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› SUNER POWER 12V 30W Solar Battery Trickle Charger & Maintainer (Model: BC-30W-PM PRO) Instruction Manual

SUNER POWER BC-30W-PM PRO

SUNER POWER 12V 30W Solar Battery Trickle Charger & Maintainer

Model: BC-30W-PM PRO

Brand: SUNER POWER

1. INTRODUCTION

The SUNER POWER 12V 30W Solar Battery Trickle Charger & Maintainer is designed to efficiently charge and maintain 12-volt batteries using solar energy. Featuring Ultra-Smart MPPT (Maximum Power Point Tracking) technology and an improved 3-stage charging algorithm, this device ensures optimal battery health and extended lifespan. Its waterproof design and comprehensive safety protections make it suitable for various outdoor applications.

ENHANCED PERFORMANCE

23.5%

High Efficiency
of Grade A+ Solar Cells

91.5%

High Transparency

98%

Peak Conversion
Efficiency

99%

High Tracking
Efficiency

30%

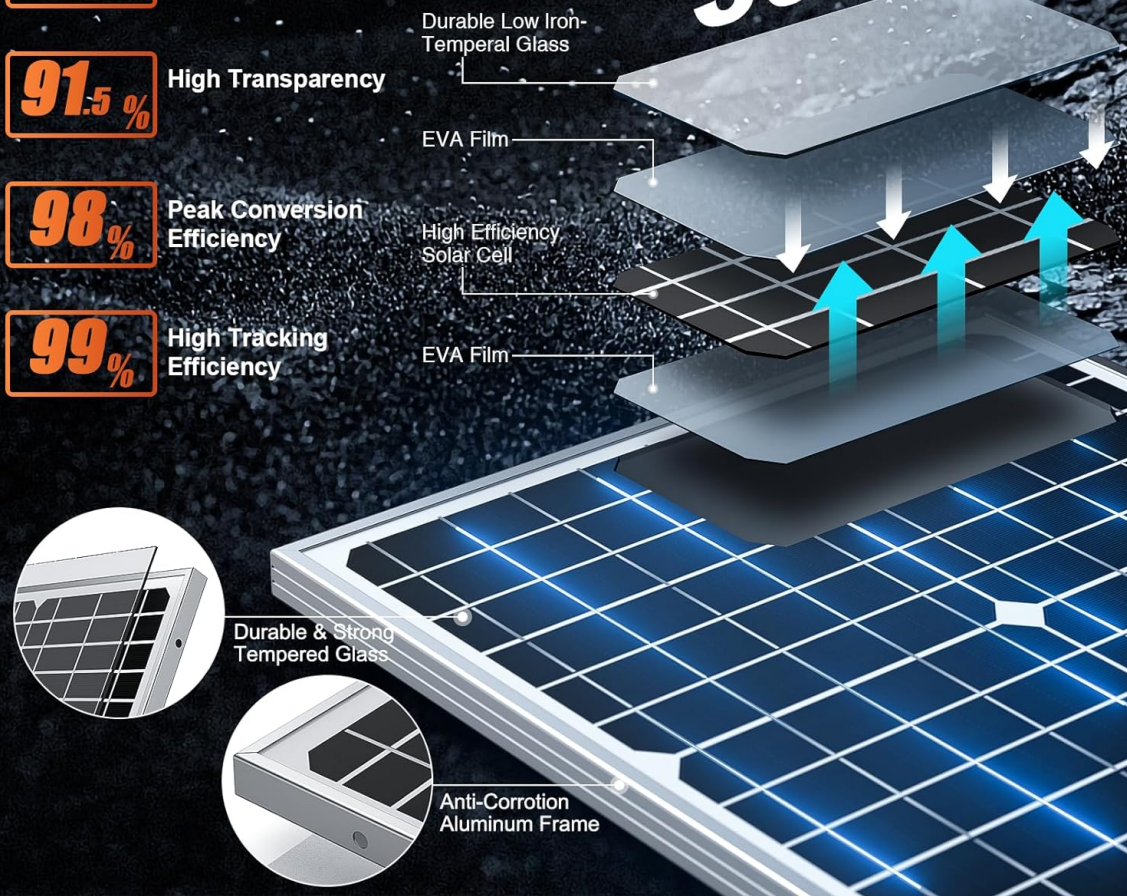


Figure 1: Diagram illustrating the layers of the solar panel, highlighting high efficiency A+ grade solar cells, durable low iron-tempered glass, EVA film, and anti-corrosion aluminum frame, contributing to 30% higher conversion rate.



Figure 2: The MPPT charge controller with LED indicators for charge level and battery type, surrounded by icons representing various safety protections.

