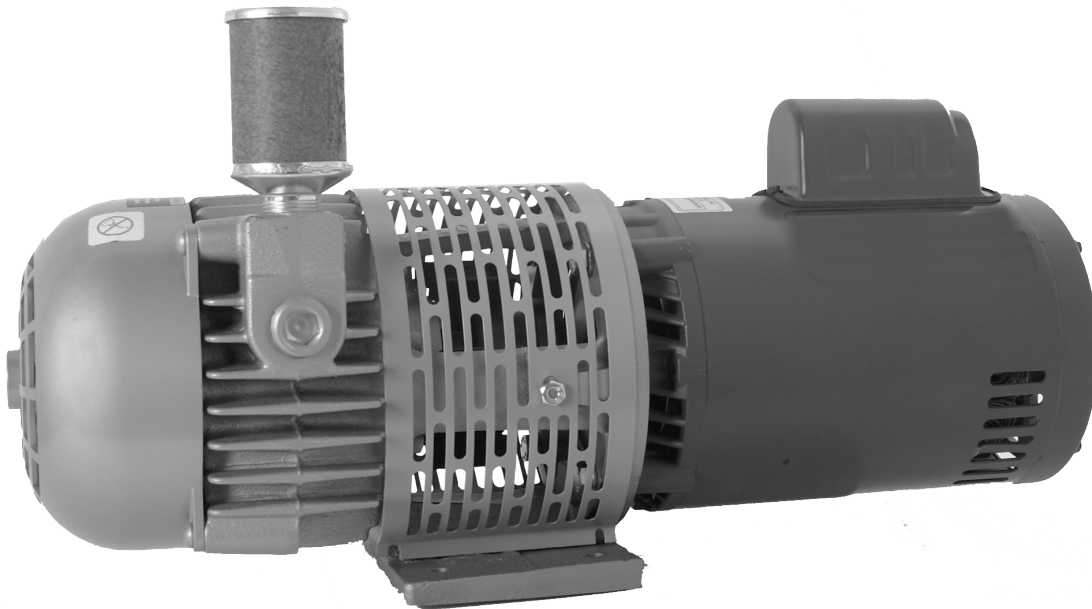




***Oilless Rotary Vane Compressor
Operating and Maintenance Instructions
(Part Nos. AQ21-AQ33)***



Part No. _____ Serial Number _____ Date Purchased _____



AQUATIC ECO-SYSTEMS™

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Safety Messages

Safety is important to us. We have included safety messages throughout this manual and for your protection. Please read and follow all directions.

A safety message has a safety alert symbol followed by an explanation of what the hazard is, what can happen and what you should do to avoid injury. This is the safety alert symbol:



The safety alert symbol and "WARNING" or "CAUTION" will precede all safety messages.



WARNING

You will be killed or seriously injured if you don't follow instructions.



CAUTION

You can be killed or seriously injured if you don't follow instructions.

- Do not pump flammable or explosive gases or use in an atmosphere that contains such gases.
- Protect all surrounding items from exhaust air. This exhaust air can become very hot.
- Corrosive gases and particulate material will damage the unit. Water vapor, oil-based contaminants or other liquids must be filtered out.
- Do not flush with kerosene or other combustible solvents.



ELECTRICAL SHOCK HAZARD

Disconnect electrical power at the circuit breaker or fuse box before installing this product. Install where it will not come into contact with water or other liquids and where it will be weather protected. Electrically ground this product. Failure to follow these instructions can result in death, fire or electrical shock.

Guidelines for Product Use

- Pump only clean, dry air.
- Operate at 32–104°F (0–40°C).
- Protect unit from dirt, foreign material and moisture.
- Never lubricate oilless air compressors.
- Use of petroleum or hydrocarbon products will reduce carbon vane life.

Operation Guidelines

Installation

Make sure the wiring is done by a qualified electrician familiar with NEMA MG2 safety standards, national electric code and all local safety codes. Select fuses, motor protective switches or thermal protective switches to provide protection. Fuses act as short circuit protection for the motor, not as protection against overload. Incoming line fuses help to withstand the motor's starting current. Motor starters with thermal magnetic overload or circuit breakers protect the motor from overload or reduced voltage conditions. The wiring diagram attached to the product provides required electrical information.

Check that power source is correct to properly operate the dual-voltage motor. All dual-voltage motors are shipped from the factory wired for 115V unless otherwise requested.

Make sure that installation clearances do not block air flow. Blocking air flow over the product in any way can cause the product to overheat.



WARNING

Product surfaces become very hot during operation; allow them to cool before handling.

