



Water Works With Otterbine



SUB-TRITON₂ Owner's Manual

A Guide to More Dependable
Water Quality Management
With Otterbine Barebo Inc.'s
Subsurface Aspirating Aeration Systems

Welcome Aboard!

Welcome to the growing family of people who depend on aerators for better water quality control and aesthetic improvement. All Otterbine products are safety tested and approved by ETL, ETL-C and CE

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Water Quality Specialists



Barebo, Inc. is a team of scientists, engineers, and crafts persons who specialize in efforts to improve water quality. Otterbine aerators 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.

Otterbine aerators, made of stainless steel and high tech engineering plastics, reflect the results of aerator research and development programs that started in 1956, plus the experience gained through thousands of installations on commercial fish farms, golf courses, parks, and architectural applications.

Follow the Guidelines

You'll find guidelines for installing, operating, and maintaining your aerator 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 aerator.

SAFETY INSTRUCTIONS

	WARNING
	<p>PLEASE READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND USING THIS PRODUCT. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE PRODUCT.</p>

ALL ELECTRICAL WORK MUST BE PERFORMED BY A QUALIFIED LICENSED ELECTRICIAN AND CONFORM WITH ALL APPLICABLE ELECTRICAL SAFETY CODES

Tous travaux électriques doivent être effectués par un électricien professionnel qualifié et conforme à tous les codes applicables sécurité électrique

ALWAYS SWITCH OFF/DISCONNECT ALL EQUIPMENT IN THE WATER BEFORE SERVICING OR PERFORMING ANY MAINTENANCE

Toujours éteindre l'équipement dans l'eau avant entretien ou de tout entretien

DO NOT OPERATE THE FOUNTAIN WHEN PEOPLE ARE IN THE WATER

Ne pas utiliser la fontaine quand les gens sont dans l'eau

CAUTION: KEEP HANDS CLEAR OF THE IMPELLER WHEN OPERATING!

ATTENTION: Garder les mains loin la turbine lors de l'utilisation!

! WARNING !




ELECTRICAL SHOCK HAZARD

Disconnect From Electrical Supply
When Servicing This Equipment

Unplug Or Switch Off All Appliances In The
Water Before Carrying Out Maintenance

This Product Must Be Properly Grounded

DANGER

STAY OUT OF WATER WHEN
EQUIPMENT IS ENERGIZED





WARNING

HAZARDOUS VOLTAGE.
Contact may cause
electric shock or burn.
Turn off and lock out
power before servicing.

DANGER

SPINNING IMPELLER
TURBINE ROTATIVE



KEEP HANDS CLEAR
TENIR LES MAINS ÉLOIGNÉE

WARNINGS

- Before entering, wading in or swimming in the water in which Otterbine Aerators or Fountains are installed, make sure they are PHYSICALLY disconnected from their electrical power sources.
- Aerators located in or near garden ponds and similar locations must be equipped with Ground Fault Circuit Interrupter.
- The permissible temperature range for this equipment is -12°C to 40°C (10°F to 104°F)
- It is possible for the water to become slightly polluted in the rare case that an oil leak occurs.
- If the power cord is damaged, it must be replaced by a special cord or assembly available from Otterbine/ Barebo, Inc. or an authorized Otterbine/Barebo, Inc. sales and service center.
- Avant d'entrer, pataugeant dans ou en nageant dans l'eau dans laquelle Aérateurs Otterbine ou fontaines sont installées, assurez-vous qu'ils sont physiquement déconnectés de leur source d'alimentation électrique.
- Aérateurs situés dans ou à proximité des bassins de jardin et des emplacements similaires doivent être équipés de disjoncteur.
- La plage de température admissible pour cet appareil est -12°C to 40°C (10°F to 104°F) aux.
- Il est possible pour que l'eau devient légèrement polluées dans les rares cas où une fuite d'huile se produit.
- Si le cordon d'alimentation est endommagé, il doit être remplacé par un cordon spécial ou de montage disponible à partir Otterbine / Barebo, Inc ou une autorisation Otterbine / Barebo, les ventes Inc et centre de service.

INSPECT AERATOR EQUIPMENT

Immediately report any shipping damage to the carrier that delivered your aerator.

Inspect your aerator and verify the following:

Unit - Check the nameplate located on the housing of the aerator unit to make sure you have received the correct horsepower and voltage aerator.

Power Control Center (PCC) - Verify the PCC is compatible with the aerator unit horsepower and voltage. Refer to the electrical specifications on the nameplate located inside on the door of the PCC.

Power Cable Assembly - Verify the correct cable gauge and length.

For proper warranty consideration return your Otterbine warranty registration card.

ELECTRICAL/PCC INSTALLATION

ELECTRICAL INSTALLATION MUST BE PERFORMED BY A QUALIFIED LICENSED ELECTRICIAN AND CONFORM TO ALL APPLICABLE LOCAL AND NATIONAL CODES

DISCONNECT EQUIPMENT FROM ELECTRICAL SUPPLY BEFORE SERVICING OR PERFORMING MAINTENANCE

Use Only OTTERBINE power cord. Do not splice or repair the cord, replacement is necessary if damage occurs.

The standard Power Control Center includes a fiberglass NEMA 4X enclosure, Hand-Off-Auto switch, twenty-four hour weekly programmable timer (mechanical timer option available) for auto setting, branch circuit protection, motor disconnect, surge protection, motor overload protection, and class A personnel ground fault protection.

Caution: GFCI Protection is required. If GFCI protection is not used, serious or FATAL electrical shock may occur.

Attention: GFCI/RCD de protection est nécessaire. Graves ou mortelles choc électrique peut se produire s'il n'est pas utilisé.

A. Feeder

1. Proper feeder circuit protection in accordance with all applicable local and national codes **must** be provided to the power control center.
2. Be certain to properly size feeder conductors to allow for no more than 5% voltage drop for the entire circuit from the feeder source to the aerator unit. Failure to do so may damage the aerator and void product warranty.

60Hz. Electrical Specifications			
HP	Volts	Phase	Full Load Amps
1	115	1	12.8
1	208/230	1	6.4
2	208/230	1	11.2
3	208/230	1	12.8
3	208/230	3	8.0
3	380	3	4.0
3	460	3	4.0
5	208/230	3	14.0
5	380	3	7.6
5	460	3	7.0
5	575	3	5.3

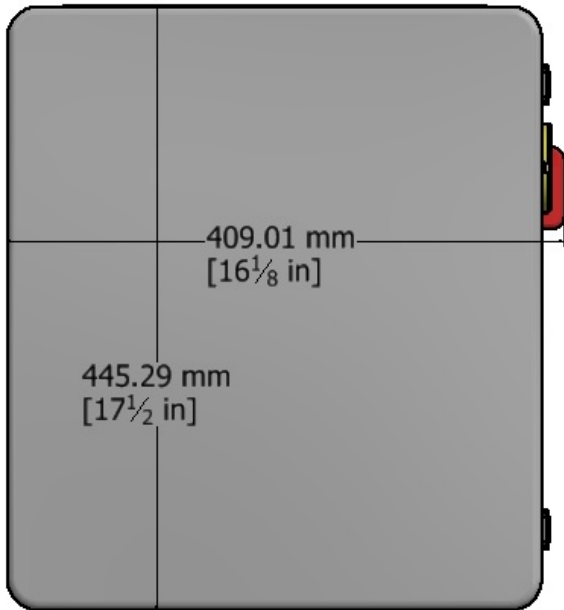
50Hz. Electrical Specifications			
HP	Volts	Phase	Full Load Amps
1	230	1	7.0
2	230	1	12.4
3	230	1	16.2
3	380/415	3	4.3
5	380/415	3	8.6

B. PCC Location

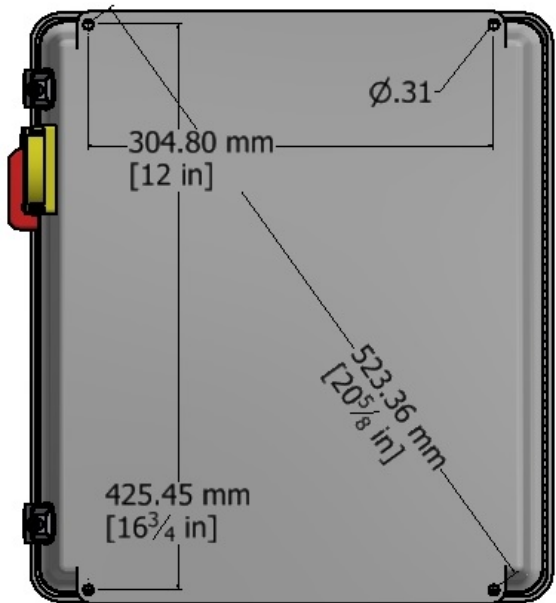
1. The power control center should be mounted where easily visible from the shoreline where the aerator is located.

