SCIENTIFIC WORLD PRODUCTS

Precision Water Technology

HFLOW

Horizontal Booster Pump

Installation & Operating Guide



CERTIFIED ISO 9001:2015 COMPANY

Copyright 2025
Scientific World Products®
All rights reserved

H80-4S

TABLE OF CONTENTS

Introduction**.....2**
- *Damaged Material Or Shortages*
- *Handling*

Warnings**.....2**
HT Booster Exploded View & Specs**.....3-5**
Installation**.....6**
- *Location*
- *Mounting*
- *Piping*

Pre Start-Up**..... 6-7**
- *Typical Installations, Figures 1 & 2*

Electrical Connections**.....7**

Start-Up Procedures**.....7-8**
- *Valves*
- *Priming*
- *Shaft Rotation*
- *Suction Flow*
- *Final Inspection*

Maintenance And Repair**.....8-11**
- *Removal Of Rotating Assembly*
- *Installation Of Rotating Assembly*
- *Removal Of Mechanical Seal*
- *Installation Of Mechanical Seal*
- *Motor Removal*
- *Motor Installation*

System Trouble Shooting**.....12-13**

INTRODUCTION

This manual was prepared to assist the installer and/or operator in understanding the proper method of installing, operating, and maintaining the HT Series (close coupled) Booster Pumps. Prior to starting the pump, thoroughly understand the correct installation and start-up procedures. If this is done, you will have years of trouble free service.

DAMAGED MATERIAL OR SHORTAGES

When the pump is received, examine the shipment to determine if it has been damaged or if any parts are missing. If so, note the damage or shortage on the bill of laden and the freight bill. Make any claims to the transportation company immediately. Retain the packaging materials until the claim is resolved. The pump should remain in the shipping carton until it is ready to be installed.

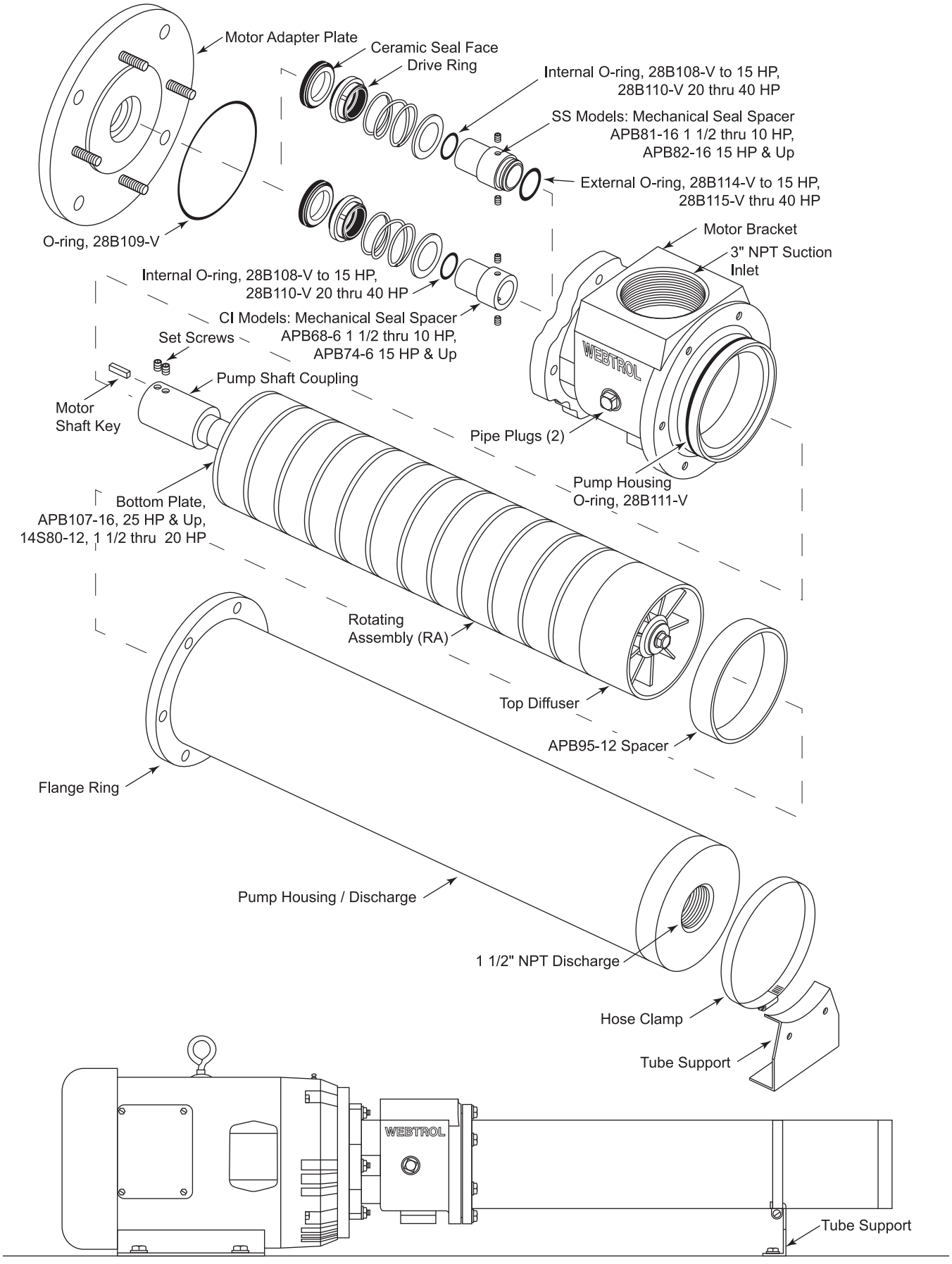
HANDLING

When handling the pump, support both the motor and pump housing. This can be done by wrapping a sling around the pump and motor. To avoid damage, handle the pump and motor with care.

