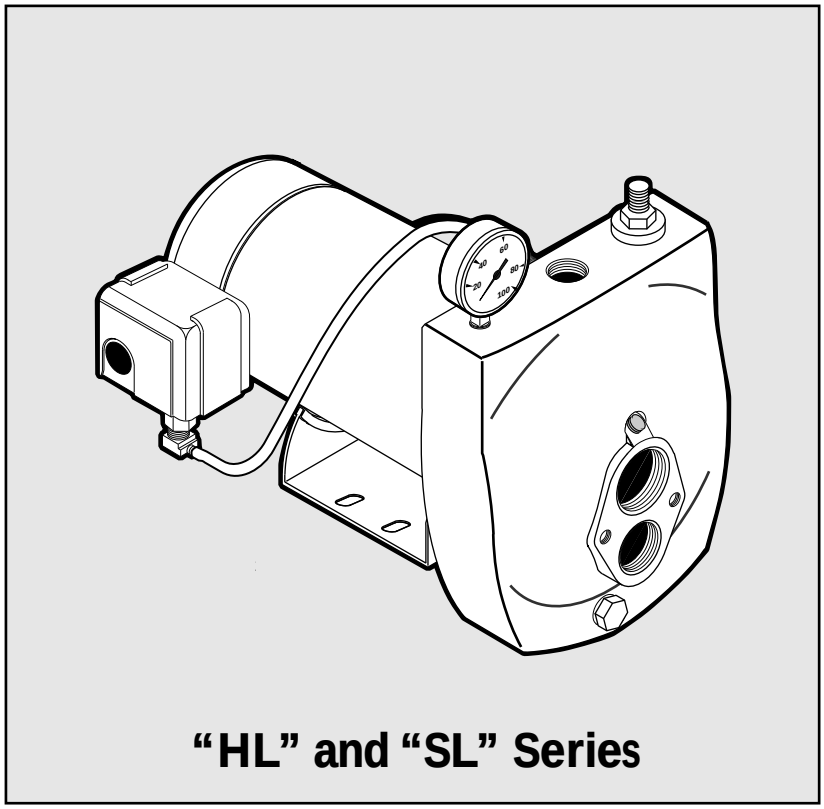
1800 Courtney Park Drive East,
Unit 5-7, Mississauga, Ontario L5T 1W1

OWNER'S MANUAL

Convertible Deep Well Jet Pumps



"HL" and "SL" Series

Installation/Operation/Parts

For further operating, installation, or maintenance assistance:

Call 1-800-363-PUMP (7867)

PRINTED IN U.S.A.

BE423 (Rev. 3/18/98)

READ AND FOLLOW SAFETY INSTRUCTIONS!

⚠ **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 **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 label **NOTICE** indicates special instructions which are important but not related to hazards.

Carefully read and follow all safety instructions in this manual and on pump.

Keep safety labels in good condition.
Replace missing or damaged safety labels.

ELECTRICAL SAFETY

⚠WARNING **Capacitor voltage may be hazardous.** To discharge motor capacitor, hold insulated handle screwdriver **BY THE HANDLE** and short capacitor terminals together. Do not touch metal screwdriver blade or capacitor terminals. If in doubt, consult a qualified electrician.

GENERAL SAFETY

⚠ CAUTION **Do not touch an operating motor.** Modern motors are designed to operate at high temperatures. To avoid burns when servicing pump, allow it to cool for 20 minutes after shut-down before handling.

Do not allow pump or any system component to freeze. To do so will void warranty.

Pump water only with this pump.

Periodically inspect pump and system components.

Wear safety glasses at all times when working on pumps.

Keep work area clean, uncluttered and properly lighted; store properly all unused tools and equipment.

Keep visitors at a safe distance from the work areas.

⚠WARNING **Pump body may explode if used as a booster pump unless relief valve capable of passing full pump flow at 100 psi is installed.**

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

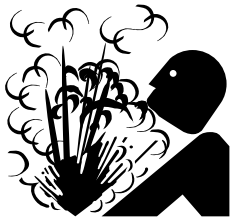
Ground pump before connecting to power supply. Disconnect power before working on pump, motor or tank.

⚠ Wire motor for correct voltage. See "Electrical" section of this manual and motor nameplate.

⚠ Ground motor before connecting to power supply.

⚠ Meet National Electrical Code, Canadian Electrical Code, and local codes for all wiring.

⚠ Follow wiring instructions in this manual when connecting motor to power lines.



⚠ WARNING

Hazardous pressure! Install pressure relief valve in discharge pipe.

Release all pressure on system before working on any component.

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ATTACH ORIGINAL RECEIPT HERE FOR WARRANTY CONSIDERATION.

Berkeley Limited Warranty

Berkeley/Wicor Canada Company ("Wicor") warrants to the original consumer purchaser ("Purchaser") of its products that they are free from defects in material or workmanship.

If within twelve (12) months from the date of installation or twenty-four (24) months from the date of manufacture any such product shall prove to be defective, it shall be repaired or replaced at Berkeley's/Wicor's option, subject to the terms and conditions set forth below.

