

SPECIFICATIONS

A FLOATING FOUNTAIN AERATION SYSTEM

1.0 GENERAL

1.1 DESCRIPTION

- A. Manufacturer shall furnish a floating fountain aeration system capable of pumping water from below the surface of a 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 decorative fountain.
- 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. **1/2 – 5HP Float** shall be made of linear low density polyethylene. Float shall contain a center tube which shall be minimum Schedule 40 PVC. Four Series 300 stainless steel brackets shall be attached to the tube, around which a stainless steel protective intake screen shall be mounted. The motor housing shall be attached to the brackets during installation. All optional lights and anchor mounting shall be capable of being installed into fixture mounting areas which are molded into the float design as an integral part of the float. (See SECTION 5).
- B. **10HP Floats** shall be made of linear low density polyethylene. Float system shall be modular and field adjustable to maintain an even floatation level. Four Series 300 stainless steel C-channel rails shall be welded to the fountain framework for float mounting. All optional lights and anchor mounting shall be capable of being installed into fixture mounting areas which are provided on the framework. (See SECTION 5).
- C. **10HP Framework** shall be a weldment of rectangular and square stainless steel tubing with a minimum wall thickness of 1/8 inch. Framework shall be equipped with four heavy duty linear low density polyethylene wheels mounted on stainless steel axles for ease of installation and routine maintenance practices. Wheels shall have a diameter of not less than ten inches and a width not less than five inches for ground bearing purposes.
- D. **Propeller and diffuser** shall be precision machined and formed using Series 300 stainless steel. The propeller and diffuser are connected to the motor shaft by a Series 300 stainless steel bolt extended through the diffuser, spacer tube, and propeller.
- E. **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.

- F. **Motor** shall contain a Series 300 stainless steel shaft. The rotor shall be dynamically balanced and ball bearings 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 3450 RPM, at relatively low temperatures. The motor shall be contained in the motor housing by a Series 300 stainless steel top plate.
- G. **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.
- H. **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 hooks mounted on the motor housing clamp. This will ensure that no potential damage can occur to any cable connections, due to tension on the cable.
- I. **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.
- J. **Fasteners and anchor connectors** shall be Series 300 stainless steel.
- K. **Electrical control panel** specifications, see SECTION 3.
- L. **Intake screen** 1/2HP–5HP shall be made of 18 Gauge, Series 300 stainless steel. The screen shall have a minimum of 58% open area, representing 42 square inches (1/2HP) and 91 square inches (1-5HP) of open intake area. The 10HP shall be made of 16 gauge, Series 300 stainless steel and shall have a minimum of 48% open area, representing 170 square inches. The screen hole size shall vary according to the horsepower for which it is to be used on.
- M. **Large custom intake screen** (option) 1/2HP–5HP shall be made of 18 Gauge, Series 300 stainless steel. The large custom intake screen shall completely enclose the motor power unit assembly. It shall have a minimum of 58% open area, representing 286 square inches (1/2HP) and 765 square inches (1-5HP) of open intake area. For 10HP, consult Factory. The screen hole size shall vary according to the horsepower for which it is used on. Additional depth is required.

FOUNTAIN AERATOR DETAIL SPECIFICATIONS

2.0 DETAILED INFORMATION

- 2.1 This specification is intended to provide prospective bidders the necessary information pertaining to the fountain aerator(s) specified for the _____ Project.
- 2.2 The MOTOR(S) shall be _____ HP, operating at _____ Volts, 60 Hertz, _____ Phase at 3450 RPM.
- 2.3 The MODEL(S) specified shall be the _____ MODEL NUMBER _____ capable of creating a _____ pattern. It shall come complete with an electrical control panel, protective intake screen to be attached to a float assembly and _____ feet of _____ gauge, 4 conductor underwater power cable.
- 2.4 The fountain aerator shall produce a SPRAY PATTERN _____ feet in diameter and _____ feet in height.

Please refer to TABLES 1, 2 and 3 to assist in the completion of SECTION 2.0

FOUNTAIN 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 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. **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 fountain 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.

FOUNTAIN AERATOR DETAIL SPECIFICATION (cont.)

4.0 SAFETY TESTING

The floating fountain 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 fountain 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 FOUNTAIN 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 – 10HP AQUAMASTER FOUNTAIN 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 1/2 HP motors have a 2 year warranty.

