



CMPower

**SEMI RIGID (WALK-ON)
SOLAR PANEL
OWNER'S MANUAL**

This manual provides the information needed to properly install, maintain and use CMPower impact resistant walk-on PV solar panels. Failure to follow these safety and installation guidelines can result in personal injury, property damage or damage to the solar panel. This manual supersedes all previous CMPower manuals.

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1. Introduction

1.1 Included in The Box

The semi-rigid (walk-on) solar panel kit includes:

- PV solar panel
- Sheet of twin wall polycarbonate backing
- Two J channel mounting extrusions
- Owner's Manual

1.2 Storage and Unpacking

- Store the semi-rigid solar panels in a dry and ventilated environment.
- Solar panels must be shipped in the box provided by manufacturer and stored in the original box prior to installation. Protect the packaging from damage.
- Open the solar panel package being careful not to scratch or scar the panel with a sharp instrument. Carefully unpack, transport and store the solar panels.
- Do not pick up or carry panels using the junction box, wires or other components. Carry the panel properly supported. Handle panels with care. Do not drop the panels.
- Inspect all solar panels for damage during transportation before installation and do not install damaged panels. Contact manufacturer or local distributor if panels arrive damaged.
- Damaged panels may affect performance and safety and may affect the warranty.
- Do not damage or scratch the surface of the panel.
- Retain the shipping boxes in case a return or warranty claim is necessary.
- Test the panel performance with a meter before installation.
- Do not disassemble or modify the solar panel.

2. Safety Precautions-Precautionary Measures



WARNING: Read and understand all safety instructions before installing, wiring, operating and/or maintaining solar panels. DC power is generated when the panel is exposed to sunlight or other light sources. Direct contact with parts of the panel when it is operating, such as terminals, whether connected or not, may result in personal injury or damage to the panel.

2.1 General Safety Considerations

All installation work must be in full compliance with local regulations and appropriate national or international electrical standards.



Use insulated tools to reduce the risk of electric shock.

Use appropriate protective measures (gloves, work clothes, etc.). Personnel must avoid direct contact with live wires at 30V DC or higher.



Do not wear metal accessories during installation to avoid damaging panels and posing a risk of electric shock.



If panels are installed or operated on during rainy, windy or damp conditions, cover the panels with an opaque material to prevent power generation to avoid injury to panels and personnel.



Children or unauthorized personnel should not be allowed to access the installation area or panel storage area.

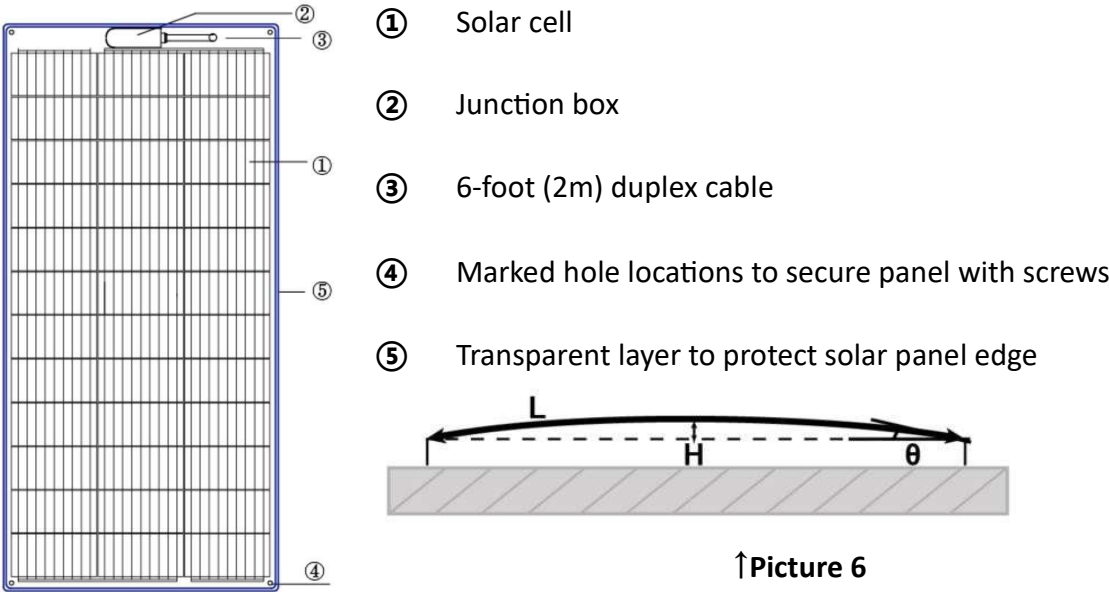
2.2 Precautionary Measures

- Ensure that the solar panels meet the overall technical requirements of the system.
- Avoid striking or putting stress on the junction box. Do not pick up or carry panels using the junction box, wires or other components. Carry the panel properly supported. Handle panels with care. Do not drop or overly bend the panels.
- Once installed, secure wires so they don't vibrate or move loosely in the wind.
- Keep the panels free of debris. Wash with water and soft cloth. Do not use harsh chemicals.
- Do not install solar panels near to flames or flammable objects.
- Do not immerse the panel in water for an extended period of time.
- Panels of different wattages should not be connected to the same charge controller.
- Do not bend panels excessively. Semi-rigid walk-on panels should not be bent more than 2-5° during installation and 2-3° for permanent installation. Always mount them on a rigid flat or slightly curved surface if they will be walked on.
- Do not apply concentrated pressure. Avoid sharp objects, chair legs, high heels, or heavy gear on panels — these can crack solar cells.
- Do not glue down the panels. Gluing the panels to a solid surface may result in delamination, panel failure, or significant shortening of the life of the panel and void the warranty.
- Install the solar panels per the instructions in Section 4.

