



Water Works With Otterbine



AIR FLO Owner's Manual

A Guide to More Dependable
Water Quality Management
With Otterbine Barebo Incorporated's
Diffused Air Aeration Systems

Welcome Aboard!

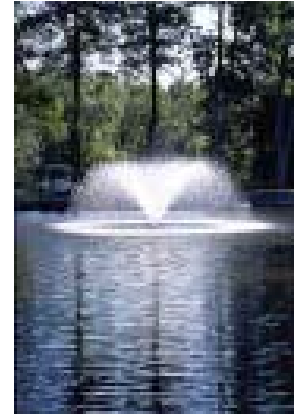
Welcome to the growing family of people who depend on aeration systems for better water quality control and aesthetic improvement. All of us at Otterbine Barebo, Inc. appreciate your confidence in our product.

Water Quality Specialists

Barebo, Inc. is a team of scientists, engineers, and crafts persons who specialize in efforts to improve water quality. Otterbine aeration systems are built at Barebo, Inc.'s 25,000 square foot factory in Emmaus, Pennsylvania. Each step in assembly is followed by a quality assurance check to maintain high quality.



COMET₃



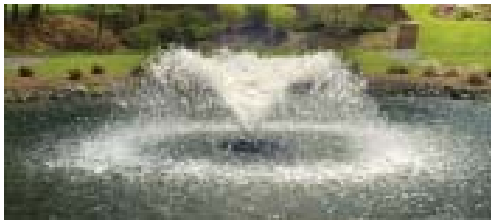
SUNBURST₃

Follow the Guidelines

You'll find guidelines for installing, operating, and maintaining your aeration system in the following pages. We strongly recommend that you read, understand, and apply these guidelines. They will help you get better performance and dependability from your Otterbine aeration system.



GEMINI₃



SATURN₃



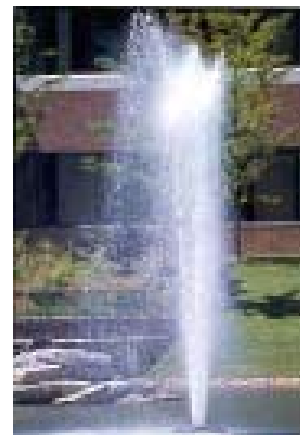
GALAXY₃



PHOENIX₃



TRI-STAR₃



ROCKET₃

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Revised 9/6/2002

Checklist & Materials for Installation

1. Unpack and inspect your diffused aeration system. Report any shipping damage to the carrier who delivered your Otterbine aeration system. Make sure you have received the following:

- **Compressor Cabinet** - This cabinet houses the air compressor(s), air outlet manifold, ventilation fan, electrical components, and miscellaneous parts. Check for damage to the cabinet and the interior components.

NOTE: A set of four vanes, a gasket and two air filter cartridges are included with the system per compressor. These are replacement maintenance parts for the first year of service.

- **Air Diffuser Manifolds** - Verify that you have received the proper number of air diffuser manifolds and air diffuser stones.

- **Barrier** - Verify that you have received one barrier for each air diffuser manifold.

- **Tubing** - Verify that you have received the correct length and type of tubing.

2. Obtain the following for installation:

- **Concrete** (if applicable)

- **30' to 50' piece of thin (1/8") nylon rope**

- **5/16" nut driver or wrench**

- **7/16" nut driver or wrench**

- **Adjustable wrench** (1-11/16" jaw capacity) **or channel locks**

- **Level**

- **Bricks** (3-hole clay bricks if unweighted tubing is used)

- **Cutting knife** (sharp enough to cut plastic tubing)

- **Shovel & Pick**

- **Buoys** (e.g. empty bleach bottle) - one for each diffuser.

- **Boat**

WARNING: This system is designed for outdoor use only.

Cabinet Installation

1. The cabinet may be mounted on a wooden frame or a concrete pad. SEE Figure 1 for the dimensions of a small cabinet (1 compressor) and SEE Figure 2 for the dimensions of a large cabinet (2 compressors). The dimensions are in inches and are for reference purposes ONLY. The bottom view shows the location of the mounting holes in the cabinet legs.