2. PRODUCT OVERVIEW

2.1 Included Components

- 1 x 30W Solar Panel with Built-in UltraSmart MPPT Controller
- 1 x Adjustable Pole Mounting Brackets
- 1 x SAE to Alligator Cable
- 1 x SAE to Battery Eyelet Cable

CHARGE LEVELS

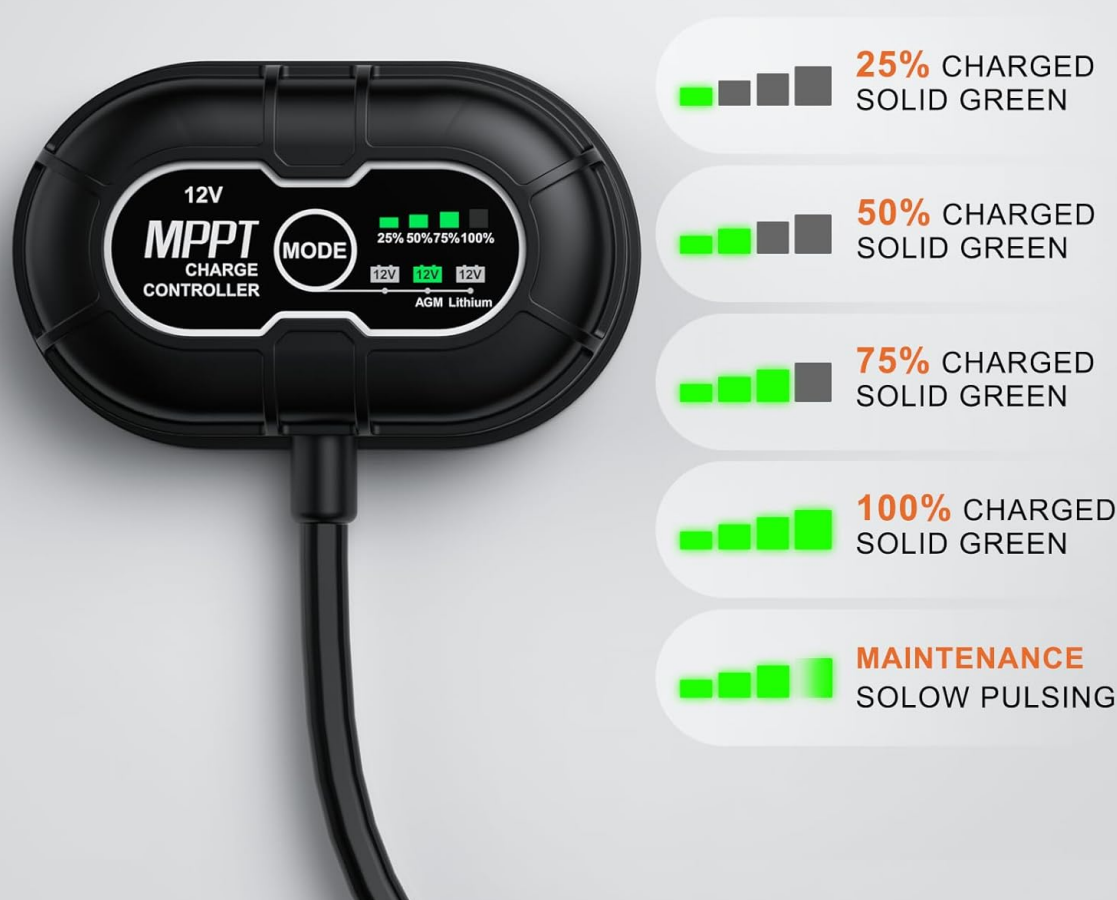


Figure 3: The SUNER POWER 30W solar panel with integrated MPPT charge controller and connection cables.

2.2 Key Features

- **Ultra-Smart MPPT Technology:** Delivers high tracking efficiency (up to 99%) and peak conversion efficiency (98%), improving utilization rate by 20%-30%.
- **Improved 3-Stage Charging:** Algorithm (Bulk, Absorption, Float) for effective 12-volt battery charging, increasing battery life and performance.
- **Free Maintenance:** Automatically stops charging when full and resumes when discharged.
- **8-Safety Protections:** Includes over-charge, over-discharge, over-voltage, over-current, over-load, short circuit, reverse polarity, and over-temperature protection. Waterproof and spark-proof.
- **Visual Charging Level:** Indicators for 25%, 50%, 75%, and 100% charge levels.
- **Three Battery Charging Modes:** Selectable modes for 12V, 12V AGM, and 12V Lithium batteries.
- **Adjustable Pole Mount Bracket:** Allows angle adjustment (0-15-30-45-60 degrees) for optimal sun exposure, designed for pole diameters 1.5-3.0 inches (40-80mm).
- **Superior Quality and Material:** Made of Grade A+ solar cells (21%-30% efficiency), tempered solar glass, and durable corrosion-resistant frame.

