MPPT solar charge controller

358-010277-03

Felicitysolar®

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USER GUIDE

MPPT solar charge controller



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1 ABOUT THIS MANUAL

1.1 Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

1.3 SAFETY INSTRUCTIONS

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
3. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
4. **CAUTION** – Only qualified personnel can install this device with battery.
5. **NEVER** charge a frozen battery.
6. For optimum operation of this charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this charger.
7. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
8. Please strictly follow installation procedure when you want to disconnect PV or battery terminals. Please refer to Installation section of this manual for the details.
9. GROUNDING INSTRUCTIONS -This charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this charger.
10. NEVER cause short circuited on battery output.
11. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this charger back to local dealer or service center for maintenance.

2. INTRODUCTION

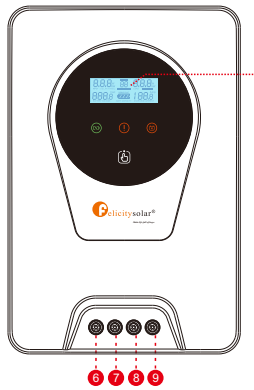
Thank you for selecting this solar charge controller. This solar charge controller is an advanced solar charger with maximum power point tracking. Applying intelligent MPPT algorithm, it allows solar charge controller to extract maximum power from solar arrays by finding the maximum power point of the array.

The MPPT battery charging process has been optimized for long battery life and improved system performance. Self-diagnostics and electronic error protections prevent damage when installation errors or system faults occur. This charger also features multifunctional LCD with communication ports for remote battery temperature and voltage measurement.

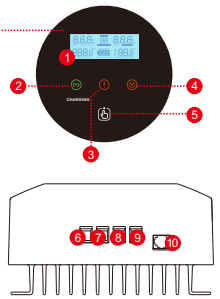
2.1 Features

- Intelligent Maximum Power Point Tracking technology increases efficiency 25%~30%
- Compatible for PV systems in 12V, 24V or 48V
- Three-stage charging optimizes battery performance (Two-stage charging in lithium battery mode)
- Maximum charging current up to 20A / 30A / 45A / 60A / 80A / 100A / 120A
- Maximum efficiency up to 98%
- Automatic battery voltage detection(Lithium battery voltage needs to be set manually)
- Supports lithium battery and various lead-acid batteries, AGM and gel battery
- Integrated intelligent slot compatible with MODBUS communication

2.2 Product Overview



100A / 120A (12V / 24V / 48V)



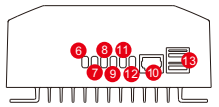
45A / 60A / 80A (12V / 24V / 48V)



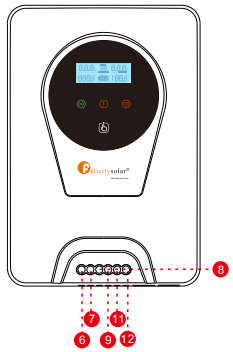
30A/45A(12V / 24V)

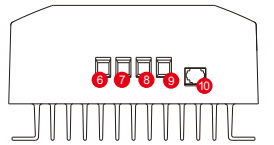


45A / 60A / 80A(12V / 24V / 48V)

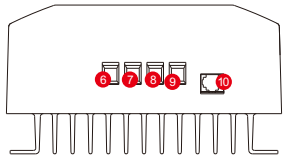


20A (12V / 24V)





30A/45A(12V / 24V)



100A / 120A (12V / 24V / 48V)

1. LCD display
2. Power On/Charging indicator
3. Fault and warning indicator
4. Wiring fault indicator
5. Operation button
6. PV Positive +
7. PV Negative -
8. Battery Negative -
9. Battery Positive +
10. Communication Port
11. LOAD Positive +
12. LOAD Positive -
13. USB

