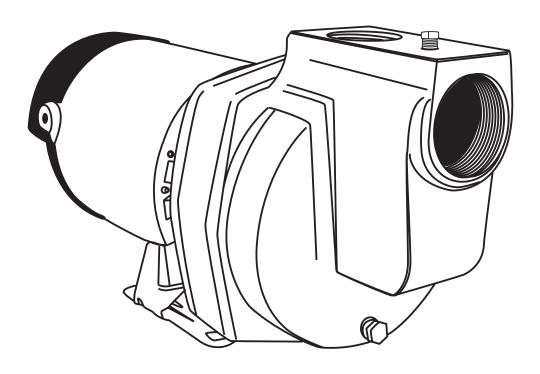


LAWN SPRINKLER, IRRIGATION PUMP

MODEL # HSP10P1, HSP15P1, HSP20P1

110 West Division St. | Boonville, IN 47601 starwatersystems.com





For installation videos and other information, scan with your smart phone.

- 1. Pre-Installation
- 2. Tools required
- 3. General Pump Information
- 4. Pump and Pipe Assembly
- 5. Check your Breaker Box
- 6. Change voltage if required Video
- 7. Wiring Instructions Video
- 8. Pump Priming and Startup Video
- 9. Irrigation System Controls
- 10. Care and Maintenance



Questions, problems, missing parts? Before returning to your retailer, call our customer service department at 1-800-742-5044, 7:30 a.m.-5:00 p.m., EST, Monday-Friday.

SAFETY INFORMATION

Please read and understand this entire manual before attempting to assemble, operate or install the product.

• **NOTE**: Pumps with the "UL" Mark and pumps with the "US" mark are tested to UL Standard UL778.CSA certified pumps are certified to CSA Standard C22.2 No. 108. (CUS)

A DANGER



ELECTRICAL SHOCK HAZARD.

Always disconnect power source before performing any work on or near the motor or its connected load. If the power disconnect point is out-of-sight, lock it in the open position and tag it to prevent unexpected application of power. Failure to do so could result in fatal electrical shock.

ELECTRICAL SHOCK HAZARD.

Do not handle the pump with wet hands or when standing in water as fatal electrical shock could occur. Disconnect main power before handling unit for ANY REASON!

RISK OF ELECTRIC SHOCK.

These pumps have not been investigated for use in swimming pool areas.

A WARNING



ELECTRICAL SHOCK ALERT.

Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

ELECTRICAL SHOCK ALERT.

Replace damaged or worn wiring cord immediately.

ELECTRICAL SHOCK ALERT.

Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.

ELECTRICAL SHOCK ALERT.

Unit must be securely and adequately electrically grounded. This can be accomplished by wiring the unit to a ground metal-clad raceway system or by using a separate ground wire connected to the bare metal of the motor frame or other suitable means.

CHEMICAL ALERT.

This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

CAUTION

ELECTRICAL SHOCK MAY OCCUR

Protect the power cable from coming in contact with sharp objects.

HOT SURFACE MAY CAUSE BURNS

Be careful when touching the exterior of an operating motor - It may be hot enough to be painful or cause injury.

PRODUCT DAMAGE MAY RESULT

Make certain that the power source conforms to the requirements of your equipment.

PREPARATION

Before beginning installation of product, make sure all parts are present. Compare parts with package contents drawing. If any part is missing or damaged, do not attempt to assemble the product. Contact customer service for replacement parts.

Estimated Installation Time: 2 hours.

Tools Required for Assembly (not included): Hacksaw, Pipe Wrenches (2), Wire Strippers, Needle-Nose Pliers, Phillips Screwdriver, Wire Cutters, Adjustable Wrench

Parts Required For Assembly (not included): 2 in. Sched 40 PVC pipe, 1-1/2 in. Sched 40 PVC pipe, 2 in. MPT x 2 in. slip adaptor, 1-1/2 in. MPT x 1-1/2 in. slip adaptor, 1-1/2 in. pipe tee, 1-1/2 in. slip x 1-1/4 in. FPT reducer bushing, 1-1/4 in. MPT plug, 2 in. 90° pipe elbow, 1-1/2 in. 90° pipe elbow, thread tape, 1/4 in. electric wire strain relief, 2-step PVC glue system (primer and sealer), and thread paste.

Optional Parts For Assembly (not included):

- Priming Plug with Pressure Gauge: Used instead of a priming plug alone. Helps determine if
 the pump is primed, indicates if the pump is operating properly and what kind of pressure is in the
 system when operating.
 - (1) 1-1/4 in. MPT x 1/2 in. FPT reducer bushing
 - (1) 1/2 in. MPT x 1/4 in. FPT reducer bushing
 - (1) 100 PSI pressure gauge
- **2. Unions:** Used for easy removal of the pump from the sprinkler system.
 - (2) 2 in. union
 - (1) 1-1/2 in. union
- **3. (1) 1-1/2 in. Ball Valve:** Prevents back flow of water from the sprinkler system when the pump is removed from the system.
- **4. 1-1/2 in. Couplers:** Quantity determined by the total length of pipe used.
- **5. 2 in. Couplers:** Quantity determined by the total length of pipe used.

GENERAL PUMP INFORMATION

Typical Pump Setup

Typical setups for lawn sprinkler pump systems include ground water wells (**Fig. 1**) or surface water, such as lakes, ponds or streams. (**Fig. 3**)

Location

For best performance, the pump must be located as close to the water source as possible and protected from the elements.

