Victron Energy MultiPlus 12/500/20-16 120V VE.Bus

Victron Energy MultiPlus 12/500/20-16 120V VE.Bus Inverter/Charger Instruction Manual

Model: MultiPlus 12/500/20-16 120V VE.Bus

1. Introduction

This manual provides essential information for the safe and efficient installation, operation, and maintenance of your Victron Energy MultiPlus 12/500/20-16 120V VE.Bus Inverter/Charger. Please read this manual thoroughly before using the product.

2. Safety Information

WARNING: Incorrect installation can be hazardous. Always consult a licensed professional and follow all applicable electrical codes during installation. Ensure adequate ventilation during charging to prevent flames and sparks. This unit is UL-Certified.

- Always disconnect the power supply before making or breaking connections to the battery.
- Charge lead-acid or Li-ion batteries only.
- Ensure proper grounding of the unit.
- Do not expose the unit to rain or moisture.

3. Product Overview

The Victron Energy MultiPlus 12/500/20-16 120V VE.Bus is a versatile device combining a true sine wave inverter, a sophisticated battery charger with adaptive charge technology, and a high-speed AC transfer switch within a single compact enclosure. It is designed to provide reliable power for various applications including RVs, boats, backup power systems, and off-grid cabins.

Key Features:

- **Pure Sine Wave Inverter:** Delivers high-quality AC power suitable for sensitive electronics.

- **Adaptive Charge Technology:** Ensures optimal charging for various battery types.
- **PowerAssist Technology:** Prevents overload of a limited AC source (e.g., generator or shore power) by supplementing with power from the battery.
- **High-Speed AC Transfer Switch:** Provides uninterrupted power by switching to inverter mode within 20ms during grid failure or power disconnection.
- **Parallel Operation:** Up to 6 MultiPlus units can operate in parallel for increased power output. Three units can be configured for three-phase output.
- **UL-Certified:** Meets safety standards for peace of mind.

Figure 1: Rear view of the Victron Energy MultiPlus Inverter/Charger, highlighting AC input, AC output, ON/OFF/CHR switch, NEG (-) and POS (+) battery terminals, SETTINGS, VE.BUS, ON/REMOTE/TEMP, and ALARM ports.

4. Setup

The MultiPlus is designed for easy wall mounting and connection. Follow these steps for proper installation.

4.1. Wall Mounting

The unit comes with a wall mount plate. Secure the plate to a sturdy surface, then hang the MultiPlus unit onto the plate using the hook at the back of its casing.

4.2. Accessing Connections

To access the connection terminals, unscrew the screws at the bottom of the enclosure and remove the service panel.

Figure 2: Detailed view of the MultiPlus connection panel, showing AC INPUT, AC OUTPUT, ON/OFF/CHR switch, NEG (-) POS (+) battery terminals, SETTINGS port, VE.BUS port, ON/REMOTE/TEMP terminals, and COM NC NO ALARM terminals.

4.3. Battery Connection

Connect the battery cables to the NEG (-) and POS (+) terminals. Use a torque wrench with an insulated box spanner to tighten connections to a maximum of 7 Newton-meters to avoid shorting the battery.

4.4. AC Mains and Load Connection

Connect the AC mains input and AC loads to the designated terminals on the service panel. Ensure all connections are secure and comply with local electrical codes.

4.5. Accessory Connections

Connect any desired accessories such as a Venus GX, Color Control GX, or optional current transformer to their respective ports (e.g., VE.Bus, Remote, Temp, Alarm). These accessories enable advanced monitoring and control.

4.6. Securing the Service Panel

Once all connections are made, reattach the service panel and secure it with its fixing screws.

4.7. Initial Power On

Locate the ON/OFF/CHR switch at the bottom of the unit. Switch it to the "ON" position (position I) to power on the inverter/charger. Position "OFF" (position 0) turns the unit off, and "CHR" (position II) activates charger-only mode.

Setup Video Guide:

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Video 1: Introduction to the Victron Energy MultiPlus-II, demonstrating key features and installation steps. This video provides a visual guide for mounting, connecting cables, and powering on the unit.

5. Operating Instructions

The MultiPlus offers various operating modes and monitoring options to optimize your power system.

