

INSTALLATION AND OPERATING INSTRUCTIONS

TO AVOID SERIOUS OR FATAL PERSONAL INJURY OR MAJOR PROPERTY DAMAGE, READ AND FOLLOW ALL SAFETY INSTRUCTIONS IN MANUAL AND ON PUMP.



This is a SAFETY ALERT SYMBOL. When you see this symbol on the pump or in the manual, look for one of the following signal words and be alert to the potential for personal injury or property damage.



Warns of hazards that WILL cause serious personal injury, death or major property damage.



Warns of hazards that CAN cause serious personal injury, death or major property damage.



Warns of hazards that CAN cause personal injury or property damage.

NOTICE: PLEASE READ AND UNDERSTAND THIS MANUAL BEFORE OPERATE OR INSTALL THE PRODUCT. IF YOU HAVE ANY QUESTION, PLEASE CONTACT YOUR DISTRIBUTOR FOR INSTRUCTION.

THIS MANUAL MUST BE KEPT WITH THE PUMP.

MAINTAIN ALL SAFETY LABELS.

IMPORTANT PRE-INSTALLATION INFORMATION



Hazardous voltage can shock, burn or cause death. All electrical work must be performed by a qualified technician. Always follow the local applicable electrical code.



The pump must be connected to a dedicated electrical circuit protected by a properly sized circuit breaker or fuses. Install a disconnect Control Panel where required by the local code.

Code questions should be directed to your electrical inspector. See Chart 1 for specific information.



Always disconnect the power source before installing or servicing the pump. This motors come with an automatic thermal overload protection, this feature may allow an overheated pump to restart suddenly.



Water and electricity can be dangerous if certain precautions are not adhered to. This pump is designed to operate in a safe way in a water environment; however, improper use and installation can result in personal harm from electrical shock. Please pay attention to the following warnings.



***Never touch this pump**, when it is touching water, in water, or even in a moist environment. Always unplug (disconnect the electricity) when working on or installing the unit.*



Do not use this pump with flammable or explosive liquids such as oil, gasoline, kerosene, ethanol, etc. Using this pump with or near flammable liquids can cause an explosion or fire, resulting in property damage, serious personal injury and/or death. Pumping any of the above mentioned liquids voids the warranty. Always make sure that this pump is pumping liquid with same composition as water.



Do not stand in water when the pump is connected to the power supply.



This pump has been evaluated for use with water only.

NOTICE: This pumps has been designed for working in presence of water. Working without water will cause severe damage to the pump.



A qualified electrician must perform all the wiring.

1. GENERAL INFORMATION

1.1. Read this Instruction Manual thoroughly prior to any work. Work should be undertaken by qualified persons only.



ATTENTION!
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 motor suppliers recommendations, may result in electrical shock or fire hazard, unsatisfactory performance, and equipment failure. Installation information is available from pump manufacturers and directly from motor suppliers. 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.

1. LOCATION

The pump should be installed in a dry, accessible place not subject to freezing temperatures. If installed in a pump pit or other location subject to dampness, proper ventilation must be provided to avoid moisture damage to the electrical equipment.

2. PIPING

Galvanized steel or plastic pipe is recommended. If copper or other dissimilar metal piping is used, a di-electric union or bushing is recommended where the piping is connected to the pump body. The pipe used should be cleaned and free of scale. Ream ends of pipe to remove burrs. Check threads to see that they are clean and not damaged. Horizontal runs of suction pipe must slope upwards from the well to the pump to avoid air pockets in the line which will make it difficult, if not impossible, to prime the pump. The recommended slope is one inch in ten feet. If pump must be offset an appreciable distance from the well, the size of horizontal pipe should be increased to reduce friction losses.

If using di-electric bushing, hand start bushing into female end of pump housing (or other female connection) first. Use a six-sided socket to tighten the bushing.

The bushing should be fully inserted into the female connection. After the male end of the bushing is fully installed, hand start pipe (or other male connection) into the female end of the bushing. Failure to follow these guidelines may damage the bushing. Caution should be taken to not cross-thread the bushing.