Ventilation

Ventilation and drainage must be provided to prevent damage to the motor from heat and moisture.

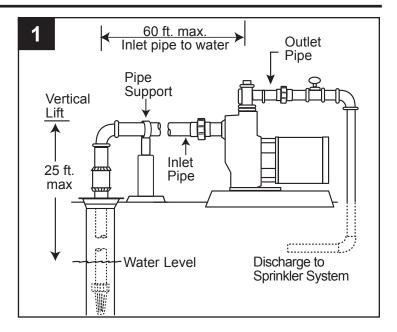
Freezing

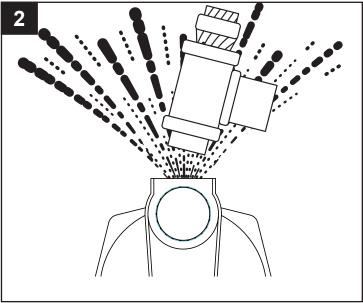
The pump and all piping must be protected from freezing. If freezing weather is forecast, drain pump or remove completely from the sprinkler system.

Water Supply

The water source must be able to supply enough water to satisfy the capacity of the pump and water needs. See performance chart on page 21.

WARNING: NEVER run pump (A) against a closed discharge. Doing so can boil water inside pump, causing hazardous pressure in unit, risk of explosion and possibly scalding persons handling pump. (Fig. 2)





GENERAL PUMP INFORMATION

Vertical Lift

Vertical lift is the vertical distance from the lowest level of the water to the pump intake. The pump will move water as long as the pump is within 25 vertical feet of the water source.

Horizontal Distance

The horizontal distance is the horizontal measurement between the pump inlet and the water source. This distance may affect the ability of the pump to operate. If it is over 60 feet, call customer service at 1-800-742-5044.

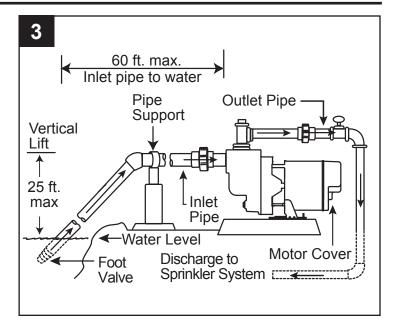
Pipe And Fittings

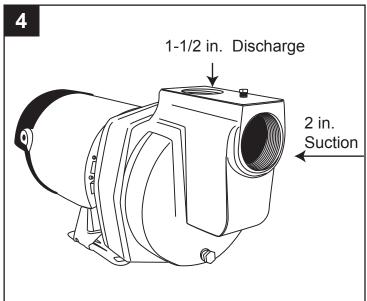
Use galvanized steel or NSF PW Schedule 40 PVC pipe and fittings. This material is designed for water pressure and will seal against air and water under pressure. Do Not Use: DWV fittings, as these are designed for drains without pressure and will not seal properly.

CAUTION: The entire system must be air and water tight for efficient operation and to maintain prime.

Wire Size:

The wire size is determined by the distance from the breaker box to the pump motor, and the horsepower rating of the motor. See the wire chart on page 15 for proper wire size.





PUMP PREPARATION FOR WELL AND SURFACE WATER

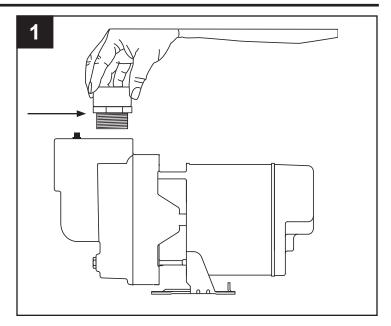
A

CAUTION: Dry-fit entire assembly to ensure proper fit before gluing or taping parts.

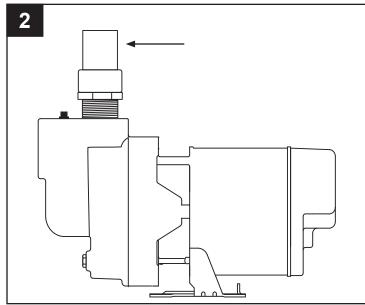
CAUTION: Follow all proper gluing procedures as specified by the glue manufacturer. Always glue in a vertical direction whenever possible to prevent glue from dripping inside pipe or fittings

CAUTION: Use thread tape and a thread paste compound on all male threads except for the unions. Tighten securely with a wrench and add another 1/4 turn to ensure proper seal.

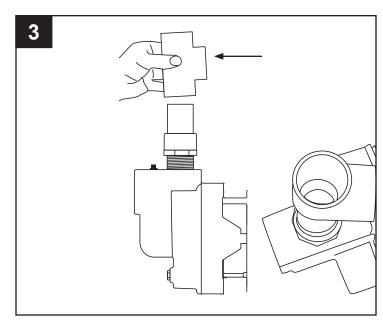
1. Thread 1-1/2 in. MPT x 1-1/2 in. slip adaptor (not included) into the outlet port located at the top of the pump.



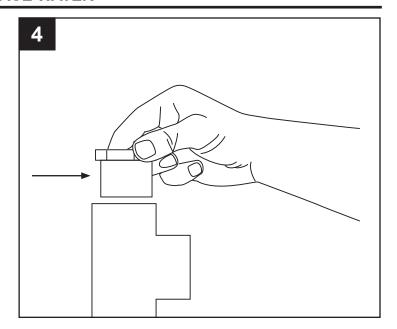
2. Glue a 6 in. piece of 1-1/2 in. pipe (not included) into the adaptor.



