

Boat Lift Solar Charger

Models: HA0110 (12V), HA0135 (24V)

Introduction

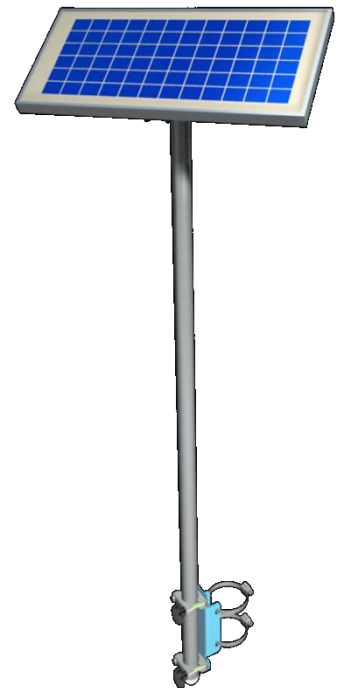
The ShoreStation Boat lift solar chargers are specifically designed to provide reliable, trouble-free charging and maintenance of your ShoreStation lift battery. Proper installation of this charging system will maximize your charger's performance and will ensure your battery maintains a sufficient charge 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.



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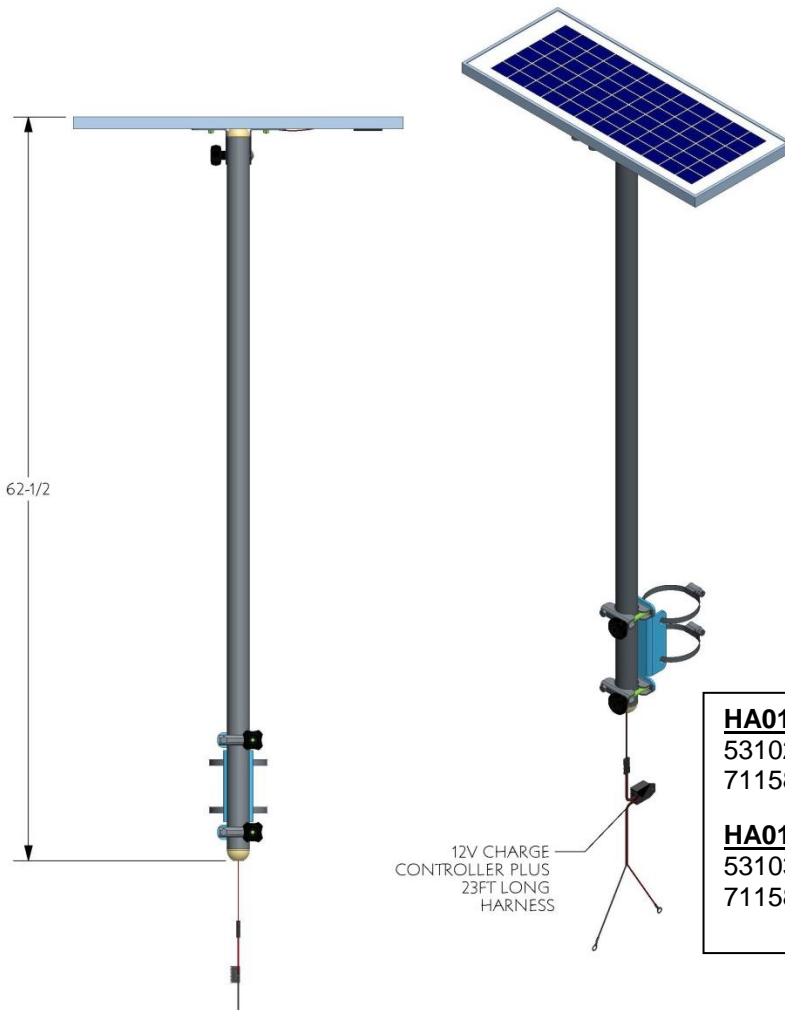
Parts Lists

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

Specifications

Model	HA0110	HA0135
Rated Max Power (Pmax)	20W	20W
Current at Pmax (Imp)	1.2A	.6A
Voltage at Pmax(Vmp)	17.1V	33.0V
Short Circuit Current (Isc)	1.25A	.65A
Open-Circuit Voltage (Voc)	21.0V	40.0V
Normal Operating Cell Temp (Tnoct)	45°C (113°F)	45°C (113°F)
Weight	2.50kg	2.5kg (5.51lbs)
Charge Controller	Lake Lite 12V	Lake Lite 24V
Harness Length	7.6m (25')	7.6m (25')

*Charge controller not required for 24V systems because of the lower current at Pmax.