3. FLUSHING

If the pump discharge line is connected to pressure tank or house service, disconnect it and flush and clean the system by

temporarily wasting the water outdoors or to drain. The pump should be operated until the water runs clear, without sand, mud or rust.

This procedure will eliminate the danger of pumping dirty water into the pressure tank and home appliances. When water runs clear, re-connect discharge line to tank and service.

4. WIRING (Use copper conductors only)

Be certain that wire and fuses of correct size are installed. Be certain the phase, voltage, and cycles of the supply circuit are the same as that shown on the motor name plate.

It is strongly recommended that a separate electric line, well protected against fire, be run from electrical service to the pump, with a fused switch box at the pump.

In the event of fire, this precaution will permit continuous operation of your pumping system. For added safety, the pump and motor should be properly grounded to the well casing or to a separate ground rod driven eight feet into the ground.

NOTE: For proper fuse, circuit breaker and wire sizes in your area, follow local codes. Otherwise:

Wire Gage and Standard Fuse Sizes						
MOTOR SIZE	WIRE SIZE		*FUSETRON		*CIRCUIT BRKR	
	115 V	230 V	115 V	230 V	115 V	230 V
1 HP	8	12	30 amp	20 amp	35 amp	20 amp
1.5 HP	6	10	35 amp	25 amp	40 amp	20 amp
2 HP	8	8	-	30 amp	-	25 amp

* Time delay fuses and circuit breakers (Single Phase).

For distances of 100 feet and over from meter to motor, larger wire than shown may be required.

5. MOTORS

Motors are equipped with sealed ball bearings and require little attention.

If motor repeatedly stops, cools off, and starts again, the cause or trouble must be located and corrected. Do not cover motor with canvas or other material that may interfere with proper air circulation and cause over-heating.

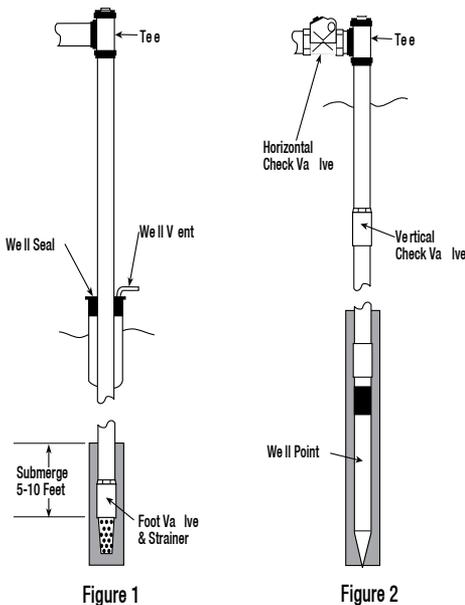


Figure 1

Figure 2

A shallow well system should not be installed where total suction lift exceeds 25 feet at sea level. Suction lift must be reduced at the rate of approximately 1 foot per 1000 feet at elevation. Total suction lift consists of the vertical distance from the water level when pumping to the pump plus losses due to friction in the pipe line. The volume of water delivered decreases with an increased suction lift.

Drilled, bored or dug wells may employ an arrangement as in Figure 1. Driven wells and sandpoints employ the configuration in Figure 2.

1. a) Install a foot valve on the bottom of the suction line and place it 5 to 10 feet below the draw down level, that is, the level of the water when the unit is pumping its rated capacity. It should be far enough from the bottom of the well to avoid pumping sand and mud. (Figure 1)

b) On driven well installation, install a spring dog- check valve on the vertical pipe at least five feet above the well point, or install a horizontal check valve in the suction line near the pump. (Figure 2)

2. Check the foot valve, see that it seats properly and that no obstruction prevents its opening or closing. A leaky foot valve may cause excessive cycling (motor starts and stops).

3. Lower first length of suction pipe, with attached foot valve into the well, fill pipe with clean water. If water recedes a leak is indicated. If no leaks occurs, assemble the remaining section(s) of pipe and check again for leaks.

