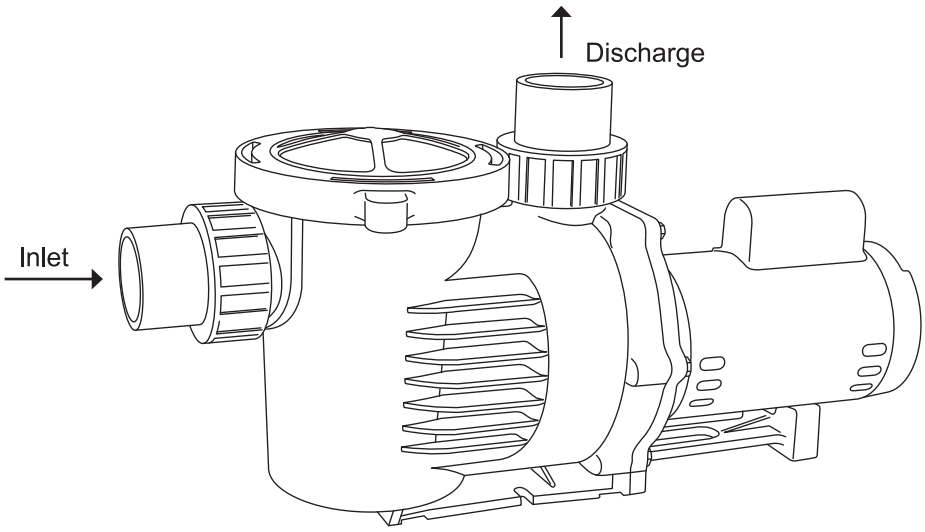
PCA SERIES PUMPS

Installation and Service Manual

for PCA Series
High Flow, Self Priming Centrifugal Pumps



Thank you for purchasing the PCA Series Pump from EasyPro! To insure proper performance, we urge you to carefully follow the instructions in this manual. If you have any questions, call your nearest distributor or EasyPro for assistance.

IMPORTANT SAFETY INSTRUCTIONS

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

HOUSING TYPE:	CORROSION RESISTANT POLYPROPYLENE
MOTOR:	NEMA 56Y FRAME
VOLTAGE:	3/4 HP: 115/230V; 1.5, 3, 5 HP: 208-230V
PORT SIZE:	3" SPIGOT WITH UNIONS
HORSEPOWER:	.75, 1.5, 3 & 5 HP
SEAL:	STATIONARY TYPE - STAINLESS STEEL, WITH BUNA TRIM FOR 5/8" SHAFT
CORD:	.75 HP INCLUDES 6' 115V CORD, NO CORD ON OTHERS

Please fill in for future reference:

MODEL: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

* Please keep copy of original purchase receipt

WARNING: Please read completely before you install or operate your new pump!
Do NOT allow this pump to become submerged. Never run dry and never reverse rotation.

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. You must fill the priming pot (volute) with water before starting the motor.
4. Never start the pump when the motor shaft is turning. To prevent unwanted 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 two gallons per minute.
7. Visually inspect the pump and motor 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 r otation. See item 7 in electrical for details.

INSTALLATION

General

Proper installation of your PCA Series 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 priming time, avoid cavitation and maximize your pumps performance. Do not allow pump to become submerged.
2. Minimize friction losses by using large diameter pipe, reducing the length of runs and minimizing the number of elbows and fittings as much as possible.
3. Protect the motor from excessive heat. 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.
4. Protect the motor against dirt, water and all foreign matter. If the motor has been flooded, do not operate it until it has been checked by an authorized motor technician and has been found to be safe to operate. If the motor is damaged by dirt, moisture or corrosion it voids the warranty.
5. Mount the motor to a stable base where it will not get submerged.
6. The pump ports are 3" on both the inlet and discharge ports. PVC fittings are available to accommodate 2", 2½" and 3" pipe. Quick connect unions are included with each pump. All plumbing lines should be self supported and properly aligned. This will prevent undue stress to the housing. Use a suitable PVC primer and cement to connect your pipe to the fittings.
7. Installations in which the discharge pipe is elevated above the pump must use a swing type check valve to prevent back flow and possible reverse rotation.

