

SPECIFICATIONS A FLOATING SURFACE AERATION SYSTEM

1.0 GENERAL

1.1 DESCRIPTION

- A. Manufacturer shall furnish a floating aeration system capable of pumping water from below the surface of a body of water and mixing it throughout the body of water.
- B. A submersible motor shall draw water into a propeller chamber where it shall be pumped into the atmosphere in the form of a random boil effect.
- C. The water droplets shall become oxygen enriched and return to the surface, therefore transferring oxygen from the atmosphere into the body of water.
- D. This repeated action shall effectively mix the body of water and distribute the dissolved oxygen continuously.
- E. Aeration system shall include a motor in a housing, attached to a float. This assembly shall be connected to an electrical control panel by underwater power cable, all of which as specified in SECTION 1.2.

1.2 AERATOR COMPONENTS DESCRIPTION

- A. **Float** shall be made of linear low density polyethylene, with a minimum 14" (for 1.5-5.5HP) and 8" (for 1/2HP) discharge area. This area shall be protected by a stainless steel discharge guard. Four Series 300 Stainless Steel brackets shall be attached to the float, around which a protective Series 300 Stainless Steel intake screen shall be mounted. The motor housing shall be attached to the brackets during installation.
- B. **Propeller** shall be precision machined and formed using Series 300 Stainless Steel. It is connected to the motor shaft by a Series 300 Stainless Steel bolt.
- C. **Propeller chamber** shall be enclosed by a Series 300 Stainless Steel intake screen. Screen shall be capable of keeping out any debris which may impede the propeller's performance.
- D. **Motor housing** shall be Series 300 Stainless Steel. 1.5-5.5HP shall have a permanent Series 300 Stainless Steel electrical hub welded on the side of the housing to allow electrical cable entry. The 1/2HP shall have a Series 300 Stainless Steel electrical hub welded on the bottom of the housing to allow electrical cable entry.

- E. **Motor** shall contain a Series 300 Stainless Steel shaft incorporating a permanent, split phase capacitor run on single phase and a polyphase induction on three phase. The rotor shall be dynamically balanced and run in a ball bearing supported system. The stator windings shall be double dipped and baked with a Class F insulation, designed for oil immersion operation. The oil shall be a highly refined mineral oil of food grade quality, specially formulated for lubrication. It shall meet FDA regulations. The oil shall provide continuous lubrication of bearings and internal seals and further function as an efficient heat transfer medium, allowing the motor to operate at 1725 RPM, at relatively low temperatures. The motor shall be contained in the motor housing by a Series 300 Stainless Steel top plate.
- F. **Seals** used to protect the motor against water or oil leakage shall be a mechanical, rotating type assembly, composed of silicon carbide and Series 300 Stainless Steel. All elastomers shall meet UL 778 requirements. This assembly shall then be encapsulated and protected within a Series 300 Stainless Steel cartridge assembly.
- G. **Underwater power cable** shall be UL Listed and specifically designed for underwater use. The conductors are flexible, stranded copper wire sized for the amp draw and length of run. The conductors shall be resistant to oil, water and cracking. Power cable shall be fitted with a cable strain relief device, located within five feet of motor housing, capable of being attached to the S hook mounted on the motor housing band clamp. This will ensure that no potential damage can occur to any cable connections, due to tension on the cable.
- H. **Underwater power cable disconnect** shall be located approximately three feet from the motor housing. It is a two piece molded assembly made of thermoplastics, meeting UL 778 requirements. The cap end shall be permanently connected to the underwater pin and socket connector (see Section 1.2 Item I.). The body end of the disconnect shall be permanently attached to the underwater power cable and sealed with an approved compound. This is intended to prevent water entry if damage should occur to the cable. The disconnect shall be sealed with an internal o-ring and by an external Series 300 Stainless Steel clamp ring, which can be easily opened.