General Terms and Conditions

Purchaser must pay all labor and shipping charges necessary to replace product covered by this warranty. This warranty shall not apply to products which, in the sole judgement of Berkeley/Wicor, have been subject to negligence, abuse, accident, misapplication, tampering, alteration; nor due to improper installation, operation, maintenance or storage; nor to other than normal application, use or service, including but not limited to, operational failures caused by corrosion, rust or other foreign materials in the system, or operation at pressures in excess of recommended maximums.

Requests for service under this warranty shall be made by contacting the installing Berkeley/Wicor dealer as soon as possible after the discovery of any alleged defect. Berkeley/Wicor will subsequently take corrective action as promptly as reasonably possible. No requests for service under this warranty will be accepted if received more than 30 days after the term of the warranty.

The warranty on all three phase submersible motors is void if three-leg overload protection of recommended size is not used.

This warranty sets forth Berkeley's/Wicor's sole obligation and purchaser's exclusive remedy for defective products.

BERKELEY/WICOR SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE DURATION OF THE APPLICABLE EXPRESS WARRANTIES PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, 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.

In the U.S.: Berkeley, 293 Wright St., Delavan, WI 53115
In Canada: Wicor Canada Company, 1800 Courtney Park Drive East, Unit 5-7, Mississauga, Ontario L5T 1W1
Wicor Canada Company, 200-E, Rue St-Louis, St-Jean-Sur-Richelieu, Québec J3B 1Y1