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 sepeate 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. The use of heavier gauge wire 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 a voltage drop from other loads.
7. When using three phase power the motor leads must be energized in the correct sequence to provide proper motor rotation. When viewed from the shaft end the motor must rotate counterclockwise. Incorrect rotation will destroy the pump and motor and void the warranty. If you are not sure of the sequence of your incoming supply lines, remove the volute (front housing) and diffuser 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 diffuser and volute.

Never test rotation by bumping a connected electrical switch. This will destroy the pump and void the warranty!

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 PCA Series pumps are high quality, industrial duty motors. Some are dual voltage motors, which can be operated at either 115 volt (low) or 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 1/4 HP, 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 its instructions for line placement.*

PCA SERIES PUMP PLACEMENT CHART

When determining the placement of your PCA Series pump, two factors will be influenced by its height above water level. First, is its ability to self-prime. To insure a reasonable prime time without the use of a swing type check valve (do not use spring loaded check valves), position the pump no higher than the height shown in the "maximum recommended suction lift" column. Second, is its ability to maintain a prime and minimize cavitation. Even with a swing type check valve, we do not recommend a pump be installed more than 9' above the water level.

Model	Maximum Recommended Suction Lift	Approximate Time to Prime
PCA75	5' — 8'	8 MINUTES
PCA150	5' — 9'	7 MINUTES
PCA300	5' — 9'	5 MINUTES
PCA500	5' — 9'	5 MINUTES

Notes:

1. The data in this chart was compiled using 2" pipe, 10' in length. If you use larger pipe or have longer runs, it will increase the time required to prime.
2. All PCA Series self-priming pumps have been tested to operate up to a height of 9' above the surface of the water. Do not install your pump higher than 9'.
3. If you use small pipe, more fittings, have longer runs, use strainers or in any other way make it harder for water to flow easily to the pump — it will reduce your maximum recommended height and may increase the time to prime.

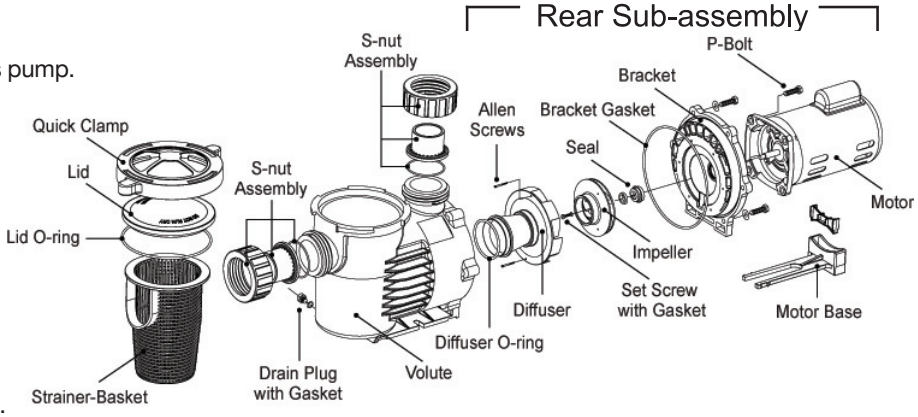
PCA SERIES PUMPS

PUMP DISASSEMBLY

All moving parts are located in the rear sub-assembly of this pump.

Tools required:

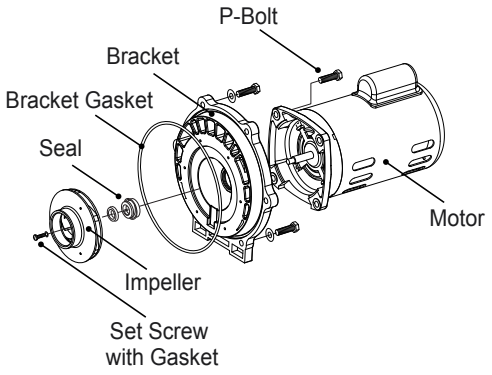
1. 3/32" Allen wrench
2. 7/16" & 9/16" open end wrench
3. Small and large flat bladed screwdrivers
4. #3 Phillips screw driver



