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VEVOR 500W mit MPPT-Regler

VEVOR 500W 12V Wind Turbine Generator with MPPT Controller User Manual

Model: 500W mit MPPT-Regler

1. Introduction

The VEVOR 500W Wind Turbine Generator is designed for efficient and reliable wind energy utilization. This 12V, 5-blade system includes an MPPT controller, making it suitable for various applications such as homes, farms, RVs, and boats. Its robust construction and optimized design ensure consistent power generation from wind resources.

2. Product Overview

Key Features

- **High Efficiency 500W Output:** Provides exceptional wind energy utilization and efficiency for diverse power needs.
- **Optimized Wind Energy Use:** Features a 2.5 m/s start-up wind speed, 12 m/s rated wind speed, and operates between 3 to 25 m/s, ensuring optimal energy production in windy areas.
- **Reliable and Durable Performance:** Equipped with a 12V AC three-phase permanent magnet synchronous generator, operating quietly at 55 dB. The MPPT microprocessor controller intelligently adjusts current and voltage.
- **Premium 5-Blade Design:** Blades are made from reinforced fiberglass nylon, offering waterproof and corrosion-resistant properties, withstanding temperatures from -40 °C to 80 °C. The 47-inch rotor diameter maximizes energy production efficiency.
- **Quality Construction:** The turbine body is constructed from die-cast aluminum, making it waterproof and corrosion-resistant. Its tail can be adjusted to align with wind direction, enhancing wind resistance and safety. Dual bearings ensure quiet and efficient operation.

Product Components and Applications

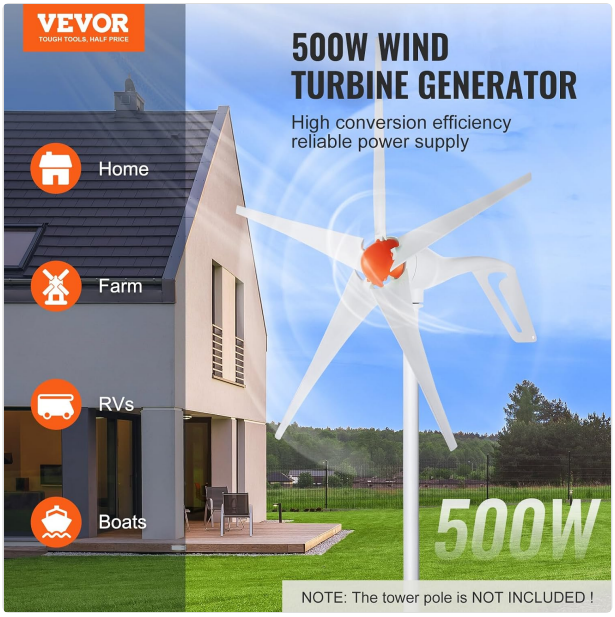


Figure 2.1: The VEVOR 500W Wind Turbine Generator is versatile for various applications such as homes, farms, RVs, and boats.



Figure 2.2: Key components include an aluminum alloy body, aerodynamic tail fin, stable dual bearings, and an MPPT controller.



Figure 2.3: The reinforced fiberglass nylon blades are designed to withstand extreme temperatures from -40°C to +80°C.



Figure 2.4: The VEVOR 500W Wind Turbine Generator.

3. Installation Guide

Safety Precautions

- Ensure all power sources are disconnected before installation.
- Wear appropriate personal protective equipment (PPE) including gloves and eye protection.
- Installation should be performed by qualified personnel or under professional supervision.
- Choose a mounting location free from obstructions and away from power lines.
- Securely fasten all components to prevent accidents due to wind or vibration.

Components Checklist

Before starting installation, verify that all parts are present:

- Wind Turbine Generator (main body with blades)

- MPPT Wind Power Controller
- Mounting hardware (bolts, nuts, washers)
- User Manual

Note: The tower pole is not included and must be prepared or purchased separately.