3. INSTALLATION

3.1 Unpacking and Inspection

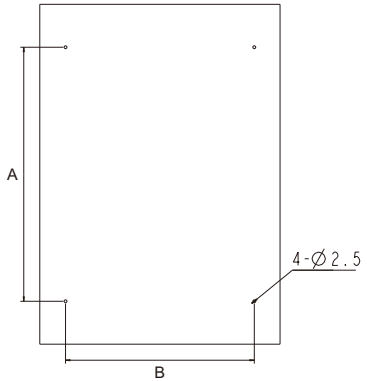
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

- •Solar charge controller x 1
- •User manual x 1
- •Installation hole map x 1

3.2 Preparation

please install the mounting holes according to the mounting hole position diagram

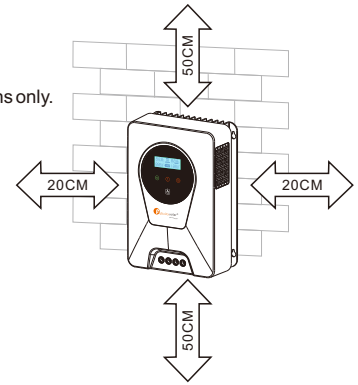
	A	B
SCCM 2024-II	140	119
SCCM 3024-II	140	119
SCCM 4524-II	178	134
SCCM 6048-II	222	165
SCCM 8048-II	224	178
SCCM 10048-II	255	197
SCCM 12048-II	255	197



3.3 Mounting the Unit

Consider the following points before selecting where to install:

- • This solar charge controller is designed in IP31 for indoor applications only.
- • Do not mount the unit on flammable construction materials.
- • Mount on a solid surface
- • Install this charger at eye level in order to allow the LCD display to be read at all times.
- • For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit.
- • The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- • The recommended installation position is to be adhered to the wall vertically.



Install the unit to the wall by screwing four screws.
Refer to right chart.



3.4 Power Connection

Wire size

The four large power terminals are sized for 14 - 2 AWG (2.5 - 35 mm 2) wire. The terminals are rated for copper and aluminum conductors. Use UL-listed Class B 300 Volt stranded wire only. Good system design generally requires large conductor wires for solar module and battery connections that limit voltage drop losses to 2% or less.

Minimum Wire Size

The table below provides the recommended minimum wire size allowed for the charger. Wire types rated for 75°C and 90°C are listed.

Recommended wire size:

Typical Amperage	Wire Type	75°C Wire	90°C Wire
20A	Copper	12 AWG (4mm²)	12 AWG (4mm²)
	Aluminum	12 AWG (4mm²)	12 AWG (4mm²)
30A	Copper	8 AWG (10 mm²)	8 AWG (10 mm²)
	Aluminum	6 AWG (16 mm²)	6 AWG (16 mm²)
45A	Copper	4 AWG (25 mm²)	6 AWG (16 mm²)
	Aluminum	2 AWG (35 mm²)	4 AWG (25 mm²)
60A	Copper	4 AWG (25 mm²)	6 AWG (16 mm²)
	Aluminum	2 AWG (35 mm²)	4 AWG (25 mm²)
80A	Copper	2 AWG (35 mm²)	4 AWG (25 mm²)
100A	Copper	2AWG(35 mm²)	2AWG(35 mm²)
120A	Copper	2 AWG (35 mm²)	2 AWG (35 mm²)

Overcurrent Protection and Disconnects

CAUTION: Circuit breakers or fuses must be installed in both battery and solar circuits. The battery circuit breaker or fuse must be rated to 125% of the maximum current or more. The recommended breaker/fuse rating for use with the charger is listed in the below table.

Recommended breaker rating:

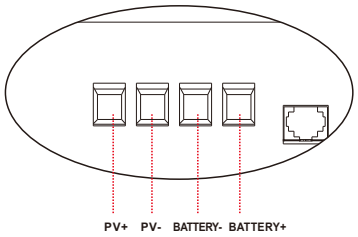
Minimum battery circuit breaker/fuse rating	
1.25 x 20Amps = 25.0 Amps	1.25 x 30Amps = 37.5 Amps
1.25 x 45Amps = 56.3 Amps	1.25 x 60Amps = 75.0 Amps
1.25 x 80Amps = 100.0 Amps	1.25 x 100Amps = 125 Amps
1.25*120Amps = 150Amps	

A disconnect is required for the battery and solar circuits to provide a means for removing power from the charger. Double pole switches or breakers are convenient for disconnecting both solar and battery conductors simultaneously.