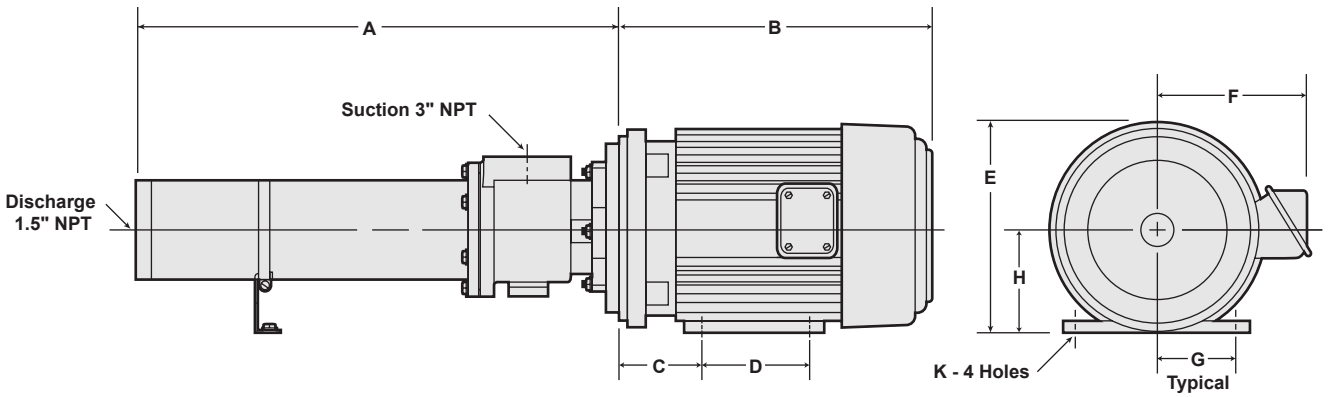
WARNING

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.
3. For maximum safety, this product should be connected to a grounded circuit, equipped with a ground fault interrupter device.
4. Before installing this product, have the electrical circuit checked by an electrician to make sure it is properly grounded.
5. Before installing or servicing your pump, BE CERTAIN pump power source is disconnected.
6. Make sure the line voltage and frequency of the electrical current supply agree with the motor wiring. If motor is dual voltage type, BE SURE it is wired correctly for your power supply.
7. Complete pump and piping system MUST be protected against below freezing temperature. Failure to do so could cause severe damage and voids the Warranty.
8. Do not run the pump at shutoff pressure, because the pump may be damaged due to high temperatures.
9. Do not run the pump dry. If it is, there will be damage to the pump seal and pump components.
10. Do not operate pump in flammable and/or explosive atmosphere.
11. To avoid internal damage to the pump, do not operate with the water temperature above 180 degrees F.
12. Do not pump chemicals or corrosive liquids with the pump unless they are compatible with the pump component materials: (Consult SWP for verification at (800) 934-0051). Use with nonflammable liquids.

