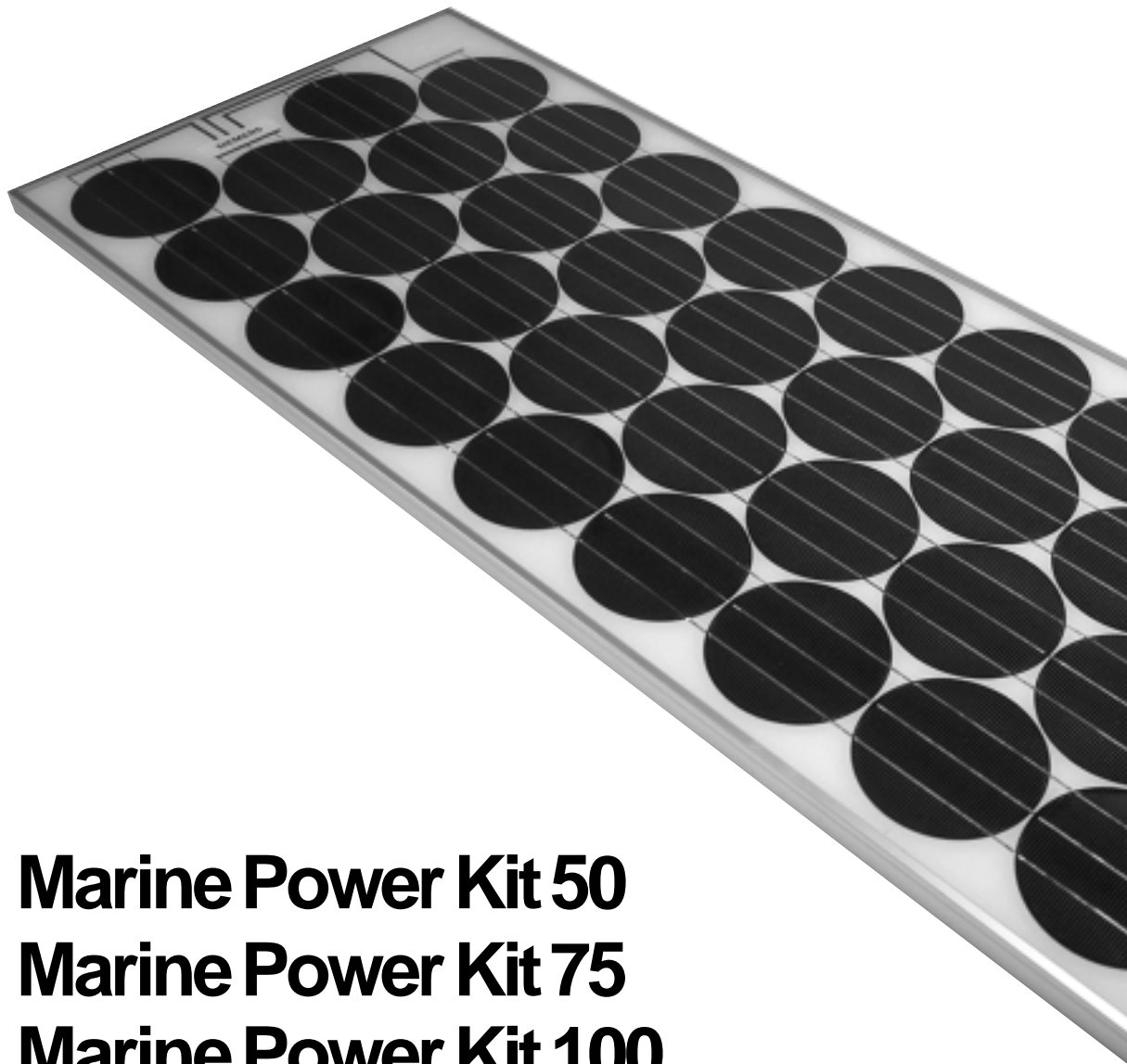


SIEMENS

Installation Guide



Marine Power Kit 50

Marine Power Kit 75

Marine Power Kit 100

Marine Power Kit 50 Expansion

Marine Power Kit 75 Expansion

Marine Power Kit 100 Expansion

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SIEMENS

Marine Power Kit 50 / Marine Power Kit 50 Expansion Marine Power Kit 75 / Marine Power Kit 75 Expansion Marine Power Kit 100 / Marine Power Kit 100 Expansion

All instructions must be read and understood before attempting to install your Marine Power Kit. Before installing the kit, review the installation design with your boat owner's manual. Contact your boat dealer if in doubt as to this kit's suitability or compatibility with your boat. Retain this guide for future reference.

