

### Lake Management Aerators

Advanced technology to enhance golf course irrigation efficiency.

A growing global trend is to install surface spray aerators in golf course ponds or lakes that are less than 15 feet (5 m) deep. The primary reason is that these aerators provide the best vertical circulation to add dissolved oxygen to the water. This circulation helps to maintain an ecological balance, which in turn assures sufficient water quality. Rain Bird offers a complete line of lake management aerators that help to maintain this water quality to support efficient golf course irrigation.

#### **Poor water quality and its effect on golf course irrigation.**

When a lake or pond loses its ecological balance, the effects or symptoms are readily apparent:

- Unightly algae build-up
- Aggressive weed growth
- Unpleasant odor
- Depleted fish populations

If this water source is used to supply a golf course irrigation system, the effects are compounded—functionally and aesthetically:

- Clogged sprinkler heads, valves and pumps
- Damaged turf
- Loss of water storage capacity
- Odors, fish kills and insect breeding
- Diminished aesthetic appeal

Not acting to preserve lake or pond water quality results in a dramatic increase in costs to restore the ecological balance. Again, when this water source is used for golf course irrigation, those costs are compounded.

**Clogged Pumps.** The build up of sludge and sediment makes it impossible to irrigate. In many cases, a commercial diver must be brought in to clear the pump. This can take four to eight hours and generally is expensive. An associated cost is repairing turf that was damaged due to a lack of irrigation during the clogged/unclogging timeframe.



#### **Sediment Blocking Valves and Sprinklers.**

Sediment/sludge build-up in valves and sprinklers effects efficient water flow, which can lead to turf damage—turf is either burned or saturated due to insufficient or excess water delivery. The cost in hours and dollars to repair or replace the turf is dependent on the extent of damage. For example, one course has spent up to \$7,500 annually to repair damage, another nearly \$20,000 annually. Ground under repair also effects course playability and appearance, which can negatively impact member/player experience and repeat rounds.

**Black Layer/Black Root Zone.** When sediment containing heavy metals, anaerobic bacteria and partially decomposed organic nutrients is present in water used for irrigation, it is likely that a black layer or black root zone will be created. This layer or zone essentially seals the turf, preventing the absorption of needed oxygen and nutrients. Often it is necessary to re-core the turf using USGA mix—or in extreme cases—rebuild and shape greens. The price tag to remedy the problem can cost hundreds of thousands of dollars.

**Loss of Storage Capacity.** Sediment/sludge build-up accumulates at a rate of 1" to 5" (2 cm to 12 cm) per year. At a mid-range rate of 3" (8 cm) per year, a surface acre (4,000 m<sup>2</sup>) lake loses 80,000 gallons (300 m<sup>3</sup>) of storage capacity. Imagine the effects after 20, 50 or 100 years. Loss of storage capacity, especially during the hot months—or under drought conditions—can seriously impact the amount of water available to maintain an effective irrigation program.

#### **Bottom Line**

The price to be paid for **not** acting to ecologically balance the water source used for golf course irrigation extends far beyond algae blankets, buzzing insects and an unpleasant odor. The costs associated with unclogging pumps, repairing or replacing valves, sprinklers—and most importantly, entire turf sections and greens—can be very high. There is a practical, far less expensive solution—the installation of a Rain Bird Lake Management Aerator.

# Lake Management Aerators

Efficiently work to dramatically reduce the costly expenses associated with a golf course water source that is ecologically out of balance.

## Benefits of Rain Bird® Lake Management Aerators

Rain Bird Lake Management Aerators effectively work to maintain an ecological balance in lakes or ponds less than 15' (5 m) deep. With the addition of dissolved oxygen into the water and the resulting convection patterns that reduce stratification, these surface aeration systems provide a number of practical, economic and aesthetic benefits.

## Performance Advantages of Lake Management Aerators

Lake management aerators available from Rain Bird improve the quality of water used for golf course irrigation by impacting three factors:

- **Oxygen**—aerating the water encourages aerobic digestion of nutrients by adding oxygen, which significantly reduces sediment/sludge build-up.
- **Nutrients**—potentially harmful nutrients are kept in ecological balance through oxidation and de-stratification.
- **Temperature**—mixing warmer surface and cooler bottom water with dissolved oxygen breaks down stratification to further enhance the ecological balance of adding carbon dioxide at lower levels.

The introduction of oxygen by surface aerators effectively prevents anaerobic digestion, which in turn dramatically reduces foul odors. Oxidation also reduces iron in irrigation water, which often causes staining on sidewalks, cart paths and buildings. A properly sized aerator will lower iron concentrations to less than 0.1 mg/L. In one case study, two aerators working in tandem lowered the iron concentration by more than 15 mg/L.