3. Glue a 1-1/2 in. tee (not included) to the pipe.

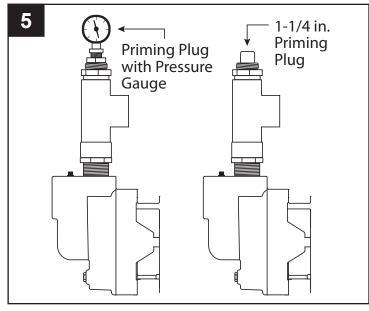


4. Glue a 1-1/2 in. slip x 1-1/4 in. adaptor (not included) to the top opening of the 1-1/2 in. tee.

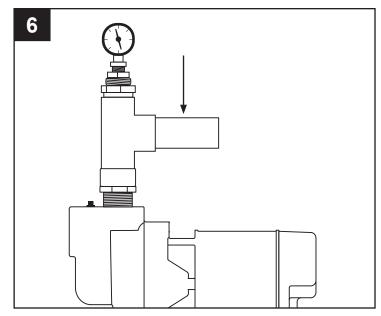


5. Thread in a 1-1/4 in. priming plug or optional priming plug with pressure gauge (neither included).

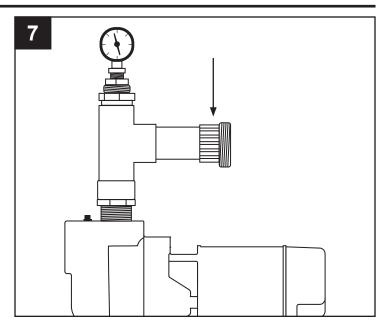
NOTE: Hand tighten only, as this will be removed for priming.



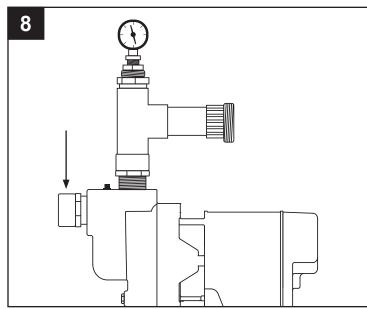
6. Glue another 6 in. section of 1-1/2 in. pipe (not included) into the opening in the 1-1/2 in. tee.



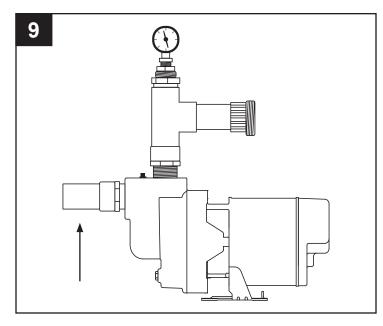
7. Glue the male thread side of a 1-1/2 in. union (not included) to the pipe.



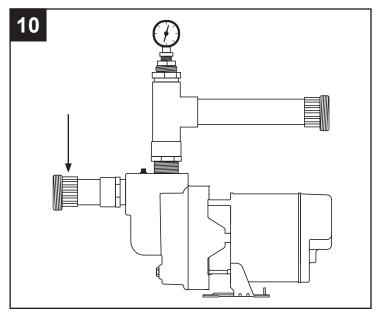
8. Thread 2 in. MPT x 2 in. slip adaptor (not included) into the inlet port located on the front of the pump body.



9. Glue an 8 in. section of 2 in. pipe (not included) into the 2 in. adaptor.

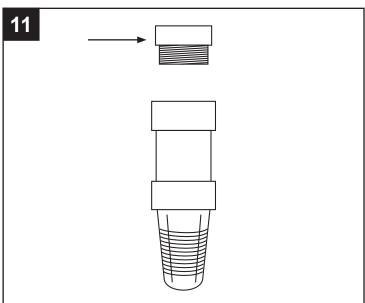


10. Glue one side of a 2 in. union (not included) to the pipe.

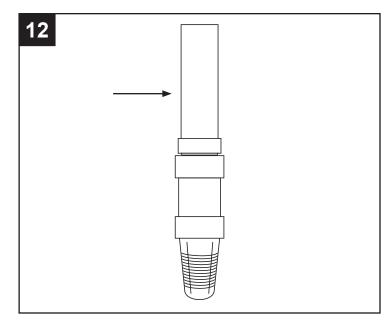


For Well Installations

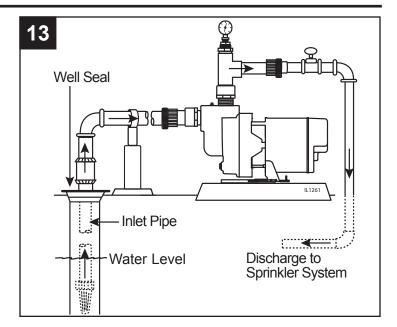
11. Thread a 2 in. MPT x 2 in. slip adaptor (not included) into the foot valve.



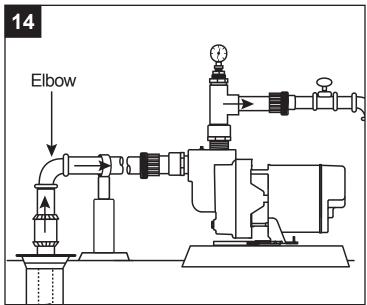
12. Glue 2 in. pipe (not included) into the adaptor. Glue enough sections of pipe together using 2 in. couplers (not included) in order for the foot valve to be completely submerged in water. Be sure inlet pipe will remain fully submerged at the lowest expected level of the water source.