Congratulations! Your new Marine Power Kit allows you to "hook up" to the sun to help charge your batteries. Electricity produced from sunlight is a silent, non-polluting, and economical source of energy.

You have joined a growing number of boat owners using solar electric power to run lights, radios, TVs, stereos, and other appliances.

Solar electricity can help put an end to the frustration and expense of dead batteries. It can reduce or eliminate your dependence upon gas or diesel generators.

Siemens Solar Marine Power Kits are an investment in your boating lifestyle. They provide independence, reliability, peace and quiet, and the confidence that you have the power you need, when you need it.

Parts List - Marine Power Kit 50, 75 or 100

Part	Quantity	Description
1	1	50, 75 or 100 Watt Solar Module
2	1	Charge Controller, 15 amp (not included in Expansion Kit)
3	25'	Power Cable, Marine Grade 2 conductor (10' with Expansion Kit)
4	4	Mounting Bracket
5	2	Mounting Struts
6	4	Screw, Hex, 1/4" x 14 x 1" SS316
7	4	Lock Washer, 1/4" SS316
8	4	Screw, Self Tap, 6 x 1/2" SS 316
9	6	Tie Wrap, Black UV Resistant
10	4	Bolt, Hex, 1/4-20 x 5/8" SS 316
11	4	Flat Washer, 1/4" SS316
12	4	Nyloc Washer, 1/4-20 SS316

Kit Specifications

Kit Power Rating (Watts)	Current (Amps)	Voltage
100	5.6	17.7
75	4.4	17.0
50	2.95	17.0

Typical Appliance Energy Usage

Appliance	DC Amps
Fluorescent Light	1-3
TV, 9" color	3
Stereo	2
Circulation Water Pump	3
Cellular Phone	2
Microwave	125

General Safety

Warning!

All instructions must be read and understood before attempting to install, wire, operate, and maintain your Siemens Solar Marine Power Kit. Keep this installation guide in a safe place for future reference. The term "Solar Module" used in this document refers to the Siemens Solar panel included in your kit.

Avoid Electrical Hazards when installing, wiring, operating, and maintaining your Solar Module and kit parts. The Solar Module included in this kit generates DC electricity when exposed to sunlight or other light sources. [Do not connect the Solar Modules in series.] Consult your Marine dealer for information regarding larger Siemens Solar electric systems. This Marine Solar Power Kit is designed for operation in 12-volt electrical systems only. Do not use this kit in systems of other voltages.

Observe Proper Polarity throughout entire power cable wiring route.

Follow Installation and Inspection Requirements. Before installing your Marine Power Kit, review installation design with the boat manufacturer's owner's manual to determine installation and inspection requirements which should be followed and to assure an installation that is in compliance with any applicable regulations. Check with your Marine dealer if you have any questions or doubts about this installation.

Work Safely. Do not wear jewelry when working with electrical or mechanical equipment. Use protective eyewear when working with batteries or drills. Use extreme caution when on ladders or on roof.

Follow all safety precautions of the battery manufacturer. Some batteries can release flammable hydrogen gas. Do not produce sparks when working in locations where flammable gases or vapors exist. Shield skin and eyes from battery acid. Wash thoroughly with water if skin or clothing come in contact with acid or any corrosive matter, which may have accumulated, on the battery. Keep the battery terminals and casing clean.

Maintenance

- Inspect installation regularly to ensure that all components, mechanical fastenings, electrical connections, and power cable securements are in good working order and clean and free of corrosion.
 - Clean Solar Modules with a damp cloth to maintain best performance.
 - Replace charge controller fuse only with a standard 15 amp; mini ATO fuse.
 - Regularly check and maintain battery electrolyte level as per battery manufacturer's instructions.
 - Keep the battery terminals and casing clean.
 - A broken or otherwise faulty Solar Module could be a safety hazard and should be replaced.
-

Installation and Operation

- Use the Marine Power Kit for its intended function only.
- Do not disassemble the Marine Power Kit or remove any part installed by the manufacturer.
- Never leave the Marine Power Kit unsecured.
- Do not drop the Marine Power Kit or allow objects to fall on it.
- Do not stand or step on any part of the Marine Power Kit.

- Do not concentrate sunlight on the Marine Power Kit with mirrors, lenses, or other means.
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Disclaimer of Liability

Since the conditions or methods of installation, operation, use, and maintenance of this kit are beyond Siemens Solar's control, the company does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance.

