

***PhotonAER®***  
***Solar Powered Submersible Aspirating Aerator***

**1. GENERAL**

Provide a total of \_\_\_\_ PhotonAER Solar Powered Floating Aspirating Aerators as manufactured by AEROMIX Systems, Incorporated of Minneapolis, Minnesota, USA. Each aerator shall sit on the bottom of the tank or pond. Each aerator shall be powered by an electric motor and the energy to drive the motor shall be solar as captured by solar panels mounted outside the tank or pond. Each aerator shall include the necessary controls and batteries to allow 24 hour operation in all weather conditions. The aerator shall draw air from above the water surface and inject it into the water through a specially designed nozzle. The aspirated air discharged by the nozzle shall mix with water drawn in by a submerged pump to produce fine bubbles and thoroughly dissolve the oxygen in the water. The aerator shall destratify and provide horizontal water circulation without the need for additional components or accessories. All aerator components shall be completely submerged and not easily visible from the surface. Each aerator shall include submersible electrical cable, air hose, solar panels, batteries and all necessary controls.

**2. PROPELLER PUMP**

A non-fouling, high efficiency, axial flow propeller pump shall be used. The propeller shall be precision cast stainless steel for maximum life and to minimize abrasion resistance. The pump housing shall also be cast stainless steel for maximum corrosion resistance.

**3. DIFFUSER VENTURI NOZZLE**

The venture nozzle shall be of stainless steel and of such design that the air/liquid mixture is discharged horizontally with a directional capability determined by aerator placement.

**4. ELECTRICAL CABLE**

Each aerator shall be supplied with 25 feet (8 m) of SEO type submersible electrical cable for connection to the control panel.

**5. AIR HOSE**

Each aerator shall include 25 feet (8 m) of ribbed plastic air hose to conduct the air from the surface to the submerged aerator.

**6. MOTOR**

A fractional horsepower (kilowatt) DC motor shall be used to turn the propeller. The motor shall be of brushless design for long maintenance free operation and shall be capable of operating at any rpm from near zero to over 1800. The motor shall be designed for extended exposure to weather in all climate conditions.

**7. BATTERIES**

Rechargeable batteries shall be provided allowing the system to operate 24 hours per day. The battery system shall have the capacity to allow full speed motor operation for at least 15 hours under no light conditions and after receiving a full charge. The batteries shall be designed to operate in any weather conditions.

**8. SOLAR PANELS**

Solar panels shall be used of adequate size to allow continuous operation of the circulator 24 hours per day, 7 days per week, during periods when solar radiation is at its lowest level for the site. The panels shall be mounted such that they can be positioned for maximum efficiency.

**9. CONTROLS**

The circulator shall be complete with controls to convert the power from the solar panels to all on board systems. These controls shall provide for automatic charging of the batteries and to allow the system to automatically operate on battery power as needed. All control cabinets, wiring, and external electrical connections shall be weather proof and water resistant.

**10. COLD WEATHER OPERATION**

The aerator shall be designed for operation during any weather conditions including ice. The aerator shall not spray or splash liquid into the air causing ice or snow build-up on the aerator or float. The solar panels shall be designed to prevent snow and ice build up on their surface.

**11. EXPERIENCE**

The circulator manufacturer shall have at least 2000 operating installations of aerators and circulators in similar applications and have been in business under the same name and selling water circulators and aerators for at least 10 years.

**12. FACTORY TESTING**

The manufacturer shall have available on site a testing tank with a minimum volume of 100,000 gallons where oxygen transfer rate, velocity, and mixing tests can be executed. The manufacturer of the circulator shall upon request provide certified test results showing the clean water oxygen transfer rate per the ASCE standard. Those results shall be independently confirmed.

**13. WARRANTY**

A warranty statement shall be provided which defines the terms of the warranty.

**14. SAFETY**

The manufacturer shall provide visible safety warning labels on the shipped equipment that comply with OSHA regulations (29 CFR 1910).

**15. INSTALLATION**

All circulators shall be designed so they can be installed and operated immediately upon arrival without assistance from the manufacturer. The manufacturer shall warranty the product when installed by others.

**16. ORIGIN**

Each aerator shall be manufactured in the USA using components mostly made in the USA. Over 80% of the content and labor shall be USA supplied.