

OWNER'S MANUAL

End Suction Centrifugal Pump



SAFETY WARNINGS

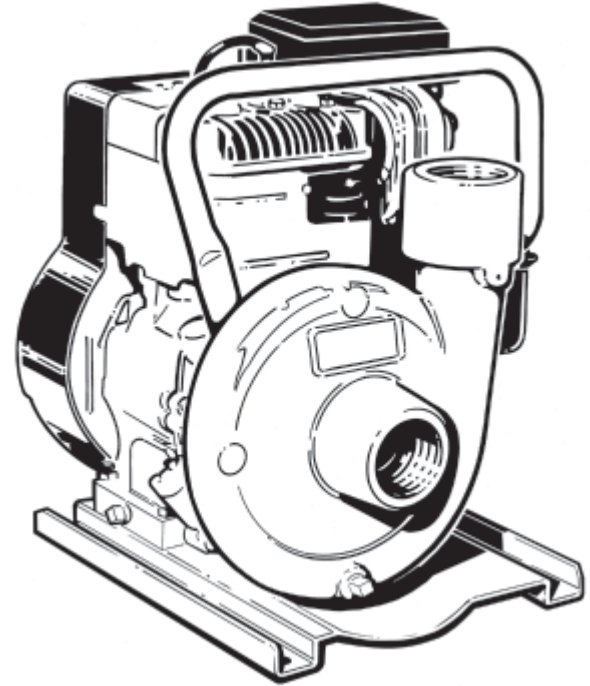


BEFORE OPERATING OR INSTALLING THIS PUMP, READ THIS MANUAL AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS.

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

- CAUTION**
- **DO NOT OPERATE THIS PUMP DRY!**
 - Review instructions before operating.
 - Wear ear protection to reduce objectionable noise.

- WARNING**
- Review chemical manufacturer's safety precautions before handling.
 - Make sure all connections are tight.
 - Do not breathe or ingest fumes or chemicals.
 - Never use with flammable fluids.
 - Turn off engine before servicing.
 - If fuel is spilled, avoid creating any source of ignition until the fuel vapors have been cleaned up and removed.



APPLICATION

These pumps are suitable for use where the vertical distance from the pump to the water level does not exceed *25 feet (7.6m), including drawdown. * Less at high altitudes.

PERFORMANCE

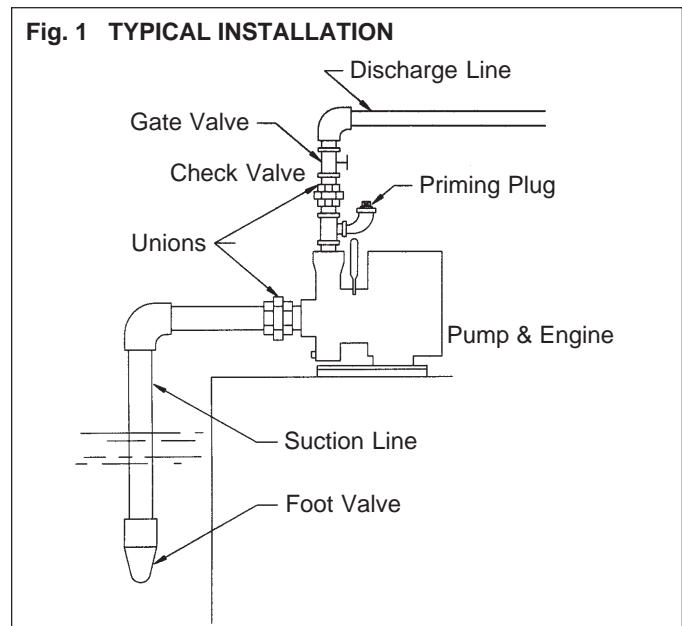
HP	Flow in GPM at Total Head (ft.)								
	50	75	100	125	150	175	200	225	250
3 HP	90	70	50	18	-	-	-	-	-
5 HP	25	105	80	50	20	-	-	-	-
8 HP	170	165	150	125	95	50	-	-	-
11 HP	177	170	152	135	112	89	72	40	-
18 HP	219	213	250	230	205	180	146	108	40

The table above gives you the performance expected from your pump when pumping water at sea level with 5' static suction lift.

At higher lifts, the maximum capacity will be reduced.

INSTALLATION

The pump should be located on a firm level surface as close as possible to the source of the water to be pumped. If possible, the unit should be bolted down and blocked to prevent creeping due to vibration. A suction hose should run from the pump directly to the water; ensure that the hose rises continuously from the water to the pump with no 'kinks', which could become an air lock. A foot valve must be installed at the bottom of the suction line. Use only suction piping and foot valve sizes, that have the same pipe size (or larger) as the pump suction tapping.