Installation

Seven Steps to Solar Power

Seven easy-to-follow steps are all that is normally needed to complete your Marine Power Kit installation:

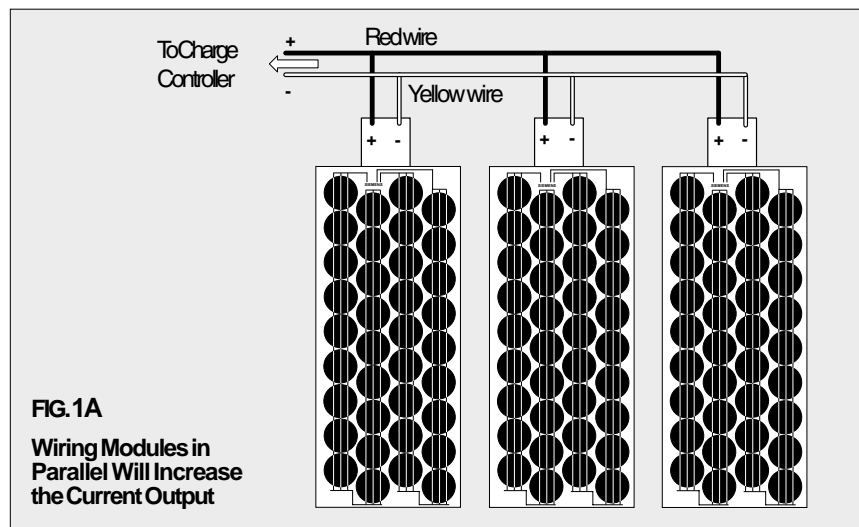
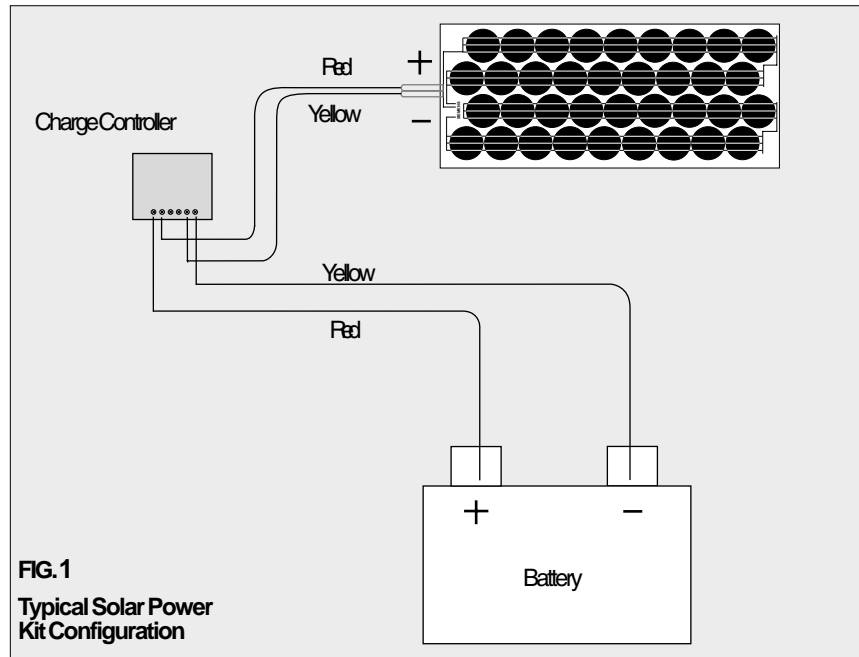
- Step 1 Get registered!
 - Step 2 Identify kit parts, materials, and hardware. Gather required tools and materials.
 - Step 3 Determine Solar Module and controller placement and mounting style.
 - Step 4 Wire Solar Module.
 - Step 5 Route power cable into and through boat.
 - Step 6 Assemble mounting bracket and mount Solar Module to boat, and secure the power cable.
 - Step 7 Mount controller.
 - Step 8 Wire power cable to charge controller and boat battery.
-

Note: For Expansion Kits, follow steps 1-6.

Step 1

Complete and Return Warranty Card

- Your product warranty card is a postage-paid survey card that should be filled out and returned to Siemens Solar.
- The top portion of the warranty card asks for your contact information and the dealer from which you purchased your Kit. This information is solely for the use of Siemens Solar and will not be sold or used for any purpose other than to provide you with warranty service and product information.
- Sections 1 and 2 of the lower portion of the warranty card ask for the correct product name (Marine Power Kit 50, 75 or 100, for example) and for the solar module's serial number. This 17-character serial number can be found on the silver label located on the back of the solar module.
- Please complete the survey and fold the warranty card in half. Seal the card's outer edge with tape and mail it back to Siemens Solar. Congratulations—you have joined the thousands of registered Marine Power Kit owners!



