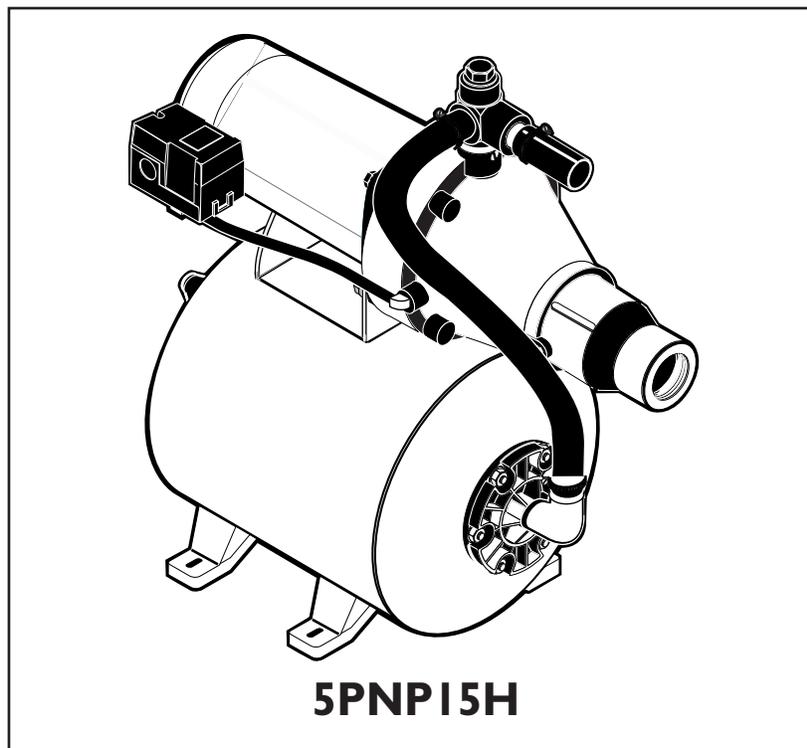


BERKELEY®

Model Discontinued
For Reference Only



Installation/Operation/Parts

For further operating, installation, or maintenance assistance:

Call 1-888-782-7483

INTRODUCTION

Please read our instructions before installing and using your Shallow Well Water System. This will help you obtain the full benefits of the quality and convenience built into this equipment. It will also help you avoid any needless service expense resulting from causes beyond our control which are not covered by our warranty.

READ AND FOLLOW SAFETY INSTRUCTIONS!

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 **will** or **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.

⚠ CAUTION Never run pump dry. Running pump without water may cause pump to overheat, damaging seal and possibly causing burns to persons handling pump. Fill pump with water before starting.

⚠ WARNING Never run pump against closed discharge. To do so can boil water inside pump, causing hazardous pressure in unit, risk of explosion and possibly scalding persons handling pump.

⚠ CAUTION Motor normally operates at high temperature and will be too hot to touch. It is protected from heat damage during operation by an automatic internal cutoff switch. Before handling pump or motor, stop motor and allow to cool for 20 minutes.

1. To avoid risk of serious bodily injury and property damage, read safety instructions carefully before installing pump.
2. Follow local and/or national plumbing and electrical codes when installing pump.
3. Keep well covered while installing pump to prevent leaves and other debris from falling into well, contaminating well and possibly damaging pump.
4. Protect pump and piping system from freezing. Allowing pump or water system to freeze could severely damage pump and voids warranty.

⚠ WARNING To avoid serious injury and equipment damage, limit system pressure to 75 pounds per square inch (PSI) or below at all times. Over-pressure can cause tank blowup; install relief valve capable of passing full pump volume at 75 PSI.

5. With a new well, test well for purity before use. Consult local Health Department for procedure.

⚠ WARNING Hazardous voltage. Can shock, burn, cause death, or start fires.

6. Disconnect electrical power source before installing or working on pump.
7. Ground pump with a ground wire run from grounding lug on motor to a grounded lead in the service panel.
8. Line voltage and frequency of electrical power supply must agree with motor nameplate.
9. Use of fuses or wire smaller than size recommended in owner's manual can cause overheating, possible fires, and will void warranty.

BASIC TOOLS AND MATERIALS NEEDED

Plastic Pipe Installation

Tools

Pipe Wrenches
Screwdriver
Knife or Saw to Cut Plastic Pipe
Tire Pressure Gauge

Materials

Plastic Pipe and Fittings (as required to complete job).
Teflon Tape (DO NOT use joint compound on plastic fittings).

Galvanized Steel Pipe Installation

Tools

Pipe Wrenches
Screwdriver
Pipe Cutting and Threading Tools
Tire Pressure Gauge

Materials

Galvanized Pipe and Fittings (as required to complete job).
Pipe Joint Compound or PTFE Pipe Thread Sealant Tape

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.

	Page
General Safety	2
Warranty.....	3
Installation.....	4-6
Electrical.....	6-7
Operation	7
Maintenance	8-12
Repair Parts	13-14
Troubleshooting.....	15

ATTACH ORIGINAL RECEIPT HERE FOR WARRANTY CONSIDERATION.

Limited Warranty

BERKELEY warrants to the original consumer purchaser (“Purchaser” or “You”) of the products listed below, that they will be free from defects in material and workmanship for the Warranty Period shown below.

Product	Warranty Period
Water Systems:	
Water Systems Products — jet pumps, small centrifugal pumps, submersible pumps and related accessories	whichever occurs first: 12 months from date of original installation, or 18 months from date of manufacture
Pro-Source™ Composite Tanks	5 years from date of original installation
Pro-Source™ Steel Pressure Tanks	5 years from date of original installation
Pro-Source™ Epoxy-Lined Tanks	3 years from date of original installation
Sump/Sewage/Effluent Products	12 months from date of original installation, or 18 months from date of manufacture
Agricultural/Commercial:	
Centrifugals – close-coupled motor drive, frame mount, SAE mount, engine drive, VMS, SSCX, SSHM, solids handling, submersible solids handling	12 months from date of original installation, or 24 months from date of manufacture
Submersible Turbines, 6” diameter and larger	12 months from date of original installation, or 24 months from date of manufacture

Our limited 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 BERKELEY’s only duty, is that BERKELEY repair or replace defective products (at BERKELEY’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.

BERKELEY 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.

In the U.S.: BERKELEY, 293 Wright St., Delavan, WI 53115
In Canada: 269 Trillium Dr., Kitchener, Ontario N2G 4W5

MAJOR COMPONENTS AND WHAT THEY DO

Impeller and Jet

Impeller turns with motor shaft, causing water to fly out from its rim by centrifugal force. Impeller rotation creates a vacuum which pulls in more water. Part of the water is diverted back to the jet where it passes through the nozzle and venturi. This creates more vacuum to draw in more water.

In shallow wells (less than 25 feet deep), the vacuum created at the pump is enough to pull water to the pump. Therefore, for shallow well use the jet is built into the pump.

