ShoreStation®
At the forefront of shorefront since 1959

Solar Panel HA0241 & HA0242

Fits Revolution Canopy Frames

Introduction

The ShoreStation Solar Panel is specifically designed to provide reliable, trouble-free charging and maintenance of your ShoreStation lift battery. Proper installation of this charging system will maximize your charger's performance and will ensure your battery maintains a sufficient charge for your lift system. This manual will provide you with information on the proper installation of your solar panel.

WARNING

DO NOT ATTEMPT TO ASSEMBLE THIS SYSTEM WITHOUT FIRST STUDYING THIS MANUAL AND INFORMATION ON LABELS INCLUDED WITH THE SYSTEM. FAILURE TO DO SO CAN LEAD TO IMPROPER OPERATION RESULTING IN SERIOUS PERSONAL INJURY AND/OR PRODUCT DAMAGE. IF YOU HAVE FURTHER QUESTIONS AFTER REVIEWING THIS INFORMATION, CONTACT A SHORESTATION REPRESENTATIVE AT (800) 859-3028.

Safety Instructions

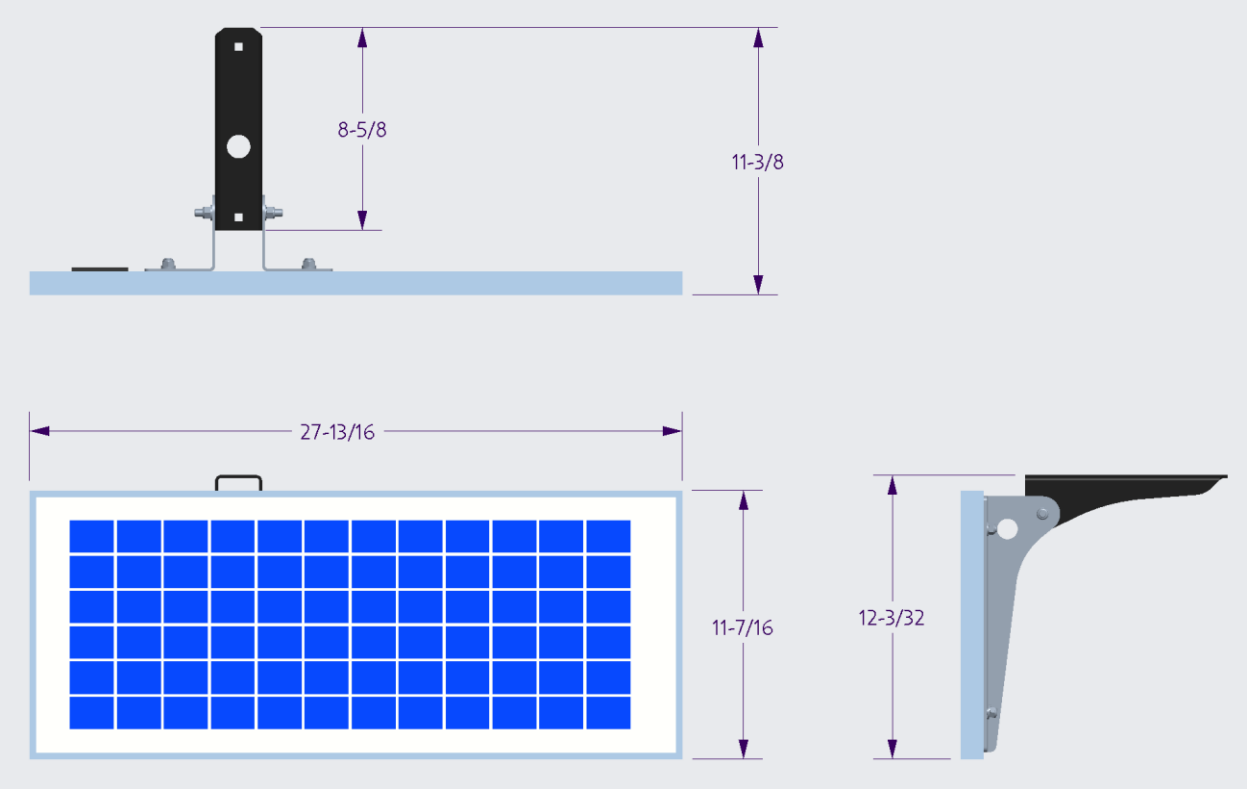
⚠ WARNING

- **ASSEMBLY AND INSTALLATION OF THIS SYSTEM MAY REQUIRE WORKING OVER WATER. ALWAYS WEAR A PERSONAL FLOATATION DEVICE (PFD) WHEN WORKING OVER THE WATER.**
- Always wear proper personal protective equipment such as safety glasses, gloves, hardhats, and clothing.
- Never work alone and observe safe lifting practices such as team lifting and proper lifting posture.
- Do not modify the equipment unless you have received direct written approval from the manufacturer (ShoreStation)
- Remove all jewelry and any conductive items from your body before working with DC system
- Check all fasteners for tightness periodically.