The advantages of installing a Rain Bird Lake Management Aerator far out-weigh the costly disadvantages of doing nothing to improve a pond or lake that is utilized to supply water to a golf course irrigation system. Rain Bird offers a number of lake management aerators to provide a tailored solution to ecologically balance source water.

## Single Pattern Lake Management Aerators

These lake management solutions include aerators with aesthetically pleasing plumes that add dissolved oxygen to sufficiently assure ecologically balanced water quality. They are available with 1-5 HP pumps.

## Basic Component Features

- Float
- Motor housing
- Support arms
- Power Control Center

## Performance Features

- All 60 Hz units are factory assembled.
- Heavy-duty 304 stainless steel arms support a float-filled with U.S. Coast Guard-approved closed cell foam.
- Stainless steel housing contains a custom-built electric motor, designed to move high volumes of water and provide years of dependable service.
- Unique pumping chamber attaches to the upper plate of the motor housing to achieve the highest pumping rates possible under pressure.
- Deflector plate provides an appealing display.
- Fine mesh screen prevents the intake of debris to allow the continuous flow of incoming water, and ensures full and symmetrical spray patterns when in operation.
- LM11 only — virtually unbreakable stainless steel chopper-style prop.

*NOTE: Rain Bird light options are available to enhance the aesthetics of these aerators. Lighting systems run on 12-volt power and are available with 65-watt halogen bulbs. Stainless steel mounting brackets facilitate installation to achieve a variety of illumination effects.*



**LM10** — Aesthetic beauty and reliability, the LM10 offers both. Its principal feature is a one-plume, geyser-like spray pattern that rises high into the air when the system is in operation.



**LM11** — Designed to transfer dissolved oxygen into the water with efficiency and economy, the LM11 delivers an unparalleled level of water quality management. With its well-proportioned fan-shaped spray, the LM11 is a perfect balance of form and function.



**LM20** — This aerator solution operates at a lower pumping rate than high-volume aerating units, yet is significantly higher when compared to fountains. The dual spray pattern is not only aesthetically pleasing, but efficiently functional.



**LM30** — The differentiating feature of this aerator is its multi-dimensional three-plume design. Again, beauty and efficiency combine to provide engaging aesthetics and ecological balance.

## Specifications

**Unit:** Manufactured of corrosion-resistant, 18-8 stainless steel and high-density thermal plastics. Corrosion resistance allows unit to be installed in almost all water source types.

**Float:** Green exterior shell is made of high-density thermal plastic polyethylene. The interior of the float is closed-cell polyethylene.

**Motor:** Custom-built electric motor with dynamically balanced rotors. Encased in a stainless steel housing that is completely hidden from view.

**Cable:** 10 and 12 gage cable is available and must be ordered separately (50' minimum).

**Screen:** ¼" nylon fine mesh water intake screen for LM10, LM20 and LM30 models only.

**Power Control Center:** Nema 3R rated control center includes ground fault interrupt (all units except 460 V); magnetic starter; surge arrestor; power disconnect; 24-hour on/off timer 460 V versions require ground fault accessories.

**Warranty:** Backed by Rain Bird Customer Satisfaction Warranty.

**Safety Testing:** Components UL and CSA listed; assembly tested and approved by ETL, ETL-C and CE.

## Lake Management Multi-Pattern Aerators

Primarily installed for their aesthetic appeal, these multi-pattern aerators also provide limited water quality enhancement in smaller ponds and lakes. Ecological balance is improved through the addition of dissolved oxygen while the aerators are in operation. They are available with ½ and ¾ HP pumps.

## Basic Component Features

- Float
- Motor housing
- Impellers/props
- Mini power center

## Performance Features

- All LMM units are factory assembled.
- Manufactured entirely of stainless steel and thermal plastics to provide years of dependable service.
- Stainless steel debris screen prevents the intake of foreign objects to allow the continuous flow of incoming water, which ensures aesthetically pleasing spray patterns.

- Mini Power Center is encased in industrial-grade, non-corroding case to assure reliability.
- Spray pattern can be changed to 10, 20 or 11.
- Diffuser ring allows the spray pattern to be varied in height and diameter (LMM with 10 and 20 patterns only).

*NOTE: Rain Bird light options are available to enhance the aesthetics of these multi-pattern aerators. Lighting systems run on 12-volt power and are available with 20-watt halogen bulbs. Stainless steel mounting brackets facilitate installation to achieve a variety of illumination effects.*



*LMM shown with 10 pattern selected*



*LMM shown with 20 pattern selected*



*LMM shown with 11 pattern selected*

## Specifications

**Unit:** Manufactured of corrosion-resistant, 18-8 stainless steel and high-density thermal plastics. Corrosion resistance allows unit to be installed in almost all water source types.