Pre-Charged Tank

The tank serves two functions. It provides a reservoir of water under pressure and maintains a cushion of air pressure to prevent pipe hammering and possible damage to plumbing components. When water is drawn off through the house fixtures, the pressure in the tank is lowered and the pump starts.

Pressure Switch

The pressure switch provides for automatic operation. Pump starts when pressure drops to 30 pounds and stops when pressure reaches 50 pounds.

Check Valve or Foot Valve

Install a check valve **as close to well as possible** on well point installations. A foot valve must be installed **in the well** on dug or cased wells. See Figures 2A and 2B (Pages 4 and 5). For long horizontal pipe runs, install check valve as close to well as possible (all types of wells).

INSTALLATION

Piping in the Well

The Shallow Well Water System can be installed on a dug well, cased well or with a driven point. In a dug or cased well, a foot valve and strainer should be installed for easy priming. It should be installed five to ten feet below the lowest level to which the water will drop while the pump is operating (pumping water level). To keep sediment from clogging the strainer, be sure it is five to ten feet above the bottom of the well. Before installing the foot valve, make sure that it works freely.

When using a foot valve, a priming tee and plug as shown in Figure 1, are recommended.

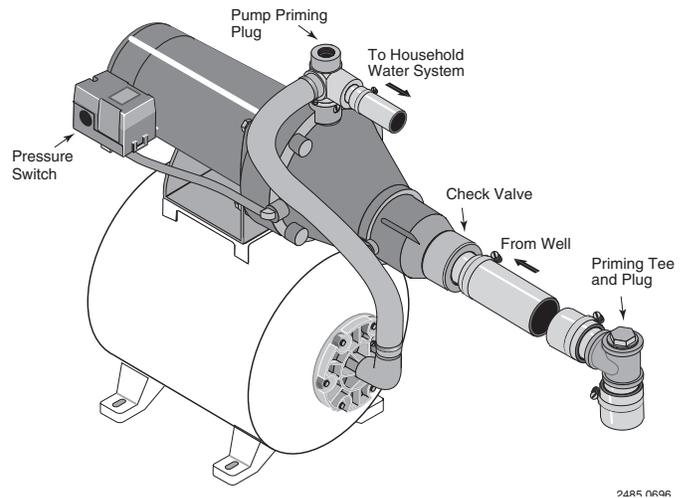


Figure 1 – Connections to water system

When installed on a driven point well, your Shallow Well Water System should have a check valve installed as shown in Figure 2A.

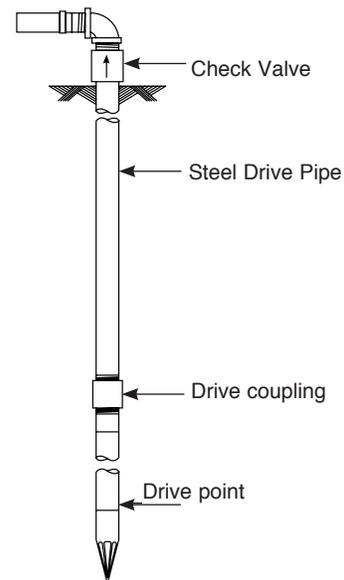


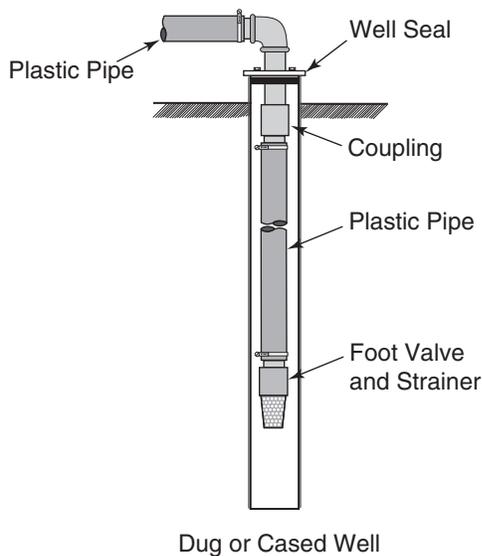
TABLE I – PUMP PERFORMANCE (IN GALLONS PER MINUTE)

NOTE: This system is designed for pumping depths of 25 feet or less.

Pump Model	Description	Suct.	Disch.	Discharge Pressure PSI	Pumping Depth in Feet				
					5'	10'	15'	20'	25'
5PNP15H	1/2 HP S.W. Jet	1-1/4"	3/4"	40	5.2	5.0	4.6	4.3	3.2

For a pump at sea level mounted directly over the well, be sure the total lift from the pumping water level to the pump does not exceed 25 feet. This will be less if the pump is offset from the well.

The maximum lift of any pump decreases at the rate of about 1' less lift for every 1,000 feet of elevation above sea level. For example, at Denver, Colorado (Elev. 5,000') the pump loses five feet of lift. The maximum depth from which it would pump water would therefore be 15 feet.



611 1293

Figure 2B – Dug or cased well

PUMP/TANK INSTALLATION

Pump

NOTICE: Use Teflon tape supplied with the pump or Plasto-Joint Stik¹ for making all pipe-thread connections to the pump itself. To avoid stress-cracking, do not use pipe joint compounds on the pump.

1. Wrap male pipe threads being attached to pump with one or two layers of PTFE pipe thread sealant tape. Cover entire threaded portion of pipe.
2. Do not overtighten threaded fittings in the plastic pump. Be sure you do not try to tighten joint past thread stop in pump port!
3. If leaks occur, remove fittings, clean off old tape, rewrap with two to three layers of tape and remake the connection. If joint still leaks, replace the fittings (fittings may be undersized).
4. Be sure to support all piping connected to the System.

Horizontal Piping from Well to Pump

When the pump is offset more than 25 feet from the well, horizontal suction pipe size should be increased to reduce friction losses. Never install a suction pipe that is smaller than the suction tapping of the pump.

1-1/4"	1-1/2"	2"
Up to 25 Ft.	25 to 50 Ft.	50 to 200 Ft.

Discharge Pipe Sizes

When the pump is some distance from the house or point of water use, the discharge pipe size should be increased to reduce pressure losses caused by friction.

1"	1-1/4"	1-1/2"
Up to 25 Ft.	25 to 100 Ft.	100 to 600 Ft.

Tank

Tank is pre-charged with 40 pounds per square inch (PSI) air pressure at the factory. Your tank requires an air charge of 28 PSI for proper operation; check tank pressure with tire gauge and adjust air charge as needed. Tank pre-charge should be checked annually; see instructions on Page 6.

In areas where the temperature is high for long periods of time, the tank pre-charge pressure may increase. This may reduce the tank drawdown (amount of water available per cycle). If this occurs, reduce the pre-charge pressure until it is 2 PSI below the pump cut-in setting of the pressure switch (normally 30 PSI).