- Cover the terminals on the end of the harness with a non-conductive material (like tape) when they are not connected to prevent shortening.

Tools Required:

SAE Sockets and Wrenches, Cordless Power Drill, 7/8" Drill Bit

Specifications



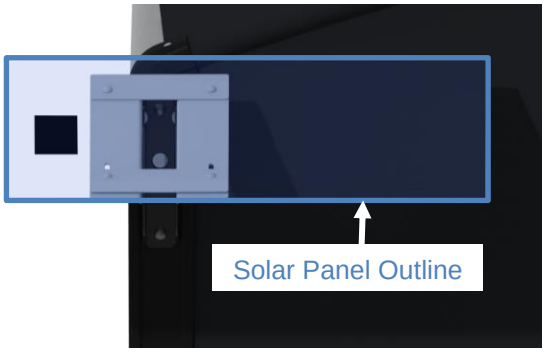
Model	HA0241 (24V)	HA0242 (12V)
Rated Max Power (Pmax)	20W	20W
Current at Pmax (Imp)	.6A	1.2A
Voltage at Pmax(Vmp)	33.0V	17.1V
Short Circuit Current (Isc)	.65A	1.25A
Open-Circuit Voltage (Voc)	40.0V	21.0V
Normal Operating Cell Temp (Tnoct)	45˚C (113˚F)	45˚C (113˚F)
Weight	2.5kg (5.51lbs)	2.50kg
Max System Voltage	600V DC	600V DC
Charge Controller	Lake Lite	Lake Lite
Harness Length	7.6m (25')	7.6m (25')

Solar Panel Placement

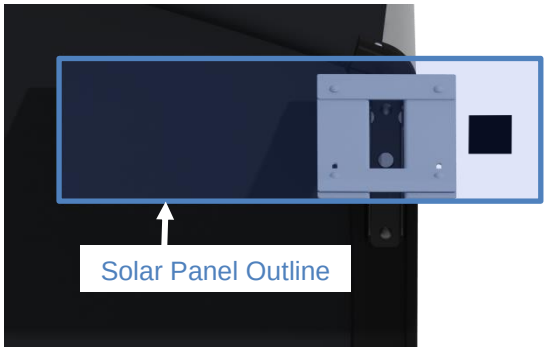
The solar panel should have a clear view of the southern sky. Choose the corner of the canopy to install the panel based on how the lift is oriented. Try to avoid corners that will cause the sunlight to be blocked for significant parts of the day. The panel includes a 23' harness that is routed from the panel to the batteries, and it should be placed close enough to the battery pack for the harness to reach. Also, consider the position of the canopy relative to the dock. You may want to install the panel on the dock side of the lift to make the cleaning process easier.

The solar panel is adjustable side to side and tilts up and down. Whether the left or right side of the canopy is best, it is recommended to have the solar panel junction box toward the outside of the canopy and the panel off-center of the mounting brackets as shown below. Keep this in mind when assembling the solar panel parts.