FOUNTAIN AERATOR LIGHTING SYSTEMS AND OPTIONS SPECIFICATIONS

- 5.0 LIGHTING SYSTEM shall be _____ 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) underwater power cable is required.
- 5.2 MULTI-PURPOSE ELECTRONIC LIGHT SYSTEM SEQUENCER shall be capable of cycling light fixtures off and on, up to 6 programs. Yes____No____
- 5.3 A total length of _____feet of 14/4 conductor underwater power cable is required for sequencer.
- 5.4 DEEP WATER INTAKE SYSTEM shall be capable of drawing water from further depths, in three foot increments. This system provides the fountain aerator the capability to de-stratify the pond very efficiently. Total length should reach beyond 50% depth but not to exceed 75%. Total _____ feet.
- 5.5 LARGE CUSTOM INTAKE SCREEN shall provide additional protected intake area if Fountain Aerator(s) will operate in a potentially high debris filled aquatic environment. Yes ____ No _____

Please refer to TABLE 4 to assist in the completion of SECTION 5.

TECHNICAL DATA

REFERENCE MATERIAL FOR SECTION 2.0 DETAILED INFORMATION

TABLE 1: Fountain Aerator Performance Specifications

Model Number	HP	Voltage and Phase	Running Amp Draw	Spray Pattern Specifications: Height x Diameter					
				Standard HVF	Aquamax *	Cloverleaf	Crown	Geyser	Wide Geyser
5401	1/2	120 - 1PH	5.0	4 x 16	3 x 10	N/A	5 x 20	8 x 3	7 x 4
5402		240 - 1PH	2.5						
5410	1	120 - 1PH	20.0	7 x 20	4 x 12	4 x 30	6 x 20	12 x 2	12 x 5
5412		240 - 1PH	10.0						
5412-3		230 - 3PH	4.4						
5414-3		460 - 3PH	2.2						
5422	2	240 - 1PH	12.5	8 x 24	5 x 18	5 x 38	8 x 24	15 x 2	14 x 6
5422-3		230 - 3PH	7.6						
5424-3		460 - 3PH	3.8						
5432	3.5	240 - 1PH	18.0	10 x 30	5 x 20	6 x 40	10 x 30	16 x 6	15 x 7
5432-3		230 - 3PH	9.0						
5434-3		460 - 3PH	4.5						
5452	5	240 - 1PH	28.0	11 x 32	6 x 22	7 x 46	12 x 36	19 x 6	16 x 10
5452-3		230 - 3PH	16.2						
5454-3		460 - 3PH	8.1						
5512	10	240 - 1PH	60.0	14 x 40	N/A	N/A	N/A	30 x 6	26 x 10
5512-3		230 - 3PH	35.0						
5514-3		460 - 3PH	17.5						
Model Number	HP	Voltage and Phase	Running Amp Draw	Spray Pattern Specifications: Height x Diameter				Minimum Operating Depth	Ship Weight LBS.
				Crown & Geyser	Crystal Geyser	Plume	Plum Tree		
5401	1/2	120 - 1PH	5.0	Geyser Ht 4 Crown 2.5 x 18	4 x 14	4 x 10	3 x 3	2'	70
5402		240 - 1PH	2.5						
5410	1	120 - 1PH	20.0	Geyser Ht 9 Crown 6 x 24	8 x 20	6 x 16	7 x 8	2.5'	280
5412		240 - 1PH	10.0						
5412-3		230 - 3PH	4.4						
5414-3		460 - 3PH	2.2						
5422	2	240 - 1PH	12.5	Geyser Ht 11 Crown 7.5 x 26	10 x 20	8 x 20	7 x 10	2.5'	280
5422-3		230 - 3PH	7.6						
5424-3		460 - 3PH	3.8						
5432	3.5	240 - 1PH	18.0	Geyser Ht 13 Crown 8 x 30	13 x 22	10 x 22	8 x 10	2.5'	280
5432-3		230 - 3PH	9.0						
5434-3		460 - 3PH	4.5						
5452	5	240 - 1PH	28.0	Geyser Ht 15 Crown 10 x 36	14 x 24	11 x 24	10 x 10	2.5'	300
5452-3		230 - 3PH	16.2						
5454-3		460 - 3PH	8.1						
5512	10	240 - 1PH	60.0	Geyser Ht 22 Crown 12 x 40	18 x 24	N/A	N/A	4'	500
5512-3		230 - 3PH	35.0						
5514-3		460 - 3PH	17.5						

All performance data (heights and diameters) have been tested at 240 volt single phase electrical. Your overall performance may vary due to actual voltage, intake restrictions and cable lengths.

* The Aquamax pattern creates an effect only by extending the float tube. Should you want to change this pattern, the adapter will have to be removed. 2' additional depth is required for a total minimum depth of 4' for 1/2HP and 4.5' for 1 – 5HP.

