PowMr POW-M45-PRO

MPPT Solar Charge Controller User Manual

Model: POW-M45-PRO

Brand: PowMr

1. Introduction and Overview

This manual provides detailed instructions for the installation, operation, and maintenance of your PowMr MPPT Solar Charge Controller. This advanced controller is designed to maximize power harvesting from your solar panels and efficiently charge various battery types in 12V or 24V systems.

The POW-M45-PRO model features Maximum Power Point Tracking (MPPT) technology, ensuring high tracking and conversion efficiency. It is equipped with a clear LCD display for monitoring system status and offers comprehensive protection features for safe and reliable operation.

2. Key Features

- **45A Solar Charge Controller:** Supports Max PV Input of 540W for 12V batteries and 1080W for 24V batteries, with a Max. PV Open-Circuit Voltage of less than 100V. Utilizes a 3-stage battery charging algorithm for rapid, efficient, and safe charging.
- **Comprehensive Protection:** Includes protections against short circuit, overcurrent, reverse polarity, and more, ensuring system safety.
- **12V/24V Battery Support:** Features a negative grounding design for enhanced safety and is compatible with various battery types, including lead-acid (Sealed, Gel, Flooded) and Lithium (LFP). Charging parameters are pre-set for common types and can be customized.
- **Advanced MPPT Technology:** Boasts up to 98% tracking efficiency and 97% peak conversion

efficiency, optimizing solar panel output and charging performance.

- **User-Friendly Interface:** Equipped with a detailed LCD screen and four intuitive buttons for easy operation and troubleshooting.