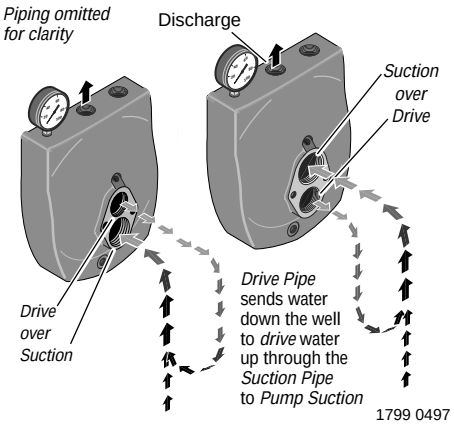


Figure 1: Drive and Suction Functions

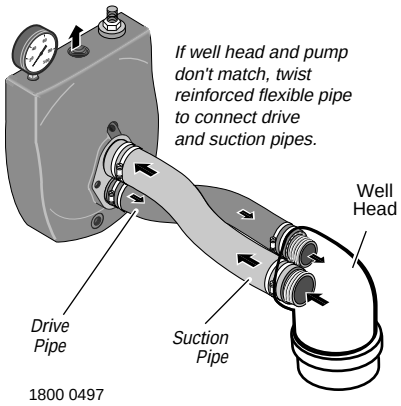


Figure 2: Reversed Connections to Well

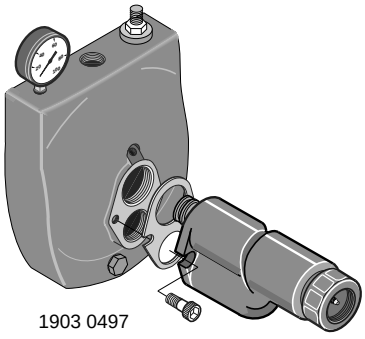


Figure 3: Mount Ejector – Shallow Well

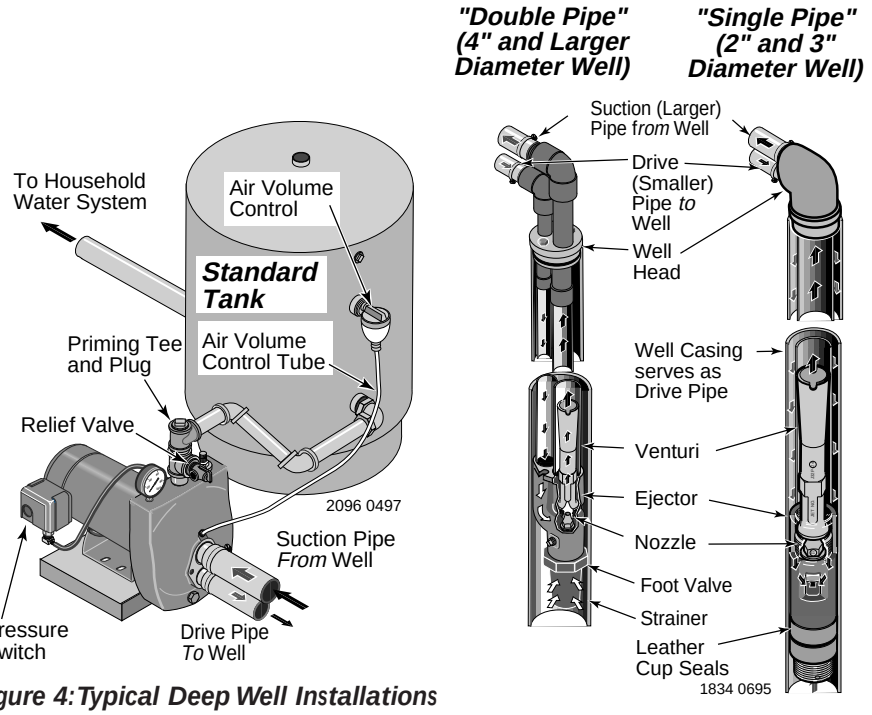


Figure 4: Typical Deep Well Installations

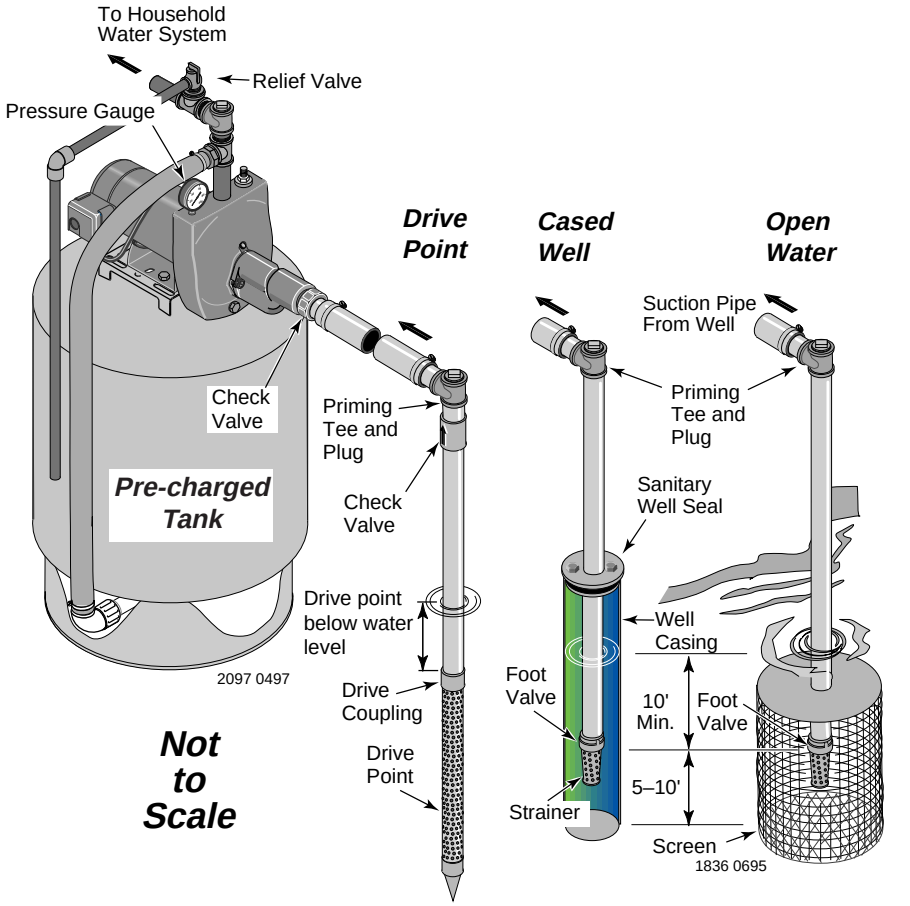


Figure 5: Typical Shallow Well Installations

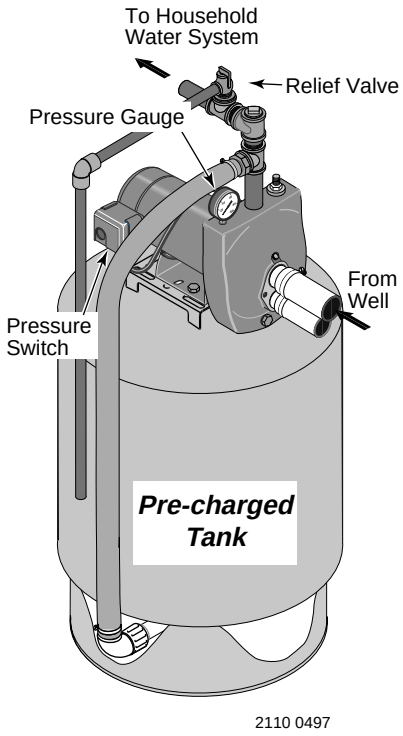


Figure 6: Pre-charged Tank Connections

PRE-CHARGE TANK CONNECTION (Figure 6)

If your system uses a pre-charged tank, it should be connected to the pump as shown in Figure 6. The relief valve must be capable of passing the entire pump capacity at 100 PSI pressure.

Check the pre-charge of air in the tank with an ordinary tire gauge. the pre-charge is measured *when there is no water pressure in the tank.* Disconnect power to the pump and drain the tank before checking the pre-charge. Your pump has a 30/50 PSI switch, so the tank pre-charge pressure should be 28 PSI (that is, it should be 2 PSI lower than the cut-in pressure of the pressure switch.

No AVC is required for a pre-charged tank; the 1/8" NPT AVC port on the pump body should be plugged.