The air stream from this product may contain solid or liquid material that can cause eye or skin damage; wear proper eye protection. Failure to follow these instructions can result in burns, eye injury or other serious injury.

Each single phase model has an automatic thermal protector that shuts the motor off if it overheats. The motor will restart without warning once the protector resets itself upon cooling.

This product can be installed in any orientation. To minimize noise and vibration, the unit should be mounted on a solid surface that will not resonate. We recommend the use of shock mounts or vibration isolation material. Inlet noise can be minimized by attaching an optional muffler.

Plumbing

Remove plugs from the IN and OUT ports. Connect with pipe and fittings that are the same size or larger than the product's threaded ports.

Starting

If the compressor is extremely cold, allow it to warm to room temperature before starting. If the motor fails to start or slows down when under load, shut it off and unplug it. Check that the supply voltage agrees with the motor post terminals and motor data name plate, and make sure the motor is turning in the proper direction. Vane life will be drastically reduced if the motor is not operating properly. Vanes can break or be damaged if the motor runs in the wrong direction.

General Maintenance



WARNING

When servicing, all power to the motor must be discharged and the plug disconnected. All rotating components must be at a standstill.

Make sure that pressure and vacuum are released from product before starting maintenance. Check intake and exhaust filters after the first 500 hours of operation. Clean filters, and determine how frequently filters should be checked during future operation. This procedure in particular will help the product's performance and service life.

1. Remove the end plate and filters. Inspect filters for rips, tears, cuts, brittleness and excessive foreign material.
2. Clean filters if in good condition with compressed air. Reinspect for wear conditions. Set filters aside.
3. Check the filter/muffler for compacted debris. If debris is present, replace the filter/muffler.
4. Check the condition of O-ring. It should be soft and flexible. Replace if it is not.
5. Remove and inspect the muffler box (not all models have a muffler box). Clean the box and set it aside.

6. Check the gasket for cracks or tears. Install new gasket if any cracks or tears exist.
7. Replace the muffler box.
8. Reinstall filters or install new filters if required. Reinstall the end plate.

Flushing the Muffler Assembly

Should excessive dirt, foreign particles, moisture or oil be permitted to enter the compressor, the vanes will act sluggish or even break. Flushing the muffler assembly should remove these materials. Do not use kerosene or other combustible solvents. Use flushing solvent (part no. **AQ255**) liberally to clean muffler parts.

Vane Replacement

Pentair Aquatic Eco-Systems recommends carbon vane replacement at nine-month intervals to ensure trouble-free operation of your compressor.

Disassembly

1. Remove two fan/coupling guard screws. Remove guard.
2. Remove four motor bolts. Remove motor.
3. Loosen two set screws in coupling flange. Remove coupling flange from drive end shaft.
4. Remove four screws from the dead end fan guard. Remove guard. Use a pulley puller to remove fan.
5. Remove eight dead end plate bolts with the special adapter tool.
6. Use a small hammer to carefully tap on dead end plate to remove. Do not use a screwdriver.
7. Remove the dowel pins from the body and dead end plate.
8. Remove vanes. If vanes are stuck, use needle nose pliers to help loosen and remove vanes.
9. Use snap ring pliers to remove snap ring.
10. Remove Belleville springs, flat washer, bearing and deflector. Note how items are placed for reassembly.
11. Place unit with the drive end shaft in an upright position on a protected surface. Remove rotor.
12. Use an adjustable spanner wrench or a special adapter tool to remove drive end cap, bearing and deflector from drive end plate.

Do not disassemble any further parts. The factory has determined the exact top and overall end clearances. Further disassembly will change these settings.

Cleaning

1. Clean all parts with solvent and remove all solvent from parts.
2. Use a 12" smooth file on the faces of end plates and body to remove burrs.
3. Use file to carefully clean out vane slots in rotor.
4. Use emery cloth to clean and remove burrs from body bore and rotor outside diameter.
5. Clean filed parts again with solvent, then remove all solvent from parts.