Important: The power control center **shall not** be accessible from the water.

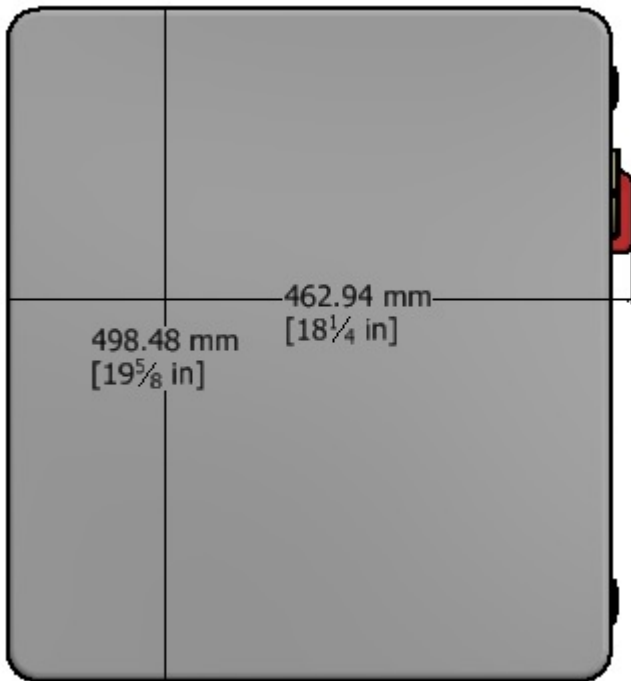
Important: Le Centre de Contrôle de la puissance ne doit pas être accessible à partir de l'eau



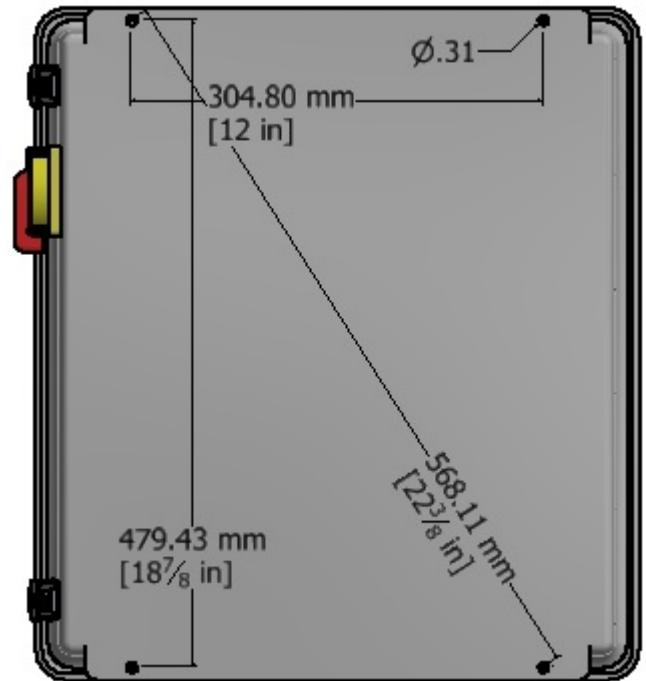
Single Phase – Overall Dimension



Single Phase – Mounting Hole Layout



Three Phase – Overall Dimension



Three Phase – Mounting Hole Layout

C. PCC Mounting

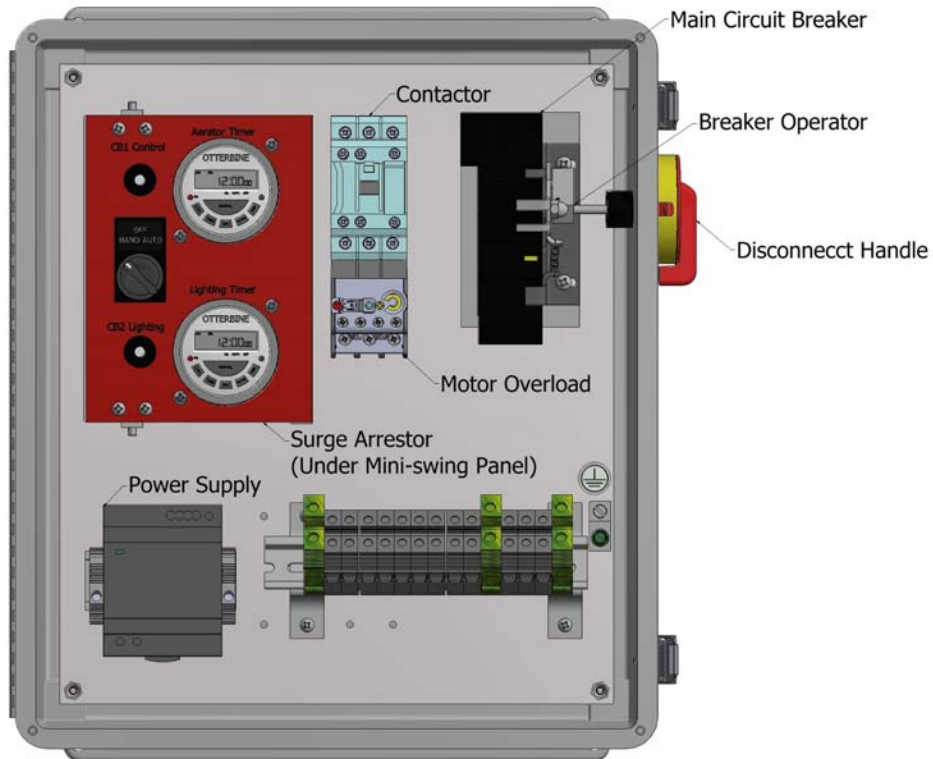
1. To prevent damage to the enclosure mount the enclosure using all four (4) mounting holes.
2. Whenever possible do not mount the PCC in direct sun light.

D. PCC Cables & Connections

1. Only Otterbine Barebo, Inc. factory approved power cord is to be used from the PCC to the aeration unit with no junction boxes or splices. **Only** use power cord gauges and lengths specified by Otterbine at the time of cable purchase. (Contact your Otterbine Distributor for proper cable sizing)
 2. It is recommended that all exposed cable between the PCC and the shoreline be installed in non-metallic conduit. It is **important** that aerator and lighting cables be installed in individual conduits to avoid induced interference between cables which could cause random GFCI tripping.
 3. **Always** use strain relief cord connectors to attach the Otterbine cable to the PCC when not using conduit.
 4. Cables and conduits must only enter into the bottom of the PCC.
 5. Factory connections may loosen during shipping. Verify tightness of all screw terminal connections before energizing.
 6. Power input and output wiring connections are accessed from the bottom of the enclosure.
- Reference label inside enclosure for terminal torque values and wire sizes.



