



## Monocrystalline Solar Panel

### User Manual



**110 Watt**

**⚠ WARNING:** Read carefully and understand all ASSEMBLY AND OPERATION INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

**Item #53000**

**SAVE THESE INSTRUCTIONS**

## Important Safety Information

Thank you for choosing a Nature Power Product.

Save the receipt and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This product is designed for certain applications only. the distributor cannot be responsible for issues arising from modification. We strongly recommend this product not be modified and/or used for any application other than that for which it was designed. If you have any question relative to a particular application, Do not use the product until you have first contacted the distributor to determine if it can or should be performed on the product.

For technical question please call 1800-588-0590

### **WARNING**

- Read and understand all instructions. Failure to follow all instructions may result in serious injury or property damage.
- The warnings, cautions, and instructions in this manual cannot cover all possible conditions or situations that could occur. Exercise common sense and caution when using this tool. Always be aware of the environment and ensure that the tool is used in a safe and responsible manner.
- Do not allow persons to operate or assemble the product until they have read this manual and have developed a thorough understanding of how it works.
- Do not modify this product in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the product. There are specific applications for which the product was designed.
- Use the right tool for the job. DO NOT attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this equipment was designed. It will be a safer experience and do the job better at the capacity for which it was intended. DO NOT use this equipment for a purpose for which it was not intended.
- Industrial or commercial applications must follow OSHA requirements.



#### **WARNING**

This product can expose you to chemicals, including Di (2-ethylhexyl) phthalate (DEHP) which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information, go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)



#### **ADVERTENCIA**

Este producto puede exponerlo a productos químicos, incluidos Di (2-etilhexil) ftalato (DEHP) que el estado de California sabe que causa cáncer, defectos de nacimiento u otros daños reproductivos. Para obtener más información, vaya a [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Cautions

- Never touch the end of output cables with your bare hands when the modules are irradiated. Handle wires with rubbergloved hands to avoid electric shock
- Do not wear metallic jewelry when working on electrical equipment
- Product should be installed and maintained by qualified personnel
- Do not drop tools or other items on the glass of the solar module
- Do not scratch the back film of the solar panel
- Avoid exposing solar panels to partial sunlight or shadows. Partial sunlight can cause hot spots on the panel
- Do not pour chemicals on module when cleaning. To clean use a damp cloth do not apply excessive pressure to the cells
- Do not expose solar module to sunlight concentrated with mirrors, lenses or similar means
- Keep module away from children

### Precautions when working with batteries

- Never smoke or allow a spark or flame near the batteries
- Batteries generate hydrogen and oxygen during charging resulting in evolution of explosive gas mixture. Care should be taken to ventilate the battery area and follow the battery manufacturer's recommendations
- Batteries contain very corrosive diluted acid as electrolyte. Precautions should be taken to prevent contact with skin, eyes or clothing
- Use caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion
- Remove metal items like rings, bracelets and watches when working with batteries. The batteries can produce a short circuit current high enough to weld a ring or the like to metal and thus cause a severe burn
- If you need to remove a battery, always remove the ground terminal from the battery first. Make sure that all the accessories are off so that you do not cause a spark
- Only use rechargeable 12 Volt batteries, ie. Sealed Lead Acid, Deep Cycle, Gel-Cell etc.
- Use properly insulated tools only when making battery connections
- When working with batteries please follow the battery's manufacturer manual and precautions

### Precautions when working with solar panels

With the incidence of sunlight or other light sources on all solar panels, a voltage appears at the output terminals of the solar panel turning it into a source of electricity. Do not make contact with the terminals when the panel is exposed to sunlight or other light sources. To avoid shock hazard make sure the solar panel is either turned over so the cells are not exposed to light or cover the cells with an opaque dark material such as paper/cloth during the installation process.

### Precautions when working with Charge Controllers

If two or more solar panels are connected in series/parallel make sure that the sum of the short circuit current ratings of all panel strings does not exceed 80% of the charge controller's current rating.

