

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

# Pressure Booster System

## Description

The booster is designed to increase water pressure from municipal sources or private water systems. The unit is equipped with a 1/2 HP, 120 volt single-phase motor. Use only to pump clear water. The system includes the pump, control box, pressure sensing switch, bladder tank, and flow sensing switch.

**⚠ WARNING** Do not attempt to use product at 240 volt. Only 120 volt is allowed.

## Unpacking

After unpacking the pressure booster system, carefully inspect for any damage that may have occurred during transit. Check for loose, missing or damaged parts.

## Safety Guidelines

This manual contains information that is very important to know and understand. This information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols.

**⚠ DANGER** Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**⚠ WARNING** Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION** Caution indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**NOTICE** Notice indicates important information, that if not followed, may cause damage to equipment.

## General Safety Information

1. Read the instruction manual included with the product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
2. Know the pump application, limitations and potential hazards.

**⚠ WARNING** Always install a pressure relief valve to match the system pressure rating and the maximum flow rate.

**⚠ WARNING** Do not use to pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. Do not use in explosive atmospheres. Pump should only be used with liquids compatible with pump component materials. Failure to follow this warning can result in personal injury and/or property damage.

**⚠ WARNING** Disconnect power and release all pressure from the system before attempting to install, service, relocate or perform any maintenance. Lock the power disconnect in the open position. Tag the power disconnect to prevent unexpected application of power.

3. Drain all liquids from the system before servicing.
4. Secure the discharge line before starting the pump. An unsecured discharge line will whip and possibly cause personal injury and/or property damage.
5. Periodically inspect pump and system components. Perform routine maintenance as required (See Maintenance).
6. **PERSONAL SAFETY:**
  - a. Wear safety glasses at all times when working with pumps.

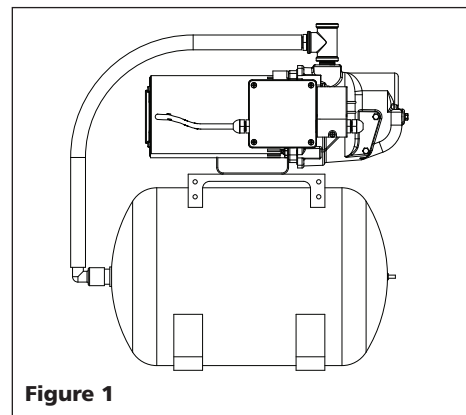


Figure 1

- b. Keep work area clean, uncluttered and properly lighted. Replace all unused tools and equipment.
  - c. Keep visitors at a safe distance from work area.
  - d. Make the workshop childproof use padlocks, master switches and remove starter keys.
7. Do not pump chemicals or corrosive liquids. Pumping these liquids shortens the life of the pumps seals and moving parts and will void the warranty.
  8. Complete pump and piping system MUST be protected against below freezing temperature. Freezing temperatures could cause severe damage and void the warranty.
  9. Do not run the pump dry or damage will occur and will void warranty.
- ⚠ WARNING** Risk of electrical shock. This pump is designed for indoor installation only.
- ⚠ WARNING** All wiring should be performed by a licensed or certified electrician.
10. For safety, the unit must be connected to a grounded circuit equipped with a ground fault interrupter device.

**REMINDER: Keep your dated proof of purchase for warranty purposes! Attach it to this manual or file it for safekeeping.**

## General Safety Information (Continued)

- Before installing the pump, have the electrical outlet checked by a licensed or certified electrician to make sure the outlet is properly grounded.
- Make sure the line voltage and frequency of electrical current supply agrees with the motor wiring.

**⚠ WARNING** Do not attempt to use product at 240 volt. Only 120 volt is allowed.

- Do not attempt repairs to the electric motor. All repairs to the motor must be completed at a licensed or certified electrical motor repair shop.

**⚠ WARNING** Do not touch an operating motor. Modern motors are designed to operate at high temperatures.

- Avoid kinking electrical cord and protect from sharp objects, hot surfaces, oil and chemicals. Replace or repair damaged or worn cords immediately.

