Water Works With Otterbine

CONCEPT 3

CE

Owner's Manual

A Guide to More Dependable
Water Quality Management
With Otterbine Barebo Inc.'s
1-5 Horsepower Surface Spray
Aerating Fountain

Table of Contents:

Revised 3/2/2001

Aerator Equipment

Unpack and inspect your aerator, report any damage to the carrier that delivered your aerator. Make sure you have received the following:

1. Unit - you will find a label located on the housing of the unit. Check the label to make sure you have received the correct horsepower and voltage aerator. The unit is supplied with a mating connector assembly with 2 meters of cable for splicing and a strain relief.

2. Float - including hardware kit to mount float to the unit

3. Warranty Registration Card - make sure to fill in your Otterbine warranty registration card and send it back to the factory so that we can send you our bi-annual customer newsletter, which will keep you up to date on all the latest aeration news. **WARRANTY IS VOID UNLESS CARD IS RETURNED.**

Electrical Requirements

Otterbine suggests coordinating electrical installation with physical installation. The electrician will need to be on hand for a one minute dry-run test of the unit and will also need to check the running amperage after installation. **These electrical tests are a crucial part of the installation process and should not be ignored.**

CAUTION: Otterbine aeration systems require the use of a residual current device (RCD) with a rated residual operating current not exceeding 30mA for safe operation. If the proper grounding and residual current device are not used, serious or FATAL electrical shock may occur.

- All electrical work must conform with European Community, national, and local codes.
- All electrical work must be done by a qualified electrician.
- A disconnect switch must be installed to provide 3mm contact separation in all poles.
- The motor unit contains no thermal protector. Separate over current protection must be provided to prevent burnout and possible fire hazard from overload or stalled motor.
- Thermal overload protection is required. The thermal overload must be set no higher than 115% of the maximum amperage stated on the motor housing label.
- If the supply cord connector is damaged, it must be replaced by a special cord available from your Otterbine Barebo distributor.

CAUTION: Disconnect all equipment in the body of water from the supply mains before physical entry into the water.

IMPORTANT! The conductor having green/yellow insulation shall only be connected to the ground terminal marked  or  .

VIGTIGT! Lederen med gron/gul isolation ma kun tilsluttes en klemme maerket  eller 

Mounting the Float to the Unit (Figure 1)

A. The unit will be received with the pumping chamber already mounted. Stand the unit upright and place the float onto it so the holes in the float line up with the holes in the mounting brackets.

B. Place a fender washer onto a hex bolt and insert into one of the four holes in the float making sure it also goes through the hole in the mouting bracket on the unit. Repeat this for the three remaining holes.

C. Place a flat washer and a nylon locknut onto each of the four hex bolts from Step B. Tighten each nylon locknut. Torque to 27 N-m