- I. **Underwater Pin and Socket Connector** (1.5-5.5HP) shall consist of a Series 900 IP68 pin and socket connector. It shall be of a 4 pin configuration rated 32 amps at 600 volts AC. The pin end shall be potted into a Series 300 Stainless Steel 90° adapter elbow with an approved ridged epoxy. This assembly shall be permanently attached to the Series 300 Stainless Steel hub that is welded onto the side of the Series 300 Stainless Steel motor housing. The socket end shall be attached to a 36” piece of UL Listed underwater power cable. It shall be permanently secured to the UL Listed power cable by means of an integrated clamp and Series 300 Stainless Steel screws. It shall be completely epoxied to prevent entry of water or any other foreign matter. The other end of this assembly is permanently attached to the cap end of the underwater cable disconnect. It is sealed with a flexible potting compound.
1/2HP shall consist of a Series 900, IP68 pin and socket connector. It shall be of a 4 pin configuration rated 32 amps at 600 volts AC. The pin end shall be potted into a Series 300 Stainless Steel straight bell-shaped adapter with an approved ridged epoxy. This assembly shall be permanently attached to a reinforced braided hose and a Series 300 Stainless Steel elbow. This shall be attached to a Series 300 Stainless Steel hub which is welded on the bottom of the motor housing. This complete assembly shall be sealed with an approved flexible potting compound. The socket end shall be attached to a 36” piece of UL Listed underwater power cable. It shall be permanently secured to the UL Listed power cable by means of an integrated clamp and Series 300 Stainless Steel screws. It shall be completely epoxied to prevent entry of water or any other foreign matter. The other end of this assembly shall be permanently attached to the cap end of the underwater cable disconnect. It shall be sealed with an approved flexible potting compound.
- J. **Fasteners and anchor connectors** shall be Series 300 Stainless Steel.
- K. **Electrical control panel** specifications, see SECTION 3.
- L. **Intake screen** shall be made of 18 Gauge, Series 300 Stainless Steel. The screen hole size shall be 3/4” wide slots on 1/2HP and 1” wide slots on 1.5HP and larger. The screen shall have openings in a random configuration capable of keeping out any debris which may impede the propeller’s performance.

FLOATING SURFACE AERATOR DETAIL SPECIFICATIONS

2.0 DETAILED INFORMATION

- 2.1 This specification is intended to provide prospective bidders the necessary information pertaining to the floating surface aerator(s) specified for the _____ Project.
- 2.2 The MOTOR(S) shall be 1/2, 1.5, 3.5 or 5.5HP (circle choices), operating at _____ Volts, 60 Hertz, _____ Phase at 1725 RPM.
- 2.3 The MODEL specified shall be the _____. It shall come complete with an electrical control panel, protective intake screen attached to a float assembly and _____ feet _____ gauge, of 4 conductor underwater power cable.

Please refer to TABLES 1 and 2 to assist in the completion of SECTION 2.0

FLOATING SURFACE AERATOR DETAIL SPECIFICATIONS (cont.)

3.0 ELECTRICAL CONTROL PANEL COMPONENTS DESCRIPTION

- A. **Electrical enclosure** shall be NEMA 3R type, gray in color. Panel shall be both lock and mount capable.
- B. **GFCI breaker** shall provide overload and short circuit protection, combined with Class A ground fault protection.
- C. **Control breaker** shall provide overload protection and be capable of disconnecting all incoming electricity from the control panel.
- D. **Motor contactor** shall provide a means for disconnection of all motor leads. It shall be a magnetic, across the line starter type.
- E. **Overload assembly** shall provide overload protection and phase loss protection by means of a solid-state smart motor protector relay. It is adjustable over the listed full load amperage draw of the motor. It shall be self powered, low energy consumption with a visual trip indicator, test button and manual/automatic reset modes.
- F. **Timer** shall be a single pole type, rated at 120 Volts, 20 Amps, capable of a timing cycle, in 30 minute increments up to 24 hours.

3.1 SAFETY TESTING CONTROL PANEL

The electrical control panel shall be tested and approved as a complete unit. It is inspected and listed by Underwriters Laboratories, Inc. under Category 508 Industrial Control Panels and Category 778 Submersible Aerators and Aerating Fountain Pump Systems.

3.2 ACCEPTABLE MANUFACTURER

This Volcano II Floating Surface Aerator electrical control panel, as specified in Section 3.0, shall be manufactured by AQUAMASTER FOUNTAINS AND AERATORS, 16024 CTH X, Kiel, WI 53042, (800) 693-3144 or approved equal.

3.3 INSTALLATION

The electrical control panel must be installed in accordance with the installation instructions, in compliance with all local and National Electrical Code requirements. This should be done by a licensed electrical contractor. Any alterations to or substitution for items in this system, unless allowed by the installation instructions, will void the Underwriters Laboratories Listing and will void the product warranty. It may also create a hazardous installation. Read the instructions thoroughly before starting the installation and follow them carefully throughout.