Disassembly and repair of the motor sub-assembly can be made as follows:

1. At the main panel turn off the circuit breaker for the pump.
2. Close all necessary valves on inlet and discharge lines and drain the pump by removing both drain plugs. It will drain faster if you loosen the lid.
3. Loosen and remove the six 3/8" P-bolts that hold the volute and the bracket together.
4. Pull the rear sub-assembly away from the volute (the volute can remain attached to the plumbing).
5. Loosen and remove the two 3/32" Allen screws that hold the diffuser to the bracket.
6. Remove the set screw from the impeller eye (if it has one). To do this, hold the impeller stationary and turn the set screw clockwise (it has a left-handed thread).
7. Hold the motor shaft stationary (by removing the cap on the opposite end of the motor and inserting a screw driver in the slot, or a wrench on the flats, depending on the motor design) and unscrew the impeller by turning it counterclockwise.
8. Loosen and remove the four 3/8" M-bolts that hold the bracket to the motor face.
9. If you wish to remove the shaft seal, place the bracket face down on a flat surface and press out the carbon/spring seal from the back side. Never pry it out from the front. Carefully remove the ceramic from the back impeller hub with a small straight screw driver.
10. Clean the bracket, seal bore housing and the motor shaft as necessary.

PUMP ASSEMBLY



1. To install a new shaft seal, clean or replace the o-ring in the bore. If there is no o-ring, clean the bore and apply a bead of 100% silicon sealant inside the bore and around the top edge.
2. Press the seal into the bore (without touching or putting pressure on the delicate carbon face) by pushing on the stainless steel collar. A large socket or a pipe nipple can be used.
3. Clean the impeller hub as necessary and press in the ceramic. Make sure that it is sitting flat. (The polished white ceramic face must be showing — not the rubber boot!)
4. Remount the bracket to the motor. Tighten the four M-Bolts (3/8" cap screws).
5. Screw the impeller clockwise onto the motor shaft while holding the motor shaft stationary until it makes firm contact. Screw in the impeller set screw (if it has one), with its gasket in place, counterclockwise to tighten.
6. Mount the diffuser onto the bracket. Make sure the plastic pins fit into the holes in the bracket, then tighten both Allen head screws.
7. Make sure the diffuser o-ring and bracket gasket are clean and properly seated.
8. Assemble the motor sub-assembly to the volute using the P-Bolts (3/8" cap screws). Do not tighten until all six P-bolts are in place and finger tightened. Tighten all six bolts uniformly and in a cross pattern.
9. Insert both drain plugs and tighten. Install strainer basket and fill the pump with water.
10. Reinstall the lid and quick clamp, and turn it clockwise until snug.

CAUTION

1. The polished and lapped faces of the seal could be damaged if not handled with care.
2. DO NOT RUN THE PUMP DRY. It must be filled with water before it is turned on.