STANDARD TANK CONNECTION (Figure 7)

If your system uses a standard tank, connect it to the pump as shown in Figure 7. The relief valve used with a standard tank must be capable of passing the entire pump capacity at 75 PSI pressure.

Connect the Air Volume Control (AVC) tube to the 1/8" NPT AVC port on the pump body. Run the tubing from the pump's AVC port to the AVC mounted on the tank. See the instructions provided with tank and AVC for details.

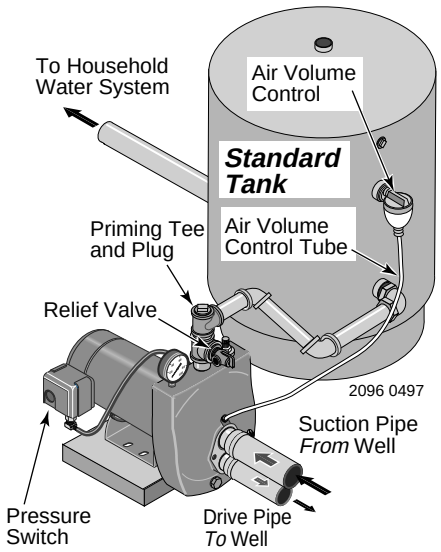


Figure 7: Standard Tank Connections

Sealing Pipe Joints

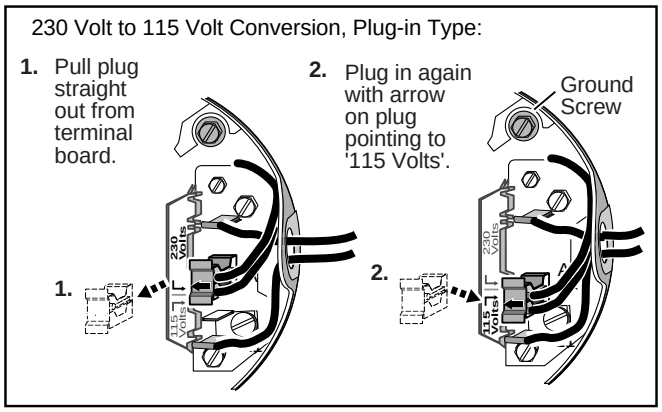
Use only Teflon tape or Teflon based joint compounds for making all threaded connections to the pump itself. **Do not use pipe joint compounds on plastic pumps:** they can react with the plastic in pump components. Make sure that all pipe joints in the suction pipe are air tight as well as water tight. *If the suction pipe can suck air, the pump will not be able to pull water from the well.*

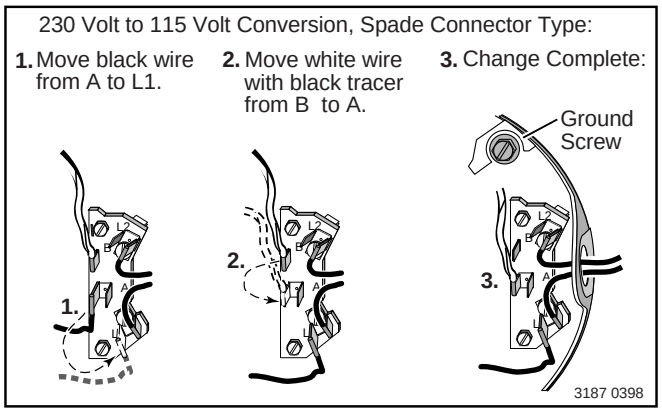
Table I: Wiring Chart – Recommended Wire and Fuse Sizes

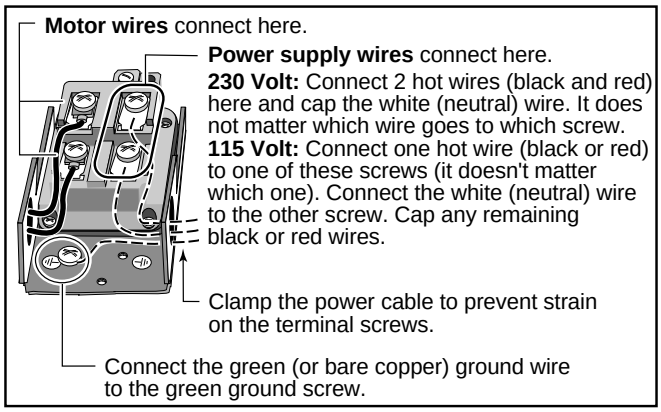
Model	HP	Max Load Amps	Branch Fuse Rating Amps	Distance in Feet (Meters); Wire Size AWG (mm²) 0-100 (0-30)	101-200 (31-61)	201-300 (62-91)	301-400 (92-122)	401-500 (123-152)
115Volts:								
5SL	1/2	8.8	15	14(2)	12(3)	10(5.5)	8(8.4)	8(8.4)
5HL	1/2	12.2	20	12(3)	10(5.5)	8(8.4)	6(14)	6(14)
7SL	3/4	12.2	20	12(3)	10(5.5)	8(8.4)	6(14)	6(14)
7HL	3/4	14.8	20	12(3)	8(8.4)	6(14)	6(14)	4(21)
10SL	1	14.8	20	12(3)	8(8.4)	6(14)	6(14)	4(21)
10HL	1	19.2	25	10(5.5)	8(8.4)	6(14)	4(21)	4(21)
15SL	1-1/2	19.2	25	10(5.5)	8(8.4)	6(14)	4(21)	4(21)
230 Volts:								
5SL	1/2	4.4	15	14(2)	14(2)	14(2)	14(2)	12(3)
5HL	1/2	6.1	15	14(2)	14(2)	14(2)	12(3)	12(3)
7SL	3/4	6.1	15	14(2)	14(2)	14(2)	12(3)	12(3)
7HL	3/4	7.4	15	14(2)	14(2)	14(2)	12(3)	10(5.5)
10SL	1	7.4	15	14(2)	14(2)	14(2)	12(3)	10(5.5)
10HL	1	9.6	15	14(2)	14(2)	12(3)	10(5.5)	10(5.5)
15SL	1-1/2	9.6	15	14(2)	14(2)	12(3)	10(5.5)	10(5.5)

