Boat Lift Solar Charger

HA0143 (24V), HA0145 (12V)

Contents:

Introduction

The ShoreStation Boat lift solar chargers are 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 charger.

Safety Instructions

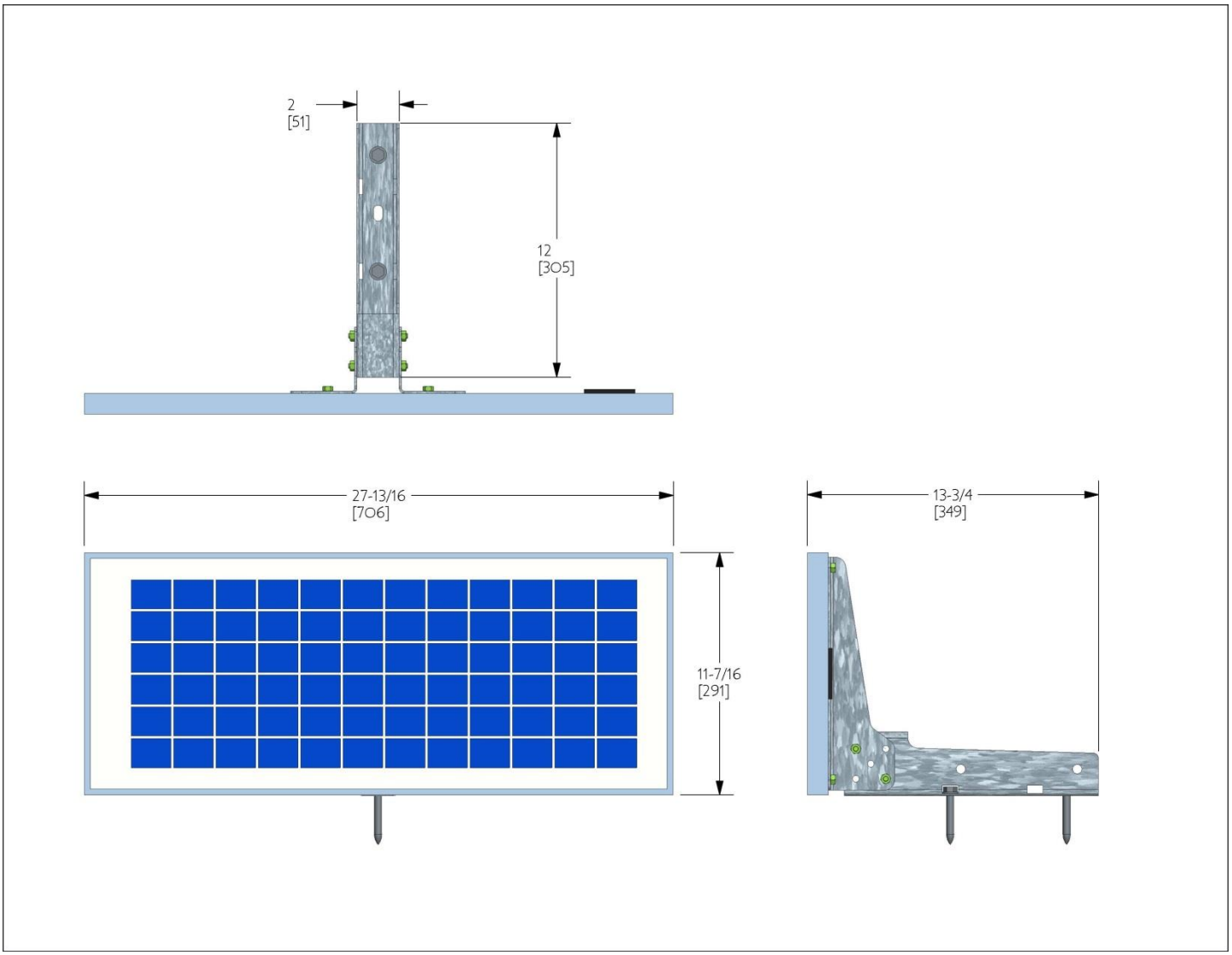
DO NOT INSTALL OR USE THIS PRODUCT WITHOUT FIRST STUDYING MANUAL AND UNDERSTANDING THE INFORMATION CONTAINED IN IT.

- Remove all jewelry and any conductive items from your body before working with DC system.
- Always wear personal protective devices (safety glasses, gloves, etc.) when working with the lift system and/or battery.
- 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 shorting.

