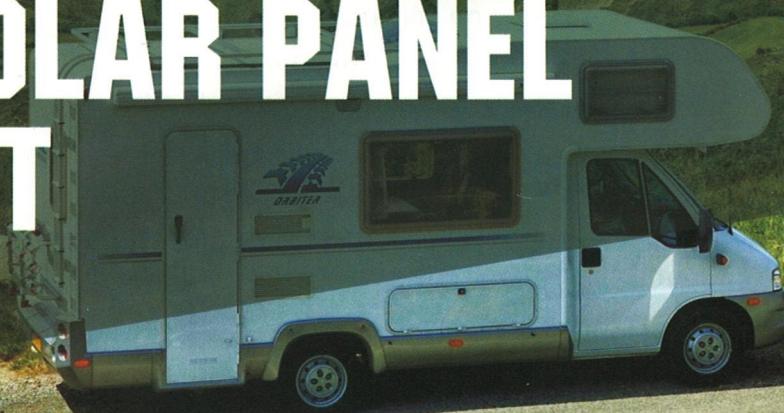




**ECO-WORTHY**  
Make Rural Life Better

# 2 PCS SOLAR PANEL KIT



## SUPPORT

If you are experiencing technical problems and cannot find a solution in this manual, please contact ECO-WORTHY for further assistance.

- Call:+44 20 7570 0328(EU)  
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- Email:[customer.service@eco-worthy.com](mailto:customer.service@eco-worthy.com)
- Web:[www.eco-worthy.com](http://www.eco-worthy.com)

# Installation Introduction

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## 1. Introduction

ECO-WORTHY solar manufacture and sell solar panels and renewable energy products since 2007, is a new energy enterprise integrating research and development, production and sales. We focus on providing one-stop solutions for solar photovoltaic products, wind power products and solar application products for off-grid regions around the world through direct-sale store, Amazon, eBay, AliExpress, Manomano etc.

## 2. General Safety

- \* Do not disassemble the module or remove any attached nameplates and components from the module.
- \* Please abide with all local, regional and national statutory regulations when installing the system or mounting on vehicles. Obtain a building permit when necessary.
- \* Please cut off the electricity before carrying out the installation.
- \* Please remove all metal items such as rings, bracelets, and watches firstly and choose proper, insulated tools to install the system.
- \* Please make sure all wire connections are tight and secure, because loose connections may cause sparks and intermittent current.

## 3.Package Content



**ECO-WORTHY 2 pcs solar basic kit** suitable for RV, caravan, marine, camper, electric scooter, golf carts, trolling motor, tool trailer, backup power supply, home off-grid system etc. The following is an introduction of our solar components.

**1.Solar Panel:** 2 pieces solar panels included. Corrosion-resistant aluminum frame, allowing the panels to last for decades as well as withstand high winds (2400Pa) and snow loads (5400Pa). IP65 rated junction box and 21% high cell efficiency.

**2.Solar Charger Controller:** 30A charge controller with USB port, PWM charge management, LCD display, your solar panel system can be expanded up to a maximum 540W(12V) or 1080W(24V). Built-in short-circuit, open-circuit and over-load protection, which ensures safety. And it supports 3 types of batteries:lithium batteries, lead-acid batteries, gel batteries.

**3.Solar Extension Cable:** 1 pair 4mm<sup>2</sup>extension solar cable (5m red and 5m black) can be used for movable, suspended or fixed installation in photovoltaic systems at temperatures ranging from -40°C to +120°C.

**4.Y Branch:** 3 male and 3 female connectors.

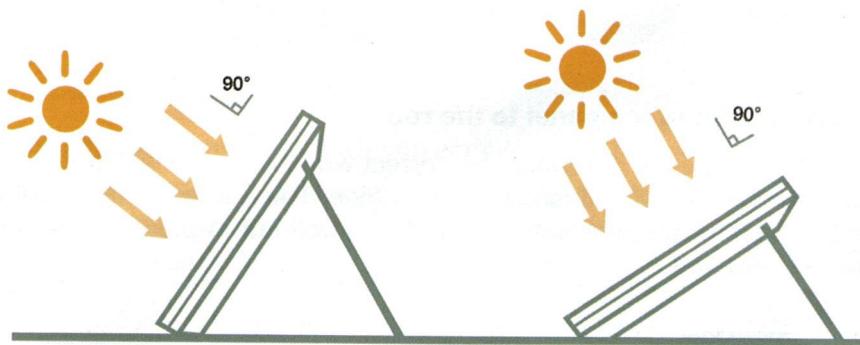
**5.Z Mounting Bracket:** Material of bracket: Aluminum Alloy. Material of screw and nut: Stainless steel, M6 Screw.