EXPLODED VIEWS



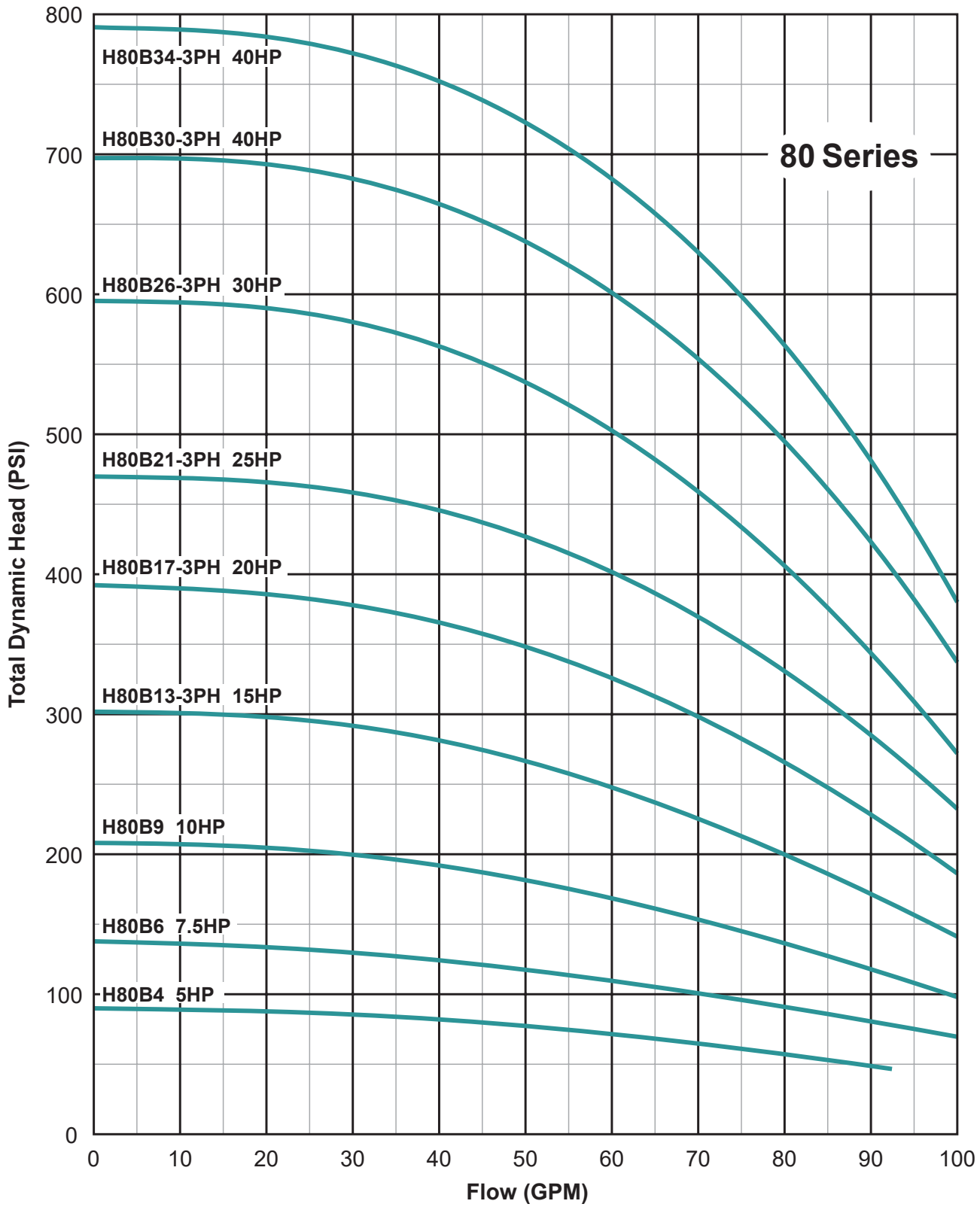
H80 SERIES DIMENSIONS



Model	HP	Dimensions (inches)									Aprox. Wt. (lbs)
		A	B	C	D	E	F	G	H	K	
H80B4	5	19.70	12.97	3.50	5.50	10.34	6.43	3.75	4.50	0.41	141
H80B6	7 1/2	23.70	18.84	3.50	5.50	10.34	6.43	3.75	4.50	0.41	151
H80B9	10	28.90	15.47	4.50	7.00	11.12	6.43	4.25	5.25	0.41	188
H80B13	15	38.00	20.05	4.25	8.25	14.94	10.00	5.00	6.25	0.53	238
H80B17	20	45.40	20.05	4.25	8.25	14.94	10.00	5.00	6.25	0.53	278
H80B21	25	52.40	23.25	4.75	9.50	16.35	12.09	6.38	7.00	0.53	329
H80B26	30	63.70	24.17	4.75	9.50	16.93	12.20	5.50	7.00	0.53	388
H80B30	40	70.70	24.37	5.25	10.50	18.16	13.74	6.25	8.00	0.66	495
H80B34	40	77.60	24.37	5.25	10.50	18.16	13.74	6.25	8.00	0.66	515

Construction Materials		
Part	**Cast Iron**	**316 SS**
Inlet/Motor Bracket	Cast Iron	316 SS
Discharge Housing	Steel	316 SS
Pump Housing	304 SS Tubing	316 SS Tubing
Impellers	Noryl	Noryl
Diffusers	Noryl	Noryl
Wear Rings	316 SS	316 SS
Shaft & Coupling	316 SS / 416 SS	316 SS
Shaft Bearing Sleeve	316 SS	316 SS
Shaft Bearing	Bronze	Rulon
Mechanical Seal	Carbon/Ceramic 302 SS, Buna-N	Carbon/Ceramic 302 SS, Buna-N
Mechanical Seal Spacer	416 SS	316 SS
O-Rings	Buna-N	Viton™

HFLOW SERIES GROUP CURVES



NOTE:
Curves are based on 60 Hz 3450 rpm motors. 50 Hz 2875 rpm curves are available. These curves are for general guidance only. Individual pump curves are available upon request. A certified curve may be requested for an additional cost. SWP will build pumps to fit your specific needs, contact factory for pricing.

INSTALLATION

LOCATION

Locate the pump as close to the liquid source as possible, so that a direct suction pipe may be used. Place the unit so that it is readily accessible for service, maintenance and allows air to freely circulate around the motor. Avoid air pockets in the suction piping that will make priming difficult. (See Figures 1 & 2, Pages 6 & 7) Note! Provide adequate space for the use of a tow - motor or hoist if required. Also, never position the pump in such a way that will allow a person to use it as a step.