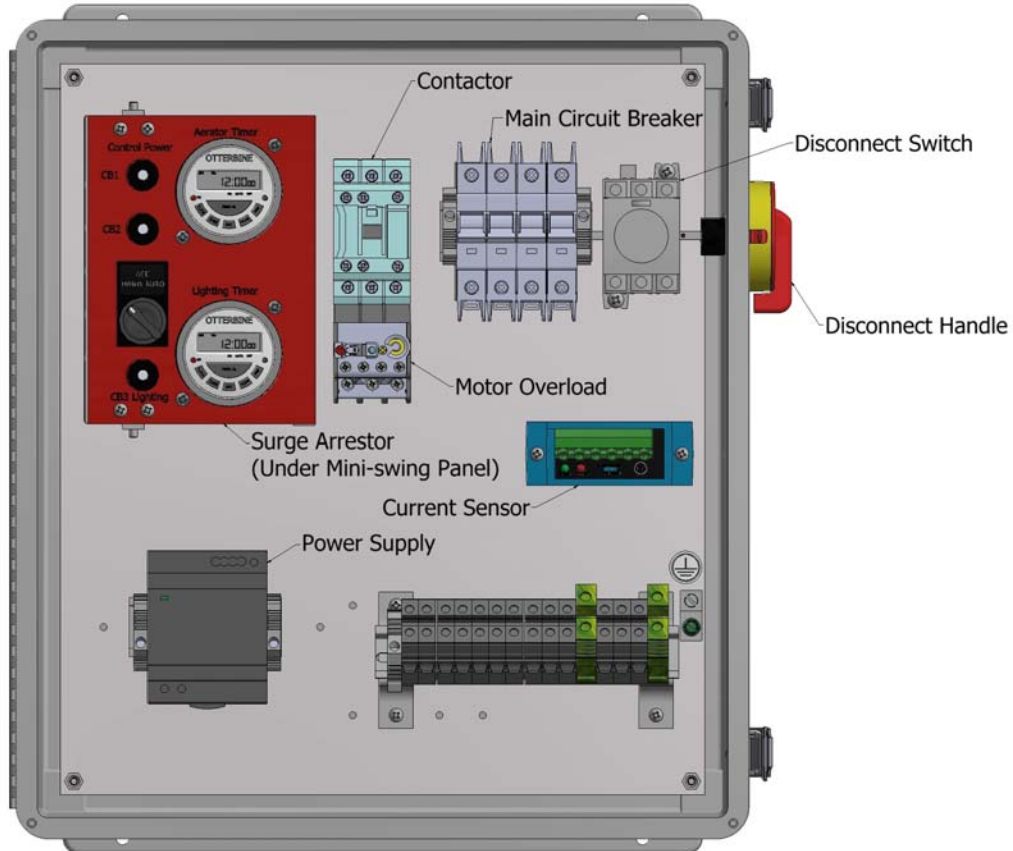
Single Phase Panel



Single Phase Panel – Cover Removed



Three Phase Panel

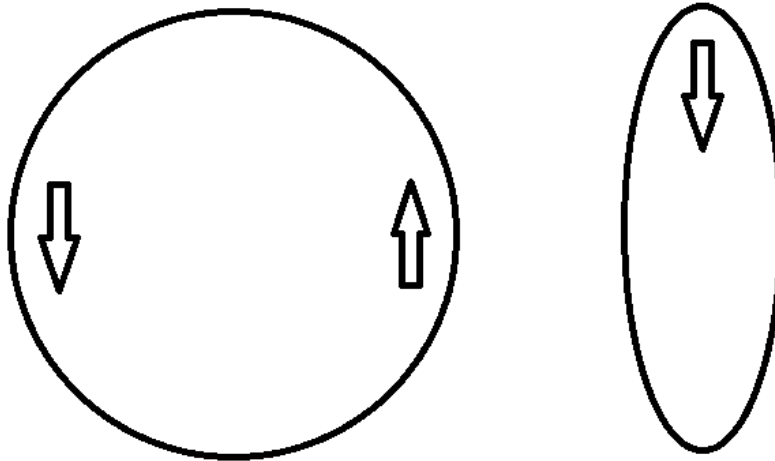


Three Phase Panel – Cover Removed

PHYSICAL INSTALLATION

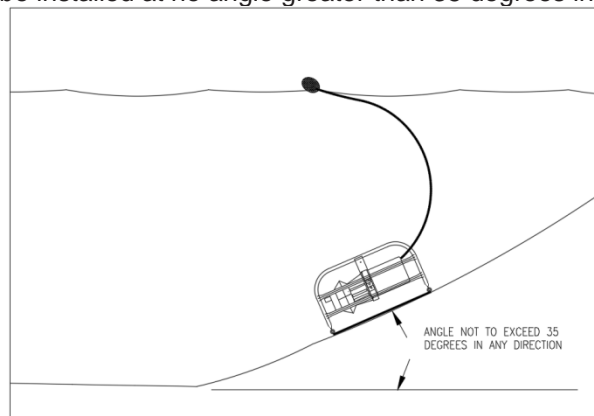
Prior to installation please measure your water depth, the SUB-TRITON₂ models require at least **30"/1.7m** of water to run properly. If high waves or large fluctuations in water depth occur, it may be necessary to allow for more than the required **30"/1.7m**. **Note:** Mixer model requires 36"/1.9m of water.

A. Select a suitable location for your Otterbine aerator. See the aerator location chart.



B. Since the Sub-Triton₂ rests on the bottom, select a site where the bottom is flat and free of large rocks which may prevent the unit from laying flat.

WARNING: The unit must be installed at no angle greater than 35 degrees in any direction.



C. Measure your water depth where the unit will be located. The Sub-Triton₂ Aspirator Model requires a minimum of 2.5'/.7m of water while the Mixer Model requires 3'/.9m to run properly. If the water is too shallow, a different location must be located. Maximum depths for the Sub-Triton₂ Aspirating models depend on horsepower (refer to the following chart). Verify the measured depth of the water does not exceed the maximum depth specified in the chart for your unit.

Horsepower	Maximum Depth
1	12' (3.5 meters)
2	21' (6.5 meters)
3	24' (7.2 meters)
5	28' (8.5 meters)

Note: Maximum operating depth of the Mixer model is 28' (8.5 meters)

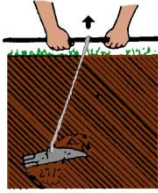
D. The SUB-TRITON₂ must be securely moored to order to keep the unit from moving. The extremely high pumping rates of this unit could push the unit in the water if not secured properly. The mooring lines also serve as a method to retrieve the unit.

Note: Use of concrete anchor kit is required on Mixer model.

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

- Use all brass and stainless steel hardware in the installation of your Otterbine aerator.
- Use 1/4"/1.63 cm or 1/2"/1.25 cm polypropylene rope or stainless steel cable for your mooring lines.

- **At the mooring points themselves you will need a wooden stake, 1/2"/1.25 cm of rebar or a duck bill" type earth anchor** (Otterbine strongly suggests using earth anchors for installation. See your local Otterbine distributor for more information.)

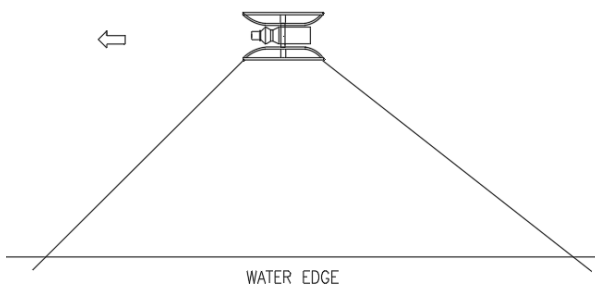


Duckbill Earth Anchors are driven into the ground, using a drive rod and heavy hammer, compacting the earth as they drive downward, until they reach the recommended depth. After removing drive rod, installer pulls up on cable. This planes or rotates the anchor into load lock position, like a toggle bolt in undisturbed earth.

