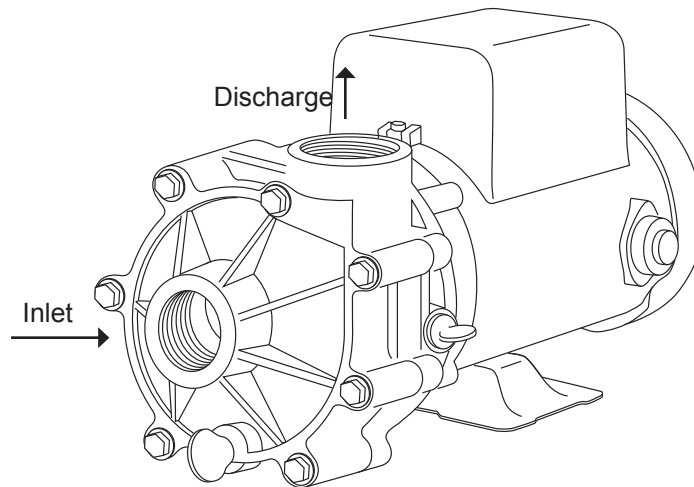


# Cascade Owners Manual

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 with 1 1/2" female NPT inlet and discharge ports.

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

Motors - NEMA 56J Frame

## 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 are not 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 from 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.
8. For 3 phase motors, insure correct motor rotation. See item 7 in electrical for details.



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# Installation

## General

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

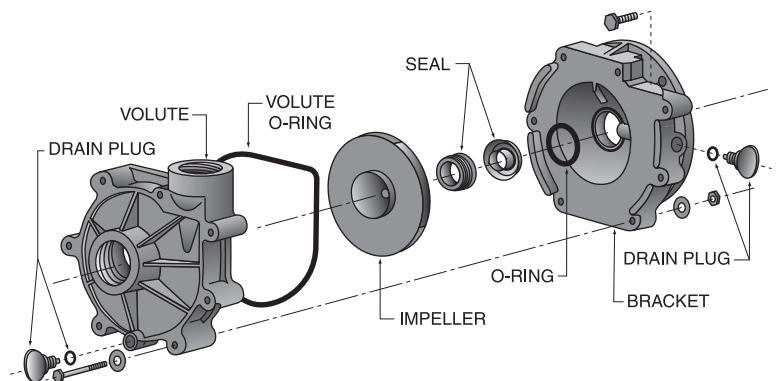
1. Position the pump as near to the water and as low as is practical. This will help reduce cavitation and maximize your pumps output.
2. Protect the motor from excessive heat and moisture. It is best to provide shade from direct sun, and insure that it has proper ventilation. Excessive heat will shorten 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 PTFE 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.**

## 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 (i.e., 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 motos 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 will not suffer voltage drop from other loads.
  7. When using three phase power the motor leads must be energized in the correct sequence to obtain correct rotation. When viewed from shaft end, the motor must rotate counterclockwise. **Incorrect rotation will destroy the pump and motor and void the warranty.** If you are unsure of the sequence of your incoming electrical supply lines, remove the volute (front housing) from the pump, then connect the power and check rotation. If it is incorrect, exchange any two of the connected leads and retest. When the rotation is correct, reinstall the volute (front housing).
- \* **Never test rotation by bumping a connected power switch. This will destroy the pump and void the warranty!!**

## 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 does not 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 PTFE TAPE ON THE THREADS. Use PTFE 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 (115V)		
LINE A	LINE B	TOGETHER
1, 3	4	2, J

HIGH VOLTAGE (230V)			
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.**

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# PerformancePro Pumps

## Cascade Series

## Limited Warranty

This Cascade series product is warranted to the Purchaser (defined herein as the original end user) to be free of defects in construction and workmanship at the time of purchase. In the event this product malfunctions within three years (for fresh water use) or one year (for use with salt water or other suitable fluids) from the date of purchase the sole obligation of PerformancePro Pumps will be to replace or make this product capable of being operated according to the original product description without charges for labor or parts to the Purchaser, and are subject to the following conditions:

1. The malfunction is proved attributable to a defect in construction or workmanship, including repairs performed under this warranty. Malfunction for any other reason - including but not limited to misuse, abuse, negligence, accident, corrosion or salt build up, incorrect wiring or electrical supply, tampering with parts, or improper installation - will not be remedied under this warranty. Problems or damage from failure to comply with instructions in the owner's manual, improper plumbing and positioning, flooding, incompatibility with fluid chemistry and running unit dry are not covered under this warranty.
2. 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. The cost of unauthorized repairs will not be reimbursed to Purchaser by PerformancePro Pumps, and are not the responsibility of PerformancePro Pumps. If repairs by Purchaser or a third party damage the product, such damage is not remediable 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. Purchaser will pay for return freight.
4. For applications that involve fluids other than water, the Purchaser shall retain and present to PerformancePro Pumps evidence of purchaser's compatibility tests under actual operating conditions. Any problems caused by a chemical incompatibility of the fluid with the pump materials, are expressly not covered by this warranty.
5. Periodic check-ups and/or maintenance are not covered by this warranty.
- 6. For all sales in the State of Oregon this is the sole and exclusive manufacturer's warranty. There are no warranties which extend beyond the warranty set forth herein, and in accord with Oregon Revised Statutes ORS 72.3160 any and all implied warranties, including any warranties of merchantability and fitness for particular purpose, are disclaimed and excluded. Some States do not allow disclaimers/exclusions of, or limitations on how long an implied warranty lasts, so in such States, and except as is otherwise provided by applicable law of said States, no action on a warranty implied at law shall be commenced more than one year following the date of purchase. No action shall be brought for breach of any express warranty subsequent to the expiration of the express written warranty.**
- 7. Incidental and consequential damages (specifically including, but not limited to, damages for loss of profits or damages relating to down time of personnel, equipment, or facilities) caused by malfunction, defect, or otherwise, whether alleged to be the result of breach of any express or implied warranty, or the negligence, willful misconduct or other act of PerformancePro Pumps are not the responsibility of PerformancePro Pumps, and to the extent permitted by law, are hereby excluded, including, but not limited to property damage, and to the extent not prohibited by applicable law, personal injury or death and Purchaser hereby agrees to expressly waive any claim for all such damages. If a final determination is made in a court of competent jurisdiction that any one or more of the damages which are disclaimed, excluded and/or waived under this paragraph are not allowed under public policy or applicable law, then the disclaimer, exclusion and waiver of all of the other damages not prohibited by public policy or applicable law shall continue to apply.**
8. This warranty does not apply to any malfunction arising out of any application of this product other than in a use compatible with the manufacturer's product description, unless such application is, upon request, specifically approved in writing by PerformancePro Pumps.
9. 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.
10. This limited warranty extends only to the original Purchaser (end user) and does not extend to transferee or purchaser from the original Purchaser. Any purported assignment without the consent of PerformancePro Pumps shall be null and void.
11. No warranty whatsoever of chemical compatibility or application suitability is given. It is the sole responsibility of the Purchaser to determine if the merchandise purchased is suitable for Purchaser's specific application. PerformancePro Pumps strongly advises that the customer perform any and all tests necessary to determine material compatibility and product suitability for customer's specific conditions and needs.
12. This contract shall be governed by and in accordance with the laws of the State of Oregon. Purchaser agrees that proper jurisdiction and venue for any claim brought hereunder is in Washington County, Oregon.
13. This limited warranty is incorporated by reference into the contract of purchase for the products supplied by PerformancePro Pumps to Purchaser under said contract.