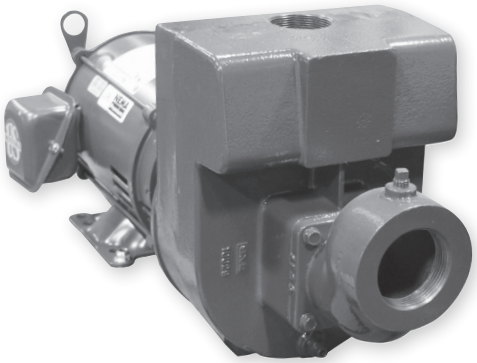
84000 Self Priming Centrifugal Pumps
Installation & Operating Instructions

SAFETY WARNING
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 instruction before operating.

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

Model	HP	VOLTS	PHASE	NPT INCH		DISCHARGE HEAD		SUCTION LIFT IN FEET					WEIGHT LBS
				SUC	DIS	PSI	FEET	5	10	15	20	25	
								Capacity - U.S. Gallons per Minutes					
84300	3	230	1	2	1 1/2	20	46	123	120	108	98	70	144
						30	69	108	105	98	94	68	
84300-3	3	230 / 460	3	2	1 1/2	40	92	87	82	76	70	62	
						50	115	60	52	44	33	18	
84500	5	230	1	2 1/2	2	20	46	162	160	151	140	98	182
						30	69	160	158	150	136	98	
84500-3	5	230 / 460	3	2 1/2	2	40	92	146	141	136	130	96	
						50	115	118	115	104	94	94	

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 prolonged period of time, the suction line should be lead 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.

WIRING

WARNING - RISK OF ELECTRICAL SHOCK

• **WIRING:** Make sure the voltage and frequency of the power supply agrees with what is on the motor label.

WARNING - ELECTRICAL PRECAUTIONS

For non-thermally protected motors use with approved motor control that matches motor input in full load amps with overload element(s) selected or adjusted in accordance with control instructions. 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: Connect wiring inside junction box on the side of the motor.
THREE PHASE: Three Phase motors require magnetic starters, and can run in either direction, depending on how they are connected to the power supply.

Check for Proper Rotation: Remove the motor end cover.
This exposes the motor shaft. If power is connected correctly, the shaft will rotate clockwise. If rotation is not clockwise, reverse any two leads to the starter and then the rotation will then be correct.

FOR DUAL VOLTAGE MOTORS

Voltage change instructions are located on motor label.

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.

- 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 intended for use in swimming pool areas.

OPERATION

WARNING - DO NOT RUN THE PUMP BEFORE PRIMING IT; 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 flapper valve functions correctly.

CAUTION - DO NOT run the pump before filling the pump case 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 counterclockwise direction as seen facing the pump from the front of the casing. In the event of wrong rotation, 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 hole is not restricted. Also, make sure that the suction line is also drained.

STORAGE OF PUMP: Drain liquid from pump to prevent freezing. Be sure the 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.

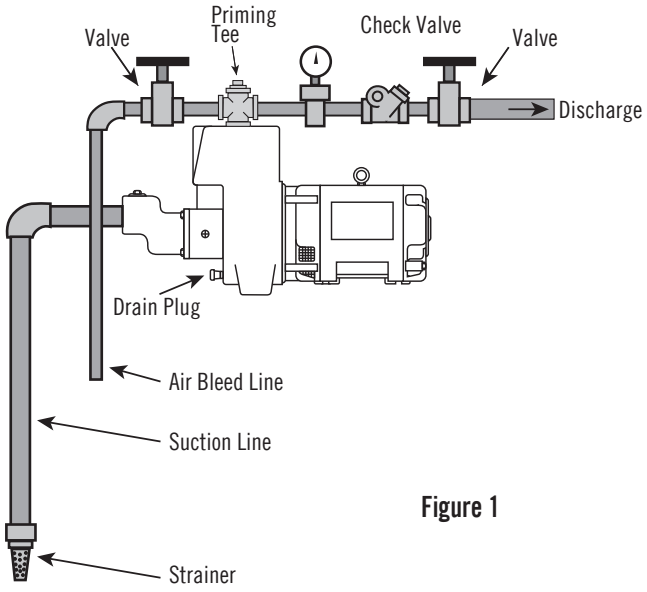


Figure 1

MAINTENANCE

Lubrication

a) The pump requires no lubrication
b) For the motor, refer to instruction provided by the motor manufacturer