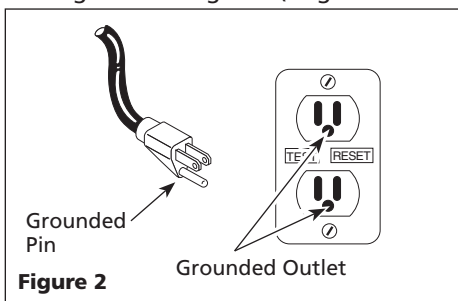
**⚠ WARNING**

Disconnect power and release all pressure from the system before attempting to install, service, relocate or perform any maintenance. Lock the power disconnect in the open position. Tag the power disconnect to prevent unexpected application of power.

- Keep fingers and foreign objects away from ventilation and other openings. Do not insert any objects into the motor.

**⚠ WARNING** Risk of electric shock! Never connect the green (or green and yellow wire) to a live terminal!

- To reduce the risk of electrical shock, the pump should be plugged directly into a properly installed and grounded 3-prong grounding type receptacle, as shown in Figure 2. The green (or green and



yellow) conductor in the cord is the grounding wire. The motor must be securely and adequately grounded for protection against shock.

- Where a 2-prong is encountered, replace the plug with a properly grounded 3-prong receptacle in accordance with the National Electrical Code, local codes and ordinances. To ensure a proper ground, the grounding means must be tested by a licensed or certified electrician.

**⚠ DANGER** Do not handle pump or pump motor with wet hands, when standing on a wet or damp surface or when standing in water. Fatal electrical shock could occur.

**⚠ WARNING** Pump motor is equipped with an automatic resetting thermal protector and may restart unexpectedly. Protector tripping is an indication of motor overloading because of operating pump at low heads (low discharge restriction), excessively high or low voltage, inadequate wiring, incorrect motor connections or defective motor or pump.

## Installation

### LOCATION

Select a location as close to the water supply as possible. Be sure to comply with any state or local codes regarding the placement of the pump. The equipment must be protected from the elements. A basement or heated pump house is a good location. Make sure the pump has proper ventilation. The temperature surrounding the pump is not to exceed 100°F (40°C) or nuisance tripping of the motor overload may occur.

### PIPING

Piping may be copper, steel, rigid PVC plastic or flexible polyethylene plastic.

**⚠ CAUTION** Flexible pipe is not recommended on suction pipe (inlet pipe). Flow sensor is designed for 1" NPT connection.

The pipe must be clean and free of rust or scale. Apply Teflon® thread tape or sealant to the 1" male NPT pipe threads and install the switch into the piping system. Thread the flow switch onto the male pipe thread until hand-tight. Tighten pipe 1 additional turn. If improper seal results, continue turning pipe into unit 1/4 turn increments. Do Not Exceed 1 Additional Turn All connections must be air tight to insure normal operation.

Slope all inlet piping upwards towards the pump to prevent trapping air.

**IMPORTANT:** Pump is built to handle clear water only; it is not designed to handle water containing sand, silt or other abrasives.

- Refer to Figure 3 for typical installations.
- Bolt pressure booster system to a secure foundation.
- Locate the pump so that there will always be a positive supply of water to the pump (See Figure 3).
- For service convenience, the installer is recommended to add gate valves and unions as needed to provide for easier maintenance.
- Pressure gauges on the inlet and outlet, provided by the installer, are recommended to show if sufficient water is being supplied to the pump and to show service pressure.

## Electrical

**⚠ WARNING** Risk of electrical shock. This pump is designed for indoor installation only.

**⚠ WARNING** Disconnect power and release all pressure from the system before attempting to install, service, relocate or perform any maintenance.