3. Mechanical and Electrical Considerations

Semi-rigid solar panels can be walked on, are skid and corrosion resistant and are suitable for harsh environments.

3.1 Mechanical Characteristics



Note: $\theta \leq 5^\circ$, maximum bending angle less than 5° . If the panel is installed on curved surface, the angle should be less than 3° . The semi-rigid panel is designed for flat or slightly curved surfaces.

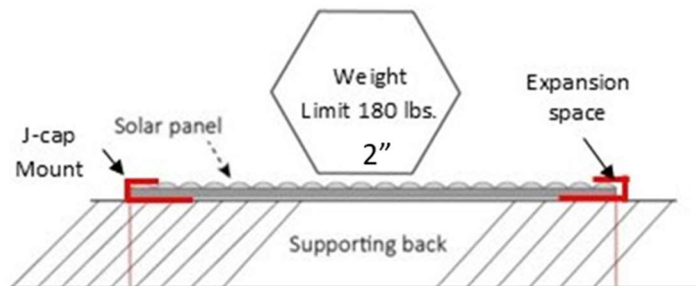
3.2 Solar Panel Loading Considerations

- Semi-rigid panels can be walked on with **anti-slip or flat soft sole shoes**. (picture 1)
- Semi-rigid panels can support a concentrated weight (minimum area of 2" x 2") of up to 180 pounds, with a rigid backing supporting the panel (picture 2). Semi-rigid panels can support a distributed weight in excess of 180 pounds if the panel has a strong rigid backing. Placing heavy objects (such as installation tools) on the surface of the solar panel during or after installation of the solar panel is acceptable. Remove all obstructions once panels are installed.
- Semi-rigid panels can be mounted on surfaces with a bending angle not to exceed 3° to conform to the shape of the mounting surface.
- Do not walk on panels that are installed on uneven surfaces.



○ ↑Picture 1

- Disconnect the panel from the controller (open the panel charging circuit) when storing gear on top of the panel. Turn off the panel when partially shading the panel with gear.



↑Picture 2

3.3 Electrical Characteristics

- **Operating Temperature[°F]:** -40/+185°F, (-40/85°C) below -40°F or over 185°F, the panel performance will decrease significantly. Keep the panel's surface within the operating temperature. A sudden big drop or rise on the panel surface temperature may shorten its lifespan. Allow the solar panel to cool off or warm up gradually.
- **Maximum System Voltage[V]:** 200 VDC; Flame retardancy: UL94 VTM-0
- The rated electrical characteristics for the solar panels are measured under standard test conditions (STC) of irradiance 1000w/m² and cell temperature 25°C. The electrical characteristics of the solar panels are displayed on the label on the back of the panel.
- In some cases, the current or voltage generated by the panel may be greater than the optimal operating current or voltage of its standard test conditions (STC). When determining solar panel ratings and load values, the panel open circuit voltage and short circuit current at STC should be multiplied by 1.25.
- The quantity of bypass diodes built into the panel will vary depending on the panel model.

4. Installation Guidelines for CMPower Impact Resistant Walk-on Solar Panels

This section is intended to provide the information needed to properly install the CMPower impact resistant walk-on panel kit for applications like boat decks, vehicle roofs and roof racks.

Background - Vehicles (Vans and RV's):

At high speeds, the air pressure between the van roof and the van rack may be elevated and the air pressure above the solar panel may be reduced. Much like an airplane wing. If the rack under the panel is not a solid material, the change in air pressure will tend to lift the panel off the rack. Also, the edge of the panel facing the front of the van which is exposed to the wind may be lifted by the air flow. Attaching the solar panel on all four corners only is not adequate and may result in loss of the panel.

Background - All Installations:

As solar panels heat up in the sun, their performance is reduced because the solar cells become less efficient at higher temperatures. In fact, a solar panel will lose up to 9% of its rated output for every 30 degrees F above 75 degrees F.

The CMPower solar panel mounting system is designed to secure the solar panel to the mounting surface and optimize panel performance by reducing the panel operating temperature. Using alternative installation techniques may void the warranty.

Components included in the kit:

1. CMPower high performance impact resistant walk-on solar panel.
2. CMPower twin wall polycarbonate underlayment sheet for strength and cooling.
3. "J" channel mounting extrusions to secure the panel and polycarbonate to the mounting surface.

Components not included in the kit:

1. Outdoor Very High Bond (VHB) $\frac{3}{4}$ or 1-inch-wide double-sided tape. We suggest a tape comparable to 3M 5952 VHB double sided tape. It is available online and at some hardware stores. One roll is required for panels 100 watts or smaller and a second roll will be required for panels larger than 100 watts.
Here is a link to a tape supplier: <https://tinyurl.com/z8nrws7p>
2. Fasteners are required if the mounting brackets are to be bolted to a vehicle or roof rack. Fastener components may include silicone sealant (optional), Rivnuts + matching bolts

and drop-in T-nuts if mounting directly to the rack crossbars through the deck panel slots or screws if mounting on a boat deck. Ensure not to over torque when fastening.