## 4. Solar Panel Installation

### 4.1 Location

Determine a location for the solar panel that is in direct sunlight and clear of any shading by adjacent obstacles such as trees, roof overhangs, etc. Ideally, the panels will be positioned to minimize the wiring distance between the solar panel and the charge controller.

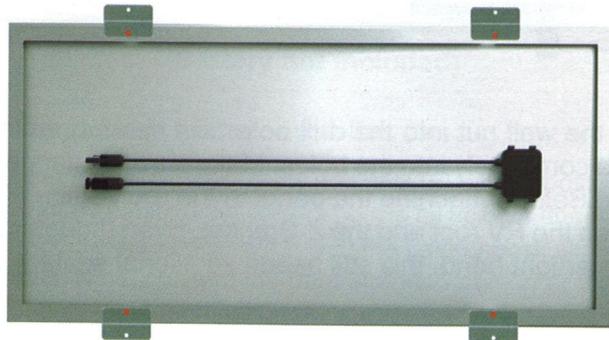
The mounting angle should be equal to the latitude location of where you are installing the solar panels. For example, the latitude of Miami, Florida, USA is 25 degrees. Therefore, solar panels installed in this area should ideally be facing true south at a tilt angle of 25 degrees.



### 4.2 Installation

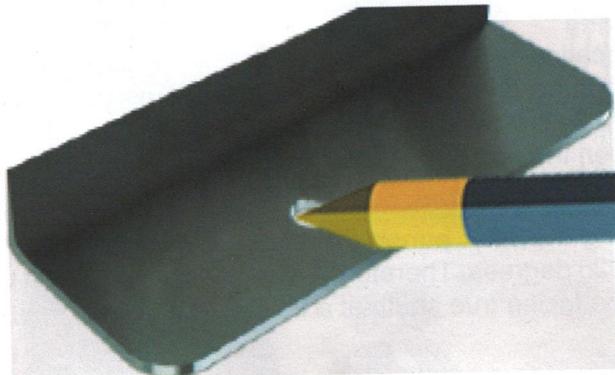
#### Step1: Attaching the Z-Bracket to a solar panel

Solar Panels have two mounting holes on each side. Attach the Z-Brackets to the panel.



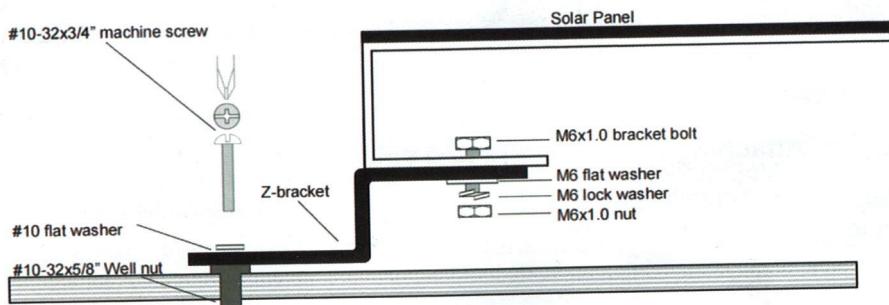
## Step2: Mark and drill holes

Mark the holes for the well-nut.

