

## SolarGo2 Rigid Solar Panel Instructions

**Please read these instructions thoroughly before installation.**

Thank you for purchasing a quality solar panel from SolarGo2. This panel will give you many years of trouble-free service. It is important that the panel is installed correctly and, by reading and acting on the below instructions, it should also be an easy trouble-free install too. In this manual we will be using some technical terms and a brief description of these terms is at the end of the instruction manual.

If your solar panel has been delivered by courier, please check the solar panel for any damage that may have occurred during transit. If the package appears damaged, sign for the package as damaged. Photograph any damage for future reference and contact your supplier.

Take care unpacking the solar panel, use the packing to rest the solar panel on flat when installing.

Take care when installing in windy conditions, the solar panel can present a large sail area and go with the wind when you least expect it.

Do not put any pressure or heavy objects on the solar panel.

Before you start installation, it is always a good idea to test that the panel is working and giving you both Volts (V) and Amps (A).

This can be done by testing the Voc (Voltage open circuit) and Isc (Current short circuit)

Always test the panel in the best light conditions possible i.e., outside in natural sunlight light. The panel will not work under artificial light or inside, and if tested in this way it could show a false/poor reading on your DVM (Digital Voltmeter).



If needed, prepare the panels cable ends for testing by removing the outer black insulating sheath and then the conductor insulation (red and black) to gain access to the copper conductor. As per the diagram Fig 1. (The Panel will be supplied with the cable ends already prepared and identified)

Fig 1

**Voc Test (Voltage open Circuit)**

To test Voc, you will need to set your DVM to 200V DC (Please refer to your DVM instructions on how to do this). Connect the meter probes to the panels cable, red probe to red conductor, black probe to black conductor. You should now see a voltage reading of 12-26V DC depending on the irradiance from the sun at that time (Fig 2). If you get a reading below 10V please make sure the solar panel is outside and facing up towards the sun. If you are still getting a poor reading i.e., under 10v, please contact us on 01684 607002