2. Choose the type of mooring you will need based on your application

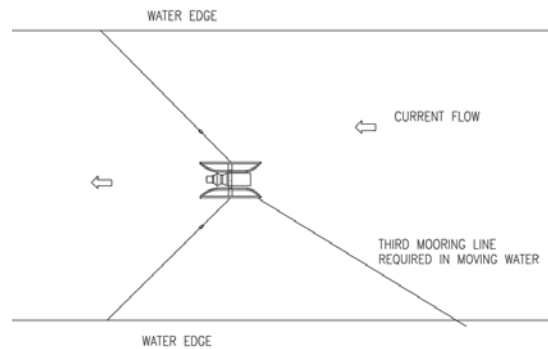
Single Sided Mooring – Stable Water

Attach one mooring line to front of support frame, attach second mooring line to rear of support frame



Two Sided Mooring – Moving Water

Attach third mooring line as shown



3. **Secure your first mooring point.** If you are using a stake or 1/2"/1.25cm rebar, make sure to pound the mooring point securely into the ground on the outer edge of the pond. If you are mooring with an earth anchor, you will need to place the earth anchor two feet into the pond and then pound the earth anchor about two feet into the pond bottom. The earth anchor will allow your mooring lines to be virtually unnoticed, as they will be hidden two feet beneath the surface of the water.

WARNING: When this unit is placed in moving water, the unit must be moored and anchored.

Concrete anchor kit P/N 12-0018 must be used. This kit has forms and the necessary hardware to produce (2) 70 lb. concrete weights to anchor the unit. (Concrete mix is not included in the kit) This kit is included and must be installed on all Mixer units. If required, contact your Otterbine distributor to obtain this kit.

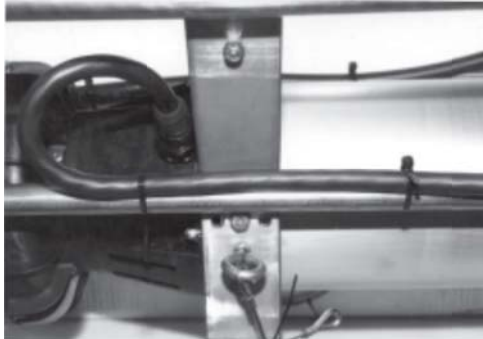
NOTE: Concrete anchors must be installed on Mixer model.

- E. If required, construct and attach the concrete weights per instructions included in the kit.** Please note that the concrete must be allowed to harden at least 24 hours before being placed in the water.
- F. Adjusting Discharge Angle - Aspirating Model:** The unit can be adjusted to allow a +/- 20 degree tilt in the discharge. To adjust, remove the top bolts securing the power unit to the support frame (one on each side). Loosen the bottom bolts, and move the unit to align the bolts with the desired holes in the support frame. Install the bolts and secure all loosened/removed bolts. Mixer Model: The unit can be adjusted to allow a +10 degree tilt in the discharge. To adjust, remove the 3" bolts from the two angle brackets. (Refer to Mixer exploded view diagram). Reinstall the bolts in the desired mounting hole and secure with washer and nut.

NOTE: Due to the extreme amount of water being discharged by the Mixer model, it is highly recommended that the discharge be set at the maximum 10 degrees to prevent erosion in front of the unit.

WARNING: Aiming the discharge down toward the bottom may erode the bottom in front of the unit, creating an unstable area, and allow the unit to shift. Otterbine does not recommend pointing the discharge down.

- G. Attach your Otterbine power cable to the aerator.** Align the pigtail connector on the cable up to the pin configuration on the bulkhead connector. **HAND TIGHTEN** the coupling nut onto the bulkhead connector. **DO NOT OVER TIGHTEN OVER TIGHTENING WILL CAUSE A FRACTURE IN THE CONNECTOR AND COULD RESULT IN A SHORT CIRCUIT.**
- H. Fasten the strain relief to the support frame.** Using two wire ties, secure the cable to the side of the support frame and place a small loop in the cable between the last wire tie and the connector.



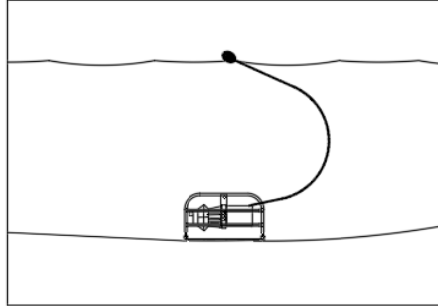
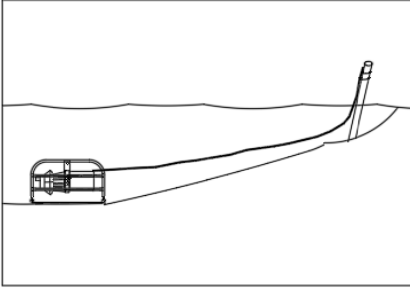
- I. Have your electrician perform an on-shore dry-run test:**
1. **Check and compare the actual power supply at the site to the information on the aerator's nameplate in regard to: motor voltage, phase, and frequency. IF THIS INFORMATION DOES NOT MATCH, DO NOT OPERATE THE UNIT!**
 2. **With the aerator on dry land, attach the power cable to the aerator and power supply.**
 3. **Turn the handle mechanism on exterior of the power control center to "ON" position.**
 4. **Energize the unit by turning the "Hand, Off/Auto" switch to the "Hand" position. DO NOT RUN UNIT FOR MORE THAN 1 MINUTE - MOTOR DAMAGE CAN OCCUR. Check for COUNTER CLOCKWISE rotation.**
 5. **Turn the "Hand/Off/Auto" switch to "Off" and the disconnect switch to "Off".**
 6. **IF Steps 1-5 are successful, you are ready to install the unit in the water. Proceed with following instructions.**

ON MIXER MODELS, STEPS J THROUGH M ARE OMITTED.

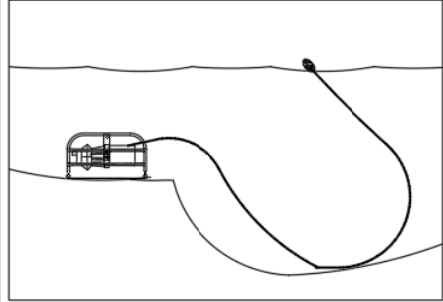
- J. Attach the aspirator tubing to the barbed fitting on the venturi assembly.** Secure the tubing to the support frame using two nylon wire ties. Cut the tubing to the desired length, allowing for fluctuations in the water depth. Connect the float/coupling assembly to the other end.



NOTE: If the float is not desired, the aspirator tubing can be secured to a rod or stake (Otterbine recommends using a 1.5" PVC pipe) along the edge of the water. The end of the tube must be fasten above the water surface. The muffler can be removed from the float and inserted into the top of the tube.



CORRECT



WRONG

NOTE: The maximum length of aspirator tubing is 500 feet or 152 meters. The tubing must not be any deeper in the water than the aerator.

- K. **Place the screen assembly (PART# F-900-004) over the unit.** Pull the mooring cables and the aspirator tubing out through the sides/top of the unit.
- L. **Secure the screen to the unit, using the ties provided.** Use eight wire ties to fasten the screen to the support frame. Place one tie on each corner below the top side support. Use the other four ties to secure the top of the screen to the support frame at each corner.



- M. **Use several wire ties to secure the bottom of the screen to the barrier and the support rods on all four sides.** Place a wire tie through each of the holes of the barrier and secure the screen in position.



- N. **Fasten a mooring line to each of the mooring cables.**
 1. Place your Sub-Triton₂ into your previously chosen location.
 2. Secure your second and, possible third mooring points to shore
- O. **Place the unit in the water, lowering the unit slowly to insure that it will rest in the proper position. Verify the discharge is pointing in the proper direction.**
- P. **Secure the mooring lines.**
- Q. **Energize your unit.**

SYSTEM STARTUP

DO NOT ALLOW THE AERATOR TO OPERATE “DRY” OUT OF THE WATER

IMPORTANT: Otterbine aerators are designed to run in a Counterclockwise direction facing the top impeller end.

Current unbalance for three phase systems shall not exceed 5%.