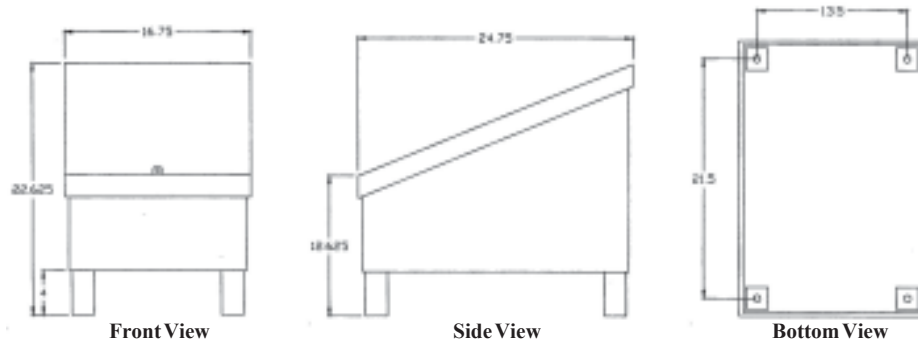


Figure 1 - Small Cabinet

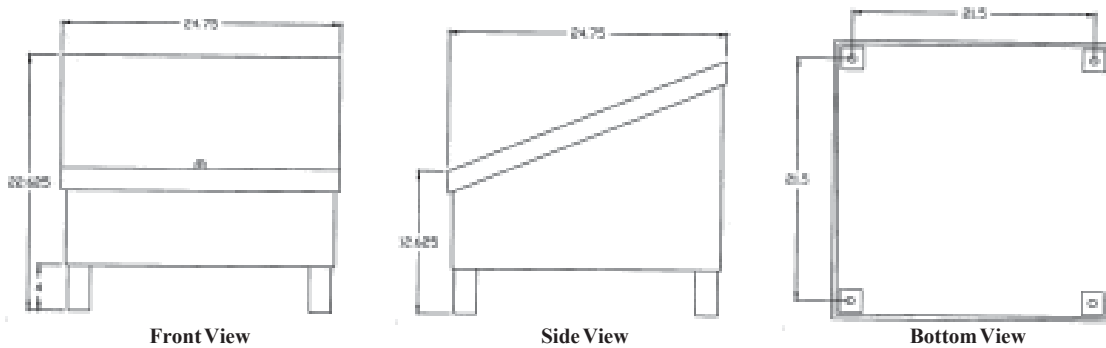


Figure 2 - Large Cabinet

2. Verify that the cabinet is mounted level by using a level on the bottom edge of it.

CAUTION: Do not block the holes in the bottom of the cabinet or the louvers on the back of the cabinet, they are used for ventilation purposes. Overheating may occur if blocked.

3. Make sure to place the cabinet so the air outlets (front of the cabinet) are facing the pond or lake.

4. Install a two foot outlet hose (per-cut and included) onto each ball valve on the outlet manifold assembly and secure using the hose clamps provided.

5. Install the outlet manifold assembly to the compressor using the union fitting and tightening (SEE Figure 3). The outlet manifold assembly should horizontal when mounted correctly. Place each outlet hose through a hole in the bottom of the cabinet and out the front.



Figure 3

Diffuser Assembly - Figure 4a-e

Item No.	Description	Part Number	Qty
1	Diffuser Manifold Barrier	41-0128	1
2	PVC Adaptor	65-0044	1
3	Check Valve	65-0045	1
4	Manifold Piping Assembly	10-0071	1
5	Diffuser Stone	10-0070	6
6	PVC Standoff	41-0132	5
7	Self-Locking Pipe Clamp	46-0130	5
8	1/4"-20 S/S Clamp Adaptor	46-0111	5
9	1/4"-20 x 4.5" S/S Hex Bolt	22-0028	5
10	1/4" S/S Fender Washer	28-0001	5

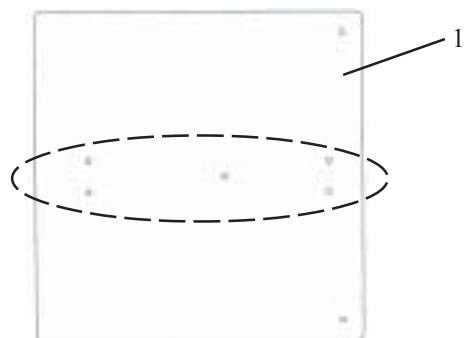


Figure 4a

1. Mount the five PVC Standoffs and Pipe Clamps to the Barrier in the five holes circled in Figure 4a using a hex bolt and fender washer for each as shown in Figure 4b. **DO NOT** tighten. **NOTE:** The 1/4"-20 S/S Clamp Adaptor is pressed into the Pipe Clamp for the bolt to fasten to.

