

40W (20W+20W) 12V / 24V solar charging kit with 10A automatic solar charge controller

Dear Customer,

Thank you very much for choosing **Photonic Universe** products! This manual explains installation of your solar kit and answers some frequently asked questions. Please read this manual carefully before installing the system.

Remember, all work should be carried out by an appropriately qualified person. Precautions and safety measures should be taken in all cases.

Contents of the package

No	Item	Quantity
1	20W polycrystalline solar panel with 2m cable	2
2	10A 12V / 24V automatic solar charge controller	1
3	5m battery cable	1
4	Instruction manual for the solar kit	1

Installation of the solar kit

- 1) This solar charging kit can be used for either 12V or 24V battery systems. Before you install the solar kit, please make sure that your battery is not over discharged. The voltage of your battery should be:

- For 12V battery at least 6V
- For 24V battery at least 18V

If your battery is discharged, please charge it by other means before installing the solar kit.

- 2) Connect your battery to the solar charge controller using the 5m cable supplied with the kit:
 - On the solar controller end, fix bare ends of the cable using screw terminals
 - On the battery end, use your battery clamps (or screw terminals if available)

When you connect the battery to the controller, the Battery LED light should switch on. This means the controller successfully detected the battery and recognised its voltage.

Red LED light next to the settings button indicates that the load terminals are switched On. Pressing the settings button switches them Off/On.

- 3) Connect the solar panels together and then to the solar terminals of the solar charge controller. Note that connection of 2 solar panels depends on the battery voltage:

- for charging a 12V battery or 12V battery bank: solar panels should be wired in parallel ("+" to "+", "-" to "-") and then connected to "+" and "-" solar terminals of the solar controller respectively

- for charging a 24V battery or 24V battery bank: solar panels should be wired in series: "+" of one panel is connected to "-" of the other panel, and the remaining "+" and "-" leads connected to "+" and "-" solar terminals of the solar controller respectively

If the solar panels are exposed to some daylight / sunlight, PV LED light on the solar controller should switch on. This means the controller started charging your battery.

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- 4) It's not necessary to connect anything to the load terminals of the solar controller. Your loads or appliances can be connected directly to your battery. However, connecting the load to load terminals of the controller will enable the discharge automatic cut off function: i.e. if your battery is getting over discharged, the controller will cut the load off automatically to prevent damage to your battery.

*Note: if load is connected to the load terminals of the controller, its maximum current drawn from the battery should be **less than 10A** at all times.*

- 5) For more information on how to operate the solar charge controller, including battery type settings, please read the instruction manual for the solar charge controller.

Common positive / negative ground of vehicles and boats

Most vehicles (including motorhomes and caravans) and boats typically have a common ground connection when the vehicle body (or boat hull) is used as a shared connection point by the engine, generator, battery, lights and other system components. When installing the solar kit on such vehicles / boats, please pay attention to the following recommendations.

To avoid any short circuits or conflicts between you vehicle / boat system and the solar kit system, you should never ground the solar panels (i.e. never connect them to your vehicle body / boat hull). Solar panel cables should be fully electrically isolated from your vehicle body / boat hull and should be connected directly to the solar controller.

Similarly, if you are using the load terminals of the solar controller, your load should be fully electrically isolated from the vehicle body / boat hull and should be connected directly to the solar controller.

Charging the battery by the engine / alternator / other chargers

If required, your battery can remain connected to the vehicle / boat system or another charging source even if the solar charging kit is connected to it at the same time. It should not cause any interference with the solar charge controller except when you are charging the battery by the engine / or when the other charging source is switched on. In such cases the following might happen:

- The voltage at the battery terminals will increase due to the alternator / or the other charger
- The solar charge controller will treat this as if the battery was fully charged and will cut the solar panel off temporarily (or reduce its output) to prevent overcharging of your battery
- When you stop charging by you engine / or the other charging source, the solar kit will resume charging automatically.

Frequently asked questions

Q. What type of batteries can be used with this kit?

A. Any sealed, gel or flooded 12V or 24V DC battery with capacity larger than 20Ah (12V) or 10Ah (24V).

Q. Can the kit charge two batteries connected in parallel?

A. It's possible but only for batteries always wired together as a single battery bank. Batteries should have the same voltage, type and capacity.

Q. Is there any risk that the solar kit will overcharge my battery?

A. The solar charge controller has a built-in overcharge protection – it will ensure that your battery is not overcharged.

Q. Can I leave the solar kit connected to the battery overnight? I heard that power might flow back into the solar panels and discharge the battery.

A. The solar charge controller will prevent any reverse power flow, so your battery will not get discharged during the night.

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Q. I need to shorten / extend the solar panel cable. Is this possible?

A. Yes, it's possible. If you are extending the solar panel cable please make sure you use cable with the same cross section and your connections are secure (soldering is recommended) and well isolated.

Q. Can the solar kit be used for positive / negative ground vehicles / boats?

A. Yes, the solar kit can be used in both positive and negative ground vehicles and boats. As per the above note, please make sure that the solar panels (and the load if you use the load terminals of the solar controller) are fully electrically isolated from the body of your vehicle / boat hull.

Q. What is the difference between polycrystalline and monocrystalline solar panels?

A. The difference relates to the process of solar cells manufacturing rather than product characteristics. Monocrystalline solar panels can use the space slightly more efficiently, but polycrystalline solar panels perform slightly better in hot weather conditions. The difference is not significant.

Q. I want to have more solar power and charge my battery faster – can I upgrade the solar kit?

A. You can easily upgrade this kit from 40W to 60W (for 12V battery system) or to 80W (for 24V battery system) by adding similar 20W **Photonic Universe** solar panels to your solar charge controller. The maximum input solar power your solar controller can accept is 160W for 12V battery system / 320W for 24V battery system.

If you need technical help with upgrading your solar kit please contact **Photonic Universe** using the contact details below.

Troubleshooting

- Make sure your battery is not over discharged. Disconnect any load which might be drawing power from your battery (also disconnect your battery from the system of your vehicle / boat).
- Check all connections to ensure they are secure and clean
- Check polarity of the battery connection and solar panel connections
- Ensure the solar panels are exposed to sufficient light – ideally position them to face the sun
- For more information refer to the Troubleshooting section of the solar controller manual

Warranty

This product is covered by the solar panel workmanship warranty (assembly and wiring) and solar controller warranty for the period of 1 year after purchase. This warranty is provided by Photonic Universe Ltd – we will repair or replace any products with defects at our discretion.

Disclaimer



Working with electricity and batteries can be dangerous. The information provided in this manual is for general guidance only. All work should follow the safety standards and should be carried out by an appropriately qualified person.

Photonic Universe Ltd is not responsible for any damage or injury caused by inappropriate installation or use of the product.

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