IMPORTANT: Aérateurs Otterbine sont conçus pour fonctionner dans le sens antihoraire regardant l'extrémité supérieure de la turbine. Courant de déséquilibre pour les trois systèmes de la phase ne doit pas dépasser 5%

A. User Control Functions

1. Disconnect Switch



Disconnect Off – Single & 3 Phase

Removes Power to the Aerator for Maintenance/Service/Repair, Timers are not Powered



Disconnect On – Single & 3 Phase

Power Applied, Operation Depends on Position of HOA Switch, Timers are Powered



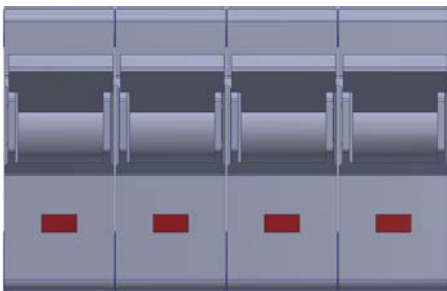
Disconnect Tripped – Single Phase Only

Indicates a ground fault trip or circuit breaker overcurrent



Disconnect Reset – Single Phase Only

Moving the handle slightly past the off position will reengage the circuit breaker and allow the breaker to be turned on.



Breaker On (Handle Up) – 3 Phase Only

Main circuit breaker is on and aerator is ready to operate. Disconnect must also be on.



Breaker Off/Tripped (Handle Down) – 3 Phase Only

Indicates a ground fault trip or circuit breaker overcurrent

2. HAND-OFF-AUTO switch.



H-O-A IN OFF
Aerator & Lighting
Will Not Function,
Timers are
Powered and
Operating,
GFCI's may be
Reset



H-O-A IN AUTO
Allows Automatic
Control of Aerator
& Lighting by
Timers & Other
Control Options



H-O-A IN HAND
Turns on Aerator,
Bypasses Timer
& Non-Critical
Control Functions

3. Aerator Ground Fault Protection – Single Phase.

- a. Ground fault protection is built into the Square D circuit breaker.
- b. Ground fault protection is enabled whenever the circuit breaker is on.
- c. The ground fault protection should be periodically tested (Every 6 months) by pressing the yellow test button and verifying the circuit breaker turns off. Panel must be powered but aerator doesn't need to be on to test ground fault protection.

4. Aerator Ground Fault Protection – 3 Phase

- a. 3 phase panels utilize an Eaton current sensor and a shunt trip circuit breaker to provide protection.
- b. Ground fault protection is enabled whenever the green power indicator on the current sensor is lit. The indication is visible with the enclosure door open through a hole in the cover panel. If the indicator is not lit when the panel is powered (disconnect & breaker on), ground fault protection is not working and the panel should be repaired before using.
- c. The ground fault protection should be periodically tested (Every 6 months) by pressing the yellow test button and verifying the circuit breaker turns off. Disconnect and circuit breaker should be on but the aerator doesn't need to be running.

5. Lighting ground fault protection

- a. The same device(s) used to provide ground fault protection for the aerator is also used to protect the lighting circuits.

6. Timer Operation

- a. Setting the Clock - Press and hold the "CLOCK" key. Press the "DAY" key to display the correct day. Do the same with the "HOUR" and "MIN" keys.
- b. Setting the Timer - Press the "DAY" key to select one of the 15 daily programs. Then press the "TIMER" key to display "1 ON" and set the turn on time by pressing the "HOUR" and "MIN" keys. To set the turn off time press the "TIMER" key again to display "1 OFF". Then again set the hour and minutes. Repeat this process for up to 8 on/off cycles per day.
- c. To enable the timer press the "MANUAL" key until the line is above "AUTO".
- d. Refer to timer instructions supplied for more detailed operation.



B. Energizing the Unit (To be performed by a qualified technician)

1. Single Phase Units: Motor rotation is factory determined and not field adjustable.
2. Three Phase Units: Verify correct motor rotation (Counter Clockwise looking at the top/impeller end of the unit). Check current readings on each phase. Verify three phase operating currents are balanced within 5%.
To calculate the percent of current unbalance:

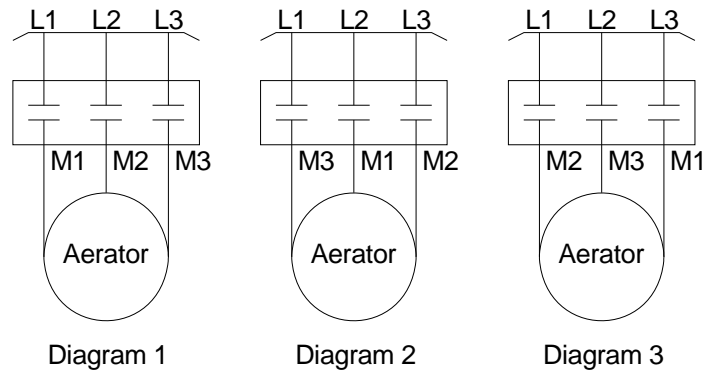
Determine the Average Current:

- a. Measure each of the three phase currents
- b. Add the three phase amperage values together.
- c. Divide the sum by three.
- d. This is the average current value.

Determine Current Unbalance:

- a. Select the phase current with the greatest difference from the average (calculated above).
- b. Determine the difference between this phase current and the average current value.
- c. Divide the difference by the average.
- d. Multiply the result by 100 to determine percent of unbalance.

3. Use connection diagram 1, 2 or 3 at right which results in the lowest current unbalance. Roll the motor cable leads on the aerator output terminal block in the same direction to avoid motor reversal. If the current unbalance is not corrected by rolling leads, locate the source of the unbalance and correct it.



a. If the phase farthest from the average current stays on the same power lead after being moved the primary cause of unbalance is the power source.

b. If the phase farthest from the average current moves on each of the connections with a particular motor lead, then the primary cause of unbalance is on the "motor side" of the circuit. Consider: damaged cable, leaking splice, poor connection, or a faulty motor as possible causes.

4. Once the unit is operational, record the operating voltage, amperage, power control center serial number, power cable length and cable gauge on the label inside the power control panel.

MAINTENANCE

For Warranty Consideration Work Must Be Performed By an Authorized Service Facility

- A. Once a year, disconnect the unit from the power source and physically inspect the aerator, float and electrical cable. Visible damage to the motor unit or cable should be repaired to avoid safety hazards and/or potential failure.
- B. Every three years, an oil change using "Otterbine Oil" is recommended to keep your aerator operating smoothly. Please contact your local Otterbine distributor to order a maintenance kit, P/N: C2-MKIT. **Warning:** Use the oil level gauge. Do not overfill motor housing with oil, may cause damage.

When a unit is properly cared for, it will give you years of trouble free service.

For Service, Repairs or Parts, Contact Your Local Otterbine Distributor

or

Call Otterbine Directly at 1-800-237-8837 or (610) 965-6018.

WINTERIZATION

If you live in a region of the country that experiences long periods of cold weather, you might want to take your aerator out of the water. If an aerator becomes frozen in, there is a possibility of motor damage.

Damage caused to the motor due to freezing will not be covered under warranty

The unit will freeze in if the weather stays severe for a long enough period of time. You can decrease the chance of freezing in if you run these units 24 hours a day during long periods of extremely cold weather.