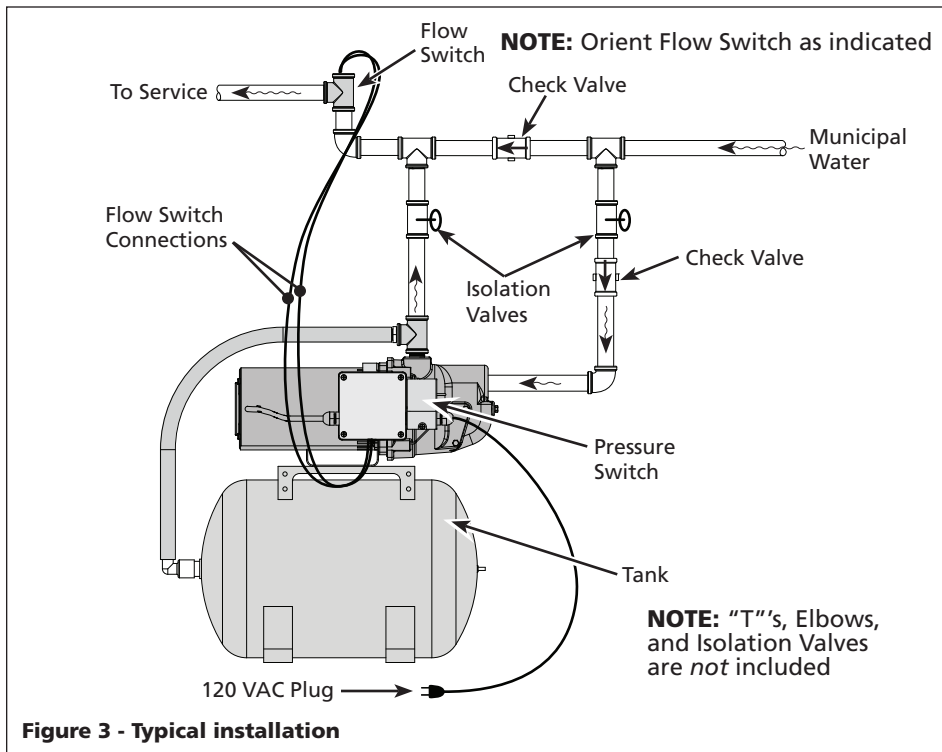
**IMPORTANT:** Do not use an extension cord or splice wires. Joints should be made in an approved junction box. If the above information is confusing, consult a licensed electrician.

Your unit is supplied with a pressure switch, flow sensor and a control box. The only wire connection needed is to plug the two red wires from the control box into the two red wires on the flow sensor (See Figure 3).

### MOTOR PROTECTION

This motor has built in thermal protection. The overload protects the motor against burnout from overload of low voltage, high voltage and other causes. The device is automatic and resets itself once the temperature has dropped to a safe point. Frequent tripping of the device indicates trouble in the motor or power lines and immediate attention is needed.

**⚠ WARNING** Never examine, make wiring changes or touch the motor before disconnecting the main electrical supply switch. The thermal device may have opened the electrical circuit. The pump motor should be equipped with a correctly fused disconnect switch to provide protection. Consult local or United States National Electrical Codes for proper fuse protection.



**MOTOR/PUMP ROTATION**

1. The motor rotates in a counter clockwise rotation when facing the pump end and cannot be reversed.

**START-UP PROCEDURE**

Once the preceding instructions have been completed, the unit is ready for normal operation.

1. During the first few hours of operation, inspect the pump, piping and any auxiliary equipment used in connection with the unit for leaks, excessive vibration or unusual noises.
2. The booster unit will turn on and off automatically, based on water usage.

**Maintenance**

**⚠ WARNING** *Disconnect power and release all pressure from the system before attempting to install, service, relocate or perform any maintenance. Lock the power disconnect in the open position. Tag the power disconnect to prevent unexpected application of power.*

**⚠ CAUTION** *Protect the pump from freezing during winter conditions.*

**Operation**

**⚠ CAUTION** *Unit must be full of fluid before operating. Do not run dry or against a closed discharge. Do not pump dirty water or abrasive liquids. To do so will cause the pump failure and will void the warranty.*

**VALVES**

The inlet and outlet isolation valves should be in the full open position.

**PRIMING**

**NOTE:** Before starting the pump it is absolutely necessary that **both the pump and the inlet pipe be completely filled with water.**

**PRESSURE BOOST INSTALLATIONS**

Priming is automatic when pump is connected to a pressure source such as a hydrant or city main. (See Figure 3).

1. Open valves or nozzle on inlet and discharge side of pump.
2. Open a faucet nearest the booster unit. Plug pump into outlet. When the water flow from the faucet reaches one gallon per minute, or greater, the pump will automatically start. Keep the faucet open for approximately 30 seconds to relieve trapped air in the line. When the faucet is closed, the pump will continue to run until pressure reaches 60 psi.

