



AQUA CONTROL, INC.

SELECT SERIES 1/2 to 7¹/₂ HP
Display Aerators and Fountains

BROCHURE 2



5 HP Geyser between two 7.5 HP Two Stage Cluster Arches

History, Products, and Mission

Aqua Control, Inc. (ACI) was founded in 1970 as a manufacturer of floating Aerators and Fountains. Since then, ACI has done extensive engineering to develop innovative new products with emphasis on creating highly efficient pumps and nozzles, and to create unique Display Aerator and Fountain spray patterns so that ACI is truly, "The Beautiful Water Quality Management System".

Today, ACI has the most extensive line of floating water features in the industry. The **Select Series** of 1/2 to 7¹/₂ HP Display Aerators and Fountains are available in single and two-stage, both vertical and horizontal configurations, and more than 30 spray patterns. The **Titan Series** provides a wide range of big and beautiful patterns from 7¹/₂ to 40 HP.

Bowl Fountains, Stationary Fountains, and Stationary Aerators provide the innovation of Free-Standing technology and offer the fountain industry with a low-cost alternative to expensive architectural fountain installations. The full line of products range from 1/2 to 7-¹/₂ Hp, with over 30 spray patterns. These Free-Standing Units can be used in any application that requires an installation in a shallow bowl, vault, or other fixed-depth environment.

In addition, Aqua Control has announced its entry into the Waterfall Pump market with innovative submersible pump technology in horsepower from 1/2 to 40 Hp and GPMs up to 1500. ACI also offers Bottom Circulators, Torrent Aerators, Lake Bed Aerators, and ClearAway, an ecologically friendly biological product to improve and maintain water quality.

As a corporate policy, ACI has always endeavored to provide conservatively accurate pumping rates and carefully and properly measured pattern dimensions. Many horsepower and spray patterns were tested for GPM at the University of Minnesota, St. Anthony Falls Laboratory, and the results confirmed the historic and current accuracy of published pumping rates.

The mission of Aqua Control is to provide its customers with efficient, effective, accurately represented, long lasting, quality products that produce a high degree of visual beauty and functionality. ACI is a dynamic company that is focused on leading the industry in finding new solutions for customers' needs by developing and maintaining a talented, creative, technically capable, well-trained, friendly, customer-oriented staff. ACI is committed to constant improvement and innovation to accomplish its mission.



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The Aqua Control design of Select Series pumps uses stainless steel submersible motors with mechanical seal and heavy duty bearings. They are attached to precision machined stainless steel, bronze, and PVC pump components with stainless steel fasteners. A suction screen constructed of 316 stainless steel filter wire is always included. This superior construction allows Aqua Control to provide a 3 year warranty on the entire system. Any of seven types of pumps may be selected; Aerator, Bottom Circulator, Display Aerator, 2 stage Display Aerator, Fountain, Bowl Fountain, or The Combo, which is a combination of both a Display Aerator and a Fountain pump. All are available in either a Vertical or a Horizontal configuration except the Combo, which is not currently available as a Horizontal. All components in the water stream are highly streamlined. This careful attention to good engineering practices creates the high efficiencies and performance that allows ACI to produce higher pumping rates and higher spray patterns.

There has been much confusion, and we think misinformation, in this industry regarding the definition of an Aerator. The Aqua Control definition is very specific. We only define high pumping rate, axial flow (propeller) pumps as Aerators since Aeration rates are highly dependent on the flow rates (gpm). We define high pressure and low flow rate pumps as Fountains. So, by definition, an Aqua Control Aerator pumps high gpm relative to the HP and achieves a high level of aeration.



Vertical Configuration

Vertical configuration pumps draw water from the bottom inlet and discharge it through the nozzle at the top. This design has the benefit of simplicity, efficiency, stability and perfect symmetry of the pattern. The deep suction provides bottom to top water movement for superior pond circulation.

In addition, simple, economical, and effective extension suction tubes can be added to any Vertical pump to provide water intake at virtually any depth so that very deep ponds or lakes can be effectively circulated.

The Aqua Control standard deep suction design allows for successful **winter de-icing**, and for very deep ponds, where the extension suction tubes are used, the de-icing capability is dramatically improved.

Brilliant lighting can be created by adding up to 12 spot or flood lights of 300 or 500 watts each that can be tilted for optimal illumination of any pattern.



Horizontal Configuration (Shallow water)

The Horizontal pumps use the same components as the Vertical but, in addition, have elbows and tubing arranged so that the motor and pump are mounted horizontally while the spray nozzle is in the normal vertical position.

This design uses the same floats as the Verticals and is completely self-centering without additional floats or weights. The advantages of a Horizontal are now available with a very simple installation that will require little or no adjustment.

Horizontal configuration pumps can be operated in as little as 28" (.7 meter) of water. They should only be used where water depth is, or could be, a problem since they are more expensive, more prone to collect surface debris, are slightly less stable, and do not create deep suction. A suction screen is always included, as with the Verticals.



The Horizontal can be lit with the same heavy-duty submersible lights as a Vertical and with up to 12 lights, spot or flood, a choice of 6 colors, and they can be tilted for optimal illumination of any spray pattern.

Aerator & Display Aerator Testing

Testing Methods

Aqua Control, Inc. (ACI) has always published conservatively accurate gallon per minute (GPM) flow rates. Because of that interest in accuracy we have helped to create, and are a member of, an industry organization, the International Irrigation Association-Aerator & Fountain Common Interest Group, (IIA-AFCIG) that is working hard to insure that everyone in the industry publishes accurate specifications. ACI has achieved greater GPM accuracy and has been able to publish increased GPMs by having offsite testing performed on a variety of patterns and Horsepowers (HPs).

IIA-AFCIG members have agreed to identify the source of testing for GPM and oxygen transfer rates. Aqua Control GPM and oxygen transfer rates published in this document are marked with* when they were determined by testing done at an IIA-AFCIG **approved and independent** test facility. ACI used the University of Minnesota, St. Anthony Falls Laboratory. Other GPM testing was done at an IIA-AFCIG member facility, in the presence of other IIA-AFCIG members, using a method validated by an independent engineering firm. Those GPMs are identified with a ^ . All unmarked GPM specifications have been determined by ACI and have been corroborated by interpolation with the formal test data wherever possible.

AERATOR

Torrent



3 HP Shown

The Torrent is an Aerator, as opposed to a Display Aerator. It creates a high volume, white boil, of highly aerated water. The Torrent is created using a special Torrent propeller and nozzle. This allows it to achieve the maximum possible flow rate for each horsepower. The very high flow rate maximizes aeration and circulation while producing a minimal surface pattern. The extremely large bottom-to-top circulation and the highest oxygen transfer rates make this the preferred selection if pond health is the primary consideration **and** no display pattern is desired. In addition, because of the very high flow rate, low spray height, and deep suction, the Torrent makes an excellent de-icer that will keep a large area of water open in freezing weather. Because the spray height is very low and the flow constantly covers the float, no ice can accumulate on the float so no winter maintenance problems will be created when operated continuously.

Torrent pumps cannot use a Display Aerator nozzle unless converted to a Display Aerator pump.

Data marked with an * was tested at the UM test lab.
Data marked with a ^ was tested at an IIA-AFCIG test facility.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	1.5	3	600	52	28	12	7	6	-	-	-	-
1	2	4	900 [^]	52	28	16	11	10	6	5	3	-
2	2.5	5	1050	56	28	-	14	13	9	8	4	-
3	3	6	1200	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	.4	.8	2280	1.32	0.7	4	-	-
1	.5	1	3120	1.32	0.7	8	4	2
2	.6	1.2	4140	1.35	0.7	11	7	4
3	.75	1.5	4600	1.44	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	-	-	-	-	-	-	-	-
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-

DISPLAY AERATORS

Arch



5 HP Two Stage Shown

The Arch is a Display Aerator that produces 8, very heavy, very high, gracefully arching streams. This pattern is spectacular with a different color light on each stream or pair of streams.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht.	Dia.	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
	(Ft.)	(Ft.)		Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	20	390	56	28	-	14	13	9	8	4	-
3	13	26	450	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	20	40	520	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht.	Dia.	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
	(M)	(M)		Vert.	Horiz.	220V	220V	380V
2	2.5	5	1521	1.42	0.7	11	7	4
3	3	6	1800	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	4.5	10	2184	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	12	2520	1.65	0.7	-	23	13

DISPLAY AERATORS

Arum



5 HP Two Stage Shown

The Arum is a Display Aerator pattern with 2 tiers and is the Aerator equivalent to the Shooting Star Fountain. A tall, heavy, vertical stream is surrounded by 12 low, medium diameter, gracefully arching, coherent streams about 1/3 the height of the center stream. This creates a beautiful and innovative look for a Display Aerator by day or when lit.

60 Hz

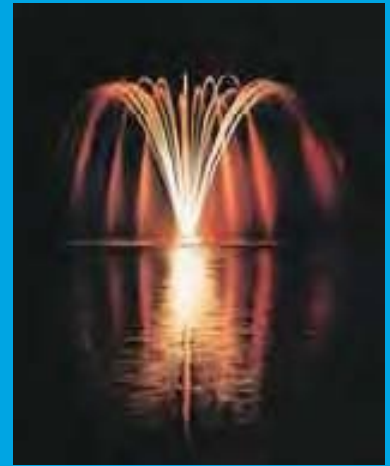
HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	18	350	56	28	-	14	13	9	8	4	-
3	12	20	390	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	20	30	500	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
2	2.5	4.25	1365	1.42	0.7	11	7	4
3	3	4.5	1560	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	4.5	6.0	2100	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	5	8.25	2310	1.65	0.7	-	23	13

DISPLAY AERATORS

Candelabra



7.5 HP Two Stage Shown

The Candelabra is a Display Aerator pattern. It has 24 high, heavy, coherent, arching streams that create a beautiful, full, arch pattern with great impact, good height, and a diameter double the height. Lighting creates a beautiful and dramatic effect, and this pattern, like similar patterns, can be very effectively lit with different colored lights.

60 Hz

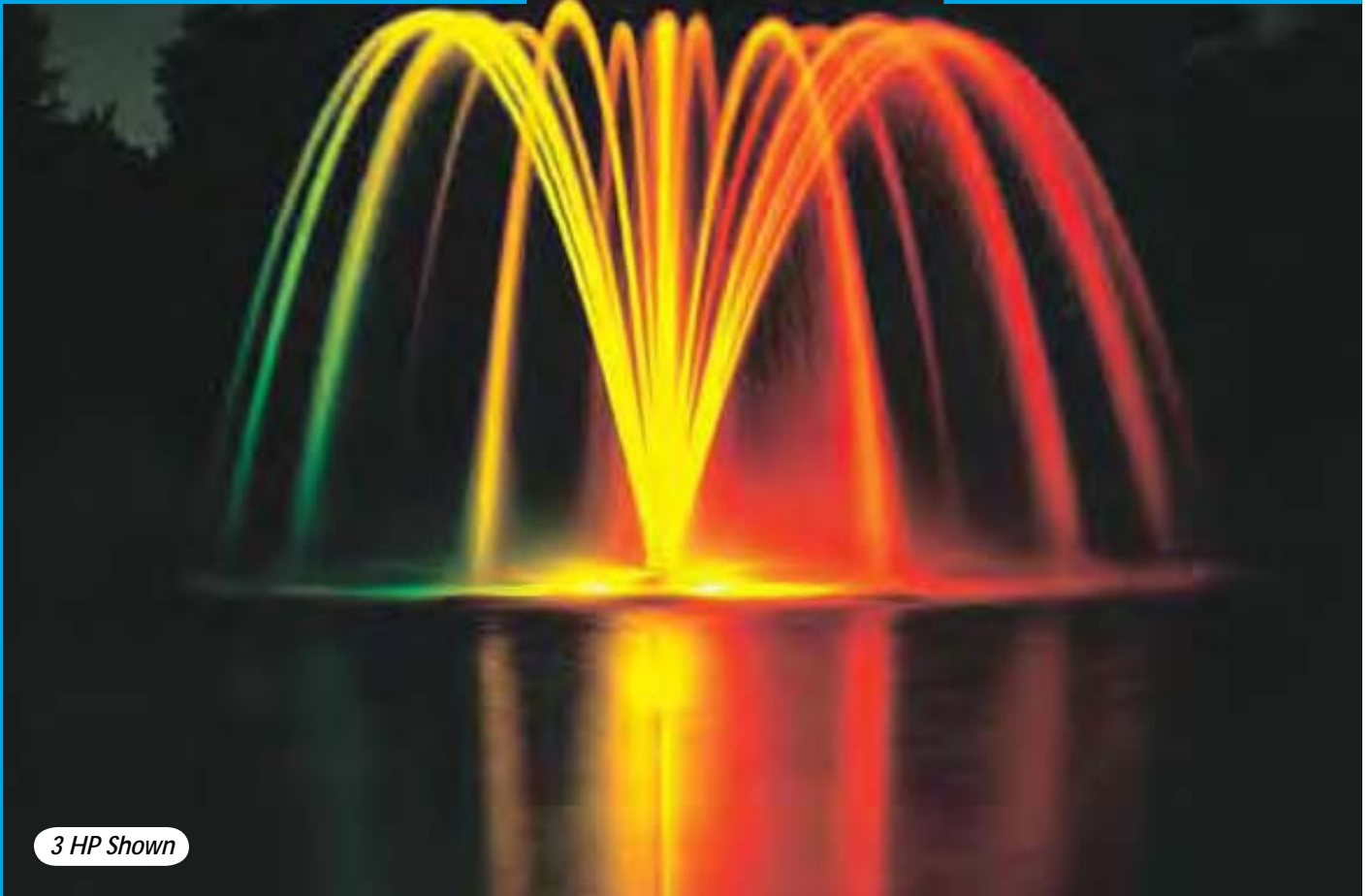
HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	20	370	56	28	-	14	13	9	8	4	-
3	12	24	410	56	28	-	20	18	13	11	6	4
5	14	28	550	62	28	-	30	28	21	18	9	7
5 - 2S	19	38	520	65	28	-	30	28	21	18	9	7
7.5	16	32	620	62	28	-	-	-	31	26	13	11
7.5 - 2S	24	48	580	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
2	2.5	5	1443	1.42	0.7	11	7	4
3	3	6	1640	1.42	0.7	17	10	6
5	3.5	7	2255	1.57	0.7	26	16	9
5 - 2S	5	10	2184	1.65	0.7	26	16	9
7.5	4	8	2542	1.57	0.7	-	23	13
7.5 - 2S	6	12	2436	1.65	0.7	-	23	13

Cluster Arch

DISPLAY AERATORS



3 HP Shown

The Cluster Arch Display Aerator produces 16 heavy, high, coherent, gracefully arching streams that are quite wind resistant and remain attractive better than most patterns of similar height. It is a perfect pattern for using several different colored lights, with or without a sequencer, to create a dramatic multicolored addition to the night skyline.