3. SAFETY INFORMATION

This solar charger is equipped with multiple safety features to protect both the device and the connected battery. Always ensure proper connection and placement to prevent damage or injury.

- **Over-Charge Protection:** Prevents battery from being overcharged.
- **Over-Discharge Protection:** Protects battery from excessive discharge.
- **Over-Voltage Protection:** Safeguards against voltage spikes.
- **Over-Current Protection:** Prevents damage from excessive current.
- **Over-Load Protection:** Protects against excessive power draw.
- **Short Circuit Protection:** Automatically shuts off in case of a short circuit.
- **Reverse Polarity Protection:** Prevents damage from incorrect battery connections.
- **Over-Temperature Protection:** Monitors and regulates internal temperature.

The unit is also **waterproof** and **spark-proof** for enhanced safety in various environments.

4. SETUP

4.1 Mounting the Solar Panel

1. Identify a location that receives maximum direct sunlight throughout the day.
2. Attach the adjustable pole mounting brackets to a pole with a diameter between 1.5-3.0 inches (40-80mm).
3. Secure the solar panel to the brackets using the provided hardware.
4. Adjust the panel angle (0-15-30-45-60 degrees) to optimize sun exposure for your specific location and season.

Adjustable angle among

0-15-30-45-60 degree



Figure 4: Adjustable pole mount bracket for optimal solar panel positioning.

4.2 Connecting to the Battery

1. Ensure the solar panel is not exposed to direct sunlight during connection to prevent accidental sparking.
2. Connect the SAE connector from the solar panel to either the SAE to Alligator Cable or the SAE to Battery Eyelet Cable.
3. Connect the alligator clips or eyelet terminals to your 12V battery, ensuring correct polarity (red to positive, black to negative).
4. Once connected, expose the solar panel to sunlight to begin charging.

Compatible with Multiple 12V Batteries

TYPES

Starter, Deep-cycle, Marine, Powersport, Car, RV, Trailer and more

CHEMISTRIES

Flooded, GEL, Maintenance-free, AGM, Seal-Lead Acid and Lithium Batteries



Figure 5: Connection diagram showing compatibility with various 12V battery types.

5. OPERATING INSTRUCTIONS

5.1 MPPT Technology and 3-Stage Charging

The built-in Ultra-Smart MPPT charge controller continuously tracks the maximum power point of the solar panel to extract the most power possible, even in varying light conditions. This power is then delivered to the battery using an advanced 3-stage charging algorithm:

- **Bulk Stage:** Delivers maximum current to rapidly charge the battery.
- **Absorption Stage:** Maintains a constant voltage to fully charge the battery without overcharging.
- **Float Stage:** Reduces voltage to a lower level to maintain the battery at full charge, compensating for self-discharge.

SMART 3-STAGES CHARGING



99% High tracking efficiency up to



98% Peak conversion efficiency of



Figure 6: MPPT charge controller detailing high efficiency and 3-stage charging process.

5.2 Selecting Battery Type

The charge controller supports three battery types. Press the 'MODE' button on the controller to cycle through and select the appropriate battery type for your connected battery:

- **12V:** For standard 12V lead-acid batteries (flooded, SLA, VRLA).
- **12V AGM:** For 12V Absorbed Glass Mat batteries.
- **12V Lithium:** For 12V LiFePO4 lithium batteries.

5.3 Visual Charging Level Indicators

The charge controller features LED indicators to visually monitor the battery's charge status:

- **25% - 50% - 75% - 100%:** Solid green LEDs indicate the current charge level.
- **Maintenance Mode:** A slow pulsing green light indicates the battery is fully charged and the controller is maintaining it.

**Designed for pole dia
1.5inch-3.0inch/40mm-80mm**

(Pole is not included)

