U.S. Solar Mounts

SLA-SD-BLDC Series Instruction Manual

REV 1

Ultra-Rugged Solar Mounting Solutions

CUSTOMER SUPPORT

U.S. Solar Mounts products are designed to be simple and easy to install. If, for whatever reason, you need help during installation, please give U.S. Solar Mounts' customer support a call. We are happy to help to ensure each installation goes as smooth as possible. Have a comment or suggestion on how we can improve your experience? Let us know. We would like your feedback… good or bad.

U.S. Solar Mounts

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1. INSTALLER RESPONSIBILITY

The installer is solely responsible for:

- Complying with all applicable local or national building codes, including any that may supersede this manual.
- Ensuring that U.S. Solar Mounts' SLA and other products are appropriate for the particular installation and the installation environment.
- Ensuring that the supplied mount can support the array under live load conditions.
- Using only U.S. Solar Mounts parts and installer-supplied parts as specified by U.S. Solar Mounts. Substitution parts may void the warranty.
- **Ensuring proper array/structure grounding**, including each module frame, the mounting pole, and each rail. Failure to provide proper grounding may result in damage to your equipment or injury to personnel.
- **Do not rely on the mounting pipe to act as a ground rod!** It is not a reliable substitute for a properly installed grounding electrode system.
- **If you are unfamiliar** with NEC **compliant** solar electric installations, consult **with the dealer** that supplied your mount. They should have the skill and expertise to supply you with the necessary wiring diagrams and the appropriate connection wire, grounding equipment, junction boxes and fusing.

Installation or service performed by unqualified and/or untrained personnel increases the risk of bodily injury and/or property damage.

2. SAFETY NOTICES, WARNINGS & CAUTIONS

This chapter contains important safety instructions. You must read, understand, and comply with all of these safety instructions in order to protect your life and safety, and to prevent equipment problems or damage. Failure to follow the instructions in this chapter may void equipment warranties.

Types of Safety Notices

Safety warnings are not in this manual for our benefit; **they are for you**. Please follow them carefully. We do not want you to become a statistic.

The following notices appear throughout this manual:

WARNING!

Warnings alert you to the possibility of death or personal injury if these instructions are not followed.

CAUTION!

Cautions alert you to the possibility of equipment damage if these instructions are not followed.

Electrical Safety

- USSM SLA installations may require working near high voltage electrical equipment. Shocks caused by electricity can be fatal. Use extreme caution at all times to avoid creating an electrocution hazard.
- There is an increased risk of electric shock if your body is grounded.
- **Never work on energized components**. Shut off all sources of electric power and follow up with the proper use of lock-out / tag-out equipment.

DON'T TRUST ANYONE ELSE! Verify for yourself that the equipment is de-energized!!

Electrocution Hazard!

Every piece of the Solar Array Structure is electrically conductive.

Check for clearance to overhead power lines before beginning any install.

WARNING!

We make every effort to remove sharp edges from our metal products. However, we highly recommend wearing gloves when handling metal parts in order to avoid sharp edges.

<u>Be aware of thin ice hazards!</u>

Ponds and lakes with aeration systems in use throughout the winter months can be very dangerous. Many States may require that these lakes be clearly marked with signs as hazardous due to thin ice or open water during the winter. **<u>DO NOT</u>** attempt to walk on aerated lakes, and ensure all proper precautions are taken to prevent severe harm or death to yourself or others!

3. SITE ENGINEERING & PREP

The first step in preparing your site for a Solar Lake Aerator is picking the installation location. This location must have good solar access throughout the entire day, while also being close to the body of water you want to aerate. Therefore, the Northern edge of the pond or lake is usually a good location to consider (but certainly isn't always the best option.) With the body of water on the South side of an installation, the North shore should be an area naturally devoid of any trees or other obstructions that could cause shading on the solar panels throughout the day.

NOTE: Any shading on the panels during the day can dramatically affect the air output of the SLA. Ensure you have picked a good location for the panels. To aid in finding a suitable location, U.S. Solar Mounts supplies a set of 15' extensions for the solar PV cables. Make sure your SLA unit and panel mount are placed close enough together for the cables to reach between the two.

Once a suitable location has been chosen, the pole needs to be mounted in the ground. Each individual SLA unit will require an installer-supplied steel mounting pole. Please refer to the supplied Solar Mount Instruction Manual for everything related to installing the modules and mount.

NOTE: The SLA will need to be installed on fairly level ground and includes (4) 7/16" holes to assist in mounting to a concrete slab/foundation, if desired.

4. RECEIVING YOUR SHIPMENT

The site chosen for the installation and/or delivery of the SLA System must have adequate access for delivery trucks, semi-tractors, or any other equipment necessary to offload the skid(s) upon arrival. U.S. Solar Mounts may request assistance with shipping and logistics.

Upon delivery of the SLA system, the customer is responsible for inspecting the shipment for any damages incurred during shipping. If any damage is apparent, a claim must be made with the driver upon drop-off.

The SLA normally arrives packaged on a single skid with all components present. You may wish to use some form of equipment such as an all-terrain forklift or track loader for unloading the shipment and relocating the materials on the jobsite. The skid will be fairly heavy, but each individual piece can be handled by no more than two people.

Please note: Multiple-unit orders will likely come packaged on multiple skids, optimized to make the best use of materials and to keep freight costs to a minimum.

5. CONNECTING THE ARRAY TO THE AERATOR

Once the installation of the Panel Mount is complete, use the included wiring diagram (at the end of this manual) to connect the modules to the SLA.

DO NOT connect the positive and negative leads of the same panel together!

