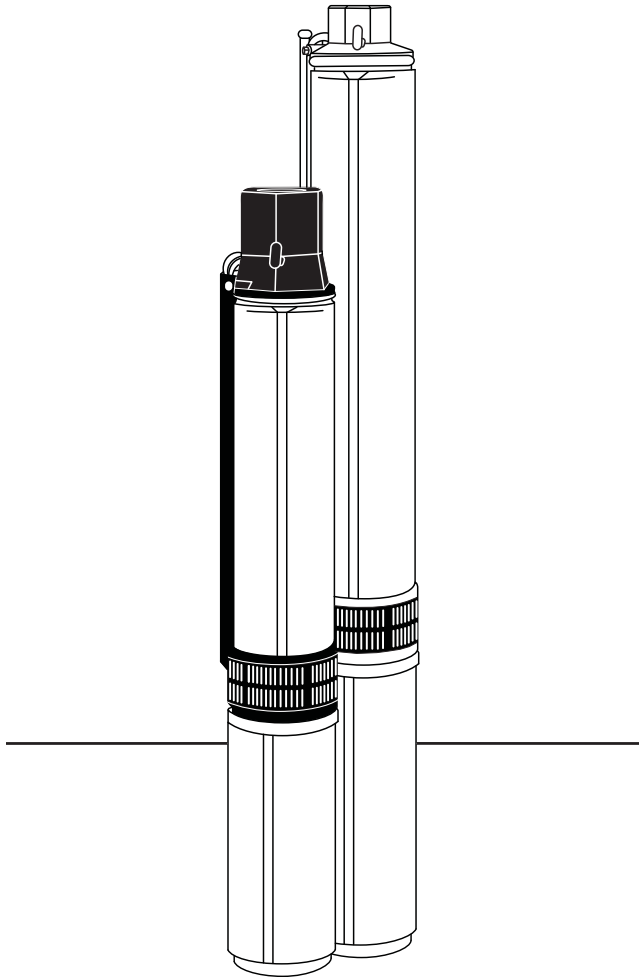




Franklin Electric

4" and 6" SUBMERSIBLE PUMPS OWNER'S MANUAL



BEFORE INSTALLING PUMP, BE SURE TO READ THIS OWNER'S MANUAL CAREFULLY.

CAUTION Fill pump with water before starting or pump will be damaged. The motor on this pump is guaranteed by the manufacturer. In event of failure it must be returned to an authorized service station for repairs. Motor warranty is void if repairs are not made by an authorized repair station.

INSPECT THE SHIPMENT

Examine the pump when it is received to be sure there has been no damage in shipping. Should any be evident, report it immediately to the dealer from whom the pump was purchased. Please check the pump package to see that it includes pump, motor, and motor leads (if your pump purchase includes a motor).

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 major property damage if ignored.

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

! 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.

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.

! WARNING

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

! WARNING Ground motor before connecting to power supply.

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

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

⚠ WARNING

IMPORTANT INFORMATION FOR INSTALLERS OF THIS EQUIPMENT!

THIS EQUIPMENT IS INTENDED FOR INSTALLATION BY TECHNICALLY QUALIFIED PERSONNEL. FAILURE TO INSTALL IT IN COMPLIANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES, AND WITH FRANKLIN ELECTRIC RECOMMENDATIONS, MAY RESULT IN ELECTRICAL SHOCK OR FIRE HAZARD, UNSATISFACTORY PERFORMANCE, AND EQUIPMENT FAILURE. FRANKLIN INSTALLATION INFORMATION IS AVAILABLE FROM PUMP MANUFACTURERS AND DISTRIBUTORS, AND DIRECTLY FROM FRANKLIN ELECTRIC. CALL FRANKLIN TOLL FREE 800-348-2420 FOR INFORMATION. RETAIN THIS INFORMATION SHEET WITH THE EQUIPMENT FOR FUTURE REFERENCE.

⚠ WARNING

SERIOUS OR FATAL ELECTRICAL SHOCK MAY RESULT FROM FAILURE TO CONNECT THE MOTOR, CONTROL ENCLOSURES, METAL PLUMBING, AND ALL OTHER METAL NEAR THE MOTOR OR CABLE, TO THE POWER SUPPLY GROUND TERMINAL USING WIRE NO SMALLER THAN MOTOR CABLE WIRES. TO REDUCE RISK OF ELECTRICAL SHOCK, DISCONNECT POWER BEFORE WORKING ON OR AROUND THE WATER SYSTEM. DO NOT USE MOTOR IN SWIMMING AREAS.

