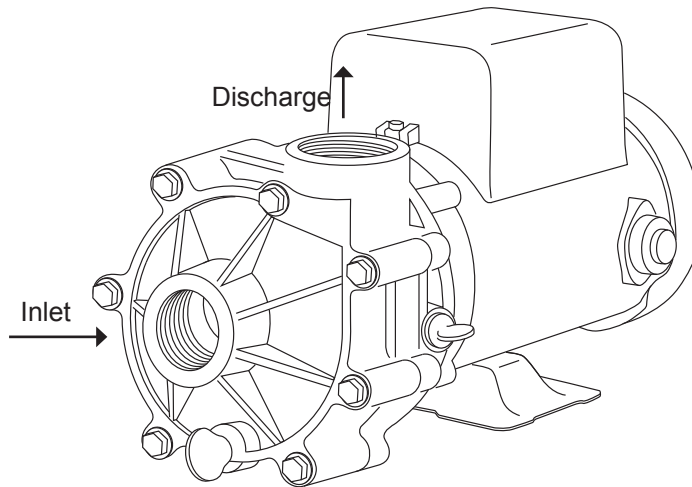


# Cascade Owners Manual

Reliable, Energy-Efficient Centrifugal Pumps



## Important Safety Instructions

Please read all instructions completely before you install or operate your new pump.  
Save this manual for future reference.

## General Specifications

Housing - Corrosion resistant noryl or polypropylene.

Port size - 1 1/2" female NPT on both inlet and discharge.

Seal - stationary 5/8" type 6A, standard materials 316 stainless steel.

Motors - NEMA 56J Frame: Available in 1/8 to 1/4 HP at 1725 RPM and 1/2 to 3 HP at 3450 RPM.

We use a variety of motor manufactures including A.O. Smith, Baldor, Emerson, Leeson, Reliance, and U.S. Motors.

## WARNINGS

1. This pump and motor unit should be installed by a qualified electrician or serviceman in accordance with all applicable state and local codes and ordinances, and in accordance with the National Electrical Code. Improper installation may create a mechanical or electrical hazard which could cause damage to property and which could result in serious injury or death. Always follow the schematic on the motor for all electrical connections!
2. In order to avoid serious injury or death, always disconnect power to the motor before servicing the pump.
3. Never run the pump dry.
4. Never start the pump when the motor shaft is turning. To prevent unwanted reverse motor rotation, install a swing type check valve.
5. If you aren't competent to install the pump, get help from a qualified source.
6. Maintain a minimum flow rate of at least two gallons per minute.
7. Visually inspect the pump and motor at least once a month. If there is any leakage the shaft seal, replace it at once. The seal faces wear (just like car tires) and must be replaced periodically. For critical applications, replace the shaft seal yearly.



5976 SE Alexander Street, Suite F, Hillsboro, OR 97123  
P: 503-356-5888 F: 503-356-1660  
[www.performancepropumps.com](http://www.performancepropumps.com)

# Installation

## General

Proper installation of your Cascade pump will help insure years of trouble free service.

1. Position the pump as near to the water and as low as is practical. This will help reduce cavitation and maximize your pumps output.
2. Protect the motor from excessive heat and moisture. It is best to provide shade from direct sun, and insure that it has proper ventilation. Excessive heat will shorten the motors life and void the warranty.
3. Protect the motor against dirt, water, corrosive salt build up, and all foreign matter. If the motor has been flooded, shut off power and do not operate it until it has been checked by an authorized motor technician, and it has been certified safe to operate. If the motor is damaged by dirt or moisture it voids the warranty.
4. Mount the motor to a stable base where it won't get submerged.
5. The pump ports are 1 1/2" NPT female on both the inlet and discharge. The fittings used to connect to the housing should be plastic. All plumbing lines should be self supported and properly aligned. This will prevent undue stress to the housing. Use teflon paste (not tape) to connect your fittings to the pump.
6. The intake to the pump should not be restricted. Keep your suction lines as free of elbows, fittings and valves as possible. The use of larger diameter pipe will help minimize friction loss.
7. This is a non self-priming pump and is best suited with a flooded suction. **Do not run the pump dry. The pump housing, and the entire suction line must be filled with fluid for it to operate properly.**