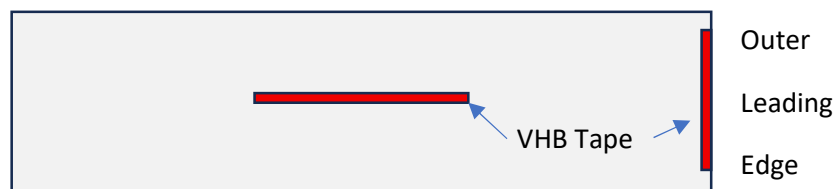
Tools needed:

1. Measuring tape
2. Pencil or marking device
3. Electric drill if using fasteners for additional security. Screwdriver, wrench
4. Volt meter

4.1 Preparation for Installation

Vehicles – Vans and RV's

1. **Test the solar panel** – Use a volt meter before beginning the installation to confirm the solar panel is operating properly. Expose the panel to the sun and place the meter probes on the positive and negative wires connected to the panel. If the panel is not producing electricity, contact your supplier or Custom Marine Products before proceeding.
2. **Create a solid surface under the solar panel** - If there are holes in the roof rack of significant size under where the panel will be mounted, we recommend covering the holes or attaching an aluminum plate securely to the roof rack to prevent the high-pressure air from lifting the solar panel assembly at high speeds.
3. **Pre-install VHB tape** - VHB tape should be used in the center of the solar panel and the polycarbonate sheet to prevent any lifting of the solar panel and the polycarbonate sheet when the vehicle is travelling at high speeds. Place a 12-inch piece of VHB tape in the center of the panel back and the polycarbonate parallel to the long edge of the panels. Peel back the release liner (protective material) covering on one side of the tape and adhere the tape to the back of the panel and to the side of the polycarbonate facing the roof rack. Leave the release liner on the other side of the tape until later in the installation process.
4. **Pre-install VHB tape** - If the panel is positioned such that the short edge of the panel is facing into the wind when the vehicle is in motion, install VHB tape in the center of the back of the solar panel along the outer leading edge. Do the same for the polycarbonate sheet using the same technique as in step 2 above.



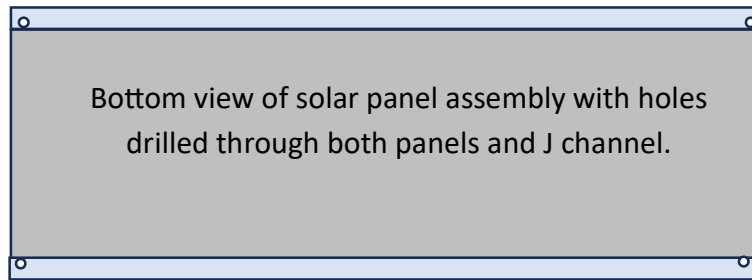
VHB Tape Position on the Solar Panel and Polycarbonate Sheet

5. **Pre-layout and hole preparation** - (If fasteners are to be used to fully secure the solar panel)

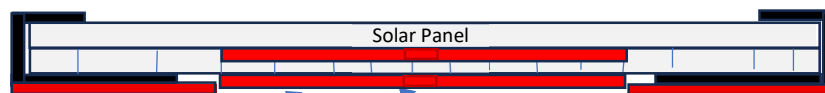
Assemble the CMPower solar panel kit by placing the solar panel over the polycarbonate and sliding on the J channels on each side. Position the assembly on the roof or van rack. Check fit.

Drill a proper size hole to accommodate the fastener through the solar panel, the polycarbonate, the J channel and the van rack. If the solar panel has grommets in the corners use the grommet hole to position the drill so the fastener will go through the grommet. **If the panel does not have grommets, drill holes only in the panel corners where marked (typically 9/16" from the edge). Drilling elsewhere will void the warranty. Holes may not penetrate the full edge of the J channel. This is okay.**

Install Rivnuts in the roof deck panel OR use T-nuts if holes align with the deck slots/crossbar channels.



6. **Pre-install VHB tape on J channels** - Clean the J channel back with alcohol or equivalent to ensure a tight bond. Apply 1" strips of VHB double sided tape to the back surface of the J channel that will be against the roof rack. Pull off about a 4-inch section of the protective tape covering (release liner) and press the tape against the J channel. The tape should be even with the outside of the J channel and will extend past the J channel back a bit. Continue for the full length of the J channel. Repeat on the second J channel and a short J channel if used on the leading edge. Punch holes in tape.

