

Manual #122910

#23130 30W Mono Manual  
#23135 80W Mono Manual  
#23137 130W Mono Manual



# INSTALLATION MANUAL

## MONOCRYSTALLINE MODELS

#23130, #23135 & #23137

## **INTRODUCTION**

This manual contains installation and safety information for the monocrystalline solar panel models #23130, #23135 or #23137. WIRTHCO reserves the right to make changes to the product specifications, or to this manual without prior notice. Therefore, check the WIRTHCO website for manual updates as necessary.

## **CAUTIONS**

- Never touch the end of output cables with your bare hands when the modules are irradiated. Handle wires with rubber-gloved 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 solar module.
- Do not scratch the back film of the solar panel.
- Avoid exposing solar panel to partial sunlight or shadows. Partial sunlight can cause hot spots on the panel.
- Do not pour chemicals on modules when cleaning.
- Keep modules 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 sulphuric 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.
- Use properly insulated tools only when making battery connections.

## **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. To avoid a shock hazard make sure the solar panel is covered with an opaque (dark) material such as paper/ cloth during the installation. Do not make contact with the terminals when the panel is exposed to sunlight or other light sources.

## **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 i.e. 24 Amps for the 30 Amp charge controller.

## **Installation Overview**

Read the supplied information in detail prior to starting any the installation procedures.

Call 1-952-941-9073 to speak with WIRTHCO's battery doctor and to ask any installation questions.

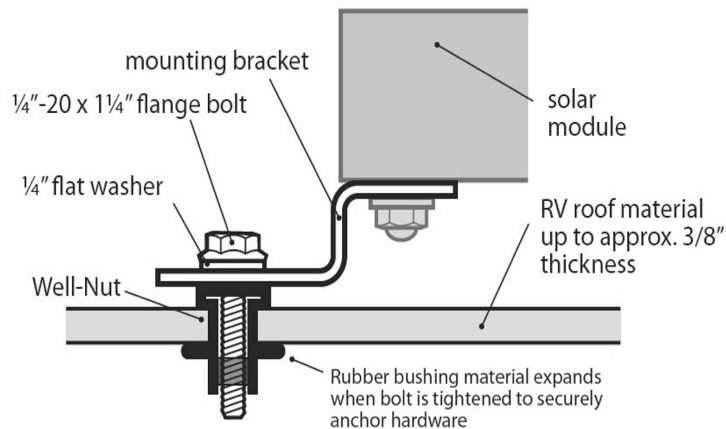
- Open the packaging and check to make sure that all parts have been received.
- Arrange to have on hand the proper tools to carry out the installation.
- Determine the mounting location of the solar panel(s).
- Mount the charge controller at the desired location.
- Wire the battery to the charge controller and then the solar panel to the charge controller to ensure that the correct polarity is observed.
- Secure the solar panel to the desired location.

## **Installation**

Be sure you solidly mount your panels to the roof of your RV. 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.