Step 2

Identify Parts and Gather Tools

Check to see that your kit has all of the parts shown on the Parts List on page 1.

Gather the following tools:

- #2 and #3 Phillips screwdriver
- Pliers
- Wire stripper
- Wire crimper
- 3/8" and 7/16" nut driver
- Hand drill with bits

Gather the following materials:

- RTV silicone sealant or comparable sealing cement. You will need enough to apply the sealant liberally on all four mounting brackets and any other deck penetrations you make.
- For best performance, we strongly recommend that ring terminals are used to attach the power cable to your battery. Gather two 12 gauge wire ring terminals that will fit either the battery terminal post or post clamp bolt, depending on your battery size and configuration.
- If additional power cable length is needed, use only 12 gauge (or heavier) stranded conductor marine grade UV resistant cable. The power cable in your kit should be used in any area exposed to sunlight.

Step 3

Solar Module Placement

Warning!

Disconnect battery(s) and electrical system from 110/220 VAC, or any other sources of electrical power before attempting to install your Marine Power Kit. Connect your Solar Module only to 12-volt DC circuits. Connect your Solar Module only according to these installation instructions.

It is the responsibility of the installer to obtain a safe and secure attachment for the Solar Module and accessories.

1. Cover Module For Safety

When first removing Solar Module from box, tape a full size (8.5" X 11") sheet of paper over the center of the module area. This blocks a substantial amount of sunlight from hitting the solar cells and thereby prevents the module from actually producing electric current during any of the installation steps. This paper will be removed only upon completion of all the installation steps, as described in the last step of this procedure.

2. Solar Module Placement

When choosing a location:

- Choose a location that is strong enough to support mounting hardware, Solar Module, and wind loads.
- Minimize the distance between the Solar Module and location where the power cable will enter the boat.
- Avoid internal boat wiring when selecting locations for drilling the mounting holes.
- For best performance, locate the Solar Module to assure that shadows do not fall across it.

Step 4

Wire Solar Module

1. Accessing the Wire Terminals

Refer to FIGURE 1 for typical solar power kit configuration. Your Solar Module is equipped with a black hard plastic junction box located on the back of the Module. The wiring terminals are accessed by removing the junction box lid, after loosening its four captive screws with a small flat head or Phillips screwdriver. Use of wire lugs is not required or recommended, but is possible.

The junction box provides six 10-32 terminal screws for external wiring of

the Module (see FIGURE 2). Two terminal screws on the left, and two on the right, are to be used for the positive and negative connection. The two terminal screws in the center are NOT to be used for your connection. The polarity of the left and right pairs of terminal screws is engraved into the junction box base.

2. Wire Entry and Connections

The junction box is equipped with small round plastic knock-out plugs on the sides of the box. Do not use one of the larger knock-outs located at the bottom of the junction box. Two of the small knock-outs on the side of the box should be removed to feed your cable through to the terminal connections. Only one

