

# OWNER'S MANUAL

## NSPHE Lawn and Turf Pumps Electric Motor Driven



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### SAFETY WARNINGS



**BEFORE OPERATING OR INSTALLING THIS PUMP, READ THIS MANUAL AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS.**

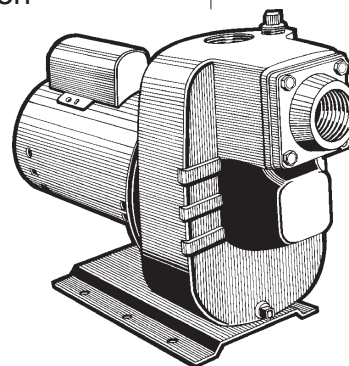
 **SAFETY** CAREFULLY READ THESE SAFETY MESSAGES IN THIS MANUAL AND ON PUMP.

### CAUTION

- **DO NOT OPERATE THIS PUMP DRY!**
- Review instructions before operating.

### WARNING - ELECTRICAL PRECAUTIONS

All wiring, electrical connections, and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician. For non-thermally protected motors use with approved motor control that matches motor input in full load amperes with overload element(s) selected or adjusted in accordance with control instructions.



### FOR DUAL VOLTAGE MOTORS:

Voltage change instructions are located on motor label or on wiring access cover.

### WARNING - RISK OF ELECTRICAL SHOCK

- Have an electrician provide electrical power to the motor.
- Motor must be grounded and terminal cover in place to reduce electrical shock hazard.
- Keep motor operating area as dry as possible.
- A ground fault interrupter (GFI) protected circuit is recommended for use with any electrical device operating near water.
- Always disconnect power before servicing.
- Not investigated for use in swimming pool areas.

## APPLICATION

This pump is suitable for installations where the vertical distance from the pump to the water level does not exceed 25 ft. In all

installations, friction losses in the suction pipe must be taken into consideration.

## PERFORMANCE

HP	Flow in GPM at total head (ft.)						Flow in L/min. at total head (Meters)				
	25	50	75	100	125	150	10	20	30	40	50
3/4	46	36	20				163	102			
1	53	44	32	10			189	136	45		
1-1/2	59	50	37	20			212	159	87		
2	90	79	62	38			329	261	155		
3		110	92	71	40			371	276	110	
5			141	121	98	66		560	466	348	148

## INSTALLATION

**PUMP LOCATION:** The pump should be installed in a clean, dry and ventilated location which provides adequate drainage and room for servicing and protection from freezing temperatures. It should be bolted down evenly on a good foundation, preferably concrete, to prevent the development of unnecessary stress. Locating the pump as close as possible to the source of water supply reduces the friction losses in the suction pipe and provides for maximum capacities.

**SUCTION PIPE:** It is recommended that only new clean pipe or

hose be used and the size be the same as that of the pump suction tapping. If the pump is installed any appreciable distance away from the source of water supply, the suction pipe should be increased by one size. The suction pipe must always slope upwards from the water source to the pump to avoid air pockets in the line. In cases where the pump has to be reprimed often and it is not necessary that a lot of water be delivered, it is advisable to use a 90° or 45° elbow on the suction line. This enables the pump to prime sooner and also prevents kinking of the hose. In cases where a maximum volume of water is required over a pro-

longed period of time, the suction line should be led almost horizontally to the pump. Non-toxic thread compound should be used on all pipe joints and connections should be thoroughly tightened. A strainer should be connected to the bottom end of the suction pipe and it should be well submerged at all times.

### **WARNING - RISK OF ELECTRICAL SHOCK**

- **WIRING:** Make sure the voltage and frequency of the power supply agrees with that stamped on the motor nameplate. If in doubt, check with the power company.

### **WARNING - ELECTRICAL PRECAUTIONS**

All wiring, electrical connections, and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician.


**SINGLE PHASE:** Determine incoming voltage to motor. Where possible, use 230V. Connect wiring to terminal board located inside motor end cover. Be sure voltage connections agree with wiring diagram on motor nameplate.

**THREE PHASE:** Three Phase motors require magnetic starters, and can run in either direction, depending on how they are connected to the power supply.

## **OPERATION - PRIMING THE PUMP**

 **WARNING:** DO NOT RUN THE PUMP BEFORE PRIMING IT, SINCE THE SEAL AND IMPELLER COULD BE PERMANENTLY DAMAGED.

**PRIMING THE PUMP:** A priming plug is provided in the top of the casing to fill the pump with water. Once filled and the priming plug replaced, the pump will prime. The priming time depends upon the vertical and horizontal distance between the pump and the water level. The pump should prime itself time after time as long as the built-in check valve functions.

 **CAUTION:** DO NOT run the pump before filling the pump case with liquid, as it may damage the seal.


**PRIMING UNDER PRESSURE:** (Refer to Figure 1) Should it be necessary to prime under pressure, place a check valve on the discharge line of the pump and a pet cock or a ball type air bleeder in place of the priming plug, or an air bleed line with a gate valve connected to the discharge line. It will then be possible for the liquid to remain in the discharge pipe and allow the pump to bleed off the remaining air, thereby facilitating priming.