Left Side



Right Side



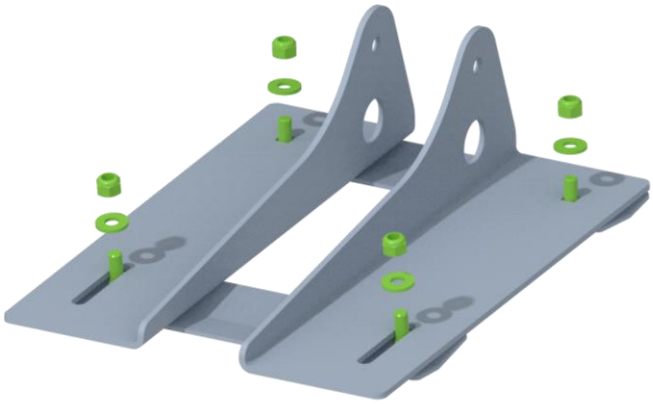
Assembly Instructions

Step #1 – Sort Hardware

Open the hardware box and bag and sort the hardware and other contents by size.

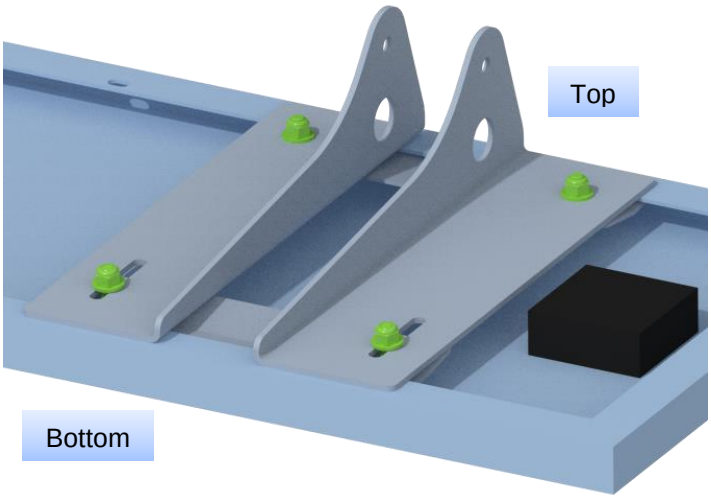
Step #2 – Connect the brackets

Place the brackets as shown below and insert the fitting carriage bolts through the brackets. Add washers and start the locknuts on the bolts, but do not tighten.



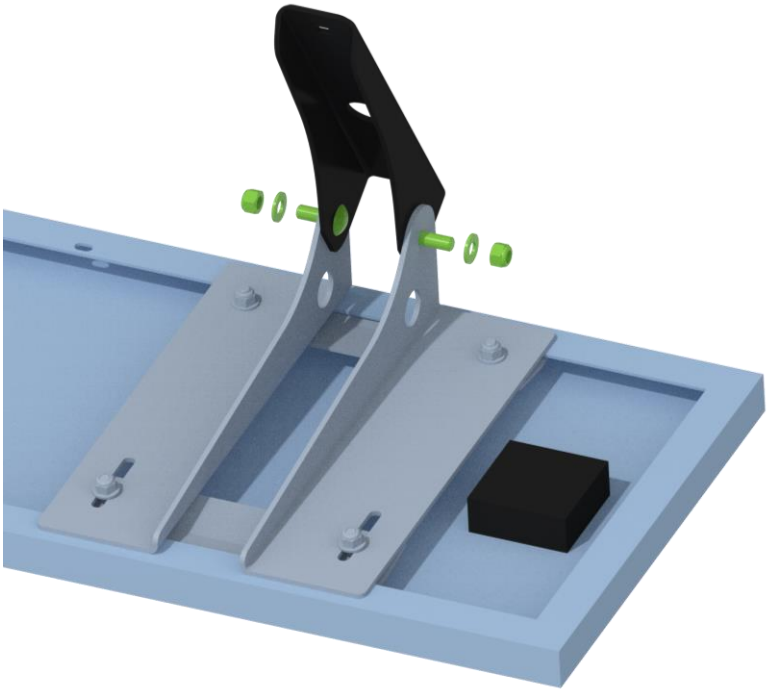
Step #2 – Add Solar Panel

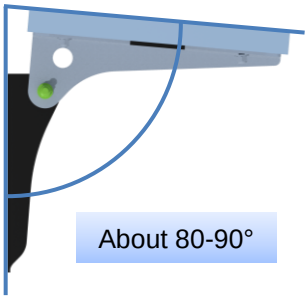
Put the edge of the solar panel between the brackets on the top of the assembly, and then slide the bottom bracket to grab the opposite edge of the solar panel. Adjust the bracket assembly side to side as needed and tighten the nuts. (Example shown below would be mounted on the left side)



Step #3 – Attach Mounting Bracket

Put the black mounting bracket between the other brackets and insert the carriage bolts as shown below. Add the washers, and tighten the locknuts so the angle is about 80-90 degrees as shown below.