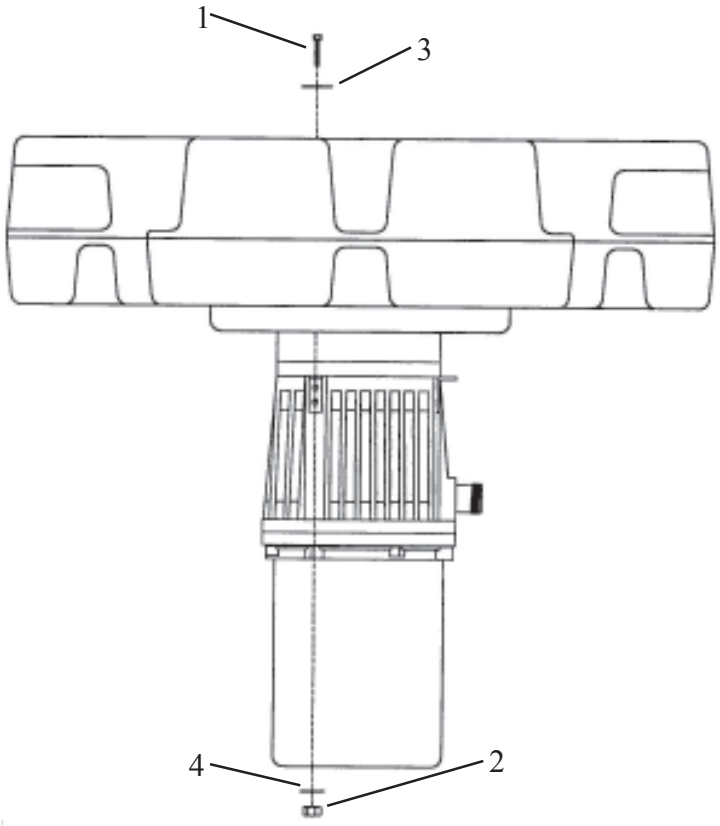

Figure 1

Item No	Description	Qty	Part Number
1	S/S Hex Bolt, M8 x 45mm	5	22-0022
2	S/S Nylon Locknut, M8	5	26-0007
3	S/S Fender Washer, M8 (5/16")	5	28-0008
4	S/S Flat Washer, M8 (5/16")	5	28-0018
5	Ty-Rap (used to secure power cable)	3	GP5008

NOTE: Quantities include extra hardware.

Physical Installation

Prior to installation please measure your water depth. All 1-5 HP Concept$_3$ Otterbine aerators require at least **75cm** of water to run properly. If the water is too shallow, dig out a portion of the pond bottom directly under the aerator. If high waves or large fluctuations in water depth occur, it may be necessary to allow for more than the required **75cm**. NOTE: The maximum depth of immersion for the unit is 75cm (must be attached to the float)

A. The aerator is supplied with 2 meters of H07RN-F cable. Additional cable of the same or higher rating must be spliced to this cable. The splice must be waterproof and conform to all electrical codes for underwater connections.

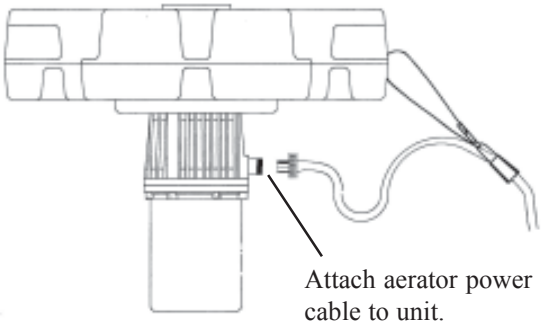

Figure 2

B. Attach your Otterbine power cable to the aerator. Using a screwdriver, remove clamp from connector nut. Align the pigtail connector on the cable up to the pin configuration on the bulkhead on the aerator. **HAND TIGHTEN** the coupling nut onto the bulkhead connector. **DO NOT OVER TIGHTEN -- OVER TIGHTENING WILL CAUSE A FRACTURE IN THE CONNECTOR AND COULD LEAD TO A SHORT CIRCUIT**--see Figure 2. Using a screwdriver, refasten clamp around connector nut.

NOTE: You will notice a small amount of silicon compound on the female end of the aerator connector. This compound has been applied during assembly and is needed in order to make proper seal between the two connectors. **DO NOT REMOVE COMPOUND!** When servicing the aerator make sure to re-apply compound (Otterbine part# 48-0001).

CAUTION: KEEP HANDS CLEAR OF THE IMPELLER WHEN TRYING TO START THE AERATOR!

C. Have your electrician perform an on-shore dry-run test:

1. Check and compare the actual power supply at the site to the information on the aerator's nameplate in regard to: motor voltage, phase, and frequency. IF VOLTAGE VARIATIONS ARE NOT WITHIN THE RANGE ON THE FOLLOWING CHART, DO NOT OPERATE THE UNIT!

Voltage	Low	High
220/240	197	250
380	380	420
415	400	436

2. With the aerator on dry land, attach the power cable to the aerator and the power supply.

3. Start the unit on the shore.

4. Run the unit 1 minute to break in seals. DO NOT RUN UNIT FOR MORE THAN 1 MINUTE -- MOTOR DAMAGE CAN OCCUR. Check for COUNTER CLOCKWISE rotation at this time.

5. IF Steps 1-4 are successful, you are ready to install the unit in the water. Proceed with following instructions.

CAUTION: OTTERBINE® aerators are designed to run in a COUNTER CLOCKWISE DIRECTION and CURRENT UNBALANCE BETWEEN THE LEGS ON 3 PHASE UNITS SHOULD NOT EXCEED 5%. Steps "L-M" on page 9 determine current unbalance.

D. Install the cable strain relief device. Pass the wire hoop through one of the holes in the float and around the aerator power cable. Reattach wire hoop to strain relief -- see Figure 3. The splice must be on the aerator side of the cable strain relief.