Data marked with an * was tested at the UM test lab.
Data marked with a ^ was tested at an IIA-AFCIG test facility.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1	8	14	320 [^] *	52	28	16	11	10	6	5	3	-
2	10	20	390	56	28	-	14	13	9	8	4	-
3	14	30	450*	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	20	40	520*	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1	2	4	1056	1.32	0.7	8	4	2
2	2.5	5	1521	1.42	0.7	11	7	4
3	3	6	1800	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	4.5	9	2184	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	12	2520	1.65	0.7	-	23	13

DISPLAY AERATORS

Crown Gusher



3 HP Shown

The Crown Gusher Display Aerator has a very high flow rate and a high, medium width, conical pattern. The relatively open spray nozzle is highly resistant to plugging. This pattern creates the maximum possible combination of height and volume in a Display Aerator while creating a beautiful shape. Additionally, because the pattern is not especially wide, the Crown Gusher can be used in narrow areas or small coves. This pattern, along with the Scepter, is perfect for blocking the sight of industrial and commercial eyesores and for masking the sounds of highway traffic. It lights extremely well.

Data marked with an * was tested at the UM test lab.
Data marked with a ^ was tested at an IIA-AFCIG test facility.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	6	8	300*	52	28	12	7	6	-	-	-	-
1	7	10	360 [^] *	52	28	16	11	10	6	5	3	-
2	10	13	500*	56	28	-	14	13	9	8	4	-
3	12	16	630*	56	28	-	20	18	13	11	6	4
5	15	20	700*	62	28	-	30	28	21	18	9	7
5 - 2S	18	22	530*	65	28	-	30	28	21	18	9	7
7.5	18	22	800	62	28	-	-	-	31	26	13	11
7.5 - 2S	24	28	700	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.5	1.5	888	1.32	0.7	4	-	-
1	2	2	1332	1.32	0.7	8	4	2
2	2.5	2.5	2021	1.42	0.7	11	7	4
3	3	3	2508	1.42	0.7	17	10	6
5	3.5	3.5	3150	1.57	0.7	26	16	9
5 - 2S	4.5	4.5	2760	1.65	0.7	26	16	9
7.5	4	4	3600	1.57	0.7	-	23	13
7.5 - 2S	5	5	3220	1.65	0.7	-	23	13

Daffodil

DISPLAY AERATORS



2 HP Shown

The Daffodil is a 2 tier Display Aerator that is similar to the Lily. It has a beautiful, wide, low fan and a thick, high center stream. This is an ideal pattern for windy lakes. It is also perfect for golf courses where a high and solid pattern might block the view of a green, whereas the low fan would likely never be a problem and the single, coherent, center stream would not obstruct the view. Like the Lily, the Daffodil lights very well.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	5.5	18	220	52	28	12	7	6	-	-	-	-
1	7.5	26	350	52	28	16	11	10	6	5	3	-
2	10	40	410	56	28	-	14	13	9	8	4	-
3	15	50	490	56	28	-	20	18	13	11	6	4
5	16	54	650	62	28	-	30	28	21	18	9	7
5 - 2S	20	60	600	65	28	-	30	28	21	18	9	7
7.5	18	56	720	62	28	-	-	-	31	26	13	11
7.5 - 2S	25	70	650	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.2	4	814	1.32	0.7	4	-	-
1	1.7	7	1295	1.32	0.7	8	4	2
2	2.2	8	1763	1.42	0.7	11	7	4
3	3	10	2156	1.42	0.7	17	10	6
5	3.5	12	2925	1.57	0.7	26	16	9
5 - 2S	4.5	16	2760	1.65	0.7	26	16	9
7.5	4	14	3240	1.57	0.7	-	23	13
7.5 - 2S	5	18	2990	1.65	0.7	-	23	13

DISPLAY AERATORS

Delmar



5 HP Two Stage Shown

The Delmar is a Display Aerator that has an impressively high, heavy, center stream surrounded by 12 or 16 heavy, arching streams about 2/3 the center height. The equivalent Fountain is the Trellis and Sky Geysers. This pattern lights very beautifully.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	12	350	56	28	-	14	13	9	8	4	-
3	12	15	390	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	22	30	500	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	24	33	550	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
2	2.5	3	1365	1.42	0.7	11	7	4
3	3	3.75	1560	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	5	6.75	2100	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	8.25	2310	1.65	0.7	-	23	13

Double Arch

DISPLAY AERATORS



5 HP Two Stage Shown

The Double Arch is a 2 tier Display Aerator pattern that is the equivalent to the Majestic Fountain. It has 8 high, coherent, arching streams and 8 medium arching streams about 2/3 the height and double the diameter, to create a beautiful, high pattern with a substantial diameter. This pattern maximizes the visual impact of this type of 2 tier pattern since all the streams are fairly high. This pattern also lights very well.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1	8	20	300	52	28	16	11	10	6	5	3	-
2	10	23	350	56	28	-	14	13	9	8	4	-
3	12	28	390	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	22	50	500	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	24	55	550	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1	2	4.2	1056	1.32	0.7	8	4	2
2	2.5	5.75	1365	1.42	0.7	11	7	4
3	3	10	1560	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	5	11.5	2100	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	13.75	2310	1.65	0.7	-	23	13

Lily

DISPLAY AERATORS



2 HP Shown

The Lily is a 2 tier Display Aerator pattern originated by Aqua Control. The Lily has become one of our most popular patterns with its beautiful, wide and low fan, and 7 thick, high, coherent arching streams, all of which are quite wind resistant. This is an ideal pattern for windy lakes. It is also perfect for golf courses where a high and solid pattern might block the view of a green, whereas the low Lily fan would not create an obstruction, and the coherent arching streams are open enough to prevent obstructing the view. The Lily lights beautifully.

Data marked with an * was tested at the UM test lab.
Data marked with a ^ was tested at an IIA-AFCIG test facility.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	5	15	290	52	28	12	7	6	-	-	-	-
1	6.5	22	370*	52	28	16	11	10	6	5	3	-
2	9	40	450	56	28	-	14	13	9	8	4	-
3	13	48	550*	56	28	-	20	18	13	11	6	4
5	15	50	680	62	28	-	30	28	21	18	9	7
5 - 2S	17	55	625*	65	28	-	30	28	21	18	9	7
7.5	17	55	760	62	28	-	-	-	31	26	13	11
7.5 - 2S	24	70	690	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single-Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.2	4	851	1.32	0.7	4	-	-
1	1.7	7	1369	1.32	0.7	8	4	2
2	2.2	8	1849	1.42	0.7	11	7	4
3	3	10	2244	1.42	0.7	17	10	6
5	3.5	12	3060	1.57	0.7	26	16	9
5 - 2S	4.5	16	2944	1.65	0.7	26	16	9
7.5	4	14	3420	1.57	0.7	-	23	13
7.5 - 2S	5	18	3174	1.65	0.7	-	23	13

Pentalator

DISPLAY AERATORS



5 HP Two Stage Shown

The Pentalator is a Display Aerator pattern with five tiers and is the Aerator equivalent to the Buckingham Fountain. A maximum height vertical stream is surrounded by 4 lower tiers of 6 heavy, gracefully arching, coherent streams each with gradually reduced height and increased diameter. This creates a pyramid effect while maintaining the traditional coherent streams that make Aqua Control patterns beautiful. This pattern is very dramatic when lit. Since only the center stream is maximum height, the overall appearance is not one of great height so it would be best to select a higher horsepower than originally planned to achieve maximum effect.

60 Hz

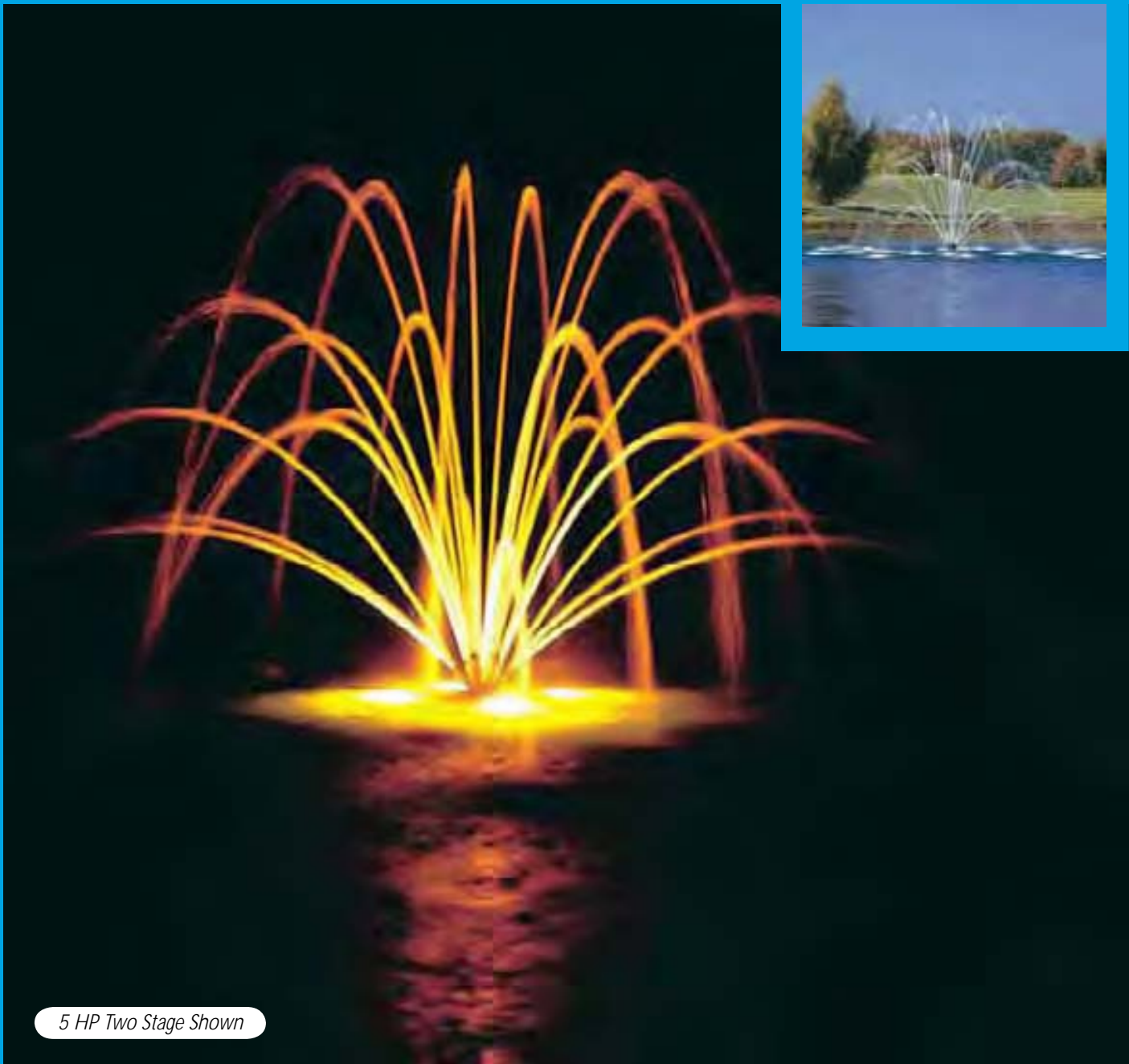
HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	20	400	56	28	-	14	13	9	8	4	-
3	12	24	470	56	28	-	20	18	13	11	6	4
5	14	28	600	62	28	-	30	28	21	18	9	7
5 - 2S	20	40	560	65	28	-	30	28	21	18	9	7
7.5	16	32	660	62	28	-	-	-	31	26	13	11
7.5 - 2S	24	48	620	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
2	2.5	5	1560	1.42	0.7	11	7	4
3	3	6	1880	1.42	0.7	17	10	6
5	3.5	7	2460	1.57	0.7	26	16	9
5 - 2S	5	9	2352	1.65	0.7	26	16	9
7.5	4	8	2706	1.57	0.7	-	23	13
7.5 - 2S	6	12	2604	1.65	0.7	-	23	13

DISPLAY AERATORS

Quad



5 HP Two Stage Shown

The Quad is a Display Aerator pattern with 4 tiers of 6 heavy, gracefully arching, coherent streams each with gradually reduced height and increased diameter. This pattern is similar to the Pentaltator but produces a higher overall appearance because 6 streams are at full height not just the single center stream of the Pentaltator. It lights extremely well.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1	8	25	300	52	28	16	11	10	6	5	3	-
2	10	30	350	56	28	-	14	13	9	8	4	-
3	12	35	390	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	22	50	500	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	24	55	550	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1	2	3.9	1056	1.32	0.7	8	4	2
2	2.5	4.25	1365	1.42	0.7	11	7	4
3	3	5	1560	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	5	8.5	2100	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	10	2310	1.65	0.7	-	23	13

Scepter

DISPLAY AERATORS



Aqua Control

 WATER FEATURES



5 HP Two Stage Shown

The Scepter is a Display Aerator that produces a heavy, opaque, mass of water high in the air while creating an attractive shape. This pattern, along with the Crown Gusher, is excellent for blocking the sight and sounds of highway traffic and industrial or commercial eyesores. It lights very effectively.

60 Hz

Data marked with an * was tested at the UM test lab.
 Data marked with a ^ was tested at an IIA-AFCIG test facility.

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	6	4	280	52	28	12	7	6	-	-	-	-
1	7.5	6	350*	52	28	16	11	10	6	5	3	-
2	10	8	400*	56	28	-	14	13	9	8	4	-
3	14	9	500*	56	28	-	20	18	13	11	6	4
5	16	10	620	62	28	-	30	28	21	18	9	7
5 - 2S	20	12	580*	65	28	-	30	28	21	18	9	7
7.5	17	8	750	62	28	-	-	-	31	26	13	11
7.5 - 2S	25	12	680	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.5	1	740	1.32	0.7	4	-	-
1	2	1.5	1295	1.32	0.7	8	4	2
2	2.5	1.7	1720	1.42	0.7	11	7	4
3	3	2	2200	1.42	0.7	17	10	6
5	3.5	2.5	2790	1.57	0.7	26	16	9
5 - 2S	5	4	2668	1.65	0.7	26	16	9
7.5	4	3	3375	1.57	0.7	-	23	13
7.5 - 2S	6	5	3128	1.65	0.7	-	23	13

DISPLAY AERATORS

Spider



3 HP Shown

The Spider Display Aerator produces 8 low, very wide, very heavy streams that create a very wide pattern. The low trajectory and heavy streams provide the maximum resistance to wind distortion. This pattern, like the Tarantula, is effective at discouraging waterfowl over its wide diameter, and when the streams impact fairly close to shore, it can help to reduce mosquito populations. Multiple units could help to control waterfowl and mosquitos on a large pond.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	2	15	180	52	28	12	7	6	-	-	-	-
1	3	25	320	52	28	16	11	10	6	5	3	-
2	4	30	390	56	28	-	14	13	9	8	4	-
3	4.5	40	450	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	6	80	520	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	0.4	3.7	594	1.32	0.7	4	-	-
1	0.7	6.2	1056	1.32	0.7	8	4	2
2	1	7.5	1521	1.42	0.7	11	7	4
3	1.2	9	1800	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	2	15	2184	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	2.2	17	2520	1.65	0.7	-	23	13