⚠ 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 to as shown for your type of switch and your supply voltage.







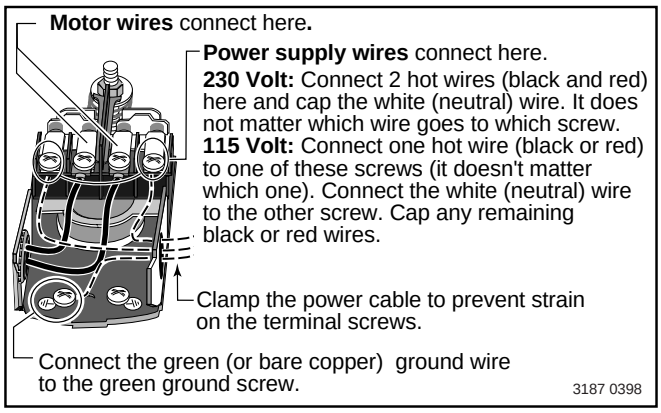


Figure 8: Motor wiring connections through Pressure Switch. Match motor voltage to line voltage.

⚠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:

Step 1. Connect the ground wire first as shown in Figure 8. The ground wire must be a solid copper wire at least as large as the power supply wires.

Step 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.

Step 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.

Step 4. Connect the power supply wires to the pressure switch as shown in Figure 8.

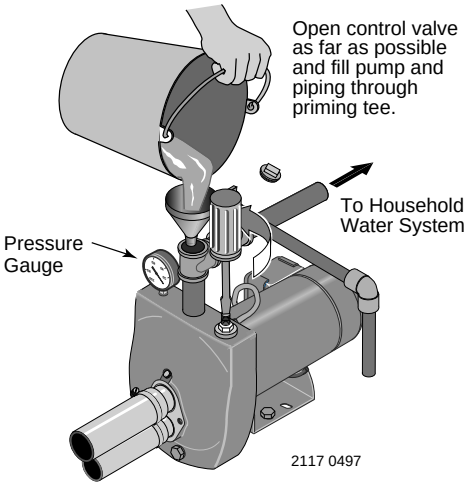


Figure 9: Fill Pump

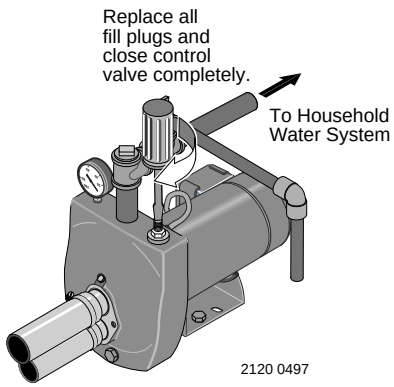


Figure 10: Prime Pump

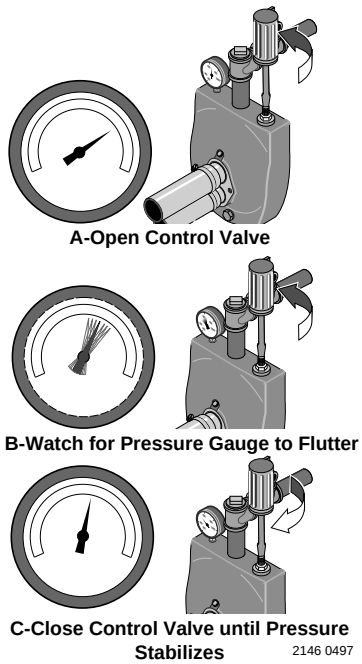


Figure 11: Set Control Valve

⚠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 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.

Step 1. Open the control valve as far as possible (see Figure 9). Then remove the priming plug from the pump and fill the pump, fill all piping between the pump and the well, and make sure that all piping in the well is full. If you have also installed a priming tee in the suction piping, remove the plug from the tee and fill the suction piping.

Step 2. Replace all fill plugs and close the control valve completely (Figure 10).