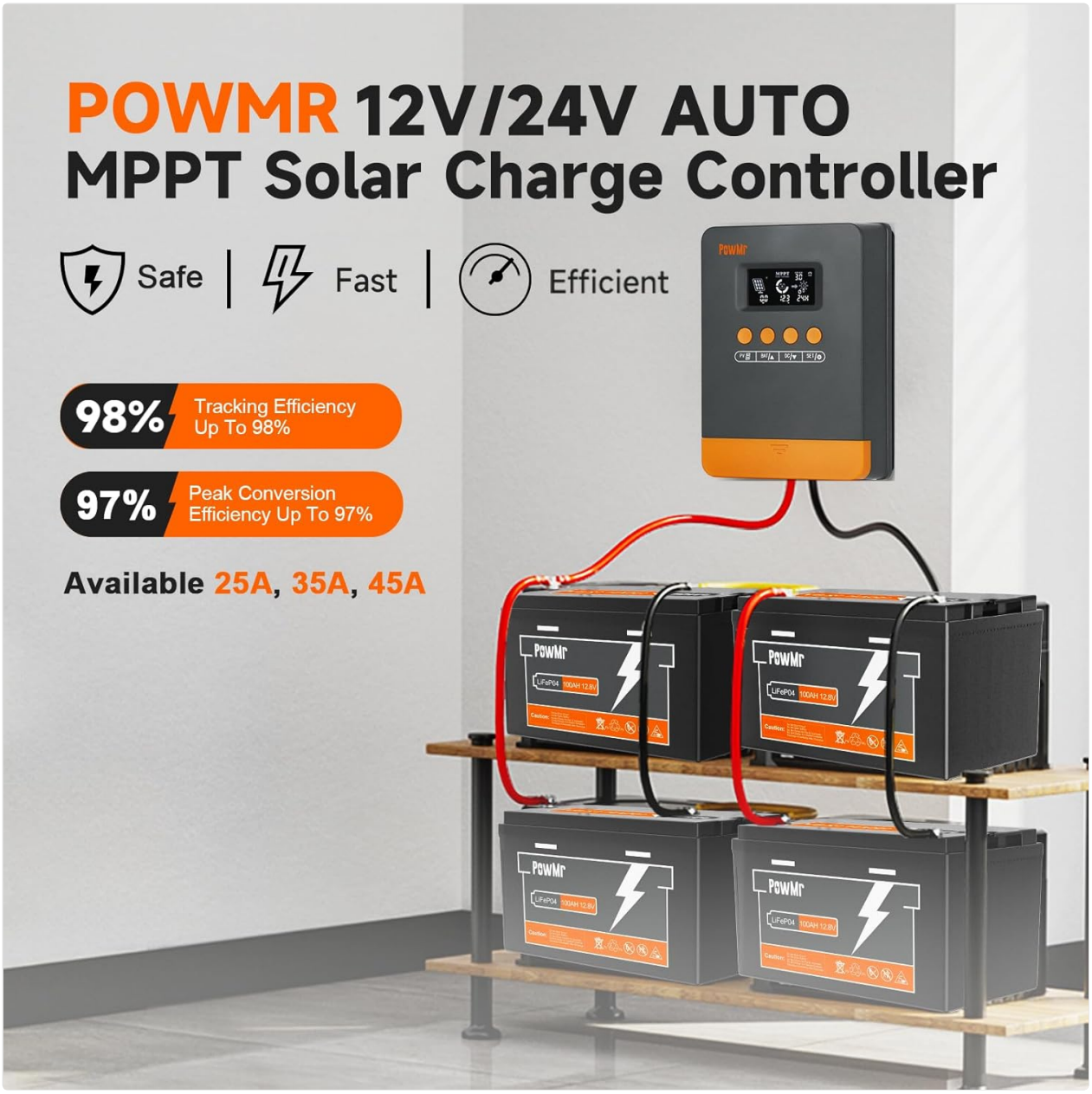

Figure 2.1: High Efficiency of PowMr MPPT Solar Charge Controller.

Figure 2.2: Certified Protections for the Solar Charge Controller.

3. Safety Information

Please read all safety instructions carefully before installation and operation. Failure to follow these instructions may result in electric shock, fire, or serious injury.

- Ensure all connections are tight and correct to prevent loose connections that can cause excessive heat.
- Always connect the battery to the controller *first*, and disconnect it *last*.
- Install appropriate circuit breakers or fuses for both the battery and solar panel circuits.
- Do not disassemble or attempt to repair the controller yourself. Contact qualified personnel for service.
- Install the controller in a well-ventilated area, away from flammable materials and direct sunlight.
- Wear appropriate personal protective equipment (PPE) such as insulated gloves and eye protection during installation.

4. Product Components and Overview

The PowMr MPPT Solar Charge Controller features a compact design with an integrated LCD display and control buttons on the front panel. The connection terminals are located at the bottom, protected by a removable cover.

Figure 4.1: Front View of the MPPT Solar Charge Controller.

4.1. LCD Display and Buttons

The LCD screen provides real-time information about the solar panel input, battery status, and load output. The four buttons (PV, BAT/▲, DC/▼, SET/⚙) allow for navigation through menus, parameter adjustment, and mode selection.

Figure 4.2: Backlight LCD Screen and Control Buttons.

5. Setup and Installation

Follow these steps carefully for proper installation. Ensure all power sources are disconnected before making any connections.

5.1. Wiring Sequence

1. **Remove the Port Cover:** Gently slide down the orange port cover at the bottom of the controller to expose the wiring terminals.
2. **Connect the Battery:** Connect the battery cables to the controller's battery terminals. Ensure correct polarity (positive to positive, negative to negative). The controller will power on once the battery is

connected.

3. **Connect the PV Array:** Connect the solar panel (PV) cables to the controller's PV terminals. Ensure correct polarity.
4. **Connect the DC Load (Optional):** If using the DC load output, connect your DC load to the designated load terminals.
5. **Reassemble the Port Cover:** Slide the orange port cover back into place to protect the connections.
6. **Start Up the Controller:** Ensure all circuit breakers are closed to allow power flow. The controller will begin operation.