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## Electrical

1. If you are not competent to wire an electric motor, hire someone who is!
2. Make sure the power is disconnected at the breaker before wiring the motor.
3. Make sure that the motor is wired internally so that it matches the supply voltage. If they do not match it will damage your motor and void the warranty. Ex. if you are connecting it to a 115V breaker, make sure the motor connections match the 115V (low) wiring diagram found on the motor. Always follow the schematic on the motor for all electrical connections.

NOTE: Baldor motors have separate wiring schematics for low (115V) and high (230V) applications. Both schematics are shown for dual voltage motors.

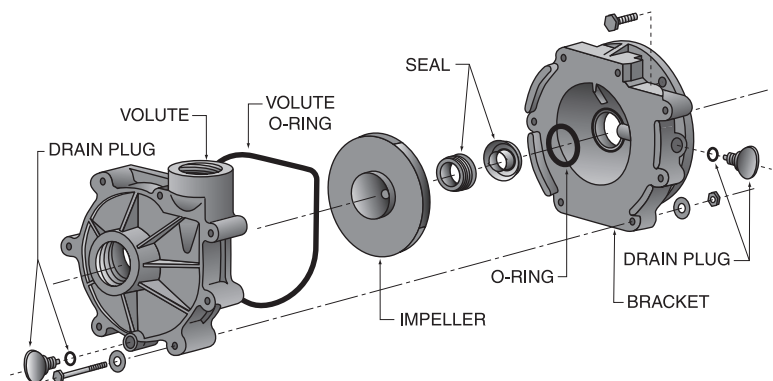
AO Smith motors use a switch to change between low (115V) and high (230V) on dual voltage motors. This switch is located under the rear cover on the back of the motor. The wiring schematic is the same for these motors since the switch determines the voltage selected.

4. Use a supply wire of adequate gauge to prevent electrical line losses. This will allow the motor to run cooler and more efficiently, by eliminating excessive line voltage loss.
5. Make sure all connections are clean and tight. Properly ground the motor. (There is normally a green ground terminal located inside the motor connection box.) Make sure the ground wire is properly connected to an electrical service ground.
6. Connect the pump permanently to an adequately sized circuit. It is best to have a dedicated circuit that won't suffer voltage drop from other loads.

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## Pump Disassembly

1. Shut off the power to the motor before disconnecting any electrical wiring from the back of the motor.
2. Close all necessary valves on suction and/or discharge lines and drain the pump by removing the drain plugs.
3. Disassemble the volute from the bracket-motor assembly by removing the seven 1/4 20 x 2 3/4 cap screws. (The volute can remain attached to the plumbing). Pull the motor/pump bracket away from the volute.



## **Pump Disassembly Continued**

4. Remove the cap covering the back end of the motor shaft and with a large screwdriver or wrench, prevent shaft rotation while unscrewing the impeller counterclockwise (as viewed from the pump end).
5. Remove the ceramic piece from the impeller hub.
6. Detach the bracket from the motor by removing the four 3/8" cap screws, and slide it forward, away from the motor.
7. Remove the carbon-graphite seal from the bracket by pressing it out from the back. Do not dig it out from the front! (A large socket or pipe nipple can be used.)

