Complete Crystalline Power Panel Instructions

Products:

- ***350 mA Polycrystalline Solar Panel***
- ***11 Watt Polycrystalline Solar Panel***
- ***33 Watt Polycrystalline Solar Panel***
- ***55 Watt Monocrystalline Solar Panel***

PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION

NOTE:

- **Avoid Electrical Hazards** when installing, wiring, operating, and maintaining your Solar Module. The solar module included in the kit generates DC electricity when exposed to sunlight or other light sources.
- For use in 12-Volt systems only
- **Observe Proper Polarity** throughout entire power cable wiring route.
- **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 terminals and casing clean.
- **Use a Charge Controller for wattages above 15W**
- **Do not attempt to charge non-recharegaeble batteries**
- **Always connect charge controller to battery first**
- **When disconnecting, always disconnect battery last**

FAQ:

What types of batteries can I recharge?
You can recharge all types of 12 volt batteries including lead-acid automotive batteries, deep cycle (traction type) batteries, gel-cell batteries, and heavy-duty (stationary type) batteries. When using the Solar Module to run appliances on a regular basis, we recommend the use of deep cycle marine batteries which are designed to withstand frequent charge and discharge cycles.

Can the Solar Module drain my battery at night?
Once the solar charge controller is installed there is no danger of reverse current, so you may leave your panel installed overnight.

Can the Solar Module overcharge my battery?
Yes, but only if used without the charge controller. That is why it is important to use a solar charge controller. Do not connect the panel directly to the battery with wattages of 15W or higher. Always use in conjunction with a solar charge controller.

Can I run my 110 volt appliances with my solar power system?
Yes. You can run your 110 volt appliances with an inverter, which will attach to your battery to change the battery's 12 volt (DC) energy into 110 volt (AC) or 220 volt (AC).

Can my panel be left outdoors without a protective covering?
Yes. The Solar Module has been weatherproofed and can be mounted outdoors without any additional protection.

Do I have to disconnect the panels from the battery when I drive my RV or while I am recharging my battery by other means?
No, solar panels are designed to be permanently connected to the battery. There is no need to disconnect them while driving a RV for example, or when charging the batteries by other means such as AC chargers, or a vehicle's generator or alternator.

The (LED)on the panel does not light up. Should I be concerned?
The (LED) indicates that your unit is receiving daylight exposure. If it is not lit, it may mean that you are not exposing the unit to enough daylight. Please position the solar panel to maximize its exposure to the sun. If this does not trigger the LED to work, it is possible that the LED is burnt out. The LED may have a more limited life span than the panel. This in no way reflects on or affects the performance of the solar panel. If the LED light is not blinking and you feel you have sufficient daylight, test the solar module with a solar voltage tester or a multimeter.

How much solar power can the 7 amp charge controller protect?
The 7 amp charge controller can handle up to 105 watts of power. For larger power requirements, please use a larger Charge Controller such as a 30 amp model which is also widely available.

INSTRUCTIONS:

MOUNTING:

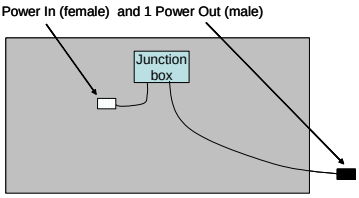
1. Choose an appropriate location that provides the most direct sunlight and can support the panel.
2. Utilize included mounting brackets. Begin using the screws and bolts to secure bracket to panel. Then use screws to connect bracket to fixed structure

MOUNTING BRACKET

3. Utilize included rubber ring in between panel and bracket to for air flow gap. Use of ring is optional.

MULTI-PANEL CONNECTION

1. Each panel comes with a female and male power plug attached to the connector box at the back of the panel. To attach panels together simply plug male of panel into female of next panel. Last male power out should connect to charge controller and then to battery.



INSTRUCTIONS:

CHARGE CONTROLLER INSTALLATION:

Connect to Battery:

Connect the Solar Charge Controller **(SCC)** battery side (right) positive to the positive battery terminal and the negative wire to the negative battery terminal

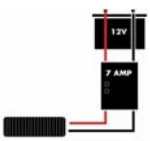
Connect to Solar Panel:

Option 1:

Strip the wire from the solar panel and connect positive to positive and negative to negative of SCC. Ensure connections are secure.

Option 2:

Some panels may include a quick connect for use with the SCC. If included, connect positive to positive and negative to negative of SCC. Ensure connections



TROUBLESHOOTING:

1, I am not sure if my panel is functioning?

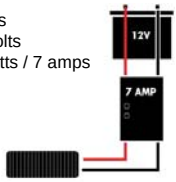
- Ensure Battery is operational. Over time, a batteries ability to recharge will deteriorate
- Ensure the distance of the wires are not longer than 30 feet and all connections are secure
- Measure the panel voltage with a voltmeter. The voltage reading should be between 16 to 25 volts in the sun. (Constantly fluctuating)
- Use a solar voltage tester or a multimeter to test the solar module to test voltage.

Complete Solar Panel Instructions

Solar Charge Controller

Specifications

Cut-in Voltage: 13 Volts
Cut-out Voltage: 14.2 Volts
Max. Load: 105 watts / 7 amps



Installation

Connect to Battery:

Connect the Solar Charge Controller **(SCC)** battery side (right) positive to the positive battery terminal and the negative wire to the negative battery terminal

Connect to Solar Panel:

Option 1:
Strip the wire from the solar panel and connect positive to positive and negative to negative of SCC. Ensure connections are secure.

