Topsolar 20A-KZQ

Topsolar 20A Solar Charge Controller (Model 20A-KZQ) User Manual

Your guide to efficient solar power management.

1. Introduction

Thank you for choosing the Topsolar 20A Solar Charge Controller (Model 20A-KZQ). This device is designed to manage the power flow from your solar panel to your battery and load, ensuring optimal charging and protecting your battery from overcharge and over-discharge. This manual provides essential information for the safe installation, operation, and maintenance of your solar charge controller.

2. Safety Instructions

- Ensure all connections are correct and secure before powering on the system.
- Always connect the battery first, then the solar panel, and finally the load. Disconnect in the reverse order.
- Do not short-circuit the solar panel, battery, or load terminals.
- Install the controller in a well-ventilated, dry environment, away from direct sunlight and moisture.
- This controller is designed for 12V/24V lead-acid batteries (sealed, gel, flooded). Do not use with other battery types unless specified.
- Keep children away from the solar power system.

3. Product Overview

The Topsolar 20A Solar Charge Controller is a Pulse Width Modulation (PWM) controller featuring an LED display for system status and easy-to-use buttons for parameter adjustment. It automatically detects 12V or 24V system voltage.

Figure 1: Front view of the Topsolar 20A Solar Charge Controller. This image displays the LED screen, which shows real-time system data, and the three control buttons (Menu, Up/Down, Enter) for navigating settings. Below the display are the clearly labeled connection terminals for solar input, battery, and load output.

Key Features:

- Automatic identification of 12V/24V system voltage.
- Intelligent 3-stage PWM charging.
- Adjustable charge/discharge control parameters.
- Multiple protection functions: overcharge, over-discharge, overload, short circuit, reverse polarity.
- LED digital display for clear status indication.
- Dual USB 5V output for charging mobile devices.

4. Setup and Installation

Follow these steps carefully to ensure proper and safe installation of your solar charge controller.

Connection Order:

1. Connect the battery to the charge controller.
2. Connect the solar panel to the charge controller.
3. Connect the DC load to the charge controller.

Important: Always connect the battery first and disconnect it last to avoid damaging the controller.