It is necessary to flush all air out of the piping system and water reservoir portion of the pre-charged tank. This is required on new installations, pumps requiring repriming and pumps that have been disassembled for service. Do this as follows:

1. Open faucets furthest from tank and allow pump to operate.
2. Air in the system will cause a sputtering flow; allow faucets to run until you have a steady, air free stream.
3. Open and close faucets repeatedly until you are sure all air has been removed.
4. If stream does not become steady, air may be leaking into the system; check for leaks in the piping on the suction side of the pump.

NOTICE: To prevent waterlogging, check tank air charge annually.

To Check Tank Air Charge

If drawdown (amount of water available per cycle) decreases significantly, check as follows:

1. To check air charge in tank, shut off electric power to pump, open faucet near tank, and drain completely.
2. At the air valve in top of tank, check air pressure with standard tire gauge. Air pressure should be the same as

the turn on pressure of the pressure switch (30 PSI).

3. If the air pressure is below 30 PSI, add air to the tank. Use an air compressor or a portable air storage tank.
4. Use soap or liquid detergent to check for air leaks around air valve. Continuous bubbling indicates a leak. If necessary, install new core in air valve. This is the same as those used for automobile tubeless tires.

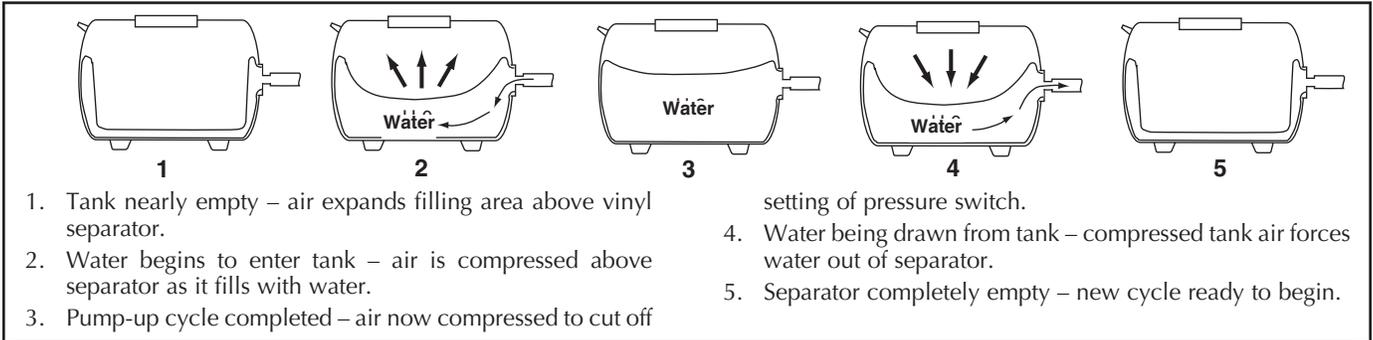


Figure 3

ELECTRICAL

⚠️ Disconnect power before working on pump, motor, pressure switch, or wiring.

Your Motor Terminal Board (under the motor end cover) and Pressure Switch look like one of those shown below.

Convert to 115 Volts as shown. Do not change motor wiring if line voltage is 230 Volts or if you have a single voltage motor. Connect power supply as shown for your type of switch and your supply voltage.

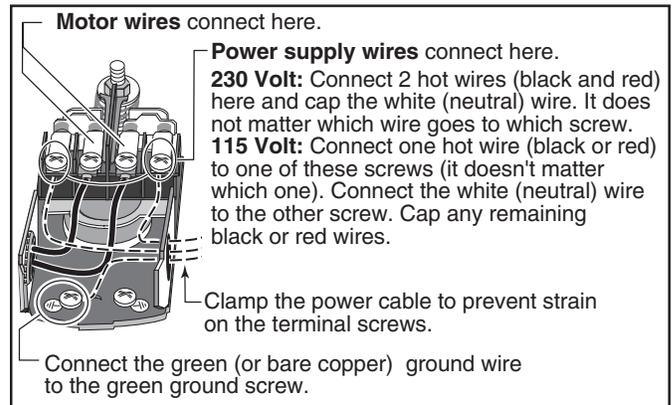
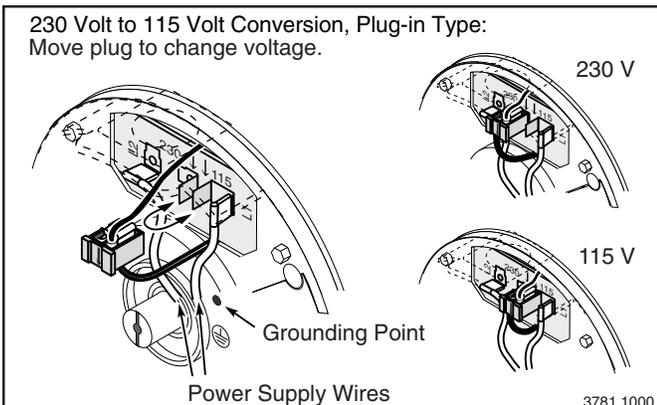
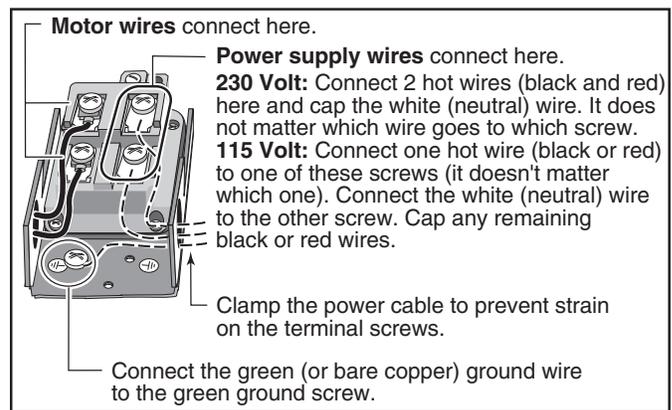
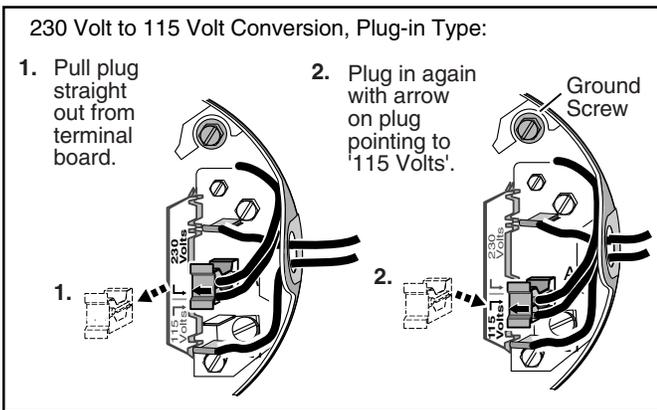


Figure 4: Motor wiring connections through Pressure Switch. Match motor voltage to line voltage.

⚠️ WARNING Hazardous voltage. Can shock, burn, or kill. Connect ground wire before connecting power supply wires. Use the wire size (including the ground wire) specified in the wiring chart. If possible, connect the pump to a separate branch circuit with no other appliances on it.

⚠️ WARNING Explosion hazard. Do not ground to a gas supply line.

