

For automatic operation, plug or wire the pump into an automatic float switch or duplex controller. The pump will run continuously when plugged directly into an electrical outlet.

Connect or wire pump to its own individual branch circuit with no other outlets or equipment in the circuit. Size fuses or circuit breakers according to the “Motor and Cord Specifications” chart.

⚠WARNING Risk of electrical shock and fire. Can burn, kill or cause property damage. Be sure that power supply information (Voltage/ Hertz/Phase) on pump motor nameplate matches incoming power supply exactly. Install pump according to all electrical codes that apply.

OPERATION

⚠WARNING Risk of fire or explosion. Can cause severe personal injury, property damage or death. Do not use in explosive atmospheres. Pump water only with this pump.

NOTICE: Do not allow the pump to run in a dry sump. It will void the warranty and may damage the pump.

An automatic overload protector in the motor will protect the motor from burning out due to overheating/overloading. When the motor cools down, the overload protector will automatically reset and start the motor.

If the overload trips frequently, check for the cause. It could be a stuck impeller, wrong/low voltage, or an electrical failure in the motor. If an electrical failure in the motor is suspected, have it serviced by a competent repairman.

The pump is permanently lubricated. No oiling or greasing is required.

Cycle the pump at least once every month to be sure that the system is working satisfactorily.

NOTE: Any of the following will void the pump warranty:

1. Submerging, plugging, damaging or taping shut a vented cord.
2. Pumping materials other than those the pump was designed to pump or continuously pumping water hotter than 140°F (60°C).
3. Cutting or splicing a power cord or switch cord.
4. Anyone other than an authorized Hydromatic service technician dismantling the pump.
5. Removing the cord tag from the cord.

SERVICE

General

⚠WARNING Hazardous voltage and risk of cord damage. Can shock, burn, or kill. Before removing the pump from the basin for service, always disconnect electrical power to the pump and the control switch. Do not lift the pump by the power cord. See the “Cord Lift Warning”, Page 2.

Disinfect the Pump

Place the pump in an area where it can be cleaned thoroughly. Remove all scale and deposits on the pump.

NOTE: Wear rubber or plastic gloves when handling the pump for service. Submerge the complete pump in a disinfectant solution (chlorox or chlorine bleach) for at least one hour before disassembling the pump.

The pump motor housing contains a special lubricating oil which should be kept clean and free of water at all times.

NOTICE: Whenever the motor housing is being removed for service, remove oil and replace it with new oil at reassembly. Use only oil listed in parts list in this manual. When filling with new oil, **DO NOT** overfill. Be sure that the oil level is 1/4" above the motor windings.

PUMP DISASSEMBLY

Impeller Replacement

1. Pull the plug, disconnect the plumbing and remove the pump from the sump or pump pit.
2. Disinfect the pump and cord.
3. Remove the oil fill plug from the top of the pump, turn the pump upside down, and drain the oil from the motor housing.
4. Remove 4 bolts holding the upper motor housing to the volute.
5. Tap around the volute with a mallet to loosen it; lift the pump off the volute.
   NOTE: Disconnect the motor leads from the power cord before completely removing the motor cover from the motor.
6. Hold the motor shaft with a screwdriver in the slot on the end of the motor shaft and unscrew the impeller by turning it counterclockwise. Remove the impeller and clean it.
7. If no more service is needed, go to "Pump Reassembly", below.

Seal Replacement

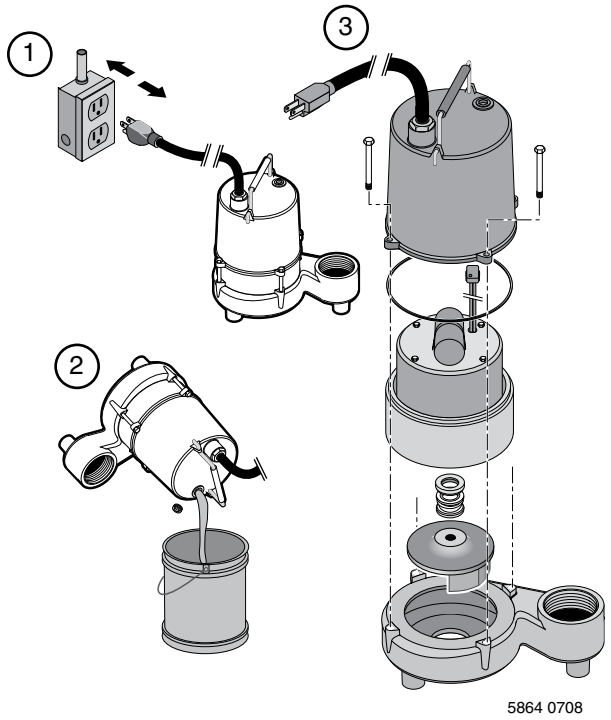
NOTE: Do not touch the faces of the new seal with your hands. Keep the seal faces free of dirt, grit, or grease during assembly.

1. Follow Steps 1 through 6 under "Impeller Replacement", above.
2. Slide the rotating half of the seal off of the motor shaft. Be careful not to scratch or mar the shaft.
3. Remove four screws from the top of the motor and pull the motor straight up to remove it from the seal plate.
4. Tap the stationary half of the seal out of the seal plate.
5. With a cardboard washer over the carbon face of the seal, press it straight down into the seal cavity in the seal plate.
6. CAREFULLY replace the motor in the seal plate, sliding the motor shaft through the seal without nicking or scratching the seal surface.
7. Replace the 4 bolts in the motor.
8. Slide the rotating half of the seal onto the shaft, carbon face first, being careful not to scratch, nick or chip the seal face.
9. Proceed to "Pump Reassembly", below.