3.4 ELECTRICAL CONTROL PANEL WARRANTY

All electrical panel and on-shore components shall have a 1 year warranty.

FLOATING SURFACE AERATOR DETAIL SPECIFICATIONS (cont.)

4.0 SAFETY TESTING

The Volcano II Floating Surface Aeration system shall be tested and approved as a complete unit. This approval must meet Underwriters Laboratories Inc. requirements in compliance with Category 508: Industrial Control Panels and Category 778: Submersible Aerators and Aerating Fountain Pump Systems. Individual component testing and wet niche environment equipment approval are not acceptable.

4.1 ACCEPTABLE MANUFACTURER

This Volcano II Floating Surface Aerator, as specified in Sections 2.2, 2.3 and 2.4, shall be manufactured by AQUAMASTER FOUNTAINS AND AERATORS, 16024 CTH X, Kiel, WI 53042, (800) 693-3144, or approved equal.

4.2 INSTALLATION

All AQUAMASTER VOLCANO II FLOATING SURFACE AERATORS are designed and built to be installed with an AQUAMASTER UL Listed control panel and to be operated as a complete system. Any alterations to or substitution for items in this system, unless allowed by the installation instructions, will void the UL Listing and will void the product warranty. It may also create a hazardous installation. Read the instructions thoroughly before starting the installation and follow them carefully throughout.

4.3 WARRANTY

All 1.5HP and larger AQUAMASTER VOLCANO II FLOATING SURFACE AERATORS motor, seal assembly, float and underwater power cable (referred to as in-water components) are covered under warranty at 100% replacement cost should it fail due to defects in materials or workmanship for a period of 3 years. This is in effect from the date of shipment, when given normal and proper usage as determined by The Seller upon examination, and when owned by the original user. All 1/2HP units have a similar 2 year warranty.

FLOATING SURFACE AERATOR LIGHTING SYSTEMS AND OPTIONS SPECIFICATIONS

- 5.0 LIGHTING SYSTEM shall be 120 Volt, Model #(s)_____. There are _____ total fixtures, containing _____ (clear or choose color(s): amber, blue, red, green or turquoise) lenses.
- 5.1 A total length of _____ feet of _____(gauge) of 3 conductor underwater power cable is required.
- 5.2 DEEP WATER INTAKE SYSTEM shall be capable of drawing water from further depths, in initial three foot length. Custom extensions available in one foot increments, additional _____ required. Total length should reach beyond 50% depth but not exceed 75%. This system provides the floating surface aerator the capability to de-stratify the pond very efficiently. Total _____ feet.
- 5.3 THE HYDROMAX SERIES creates a uniform conical pattern by adding an optional assembly. Choose either SHASTA (low) or ETNA (high) patterns, note that Etna is not available in 1/2HP. Yes _____ No _____

Please refer to TABLES 3 and 4 to assist in the completion of SECTION 5.

TECHNICAL DATA

REFERENCE MATERIAL FOR SECTION 2.0 DETAILED INFORMATION

TABLE 1: Volcano II Floating Surface Aerator Performance Specifications

Model Number	HP	Voltage and Phase	Suggested Pond Size S.A. *	Minimum Operating Depth	Spray Height	Spray Diameter	Pumping Rate GPM	Ship Weight Lbs.
V5401	1/2	120V – 1PH	Up to 3/4	2'	1'	4'	420	70
V5402	1/2	220V – 1PH	Up to 3/4	2'	1'	4'	420	70
V5412	1.5	220V – 1PH	Up to 1	3'	2.5'	6'	984	250
V5412-3		230V – 3PH						
V5414-3		460V – 3PH						
V5432	3.5	220V – 1PH	1+	3'	4'	12'	2390	300
V5432-3		230V – 3PH						
V5434-3		460V – 3PH						
V5452	5.5	220V – 1PH	1+	3'	4.5'	14'	3160	300
V5452-3		230V – 3PH						
V5454-3		460V – 3PH						

*A pond's surface acreage (S.A.) is determined by multiplying its length by its width. A pond's actual shape and depth should all be considered when selecting Horsepower and unit size(s).