DISPLAY AERATORS

Spider & Arch



5 HP Two Stage Shown

The Spider and Arch Display Aerator is a popular pattern that produces 8 beautiful, high, heavy, arching coherent streams and 8 wide, low, heavy streams that create a large diameter pattern. This Spider and Arch is popular because it covers a large surface area while still providing an attractive and highly visible pattern, both day and night.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	6	20	180	52	28	12	7	6	-	-	-	-
1	8	30	320	52	28	16	11	10	6	5	3	-
2	10	40	390	56	28	-	14	13	9	8	4	-
3	12	50	450	56	28	-	20	18	13	11	6	4
5	14	60	580	62	28	-	30	28	21	18	9	7
5 - 2S	20	90	520	65	28	-	30	28	21	18	9	7
7.5	16	66	660	62	28	-	-	-	31	26	13	11
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.5	3.7	594	1.32	0.7	4	-	-
1	2	7	1056	1.32	0.7	8	4	2
2	2.5	9	1521	1.42	0.7	11	7	4
3	3	11	1800	1.42	0.7	17	10	6
5	3.5	14	2378	1.57	0.7	26	16	9
5 - 2S	4.5	20	2184	1.65	0.7	26	16	9
7.5	4	16	2706	1.57	0.7	-	23	13
7.5 - 2S	6	22	2520	1.65	0.7	-	23	13

Super Lily

DISPLAY AERATORS



2 HP Shown

The Super Lily is a 2 tier Display Aerator that is similar to the Lily. It also has a beautiful, wide, low, fan pattern but it has 12 high, smaller diameter, arching streams. Like the Lily, it lights very well and the fan is quite wind resistant.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	5	15	230	52	28	12	7	6	-	-	-	-
1	6.5	22	370	52	28	16	11	10	6	5	3	-
2	9	40	430	56	28	-	14	13	9	8	4	-
3	13	48	510	56	28	-	20	18	13	11	6	4
5	15	50	680	62	28	-	30	28	21	18	9	7
5 - 2S	17	55	640	65	28	-	30	28	21	18	9	7
7.5	17	55	760	62	28	-	-	-	31	26	13	11
7.5 - 2S	24	70	690	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1.2	4	851	1.32	0.7	4	-	-
1	1.7	7	1369	1.32	0.7	8	4	2
2	2.2	8	1849	1.42	0.7	11	7	4
3	3	10	2244	1.42	0.7	17	10	6
5	3.5	12	3060	1.57	0.7	26	16	9
5 - 2S	4.5	16	2944	1.65	0.7	26	16	9
7.5	4	14	3420	1.57	0.7	-	23	13
7.5 - 2S	5	18	3174	1.65	0.7	-	23	13

DISPLAY AERATORS

Tornado



5 HP Shown

OXYGEN TRANSFER RATE - 60 HZ

	1/2 HP	1 HP	3 HP
SOTR = lb/hr	1.80'	3.43'	4.67'
SAE = lb/KW hr	1.87'	2.07'	1.23'

The Tornado produces the maximum pumping rate of any Display Aerator while also creating a beautiful, full, conical spray pattern. The very large opening in this nozzle makes it virtually impossible to plug. The Tornado produces the highest circulation rate and the highest oxygen transfer rate and does it more efficiently than any other Display Aerator, as determined by testing at the University of Minnesota, St. Anthony Falls Laboratory. Only the Torrent, a non Display Aerator, has higher pumping rates, higher oxygen transfer rates, and is more efficient.

60 Hz

Data marked with an * was tested at the UM test lab.
Data marked with a ^ was tested at an IIA-AFCIG test facility.

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2 *	4.5	12	300	52	28	12	7	6	-	-	-	-
1	6	20	400^*	52	28	16	11	10	6	5	3	-
2	8	25	510	56	28	-	14	13	9	8	4	-
3	10	30	620	56	28	-	20	18	13	11	6	4
5	11	33	800	62	28	-	30	28	21	18	9	7
5 - 2S	18	32	680	65	28	-	30	28	21	18	9	7
7.5	13	37	900	62	28	-	-	-	31	26	13	11
7.5 - 2S	-	-	-	-	-	-	-	-	-	-	-	-

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1/2	1	3	1140	1.32	0.7	4	-	-
1	1.5	6	1560	1.32	0.7	8	4	2
2	2	7	2346	1.42	0.7	11	7	4
3	2.5	8	2852	1.42	0.7	17	10	6
5	3	9	4000	1.57	0.7	26	16	9
5 - 2S	4	11	2856	1.65	0.7	26	16	9
7.5	3.2	11	4140	1.57	0.7	-	23	13
7.5 - 2S	-	-	-	-	-	-	-	-

DISPLAY AERATORS

Trillium



5 HP Two Stage Shown

The Trillium is a Display Aerator pattern with three tiers and is the Aerator equivalent to the higher and more delicate Fleur de Lis Fountain. A vertical stream is surrounded by 2 tiers of 8 heavy, gracefully arching, coherent streams with each tier about 2/3 the height of the previous but with an increased diameter. This creates a pyramid that maintains the traditional coherent streams that make Aqua Control patterns beautiful. This pattern lights extremely well.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
2	10	18	390	56	28	-	14	13	9	8	4	-
3	12	22	450	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	22	38	520	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	24	42	600	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
2	2.5	4.25	1521	1.42	0.7	11	7	4
3	3	5	1800	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	5	8.5	2184	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	10	2520	1.65	0.7	-	23	13

DISPLAY AERATORS

Weeping Willow



5 HP Two Stage Shown

The Weeping Willow is a Display Aerator pattern with two tiers. It is the Aerator equivalent to the Double Trellis Fountain. It has 8 high, coherent, arching streams with 8 similar, lower, arching streams about 2/3 the height, that all produce the same diameter. This is another pattern that is spectacular with lights.

60 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM	Min. Water Depth (Inches)		Single Phase			Three Phase			
				Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1	8	14	300	52	28	16	11	10	6	5	3	-
2	10	17	350	56	28	-	14	13	9	8	4	-
3	12	20	390	56	28	-	20	18	13	11	6	4
5	-	-	-	-	-	-	-	-	-	-	-	-
5 - 2S	22	36	500	65	28	-	30	28	21	18	9	7
7.5	-	-	-	-	-	-	-	-	-	-	-	-
7.5 - 2S	24	40	550	65	28	-	-	-	31	26	13	11

50 Hz

HP 2S = Two Stage	PERFORMANCE			DEPTH		AMPS		
	Ht. (M)	Dia. (M)	CMD	Min. Water Depth (Meters)		Single Phase	Three Phase	
				Vert.	Horiz.	220V	220V	380V
1	2	3.5	1056	1.32	0.7	8	4	2
2	2.5	4.25	1365	1.42	0.7	11	7	4
3	3	5	1560	1.42	0.7	17	10	6
5	-	-	-	-	-	-	-	-
5 - 2S	5	8.5	2100	1.65	0.7	26	16	9
7.5	-	-	-	-	-	-	-	-
7.5 - 2S	6	10	2310	1.65	0.7	-	23	13

DISPLAY AERATOR & FOUNTAIN

The Combo



5 HP Shown

The Combo uses one motor to power two pumps to produce both a Tornado Display Aerator and a Sky Geyser Fountain. It creates a very high flow, classical, conical Tornado Display Aerator pattern, and a very high, single-stream, coherent Sky Geyser Fountain pattern. The Combo looks similar to the Flare and Sky Geyser Fountain but it pumps several times more water. This makes The Combo the perfect choice where high circulation and aeration are needed and a high pattern is also desired. It creates a real focal point in a landscaped area, especially at night when lit.

60 Hz

HP	PERFORMANCE			DEPTH Min. Water Depth (Inches)	AMPS						
	Ht. (Ft.)	Dia. (Ft.)	GPM		Single Phase			Three Phase			
					115V	208V	230V	208V	230V	460V	575V
3	20	20	550	56	-	20	18	13	11	6	4
5	35	30	700	62	-	30	28	21	18	9	7
7.5	40	40	900	62	-	-	-	31	26	13	11

50 Hz

HP	PERFORMANCE			DEPTH Min. Water Depth (Meters)	AMPS		
	Ht. (M)	Dia. (M)	CMD		Single	Three Phase	
					Phase	220V	220V
3	5	4.3	2475	1.42	17	10	6
5	9	7.5	3150	1.65	26	16	9
7.5	8	10	4050	1.65	-	23	13

Buckingham

FOUNTAINS



3 HP Shown

The Buckingham is a Fountain with 5 tiers and is the Fountain equivalent to the Pentalator Display Aerator. A tall center stream is surrounded by 4 tiers of 6, gracefully arching, coherent streams each with gradually reduced height and increased diameter. This creates a pyramid effect while maintaining the traditional coherent streams that make Aqua Control patterns so beautiful. Lighting this pattern creates a beautiful and dramatic water feature and multiple colored lights are very effective.

60 Hz

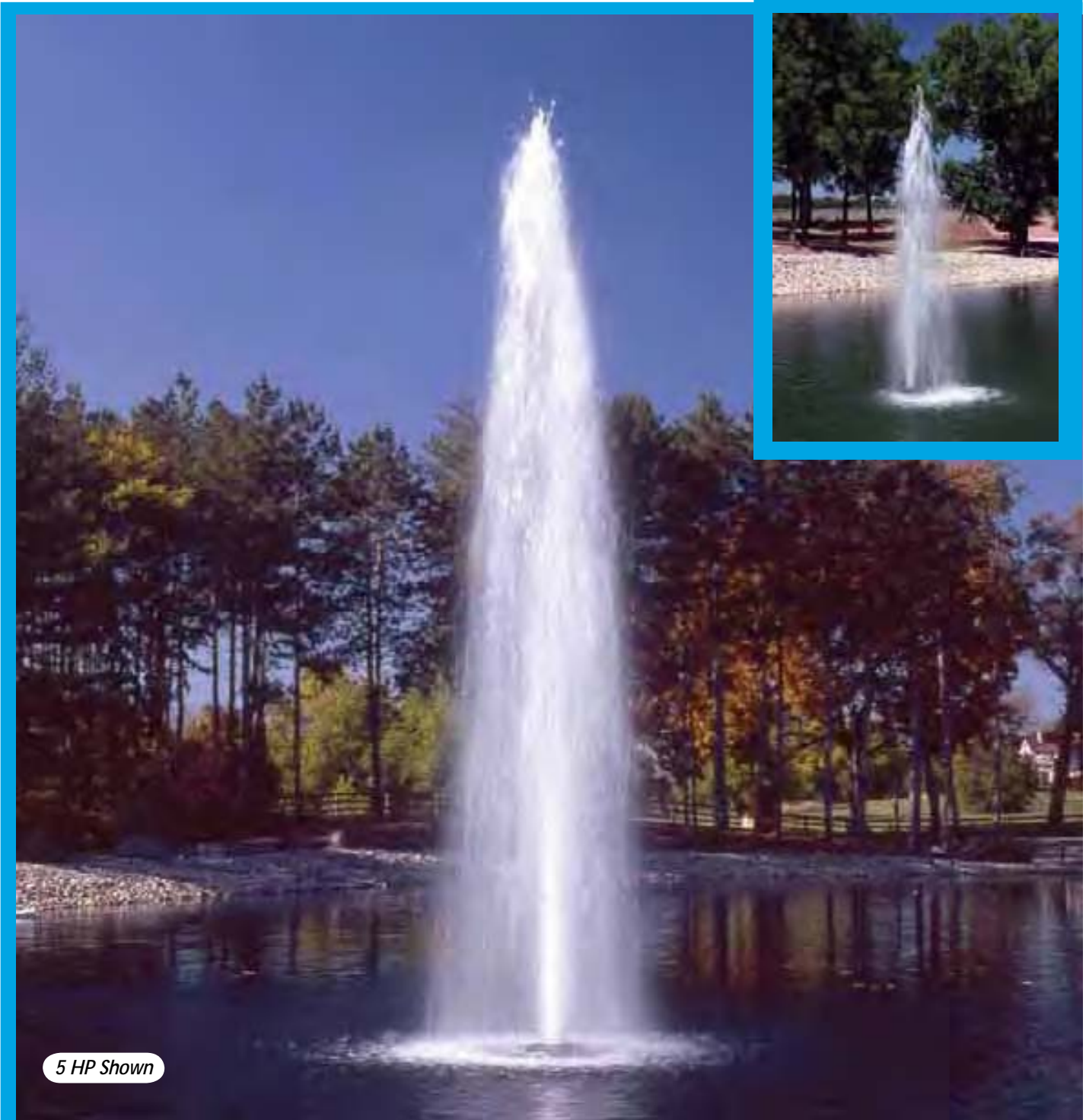
HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	13	26	52	28	12	7	6	-	-	-	-
1	20	40	52	28	16	11	10	6	5	3	-
2	22	44	56	28	-	14	13	9	8	4	-
3	25	50	56	28	-	20	18	13	11	6	4
5	30	60	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.2	4.4	1.32	0.7	4	-	-
1	3.5	7	1.32	0.7	8	4	2
2	4.5	9	1.42	0.7	11	7	4
3	5.5	11	1.42	0.7	17	10	6
5	7	14	1.57	0.7	26	16	9

FOUNTAINS

Cascade



5 HP Shown

The Cascade shows a thick, highly visible frothing and foaming spray pattern that provides optimum sound and visual effects and also looks great with spot lights.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1	8	2.5	63	36	16	11	10	6	5	3	-
2	12	3	67	36	-	14	13	9	8	4	-
3	16	4	67	36	-	20	18	13	11	6	4
5	24	6	73	36	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1	1.7	.5	1.6	.9	8	4	2
2	2.6	.6	1.7	.9	11	7	4
3	3.4	.9	1.7	.9	17	10	6
5	5.1	1.3	1.9	.9	26	16	9

FOUNTAINS

Double Trellis



3 HP Shown

The Double Trellis is the 2 tier Fountain equivalent to the Weeping Willow Display Aerator. It has 8 high, coherent, arching streams with 8 similar, lower, arching streams about 2/3 the height that all produce the same diameter. This is another pattern that is beautiful with lights and especially with multiple colored lights.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	10	17	52	28	12	7	6	-	-	-	-
1	18	30	52	28	16	11	10	6	5	3	-
2	22	37	56	28	-	14	13	9	8	4	-
3	26	43	56	28	-	20	18	13	11	6	4
5	30	50	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.3	3.8	1.32	0.7	4	-	-
1	4.1	6.8	1.32	0.7	8	4	2
2	5	8.4	1.42	0.7	11	7	4
3	5.9	9.8	1.42	0.7	17	10	6
5	6.8	11.3	1.57	0.7	26	16	9

FOUNTAINS

Flare & Sky Geyser



3 HP Shown

The Flare and Sky Geyser Fountain is a multi adjustable, 2 tier pattern, that creates a lower conical pattern that is adjustable over a wide range of diameter and flow. The center stream is a narrow, smooth, coherent, Sky Geyser pattern. This pattern creates the general shape of The Combo, but as with all Fountains, it has much thinner and more delicate streams and a much lower aeration and circulation rate. It lights well.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht.	Dia.	Min. Water Depth		Single Phase			Three Phase			
	(Ft.)	(Ft.)	Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	10 - 20	6 - 20	52	28	12	7	6	-	-	-	-
1	15 - 22	12 - 30	52	28	16	11	10	6	5	3	-
2	16 - 25	13 - 40	56	28	-	14	13	9	8	4	-
3	17 - 28	15 - 50	56	28	-	20	18	13	11	6	4
5	30 - 40	20 - 70	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht.	Dia.	Min. Water Depth		Single Phase	Three Phase	
	(M)	(M)	Vert.	Horiz.	220V	220V	380V
1/2	2 - 3	1.2 - 5	1.32	0.7	4	-	-
1	3 - 5	2.4 - 6	1.32	0.7	8	4	2
2	3.2 - 6	2.6 - 8	1.42	0.7	11	7	4
3	3.4 - 7	3 - 10	1.42	0.7	17	10	6
5	4.8 - 9	4 - 14	1.57	0.7	26	16	9