Reassembly

1. Place drive end plate on shim, aligning bolt holes.
2. Install eight drive end bolts by hand. Do not tighten at this time.
3. Drive two dowel pins into body through drive end plate.
4. Torque bolts to 75-125 in-lbs.
5. Place rotor with drive end up in a fixture on an arbor press.
6. Place body and drive end plate assembly over shaft so that drive end plate is on the face of rotor.
7. Place deflector and bearing on shaft and slide both down to bearing journal.
8. Use bearing pusher and arbor press to press bearing down all the way. Bearing pusher must make contact with both inner and outer race of bearing.
9. Flip unit over so the dead end is up.
10. Install vanes into rotor.
11. Replace dead end plate over shaft and body, aligning bolt holes.
12. Place deflector and bearing on shaft and slide both down to bearing journal.
13. Drive two dowel pins into body through drive end plate.
14. Torque bolts to 75-125 in-lbs.
15. Place large cupped end of one Belleville spring down against the outer bearing race. Place a flat washer on top of Belleville spring.
16. Use snap ring pliers to place snap ring over Belleville spring and press into groove in dead end plate.
17. Secure a dial indicator onto dead end shaft to check axial movement. Push in indicator to allow for a free travel of .01" to the rear.
18. Install drive end cap onto drive end plate. Hand tighten until end cap bottoms out on bearing.
19. Tighten drive end cap with a spanner wrench or a special adapter tool until drive end cap is tight. Dial indicator should move back to .007" or .0075" for the 2067/12567 Series models, .0049" to .0055" for the 1567 Series model and .0035" to .004" for the 1067 Series model to assure proper clearance. If reading does not fall into range for the model in question, disassemble and add or remove shims until proper clearance range is achieved.
20. Remove drive end cap and apply several drops of Loctite 222 to threads. Replace drive end cap and tighten until clearance dial indicator moves to .002" back for 1567 and 2067/2567 Series models and .001" back for the 1067 Series model. Clearances should be:

End	2067/2507 Series	1567 Series	1067 Series
Drive	.042"	.002"	.001"
Dead	.005".0055"	.0029"-.0035"	.0035"
21. Press dead end cooling fan on and center it so it will not hit dead end plate or fan guard.
22. Replace dead end fan guard and attach with four bolts.
23. Replace drive end coupling on drive end shaft. Tighten set screws.
24. Place motor on motor bracket and attach with four motor bolts.
25. If motor is 3 phase, check that rotates properly.
26. Push motor coupling flange against coupling sleeve until tight. Tighten set screws in motor coupling flange.
27. Replace coupling fan guard and attach with two guard bolts.

Frequently Asked Questions (FAQ)

Is my compressor running too hot?

It is normal for a motor to run hot to the touch because the shell transfers heat away from the motor windings.

However, improved materials used in motor manufacturing make the "too-hot-to-touch" test obsolete. The best way to determine if a motor is operating properly is to check the ampere (amp) draw. Each motor has a nameplate listing full-load amps (FLA). If the tested amp draw does not exceed the nameplate rating, its internal or external cooling fan is working (if so equipped), and the ambient air temperature around the motor is below 104°F (40°C). The motor is probably not running hot, even though it is too hot to touch.

Even so, make sure that there is plenty of air flow around the motor, and keep the area around the motor clear so that there is no blockage of air flow to the motor. Also keep paint and other flammable materials away from the motor.

How much will it cost to operate my compressor?

The cost of operation will depend on the length of time the compressor is run each day. The following example is for a typical 1-hp, single-phase compressor operated 24 hours a day at \$.08 per kWh. The cost per kWh will vary from location to location. Check your electric bill for the cost per kWh.

9.7 amps x 115 volts = 1,115.5 watts (amps & volts are on the motor nameplate)

1,115.5 watts x 1,000 = 1.116 kW

1.116 kW x 24 hrs = 26.77 kWh

26.77 kWh x \$.08 per kWh = \$2.14 per day

Why is my compressor so noisy?

Compressor noise can be the result of vibration or mechanical noise.

1. Vibration is the intensification of normal compressor noise. The noise should decrease if the compressor is firmly attached to the foundation or if the compressor is completely isolated by using a rubberized or cushioned base.
2. Mechanical noise is typically a high-pitched squealing sound. The most common causes include worn motor bearings and rubbing of the impeller against the compressor housing.

What causes my compressor to turn off by itself?

Check to make sure the proper voltage is supplied to the compressor. Most compressors are dual voltage, meaning that they are capable of using either 115V or 230V. The motor may have been wired for 230V. If you are using 115V, you will need to change the wiring (see wire diagram on the motor nameplate). Contact a licensed electrician if you need help with wiring modifications.

On single-phase motors a high-temperature switch will turn the motor off if it overheats. The switch will automatically reset itself and turn on after the motor cools. If this overheating and restarting cycle continues for a period of time, the temperature switch will ultimately fail. This cycle will also shorten the life of the motor.

High amp draw results in overheating. High amperage is caused by the following:

1. Low voltage. Usually caused by power supply wire being undersized and/or wire being too long. Extension cords are not recommended to power larger compressors. If you believe that this may be the problem, contact a licensed electrician to check your installation.
2. Motor is locked up. Something may be lodged in the impeller, causing parts to bind.
3. Worn motor bearings.