HA0110	Bundles Required
5310270	Solar Panel 12V 20W Module W/CO
71158	Solar Panel Support Kit 2012
HA0135	Bundles Required
5310320	Solar Panel 24V 20W
71158	Solar Panel Support Kit 2012

Preparation

Before installing the solar charger, evaluate where your lift will be installed on your lakefront. The solar panel should have a clear view of the southern sky. Choose a corner post of the lift to install the panel based on how the lift will be oriented on the dock. Try to avoid positions on the lift that will cause the sun light to be blocked for significant parts of the day. Also, consider the position of the lift relative to the dock. You may want to install the panel on the dock side of the lift to ease the pointing and cleaning processes.

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 and note it for reference during the pointing instructions.

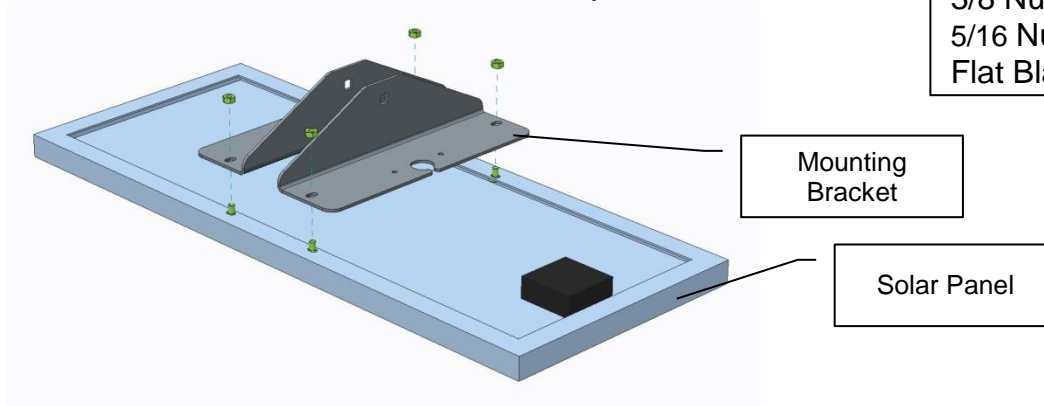
Assembly Instructions

HA0110 – 12 Volt & HA0135 – 24 Volt

- Break the bundles and sort all items by size.

