

HALLMARK INDUSTRIES INC.

Deep Well Submersible Pumps

Operating & Installation Instructions

WARNING:

Read the user's manual thoroughly before installing the pump!

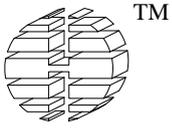
- The pump's voltage on its nameplate must match your power line voltage! Warranty voided if the pump damaged because of the wrong voltage! Believe us, many users burnt their pumps this quick and this easy! **CHECK THE VOLTAGE!**
- The ground wire maybe marked as 'PE', or ground symbol \perp . For 3 wire pumps, in addition to the ground wire, a 110V pump has black and blue wires (hot + neutral, OK to reverse). A 220V pump has red and brown wires (hot + hot). Wires may have other colors.
- The external control box for 4 wire 220V pumps may come with a 3 prong plug. The plug is for 220V.
- The pump may have been water tested, and may contain water.
- The pump must be installed in a proper sized well casing.
- The pump has not been investigated for use in swimming pool or marine areas.
- Do not run pump dry. Pump must be fully submersed in water prior to starting. Or the pump and motor will be damaged.
- We strongly recommend testing the pump in a bucket of water first, before your final installation.

Hallmark Industries Inc

624 Estes Ave.

Schaumburg, IL 60193, USA

www.hallmarkind.com



HALLMARK INDUSTRIES, INC.

624 Estes Ave, Schaumburg, IL 60193, U.S.A.

Tel: 847-301-8050

Fax: 847-301-8839

Email: sales@hallmarkind.com

Website: www.hallmarkind.com

PUMP SELECTION GUIDE (MUST READ!)

Never select a pump based on the horse power (HP)! Many brands mark down their HP to falsely claim that their pumps use less electricity. It is common in the pump industry. So your old 1/2HP pump may actually be a 1HP pump. We do not mark down our pumps' HP. But Amps won't lie. Compare the Amps, NOT HP!

If a pump has max 150' head & 25 gpm, its gpm is not always 25! Gpm reduces with the increase of pumping level, from max 25 gpm (@0' head) and reduces to 0 gpm (@150' head). Read the flow curve! 150' head is *to an open water tank with no back pressure!* **A pressure tank will reduce the pump's head significantly.** 1 psi setting in the pressure tank equals 2.307' of head. We use our 1/2HP (max head 150') for 2 cases below.

Case 1: To determine its flow at water level 20', 20/40 psi pressure switch setting:

$$\text{The min total head (@20 psi)} = 20' + 20 \times 2.307 = 66'$$

$$\text{The max total head (@40 psi)} = 20' + 40 \times 2.307 = 112.3'$$

Read the flow chart for MA0343X-4 (MA0343X-4A). The flow at 66' is about 15 gpm, at 112.3' is about 10 gpm. So the pump will start at 15 gpm (@ 20 psi on) and lower to 10 gpm (@40 psi off). In this case, the head used is not 20', and flow is not 19 gpm (@ 20').

Case 2: To decide the max pumping level (1/2HP) to a pressure tank, 30/50 psi setting (@50 psi):

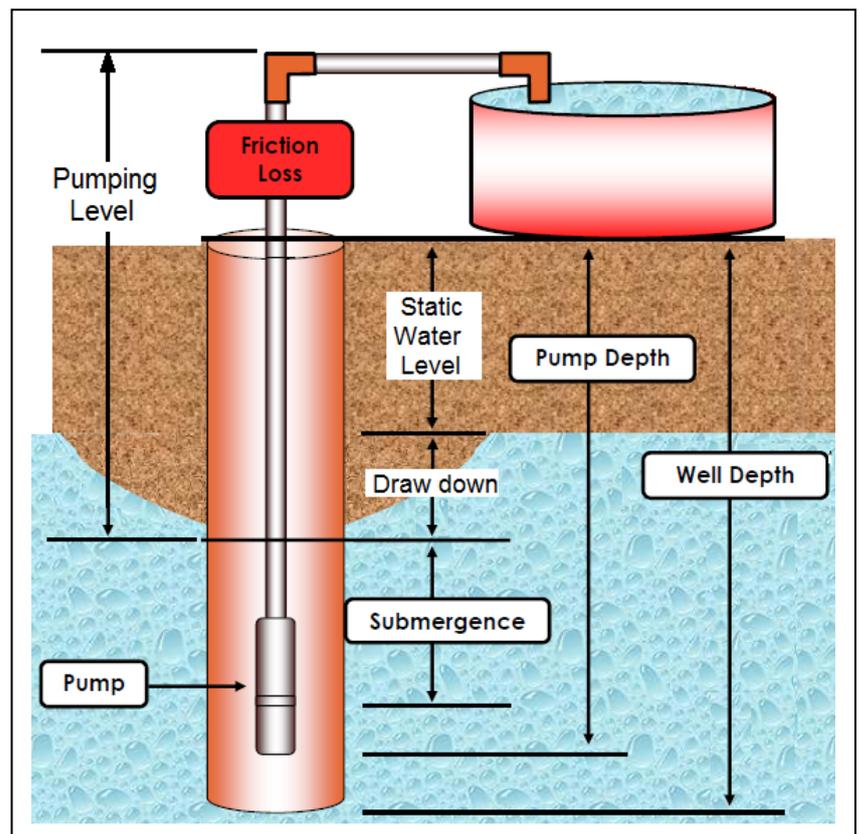
$$150 - 50 \times 2.307 = 34.65 \text{ (feet)}$$

So the water level should be less than 34 feet in order for this pump to get 50 psi in the pressure tank. If the water level is deeper than 34 feet (i.e. 38 feet), you will not get 50 psi. Fittings, and elbows etc will add resistance to the water head, and reduce the psi. Here is the chart for the pumping levels vs. psi settings.

Our Pump's true HP	1/2HP	1HP	2HP
Pump's Max rated Head	150 (feet)	207 (feet)	400 (feet)
Max pumping level for 20/40 psi setting	57 (feet)	114 (feet)	307 (feet)
Max pumping level for 30/50 psi setting	34 (feet)	91 (feet)	284 (feet)
Max pumping level for 40/60 psi setting	11 (feet)	68 (feet)	261 (feet)

For pressure tank application:

If your old pump was 1/2HP and not Hallmark Industries brand, you may need our 1HP pump!



HALLMARK INDUSTRIES INC.