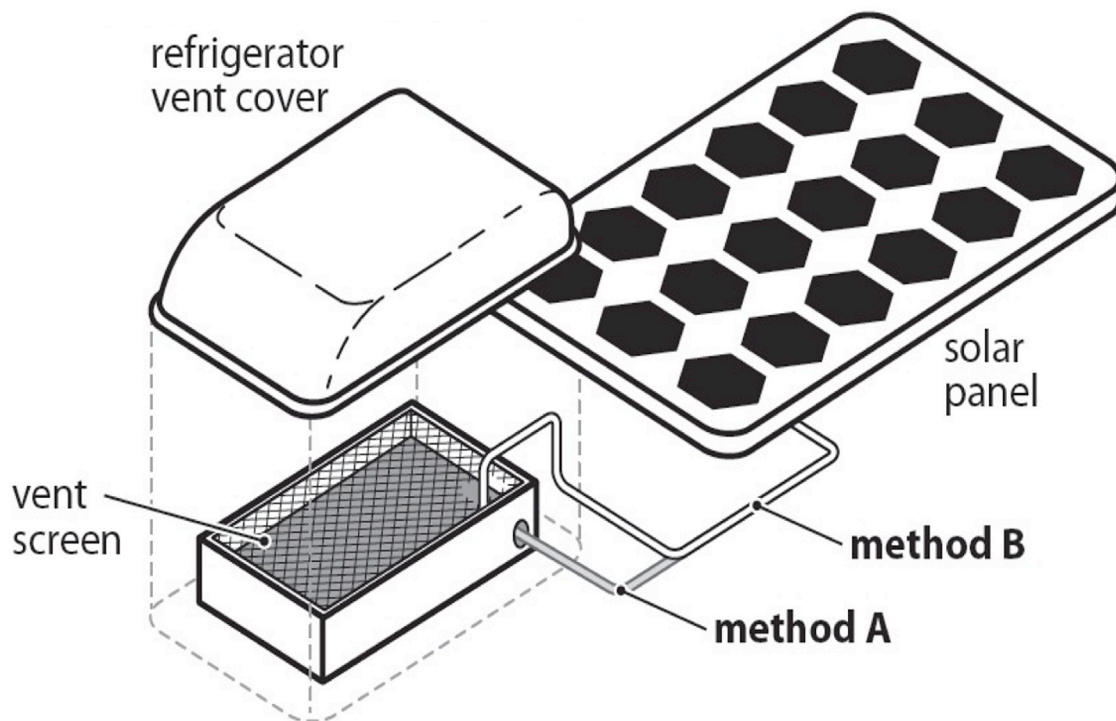
The solar panels can be permanently installed flat using the hardware provided. Install your solar panel to ensure it receives the maximum exposure to sunlight. If you desire a flat solar panel installation, your panel(s) will be receiving maximum solar power as the sun is directly overhead. However, for maximum solar power absorption throughout the day, a tilt-mounting kit is recommended. WIRTHCO provides a tilt-mounting kit that is sold separately. Contact your dealer for information about the tilt-mounting kit.

Figure 1 shows an example of how the panel can be installed on the roof of your RV.



**Figure 1. Mounting Bracket Assembly (Some bracket kits may vary)**

The wire pair from the solar panel can be routed to the interior of the RV through the roof-top refrigerator vent. In this kind of installation attempt to mount the panel near the refrigerator vent. See Fig. 2.

