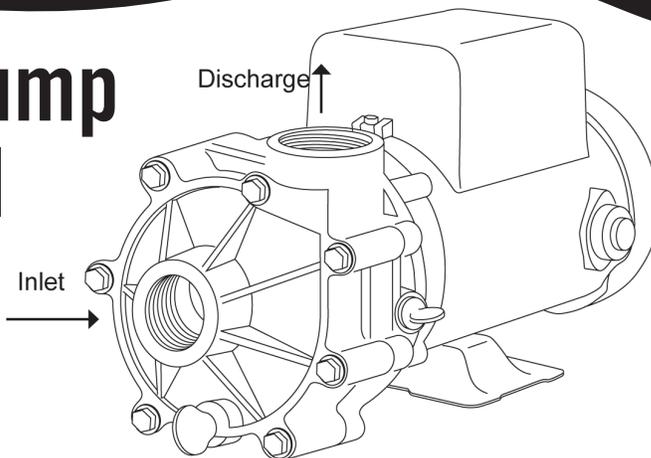


RK2 Systems Pump Owner's Manual

**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. 1½" female NPT on both inlet and discharge.

Seal. Stationary 5/8" type 6A, materials Teflon Coated 316 Stainless Steel, Silicon Carbide Faced, Buna Seat.

Motors. NEMA 56J frame: available in 1/8 to 1/4 HP at 1725 RPM and 1/2 to 3 HP at 3450 RPM. Standard motor manufacturer is Baldor, but we will substitute if availability is uncertain with equivalent motor manufacturer.



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 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. **The motor leads must be energized in the correct order. If you are not sure of the sequence of your incoming supply line, remove the volute from the pump, connect the power and check rotation. When the rotation is correct, reinstall the volute. Do not test with volute in place! Never test rotation by bumping a switch!!! This will destroy the pump and void the warranty!!!! If it is incorrect, exchange any two of the connected leads and retest.**



Quality Water

INSTALLATION

General Installation Instructions

Proper installation of your RK2 System 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.

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.

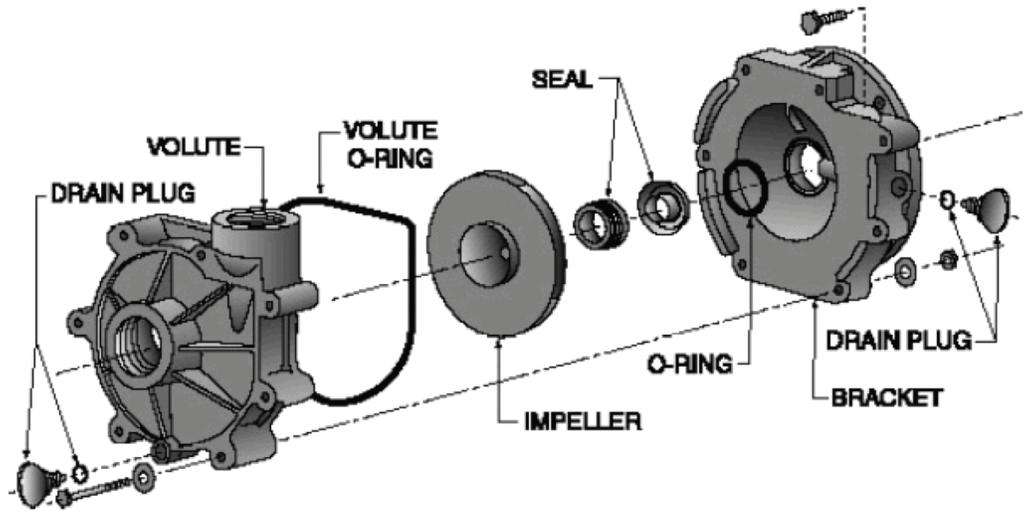
AO Smith motors use a switch to change between low (115V) and high (230V) on dual voltage motors. This switch is located under the rear cover on the back of the motor. The wiring schematic is the same for these motos since the switch determines the voltage selected.
4. Use a supply wire of adequate gauge 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 won't suffer voltage drop from other loads.
7. Insure proper motor rotation. When viewed from the shaft end, the motor must rotate counterclockwise. Incorrect rotation will destroy the pump and motor.

Note: The motor leads must be energized in the correct order. If you are not sure of the sequence of your incoming supply line, remove the volute from the pump, connect the power and check rotation. When the rotation is correct, reinstall the volute. Do not test with volute in place! Never test rotation by bumping a switch!!! This will destroy the pump and void the warranty!!! If it is incorrect, exchange any two of the connected leads and retest.

PUMP DISASSEMBLY AND ASSEMBLY

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 $\frac{1}{4} \times 2 \frac{3}{4}$ cap screws. (The volute can remain attached to the plumbing). Pull the motor/pump bracket away from the volute.
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 $\frac{3}{8}$ " 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 $\frac{3}{8}$ " 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 $\frac{1}{4} \times 2 \frac{3}{4}$ " 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 $\frac{1}{4}$ " holes in the volute and bracket.

