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› MPPT 30A Solar Charge Controller 12V 24V Auto User Manual

NUOFUWEI MPPT 30A

MPPT 30A Solar Charge Controller User Manual

MODEL: MPPT 30A | BRAND: NUOFUWEI

1. Introduction

This manual provides essential information for the safe and efficient operation of your NUOFUWEI MPPT 30A Solar Charge Controller. This device is designed to manage the power flow from your solar panels to your battery bank, ensuring optimal charging and protecting your battery from overcharge and over-discharge. It is compatible with 12V and 24V systems and various battery types, including lead-acid (AGM, gel, open) and lithium batteries (LiFePO₄, ternary lithium).

Key features include a backlit LED display, temperature sensor, and dual 5V/2A USB outputs for charging mobile devices. The controller incorporates an industrial-grade intelligent chip for high efficiency and reliability, along with comprehensive protection mechanisms.

2. Safety Precautions

Please read and understand all safety instructions before installation and operation. Failure to follow these instructions may result in damage to the controller, battery, or solar panels, and could lead to personal injury.

- Before initial installation, ensure the battery has sufficient voltage for the controller to recognize the battery type.
- Battery cables should be as short as possible to minimize power losses.
- The controller is suitable for lead-acid batteries (AGM, gel, and open) and lithium batteries (lithium iron phosphate, ternary lithium batteries, etc.). Ensure correct battery type selection in settings.
- This controller is designed exclusively for photovoltaic (solar) panel charging. Do not connect DC power supplies or other power sources as charging inputs.
- **Connection Order:** Connect the controller to the battery first, then to the solar panel, and finally to the load.
- **Disconnection Order:** Disconnect the load first, then the solar panel, and finally the battery.
- Ensure proper ventilation around the controller to prevent overheating.
- Avoid exposing the controller to water or excessive humidity.

3. Product Overview



Figure 3.1: Front view of the MPPT 30A Solar Charge Controller, showing the backlit display, control buttons, and USB ports.



Figure 3.2: Product dimensions of the MPPT 30A Solar Charge Controller, measuring 16.8cm (6.6in) in length, 9.4cm (3.7in) in width, and 3.7cm (1.3in) in thickness.

The MPPT 30A Solar Charge Controller features a large, backlit LED display for clear visibility of system parameters. It includes three control buttons for navigation and settings adjustment, and two 5V/2A USB ports for convenient charging of external devices.

The robust design incorporates an aluminum alloy heat sink for efficient heat dissipation, ensuring stable performance and a low failure rate. Its compact size makes it suitable for various solar off-grid applications.

4. Setup and Installation

Proper installation is crucial for the performance and longevity of your solar charge controller. Follow these steps carefully:

1. **Prepare the Installation Location:** Choose a dry, well-ventilated area away from direct sunlight, high temperatures, and moisture. Ensure there is sufficient space around the controller for air circulation.
2. **Connect the Battery:**

- Connect the positive (+) terminal of the battery to the battery positive (+) terminal on the controller.
- Connect the negative (-) terminal of the battery to the battery negative (-) terminal on the controller.
- Ensure the battery cables are as short as possible and of appropriate gauge to minimize voltage drop. The controller display should illuminate, indicating successful battery connection.

3. Connect the Solar Panel:

- Connect the positive (+) terminal of the solar panel to the solar panel positive (+) terminal on the controller.
- Connect the negative (-) terminal of the solar panel to the solar panel negative (-) terminal on the controller.
- Ensure the solar panel voltage does not exceed the controller's maximum PV voltage (50V).

4. Connect the Load (Optional):

- Connect the positive (+) terminal of your DC load to the load positive (+) terminal on the controller.
- Connect the negative (-) terminal of your DC load to the load negative (-) terminal on the controller.
- Do not exceed the controller's rated load current.