**⚠ CAUTION** *The pressure switch is factory set at 50 psi and must not be changed.*

3. If you installed a pressure gauge at the pump inlet, a reading of 2 psi minimum should show whenever the pump is in operation. This reading ensures that there is an ample supply of water into the pump inlet housing.
4. The controller, flow sensor and pressure switch continuously monitor water pressure and flow. The system automatically turns the unit off if pressure reaches 50 to 53 psi. The control package also protects the unit from dry run by shutting down if water usage drops below 1 gallon per minute.

**DRAINING THE PUMP**

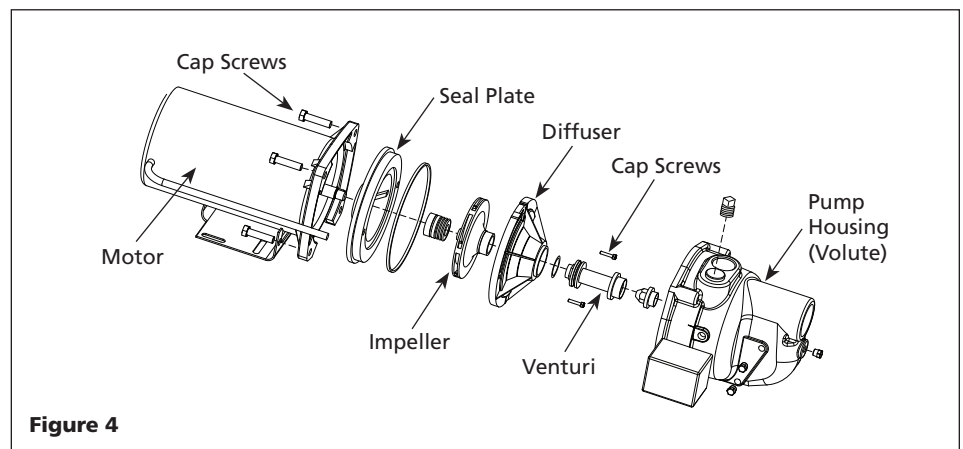
Drain openings are provided on all models. To drain the pump:

1. Remove drain plug and prime plug to vent the system.

**REMOVING OLD SHAFT SEAL**

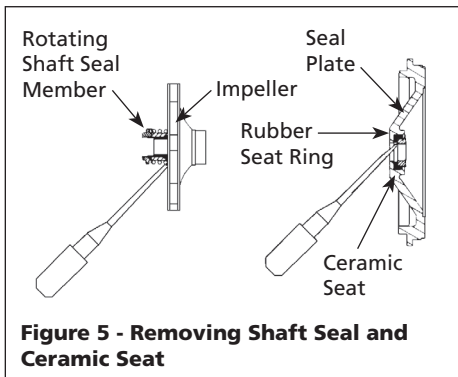
**⚠ CAUTION** *Turn disconnect switch to "off" position.*

1. Open a faucet nearest the tank and allow all water to drain from the tank.
2. Remove the four cap screws holding the pump housing (volute) to the motor (Figure 4).



## Operation (Continued)

3. Separate the pump housing (volute) from the motor to expose the diffuser and the seal plate.
4. Remove the two cap screws and diffuser from the seal plate to expose the impeller.
5. Remove the small end cap on the end of the motor opposite the impeller.
6. With a large screwdriver or adjustable wrench, keep the shaft from rotating and remove the impeller by hand (standard right hand thread). Be sure to hold onto the seal plate when removing the impeller from the shaft.
7. Remove the seal plate.
8. Pry the rotating shaft seal member from the impeller (Figure 5).



**Figure 5 - Removing Shaft Seal and Ceramic Seat**

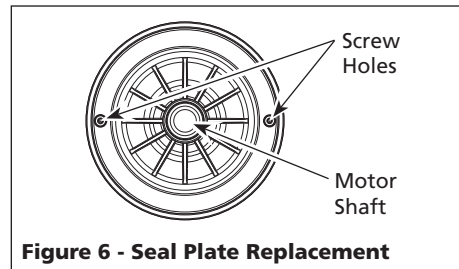
9. Push or pry the ceramic seat free from the seal plate (Figure 5).
10. Remove loose particles from impeller hub and seal plate.