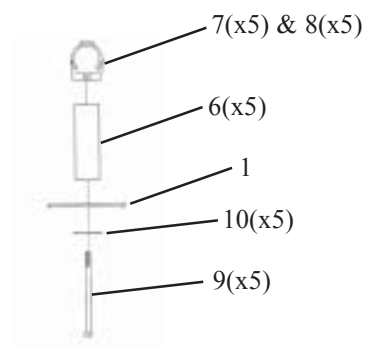


Figure 4b

2. Thread the Check Valve and PVC Adaptor into Manifold Piping Assembly as shown in Figure 4c. Do not overtighten. Make sure the arrows on the Check Valve are pointing in the direction of the air flow. This check valve will help to prevent the back flow of water into the air line when the compressor is not in operation.



Figure 4c

3. Verify the Pipe Clamps are open and insert the Manifold Piping Assembly as shown in Figure 4d. Press down on the Manifold Piping Assembly so each of the five Pipe Clamps locks around the piping. Tighten the hex bolts to secure the PVC Standoffs to the Barrier.

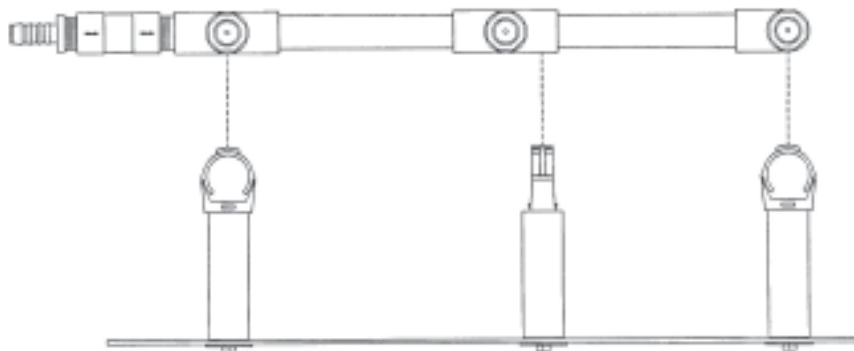


Figure 4d

Diffuser Assembly - Figure 4a-e

4. Thread six Diffuser Stones into the Manifold Piping Assembly as shown in Figure 4e:

WARNING

- HAND TIGHTEN ONLY. DO NOT OVERTIGHTEN.
- DO NOT USE SEALANT TO SECURE THE DIFFUSERS INTO THE MANIFOLD.

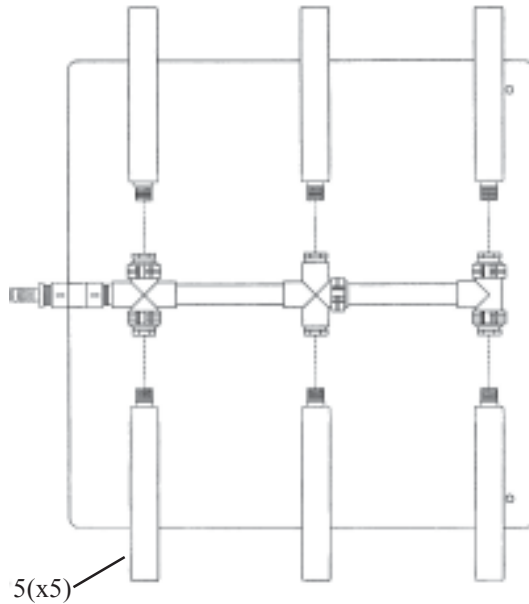


Figure 4e

Note: when this piece is completely assembled it is referred to as the diffuser assembly.

Diffuser Placement

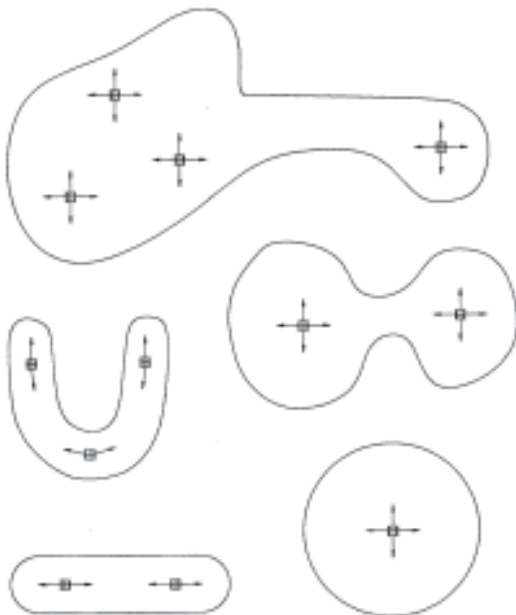


Figure 5

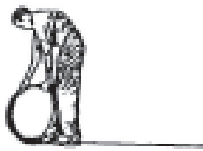
Placement is crucial to how quickly and efficiently your Otterbine Airflo aerator is able to aerate your pond. Figure 5 shows the most common pond shapes and the most effective diffuser placement in these ponds.

