



MakeSkyBlue S3-30A MPPT Solar Charge Controller User Manual

[Home](#) » [MakeSkyBlue](#) » MakeSkyBlue S3-30A MPPT Solar Charge Controller User Manual 

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USER MANUAL OF MPPT SOLAR CHARGE CONTROLLER
For Models: S3-30A, S3-40A, S3-50A, S3-60A

Contents

- [1 Important note](#)
- [2 Features](#)
- [3 Basic Parameter](#)
- [4 Warning](#)
- [5 Installation steps](#)
- [6 How to make controllers in parallel](#)
- [7 Troubleshooting](#)
- [8 Manual Setting](#)
- [9 Dimension](#)
- [10 Batteries charge voltage reference](#)
- [11 Documents / Resources](#)
- [12 Related Posts](#)

Important note

All expressed or written warranties shall be deemed void if controller has been opened, disassembled, altered or used in any manner inconsistent with written instructions. All warranties shall also be deemed void if controller is overpowered, input PV polarity reversed or battery polarity reversed. It's user's responsibility to control input wattage and connect all polarity correctly to avoid damaging controller.

Features

- 30A/40A/50A/60A MPPT solar charge controller
- MPPT technology
- Built-in High Performance DSP controller
- Automatic battery voltage detection for 12V/24V/36V/48V
- 3-stage charging optimizes battery performance
- The MPPT track speed is 5 times faster than traditional controllers
- The charging voltage accuracy is $\pm 0.2V$
- Output limited current protection, Overcharge protection, Over-temperature protection
- Suitable for battery types such as lead acid, vented gel, and lithium battery, etc

Basic Parameter

Models	53-30A	S3-40A	S3-50A	53-60A
Battery voltage automatic recognition	12V system: 9V- 1 5V 24V system: 18V-29V 36V system: 30V-39V; 48V system: 40V-60V			
Overcharging protection voltage	12V Bat: 15V; 24V Bat: 30V; 36V Bat: 45V, 48V Bat: 60V			
Limited current protection	31A	42A	51A	61A
Max efficiency	98.%			
PV utilization	_99%			

Protection function	
Temperature protection	75°C / 167°F
Fan-on temperature	>45°C / 113°F
Fan-off temperature	<40°C / 104°F
Properties	
Dimensions	214x115x50mm / 8.4*4.5*1.97in
Net weight	1.2KG / 2.65LB
Electromagnetic compatibility	Accord to EN61000, EN55022, EN55024
Enclosure	IP21
Environmental temperature	-20°C – +55°C / -4°F – + 131°F
Storage temperature	-40°C – +75°C / -40°F – + 167°F

How to choose PV Module

Models		S3-30A	S3-40A	S3-50A	S3-60A
Maximum PV Module Input Power (Never overpowered)	For 12V Battery	.s.400W	.480W	.600W	tc.720W
	For 24V Battery	720W	960W	.1200W	.1440W
	For 36V Battery	.1000W	1400W	s.1800W	.2100W
	For 48V Battery	<_ 1200W	.1700W	s;2200W	.2800W
PV Module Open Circuit Voltage	For 12V Battery	DC20V-DC80V			
	For 24V Battery	DC37V-DC105V			
	For 36V Battery	DC50V-DC160V			
	For 48V Battery	DC72V-DC160V			
Maximum PV Module Open Circuit Voltage (Never over max PV Voc)		For 12V Battery: 80V; For 24V battery: 105V; For 36V battery: 160V; For 48V battery: 160V.			

Notes: Voc of PV should be in the correct range and when it's 1.5 or 2 times than battery voltage, then it's best efficiency. Please choose the PV modules with right Voc.