13. Install well seal (not included) in order to hold the inlet pipe in position in the well.



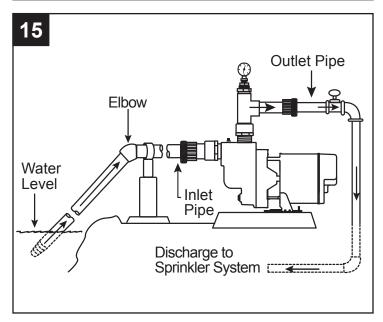
14. Glue a 90° elbow (not included) when the inlet pipe is in line with the inlet port of the pump.



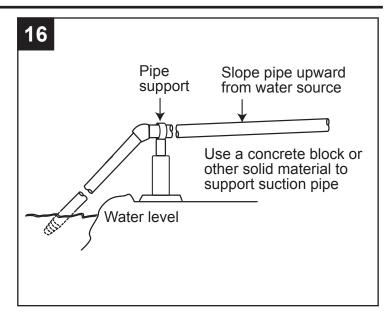
For Surface Water Installations

For surface water installations, follow steps 11 and 12 above and then:

15. Glue a 45° elbow (not included) when the inlet pipe is in line with the inlet port of the pump.



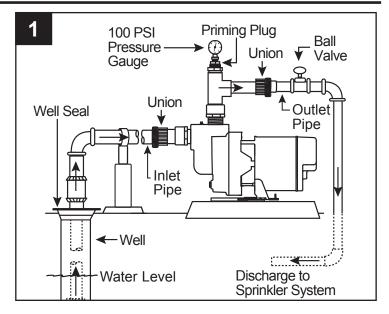
16. Support inlet pipe with pipe support (not included).



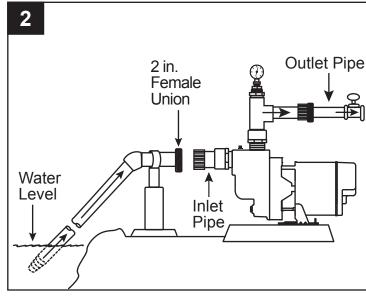
PUMP INSTALLATION FOR WELL AND SURFACE WATER

 Mount pump on a solid foundation as close to the water source as possible.

CAUTION: Support the 2 in. inlet pipe from the well or lake to the inlet port to prevent sagging. Sagging will create air pockets within the pipe that will prevent the pump from priming and operating correctly.

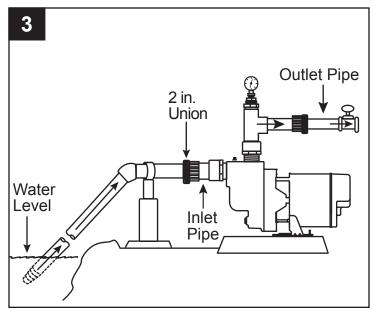


2. Glue female 2 in. union (not included) to the end of inlet pipe leading from the water source.

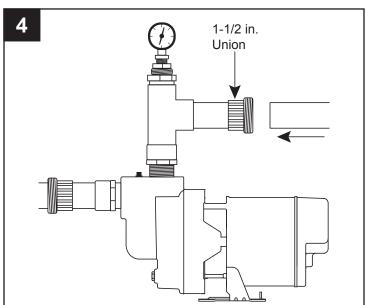


PUMP INSTALLATION FOR WELL AND SURFACE WATER

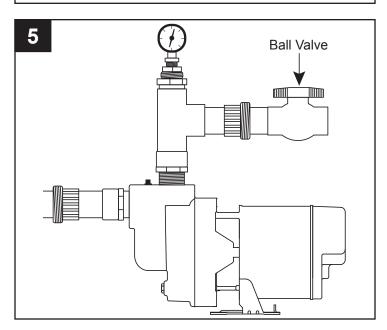
3. Connect the 2 in. union together to complete the inlet line to the pump.



4. Glue a 6 in. piece of 1-1/2 in. pipe (not included) to the female portion of the 1-1/2 in. union.

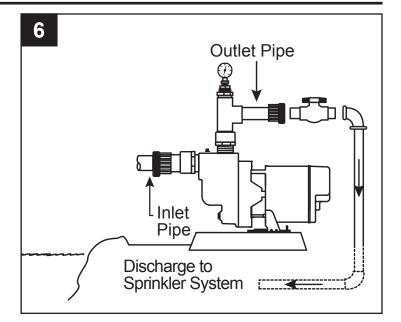


5. Glue 1-1/2 in. ball valve (not included) to the other end of the 6 in. piece of pipe.



PUMP INSTALLATION FOR WELL AND SURFACE WATER

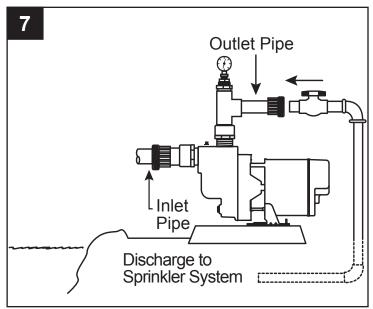
6. Connect the 1-1/2 in. outlet pipe to the sprinkler system (not included) by gluing in additional sections of pipe (not included) as needed.