Midwest Industries, Inc.
122 E State Hwy 175
PO Box 235
Ida Grove, IA 51445
(800) 859-3028
www.shorestation.com

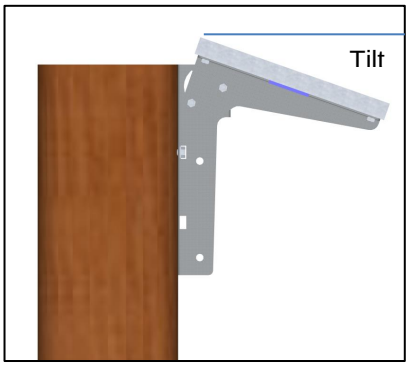
Specifications

Model	HA0143 (24V)	HA0145 (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')



Preparation

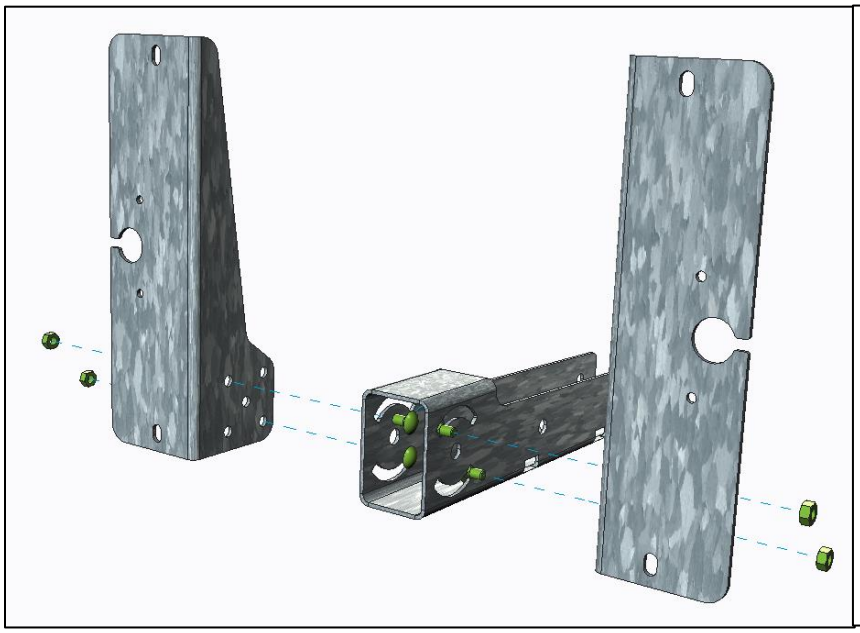
The solar panel should have a clear view of the southern sky. Try to avoid positions on the lift that will cause the sun light to be blocked for significant parts of the day. You may want to install the panel on the dock side of the lift to ease the pointing and cleaning processes. The panel includes a 23' harness that is routed from the panel to the batteries. ***These harnesses need to be connected in numerical order for correct polarity.*** The panel should be placed close enough to the battery pack for the harness to reach.



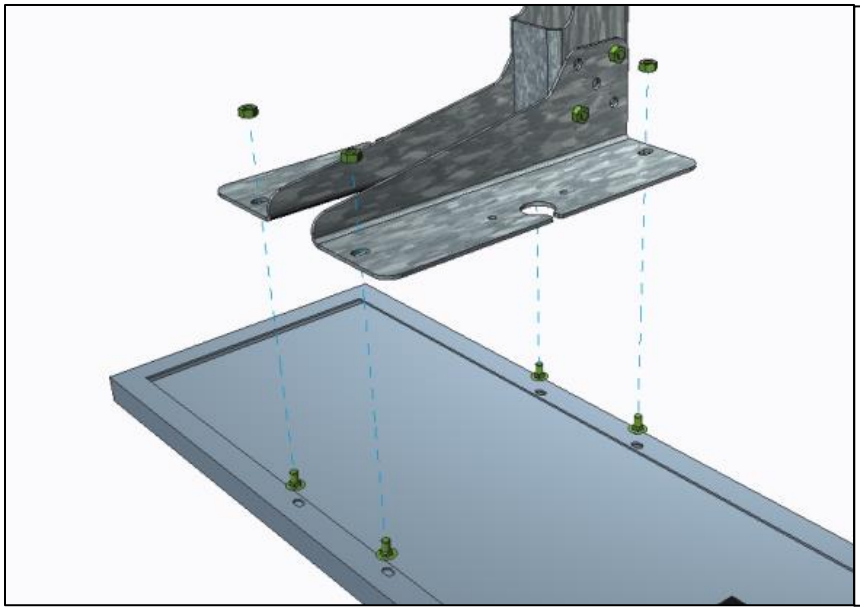
To point the solar panel correctly, you will need to know your geographic location. The latitude of your location is used to determine the amount of tilt adjustment for the solar panel. Use a globe or a maps website to determine the latitude of your lift installation. The latitude is used in the following guidelines:

- The angle of tilt is determined by taking your latitude – 15 degrees.
  Example: A lift installed in Minneapolis, MN will have a latitude near 45 degrees. A panel in this location will be tilted 45-15 (30 degrees) from horizontal, towards the south.
- 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.