FOUNTAINS

Fleur de Lis



3 HP Shown



The Fleur de Lis Fountain is the classic name for a historic and beautiful 3 tier pattern. It has a high, narrow, Sky Geysier surrounded by an 8 stream Trellis about 2/3 the height that in turn is surrounded by a lower and wider 8 stream Trellis about 2/3 that height. This creates a pyramid effect while maintaining the traditional coherent streams that make Aqua Control patterns so beautiful. This pattern is higher than the 5 tier Buckingham and is the Fountain equivalent of the heavier and lower Trillium Display Aerator pattern. This pattern lights spectacularly and multiple colored lights, especially when sequenced, are particularly beautiful.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	12	20	52	28	12	7	6	-	-	-	-
1	20	32	52	28	16	11	10	6	5	3	-
2	23	40	56	28	-	14	13	9	8	4	-
3	26	48	56	28	-	20	18	13	11	6	4
5	35	56	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.7	4.5	1.32	0.7	4	-	-
1	4.5	7.3	1.32	0.7	8	4	2
2	5.7	9.1	1.42	0.7	11	7	4
3	6.8	10.8	1.42	0.7	17	10	6
5	8	12.7	1.57	0.7	26	16	9

FOUNTAINS

Full Geyser



3 HP Shown

The Full Geyser Fountain has several vertical streams that intermingle to produce a single, heavy, moderately high, and undulating pattern that “fluffs out” near the top creating a full, interesting, dynamic, and constantly changing pattern. This is an excellent pattern to use where a single, moderately high, pattern is desired that has the fullness to give it good visibility. It is also effective where several Full Geyser Fountains are arranged in a group to form a shape in the pond or lake such as a line, triangle, circle, or other pattern. Like the Geyser, this lights dramatically with spot lights.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	10	4	52	28	12	7	6	-	-	-	-
1	20	6	52	28	16	11	10	6	5	3	-
2	24	8	56	28	-	14	13	9	8	4	-
3	28	10	56	28	-	20	18	13	11	6	4
5	34	12	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS			
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase 220V	Three Phase		
			Vert.	Horiz.		220V	380V	
1/2	2.4	0.8	1.32	0.7	4	-	-	
1	4	1.2	1.32	0.7	8	4	2	
2	5.5	1.6	1.42	0.7	11	7	4	
3	7	2	1.42	0.7	17	10	6	
5	9	2.4	1.57	0.7	26	16	9	

FOUNTAINS

Geyser



3 HP Shown

The Geyser Fountain has several streams that intermingle and produce a single, tall, and constantly undulating pattern that “fluffs out” near the top. This is a great pattern to light with spot lights.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	15	3	52	28	12	7	6	-	-	-	-
1	24	4	52	28	16	11	10	6	5	3	-
2	28	5	56	28	-	14	13	9	8	4	-
3	34	6	56	28	-	20	18	13	11	6	4
5	45	7	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	3	0.5	1.32	0.7	4	-	-
1	5	1	1.32	0.7	8	4	2
2	6	1.2	1.42	0.7	11	7	4
3	7.5	1.4	1.42	0.7	17	10	6
5	9.5	1.6	1.57	0.7	26	16	9

Majestic

FOUNTAINS



2 HP Shown

The Majestic is a 2 tier Fountain that is similar to the Double Arch Display Aerator. It has 8 high, coherent, arching streams and 8 medium arching streams about 2/3 the height and double the diameter to create a beautiful pattern of maximum height and substantial diameter. This pattern maximizes the visual impact of this type of 2 tier pattern since all the streams are high and with a large diameter. This pattern lights very well, as do all multiple arching patterns.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)	Vert.	Single Phase			Three Phase			
					115V	208V	230V	208V	230V	460V	575V
1/2	10	23	52	28	12	7	6	-	-	-	-
1	18	40	52	28	16	11	10	6	5	3	-
2	22	50	56	28	-	14	13	9	8	4	-
3	26	60	56	28	-	20	18	13	11	6	4
5	30	70	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)	Vert.	Single Phase	Three Phase	
					220V	220V	380V
1/2	2.3	5.3	1.32	0.7	4	-	-
1	4.1	9.4	1.32	0.7	8	4	2
2	5	11.5	1.42	0.7	11	7	4
3	5.9	13.6	1.42	0.7	17	10	6
5	6.8	15.6	1.57	0.7	26	16	9

Shooting Star

FOUNTAINS



3 HP Shown

The Shooting Star is a Fountain pattern with 2 tiers and is the Fountain equivalent to the Arum Display Aerator. A tall, smooth, central, Sky Geyser is surrounded by 12 low, medium diameter, gracefully arching, coherent streams about 1/3 the height of the center stream. This creates a beautiful and interesting look for a Fountain. And it lights well.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	12	20	52	28	12	7	6	-	-	-	-
1	20	32	52	28	16	11	10	6	5	3	-
2	25	40	56	28	-	14	13	9	8	4	-
3	30	48	56	28	-	20	18	13	11	6	4
5	35	56	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS			
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase		
			Vert.	Horiz.	220V	220V	380V	
1/2	2.7	4.5	1.32	0.7	4	-	-	
1	4.5	7.3	1.32	0.7	8	4	2	
2	5.7	9.1	1.42	0.7	11	7	4	
3	6.8	10.8	1.42	0.7	17	10	6	
5	8	12.7	1.57	0.7	26	16	9	

FOUNTAINS

Sky Geyser



The Sky Geyser Fountain creates a single, narrow, smooth, coherent stream that is able to achieve the maximum height the pump can generate. This is the pattern to use if the goal is to create a landmark of extreme height with a Fountain. All very high patterns, like the Sky Geyser, are subject to distortion from wind. As with all high and narrow patterns, extra spot lights are required for good illumination.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	16	2	52	28	12	7	6	-	-	-	-
1	30	3	52	28	16	11	10	6	5	3	-
2	35	4	56	28	-	14	13	9	8	4	-
3	38	5	56	28	-	20	18	13	11	6	4
5	50	7	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	4	0.4	1.32	0.7	4	-	-
1	6	0.6	1.32	0.7	8	4	2
2	7.7	0.8	1.42	0.7	11	7	4
3	8.6	1	1.42	0.7	17	10	6
5	11	1.2	1.57	0.7	26	16	9

FOUNTAINS

Spoke & Trellis



3 HP Shown

The Spoke and Trellis has a 12 stream, moderately high, arching Trellis pattern surrounded by a 12 stream, low and wide, wind resistant, Spoke pattern. The Spoke and Trellis creates a high pattern with good visual impact and the very wide pattern provides a large area of coverage that can help to discourage waterfowl. This pattern is especially attractive when it is viewed from a higher vantage point, both during the day and when lit.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	9	25	52	28	12	7	6	-	-	-	-
1	16	40	52	28	16	11	10	6	5	3	-
2	18	45	56	28	-	14	13	9	8	4	-
3	20	50	56	28	-	20	18	13	11	6	4
5	25	80	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	1.8	6	1.32	0.7	4	-	-
1	3.8	12	1.32	0.7	8	4	2
2	4.8	15	1.42	0.7	11	7	4
3	5.2	16	1.42	0.7	17	10	6
5	7	20	1.57	0.7	26	16	9

Tiara

FOUNTAINS



3 HP Shown

The Tiara is an especially beautiful and popular Aqua Control pattern. It is a 3 tier pattern with a high, central, Sky Geyser that is surrounded by 12 coherent, high arching streams about 2/3 the height of the center, and 12 long low streams creating a large diameter pattern. It is also gorgeous when lit.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	13	45	52	28	12	7	6	-	-	-	-
1	20	54	52	28	16	11	10	6	5	3	-
2	22	60	56	28	-	14	13	9	8	4	-
3	25	66	56	28	-	20	18	13	11	6	4
5	30	95	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.2	5	1.32	0.7	4	-	-
1	3.5	10	1.32	0.7	8	4	2
2	4.5	13	1.42	0.7	11	7	4
3	5.5	15	1.42	0.7	17	10	6
5	7	18	1.57	0.7	26	16	9

FOUNTAINS

Trellis



3 HP Shown

The Trellis has 12, high, gracefully arching, coherent streams. As with other patterns with arching steams, the Trellis lights extremely well and is another pattern that is especially beautiful when lit with different colored lights.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	10	20	52	28	12	7	6	-	-	-	-
1	18	36	52	28	16	11	10	6	5	3	-
2	22	44	56	28	-	14	13	9	8	4	-
3	26	52	56	28	-	20	18	13	11	6	4
5	30	60	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.3	4.5	1.32	0.7	4	-	-
1	4.1	8.2	1.32	0.7	8	4	2
2	5	10	1.42	0.7	11	7	4
3	5.9	11.8	1.42	0.7	17	10	6
5	6.8	13.6	1.57	0.7	26	16	9

FOUNTAINS

Trellis & Sky Geyser



3 HP Shown

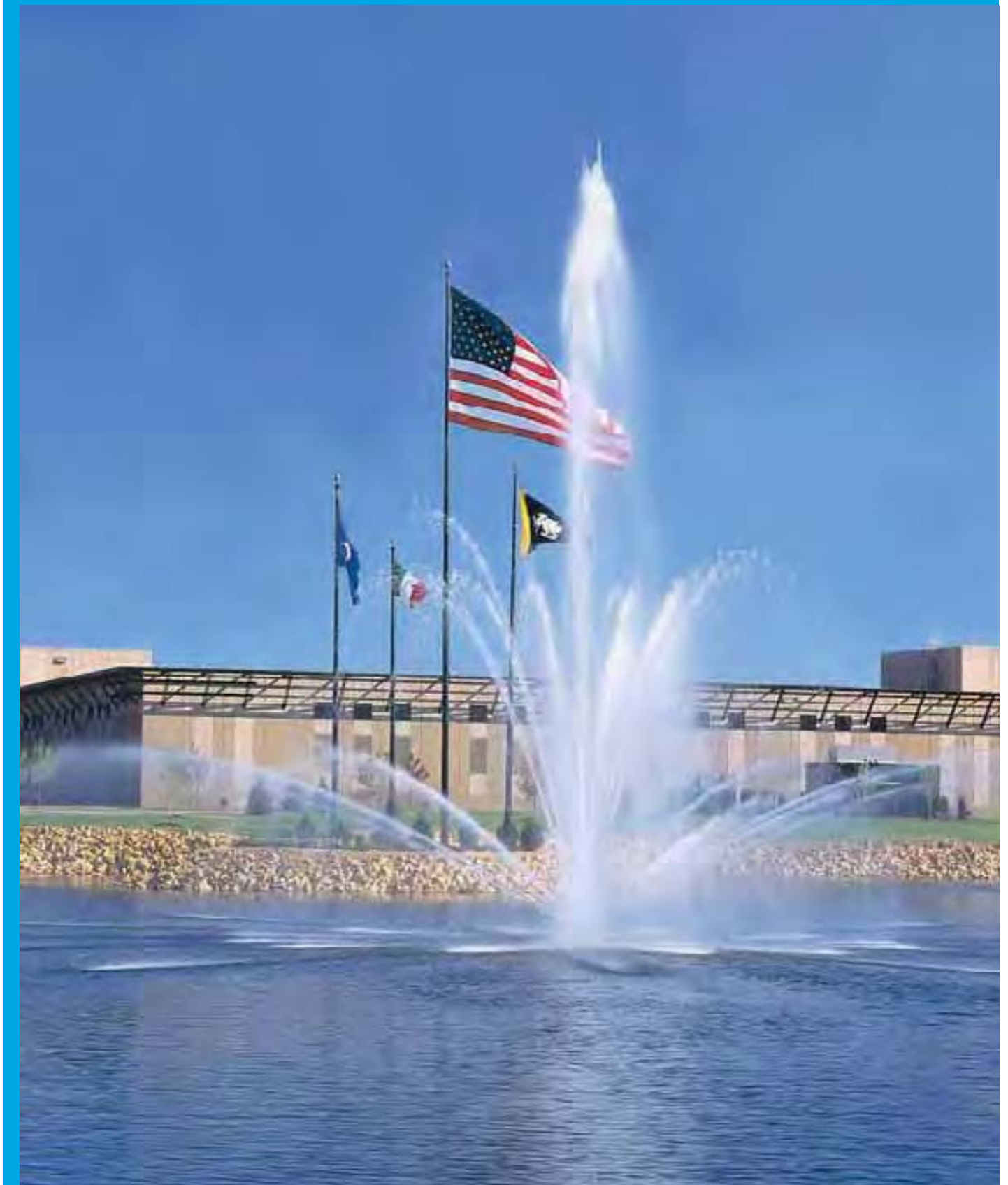
The Trellis & Sky Geyser has been a beautiful Aqua Control Fountain pattern for years, and it now has an Aerator equivalent, the Delmar. The Trellis & Sky Geyser has a high, single, coherent, Sky Geyser pattern surrounded by 12 beautifully arching, moderate-height streams about 2/3 the height. This is another pattern that lights particularly beautifully.