## Parts List

| Reference | Part Description         | Quantity |
|-----------|--------------------------|----------|
| 1         | 110W Solar panel         | 1        |
| 2         | 11 AMP charge controller | 1        |
| 3         | SAE-Battery clamp cable  | 1        |
| 4         | SAE-bare end cable       | 1        |
| 5         | Z-brackets               | 4        |
| 6         | Manual                   | 1        |

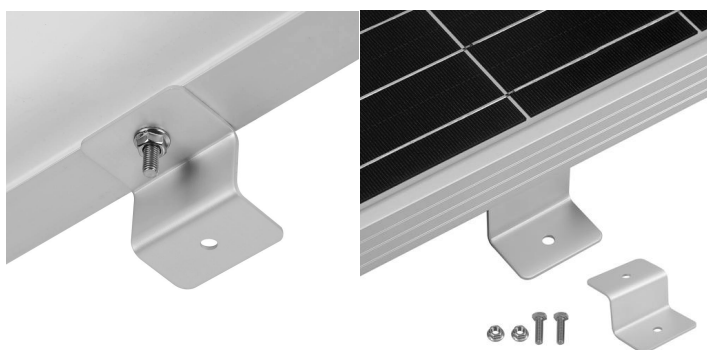
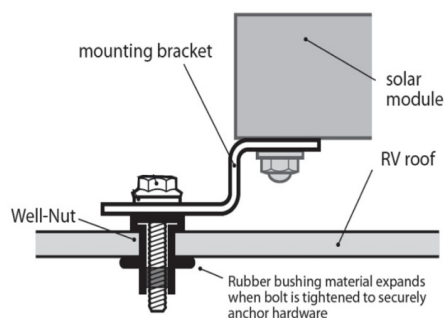
## Technical Specifications

| Property                    | Specification |
|-----------------------------|---------------|
| Maximum Power - Pmax        | 110 Watt      |
| Voltage at Pmax             | 18.9 V        |
| Open Circuit Voltage - Voc  | 22.31V        |
| Short Circuit Current - Isc | 6.27A         |
| Class                       | A             |

## Mounting the Solar Panel

Choose a site for mounting the solar panels that is free from shade and located in an area that receives maximum sunlight daily. In the Northern Hemisphere, The best direction to face solar panels is south. However, using your judgment in figuring out which location gets the most sun, would be helpful. For maximum solar power absorption throughout the day, a tilt-mounting is recommended.

### Roof / RV Mounting



The solar panels can be permanently installed level using the Z-brackets.

Measure the distance between the mounting site and the battery location. The charge controller should be mounted in close proximity to the battery bank (within 5 feet). Refer to the DC electrical wire guide to choose an appropriate gauge wire for the length of the wire.

If you choose to mount your Solar Panel on your RV, be sure you solidly mount your panels to the roof. If you have a rubber roof over thin plywood you may want to use molly fasteners to get a better grip. If you have a fiberglass roof, drill some pilot holes through the fiberglass to reach plywood below. This will prevent cracking or damaging the fiberglass. If your RV is equipped with a metal roof you must mount the solar panel to the joists supporting the roof.

## Assembly Instructions

### Selecting the Correct Battery

We do not offer batteries. However, please choose a 12 Volt rechargeable battery. Do not attempt to recharge non-rechargeable batteries. 6 Volt battery configurations may also be used if connected in series Negative to Positive. You may choose a Sealed Lead Acid battery, a Gel-Cell or a Deep Cycle 12 Volt battery. Batteries come in all different sizes, Please converse with your battery dealer for more information on which type of battery you should use for your system. Note your solar panel amperage rating when selecting your battery size.

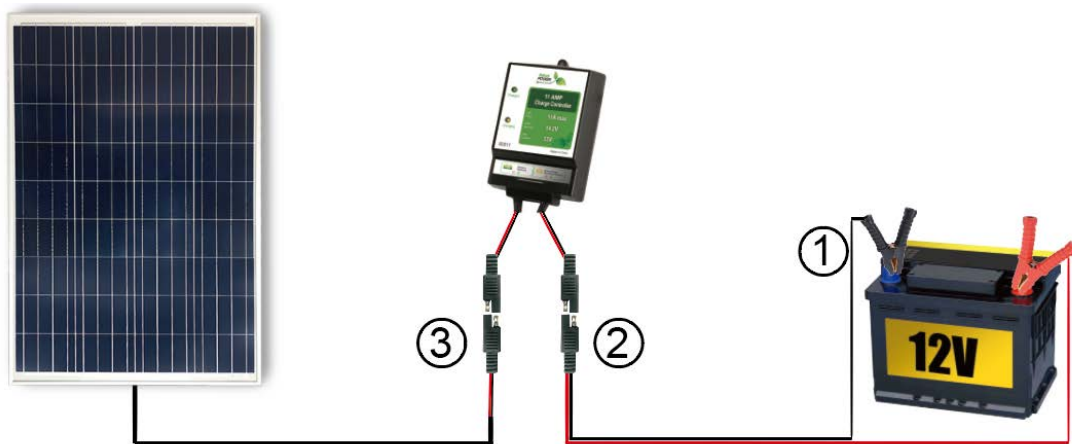
### Electrical Installation

Please confirm that you have all parts to your system before starting installation.