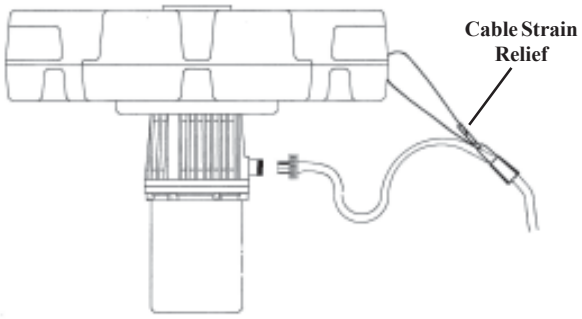

Figure 3

There are two different methods of securing your aerator, anchoring and mooring. Otterbine suggests mooring as it will be easier to install and service the aerator. On the next page you will find instructions for mooring the aerator; if you prefer to anchor your aerator, please see "Anchoring Your Aerator."

MOORING YOUR AERATOR:

A. Proceed to page 7, follow steps E-K.

B. Proceed to page 9, follow steps L-O.

ANCHORING YOUR AERATOR:

A. Proceed to page 8, follow steps E-K.

B. Proceed to page 9, follow steps L-O.

Mooring the Aerator

An illustration showing how to moor an aerator is given in Figure 4.

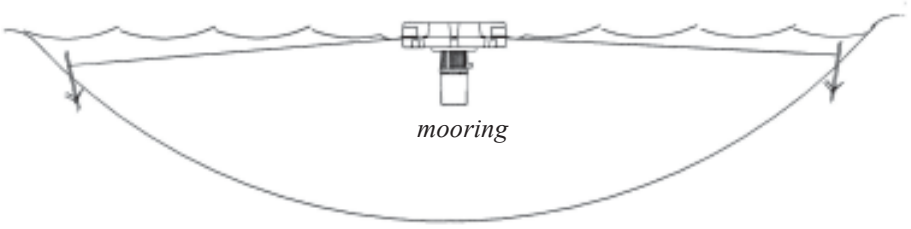

Figure 4

E. You will need the following items in order to moor your Otterbine aerator.

1. Use all brass and stainless steel hardware in the installation of your Otterbine aerator.
2. Otterbine recommends using .63 cm or 1.25 cm polypropylene rope or stainless steel cable for your mooring lines.
3. At the mooring points themselves you will need a wooden stake, 1.25 cm of rebar or earth anchor.

F. Choose a suitable location for your Otterbine aerator.

G. Secure your first mooring point. If you are using a stake or 1.25cm rebar, make sure to pound the mooring point securely into the ground on the outer edge of the pond. It is allowable to have the mooring points slightly below the water surface.

H. Attach the mooring lines to the holes in the float. Use a strong, tight knot as it will secure the Otterbine aerator in its place.

I. Launch your aerator into the water. Walk one mooring line around to the other side of the pond.

J. Pull your Otterbine aerator into your previously chosen location.

K. Put in the other mooring stake. Tie down your Otterbine aerator leaving enough slack in your lines to allow the aerator to turn 90^{o} or 1/4 turn. The slack in the lines will allow for proper start up, wave action, and fluctuations in the water level. Proceed to step L (**page 9**).

Anchoring the Aerator

An illustration showing how to anchor an aerator is given in Figure 5.

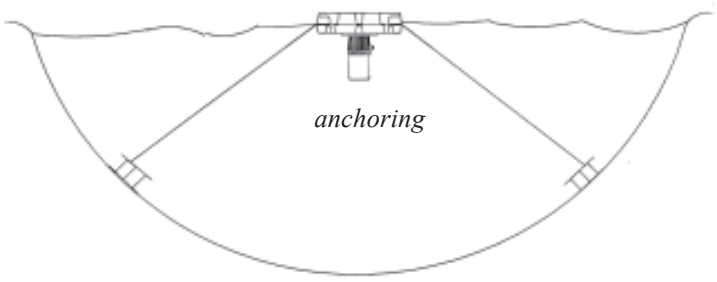

Figure 5

E. You will need the following items to anchor your Otterbine aerator:

1. Use all stainless steel and brass hardware in the installation of your Otterbine aerator.
2. Otterbine recommends using .63 cm or 1.25 cm polypropylene rope or stainless steel cable for your anchoring lines.
3. Two 27 - 36 kilo anchors.
4. Small boat.