Deep Well Submersible Pumps

Operating & Installation Instructions

CAUTION: Before operating or installing this pump, read this manual and follow all Safety Rules and Operating Instructions

INSPECT THE EQUIPMENT

Inspect your pump when you receive it to make sure there is no damage during shipping.

Pump's voltage must match your power line voltage! Or warranty is voided!

Two wire plus GROUND pump/motor assemblies DO NOT require a control box.

NOTE: Internal pipe threads in the discharge head are 1-1/4" standard NPT.

WARNING - General Precautions

- Review all the instructions before operating. Failure to follow these instructions could cause bodily injury and/or property damage.
- The pump's voltage must match your power supply! Or warranty will void!
- Pump must be installed in the appropriately sized casing or it may overheat to cause the pump fail.
- This pump is for clean water, pumping sand will clog the pump. Installing a good filter may prevent the pumping of abrasives.
- This pump may have been water tested at factory, and may contain water.
- Do NOT run pump dry!
- Pump must installed in an appropriately sized well casing to prevent pump from over heating
- The pump, piping and system must be protected against freezing temperatures.
- Wear gloves and eye protection during assembly and installation as precautionary safety measures.
- Never use in swimming pools or pool areas.

WARNING - Electrical Precautions

All wiring, electrical connections and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician.

- A ground fault interrupter (GFI) protected circuit is recommended for use with any electrical device operating near water.
- Have a qualified electrician provide electrical power to the motor. For cable sizes, see Table 1.
- Make sure the line voltage, frequency of the electrical current supply match the specifications printed on the motor.
- Be sure leads and ground wires are properly waterproofed and securely connected.
- Ensure the motor is properly grounded.
- Always disconnect the power before servicing.
- Never test a pump or use outside a well without proper electrical grounding of the system.

Assembly

Tools Required for Assembly

- Pipe wrenches
- Pipe vises or clamps
- Teflon tape
- Gloves and safety glasses
- CSA or UL approved PVC electrical tape
- Tripod with chain hoist or some other device to support the unit while lowering it into the well
- Miscellaneous wrenches / tools as needed

Table 1 - Cable Selection SINGLE PHASE MOTOR (For reference only)

Motor Rating		Copper Wire Size (1)								
Volts	HP	14	12	10	8	6	4	2	0	00
115	1/2	100	159	249	390	608	930	1410	1910	
230	1/2	404	641	1003	1575	2450	3750	5710		
	3/4	293	473	740	1161	1810	2760	4210	5680	
	1	248	392	617	968	1507	2300	3510	4730	5920
	1-1/2	205	326	510	801	1248	1920	2930	3950	4940
	2	180	286	449	703	1096	1675	2550	3440	4300
	3		229	359	563	877	1339	2041	2750	3440
	5			216	315	490	750	1142	1540	1925

CAUTION:

1. Use of wire size smaller may damage the pump and thus void warranty.
2. For 1HP 115V wire, use the wire size for 2HP 230V.

Installation

General Information

The most important things you should know about your well are:

1. **Well total depth** - the distance from the ground level to the bottom of the well.
2. **Head** – A vertical distance from the pump to the ground level where water is discharged or into a pressure tank.
3. **GPM** - the amount of water in GPM the pump produces.

Suitability of Well

IMPORTANT: The well should be fully developed and **must** be pumped until all fines and foreign matter are removed **before this pump is installed**. Make sure the well is large enough to allow the pump to be set at the required depth. **Do not** set the pump below the casing perforations or well screen unless you are sure there is adequate flow of water around the motor for cooling. To determine the correct pump setting use the driller's records by taking into account the depth to water level and draw down at the proposed pumping rate. Always keep the pump a minimum of five feet from the bottom of the drilled well.

Grounding

All wiring, electrical connections and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician.

Permanently ground all electrical components in accordance with National Electrical Code and applicable local codes and ordinances.

DO NOT ground to a gas supply line.

DO NOT connect to electric power supply until unit is permanently grounded.

If a plastic well casing is used in your installation, ground the metal well cap or well seal, providing electrical leads to the pump motor go through the well cap or well seal. Ensure correct wire size is used. **Refer to local electrical code.**

Cable Splicing Methods

When the drop cable must be spliced or connected to the motor leads, it is necessary that the splice be water tight. The splice can be made with commercially available potting or heat shrink splicing kits. Follow the kit instructions carefully.

1. Heat Shrink Tubing Method - RECOMMENDED METHOD

- i) Strip about 1/2" of insulation from cable and lead ends.
- ii) Slide about 3" long heat shrink tubing over the cables.
- iii) Connect cable and lead ends with STA-KON or similar connectors (Figure 1).

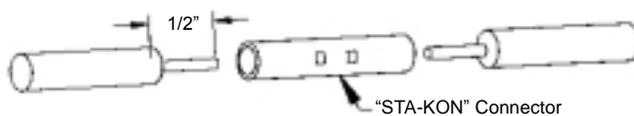


Figure 1 - Heat Shrink Splicing

- iv) Position the tubing over the connection keeping the connector at its center.
- v) Apply heat (about 135°C) evenly on the tubing and working from center outwards to avoid trapping air. While heated, the adhesive liner seals the interfaces between the tubing and the connector cable. Perfect sealing is achieved when adhesive liner flows outside the tubing and seals the ends.

While heating, care must be taken not to overheat the cable outside the tubing. This will damage the insulation of the cable.

2. Tape Method (Alternative)

SPLICING SUBMERSIBLE CABLES WITH TAPE

Tape splicing should use the following procedure. See Figure 2.

- i) Strip individual conductor of insulation only as far as necessary to provide room for a stake type connector. Tubular connectors of the staked type are preferred. If connector O.D. is not as large as cable insulation, buildup with CSA/UL approved rubber electrical tape.

ii) Tape individual joints with CSA/UL approved rubber electrical tape, using two layers; the first extending two inches beyond each end of the conductor insulation end, the second layer two inches beyond the ends of the first layer. Wrap tightly, eliminating air spaces as much as possible.

iii) Tape over the rubber electrical tape with #33 Scotch® or CSA/UL approved PVC electrical tape, (3M Canada Inc./Minnesota Mining and Manufacturing Co.) or equivalent, using two layers as in step "2" and making each layer overlap the end of the preceding layer by at least two inches.