WIRING CONNECTIONS

⚠️ WARNING Fire hazard. Incorrect voltage can cause a fire or seriously damage the motor and voids the warranty. The supply voltage must be within ±10% of the motor nameplate voltage.

NOTICE: Dual-voltage motors are factory wired for 230 volts. If necessary, reconnect the motor for 115 volts, as shown. Do not alter the wiring in single voltage motors.

Install, ground, wire, and maintain your pump in compliance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC), as applicable, and with all local codes and ordinances that apply. Consult your local building inspector for code information.

Connection Procedure:

1. Connect the ground wire first as shown in Figure 4. The ground wire must be a solid copper wire at least as large as the power supply wires.
2. There must be a solid metal connection between the pressure switch and the motor for motor grounding protection. If the pressure switch is not connected to the motor, connect the green ground screw in the switch to the green ground screw under the motor end cover. Use a solid copper wire at least as large as the power supply wires.
3. Connect the ground wire to a grounded lead in a service panel, to a metal underground water pipe, to a metal well casing at least ten feet (3M) long, or to a ground electrode provided by the power company or the hydro authority.
4. Connect the power supply wires to the pressure switch as shown in Figure 4.

OPERATION

Priming the Pump

NOTICE: To prevent damage to internal parts, do not start motor until pump has been filled with water.

To prime pump:

1. Remove priming plug (Figure 1, Page 4).
2. Fill pump with water.
3. Replace priming plug, using PTFE pipe thread sealant tape on plug threads; tighten plug.
4. Start the pump. Water should be pumped in 1-2 minutes. If not, repeat steps 1, 2 and 3.

On shallow depths to water (10 feet or less), the pump will probably prime the first time after following steps 1 through 4 above.

From 10 to 25 foot depths, you might have to shut off the pump and repeat steps 1, 2 and 3 several times.

5. If, after priming pump several times, no water is pumped, check the following:
 - A. Be sure suction pipe is in the water.
 - B. Be sure suction pipe does not leak.
 - C. Be sure that pump is not trying to lift water too high (see “Piping in the Well”, Page 4).
 - D. As long as foot valve and check valve function correctly and suction pipe does not develop leaks, pump should not need repriming in normal service.

Table II Wiring Chart – Recommended Wire and Fuse Sizes

Motor Horsepower	Volts	Max. Load Amps.	Branch Fuse* Rating Amps	Distance in Feet from Motor to Meter				
				0' to 100'	101' to 200'	201' to 300'	301' to 400'	401' to 500'
				Wire Size				
1/2	115/230	8.8/4.4	15/15	14/14	12/14	10/14	8/14	8/12

Lubrication

It is not necessary to lubricate the pump or its motor. The motor bearings are lubricated for life. The mechanical shaft seal in the pump is water lubricated and self-adjusting.

Draining for Winter

▲ WARNING Risk of electric shock. Disconnect power before working on unit.

Pump should be drained whenever it is disconnected from service or is in danger of freezing.

1. DISCONNECT POWER.
2. Open faucet and relieve all pressure on system before proceeding.
3. Disconnect pressure switch tube (Key No. 15, Page 13) at barbed elbow on pressure switch (Key No. 26) and allow tube to drain.
4. Unscrew barbed elbow (Key No. 14) from pump body and allow pump to drain. If necessary to drain completely, tilt pump.
5. Remove priming plug to vent pump; disconnect hose (Key No. 8, Page 14) at tank end and drain pressure tank and all piping to a point below the frost line.
6. Be sure to drain any piping that may be cut off from normal system drain due to check valve installation.

Vinyl Bag Replacement

▲ WARNING Be sure ALL air pressure has been released from tank before removing nuts from flange. Failure to do this may result in serious or fatal injury. Do not attempt to open tank unless all pressure has been relieved!

▲ WARNING Risk of electric shock. Disconnect power before working on unit.

1. DISCONNECT POWER TO PUMP.
2. Drain system as follows:
 - A. Open faucet closest to tank.
 - B. Remove hose (Key No. 8, Page 14) from tank elbow.
3. Relieve (expel) ALL air pressure in system by removing valve core.
4. Disconnect outside piping from tank and pump.

▲ WARNING To avoid serious or fatal injury, be sure all air pressure has been released from tank before proceeding to step 5.

5. Remove nuts from inlet flange (Key No. 4, Page 14). Tap inlet flange to break seal. Remove flange.

6. Wherever convenient, hold bag with pliers and cut with single-edge razor blade or sharp knife. Bag will not come out in one piece. Continue pulling and cutting until bag is removed.
7. Clean and dry inside of tank.
8. Place replacement bag on a clean surface with opening up. Flatten bag and force air out.
9. Tightly roll bag towards center opening.
10. Before center opening is covered up, force air out of remaining portion of bag. Finish rolling bag.
11. To make bag easier to insert into tank, sprinkle outside of bag with talcum powder.
12. Being careful not to break valve, stand tank on end. Push tightly rolled bag into tank.
13. Reach into bag and push out sidewalls. You need not remove all wrinkles.
14. Clean center opening ring on bag and lip on tank.
15. Pull ring on bag through tank opening and fit over tank lip. BE SURE it seats properly in groove on tank lip.
16. Clean sealing surface of inlet flange and place on studs.
17. **NOTICE:** Tighten nuts as follows:
 - A. Hand tighten all nuts.
 - B. Tighten one nut snug.
 - C. Tighten opposite nut snug.
 - D. Proceed, tightening opposite pairs to a snug fit.
 - E. Recheck all nuts, using same pattern. Be sure all nuts are tight and you have a good seal.
- NOTICE:** Do not overtighten; you may twist studs off of tank. If you have a torque wrench, tighten to 85 inch-pounds torque.
18. Stand tank on feet and reconnect piping.
19. Recharge tank to proper air pressure (see Page 6).
20. Reconnect hoses and pressure switch tube; prime pump (above).

Air Valve Replacement

1. Follow steps 1 through 5 under "Vinyl Bag Replacement".
2. Cut valve off as close to tank as possible. Push remaining portion back into tank.
3. Tip tank on end and BE SURE all water is drained from bag.
4. Carefully remove bag ring from lip on tank opening and push bag ring back into tank; reach in around it and remove cut off portion of valve from tank.
5. Wipe a thin film of soapy solution on replacement valve and from inside tank insert in hole in top of tank.

6. Pull valve through hole with pliers or a valve tool (available at your local filling station or Automotive Center).
7. Follow steps 14 through 20 under “Vinyl Bag Replacement”, Page 8, to reinstall bag in tank.

Testing for Bag Leakage

1. Follow steps 1 through 4 under “Vinyl Bag Replacement”, Page 8.
2. Tip tank on end, valve down. Be careful not to break valve!
3. If bag leaks, water will run out of valve. If so, replace bag as instructed above.

DISASSEMBLY AND ASSEMBLY OF PUMP

⚠️ WARNING Risk of electrical shock. Be sure unit is grounded and power disconnected before attempting any work on pump or motor.

