

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" 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. It shall have a permanent Series 300 stainless steel electrical hub welded on side of housing to allow electrical cable entry.
- E. **Motor** shall contain a Series 300 stainless steel shaft. The rotor shall be dynamically balanced and ball bearing supported. 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 ceramic, carbon 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. One end of this disconnect is permanently attached to the stainless steel motor housing by means of a reinforced braided hose, sealed with a flexible potting compound. The other end is permanently attached to the underwater power cable and sealed with an approved compound to prevent water entry if damage would occur to the cable. This disconnect is sealed with an internal o-ring and by an external Series 300 stainless steel clamp ring, which can be easily opened. This allows removal of the motor housing without the power cable attached for storage or maintenance.
- I. **Fasteners and anchor connectors** shall be Series 300 stainless steel.
- J. **Electrical control panel** specifications, see SECTION 3.
- K. **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 or 3.5HP (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 panels and their components 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 II VOLCANO 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 motors and 3 year seal assemblies are covered under warranty at 100% replacement costs should it fail due to defects in materials or workmanship for a period of 3 years 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 motors and seal assemblies have a 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 FOUNTAIN CONE PATTERN ASSEMBLY is available in 1/2HP to create a more decorative pattern. Yes _____ No _____

Please refer to TABLE 3 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 | Running Amp Draw @ 1725 RPM | Suggested Pond Size S.A. * | Minimum Operating Depth | Spray Height | Spray Diameter | Pumping Rate GPM | Ship Weight Lbs. |
|-------------------------------|-----|-------------------|-----------------------------|----------------------------|-------------------------|--------------|----------------|------------------|------------------|
| V5401 | 1/2 | 120 – 1PH | See Below | | | | | | |
| Without Fountain Pattern Assy | | | 7.5 | Up to 3/4 | 24" | 16" | 35" | 420 | 75 |
| With Fountain Pattern Assy | | | 7.0 | Up to 3/4 | 24" | 24" | 60" | 360 | 75 |
| V5402 | 1/2 | 220V – 1PH | See Below | | | | | | |
| Without Fountain Pattern Assy | | | 3.8 | Up to 3/4 | 24" | 16" | 35" | 420 | 75 |
| With Fountain Pattern Assy | | | 3.5 | Up to 3/4 | 24" | 24" | 60" | 360 | 75 |
| V5412 | 1.5 | 220V - 1PH | 11 | Up to 1 | 36" | 2.5' | 6' | 984 | 260 |
| V5412-3 | | 230V - 3PH | 6 | | | | | | |
| V5414-3 | | 460V - 3PH | 3 | | | | | | |
| V5432 | 3.5 | 220V - 1PH | 18 | 1+ | 36" | 4' | 12' | 2390 | 260 |
| V5432-3 | | 230V - 3PH | 12 | | | | | | |
| V5434-3 | | 460V - 3PH | 6 | | | | | | |

*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 | Approx Amps | #1 4 | #12 | #10 | #8 | #6 | #4 | #2 |
| Single Phase | | | | | | | | | |
| 1/2HP | 120 | 7.5 | 12 5 | 200 | 325 | 525 | 825 | 1400 | 2300 |
| 1/2HP | 220 | 3.8 | 40 0 | 700 | 1250 | 1900 | 3000 | 5000 | 7000 |
| 1.5HP | 220 | 11 | -- | 225 | 375 | 600 | 950 | 1500 | 2400 |
| 3.5HP | 220 | 18 | -- | 100 | 200 | 300 | 500 | 800 | 1200 |
| Three Phase | | | | | | | | | |
| 1.5HP | 230 | 6 | -- | 400 | 600 | 1000 | 1600 | 2500 | 4000 |
| 1.5HP | 460 | 3 | -- | 1500 | 2300 | 3700 | 6000 | 9500 | 15000 |
| 3.5HP | 230 | 12 | -- | 200 | 300 | 500 | 800 | 1200 | 2000 |
| 3.5HP | 460 | 6 | -- | 750 | 1200 | 2000 | 3200 | 5000 | 8000 |

TABLE 3: FLOATING SURFACE AERATOR LIGHTING SYSTEMS

AQUAMASTER 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 ONLY: 120 Volt Lighting Systems, 75 watt fixtures only available on all Volcano II Floating Surface Aerators

A) 2 light system: Model # 870312

B) 4 light system: Model # 870314

Each system includes:

- 75 Watt Par 30 halogen flood lamps
- 50’ of underwater cable
- GFCI Protection
- Timer
- Clear Lenses
- UL and cUL Listed

**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 | #1 4 | #12 | #10 | #8 | #6 | #4 | #2 |
| 75 | 2 | 120 | 1.3 | 75 0 | 120 0 | 200 0 | 300 0 | 500 0 | 800 0 | 13000 |
| 75 | 4 | 120 | 2.5 | 40 0 | 600 | 100 0 | 160 0 | 250 0 | 430 0 | 6900 |