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.

LIMITED WARRANTY

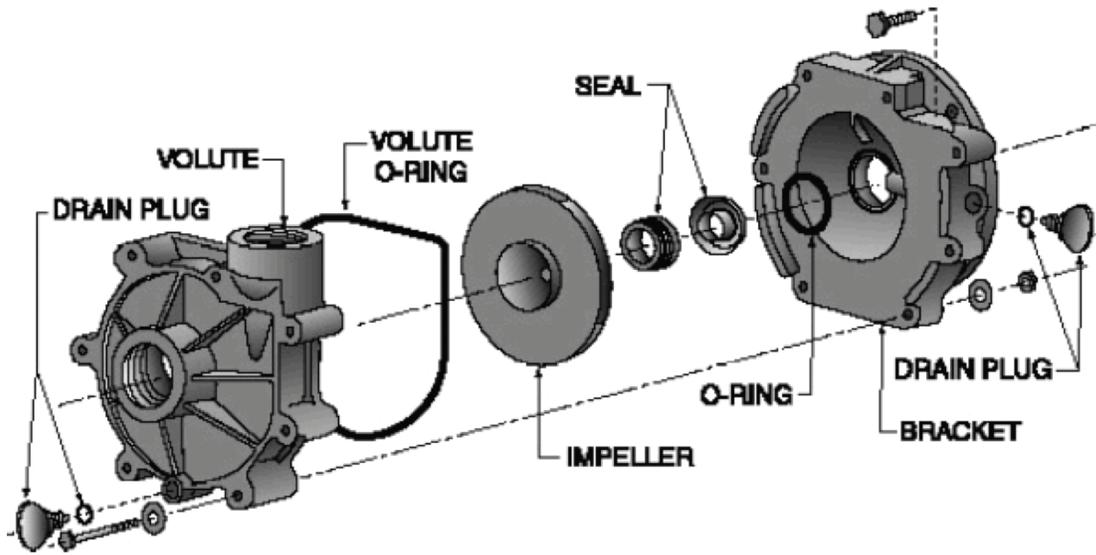
RK2 Systems Pump Limited Warranty

RK2 Systems warrants its Pump 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 one year from the date of purchase, the sole obligation of RK2 Systems will be to repair or replace the product. The one 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. RK2 Systems 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 RK2 Systems, and are not the responsibility of RK2 Systems. 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 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 RK2 Systems, 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 RK2 Systems. Regardless of the terms of any consent in writing, the assignees shall have no greater rights than his assignor had against RK2 Systems. Any purported assignment without the consent of RK2 Systems shall be null and void.
9. This contract shall be governed by and in accordance with the laws of the state of California.
10. This limited warranty is incorporated by reference into the contract of purchase for the products supplied by RK2 Systems to purchaser under said contract.

PUMP PLACEMENT CHART



PART	DESCRIPTION	PART NUMBER
Volute	Volute (Front Housing in Noryl)	4362
O-Ring	Volute O-Ring - Buna	4365
Impeller	Impeller #2 - for 1/3 HP, MODEL 47032.304	4371-1/3
	Impeller #3 - for 1/2 HP, MODEL 41052.301	4370-1/2
	Impeller #5 - for 3/4 HP, MODEL 41072.301	4373-3/4
	Impeller #5 - for 1 HP, MODEL 41102.301	4373-1
	Impeller #5 - for 1 1/2 HP, MODEL 41152.304	4373-1 1/2
	Impeller #7 - for 2 HP, MODEL 41202.304	4380-2
	Impeller #6 - for 1/4 HP, MODEL 41022.505	4376-1/4
	Impeller #7 - for 1/4HP HIFLO, MODEL 41022.505	4380-1/4HF
	Impeller #6 - for 1/8 HP, MODEL 41012.354	4376-1/8
	Impeller #3 - for 1/8 HP ENERGY MAX, MODEL 47012.306	4370-1/8EM
Seal	316 S.S. Shaft Seal - Teflon Coated S.S. with SIC & Buna	4301
Bracket	Bracket (Rear Housing in Noryl)	4363
Drain Plug	Noryl Drain Plug with O-Ring (2 required)	4367
Hardware	Set of Stainless Steel Hardware (includes M-Bolts, P-Bolts, Washers and Nuts)	4280
Bracket O-Ring	O-Ring in Bracket Bore	4368
Motor Bracket	RK2 System Pump Motor Bracket	4363
Pump Cover	RK2 System Pump Motor Cover, UV Resistant, Insulated	4285

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.

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.

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RK2 Systems Product List



Protein Fractionators



Pumps



Fluidized Sand Filters



Chillers



Filtration Systems



Heaters



Ozone Systems



Parts & Fittings



Controllers/Monitoring Equipment



UV Sterilizers



Contact your local distributor.

Quality Water