5A Mini Waterproof Solar Charge Controller by Voltaic Systems

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Product Summary

The 5A Mini Waterproof Solar Charge Controller by Voltaic Systems was selected for its simplicity, size, and waterproofing. Perfect for charging 6V and 12V sealed lead acid batteries (SLA), it utilizes a 3-stage charge system of bulk, absorption, and float, which incorporates overcharge protection. In addition, it has load output wires with built-in over-discharge protection and auto-restart.

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To make it even easier to get your project started, a female 3.5x1.1mm connector is provided to link up with any Voltaic solar panels.
5A Mini Solar Charge Controller Set-up / Pairing
To use this charge controller you'll need a 6V or 12V sealed lead acid battery. These are the small back-up or UPS batteries. You should not use an AGM or gel battery with this controller since it does not limit current and the preset charge voltages in the charge controller are not ideal for those 2 types. In addition, you will need a properly sized solar panel. It needs to have a operating voltage greater than the voltage of the battery, preferably 1.5x greater at least (ie 18V for a 12V battery). For example, for charging a 12V battery, you can pair the Voltaic 17 Watt/18V panel] or **9W/18V panel**, or three (3) of 6V panels wired in series like the Voltaic 9W], 6W, 3.5W, 2W, or 1W] panels. Use the **Voltaic 3-Panel Circuit Box** for easy wiring.
Solar modules up to 90 Watts from other manufacturers can easily be used with this controller too.

Observe Battery Specifications

An important thing to keep in mind is the max charge current of the battery. In-house we have a UB645k 6V SLA which has a max charge current of 1.35A, as well as a ExpertPower EXP1270 which has a max charge current of 2.1A. Because this controller cannot know what that limit is, it's important to make sure your solar panel will not supply greater current than the amount specified by the battery manufacturer.

Connecting The Controller

Connect the battery to the controller first. Then connect the solar panel. If you have a load, connect that last.

Solar input Connector : Female 3.5 x 1.1 (fits the Voltaic solar panel cable, but we can provide an edit to fit any other solar panel.

Output & Load Connectors : Bare Wires

Mini Waterproof Solar Charge Controller Specifications

Lead Acid Battery Voltage: 6V & 12V

Maximum Charging Current: 5A

Maximum Load Output: 5A

Maximum Voltage: 24V

Operating Specifications

Voltage at Battery Terminals : 6V Battery (V) 12V Battery (V)

Absorption voltage: 7.16 / 14.3 (suitable for most lithium LFP batteries)

Float voltage: 6.98 / 13.98

Cut-off voltage: 5.7 / 11.4

Load restart voltage: 6.34 / 12.68

3-Stage Charging Operation

The controller will adjust the charge stage based on the voltage of the battery.

In the first stage, it will pull down the voltage of the panel to just slightly above the battery voltage and funnel as much current as it can (constant current).

The second stage holds the voltage steady (at 14.3V for a 12V battery and at 7.16V for a 6V) while allowing current to slowly taper off.

At the third stage, the controller will keep the batteries topped off at float voltage (13.8V for 12V battery, 6.98V for 6V battery).

For the last two stages, the controller regulates the voltage down to what it needs but passes through all the current. As a result, if the solar panel voltage is very high, then there is a low efficiency, which is why it is good to match your solar panel MPP voltage to the battery voltage.

Load Regulation

For those users who are using the load wires, there are a couple voltages to pay attention to. The load wires are unregulated from the battery, and they continue to

supply power until the battery voltage falls below 11.4V for a 12V battery, or 5.7V for a 6V battery. Keep in mind that this voltage is with a load applied. At this point the controller will disconnect the battery from the load.
It only begins to supplying power again when the battery voltage reaches 12.68V for a 12V battery and 6.34V for a 6V battery. The controller will automatically connect the battery to the load leads when this happens, with no need for user interaction and making it suitable for a long-term solar application.

Pass-Through Power Management

This controller allows pass-through charging.
What this means:
If the load is less than the solar panel input, the power in will be divided between the load and charging the battery.
If the load is equal to the solar panel input, the power in will pass directly to the load, and no current will go in or out of the battery.
If the load is greater than the solar panel input, the power in will pass directly to the load, and the load will pull current from the battery to supplement it.

Product Attributes

- Dimensions: 1 × 1 × 1 cm
- Weight: .2 kg