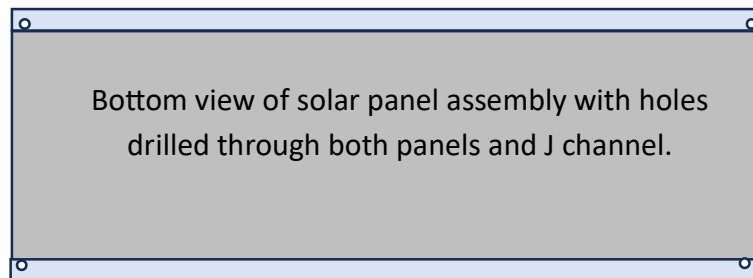


Van Rack Solar Panel Kit Assembly Ready for Installation

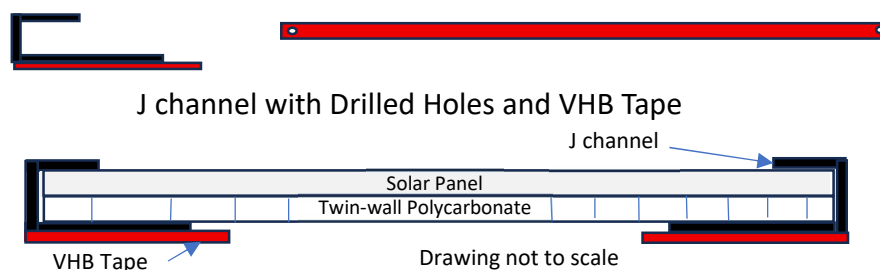
Marine – Boats

1. **Test the solar panel** – Use a volt meter before beginning the installation to confirm the solar panel is operating properly. Expose the panel to the sun and place the meter probes on the positive and negative wires connected to the panel. If the panel is not producing electricity, contact Custom Marine Products before proceeding.
2. **Pre-layout and hole preparation** - (If fasteners are to be used to fully secure the solar panel)

Assemble the CMPower solar panel kit by placing the solar panel over the polycarbonate and sliding on the J channels on each side. Position the assembly on the deck. Check fit. Drill a proper size hole to accommodate the fastener through the solar panel, the polycarbonate, the J channel and the deck if appropriate. If the solar panel has grommets in the corners use the grommet hole to position the drill so the fastener will go through the grommet. **If the panel does not have grommets, drill holes only in the panel corners where marked (typically 9/16" from the edge). Drilling elsewhere will void the warranty. Holes may not penetrate the full edge of the J channel. This is okay.**



3. **Pre-install VHB tape on J channels** - Apply 1" strips of VHB double sided tape to the back surface of the J channel that will be against the mounting surface. Clean the J channel back with alcohol or equivalent to ensure a tight bond. Pull off about a 4-inch section of the protective tape covering (release liner) and press the tape against the J channel. The tape should be even with the outside of the J channel and will extend past the J channel back a bit. Continue for the full length of the J channel. Repeat on the second J channel and a short J channel if used on the leading edge. Punch holes in tape.



Solar Panel Kit Assembly Ready for Installation

4.2 Solar Panel Installation Instructions

1. Position the solar panel assembly on the mounting surface.

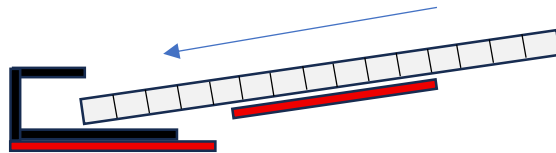
Assemble the CMPower solar panel kit by placing the solar panel over the polycarbonate and sliding the J channels on each side. **Position the assembly lining up all holes if fasteners are to be used.**

2. Draw a line along the edges of the J channel and mark each end position.
3. Install the first J channel mount.

Clean the area on the mounting surface where the tape will adhere to using alcohol or equivalent solvent. Clean the areas for both J channels. Peel off the release liner from the VHB tape and carefully position the J channel on the mounting surface using the markings from step 2. Press firmly on the J channel to ensure a strong bond.

4. Slide the twin-wall polycarbonate panel into the J channel.

Remove the release liner from the tape in the center of the polycarbonate panel and on the leading edge of the polycarbonate panel (if used). The polycarbonate panel will adhere to the protruding VHB tape on the J channel so carefully slide the panel in at an angle and then lower onto the mounting surface.



5. Slide in the solar panel between the top of the J channel and the polycarbonate.

Remove the release liner from the tape in the center of the solar panel and on the leading edge of the panel (if installed). Slide the solar panel in at an angle and then lower onto the polycarbonate panel.

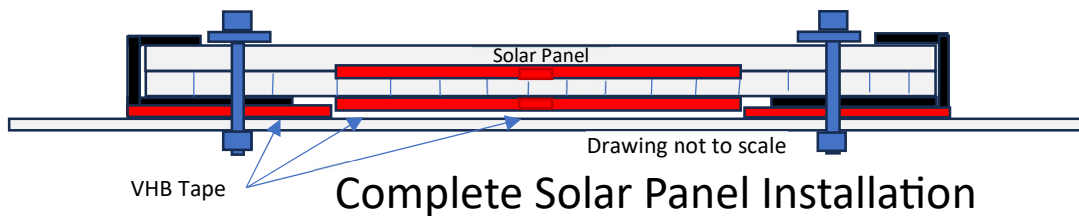
6. Install the second J channel mount.

Peel back the release liner about 3 inches and fold so the liner sticks out beyond the outside of the J channel. This will act as a pull tab. Slide the J channel onto the solar panel and polycarbonate. The VHB tape extending beyond the back of the J channel will make this a bit tricky so approach the panel with the J channel raised at an angle. Two people may be required for this step.

Important: Allow about 1/8th of an inch between the panel and the inside of the J channel to accommodate panel expansion.