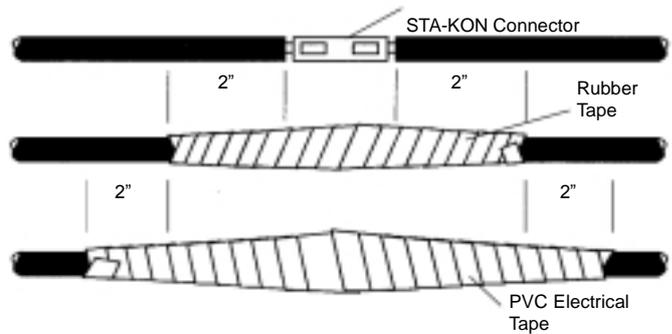


Figure 2 - Tape Splicing

In the case of a cable with **three** or **four** conductors encased in a single outer sheath, tape individual conductors as described, staggering joints.

Total thickness of the tape should be no less than the thickness of the conductor insulation.

The following test is recommended before installation. Cable and splice test for leaks to ground.

1. Immerse the cable and splice connections into a steel barrel of water with both ends out of the water and not touching the barrel (Figure 3).
2. Set ohmmeter on RX 100K and adjust needle to zero (0) with leads clipped together.
3. Clip one ohmmeter lead to the barrel and the other to each cable lead individually.
4. If the needle deflects to zero (0) on any of the cable leads, a faulty splice connection is indicated. To double check the faulty splice connection, pull the splice out of the water. If the needle now moves to ∞ (infinite resistance) the leak is in the splice.
5. Repairs should be made with CSA and or UL approved electrical Rubber & PVC tape.
6. If the leak is not in the splice, pull the cable out of the water slowly until the needle moves to ∞. When the needle moves to ∞ the leak is at that point.

Installing Your Pump

PUMP LOCATION

Your submersible pump should be installed no less than 5 feet (1.5 meters) from the bottom of your well.

CAUTION: To avoid accidental loss of the pump in the well, it is recommended that a 1/4" polypropylene rope be permanently attached to the eye provided on the discharge head of the pump. The other end of the polypropylene rope should be secured to an anchor at the well head.

Drilled Well Installation

1. Check your submersible pump and accessories for physical damage.
2. Check the electric supply for proper voltage, fusing, wire size, grounding and transformer size.
3. Check the well casing. The upper edge of the casing should be perfectly smooth. Jagged edges could cut or scrape the cable and cause a short circuit.
4. Select your pipe. Use only CSA approved polyethylene pipe, semi-rigid plastic pipe or schedule 40 steel pipe for setting high pressure pumps. The pipe must have sufficient strength to withstand the system's maximum pressure. The pump discharge is 1-1/4". 1" pipe may be used on the 5, 7 & 10 gpm units. On 10 gpm units when depth to water level exceeds 300 feet (91 m) deep use only 1-1/4" pipe sizes. On 15 and 20 GPM units use only 1-1/4" pipe sizes. Ensure that you have the correct length of pipe required. The pump should be installed no less than 5 feet (1.5 meters) from the bottom of the well.

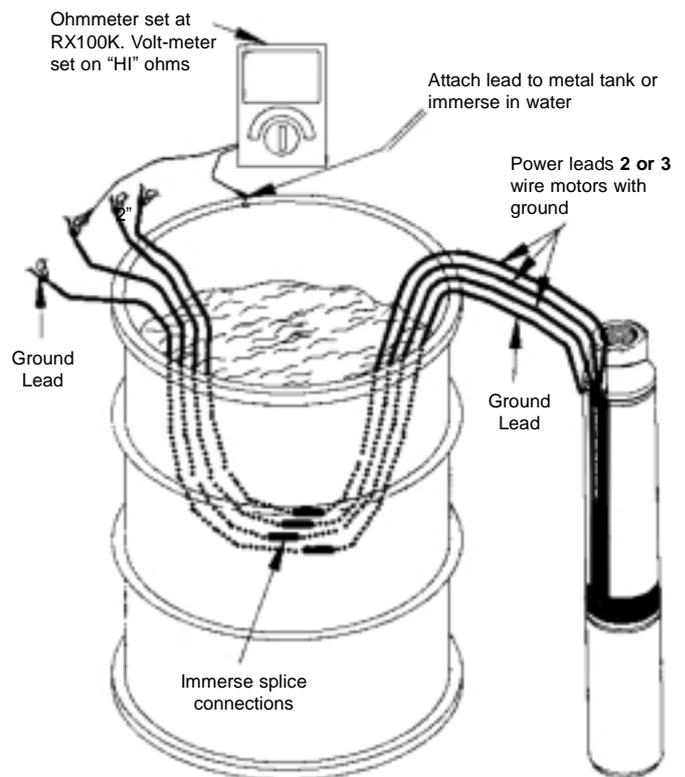


Figure 3 - Cable Test

Installation Cont'd

Installing The Pump With Polyethylene Pipe

- Wrap the thread of a 1-1/4" NPT x 1" male plastic pipe adapter with teflon tape if 1" pipe is being installed.
- Install the adapter into the pump discharge opening **while holding the discharge head with a pipe wrench to prevent the head from loosening from the pump housing.**
- Install two 1" **all stainless steel** hose clamps over one end of the pipe and tighten.
- Heat the polyethylene pipe to soften the pipe.
- Press the polyethylene pipe over the adapter.
- Tighten clamps securely around the pipe over the adapter end.
- As the pump and pipe are lowered into the well, the submersible wire cable must be secured to the discharge pipe 5 feet from the top of the pump using electrical tape or snap wire ties. Then repeat this procedure at 10 foot (3 m) intervals along the discharge piping.

NOTE: A pipe vise or collar clamp should always be firmly affixed to the upper end of the pipe as it is being lowered.

- When the pump has reached the desired depth, pass the pipe and cable through the openings in the well seal. **The well seal must be vented.**
- Continue pipe connection to the tank location in the house. Continue securing the submersible pump cable to the pipe. Additional clamps and fittings will be required to make the necessary connections at the elbow and at the control center.

Installing The Pump With Semi-Rigid Plastic Pipe

- Wrap the thread of the pipe with teflon tape.
- Thread the first section of the pipe into the pump discharge opening.
- Sections are available in 10 and 20 foot lengths. Use a pipe coupling and solvent to join pipe sections together.