Mounting the Wind Turbine

1. **Select Mounting Location:** Choose an elevated area with consistent wind flow, free from obstacles like trees or buildings that could create turbulence.
2. **Prepare Mounting Pole:** The recommended mounting height is 6m - 8m. The wall thickness of the mounting iron rod should be ≥4mm. Refer to Figure 3.1 for accessory sleeve dimensions.
3. **Attach Accessory Sleeve:** Weld a suitable iron rod to the accessory sleeve.
4. **Secure Turbine to Sleeve:** Attach the wind turbine generator to the accessory sleeve using the provided screws. Ensure a reliable and secure connection.
5. **Erect the Pole:** Carefully erect the mounting pole with the attached turbine.

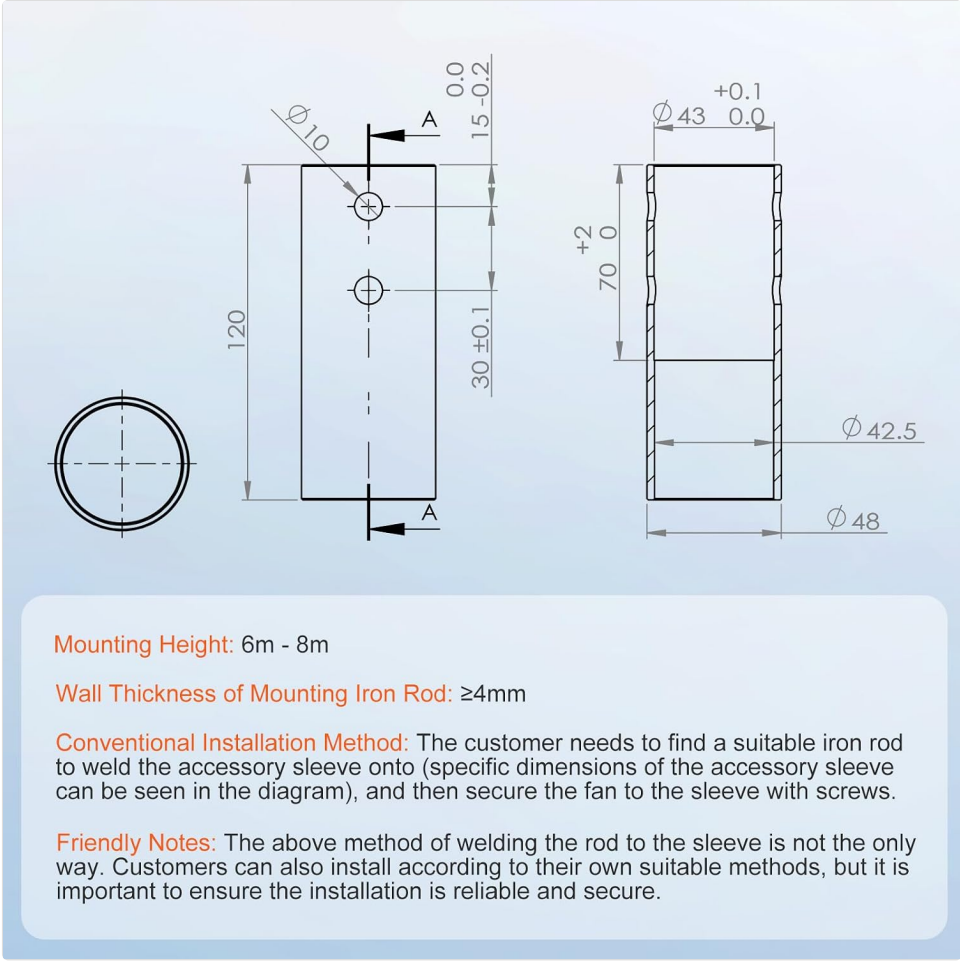


Figure 3.1: Mounting dimensions for the wind turbine pole. The accessory sleeve has a diameter of ∅48mm and a height of 70mm.