**IMPELLER ROTATION:** The impeller must rotate in a counter-clockwise direction as seen facing the pump from the front of the casing. In the event of wrong rotation for electric motor models, refer to the instructions furnished with the motor. The rotation of three phase motors can be changed by interchanging any two lead wires.

**STARTING THE PUMP:** Never operate the pump dry as this may damage the seal. If an exceptionally long suction line is used, the water in the pump casing may become overheated or vapour locked. Should this occur, replace the water in the casing with cold water and continue priming.

**DRAINING:** Should the pump be subject to freezing temperatures, it will be necessary to drain the pump completely. To drain, remove the drain plug located at the bottom of the front face of the pump casing and the priming plug and make sure that the drain

**To Check for Proper Rotation:** Remove the motor end cover. This exposes the motor shaft. If hookup is correct, the shaft will rotate clockwise. If rotation is not clockwise, reverse any two leads to the starter. The rotation will now be correct.

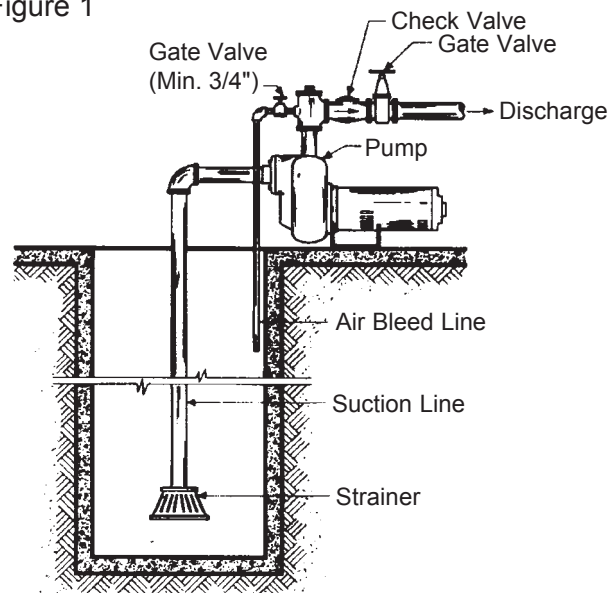
 **WARNING - RISK OF ELECTRICAL SHOCK**  
**GROUNDING THE MOTOR: WIRING TO THIS PUMP MUST BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE OR YOUR LOCAL ELECTRIC CODE. IF MORE INFORMATION IS NEEDED, CALL YOUR LOCAL LICENSED ELECTRICIAN OR YOUR POWER COMPANY.**

It is recommended that a permanent ground connection be made to the unit using a conductor of appropriate size from a metal underground water pipe or a grounded lead in the service panel. Do not ground to a gas supply line. Do not connect to electric power supply until unit is permanently grounded. Connect the ground wire to the approved ground and then connect to the terminal provided.

hole is not restricted. After all the water has been drained, operating the pump for a few seconds will ensure that the impeller is devoid of water (make sure that the suction line is also devoid of water).

**STORAGE OF PUMP:** Drain liquid from pump to prevent freezing. It is recommended that a good rust inhibitor be put in the liquid end to prevent excessive corrosion. Be sure motor is kept dry and covered. When restoring the use of the pump, replace all plugs and make sure all connections are tightly sealed. After a complete check is made, make the initial prime according to directions under the section, Priming the Pump.

Figure 1



## **⚠ WARNING - ELECTRICAL PRECAUTIONS**

All wiring, electrical connections, and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician.

## **⚠ WARNING - RISK OF ELECTRICAL SHOCK**

- Have an electrician provide electrical power to the motor.
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- Always disconnect power before servicing.
- Not investigated for use in swimming pool areas.

## **LUBRICATION:**

- The pump requires no lubrication.
- For electric motor models, refer to instructions provided by the motor manufacturer.

## **REPLACING MECHANICAL SEAL:**

(Refer to Figure 2)