Diffuser Assembly Installation and Placement

- using weighted or unweighted tubing -

1. Locate the deepest areas in your pond/lake.
2. Place some sort of buoy (e.g. empty bleach bottle) in the areas where you intend to place diffuser assemblies. This will help to get exact placement of the diffuser assemblies and will assist in tubing placement.
3. Uncoil the tubing by rolling the coil like a hoop. If a loop pops out during uncoiling, re-roll and return the loop to the coil to avoid kinking.

CAUTION: NEVER lay the coil down and throw the tubing out in loops, TUBING will kink.



RIGHT



WRONG

4. Attach one end of the tubing to the barbed fitting on the diffuser assembly and secure with the hose clamps provided. Repeat for each diffuser assembly.
5. Attach any additional lengths of tubing, if necessary, to the tubing from the previous step with the couplings provided and secure with the hose clamps provided until desired length is achieved. See Figure 6 for the proper coupling configuration.

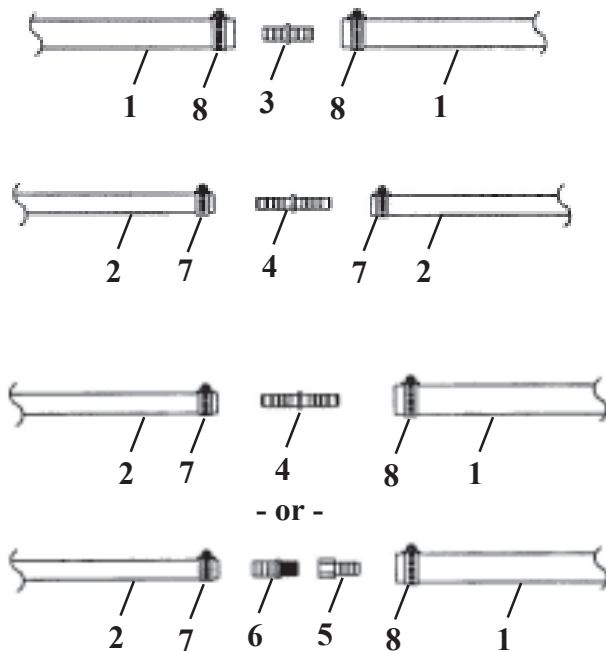


Figure 6

Item No	Description	Part Number
1	Weighted Airflo Tubing	*
2	Unweighted Airflo Tubing	**
3	Brass Barbed Coupling	67-0008
4	Plastic Barbed Coupling	56-0001-008
5	Brass Barbed x NPT Fitting, Female	67-0010
6	Brass Barbed x NPT Fitting, Male	67-0009
7	Small Hose Clamp	46-0117
8	Large Hose Clamp	46-0124

* Weighted Tubing sold in 100 ft kit (P/N 12-0093-100)

** Unweighted Tubing sold in 100 ft kit (P/N 12-0094-100)

Diffuser Assembly Installation and Placement - continued

- using weighted or unweighted tubing -

6. Place the tubing that will be attached to the compressor plus an extra 5 feet some place near the cabinet and secure with a ty-rap. This will help to insure that you have enough tubing to make it from the diffuser assembly to the compressor. The portion of tubing not in the water may be direct buried or run through conduit.

NOTE: The tubing must enter the water below the average winter ice depth in the area

7. If unweighted tubing is used in the water it must be weighed down with bricks as shown in Figure 7. Place bricks 2-3 feet from the ends of the tubing and at 6-8 foot intervals thereafter.