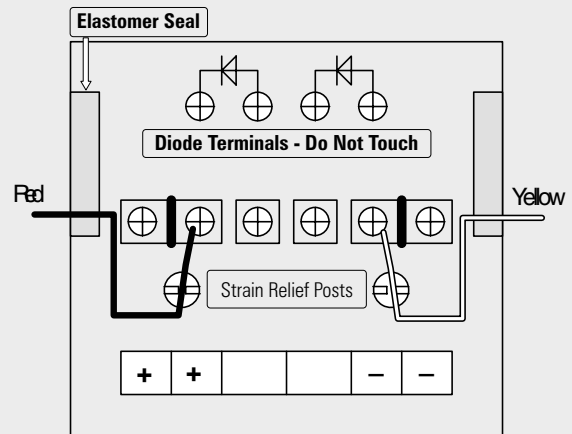


FIG. 2
Wiring Connections
in Junction Box

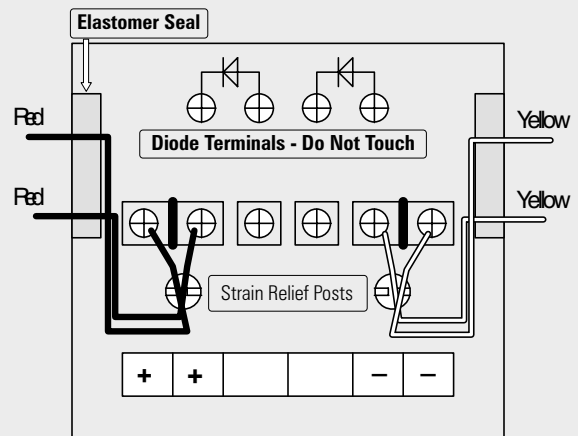


FIG. 2A
Parallel Wiring
Connections in
Junction Box

wire should be fed through each knock-out. Remove the small knock-out plug with a screwdriver using moderate impact. Moisten and slide the orange rubber foam seal into the cavity in front of the knock-out and push it down and flat all the way with a screwdriver. Punch a small hole through the center of the foam seal to allow the wire to move through the foam seal easily. Insert the stripped end of the power cable through the knockout hole and the foam seal. Feed the appropriate length of wire to reach the strain relief post and the terminal screw. Insert the stripped wire between the terminal plate and the square screw washer. Connect the red conductor to one of the positive terminal screws. Connect the yellow conductor to one of the negative terminal screws. Tighten the screws to 15-20 in-lb. Use cable ties to secure the wires to the strain relief. Once wiring is complete, coat the exposed wire and terminals with Corrosion Block® or equivalent. Mount the junction box lid and tighten both screws to 4-6 in-lb. Do not overtighten.

3. Strain Relief

No additional wire strain relief is required. However, it is recommended

that strain relief be used. Two posts are provided to accept cable ties for securing wire or cable to the junction box. (FIGURE 2; FIGURE 2A)

4. Expansion Kit Wiring

The Expansion Kit allows you to increase the charging capacity of your system. This is accomplished by wiring the Expansion Kit module in parallel with the existing module (refer to FIGURE 1A).

Connect the positive (+) terminal of the Expansion Kit module to the positive (+) terminal of the existing module. Refer to FIGURE 2A for terminal connections in the junction box. Use the red wire for these connections. Connect the yellow wire to the negative (-) terminal of the Expansion Kit module and the negative (-) terminal of the existing module.

**Step 5
Route Power Cable**

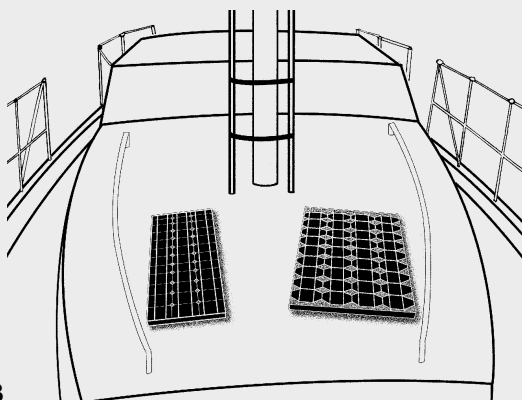
The power cable included in your kit must be installed carefully to ensure a safe and reliable installation.

Caution!

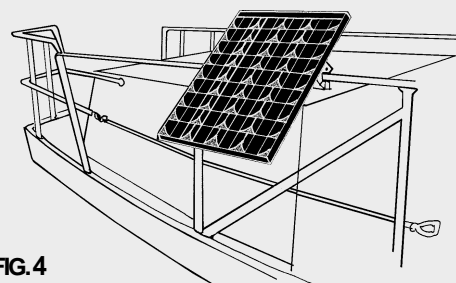
Check to make sure you can route the power cable free from hot, sharp, or abrasive materials. Refer questions to your Marine dealer before installing.

1. Determine the best path to run the power cable from the solar module to the controller and on to the battery. The cable should be directed through the deck close to the solar module.
2. Drill a hole in the deck (if necessary). Insert the cable and seal the hole to prevent water leaks.
3. Route the power cable to the controller and on to the battery. Leave enough slack to allow for easy connection. FIGURE 7
4. Make sure that the power cable is free from abrasion and sharp edges. Use cable ties to prevent the power cable from contacting anything hot, sharp, or abrasive.

If your configuration is different from the one shown, please consult your local boat dealer.



**FIG. 3
Deck Mount Example**



**FIG. 4
Rail Mount Example**

Step 6A

Assemble and Mount Solar Module

Mounting Bracket Assembly

Assemble the mounting brackets onto each corner of the Solar Module using 1/4" bolt, washer, and nyloc nut as shown in FIGURE 5 and FIGURE 6. Tighten hardware securely with a 7/16" driver.