### INSTALLING NEW SHAFT SEAL

**CAUTION** Before handling shaft seal parts wipe hands clean. Dirt or grease can damage the seal.

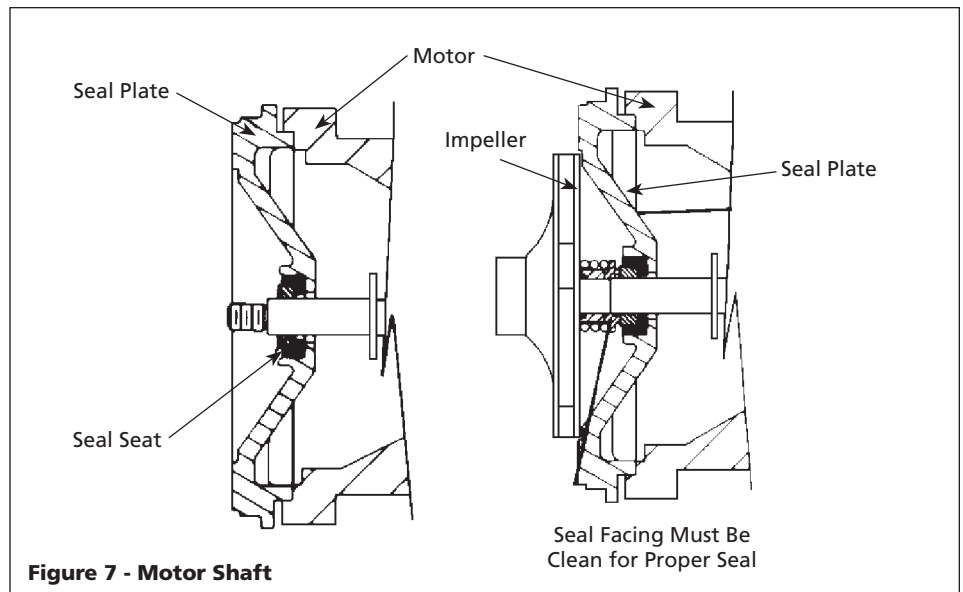
1. Wet the inside of the seal cavity on seal plate and the rubber cup enclosing the new ceramic seat with cooking oil. Be careful not to scratch the ceramic surface of the seal seat and push seat enclosed in rubber into seal cavity on seal plate. Use a cardboard washer to protect polished surface when pushing against ceramic seat with any object. Be sure to remove cardboard washer.

2. Carefully slip seal plate over shaft. Do not disturb seal position in seal plate. The seal plate must be orientated during assembly so the two screw holes are on a horizontal line across the motor shaft and the (4) locating pins on the back of the seal plate line up with the tabs on the motor housing (Figure 6). This placement should be done to ensure proper draining and priming.



**Figure 6 - Seal Plate Replacement**

3. Place rotating shaft seal member in position on impeller and press into place. Take care not to press against polished seal surface.
4. Position impeller on shaft and tighten securely (Figure 7).



**Figure 7 - Motor Shaft**

5. Secure diffuser to seal plate using the two cap screws. Be sure the screws are orientated on a horizontal line as described in Step 2.
6. Carefully position pump housing (volute) gasket over the diffuser onto the seal plate. In all shallow well applications care must be taken that the o-ring is clean and properly positioned on the venturi. Cleaning and positioning makes a good seal inside the diffuser when assembled.
7. Assemble the pump housing (volute) to the motor using the four cap screws. Be sure the pump housing (volute) gasket is positioned correctly and tighten the screws securely.

**NOTE:** Shaft must rotate freely and motor end cap should be secured before operation.

## Troubleshooting Chart

**⚠ WARNING** ***ELECTRICAL PRECAUTIONS** - Before servicing a pump, always shut off the main power breaker and then unplug the pump. Make sure you are not standing in water and are wearing insulated protective sole shoes. Under flooded conditions, contact your local electric company or qualified licensed electrician for disconnecting electrical service prior to pump removal.*