Connect the Power Wires

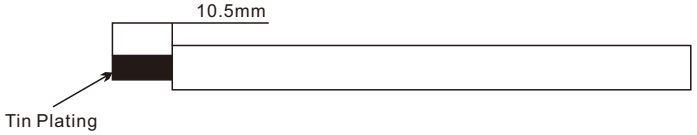
WARNING: Shock Hazard

The solar modules can produce open-circuit voltages in excess of 100 Vdc when in sunlight. Verify if solar input breaker or disconnect has been opened (disconnected)before connecting system wires.



Connect terminals by following below steps (Refer to diagram above):

1. Make sure that the system input and output disconnect switches are both turned off before connecting power wires to the charger. There are no disconnecting switches inside the charger.
2. Make 4 power wires first. Remove insulation sleeve 10.5mm and the conductor should be plated Tin. Refer to the chart below.



3. Pull all wires into the wiring box. The Remote Temperature Sensor and Battery Sense wires can be inside the conduit with the power conductors. It is easier to pull RTS and Sense wires before the power cables.

WARNING: Risk of Damage

Be sure that the battery connection is made with correct polarity. Turn on the battery breaker/disconnect and measure the voltage on the open battery wires BEFORE connecting to the controller. Disconnect the battery breaker/disconnect before wiring to the controller.

4. Connect positive terminal (+) of battery to the battery positive terminal (+) on the controller.
5. Connect negative terminal (-) of battery to one of the Common Negative terminals (-) on the controller.

WARNING: Risk of Damage

Be sure that solar connection is made with correct polarity. Turn on the solar breaker/disconnect and measure the voltage on the open wires BEFORE connecting to the controller. Disconnect solar breaker/disconnect before wiring to the controller.

6. Connect positive wire (+) of solar module to the solar positive terminal (+) on the controller.
7. Connect negative wire (-) of solar module to one of the Common Negative terminals (-) on the controller.
8. Screw four (4) power terminals tightly with 50 in-lbs torque. (5.65 Nm)
9. Connect the positive conductor of the load module (+) to the positive terminal of the load on the controller (+).
10. Connect the negative conductor of the load module (-) to the negative terminal of the controller (-).

3.5 Grounding and Ground Fault Interruption

Use a copper wire to connect the grounding terminal in the wiring box to earth ground.The grounding terminal is identified by the ground symbol shown below that is stamped into the wiring box just below the terminal:



The minimum size of the copper grounding wire is 8 AWG (10 mm2).

WARNING: Risk of Fire

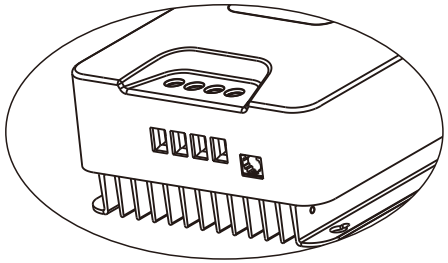
DO NOT bond system electrical negative to earth ground at the controller.

3.6 Remote Temperature Sensor

The included Remote Temperature Sensor (RTS) is recommended for effective temperature compensated charging. Connect the RTS to the 2-pole terminal (see figure as below). The RTS is supplied with 33 ft (10 m) of 22 AWG (0.34 mm2) cable. There is no polarity, so either wire (+ or -) can be connected to either screw terminal.

The RTS cable may be pulled through conduit along with the power wires. Tighten the connector screws with 5 in-lb (0.56 Nm) torque.

NOTE: The RTS is optional package. Please check local dealer for the details.