TABLE 2: Cable Sizing Charts

MAXIMUM RECOMMENDED LENGTH FROM AERATOR TO CONTROL PANEL

4 conductor cable required on all Volcano II Floating Surface Aerators

4 Conductor			Copper Wire Gauge Size						
Unit	Volts	Running Amp Draw @ 1725 RPM	#14	#12	#10	#8	#6	#4	#2
Single Phase									
1/2HP	120	7.0	125	200	325	525	825	1375	2150
1/2HP	208-240	3.5	400	700	1250	1900	3000	4825	7000
1.5HP	208-240	8.0	--	225	375	600	950	1500	2400
3.5HP	208-240	16.0	--	100	200	300	500	800	1200
5.5HP	208-240	26.0	--	--	150	250	400	650	1000
Three Phase									
1.5HP	208-240	6.0	--	400	600	1000	1600	2500	4000
1.5HP	440-480	3.0	--	1500	2300	3700	6000	9500	15000
3.5HP	208-240	11.0	--	200	300	500	800	1200	2000
3.5HP	440-480	5.5	--	750	1200	2000	3200	5000	8000
5.5HP	208-240	16.0	--	150	250	400	600	950	1500
5.5HP	440-480	8.0	--	600	950	1550	2475	3900	6250

TABLE 3: THE HYDROMAX SERIES CONICAL PATTERNS

SHASTA					ETNA				
Part No.	HP	Height	Diameter	GPM	Part No.	HP	Height	Diameter	GPM
910042	1/2	1.5'	7'	324	N/A	1/2	N/A	N/A	N/A
910070	1.5	4'	13'	664	910080	1.5	5'	16'	517
910071	3.5	5'	16'	1070	910081	3.5	8'	22'	845
910072	5.5	7'	18'	1415	910082	5.5	10'	24'	1350

TABLE 4: FLOATING SURFACE AERATOR LIGHTING SYSTEMS

AQUAMASTER VOLCANO II FLOATING SURFACE AERATORS are even more dramatic at night, with the addition of a UL and cUL Listed NIGHT GLOW LIGHTING SYSTEM.

Any lighting system choice includes stainless steel lamp housings, ready to be installed in the float, sealed with clear tempered glass lenses in a stainless steel clamp ring. Minimal installation is required. All lights remain water-cooled and out of sight below the surface.

All necessary electrical controls, including timer, are pre-wired into the aerator’s existing UL Listed control panel. Optional glass colored lenses (amber, blue, red, green or turquoise), complete your dramatic aquatic display.

For uniformity of spray pattern coverage, 4 lights is recommended.

LINE VOLTAGE: 120 Volt Lighting Systems

- A. 1/2HP Volcano II Aerator
1/2HP Volcano II Aerators are only available with 75 watt fixtures

75 Watt Fixtures	Each system includes:
2 light system: Model # 870312	
4 light system: Model # 870314	
	<ul style="list-style-type: none"> • 75, 150 or 250 Watt quartz halogen flood lamps • 50' of underwater cable • GFCI Protection • Timer • Clear lenses • UL and cUL Listing

LINE VOLTAGE: 120 Volt Lighting Systems (Cont.)

- B. 1.5-5.5HP Volcano II Aerator
 1.5-5.5HP Volcano II Aerators available with 75, 150 or 250 watt fixtures

75 Watt Fixtures	Each system includes:
2 light system: Model # 870382	
4 light system: Model # 870384	
150 Watt Fixtures	
2 light system: Model # 870392	
4 light system: Model # 870394	
250 Watt Fixtures	
2 light system: Model # 870402	
4 light system: Model # 870404	

- 75, 150 or 250 Watt quartz halogen flood lamps
- 50' of underwater cable
- GFCI Protection
- Timer
- Clear lenses
- UL and cUL Listing

CABLE SIZING CHART FOR LIGHTS
MAXIMUM RECOMMENDED LENGTH FROM AERATOR TO CONTROL PANEL

3 Conductor				Copper Wire Gauge Size					
Watts Per Fixture	# of Fixtures	Volts	Approx Amps	#14	#12	#10	#8	#6	#4
75	2	120	1.3	750	1150	1900	2950	4750	7500
75	4	120	2.5	375	600	1000	1550	2450	3900
150	2	120	2.5	375	600	1000	1550	2450	3900
150	4	120	5	190	300	500	775	1200	1950
250	2	120	4.2	225	350	600	900	1450	2300
250	4	120	8.5	100	175	290	450	725	1125