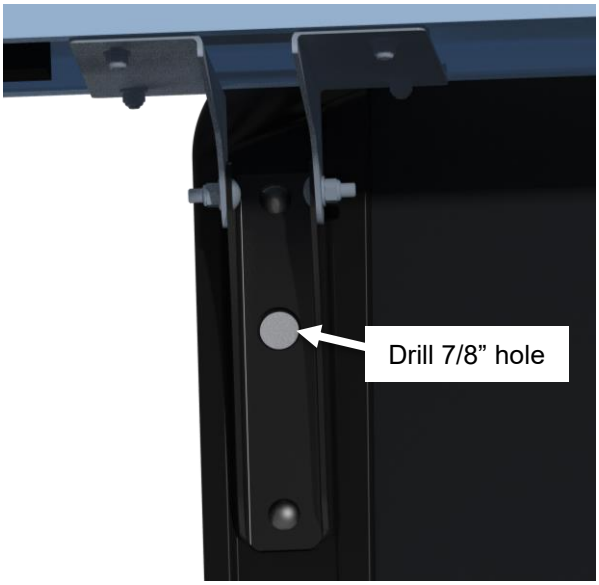


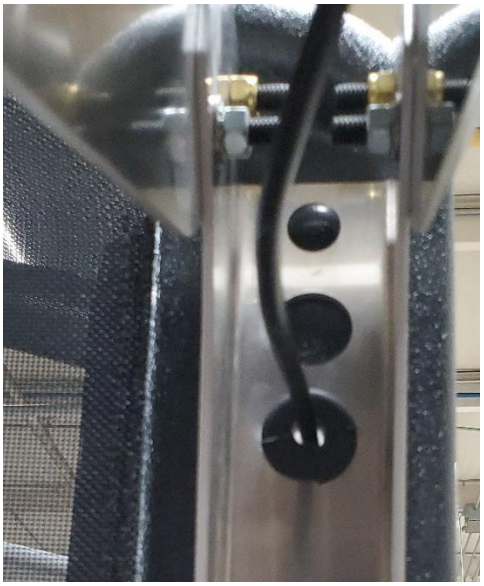
Step #4 – Mount Solar Panel

Line up the top two holes of the plastic end part with the black mounting bracket. Insert two black plated carriage bolts, add the washers on the backside, and tighten the locknuts.

Step #5 – Drill Hole

In the center of the hole in the black mounting bracket, drill a 7/8” hole into the plastic part. Put the grommet around the harness wire and feed the harness through the 7/8” hole. Press fit the grommet into the 7/8” hole and connect the harness wires.





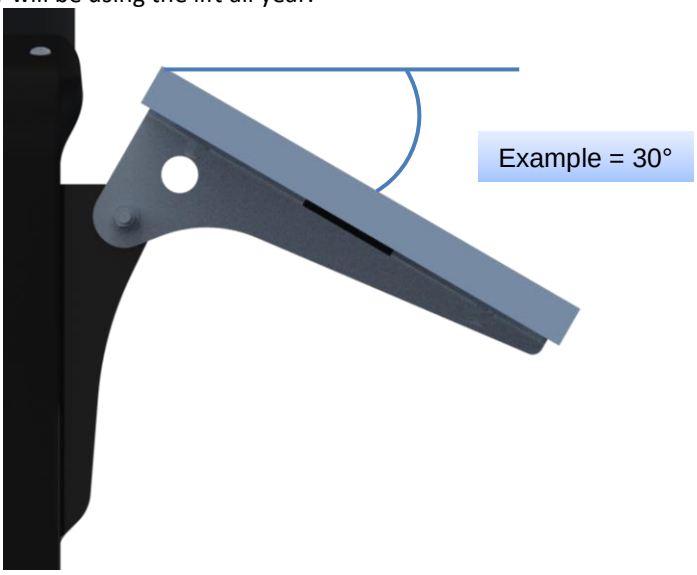
Step #7 – Angle Adjustment

Formula for optimum angle of the solar panel is: Latitude – 15 = angle from horizontal

Use a globe, Google, or a maps website to determine the latitude of your boat lift installation.
Example: A lift installed in Minneapolis, MN will have a latitude near 45 degrees.