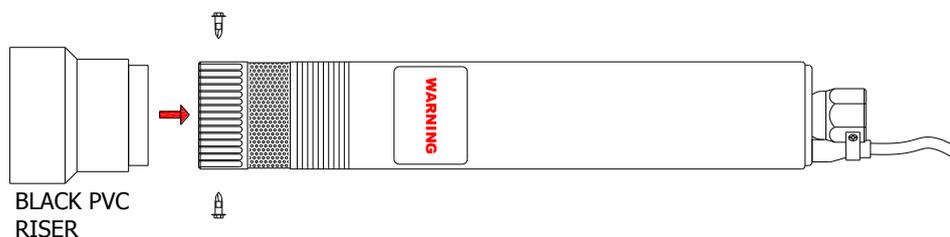
NOTE: A pipe vise or collar clamp should always be firmly affixed to the upper end of the pipe as it is being lowered.

- As the pipe is lowered, the submersible wire cable must be secured to the discharge pipe 5 feet from the top of the pump using electrical tape. Then repeat this procedure at 10 foot (3 m) intervals along the discharge piping.
- When the pump has reached the desired depth, pass the pipe and cable through the openings in the well seal. The discharge pipe goes through the centre hole and the cable through the conduit opening. The well seal must be vented.
- Cut the last section to the length required.
- Install a 1" or 1-1/4" male connector over the end of the pipe using solvent to weld the pieces together.
- Wrap the threads of a 90 degree plastic elbow with teflon tape.
- Thread the elbow into the male connector.

NOTE: If the pipe was not cut, and the last section of pipe has a female connector, use a 2" long nipple and then thread the elbow into the nipple.

- Install the well seal into the well casing by tightening down cap screws on the well seal. The well seal must be vented.
- Continue pipe connection to the tank location in the house. Continue securing the submersible pump cable to the pump. Additional clamps and fittings will be required to make the necessary connections at the elbow and at the control center.

NOTE: Some bottom intake pumps may come with an optional black PVC riser, which is used to prevent sand or mud being sucked into the pump. The riser is optional and its diameter is bigger than 4 inch. If your well casing is suitable for the riser, and you plan to use the riser, please insert the riser into the bottom of the pump, and then tighten it with 2 self drilling screws.



Riser is optional, and for bottom suction pumps only.

Installing The Control Center (Figure 5)

NOTE: Teflon tape must be used on all thread joints.

- Wrap the outside thread of the tank control center with teflon tape at position (A) and thread into tank opening (see Figure 4). Control center will thread directly into 1" opening in the side of the pre-charged tank.
- Install the pressure gauge with a 3/4" x 1/4" busing at the opening marked position (B) on the control center.
- Install a pressure switch or "loss of pressure" switch using 1/4" x 3" nipple at the opening position (C) in the control center.
- Connect pipe coming from well and pump to position (E) in the control center using the appropriate male plastic adapter and clamp, if polyethylene is used or thread directly into control center if ABS or steel pipe is used.
- Proceed from position (D) on the control center to house service lines.

NOTE: The use of teflon tape is recommended on all threaded joints.

NOTE: It is recommended that the 1 HP and 1-1/2 HP models should not be installed where the pumping level is less than 30 m (100 ft).