How choose Two-pole Circuit Breaker and Wires

Models	S3-30A	S3-40A	S3-50A	S3-60A
Pure copper wires	6mm2/9AWG	6mm219AWG	2PCS 6mm2; 9AWG	2PCS 6mm2 9AWG
Circuit Breaker	2PCS 63A	2PCS 63A	2PCS 63A	2PCS 100A

Warning

- Be aware that only qualified professionals should install these controllers. Please read full manual before installing. Please don't set any parameters if you are not a professional installer. The controller will work well on defaults for Lead acid. Lithium battery require parameter change.
- The controllers should be installed indoors only. Keep controller away from water. Don't use wet towel to wipe controller.
- Never open the controller case without permission. Never reverse input PV polarity. Never reverse the battery polarity. Never overpower input PV.
- The controller can't connect 110V or 240V or any other AC appliances in the OUT+, OUT- terminal. The output is only for DC load current less than 5A. If your battery is 48V, then load should be 48V and current less than 5A.
- Must use two-pole circuit breakers, and make sure the input and output are using separate circuit breakers.
- Use the pure copper wires and connect all polarity correctly.
- Please don't insert any meter or other devices between controller and battery or controller and PV.
- It's important to open terminal lugs 100% before inserting wire into terminal block. Then tighten and recheck to make sure wires are secure.
- Please note that running maximum wattage could be a hazard if atmospheric conditions allow for PV array to over power unit. There are times that a 2800 rated PV array can produce in excess of 3400 watts. This can damage controller. It is best to allow room for that occurrence.

- Please refer to an awg wire size calculator to properly size your wire from your PV, Battery, and Inverter. When in doubt, larger size wire is always a better choice.

Reminder

- The battery voltage must be over 12V, then can start up the controller.
- Keep controller in an environmental temperature of -22°C~+55°C. Avoid direct sunlight.
- Keep good heat dissipation.
- Please contact us or authorized distributor if any doubts before installation or any errors after installed.

Installation steps

1. Use one two-pole circuit breaker in “OFF” position. Install this circuit breaker between controller and battery. Connect batteries to controller ensuring correct polarity. Set circuit breaker to “ON” position. Startup screen will appear with model and version displayed. Set the controller parameter that you want (See Manual Setting steps) and reboot controller. Double check the settings to ensure successful. If using lead acid battery, you don't need to set the parameter and controller will work well. Controller requires 12V to start up. Turn “OFF” the circuit breaker.
2. Take another two-pole circuit breaker in “OFF” position. Install this circuit breaker between controller and PV modules. Make sure the PV polarity is correct, then connect PV wires to controller PV Input. Ensure all wire connection are stable, if not, damage to CPU will result.
3. Turn “ON” the circuit breaker between controller and batteries, and turn “ON” the circuit breaker between controller and PV modules.
4. The controller LCD displays the parameters if all is correct.

GND: Connect a cable to Battery negative from controller screw.