OPERATION - PRIMING THE PUMP

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

- 1) Before starting this pump, check the engine **oil level** and refill if necessary.
- 2) These pumps are not self priming. A foot valve must be installed on the suction line as shown in Fig. 1. Fill the pump casing and the suction line with water (see installation diagram). Do not run the pump dry, or seal damage will occur.

Start the engine and allow it to run 1/2 a minute. If the pump does not deliver water by this time, stop the engine and repeat the priming operation. Several attempts may be necessary to expel air in the suction line.

MAINTENANCE

WARNING

- Review chemical manufacturer's safety precautions before handling.
- Make sure all connections are tight.
- Do not breathe or ingest fumes or chemicals.
- Never use with flammable fluids.
- Turn off engine before servicing.
- If fuel is spilled, avoid creating any source of ignition until the fuel vapors have been cleaned up and removed.

- 1) **Check engine oil level regularly.** Refer to the manufacturer instruction booklet for maintenance.
- 2) To disassemble the pump for periodic cleaning:
 - a) Disconnect the suction and discharge hoses.
 - b) Remove four bolts and take off casing.
 - c) Unscrew the impeller in a counter clockwise direction.
 - d) Slip the seal and sleeve off the engine shaft.
 - e) Remove adapter from the engine, being very careful not to damage the ceramic seat.
 - f) Inspect the ceramic seat, if it needs replacing, press it out of the adapter from the engine side.

- 3) To reassemble:
 - a) Clean all parts thoroughly before reassembly. Lubricate the rubber cup of the ceramic seat with soapy water and push it into the adapter. Make sure that the smooth surface of the seal faces out.
 - b) Assemble the adapter to the engine, being careful not to damage the ceramic seat.
 - c) Lubricate the inner rubber ring of the rotating portion of the seal and slip it onto the sleeve and then slip the assembly onto the engine shaft with the rotating seal face toward the ceramic seat. Make sure that the seal face on the rotating seal is in contact with the ceramic seat.
 - d) Screw on the impeller. Install a new gasket and assemble the casing using the supplied mounting hardware. Use thread locking/sealing compound on casing bolts to prevent leaks. Check to ensure that the impeller can rotate freely in the casing.
 - e) Reconnect pump to suction and discharge hoses.
 - f) All models have a flinger on the shaft. This flinger must not be removed, unless it needs to be replaced.

TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
<i>Pump will not pump</i>	The suction and/or discharge line(s) may be blocked (4), or the valve(s) are closed, faulty, and/or blocked. The end of the suction line is not submerged. Total head is too high for the pump.	Check to see that the line and valves are in good working order. Increase its length, or move pump closer. Reduce total head or use a "higher head" pump.
<i>Pump doesn't catch prime</i>	No foot valve is being used. Excessive suction lift (1). Engine speed is too low.	Move the pump closer to "pump from" source. Increase the RPM.
<i>Priming takes a long time</i>	Suction line is quite long. No foot valve is being used. Air pockets or leaks may exist in the suction line.	Refer to "Starting the Pump", paragraph 3, under "Operation". Check the line for loose connections.
<i>Pump does not perform as well as it should</i>	Flow is restricted due to: a) debris build-up (4) b) Faulty or semi-open valve(s). c) Piping/hosing used is smaller than the thread sizes on the pump. Insufficient submergence of the end of the suction line. Excessively worn impeller (2). Seal is damaged (3). Liquid will be leaking through the adapter. Air pockets or leaks in the suction line. Clogged impeller (4).	Clean the lines and fittings. Check to see that the valves are in good working order. Increase the size of hose/pipe to reduce friction losses. The end of the suction line must be submerged. Replace impeller. Replace seal. Check suction line. Remove casing to clean out.
<i>Pump loses prime</i>	Liquid level drops below the end of the suction line. Foot valve is leaking - not holding water in suction line.	Increase length of suction line or if using flexible hose, you may be able to move the pump closer to the "pump from" source.

1) Excessive suction lift, must take in to consideration, the following:

- a) Size and length of pipe
- b) Density and temperature of liquid
- c) Pipe fittings
- d) Elevation above sea level

Including all of the above, we recommend the total suction head not exceed 25 ft.

2) An excessively worn impeller is mainly caused from "cavitation". Cavitation can be caused from a number of situations. Examples:

- a) Restricted suction
- b) Excessive suction lift

Contact your nearest Monarch Depot for any further assistance.

3) The seal may be damaged due to:

- a) Normal wear
- b) Overheating
- c) Pumping chemicals that this seal is not designed for

4) In a dewatering application, a foot valve is recommended on the suction line.

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