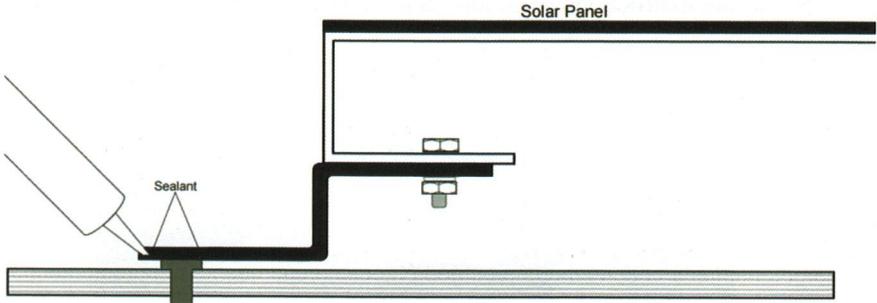


## Step 3: Attaching the panel to the roof

Figure picture below illustrates the correct way to use the well-nut. The rubber flange has to be flush with the roofline. The Z-Bracket, along with the flat washer and lock washer, hold the well-nut in place when the screw is fastened.



Gently insert the well nut into the drill hole . Be careful not to push the well nut flange completely into the holes. Make sure the flange is flushed on the roofline. Before attaching the panel to the roof, a film of caulk can be laid between the RV roof and the Z-Bracket. Even though the well-nut provides a watertight bond, this still needs additional sealant.

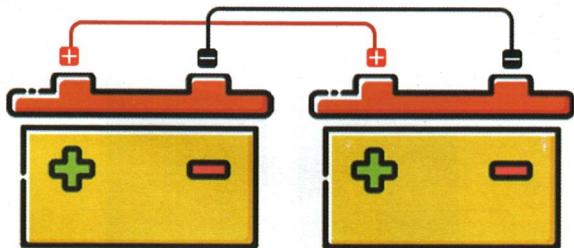


## 5. Connection Method

### 5.1 How to connect as a 12V system (Battery not included)

#### 1. Connect the battery pack (If you want to equip the kit with batteries).

Firstly, use battery-to-battery cables to form the 2 batteries in parallel by connecting the positive terminal to the positive terminal, and the negative terminal to the negative terminal.

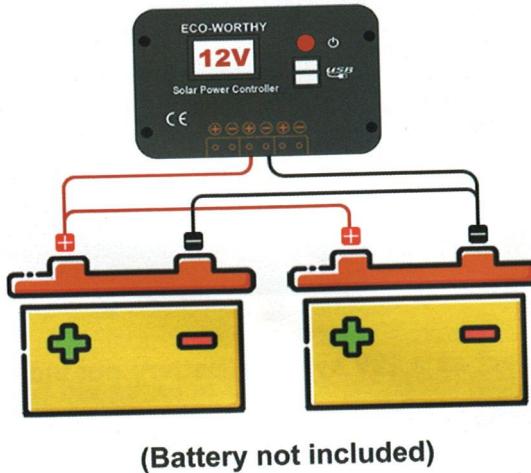


(Battery not included)

#### 2. Connect the battery to the controller.

First, connect the negative cable to the negative (-) battery post. The best way to secure the battery cable to the battery post is by using a ring terminal. A bolt is sufficient to secure the ring terminal onto the battery post, allowing for better electrical contact. Next, connect the bare stranded portion of the cable to the negative (-) battery input terminal on the charge controller.

Similarly to the instructions described above, connect the positive cable to the positive (+) battery post. An in-line fuse can be added to this cable for better protection, a fuse holder would be commonly recommended. This is usually done with a fuse holder.



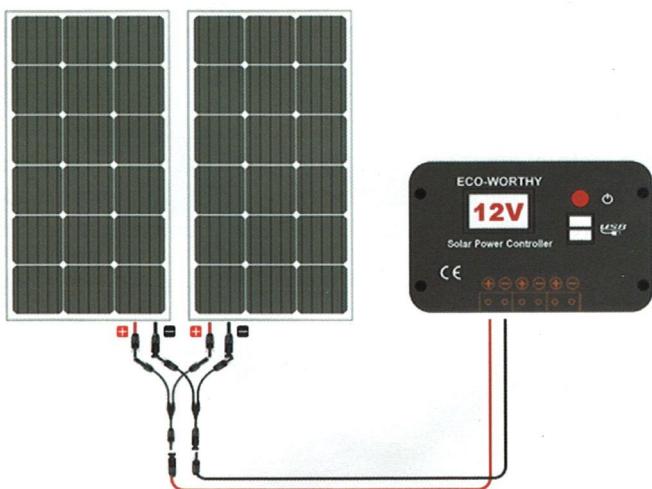
### 3. Connect every 2 solar panels in parallel

To build a 12v DC solar panel kit with 2 panels, wire them in parallel with the Y branch connectors.