Tools Required

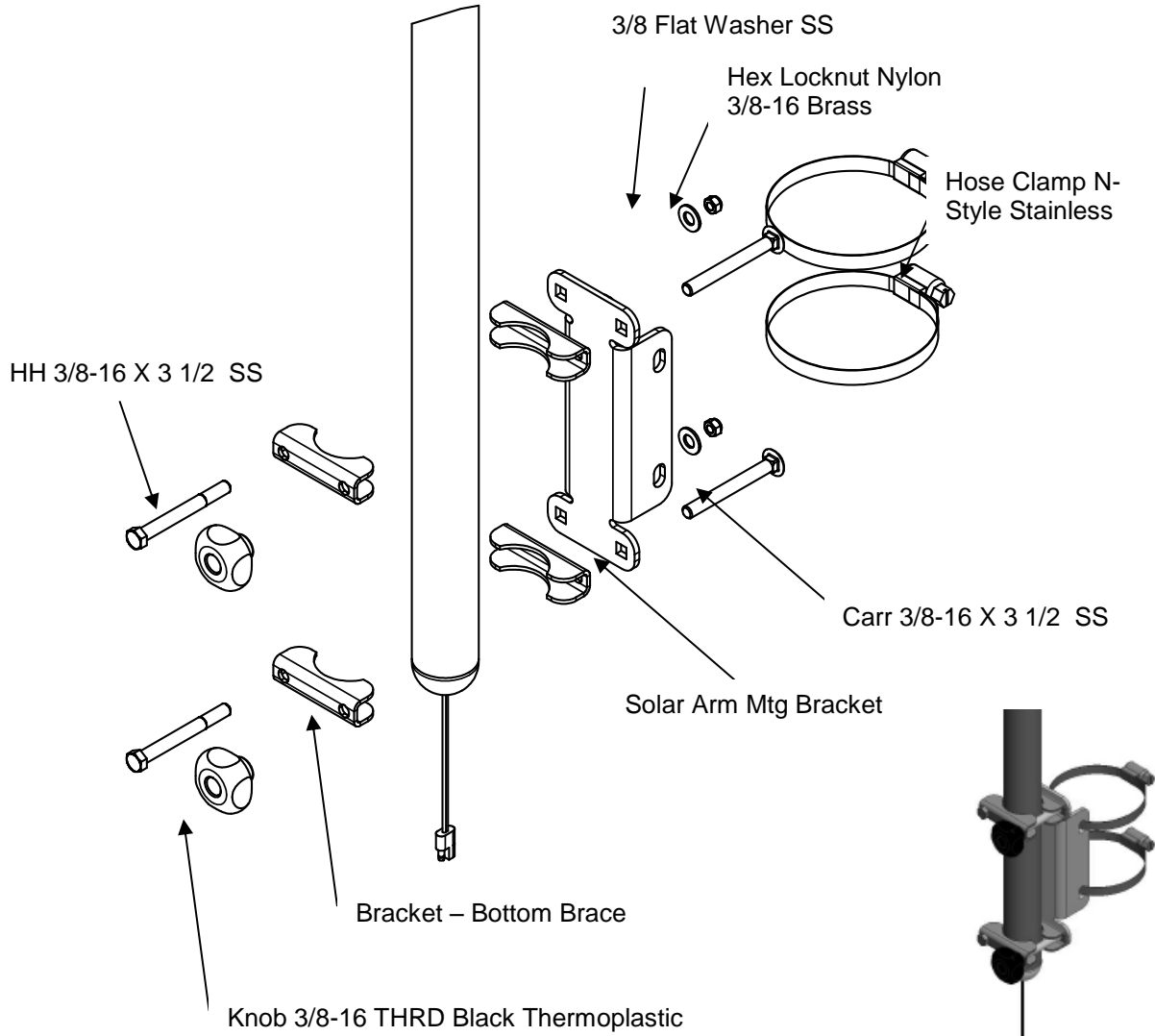
9/16 Wrenches and/or Socket
3/8 Nut Driver and/or Wrench
5/16 Nut Driver and/or Wrench
Flat Blade Screwdriver



- Locate the two solar panel mounting brackets. Align the holes with those in the solar panel mounting bracket and insert 1/4 X 1/2 carriage bolts and secure with 1/4" kep nut.
- Repeat the previous mounting step on the remaining solar panel mounting bracket.

Connect the mounting bracket to the mounting arm tube

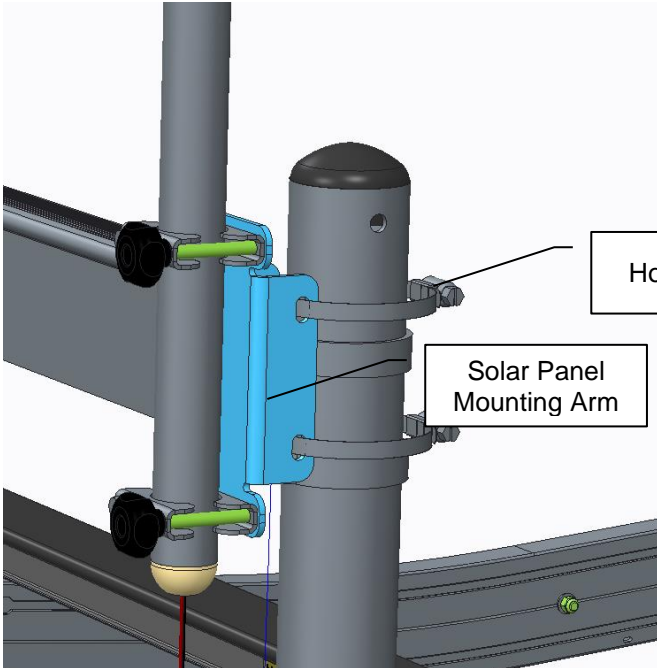
- Insert a 3/8" x 3 1/2" stainless steel hex bolt into the bracket – bottom brace. Insert into another bracket and then thru the solar arm mounting bracket as shown. Place on 3/8" stainless steel flat washer and thread on the 3/8" brass lock nuts with nylon inserts just enough to secure in place. Repeat these steps for the other end of the solar arm mounting bracket. Important! Make sure both hex bolts are on the same side of the tube – solar panel post.