45 – 15 = 30° from horizontal

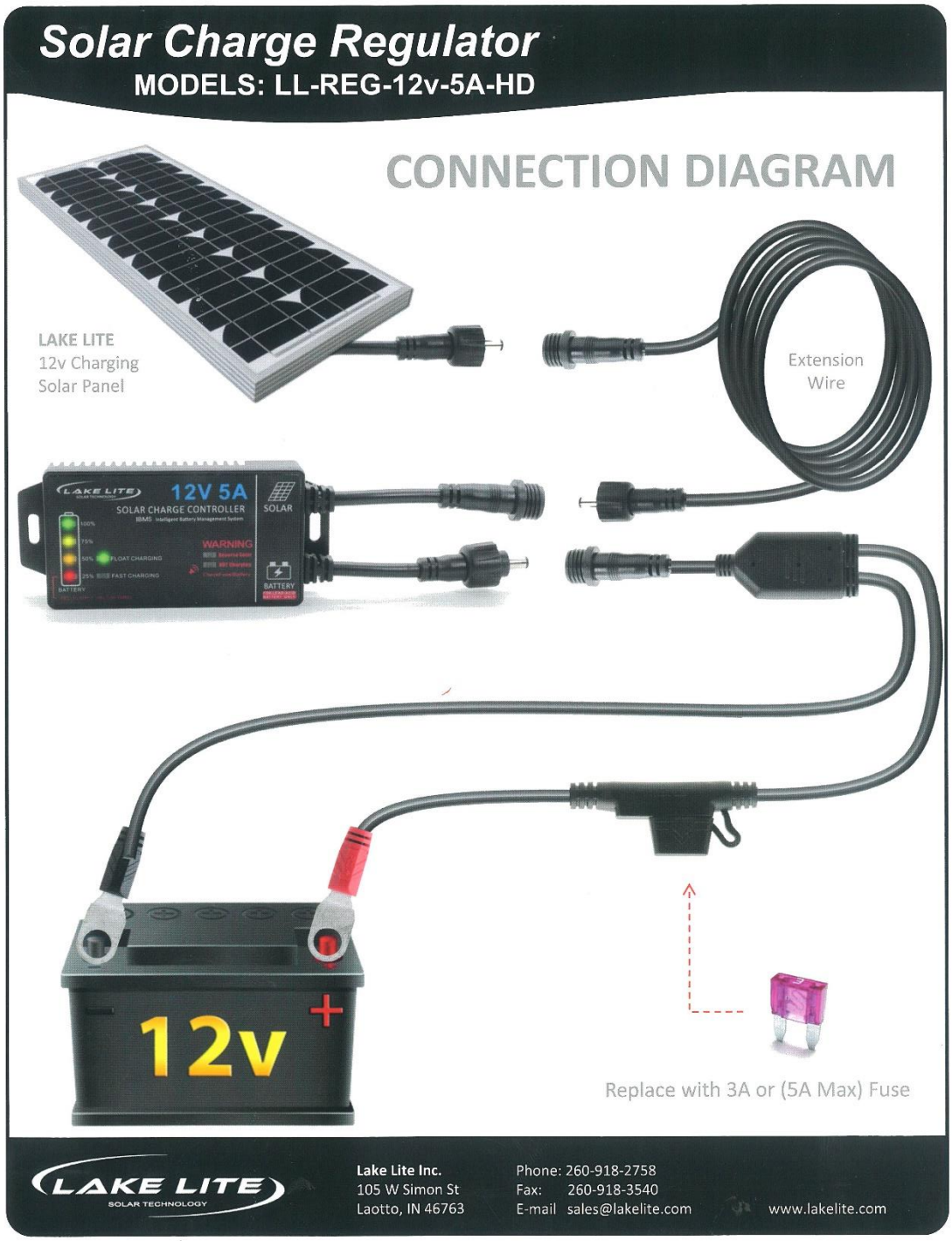
There are many online resources with good information on pointing techniques to use if you live in a different region or will be using the lift all year.



