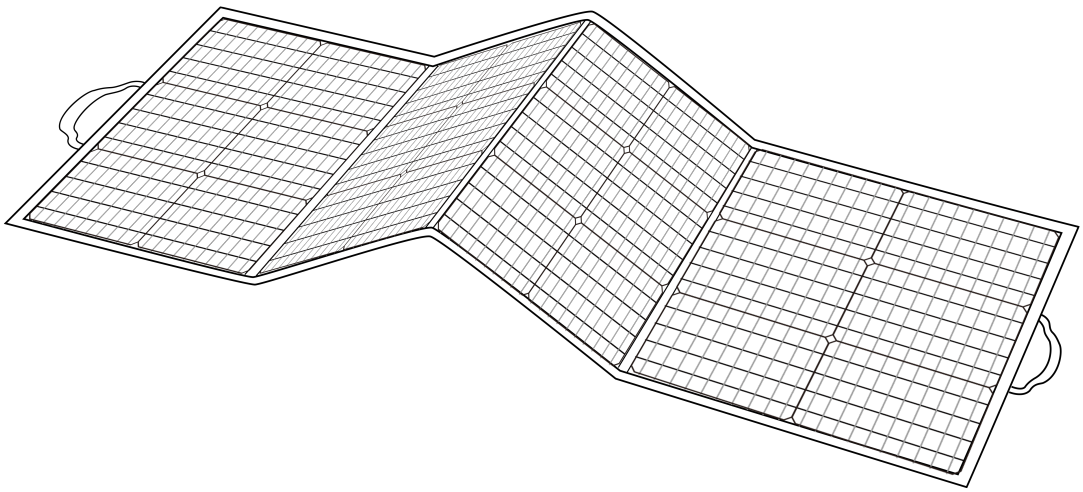
MHPOWOS



220W 40V Portable Solar Panel
Model: MH-SP-002-40V
User Manual

Specifications

Model	220W
Open Circuit Voltage (Voc)	48V
Short Circuit Current (Isc)	6A
Maximum Power Voltage (Vmp)	40V
Maximum Power Current (Imp)	5.5A
Solar Energy Conversion Rate	23.5%
Operating Temperature	-20°C~60°C（-4°F ~ 140°F）
Folded Size	59.6 x 54.0 x 5.8cm 23.5 x 21.25 x 2.3inch
Unfolded Size	216.3 x 59.6 x 2.8cm 85.2 x 23.5 x 1.1inch
Weight	8.5kg / 18.73lb
WeigMaximum System Voltageht	70vDC

All technical data at standard test condition (STC: E=1000W/m2 TC=25CAM=1.5)

Usage Method

1. Unfold the solar panel and place it in direct sunlight. Adjust the solar panel to ensure that the light source is perpendicular to the panel's surface, achieving optimal charging efficiency.