Assembly Instructions



Connect the two angle brackets to the mounting bracket using 4 ¼ x ½ carriage bolts and ¼ kep nuts. Snug the fasteners, but do not completely tighten. They will be tightened completely when the panel is ready for adjustment.



Connect the bracket assembly to the underside of the solar panel using 4 1/4x1/2 carriage bolts and kep nuts. Tighten the four fasteners.

The wire harness from the panel can be routed through the mounting bracket tube.

Installation Instructions

The solar panel is designed for mounting in a variety of positions. The panel can be mounted using the lag bolts provided directly to the pilings that support the lift or roof, on top or side of the roof, or connected to a dock pole.

Figure 1 - Roof mounting options

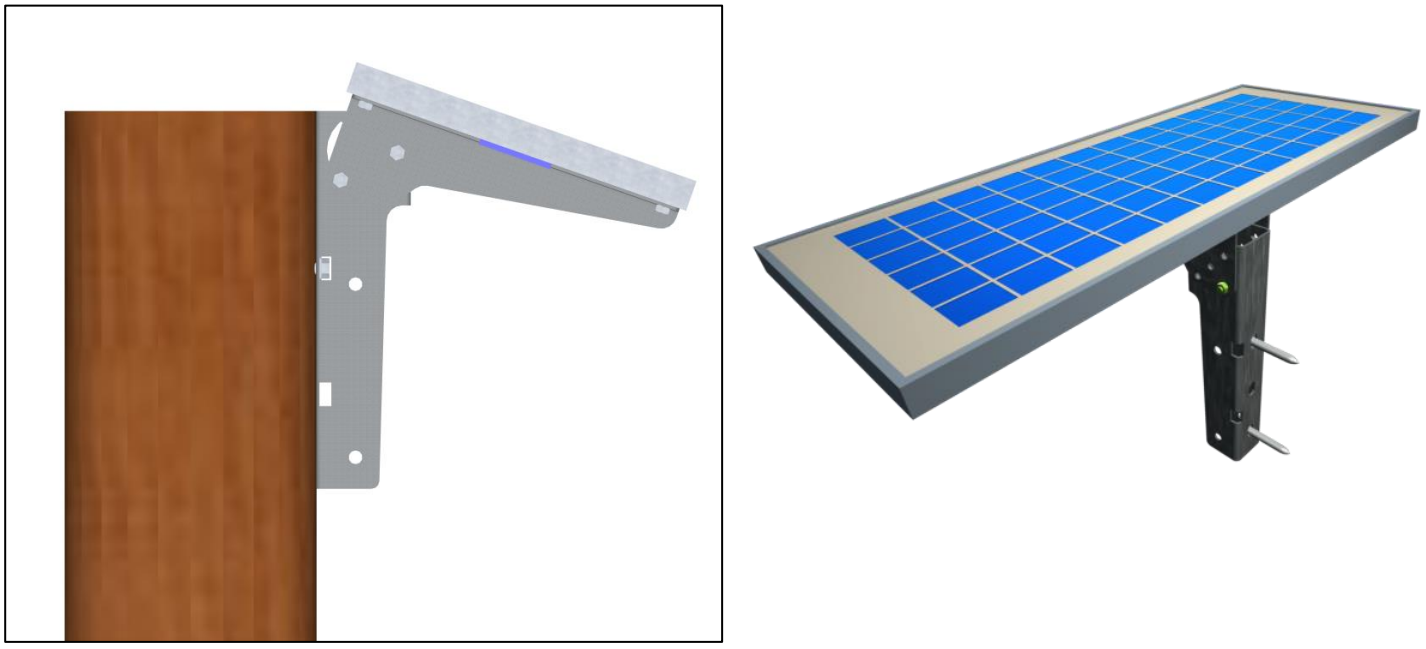


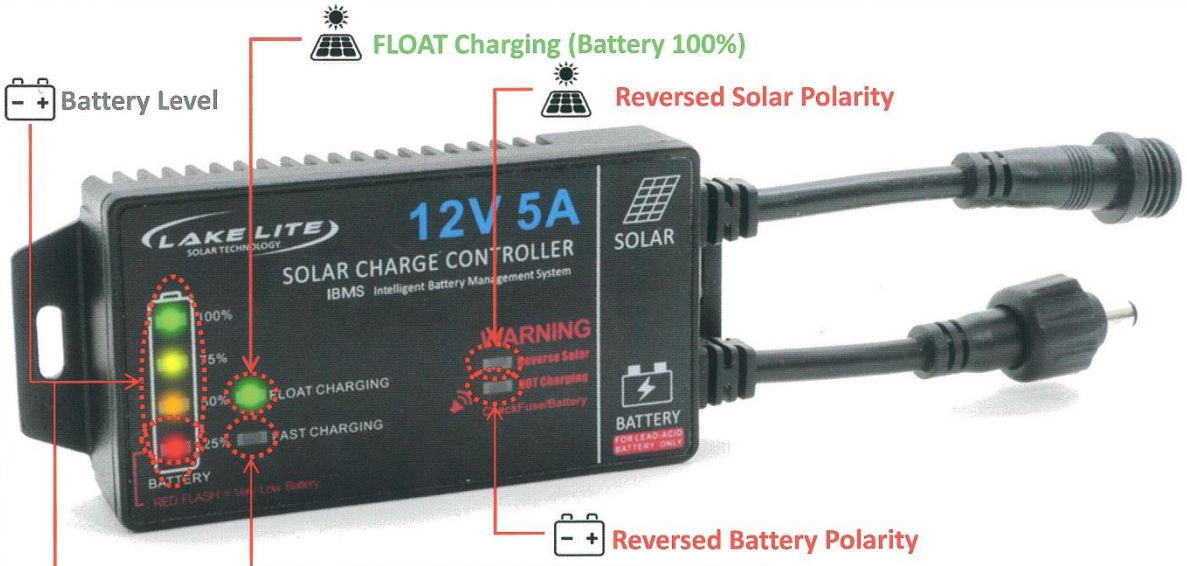
Figure 2 - Piling mount

Route and Connect the Main Harness

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

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**

LAKE LITE SOLAR TECHNOLOGY

Lake Lite Inc.
105 W Simon St
Laotto, IN 46763

Phone: 260-918-2758
Fax: 260-918-3540
E-mail sales@lakelite.com

www.lakelite.com

Solar Charge Regulator

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CONNECTION DIAGRAM

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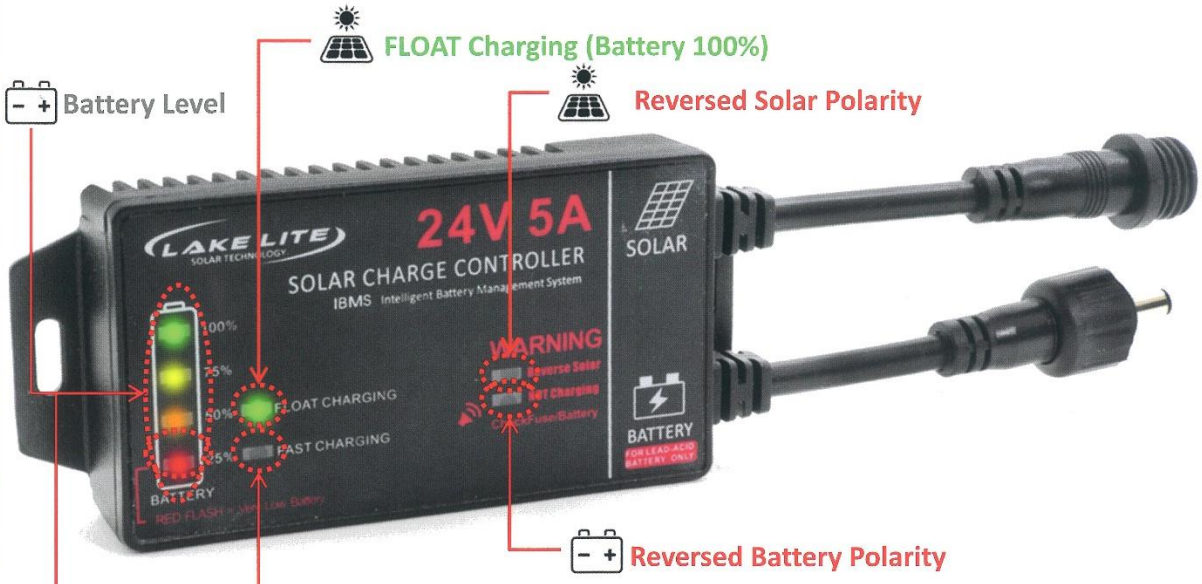