MOUNTING

Bolt the pump to a secure and dry base. This will prevent noise, vibration, or creeping. Type JM motors are used on these pumps. This allows the motor to be bolted down using the two or four bolt holes provided in the motor feet. After bolting the motor down, position the tube support near the discharge. See page 3. If a gap exists between the tube support and pump housing/discharge, place a washer beneath the tube support. Secure it with a 3/8 -16 UNC bolt. Now, tighten the hose clamp.

PIPING

To minimize friction losses, the 4" suction line should be short with as few elbows as possible. The piping should be galvanized, rigid plastic or other suitable pipe that will not collapse or burst when exposed to suction or discharge pressure.

PRE START-UP

Prior to installing the piping and wiring the motor, rotate the pump shaft. To do this, insert a 9/16" socket into the discharge and rotate the hex head cap screw clockwise. Clockwise rotation will avoid releasing the compression on the impellers, which can cause the pump to fail. The pump shaft must rotate freely. If the pump shaft cannot be rotated, do not proceed. Contact your representative or call the SWP at (800) 934-0051) and ask for assistance.

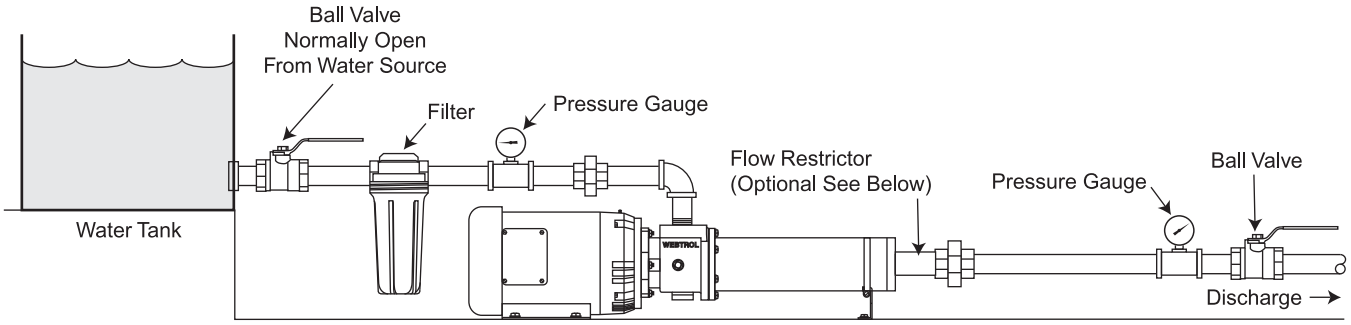


Figure 1 - This pump installation is designed to boost water pressure obtained from a water tank, which provides a gravity flow, flooded suction.

Important: If a regulating valve is not used in the discharge line a FLOW RESTRICTOR is recommended to prevent the pump from going into upthrust.

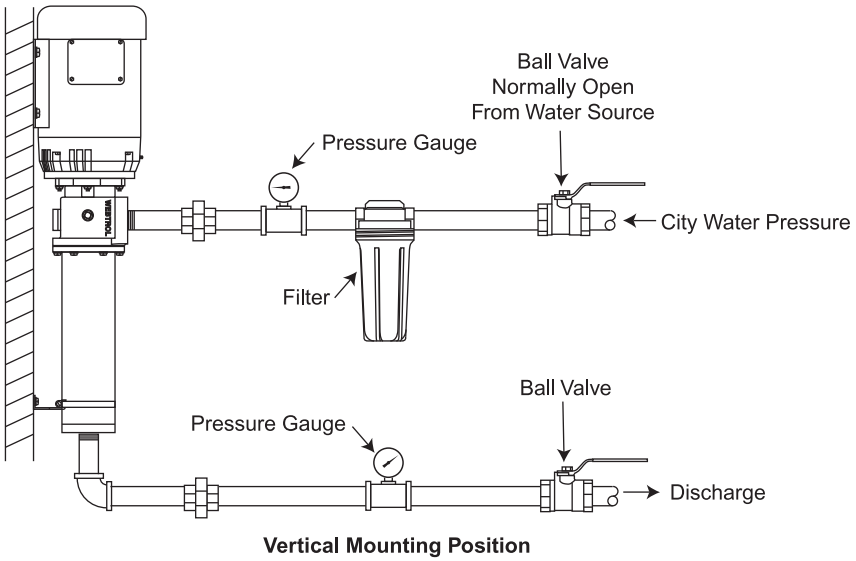


Figure 2 - Whenever dirt, sand or debris is present in the water supply, install a filter or strainer to prevent clogging or damaging the pump or mechanical seal faces.

ELECTRICAL CONNECTIONS

Before wiring the pump to the power source, verify that the motor voltage and frequency match the power sup ply. See motor nameplate. The supply voltage must be within plus or minus 10% of the nameplate voltage. Incorrect voltage can cause fire or seriously damage the motor and voids the warranty. Wire the motor according to the diagram shown on the motor nameplate or on the cover of the terminal box.