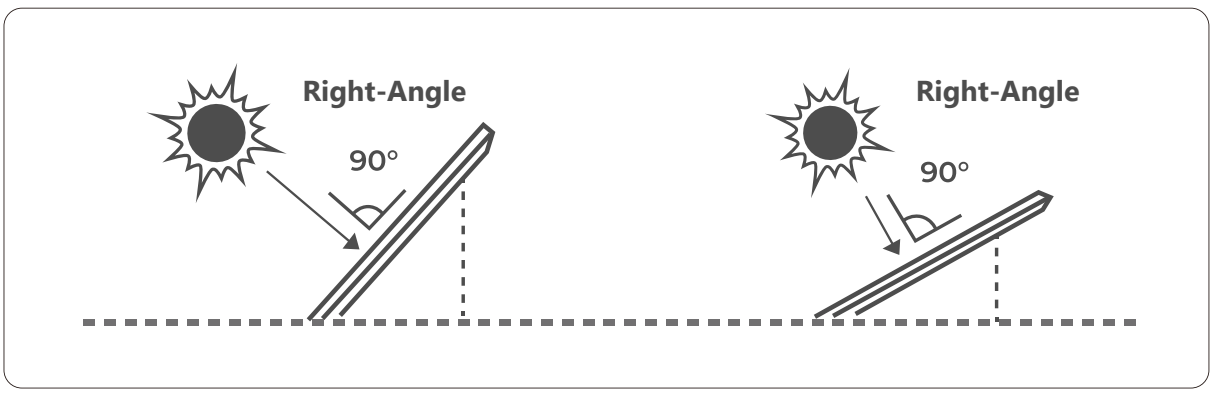


Diagram of the angle between sunlight and solar panel surface

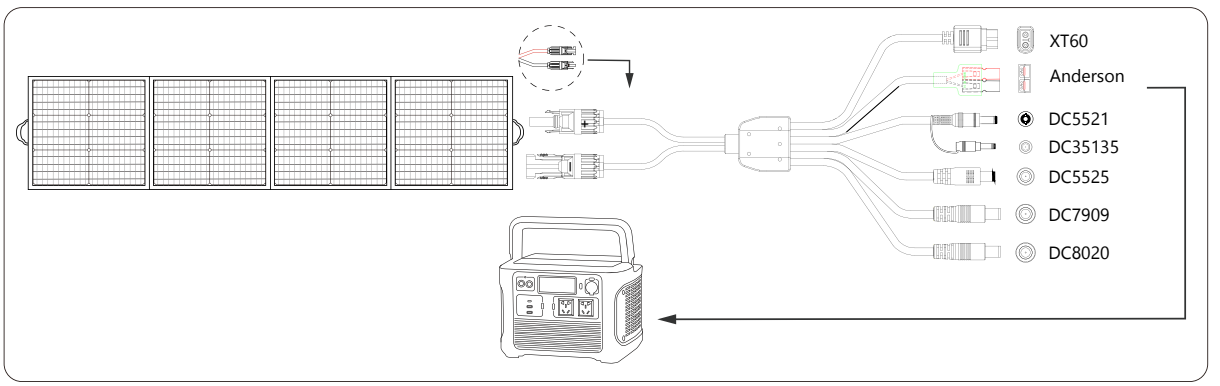
2. The solar panel must be exposed to direct sunlight with no obstructions on its surface. Please use it under clear sunlight without clouds, trees, or buildings blocking the sunlight.

3. Please use a suitable solar cable and appropriate adapters to connect the solar panel to your energy storage unit or other electrical devices. Solar panel and power station connection instruction.

(1) Connect the MC4 cable to MC4 interface on the solar panel.

(2) The output MC4 cable includes connectors of XT60/Anderson/ DC5521/DC5525/DC7909/DC8020/DC35135.
Please choose the appropriate connector to connect to your power station for charging.

(3) Please ensure that all connection cables, adapters and ports are securely attached to ensure proper charging.You can check the charging status through the display screen or indicator lights on your power station.

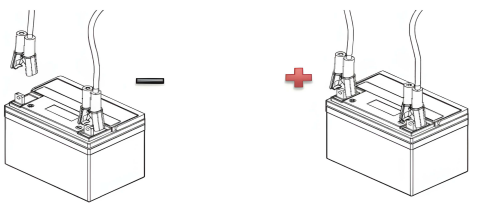


Solar panel and power station connection diagram

Other Uses

1. Charge the 12V battery with battery alligator clips (Recommended for use with solar controllers)

Attention: Be sure all polarities are wired correctly, “+" for positive/"-" for negative.



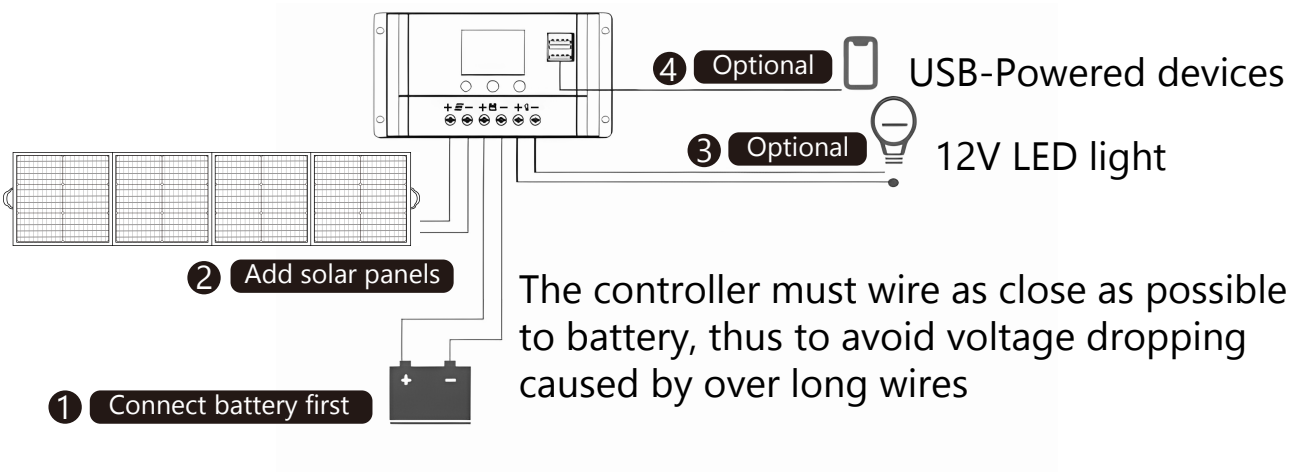
* In the emergency case that we meet a starting problem, we suggest to charge the battery with this kit for 2-3 hours only, for longer charging, please add a solar regulator, otherwise, the batteries will be damaged from overcharging without regulation.