**Step1** Connect the battery with the SAE-battery clamp cable

**Step2** Connect the SAE connector to the charge controller (the Battery side)

**Step3** Connect the solar panel to the charge controller (the solar panel side)



\* If your battery can not connect with the battery clamp, the included SAE-Bare end cable can be used

When installing solar panels configuration and systems, please carefully observe correct cable connections and polarity. The solar panels can be damaged by not observing the correct electrical installation and polarity; in addition, this will void the warranty of your solar panels. Having a multi-meter handy will help to confirm correct polarities.

### Extending the wiring

If you choose to mount your solar panel further away from the charge controller by extending the wiring we recommend the following gauges at each specified distance. Use stranded wire instead of solid wire. Stranded wire does not fatigue or loose connections over time.

Appropriate wire gauge should be used for distance and total amperage, for further information please consult with a licensed electrician or through an online wiring chart calculator

To prevent loss of current we suggest mounting the solar panel within 20 feet of the charge controller and the charge controller should be installed within 5 feet of the battery.

## Connecting an Inverter

An inverter can be used to converting the 12 Volt energy created to 120 Volt Electricity. Inverter sizes and types vary depending on your power consumptions needs. Please call us to find a suitable inverter.

## Connecting Additional Solar Panels

**Go to [www.naturepowerproducts.com](http://www.naturepowerproducts.com)  
for a larger selection of renewable energy products and accessories.**

## Solar Kit Weekly Power Chart

Please refer to the run times chart to choose how much solar power your desired system requires.

**Note: All run times/ratings are estimates only and may vary depending on your location, time of day, time of year and are based on 7 Hours of full sunlight per day.**

| Solar panel Rated Hourly<br>(Maximum output) | 110 Watt  | 220 Watt   | 330 Watt   | 440 Watt   |
|----------------------------------------------|-----------|------------|------------|------------|
|                                              | 5.81 Amp  | 11.62 Amp  | 17.43 Amp  | 23.24 Amp  |
| Weekly Output                                | 5.39 kW·h | 10.78 kW·h | 16.17 kW·h | 21.56 kW·h |
| Weekly Power Run Times                       |           |            |            |            |
| Fluorescent Light 40 watts                   | 134 hr    | 269 hr     | 402 hr     | 536 hr     |
| Laptop 20-50 watts                           | 107 hr    | 214 hr     | 321 hr     | 428 hr     |
| Fan 10-50 watts                              | 107 hr    | 214 hr     | 321 hr     | 428 hr     |
| Halogen Light 100 watts                      | 53 hr     | 106 hr     | 159 hr     | 215 hr     |
| PC 120 watts                                 | 45 hr     | 90 hr      | 135 hr     | 180 hr     |
| TV 40" Color 150 watts                       | 36 hr     | 72 hr      | 108 hr     | 144 hr     |
| Projector 300 watts                          | 18 hr     | 36 hr      | 54 hr      | 72 hr      |
| Coffee Maker 800 watts                       | 6 hr      | 13 hr      | 20 hr      | 27 hr      |
| Portable Heater 1500 watts                   | 3 hr      | 7 hr       | 10 hr      | 14 hr      |

## 11AMP Charge Controller



### Intended Use

Any solar panel that is rated 12 watts or higher requires the use of a charge controller. Nature Power Solar panels and charge controllers come equipped with easy j-plug adapters. The 11 Amp Charge controller is designed to protect your 12 Volt batteries from being overcharge by high voltage surges and prevents discharging of the battery overnight. LED lights display battery "Charged" or battery "Charging". Never deeply discharge your battery; never let your battery voltage pass below 11.0 volts. It will cause permanent damage to the battery. Use a DMM Digital Multi-Meter to measure your battery's voltage. When connecting and during operation it is normal for both lights to flicker for a short time.