Harness & Controller

Harness Connection

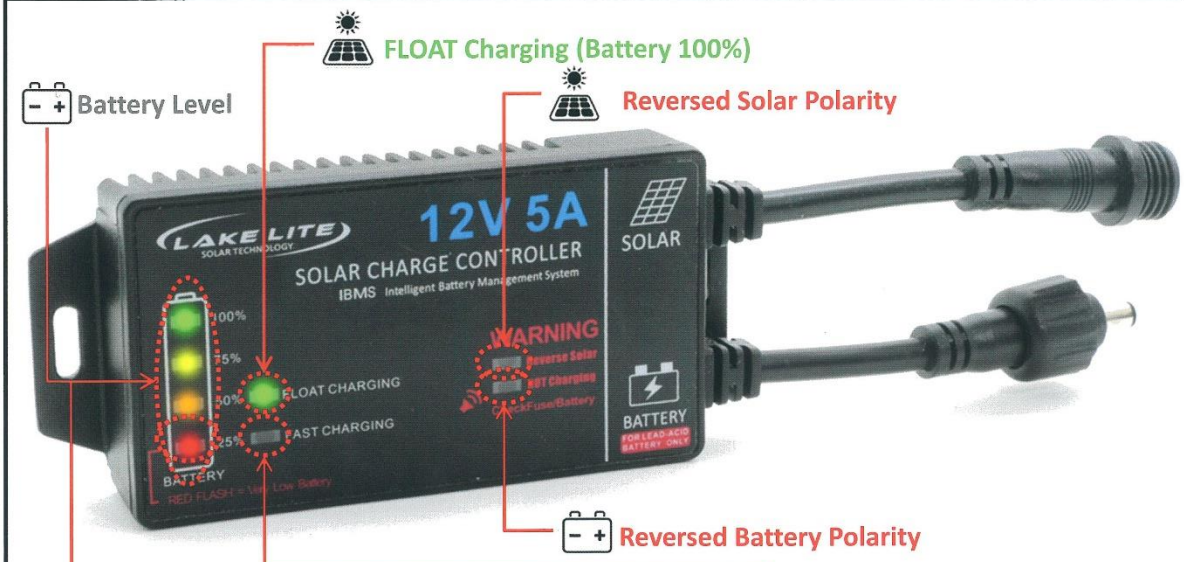
The solar panel kit includes a 23' long harness that can be routed through your structure. Each end of the harness has a quick-connect with connectors that allow you quick disconnect the panel and battery. On 24V systems, the battery harness must be connected to the 'outside' terminals of the 24V series as shown.



Solar Charge Regulator

Solar Charge Regulator

MODELS: LL-REG-12v-5A-HD



BATTERY LED INDICATORS

TIME	LED COLOR	DESCRIPTION
ANY	GREEN - FLASHING	Over Voltage Detected: Regulator will correct back to Green-Constant to protect the battery:
Any	GREEN - CONSTANT	High Battery Level – Good
Any	ORANGE - CONSTANT	Medium Battery Level – Charge Battery
Any	RED - CONSTANT	Very Low Battery Level – Limit Battery Use
Any	RED - FLASHING	Extremely Low Battery ***OR (BLOWN FUSE)*** *& No Connection to Battery*
ANY	OFF	**Blown Fuse** and or No Battery Voltage Detected Replace Fuse or Connect Regulator to Battery

SOLAR LED INDICATORS

TIME	LED COLOR	DESCRIPTION
DAY	GREEN-CONSTANT	Float Charging
DAY	BLUE - CONSTANT	Fast Charging or Bulk Charging
DAY	OFF	No power from Solar Panel Check connections, & solar panel.
NIGHT	*OFF*	*Solar Panel is NOT Charging due to lack of sunshine*

WARNING WARNING

Reverse Solar	NOT Charging
Solar Panel Polarity is reversed / backwards. Check & correct connection inside black box on back of solar panel	Check regulator is connected to battery correctly **Check & Replace Blown Fuse**