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Solar Charge Regulator

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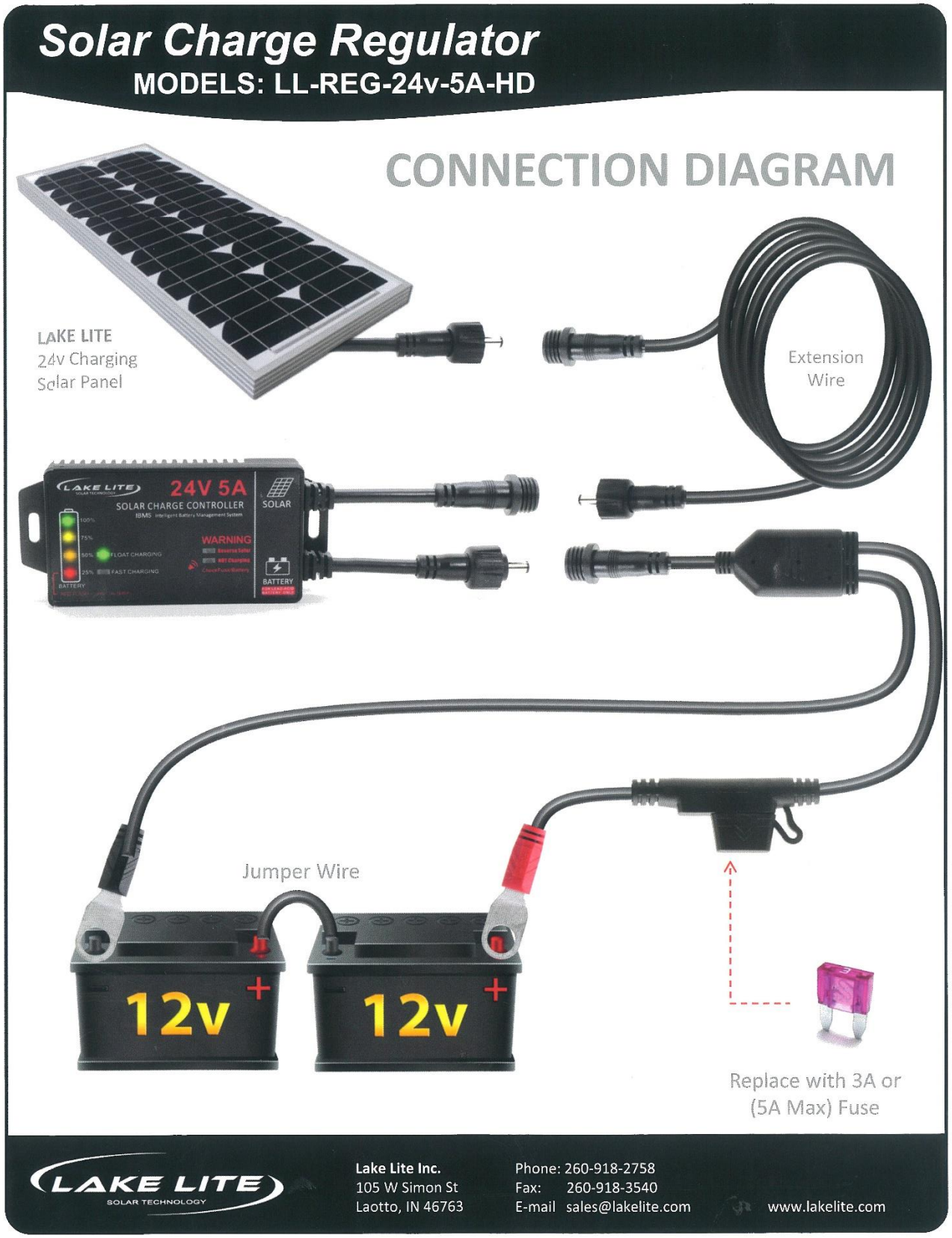

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Care and Maintenance

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. The solar panel is easily removed by disconnecting the harness quick connect near the panel and removing the mounting bolt and knob. 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 installation 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.

If the problems stated above do not describe the issues you are experiencing, contact ShoreStation at (800) 859-3028.