- Insert a carriage bolt thru the solar arm mounting bracket, thru the bracket - bottom brace then thru the other bracket – bottom brace. Secure with a knob 3/8-16 THRD and tighten. Repeat these steps. *Important! Make sure both carriage bolts are on the same side of the tube – solar panel post.*

Installation Instructions

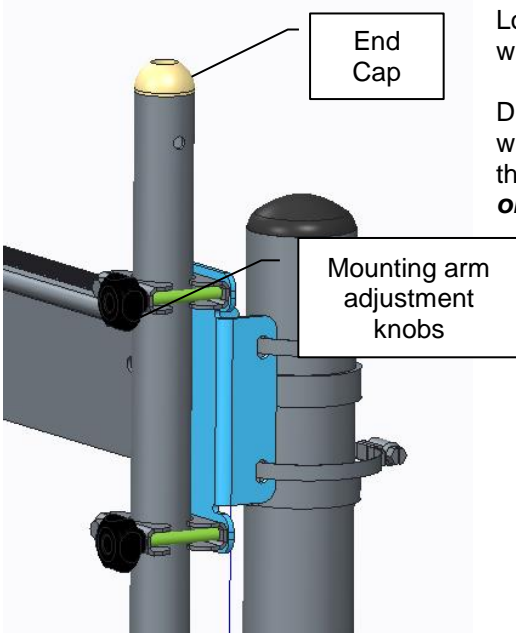
Connect the solar panel mounting arm to the lift corn post



The solar panel mounting arm can be mounted either to the corner post of the lift or the canopy post if a canopy system is installed on the lift.

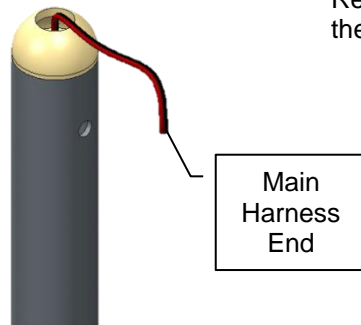
Slide the two stainless hose clamps through the slotted holes of the solar arm mounting bracket as shown. Hold the mounting arm against the corner post or the canopy post of the boat lift. Place the free end of the hose clamp into the gear end of the clamp and tighten.

Connect the solar panel to the mounting arm

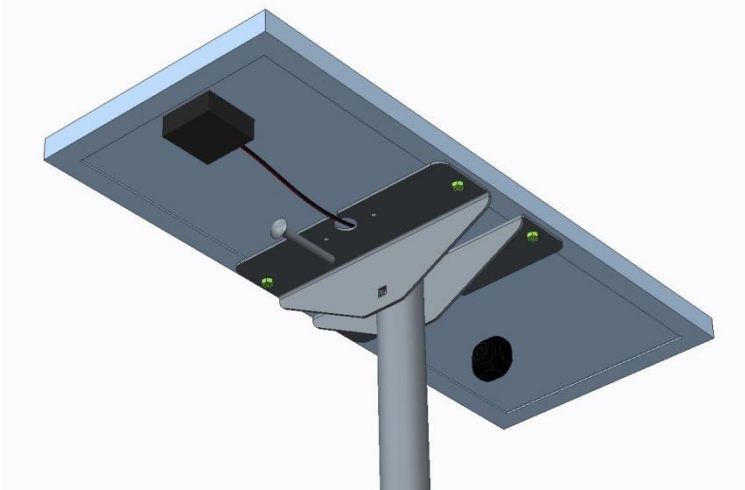


Loosen the two knobs to allow the solar panel mounting arm to be lowered. This will make it easy to reach the mounting hole for the solar panel.

Disconnect the wire harness from the panel using the quick connect. Route the wire harness through the end caps on the mounting tube with the quick connect through the top hole. **These harnesses need to be connected in numerical order for correct polarity.**



Reconnect the panel to the quick connect on the main harness.