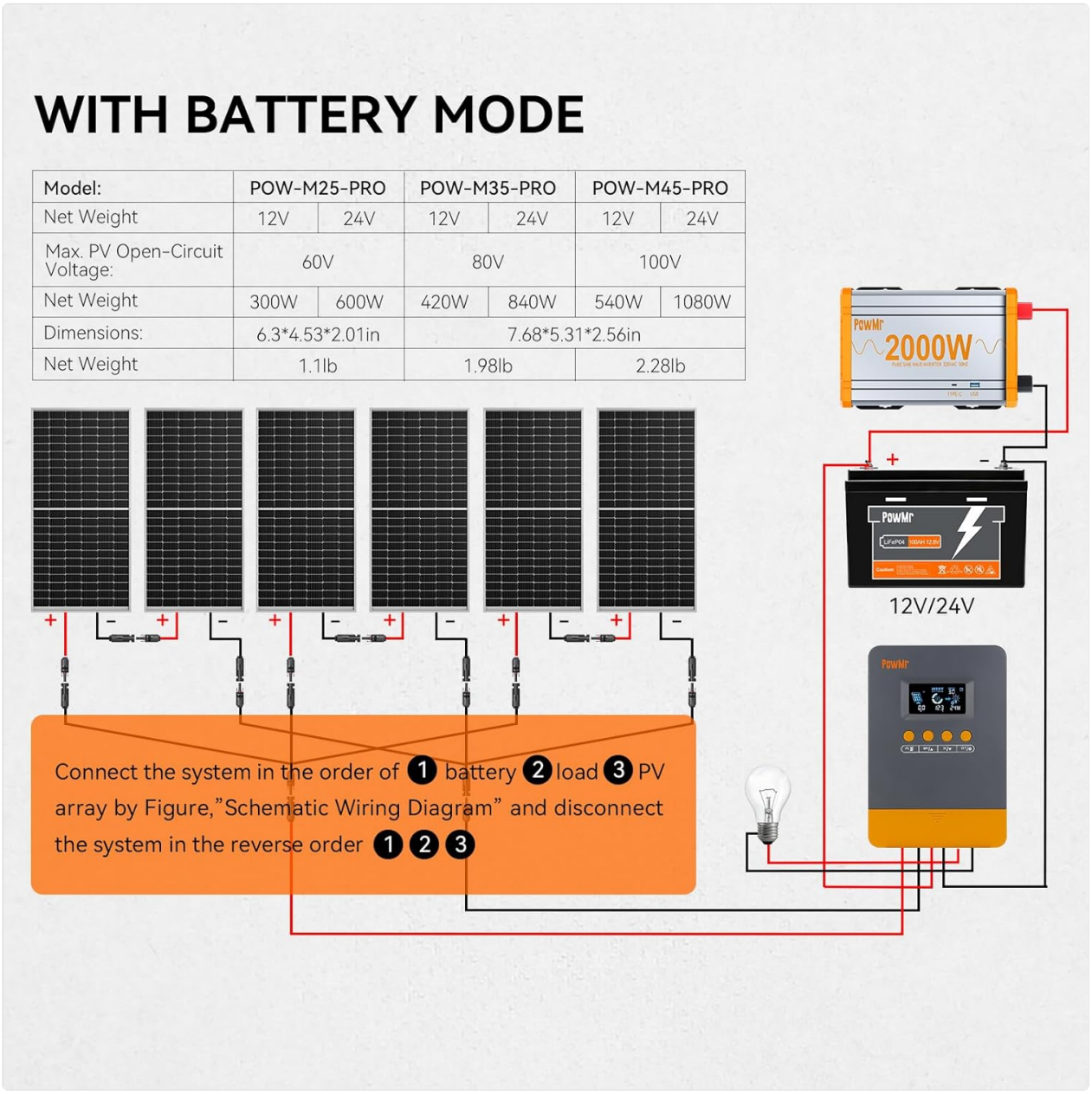

Figure 5.1: Schematic Wiring Diagram for Installation.

Figure 5.2: Compatibility with Multiple Battery Types.