TABLE 2: CABLE SIZING CHARTS

MAXIMUM RECOMMENDED LENGTH FROM FOUNTAIN TO CONTROL PANEL

Single Phase 3 Conductor			Copper Wire Gauge Size						
Unit	Volts	Approx Amps	#1 4	#12	#10	#8	#6	#4	#2
1/2 HP	120	6	17 5	275	450	675	1000	1700	2700
1/2 HP	208-240	3	55 0	875	1400	2200	3500	5500	8000
4 conductor: Required on all 1 - 10HP Single Phase Aerators									
1 HP	120	20	----	----	130	200	325	500	800
1 HP	208-240	10	----	250	375	600	1000	1500	2400
2 HP	208-240	12.5	----	200	300	475	775	1200	1900
3.5 HP	208-240	19	----	--	200	350	550	850	1350
5 HP	208-240	28	----	----	150	275	450	800	1250
10HP	208-240	55	----	----	----	100	200	300	450

Three Phase 4 conductor			Copper Wire Gauge Size						
Unit	Volts	Approx Amps	#1 4	#12	#10	#8	#6	#4	#2
1 HP	208-240	5.8	---	450	700	1200	1800	3000	4800
1 HP	440-480	2.9	---	1700	2700	4300	6900	11000	17500
2 HP	208-240	8	---	300	500	800	1200	1900	3100
2 HP	440-480	4	---	1100	1750	2800	4450	7000	11200
3 HP	208-240	10	---	250	400	650	1000	1650	2600
3 HP	440-480	5	---	1000	1600	2550	4000	6400	10000
5 HP	208-240	18	---	150	250	400	600	950	1500
5 HP	440-480	9	---	600	950	1550	2475	3900	6250
10 HP	208-240	33.5	---	---	100	200	300	500	700
10 HP	440-480	16.7	---	--	450	700	1100	1800	2800
15 HP	208-240	46	---	---	----	150	225	375	600
15 HP	440-480	23	---	---	350	600	950	1500	2400
20 HP	208-240	58	---	---	----	100	175	275	400
20 HP	440-480	29	---	---	275	400	700	1100	1700
25 HP	208-240	72	---	---	----	---	150	225	350
25 HP	440-480	36	---	---	200	375	600	950	1500

TABLE 3: FOUNTAIN AERATOR SPRAY PATTERN DESCRIPTIONS

1. **STANDARD HIGH VOLUME FLOW (HVF)**
This pattern is achieved by propeller diffuser combination without a nozzle, resulting in maximum circulation and aeration. This model (HVF) is Standard with every unit.
SPECIFICATION DESCRIPTION: FAN SHAPE
2. **CLOVERLEAF**
Nozzle creates a variation of the Standard HVF, decreasing height, increasing diameter. It is field adjustable.
SPECIFICATION DESCRIPTION: LOW FAN SHAPE
3. **AQUAMAX**
This adapter extends the float tube, lowering the motor housing to create a heavy water Standard HVF. This pattern requires additional depth.
SPECIFICATION DESCRIPTION: HEAVY FAN SHAPE
4. **WIDE GEYSER**
A modification of the Geyser nozzle produces a less dense, more decorative version.
SPECIFICATION DESCRIPTION: WIDE VERTICAL COLUMN
5. **GEYSER**
A multiport nozzle achieves a dramatic vertical pattern in a solid column of water, fanning slightly at the top.
SPECIFICATION DESCRIPTION: SOLID VERTICAL COLUMN
6. **CROWN**
Scalloped nozzle channels the water into separate streams without reducing the GPM or beneficial aeration.
SPECIFICATION DESCRIPTION: SCALLOPED FAN SHAPE
7. **CROWN & GEYSER**
A beautiful, dramatic pattern still achieves aeration results. This nozzle combines the Standard HVF with the vertical Geyser column of water through its center.
SPECIFICATION DESCRIPTION: COMBINED FAN & COLUMN
8. **CRYSTAL GEYSER**
This nozzle produces a very decorative crystalline spray pattern in an abstract, multi-tiered formation.
SPECIFICATION DESCRIPTION: FROTHY SPRAY
9. **PLUME**
This nozzle separates the Standard HVF into four tight Geysers that fan out slightly at the top, also creating a dramatic effect on the water's surface.
SPECIFICATION DESCRIPTION: NARROW FAN SHAPE
10. **PLUM TREE**
The narrower opening of the nozzle results in a dense, elliptical canopy of water.
SPECIFICATION DESCRIPTION: DENSE, ROUND

TABLE 4: FOUNTAIN AERATOR LIGHTING SYSTEMS

AQUAMASTER FOUNTAIN 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 required. All lights remain water-cooled and out of sight below the surface.

All necessary electrical controls, including timer, are pre-wired into the fountain aerator’s existing UL Listed control panel. Optional glass colored lenses (amber, blue, red, green or turquoise), with or without an optional sequencer complete your dramatic aquatic display.