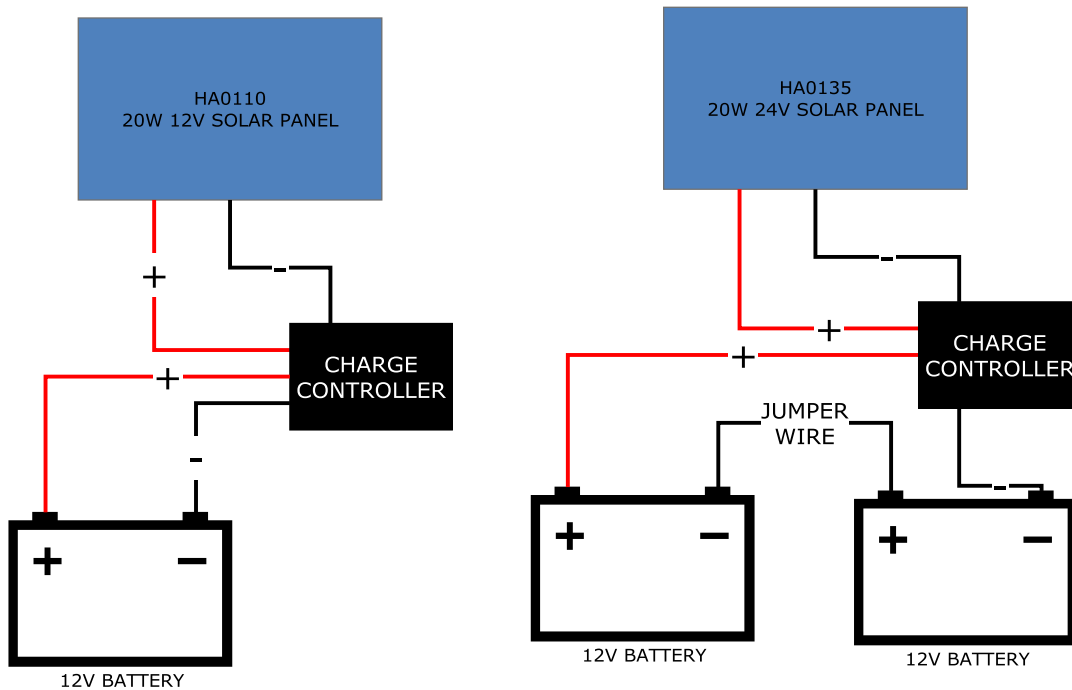


Locate the 3/8" x 2 1/2" stainless steel carriage bolt. Insert into the solar panel mounting bracket thru the tube and then thru the other bracket as shown. Thread on the black knob with 3/8" brass threaded insert.

Route and Connect the Main Harness

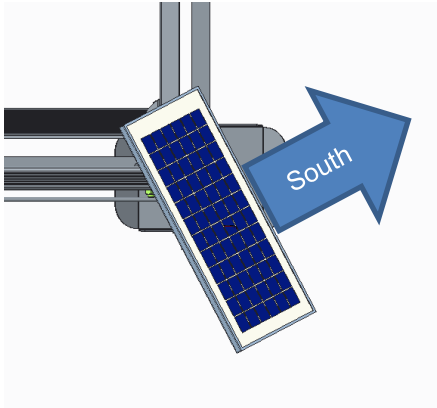
The main harness can now be routed to the lift battery location. If a canopy is installed, the harness can be routed along the canopy frame structure. **These harnesses need to be connected in numerical order for correct polarity.** Use the supplied wire ties to connect the harness to the lift and canopy structure. **Do not route the wire harness under water or along moving lift components.**

Refer to the diagram below for your solar charger/battery connection. **Never connect a 24V panel to a 12V system. Doing so could cause damage to the battery.**

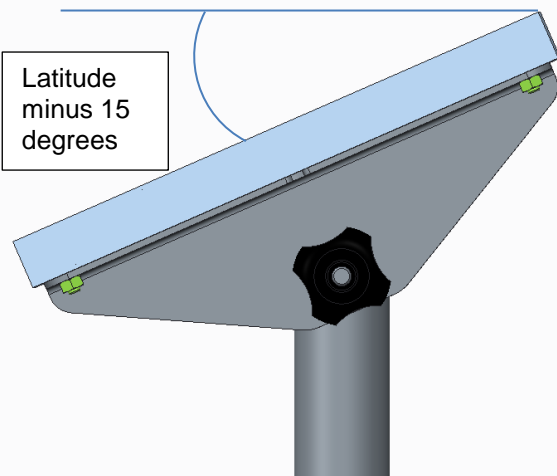


Operating Instructions

When the lift is installed in the lake, the solar panel should be 'pointed' to ensure the highest charging performance. The orientation of the panel will depend on the geographic location of the lift and the season in which the lift is used. The following instructions assume you are in the northern hemisphere and will require the highest charging performance during summer months.