#### 4. Connect solar panels to controller

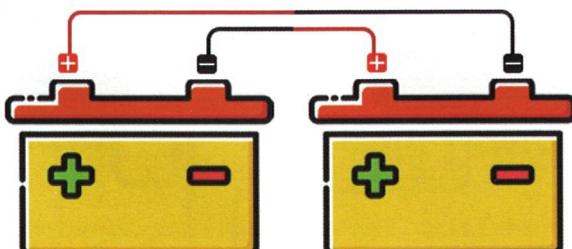
Finally, With 1 pair of solar extension cable to connect solar panel and controller.



#### 5.2 How to connect as a 24V system (Battery not included)

##### 1. Connect the battery pack (If you want to equip the kit with batteries).

Firstly, use battery-to-battery cables to form the 2 batteries in series by connecting the positive terminal to the negative terminal, and the negative terminal to the positive terminal.

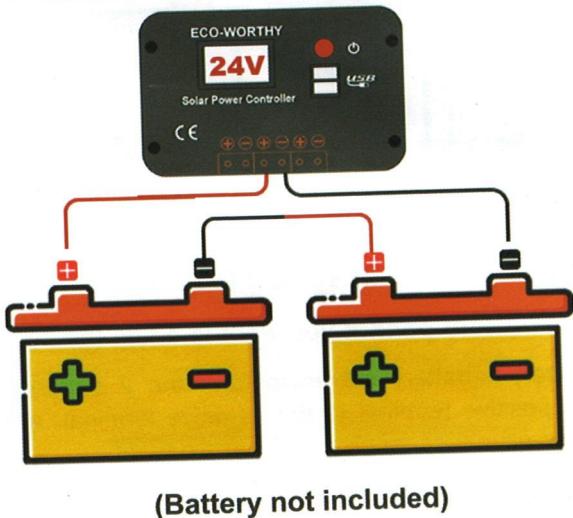


(Battery not included)

## **2. Connect the battery to the controller.**

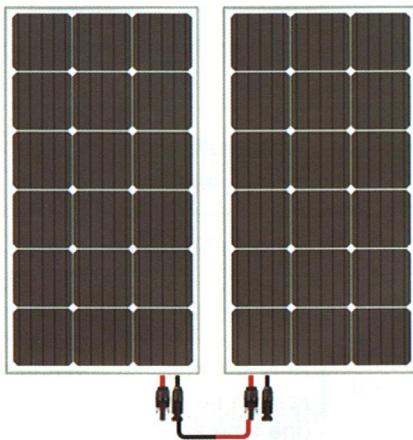
First, connect the negative cable to the negative (-) battery post of one of the battery. The best way to secure the battery cable to the battery post is by using a ring terminal. A bolt is sufficient to secure the ring terminal onto the battery post, allowing for better electrical contact. Next, connect the bare stranded portion of the cable to the negative (-) battery input terminal on the charge controller

Similarly to the instructions described above, connect the positive cable to the positive (+) battery post of other battery. An in-line fuse can be added to this cable for better protection, a fuse holder would be commonly recommended. This is usually done with a fuse holder.