Symptom	Possible Cause(s)	Corrective Action
Pump won't start or run at full speed	<ol style="list-style-type: none"> <li>Blown fuse or open circuit breaker</li> <li>AC power is OFF</li> <li>Incorrect voltage</li> <li>Defective motor</li> <li>Pump internal components clogged/ worn/ damaged</li> </ol>	<ol style="list-style-type: none"> <li>Replace fuse or close circuit breaker. See wire chart for proper breaker/fuse size</li> <li>Turn power on</li> <li>Low voltage                             <ol style="list-style-type: none"> <li>Voltage must be within <math>\pm 10\%</math> of motor rated voltage. Check incoming voltage. Contact power company</li> <li>Motor voltage is set for 120V AC. <b>System is not designed for 240V service.</b></li> </ol> </li> <li>Replace motor</li> <li>Replace worn parts or entire pump. Clean parts if required</li> </ol>
Pump operates, but delivers little or no water	<ol style="list-style-type: none"> <li>Valves plumbed into system restricting flow</li> <li>In-line filter restricting flow</li> <li>Low line voltage</li> <li>Inadequate water supply to booster pump</li> <li>Undersized piping</li> <li>Leak on inlet side of system</li> <li>Worn or defective pump parts or pump</li> <li>Suction lift to great</li> <li>Pump not primed</li> </ol>	<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>Check valves on pump inlet and discharge sides of system. Be certain they are opened completely to allow flow to and from the pump.</li> <li>Bleed trapped air in pump. (Normally due to closed valve in discharge plumbing).</li> </ol> </li> <li>Check all in-line filters to be sure they are not plugged or restricted</li> <li>See low line voltage corrective action (above)</li> <li>Check pressure on inlet side of booster to be sure positive pressure is maintained to the booster pump at all times</li> <li>Replace undersized piping</li> <li>Make sure connections are tight. Repair leaks as needed</li> <li>Replace worn parts or entire plugged impeller. Clean parts if required</li> <li>Pump should be operated under flooded suction only. See Corrective Action 4 above.</li> <li>Prime pump. Make certain inlet pipe connections are tight and pump and pipe are full of water</li> </ol>
Excessive noise while pumping	<ol style="list-style-type: none"> <li>Pump not secured to firm foundation</li> <li>Piping not supported</li> <li>Restricted inlet line</li> <li>Cavitation (pumping marbles)</li> <li>Worn motor bearings</li> </ol>	<ol style="list-style-type: none"> <li>Secure properly</li> <li>Make adjustments</li> <li>Clean, correct, or eliminate restrictions</li> <li>Increase inlet pipe size</li> <li>Replace motor</li> </ol>
Pump leaks	<ol style="list-style-type: none"> <li>Worn mechanical seal (leaks at shaft)</li> <li>Damaged o-ring seals</li> </ol>	<ol style="list-style-type: none"> <li>Replace shaft (rotary) seal</li> <li>Replace square ring rubber gasket</li> </ol>

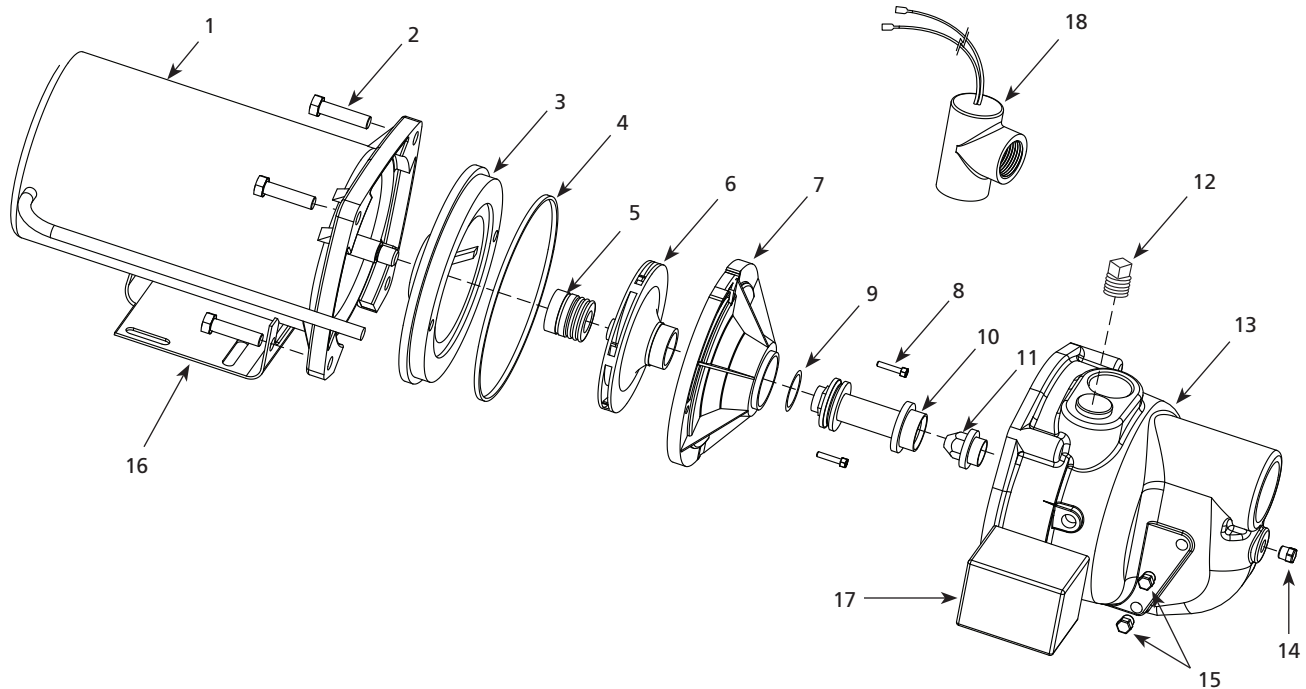
**For Replacement Parts, call 1-888-636-6628**