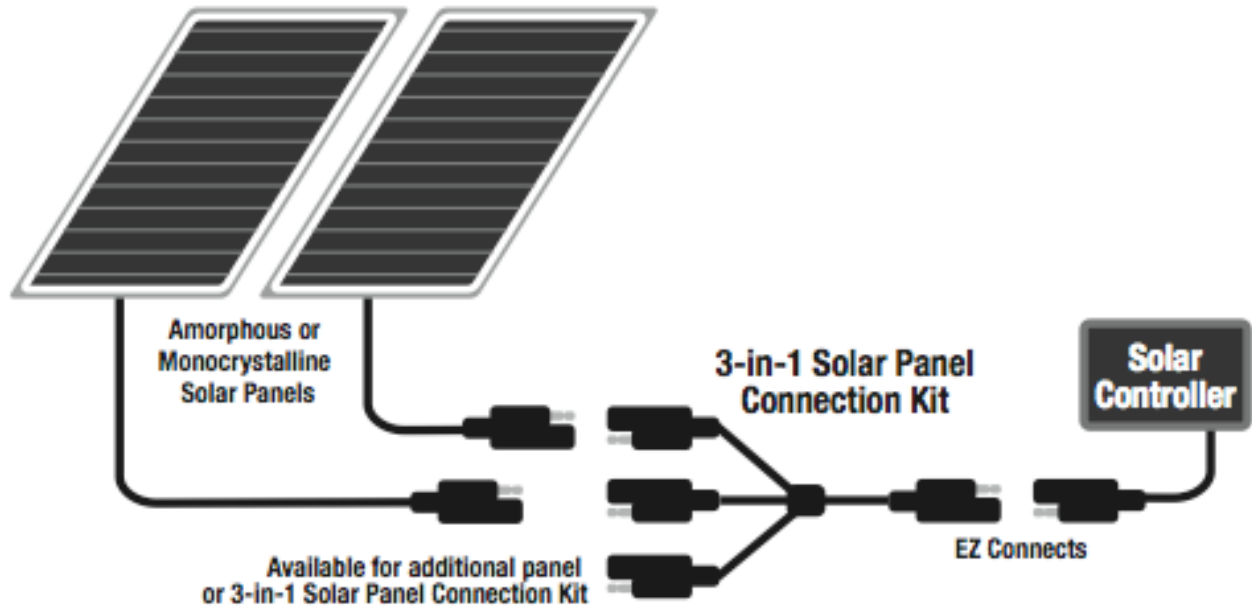


**Figure 2. Wire Pair installed through Refrigerator Vent**

When connecting the solar panel to a battery or to other modules you must carefully observe correct cable connection polarity. The panel can be damaged by not observing correct polarity and in addition, this will void the warranty for your solar panel.

Figure 3 shows an example of how to one or more solar panels can be connected to the battery. If needed branch connectors are available and can be purchased separately.

### Connecting Solar Panels in Parallel



**Figure 3. Wire Harness and Connections (Wire connectors not exactly as shown)**

### Installation Recommendations

Choose a site for mounting the solar panels that is free from shade and located to receive maximum sunlight daily. Ensure there is clearance to allow for at least a ½ inch space between the mounting surface (RV roof) and the solar panel to allow for airflow. When making connections ensure polarity is maintained, reverse polarity may cause damage and will void the warranty. Measure the distance between the mounting site and the battery location. The charge controller should be mounted in close proximity to the battery bank, distance between the solar panels and charge controller is accepted. Refer to a DC electrical wire guide to choose an appropriate gauge wire for the amperage and the length of the wire.

## ELECTRICAL RATINGS

Rated electrical characteristics are within  $\pm 10$  percent of the indicated values of  $I_{sc}$ ,  $V_{oc}$ ,  $P_{max}$  under Standard Test Conditions (irradiance of 100 mW/cm<sup>2</sup>, AM 1.5 spectrum, and a cell temperature of 25°C {77°F}).

The above electrical characteristics are based on the results of outgoing test. The warranty condition is specified in the warranty card separately issued.

<b>Pmax</b>	<b>#23130 - 30W</b>	<b>#23135 - 80W</b>	<b>#23137 - 130W</b>
<b>Vmp</b>	17.6V	17.6V	17.6V
<b>Imp</b>	1.7A	4.55A	7.38A
<b>Voc</b>	21.2V	21.2V	21.2V
<b>Isc</b>	1.84A	4.92A	7.97A
<b>Dimension</b>	570*430*35MM	1190*546*35MM	1470*670*35MM
<b>Solar cell</b>	125*125	125*125	156*156
<b>Efficiency</b>	16.50%	15.50%	15.50%
<b>Array</b>	4*9	4*9	4*9
<b>cell</b>	125*42	125*125	156*156
	Monocrystalline	Monocrystalline	Monocrystalline
<b>Class</b>	A	A	A
<b>Weight</b>	3KG	8.5KG	13KG

The above electrical characteristics are based on the results of outgoing test. Do not expose solar module to sunlight concentrated with mirrors, lenses or similar means.

Under normal conditions, a photovoltaic module may experience conditions that produce more current and/or voltage than reported at Standard Test Conditions. Modules should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes and size of controls connected to the module output. Refer to Sec. 6908 of the National Electric Code for an additional multiplying factor of 125 percent (80 percent of rating) which may be applicable.

Please refer to Section 690-8 of the National Electrical Code for an additional multiplying factor of 1.25 which may be applicable.

## **Routine Maintenance**

- Inspect the solar panels and make sure the surface is free from dust, dirt and other debris, clean with a wet cloth or glass cleaner, if necessary.
- Check to make sure all structural components, mechanical fasteners and electrical connections are secure, clean and corrosion-free.
- Check and maintain the battery electrolyte levels at regular intervals as per the battery manufacturer's recommendations if flooded wet cell lead acid batteries are used.
- Check and replace damaged components if necessary.

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