F. Choose a suitable location for your Otterbine aerator.

G. Launch your aerator into the water upside down, with the motor housing sticking up into the air. Take a piece of rope and pass it through one of the holes on the float.

H. In a small boat tow the aerator into your previously chosen location.

I. Determine where to locate the anchors. Where the anchors are located will vary depending on the depth of your pond. See the chart below to determine the best location for your anchors.

MAXIMUM DEPTH	DISTANCE BETWEEN ANCHORS
meters	meters
1.5m	3.4m
1.8m	4.6m
2.1m	6.1m
2.4m	9.1m
2.7m	12.0m
3.0m	16.7m
3.3m	21.2m
3.6m	26.8m
3.9m	30.3m
4.2m	36.4m
4.6m	42.4m

J. Drop in the first anchor line. Place your aerator in the desired location and securely tie the anchor line to one of the holes on the outside edge of the float.

K. Drop in the second anchor line. Securely tie the anchor line to the hole on the outside edge of the float which is directly opposite of the first anchor line that was tied onto the float. Make sure the unit can rotate 90° or 1/4 turn. The slack in the anchoring lines will allow for proper start up, wave action, and fluctuations in the water level. Flip the unit over. Proceed to step L (page 9).

L. Start your unit.

M. Have your electrician do the following while the unit is in the water under load:

1 PHASE UNITS: Record running voltage & running amperage and cable length and size on the inside of the motor control panel. Go to step N.

3 PHASE UNITS:

1. Check the direction of the rotation. Three-phase motors can run in either direction depending on how they are connected to the power supply. When the three cable leads are first connected to the power supply, there is a 50% chance that the motor will run in the right direction.

2. Establish the correct motor rotation by running in both directions. Change rotation by exchanging any two of the three motor leads. **The rotation that gives the lowest current readings is always correct. Failure to do the above MAY CAUSE THE MOTOR TO FAIL WITHIN ONE WEEK OF RUNNING TIME. MOTOR FAILURE DUE TO REVERSED POLARITY WILL NOT BE COVERED UNDER WARRANTY.**

3. Check current readings in amps on each leg using the three possible hook-ups. Roll the motor leads across the starter in the same direction to avoid motor reversal. EXAMPLE:

A B C	⇒	A B C	⇒	A B C
1 2 3		3 1 2		2 3 1

4. Calculate the percent of current unbalance:

- **A. Add the three line amp values together.**
- **B. Divide the sum by three,** yielding current average.
- **C. Pick the amp value that is furthest from the average current** (either high or low).
- **D. Determine the difference between this amp value (line C) and the average (line B).**
- **E. Divide this difference (line D) by the average (line B).**
- **F. Multiply the result (line E) by 100** to determine percent of unbalance.

5. Current unbalance should not exceed 5% at the service factor load. If unbalance cannot be corrected by rolling leads, locate source of unbalance & correct it. IF Leg furthest from average stays on the same power lead, THEN the primary cause of unbalance is the power source. IF leg furthest from average moves on each of the hookups with a particular motor lead, THEN the primary cause of unbalance is the "motor side" of starter. Consider: damaged cable, leaking splice, poor connection, or faulty motor as possible causes.

6. Record running voltage & running amperage, power control center serial #, and cable length and size on the sticker inside the power control panel. Proceed to step N.

N. Have the electrician test the residual current device (RCD) for proper operation.

CAUTION: The aerator should be allowed to run continuously for 12 hours after installation. This will allow the aerator to properly "break in."

Maintenance

Your Otterbine aerator requires periodic maintenance:

WARNING: Disconnect or unplug aerator before carrying out any maintenance

A. **Once a year**, disconnect the unit from the power source and physically inspect the aerator and underwater cable for any cuts, cracks or breaks. These may cause oil leaks and/or electrical shorts. Inspect and clean the pumping chamber components and screen.

B. **After every three running seasons**, a simple oil change is necessary to keep your unit running smoothly. Otterbine oil must be used for this oil change. Please contact your local Otterbine distributor to order a maintenance kit, p/n 12-0077.

When a unit is properly cared for, it will give you years of trouble free service. If a problem does arise, please contact your Otterbine distributor or the factory directly.