The compressor may be set up with an automatic timer that will control the run time so that you don't have to manually turn the compressor on and off.

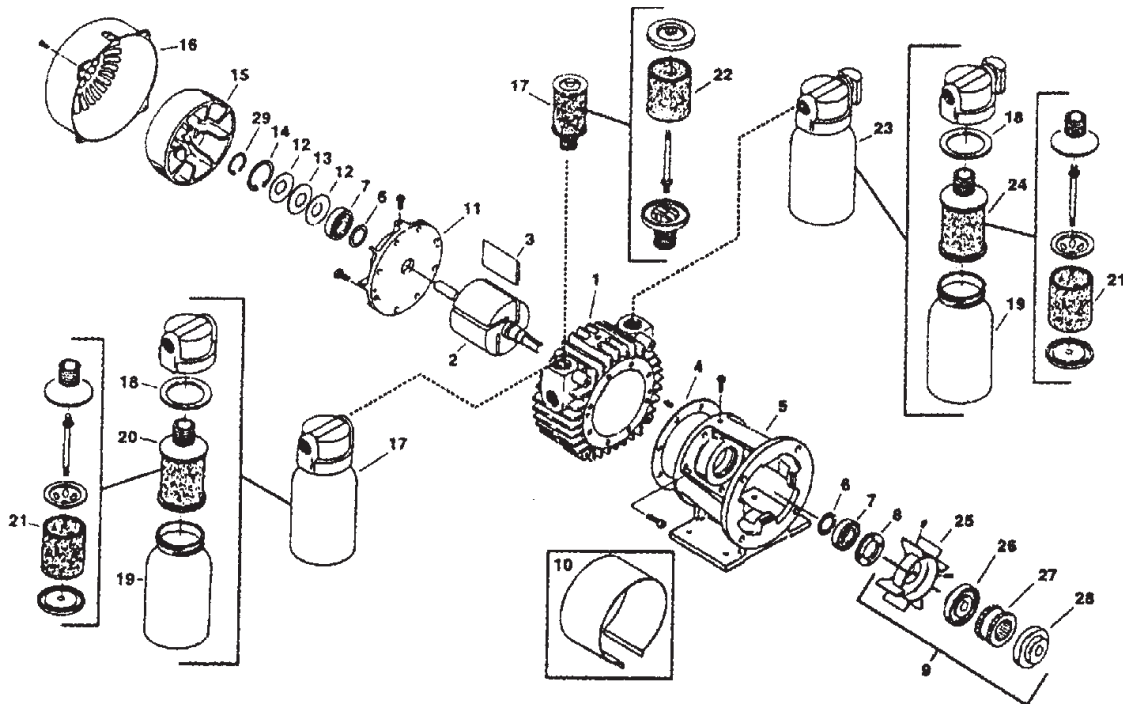
Troubleshooting Chart

Low Pressure	High Pressure	Compressor Overheat	Motor Overload	Problem Cause and Solution
X		X	X	Filter Dirty. Clean or replace.
X	At Compressor	X	X	Plugged or collapsed pressure line. Inspect and repair.
X				Vanes sticking. Clean or replace.
X				Vanes worn. Replace.
X				Shaft seal worn. Replace.
X		X	X	Debris in compressor. Inspect and clean.
X		X	X	Motor not wired correctly. Check wiring diagram and line voltage.

Should you require service or repair parts, contact Pentair Aquatic Eco-Systems at 877-347-4788 from 8 AM to 7 PM Monday to Thursday and 8 AM to 5 PM Friday. Have your part and serial numbers handy, and our technical staff will gladly help you resolve any problems

Exploded Product View, Parts and Ordering Information

For the following exploded view, please reference Series and Model Parts Chart on the next page.