Wiring Diagram

Connect the wind turbine generator to the MPPT wind power controller, and then to your battery group, UPS inverter, and AC load. A solar panel can also be integrated into the system for hybrid power generation.

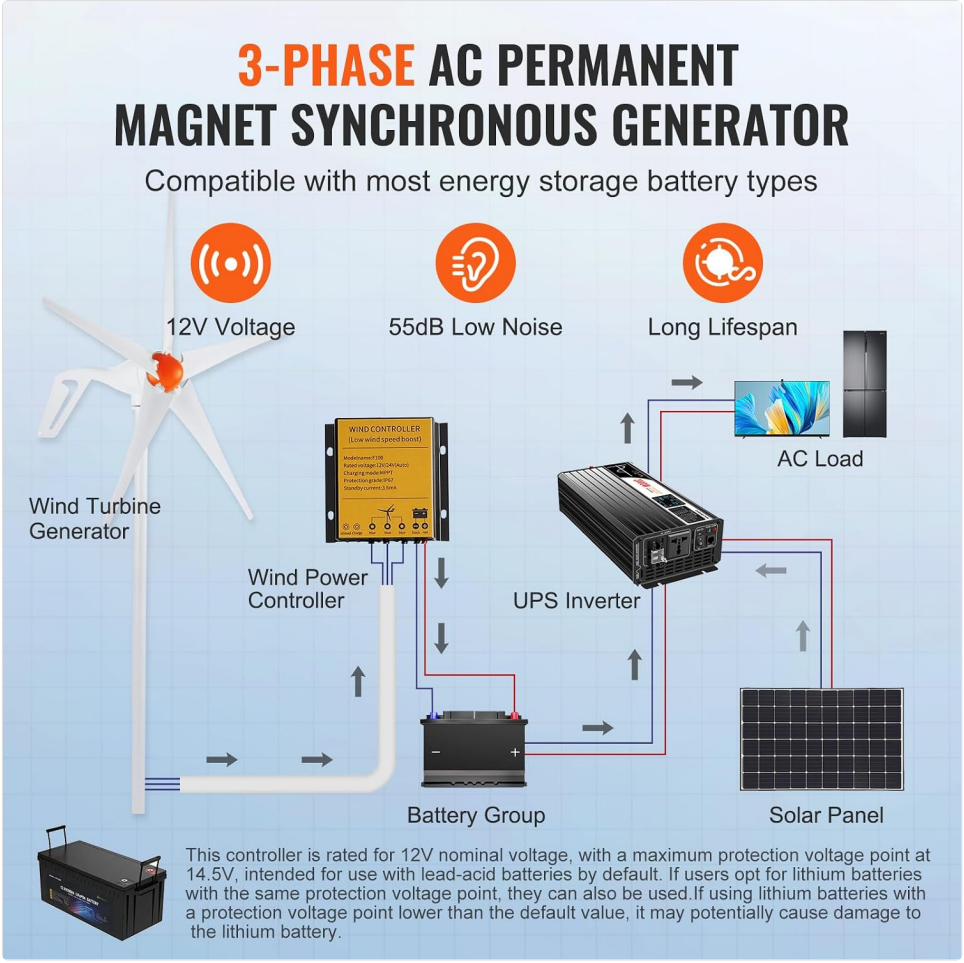


Figure 3.2: Wiring diagram for the wind turbine system. The controller is rated for 12V nominal voltage, with a maximum protection voltage point at 14.5V for lead-acid batteries. For lithium batteries, adjust the protection voltage point accordingly.

4. Operating Instructions

Initial Startup

Once installed and wired correctly, the wind turbine will begin to rotate and generate power when sufficient wind speed is present. The MPPT controller will manage the charging process to your battery bank.