60 Hz

HP	PERFORMANCE		DEPTH		AMPS						
	Ht. (Ft.)	Dia. (Ft.)	Min. Water Depth (Inches)		Single Phase			Three Phase			
			Vert.	Horiz.	115V	208V	230V	208V	230V	460V	575V
1/2	12	16	52	28	12	7	6	-	-	-	-
1	20	26	52	28	16	11	10	6	5	3	-
2	25	32	56	28	-	14	13	9	8	4	-
3	30	36	56	28	-	20	18	13	11	6	4
5	35	46	62	28	-	30	28	21	18	9	7

50 Hz

HP	PERFORMANCE		DEPTH		AMPS		
	Ht. (M)	Dia. (M)	Min. Water Depth (Meters)		Single Phase	Three Phase	
			Vert.	Horiz.	220V	220V	380V
1/2	2.7	3.6	1.32	0.7	4	-	-
1	4.5	5.9	1.32	0.7	8	4	2
2	5.7	7.3	1.42	0.7	11	7	4
3	6.8	8.1	1.42	0.7	17	10	6
5	8	10.5	1.57	0.7	26	16	9

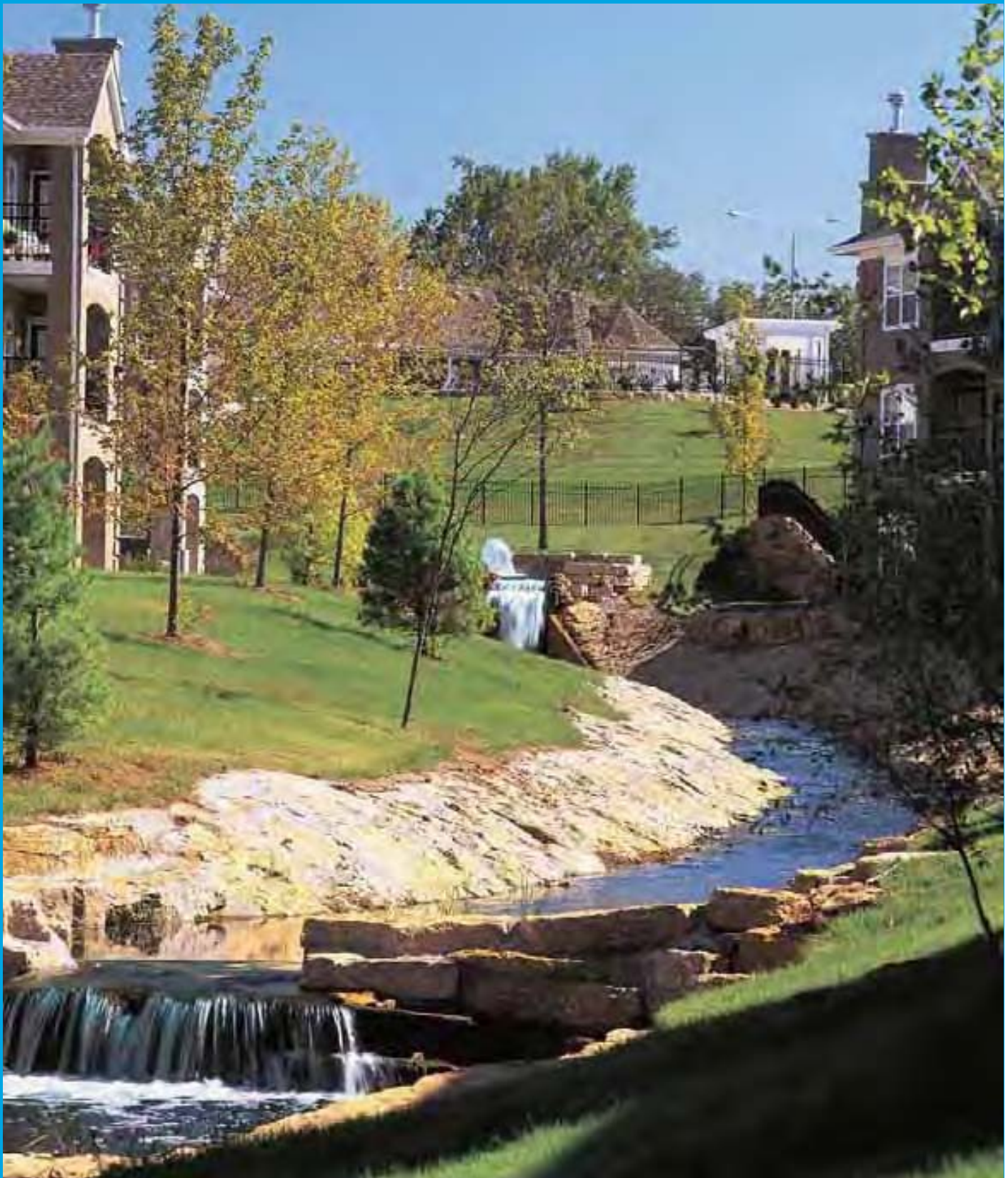


The Titan Series consists of 7½ to 40 HP Fountains that use heavy-duty submersible motors and long lasting turbine pumps. These pumps produce high pressures **and** high volumes to create a wide variety of really big, powerful, and beautiful patterns. Most Select Series Fountain patterns and some Select Series Display Aerator patterns are available in the Titan Series.

The pattern shown is a 30 HP Tiara. Request Titan Series literature for more information.

WATERFALL PUMPS

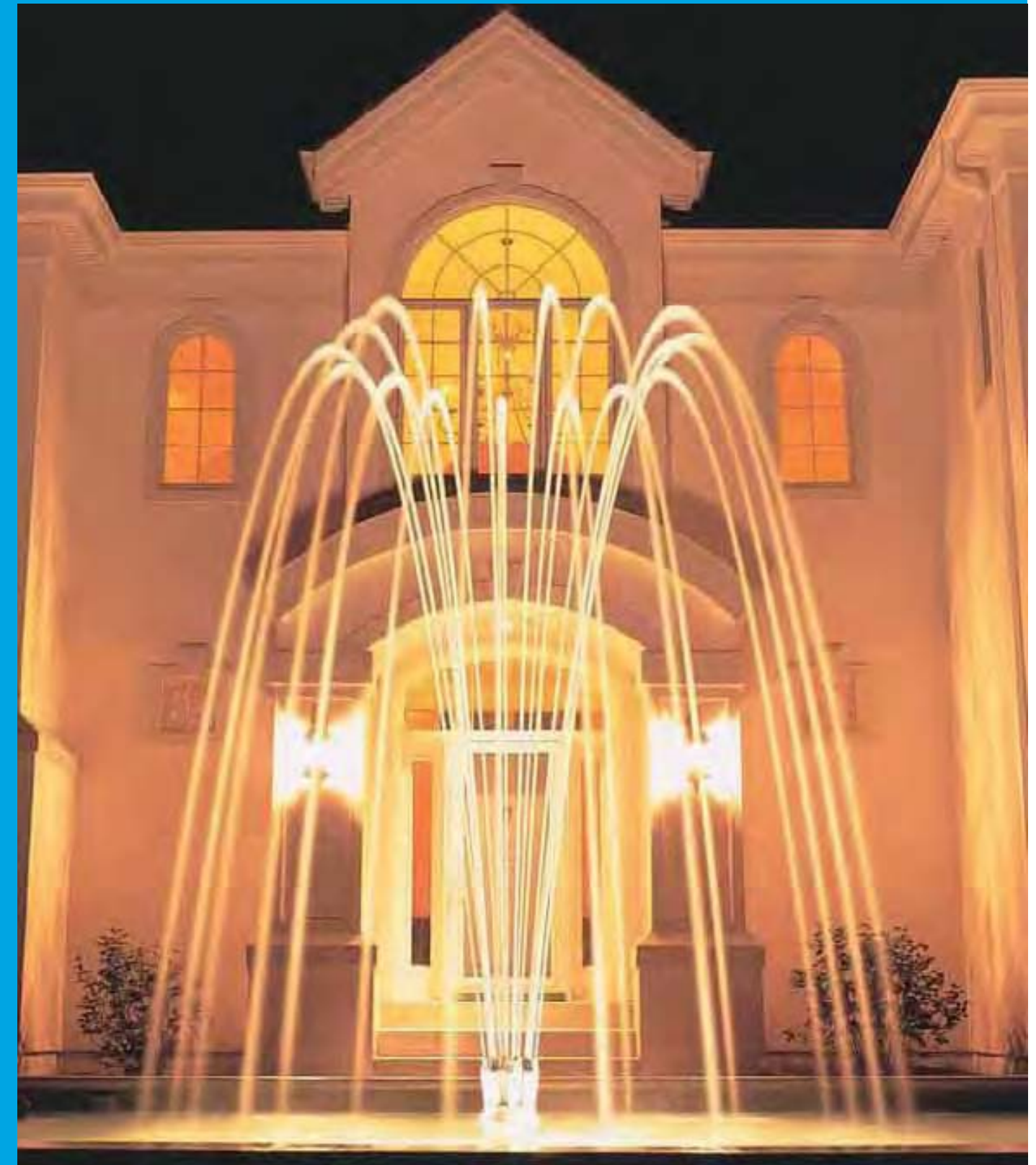
15 HP Titan Pump



Aqua Control can provide economical and highly effective pumps to create beautiful waterfalls or streams. The Aqua Control Select Series Aerator pumps are extremely efficient at pumping very high volumes through suitable pipe for waterfalls and streams with an elevation gain up to 15' above the low pool. The Titan Series pumps are able to pump up to 1500 GPM for long distances and for very high waterfalls.

The waterfall and stream picture shown was created with a 15 HP Titan Series pump.

Request the Specialty Products brochure for more information.



The Aqua Control Bowl Fountain can easily and economically create a beautiful spray pattern in a small "bowl". The Bowl Fountain is a variation of our Horizontal technology. The float is removed, legs are attached, and the pump is set on the bottom of a small hard surfaced pool, typically a bowl that is 12" to 24" deep and 8' to 20' in diameter. Most Bowl Fountains are 1/2 or 1 HP, but any size Bowl Fountain can be accommodated, limited only by the size of the bowl or pool, and virtually any depth pool can be accommodated. The Bowl Fountain is the perfect solution for city scapes and architectural fountains where space or safety does not allow a larger or deeper pool.

A 1HP Bowl Fountain is shown.

Request the Specialty Products brochure for more information.

CLEARAWAY

Before Treatment



After Treatment



ClearAway is an ecologically friendly and natural method of improving and maintaining pond health. ClearAway is not a poison; it does not require training or licensing for use and it is safe for all animals and marine life. It uses naturally occurring microbes that digest organic sludge and also consume excess nutrients that promote excessive growth. Application is as simple as throwing a few 1/2 lb. bags into the pond every week or two.

Request the ClearAway brochure for more information.

ClearAway

- SECTION 2 -

SPECIALTY PRODUCTS

Bottom Circulator

The Bottom Circulator uses the very high volume Select Series Torrent Aerator pump. It is built to sit on three large legs on the pond bottom. The legs are designed to sink through the silt until they encounter a hard bottom, thus solving the stability problem that plagues other designs. The Bottom Circulator is typically positioned so that the pumped water will swirl around the pond, and the discharge is inclined slightly so the pumped water is ultimately pushed to the surface. This allows the entire pond to be circulated and the deep, oxygen poor, water to be brought to the surface for natural aeration. This is an excellent method of enhancing pond water quality without having a surface pattern.



Request the Specialty Products brochure for additional information.

Lake Bed Aerator



The Lake Bed Aerator system creates many small air bubbles at the bottom of a pond in an arrangement that carries a large column of water to the surface with the bubbles. This "pumping" action is effective in providing bottom to top circulation in deep ponds where it is very effective in bringing the stagnant deep water to the surface for natural aeration. A small shore mounted air compressor pumps air down a weighted tube to a bottom diffuser where tiny air bubbles are formed to create the lift for "pumping" a column of water to the surface.

Request the Specialty Products brochure for additional information.

LIGHTS / LIGHT OPTIONS

Light Features

Submersible Lights

The Aqua Control submersible lights create a beautiful night display for Display Aerators, Fountains, Bowl Fountains, and Waterfalls. These UL listed lights are specially made for Aqua Control by a leading underwater light manufacturer. They are made of bronze and copper for corrosion resistance, they are neutral buoyancy so adding or removing lights will not change the float height, and they are provided with a submersible disconnect system. Saltwater bronze lights are optionally available.

The light bulbs are par 56, 120V, spot or flood, and either 300 watt incandescent with a 2000 hr rated life or 500 watt halogen with a 4000 hr rated life. Spot lights produce a narrow, intense beam of light designed for optimally illuminating high and narrow spray patterns. Flood lights produce a wide beam designed to illuminate spray patterns that are wide and full but not especially high. Lights are available with clear lenses or with a variety of available colored lenses; Red, Green, Blue, Amber, and Turquoise. Colored lenses reduce light significantly so the use of 500 watt lights is strongly recommended. Blue and Green reduce the light most dramatically so doubling of the number of those colored lights should be considered.

The Aqua Control float allows for attachment of 2, 3, 4, 6, 8, 9, 10 or 12 lights. Lights are normally supplied as sets of 2, 3 or 4 lights as floods, spots, or a combination of spots and floods. They are also available in sets of 1 or 2 lights per set for use with sequencers. Most sets of lights can be operated with sequencers (see following table) that allow various colors of lights, or sets of lights, to be turned on or off in a random or a programmed manner.

Light Sequencers

Sequencing of lights is a process that turns 2 or more sets of lights on and off with a frequently repeating, adjustable pattern to create a spectacular light show. Aqua Control provides two methods to create sequencing.

Random Sequencer. The Random Sequencer is a dedicated light sequencer that, easily, automatically, adjustably, and economically creates a random "on-off" light sequence that makes an always changing and never repeating light show that is particularly captivating. Random sequencing is created by using a special timer for each set of lights that is to be sequenced. Up to 6 sets of lights can be sequenced and each set can have 1 to 4 lights (maximum 12 lights total). A light set can have a maximum of 4 x 500 W lights, for a maximum of 2000 W per set. When the light timer initiates the light cycle, the Random Sequencers are energized and one, more than one, or all may be on or off at any time. This "on" and "off" action of each set of lights continues without ever repeating a sequence until the light timer shuts off the lights. A particularly simple and economical method of random sequencing would be to use 2 Random Sequencers to sequence 2 sets of 2 lights for a total of 4 lights and using 2 colored lights in 1 set and 2 different colored lights in the other set, a 4 wire light cable (see below) and a 2 light set capable control panel (see panel section).

Fountain Managers. Both the Standard and Programmable Fountain Managers (see page 52) have a setting to create light sequencing, both Random and Ramping. The Standard Fountain Manager can Ramp or Random Sequence 2 or 3 sets of lights, and the Programmable Fountain Manager can Ramp or Random Sequence 2 to 8 lights or sets of lights. Random Sequencing with Fountain Managers uses a different control method to achieve the same light sequencing as the Random Sequencer. In addition they can also create Ramping Sequencing which is sequential lighting of each set of lights where each can be adjusted to gradually light and gradually dim with an adjustable overlap with the next set of lights in the sequence. The Ramping sequencing repeats exactly unless the controller is adjusted.

Aqua Control uniquely offers 4 wire light cable that allows the cable to be much smaller than normal and allows operation of two sets of lights with just one 4 wire cable. This allows simple, effective, and inexpensive random sequencing for two sets of lights. Select cable from the table on pages 46 & 47.

- UL listed, submersible
- Cast bronze rings
- Spun copper body
- Stainless steel fasteners
- Heavy-duty, high temperature, silicon rubber gasket
- Tempered glass lens
- Colored lenses available
- PAR 56, 120V lights
- Spot or flood
- 300 W, 2000 hr incandescent
- 500 W, 4000 hr halogen
- Optional Stainless Steel rock guard (shown)
- UL rated cable, epoxy potted
- Optional cable armoring
- Includes submersible cable disconnect
- Includes U bracket for tilting
- Sets of 1 to 4 on 1 disconnect
- Neutral buoyancy, doesn't change the flotation level
- Easily ramped or sequenced



Configurations

AVAILABLE LIGHTS

Typical lighting is one set of 3 or 4 lights, spot or flood, 1 light set control panel light rating, and 3 wire light cable.