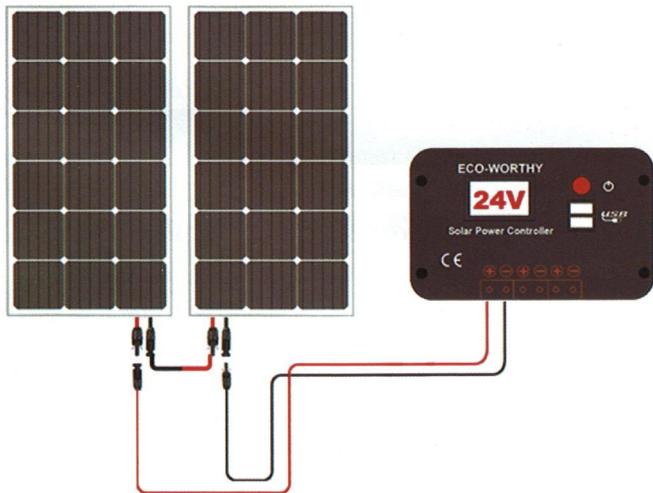
### **3. Connect every 2 solar panels in parallel**

To build a 24v DC solar panel kit with 2 panels, wire them in series. The way of connection is positive socket to the negative socket with their own cables.



### **4. Connect solar panels to controller**

Finally, With 1 pair of solar extension cable to connect solar panel and controller.



## 6.Solar Charge Controller Troubleshooting

	Possible Issue	Troubleshooting
E01	Battery low voltage warning	Press button to ignore for one time and force to work again.
E02	Battery high voltage warning	Press button to ignore for one time and force to work again.
E03	Output over current warning	If it does not resume within 60 seconds,it will turn into E04 warning. Press button to ignore for one time and force to work again.
E04	Output short-circuit warning	After the 10s, the controller will automatically reopen the load.Or Press button to ignore for one time and force to work again.
E05	High temperature warning	Wait temperature drop to 70°C or press button to ignore for one time and force to work again.
E06	Solar panel overvoltage warning	Recovery when the voltage of solar panel drops to 45V.

## 7.QA

**Q1. Why doesn't my photovoltaic panel display charging after it is connected?**

**A1.** Check whether the photovoltaic panel wiring is correct, whether there is reverse connection, whether the photovoltaic panel voltage is higher than the battery voltage, whether the photovoltaic panel has obstructions that cause the voltage to drop, under normal circumstances, please use a photovoltaic panel with a rated voltage of 18V for a 12V battery.

**Q2. Why is my charging current low?**

**A2.** The greater the power of the photovoltaic panel, the stronger the sun, and the greater the charging current. On the contrary, incorrect photovoltaic panel voltage, foreign object blocking, shadow blocking, etc. will cause the current to decrease. In addition, when the battery voltage is high, it will enter the floating charge. State, the charging current will also become smaller and smaller at this time.

**Q3. Why doesn't my load light up?**

**A3.** The reasons for the load not turning on may include incorrect setting of the load working mode, such as setting the light control but asking why the load is not turned on during the day, the controller cuts off the load due to insufficient battery power, or the load wire is not connected and disconnected , The load burns out, etc.

**Q4. What should I do if my electricity time is not long enough?**

**A4.** If the daily power generation of the photovoltaic panel is less than the power consumption of the load, it will cause a situation of making ends meet. It is recommended to increase the photovoltaic panel to cope with the extreme rainy weather. In addition, the battery capacity can be increased, or the load wattage can be reduced or Work time to balance the entire system.

**Q5. Why does a fully-charged battery run out after a single use?**

**A5.** The battery is close to end of life. You can do a simple test. For example, after the battery is discharged, use photovoltaic panels or power supply to charge, the voltage will rise quickly, and then disconnect the charging, and then drop quickly after loading, it indicates that the battery performance has declined. The battery should be replaced with a new one.

## **8.Maintenance**

The following maintenance suggestions can better ensure the optimum performance and longevity of the solar system:

- \* Inspect the solar panels and make sure the surfaces are free from dust, dirt, and other debris. Clean the glass surface when necessary.
- \* Always use water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent can be used to remove dirt.
- \* Check the electrical and mechanical connections every six months to verify that they are tight, secure and undamaged.
- \* Check to make sure all structural components and mechanical fasteners are clean, secure, and corrosion-free. Replace the damaged components if necessary.

## **9.Support**

This product is covered by a 1-year warranty provided by ECO-WORTHY. We will provide a part or full refund or a replacement for defected products.

If you encounter any technical problems and cannot find a solution in this manual, please contact ECO-WORTHY for further assistance.

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