**Float:** Black exterior shell is made of high-density thermal plastic polyethylene. The interior of the float is closed-cell polyethylene. Each float consists of specially designed float rings, which call the unit to ride level in the water.

**Motor:** Custom-built submersible, water-cooled, corrosion-resistant, stainless steel motor. Constructed to run continuously and are available in 50 Hz @ 2875 RPM or 60 Hz @ 3450 RPM.

**Impellers/Props:** Manufactured of polyphenylene oxide, modified. Material is corrosion-resistant to most types of water, salt solutions and acids.

**Cable:** 10 and 12 gage cable is available and must be ordered separately (50' minimum).

**Mini Power Center:** 115 V unit controls are enclosed in a 5" x 5" x 4" industrial-grade, all plastic, non-corroding case. 115 V controls consist of 24-hour on/off timer and GFI. 230 V units are enclosed in an 11" x 11" x 6" high-impact, corrosion-resistant thermal plastic, Nema rated type 3S. 230 V unit controls consist of 24-hour on/off timer, fuse or circuit breaker protection and GFI.

**Screen:** Corrosion-resistant 18-8 stainless steel intact screen to efficiently prevent clogging.

**Warranty:** Backed by Rain Bird Customer Satisfaction Warranty.

**Safety Testing:** Safety tested and approved as a package by ETL, ETL-C and CE.



**Rain Bird® Lake Management Aerators  
Technical Specifications—50 Hz (Metric Measure)**

Pattern	HP	Voltage & Phase	Motor RPM	Running AMP Draw	Spray Height in Meters		Spray Diameter in Meters		Minimum Operating Depth in Meters	Shipping Weight in kg*		
<b>LM10</b>	1	220/240 1 ph	1425 @ 50 Hz	7.1	3.0 - 3.4		1.2		1	93		
	2	220/240 1 ph	1425 @ 50 Hz	11.6	4.4 - 4.9		1.2		1	93		
	3	220/240 1 ph	1425 @ 50 Hz	14.0	5.2 - 5.8		1.2		1	95		
	3	380/415 3 ph	1425 @ 50 Hz	4.0	5.2 - 5.8		1.2		1	95		
	5	380/415 3 ph	1425 @ 50 Hz	5.8	6.0 - 6.8		1.2		1	98		
<b>LM11</b>	1	220/240 1 ph	1425 @ 50 Hz	7.7	1.4		5.1		1	93		
	2	220/240 1 ph	1425 @ 50 Hz	11.0	1.6		7.3		1	93		
	3	220/240 1 ph	1425 @ 50 Hz	11.8	1.8		8.2		1	95		
	3	380/415 3 ph	1425 @ 50 Hz	3.4	2.1		8.2		1	95		
	5	380/415 3 ph	1425 @ 50 Hz	6.0	2.4		9.1		1	98		
<b>LM20</b>	1 2 3 3 5	220/240 1 ph 220/240 1 ph 220/240 1 ph 380/415 3 ph 380/415 3 ph	1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz	7.3 12.0 14.5 4.3 6.2	I/S O/S		I/S O/S		1 1 1 1 1	93 93 95 95 98		
					3.0	1.0	0.9	4.0				
					4.0	1.4	0.9	4.6				
					4.2	1.7	0.9	5.8				
					4.2	1.7	0.9	5.8				
4.6	2.2	0.9	6.1									
<b>LM30</b>	1 2 3 3 5	220/240 1 ph 220/240 1 ph 220/240 1 ph 380/415 3 ph 380/415 3 ph	1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz 1425 @ 50 Hz	7.0 11.1 14.0 4.1 5.9	O/S		Middle		I/S		1 1 1 1 1	93 93 95 95 98
					H	W	H	W	H	W		
					0.9	4.1	1.5	3.0	2.6	0.6		
					1.2	5.1	2.0	3.3	3.6	0.6		
					1.5	6.1	2.5	4.1	4.3	0.8		
1.5	6.1	2.5	4.1	4.3	0.8							
1.8	7.1	2.7	4.8	4.6	0.8							

\*Shipping weight includes unit, 50'/15.24 m cable and power control center.