CAUTION: The controller will not activate temperature compensate charging function if the RTS is not used.

CAUTION: Equipment Damage

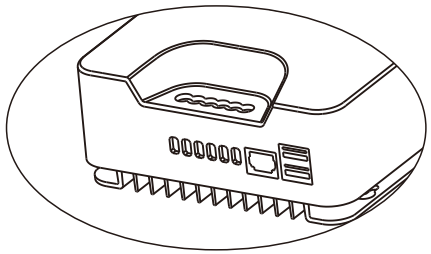
Never place the temperature sensor inside a battery cell. Both the RTS and the battery will be damaged.

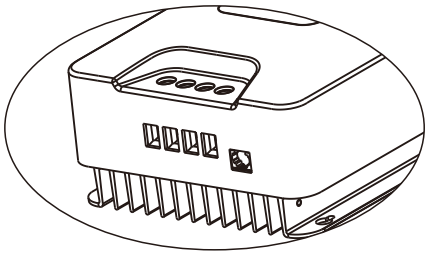
NOTE: The RTS cable may be shortened if the full length is not needed.

3.7 Battery Voltage Sense

The voltage at the battery connection on the controller may differ slightly from the voltage directly at the battery bank terminals due to connection and cable resistance. The Battery Voltage Sense connection enables the controller to measure the battery terminal voltage precisely with small gauge wires that carry very little current, and thus have no voltage drop. Both battery voltage sense wires are connected to the 2-pole terminal inside of wiring box (see figure as below).

Be careful to connect the battery positive (+) terminal to the voltage sense positive (+) terminal and battery negative (-) terminal to the voltage sense negative terminal (-). No damage will occur if the polarity is reversed, but the controller cannot read a reversed sense voltage.





A battery voltage sense connection is not essential required to operate your controller, but it is recommended for best performance. The battery voltage sense will ensure that the voltage display in LCD is very accurate.

The voltage sense wires should be cut to length as required to connect the battery to the voltage sense terminal. The wire size can range from 16 to 24 AWG (1.0 to 0.25mm2). A twisted pair cable is recommended but not required. Use UL rated 300 Volt conductors. The voltage sense wires may be pulled through conduit with the power conductors. Tighten the connector screws with 5 in-lb (0.56 Nm) torque.The maximum length allowed for each battery voltage sense wire is 98 ft (30 m).

4. OPERATION

4.1 Power-Up

WARNING: Risk of Damage

Connecting the solar module to the battery connector will permanently damage the controller.

• Confirm that the solar and battery polarities are correctly connected to the controller.

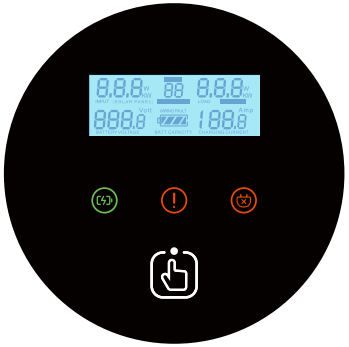
• A battery must be connected to the controller before operating it. The controller will not operate only with solar input. Solar input can trigger the controller to start up when the battery is connected without pressing the button.

• Turn on battery disconnect switch first. And press operation button for a while. Then, it will indicate a successful start-up in LCD display.

• Turn on solar disconnect switch. If the solar module is in full sunlight, the controller will begin charging.

4.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the controller. It includes three indicators, one operation button and a LCD display, indicating the operating status and input/output power information.



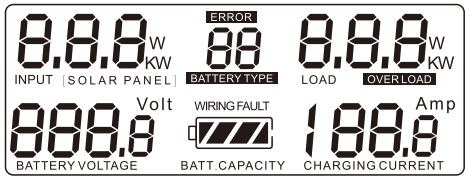
LED Indicator

LED Indicator			Messages
POWER ON/ CHARGING	Green	Solid On	The controller is on.
		Flashing	The controller is charging. Bulk charge stage: flashing every 0.5 second Absorption stage: flashing every second Equalize stage: flashing every 3 seconds Float stage: flashing every 5 seconds
FAULT/ WARNING	Red	Solid On	Fault occurs.
WIRING FAULT	Red	Solid On	Battery polarities are not connected correctly.