1. Position the Solar Module.
2. Mark four pilot hole locations by tracing the mounting bracket holes with a pencil or marker.
3. Set the Solar Module aside.
4. Drill four pilot holes. **Caution!** Drill all holes only 1" deep. Avoid internal electrical wiring. Be careful not to oversize the holes or drill the holes off angle.
5. Apply a liberal ring of RTV or comparable sealing cement around each pilot hole within 1/8" of each hole.
6. Place the Solar Module back in position.
7. Start each 1/4 x 14 x 1" screw in all four pilot holes with a nut driver. Do not tighten until you have confirmed that

all pilot holes are aligned with the mounting brackets.

8. Tighten each 1/4 x 14 x 1" screw securely.
9. Completely cover all 1/4 x 14 x 1" screw heads and mounting brackets with a generous amount of RTV or comparable sealing cement. **Warning!** To prevent possible corrosion, make sure the screws are completely sealed from exposure to air or water by covering them with RTV or comparable sealing cement.
10. Seal the power cable entry hole.

Step 6B

Alternative Mounting

Mounting Strut Assembly

Mounting struts are provided with pre drilled holes for helm rail clamps (HR- Series) [not included]

1. Attach the helm rail clamps to the mounting struts using the bolts provided by the clamp.
2. Attach the struts to the solar module using the 1/4" bolt, washer, and nyloc nut. Tighten hardware securely.
3. Attach the solar module to the boats tubular rail as directed by the clamp manufacturers specifications.

Step 7

Wire and Mount Charge Controller

1. **Select a Location to Mount the Charge Controller**

The enclosed charge controller should be mounted out of the way and easily visible. Determine the length of wire that will be needed to connect the controller to the boat battery. The controllers should be mounted as close to the boat battery system as possible. The controller should also be mounted indoors to protect the unit from weather exposure.

2. **Prepare the Mounting Surface**
Drill the pilot mounting holes using a drill bit.

3. **Remove Power from the Battery and Solar Module**

Ensure that a sheet of paper, as instructed in Step 3 securely covers the solar module atop the boat. This is important to ensure that no current is flowing from the Solar Module during wiring. Disconnect power from the boat's batteries prior to running the wires to the controller.