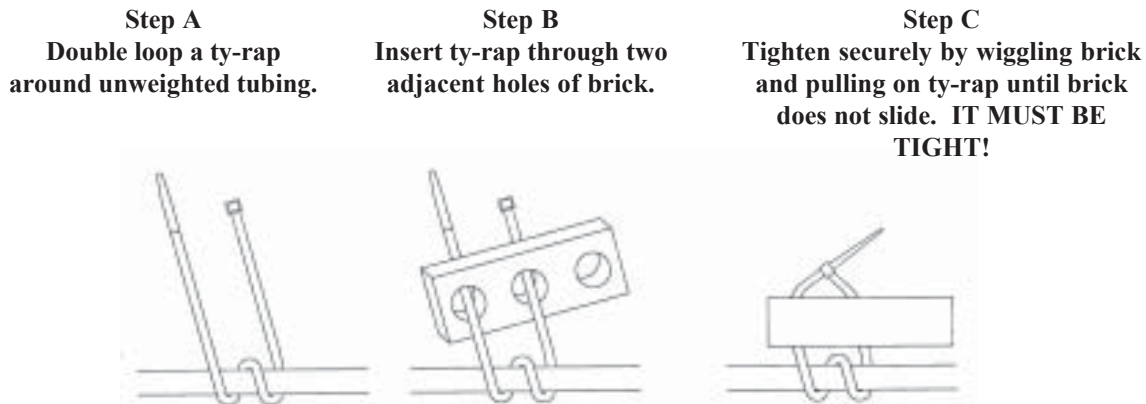


Figure 7

CAUTION: Otterbine strongly suggests you use this method of securing your bricks as it prevents the bricks from sliding during and after installation.

8. Thread a thin piece of nylon rope through the top of one installation hole on the barrier of the diffuser assembly and back up through the bottom of the other installation hole (SEE Figure 8). The length of the rope must be at least twice the depth of the location for the diffuser assembly.

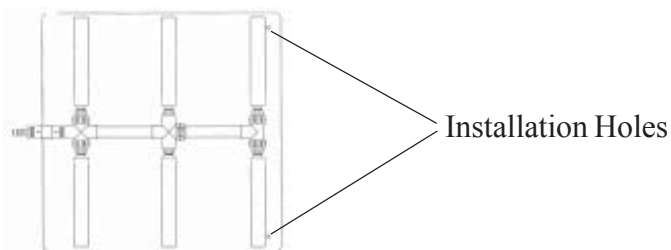


Figure 8

9. Place your tubing and diffuser assembly in your boat.

10. As you slowly paddle out to your diffuser placement site begin to lower the tubing into the water.

11. After you have reached the placement site, begin to slowly lower the diffuser assembly into the water with nylon rope.

WARNING: Do not lower the diffuser assembly into the water with the diffuser face down in the water. The barrier should be the piece of the assembly on the pond/lake bottom.

Diffuser Assembly Installation and Placement - continued

- using weighted or unweighted tubing -

12. As you lower the diffuser into the water paddle away from shore.
13. Once the diffuser assembly reaches the pond/lake bottom let go of one end of the rope and pull the rope back into the boat with the other end. Installing the diffuser assembly in this manner will help to insure that it does not flip over during installation.
14. Installation of your diffuser assembly is complete. Follow the same procedure if you have more than one diffuser assembly to install.
15. Upon returning to shore, attach the tubing from each diffuser assembly to the high temperature outlet hose coming out of the compressor cabinet and secure with the hose clamps provided. See Figure 9 for the proper coupling configuration.

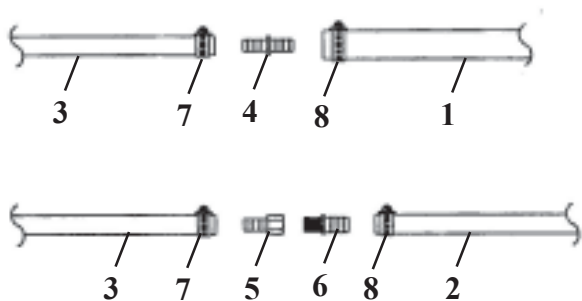


Figure 9

Item No	Description	Part Number
1	Weighted Airflo Tubing	*
2	Unweighted Airflo Tubing	**
3	High Temperature Heater Hose	46-0122
4	Brass Barbed Coupling	67-0008
5	Brass Barbed x NPT Fitting, Female	67-0010
6	Brass Barbed x NPT Fitting, Male	67-0009
7	Small Hose Clamp	46-0117
8	Large Hose Clamp	46-0124

* Weighted Tubing sold in 100 ft kit (P/N 12-0093-100)

** Unweighted Tubing sold in 100 ft kit (P/N 12-0094-100)

WARNING: Do not attach weighted or unweighted tubing directly to compressor, tubing may melt. A minimum of two feet of the high temperature heater hose must be connected between the compressor and the tubing. The fittings used to connect the heater hose to the tubing must be metal.

16. The unit is ready to start, proceed to Compressor Start-Up Section

Compressor Start-Up

1. Have a licensed, certified electrician bring power to the utility box in the cabinet.

WARNING: Cabinet must be connected to a grounded, metallic permanent wiring system or equipment-grounding terminal.

2. Turn each ball valve to about 1/3 open (SEE NOTE BELOW). Valve is closed when it is in the horizontal position (ie - perpendicular to the valve body) and full open when it is in the vertical position (ie - parallel to the valve body).