INSTALLATION RECORDS

It is good idea to keep an accurate record of your installation. Be sure to record the data below:

Purchased From:			
Date of Installation:			
Pump Model No.*			
Pump Date Code*			
Well Inside Dia.(in/mm):			
Depth of Well(ft/m):			
Depth of Water(ft/m):			
Pump Setting(ft/m):			
Drop Pipe Size:			
Wire Size(pump to control box):			
Wire Size(control box to power source):			
Horizontal Offset(between well & house):			
Make of Motor*			
Amps	HP	Volts	Ph
Make of Control Box			
HP		Volts	
Power Supply			
Volts		HZ	
Pressure Switch (PSI)			
Cut-in		Cut-out	

* This Information is on your pump or motor tag. It will help us identify your pump in case of later inquiries.

TEST RUNNING

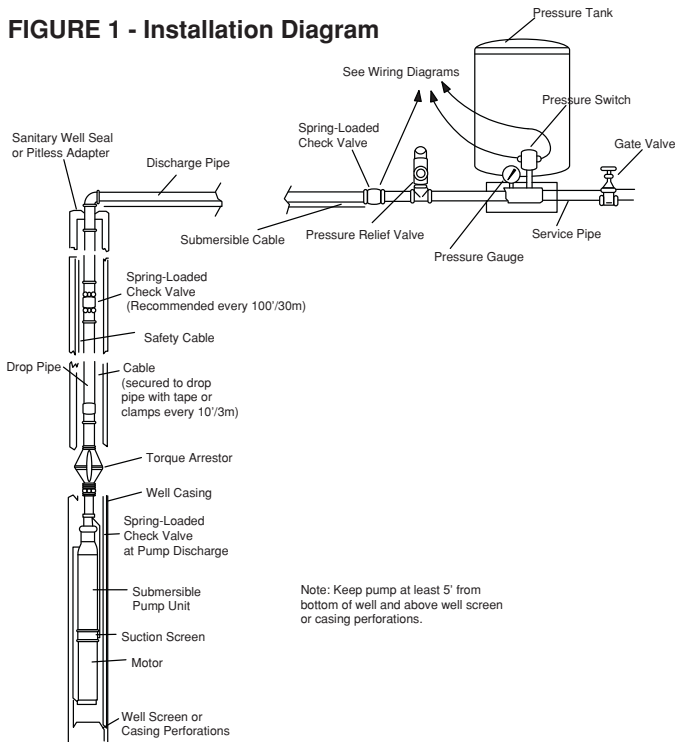
If test running pump before installation:

1. Insure that the power supply corresponds with that shown on the nameplate of the motor and control box. (if required).
2. Install pump and components appropriate for the test as shown in Fig. 1.
3. Make sure power supply is turned off and circuit breaker or disconnect switch is open. Make electrical connections appropriate to your motor as shown in Fig. 2, 3 or 4.
4. THREE-PHASE UNIT - A three-phase motor requires a magnetic starter equipped with quick-trip, ambient compensated heaters of correct size for the horsepower of the motor.

To insure correct rotation of three-phase units, brace pump shell securely and apply power momentarily by snapping line switch quickly on and off. If rotation is correct, reaction of the shell will be clockwise when viewed from pump discharge (that is, pump shaft will rotate counter clockwise). Interchange any two leads at magnetic starter to reverse rotation.

- Run pump and motor unit for a few seconds to ensure that it is in working order.

FIGURE 1 - Installation Diagram



DROP PIPE

Galvanized pipe is recommended for suspending submersible pumps into the well. Plastic pipe may be used only when observing the plastic pipe manufacturer’s recommendations of depth and pressure. Give special consideration to:

- A safety cable to prevent loss of pump if pipe should break.
- Torque arrestor just above pump to prevent chafing the cable when pump and pipe twist during the starting and stopping cycle. (See Figure 1)

Schedule 40 galvanized pipe is suitable for settings to 600 feet(180m). For deeper settings, use schedule 40 pipe for the bottom 600 feet (180m), and schedule 80 for the remainder.

Take great care to keep pipes clean and free from pebbles, scale and thread chips. Make sound, air-tight connections at all fittings. Pipe sealant is recommended.

CHECK VALVES

Many pumps have a built-in or externally supplied check valve. For a pump without one, install a check valve immediately above the pump. Install an additional check valve above the ground. If the pump is more than 100 feet (30m) below the wellhead, install another check valve in the drop pipe 100 feet (30m) above it. For pump settings deeper than 200 feet (60m), install additional check valves at intervals of 100 feet (30m).