Your pump is designed for ease in servicing. Should repair or replacement of the motor or seal be needed, the pump and piping do not need to be disconnected or disturbed.

1. Disassemble pump as follows:
 - A. Disconnect power.
 - B. Remove pressure switch tube from pump body and allow pump to drain.
 - C. Remove four hexnuts and lockwashers (Key Nos. 24 and 23, Page 13) which hold the pump body to the motor.
 - D. Remove motor, seal plate, impeller, rubber pad and diffuser (Key Nos. 1, 3, 7, 8 and 9, Page 13) as a unit. You may have to pry gently with two screwdrivers between the motor flange and the pump body to separate pump and motor.
2. Reassembly of pump:
 - A. Install O-Ring gasket on seal plate (Key Nos. 5 and 3, Page 13).
 - B. Pick up a small amount of petroleum jelly on one finger and spread evenly over seal plate and venturi O-Ring gasket for lubrication during reassembly. Be careful not to nick or tear O-Ring.
 - C. Replace motor onto pump body; be sure rubber pad (Key No. 8, Page 13) stays in place on top of diffuser. Remount base on lower studs. Tighten four hexnuts and lockwashers snugly (35-45 inch-lbs. torque). Do not overtighten.
 - D. Replace pressure switch tubing and motor wiring.
 - E. Prime pump according to instructions above.
 - F. Check for leaks.

Removing Motor for Service and Replacing Shaft Seal

If it is necessary to separate motor and seal plate, always replace the shaft seal. We suggest you purchase this item, U109-6A, and have it on hand for future use.

NOTICE: The seal consists of two parts, a rotating member and a ceramic seat. The surfaces of the seal are easily damaged. Read instructions carefully.

Remove motor as follows:

1. Disassemble pump per instructions above.
2. Remove diffuser and impeller as follows (Key Nos. 9 and 7, Page 13).
 - A. Remove screws holding diffuser.
 - B. Loosen two screws and remove motor canopy from motor (Key No. 1, Page 13).
 - C. Place 7/16" open end wrench on motor shaft flat.
 - D. Turn impeller counterclockwise when facing it.
3. Remove seal plate from motor by inserting two screwdrivers between the seal plate and the motor flange. Pry seal plate off motor flange. This will force rotating portion of seal off of shaft.

NOTE: Be sure you do not scratch shaft!

See Figures 5 & 6.

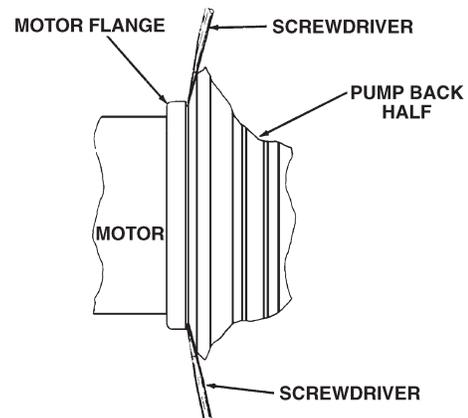


Figure 5

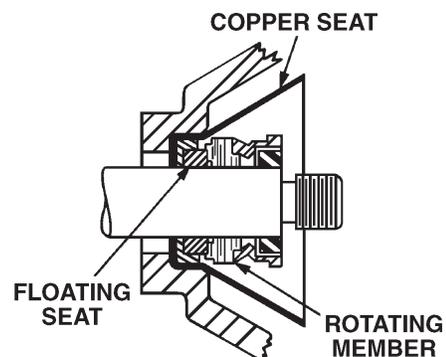


Figure 6

4. Place seal plate face down on flat surface and tap out ceramic seat.

NOTICE: Do not force out copper insert. If it has moved, leakage will occur. See section on installing copper insert on Page 11.

5. Clean seal cavity.
6. Install new seal.
 - A. Clean polished surface of ceramic seat with clean cloth.
 - B. Wet outer edge of cup seal with petroleum jelly or detergent solution.
 - C. With finger pressure, press firmly and squarely into cavity. Polished face of seat faces inside of pump. If seat will not locate properly, place cardboard washer over polished face and use piece of 3/4" standard pipe for pressing purposes. See Figure 7.

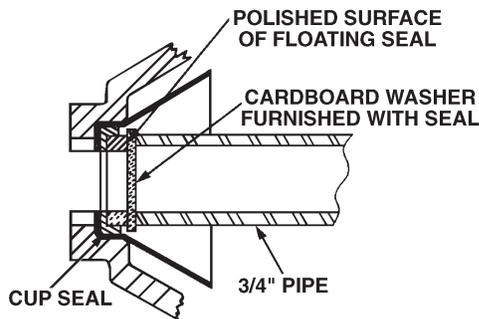


Figure 7

- D. Dispose of cardboard washer and clean surface of seat.
- E. Clean motor shaft.
- F. Reassemble seal plate to motor flange. BE SURE it is right side up: index pins should be down; seal plate is marked at top. See Figures 8A and 8B.

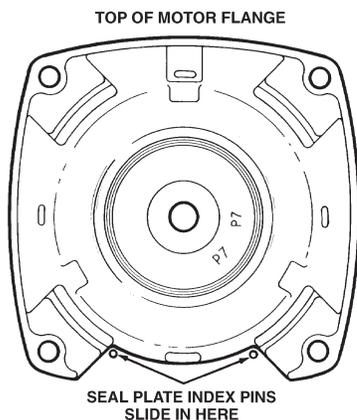


Figure 8A

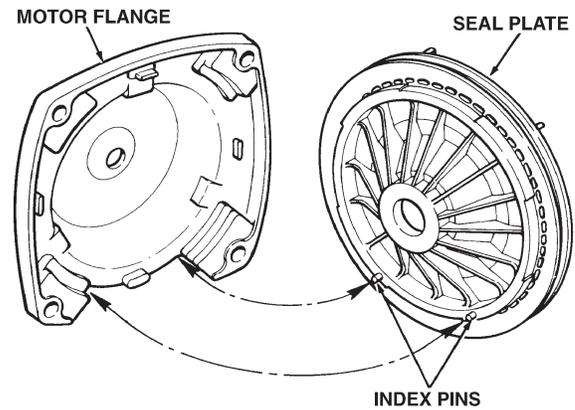


Figure 8B

- G. Apply detergent solution to inside diameter of rotating seal member.
- H. Slide rotating member on shaft until rubber drive ring hits shaft shoulder.

NOTE: Be sure you do not chip or scratch seal face on shaft shoulder or seal will leak!
- I. Screw impeller on shaft (clockwise) while holding shaft with 7/16" open end wrench on shaft flats. This will automatically locate seal in place. See Figure 9.