3. Plug in the compressor(s) and the ventilation fan.

CAUTION: Check that the air compressor(s) have the proper voltage and are drawing the correct running amperage per the specs on the next page.

4. Run compressor for five minutes, then carefully touch each valve. If any of the valves are cool to the touch open them a bit more. A cool valve is an indication of little or no flow passing through the valve.

IMPORTANT NOTE REGARDING COMPRESSORS WITH MULTIPLE OUTLET VALVES:

• **One valve must always be in a full open position.** If all valves are in a partially closed position this greatly increases the pressure at which the compressor must operate.

Example: A compressor with three diffuser assemblies at three different depths requires a separate valve for each diffuser assembly. The deepest diffuser assembly should have its valve fully open. The two shallower diffusers will take most of the air unless their valves are partially closed. If the valve going to the deepest diffuser were partially closed that would further increase the pressure at which the compressor must operate. **Thus, shortening motor longevity.**

AIR FLO START UP WARNING:

If you have an oxygen reading of less than 1 PPM at the depth where you have located your diffuser, Otterbine suggests the following running time:

WEEK 1	1 HR PER DAY
WEEK 2	3 HRS PER DAY
WEEK 3	8 HRS PER DAY
WEEK 4	24 HRS PER DAY

5. Return your warranty card to register your product. Plus, you will then receive a free newsletter that will keep you updated on all the latest Otterbine news.

Airflo System Specifications

System*	HP	Voltage Phase/Hz	Running Amp Draw @ 8PSI	Quantity of		Area Effected	Operating Depth	Pond Volume Influenced GPM (m ³ /hr)
				Air Compressors	Air Diffusers			
1	3/4	115/1/60	12	1	2	to 1/2 acre 1/2 - 1 acre 1 - 3 acres	4 - 8 ft 8 - 14 ft 14 - 18 ft	2250 3250 3750
		230/1/60	6					
		220/1/50	7	1	2	to 2023 m ² 2023 - 4046 m ² 4046 - 12140 m ²	1.2 - 2.4 m 2.4 - 4.3 m 4.3 - 5.5 m	(511) (738) (852)
2	1/4	115/1/60	4.6	1	1	to 1/2 acre 1/2 - 1 acre	8 - 14 ft 14 - 18 ft	3250 3750
3	3/4	115/1/60	12	1	1	to 1/2 acre 1/2 - 1 acre 1 - 3 acres	18 - 26 ft 18 - 26 ft 18 - 26 ft	4000+ 4000+ 4000+
		230/1/60	6					
		220/1/50	7	1	1	to 2023 m ² 2023 - 4046 m ² 4046 - 12140 m ²	5.5 - 7.9 m 5.5 - 7.9 m 5.5 7.9 m	(908+) (908+) (908+)
4	3/4	115/1/60	24	2	4	to 1 acre 1 - 5 acres 1 - 5 acres	4 - 8 ft 8 - 14 ft 14 - 18 ft	2250 3250 3750
		230/1/60	12					
		220/1/50	14	2	4	to 4046 m ² 4046 - 20234 m ² 4046 - 20234 m ²	1.2 - 2.4 m 2.4 - 4.3 m 4.3 - 5.5 m	(511) (738) (852)
5	3/4	115/1/60	24	2	6	to 3 acres 3 - 8 acres 3 - 8 acres 8 - 12 acres	4 - 8 ft 8 - 14 ft 14 - 18 ft 14 - 18 ft	2250 3250 3750 3750
		230/1/60	12					
		220/1/50	14	2	6	to 12140 m ² 12140 - 32375 m ² 12140 - 32375 m ² 32375 - 48562 m ²	1.2 - 2.4 m 2.4 - 4.3 m 4.3 - 5.5 m 4.3 - 5.5 m	(511) (738) (852) (852)
6	3/4	115/1/60	12	1	3	to 3 acres to 3 acres	8 - 14 ft 8 - 14 ft	3250 3250
		230/1/60	6					
		220/1/50	7	1	3	to 12140 m ² to 12140 m ²	2.4 - 4.3 m 2.4 - 4.3 m	(738) (738)
8	3/4	115/1/60	24	2	2	to 5 acres to 5 acres	18 - 26 ft 18 - 26 ft	4000+ 4000+
		230/1/60	12					
		220/1/50	14	2	2	to 20234 m ² to 20234 m ²	5.5 - 7.9 m 5.5 - 7.9 m	(908+) (908+)

Pumping rates may vary due to voltage, elevation, and relative humidity. Specification are subject to change without notice (Updated 2/15/02).