## **TO DISASSEMBLE:**

**For Models up to 2-1/2 HP (Square flange motors)**

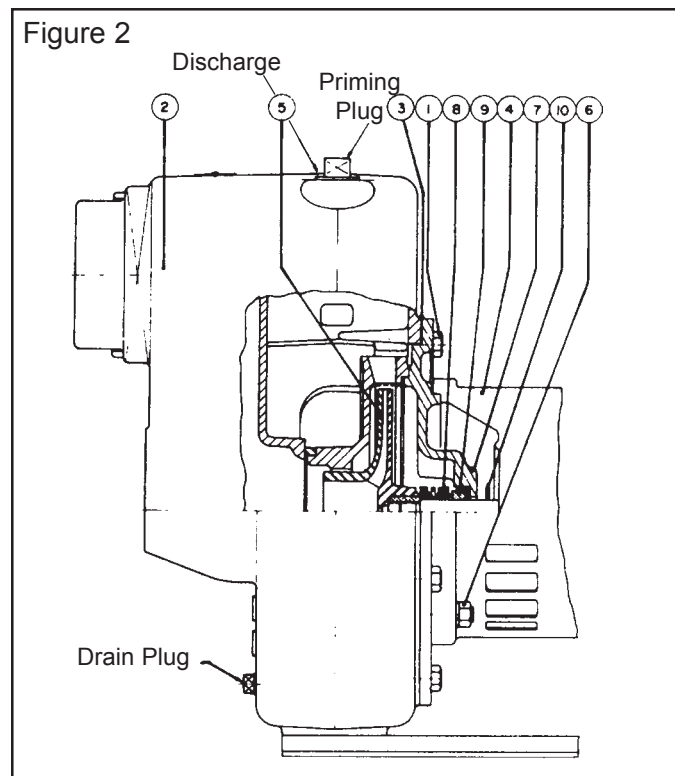
- Remove the bolts (1) and remove the seal plate and motor assembly from the casing (1).
- Remove suction diffuser (2) by prying it off of seal plate.
- Unscrew the impeller (5) counter clockwise.
- Slip the seal off the shaft.
- For models up to 1-1/2 HP, remove the seal plate from the motor. For models 2 and 2-1/2 HP, remove the 4 hex nuts and remove the motor from the seal plate. Take care not to damage the ceramic seal.
- If the seat (9) needs to be replaced, push it out of the seal plate from the motor side.

## **TO REASSEMBLE:**


- Clean all parts.
- Wet rubber part of the seal seat with liquid soap and press it into its housing in the seal plate or adapter (smooth ceramic surface facing upwards).
- Assemble the seal plate or adapter to the motor.
- Wet the rubber ring of the seal assembly with liquid soap and slip it onto the motor shaft. Make sure the sealing face is towards the ceramic seat.
- Replace the impeller.
- Reassemble to the casing and diffuser ring. It is recommended to use a new gasket (3).
- Reconnect the suction and discharge piping and reconnect the electrical wiring.

## **PRECAUTIONS**

- Whenever pump is dismantled and then reassembled, always check to see that the impeller rotates freely within the casing.
- The NSPHE models have a flinger (10) on the shaft. This flinger must not be removed.



## TROUBLESHOOTING GUIDE

TROUBLES AND CAUSE	REMEDY
<b>Failure to Pump:</b> 1. Pump not properly primed.  2. Speed too low.     3. Total head more than for which pump was intended. 4. Suction lift is too great.	1. Make sure pump casing and suction line are full of water. See priming instructions. 2.  <b>WARNING - ELECTRICAL PRECAUTIONS</b> All wiring, electrical connections and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician. Check voltage at motor terminals and at meter when pump is operating. If low, refer to wiring instructions or check with your power company. Check loose connections. 3. A pump designed for higher head needed. 4. Locate pump closer to source of water. Make sure suction piping is large enough.
<b>Reduced Capacity and/or Head:</b> 1. Air pockets or leaks in suction line. 2. Clogged impeller. 3. Strainer too small or clogged. 4. Insufficient submergence of suction line.  5. Excessive suction lift.  6. Total head more than that for which the pump was intended. 7. Excessively worn impeller.	1. Check suction piping. 2. Remove and clean. 3. Use larger strainer or clean. 4. Add lengths of suction pipe to keep submerged end well below the water surface. 5. If caused by suction pipe friction, enlarge piping. Otherwise, move pump closer to water level. 6. A pump designed for higher head is needed.  7. Order replacement parts using Repair Parts List.
<b>Pump Loses Prime:</b> 1. Air leaks in suction line. 2. Excessive lift and operating too near shut-off point. 3. Water level drops while pumping, uncovering suction piping.	1. Check suction piping. 2. Move pump nearer water level. 3. Check water supply. Add length of pipe to suction to keep submerged end under water.
<b>Mechanical Troubles and Noise:</b> 1. Bent shaft and/or damaged bearings. 2. Suction and/or discharge piping not properly supported and anchored.	1. Take motor to authorized motor repair shop. 2. See that all piping is supported to relieve strain on pump assembly.

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### LIMITED MONARCH INDUSTRIES WARRANTY

For one year from date of purchase, Monarch Industries will replace or repair for the original purchaser, free of charge, any part or parts, found upon examination by any Monarch Industries Authorized Service Depot or by the Monarch factory, to be defective in material or workmanship or both. Equipment and accessories not manufactured by Monarch Industries are warranted only to the extent of the original manufacturer's warranty. All transportation charges on parts submitted for replacement or repair under this warranty must be borne by the purchaser. For warranty service see your nearest Monarch Industries Authorized Service Depot. THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO ONE YEAR FROM PURCHASE AND TO THE EXTENT PERMITTED BY LAW. LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW. This warranty is an addition to any statutory warranty.

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