5.2. Installation Video Guide

For a visual guide on the wiring process, please refer to the official installation video:

Video 5.1: Solar Charge Controller Wiring Guide. This video demonstrates the step-by-step process of connecting the battery, PV array, and DC load to the PowMr solar charge controller, including removing and reassembling the port cover and starting up the controller.

6. Operating Instructions

6.1. LCD Display Navigation

The LCD display shows various parameters. Use the PV, BAT/▲, DC/▼, and SET/⚙ buttons to navigate and adjust settings.

- Press the **PV** button to cycle through PV input parameters.
- Press the **BAT**/▲ button to view battery parameters or increase values in settings.

- Press the **DC/▼** button to view DC load parameters or decrease values in settings.
- Press the **SET/⚙** button to enter or exit setting menus and confirm selections.

6.2. Battery Type Setting

To set the battery type:

1. Long press the **BAT/▲** key to enter the setting program.
2. Use the **BAT/▲** and **DC/▼** keys to toggle through the battery type options (e.g., SEL for Sealed, GEL for Gel, FLD for Flooded, LI for Lithium, USE for User-defined).
3. Press the **SET/⚙** key to save and confirm your selection.

6.3. Load Work Modes

The controller supports multiple load work modes for the DC output:

- **00H:** Load Turn OFF.
- **24H:** Load always Turn ON.
- **01H~23H:** Time control (Set load ON's duration).