Note: Otterbine can manufacture a variety of Air Flo systems to meet the needs of even the largest lake. The above listing of sizes is only sampling. Please see your local Otterbine distributor or call Otterbine for help with sizing and placement of diffused aeration systems.

Airflo Maintenance

MAINTENANCE SCHEDULE	
COMPRESSOR: Twice per year	<ul style="list-style-type: none"> • Change air filter cartridge element (P/N 46-0116)
Once a year	<ul style="list-style-type: none"> • Replace rotary vanes and gasket
Every 3 years	<ul style="list-style-type: none"> • Replace electric motor bearing.
DIFFUSER ASSEMBLY: 3 years: (or earlier depending on conditions)	<ul style="list-style-type: none"> • Replace diffuser stones (P/N 10-0070)

CAUTION: All of Otterbine's air compressors are OIL-LESS. There is no need for lubrication. Lubricating oils used on, in or around the compressors, can cause damage or poor performance.

NOTE: ALL SERVICE WORK SHOULD BE PERFORMED BY AN AUTHORIZED OTTERBINE SERVICE CENTER. PLEASE CALL OTTERBINE AT (610)-965-6018 OR (800)-AER8TER FOR THE ONE NEAREST TO YOU.

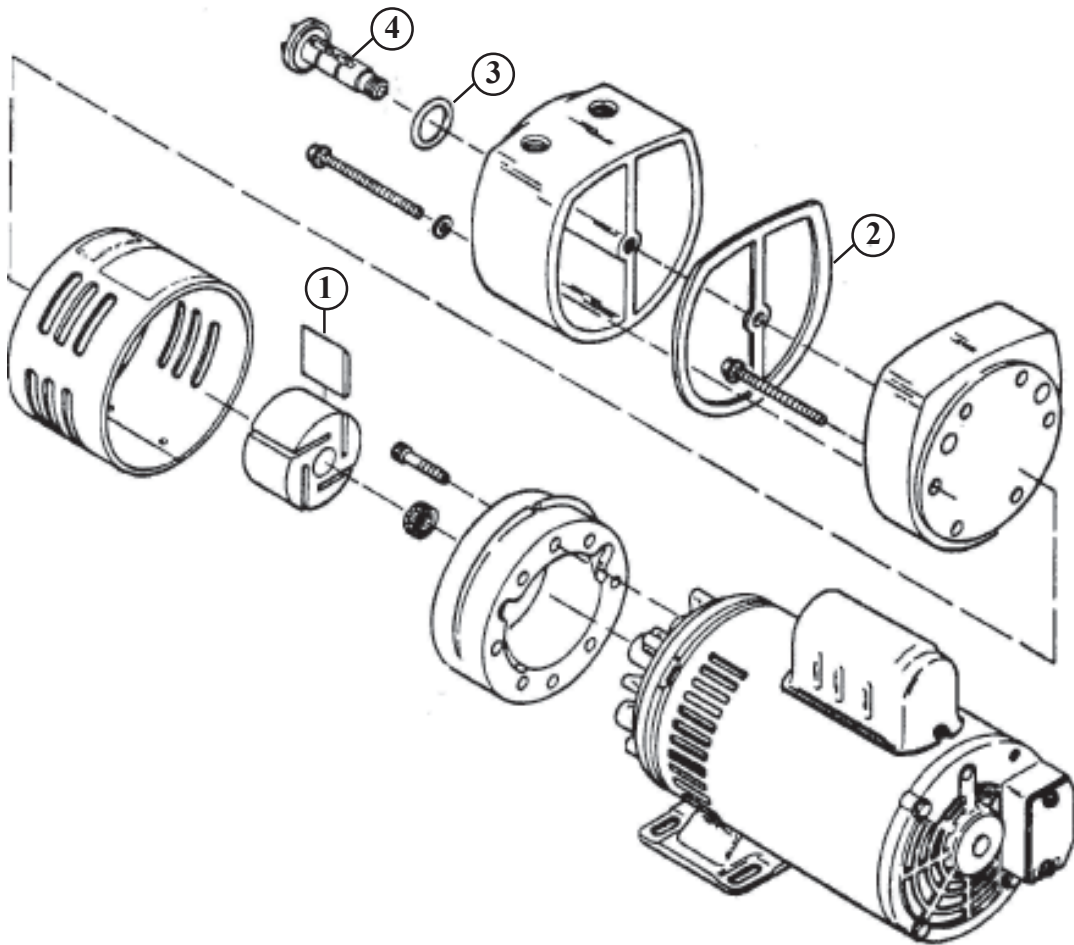
Replacement parts are available through your local Otterbine service center.