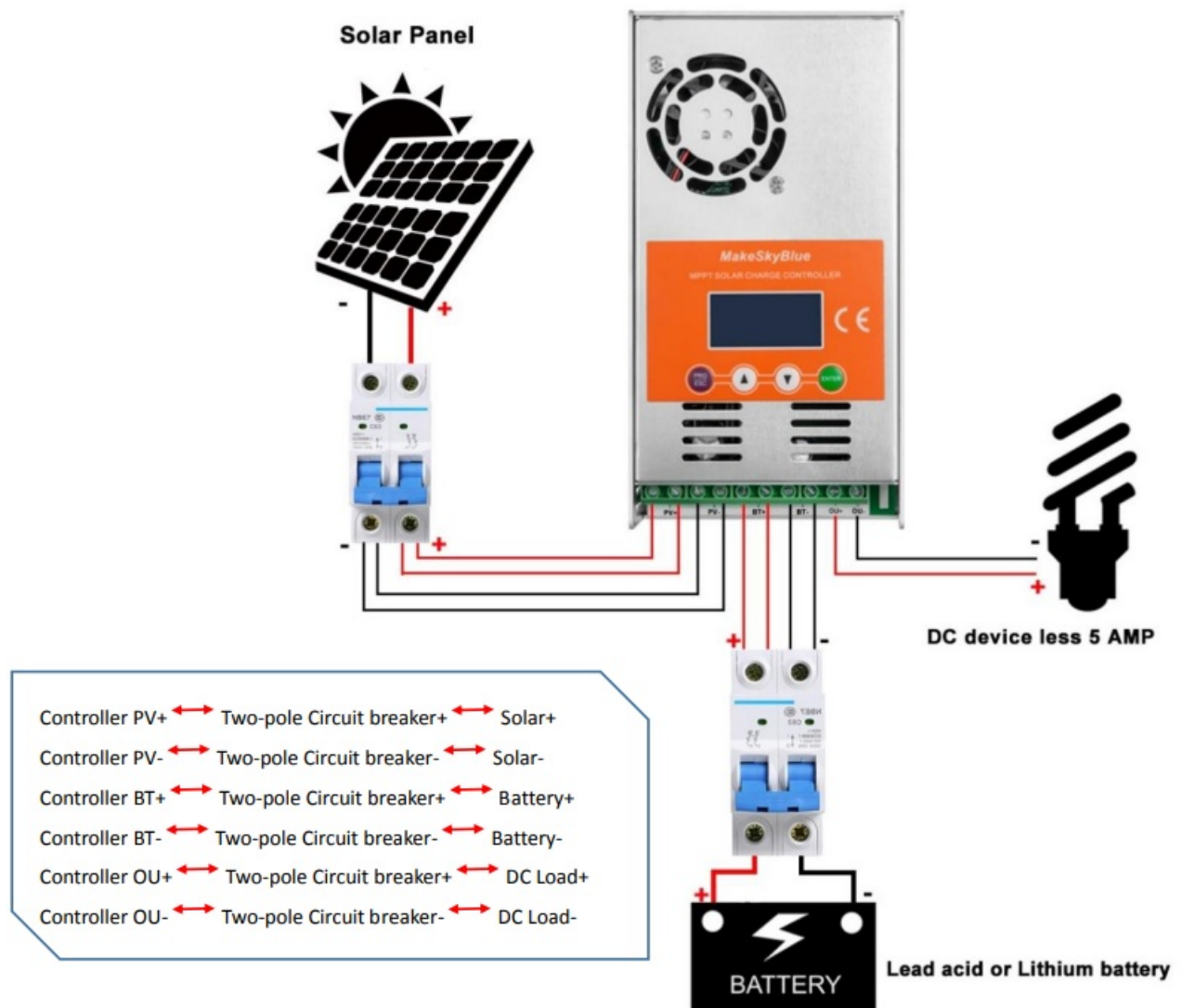
How to connect diagram

For S3-30A and S3-40A, you can connect one wire to one PV+ and another wire to one PV-.

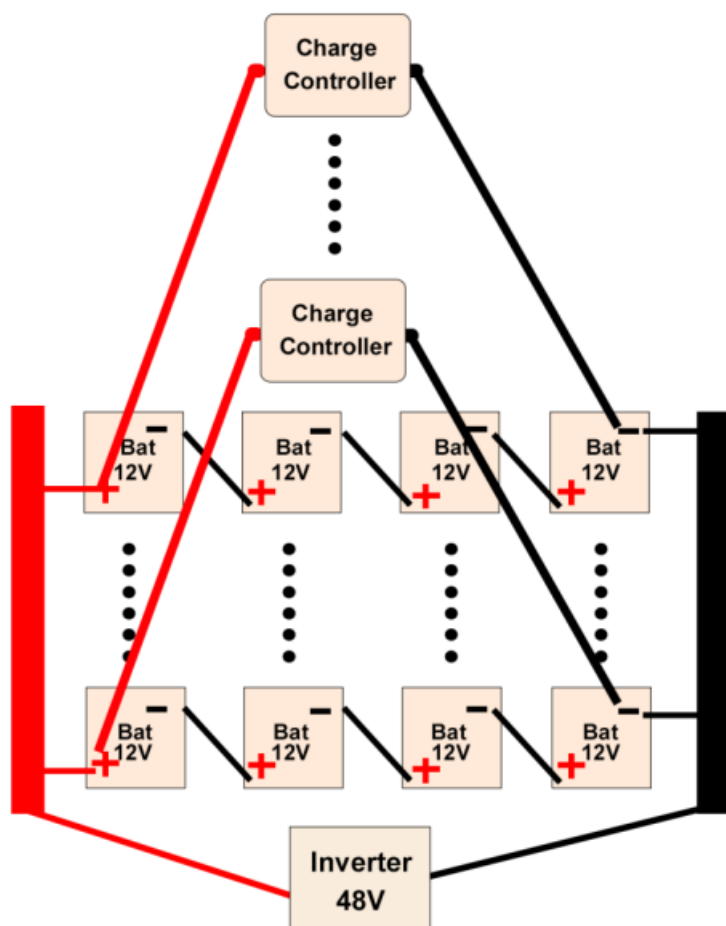
For S3-50A and S3-60A, please connect two wires to two PV+ and another two wires to two PV-.