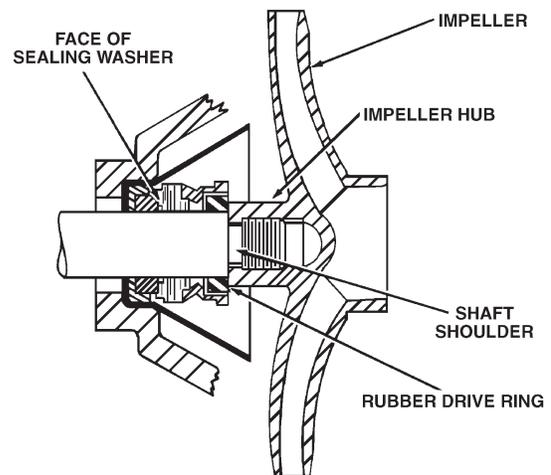


Figure 9

- J. Remount diffuser on seal plate. Be sure diffuser is right side up as follows (see Figures 10 and 11).
 - a. Rib next to priming hole should be at six o'clock position;
 - b. Part number (N1-28P) should be between nine o'clock and ten o'clock.

- c. Both mounting screws must engage screw holes in seal plate. See Figure 10.
- d. Be sure rubber pad (Figure 10; Key No. 8, Page 13) stays in place on top of diffuser.

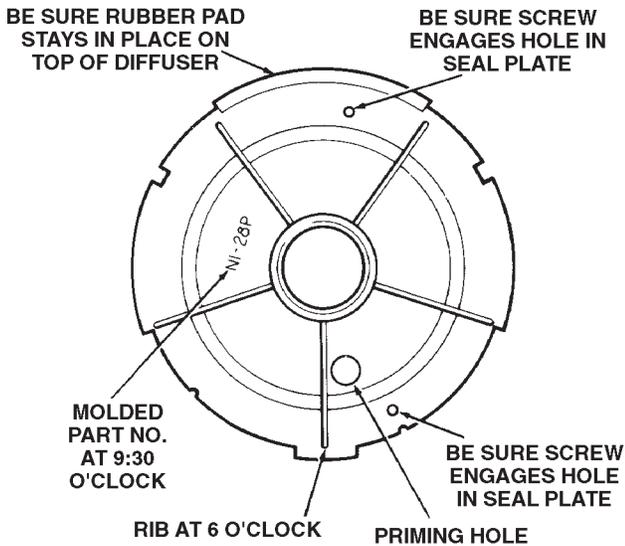


Figure 10

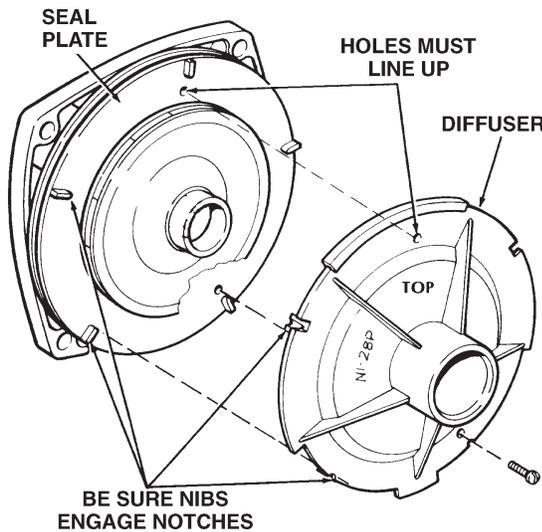


Figure 11

Installing Copper Insert

NOTE: If the copper insert (Key No. 4, Page 13) moves or shifts during seal removal, it should be removed and reinstalled.

1. Remove copper insert as shown in Figure 12. do not deform.

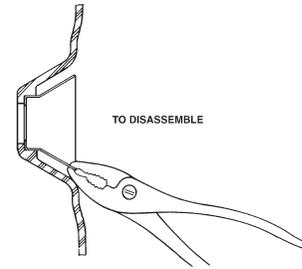


Figure 12

2. Replace copper insert:
 - A. Clean off surplus Permatex* from around insert cavity. Be careful not to scratch or mark the machined bore. It is important that this area be clean so no old Permatex lodges behind the new insert and causes improper seating.
 - B. Place a small amount of No. 2 non-hardening Permatex on surface of insert as shown. Smooth out with finger. See Figure 13.

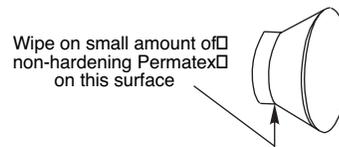


Figure 13

- C. Pull insert into cavity as shown in Figure 14.

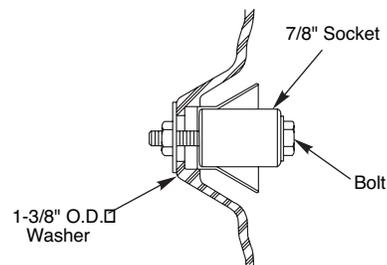


Figure 14

- D. Clean out any surplus Permatex from insert cavity where new seal will be located. See Figure 15.

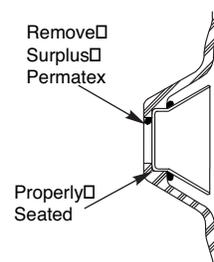


Figure 15

Cleaning Impeller

1. Follow steps 1A through 1D under “Disassembly and Assembly of Pump” on Page 9.
2. Remove diffuser and impeller from pump per instructions under “Removing Motor for Service and Replacing Shaft Seal” on Page 9.
3. Clean impeller and reassemble impeller and diffuser per instructions under “Removing Motor for Service and Replacing Shaft Seal” on Page 9.

Cleaning Shallow Well Jet

To remove debris from venturi or nozzle, proceed as follows:

1. Disassemble pump per instructions on Page 9.
2. Turn venturi counterclockwise and remove it. The nozzle is now exposed. Remove it using a 5/8” hex socket wrench with extension. Turn counterclockwise. If socket wrench is not available, insert an ice pick or similar pointed tool carefully into the nozzle. This will dislodge debris.
3. Flush out the debris by running water through the nozzle in the same direction as the dislodging tool was inserted.
4. Replace nozzle and venturi. Do not overtighten!
5. Reassemble per pump instructions on Page 9.

HELPFUL HINTS

How to Handle a Gaseous Well

In some areas well water contains gases which must be allowed to escape before the water is used. This can be done as shown in Figure 16.