I/S = inner spray pattern O/S = outer spray pattern

RPM = Revolutions Per Minute HP = Horsepower

ph = Phase



**Rain Bird® Lake Management Aerators  
Technical Specifications—60 Hz (English Measure)**

Model	HP	Volts	Phase	Motor RPM	Full Load in Amps	Spray Height in Feet	Spray Width in Feet	Minimum Operating Depth in Inches	Shipping Weight in Lbs*				
<b>LM10</b>	1	115	1 ph	1725	13.4	10 - 12	4	40	205				
	1	230	1 ph	1725	6.8	10 - 12	4	40	205				
	2	230	1 ph	1725	12.0	16 - 18	4	40	205				
	3	230	1 ph	1725	13.7	20 - 21	4	40	210				
	3	230	3 ph	1725	8.0	20 - 21	4	40	210				
	3	460	3 ph	1725	4.0	20 - 21	4	40	210				
	5	230	3 ph	1725	14.4	23 - 24	4	40	215				
	5	460	3 ph	1725	7.2	23 - 24	4	40	215				
<b>LM11</b>	1	115	1 ph	1725	13.4	4	15	40	205				
	1	230	1 ph	1725	6.8	4	15	40	205				
	2	230	1 ph	1725	11.0	6	25	40	205				
	3	230	1 ph	1725	12.8	7	30	40	210				
	3	230	3 ph	1725	7.9	7	30	40	210				
	3	460	3 ph	1725	4.0	7	30	40	210				
	5	230	3 ph	1725	14.0	8	35	40	215				
	5	460	3 ph	1725	7.2	8	35	40	215				
<b>LM20</b>						O/S		I/S					
						H	W	H	W				
						4	12	8	3				
						4	12	8	3				
						6	19	12	3				
						8	23	16	3				
						8	23	16	3				
						8	23	16	3				
9	26	18	3										
9	26	18	3										
<b>LM30</b>						O/S		Middle		I/S			
						H	W	H	W	H	W		
						3	11	5	7	8	1.5		
						3	11	5	7	8	1.5		
						4	15	7	10	12	1.5		
						6	18	8	11	15	1.5		
						6	18	8	11	15	1.5		
						6	18	8	11	15	1.5		
7	24	10	12	16	1.5								
7	24	10	12	16	1.5								

\*Shipping weight includes unit, 50'/15.24 m cable and power control center.

RPM = Revolutions Per Minute    HP = Horsepower  
ph = Phase    Lbs. = Pounds



**Note:** Deduct 15% from the spray pattern when operating on 50 Hz power.

I/S = inner spray pattern    O/S = outer spray pattern

All 60 Hz units are factory assembled.



**Rain Bird® Lake Management Multi-Pattern Aerators  
Technical Specifications**

Pattern	HP	Voltage	Phase	Motor RPM	Running AMP Draw	Spray Height*		Spray Diameter*	
10*	1/2	115	1 ph	3450 @ 60 Hz	12.0	12'		2'	
	1/2	230	1 ph	3450 @ 60 Hz	6.0	12'		2'	
	1/2	220	1 ph	2875 @ 50 Hz	3.9	2.9 m		0.6 m	
	3/4	230	1 ph	3450 @ 60 Hz	8.0	15'		2'	
11	1/2	115	1 ph	3450 @ 60 Hz	12.0	2.5'		12'	
	1/2	230	1 ph	3450 @ 60 Hz	6.0	2.5'		12'	
	1/2	220	1 ph	2875 @ 50 Hz	3.9	0.8 m		4.3 m	
	3/4	230	1 ph	3450 @ 60 Hz	8.0	3.0'		19'	
20*	1/2	115	1 ph	3450 @ 60 Hz	12.0	I/S	O/S	I/S	O/S
						8'	4'	2'	12'
	1/2	230	1 ph	3450 @ 60 Hz	6.0	8'	4'	2'	12'
						2.1 m	1.2 m	0.6 m	3.7 m
3/4	230	1 ph	3450 @ 60 Hz	8.0	9'	6'	2'	16'	

\*Spray patterns will vary by adjusting the diffuser ring. Therefore, the figures given are averages. Spray patterns will also vary due to voltage drop, humidity and other relevant site situations.

**Unit Weight:** 45 lbs. or 21Kg. Total weight includes power center, unit, spray patterns and 50' or 15.24 m of underwater cable.

**Minimum Operating Depth:** 18" (500 mm).

I/S = inner spray pattern

O/S = outer spray pattern

**Lake Management Aerators  
Standard/Optional Equipment**

	LM Series 60 Hertz				LM Series 50 Hertz				LMM	
	LM10	LM11	LM20	LM30	LM10	LM11	LM20	LM30	50 Hz	60 Hz
Aerator Assembled	Std.	Std.	Std.	Std.	Requires Assembly				Std.	Std.
Power Control Center	Std.	Std.	Std.	Std.	Optional	Optional	Optional	Optional	Optional	Std.
Intake Screen	Std.	Optional	Std.	Std.	Std.	Optional	Std.	Std.	Std.	Std.
Lights	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (65 W only)	Optional (20 W only)	Optional (20 W only)
Power cable* (50 feet)	Required	Required	Required	Required	Required	Required	Required	Required	Required	Required

\*Additional charge

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