High quality chip

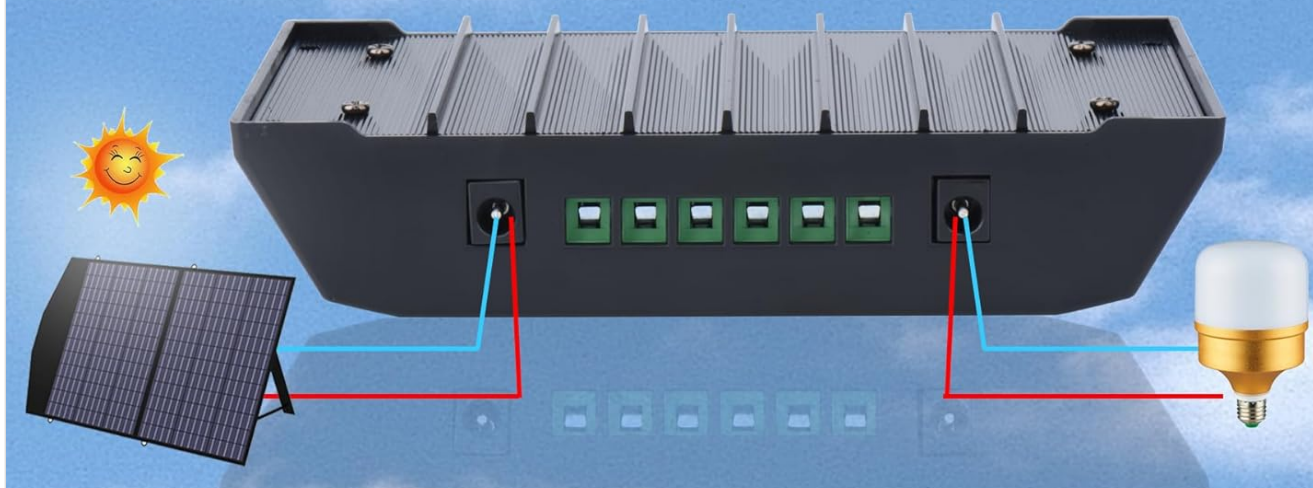
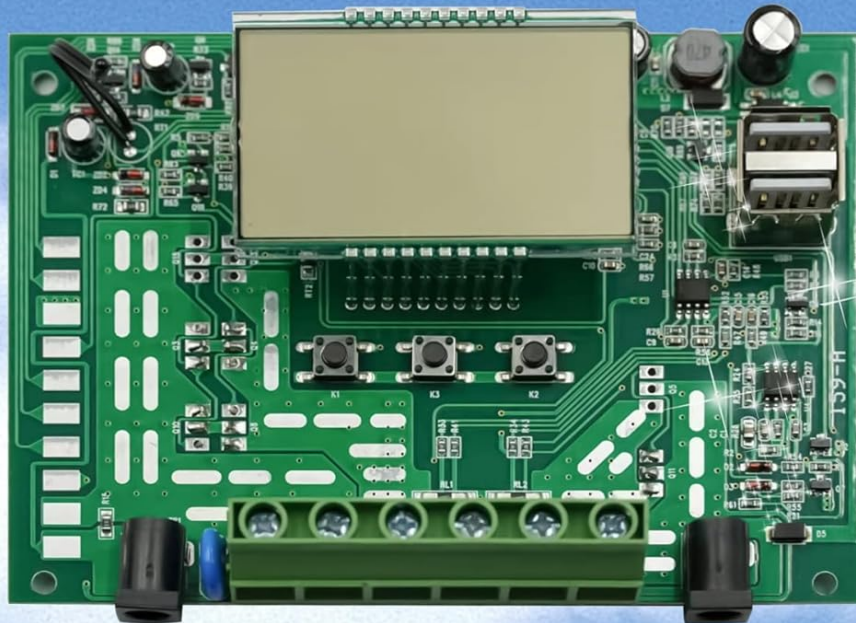


Figure 4.1: Internal view of the controller's circuit board and a diagram illustrating the correct connection sequence for solar panels, battery, and DC load.

Important: Always follow the specified connection order (Battery -> Solar Panel -> Load) and disconnection order (Load -> Solar Panel -> Battery) to prevent damage to the controller.

5. Operating Instructions

The controller features a user-friendly interface with a backlit LED display and three control buttons for easy operation.

5.1. Display and Buttons

The LED display shows real-time system status, including battery voltage, charging current, load status, and various error codes. The buttons allow you to navigate through menus and adjust settings.