With the J channel in place, pull the release liner tab carefully while holding the J channel in position. Once the release liner is fully removed, press hard on the J channel to secure the J channel to the mounting surface.

7. Apply pressure to all areas where the VHB tape is used to firmly adhere the panels to the mounting surface.
8. If using fasteners - Install fasteners to each corner of the solar panel using the holes drilled in the preparation section. If the panel does not have grommets, use an appropriate size washer with the fastener. Applying a silicone sealant around the fastener to assure proper sealing is optional but should be considered. Secure each fastener.
9. Secure the solar panel wire tightly against the mounting surface so that it will not vibrate in the wind.

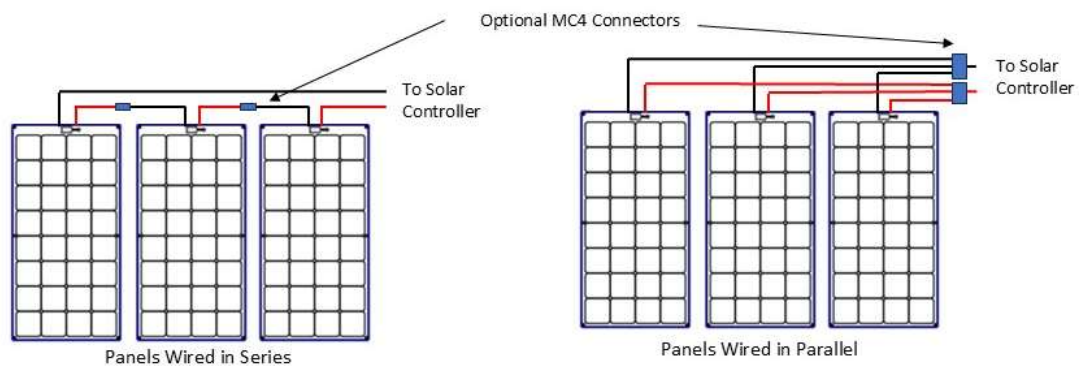


VHB Application Tips:

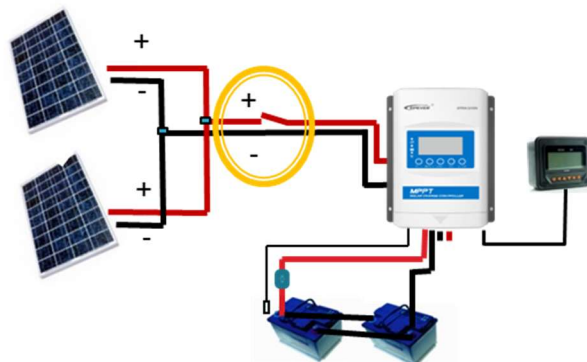
- Clean surfaces with a 50:50 mix of isopropyl alcohol and water.
- Ensure surfaces are fully clean and dry.
- Apply tape, then press firmly with a roller or by hand. The bond will achieve 50% strength in 20 minutes, 90% after 24 hours, 100% after 72 hours.

4.3 Solar Panel Wiring Considerations

- Check that the wiring is correct before activating the system. If the measured open circuit voltage (Voc) and short circuit current (Isc) are not within 20% of the specifications provided on the label on the back of the panel, there may be a wiring fault.
- Arrays with panels wired in series will increase voltage (add the voltage of each panel). Arrays with panels wired in parallel will increase current (add the current of each panel).
- In series connection, the positive pole of the panel is connected to the next negative pole. In parallel connection, the positive terminal of the panel is connected to the positive terminal of the next panel.



- Place a switch or breaker on the positive wire between the panel and the solar controller.
Use a DC switch rated for the array's amperage or a circuit breaker at least 5 amps higher than the array's maximum rated amperage. This allows you to safely shut down the array when shaded by gear, trees, or during maintenance. The breaker can also be used to shut down the solar system if the alternator is prematurely going into float mode because it is seeing a higher voltage due to the solar input.



Solar Panel Wiring Considerations - continued

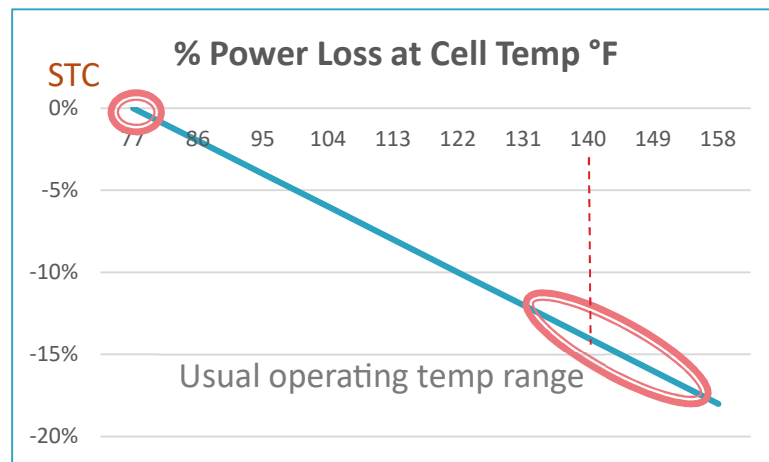
- If overcurrent protection devices (fuses) are not used in-line within each string of panels, maximum 2 strings of panels can be connected in parallel. If a suitable validated overcurrent protection device(fuse) is connected in-line with each string of panels, 3+ panels can be connected in parallel. If the system current in parallel is greater than the solar panels' maximum series fuse rating (this data can be found on label stickers put on back of solar panel), individual fuses (10 amp) should be placed in the positive line of each panel before the parallel connection to prevent damage from overcurrent.
- If the circuit breaker and overcurrent protection circuit breaker cannot be turned on, or controller cannot be turned off during solar panel installation or wiring, cover the array panels with opaque material to stop the power output.