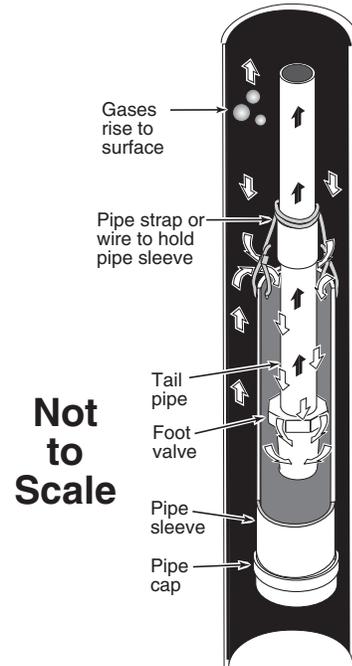
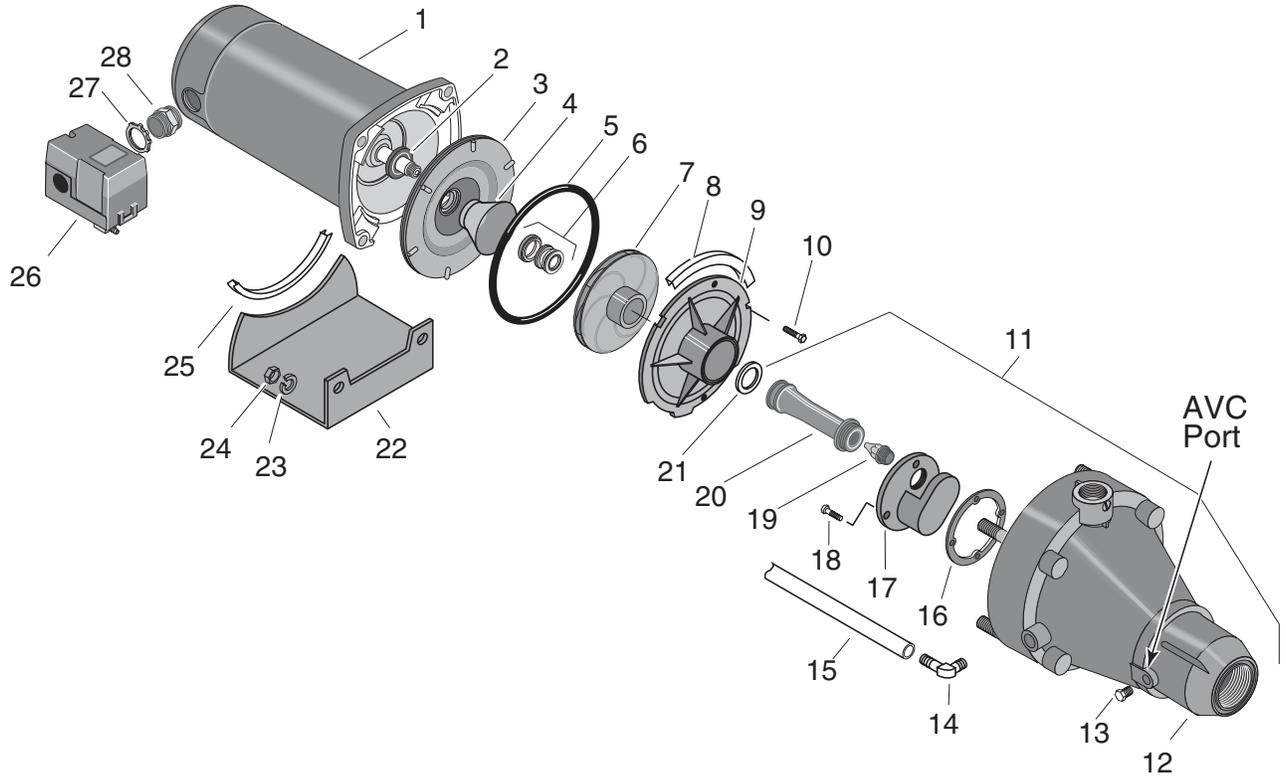


Figure 16

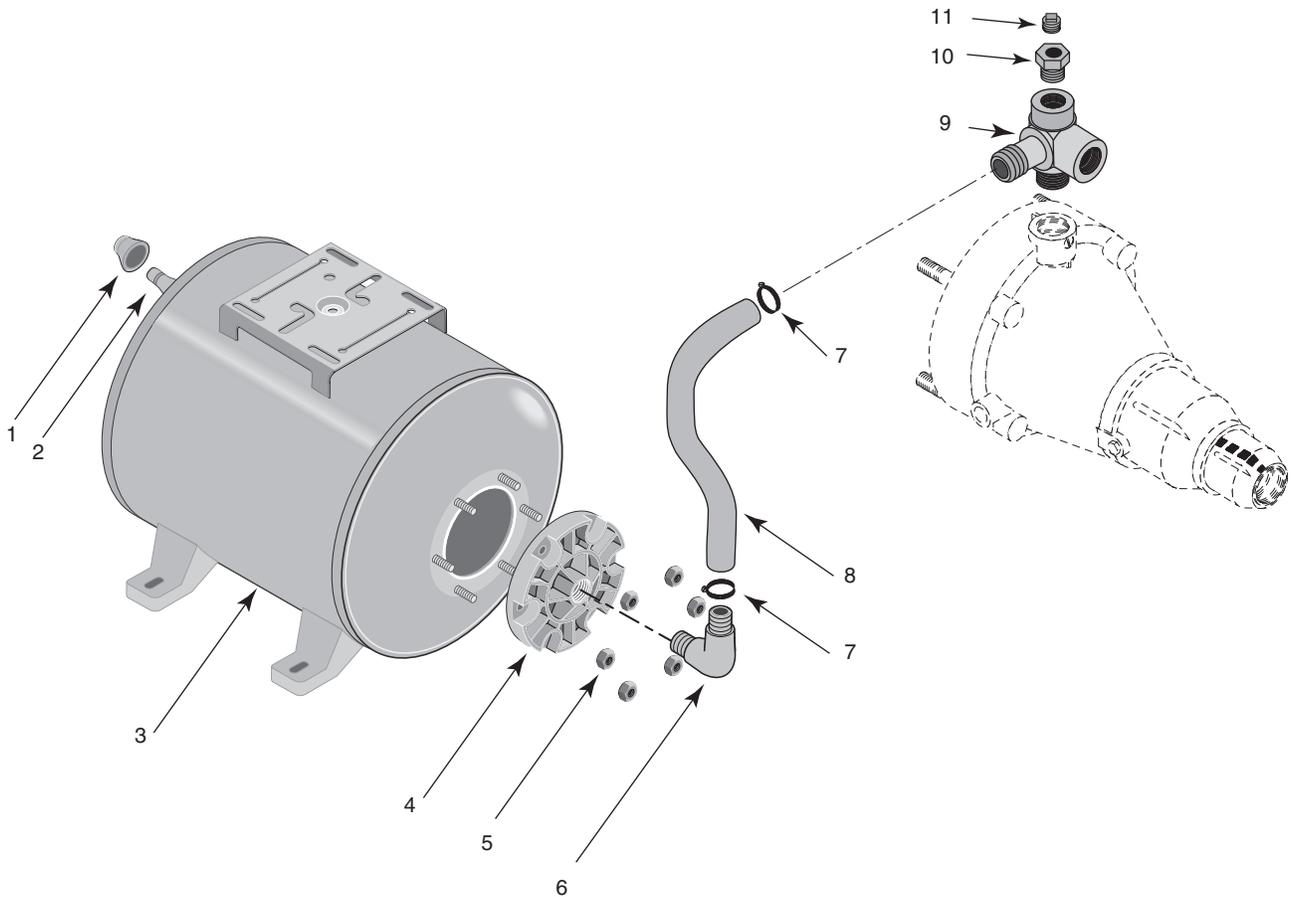
A good way of delivering gas-free water is to suspend a pipe, closed at the bottom and open at the top, surrounding the suction pipe. Since the gases rise in the well casing, the water sucked down through the pipe and into the suction pipe is free of gas. This type of well must be vented to the outside of any enclosure.