Once the proper connections have been made at the array, route the remaining positive and negative leads to the SLA enclosure. Take care to route the cables so that they are neat and protected from physical damage.

While the PV output leads supplied with the unit may be direct-buried, the MC-4 Solar connectors should NEVER BE BURIED. These leads may also be installed in a suitably-sized PVC conduit. In areas where damage by animals or livestock is of concern, the installer is responsible for restricting access to the enclosure, wiring, and array.

If you have any questions about wiring methods and/or procedures, please call U.S. Solar Mounts at (608)272-3999. We'll be glad to offer advice & guidance.

Recommended SLA Array Tilt (Optimal Year-Round*)	
Latitude	**Tilt Angle**
0° to 25°	20°
25° to 35°	30°
35° to 45°	40°
45°+	50°

*Angles shown are based on optimal year-round tilt angles for a fixed array and may not be accurate for all locations. Arrays can also be adjusted seasonally for better production. Consult with your dealer or a local solar professional for more information on what angle will work best for your area.

6. DEPLOYING THE DIFFUSERS

Deploying the aeration diffusers will most likely be easiest with the assistance of a boat appropriate for the body of water you will be aerating. A second person may also be helpful for this step to ensure the weighted hose uncoils properly and does not pull on the connection at the enclosure.

The weighted hose may need to be trimmed or extended, depending on the positioning of the diffusers relative to the enclosure. If the diffusers and hose were not sourced from US Solar Mounts, the installer is responsible for supplying the necessary hose, diffusers, and fittings. The SLA comes with 3/8" brass barb fittings for the external hose connections.

WARNING!!
Use proper boating and water safety precautions while deploying the aerator diffusers!

Note: The positioning of the diffusers can have a large impact on the overall effectiveness of the aeration process and in maintaining the general health of your pond or lake. Consult your DEALER or Professional Aquatic Engineer to help determine the most effective way to operate your SLA and to optimize diffuser locations.

7. COMMISSIONING THE SLA-SD

Once the PV Output cables have been connected to the SLA and the diffusers have been deployed, the system can be turned on. Ensure the ball valves are open fully on the compressor manifold(s) by turning the knobs so they are in line with the valves.

Turn the system on by toggling all of the breakers to the on position. The SLA has a start delay built into the system, so there may be a 60-90 second delay before the compressor(s) kicks in. This delay varies based on solar conditions at the time. Once the system is running, adjust the valves as necessary to even out the flow to each diffuser. This is best done by watching the bubbles rise from each head and adjusting the valves until both streams are approximately equal.

Once all adjustments have been completed and the system appears to be running properly, close the lid and secure both of the latches. The SLA installation is now complete!

Making a healthy transition to an aerated lake or pond

When installing an aeration system in an older, existing pond, a few extra steps are recommended for ensuring a healthy transition to a fully aerated body of water.

An old pond will most likely have a thick layer of unhealthy muck built up at its bottom that may contain damaging amounts of harmful gasses. Disturbing this layer could cause foul odors to rise to the surface upon activation of an aeration system. In sufficient concentration, this could also harm or kill fish or other aquatic life if allowed to mix into the pond too rapidly.

To avoid any such issues, it is recommended that the aerator(s) be operated intermittently at first. Operate the system for only 30 minutes to an hour for the first couple days. Increase the run time by at most one hour each day, until reaching the final desired operational period. This should allow enough time for the harmful gasses to escape. It will also give your pond and fish some time to get used to the changes in the water ecosystem, preventing any harm.

8. TROUBLESHOOTING

In the unlikely event that your SLA experiences an issue, use the troubleshooting chart below to assist with determining the problem and a solution.

Troubleshooting Guide		
Issue	**Possible Cause**	**Solution**
Compressor won't run at all	Poor solar conditions/very dark clouds	Wait for better conditions
	Shading on modules	Correct or remove cause of shading.
	Snow on Modules	Remove snow from the array.
	Damaged or Failed electrical connection	Check all connections & repair or replace
	Tripped circuit breaker	Reset breaker. If problem persists, the compressor likely needs replacement.
	Compressor has failed	Replace compressor
	Controller has failed (extremely rare)	Replace controller
Compressor runs intermittently	Poor solar conditions/clouds	Wait for better conditions. Unit will Auto Re-start
	Enclosure over-temperature	See "Enclosure Over-Heating" below.
	Compressor Over-Current	The controller will shut down the compressor if an over-current condition occurs. This could be a sign that the compressor needs replacement.
Pressure Relief Valve is "popping off"	Hose is kinked, crushed or damaged	Repair or replace damaged hose
	Diffuser(s) are clogged	Clean diffusers
	Diffuser(s) too deep in lake	Relocate diffusers
	Possible ice in hose(s)	DO NOT operate the system in this condition. Shut down the system and Remove ice from the lines.
	Balancing valves are too restricted	Adjust valves
Compressor runs - low air output	Poor solar conditions/clouds	Wait for better conditions
	Balancing valves set incorrectly	Adjust valves
	Compressor Intake Filter is dirty	Replace the filter
	Hose(s) kinked, crushed or damaged	Repair or replace the hose
Enclosure Over-Heating	Dirty Enclosure Intake Filter(s)	Clean or replace filters
	Obstructed intake and/or exhaust ports	Remove obstruction(s)
	Cooling fan(s) stopped	Check the circuit breaker for the fan(s). If the breaker is not tripped, this indicates that the cooling fan(s) has failed and needs replacement.
If you have any questions about your SLA System or need replacement parts, please contact U.S. Solar Mounts. We'll be glad to assist you in getting your system up and running as quickly as possible.		