## **Pump Assembly**

1. Check all pump parts and clean as needed.
2. If the motor shaft has corrosion build up, use emery cloth to clean it.
3. Install the O-ring into the O-ring gland in the bracket bore.
4. Press the carbon seal head into the bracket bore. CAUTION! Press only on the seal collar, NOT ON THE DELICATE CARBON FACE! DO NOT TOUCH THE CARBON SEAL FACE!
5. Insert the slinger (rubber washer), if you are using one, onto the motor shaft. Note: Never use a slinger in conjunction with a PVC shaft sleeve for salt water.
6. Mount the bracket onto the motor C-face using four 3/8" cap screws and tighten them snugly.
7. Press the ceramic into the impeller hub. It helps to moisten the rubber boot with water first. The ceramic MUST SIT FLAT. If one side is higher than the other, the seal will leak! The smooth face must be up and exposed. This is facilitated by placing the ceramic face down on a bench and pressing the impeller down over it.
8. Screw the impeller clockwise onto the motor shaft and tighten. You can hold the shaft stationary at the opposite end of the motor with a large screwdriver or wrench.
9. Place the large O-ring in the groove in the volute. Note: It is easiest to lay the volute, suction side down, place the O-ring in the groove, and lower the bracket/motor assembly down onto the volute. (So the O-ring doesn't pop out.)
10. Install the seven 1/4" x 2 3/4" cap screws with washers and tighten in a cross pattern until they are reasonably snug. (Do not overtighten).
11. Place the small O-rings onto both drain plugs, and screw them into the 1/4" holes in the volute and bracket.

## **Trouble Shooting Aid**

### *Motor Will Not Start.*

1. Check for voltage present at connection box.
2. Check that the supply voltage matches the motor voltage connections.
3. Check that you have proper line voltage at the motor.
4. Check that all connections are sound.
5. Check that the motor shaft rotates easily by hand. (This can be checked at the rear of motor by turning with screwdriver or wrench.)

### *Motor Won't Start, But It Hums.*

1. Check items 2-5 above.
2. Check that there is no foreign matter lodged between the contacts of the start switch.
3. Check to insure the capacitor is functioning properly.
4. Make sure the motor fan cover isn't hitting the fan.

## **Trouble Shooting Aid Continued**

### *Motor Gets Hot And Shuts Down.*

1. Check for proper wiring in the motor box. The supply voltage must match the motor voltage connections.
2. Check the voltage at the motor, with the motor and all other loads on the circuit running. It must not be significantly (10% or more) above or below the nominal voltage.
3. Check to see if the motor shaft turns without excessive resistance. Bad bearings, or a clogged impeller can cause excessive resistance.
4. Check that the pump impeller and the housing are not clogged or blocked.

### *Pump Will Not Hold A Prime.*

1. Check for defective joints at all pipe fittings. They must all be air tight. DO NOT USE TEFLON TAPE ON THE THREADS. Use Teflon paste.
2. Check for a defective check valve or foot valve. The pump and suction line must be full of water before start up.
3. Check for a leaking seal.
4. Make sure the drain plugs have their o-rings in place and are tight.



For performance that's **OFF THE CHART** of ordinary pumps!

**WIRING INSTRUCTIONS**



**IMPORTANT SAFETY INSTRUCTIONS**

**Please read all instructions completely before you install or operate your new pump. Save these instructions for future reference.**



The motors used with the PerformancePro pumps are high quality, industrial duty motors. Some are dual or triple voltage motors, which can be operated at either 115 volt (low) or 208-230 volt (high). They have been tested at the factory before being shipped.

It is vitally important to supply proper voltage and amperage to the motor. Set the internal connections on your motor to match your supply line voltage. If these do not match, you will damage the motor and void the warranty. **DO NOT ATTEMPT TO WIRE THE MOTOR IF YOU DON'T KNOW WHAT YOU ARE DOING!!!** Have a qualified electrician do the work.

The following example shows how to wire a "typical" Baldor 1/4HP, Single Phase, 1725 RPM motor (with the following diagram)

LOW VOLTAGE		
LINE A	LINE B	TOGETHER
1, 3	4	2, J

HIGH VOLTAGE			
LINE A	LINE B	TOGETHER	TAPE
1	4	2, 3	J

**CONNECTIONS ABOVE GIVE CLOCKWISE ROTATION FACING LEAD END.**

For low voltage:

1. Connect your incoming hot lead (normally the black wire) to the wires marked #1 and #3.
2. Connect your incoming neutral lead (normally the white wire) to the #4 wire.
3. Twist wires #2 and #J together.
4. Use appropriately sized wire nuts to insure all connections are secure and insulated.
5. Connect your incoming ground (normally green) to the green screw in the connection box.