Install the ground wire and maintain this pump in compliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC) and with all local codes and ordinances that apply. Consult your local building inspector for local code information. The motors used on the H-FLOW Series Booster Pumps are manufactured by Baldor or U.S. Motor. The motors are factory wired for 230 volts. If permissible, use flexible conduit when wiring the motor. Allow enough slack in the line to remove either the motor or pump if the need arises.

START-UP PROCEDURES

VALVES

The valve installed in the suction line should be fully opened and the discharge valve should be par tially open. This will allow the pump to rapidly build pressure.

PRIMING

The pump will automatically fill with water when the pump is connected to a city main, hydrant, to water tank.To relieve the trapped air inside the pump, allow the water supply to run a minimum of 1 minute before starting the pump. Then, turn the motor on and off several times to free the air trapped inside the pump. Repeat this priming sequence several times to be sure that all the air has been removed from the pump.

SHAFT ROTATION

During the priming process, look into the fan guard located at the end opposite the motor shaft to determine the correct fan rotation which is clockwise. To correct the shaft rotation on three phase motors, interchange the external line connections of any two leads.

SUCTION FLOW

To insure that the pump and mechanical seal are adequately lubricated with water, the pres sure gauge installed on the suction line should read at least 2 PSI during operation. If the pressure gauge reads 0 PSI, calculate the Net Positive Suction Head Available (NPSHA) and compare it to the Net Positive Suction Head Required (NPSHR). Contact the Webtrol factory for the NPSHR.To prevent cavitation, the NPSHA must be greater than the NPSHR. To increase the NPSHA, increase the size of the suction pipe or if possible reduce the flow rate.

FINAL INSPECTION

Once the proceeding instructions have been completed, the pump can be started. During the first few hours of operation, inspect the pump, piping, and auxiliary equipment used in conjunction with the pump. Check for leaks, vibration, or unusual noises. If a problem arises and assistance is required contact SWP at (800) 934-0051).

MAINTENANCE AND REPAIR

Prior to servicing the pump or removing any component, disconnect the electrical supply and depressurize the system.

REMOVAL OF ROTATING ASSEMBLY (RA)

1. Loosen the two set screws in the pump shaft coupling by inserting an allen wrench thru the 3" NPT suction inlet of the motor bracket.

2. Disconnect the pump housing/discharge from the motor bracket. To do this, remove the four (4) 3/8 - 16 x 1 1/4 hex head bolts that attach the flange on the pump housing to the motor bracket. Now, twist and pull the pump housing off the shoulder on the motor bracket.

3. Remove the top diffuser containing either the brass or rulon (pink) bearing. The location of the top diffuser is shown on page 3 Exploded View.

4. Grasp the stainless steel shaft sleeve bearing and pull the the pump shaft coupling off the motor shaft. If a pair of pliers is required, be careful not to damage the stainless steel shaft sleeve bearing. Wrap the bearing in protective covering. On longer pumps, it might become necessary to insert a screwdriver into the suction inlet of the motor bracket and pry the pump shaft coupling off the motor shaft. (See Figure 3)

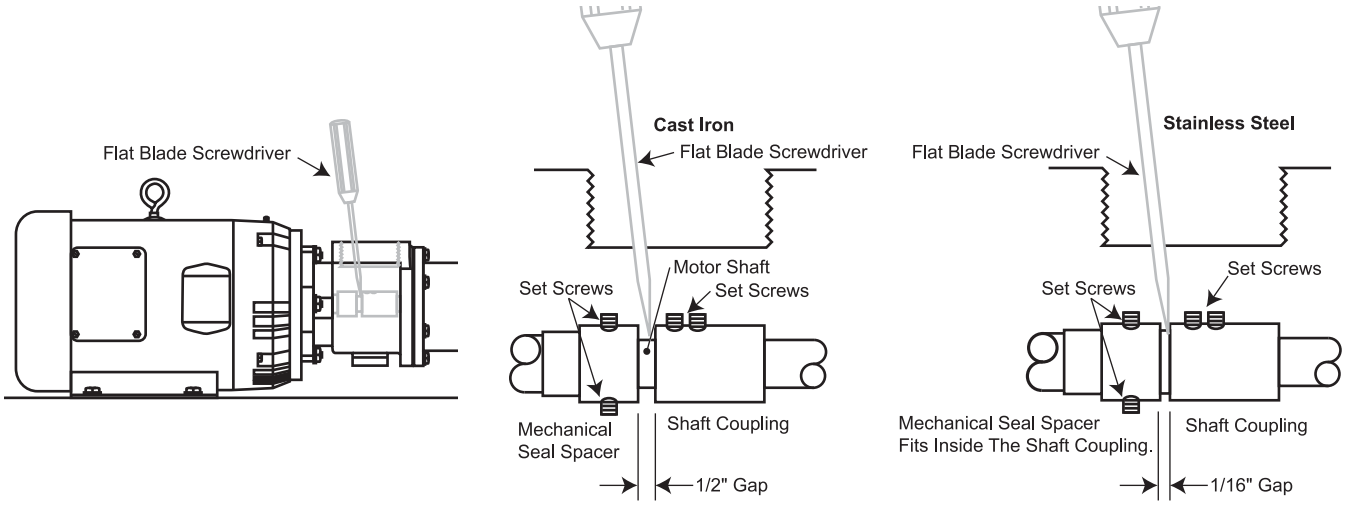


Figure 3

INSTALLATION OF ROTATING ASSEMBLY (RA)

1. Place the proper bottom plate on the RA. Note! For models 25 HP and up, use the SS bottom plate, APB107-16. For the remaining models, place the thermoplastic bottom plate against the diffuser so that the part number on the bottom plate is not legible when looking at it.