5. Factors Affecting Solar Panel Performance

There are five primary factors contributing to solar panel performing below its published rating (in watts). Lack of performance is likely a combination of these factors.

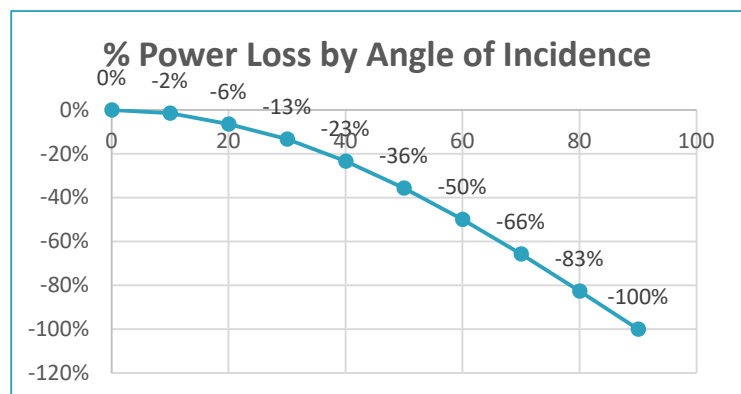
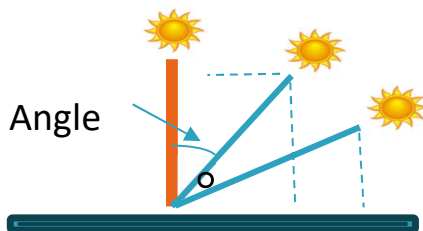
- 1. Temperature** - Solar panel performance decreases as the temperature of the solar cells increases.

The rated capacity of a solar panel in watts is based on its capacity under Standard Test Conditions (STC). The cells of the panel typically operate much warmer than STC (77F).

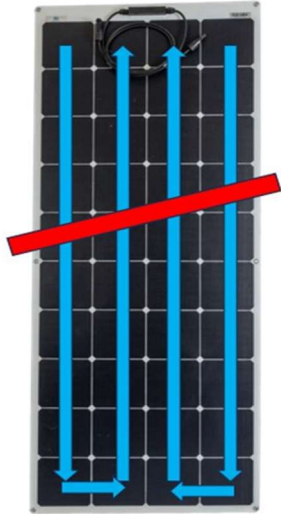


For every 10°F above 77°F the solar cells will have a ~2.2% power loss.

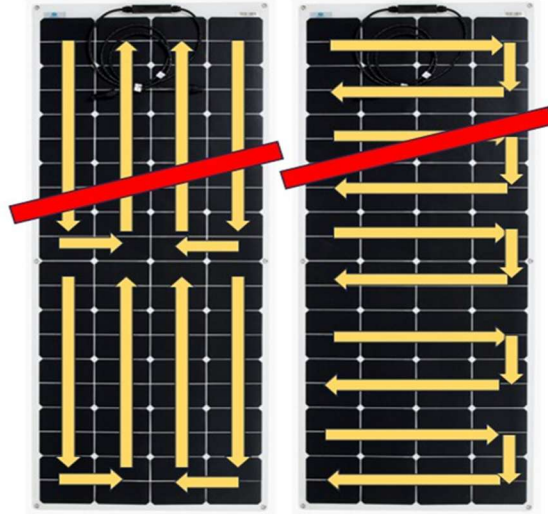
- 2. Sun Angle** - Solar panel performance decreases at less-than-optimal sun angles of incidence.



- 3. Shading** – Solar panel design is critical to mitigate shading. CMPower Shade Tolerant (ST) panels will have considerably higher performance in shading conditions (up to 40% more power generation).

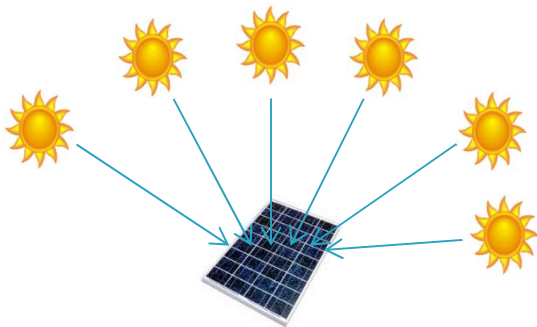


Typical Solar Panel with 2 series strings of solar cells.
Loss of Power: 40-80%



Shade Tolerant Solar Panel with 4+ series strings of solar cells.
Loss of Power: 10-30%

- 4. Quality of the Solar Cells** - The quality of the solar cells used in a solar panel will have a direct effect on the overall performance of the panel.