5.1. Operating Modes

- **ON (I):** The unit functions as both an inverter and a charger, providing AC power from the battery and charging the battery when AC input is available.
- **OFF (0):** The unit is completely off.
- **CHARGER ONLY (II):** The unit only functions as a battery charger, passing through AC input to loads but not inverting.

5.2. PowerAssist Functionality

The unique PowerAssist feature prevents overload of a limited AC source (such as a generator or shore power connection). If the AC load exceeds the capacity of the external source, the MultiPlus will automatically supplement the power from the battery. When the load reduces, surplus power is used to recharge the battery.

5.3. Monitoring and Control

For comprehensive monitoring and control of your MultiPlus and entire power system, Victron Energy offers several accessories and software solutions:

- **VictronConnect App:** Use with a BMV-712 Smart Battery Monitor (or other compatible devices) for instant access to battery voltage, current, power, and more via Bluetooth.
- **Venus GX / Color Control GX:** These devices allow for remote configuration and monitoring when connected to the internet via the free Victron Remote Management (VRM) website. They store and display your installation data.

Understanding Standby Power Consumption (ECO Mode):

Inverters consume some power even when no load is connected (no-load consumption or standby power). The MultiPlus-II has a low standby power consumption of just 11 Watts, less than half of previous MultiPlus models. To further reduce power consumption in no-load situations, the unit can be configured with an ECO mode (Automatic Energy Saver - AES).

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Video 2: Explains how to reduce inverter power consumption in standby mode using the Automatic Energy Saver (AES) function, also known as ECO mode.

The AES function can be configured via VE.Configure software or the VictronConnect app (for Smart models). It offers two modes:

- **Modified Sine Wave:** Reduces consumption by about 20% by lowering the amount of time the FETs are switching. This results in a less perfect sine wave.
- **Search Mode:** Changes the frequency to 1Hz, switching only once per second and producing one sine wave per second. This uses significantly less energy (about 70% less than normal consumption). When a load is applied, the inverter returns to normal operation.

Be aware that using AES modes, especially search mode, can affect certain appliances (e.g., slowing down a microwave clock or reducing light bulb output). Always choose the smallest possible inverter for your system to maximize efficiency.

6. Maintenance

Regular maintenance ensures the longevity and optimal performance of your MultiPlus unit.

- **Cleaning:** Keep the unit clean and free from dust and debris. Ensure ventilation openings are not obstructed.
- **Connections:** Periodically check all electrical connections (battery, AC input, AC output) for tightness and corrosion. Tighten as necessary.
- **Battery Health:** Monitor battery voltage and state of charge regularly, especially if using lead-acid batteries, to prevent deep discharge.

7. Troubleshooting

If you encounter issues with your MultiPlus, refer to the following basic troubleshooting steps:

- **No Power Output:**
    - Check if the unit is switched to "ON" (I) or "CHARGER ONLY" (II) mode.
    - Verify battery connections are secure and battery voltage is sufficient.
    - Check AC input and output connections.
- **Battery Not Charging:**
    - Ensure AC input is present and the unit is in "ON" (I) or "CHARGER ONLY" (II) mode.
    - Check AC input circuit breakers.
    - Verify battery connections.
- **Overload/Shutdown:**
    - Reduce the connected AC load.
    - Check for short circuits in the AC output wiring.
    - Allow the unit to cool down if it has overheated.

For more detailed troubleshooting, consult the full Victron Energy MultiPlus manual available on the manufacturer's website or contact Victron Energy support.

8. Specifications

Feature	Detail
Brand	Victron Energy
Model Name	Victron Energy MultiPlus
Item Model Number	MultiPlus 12/500/20-16 120V VE.Bus
Product Dimensions	12.2 x 7.2 x 3.9 inches
Item Weight	11.8 pounds
Power Source	Solar and Battery Powered
Wattage	400 watts
Recommended Uses	RV, Boat, Backup Power, Off-grid Cabin
Date First Available	July 11, 2024

9. Warranty & Support

This product is manufactured by Victron Energy. For warranty information, technical support, or service, please refer to the official Victron Energy website or contact their customer service directly. Always provide your product model number (MultiPlus 12/500/20-16 120V VE.Bus) and serial number when seeking support.
You can visit the Victron Energy Store on Amazon for more products and information:Victron Energy Store