Wind Speed Considerations

- **Start-up Wind Speed:** The turbine begins generating power at a low wind speed of 2.5 m/s.
- **Rated Wind Speed:** Optimal power output is achieved at the rated wind speed of 12 m/s.
- **Operating Wind Speed:** The turbine is designed to operate efficiently within a wind speed range of 3 to 25 m/s.
- **High Wind Conditions:** The aerodynamic tail fin and robust construction ensure stable operation and enhanced wind resistance during strong winds.

MPPT Controller Functionality

The integrated MPPT (Maximum Power Point Tracking) controller optimizes the power output from the wind turbine by continuously adjusting the current and voltage to match the battery's charging requirements. This ensures maximum charging efficiency and protects the battery from overcharging. If the battery is fully charged, the controller will activate a brake protection function to prevent overcharging.

5. Maintenance

Regular maintenance ensures the longevity and optimal performance of your wind turbine generator.

- **Visual Inspection:** Periodically inspect the blades, tower, and connections for any signs of damage, corrosion, or loose fasteners.
- **Blade Cleaning:** Clean the blades as needed to remove dirt, debris, or ice buildup, which can affect efficiency.
- **Electrical Connections:** Check all electrical connections for tightness and signs of wear or corrosion.
- **Bearing Check:** Listen for unusual noises from the bearings, which may indicate a need for lubrication or replacement.
- **Controller Inspection:** Ensure the MPPT controller is clean and free from moisture. Check indicator lights for normal operation.

6. Troubleshooting

This section addresses common issues you might encounter with your wind turbine generator.

Problem	Possible Cause	Solution
Turbine not generating power	Insufficient wind speed; Loose electrical connections; Controller malfunction; Obstructions.	Check wind conditions; Verify all wiring connections; Inspect controller status; Ensure no physical obstructions.
Low power output	Low average wind speed; Turbulent airflow due to nearby obstacles; Dirty or damaged blades.	Relocate turbine to a windier, unobstructed area; Clean blades; Inspect blades for damage.
Unusual noise or vibration	Loose mounting hardware; Damaged blades; Bearing wear.	Tighten all fasteners; Inspect and replace damaged blades; Check bearings for wear.
Battery overcharging	Controller malfunction.	The MPPT controller should automatically activate brake protection. If not, inspect or replace the controller.

Frequently Asked Questions (FAQ)

- **Q: Does the wind turbine include a tower pole?**
  A: No, the tower pole is not included. Users need to prepare or purchase it separately.
- **Q: Will the turbine continue charging the battery when it is fully charged?**
  A: No. The controller will automatically activate the brake protection function to prevent the battery from overcharging.
- **Q: Why does the wind turbine sometimes fail to reach the rated power as advertised?**
  A: The wind strength and stability directly affect the output power of the wind turbine. If the wind speed is too low or too high, or if the wind direction changes frequently, the turbine may not reach its optimal operating condition, which will affect power generation efficiency. In addition, trees, buildings or other obstacles near the installation site may create turbulent airflow, affecting the turbine's performance. It is recommended to avoid installing the turbine in such areas.

7. Technical Specifications

Specification	Value
Rated Power	500W
Rated Voltage	12V
Wheel Diameter	47 inches / 1.2 m
Startup Wind Speed	2.5 m/s
Rated Wind Speed	12 m/s
Controller	Included (MPPT)
Net Weight	15.32 lbs / 6.95 kg
Product Dimensions (L x W x H)	120 x 120 x 68 cm
Manufacturer	VEVOR
Model Number	500W mit MPPT-Regler

8. Product Video

Watch the official product video for a visual guide to the VEVOR Wind Turbine Generator's features and applications.

▶ **Watch video online**

Official VEVOR Wind Turbine Generator product showcase video.

9. Warranty and Support

For warranty information, technical support, or any inquiries regarding your VEVOR 500W Wind Turbine Generator, please refer to the official VEVOR website or contact VEVOR customer service directly. Keep your purchase receipt for warranty claims.

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