Step 3. Power on! Start the pump and watch the pressure gauge. The pressure should build rapidly to 50 PSI as the pump primes.

Step 4. After 2 or 3 minutes, the gauge should show pressure. If not, stop the pump, remove the fill plugs, reopen the control valve, and refill the pump and piping. You may have to repeat this two or three times in order to get all the trapped air out of the piping. Don't forget to close the control valve each time before you start the pump.

Step 5. When pressure has built up and stabilized at about 50 PSI, slowly open the control valve (see Figure 11) and let the pressure drop until the pressure gauge needle starts to flutter. When the needle flutters, close the valve just enough to stop the flutter (see Figure 11). Your pump is now operating at its most efficient point.

Step 6. After the pump has built up pressure in the system and shut off, check the pressure switch operation by opening a faucet or two and running enough water out to bleed off pressure until the pump starts. The pump should start when pressure drops to 30 PSI and stop when pressure reaches 50 PSI. Run the pump through one or two complete cycles to verify correct operation. This will also help clean the system of dirt and scale dislodged during installation.

NOTICE: Packer jets (2" and 3" single pipe wells) do not form a perfect seal. Normal irregularities in the cup seal leather and the inner walls of the casing will allow the pressure in a dormant system to leak off over time. This will cause the pump to cycle periodically to maintain the system pressure level.

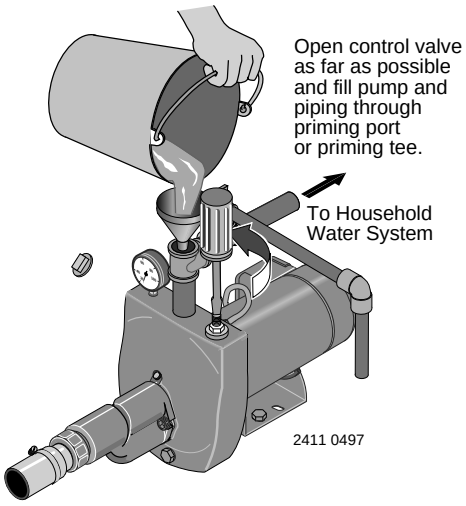


Figure 12: Open Control Valve

⚠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 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.

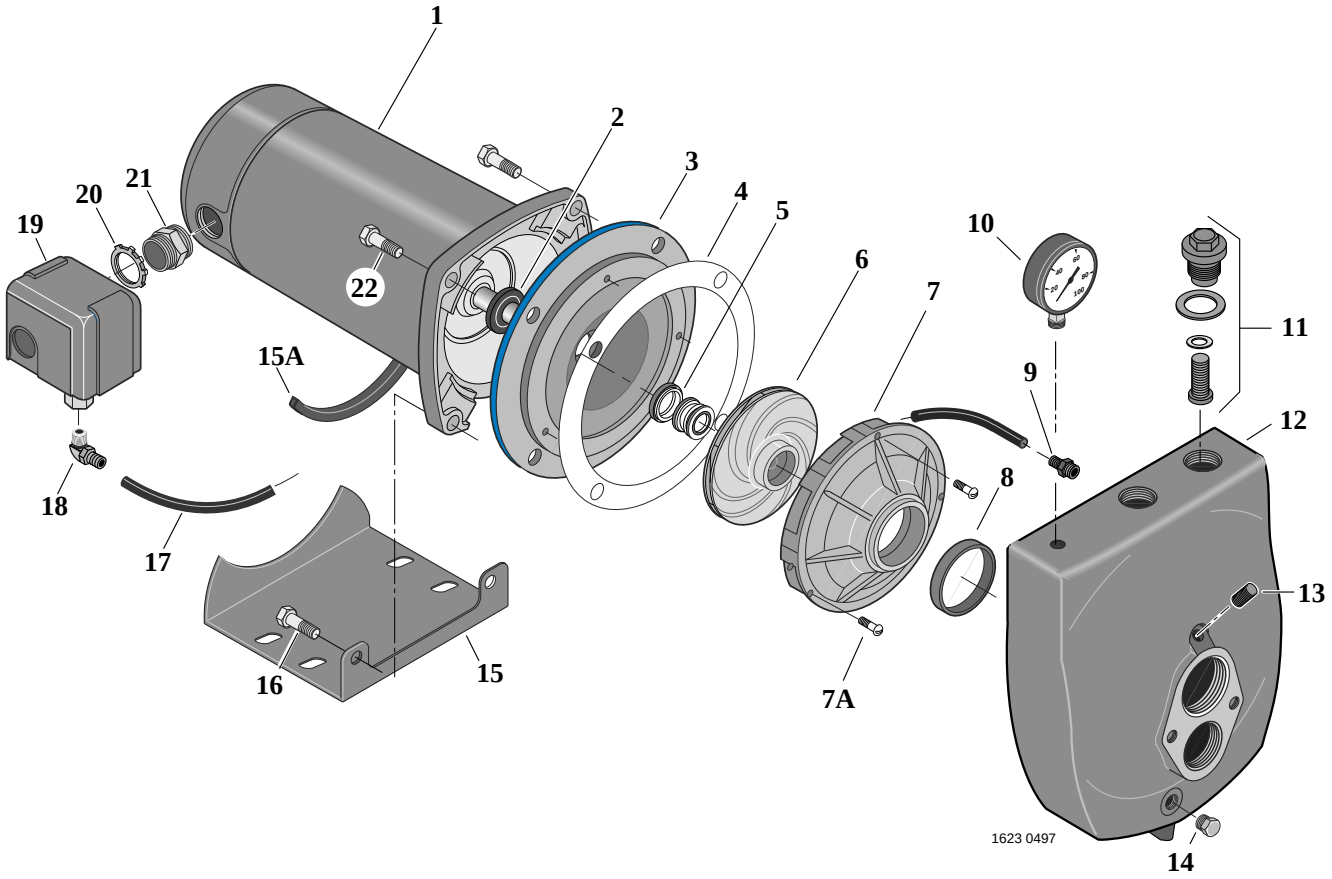
Step 1. Open the control valve as far as possible (see Figure 12). Then remove the priming plug from the pump and fill the pump, fill all piping between the pump and the well, and make sure that all piping in the well is full. If you have also installed a priming tee *in* the suction piping, remove the plug from the tee and fill the suction piping.