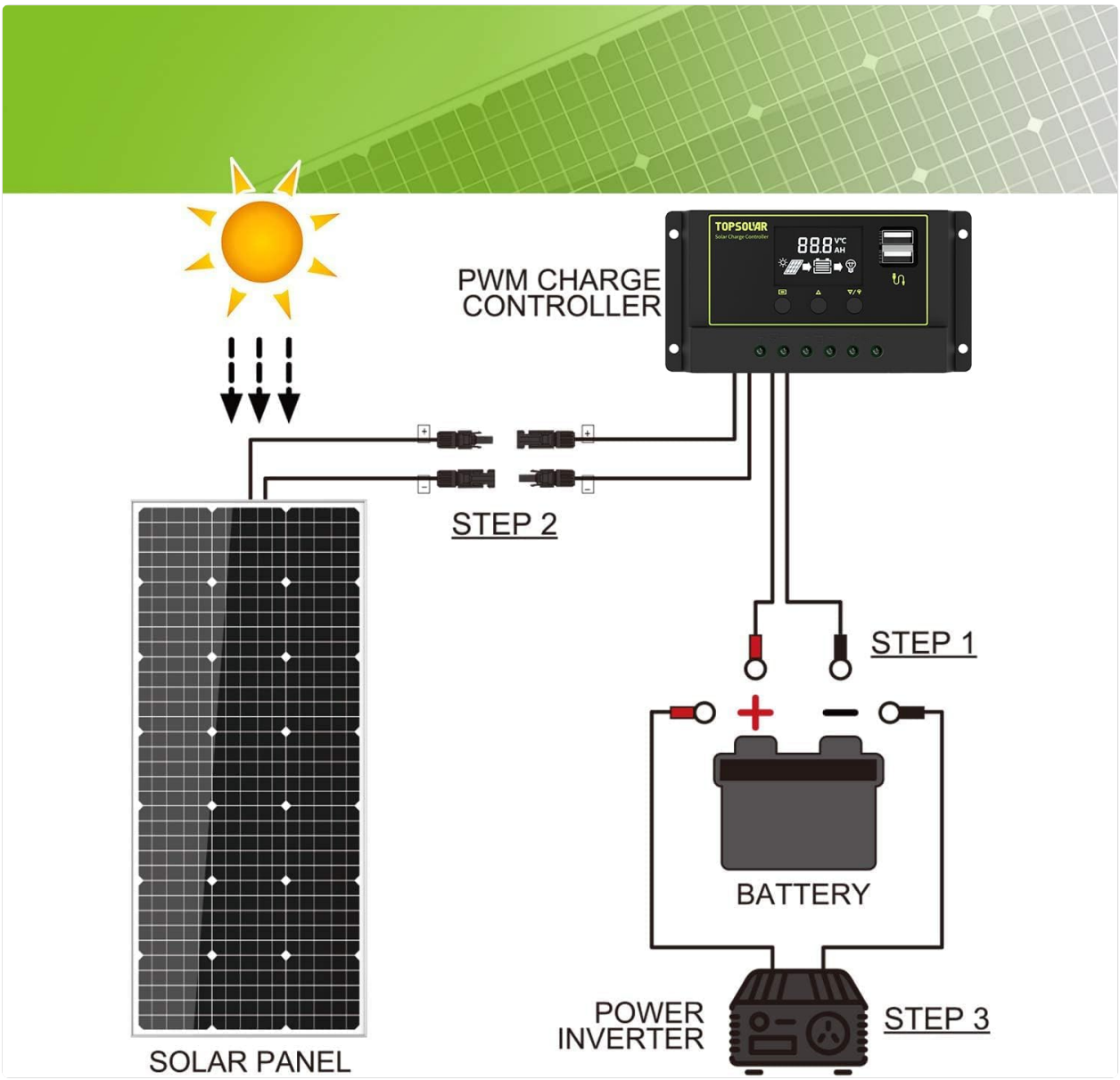

Figure 2: Standard Solar System Connection Diagram. This diagram illustrates the three main steps for connecting a solar panel to the PWM charge controller, then to the battery, and finally to a power inverter. Step 1 connects the battery, Step 2 connects the solar panel, and Step 3 connects the power inverter.