7. Connect union to ensure proper fit. Do not tighten until after priming.



CAUTION: Do not glue union together.



A WARNING



ELECTRICAL SHOCK ALERT.

Under-size wiring can cause motor failure and even fire. Use proper wire size specified in the wire size chart on page 15.

ELECTRICAL SHOCK ALERT.

Replace damaged or worn wiring cord immediately.

ELECTRICAL SHOCK ALERT.

Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.

ELECTRICAL SHOCK ALERT.

The pump must be properly grounded using the proper wire cable with ground.

ELECTRICAL SHOCK ALERT.

Always disconnect pump from electricity before performing any work on the motor.

CAUTION

ELECTRICAL SHOCK MAY OCCUR

All wiring should be performed by a qualified electrician in accordance with the National Electric Code and local electric codes.

ELECTRICAL SHOCK MAY OCCUR

Connect the pump to a separate electrical circuit with a dedicated circuit breaker. Reference the wire size chart below for proper fuse size.

ELECTRICAL SHOCK MAY OCCUR

Protect the power cable from coming in contact with sharp objects.

PRODUCT DAMAGE MAY RESULT

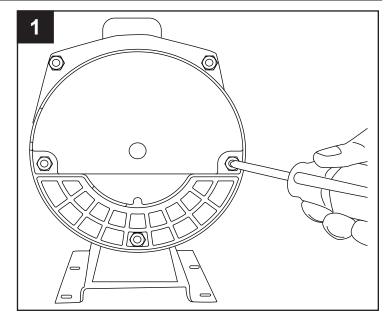
Make certain that the power source matches the pump requirements. This pump has a dual voltage motor and can run on 115 V or 230 V. This pump is wired from the factory to run on 230 volts; refer to page 17 if you want to change the pump to run on 115 volts.

Wire Size Chart								
Distance From	Minimum Copper Wire Size Chart (Gauge)							
Motor To Fuse	Single Phase Motors							
Box, Meter or	x, Meter or 1 HP 1-1/2 HP 2 HP				HP			
Electrical Outlet	115 Volt	230 Volt	115 Volt	230 Volt	115 Volt	230 Volt		
0-50 Ft.	12	14	12	14	12	14		
50-100 Ft.	8	14	10	14	10	14		
100-150 Ft.	*	12	8	12	8	12		
150-200 Ft.	*	12	*	12	*	10		
200-300 Ft.	*	10	*	10	*	10		
Fuse Size (Amps)	20	15	20	15	20	15		
(*) Not economical to run in 115 V; use 230 V								

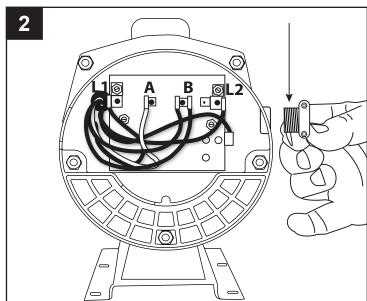
NOTE: This pump can be used with a variety of controls, including a pump start relay, pressure switch with tank and indexing valve. See control manufacturer's instructions for details.

PUMP ELECTRICAL INSTRUCTIONS

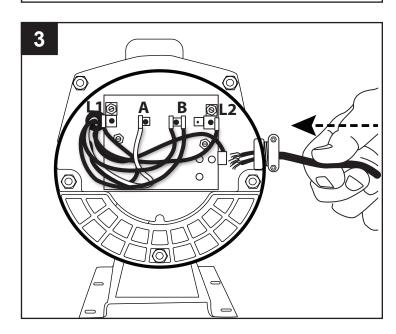
1. Remove rear motor cover on pump by unscrewing the two screws.



2. Thread electric wire strain relief (not included) into wire opening on the side of the motor of pump.

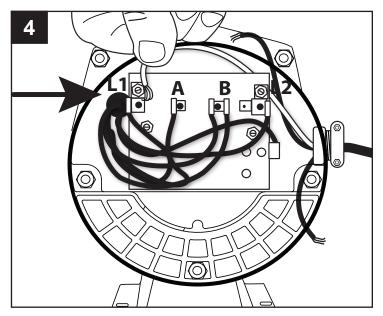


3. Insert wire through electric wire strain relief and tighten screws.

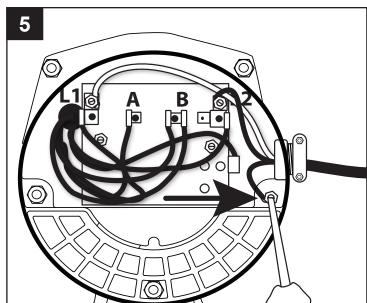


PUMP ELECTRICAL INSTRUCTIONS

4. Connect white power lead to L1 and black power lead to L2.

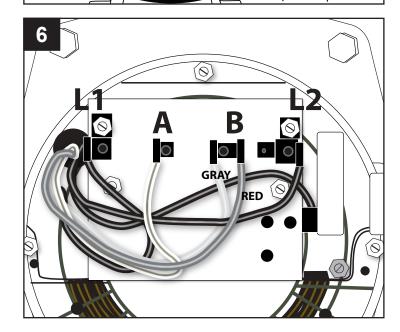


5. Connect green ground wire to green grounding screw. Re-install rear motor cover to pump.



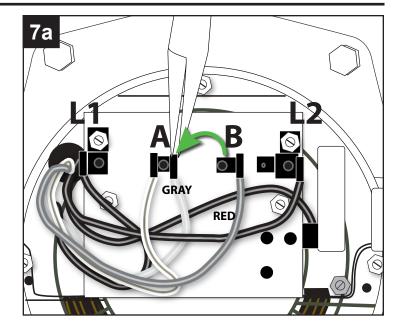
To change from 230 V to 115 V

6. The motor of pump is dual voltage and can run on either 115 volts or 230 volts. In general, 230 volts is more economical to run, and requires a smaller wire size. The pump is pre-set in the factory to run at 230 volts.