MAXIMUM CABLE LENGTHS (From Service Entrance to C2 Unit)

Concept 2 Maximum Cable Lengths											
	HP	Electrical Rating	Motor FLA	12AWG / 4mm ²		10AWG / 6mm ²		8AWG / 10mm ²		6AWG / 16mm ²	
				Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
60Hz	1	115V 1Ph 60Hz	12.8			150	45.72	250	76.2		
	1	208/230V 1Ph 60Hz	6.4	375/425	114/130	600/675	183/206	950/1000	290/305		
	2	208/230V 1Ph 60Hz	11.2	200/225	61/68.6	325/375	99.1/114	525/600	160/183	825/925	251/282
	3	208/230V 1Ph 60Hz	12.8			275/325	83.8/99.1	450/500	137/152	725/800	221/244
	3	208/230V 3Ph 60Hz	8.0	350/375	107/114	550/625	168/191	900/1000	274/305		
	3*	380V 3Ph 60Hz	4.7	1000	304.8						
	3*	460V 3Ph 60Hz	4.0	1000	304.8						
	5	208/230V 3Ph 60Hz	16.0	200/225	61/68.6	325/350	99.1/107	500/575	152/175		
	5*	380V 3Ph 60Hz	7.8	700	213.36	1000	304.8				
	5*	460V 3Ph 60Hz	8.0	900	374.32	1000	304.8				
5*	575V 3Ph 60Hz	6.0	1000	304.8							
50Hz	1	220-240V 1Ph 50Hz	7.0	350	106.68	550	167.64	875	266.7		
	2	220-240V 1Ph 50Hz	12.4	225	68.58	350	106.68	575	175.26		
	3	220-240V 1Ph 50Hz	16.2			300	91.44	500	152.4		
	3*	380/415V 3Ph 50Hz	4.3	1000/1000	305/305						
	5*	380/415V 3Ph 50Hz	7.0	775/850	236/259	1000/1000	305/305				

* Cable for these systems may be available in longer lengths, call the factory to inquire.

!!IMPORTANT!!	Cable lengths are based on a 5% cable voltage drop between the PCC and the motor unit. It is important to consider the total voltage drop is 5% including the branch circuit to the PCC.
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TROUBLESHOOTING GUIDE

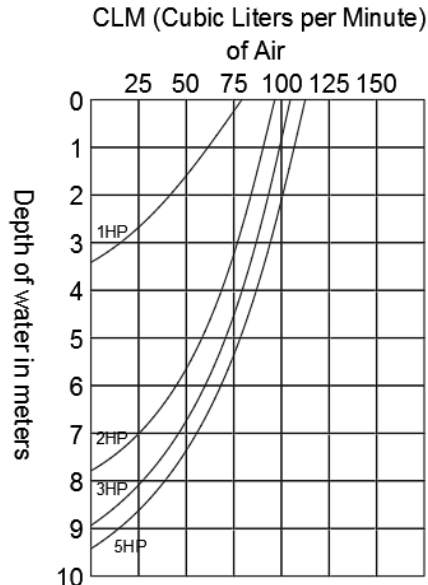
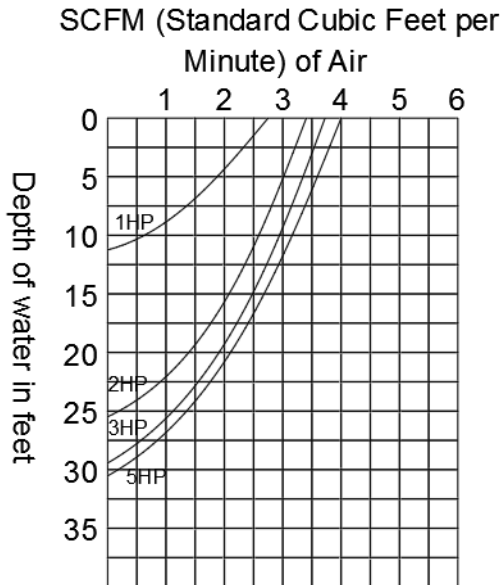
Small spray pattern (Spray drops gradually , i.e. minutes or hours).	Clogged intake	Remove debris
	Clogged screen	Remove debris
	Loose impeller	Tighten impeller bolt
Cavitation or low spray pattern. (Spray drops suddenly , less than one second.)	Low line voltage	Check voltage at the PCC & at the aerator. Make sure the unit is within the specified voltage range.
	Check for air bubbles surfacing around float	Make sure mooring and anchoring lines are securely tightened
	Debris between slinger and Impeller	Remove debris
Motor will not start	Breaker/fuse has tripped	Check circuit breaker or fuse, reset and/or replace, if necessary. Check voltage.
	Loose or broken terminals	Look for loose or broken terminals.
	Low voltage	Measure power to starter. Check acceptable maximum cable length (see below)
	Defective power cable	Check cable. If defective, call distributor.
	GFCI has Tripped	Reset and test GFCI device. If device trips again call electrician or distributor

Technical Specifications – Aspirating Model

Model	HP	Voltage and Phase	Motor RPM	Running Current Draw (Amps)	** Pond Volume Influenced ft ³	Minimum Depth	Shipping Weight*
100	1	115 1Ph	1725@60Hz	12.6	210,000	2.5'	202 lbs
	1	208-230 1Ph	1725@60Hz	6.5	210,000	2.5'	202 lbs
	1	220 1Ph	1425@50Hz	7.3	794,850 L	80 cm	92 kg
200	2	208-230 1Ph	1725@60Hz	11.5	420,000	2.5'	202 lbs
	2	220 1Ph	1425@50Hz	12.0	1,589,700 L	80 cm	92 kg
300	3	208-230 1Ph	1725@60Hz	12.5	630,000	2.5'	202 lbs
	3	220 1Ph	1425@50Hz	14.5	2,384,550 L	80 cm	92 kg
	3	208-230 3Ph	1725@60Hz	8.7	630,000	2.5'	205 lbs
	3	380 3Ph	1680@60Hz	4.7	610,000	2.5'	205 lbs
	3	460 3Ph	1725@60Hz	4.1	630,000	2.5'	205 lbs
	3	380/415 3Ph	1425@50Hz	4.3	2,384,550 L	80 cm	93 kg
500	5	208-230 3Ph	1725@60Hz	13.5	1,050,000	2.5'	205 lbs
	5	380 3Ph	1680@60Hz	7.5	1,022,000	2.5'	205 lbs
	5	460 3Ph	1725@60Hz	7.0	1,050,000	2.5'	205 lbs
	5	380/415 3Ph	1425@50Hz	6.2	3,974,250 L	80 cm	93 kg

* Shipping weight includes unit, 50' (16.7m) of cable and power control center.