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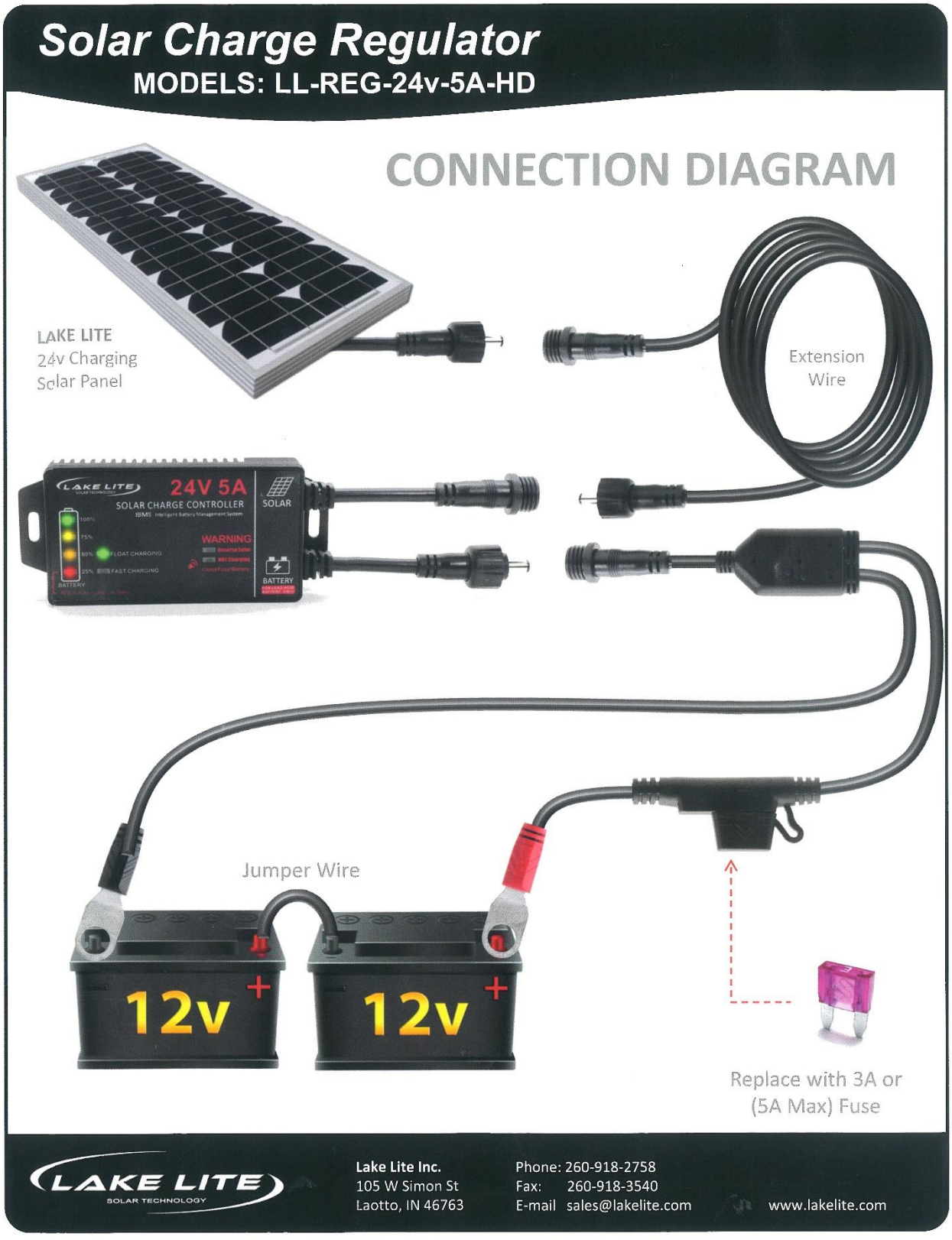
www.lakelite.com