WARNING: DISCONNECT THE UNIT FROM THE POWER SOURCE BEFORE SERVICING THE UNIT!!!!

Airflo Troubleshooting Guide

PROBLEM	POSSIBLE CAUSE	SOLUTION
<ul style="list-style-type: none"> • Decreased air flow 	<ul style="list-style-type: none"> • Clogged diffuser stones • Loose valve • Clogged inlet filter • End caps leaking • Blocked inlet • Leak in outlet assembly • Multiple valve units: Valve flow needs adjusting. • High pressure (Install a 0-15psi pressure gauge at pressure relief valve location) • Vanes stuck (spin rotor 360° & listen for clicking noise as 4 vanes slide down to the body) 	<ul style="list-style-type: none"> • Change diffuser stones • Tighten valve attachment • Clean or replace air filters cartridge element in glass jar muffler • Tighten. If that doesn't work, replace end caps. • If felt on the internal muffler box cap, remove it. It isn't necessary in this application. • Check in & around cabinet • Check ground from compressor to lake edge. • Check for bubbles in lake. • One outlet must be fully open. • Check temperature on other valves. Hotter temperatures mean more flow. Try to adjust for equal air flow. • Check water depth to be sure diffuser isn't too deep (1psi=27.6" water). • See if diffuser is clogged, replace. • Check tubing to see if obstructed. If yes, remove diffuser and try to blow obstruction out with high pressure air. • If not clicking, remove end plate. Check vanes. Dislodge or replace if necessary.

Otterbine® Airflo Compressor Exploded Parts Drawing



Item	Description (Qty)	Part Number
1	Vane (4)	*
2	Gasket (1)	*
3	O-Ring (2)	56-0001-010
4	End Cap (2)	56-0001-011

* Part of Vanes/Gasket Kit - P/N 56-0003-001 for 1/4 HP Compressor
P/N 56-0003-002 for 3/4HP Compressor

Limited 2 year Warranty
Otterbine® Aerator

WARRANTY: Barebo, Inc 3840 Main Road East, Emmaus Pennsylvania 18049, U.S.A. hereby warrants, subject to the conditions hereinbelow set forth, that should the **OTTERBINE** aerator prove defective by reason of improper workmanship or materials at any time during the warranty period the Purchaser at retail will be guaranteed that **BAREBO** will repair or replace the said **OTTERBINE** aerator as may be necessary to restore it to satisfactory operating condition, without any charge for materials or labor necessarily incident to such repair or replacement, provided that:

- a) The enclosed Warranty Registration Card should be mailed to **BAREBO** within fifteen (15) days of the original receipt by the Purchaser at retail in order to avoid delays:

- b) The **OTTERBINE** aerator must be delivered or shipped, prepaid, in its original container or a container offering an equal degree of protection, to **BAREBO** or a facility authorized by **BAREBO** to render the said repair or replacement services or, if purchased from an authorized **OTTERBINE** dealer, to such dealer;

- c) The **OTTERBINE** aerator must not have been altered, repaired or serviced by anyone other than **BAREBO**, a service facility authorized by **BAREBO** to render such service, or by an authorized **BAREBO** dealer, and the serial number of the **OTTERBINE** aerator must not have been removed or altered: and

- d) The **OTTERBINE** aerator must not have been subjected to lightning strikes and other Acts of God, vandalism, freezing-in, accident, misuse or abuse, and must have been installed in conformance with applicable electrical codes (including proper electrical protection), and also installed, operated and maintained in accordance with guidelines in the Owner's Manual shipped with the Otterbine aerator.

No implied warranties of any kind are made by **BAREBO** in connection with this **OTTERBINE** aerator, and no other warranties, whether expressed or implied, including implied warranties of merchantability and fitness for a particular purpose, shall apply to this **OTTERBINE** aerator. Should this **OTTERBINE** aerator prove defective in workmanship or material, the retail Purchaser's sole remedy shall be repair or replacement as is hereinabove expressly provided and, under no circumstances, shall **BAREBO** be liable for any loss, damage or injury, direct or consequential, arising out of the use of, or inability to use, the **OTTERBINE** aerator, including but not limited to retail Purchaser's cost, loss of profits, goodwill, damages due to loss of product or interruption of service, or personal injuries to Purchaser or any person.

AIRFLO SYSTEM NO. _____

VOLTAGE _____ **PHASE** _____ **HERTZ** _____

TUBE LENGTH _____

SERIAL NUMBER _____



Water Works With Otterbine!

**Otterbine/Barebo, Inc.
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Emmaus, PA 18049
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