- The panel should be pointed due south.



- Determine your latitude using a map, globe, or web-based map (Google Maps). Your panel will be tilted towards the south. 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.

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 FlexPower 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 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

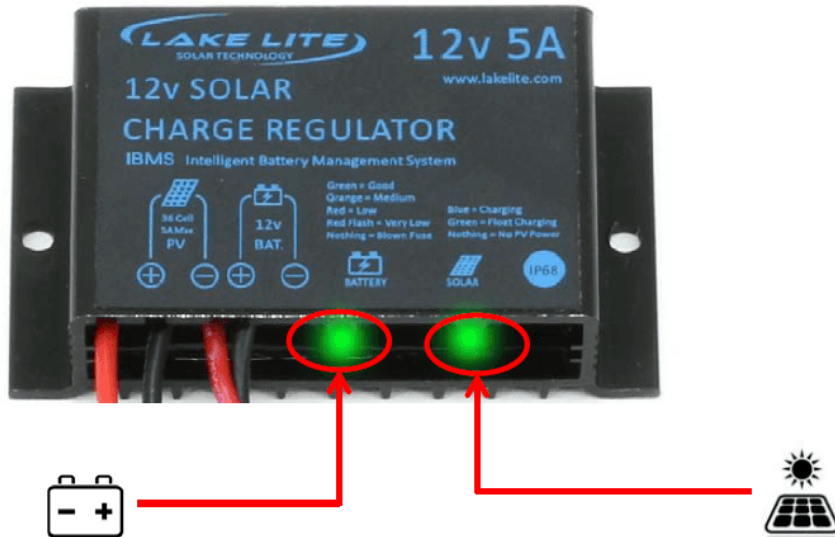
The solar panel surface should be cleaned to remove debris and ensure maximum performance. Standard household glass cleaners can be used on the glass surface of the panel.

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



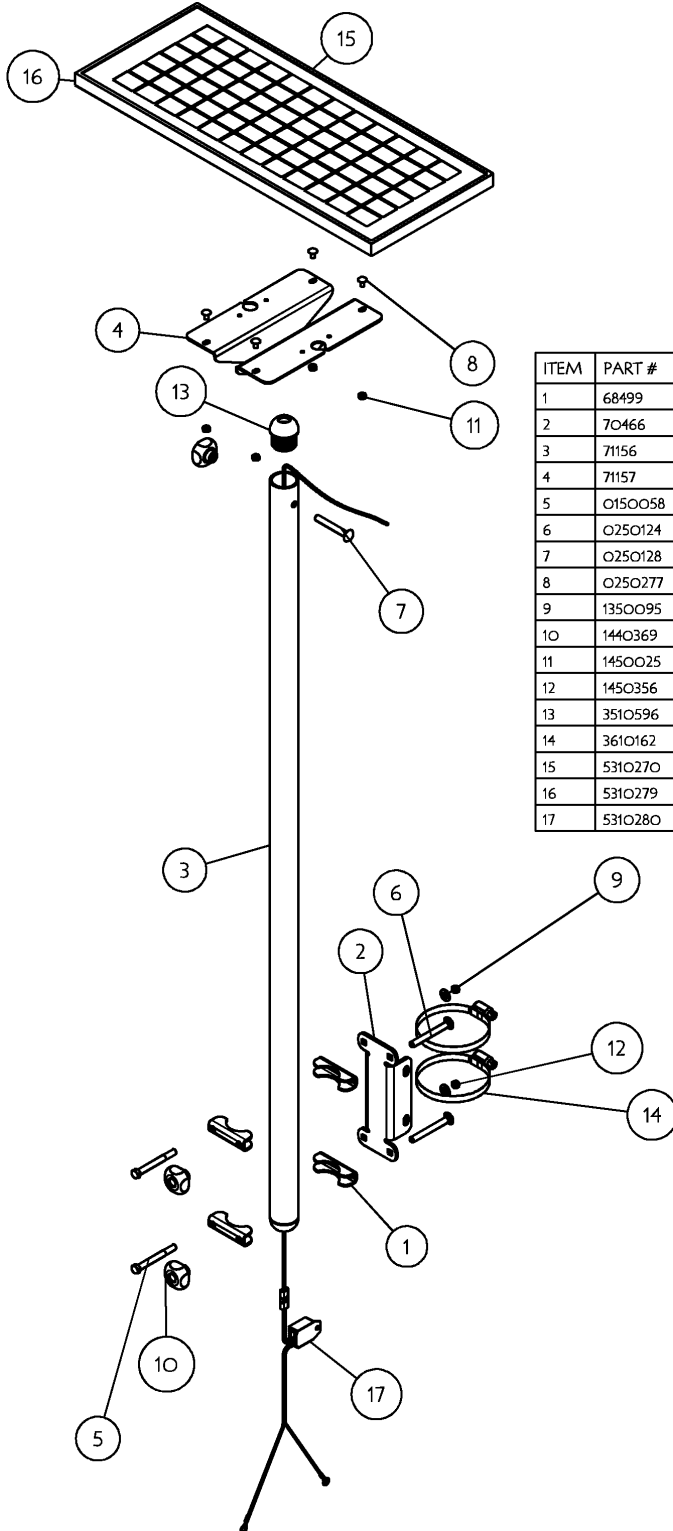
TIME	LED COLOR	DESCRIPTION
Any	Red-Slow-Flash	Extremely Low Battery Level - Do NOT use battery
Any	Red-Constant On	Very Low Battery Level – Limit Battery Use
Any	Orange-Constant-On	Medium Battery Level – Charge Battery
Any	Green-Constant-On	High Battery Level – Good!
ANY	Green-Slow-Flash	Over Voltage Detected: Regulator will correct back to Green-Constant to protect battery:
ANY	OFF	Blown Fuse and or No Battery Detected Replace Fuse or Connect Battery