4. **Run Solar Panel Wiring**
After disconnecting the power sources,

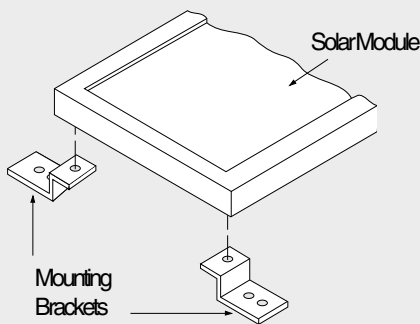


FIG. 5
Mounting Bracket assembly

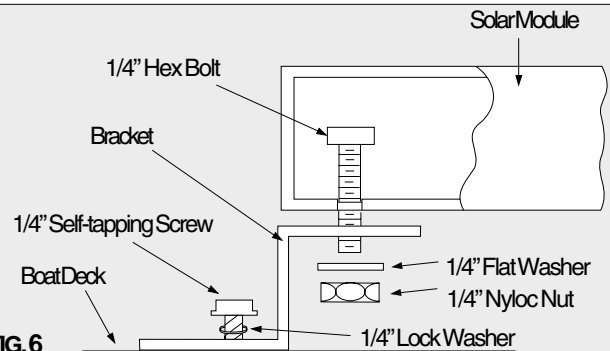


FIG. 6
Mounting Bracket assembly close up

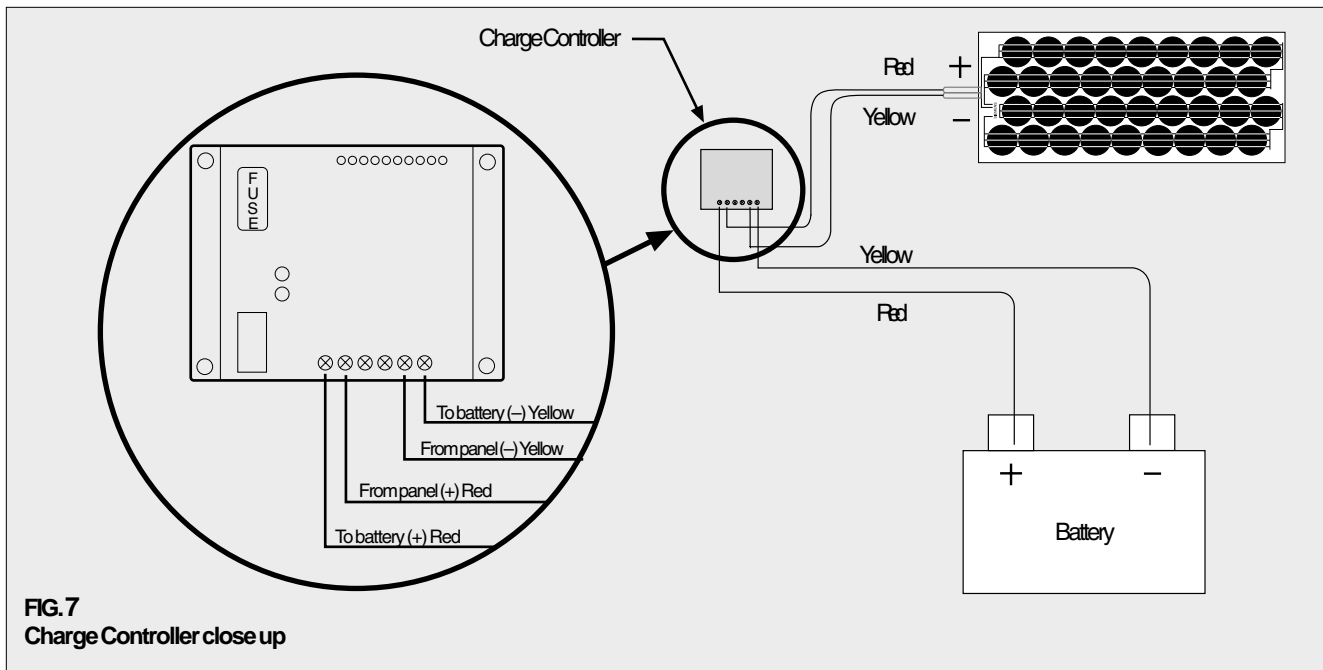


FIG. 7
Charge Controller close up

run the wires from the solar panel to the location selected for the controller. The wires should reach the location of the controller and be secured with a little extra length for strain relief loops.

5. Prepare Power Cable Ends and Note Wire Polarity

Strip the ends of the power cable coming from the Module to expose the red (positive) and yellow (negative) wires. Make sure to correctly mark the source and polarity of the wires. Incorrectly connecting the opposite polarity wires may damage the charge controller. Strip the wires to expose approximately 1/2 inch of copper wire that will be used to make a connection to the charge controller.

6. Remove the Fuse from the Charge Controller

The charge controller is equipped with a 15-amp automotive fuse that is located on the face of the control. Remove the fuse for this stage of the installation.

7. Connect the Solar Module to the Charge Controller

Wire the controller according to FIG. 7. The red (positive) wire coming from the Solar Module should be connected to the positive "Array" terminal on the controller.

The yellow (negative) wire coming from the Solar Module should be connected to the negative "Array" terminal on the controller. The yellow (negative) wire to be connected to the battery terminal should be connected to the negative "Battery" terminal on the controller.

8. Wire the Charge Controller for the Battery Connection

The red (positive) wire that will be connected to the positive battery terminal should be connected to the positive "Battery" terminal on the controller.

Note: The terminals marked load (+) and load (-) are not used.

9. Mounting the Controller

Using four 6 x 1/2" self-tapping screws, mount the controller to the wall.

10. Replace the 15-amp Fuse in the Charge Controller

The 15-amp fuse that was previously removed should be replaced in its housing on the front of the controller.

11. Connect to the Battery

Connect the red (positive) and yellow (negative) wires leading from the controller connections to the appropriate battery terminals.

12. Remove the 8 1/2" x 11" piece of paper from the solar module(s)

If the sun is shining, your Marine Power Kit should now be operational. If your battery power is low and the solar modules are producing power, your battery should begin to charge.

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SIEMENS

Limited Warranty

SIEMENS SOLAR MARINE POWER KITS

Limited Warranty - 30 Day Repair, Replacement or Refund Remedy:

Siemens Solar warrants the parts, materials and hardware included in the Marine Power Kits to be free from defects in materials and workmanship under normal application, installation, use and service conditions. If the product fails to conform to this warranty, then for a period ending thirty (30) days from date of sale to the original consumer purchaser, Siemens Solar will, at its option, either repair or replace the parts, materials or hardware, or refund the purchase price. The repair or replacement or refund remedy shall be the sole and exclusive remedy provided under the warranty and shall not extend beyond the thirty (30) day period set forth herein.