Please provide following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

Address parts correspondence to:

Blue Angel Pumps  
 101 Production Drive  
 Harrison, OH 45030 U.S.A.



Ref. No.	Description	Part Numbers	Qty.
1	Motor	32059-001	1
2	Screw	16636-002	1
3	Seal plate	17145-001	1
4	• Square ring rubber gasket	17150-001	1
5	• Shaft seal assembly	56393	1
6	Impeller	23285-002	1
7	Diffuser	17148-001	1
8	Screw	67007-001	
9	• O-ring	15557	1
10	Venturi	17151-002	1
11	Nozzle	15672	1
12	Pipe plug 3/4"	15921	1
13	Volute	56869-001	1
14	Pipe plug 1/4" NPT	16314-002	1
15	Pipe plug 1/8" NPT	15766-002	1
16	Base	23029-001	1
17	Pressure switch	30010-001	1
18	Flow switch	30048-001	1
•	Repair kit (Includes #4, 5 and 9)	56874-001	1



## Limited Warranty

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For one year from the date of purchase, Blue Angel Pumps will repair or replace, at its option, for the original purchaser any part or parts of its Pond Kit, Sump Pumps or Water Pumps ("Product") found upon examination by Blue Angel Pumps to be defective in materials or workmanship. Please call Blue Angel Pumps (1-888-636-6628) for instructions or see your dealer. Be prepared to provide the model and serial number when exercising this warranty. All transportation charges on Products or parts submitted for repair or replacement must be paid by purchaser.

This Limited Warranty does not cover Products which have been damaged as a result of accident, abuse, misuse, neglect, improper installation, improper maintenance, or failure to operate in accordance with Blue Angel Pumps's written instructions.

**THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO ONE YEAR FROM THE DATE OF PURCHASE. THIS IS THE EXCLUSIVE REMEDY AND ANY LIABILITY FOR ANY AND ALL INDIRECT OR CONSEQUENTIAL DAMAGES OR EXPENSES WHATSOEVER IS EXCLUDED.**

Some states do not allow limitations on how long an implied warranty lasts, or do not allow the exclusions or limitations of incidental or consequential damages, so the above limitations might not apply to you. This limited warranty gives you specific legal rights, and you may also have other legal rights which vary from state to state.

In no event, whether as a result of breach of contract warranty, tort (including negligence) or otherwise, shall Blue Angel Pumps or its suppliers be liable for any special, consequential, incidental or penal damages including, but not limited to loss of profit or revenues, loss of use of the products or any associated equipment, damage to associated equipment, cost of capital, cost of substitute products, facilities, services or replacement power, downtime costs, or claims of buyer's customers for such damages.

You **MUST** retain your purchase receipt along with this form. In the event you need to exercise a warranty claim, you **MUST** send a **copy** of the purchase receipt along with the material or correspondence. Please call Blue Angel Pumps (1-888-636-6628) for return authorization and instructions.

**DO NOT MAIL THIS FORM TO Blue Angel Pumps.** Use this form only to maintain your records.

MODEL NO. \_\_\_\_\_ SERIAL NO. \_\_\_\_\_ INSTALLATION DATE \_\_\_\_\_

**ATTACH YOUR RECEIPT HERE**