MakeSkyBlue 40A-V119

MakeSkyBlue 40A MPPT Solar Charge Controller

Model: 40A-V119

1. Introduction

The MakeSkyBlue 40A MPPT Solar Charge Controller (Model 40A-V119) is an advanced device designed to efficiently manage power flow from your solar panels to your battery bank. Utilizing Intelligent Maximum Power Point Tracking (MPPT) technology, it optimizes solar energy harvesting, ensuring your batteries are charged effectively and safely. This controller features a built-in DSP controller for high performance and supports three-stage charging to prolong battery life.

Equipped with a multi-function LCD display, the V119 model provides real-time system information. It is suitable for various battery types, including 12V, 24V, 36V, and 48V systems. The V119 also includes Wi-Fi connectivity for monitoring via an Android application, facilitating convenient system management. Please note that the Wi-Fi function is for direct connection between the controller and an Android phone only, not for internet or cloud services.

Figure 1: Front view of the MakeSkyBlue 40A MPPT Solar Charge Controller, showing the LCD display and control buttons.

2. Safety Information

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

- Ensure all wiring is performed by qualified personnel and complies with local electrical codes.
- Always disconnect power from solar panels and batteries before installing or servicing the controller.
- Use appropriate circuit breakers for both solar panel input and battery output to prevent overcurrent.
- Do not expose the controller to water, excessive humidity, or corrosive environments.
- Ensure adequate ventilation around the controller to prevent overheating.
- Batteries can produce explosive gases; ensure proper ventilation when working with batteries.
- Wear appropriate personal protective equipment, including eye protection, when working with batteries and electrical systems.

3. Setup and Installation

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

3.1 Mounting the Controller

Mount the controller vertically on a non-flammable surface, ensuring sufficient clearance (at least 6 inches) around the unit for proper airflow and heat dissipation. Avoid direct sunlight exposure to the controller.

Figure 2: Side view of the controller, highlighting the cooling fan and ventilation slots.

3.2 Wiring Connections

Connect the components in the following order: Battery > Solar Panel > DC Load. Always ensure circuit breakers are

open (off) before making connections.

1. **Battery Connection:** Connect the battery cables to the 'BT+' and 'BT-' terminals on the controller. Ensure correct polarity. It is recommended to install a circuit breaker (e.g., 63A for 40A controller) between the battery and the controller.
2. **Solar Panel Connection:** Connect the solar panel cables to the 'PV+' and 'PV-' terminals. Ensure correct polarity. Install a circuit breaker (e.g., 15A) between the solar panels and the controller.
3. **DC Load Connection (Optional):** If using, connect your DC load to the 'OU+' and 'OU-' terminals. Ensure the load current does not exceed 5 Amps.

Use appropriate wire gauge (e.g., 10 AWG) for all connections, ensuring all wires from breakers are of the same length and size for optimal performance.

Controller Version	V118 30A-60A	V119 30A-60A V119=V118+Wifi Box	V120 30A-60A	V121 30A-60A V121=V120+Wifi Box	V122 80A-120A
PV Start ON&Lithium BMS Activation	☹	☹	☺	☺	☺
Lithium Battery Priority	☹	☹	☺	☺	☺
Lead-acid Battery Priority	☺	☺	☹	☹	☺
WiFi Connection	☹	☺	☹	☺	☺
Single Voltage	☹	☹	☺	☺	☺
Automatic Battery Voltage Detection	☺	☺	☹	☹	☺
Voltage Lock Function	☹	☹	☹	☹	☺
Set Charging Current Limitation	☹	☺	☹	☺	☺
Relay Control	☺	☺	☺	☺	☺
Calibration	☺	☺	☺	☺	☺
APP for Android	☹	☺	☹	☺	☺
Output Limited Current Protection	☺	☺	☺	☺	☺
Overcharge Protection	☺	☺	☺	☺	☺
Over-temperature Protection	☺	☺	☺	☺	☺

Figure 3: Detailed wiring diagram showing connections for solar panels, battery, and DC load with recommended circuit breakers.

3.3 Initial Power-Up

Once all connections are secure and verified for correct polarity, close the battery circuit breaker first, then the solar panel circuit breaker. The LCD display should illuminate, indicating the controller is powered on.

4. Operating Instructions

The controller features an LCD display and four buttons for navigation and settings adjustment.