Limited Warranty - Five Year Repair, Replacement or Refund Remedy

Siemens Solar warrants the charge controller to be free from defects in materials and workmanship under normal application, installation, use and service conditions. If the product fails to conform to this warranty, then for a period ending sixty (60) months from date of sale to the original consumer purchaser, Siemens Solar will, at its option, either repair or replace the product, or refund the purchase price. The repair or replacement or refund remedy shall be the sole and exclusive remedy provided under the warranty and shall not extend beyond the sixty (60) month period set forth herein.

Limited Warranty - Limited

Remedy for 50, 75 and 100 watt solar module:

If, within twenty-five (25) years from the date of sale to the original consumer purchaser, any module(s) exhibits a power output less than 90% of the minimum power specified at time of delivery, then, provided that such loss in power is determined by Siemens Solar (at its sole and absolute discretion) to be due to defects in materials or workmanship, Siemens Solar will replace such loss in power by either providing to the buyer additional modules to make up the total wattage loss, or by repairing or replacing the module, at the option of Siemens Solar.

The remedy set forth in these paragraphs shall be the sole and exclusive remedy provided under the extended term warranty. The limited warranties set forth herein do not apply to any module which in Siemens Solar's sole and absolute judgment has been subjected to misuse, neglect or accident, or which has been damaged through abuse, alteration, improper installation or application, or negligence in use, storage, transportation or handling, or has been repaired, or in any way tampered with by anyone other than Siemens Solar. The limited warranties do not cover any transportation costs for return of module, or for reshipment of any repaired or replaced module, or cost associated with installation, removal or reinstallation of modules.

"THE LIMITED WARRANTIES SET FORTH HEREIN ARE EXPRESSLY IN LIEU OF AND EXCLUDE ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, USE, OR APPLICATION, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF SIEMENS SOLAR, UNLESS SUCH OTHER WARRANTIES, OBLIGATIONS OR LIABILITIES ARE EXPRESSLY AGREED TO IN WRITING, SIGNED AND APPROVED BY SIEMENS SOLAR. SIEMENS SOLAR SHALL HAVE NO RESPONSIBILITY OR LIABILITY WHATSOEVER FOR DAMAGE OR INJURY TO PERSONS OR PROPERTY, OR FOR OTHER LOSS OR INJURY RESULTING FROM ANY

CAUSE WHATSOEVER ARISING OUT OF OR RELATED TO THE PRODUCT, INCLUDING, WITHOUT LIMITATION, ANY DEFECTS IN THE MODULE, OR FROM USE OR INSTALLATION. UNDER NO CIRCUMSTANCES SHALL SIEMENS SOLAR BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, HOWSOEVER CAUSED.

SIEMENS SOLAR'S AGGREGATE LIABILITY, IF ANY, IN DAMAGES OR OTHERWISE, SHALL NOT EXCEED THE PAYMENT, IF ANY, RECEIVED BY SELLER FOR THE UNIT OF PRODUCT OR SERVICE FURNISHED OR TO BE FURNISHED, AS THE CASE MAY BE, WHICH IS THE SUBJECT OF CLAIM OR DISPUTE.

SOME STATES DO NOT ALLOW LIMITATION ON IMPLIED WARRANTIES OR THE EXCLUSION OR LIMITATION OF DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU."

Obtaining Warranty Performance

Fill out and return the Warranty Registration Card, if supplied with the module, within thirty (30) days after purchase. Failing to return the card will not affect your rights under the warranty so long as you can establish the date on which you purchased the module.

If you feel you have a claim covered by warranty, you must immediately notify the dealer who sold you the module or any authorized Siemens Solar distributor of the claim. Check local telephone listings for location. The dealer or distributor will give advice on handling the claim. If further assistance is required, write Siemens Solar for instructions.

The factory will not accept the return of any modules unless Siemens Solar has given prior written authorization.

Severability

If a part, provision or clause of the terms and conditions of sale, or the application thereof to any person or circumstance, is held invalid, void or unenforceable, such holding shall not affect and shall leave all other parts, provisions, clauses or applications of the terms and conditions remaining, and to this end the terms and conditions shall be treated as severable.

Disputes

No action, regardless of form, arising out of or in any way connected with the products or services furnished by Siemens Solar, may be brought by the customer or purchaser more than one (1) year after the cause of action has accrued.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

Force Majeure

Neither party shall be in any way responsible or liable to the other party, or to any third party, arising out of nonperformance or delay in performance of the terms and condition of sale due to acts of God, war, riots, strikes, unavailability of suitable and sufficient labor, material, die, or capacity or technical or yield failures and any unforeseen event beyond its control, including, without limitations, any technological or physical event or condition which is not reasonably known or understood at the time of sale.

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