LIGHTS		WATTS		REQUIREMENTS		LIGHTING APPLICATIONS		
Total	Light set description	Watts/Light	Total Watts	Cable	Control Panel light rating	Cable Options		Sequencing
						3 Wire Cable	4 Wire Cable	Sets Sequencing
2	1 set of 2 lights	300	600	1x3 wire	2000 watt - 1 light set	1	na	0
2	1 set of 2 lights	500	1000	1x3 wire	2000 watt - 1 light set	1	na	0
3	1 set of 3 lights	300	900	1x3 wire	2000 watt - 1 light set	1	na	0
3	1 set of 3 lights	500	1500	1x3 wire	2000 watt - 1 light set	1	na	0
4	1 set of 4 lights	300	1200	1x3 wire	2000 watt - 1 light set	1	na	0
4	1 set of 4 lights	500	2000	1x3 wire	2000 watt - 1 light set	1	na	0
4	2 sets of 2 lights	300	1200	1x4 wire	4000 watt - 2 light sets	2	1	2
4	2 sets of 2 lights	500	2000	1x4 wire	4000 watt - 2 light sets	2	1	2
6	2 sets of 3 lights	300	1800	2x3 wire	4000 watt - 2 light sets	2	1	2
6	2 sets of 3 lights	500	2000	2x3 wire	4000 watt - 2 light sets	2	1	2
6	2 sets of 3 lights	300	1800	1x4 wire	4000 watt - 2 light sets	2	1	2
6	2 sets of 3 lights	500	3000	1x4 wire	4000 watt - 2 light sets	2	1	2
6	3 sets of 2 lights	300	1800	3x3 wire	4000 watt - 3 light sets	3	na	3
6	3 sets of 2 lights	500	3000	3x3 wire	4000 watt - 3 light sets	3	na	3
8	2 sets of 4 lights	300	2400	1x4 wire	4000 watt - 2 light sets	2	1	2
8	2 sets of 4 lights	500	4000	1x4 wire	4000 watt - 2 light sets	2	1	2
8	4 sets of 2 lights	300	2400	2x4 wire	4000 watt - 4 light sets	4	2	4
8	4 sets of 2 lights	500	4000	2x4 wire	4000 watt - 4 light sets	4	2	4
up to 8	up to 8 lights,	300	2400	8x3 wire	4000 watt - 4 to 8 light sets	up to 8 sets	up to 4 sets	up to 8 sets
up to 8	1 light per set	500	4000	8x3 wire	4000 watt - 4 to 8 light sets	up to 8 sets	up to 4 sets	up to 8 sets
9	3 sets of 3 lights	300	2700	3x3 wire	6000 watt - 3 light sets	3	na	3
9	3 sets of 3 lights	500	4500	3x3 wire	6000 watt - 3 light sets	3	na	3
12	3 sets of 4 lights	300	3600	3x3 wire	6000 watt - 3 light sets	3	na	3
12	3 sets of 4 lights	500	6000	3x3 wire	6000 watt - 3 light sets	3	na	3
12	4 sets of 3 lights	300	3600	2x4 wire	8000 watt - 4 light sets	4	2	4
12	4 sets of 3 lights	500	6000	2x4 wire	8000 watt - 4 light sets	4	2	4

Lighting Recommendations

Letter Key: A = 3 x 300 W flood C = 3 x 300 W spot F = 4 x 500 W flood
 B = 3 x 500 W flood D = 3 x 500 W spot H = 4 x 500 W spot

PATTERNS Select Series Aerators	NORMAL LIGHTING		BRILLIANT LIGHTING		SEQUENCER LIGHTING	
	1/2 HP - 2 HP	3 - 7.5 HP	1/2 HP - 2 HP	3 - 7.5 HP	1/2 HP - 2 HP	3 - 7.5 HP
Arch, Candelabra, Cluster Arch, Crown Gusher, Scepter, Spider, Tornado	A	B	B	F	B	F
Arum, Daffodil, Delmar, Double Arch, Lily, Pentalator, Quad, Spider & Arch, Super Lily, Trillium, Weeping Willow	A	B	F	B+D	F	B+D
Select Series Fountains						
Geyser, Full Geyser, Sky Geyser, Cascade	C	D	H	D+D	D	H
Double Trellis, Majestic, Trellis, Spoke & Trellis	A	B	F	D+D	B	F
Buckingham, Flare & Sky Geyser, Fleur de Lis, Shooting Star, Tiara, Trellis & Sky Geyser	A	F	B+D	F+H	F	F+H
Select Series, The Combo						
The Combo	na	A+C	na	F+H	na	F+H

Use of only 2 lights is recommended only for minimal lighting for 1/2 or 1HP Display Aerators or for sequencing.

Colored lights should always be 500 W, so all lights used with sequencers should be 500 W.

LIGHT CABLE

60 Hz - for use without Sequencers

60 Hz maximum length in feet per US wire gage and type

LIGHTS				WATTS		AMPS	3 Wire Light Cable Used for 1 set of lights per cable.				4 Wire Light Cable Used for 2 sets of lights per cable.			
Total	Light set description	Sets	Lights/set	Watts/set	Total	Total	#12	#10	#8	#6	#12	#10	#8	#6
2	2 lights x 300 W	1	2	600	600	5	300	500	800	1300	-	-	-	-
2	2 lights x 500 W	1	2	1000	1000	8	200	300	500	750	-	-	-	-
3	3 lights x 300 W	1	3	900	900	7	230	360	580	850	-	-	-	-
3	3 lights x 500 W	1	3	1500	1500	13	120	200	300	500	-	-	-	-
4	4 lights x 300 W	1	4	1200	1200	10	160	250	400	640	-	-	-	-
4	4 lights x 500 W	1	4	2000	2000	17	100	150	240	380	-	-	-	-
4	4 lights x 300 W	2	2	600	1200	10	-	-	-	-	640	1000	1600	2500
4	4 lights x 500 W	2	2	1000	2000	17	-	-	-	-	400	600	1000	1500
6	6 lights x 300 W	2	3	900	1800	15	-	-	-	-	450	720	1060	1700
6	6 lights x 500 W	2	3	1500	3000	25	-	-	-	-	210	400	600	1000
8	8 lights x 300 W	2	4	1200	2400	20	-	-	-	-	300	500	800	1300
8	8 lights x 500 W	2	4	2000	4000	34	-	-	-	-	200	300	500	750

Lighting is most commonly accomplished using 3 or 4 lights and they are powered with one 3 wire light cable. Each 4 wire light cable can be used only with 2 sets of lights and where each set has equal wattage such as 2 sets of 2 lights, 4 lights total. The advantages of 4 wire light cable are that much smaller cable can be used and that no additional cable is required when sequencing 2 sets of lights. The 4 wire light cable is the same cable as the Aqua Control motor cable except that it is terminated with two plugs, one for each set of lights. The 4 wire cable can only be used with Control Panels designated to control 2 sets of lights, or 4, 6 or 8 sets of lights if 2, 3, or 4 of the 4 wire light cables are used.

Total amps for 4 wire cable is the sum of the amps on each "hot" leg of the 240V power. It is provided for reference only. The actual current draw on each leg of a 4 wire light cable is 1/2 the total.

50 Hz - for use without Sequencers

50 Hz maximum length

LIGHTS				WATTS		AMPS	3 Wire Light Cable (220 V) Used for 1 set of lights per cable. <i>in meters per sq mm / ft per US wire gauge</i>				4 Wire Light Cable (380 V) Used for 2 sets of lights per cable. <i>in meters per sq mm / ft per US wire gauge</i>			
Total	Light set description	Sets	Lights/set	Watts/set	Total	Total	4/#12	6/#10	10/#8	16/#6	4/#12	6/#10	10/#8	16/#6
2	2 lights x 300 W	1	2	600	600	3	300/1000	490/1625	775/2575	1230/4100	-	-	-	-
2	2 lights x 500 W	1	2	1000	1000	5	180/600	295/975	465/1550	735/2450	-	-	-	-
3	3 lights x 300 W	1	3	900	900	4	200/675	325/1075	520/1725	820/2725	-	-	-	-
3	3 lights x 500 W	1	3	1500	1500	7	120/400	200/650	310/1025	500/1650	-	-	-	-
4	4 lights x 300 W	1	4	1200	1200	6	150/500	240/500	390/1300	615/2050	-	-	-	-
4	4 lights x 500 W	1	4	2000	2000	9	90/300	145/475	235/775	370/1225	-	-	-	-
4	4 lights x 300 W	2	2	600	1200	6	-	-	-	-	610/2025	975/3250	1550/5175	2460/8200
4	4 lights x 500 W	2	2	1000	2000	9	-	-	-	-	370/1225	585/1950	930/3100	1480/4925
6	6 lights x 300 W	2	3	900	1800	8	-	-	-	-	405/1350	655/2175	1035/3450	1645/5475
6	6 lights x 500 W	2	3	1500	3000	14	-	-	-	-	240/800	390/1300	625/2075	985/3275
8	8 lights x 300 W	2	4	1200	2400	11	-	-	-	-	300/1000	490/1625	775/2575	1230/4100
8	8 lights x 500 W	2	4	2000	4000	18	-	-	-	-	180/600	295/975	465/1550	735/2450

Total amps for 4 wire cable is the sum of the amps on each "hot" leg of the 380V power. It is provided for reference only. The actual current draw on each leg of a 4 wire light cable is 1/2 the total.

60 Hz - with Sequencers

LIGHT CABLE

60 Hz maximum length in feet per US wire gage and type

LIGHTS				WATTS		AMPS		3 Wire Light Cable for use with Sequencer			
Total	Light set description	Sets	Lights/Set	Watts/set	Total	Total	Amps/line	#12	#10	#8	#6
2	2 lights x 300 W	1	2	600	600	5	5	300	500	800	1300
2	2 lights x 500 W	1	2	1000	1000	8	8	200	300	500	750
3	3 lights x 300 W	1	3	900	900	7	7	230	360	580	850
3	3 lights x 500 W	1	3	1500	1500	13	13	120	200	300	500
4	4 lights x 300 W	1	4	1200	1200	10	10	160	250	400	640
4	4 lights x 500 W	1	4	2000	2000	17	17	100	150	240	380

LIGHTS				WATTS		AMPS		4 Wire Light Cable for use with Sequencers , powers 2 light sets per cable							
Total	Light set description	Sets	Lights/Set	Watts/set	Total	Total	Amps/set	#12	#10	#8	#6				
2	2 lights x 300 W	2	1	300	600	5	3	640	1000	1600	2500				
2	2 lights x 500 W	2	1	500	1000	8	4	400	600	1000	1500				
4	4 lights x 300 W	2	2	600	1200	10	5	300	500	800	1300				
4	4 lights x 500 W	2	2	1000	2000	17	8	200	300	500	750				
6	6 lights x 300 W	2	3	900	1800	15	7	230	360	580	850				
6	6 lights x 500 W	2	3	1500	3000	25	13	120	200	300	500				
8	8 lights x 300 W	2	4	1200	2400	20	10	160	250	400	640				
8	8 lights x 500 W	2	4	2000	4000	33	17	100	150	240	380				
3	3 lights x 300 W	3	1	300	900	7	3	See text below regarding cable for sequencing 3 sets of lights.							
3	3 lights x 500 W	3	1	500	1500	13	4								
6	6 lights x 300 W	3	2	600	1800	15	5								
6	6 lights x 500 W	3	2	1000	3000	25	8								
9	9 lights x 300 W	3	3	900	2700	23	7								
9	9 lights x 500 W	3	3	1500	4500	38	13								
12	12 lights x 300 W	3	4	1200	3600	30	10								
12	12 lights x 500 W	3	4	2000	6000	50	17								
4	4 lights x 300 W	4	1	300	1200	10	3					640	1000	1600	2500
4	4 lights x 500 W	4	1	500	2000	17	4					400	600	1000	1500
8	8 lights x 300 W	4	2	600	2400	20	5	300	500	800	1300				
8	8 lights x 500 W	4	2	1000	4000	33	8	200	300	500	750				
12	12 lights x 300 W	4	3	1200	3600	30	7	230	360	580	850				
12	12 lights x 500 W	4	3	1500	6000	50	13	120	200	300	500				

One Random Sequencer is required to sequence each set of lights. The Standard Fountain Manager can Random Sequence or Ramp 2 or 3 sets of lights and the Programmable Fountain Manager can Random Sequence or Ramp 2 to 8 sets of lights. A set of lights consists of 1, 2, 3, or 4 lights. Each light set can be powered with a 3 wire light cable or any 2 sets can be powered with a 4 wire light cable. If 3 sets of lights are being sequenced then all 3 sets could be powered with individual 3 wire light cables. If it is desirable to use 4 wire light cable then 2 of the 3 light sets could be powered by one 4 wire light cable and the third set by one 3 wire light cable, or if each set of lights has an even number of lights then the third set could be made into 2 smaller sets with half the lights per set (using two of the 2 light sets instead of one of the 4 light set, for instance) and also operated with a 4 wire light cable. Size each cable based on its respective light wattage.

Total amps for 4 wire cable is the sum of the amps on each "hot" leg of the 240V power. It is provided for reference only. The actual current draw on each leg of a 4 wire light cable is 1/2 the total. (See amps per set).

50 Hz: Consult Aqua Control for metric cable requirements for use with sequencers.

MOTOR CABLE

Motor Data - 60 Hz

Single Phase - 60 Hz										Three Phase - 60 Hz									
MOTOR					MAXIMUM COPPER CABLE					MOTOR					MAXIMUM CABLE LENGTH				
Nominal		Service Factor			in feet per US wire gauge					Nominal		Service Factor			in feet per US wire gauge				
HP	volts	HP	amps	KW	#14	#12	#10	#8	#6	HP	volts	HP	amps	KW	#14	#12	#10	#8	#6
1/2	115	.8	12	1.0	-	160	250	390	620	1/2	-	-	-	-	-	-	-	-	-
1/2	208	.8	7	1.0	-	400	650	1020	1610	1/2	-	-	-	-	-	-	-	-	-
1/2	230	.8	6	1.0	-	650	1020	1610	2510	1/2	-	-	-	-	-	-	-	-	-
1	115	1.4	16	1.6	-	100	150	250	360	1	208	1.4	6	1.4	430	690	1080	1710	2670
1	208	1.4	11	1.6	-	250	400	630	990	1	230	1.4	5	1.4	560	910	1430	2260	3520
1	230	1.4	10	1.6	-	400	630	990	1540	1	460	1.4	3	1.4	2300	3670	5770	9070	-
2	208	2.5	14	2.6	-	150	250	390	620	2	208	2.5	9	2.7	240	390	610	970	1520
2	230	2.5	13	2.6	-	250	390	620	970	2	230	2.5	8	2.7	320	510	810	1280	2010
2	-	-	-	-	-	-	-	-	-	2	460	2.5	4	2.7	1300	2070	3270	5150	8050
3	208	3.5	20	3.6	-	120	250	390	470	3	208	3.5	13	3.4	180	290	470	740	1160
3	230	3.5	18	3.6	-	190	300	470	750	3	230	3.5	11	3.4	240	390	620	990	1540
3	-	-	-	-	-	-	-	-	-	3	460	3.5	6	3.4	1000	1600	2520	3970	6200
3	-	-	-	-	-	-	-	-	-	3	575	3.5	5	3.4	1580	2530	3980	6270	-
5	208	5.7	30	5.9	-	-	-	180	280	5	208	5.7	21	5.8	-	170	280	440	690
5	230	5.7	28	5.9	-	-	-	280	450	5	230	5.7	18	5.8	-	230	370	590	920
5	-	-	-	-	-	-	-	-	-	5	460	5.7	9	5.8	590	950	1500	2360	3700
5	-	-	-	-	-	-	-	-	-	5	575	5.7	7	5.8	920	1480	2330	3680	5750
7.5	-	-	-	-	-	-	-	-	-	7.5	208	8.6	30	8.5	-	-	200	310	490
7.5	-	-	-	-	-	-	-	-	-	7.5	230	8.6	26	8.5	-	-	260	420	650
7.5	-	-	-	-	-	-	-	-	-	7.5	460	8.6	13	8.5	420	680	1070	1690	2640
7.5	-	-	-	-	-	-	-	-	-	7.5	575	8.6	11	8.5	660	1060	1680	2650	4150

Cable lengths longer than 200' may cause GFCI nuisance tripping, especially for single phase motors.