TIME	LED COLOR	DESCRIPTION
DAY	BLUE - CONSTANT	(Charging) Fast Charging or Bulk Charging
DAY	GREEN-CONSTANT	Float Charging
DAY	OFF	Check Solar Panel (Shorted / Bad or No Connection / Bad Diode)
NIGHT	OFF	Solar Panel is NOT Charging

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

Parts Lists

HA0110 - 12 Volt Solar Panel Battery Charger



ITEM	PART #	DESCRIPTION	QTY
1	68499	BRACKET - BOTTOM BRACE	4
2	70466	SOLAR ARM MTG BRACKET	1
3	71156	TUBE - SOLAR PANEL POST	1
4	71157	SOLAR PANEL MTG BRKT	2
5	0150058	HH 3/8-16 X 3 1/2 CS GR5 SS	2
6	0250124	CARR 3/8-16 X 3 1/2 SS GR5	2
7	0250128	CARR 3/8-16 X 3 GR5 STAINLESS	1
8	0250277	CARR 1/4-20 X 1/2 GR5	4
9	1350095	WASHER USS FLAT 3/8 STAINLESS	2
10	1440369	KNOB 3/8-16 THRD BLACK THERMOPLASTIC	3
11	1450025	NUT KEP 1/4-20 SS	4
12	1450356	HEX LOCKNUT NYLON 1/4-20 STAINLESS	2
13	3510596	HAND RAIL END CAP Sand Beige	2
14	3610162	HOSE CLAMP N-STYLE STAINLESS	2
15	5310270	SOLAR PANEL 12V 20W MODUL W/CONTROL	1
16	5310279	SOLAR PHOTOVOLTAIC MODULE PANEL	1
17	5310280	SOLAR CHARGE CONTROLLER 12VOLT 20WATT	1

Solar Charge Regulator

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



24v Systems ONLY



TIME	LED COLOR	DESCRIPTION
Any	Red-Slow-Flash	Extremely Low Battery Level - Do NOT use battery
Any	Red-Constant On	Very Low Battery Level – Limit Battery Use
Any	Orange-Constant-On	Medium Battery Level – Charge Battery
Any	Green-Constant-On	High Battery Level – Good!
ANY	Green-Slow-Flash	Over Voltage Detected: Regulator will correct back to Green-Constant to protect battery:
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TIME	LED COLOR	DESCRIPTION
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DAY	GREEN-CONSTANT	Float Charging
DAY	OFF	Check Solar Panel (Shorted / Bad or No Connection / Bad Diode)
NIGHT	OFF	Solar Panel is NOT Charging

Reverse Battery	Reverse Solar Panel	System Result
YES	NO	Fuse will be Blown – (Correct & Replace Fuse)
NO	YES	NO CHARGING – (Correct Solar Connection)
YES	YES	Fuse will be Blown – (Correct & Replace Fuse)