Button Operation

Function	Action Description
Power on	Press the button until LCD backlight is on.
Backlight on	Press shortly
Enter LCD setting mode	Press the button for 3 seconds.
Select LCD setting programs or modify parameter	Press shortly.
Confirm selection in setting programs or return back to previous menu	Press the button for 1.5 seconds.

4.3 LCD Display Icons



Icon	Function description
Input Source Information	
INPUT SOLAR PANEL	Indicates the PV input voltage.
Configuration Program and Fault Information	
E9	Indicates battery equalization is activated.
ERROR	Indicates fault codes.
	Indicates warning codes.
Output Information	
Volt BATTERY VOLTAGE	Indicate battery voltage.
W KW	Indicate charging power.
Amp CHARGING CURRENT	Indicate charging current.
BATT.CAPACITY	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.
LOAD Information	
LOAD	Indicates that the output is on
OVER LOAD	Indication current overcurrent

Battery Charging Status.

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	< 2V/cell	4 bars will flash in turns.
	2 ~ 2.083V/cell	The right bar will be on and the other three bars will flash in turns.
	2.083 ~ 2.167V/cell	The two right bars will be on and the other two bars will flash in turns.
	> 2.167 V/cell	The three right bars will be on and the left bar will flash.
Floating mode	Batteries are fully charged.	4 bars will be on.

4.4 LCD setting

After pressing button for 3 seconds, the unit will enter setting mode. Shortly press button to select setting programs. And then, pressing button for at least 1.5 seconds to confirm the selected program. After that, shortly press button to modify the parameter of the program. If pressing button for at least 1.5 seconds, you will return to previous menu. After waiting for 10 seconds without any action, it will automatically exit setting mode.

Setting Programs:

Program	Description	Options	
00	Exit setting mode	Escape 00 ESC	
01	Maximum charging current	20A(Default) 01 20A	Setting range is from 20A,30A ,45A , 60A , 80A,100A or 120A. Increment of each short press is 1A. The value will be back to 10A once the value is a 20A,30A,45A ,60A , 80A, 100A or 120A.
		30A(Default) 01 30A	
		45A(Default) 01 45A	
		60A(Default) 01 60A	
		80A(Default) 01 80A	
		100A(Default) 01 100A	
		120A(Default) 01 120A	

02	Battery type	Use-Defined(Default) 02 USE	If “Use-Defined” is selected, battery charge voltage can be set up in program 3 and 4.If “LIb” is selected, battery charge voltage can be set up in program 3 . Note: "Lib" mode can only be displayed after parameter 05 is set as one of 12V 24V / 48V.If you want to set “Lib”, first set the 05 battery rated voltage (MPPT 45A(12/24V) can't set the Absorption voltage to 48v, LIb mode can't set the AUO), then set 02 to "LIb"
		AGM 02 AGn	
		Flooded 02 FLd	
		LIB 02 LIb	
03	Absorption voltage	14.40V (Default) 03 14.4	If “Use-Defined” is selected in program 02, this program can be set up. The setting range is from12.0V to 15.0V. If “LIb” is selected in program 02, the setting range is from 12.0V to 15.0V/24.0V to 30.0V/48.0V to 60.0V
		If this program is selected to modify,the changeable figure will be shown as below. 03 14.4	Increment of each short press is 0.1. Once the value is achieved 15.0V, the value will jump back to 12.0V.
04	Float voltage	13.6V (Default) 04 13.6	If “Use-Defined” is selected in program 02, this program can be set up. The setting range is from 12.0V to 15.0V. If “LIb” is selected in program 02,this parameter is consistent with Absorption voltage
		If this program is selected to modify, the changeable figure will be shown as below. 04 13.6	Increment of each short press is 0.1V. The value will jump back to 12.0V after 15.0V is achieved.