** Pond volume influenced based from empirical data and may vary due to voltage, elevation, and relative humidity.



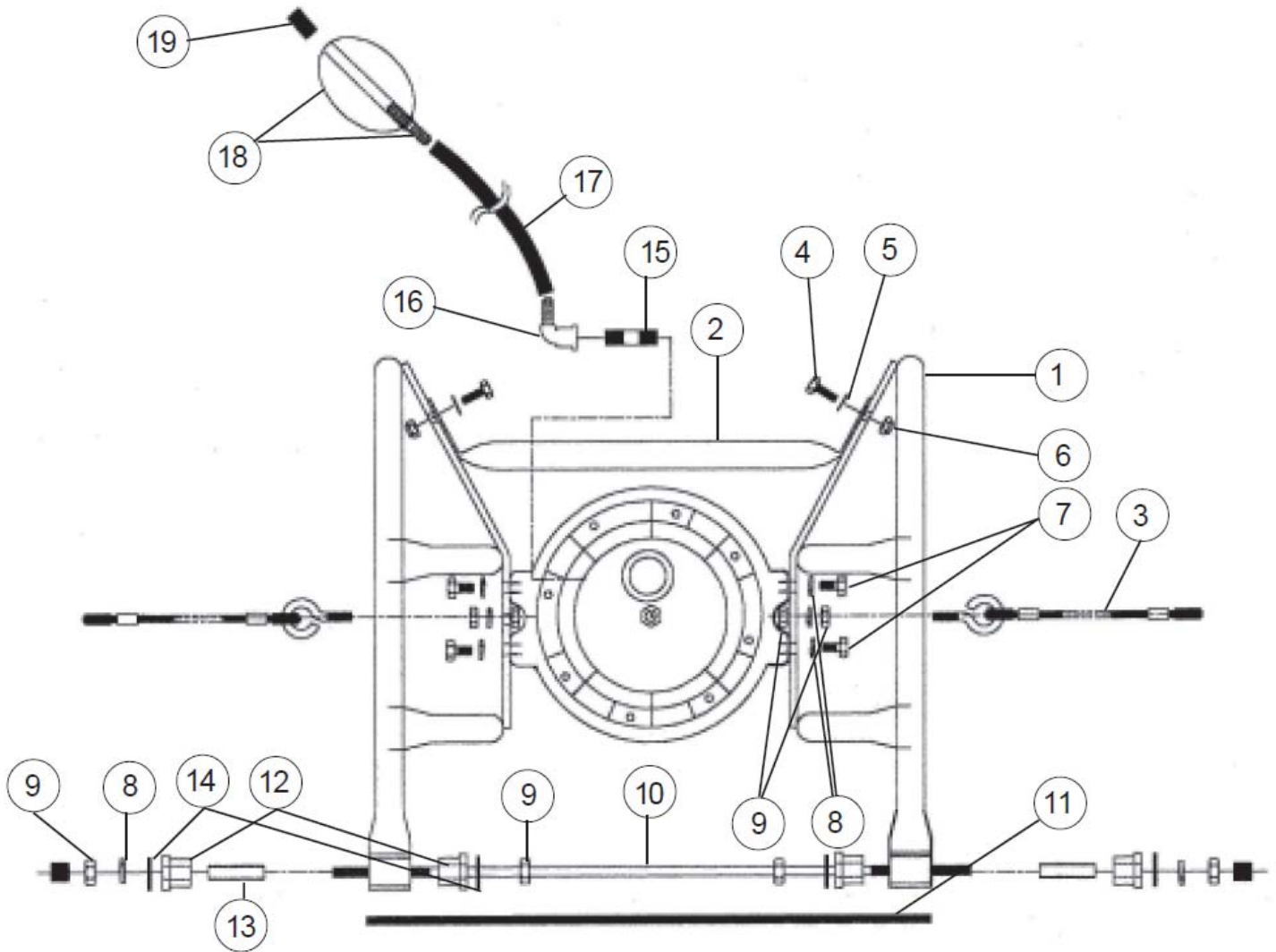
Technical Specifications – Mixer Model

Model	HP	Voltage and Phase	Motor RPM	Running Current Draw (Amps)	** Pond Volume Influenced ft ³	Minimum Depth	Shipping Weight*
100	1	115 1Ph	1725@60Hz	12.6	490,000	3'	202 lbs
	1	208-230 1Ph	1725@60Hz	6.5	490,000	3'	202 lbs
	1	220 1Ph	1425@50Hz	7.3	1,854,560 L	1m	92 kg
200	2	208-230 1Ph	1725@60Hz	11.5	908,000	3'	202 lbs
	2	220 1Ph	1425@50Hz	12.0	3,709,300 L	1m	92 kg
300	3	208-230 1Ph	1725@60Hz	13.7	1,470,000	3'	202 lbs
	3	220 1Ph	1425@50Hz	12.5	5,563,950 L	1m	92 kg
	3	208-230 3Ph	1725@60Hz	8.8	1,470,000	3'	205 lbs
	3	380 3Ph	1680@60Hz	4.7	1,430,000	3'	205 lbs
	3	460 3Ph	1725@60Hz	4.2	1,470,000	3'	205 lbs
	3	380/415 3Ph	1425@50Hz	4.0	5,563,950 L	1m	93 kg

* Shipping weight includes unit, 50' (16.7m) of cable and power control center.

** Pond volume influenced based from empirical data and may vary due to voltage, elevation, and relative humidity.

Otterbine® Sub-Triton₂ Exploded Parts Drawing

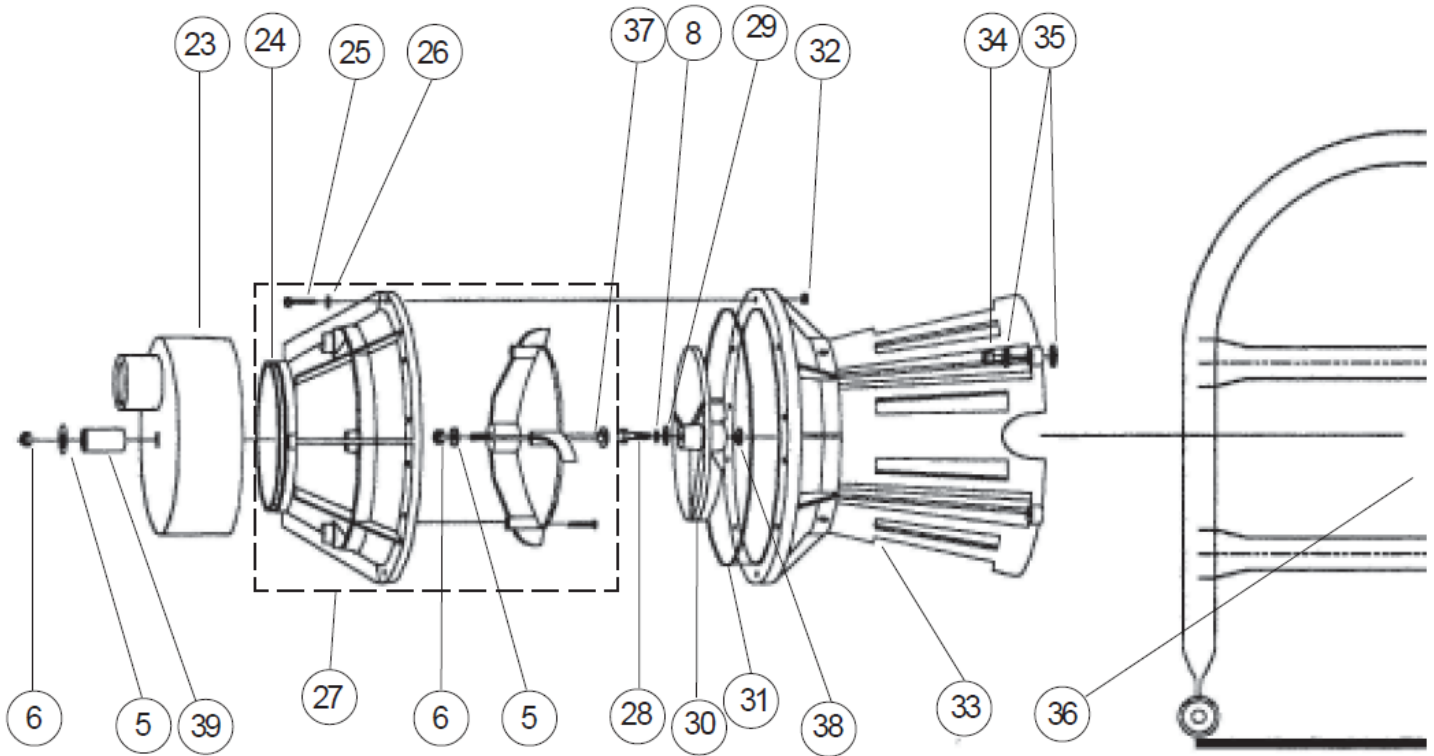


Item	Description	Qty.	Part #
1	Support Frame	2	10-0009
2	Support Brace	1	40-0003
3	Mooring Cable Assembly	2	10-0010
4	5/16" Bolt	2	106-302
5	5/16" Flat Washer	4 (2)	28-0018
6	5/16"-18 Lock Nut	4 (2)	GP1208
7	3/8" Bolt	4	C2-111
8	3/8" Lock Washer	10 (12)	EP6301
9	3/8" Hex Nut	12 (14)	MP2001
10	Support Rod	2	40-0011
11	Bottom Barrier	1 (0) 0 (1)	41-0004 41-0005
12	Bushing	8	41-0002
13	2" Spacer	4	40-0005
14	3/8" Fender Washer	8 (6)	29-0004
15	Pipe Nipple	1 (0)	46-0006
16	Elbow Fitting	1 (0)	46-0007
17	Tubing	50 (0)	TUBING

Item	Description	Qty.	Part #
18	Float/Coupling Assembly	1 (0)	10-0014
19	Muffler	1 (0)	46-0005
Items Not Illustrated			
22	Concrete Weight Kit	0 (1)	12-0018

Note: Quantity in () is for mixer model if different than aeration model.