"Captive Air"
Precharged Tank

Epoxy or Glass Lined
Pre-chargeable Tank

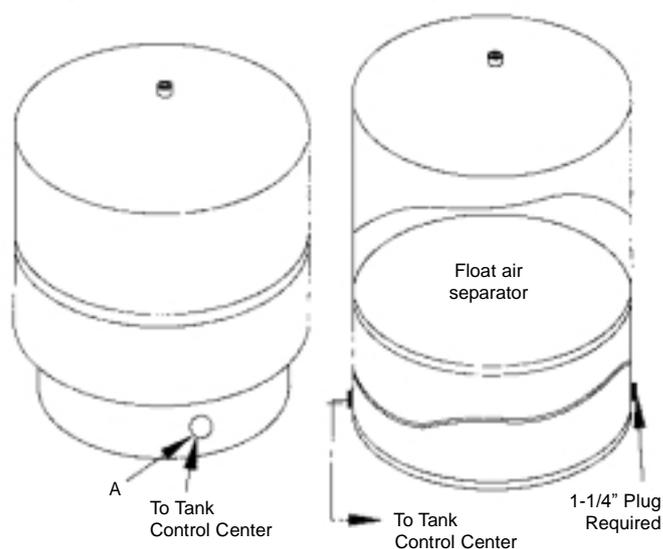


Figure 4 - Tank Openings

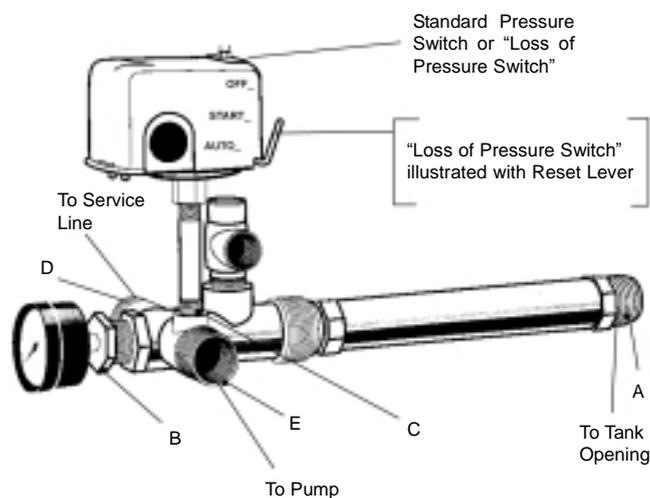


Figure 5 - The Control Center

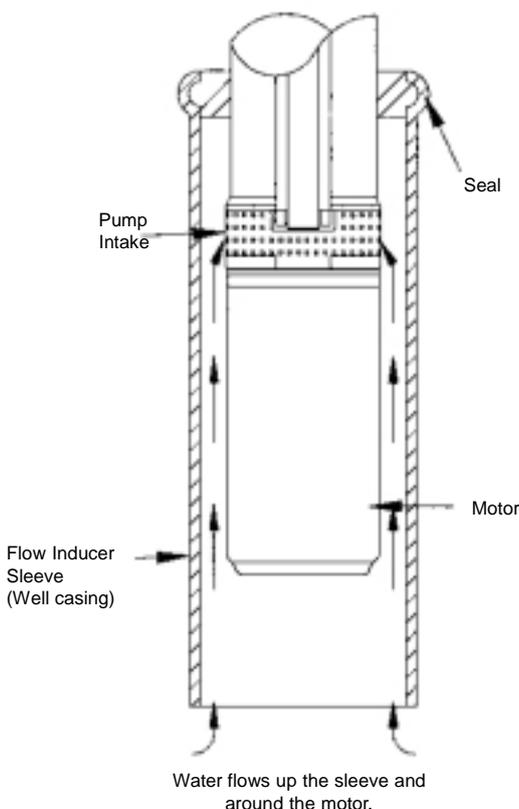


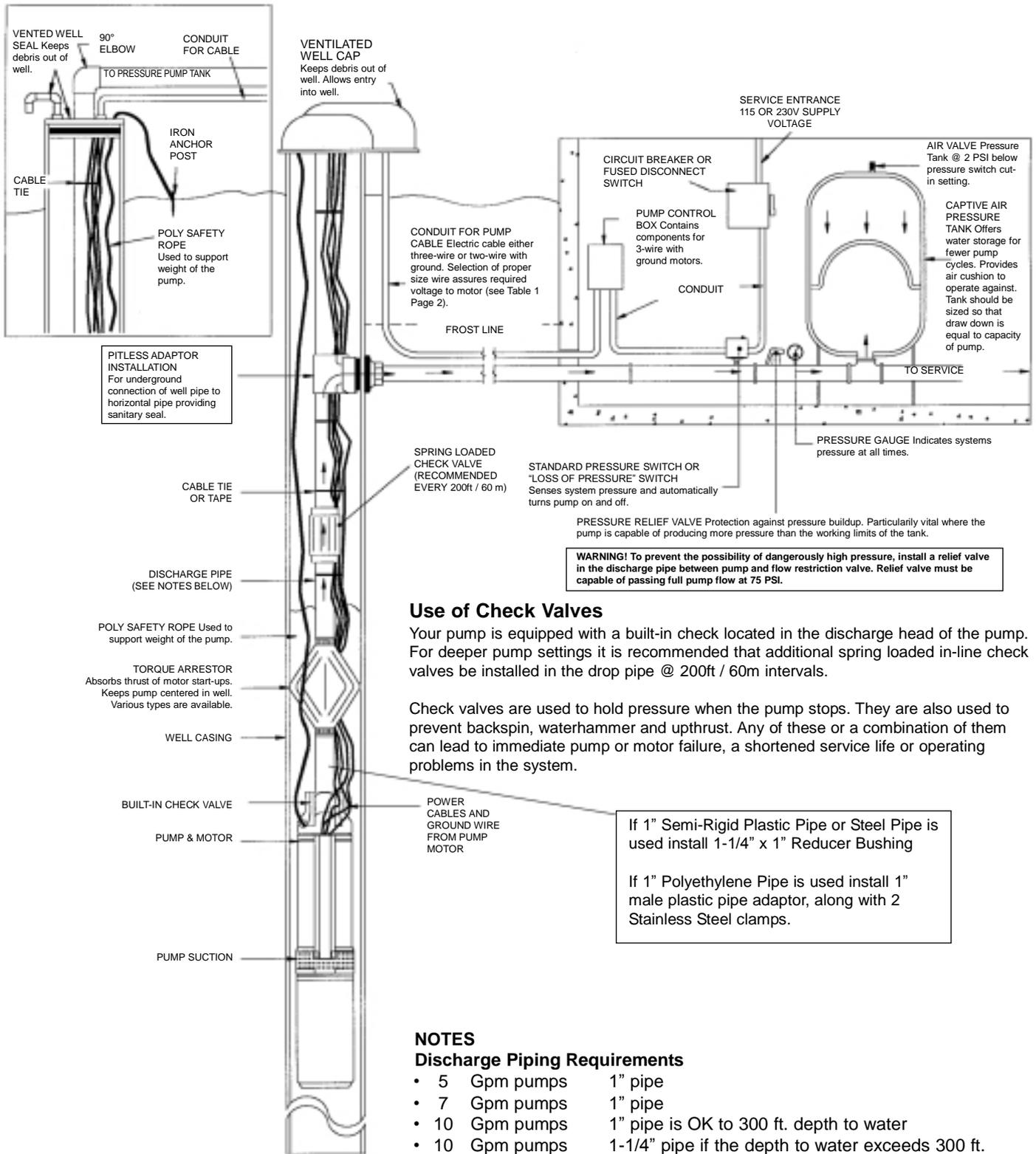
Figure 6 - Flow Inducer Sleeve

Lake or Large Diameter Well Installation

All wiring, electrical connections and system grounding must comply with the National Electrical Code (NEC) and with any local codes and ordinances. Employ a licensed electrician.

If a pump is installed in a lake or large diameter well, a flow inducer sleeve must be placed around the motor. The sleeve should have an inside diameter of 4" to 6", and be composed of corrosion resistant metal or heavy plastic. The sleeve will ensure proper flow of water around the motor for cooling purposes. The flow inducer sleeve is closed off above the pump intake and extends to the bottom of the motor or lower as shown in Figure 6.

Pictorial of 3 Wire System With and Without a Pitless adapter
 (see page 9, Figure 9 in this manual for Wiring Diagrams)