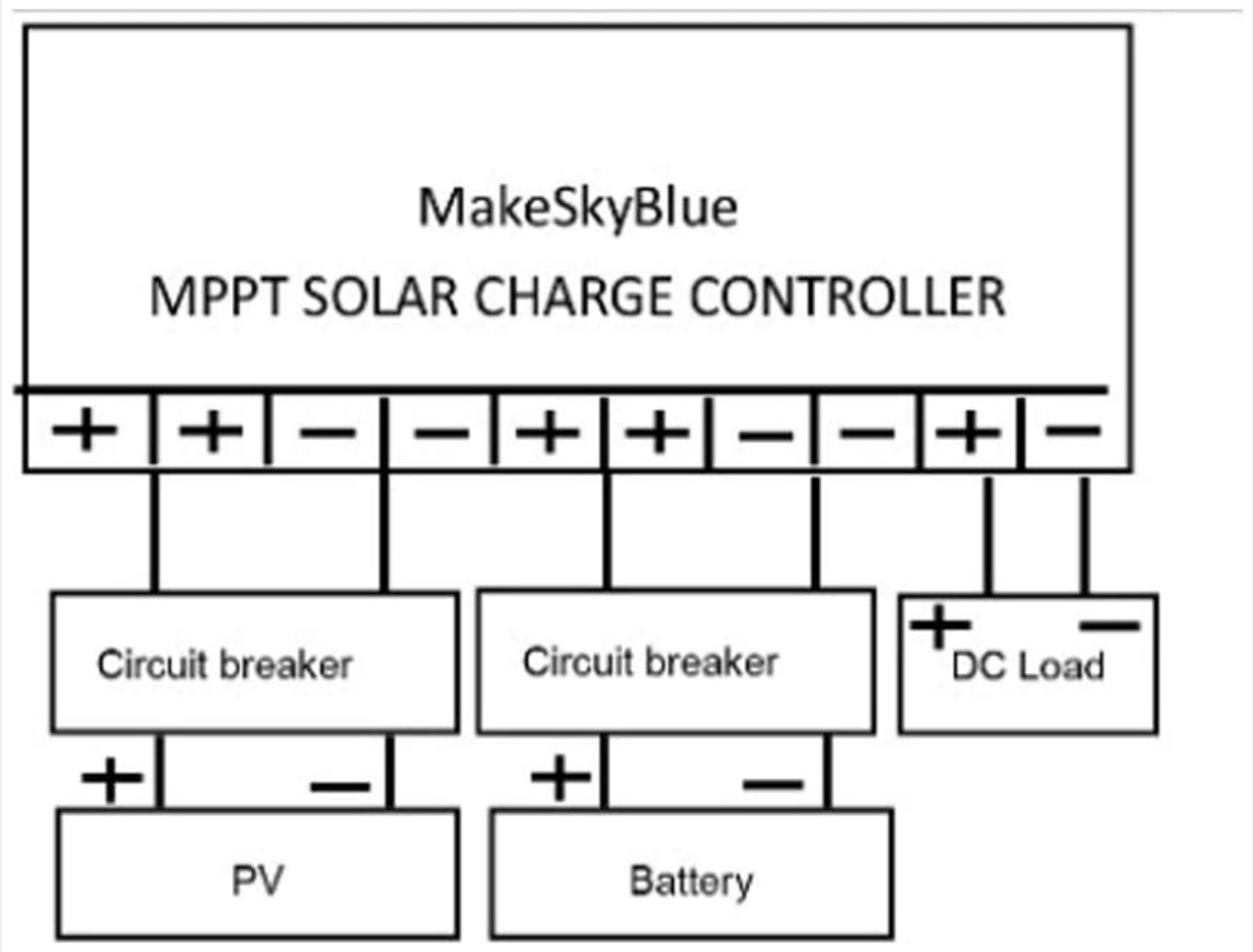


Figure 4: Close-up of the controller's LCD display and control buttons (PRG/ESC, Up, Down, ENTER).

4.1 LCD Display Functions

The LCD cycles through various parameters, including battery voltage, charging current, solar panel voltage, and power output. Refer to the on-screen indicators for specific data.

4.2 Button Navigation

- **PRG/ESC:** Enters programming mode or exits current menu/setting.
- **Up/Down Arrows:** Navigate through menu options or adjust values.
- **ENTER:** Confirms selection or saves changes.

4.3 Battery Type and Voltage Settings

The controller supports various battery types. The default charging mode is for lead-acid batteries. You can set the charging voltage range:

- For 12V Battery Systems: Set voltage from 12V-17V.
- For 24V Battery Systems: Set voltage from 24V-34V.
- For 48V Battery Systems: Set voltage from 48V-68V.

It is important to calibrate the battery voltage reading in the device for accurate measurements, especially for lithium battery configurations.

4.4 Wi-Fi Connectivity (V119 Model)

The V119 model includes a Wi-Fi module for monitoring via a dedicated Android application. To connect:

1. Download the MakeSkyBlue application from the Android app store.
2. Enable Wi-Fi on your Android phone and search for the controller's Wi-Fi network.
3. Connect to the network. The default password is typically '88888888'.
4. Open the application to view real-time data and adjust settings.

Note: This Wi-Fi connection is a direct link between the controller and your phone and does not provide internet access or cloud connectivity.

5. Maintenance

Regular maintenance ensures the longevity and efficient operation of your charge controller.

- **Cleaning:** Periodically clean the exterior of the controller with a dry, soft cloth. Ensure ventilation openings and the cooling fan are free from dust and debris.
- **Fan Operation:** The internal cooling fan activates when the internal temperature exceeds 45°C and turns off when it drops below 40°C. Ensure the fan is not obstructed.
- **Connection Checks:** Annually inspect all wiring connections for tightness and corrosion. Re-tighten if necessary.
- **System Monitoring:** Regularly monitor the LCD display and the mobile application for any unusual readings or error messages.