Properly cooled 60 Hz motors can operate at a service factor (SF) horsepower that is higher than nominal. Aqua Control designs for operation of these motors between nominal and SF horsepower.

Notes on 50 & 60 Hz: Three phase motors and 2 HP and larger single phase motors always use 4 wire cable. 1/2 and 1 HP motors, except 1 HP 115V, usually use 3 wire motor cable. The standard cable is double insulated, flat jacketed, UL listed, submersible cable. Armored cable is available where rodent chewing is a problem, but this expensive and more difficult to use cable should usually only be selected when there is a known rodent problem with standard cable.

Heavier gage cable WILL NOT solve GFCI nuisance tripping problems resulting from long cable lengths or from other interference with the GFCI.

Motor Data - 50 Hz

Single Phase - 50 Hz									Three Phase - 50 Hz								
MOTOR				MAXIMUM COPPER CABLE					MOTOR				MAXIMUM COPPER CABLE				
				in meters per sq mm / ft per US wire gauge									in meters per sq mm / ft per US wire gauge				
HP	volts	amps	KW	2.5/#14	4/#12	6/#10	10/#8	16/#6	HP	volts	amps	KW	2.5/#14	4/#12	6/#10	10/#8	16/#6
1/2	220	4	.7	-	330/940	500/1500	820/2310	999/3600	1/2	-	-	-	-	-	-	-	-
1	220	7	1.2	-	180/500	270/800	440/1240	690/1940	1	220	4	1.1	270/750	430/1210	650/1930	1070/2980	1680/4660
1	-	-	-	-	-	-	-	-	1	380	2	1.1	820/2260	1300/3640	1950/5780	3200/8920	5020/9999
2	220	11	2.2	60/170	100/280	150/450	250/710	400/1120	2	220	7	2.1	140/390	230/640	340/1030	570/1600	900/2510
2	-	-	-	-	-	-	-	-	2	380	4	2.1	430/1210	700/1940	1040/3090	1720/4790	2700/7500
3	220	17	3.3	40/110	60/190	100/300	170/470	270/750	3	220	11	3.1	90/260	150/430	230/680	380/1070	600/1680
3	-	-	-	-	-	-	-	-	3	380	6	3.1	290/800	460/1300	700/2060	1150/3210	1800/5000
5	220	25	5.2	-	40/na	60/190	110/300	170/480	5	220	16	5.0	50/150	90/250	130/400	220/630	360/1000
5	-	-	-	-	-	-	-	-	5	380	9	5.0	170/470	270/770	410/1220	680/1910	1080/3000
7.5	-	-	-	-	-	-	-	-	7.5	220	23	7.5	30/na	60/na	90/270	150/430	240/680
7.5	-	-	-	-	-	-	-	-	7.5	380	13	7.5	110/320	190/520	280/840	470/1310	740/2060

Cable lengths longer than 60 meters/200 feet may cause GFCI nuisance tripping, especially for single phase motors.

50 Hz motors do not have a service factor (SF). They are only allowed to operate at nominal horsepower. Aqua Control designs for operation of 50 Hz motors at no more than nominal horsepower.

SUGGESTED POWER SUPPLY CABLE REQUIREMENTS, POWER SOURCE TO CONTROL PANEL

This table does not cover all possible issues; always follow electrical codes.

TABLE 1 - MOTOR AMPS

575V use 460V amps

HP	AMPS					
	Single Phase			Three Phase		
	120V	208V	230V	208V	230V	460V
1/2	12	7	6	-	-	-
1	16	11	10	6	5	3
2	-	14	13	9	8	4
3	-	20	18	13	11	6
5	-	30	28	21	18	9
7.5	-	-	-	30	26	13

Instructions for 120V or 208/240V 60 Hz motors: From Table 1, add the motor amps for the HP, voltage, and phase to the Table 2 light amps for the appropriate watts and number of light wires, 3 or 4. Use that amp total in Table 3 or Table 4, based on the motor voltage, to determine supply cable gage size for various cable lengths.

All power supply cable is sized based on an allowed 3% voltage drop from the power source to the control panel. If the supply voltage is low, it may be necessary to use heavier cable to minimize voltage loss.

Table 3 Note: for 120V power a 3 wire cable is required and the neutral wire must be the same gage as the hot wire.

TABLE 3

120V POWER SUPPLY CABLE

Single phase power based on amps and supply cable length

Total motor & lights	AMPS Minimum circuit breaker	CABLE SUPPLY LENGTH Feet				
		Up to 20'	20-100'	100-250'	250-500'	500-1000'
1-5	10	14	14	10	6	4
6-10	15	14	10	6	4	1
11-15	20	12	8	4	2	2/0
16-20	25	10	8	4	1	3/0
21-25	30	10	6	3	0	4/0

TABLE 5 -

460 or 575V POWER SUPPLY CABLE

Three phase power based on amps and supply cable length

Total motor & lights	AMPS Minimum circuit breaker	CABLE SUPPLY LENGTH Feet				
		Up to 20'	20-100'	100-250'	250-500'	500-1000'
1-5	10	14	14	14	12	10
6-10	15	14	14	12	10	8
11-15	20	12	12	10	8	6
16-20	25	10	10	10	8	4
21-25	30	10	10	8	6	3
26-30	40	8	8	8	6	2
31-40	50	8	8	6	4	1

TABLE 2 - LIGHT AMPS

LIGHTS Light Set Description	WATTS Total	AMPS	
		3 Wire	4 Wire
2 lights x 300 W ea	600	5	3
2 lights x 500 W ea	1000	9	5
3 lights x 300 W ea	900	8	-
3 lights x 500 W ea	1500	13	-
4 lights x 300 W ea	1200	10	5
4 lights x 500 W ea	2000	17	8
6 lights x 300 W ea	1800	15	8
6 lights x 500 W ea	3000	25	13
8 lights x 300 W ea	2400	20	10
8 lights x 500 W ea	4000	34	17

Table 4 Note: 208/230V single phase power requires 4 incoming wires, 2 hots, a neutral, and a ground. 3 phase requires 5 incoming wires, 3 hots, a neutral, and ground. The neutral wire must be the same gage as the hot wire.

TABLE 4

208 or 230V POWER SUPPLY CABLE

Single or 3 phase power based on amps and supply cable length

Total motor & lights	AMPS Minimum circuit breaker	CABLE SUPPLY LENGTH Feet				
		Up to 20'	20-100'	100-250'	250-500'	500-1000'
1-5	10	14	14	12	10	6
6-10	15	14	12	10	6	4
11-15	20	12	10	8	6	3
16-20	25	10	10	6	4	1
21-25	30	10	8	6	3	0
26-30	40	8	8	4	2	2/0
31-35	50	8	8	4	2	2/0
36-40	50	8	8	4	1	3/0
41-50	60	6	6	3	0	4/0

Instructions for 460 or 575V motors: Determine motor amps from Table 1 and light amps from Table 2. For 575V motors use 460V amps.

1. If light power is supplied from a transformer installed near the control panel, add only 1/4 of the 3 wire light amps to the motor amps to determine the total supply cable amps required and size cable from table 5. Wires required are, 3 hots plus a ground.
2. When an external source of 120V is available for 3 wire lights and separate motor and light supply cables provide power, size the motor supply cable for just the motor amps from Table 5 and size the light supply cable separately for 3 wire lights from Table 3. Thus, total supply wires required are 3 motor wires plus 3 light wires, including a common ground.
3. When an external source of 120/240V is available for 4 wire lights and separate motor and light supply cables provide power, size the motor supply cable for just the motor amps from Table 5 and size the light supply cable separately for 4 wire lights from Table 3. Thus, total supply wires required are 3 motor wires plus 4 light wires, including a common ground.

ELECTRICAL CONTROLS

Panel Features



(Single phase shown)

- UL listed control panels
- NEMA 4X fiberglass outdoor enclosure
- Compact size
- Carefully engineered
- Stainless Steel hardware
- Stainless Steel hinge
- Padlock lockable
- Through door safety disconnect switch
- GFCI circuit breakers pump and lights
- Heavy duty pump timer
- Built in motor control box with capacitors, start circuit, and resettable overloads
- Easy connect, screwless terminal blocks
- Lightning/surge arrester
- Ground connectors
- Wire ways for neat and safe wiring
- Din rail mounted parts for easy service
- Easy to read schematic
- 3 phase panels built with the same quality

Control Panel Options - See details on pg. 53



- Light Control
 - Easy set light timer
 - Light contactor
 - Light safety interlock
 - Light Random Sequencers
 - Multiple control panels in one enclosure
 - Special GFCIs
 - 7 day and battery backup timers
 - Variable Frequency Drive (VFD)
 - Standard and Programmable
- Fountain Managers with:
- 1 step wind control (off in high wind)
 - 2 step wind control with VFD
 - Light Random Sequencers and Ramping
 - Variable light output relays
 - Water fill and low water level shutoff
 - Digital timers
 - Pattern height program when used with VFD

Control Panels

Aqua Control is certified to manufacture UL listed Industrial Control Panels. The controls are housed in NEMA 3R/4X (outdoor rated and corrosion proof) fiberglass enclosures with a stainless steel hinge and padlock lockable latches. The standard enclosure for 1/2 and 1 HP control panels for single phase and all 3 phase motors is 16" x 14" x 8" deep. The enclosure for 2-5 HP single phase control panels is 18" x 16" x 6" deep. Control panels with certain options require larger 3R steel enclosures.

All control panels include an externally operated disconnect switch, short circuit protection, GFCI protection, timer(s), overload protection, contactor(s), lightning/surge arrester, and output terminal blocks. 120V, 1 HP and 2 through 5 HP single phase control panels additionally include the motor control box required for the motor capacitors, start relay, and manually resettable overloads. If lights are purchased, the control panel includes a circuit with circuit breaker, GFCI, timer, and contactor to control the lights. Light operation is interlocked with the pump operation for all but the 1/2 and 1 HP 2 wire motors so that light cannot operate unless the pump is operating. This virtually assures that, if lights are properly installed, the pump thrust will always keep the lights submerged for proper cooling.

Power Variations

There are a wide variety of power variations, each of which requires a specific control panel. Therefore, it is critically necessary to correctly identify the power available. If there are several power choices, it is usually preferable and more economical to use 3 phase power since the control panel is simpler and smaller, and less expensive cable can be used.

Control panels for 120V. Only 1/2 and 1 HP motors are available for 120V. 4 wire light cable cannot be used.

Control panels for 208-240V, single phase. Either 208V or 230V are the voltages found in residential and most commercial buildings. Each voltage automatically provides 120V. The single phase motors will operate properly at either voltage, however, it is important with 208V power that excessive voltage loss does not reduce the voltage at the motor further since 208V is already the low end of the motor's voltage range. Occasionally, when the voltage is low or the electric cables are long or undersized, it may be necessary to use a boost transformer to increase the voltage to a normal level. The control panels are usually identical for 208V or 230V, but the supply cable and motor cable must be sized to insure that only minimal voltage loss occurs. Either 3 wire or 4 wire light cable can be used with this power.

Control panels for 208V or 240V, three phase. It is necessary to discriminate between these voltages since the control panels are not always identical. 120V is automatically provided with either of these voltages for the control circuit power and 120/208V or 120/240V power is available for 3 or 4 wire light cable.

Control panels for 460V, three phase. 460 power is always 3 phase. This power does **not** provide 120V for the control circuit or lights, therefore it must be provided. If no lights are to be operated and no external source of 120V power is available then the required 120V for the control circuit is provided by a built in control transformer. If 1 set of lights is to be operated then the 120V power must be provided by an external source, either an existing source of 120V power that is available or from a 460-120V light transformer. If more than 1 set of lights are used, the control panel must be rated for the number of light sets 2, 3, 4, 6, or 8. The external power from an existing source must be 120/208V or 120/240V, or it must be supplied from a 460-120/240V light transformer rated for the total wattage of all lights.

Notes:

Although there is no standard that requires GFCI for 460V power, and there is no assurance that a GFCI circuit for 460V will provide protection from electrocution, Aqua Control provides a human protection (class A) GFCI with 460V control panels.

GFCIs are very sensitive devices that measure current leakage to ground. **(This has nothing to do with cable size!)** It can easily nuisance trip and shut off the circuit when nothing is actually wrong. Nuisance tripping occurs when the GFCI randomly trips after operating properly for minutes, hours, or days. This may happen when the cable to the pump is longer than about 200', when power fluctuations occur, or when external devices such as a VFD operates nearby. VFDs are common in irrigation pumping stations and will often cause nuisance tripping of GFCIs!

As a practical matter, light cables and three phase motor circuits are significantly less susceptible to nuisance tripping (except for VFD interference). If nuisance tripping is a persistent problem, it may be necessary to shorten the motor cable, operate when a VFD is not operating, or install a special option GFCI that may not provide Class A protection.

Lights

Light control is a control panel option. The maximum light wattage for a 1/2 and 1 HP control panel is 4000 watts (2 light sets). Control panels for 2 HP and larger, single or three phase, can optionally control 1, 2, 3, 4, 6, or 8 sets of lights (12 lights maximum) and up to 6000 watts maximum. More information on lights and light options can be found in Section 3, *Lights*.

Random Sequencers

Random Light Sequencers produce a complex, repeating, light show where different light colors and light types (spot or flood) are randomly cycled "on" and "off" to create dramatic and constantly changing lighting effects.

The **Random Sequencer** consists of a solid state relay and a special timer that independently controls the "on" and "off" times of 1 set of lights. The set can consist of from 1 to 4 lights. A minimum of 2 random sequencers are required to create random sequencing and require 2 sets of lights. The maximum is 6 random sequencers to control 6 sets of lights. A common random sequencing arrangement is to use two Random Sequencers, each controlling a set of 2 lights (4 total), using a 4 wire light cable, and using the 2 light set control panel option. More lights can be sequenced with this arrangement simply by using 3 or 4 lights per set, thus sequencing 6 or 8 lights. More complex Random Sequencing can also be easily achieved by adding random sequencers and additional light sets. So, 3 or 4 random sequencers can be easily used for sequencing 3 or 4 sets of lights. If 4 sets of lights are being sequenced, each set would be limited to 3 lights since the maximum number of lights is 12. Specials can easily be provided. Inquire to Aqua Control.

Timers

Timers can be optionally provided as 7 day timers and/or with battery backup so that a power outage will not require resetting the clock time. Except when used with 2 wire motors, 7 day timers are not normally required for lights since the lights cannot operate on the days a 7 day timer does not operate the pump because the lights are interlocked with the pump. Also, the standard 24 hour timer gives finer control for setting the light on-off time.

Fountain Managers

The Standard and Programmable Fountain Managers provide a variety of special control functions in one device when used with required options.