For BAT+ and BAT-, it's same way to connect wires as above.

(See diagram on next page)



How to make controllers in parallel



Make sure all wires are same size and length. Wire resistance is very important when installing parallel units and battery banks

LCD display

1	PV voltage / Output power
2	Battery voltage / Charging current
3	Working mode/Error code/Temperature
4	ACC Power Generation

Working mode

3.0	Night mode, no charging
4.0	MPPT mode
7.0	Absorption mode
8.0	Floating mode

Troubleshooting

Code	Description	How to solve
18	Input PV voltage is low	Increase the PV voltage
60	Over-temperature protection	Fan will work and temperature reduction automatically
63	Battery voltage is high	Battery high voltage protection and wait for recovery
65	Battery voltage is low	Battery over-discharge and wait for recovery
71	Input PV voltage is high	Decrease the PV voltage, refer to correct Voc range
73	Over-charging current	Decrease the PV power, refer to correct Voc range
74	Output load is short	Disconnect the load and press ENT over 5 seconds

Manual Setting

Reminder: The controller will work well on default setting except lithium battery.

Caution! Disconnect the PV modules before setting the controller. When you set up all steps, please reboot the controller to see if all setting is successful.

1. D00 Press the button PRG, then LCD displays D00. This is setting for load working time (Default is 24-hour). Press ENTER until numbers flash, then press P/DOWN to set up time that you want, press ENTER to confirm it. This output voltage is same as battery. The load is only for small DC load less 5AMP current. If no load, just leave it.
2. D01 Press the button UP, LCD shows 13.8 (Voltage can be set from 12V-17V). This is default value of floating voltage. Press ENTER until numbers flash, then press UP/DOWN to set up voltage that you want, press ENTER to confirm it.
3. D02 Continue to press the button UP, LCD shows 14.5 (Voltage can be set from 12V-17V). This is highest constant voltage for battery. Press ENTER until numbers flash, then press UP/DOWN to setup voltage that you want, press ENTER to confirm it.
4. D03 Continue to press the button UP, LCD shows 10.0. This is protection value of battery discharge. Press ENTER until numbers flash, then press UP/DOWN to set up voltage that you want, press ENTER to confirm it. It means it's protected when 12V battery is less 10.0V and there is no output power from OU+ and OU-.
5. D04 Continue to press the button UP, LCD shows 00. 00 is default for lead acid batteries. If it's for lithium battery, please press ENTER until numbers flash, then press UP/DOWN to choose 01, press ENTER to confirm it. Step 2 (D01) is not useful when you choose 01 for lithium battery. And the voltage in step 3 (D02) will be highest charging voltage for lithium battery. Press ESC to exit the setting menu. Reboot the controller and check settings again.
6. D05 Clear password for Wifi version
7. D06 If you have accurate device and need to calibrate the battery voltage, then calibrate it by D06. Please be cautious to use this function. For example, if your accurate meter tests the battery and the voltage is 24.5V, but the controller battery voltage reads 24V, then use D06 to calibrate the voltage to 24.5V.

Dimension

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Documents / Resources

USER MANUAL OF MPPT SOLAR CHARGE CONTROLLER

Important Note

Be sure to read the manual carefully before using the controller. The manual contains important information about the controller's operation, safety, and maintenance. It is your responsibility to read the manual carefully and follow the instructions. The manual is provided for your reference and should be kept in a safe place for future reference.

Features

- MPPT technology
- Built-in high efficiency MPPT controller
- Maximum power point tracking (MPPT) efficiency up to 99.9%
- 12 step charging voltage control
- The charging voltage accuracy is ±0.1V
- Battery voltage protection, low voltage protection, low voltage protection
- Battery low voltage protection, low voltage protection, low voltage protection

Key Parameter

Parameter	Unit	Min	Max	Typ
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2
Battery voltage protection	V	12.0	14.0	13.2

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