Otterbine® Sub-Triton₂ Aspirator Model Pumping Chamber

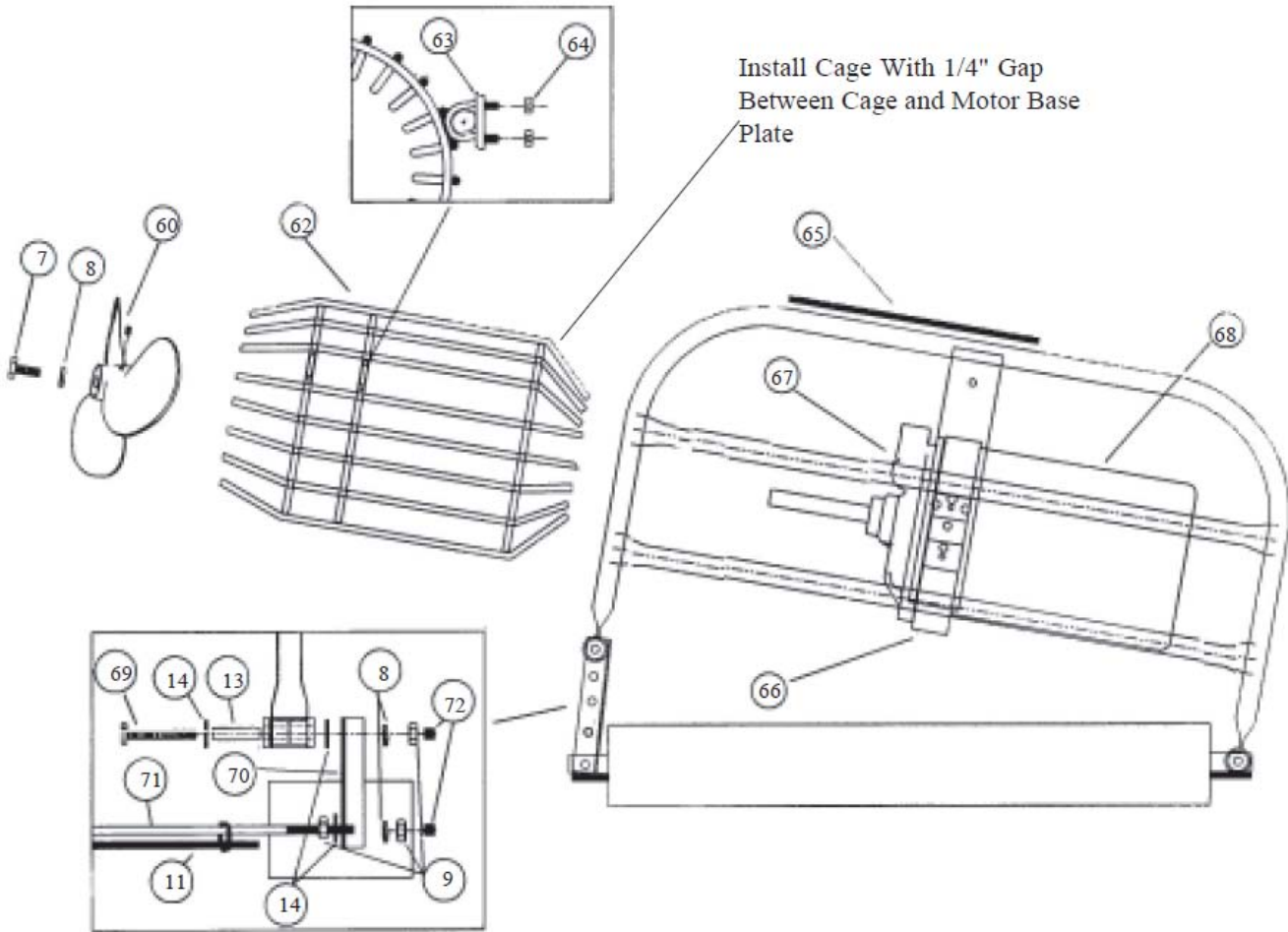


Item	Description	Qty.	Part #
5	5/16" Flat Washer	4 (2)	927-004
6	5/16"-18 Lock Nut	4 (2)	GP1208
8	3/8" Lock Washer	15 (14)	EP6301
23	Venturi Assembly	1 (0)	10-0013
24	Manifold O Ring	1 (0)	49-0018
25	10-24 x 1.25" Bolt	8 (0)	MP2004
26	#10 Flat Washer	8 (0)	GP5011
27	Volute Manifold Assy	1 (0)	10-0006
28	3/8-16x 1.25" Bolt	1 (0)	C2-131
29	3/8" Flat Washer	1(0)	927-003
30	Impeller, 1HP/60Hz only	1	C2-811
	Impeller, 1HP/50Hz only		C2-816
	Impeller, 2HP/60Hz only		C2-812
	Impeller, 3HP/60Hz or 2HP/50Hz only		C2-813
	Impeller, 5HP/60Hz or 3HP/50Hz only		C2-815
	Impeller, 5HP/50Hz only		C2-817
31	Pump Chamber O Ring	1 (0)	C2-706
32	10-24 Lock Nut	8 (0)	GP1207
33	Strainer/Lwr Cham Assy.	1 (0)	10-0005
34	¼" Lock Nut	4 (0)	C2-112
35	¼" Flat Washer	8 (0)	927-000
36	Power Unit	1	*
37	5/16-18x5 ¼ Carr. Bolt	1 (0)	C2-140
38	Shim, prop spacer	1 (0)	40-0099
39	Spacer, 1.375" Long	1 (0)	895-0045

Note: Quantity in () is for mixer model if different than aeration model.

* Part number depends on model and horsepower rating.

Otterbine® Sub-Triton₂ Mixer Option



Item	Description	Qty.	Part #
7	3/8" Bolt	0 (1)	C2-111
8	3/8" Lock Washer	10 (13)	EP6301
9	3/8" Hex Nut	12 (14)	MP2001
11	Bottom Barrier	0 (1)	41-0005
13	2" Spacer	4	40-0005
14	3/8" Fender Washer	8 (10)	29-0004
60	Mixer Impeller w/ Set Screw	0 (1)*	
	1HP 60Hz		50-0006-001
	2HP 60Hz & 1HP 50Hz		50-0006-002
	3HP 60 Hz & 2HP 50Hz		50-0006-003
	3HP 50Hz		50-0006-053
62	Protective Cage	0 (1)	C2-340
63	Cage Clamp	0 (4)	C2-345
64	1/4" Lock Nut	4 (8)	C2-112
65	Vortex Plate	0 (1)	41-0006
66	Brass Ring		Reference
67	Motor Base Plate		Reference
68	Power Unit	1	*
69	3/8-16 x 3" Bolt	(2)	22-0004
70	Adjustment Bracket	(2)	C2-350
71	Support Rod	(2)	40-0011
82	Rod End Cap	(4)	46-0012

Note: Quantity in () is for mixer model if different than aeration model.

* Part number depends on model and horsepower rating.

**Limited 3 year (moving and related parts)
+ 5 year (non-moving parts) Warranty
Otterbine® Product**

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** product 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** product 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** product 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** product 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** product must not have been removed or altered: and
- d) The **OTTERBINE** product 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 product.

No implied warranties of any kind are made by **BAREBO** in connection with this **OTTERBINE** product, and no other warranties, whether expressed or implied, including implied warranties of merchantability and fitness for a particular purpose, shall apply to this **OTTERBINE** product. Should this **OTTERBINE** product 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** product, 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.

AERATOR MODEL _____

HORSEPOWER (circle one): 1 2 3 5

VOLTAGE (circle one): 115 230 208-230 380 415 460 575

PHASE (circle one): Single Three FREQUENCY (circle one): 50Hz 60Hz

CORD GAUGE & LENGTH _____

UNIT SERIAL NUMBER _____

PCC SERIAL NUMBER _____

OPTIONS _____



Water Works With Otterbine!

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Emmaus, PA. 18049
U.S.A.**

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