Both Fountain Managers provide Random Sequencing and Light Ramping for 2 or 3 sets of lights, one or two speed Wind Control, and variable light brightness when used with required options. In addition, the Programmable Fountain Manager provides clock functions for both pump and lights including daylight savings time, 7 day, and battery back up. It can also Ramp or Random Sequence up to 8 sets of lights and control water level with available options. It can control a VFD to create a program to vary the spray height, and it can be programmed for any of these functions from a built in digital screen.

The Random Sequencer built into each Fountain Manager operates just like the dedicated Random Sequencer described above. Light Ramping, however, is a process which gradually turns on one set of lights while another set is gradually turning off, stays on for a set time, and gradually turns off while another set is turning on. Ramping requires the optional variable output relays.

There are 2 types of Wind Control, 1 step and 2 step. A 1 step wind control shuts the pump off at an adjustable high wind speed and turns it back on when the wind subsides below that set point for a preset time. A 2 step wind control reduces the spray height during moderately high winds and returns it to normal when the wind subsides. If the wind speed becomes higher, it will shut the pump off until the wind subsides, and it resumes at either intermediate or full height depending on the wind speed. The various speed settings are completely adjustable. The 2 step control requires the use of the optional VFD. See below. Each wind control has a delay circuit to prevent rapid cycling during gusty winds.

Variable Frequency Drive (VFD)

The VFD is used with the Programmable Fountain Manager to create a repeating program that can automatically operate the pump at varying speeds, if desired, to create changing pattern heights. The VFD also allows a wind sensor to automatically lower the maximum pattern height at a preset wind speed even while continuing to operate a program. When a higher preset wind speed is reached, the pump will shut off. Only 3 phase motors can operate at variable frequencies, but the VFD can create 3 phase power from single phase power so that a standard 3 phase motor can be used with single phase power.

Transformers

Power transformers are not actually control panel options since they are never inside the control panel. However, Power Transformers may be required to provide 120V or 120/240V for light operation with 480V power, and Buck-Boost transformers are used for boosting low 208V single phase to 220V to insure adequate motor voltage.

Control Panel Selection Table

HP	MOTOR VOLTS	PHASE	PANEL DESCRIPTION	120V AVAILABLE FROM
1/2 & 1	120	1	Motor Control Panel, no lights	The standard 120V and 208V to 240V, 1 or 3 phase, power automatically provides 120 volts for the control circuit and 120/208V or 120/240V suitable for 1 to 8 sets of lights.
1/2 & 1	120	1	Motor & Light Control Panel	
1/2 - 5	208 to 240	1	Motor Control Panel, no lights	
1/2 - 5	208 to 240	1	Motor & Light Control Panel	
1 - 7.5	208 or 240	3	Motor Control Panel, no lights	
1 - 7.5	208 or 240	3	Motor & Light Control Panel	
1 - 7.5	460	3	Motor only Control Panel, no lights, no external 120V	A control transformer is included to provide 120V for the control circuit only. It cannot be used to power lights.
1 - 7.5	460	3	Motor Control Panel, no lights	An external power source or a transformer provides 120/240V for the control circuit and lights.
1 - 7.5	460	3	Motor & Light Control Panel	

Control Panel Option Table

OPTION	FEATURE	PANEL DESCRIPTION	
Lighting Control	1 set of lights	2000 W max	Use one 3 wire cable to power 2, 3, or 4 lights.
	2 sets of lights	4000 W max, 2000 W max/set	Use two, 3 wire light cables to power 2 sets of 2, 3, or 4 lights per set or use one, 4 wire light cable.
	3 sets of lights	6000 W max, 2000 W max/set	Use three, 3 wire light cables to power 3 sets of 2, 3, or 4 lights per set. Or use one, 4 wire light cable and one 3 wire light cable.
	4 sets of lights	6000 W max, 1500 W max/set	Use two, 4 wire light cables to power 4 sets of 1, 2 or 3 lights per set.
Random Sequencers	Sequence lights	Each of 2 to 6 Random Sequencers provides random, "on-off" control for one set of 1 to 4 lights, 12 lights maximum.	
VFD	Program	Creates changing pattern sizes using Programmable Fountain Manager.	
	Height control	Allows the fountain height to be controlled at an intermediate height when used with either Fountain Manager and with the optional anemometer.	
Timers	7 day	Program in 2 hour increments for any day of the week. Not usually needed for lights.	
	Battery backup	A battery inside the timer maintains the correct time during power outages.	
GFCI	High trip point	Optional, non UL, GFIs are available for use where the standard GFI cannot operate properly.	

Fountain Managers

FEATURE	STANDARD FOUNTAIN MANAGER	PROGRAMMABLE FOUNTAIN MANAGER (available by June 2005)
Light sequencing	Sequences 2 or 3 sets of lights. Requires optional solid state relay (SSR).	Sequences 2 to 8 sets of lights. Requires optional solid state relays (SSR).
Light ramping and light brightness	Ramps or varies brightness of 2 or 3 sets of lights. Requires optional analog SSR.	Ramps or varies brightness of 2 to 8 sets of lights. Requires optional solid state relays (SSR).
Water level control	NA	Provides control for a water fill valve and/or shuts the pump off at extreme low water level. Requires optional probes.
Continuously varying pattern height program	NA	Built in and programmable patterns allow continuously varying pattern heights. Requires optional VFD.
Time clocks	NA	Highly programmable digital timers are built in and include automatic daylight savings time and battery backup.
Wind control	Allows either 1 point wind control (off in high wind) with optional anemometer or 2 point control (reduced height in intermediate wind) with optional VFD.	

Transformer Selection Table

BOOST TRANSFORMER - single phase

Changes 208V to 220V where low 208V or long lines reduce voltage excessively. Inquire if more than 4000 W of light.

LIGHT POWER TRANSFORMER - single phase

Changes 480V to 120/240V to power lights where 120/240V is not available. 240V is automatically available with these transformers so 4 wire light cable can be used with 2 or 4 sets of lights or 1, 2, 3, or 4 of the 3 wire light cables can be used.

Description	KVA Rating	Watts per	Watts per	Watts per	Watts per	Max total light watts	KVA rating
		1 light set	2 light sets	3 light sets	4 light sets		
1/2 thru 5 HP, without lights	.5 KVA	2000	1000 / set	500 / set	500 / set	2000	2 KVA
1/2 thru 2 HP with up to 2000 W of 1 set of lights	.5 KVA	na	1500 / set	600 / set	600 / set	3000	3 KVA
1/2 thru 2 HP with up to 4000 W of 2 sets of lights using 4 wire light cable	.5 KVA	na	2000 / set	1200 / set	1200 / set	5000	5 KVA
3 - 5 HP with up to 2000 W of 1 set of lights	.75 KVA	na	na	1500 / set	1500 / set	6000	7.5 KVA
3 - 5 HP with up to 4000 W of 2 sets of lights using 4 wire light cable	.75 KVA	na	na	2000 / set	2000 / set	8000	10 KVA

Options

Rope

Mooring rope is 1/4" black nylon that sinks out of sight.

Anchoring rope is 1/4" black poly that floats if dropped while anchoring.



Mooring Auger

Auger with eye for convenient and secure mooring in soft or sandy shore soil or underwater.

Use the 30" length for deep, soft, sand or muck.

15" length | 30" length

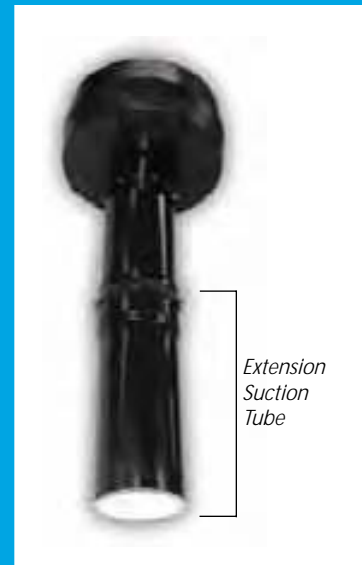


Extension Suction Tube

Rugged PVC tubing attaches to the end of the pump suction with stainless steel screws. It allows suction from any depth for complete lake circulation. 6' max shipping limit. Any number can be installed to achieve lengths greater than 6'. The extra weight of the tubing may require auxiliary, extra cost floatation. Contact the factory before ordering.

The suction screen must be removed from the pump inlet and attached to the extension suction tube because any debris ingested into the pump would be difficult to remove.

6' length | 5' length | 4' length | 3' length | 2' length



Warranty

All standard AQUA CONTROL products listed in these specifications, except light bulbs and lenses, are warranted for 3 years against defects in materials or workmanship, under normal operating conditions. Aqua Control will repair or replace failed parts under warranty when the defective part, partial pump assembly, or the entire pump is returned to the factory, shipping prepaid, and factory inspection establishes that the part was defective. These parts must be returned to the factory prior to shipment of replacement parts. All parts replaced under this warranty will be returned with shipping prepaid and will not be invoiced if the failed part has been returned and judged to be defective.

Aqua Control will not be liable for consequential damage nor for any costs associated with removal or attempts to repair components in the field. See the complete warranty statement in the **Installation and Operating Instructions** or ask for a copy of the full statement.

Specifications Notice

Aqua Control reserves the right to change specifications at any time.

Definitions

C.M.D.: Cubic Meters per Day

Combo: One motor driving both a Display Aerator pump and Fountain pump so that both patterns are produced.

GFCI: Ground Fault Circuit Interrupter is a device that detects very small imbalances in the electrical circuit caused by leakage to ground and shuts off the power. It is designed to protect from electrocution.

G.P.M.: Gallons Per Minute

Display Aerator: An axial flow pump designed to produce large amounts of water by using a propeller(s). This pump produces large water volume but with low pressure.

Fountain: A centrifugal flow pump designed to create higher pressures than a Display Aerator, but at lower flow rates. It has an impeller and diffuser.

Fountain Manager: An electronic device that provides a variety of special control functions.

Horizontal Unit: The design used for shallow ponds. The motor and pump portion of the unit floats horizontally.

Hz: 60 Hz and 50 Hz specify the frequency of alternating current in cycles per second. 60 Hz is used in North America and 50 or 60 Hz is used elsewhere.

Ramping: Ramping is control of lights so that one color gradually comes to full brightness, stays at full brightness for a time, and gradually dims while the next color is gradually turning on.

Random Sequencer: Random Sequencers control one set of lights per sequencer and create a random on-off light show.

Sequencer: A Sequencer controls a repeating cycle of programmable on-off times for up to 8 lights to create a light show.

Set: A set of lights refers to a grouping of 1 to 4 lights that are powered by the same "hot" wire.

Single phase power: Single phase power uses 1 "hot" line and a neutral to create common 120V power. Two "hot" lines create 240V power (sometimes called two phase), and 2 "hot" lines and a neutral create 120/240V power.

Three phase power: Three phase power has 3 "hot" lines, and is used to power 3 phase motors.

Two Stage Display Aerator: A pump with two propellers separated by an intermediate flow straightener to produce increased pressure and increased spray pattern height.

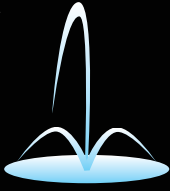
U.L.: Underwriters Laboratory, the national policy-making authority for safety testing.

Vertical Unit: Aqua Control's standard Display Aerator and Fountain design. The motor and pump portion of the unit floats in the water vertically.

VFD.: A VFD (Variable Frequency Drive) is an electronic device that allows a 3 phase motor to operate at slower speeds than normal so that the pattern height can be reduced.

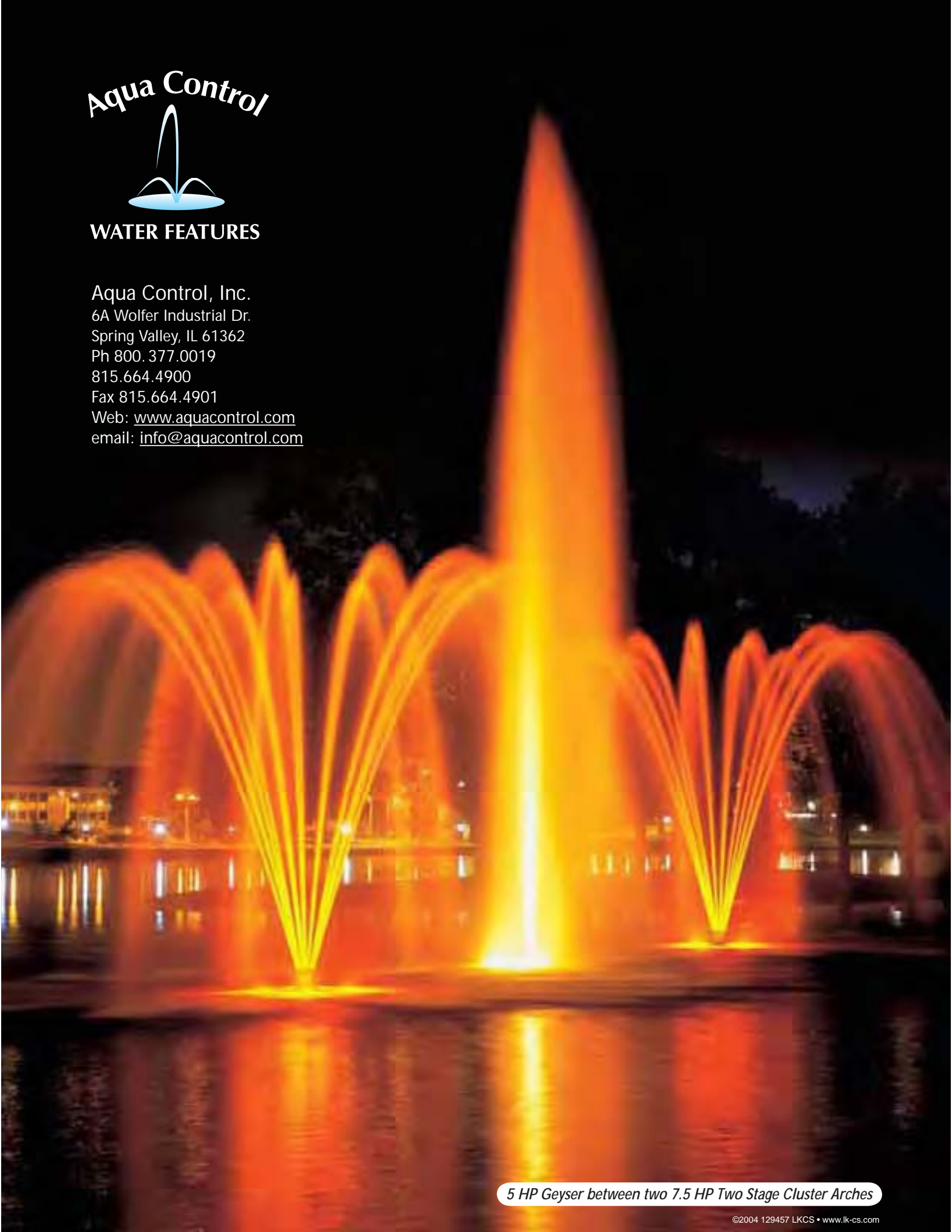
Voltage: Voltage is the force on a wire that drives current (amps) to flow and do work. Typical voltages are 120, 208, 230 single phase and 208, 230, and 460

Aqua Control



WATER FEATURES

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5 HP Geyser between two 7.5 HP Two Stage Cluster Arches