

**SPECIFICATIONS**  
**ULTIMAX® SUB-SURFACE DIRECTIONAL AERATION SYSTEM**

**1.0 GENERAL**

**1.1 DESCRIPTION**

- A. Manufacturer shall furnish an aspirating directional aerator (aspirator) \_\_\_\_\_ or a high-flow directional aerator (mixer) \_\_\_\_\_ capable of providing horizontal circulation of oxygenated water throughout complete aquatic system (check one).
- B. This shall be achieved without disturbing the sight lines or sound levels surrounding the aquatic environment.
- C. Water aerator will be \_\_\_\_\_ HP and be horizontally positioned float mounted on the surface \_\_\_\_\_ or out of sight fixed base mounted on the bottom of the pond \_\_\_\_\_ (check one).
- D. A submersible motor shall draw in oxygen from above the water's surface, through an air intake tube (aspirator) \_\_\_\_\_ or no air intake tube (mixer) \_\_\_\_\_ (check one).
- E. The oxygen enters the propeller chamber where it is mixed with water rapidly by a specially designed propeller, which further breaks down the aspirated oxygen into fine bubbles (aspirator) \_\_\_\_\_ or a high-flow current is created (mixer) \_\_\_\_\_ (check one).
- F. The aspirated bubbles (aspirator) \_\_\_\_\_ or the high-flow current (mixer) \_\_\_\_\_ are then thrust via the propeller providing a horizontal circulation of oxygenated water (check one).

**1.2 AERATOR COMPONENTS DESCRIPTION**

- A. **Housing** shall be Series 300 Stainless Steel. 1-5HP shall have a permanent series 300 stainless steel electrical hub welded on the side of the housing to allow electrical cable entry. An additional permanent series 300 stainless steel collar shall be attached at bottom of housing for protection. Motor housing shall be attached to series 300 stainless steel brackets which are permanently mounted to a modular float system or in a support base. The 1/2HP shall have a series 300 stainless steel electrical hub welded on the bottom of the housing to allow electrical cable entry.
- B. **Propeller** shall be a non-fouling, high efficiency precision machined type, made of Series 300 Stainless Steel. It shall be connected to the motor shaft by a series 300 stainless steel fastener.
- C. **Propeller Chamber** shall be enclosed by a series 300 stainless steel intake screen. Screen shall be capable of keeping out any debris or fish which may impede the propeller's performance.
- D. **Intake Screen** shall be made of 18 Gauge, Series 300 Stainless Steel. The screen shall have a minimum of 58% open area and have a minimum of 91 square inches of intake area. The screen hole size shall vary according to the horsepower for which it is to be used on.

- E. **Motor** shall contain a Series 316 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 3450 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. **Discharge Chamber** shall be Series 300 Stainless Steel and attached to motor housing with series 300 stainless steel brackets. It shall be either top-fitted with an air inlet pipe capable of having an intake hose reach the surface (aspirator) or not (mixer).
- H. **Floats (where applicable)** shall be made of linear low density polyethylene. Four series 300 stainless steel C-channel rails shall be welded to the framework for float mounting. Unit is mounted to float with series 300 stainless steel mounting brackets and adjusting brackets so that the mounting angle can be adjusted without removing the unit from the float or water.
- I. **Semi-rigid Base Plate (where applicable)** made of minimum 1/2" polypropylene shall be used for fixed based mounted units. Aerator shall be attached to base plate with series 300 stainless steel brackets capable of being adjusted without removing unit from base.
- J. All fasteners, clamps, etc. shall be made of corrosion resistant Series 300 Stainless Steel.
- K. **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 provided. This will ensure that no potential damage can occur to any cable connections, due to tension on the cable.
- L. **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 M.). 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.

- M. **Underwater Pin and Socket Connector** (1-5HP) 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.
- N. **Series 316 Stainless Steel Upgrade** (optional) is available for sites with salt or brackish water. This option will upgrade all series 300 stainless steel components to series 316. Yes \_\_\_\_\_ No \_\_\_\_\_ (check one)

## 2.0 ELECTRICAL CONTROL PANEL COMPONENTS DESCRIPTION

- A. **Electrical enclosure** shall be NEMA 3R type, galvanized and powder-coat painted gray in color. Panel shall be both lock and mount capable.
- B. **Ground Fault Protection**
  - 1. Single phase applications, a GFCI breaker shall provide overload and short circuit protection, combined with Class A ground fault protection.
  - 2. Three phase applications, a molded case breaker shall provide overload and short circuit protection, while a residual current device rated at 30 mA shall provide 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 Relay** shall provide overload protection by means of a bi-metallic overload relay. It is adjustable over the listed full load amperage draw of the motor. It shall have a visual trip indicator, test button and manual/automatic reset modes.
- F. **Digital Timer** shall be a single pole type, rated at 120 Volts, 16 Amps, capable of 8 ON / OFF functions per day for 7 days. Digital timer has a lithium battery to retain the programming when power is disconnected.

## 2.1 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.

## 2.2 COLD WEATHER OPERATION

Unit must operate 24 hours per day and be installed in a minimum of six feet of water. Do not install in ponds with liners where temperatures drop below 32 degrees. Please consult Factory.

## 2.3 ELECTRICAL CONTROL PANEL WARRANTY

All electrical panel and their components shall have a 3 year warranty on parts and labor.

### **3.0 SAFETY TESTING**

The sub-surface aspirating 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.