- **Menu Button:** Press to cycle through display screens and enter setting modes.
- **Up Button:** Used to increase values or navigate upwards in menus.
- **Down Button:** Used to decrease values or navigate downwards in menus.

5.2. Charging Modes

The controller employs an intelligent 4-stage PWM charging mode to optimize battery life and performance:

- **Fast Charging:** Delivers maximum current to quickly bring the battery to a certain voltage level.
- **Boost Charging:** Applies a higher voltage for a set period to ensure the battery is fully charged and to equalize cell voltages (for lead-acid batteries).
- **Floating Charging:** Maintains the battery at a constant, lower voltage to prevent self-discharge and keep it fully charged.
- **Balanced Charging:** (Applicable to some battery types) Periodically overcharges the battery slightly to prevent sulfation and equalize cell voltages.

5.3. Load Control Modes

The controller offers various DC output modes for managing connected loads:

- **Normally Open Mode:** The load output is continuously on.
- **Light Control Mode:** The load output turns on automatically at dusk and off at dawn.
- **Reverse Light Control Mode:** The load output turns off at dusk and on at dawn.
- **Double Time Control Mode:** Allows setting specific on/off times for the load output.

Refer to the on-screen menu for detailed instructions on how to select and adjust these load control parameters.

5.4. USB Output

The two 5V/2A USB ports can be used to charge mobile phones and other USB-powered devices. These ports are active when the controller is powered by the battery.

6. Maintenance

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

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry, soft cloth for cleaning.
- **Connection Checks:** Periodically inspect all wiring connections to ensure they are tight and free from corrosion. Loose connections can lead to power loss or overheating.
- **Ventilation:** Ensure that the ventilation openings are not blocked and that there is adequate airflow around the unit.
- **Environmental Conditions:** Verify that the operating environment remains within the specified temperature and

humidity ranges.

7. Troubleshooting

The controller is equipped with intelligent protection features to prevent damage. If you encounter issues, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Controller display is off / No power	Battery not connected or low voltage; reversed battery polarity.	Check battery connections and voltage. Ensure correct polarity. Recharge battery if voltage is too low.
Battery not charging from solar panels	Solar panel not connected; insufficient sunlight; reversed solar panel polarity; PV voltage too low/high.	Verify solar panel connections. Ensure adequate sunlight. Check solar panel polarity. Confirm PV voltage is within acceptable range (max 50V).
Load not working	Load not connected; load short circuit; overload; battery low voltage cut-off; incorrect load control mode.	Check load connections. Disconnect load and check for short circuit. Reduce load. Check battery voltage. Adjust load control mode settings.
Overcurrent / Short Circuit Protection activated	Excessive current draw from load or short circuit in wiring.	Identify and resolve the short circuit or reduce the load. The controller will automatically resume operation once the fault is cleared.
Overheat Protection activated	Controller temperature is too high due to poor ventilation or excessive load.	Improve ventilation around the controller. Reduce load if necessary. Allow the unit to cool down.

The controller features comprehensive protection against overcurrent, short circuit, reverse current, reverse connection, overheat, lightning, undervoltage, and overload. In most cases, the controller will automatically recover once the fault condition is removed.

8. Specifications

Parameter	Value
Rated Voltage	12V / 24V Auto-sensing
Rated Current	30A
Maximum PV Voltage	50V
Maximum PV Input Power	360W (12V system) / 720W (24V system)
USB Output	2 x 5V/2A
Display Type	Backlit LED
Dimensions (L x W x H)	16.8 cm x 9.4 cm x 3.7 cm (6.6 in x 3.7 in x 1.3 in)
Net Weight	290g (9.6 ounces)
Operating Temperature	-35°C to +60°C (Approximate, typical for solar controllers)
Battery Compatibility	Lead-acid (AGM, Gel, Flooded), Lithium (LiFePO4, Ternary Lithium)

9. Warranty and Support

For information regarding warranty coverage, technical support, or service, please refer to the documentation provided with your purchase or contact NUOFUWEI customer service directly. Contact details can typically be found on the manufacturer's official website or on the product packaging.

Please have your product model number (MPPT 30A) and purchase details ready when contacting support.