Replacing the mechanical seal

A) Disconnect the electrical wiring
B) Remove the suction side and discharge piping
C) Remove the drain plugs and let the pump drain
D) Remove the hex-head bolts holding the pump housing to the motor adapter and remove the pump housing
E) Remove the bolts holing the diffuser to the motor adapter and remove the diffuser
F) Unscrew the impeller in a counterclockwise direction. If needed, the motor shaft end can be held in place with a screwdriver
G) Pull the rotating mechanical seal off of the motor shaft
H) Remove the bolts that hold the motor adapter to the motor
I) Pull the motor out taking care to not let the motor shaft contact the ceramic seat
J) Inspect the ceramic seat for damage and if it needs to be replaced press it out of the motor adapter

Reassembling the pump

A) Clean all parts thoroughly before re-assembly paying particular attention to all sealing surfaces
B) Wet the rubber cup on the ceramic seat and push it into the adapter. Make sure the smooth surface of the ceramic seat is facing outwards
C) Assemble the motor adapter to the motor taking care to not let the motor shaft damage the ceramic seat
D) Slide the rotating seal onto the motor shaft with the seal ring towards the ceramic seat
E) Be sure the seal ring on the rotating seal is in contact with the ceramic seat
F) Screw on the impeller in a clockwise direction until the impeller seats on the shoulder of the motor shaft
G) Reassemble the diffuser to the motor adapter
H) Assemble the pump housing to the motor adapter using a new pump housing gasket
I) Reinstall the pump drain plugs and fill the pump housing with water
J) Reconnect the suction and discharge piping
K) Reconnect the electrical wiring

NOTE: Whenever a pump is disassembled and reassembled always check to be sure the impeller rotates freely. Also, there is a rubber flinger on the motor shaft between the motor adapter and the motor that must be in place.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Failure to pump	Pump not properly primed.	Make sure pump casing and suction line are full of water. See priming instructions.
	Speed too low	⚠ **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. Check voltage at motor when pump is operating. If low, refer to wiring instructions or check with your power company. Check for loose connections.
	Total head more than that for which pump was intended	A pump designed for higher head is needed.
	Suction lift is too great.	Locate pump closer to source of water. Make sure suction piping is large enough.
Reduced capacity and / or head:	Air pockets or leaks in suction line.	Check suction piping.
	Clogged impeller	Remove and clean.
	Stainer too small or clogged	Use larger strainer or clean.
	Insufficient submergence of suction line.	Add lengths of suction pipe to keep submerged end well below the water surface.
	Excessive suction lift.	If caused by suction pipe friction, enlarge piping. Otherwise, move pump closer to water level.
	Total head more than that for which pump was intended	A pump designed for higher head is needed.
	Excessively worn impeller	Order replacement parts using Repair Parts List.
Pump loses prime:	Air leaks in suction line.	Check suction piping.
	Excessive lift & operating too near shut-off point.	Move pump nearer to water level.
	Water level drops while pumping, uncovering suction piping.	Check water supply. Add length of pipe to suction to keep submerged end under water.
Mechanical troubles and noise	Bent shaft and/or damaged bearings.	Take motor to authorized motor repair shop.
	Suction and/or discharge piping not properly supported and anchored	See that all piping is supported to relieve strain on pump assembly.

⚠ **WARNING:** It is unlawful in **CALIFORNIA & VERMONT (effective 1/1/2010); MARYLAND (effective 1/1/2012); LOUISIANA (effective 1/1/2013) and the UNITED STATES OF AMERICA (effective 1/4/2014)** to use any product in the installation or repair of any public water system or any plumbing in a facility or system that provides water for human consumption if the wetted surface area of the product has a weighted average lead content greater than 0.25%. This prohibition does not extend to service saddles used in California, Louisiana or under USA Public Law 111-380.