2. With the RA in hand, align the pump shaft coupling with the keyway in the motor shaft. Slide the RA onto the motor shaft until the bottom plate locates against the motor bracket.

3. Slide the pump housing/discharge over the RA, motor bracket, and o-ring. ***Note! Be careful not to nick/cut the o-ring during assembly.***

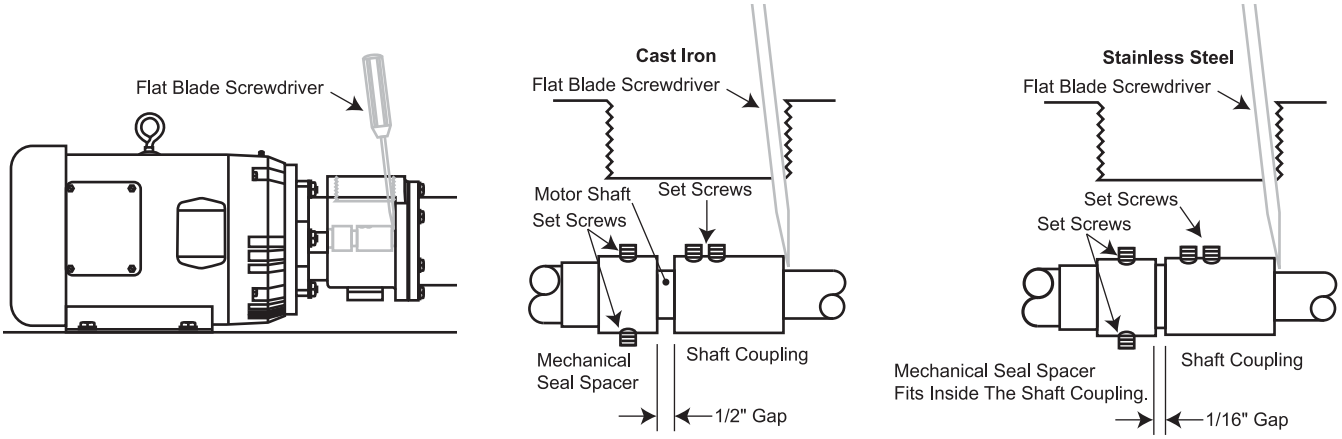


Figure 4

4. Tighten the flange ring on the pump housing to the motor bracket using four (4) 3/8 - 16 x 1 1/4 hex head bolts and lockwashers. Cross tighten the bolts evenly until the flange on the pump housing butts against the motor bracket.

5. Insert a flat blade screwdriver thru the suction inlet of the motor bracket and place it adjacent to the shaft coupling. (See Figure 4) Then, apply a prying force against the pump shaft coupling until the motor shaft butts against the pump shaft inside the shaft coupling. A “metalic thud” will be heard when contact is made. Now, tighten the two set screws securely.

6. After assembly, rotate the pump shaft. To do this, insert a 9/16” socket into the discharge and rotate the hex head cap screw clockwise. It must rotate freely.

7. Attach the proper tube support to the pump housing with a hose clamp.

REMOVAL OF MECHANICAL SEAL

1. Remove the 3/4” pipe plug protruding from the side of the motor bracket.

2. Loosen the set screws in the pump shaft coupling.

3. Unscrew the four (4) bolts that attach the motor to the motor bracket and the motor feet to the base.

4. Slide the motor away from the motor bracket.

5. Loosen the two (2) set screws in the mechanical seal spacer and slide it off the motor shaft.

6. Grasp and pull the rotating element of the mechanical seal off the mechanical seal spacer.

7. Pry the stationary seat of the mechanical seal out of the motor adapter plate with a screwdriver.

INSTALLATION OF MECHANICAL SEAL

1. Select the proper mechanical seal and lightly lubricate the rubber seat ring with mineral oil. (See Figure 6) Depending on the size of the seal, use a piece of 1 1/4" or 1 1/2" PVC pipe to press the ceramic seat firmly and squarely into the seal cavity. Be sure the seal face is not damaged during assembly (cracked, scratched, or chipped) or the seal will leak. Clean the polished surface of the ceramic seat with a soft cloth or tissue to remove all dust and grit.