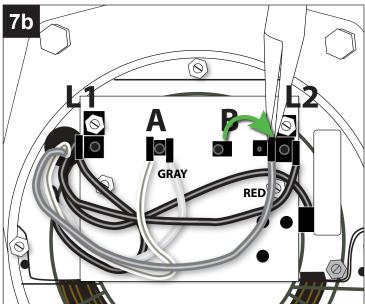


PUMP ELECTRICAL INSTRUCTIONS

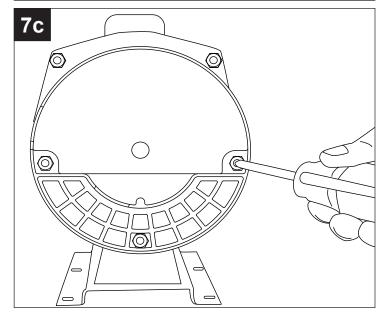
- 7. For 115 volts service, change the following wires on the terminal board:
 - a. Using a pair of needle nose pliers, pull the gray wire with the female flag connector from the "B" terminal spade post. Place it to the left on the "A" terminal space post.



b. Pull the red wire with the female flag connector from the "B" terminal. Place it to the right on the L2 terminal space post.



c. Reinstall the rear motor cover.

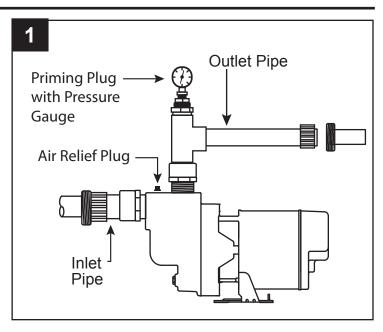


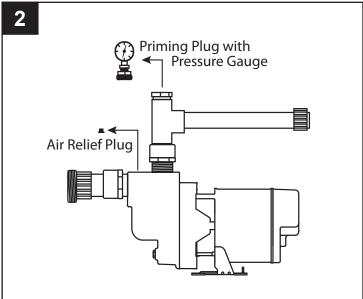
PUMP PRIMING AND STARTUP

CAUTION: All pumps must be primed by filling the pump cavity with water before they are first operated. This may take several gallons of water, as the entire inlet line will be filled in addition to the pump cavity. The longer the inlet line, the more water is required for priming.

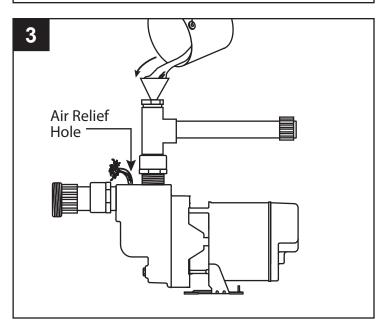
1. Disconnect the 1-1/2 in. outlet union and separate the pipe.

2. Remove the air relief plug on top of pump and the 1-1/4 in. priming plug with pressure gauge or plug. Refer to Pump Preparation Step 5.



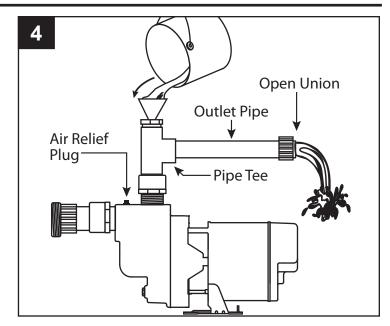


3. <u>Slowly</u> fill pump cavity until water comes out of air relief hole on top of the pump.

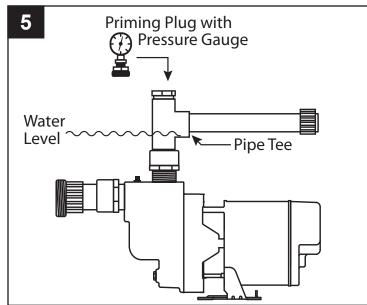


PUMP PRIMING AND STARTUP

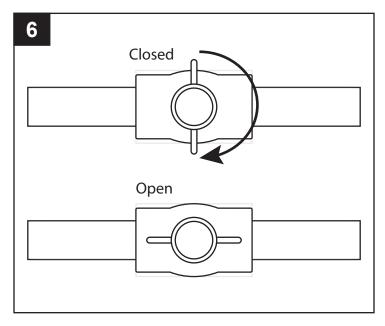
4. Replace air relief plug and continue adding water to pump cavity until water comes out of the open outlet pipe at the open union.



5. Wait 10 minutes to see if water level drops below the pipe tee. If level drops, check foot valve. If level stays constant, replace the priming plug.



6. Reconnect 1-1/2 in. union on outlet pipe. Open the ball valve (turn handle to line up with pipe), and then turn on breaker to start pump.