Average equivalent sun hours in a typical day

– 5 to 6 hours –

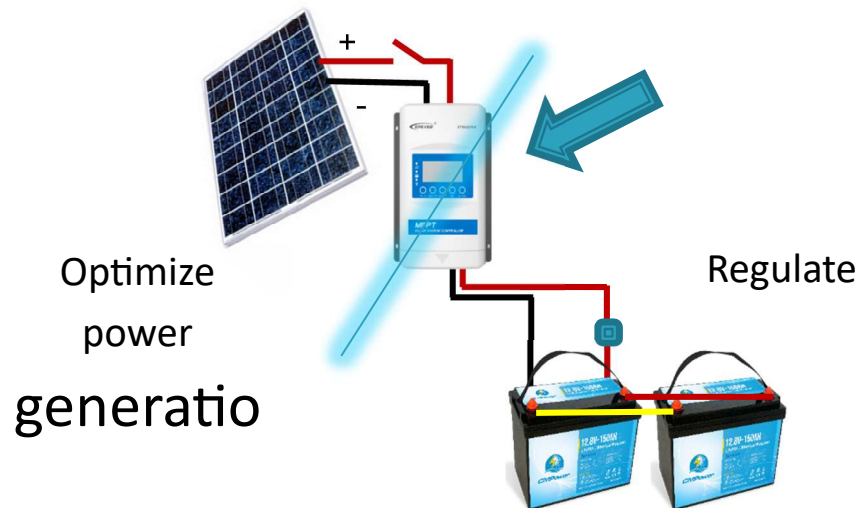
It's all about **watt hours**

Higher performance solar cells produce more power at sub-optimal sun angles than lower performance solar cells - up to 30% more power.

5. Battery Bank's ability to accept the solar charge –

The solar controller will pull power from the solar panel based on the how much power the battery bank will accept.

A fully charged battery bank, for example, will not accept a solar charge and thus the solar panel may produce only a minimum amount of power to trickle charge the battery bank. The hungrier the batteries, the more solar power they will accept.



	Example
• Solar cell temperature	-14%
• Sun angle of incidence	-13%
• Shading	<u>-15%</u>
	-42%

Solar cell quality will affect all performance factors.

6. Maintenance

Inspect all components regularly to ensure long-term safety and performance. Every 3–4 months, recheck the following:

- **VHB Tape Bond:** Verify that all adhesive joints remain secure and fully bonded. Look for any peeling, lifting, or signs of separation, especially at the channel edges or where exposed to heat and UV.
- **Bolts and Fasteners:** Confirm that all hardware is tight and torqued correctly. Retighten any loose bolts and apply thread locker if needed.
- **Panel Alignment:** Ensure the solar panel and polycarbonate sheet remain flush and evenly supported within the J-channels.
- **Routine maintenance measures** should be taken to keep the solar panel free of sun blocking obstacles such as snow, bird droppings, seeds, pollen, leaves, branches, dust, stains, etc.
- If the assembly has sufficient tilt angle (at least 15°), it is usually not necessary to clean the surface (ETFE surface can clean itself under rain). If there is significant dirt on the surface, flush the solar array with water (do not use detergent) and a soft sponge or cloth during the day when it is cool. Do not scratch or wipe the dust in a dry condition as it may cause minor scratches.
- The system should be inspected regularly to ensure that the wiring and support structure are intact.

7. Troubleshooting

If your solar system is not producing the power it is designed to produce, there are four areas to evaluate to determine the probable cause of the lower-than-expected performance. The four areas are:

1. The solar panels
2. The solar system wiring (most common issue. (Fuses, wiring, MC4 or other connector failure)
3. The solar controller
4. The batteries connected to the solar system

Below, we will set forth the potential causes of underperformance in each area and suggest a methodology for trouble shooting that area. The tools you will need are a meter that will measure both voltage and amperage, a small screwdriver and perhaps wire cutters.

Factors affecting Solar Panel Performance

The factors affecting solar panel performance are highlighted in Section 5.0

In addition to the factors listed in Section 5.0, another common reason for solar panel underperformance is loose or corroded wires somewhere in the system. Possibly a blown fuse. We have had customers with failed connectors (MC4 or others) who have snipped them off and replaced the connectors and performance went back to 100%.

In summary, sun intensity, sun angle, temperature of the panel cells, state of charge of the batteries, quality of the solar cells and the condition of the system wiring are all factors related to panel performance.

7.1 Troubleshooting the solar panels and the wiring from the controller to the solar array.

In this operation, we will start at the controller and work our way up the wires to the individual solar panels to determine if there is a failure in the system. Do the following in full or nearly full sun.

1. Disconnect the PV solar wires entering the solar controller. Place a meter on the two wires and confirm positive and negative and measure the voltage and amperage (V and A). If the V and A are as expected, the reason for system underperformance is likely

from the controller to the battery bank. If the V and A are below expectations, move up the system to where the panels are joined with a MC4 T-branch or busbars. Check the V and A at this point. If it is below expectations, disconnect each panel in the array and test the V and A of each panel individually. If the panels are performing within 20% of spec, the problem may be in the wires between the panels and the controller. MC4's connectors do corrode or fail on occasion. If used, check the MC4 connectors carefully and replace them if they are suspect. If one or more panels measure below expected V and A, contact CMP for support. The panel may need to be repaired or replaced.