2. Inspect the motor shaft to make sure it is clean. Clean seal seat in motor adapter plate.

3. To prevent slip - stick lightly lubricate both the ceramic, carbon seal face, and rubber driving ring with mineral oil. (See Figure 6)

4. Note! The cast iron seal spacer contains one inter-nal o-ring. The stainless steel seal spacer contains one internal o-ring and one external o-ring. (See Figure 5)

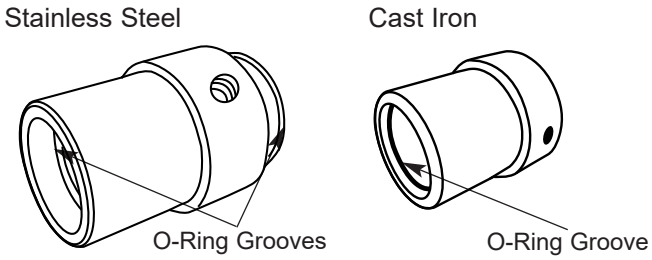


Figure 5

5. Apply Loctite 565 thread sealant to one of the two set screws a thread it into the mechanical seal spacer half-way.

6. Slide the rotating element of the mechanical seal onto the mechanical seal spacer. (See Exploded View, Page 3) The carbon seal face will butt against the white ceramic sealing face of the stationary seat after the mechanical seal spacer is positioned on the motor shaft.

7. Slide the mechanical seal spacer with the rotating element of the mechanical seal, onto the motor shaft until a metallic click is heard which signifies that it has hit the shoulder on the motor shaft. Then, visually align one of the two dimples in the motor shaft with the set screw hole - without the set screw installed.

8. Tighten down the set screw that is already installed. Rotate 180 degrees and install the second set screw after applying Loctite 565 thread sealant. Tighten securely.

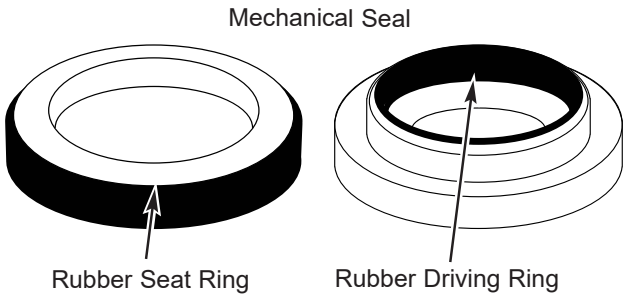


Figure 6

9. Slide the motor shaft key on the motor shaft key-way.

10. Align the keyway in the pump shaft coupling with the keyway in the motor shaft. Then, slide the motor shaft into the pump shaft coupling until a "metalic thud" is heard. This noise indicates that the motor shaft has made contact with the pump shaft inside the pump shaft coupling. Do not tighten the set screws in the pump shaft coupling.

11. Align the motor bracket with the rabbet fit and the four threaded studs on the motor adapter plate. Gently, position the motor bracket against the motor adapter plate. Do not pinch, nick, or damage the o-ring during installation. Secure with four (4) 3/8 -16 nuts and lockwashers.

12. Prior to tightening the set screws in the pump shaft coupling insert a screwdriver into the hole in the side of the motor bracket. Move the pump shaft coupling back and forth by prying against it.The total axial movement should be .062 inches or more.

13. Before tightening the set screws in the pump shaft coupling, move the pump shaft coupling as close to the motor as possible by prying against it (See Figure 4, Page 9). This movement will cause the motor shaft to make contact with the pump shaft inside the pump shaft coupling. Note! For 316 SS pumps, apply Loctite PST Pipe sealant or equivalent on the set screw threads. Clean threads thoroughly prior to installation.

MOTOR REMOVAL

1. Remove the 3/4” pipe plug protruding from the side of the motor bracket.
2. Loosen the set screws in the pump shaft coupling.
3. Unscrew the four (4) bolts that attach the motor to the motor bracket and the motor feet to the base.
4. Slide the motor away from the motor bracket.
5. Loosen the two (2) set screws in the mechanical seal spacer and slide it off the motor shaft.
6. Remove the four (4) bolts that attach the motor adapter plate to the motor.

MOTOR INSTALLATION

1. Slide the water slinger over the motor shaft, as far back as possible.
2. Bolt the motor adapter plate to the motor with the four (4) bolts.
3. Refer to “Installation of Mechanical Seal” instructions 7 thru 13.

SYSTEM TROUBLE SHOOTING

Motor Failure

Possible Cause Of Trouble	Corrective Action
Loss Of Power: If you suddenly lose all power to the motor, check the fuses or circuit breakers that control the power to the motor. Be sure that you still have power coming to your main control panel.	Replace any bad fuses or reset circuit breakers. If you lose power to your main control panel, contact your local power company.
Incorrect Voltage: Measure the line voltage at the terminals of the motor with a voltmeter. The voltage must be within plus or minus 10% of the rated voltage of the motor.	If voltage is high, consult the local power company. If voltage is low, check for over loaded circuits, under-sized wiring or poor connections.
Incorrect Overload Protection: Make sure you are using the recommended overload protection for the motor.	Replace with properly sized overload protection.
Inadequate Wire Size: The distance between the power supply and the motor is very important. The farther away the pump motor is from the power supply, the larger the wire size should be. Check the voltage at the power supply and at the motor. These readings should be close to the same.	Replace with the correct size wire.
Defective Wire Or Connections: When the wires or connections going to the motor or controls are loose, corroded or damaged, there can be a loss of power.	Replace any corroded or damaged wires. Tighten or clean all connections.
Grounded Motor: When the insulation covering the windings inside the motor either deteriorates or is burned off allowing the winding to come in contact with the motor frame, the motor is grounded.	Have the motor rewound with new windings. Replace motor with new one.