TROUBLE SHOOTING GUIDE

Symptom	Problem	Resolution
No Flow	Insufficient Prime	Prime system with water and purge all air from suction piping.
		Install check valve.
	Insufficient Power	Verify power supply and connection from panel to pump.
		Verify proper voltage. Some models are dual voltage (115/230).
	Flow Restriction	Ensure valves are open.
		Ensure plumbing is clear, including suction strainers, check valves, etc.
		Verify check valve orientation and direction of permitted flow.
		Clean out leaves or other debris from basket strainer (if applicable).
	Air leak	Fix air leaks at fittings, connections, strainer basket etc. This typically occurs on the intake side.
	Improper Application	Verify pump and pipe are properly sized for the system.
Low Flow	Air leak	Fix air leaks at fittings, connections, strainer basket etc. This typically occurs on the intake side.
	Improper Application	Verify pump and pipe are properly sized for the system.
	Insufficient Power	Verify power supply and connection from panel to pump.
		Verify proper voltage. Some models are dual voltage (115/230).
	Flow Restriction	Ensure valves are open.
		Ensure plumbing is clear, including suction strainers, check valves, etc.
		Clean out leaves or other debris from basket strainer (if applicable).
	Insufficient Prime	Prime system with water and purge all air from suction piping.
	Cavitation	Verify airtight plumbing on the suction plumbing especially fittings!
		Clean out leaves or other debris from basket strainer (if applicable).
		Increase pipe size where possible.
		Decrease suction pipe length, reduce the number of elbows, etc.
		Verify hydraulic compatibility: i.e. pump and pipe are sized for the system.
Sporadic Operation	Insufficient Power	Verify power supply and connection from panel to pump.
		Verify proper voltage. Some models are dual voltage (115/230).
	Poor Ventilation	Ensure adequate aiflow over motor to prevent overheating.
Excessive Noise	Cavitation	Verify airtight plumbing on the suction plumbing especially fittings!
		Clean out leaves or other debris from basket strainer (if applicable).
		Increase pipe size where possible.
		Decrease suction pipe length, reduce the number of elbows, etc.
		Verify hydraulic compatibility: i.e. pump and pipe are sized for the system.
	Insufficient Power	Verify power supply and connection from panel to pump.
		Verify proper voltage. Some models are dual voltage (115/230).
	Flow Restriction	Ensure valves are open.
		Ensure plumbing is clear, including suction strainers, check valves, etc.
		Verify check valve orientation and direction of permitted flow.

EASYPRO POND PRODUCTS LIMITED WARRANTY

EasyPro Pond Products ("EasyPro") warrants to the purchaser that this product (PCA Series Pump) will be free from any mechanical or material defects for a period of **three years (when used for fresh water)** or **one year (when used for salt water or other suitable fluids)** from the date of purchase. Malfunction due 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. This warranty only covers properly installed and maintained Products sold by authorized EasyPro Sellers who are subject to and follow EasyPro's quality control standards. Please note that because EasyPro is unable to control the quality of Products sold by unauthorized sellers, unless otherwise prohibited by law, this warranty does not cover Products purchased from unauthorized sellers.

This warranty does not cover normal wear and tear, nor any deterioration suffered through overloading, improper use, negligence, improper installation, acts of God or accident. Similarly, any modification made by the purchaser to the Product will cause the warranty to be null and void. This warranty does not cover any cost associated with the installation or removal of the Product subject to a warranty claim.

For applications that involve fluids other than water, the purchaser shall retain and present to EasyPro Pond Products 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.

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. EasyPro Pond Products 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.

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. For applications that involve fluids other than water, the purchaser shall retain and present to EasyPro Pond Products 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.

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. EasyPro Pond Products 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.

All returned items will be inspected to determine cause of failure before a warranty claim is approved. The exclusive remedies provided hereunder shall, upon EasyPro's inspection and option, be either repair or replacement of the Product or parts covered under this warranty.

Making a Claim: A Return Authorization ("RA") number must first be obtained by calling EasyPro at 800-448-3873 or via email at warranty@easypro.com. It is the purchaser's responsibility to pay the return shipping charges. Be sure to include the RA number, original receipt (in the form of an invoice or sales receipt), your name, your return address and your phone number inside of the package. No warranty claims will be honored without the original receipt that shows that your purchase was made from an Authorized EasyPro Seller. Ensure the product is properly packaged and insured for the replacement value. Damage due to improper packaging is the responsibility of the sender.

ALL OTHER EXPRESS OR IMPLIED WARRANTIES INCLUDING MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY LIMITED IN DURATION TO THE DURATION OF THE WARRANTY AS DESCRIBED ABOVE. Some States do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

EasyPro shall not be held liable for any damages caused by defective components or materials of this Product; or for loss incurred because of the interruption of service; or any consequential/incidental damages and expenses arising from the production, sale, use or misuse of this Product. 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.

EasyPro shall not be held liable for any loss of fish, plants or any other livestock as a result of any failure or defect of this Product. This warranty gives you specific legal rights, and you may also have other rights that vary from State to State.

EasyPro™ pond products

EasyPro Pond Products, 4385 East 110th, Grant, MI 49327

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