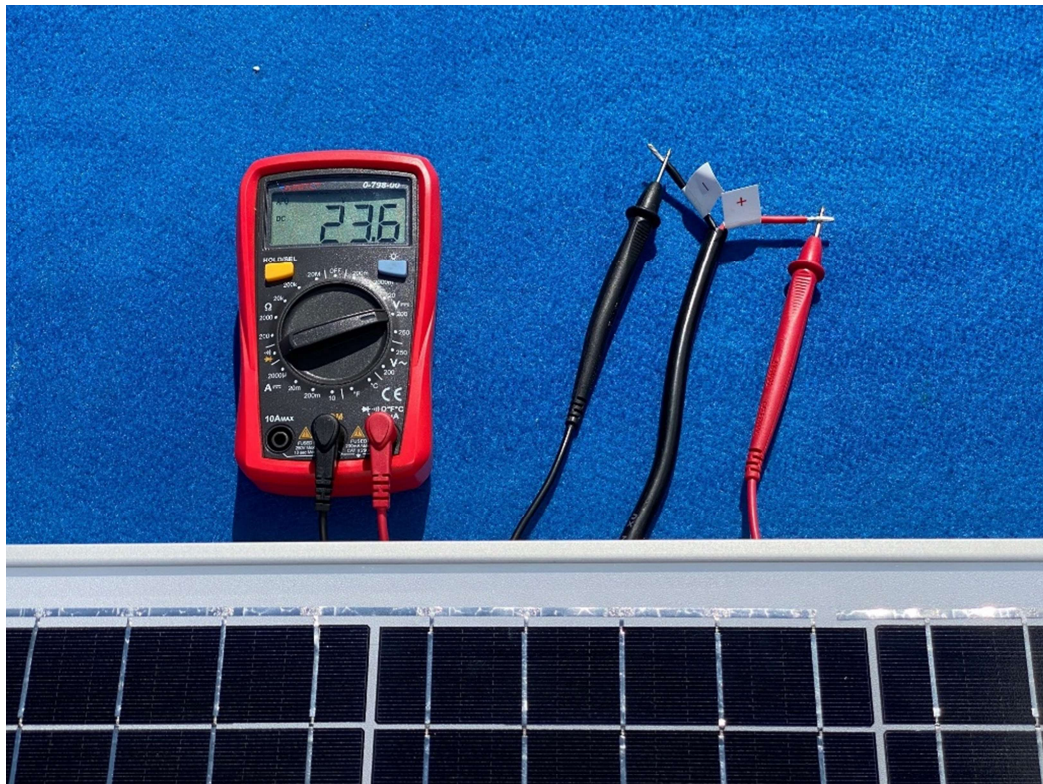


Fig 2

If it helps, please enter the value you have just read here \_\_\_\_\_ volts

### Isc Test (Current short Circuit)

Next test Isc. This could involve rearranging the probes and settings on your DVM (Please refer to your DVM Instructions). Normally the black probe will stay in the black socket, the red probe will move to the 10A socket and the dial setting will need moving to select 10A DC. Connect the meter probes to the panel, red probe to red conductor, black probe to black conductor. You should see a current reading; this value will depend upon the rating of the panels Isc and the irradiance from the sun. The fact that you have a reading is a good indication that the panel is in good order (Fig 3)

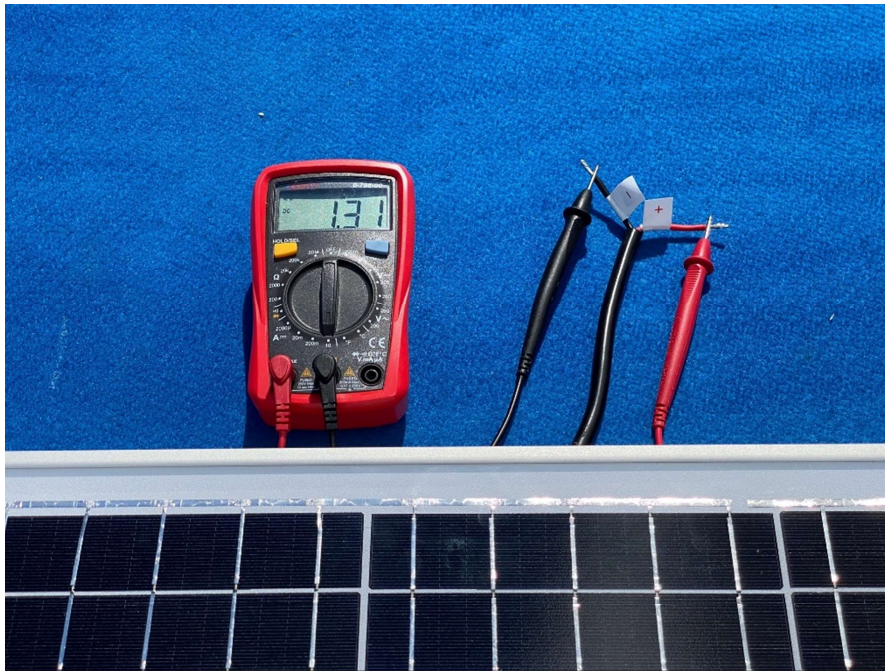


Fig 3

If it helps, please enter the value you have just read here \_\_\_\_\_ Amps

All technical specifications and performance values can be found on the panels data plate on the reverse of the panel, or the technical specification area for that panel on our website.

[www.solargo2.com](http://www.solargo2.com)

This test procedure is very useful for future reference and may help on diagnostics of the PV system.

## **You are now ready to install your solar panel.**

**Please read the following instructions thoroughly**

**Note:** if you haven't already, please measure your battery's terminal voltage using your DVM, record the measured voltage below. We will then use this to compare once you have fully installed your solar panel.

Battery voltage before install of solar panels \_\_\_\_\_ V

The installation is simple, the components comprise of

1. Solar panel
2. Inline fuse and holder (included with your solar panel as standard)
3. Charge controller/voltage regulator (not included with your solar panel as standard)
4. Battery (not included with your solar panel as standard)
5. Panel mounts / fittings (not included with your solar panel as standard)

You now need to decide on panel position and how the panel is to be secured. Always make sure that you have enough area on the roof to accommodate the panel and the associated mounting brackets. When bonding your chosen brackets to a roof, the area must be clean and grease free. Remove any loose or flaking material, clean the area with a preparatory cleaner such as an alcohol wipe. (Please refer to the fitting instructions for your mounting brackets for more information on this)

*The main considerations to be aware of during the installation will be, panel position, charge controller position, cable gland position, cable run and access.*

### **Panel position**

Site the panel to avoid shade as much as possible (shading will have an adverse effect on performance) for example on a caravan roof you might have a TV aerial or air-conditioning unit that, during the day, can cause shadows onto the panel. This will have a dramatic effect of reducing the power produced by the panel so it's something best to avoid.