Step 2. Replace all fill plugs. Leave the control valve open (in a shallow well installation, the control valve always stays open).

Step 3. Power on! Start the pump. The pump should pump water in two or three minutes.

Step 4. If you don't have water after 2 or 3 minutes, stop the pump and remove the fill plugs. Refill the pump and piping. You may have to repeat this two or three times in order to get all the trapped air out of the piping. The control valve remains open throughout this procedure.

Step 5. After the pump has built up pressure in the system and shut off, check the pressure switch operation by opening a faucet or two and running enough water out to bleed off pressure until the pump starts. The pump should start when pressure drops to 30 PSI and stop when pressure reaches 50 PSI. Run the pump through one or two complete cycles to verify correct operation. This will also help clean the system of dirt and scale dislodged during installation.



Repair Parts – "HL" Series Cast Iron Jet Pumps

Key No.	Part Description	Qty.	5HL 1/2 HP	7HL 3/4 HP	10HL 1 HP
1	Motor	1	A100CHL	A100DHL	A100EHL
#§2	Water Slinger	1	C69-2	C69-2	C69-2
3	Seal Plate	1	N3-9	L3-10	L3-10
#§4	Seal Plate Gasket	1	N20-35	C20-21	C20-21
#§5	Shaft Seal	1	U109-6A	U109-6A	U109-6A
#6	Impeller	1	J105-86P	J105-85P	J105-22PA
#7	Diffuser	1	L1-48P	L1-47P	L1-23P
7A	8-32x3/4" Rd. Hd. Capscrew	3	–	U30-489SS	U30-489SS
#§8	Diffuser Ring	1	L21-1	L21-1	L21-1
9	Quick Connect – Straight	1	U11-217P	U11-217P	U11-217P
10	Pressure Gauge	1	U239-2	U239-2	U239-2
11	Control Valve Assembly	1	L262-4PS	L262-5PS	L262-5PS
12	Pump Body	1	L76-48A	L76-49A	L76-49A
13	Pipe Plug	1	U78-56ZPS	U78-56ZPS	U78-56ZPS
14	Drain Plug	1	U78-941ZPV	U78-941ZPV	U78-941ZPV
15	Base	1	J4-9	J104-9C	J104-9C
15A	Motor Pad	1	C35-5	C35-5	C35-5
16	3/8-16x1-1/2" Capscrew	2	U30-76ZP	U30-76ZP	U30-76ZP
17	Switch Tube	1	U37-672P	U37-672P	U37-677P
18	Quick Connect – Elbow	1	U11-218P	U11-218P	U11-218P
19	Pressure Switch	1	U217-1216	U217-1216	U217-1216
20	Lock Nut	1	U36-112ZP	U36-112ZP	U36-112ZP
21	Connector	1	L43-5C	L43-5C	L43-5C
22	3/8-16x1-1/4" Capscrew	2	U30-75ZP	U30-75ZP	U30-75ZP

SERVICE KITS

§	Seal and Gasket Kit	PP1550	PP1551	PP1551
#	Overhaul Kit	PP1565	PP1566	PP1564

NOTE: § Included in Seal and Gasket Kit. # Included in Overhaul Kit.