2. Reconnect the system step by step and verify performance and each point in the system.

7.2 Troubleshooting the battery bank connections.

If the solar array is performing as expected at the controller, the next step is to test the wiring from the controller to the battery bank.

1. Disconnect the wires from the controller that are going to the battery bank. Put a meter on the wires to confirm the controller is getting power from the battery bank. If it is not receiving power, inspect the fuse in the positive line at the battery bank and inspect the terminal connections at the battery bank.
2. Notes:
 1. Be sure the wires from the controller are of sufficient capacity to handle the power coming from the controller. #8 or #6 is often appropriate for this wire run.
 2. Even if there is no power coming from the battery bank to the controller, the controller will often light up using power from the solar array. The controller is actually powered by the battery bank and if this connection is faulty, it will not allow full power from the solar panels.
 3. The controller requires at least 10 volts from the battery bank to function. If the battery bank is below 10 volts (20 volts for a 24-volt system) the controller will not operate and no power will be generated by the solar array.
3. If the power to the controller is appropriate and solar panels are producing power, the problem may be with the controller.

7.3 Troubleshooting the solar controller. Try rebooting the controller.

1. Disconnect all wires from the solar controller and let it set for 20 minutes.
2. Reconnect the wires from the battery bank first.
3. Reconnect the wires from the solar array second.
4. Give the controller 15-20 minutes to reset and find the maximum power point of the array.
5. If it is determined the controller is not functioning, contact CMP or the controller manufacturer.

7.4 Troubleshooting the battery bank.

Older batteries lose their ability to accept and hold a charge. If they are full or not accepting a charge, there is no place for solar energy to be stored so the controller will back off the solar power.

1. Check the water level in lead acid batteries.
2. Connect the solar controller to a different battery and see if the system produces power.
3. If the battery bank is having difficulty holding a charge, it is likely the battery bank is not accepting a charge.
4. Have the batteries tested for capacity and health.
5. If the batteries are LiFePO₄ batteries, it is possible the batteries have gone into a sleep or protection state and will not accept a charge. Often these batteries can be awakened by applying a load or applying a charge with a “dumb” charger. This is a charger that does not require battery voltage reading to initiate a charge. A trickle charger will often awaken the batteries.

8. Warranty

Custom Marine Products CMPower Solar Panel Limited Warranty

CMPower solar panels are warranted for 5 years prorated at a sliding scale, 100% first year, 80% second year, 60% third year, 40% fourth year, 20% fifth year. Custom Marine Products (CMP) reserves the right to replace, refurbish, or provide a refund for a failed or defective solar panel.

The CMPower 5 year prorated solar panel warranty is valid only if the panels are mounted as specified in the CMPower Installation Guide or mounted using another method pre-approved in writing by Custom Marine Products. Improper solar panel mounting could avoid the warranty.

The twin wall polycarbonate sheet may be discarded if pre-approved by Custom Marine Products. Smaller J channel mounts that will accommodate only the solar panel will be necessary. These are available by special order.

If solar panel replacement is appropriate, the limited warranty includes replacement of a failed or defective panel one time once the requested documentation is promptly received. CMP does not cover labor or any other associated costs for warranty replacements. Within the warranty period CMP will replace (at 100%, 80%, 60%, 40%, 20%) or repair the product and/or parts of the product if it is determined to be defective in material or workmanship.

This warranty applies to the original owner only.

Custom Marine Products (CMP) has no obligation under this Limited Warranty for products subjected to the following conditions (including but not limited to):

- Damage due to improper installation; loose or improper connections, under-sized cabling, incorrect series (maximum of 4 panels) or parallel connections (maximum of 6 panels), reverse polarity connections or insufficient space for airflow.
- Improper installation including an installation that does not comply with Custom Marine Products Installation Manual or any other instructions included with the solar panels, and all national, state, and local laws, codes, ordinances and regulations.
- Environmental damage such as inappropriate storage conditions as determined by CMP, exposure to extreme hot or cold temperatures, fire or freezing, water damage, impact, or collision.
- The solar panel was not stored in compliance with CMP instructions.
- Damage due to improper operation or maintenance such as lack of cleaning resulting in corroded terminal connections or build-up of dirt, debris, organic matter, fossil fuels, or chemicals on the panel. Damage from people, insects, animals, or chemical exposure.

- Product that has been modified (including but not limited to sewing, drilling) or tampered with or repair has been attempted.
- Product that was used for applications other than those which it was designed and intended for by CMP or product that is under-sized for the application. Damage due to significant impact, force or other events outside Custom Marine Products' control.
- Damage due to natural disasters such as, but not limited to, power surges, power outages, acts of war, tornados, hurricanes, lightning, flood, lava flow, ash or fire.

Disclaimer: By installing this product, the user assumes full responsibility for correct installation, maintenance and use. Custom Marine Products expressly disclaims all liability for any damage, injury, or loss resulting from improper installation, misuse, inadequate surface preparation, insufficient adhesion, or failure to follow instructions. Use of this system constitutes acceptance of these terms and a waiver of all claims against Custom Marine Products and their affiliates. It is the user's responsibility to ensure secure adhesion and fastener integrity prior to operating the vehicle.

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