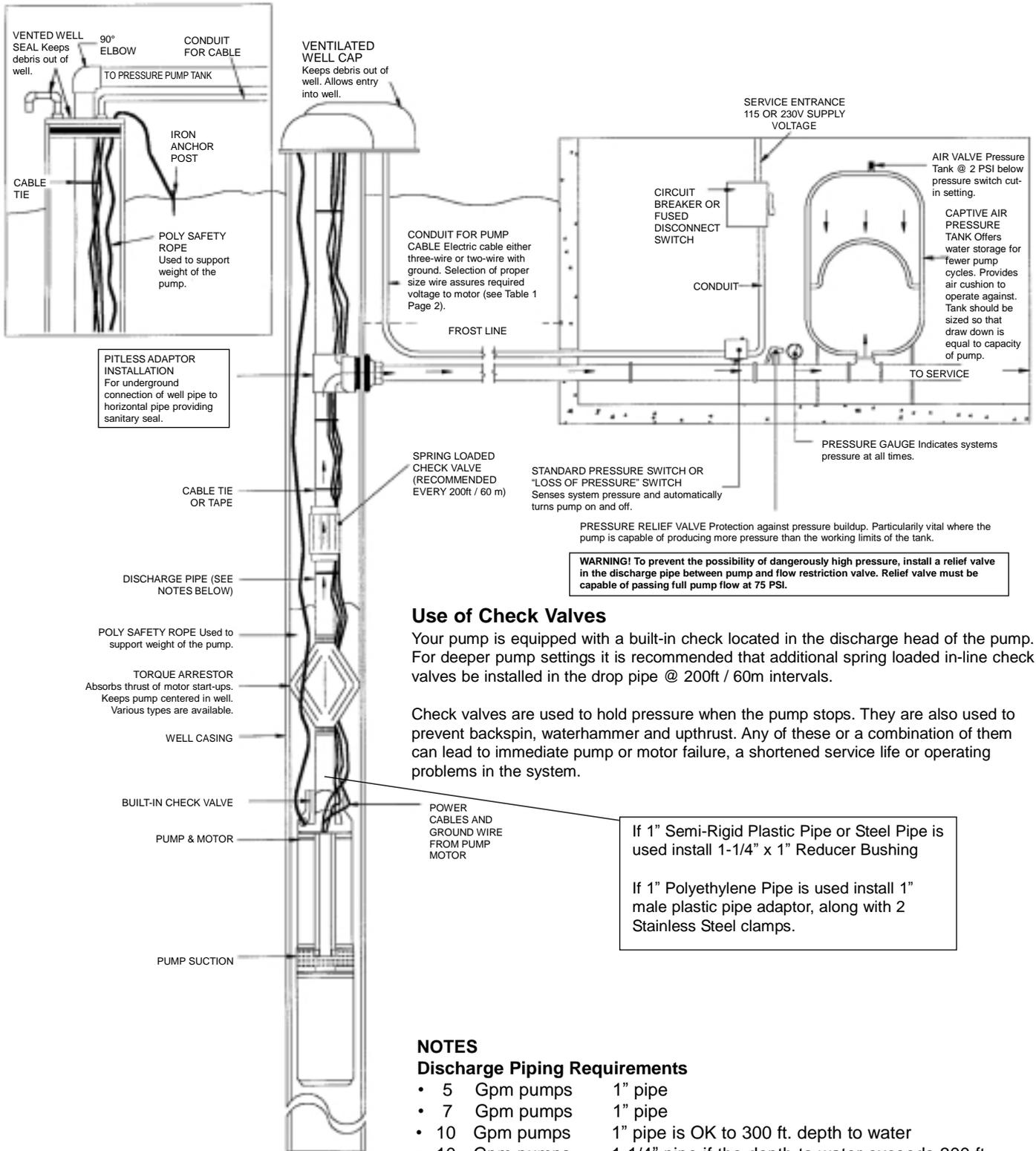
NOTES

Discharge Piping Requirements

- 5 Gpm pumps 1" pipe
- 7 Gpm pumps 1" pipe
- 10 Gpm pumps 1" pipe is OK to 300 ft. depth to water
- 10 Gpm pumps 1-1/4" pipe if the depth to water exceeds 300 ft.
- 15 Gpm pumps 1-1/4" pipe
- 20 Gpm pumps 1-1/4" pipe
- 30 Gpm pumps 2" pipe
- 50 Gpm pumps 2" pipe
- 85 Gpm pumps 2" pipe

Figure 7 - Pump Installation

Pictorial of 2 Wire System With and Without a Pitless Adapter
(see page 9, Figure 9 in this manual for Wiring Diagrams)



NOTES

Discharge Piping Requirements

- 5 Gpm pumps 1" pipe
- 7 Gpm pumps 1" pipe
- 10 Gpm pumps 1" pipe is OK to 300 ft. depth to water
- 10 Gpm pumps 1-1/4" pipe if the depth to water exceeds 300 ft.
- 15 Gpm pumps 1-1/4" pipe
- 20 Gpm pumps 1-1/4" pipe
- 30 Gpm pumps 2" pipe
- 50 Gpm pumps 2" pipe
- 85 Gpm pumps 2" pipe

Figure 8 - Pump Installation

Installation Cont'd

Electrical Connections (Figure 9)

WARNING - Electrical Precautions - All wiring, electrical connections and system grounding must comply with the national electrical code (NEC) and with any local codes and ordinances. A licensed electrician should be employed.

WARNING - Risk of Electrical Shock

Employ a licensed electrician to do the electrical wiring. A separate circuit breaker in your home's electrical panel is required. A ground fault interrupter (GFI) protected circuit should be used for all electrical devices operating near water. Install a properly fused disconnect switch in the line and make certain the wiring is adequately sized and well insulated. **Undersized wire between the motor and the power source will adversely limit the starting and load carrying abilities of the motor and void the warranty.** Minimum wire sizes for motor branch circuits are recommended in Table 1, Page 2. **For safety, the pump motor must be properly grounded.** For fusing requirements, see Table 2.

- Turn off main power supply to pump before attempting in wiring.
- Turn the pressure switch control lever to the "OFF" position (if your switch is equipped with a control lever), disconnecting the switch.
- Remove the cover from the pressure switch by loosening the cover nut. Connect the wires coming from the power source to the "LINE" terminals on the pressure switch. Use no less than 14 gauge wire to the terminals on the pressure switch.
- Cut the submersible wire cable to length from the well and connect the wires to the "LOAD" terminals on the pressure switch.
- Replace the cover on the pressure switch and reset lever to **AUTO** if your switch is so equipped.

Starting the Pump

Turn the circuit breaker switch to the "ON" position to start pump. Pump should start building pressure immediately. Allow pump to run until water runs clear.

NOTE: If your pressure switch is equipped with a loss of pressure cut-off switch (with a lever) it will be necessary for you to hold the lever in the start position until the pump build sufficient pressure to remain on without holding lever in the start position. The pump will run until system pressure builds up to the cutoff setting of the switch. The system will operate automatically between the cut-in & cut-out pressure settings on the switch.