### Technical Specifications

| Property               | Specification |
|------------------------|---------------|
| Battery Voltage system | 12V           |
| Charging current (max) | 11A           |
| Charging power (max)   | 165W          |
| Cut-in voltage         | 13V           |
| Cut-out voltage        | 14.2V         |

### Operating Instructions

- Observe manufacturer's safety procedures when working around batteries and other electrical equipment.
- Always connect charge controller to the battery first and remove last.
- This product is designed to be used on 12 volt configurations in parallel, optional 6 volt in series.
- This product is designed to receive charges from 12 Volt Solar Panels.
- This product should be placed in a well ventilated dry area, free from flammable gases, weather, and moisture Charge controller is NOT weatherproof.
- Charge controller should not be installed further than 2 to 5 ft. way from the battery. Solar Panel length must not reach further than 20 ft way from battery or loss of current may occur.
- LED light indicates a full battery charge "green" at 14.2 Volts, at this time the charge controller will cut out to prevent overcharging.
- LED light indicates battery charging "yellow" when battery reaches below 13 Volts, charge controller will cut in and allow solar panel to be charging.
- Charge controller can handle up to Watts of solar power.

## Trouble Shooting

- **Charge controller not working after battery connected.**

Confirm that it is a 12V battery and the voltage is higher than 6.5V.

- **Battery are not charging.**

1, Check your controller and battery first of all , make sure your battery is available 12V battery.

2, Faulty connections

The wires should always be water tight and insulated. Poor wiring may cause loose connections, corrosion and oxidation of the wires. Voltage levels at various parts of your connection can be checked by a multimeter to help you find out the points at which low voltage problems start. Do not connect the solar power to the controller during the solar power voltage check.

3, Solar panel faults

This condition is not common as most of the solar panels are able to sustain harsh weather conditions and last for a long period of time. Checking on your solar panels is also advised as the last resort. The main defects a solar panel may experience are: Delamination, junction box faults ( increased resistance in the junction boxes due to exposure to moisture).

- **Low power output from Solar panel / Battery charging slow.**

1, Shading

Shading should always be avoided at all times. Shading causes massive loss of power output and solar panels need high exposure to sun light so as to produce high power outputs. One should always make sure that there are no tree branches blocking the solar panels from direct sunlight. Dust and debris also causes shading. Solar panels should always be cleaned to prevent dust and debris particles from causing shading on the solar panels.

## FAQ

- **Will this kit work with a 12V or 24V battery?**

This is a 12V battery charging system only. Please call Nature Power Customer Service for more 24V system configuration.

- **How do solar system work?**

The panel's photovoltaic cells convert the energy in sunlight to electricity, the electricity is then stored in the battery and an inverter will allow you to plug in appliances. there is 4 major components needed to set up your solar off grid system. Solar panels, charge controller to control the charge to the battery bank, a battery for power storage and an inverter to transfer DC power from the battery to an AC power.

- **How should my solar panels be positioned in order to produce the most power?**

In the Northern Hemisphere, The best direction to face solar panels is south. However, using your judgment in figuring out which location gets the most sun, would be helpful.

- **Does the panels need to be in direct sun to work?**

No, although solar panels produce the highest wattage output in direct sunlight, they will still produce power on cloudy days.

- **Do I need a battery to store Power?**

Yes, a battery is needed to store the power from the solar panel, the inverter will also connect to the battery.

- **What size battery can I use?**

The amount of battery storage you need is based on your energy usage. Energy usage is measured in Watts or kilowatt hours over a period of time. You can use any size battery, best used with Deep Cycle batteries. 12V only.

- **Can you connect this to the breaker box in the house?**

No, this is an off grid only solar kit, you can not connect to the breaker box.

- **Will I need solar maintenance?**

Solar panels generally require very little maintenance. They are very durable but should always be cleaned to prevent dust and debris particles from causing shading on the solar panels. batteries might need to be changed every few years.

- **How long does installation take?**

This is a very basic setup plug and play, however, installing the panel to a flat surface might require able bodies with a little bit of know how's.

- **On what roof materials can solar be installed?**

Solar panels can be installed on any roof material that can take the weight of the panel. properly mounted solar panel system is essential, as a an improperly mounted solar panel can cause leaks or other roof issues.

## Limited Warranty

Nature Power warrants our products to the original purchaser that this product is free from defects in materials and workmanship for the period of 1 year from date of purchase, 2 year warranted to generate up to 80% of rated power from date of purchase. In the case of product defect, contact Nature Power customer service to receive troubleshooting. If defective part or unit should be returned, a Return Authorization Number must be issued by Nature Power and the defective part or unit should be returned to the authorized location at the purchasers' expense. A dated proof of purchase is required to receive warranty service. Once received at authorized location and defect proves to be the result of defective material and workmanship, the defective part or unit will be replaced at warrantors' option and returned to the original purchaser at warrantors' expense. No refunds will be granted by the warrantor, in the event of buyer's remorse please contact your point of purchase within and in adherence to their return policy. Refunds are granted at the retailers' discretions.



**Please contact Nature Power Products to acquire more information:**

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