Motor Or Pump Shaft Locked Up (Hard To Turn)

Possible Cause Of Trouble	Corrective Action
Pump Clogged: Whenever it is possible for foreign matter (tape, pipe dope, etc.) to get into the pump, the pump can clog/lockup.	Install a screen in the suction inlet line to remove any materials that could clog the pump.
Pump Bearings Froze: The pump bearings can seize when there is an insufficient amount of water flowing through the pump, for lubrication. The bearings will generate heat, causing the bearings to swell and lock up. In a pump where the bearings have been worn by abrasives, it is possible for small pieces of foreign matter to become wedged between the two bearings, causing them to lock up.	Increase the flow rate to the minimum flow rate of 30 GPM.
Loose Coupling Or Broken Shaft: If the pump shaft coupling becomes loose or the motor shaft or pump shaft breaks, the rotating assembly will be hard to rotate or possibly lock up.	If the motor shaft is broken replace the motor. If the pump shaft or the pump coupling is either broke or loose, replace the rotating assembly.
Impellers And Diffusers Galled Together: To prevent the impellers and diffusers from seizing, they must be kept lubricated by water passing through them. If the pump has insufficient water flow, the impellers will heat the water, causing the impellers and diffusers to distort and seize.	See section on insufficient amount of water flow.
Motor Bearings Bad: These bearings can fail for basically two reasons: lack of lubrication or fatigue. When a motor bearing fails, it is possible that the motor shaft will lock up.	Replace bearings in motor. Replace motor.

Insufficient Amount Of Water Flow/Pressure

Possible Cause Of Trouble	Corrective Action
Motor Running Backwards: This problem can only occur on three phase units. See shaft rotation section under Start-up Procedures page 7.	Interchange any two lead wires going to the motor.
Air Locked Pump: When air is trapped inside the impellers and diffusers of the pump, it prevents water from passing through the pump, thus loss of water flow. When this happens you will see numerous air bubbles will be visible in the discharged water.	Tighten all pipe joints in the suction inlet line. Make sure that the supply line and/or supply tank are completely filled with water. See Priming, on page 7 Start-Up Procedures.
Check Valve Sticking Or Installed Backwards: If the check valve does not open completely, the water flowing through it will be restricted. If the check valve is installed backwards, no water can pass through.	Replace the check valve if it is sticking. Reverse the check valve if it is installed backwards.
Impellers Worn inside of Pump: When the diameters of the impellers wear, the pressure that the pump was once able to produce is lost. When the pressure is lost, the amount of water passing through a pipe is reduced. The impellers will wear when there are abrasives in the liquid being pumped, or if the pH value of the liquid is not between 5-9.	Install a screen in the suction inlet line to remove abrasives. Correct the pH of the liquid being pumped. Remove/replace the rotating assembly.
Loose Coupling Or Broken Shaft: The amount of water passing through the pump will be reduced if the coupling located between the motor shaft and pump shaft comes loose or if either the pump shaft or motor shaft breaks.	If the motor shaft is broken, replace motor. If the pump shaft coupling is either broke or loose, replace rotating assembly.
Clogged Impeller: If the impeller becomes clogged with foreign matter (tape, pipe dope, etc.) the water flow will be restricted.	Clean or replace clogged impeller. Install screen in suction inlet line.

Mechanical Seal Failure

Possible Cause Of Trouble	Corrective Action
Misalignment: If this happens, you will see uneven wear on the ceramic and carbon mating surfaces of the seal.	Remove and thoroughly clean seal and seal seat area in the inlet housing check for a bent motor shaft.
Lack Of Water (Lubrication): This will cause thermal stresses on the seal faces which can crack the ceramic seal seat face or harden / crack elastomers (rubber), or wear the carbon seal face creating carbon dust.	Increase the pressure in the suction inlet housing. See section Suction Flow under Start-up Procedures.
Abrasives: Any abrasives present in the pumping liquid will damage the seal. This will show up on the ceramic and carbon sealing faces in the form of grooves cut into the sealing surface.	Install a screen in the suction inlet line to remove any abrasive material in liquid. If there is no way of removing the abrasives from the liquid, contact SWP factory for a alternate seal capable of handling abrasives.
Corrosion: If the fluid is not compatible with the materials used in the mechanical seal, chemical attack will occur and the seal will leak. The elastomers can become soft, sticky or hard.	Contact SWP factory for a alternate seal that will be compatible with the fluid.
Inlet Line Pressure Is Too High: If the seal leak increases as the operating pressure of the pump decreases, this is usually a sign that the pressure of the water going into the pump inlet housing is greater than the seal was designed to handle.	Replace mechanical seal.

NOTES

NOTES

THANK YOU FOR PURCHASING AN H-FLOW BOOSTER PUMP

SCIENTIFIC WORLD PRODUCTS

Precision Water Technology