* Disconnect the clip-on cable from your car battery before starting the engine as electrical surge from car engine may damage the solar charger.

2. Charging for DC devices including USB-Powered application such as portable external battery pack, car on-boarded device like car fridge, 12V LED light, etc.(Recommended for use with solar controllers)

* An appropriate solar controller/regulator must be placed between the solarkit and your battery, connect all components according to controller /regulator's instructions.

* High power electrical system (12V battery group) pose dangers and it is the user's responsibility to be familiar with these dangers and take any necessary action to ensure safe use.



Safety Tips

1. Please avoid dropping, placing heavy objects, puncturing, throwing, or bending the solar panel to prevent damaging the monocrystalline silicon cells within it and affecting its performance. Any damage caused by external forces will result in the warranty being voided.

2. Never attempt to disassemble or modify the solar panel, as this may lead to unforeseen issues.

3. Regularly clean the solar panel by gently wiping it with a damp cloth. Do not use corrosive liquids to clean the solar panel, and avoid using high-pressure water jets, as excessive pressure might damage the solar panel.

4. Do not use or store this solar panel near fire or heater. During recharging, keep your portable power station away from heat and direct sunlight to extend its life span.

5. Do not use this product as a children's toy.

Frequently Asked Questions

Q: What factors may affect the solar conversion rate?

1. The weather condition.

2. Working environment temperature.

3. The length of solar panels.

4. The angle from the panels to sunlight.

Q: How to decide the number of panels required to recharge?

1. The output power of solar panels should fit the recommended voltage.

2. The max open circuit voltage is not able to exceed in the max input voltage of power station.

3. The gross output current of solar panels should be between the commended working voltage.

When using multiple solar panels in series or parallel, please make sure that the accumulated maximum voltage and current of the solar panels does not exceed the maximum voltage and current of the power station.

Q: What's the difference between the nominal output power of the solar panel and the actual charging power?

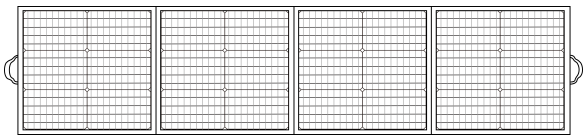
1. The nominal output power is measured under STC (Standard Test Conditions), which involve a surface temperature of 25°C, air mass of 15, and solar intensity of 1000W/m² — a globally recognized standard for ground solar panel testing. This is an idealized testing environment and may significantly differ from actual usage conditions.

2. Nominal output power is directly proportional to the power and quantity of solar cells used in the solar panel. Therefore, different models of solar panels may have different nominal output powers, and there is no direct one-to-one relationship with actual charging power.

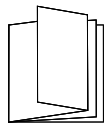
3. Actual charging power is influenced by multiple factors, including the output parameters of the controller, sunlight intensity, the orientation and angle of the solar panel, environmental temperature, air mass, charging protocols, cable quality, and the maximum charging power supported by the connected devices. Additionally, some devices may accept different power levels at various stages of charging (for example, some appliances may reduce charging power when the battery level exceeds 50% to protect the battery). In summary, nominal output power represents the theoretical maximum output of the solar panel under ideal conditions, as measured in the standardized STC environment. Actual charging power, on the other hand, is influenced by various practical factors and may be lower than the nominal output power.

Packing List

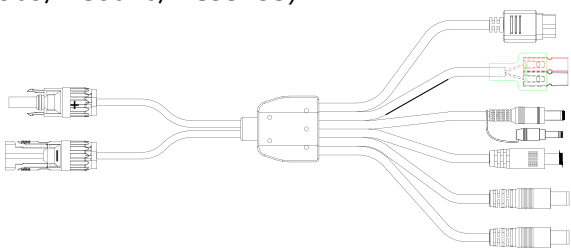
❶ 220W Solar Panel*1



❷ User Manual*1



❸ A Solar cable with MC4 connector to connectors of XT60/Anderson/DC5521/ DC5525/DC7909/DC8020/DC35135)*1



Warranty Policy

We provide a 18 months warranty service for this product. Within 18 months from the date of purchase, if your solar panel experiences faults under normal usage, you can apply for warranty with your purchase receipt.

The following situations are not covered by the warranty:

1. Cosmetic flaws caused during use.
2. Product malfunctions resulting from self-disassembly, repairs, or human-induced causes.
3. Damages caused by natural disasters, thunderstorms, accidents, and other uncontrollable factors.

Warranty Application Process:

1. Please contact our customer service team, providing the purchase receipt and a detailed description of the issue.
2. Our customer service team will assist you in submitting the necessary information and documents.
3. After confirmation, we will provide you with an appropriate warranty solution.

If you have any questions or need assistance, please feel free to reach out to us via the following email or website:
Email: support@mhpowos.com
Website: www.mhpowos.com