Repair Parts – "SL" Series Cast Iron Jet Pumps

Key No.	Part Description	Qty.	5SL 1/2 HP	7SL 3/4 HP	10SL 1 HP	15SL 1-1/2 HP
1	Motor	1	A100CLL	A100DLL	A100ELL	A100FLL
#§2	Water Slinger	1	C69-2	C69-2	C69-2	C69-2
3	Seal Plate	1	N3-9	N3-9	L3-10	L3-10
#§4	Seal Plate Gasket	1	N20-35	N20-35	C20-21	C20-21
#§5	Shaft Seal	1	U109-6A	U109-6A	U109-6A	U109-6A
#6	Impeller	1	J105-40P	J105-86P	J105-85P	J105-22PA
#7	Diffuser	1	L1-25P	L1-48P	L1-47P	L1-23P
7A	8-32x3/4" Rd. Hd. Capscrew	3	–	–	U30-489SS	U30-489SS
#§8	Diffuser Ring	1	L21-1	L21-1	L21-1	L21-1
9	Quick Connect – Straight	1	U11-217P	U11-217P	U11-217P	U11-217P
10	Pressure Gauge	1	U239-2	U239-2	U239-2	U239-2
11	Control Valve Assembly	1	L262-4PS	L262-4PS	L262-5PS	L262-5PS
12	Pump Body	1	L76-48A	L76-48A	L76-49A	L76-49A
13	Pipe Plug	1	U78-56ZPS	U78-56ZPS	U78-56ZPS	U78-56ZPS
14	Drain Plug	1	U78-941ZPV	U78-941ZPV	U78-941ZPV	U78-941ZPV
15	Base	1	J4-9	J4-9	J104-9C	J104-9C
15A	Motor Pad	1	C35-5	C35-5	C35-5	C35-5
16	3/8-16x1-1/2" Capscrew	2	U30-76ZP	U30-76ZP	U30-76ZP	U30-76ZP
17	Switch Tube	1	U37-677P	U37-677P	U37-672P	U37-677P
18	Quick Connect – Elbow	1	U11-218P	U11-218P	U11-218P	U11-218P
19	Pressure Switch	1	U217-1225	U217-1225	U217-1225	U217-1225
20	Lock Nut	1	U36-112ZP	U36-112ZP	U36-112ZP	U36-112ZP
21	Connector	1	L43-5C	L43-5C	L43-5C	L43-5C
22	3/8-16x1-1/4" Capscrew	2	U30-75ZP	U30-75ZP	U30-75ZP	U30-75ZP

SERVICE KITS

§	Seal and Gasket Kit	PP1550	PP1550	PP1551	PP1551
#	Overhaul Kit	PP1560	PP1565	PP1566	PP1564

NOTE: § Included in Seal and Gasket Kit. # Included in Overhaul Kit.

Symptoms	Things to Do:
A. Motor will not run.	A. Check that the disconnect switch is ON and that the circuit breaker has not tripped or the fuse has not blown. DISCONNECT POWER and make sure that wires connecting motor to power supply and pressure switch are tight and correctly connected (see Page 6). If the remedies above do not solve the problem, call your well professional.
B. Motor runs hot and overload trips.	B. Turn to electrical instructions on Page 6 and verify that motor is correctly wired. Check with the power company or hydro authority to make sure that the voltage at the pump is within ± 10% of the motor's rated nameplate voltage. DISCONNECT POWER and make sure that the wires connecting the motor to the power supply are sized according to Table I, Page 5. If not, rewire according to the instructions on Page 6. If the pump is cycling too frequently, see Section E, below.
C. Motor runs but no water is delivered.	C. FIRST, check the prime; that is, make sure that the pump and all the suction piping plus the piping in the well are full of water. If they aren't, fill them up. In cold weather, make sure that the pipes and pump are not frozen. If they are, thaw them, watching out for split pipes and fittings as you work. Heat the pump pit or pump house and bury all piping below the frost line. Other possible causes (call your pump professional if you suspect one of these): Air leaks in the suction line, dropping water level in the well, foot valve stuck or plugged, ejector plugged, impeller plugged, foot valve or strainer stuck in the mud in the bottom of the well, a shallow well pump installed on a well with more than 25 ft depth to water (in this case a deep well jet pump is needed).
D. Pump does not deliver water to full capacity.	D. Possible causes are: the well water level is lower than estimated, making a different nozzle/venturi combination necessary; steel piping (if used) is corroded or limed, restricting capacity and increasing friction; or the piping is too small for the installation. Consult your well professional for any of these conditions.
E. Pump cycles too frequently or does not shut off at all.	E. Make sure no faucets have been left open. If system has a standard tank, make sure it isn't waterlogged. If it is, drain it down to the level of the air volume control. Make sure the AVC isn't defective and that there are no leaks at any connections. If system has a precharged tank, **disconnect power**, open all system faucets and bleed all pressure off of tank. Use a tire gauge to check the air pressure in the tank. This should be lower than the cut-in setting of the pressure switch by 2 PSI (that is, if the pressure switch starts the pump at 30 PSI, the precharge should be 28 PSI). Check the air valve for leaks (use a soap solution) and replace the core if necessary. If you suspect any of the following conditions, consult your well professional: leaky pipes, leaky foot valve, water level in the well lower than estimated, clogged ejector or impeller.
F. Air spurts from faucets.	F. Pump may still be priming; when priming is complete all air will have been ejected from the system. If you suspect leaks in the suction piping, gasses in the well, or that the pump is intermittently overpumping the well (that is, drawing the water level down below the foot valve), consult your well professional.
G. Pump leaks around clamp.	G. Tighten clamp nut 1-2 turns. *Do not overtighten.*