Option 2:
Some panels may include a quick connect for use with the SCC. If included, connect positive to positive and negative to negative of SCC. Ensure connections are secure. Please see figure below

In Operation:
- GREEN LIGHT INDICATES BATTERY IS FULL
- When battery reaches 14.2V, the SCC will cut out thereby ensuring no overcharging of the battery
- YELLOW LIGHT INDICATES SOLAR PANEL IS CHARGING PANEL
- When Battery reaches below 13V, the SCC will cuts in and charging begins.

Note: IT IS NORMAL FOR BOTH LIGHTS TO FLICKER IN AND OUT DURING NORMAL OPERATION.

NOTES:

- Solar Charge Controller should be placed within 5 feet of the battery and in a dry, well ventilated area
- This Solar Charge Controller can support up to 105 Watts of power. It is not advisable to use with greater wattage
- All connections should be in parallel to ensure 12V – positive to positive, negative to negative

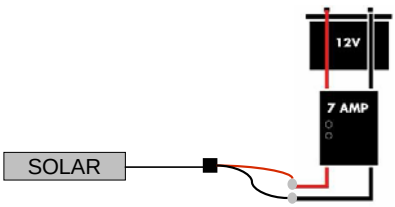
FAQ

1. How many panels can I connect to my 7 Amp Solar Charge Controller?

A. You can connect up to 105 Watts of Solar Power to the 7 Amp Solar Charge Controller. Panels should be connected in parallel – positive to positive, negative to negative.

2. When will the Charging Indication light (green) light up?

A. The charging controller indication green light will light up when the battery voltage reaches 14.2 Volts and the SCC will prevent the solar panels from overcharging the battery. It is normal for the SCC LED to light on and off as the battery voltage cuts in and out.



GENERAL TESTING PROTOCOL

Always test outdoors under optimal sunlight conditions.

A. Test Solar Panels for Voltage.

Connect Voltmeter to each individual panel separately and observe Open Voltage. Open Voltage can range from 16 Volts to 24 Volts. Once all panels test for voltage, proceed to step B. (Using a solar voltage tester is also an option)

B. Test Connection to Charge Controller for Voltage.

Reconnect Solar Panels, and connect to charge controller as per instructions. Measure open circuit Voltage at the battery side of the charge controller. Open circuit voltage should read 5-10% lower than without charge controller. Open circuit measurement will read between 15 and 23.5.

C. Connect charge controller to battery

First, disconnect solar panels and connect charge controller to battery. Always connect charge controller to battery first and remove last. Observe polarity – positive to positive and negative to negative.

D. Reconnect Solar Panels to Charge Controller.

If battery voltage is 14.2 or higher, the GREEN light should be on. If battery voltage is between 13 and 14.2, the YELLOW LED should be on.
If battery voltage is 13 or lower, the YELLOW LED should be on.

If all testing results within the above indicated ranges, solar system is in acceptable range. If Voltage reading indicate lower ranges, repeat above connections and retest. Finally, it is common to have 12V Battery issues such as dead cells or non-rechargeable battery problems.

General Info

1. How do solar cells generate electricity?

A. Solar Panels, also known as Photovoltaics or PV for short can be thought of as a direct current (DC) generator powered by the sun. When light photons of sufficient energy strike a solar cell, they knock electrons free in the structure forcing them through an external circuit (battery or direct DC load), and then returning them to the other side of the solar cell to start the process all over again.

2. Will solar work in my location?

A. Solar is universal and will work virtually anywhere, however some locations are better than others are. Irradiance is a measure of the sun's power available at the surface of the earth and it averages about 1000 watts per square meter. Obviously different parts of the world receive more sunlight from others, so they will have more "full sun hours" per day.

3. These panels are made of amorphous type solar panels. What is the difference between amorphous and polycrystalline cells?

A. Amorphous solar panels contain no cells per say but are created rather through a deposition process which actually forms the silicon material directly on the glass substrate. To understand this a bit clearer, think of it as spraying the silicon onto the glass in very thin layers. This film which gives amorphous panels the "thin-film" nick name, is laser patterned which interconnects instead of physical connecting tabs which eliminates a mechanical connection that can break down and fail. The amount of silicon used in this process produces a film, which is often up to 100 times thinner than that of a polycrystalline cell. Furthermore, amorphous type solar cells are better at generating electricity in all lighting conditions

LIMITED WARRANTY:

THESE PRODUCTS ARE WARRANTED FROM DEFECTS IN WORKMANSHIP AND FUNCTIONALITY FOR A PERIOD INDICATED ON THE PACKAGING. THIS WARRANTY DOES NOT APPLY IN THE EVENT OF MISUSE OR ABUSE OF THE PRODUCT OR AS A RESULT OF UNAUTHORIZED REPAIRS OR ALTERATIONS. POWER OUTPUT IS WARRANTED UP TO 80% OF STATED OUTPUT AND MUST BE TESTED UNDER FULL SUNLIGHT CONDITIONS. TO ADDRESS WARRANTY ISSUES, PLEASE CONTACT INITIAL POINT OF PURCHASE.