PUMP PRIMING AND STARTUP

IMPORTANT: If the pump fails to prime within five minutes:

7. Turn the power off at the break box. Check all pipe connections for leaks, making sure all connections are water and air tight. Check the inlet pipe for any sagging, making sure the inlet pipe is in a straight line to the pump. Watch for leaks or a milky color in the discharged water, which indicated an air leak. Re-prime if necessary, following steps 1 through 6. Reset breaker at the breaker box.

IMPORTANT: If the pump hums instead of pumping or turns off repeatedly, shut pump off immediately. Check voltage. Pump is wired to run on 230 volts. If the pump cuts out or stops, you may be attempting to connect to 115 volts. See PUMP ELECTRICAL INSTRUCTIONS Page 17 to see how to correctly change the motor voltage to 115 volts.

SPECIFICATIONS

MOTOR DATA CHART - HSP SERIES							
HP	Phase	Volts	Code Letter	Max Amps	Locked Rotor Amps		
1	1 1	115 230	Н	17.6 8.8	62.0 31.0		
1-1/2	1 1	115 230	G	18.00 9.00	72.0 36.0		
2	1	115 230	G	21.00 10.50	108.0 54.0		

PERFORMANCE

Model	HP	Suction	Capacity - U.S. Gallons per Hour Discharge Pressure (PSI)					Suction	Discharge	
		Lift (FT)	15	20	25	30	35	40	Pipe	Pipe
	1	10	3420	3120	2700	2100	1200	0	2"	1-1/2"
HSP10P1		15	2820	2640	2220	1800	600	0		
ПОРТОРТ		20	2640	2520	2160	1500	480	0		
		25	1440	1380	1320	1020	300	0		
	1-1/2	10	4092	3894	3564	3168	2508	1716	2"	1-1/2"
UCD1ED1		15	3780	3660	3420	2970	2310	1188		
HSP15P1		20	3366	3300	2838	2640	1848	600		
		25	2520	2490	2430	2280	1452	0		
HSP20P1	2	10	4309	4172	4036	3625	3078	2462	2"	1-1/2"
		15	3894	3780	3600	3300	2772	2112		
		20	3557	3488	3420	3215	2531	1573		
		25	2640	2599	2531	2430	2220	720		

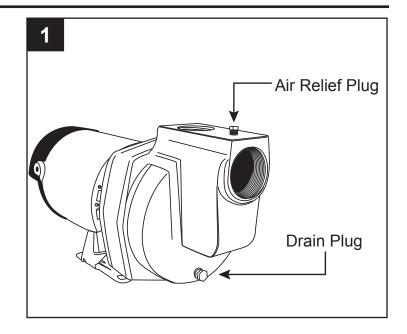
TROUBLESHOOTING

Problem	Possible Cause	Corrective Action
A. Little or no	Casing not initially filled with water	1. Fill pump casing
discharge	2. Vertical lift too high, or too long3. Hole or air leak in inlet line	2. Move pump closer to water source3. Repair or replace inlet line. Use thread
	3. Hole of all leak in line line	tape and pipe sealing compound
	4. Foot valve too small	4. Match foot valve to piping or install one
	4. Foot valve too siriali	size larger foot valve.
	5. Foot valve or inlet line not	5. Submerge foot valve lower in water
	submerged deep enough in water	3. Submerge loot valve lower in water
	6. Motor wired incorrectly	6. Check wiring diagram
	7. Inlet or outlet line valves closed	7. Open valves
B. Pump will not	No priming water in casing	Fill pump casing
deliver water	2. Leak in inlet line	2. Repair or replace
or develop	3. Outlet line is closed and priming air	3. Open ball valve
pressure	has nowhere to go	3. Open ball valve
pressure	4. Inlet line (or valve) is closed	4. Open line or valve
	5. Foot valve is leaking	5. Replace foot valve
	6. Inlet screen clogged	6. Clean or replace inlet screen
C. Loss of	1. Hole or air leak in inlet line	Repair or replace inlet line. Use thread
suction		tape and pipe sealing compound
000.011	2. Vertical lift too high	Reduce vertical lift, install foot valve
		and prime
	3. Insufficient inlet pressure or suction	3. Increase inlet pressure by adding
	head	more water to tank or increasing back
		pressure
	4. Clogged foot valve or strainer	4. Inspect foot valve and/or strainer for
		debris, and remove
D. Pump	1. Mounting plate or foundation not rigid	Reinforce plate or foundation
vibrates and/	enough	· ·
or makes	2. Foreign material in pump	2. Disassemble pump and clean
excessive	3. Impeller damaged	3. Replace impeller
noise		
E. Pump will not	Motor wired incorrectly	Check wiring diagram
start or run	2. Blown fuse or open circuit breaker	2. Replace fuse or close circuit breaker
	3. Loose or broken wiring	3. Tighten connections, replace broken
	_	wiring
	4. Stone or foreign object lodged in	4. Disassemble pump and remove
	impeller	foreign object
	5. Motor overheated	5. Allow unit to cool, restart after cooling
F. Pump loses	Clogged foot valve or strainer	Inspect foot valve and/or strainer for
prime.		debris, and remove.
	2. Worn or broken foot valve	2. Inspect and replace
	3. Hole or air leak in inlet line	3. Repair or replace inlet line. Use thread
		tape and pipe sealing compound

CARE AND MAINTENANCE

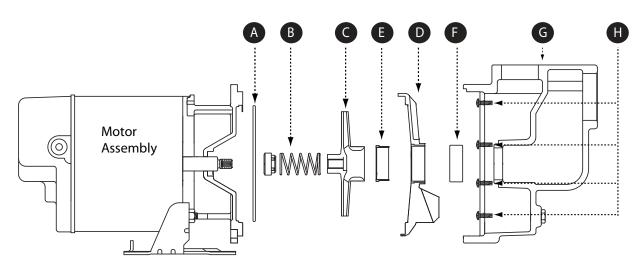
Winterizing

CAUTION: Drain the entire system if there is danger of freezing. A drain plug is provided at the bottom of pump for this purpose. Remove drain plug then loosen air relief plug.