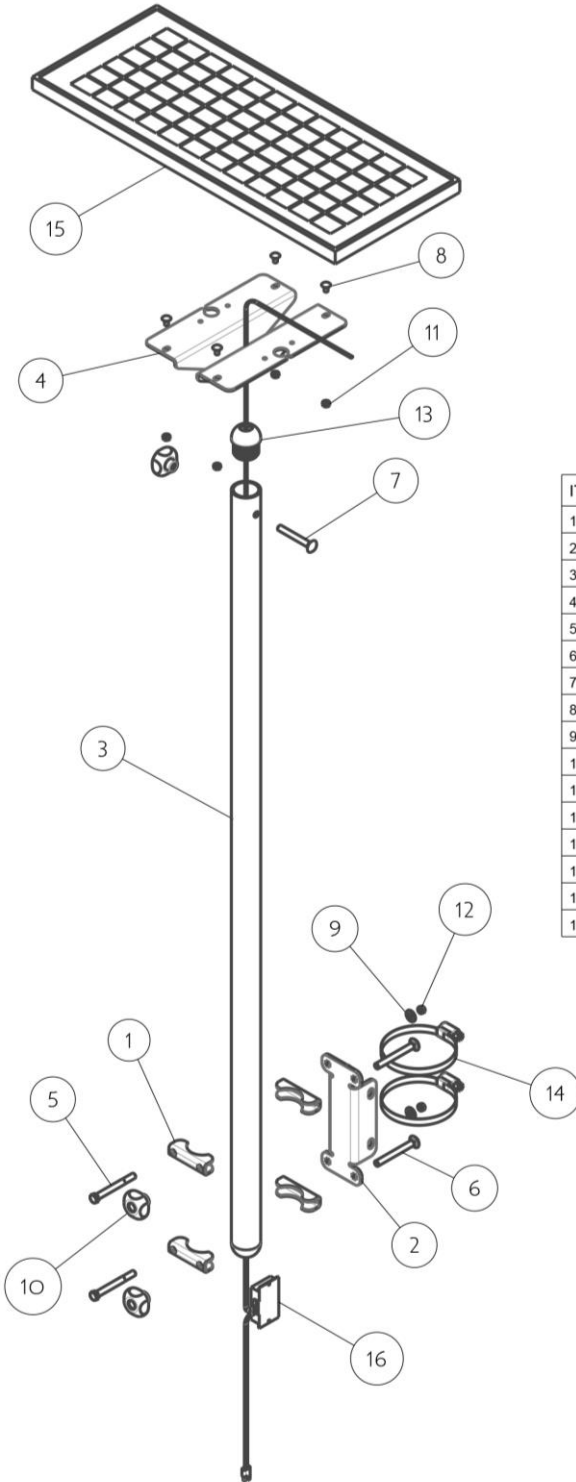


Lake Lite Inc.
105 W Simon St
Laotto, IN 46763

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

www.lakelite.com

HA0135 - 24 Volt Solar Panel Battery Charger



ITEM	PART #	DESCRIPTION	QTY	NOTE
1	68499	BRACKET - BOTTOM BRACE	4	
2	70466	SOLAR ARM MTG BRACKET	1	
3	71156	TUBE - SOLAR PANEL POST	1	
4	71157	SOLAR PANEL MTG BRKT	2	
5	0150058	HH 3/8-16 X 3 1/2 CS GR5 SS	2	
6	0250124	CARR 3/8-16 X 3 1/2 SS GR5	2	
7	0250128	CARR 3/8-16 X 3 GR5 STAINLESS	1	
8	0250277	CARR 1/4-20 X 1/2 GR5	4	
9	1350095	WASHER USS FLAT 3/8 STAINLESS	2	
10	1440369	KNOB 3/8-16 THRD BLACK THERMOPLASTIC	3	
11	1450025	NUT KEP 1/4-20 SS	4	
12	1450356	HEX LOCKNUT NYLON 1/4-20 STAINLESS	2	
13	3510596	HAND RAIL END CAP Sand Beige	2	
14	3610162	HOSE CLAMP N-STYLE STAINLESS	2	
15	5310279	SOLAR PHOTOVOLTAIC MODULE PANEL	1	
16	5310341	SOLAR CHARGE REGULATOR 24VOLT	1	