Series and Model Parts Chart

	PRODUCT SERIES Pump or Compressor Models #		SERIES 1067 Vacuum Pump 1067-V103	SERIES 1067 Compressor 1067-P102	SERIES 1567 1567-101	SERIES 2067 Vacuum Pump 2067-V103	SERIES 2067 Compressor 2067-P102	SERIES 2567 Vacuum Pump 2567-V103	SERIES 2567 Compressor 2567-P102
REP	DESCRIPTION	QTY							
1	BODY	1	AH345	AH345	AH291	AH191	AH191	AH355	AH355
2	ROTOR ASSEMBLY	1	AH428	AH428	AH292	AH192	AH192	AH192	AH192
*3	VANE	4	AH430	AH430	AB125B	AH195	AH195	AH195	AH195
*4	BODY GASKET	1	AH567	AH567	AH567	AH567	AH567	AH567	AH567
5	FOOT BRACKET	1	AH208	AH208	AH208A	AH208	AH208	AH208	AH208
*6	DEFLECTOR	2	AH193	AH193	AH193A	AH193	AH193	AH193	AH193
*7	BALL BEARING (Drive & Dead)	2	AC894	AC894	AC894	AC894	AC894	AC894	AC894
8	END CAP, DRIVE	1	AB339	AB339	AB339	AB339	AB339	AB339	AB339
9	FAN COUPLING ASSEMBLY	1	—	—	AH198-1	AH198-1	AH198-1	AH198-1	AH198-1
10	FAN GUARD	1	AH194	AH194	AH194	AH194	AH194	AH194	AH194
11	END PLATE, DEAD	1	AH205	AH205	AH205B	AH205	AH205	AH205	AH205
12	BELLEVILLE SPRINGS	2	AB337	AB337	AB337	AB337	AB337	AB337	AB337
13	WASHER	1	AB338	AB338	AB338	AB338	AB338	AB338	AB338
14	SNAP RING	1	AB335	AB335	AB335	AB335	AB335	AB335	AB335
15	FAN	1	AC326B	AC326B	AC326B	AC326B	AC326B	AC326B	AC326B
16	FAN GUARD	1	AC102C	AC102C	AC102C	AC102C	AC102C	AC102C	AC102C
17	INTAKE FILTER ASSEMBLY	1	AA800C	AA905F	—	AA900D	AA905G	AA900D	AA905G
18	GASKET	2	AA405	—	—	AA405	—	AA405	—
19	JAR	2	AA401	—	—	AA401	—	AA401	—
20	FILTER ASSEMBLY	1	AC434-1	—	—	AC435-1	—	AC435-1	—
*21	CARTRIDGE	2	AC393	—	—	AC393	—	AC393	—
*22	FILTER FELT	1	—	D344B	—	—	D344B	—	D344B
23	MUFFLER	1	AA800F	—	—	AA900F	—	AA900F	—
24	MUFFLER ASSEMBLY	1	AC434-1	—	—	AC436-1	—	AC436-1	—
25	FAN	1	AH197	AH197	AH197	AH197	AH197	AH197	AH197
26	FLANGE	1	AH196	AH196	AH196	AH196	AH196	AH196	AH196
27	SLEEVE	1	AE546	AE546	AE546	AE546	AE546	AE546	AE546
28	FLANGE	1	AE545B	AE545B	AE546B	AE545B	AE545B	AE545B	AE545B
29	RETAINER RING	1	AC447	AC447	AC447	AC447	AC447	AC447	AC447
	SERVICE KIT	1	K356	K356	K897	K350	K357	K350	K357

*Denotes parts included in the service kit.

When corresponding or ordering parts, please give model and serial numbers.

LIMITED WARRANTY

Pentair Aquatic Eco-Systems, Inc. (PAES) warrants that its products shall, at the time of delivery and for a period of twelve (12) months thereafter, except for filters, be free from defects in materials and workmanship; and, if any such product shall prove to be defective in material or workmanship under normal intended usage and maintenance during the warranty period, upon examination by PAES or its authorized representative, then PAES shall repair or replace, at its sole option, such defective products at its own expense; provided, however, that the Purchaser shall be required to ship each such defective product, freight prepaid, to PAES' designated facility. The warranty on products and/or components not manufactured by PAES, is limited to the warranty, if any, provided by the original manufacturer of said product or component. PAES sole warranty in regard to any components or products that are not manufactured by it shall be limited to the repair or replacement of the product, as set forth herein, with the condition that the Purchaser first return such defective item, freight prepaid, to PAES' designated facility. After PAES has made an inspection of the product, and has confirmed that there is a defect in the manufacture of the product, a credit will be issued to Purchaser's account. PAES HAS MADE NO AFFIRMATION OF FACT AND HAS MADE NO PROMISE RELATING TO THE GOODS BEING SOLD THAT HAS CREATED OR AMOUNTED TO AN EXPRESS WARRANTY OR THAT THE GOODS CONFORM TO ANY

AFFIRMATION OR PROMISE. PAES DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS. PAES SHALL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

This Warranty does not extend to any Equipment that have been subjected to:

1. Damage caused by careless handling, improper repackaging, or shipping.
2. Damage due to misapplication, misuse, abuse or failure to properly operate equipment.
3. Damage caused by improper installation or storage.
4. Damage due to unauthorized product modifications or repairs.
5. Damage caused by negligence, or failure to properly maintain products.
6. Accidental damage, fire, acts of God, or other circumstances outside the control of PAES.



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