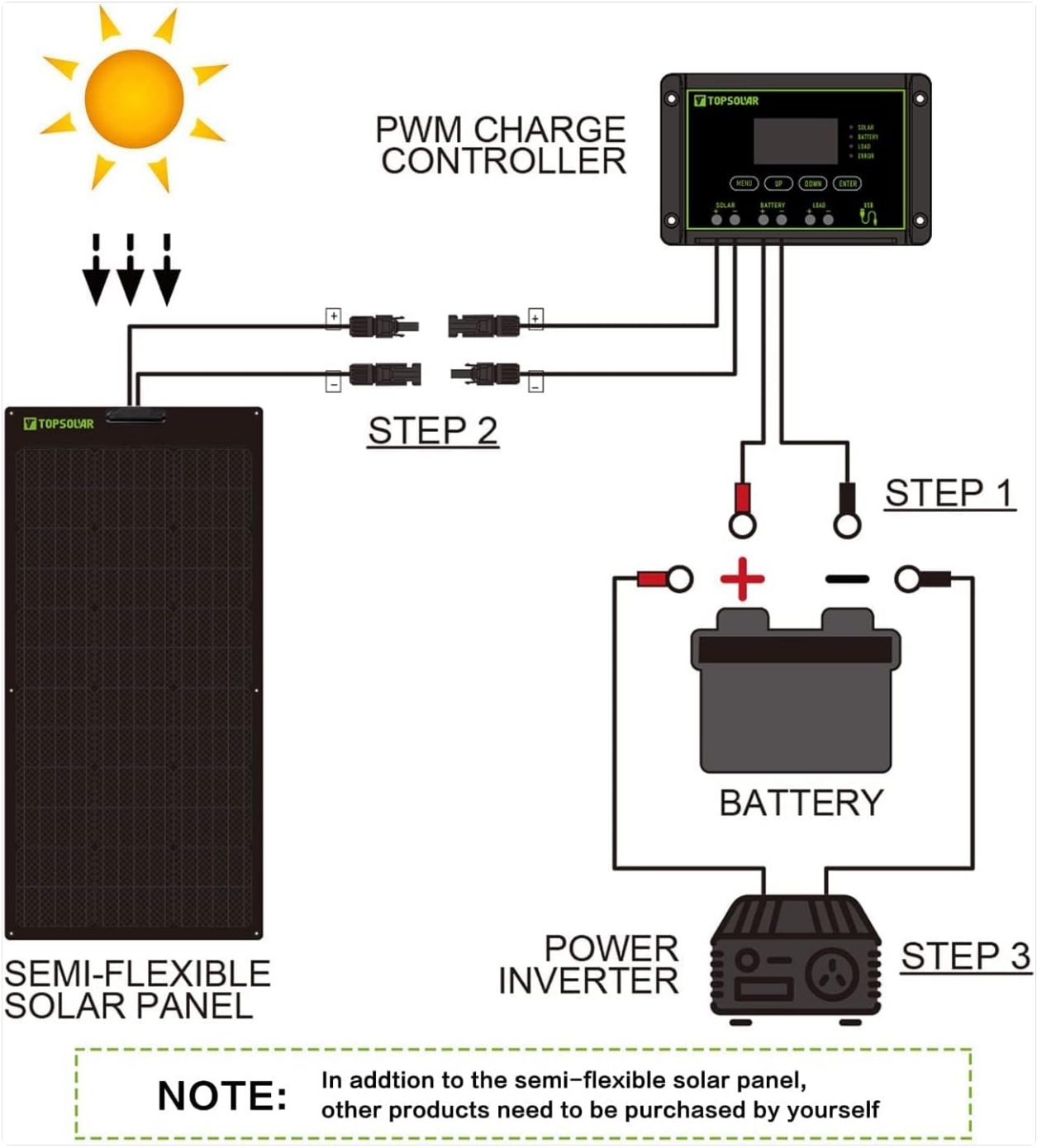

Figure 3: Semi-Flexible Solar Panel System Connection Diagram. Similar to Figure 2, this diagram shows the connection sequence for a semi-flexible solar panel. A note at the bottom clarifies that the semi-flexible solar panel is included, but other components like the battery and inverter must be purchased separately.

Detailed Connection Steps:

1. **Battery Connection (Step 1):** Connect the positive and negative terminals of the battery to the corresponding battery terminals on the charge controller. Ensure correct polarity. The controller will automatically detect the system voltage (12V or 24V).
2. **Solar Panel Connection (Step 2):** Connect the positive and negative terminals of the solar panel to the corresponding solar panel terminals on the charge controller. Ensure correct polarity.
3. **Load Connection (Step 3):** Connect the positive and negative terminals of your DC load (e.g., lights, fan) to the corresponding load terminals on the charge controller. Ensure correct polarity.

5. Operating Instructions

The controller's LED display shows various system parameters. Use the buttons to navigate and adjust settings.

Display Information:

- Battery Voltage
- Solar Panel Charging Status
- Load Discharge Status
- Battery Type
- Charge and Discharge Parameters

Button Functions:

- **MENU:** Short press to cycle through display modes. Long press to enter/exit setting mode.
- **UP/DOWN:** In setting mode, short press to adjust parameter values.
- **ENTER:** In setting mode, short press to confirm selection.

Parameter Settings:

To enter setting mode, long press the MENU button. Use UP/DOWN to select the parameter and ENTER to confirm. Long press MENU again to exit.

- **Overcharge Protection Voltage:** 14.4V (for 12V system) / 28.8V (for 24V system)
- **Overcharge Recovery Voltage:** 13.7V (for 12V system) / 27.4V (for 24V system)
- **Discharge Recovery Voltage:** 12.6V (for 12V system) / 25.2V (for 24V system)
- **Over-discharge Protection Voltage:** 10.7V (for 12V system) / 21.4V (for 24V system)
- **Battery Type Setting:**
  - **B01 (Sealed):** 14.4V
  - **B02 (Gel):** 14.2V
  - **B03 (Flooded):** 14.6V
- **Load Working Mode:** 24 hours (default) - can be adjusted for timed load output.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your solar charge controller.

- Periodically check all wiring connections for tightness and corrosion.
- Clean the controller's casing with a dry cloth to remove dust and dirt.
- Ensure the installation area remains dry and well-ventilated.
- Monitor the battery voltage and charging status regularly to ensure proper operation.

7. Troubleshooting

If you encounter issues with your controller, refer to the following common problems and solutions:

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
Controller display is off	Battery not connected or low voltage	Check battery connections; charge battery if voltage is too low.
Solar panel not charging	Solar panel not connected, insufficient sunlight, or panel fault	Check solar panel connections; ensure adequate sunlight; test panel output.
Load not working	Load not connected, over-discharge protection active, or load fault	Check load connections; ensure battery voltage is above discharge protection; test load device.
Battery not fully charging	Incorrect battery type setting, insufficient solar input, or battery degradation	Verify battery type setting; increase solar panel capacity or improve sun exposure; consider battery replacement.

8. Specifications

Parameter	Value
Model Number	20A-KZQ
Rated Charge Current	20A
System Voltage	12V/24V Auto-detect
Max. Input Power (12V)	390W
Max. Input Power (24V)	780W
Overcharge Protection	14.4V (12V) / 28.8V (24V)
Overcharge Recovery	13.7V (12V) / 27.4V (24V)
Discharge Recovery	12.6V (12V) / 25.2V (24V)
Over-discharge Protection	10.7V (12V) / 21.4V (24V)
USB Output	Dual 5V
Display Type	LED
Material	Plastic
Operating Temperature	-35°C to +60°C
Origin	China

9. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact Topsolar customer service. Keep your purchase receipt as proof of purchase.