### **Charge controller position**

The charge controller needs to be sited close to where the battery you want to charge is located, in a well-ventilated position, and easily accessible. Options would be in a cupboard that's being used for the cable run from the roof or even under the seat next to the battery box. Please remember this controller will need to have room around it to keep cool. Don't place in a small, confined area! (Please refer to the charge controller instructions for more information on this)

### **Cable gland**

Position the cable gland as near to the solar panel as possible. For example, on a caravan over an internal floor to ceiling cupboard so the cable can be hidden away (please refer to the instructions supplied with the cable gland on the best way to seal and fit this to your roof)

**Cable run and Charge controller. (Please refer to the charge controller manual for more information)**

The installation wiring is straight forward; the panel comes with 5M of cable already connected. Run the cable from the panel, through the gland and to the charge controller position. Any spare cable can be cut off. It is good practice to keep cable runs to a minimum to avoid volt drop and unnecessary circuit resistance. The solar panel wires (Red & Black, red = positive & black = Negative) are connected to the solar connections on the controller. This will be indicated on the controller (PV / Solar input). Be sure to observe the correct polarity of the wires.

Any spare cable (if you have any left) is then used to connect the controller to the battery; The battery connection on the controller is clearly identified "BATT". Connect the battery using these terminals via an inline fuse placed as near to the battery as possible on the positive red wire (Please refer to controller instructions for more information on this connection)

The terminals indicated LOAD can be used to run an appliance. These terminals will be energised once the battery has reached full charge. When the battery goes into a discharged state the terminals will be de-energised and will not be re-energised until the battery reaches full charge again. This is designed to protect the battery from being discharged.

**Please note:** The connection between the charge controller and the battery must be fused on the red wire as close to the battery positive terminal as possible and must be connected directly to the battery and NOT connected into part of a wiring loom. Please see Fig 4.



Fig 4

We recommend direct connection from the charge controller to the battery via the inline fuse. Integration into the existing wiring can lead to power loss and erratic voltage and poor performance and problems may not be supported.

When you have completed the installation and the solar panel and controller are connected to the battery, wait for 30 mins to 1 hour and measure the battery terminal voltage again with a DVM. You



should see a slight rise in voltage. This will depend entirely on the amount of irradiance the panel is receiving, but this is a good indicator that everything is now working.

### **Terminology used/abbreviations**

PV = (Photo Voltaic, sunlight energy, converted to electrical energy))

Module or PV Module = (Solar Panel) = a number of cells (Typically 36/72) connected together and built into a frame)

DVM = (Digital Voltmeter)

Irradiance = (Natural sunlight light level)

Voc = (Voltage open Circuit)

Isc = (Current short Circuit)

Vmp = (Voltage Max power)

Imp = (Current Max Power)

STC = (Standard Test Conditions) the data on the panels data plate is taken at STC, this is an industry standard used by PV panel manufacturers. STC conditions are stated on the panel data plate

The data has been derived from three conditions.

- 1) Irradiance =  $1000\text{Wm}^2$
- 2) Air Mass = 1.5 (Position of the sun in the sky)
- 3) Temperature =  $25^{\circ}\text{c}$

The panel data has been derived through a laboratory test called flash testing. Any deviation from the STC conditions will lead to different test results. So, any change in irradiance, angle/orientation of the panel, or temperature.

### **General Health and safety**

**With any electrical installation the dangers can be electric shock and fire. The main potential danger with low voltage DC/Battery energy source, will be more fire than electric shock, but as more solar panels are added to installation the risk of shock increases. Always install protection devices of the correct rating.**

**Take care when handling the solar panel, the solar panel will produce voltage and current when exposed to daylight. If multiple solar panels are connected higher currents and voltages can be achieved. Insulate bare connections or cover the solar panel when installing.**

**If you have installed an inverter, please read the inverter manual and instructions, even though the inverter is powered by 12V DC, the inverter will produce the same voltage as the grid power supply in your house. The amount of current that it can deliver will depend on the rating of the inverter so the health and safety protocols are the same as grid derived power.**