Pump Reassembly

1. Apply Loctite to the impeller and shaft threads (NO Loctite on the seal!) and then screw the impeller onto the shaft (turn clock-wise). Hold the shaft with a screwdriver while you tighten the impeller.
4. Reattach the motor leads to the cord leads.
5. Reassemble the motor cover, motor and seal plate, and volute.
6. Fill the pump with about 1/2 gallon of clean dielectric oil (Part No. U197-8A).
   NOTE: Be sure the oil level is 1/4" above the top of the motor. Allow air space for expansion when the motor warms up.
7. Replace the oil fill plug. The pump is ready for service.

Pump Disassembly



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Check Pump Ground

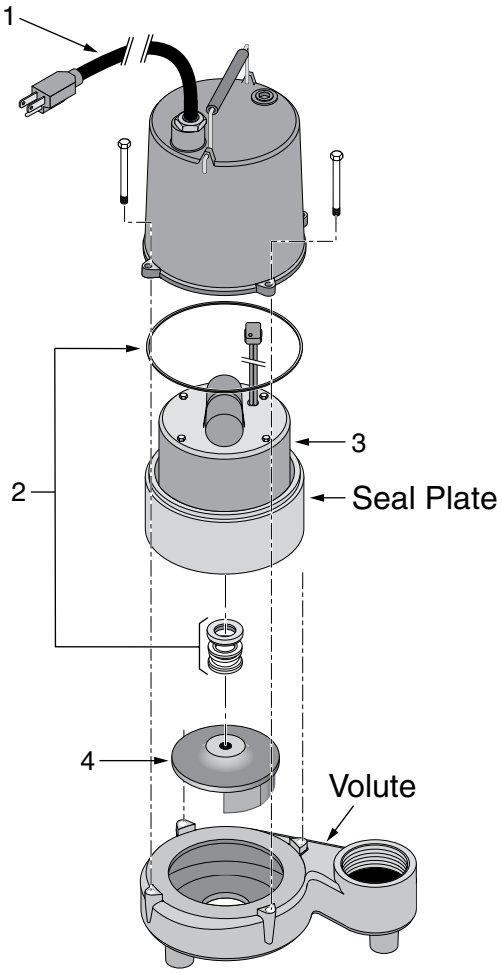
1. Set the meter to Rx100.
2. Touch one lead to the grounding pin and the other lead to one flat prong of the plug. Repeat for the other prong.
   a. Reading should be infinity for both prongs.
   b. If the reading is anything other than infinity, the stator must be removed, dried and rechecked.

   A reading of "0" indicates a dead short. Return the pump to an authorized Hydromatic distributor, service center or place of purchase.

Check Operation

Replace the pump in the sump, connect the plumbing, and then fill the sump to run the pump through one complete operational cycle. Failure to make this operational check can lead to flooding if the pump requires further attention.

EXPLODED VIEW



REPAIR PARTS LIST

Key No.	Part Description	Qty	SHEF45M1	SHEF45M2
1	Cord 115V 20'	1	146230201	146232201
2	Seal Kit (Includes shaft seal and Motor Cover O-Ring)	1	517001277	517001277
3	Motor	1	*	*
4	Impeller	1	08155-002-1	08155-002-1
•	Dielectric Oil (1 Qt.)	2	U197-8A	U197-8A

* If motor fails, replace entire pump.
• Not illustrated

TROUBLES-REMEDIES

⚠WARNING Sudden Starts. If the power is on to the pump when thermal overload resets, the pump may start without warning. If you are working on the pump, you may get an electrical shock or the impeller may catch fingers or tools. Disconnect the power before servicing the pump.

A. Pump fails to operate:	1. Check to be sure that power cord is securely plugged into outlet or securely wired into controller or switch box. 2. Check to be sure you have electrical power. Be sure that the piggyback plugs are tight. 3. Check that liquid fluid level is high enough to activate switch or controller. 4. Check to be sure that 1/8" (3 mm) vent hole in discharge pipe is not plugged. 5. Check for blockage in pump inlet, impeller, check valve or discharge pipe. 6. Disconnect the pump from the power source for a minimum of 30 minutes to allow the motor to cool and to protect yourself from sudden starts. See Warning above. Check for the cause of overheating: pump running dry because the float switch is caught up on something; inlet pipe is plugged; outlet pipe is plugged. 7. Motor windings may be open. Take unit to authorized service center.
B. Pump fails to empty sump:	1. Be sure all valves in discharge pipe are fully open. 2. Clean out discharge pipe and check valve. 3. Check for blockage in pump inlet or impeller. 4. Pump not sized properly. A higher capacity pump may be required.
C. Pump will not shut off:	1. Check switch or controller automatic floats for proper operation and location. See installation instructions for switch/controller. 2. If pump is completely inoperative or continues to malfunction, consult your local serviceman.

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 LIMITED WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING LIMITED WARRANTIES SHALL NOT EXTEND BEYOND THE DURATION 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 Limited Warranty is effective June 1, 2011 and replaces all undated warranties and warranties dated before June 1, 2011.

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