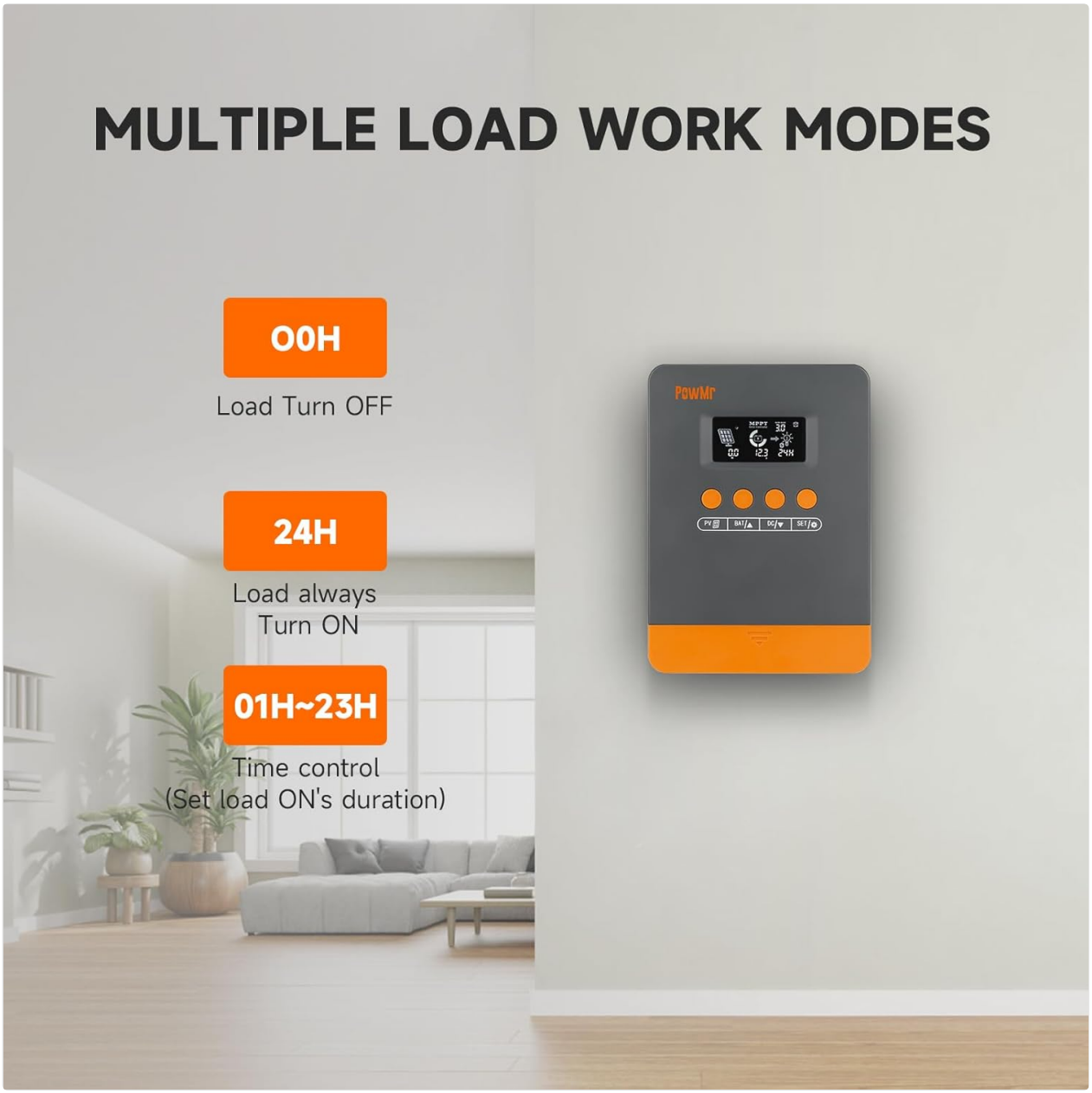

Figure 6.1: Multiple Load Work Modes.

6.4. Calibrating Battery Voltage

If there is a discrepancy between the battery voltage monitored by the controller and a multimeter reading, you can calibrate it:

1. Long press the **BAT**/▲ key to enter the setting program.
2. Use the **BAT**/▲ and **DC**/▼ keys to adjust the value.
3. Press the **SET**/⚙ key to save and confirm.

7. Maintenance

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

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- **Connection Checks:** Periodically inspect all wiring connections to ensure they are secure and free from corrosion.
- **Ventilation:** Ensure the installation area remains well-ventilated to prevent overheating.
- **System Monitoring:** Regularly check the LCD display for any error codes or unusual readings.

8. Troubleshooting

The LCD display provides fault codes to help diagnose common issues. Refer to the table below for common fault codes and their solutions.

Fault Code	Cause	Solution
18	Input photovoltaic voltage too low	Increase the number of solar panels or connect them in series to raise the photovoltaic input voltage.
60	Overtemperature protection	Allow the equipment to cool to below the recovery temperature to resume normal charging and discharging.
63	Battery voltage too high	Measure to confirm if battery voltage exceeds rated voltage and disconnect photovoltaic array circuit breaker.
65	Battery voltage too low	Charge the battery until voltage exceeds the undervoltage recovery point. Refer to '5.7 Default Parameters for Different Battery Types' for specific details.
71	Input photovoltaic voltage too high	Reduce the number of photovoltaic arrays connected to the controller to lower photovoltaic input; or adjust series and parallel connections to reduce voltage or current values.
73	Overcharging current	Reduce output terminal load to ensure total load is within rated limits of the controller and battery.

Fault Code	Cause	Solution
72	Overdischarging current	Reduce output terminal load to ensure total load is within rated limits of the controller and battery.

9. Specifications

Specification	Value
Model Number	POW-M45-PRO
Display Type	LCD
Product Dimensions	7.68 x 5.31 x 2.56 inches (19.5 x 13.5 x 6.5 cm)
Item Weight	2.28 pounds (1035 Grams)
Voltage	12V/24V Auto (24 Volts DC nominal)
Max PV Input (12V Battery)	540W
Max PV Input (24V Battery)	1080W
Max. PV Open-Circuit Voltage	<100V
Tracking Efficiency	Up to 98%
Peak Conversion Efficiency	Up to 97%
Country of Origin	China

10. Warranty and Support

PowMr products are designed for reliability and performance. For warranty information or technical support, please refer to the documentation included with your purchase or visit the official PowMr website. Ensure you have your product model number (POW-M45-PRO) and purchase details ready when contacting support.