SUITABILITY OF WELL

Install the pump only in a well that has been properly developed. Water from an undeveloped well often contains an excessive amount of sand, dirt, and abrasives which can damage the pump. Check that 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 make arrangements to ensure an adequate flow of water over the motor for cooling purposes. Determine the correct pump setting from the driller’s record by taking into account the static water level and the drawdown at the proposed pumping rate. Keep the pump at least five feet from the bottom of a drilled well.

SPLICING THE POWER CABLE

Follow the instructions enclosed in the cable splicing kit you purchase.

INSTALLATION OF PUMP, DROP PIPE, AND ASSOCIATED EQUIPMENT

Fig. 1 illustrates a typical well installation showing in-ground components. Franklin recommends the following procedure when installing the pump and drop pipe:

1. Fasten the submersible cable to the drop pipe with clamps or appropriate tape every 10 ft. (3m) to prevent tangling and damage to the cable. The cable must remain slack when using plastic drop pipe to allow for stretching of pipe when installed in the well.
2. Take care not to scrape or pinch the submersible cable against the well casing.
3. Use an ohmmeter or megger to make insulation and continuity checks on the cable once the pump is installed. This locates any fault in the cable.
4. Make sure a check valve is installed immediately above the pump. Install additional check valves at 100' (30m) intervals.
5. Install a torque arrestor just above the pump to prevent chafing the cable when pump and pipe twist during starting and stopping.
6. Attach a safety cable to pump to prevent loss of pump if pipe should break.
7. Place a sanitary well seal or pitless adapter with an approved cover plate over top of well per manufacturers recommendations.
8. Keep pump at least 5' (1.5m) from bottom of well and above well screen or casing perforations.

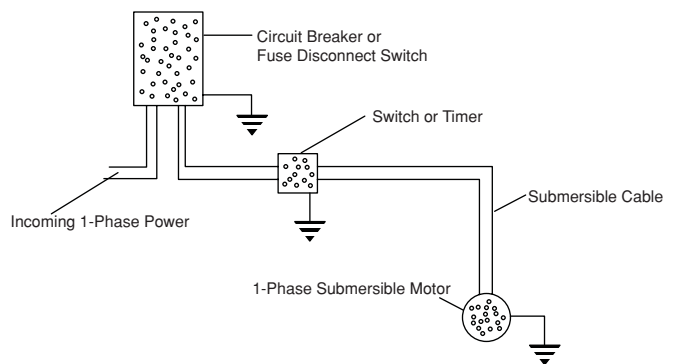
ELECTRICAL INFORMATION

1. Employ a licensed electrician to perform the wiring. All wiring must be done in accordance with applicable national and local electrical codes.
2. Check that the power supply corresponds with the electrical rating of the submersible motor and the control box (if required). Make sure that the control box electrical rating matches the motor electrical rating.
3. Every installation requires a fused disconnect switch or circuit breaker.
4. Every installation must be grounded. There must be a reliable ground connection between the pump and the distribution panel. The motor lead incorporates a green grounding conductor.
5. Lightning arrestors are recommended for every installation. All stainless steel, single phase motors thru 5HP have built-in lightning arrestors. Any 6" motor or 4", 3-phase motor requires a separate lightning arrestor installed as close to the wellhead as possible. Install the arrestor in accordance with manufacturers recommendations. A lightning arrestor provides protection against induced voltage surges on

secondary power lines; it is not effective against direct hits.

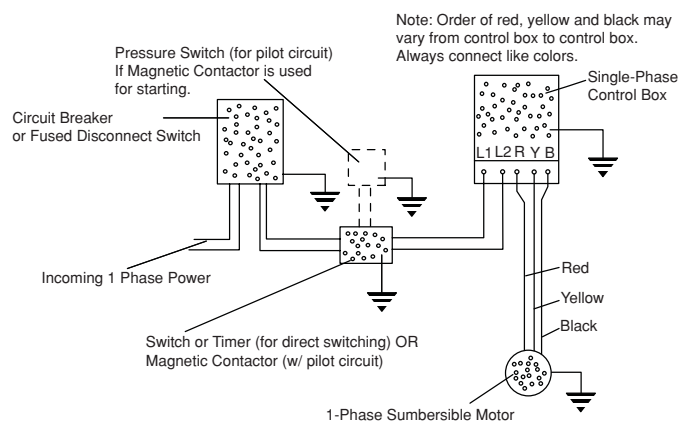
6. Mount the control box in an area protected from rain, snow, direct sunlight or other high temperatures as this may cause tripping of the overload protector. Also protect the control box from extreme cold (below 25°F/-32°C) as this may have adverse effects on starting capacitor.
7. A two-wire pump does not require a motor control box, since all electrical components are built inside the motor. Fig. 2 shows a typical wiring diagram for a two-wire installation.