Repair Parts

Key No.	Description	Qty.	Part Number
1#	Motor - 115/230V	1	A100CLL
2	Water Slinger	1	C69-2
3*	Seal Plate Assembly	1	N103-12PSS
4	Seal Plate Insert	1	J3-2SS
5	O-Ring	1	U9-390
6	Shaft Seal	1	U109-6A
7	Impeller	1	J105-40PF
8	Rubber Pad	1	C35-41
9	Diffuser	1	N1-28P
10	Capscrew #10-16 Hex Head	2	U30-738SS
11**	Pump Body Assembly	1	N176-35P
12	Pump Body	1	N76-35P
13	Pipe Plug 1/8" NPT	1	WC78-41T
14	90° Hose Barb	1	U111-86T
15	Pressure Switch Tube	1	U37-670P
16	Gasket	1	J20-18
17	Pump Body Jet Insert	1	N76-29P
18	Capscrew #10-16	4	U30-742SS
19	Nozzle #45	1	N34P-19
20	Venturi	1	N32P-66
21	O-Ring	1	U9-201
22	Base Assembly Painted	1	J104-9F
23	Lock Washer 3/8"	4	U43-12ZP
24	Nut 3/8" - 16	4	U36-38ZP
25	Rubber Pad	1	C35-5
26	Pressure Switch	1	U217-1216
27	Locknut 1/2"	1	U36-112ZP
28	Connector 1/2"	1	L43-5C

For repair or service to motors, always give the motor model number and any other data found on the motor model plate.
 * Includes Key No. 4.
 ** Includes Key Nos. 12, and 16 through 21.



2422 0506 BE

Repair Parts - Tank Only

Key No.	Description	Qty.	Part Number
1	Air Valve Cover	1	U31-380P
2	Air Valve and Cap	1	U212-160
3	Replacement Tank	1	PS15H-S05
4	Inlet Flange	1	U31-442P
5	Nut, 5/16-18 Hex	6	U36-202BT
6	Elbow, 3/4" MPT x 1" Insert	1	U78-770P
7	Clamp	2	U19-55SS
8	Hose - 1" x 23"	1	U74-37X
9	Discharge Tee with Barb	1	U78-972P
10	1/2" x 1/8" NPT Reducer Bushing	1	U78-107PT
11	1/8" NPT Pipe Plug	1	WC78-41T
•	Diaphragm	1	U20-7

• Not illustrated.

† Standard hardware item, may be purchased locally.

TROUBLE	POSSIBLE CAUSES	REMEDIES
Motor will not run	<ol style="list-style-type: none"> 1. Disconnect switch is off 2. Fuse is blown 3. Starting switch is defective 4. Wires at motor are loose, disconnected, or wired incorrectly 5. Motor is wired incorrectly 6. Pressure switch contacts are dirty 	<ol style="list-style-type: none"> 1. Be sure switch is on 2. Replace fuse 3. Replace starting switch 4. Refer to instructions on wiring 5. Refer to instructions on wiring 6. Clean by sliding piece of plain paper between contacts
Motor runs hot and overload kicks off	<ol style="list-style-type: none"> *1. Motor is wired incorrectly 2. Voltage is too low 3. Pump cycles too frequently 	<ol style="list-style-type: none"> 1. Refer to instructions on wiring 2. Check with power company. Install heavier wiring if wire size is too small. See wiring instructions 3. See section below on too frequent cycling
Motor runs but no water is delivered (*Note: Check prime before looking for other causes. Unscrew priming plug and see if there is water in priming hole)	<ol style="list-style-type: none"> *1. Pump in a new installation did not pick up prime through: <ol style="list-style-type: none"> a. Improper priming b. Air leaks c. Leaking foot valve *2. Pump has lost its prime through: <ol style="list-style-type: none"> a. Air leaks b. Water level below suction of pump 3. Jet or impeller is plugged 4. Check valve or foot valve is stuck in closed position 5. Pipes are frozen 6. Foot valve and/or strainer are buried in sand or mud 	<ol style="list-style-type: none"> 1. In new installation: <ol style="list-style-type: none"> a. Re-prime according to instructions b. Check all connections on suction line and jet c. Replace foot valve 2. In installation already in use: <ol style="list-style-type: none"> a. Check all connections on suction line, jet and shaft seal b. Lower suction line into water and re-prime. If receding water level in a shallow well operation exceeds suction lift, a deep well pump is needed 3. Clean jet or impeller according to instructions 4. Replace check valve or foot valve 5. Thaw pipes. Bury pipes below frost line. Heat pit or pump house 6. Raise foot valve and/or strainer above well bottom
Pump does not deliver water to full capacity (also check point 3 immediately above)	<ol style="list-style-type: none"> 1. Water level in well is lower than estimated 2. Steel piping (if used) is corroded or limed, causing excess friction 3. Offset piping is too small in size 	<ol style="list-style-type: none"> 1. A deep well jet pump may be needed (over 25 ft. to water) 2. Replace with Plastic Pipe where possible, otherwise with new steel pipe 3. Use larger offset piping
Pump pumps water but does not shut off	<ol style="list-style-type: none"> 1. Pressure switch is out of adjustment or contacts are "frozen" 2. Faucets have been left open 3. Jet or impeller is clogged 4. Motor is wired incorrectly 5. Water level in well is lower than estimated 	<ol style="list-style-type: none"> 1. Adjust or replace pressure switch 2. Close faucets 3. Clean jet or impeller 4. Refer to instructions on wiring 5. Check possibility of using a deep well jet pump
Pump cycles too frequently	<ol style="list-style-type: none"> 1. Pipes leak 2. Faucets or valves are open 3. Foot valve leaks 4. Pressure switch is out of adjustment 5. Air charge too low in pre-charged tank 	<ol style="list-style-type: none"> 1. Check connections, replace pipe fittings 2. Close faucets or valves 3. Replace foot valve 4. Adjust or replace pressure switch 5. Disconnect electrical power and open faucets until all pressure is relieved. Using automobile tire pressure gauge, check air pressure in tank at the valve stem located at top of tank. If less than 30 pounds, pump air into tank from outside source, until 30 pounds pressure is reached. Check air valve for leaks, using soapy solution, and replace core if necessary
Air spurts from faucets	<ol style="list-style-type: none"> 1. Pump is picking up prime 2. Leak in suction side of pump 3. Well is gaseous 4. Intermittent over-pumping of well 	<ol style="list-style-type: none"> 1. As soon as pump picks up prime, all air will be ejected 2. Check suction piping, make sure joints are not sucking air 3. Change installation as described in manual 4. Lower foot valve if possible, otherwise restrict discharge side of pump