For high voltage:

1. Connect your incoming hot lead (normally the black wire) to wire #1.
2. Connect your other hot lead (normally the white wire) to wire #4.
3. Connect wire #2 and #3 together.
4. Tape off the wire marked J.
5. Use appropriately sized wire nuts to insure all connections are secure and insulated.
6. Connect your ground lead (normally green) to the green screw in the connection box.

**Note: Your motor may have a different wiring diagram. Follow it's instructions for line placement.**

**PerformancePro Pumps Inc.**

5976 S.E. Alexander St., Suite F, Hillsboro, OR 97123  
 Phone: 503/356-5888 Fax: 503/356-1660  
 www.performancepropumps.com

# **PerformancePro Pumps Cascade Series Limited Warranty**

PerformancePro Pumps warrants its single and two speed Cascade series of centrifugal pumps to be free of defects in material and/or workmanship at the time of purchase. In the event this product malfunctions within three years from the date of purchase, the sole obligation of PerformancePro Pumps will be to repair or replace the product. The three year period applies only to pump and motor units used for fresh water applications. A one year period applies to pumps used in brackish, saltwater or other suitable applications.

THIS LIMITED WARRANTY IS SUBJECT TO THE FOLLOWING CONDITIONS AND EXCLUSIONS:

1. PerformancePro Pumps must perform all warranty repairs. Purchaser must retain the purchase receipt and present it with this certificate as proof of ownership and entitlement to warranty repairs. Unauthorized repairs will not be compensated by PerformancePro Pumps, and are not the responsibility of PerformancePro Pumps. If such repairs damage the product, such damage is not remediable under this warranty.
2. Problems or damage resulting from failure to comply with instructions in the owner's manual, improper plumbing and positioning, flooding, corrosion or salt build up, incompatibility with fluid chemistry, inadequate ventilation and running unit dry are not covered under this warranty. Malfunction for any other reason - including but not limited to misuse, negligence, accident, tampering with parts, incorrect wiring, or improper installation - will not be remedied under this warranty.
3. Purchaser shall bear all shipping, packing, and insurance costs and all other costs, excluding labor and parts necessary to effectuate repairs under this warranty.
4. Periodic check-ups are not covered by this warranty.
5. This is the sole and exclusive manufacturer's warranty. Any and all implied warranties, including any warranties of merchantability and fitness for particular purpose, shall have no greater duration than the duration period of the express written warranty applicable to this product, and shall terminate automatically upon the expiration of such duration period. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. No action shall be brought for breach of any express warranty subsequent to the expiration of this express written warranty. Except as is otherwise provided by applicable law, no action on a warranty implied at law shall be commenced more than one year following the date of purchase.
6. Incidental and consequential damages (specifically including, but not limited to, damages for loss of profits or damages relating to down time of people or equipment) caused by malfunction, defect, or otherwise, and with respect to breach of any express or implied warranty, are not the responsibility of PerformancePro Pumps, and, to the extent permitted by law, are hereby excluded both for property damage and, to the extent not prohibited by applicable law, for personal injury damage. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
7. The provisions of this warranty are severable and if any provision shall be deemed invalid, the remaining provisions shall remain in full force and effect.
8. Rights under this warranty are not assignable without the express prior consent in writing by PerformancePro Pumps. Regardless of the terms of any consent in writing, the assignees shall have no greater rights than his assignor had against PerformancePro Pumps. Any purported assignment without the consent of PerformancePro Pumps shall be null and void.
9. This contract shall be governed by and in accordance with the laws of the state of Oregon.
10. This limited warranty is incorporated by reference into the contract of purchase for the products supplied by PerformancePro Pumps to purchaser under said contract.