FIGURE 2 - 2 WIRE, 1-Phase, 1/2 thru 1-1/2 HP Pump Wiring Diagram



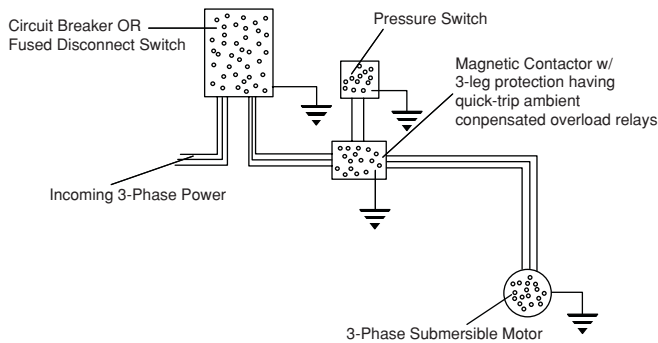
8. A three-wire, single-phase pump requires a motor control box incorporating overload relays. Fig. 3 shows a typical wiring diagram for a three-wire, single-phase installation. Note that a magnetic contactor must be used if the pressure switch electrical rating is not sufficient to handle the submersible motor electrical rating. The pressure switch would then be incorporated into a pilot circuit to control the magnetic contactor. Make the connections at the control box in accordance with the wiring diagram in the control box to avoid damage to the motor.

FIGURE 3 - 3-WIRE, 1-Phase, 1/2 thru 3 HP Pump Wiring Diagram



9. A three-phase pump does not require a motor control box . Fig. 4 shows a typical wiring diagram for a 3-wire, three-phase installation. A magnetic contractor with 3-leg protection having quick-trip ambient compensated overload relays must be used.

FIGURE 4 - 3-Wire, 3-Phase, 1-1/2 thru 50 HP Pump Wiring Diagram



10. Use an ohmmeter to make continuity and insulation checks after the installation is completed.
11. Place the additional motor label with the pump label and place both in the disconnect switch or circuit breaker box for future reference.

WELL TEST

Check the pump and well performance before making the final connection to the discharge system.

1. Install a gate valve on the end of the pipe. Partially open the valve.
2. Start the pump.
3. Open valve gradually to give full flow.
4. If the discharge is not clear, let the pump run until water clears. If water does not clear in 30 minutes, stop the pump and take the necessary steps to correct the condition. After the water has appeared clear, check for sand by discharging into a clean bucket or suitable container.
5. Close valve until maximum required system flow rate is obtained (this should correspond to the cut-in pressure of the pressure switch). Ensure that the output of the pump at this setting is not greater than the yield of the well. This can be checked by monitoring the well drawdown level and ensuring that the level is stable at the maximum required system flow rate.

CAUTION Never run pump unless it is completely submerged in water. If run without water, the pump and motor could be damaged. Note also that air drawn into the pump can cause an airlock under certain conditions.

LOW-YIELDING WELL

A low-yielding well exists when the output from the pump is greater than the yield of the well. It can reduce the water level to the suction screen so that a mixture of air and water enters the pump. Pumping may stop since the pump cannot generate pressure with insufficient water. In this case, the column of water already in the drop pipe holds the check valve closed and an airlock may develop inside the pump. Because the conditions ensure neither adequate lubrication of the pump nor proper cooling for the motor, damage can result if power is not cut off quickly. Use one or more of the following methods to correct and/or protect this installation.

1. Install additional length of drop pipe to place pump lower in well if possible.
2. Install a Franklin Pumptec or similar electronic drawdown sensor.
3. Install a floatless liquid level control. This device consists of an electrical relay activated by currents flowing through the ground-return circuits of electrodes hung in the well. The lower (STOP) electrode, just above the pump, ensures that the water level can never be pumped down to the suction screen. The upper (START) electrode, just below the lowest static water level, ensures that the pump can start again as soon as the well has recovered. A floatless liquid level control works in series with the pressure switch. Refer to the manufacturers instructions provided with control.
4. Install a flow control valve in the discharge line upstream from the pressure switch. This restricts the output from the pump without affecting the rate that water can be drawn from the pressure tank. Nevertheless, a heavy demand for water could empty the pressure tank, so a tank with a bonded diaphragm, air cell, or water bag is recommended.
5. Install a smaller pump to avoid over pumping the well. Have dealer size pump to the well yield.
6. Install a low-pressure cut-off switch. A low pressure cut off switch, or a pressure switch with such an arrangement built in, protects a shallow-well pump from losing its prime, but it does not always provide satisfactory protection to a submersible pump from the effects of over pumping the well. This is because it responds to a loss of pressure at the surface, which may occur after an air lock has formed inside the pump. We recommend either a floatless liquid level control or a flow control valve, in that order, in preference to a low-pressure cutoff switch as protection against over pumping.