4. Install the well seal at the top of the well casing and tighten well seal bolts. (Figure 1)

5. Install a tee at top of suction pipe, with a plug in the top opening, and connect through a union to the female thread in the pump body.

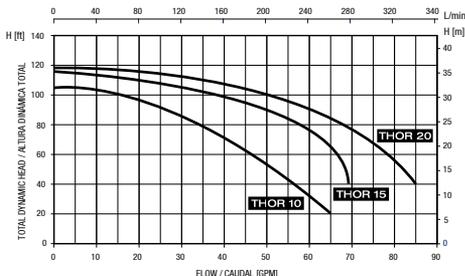
6. Connect pump discharge to pressure tank, and pressure tank to house plumbing.

7. After piping is completed and motor is properly wired, remove the priming plug on top of pump and fill pump with clean water. Allow time for air in the system to escape, and refill pump if necessary before replacing the priming plug. Start motor and the unit should operate. If it does not, it may be necessary to reprime.

8. When unit has built up to maximum pressure, and has automatically stopped, check all piping both suction and discharge lines for leaks; as they will be under pressure.

NOTE: If the unit is to be used with a vacuum type air volume control where the source of supply is on a level with the pump or above it (artesian well, pond, cistern or shallow well with less than five feet lift) a valve should be installed in the suction line that may be partially closed to cause the pump to operate under a moderate suction lift of 8-10 ft. to insure correct operation of the air volume control which is operated by vacuum.

7. PERFORMANCE CURVES AND DATA



THOR 10

HP	SUCTION LIFT DEPTH (feet)	DISCHARGE PRESSURE - PSI				MAX SHUT-OFF PSI
		10	20	30	40	
		FLOW US GPM				
1.0	0	63	54	41	24	46
	5	61	51	38	19	44
	10	56	46	32		40
	15	51	44	28		39
	20	43	40	23		38
	25	35	34	18		34

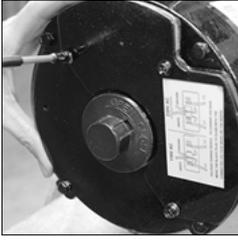
THOR 15

HP	SUCTION LIFT DEPTH (feet)	DISCHARGE PRESSURE - PSI				MAX SHUT-OFF PSI
		10	20	30	40	
		FLOW US GPM				
1.5	0	69	68	64	48	49
	5	62	61	58	42	48
	10	55	53	51	35	46
	15	48	48	46	26	44
	20	42	40	39	30	43
	25	34	34	30		41

THOR 20

HP	SUCTION LIFT DEPTH (feet)	DISCHARGE PRESSURE - PSI				MAX SHUT-OFF PSI
		10	20	30	40	
		FLOW US GPM				
2.0	0	83	83	73	54	51
	5	73	73	69	49	48
	10	57	57	56	39	47
	15	50	50	50	43	45
	20	42	42	42		44
	25	34	34	34		42

8. VOLTAGE CHANGE PROCEDURE



1 Unscrew and remove the cover.



4 Choose connection for 230 V.



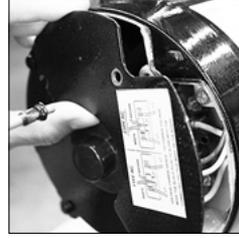
2 Remove the Voltage plug.



5 Choose connection for 115 V.



3 Install the Voltage Plug aligning the arrow with the voltage needed.



6 Reinstall the cover back.

9. PEARL MOTOR DATA

MOTOR PART #	HP	VOLTS	PHASE	SERVICE FACTOR	Pump MAX. LOAD AMPS
THOR 10	1	115 V / 230 V	1	1.75	16.60 / 8.30
THOR 15	1.5	115 V / 230V	1	1.60	21.00 / 10.50
THOR 20	2	230	1	1.40	11.8

10. MOTOR FACTORY PRE-WIRING

PEARL Motors for our THOR Pumps are factory pre-wired at 230 V.