### **3.1 MANUFACTURER**

The sub-surface aspirating aeration system shall be an ULTIMAX<sup>®</sup> SERIES AERATOR, Air Injector Model # \_\_\_\_\_ and/or HydroMixer Model # \_\_\_\_\_, Floating \_\_\_\_ or Fixed Base Mounted \_\_\_\_ (check one) as manufactured by AQUAMASTER<sup>®</sup> FOUNTAINS AND AERATORS, 16024 CTH X, Kiel, WI 53042, 800-693-3144, or approved equal.

### **3.2 INSTALLATION**

All AQUAMASTER<sup>®</sup> ULTIMAX<sup>®</sup> SERIES AERATORS are designed and built to be installed with an AQUAMASTER<sup>®</sup> 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 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.

### **3.3 WARRANTY**

All 1 - 5HP AQUAMASTER<sup>®</sup> ULTIMAX<sup>®</sup> SERIES 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 on parts and labor. 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 on parts and labor.

**TECHNICAL DATA**  
**REFERENCE MATERIAL FOR SECTION 1 DETAILED INFORMATION**

**TABLE 1: Ultimax® Air Injector and Hydromixer Float Mounted Performance Specifications**

Model Number	HP	Voltage And Phase	Running Amp Draw	Minimum Operating Depth	Maximum Operating Depth	Ship Weight LBS.
6401	1/2	120V - 1PH	5.6	2'	unlimited	70
6402		208-240V - 1PH	2.8	2'	unlimited	70
6410	1	120V - 1PH	19.0	3'	unlimited	250
6412		208-240V - 1PH	9.6	3'	unlimited	250
6412-3		208-240V - 3PH	5.4	3'	unlimited	250
6414-3		440-480V - 3PH	2.7	3'	unlimited	250
6422	2	208-240V - 1PH	12.6	3'	unlimited	250
6422-3		208-240V - 3PH	6.3	3'	unlimited	250
6424-3		440-480V - 3PH	3.1	3'	unlimited	250
6432	3.5	208-240V - 1PH	15.2	3'	unlimited	250
6432-3	3	208-240V - 3PH	10.1	3'	unlimited	250
6434-3		440-480V - 3PH	5.1	3'	unlimited	250
6452	5	208-240V - 1PH	27.1	3'	unlimited	300
6452-3		208-240V - 3PH	18.0	3'	unlimited	300
6454-3		440-480V - 3PH	9.0	3'	unlimited	300

**TABLE 2: Ultimax® Air Injector and Hydromixer Fixed Base Mounted Performance Specifications**

Model Number	HP	Voltage and Phase	Running Amp Draw	Minimum Operating Depth	Maximum Operating Depth	Ship Weight Lbs.
B6401	1/2	120V - 1PH	5.6	3'	10'	70
B6402		208-240V - 1PH	2.8	3'	10'	70
B6410	1	120V - 1PH	19.0	3'	10'	250
B6412		208-240V - 1PH	9.6	3'	10'	250
B6412-3		208-240V - 3PH	5.4	3'	10'	250
B6414-3		440-480V - 3PH	2.7	3'	10'	250
B6422	2	208-240V - 1PH	12.6	3'	10'	250
B6422-3		208-240V - 3PH	6.3	3'	10'	250
B6424-3		440-480V - 3PH	3.1	3'	10'	250
B6432	3.5	208-240V - 1PH	15.2	3'	10'	250
B6432-3	3	208-240V - 3PH	10.1	3'	10'	250
B6434-3		440-480V - 3PH	5.1	3'	10'	250
B6452	5	208-240V - 1PH	27.1	3'	10'	300
B6452-3		208-240V - 3PH	18.0	3'	10'	300
B6454-3		440-480V - 3PH	9.0	3'	10'	300

### TABLE 3: CABLE SIZING CHARTS

**Maximum recommended length (in feet) from fountain aerator to control panel**

*AquaMaster<sup>®</sup> recommends consulting a Licensed Electrician to properly size any underground cable from the main power source to our control panel. Cable runs to the panel located away from main power source requires recalculating voltage drop to insure proper cable sizing. Please contact AquaMaster<sup>®</sup> if assistance is required..*

Single Phase 3 conductor			3 conductor Copper Wire Gauge Size						
Unit	Volts	Approx Amps	#14	#12	#10	#8	#6	#4	#2
1/2HP	120	5.6	173	268	446	687	1093	1728	2679
1/2HP	208-240	2.8	599	929	1548	2381	3790	5991	9286

4 conductor: Required on all 1 - 10HP Single Phase & Three Phase Aerators									
Single Phase 4 conductor			4 conductor Copper Wire Gauge Size						
Unit	Volts	Approx Amps	#14	#12	#10	#8	#6	#4	#2
1HP	120	19.0	--	--	132	202	322	509	789
1HP	208-240	9.6	--	271	451	694	1105	1747	2708
2HP	208-240	12.6	--	206	344	529	842	1331	2063
3.5HP	208-240	15.2	--	--	285	439	698	1104	1711
5HP	208-240	27.1	--	--	--	246	392	619	959

Three Phase 4 conductor			4 conductor Copper Wire Gauge Size						
Unit	Volts	Approx Amps	#14	#12	#10	#8	#6	#4	#2
1HP	208-240	5.4	--	556	927	1426	2269	3587	5560
1HP	440-480	2.7	--	2352	3920	6031	9601	15176	23522
2HP	208-240	6.3	--	477	794	1222	1945	3075	4766
2HP	440-480	3.1	--	2049	3415	5253	8362	13218	20487
3HP	208-240	10.1	--	297	495	762	1213	1918	2973
3HP	440-480	5.1	--	1245	2076	3193	5083	8034	12453
5HP	208-240	18.0	--	--	278	428	681	1076	1668
5HP	440-480	9.0	--	706	1176	1809	2880	4553	7057

**Actual voltage to motor will affect your fountain's performance.**