REPLACEMENT PARTS LIST

To order parts, call 1-800-742-5044



HSP SERIES		HP	1	1-1/2	2
ITEM	SINGLE PHASE	MODEL NO.	HSP10P1	HSP15P1	HSP20P1
	DESCRIPTION	PART NO.		<u> </u>	
Α	Ring, Square Cut	132429	1	1	1
В	Seal, Rotary and Ceramic (with Spring)	131100	1	1	1
С	Impeller	023211	021280	134138	134138
D	Diffuser	132425	1	1	1
E	Diffuser Insert	134240	1	1	1
F	Rubber Diffuser	132428	1	1	1
G	Pump Body	023115	1	1	1
H*	Hex Hd. Cap Screws 3/8 in. x 3/4 in.	*	4	4	4

^(*) Standard hardware item

NOTE: Motor assembly not available as a replacement part.



THIS PLAN COVERS:

- ★ LIGHTNING
- ★ CORROSION
- ★ ABRASION

- ★ DEFECTS IN MATERIAL
- ★ DEFECTS IN WORKMANSHIP

WITH THE PURCHASE OF THIS PLAN, your Star jet pump, submersible pump, or HSP centrifugal pump will be replaced or repaired at no charge to you if the pump fails within five years from date of original purchase, if failure occurs due to damage from lightning, abrasion, corrosion, or due to defects in material or workmanship. Not valid for cash refunds. This plan will be sold only on original purchase. Not valid for any warranty replacements.

With the purchase of this plan, Star Water Systems agrees to replace with comparable product or repair at no charge the pump identified on the validated agreement, if failure occurs within 5 years from the date of the original pump purchase. If a replacement pump is required it will be protected for the remaining portion of the original 5 year period. The plan is not transferable and applies only to the original purchaser.

The plan covers the pump and/or motor. It protects against failures caused by lightning, corrosion, abrasion and defects in material and workmanship. It does not cover submersible control box, submersible drop cable, power cable, pressure tanks, pressure switches, gauges or any other system accessory. Failures caused by low voltage, dry wells, plugged well points and/or screens, floods, droughts or freeze conditions are not covered by this plan. The plan does not apply to product abuse or applications for purposes other than those for which the product is designed or manufactured. Nor does the plan provide allowance for consequential damages, labor expenses or contingent liabilities incurred as a result of pump failure.

This plan covers the pump and/or motor. It is not intended to replace such actual insurance coverage that is otherwise applicable.

- Plan cost: \$95.00 (US).
- Models available for Protection Plan: Any Star jet pump or deep well submersible pump (1/3 thru 1-1/2 HP) and any "HSP" centrifugal pump (3/4 thru 2 HP)
- Eligible purchasers: The original retail consumer of the pump
- For replacement or repair only -- not valid for cash refund.
- This 5 Year Limited Pump Protection Plan is available only in the United States and Canada.
- See installation instructions for the Star Water Systems standard one year limited warranty.



110 W. Division St., PO Box 621 | Boonville, IN 47601 www.starwatersystems.com

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5 YEAR PUMP PROTECTION PLAN AGREEMENT FORM

Must be submitted along with sales receipt within 30 days of pump purchase date.

This agreement is valid once accepted by Star Water Systems, and returned to the consumer.

For replacement or repair only. Not valid on cash refund.

INSTRUCTIONS:

To apply for 5 Year Pump Protection, complete the following steps:

- 1. Read program details carefully
- 2. Mail completed agreement along with pump sales receipt and check or money order for \$95.00 (US) to:

Star Water Systems
95 North Oak Street
Kendallville, IN 46755
Attention: Warranty Information Center

Do Not Send Cash

- 3. After your information is validated by Star Water Systems, your confirmed agreement will be returned to you. Please allow two to four weeks for return.
- 4. Retain the validated agreement as evidence of the protection purchased. This form must be presented in order to ensure pump warranty.

NOTE: Serial Numbers (Required for the application) can be found as shown below:

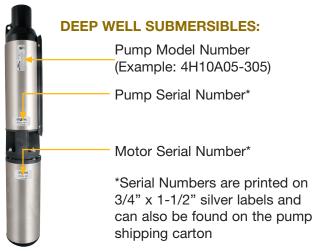
JET PUMPS / HSPJ CENTRIFUGAL PUMPS:

Motor Serial Number*

Pump Model Number (Example: JHU05)

Pump Serial Number*











ALL BLANKS MUST BE COMPLETED. PLEASE PRINT OR TYPE. USE INK IF PRINTED.

Consumer's Name		
Street		
City	State	Zip
Phone Number		
Signature		
Retailer Name		
Street		
City	State	Zip
Phone Number		
Date		
Pump Model Number:		
Pump Serial Number:		
Motor Serial Number:		
Date of Purchase:		