DISCHARGE PLUMBING

Fig. 1 illustrates a typical well installation showing above ground components. Adhere to the following items when installing the discharge plumbing.

1. Install an above ground check valve upstream from the pressure switch.
2. Always install a pressure relief valve in the system. The relief valve should be capable of discharging the flow rate of the pump at the rated working pressure of the pressure tank. Locate the relief valve close to the pressure tank.
3. Install a pressure switch between the check valve and the pressure tank. Refer to Fig. 2, 3, or 4 for proper wiring connections of pressure switch.
4. Install a pressure tank as close as possible to the pressure switch. Refer to manufacturer's recommendations for installation.

TROUBLESHOOTING

1. PUMP FAILS TO START

- a) Electrical trouble - call dealer or electrician.
- b) Drawdown protection device has pump turned off.
- c) Overload tripped.
- d) Reset low pressure cutoff switch (if installed).

2. PUMP FAILS TO DELIVER WATER

- a) Air lock in pump.
- b) Clogged intake screen.
- c) Insufficient well yield.

3. PUMP GIVES REDUCED OUTPUT

- a) Insufficient well yield.
- b) Worn pump.
- c) Clogged intake screen.
- d) Low voltage.
- e) Incorrect rotation (3-phase only).

4. PUMP CYCLES TOO FREQUENTLY

- a) Excessive pressure drop between pressure switch and pressure tank.
- b) "Cut-in" pressure at pressure tank too high.
- c) "Cut-out" pressure at pressure tank too low.
- d) Waterlogged pressure tank.
- e) Start and stop electrodes of floatless liquid level control set too close together.
- f) Tank sized too small to meet system requirements.

5. OVERLOADS TRIP

- a) Electrical trouble - call dealer or electrician.

6. PRESSURE SWITCH CYCLES RAPIDLY WHEN PUMP STARTS

- a) Pressure switch too far from pressure tank.
- b) Adjust air charge of tank to manufacturer's recommendations.

U.S. LIMITED WARRANTY*

Franklin Electric Co., Inc.

Franklin Electric Co., Inc. warrants its new products to be free of defects in material and workmanship for a period of 1 year from date of installation or 2 years from date of manufacture, whichever comes first, WHEN installed in clean, potable water applications. Warranty does not cover applications pumping saltwater or other corrosive liquids. Consult and adhere to local codes for all applications. Franklin Electric Co., Inc. also provides additional warranty coverage on specific products as specified herein.

Franklin Electric's warranty obligation with regard to equipment not of its own manufacture is limited to the warranty actually extended to Franklin Electric by its suppliers.

This warranty extends only to the original retail purchaser and only during the time in which the original retail purchaser occupies the site where the product was originally installed.

Requests for service under this warranty shall be made by contacting the installing Franklin Electric dealer (point of purchase) as soon as possible after the discovery of any alleged defect. Franklin Electric will subsequently take corrective action as promptly as reasonably possible.

Franklin Electric at its discretion may replace or repair any product that fails under this warranty after inspection by an authorized company representative or after Franklin Electric has received the product at our factory. Replacement or repair cannot be made until after the product is inspected. All charges or expenses for freight to and from the factory, removal and reinstallation of the product, or installation of a replacement product are the responsibility of the purchaser.

THIS WARRANTY SUPERSEDES ANY WARRANTY NOT DATED OR BEARING AN EARLIER DATE. ANY IMPLIED WARRANTIES WHICH THE PURCHASER MAY HAVE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIOD. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. IN NO EVENT SHALL FRANKLIN ELECTRIC BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

This warranty does not apply to any product which has been subjected to negligence, alteration, accident, abuse, misuse, improper installation, vandalism, civil disturbances, or acts of God. The only warranties authorized by Franklin Electric are those set forth herein. Franklin Electric does not authorize other persons to extend any warranties with respect to its products, nor will Franklin Electric assume liability for any unauthorized warranties made in connection with the sale of its products.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

* Contact Franklin Electric Co., Inc. Export Division for International Warranty.



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