6. Troubleshooting

This section addresses common issues you might encounter with your MPPT charge controller.

Problem	Possible Cause	Solution
Controller not powering on	No battery connection or reversed polarity; Battery voltage too low.	Check battery connections and polarity. Ensure battery voltage is within operating range.
No charging current	No solar input; Reversed solar polarity; Solar panel voltage too low/high; Overcast weather.	Check solar panel connections and polarity. Verify solar panel Voc is within specified range (20V-80V for 12V, 37V-105V for 24V, 72V-160V for 48V).
Inaccurate battery voltage reading	Calibration required; Loose battery connections.	Perform battery voltage calibration through the controller's menu. Check and tighten battery terminal connections.
Wi-Fi connection issues	Incorrect password; App issues; Interference.	Ensure correct Wi-Fi password ('88888888'). Restart the app and controller. Try connecting with another Android device.

Problem	Possible Cause	Solution
Overheating / Fan constantly running	Insufficient ventilation; Excessive load; High ambient temperature.	Ensure proper airflow around the unit. Reduce load if possible. Check ambient temperature.

6.1 Protection Features

The controller is equipped with several protection mechanisms:

- **Limited Current Protection:** Limits output current to 42A.
- **Temperature Protection:** Shuts down if internal temperature exceeds 75°C.
- **Overcharging Protection Voltage:** Prevents overcharging at 15V (12V battery), 30V (24V battery), and 60V (48V battery).

7. Specifications

Feature	Specification
Model Number	40A-V119
Brand	MakeSkyBlue
Maximum PV Array Power (12V Battery)	≤ 480W
Maximum PV Array Power (24V Battery)	≤ 960W
Maximum PV Array Power (48V Battery)	≤ 1700W
PV Array Open Circuit Voltage (12V Battery)	20V-80V
PV Array Open Circuit Voltage (24V Battery)	37V-105V
PV Array Open Circuit Voltage (48V Battery)	72V-160V
Limited Current Protection	42A
Temperature Protection	>75°C
Fan-on Temperature	>45°C
Fan-off Temperature	<40°C
Overcharging Protection Voltage (12V)	15V
Overcharging Protection Voltage (24V)	30V
Overcharging Protection Voltage (48V)	60V
Product Dimensions	8.46 x 1.97 x 4.53 inches
Item Weight	2.52 pounds
Display Type	LCD

Feature	Specification
Operating Temperature	Up to 55 Degrees Celsius

8. Warranty Information

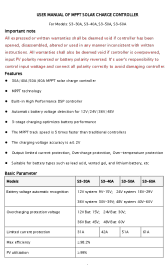
MakeSkyBlue products are manufactured to high-quality standards. For specific warranty terms and conditions, please refer to the warranty card included with your product or contact MakeSkyBlue customer support. Keep your purchase receipt as proof of purchase for any warranty claims.

9. Support

For further assistance, technical support, or inquiries, please contact MakeSkyBlue customer service. You may also find additional resources and FAQs on the official MakeSkyBlue website.

A digital version of this user manual is available for download:User Manual (PDF)

Related Documents - 40A-V119

	MakeSkyBlue S3 Series MPPT Solar Charge Controller V117 User Manual Detailed user manual for the MakeSkyBlue S3 Series MPPT Solar Charge Controller (Models S3-30A, S3-40A, S3-50A, S3-60A, V117). Covers features, installation, requirements, troubleshooting, and settings for efficient solar energy management.
	MPPT Solar Charge Controller User Manual for S3 Series Comprehensive user manual for MakeSkyBlue S3 series MPPT solar charge controllers (S3-30A, S3-40A, S3-50A, S3-60A). Covers features, specifications, installation, operation, troubleshooting, and battery charging reference.
	PowMr MPPT 30A/40A/50A/60A Solar Charge Controller User Manual Comprehensive user manual for PowMr MPPT solar charge controllers (models 30A, 40A, 50A, 60A). Includes installation, operation, troubleshooting, and technical specifications for efficient solar system management.
	PowMr Keeper SERIES MPPT 20A-40A Solar Charge Controller User Manual Comprehensive user manual for the PowMr Keeper SERIES MPPT solar charge controller (20A-40A). Covers wiring, setup, operation, status indicators, button functions, battery types, system voltage, load modes, protection, fault management, and technical specifications.

	Keeper Series MPPT 20A-40A Solar Charge Controller User Manual This manual provides comprehensive instructions for the Keeper Series MPPT solar charge controllers, covering installation, operation, protection, and technical specifications for models 20A-40A.
	Keeper Series MPPT Solar Charge Controller User Manual User manual for the Keeper Series Maximum Power Point Tracking (MPPT) Solar Charge Controller, models MPPT 20A-40A. Provides detailed information on product overview, appearance, wiring, operation, protection, common faults, and technical specifications.