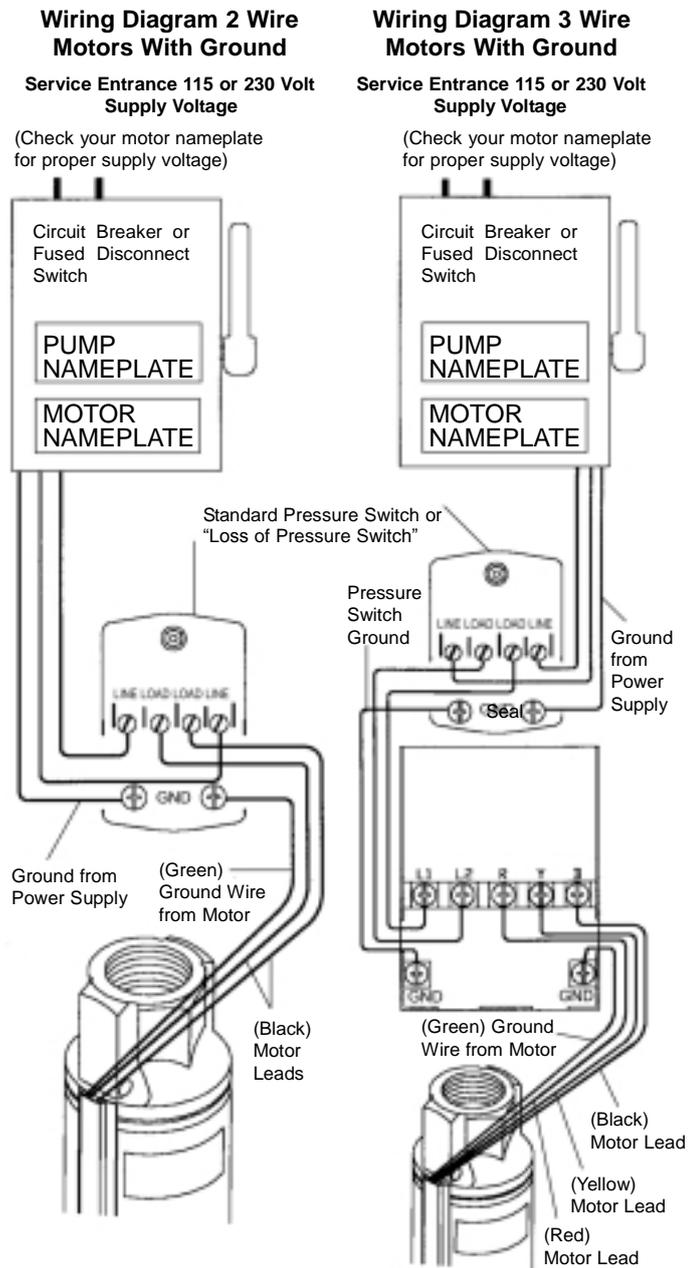


Figure 9 - Wiring Diagram

Table 2 - Motor Circuit Breaker or Fuse Requirement

Rating			Wire	Phase	Circuit Breakers or Fuse Amps					
HP	KW	Volts			(Maximum Per NEC)			(Typical Submersible)		
					Standard Fuse	Dual Element Time Delay Fuse	Circuit Breaker	Standard Fuse	Dual Element Time	Circuit Breaker
1/2	0.37	115	2	1	35	20	30	30	1	30
1/2	0.37	230	2	1	20	10	15	15	8	15
3/4	0.55	230	2	1	25	15	20	20	1	20
1	0.75	230	2	1	30	20	25	25	1	25
1.5	1.1	230	2	1	35	20	30	35	1	30
1/2	0.37	115	3	1	35	20	30	30	1	30
1/2	0.37	230	3	1	20	10	15	15	8	15
3/4	0.55	230	3	1	25	15	20	20	1	20
1	0.75	230	3	1	30	20	25	25	1	25
1.5	1.1	230	3	1	35	20	30	30	1	30
2	1.5	230	2 or 3	1	30	20	25	30	1	25
3	2.2	230	2 or 3	1	45	30	40	45	2	40
5	3.7	230	3	1	80	45	60	70	3	60
7.5	5.5	230	3	3	80	45	60	70	3	60
7.5	5.5	575	3	3	30	20	25	30	1	25
7.5	5.5	460	3	3	40	25	30	35	1	30
10	7.5	575	3	3	45	25	35	40	2	35
10	7.5	460	3	3	60	30	45	50	2	45

Maintenance

No regular maintenance is required on a submersible pump. However, it is advisable to check the wiring and piping annually.