Solar Charge Regulator

MODELS: LL-REG-24v-5A-HD



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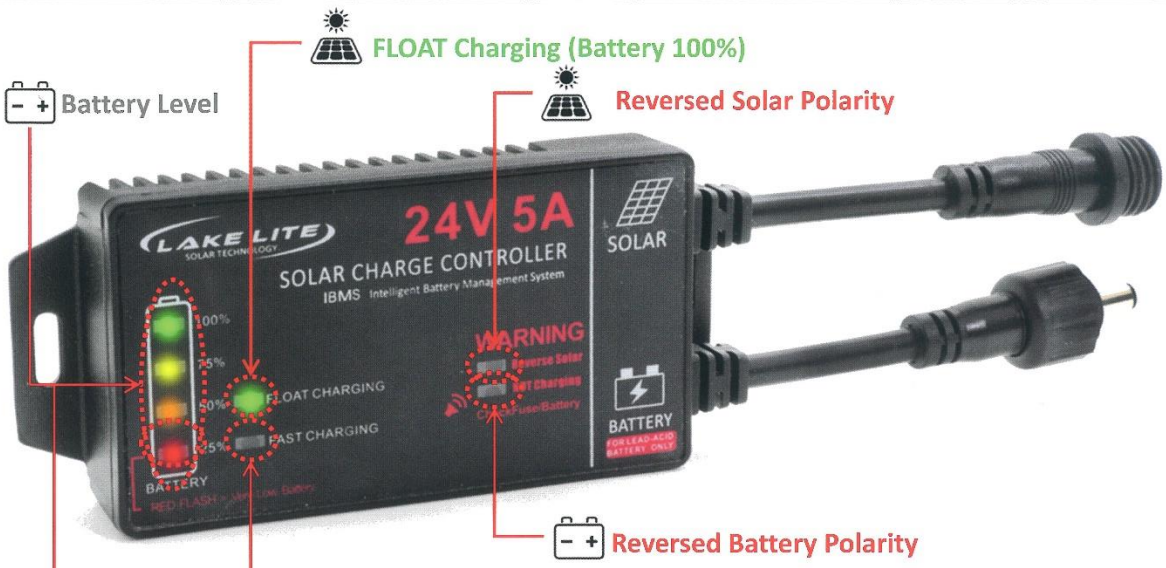

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Care & Maintenance

Storage

There is no need to remove the panel or battery during winter months if your solar charger will be exposed to the sun. Even if the panel is not pointed perfectly, it can easily produce the charging current required for storage. ShoreStation Electric and Hydraulic system have wireless controllers that will draw a small amount of current from the battery, even when the lift is not in use. In most cases, the motor should be disconnected from the battery to eliminate this power draw during the off season. The solar panel will continue to charge the battery during the winter months. A charged battery is less likely to be damaged by cold weather when fully charged. This is similar to a car battery – it is less susceptible to cold temperature damage because it is remains fully charged.
If you plan to remove your solar panel or you feel the panel will not be sufficiently exposed to sunlight in the off season, you should also remove and store the battery. Remove the solar panel by disconnecting the harness quick connect near the panel and unscrewing the locknuts holding it to the canopy frame. A quick connect is also located in the harness near the battery connection. This allows the battery to be quickly removed for storage. It is recommended that you connect the battery to a charging source (solar panel, Battery Tender, etc.) during storage.

Cleaning

The solar panel surface should be cleaned to remove debris and ensure maximum performance. Standard household glass cleaners can be used on the glass surface of the panel.

Inspection

Check the harness connections regularly to ensure they are connected and corrosion free. Dielectric grease can be applied to the connectors to protect them from corrosion in harsh environments. This can be purchased from an automotive parts store or online. Battery terminals may need to be cleaned periodically if corrosion occurs.

Inspect the condition of the harness after lift installation to make sure it is not pinched or broken.

Troubleshooting

Symptom	Cause	Remedy
Battery does not charge	Improper or disconnected solar charger	Check all quick connected and battery connections to ensure they are connected and connected to the correct battery terminals. Inspect the harness for damage.
	Not enough sun exposure	Make sure the solar panel has exposure to the sun for most of the day. Also make sure the panel has been properly pointed as discussed in the assembly instructions.
	Weak or damaged battery	Use a battery tester to test the condition of the battery.
	High lift use	The solar charger should keep up with normally used lifts. In most cases, it will take nearly 1/3 of a day to recharge from one full lift (completely up and down once). Most batteries can deliver 10-13 lifts with one charge. If you have a high lift use, you may want to consider a second panel or other means of charging the battery.