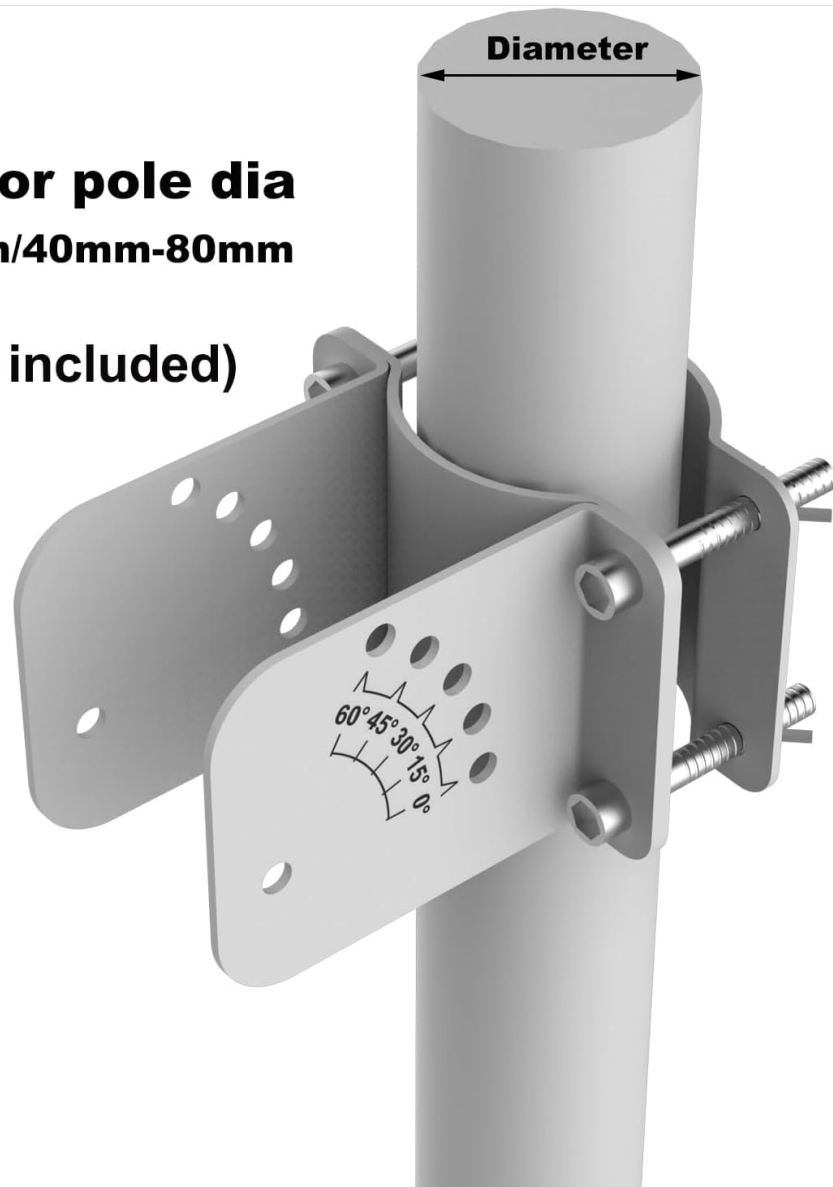


Figure 7: Visual indicators for monitoring battery charge levels.

6. MAINTENANCE

The SUNER POWER solar charger is designed for minimal maintenance. Its robust construction and intelligent charging system ensure reliable operation.

- **Panel Cleaning:** Periodically clean the solar panel surface with a soft, damp cloth to remove dust, dirt, or debris that may reduce efficiency.
- **Connection Check:** Occasionally inspect all cable connections to ensure they are secure and free from corrosion.
- **Waterproof Design:** The unit is designed to withstand outdoor elements, but avoid submerging it in water.



Figure 8: The solar panel's waterproof surface, designed for durability in outdoor conditions.

7. TROUBLESHOOTING

If you encounter issues with your solar charger, refer to the following common troubleshooting steps:

- **No Charging Indication:** Ensure the solar panel is receiving direct sunlight. Check all connections for proper contact and polarity. Verify the battery type selected on the controller matches your battery.
- **Slow Charging:** Confirm the solar panel surface is clean and free from obstructions. Ensure the panel is angled correctly towards the sun. Check battery health; a severely discharged or damaged battery may charge slowly or not at all.
- **Controller Not Responding:** Disconnect and reconnect the solar panel and battery. If the issue persists, contact customer support.

8. SPECIFICATIONS

Feature	Specification
Brand	SUNER POWER
Model Number	BC-30W-PM PRO
Maximum Power	30 Watts
Maximum Voltage	12 Volts
Product Dimensions (L x W x H)	18.1"L x 15.3"W x 0.7"H
Material	A+ Grade Solar Cell, Aluminum Frame, Tempered Glass
Efficiency	High Efficiency (21%-30% solar cells, 99% tracking, 98% conversion)
Included Components	30W Solar Panel with MPPT Controller, Adjustable Pole Mounting Brackets, SAE to Alligator Cable, SAE to Battery Eyelet Cable
Special Features	UltraSmart MPPT charge controller, improved 3-stages charging, full safety protections, adjustable pole mount bracket, three battery charging modes, visual charging level, superior quality and material
Connector Type	Plug & Play SAE Harness

9. WARRANTY AND SUPPORT

For warranty information or technical support, please refer to the product packaging or contact SUNER POWER customer service directly. Keep your purchase receipt for warranty claims.