Trouble Shooting

PROBLEM	CAUSE	CORRECTIVE ACTION
1. Your pump delivers little or no water	<p>A. Water level in a low producing well drops too low while pump is operating, causing it to air lock. (Resulting in loss of prime and possibly serious damage to the pump)</p> <p>B. Intake screen is partially plugged.</p> <p>C. Check valve(s) may be stuck.</p> <p>D. Voltage is too low; the motor runs slowly, causing low discharge pressure (head) and high operating current draw.</p>	<p>A. Lower the pump further into the well, but make sure it is at least five feet from the bottom of the well. Install a control valve in the discharge pipe between the pump and pressure tank. Use the control valve to restrict the flow until the discharge rate does not exceed well recovery rate. WARNING! To prevent the possibility of dangerously high pressure, install a relief valve in the discharge pipe between pump and flow restriction valve. Relief valve must be capable of passing full pump flow at 75 PSI.</p> <p>B. Lime or other matter in the water may build up on screen. Pull pump and clean screen.</p> <p>C. Make sure that the built-in check valve in the pump and any check valves in the discharge line are free to open properly.</p> <p>D. Have a certified electrician verify voltage at the electrical disconnect box (2 wire) or control center (3 wire) while the pump is operating. If the voltage is low, the power company may need to raise it or installation may require larger wire. Discuss this with the power company or a licensed electrician.</p>
2. Air or milky water discharges from your faucets	<p>A. Well water may be gaseous.</p>	<p>A. If your well is naturally gaseous and your system has a standard tank, remove the bleeder orifices and plug the tees. If the condition is serious, check with certified well professionals.</p>
3. Pump starts too frequently	<p>A. Leak in the pressure tank or plumbing.</p> <p>B. Pressure switch is defective or out of adjustment.</p> <p>C. Check valve is leaking.</p> <p>D. Tank is waterlogged.</p> <p>E. Drop pipe leaking.</p> <p>F. Pressure switch is too far from the tank.</p>	<p>A. Check all connections with soapsuds for air leaks. Fix any leaks you find. Check the plumbing for water leaks. Fix any leaks you find.</p> <p>B. If necessary, replace switch.</p> <p>C. Inspect valves and replace if necessary.</p> <p>D. Captive Air® Tanks: Check the tank for leaks; correct if possible. Precharge tanks to 18 PSI with a 20-40 PSI switch, 28 PSI for a 30-50 PSI switch, 38 PSI for a 40-60 PSI switch, etc. Standard tanks: Check the tank for leaks; correct if possible. Check bleeder orifices and clean bleeders; replace if necessary.</p> <p>E. Raise one length of pipe at a time until the leak is found. When water stands in the pipe there is no leak below this point.</p> <p>F. Move the pressure switch to within one foot of the tank.</p>
4. Fuses blow or overload protector trips when the motor starts	<p>A. Fuses or wires are too small.</p> <p>B. Low or high voltage.</p> <p>C. Cable splices or motor windings grounded, shortened, or open.</p> <p>D. 3-wire only; Cable leads may be improperly connected in pump control box, pressure switch or fused disconnect switch.</p> <p>E. 3-wire only; There may be a broken wire in the pump control box.</p> <p>F. 3-wire only; Starting or running capacitor in control box may be defective or vented (blown out).</p>	<p>A. Replace with correct wire sizes (see Table 1 on Page 2).</p> <p>B. While motor is running, voltage should not exceed plus 5% or minus 5% or rated voltage shown on motor nameplate. Call the electric power company to adjust line voltage if not within these limits.</p> <p>C. Consult certified electrician or service technician.</p> <p>D. Check wiring diagram on pump control box (also see Figure 9 on Page 9) and color coding of drop cable.</p> <p>E. Employ certified electrician examine all connections and wiring in control panel. If necessary, repair them.</p> <p>F. Inspect capacitors. Employ a certified electrician to check capacitors and replace them if necessary. WARNING! Hazardous voltage, can shock, burn or cause death. Capacitors may still carry voltage charges even after being disconnected from wiring. Have them checked by a certified electrician.</p>

Trouble Shooting Cont'd

PROBLEM	CAUS	CORRECTIVE ACTION
<p>5. Motor will not start but does not blow fuses.</p> <p>WARNING! Hazardous voltage. Can shock, burn or cause death. Employ a qualified electricians should work on electrical service.</p>	<p>A. No voltage to motor.</p> <p>B. Cable splices or motor windings may be grounded, shorted or open-circuited.</p> <p>C. Open circuit in pump control box (3-wire only); faulty connections; faulty wires.</p> <p>D. Faulty pressure switch.</p> <p>E. 3-wire only; Cable leads improperly connected in the control center.</p>	<p>A. With a voltmeter check; 1) fuse box to make sure full voltage is available; 2) pressure switch terminals, to make pressure switch is passing voltage correctly; and 3) terminal strips in pump control box or disconnect switch box to make sure voltage is available there. On 1-1/2 through 3 HP: Push red overload reset button(s) on the bottom of control center.</p> <p>B. Consult certified electrician or service electrician. Do not attempt to disassemble pump or motor.</p> <p>C. Examine all connections and wires; examine terminal strips in the control center (3-wire only); repair if necessary.</p> <p>D. Check pressure switch; replace if necessary.</p> <p>E. Check wiring diagram on control center panel (or see Figure 9 on Page 9 of this manual) and color coding of drop cable.</p>
<p>6. Pressure switch fails to shut off pump.</p>	<p>A. You may have selected an undersized pump. Please refer to Pump Selection Guide (p2).</p> <p>B. Voltage is too low; motor will run slowly, causing low discharge pressure (head) and high operating current draw.</p> <p>C. Faulty pressure witch.</p> <p>D. Drop pipe is leaking.</p> <p>E. Water pumping level in the well may become too low when pump is running.</p>	<p>A. Lower the pressure setting.</p> <p>B. Verify voltage while the pump is operating. If the voltage is low, your power company may require larger wire. Discuss with the power company or a certified electrician. Check voltage with a recording meter if trouble recurs.</p> <p>C. Replace switch.</p> <p>D. Raise one length at a time until the leak is found. When water stands in the pipe, there is no leak below this point.</p> <p>E. Lower pump further into well, make sure it is between five and ten feet from the bottom of the well. Install a valve into the discharge pipe between the pump and the pressure tank. Use the valve to restrict flow until discharge rate does not exceed the well recovery rate.</p> <p>WARNING! To prevent the possibility of dangerous high pressure, install a relief valve in the discharge pipe between the pump and flow restriction valve. The relief valve must be</p>
<p>7. Fuses blow or overload protector trips when motor is running.</p>	<p>A. Low or high voltage.</p> <p>B. 3-Wire only: High ambient (atmospheric) temperature.</p> <p>C. 3-Wire only: Pump control box is wrong horsepower or voltage for installation.</p> <p>D. Wire size is too small. Improperly connected in the pump control box.</p> <p>E. Cable splices or motor windings may be grounded, shorted or open-circuited.</p>	<p>A. While the motor is running, voltage should not exceed plus 5% or minus 5% of rated voltage shown on motor nameplate. Call your power company to adjust line voltage if it is not within these limits.</p> <p>B. Make sure the pump control box is installed out of direct sunlight.</p> <p>C. Compare horsepower and voltage rating of motor (from motor nameplate) with those of the pump control box (from pump control box nameplate). These numbers must match.</p> <p>D. See Table 1 on Page 2 of this manual and make sure the wire sizes match specifications in the Table.</p> <p>E. Consult certified electrician or a service technician to determine if this is the cause of the problem or not.</p> <p>Do not attempt to disassemble pump or motor.</p>

Before you decide to return this pump, please test it in a bucket of water with a short electric cable. Make sure that the pump is completely submerged in water while its discharge outlet above water level. If the pump works in the testing condition, **IT IS A GOOD PUMP**. We have received many good pumps returned to us. Possible causes:

1. Loose electric cable connections.
2. Your electric cable is too long which causes the volt drop. Please change to a bigger wire gauge cable according to the wire gauge calculation sheet.
3. Air in the pipe system. Prime the system before running the pump.

Congratulations!

You are now the owner of a quality Hallmark Industries' Submersible Well Pump. The product that you have purchased has been manufactured using the latest techniques, best materials and quality workmanship.