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

1. LINE VOLTAGE: 120 Volt Lighting Systems

A. 1/2 – 5 HP Fountain Aerator

1/2HP Fountain Aerators are only available with 75 watt fixtures

1 – 5HP Fountain Aerator Lighting Systems available in 75, 150, or 250 watt fixtures

75 Watt Fixtures – 1/2HP Units	Each system includes: <ul style="list-style-type: none"> • 75 Watt Par 30 halogen flood lamps • 50’ of underwater cable • GFCI Protection • Timer • Clear lenses • UL and cUL Listing
2 light system: Model # 870282	
3 light system: Model # 870283	
4 light system: Model # 870284	
6 light system: Model # 870286	
8 light system: Model # 870288	
75 Watt Fixtures - 1 – 5HP Units	
2 light system: Model # 870252	
3 light system: Model # 870253	
4 light system: Model # 870254	
6 light system: Model # 870256	
8 light system: Model # 870258	

150 Watt Fixtures – 1 – 5HP Units	Each system includes: <ul style="list-style-type: none"> • 150 or 250Watt quartz halogen flood lamps • 50’ of underwater cable • GFCI Protection • Timer • Clear lenses • UL and cUL Listing
2 light system: Model # 870262	
3 light system: Model # 870263	
4 light system: Model # 870264	
6 light system: Model # 870266	
8 light system: Model # 870268	
250 Watt Fixtures – 1 – 5HP Units	
2 light system: Model # 870272	
3 light system: Model # 870273	
4 light system: Model # 870274	
6 light system: Model # 870276	
8 light system: Model # 870278	

TABLE 4: FOUNTAIN AERATOR LIGHTING SYSTEMS (cont.)

A. 10HP Fountain Aerator

150 Watt Fixtures	Each system includes: <ul style="list-style-type: none"> • 150, 250 or 500 Watt quartz halogen flood lamps • 100' of underwater cable • GFCI Protection • Timer • Clear lenses • UL and cUL Listing
4 light system: Model # 890134	
6 light system: Model # 890136	
8 light system: Model # 890138	
250 Watt Fixtures	
4 light system: Model # 890144	
6 light system: Model # 890146	
8 light system: Model # 890148	
500 Watt Fixtures	
4 light system: Model # 890154	
6 light system: Model # 890156	
8 light system: Model # 890158	

CABLE SIZING CHART FOR LIGHTS

MAXIMUM RECOMMENDED LENGTH FROM FOUNTAIN LIGHTS 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	3	120	1.9	50 0	800 0	130 0	200 0	330 0	570 0	9000	
75	4	120	2.5	40 0	600 0	100 0	160 0	250 0	430 0	6900	
75	6	120	3.8	25 0	400 0	650 0	100 0	165 0	280 0	4500	
75	8	120	5	20 0	300 0	500 0	800 0	120 0	210 0	3400	
150	2	120	2.5	40 0	600 0	100 0	160 0	250 0	430 0	6900	
150	3	120	3.8	25 0	400 0	650 0	100 0	165 0	280 0	4500	
150	4	120	5	20 0	300 0	500 0	800 0	120 0	210 0	3400	
150	6	120	7.5	12 5	200 0	325 0	525 0	825 0	140 0	2300	
150	8	120	10	10 0	150 0	250 0	400 0	625 0	100 0	1700	
250	2	120	4.2	25 0	400 0	640 0	100 0	160 0	250 0	4100	
250	3	120	6.3	16 0	260 0	420 0	675 0	105 0	170 0	2700	
250	4	120	8.5	10 0	200 0	300 0	500 0	750 0	125 0	2000	
250	6	120	12.5	--	125	200	325	500	800	1300	
250 *	8	120	17	Requires 2 runs of cable							

			2 runs at:	10 0	200	300	500	750	125 0	2000
500 *	4	120	17	Requires 2 runs of cable						
			2 runs at:	10 0	200	300	500	750	125 0	2000
500 *	6	120	25	Requires 2 runs of cable						
			2 runs at:	--	125	200	325	500	800	1300
500 *	8	120	34	Requires 2 runs of cable						
			2 runs at:	--	100	150	250	400	625	1000

* 2 runs of cable required

TABLE 4: FOUNTAIN AERATOR LIGHTING SYSTEMS (cont.)

2) **LOW VOLTAGE:** 12 Volt kits
Only available for 1/2 – 5HP models

A. Set #1: Model #870102
2 light kit

B. Set #2: Model #870104
4 light kit

Each set includes:

- 50 Watt Par 36 halogen sealed beam lamps
- 50' of underwater cable
- Heavy duty transformer
- Timer
- Clear lenses

CABLE SIZING CHART

MAXIMUM RECOMMENDED LENGTH FROM FOUNTAIN AERATOR LIGHTS TO TRANSFORMER AT CONTROL PANEL

3 CONDUCTOR			COPPER WIRE GAUGE SIZE				
# OF FIXTURES	VOLTS	WATTS	#14	#12	#10	#8	#6
2	12	100	50	100	150	N/A	N/A
4	12	200	---	50	100	150	N/A