05	Battery rated voltage	Auto (Default) 05 AUO	If “AUO” is selected, connected battery voltage system will be automatically detected. Note:LIb mode can't set the AUO
		12V 05 12V	If “12V” is selected, the unit is considered as 12V battery system.
		24V 05 24V	If “24V” is selected, the unit is considered as 24V battery system.
		48V 05 48V	If “48V” is selected, the unit is considered as 48V battery system. Note:MPPT 30A,45A(12/24V) can't set the Absorption voltage to 48v.
06	Battery C.V. charging duration	150 minutes(Default) 06 150	The setting range is from 5 minutes to 900 minutes. Increment of each short press is 5 minutes. It will jump back to 5minutes after 900 is achieved.
07	BTS temperature compensation ratio	0mV (Default) 07 0.0	The setting range is from 0mV to 60.0mV. Increment of each short press is 0.1 mV. The value will jump back to 0mV after 60.0mV is achieved. For each 12V battery, the derated battery charging voltage is followed the below formula:(Battery temperature – 25 o C) * BTS ratio.
08	Battery equalization enable/disable	Disable (Default) 08 E9d	In lithium battery mode, it is disabled by default and cannot be set
		Enable 08 E9E	
09	Battery equalization voltage	14.60V(Default) 09 14.6	The setting range is from 12.0V to 15.5V.
		If this program is selected to modify, the changeable figure will be shown as below. 09 14.6	Increment of each short press is 0.1V. The value will jump back to 12.0V after 15.5V is achieved.
10	The maximum current of battery equalization	15A (Default) 10 15A	The setting range is from 30A,45A, 60A,80A,100A or 120A.Increment of each short press is 1A. The value will jump back to 30A,45A ,60A ,80A, 100A or 120A is achieved.
11	Battery equalized time	60 minutes(Default) 11 60	The setting range is from 5 minutes to 900 minutes. Increment of each short press is 5 minutes. The value will jump back to 5 minutes after 900 minutes are achieved.

12	Battery equalized timeout	120 minutes(Default) 12 120	The setting range is from 5 minutes to 900 minutes. Increment of each short press is 5 minutes. The value will jump back to 5 minutes after 900 minutes are achieved.
13	Equalization interval	30 days (Default) 13 30d	The setting range is from 0 day to 90 days.
14	Equalization activated immediately	Disable (Default) 14 AdS	If equalization function is enabled in program 08, this program can be set up. If “Enable” is selected in this program, it’s to activate battery equalization immediately and LCD main page will shows “ E9 ”. If “Disable” is selected, it will cancel equalization function until next activated equalization time arrives based on program 13 setting. At this time, “E9” will not be shown in LCD main page.
		Disable (Default) 14 AEn	
15	Overdischarge voltage	11.0V (Default) 15 11.0	If “Use-Defined” is selected in program 02, this program can be set up. The setting range is from10.0V to 12.5V. If “LIb” is selected in program 02, the setting range is from 10.0V to 12.5V/20.0V to 25.0V
		If this program is selected to modify,the changeable figure will be shown as below. 15 11.0	Increment of each short press is 0.1. Once the value is achieved 12.5V, the value will jump back to 10.0V.
16	Load mode	If this program is selected to modify,the changeable figure will be shown as below. 16 17	Increment of each short press is 1. Once the value is achieved 17, the value will jump back to 0.

4.5 Reference Code

Type	Code	Event
Fault	01	Over charge current
	02	Over temperature
	03	Battery voltage is too low
	04	Battery voltage is high
	05	PV is high loss
	06	Battery temperature is too low
	07	Battery temperature is too high
	09	Load short circuit
	10	Load overcurrent
Warning	20	PV is low loss
	21	Output derating caused from high PV voltage
	22	Output derating caused from high temperature
	23	Low alarm for battery temperature

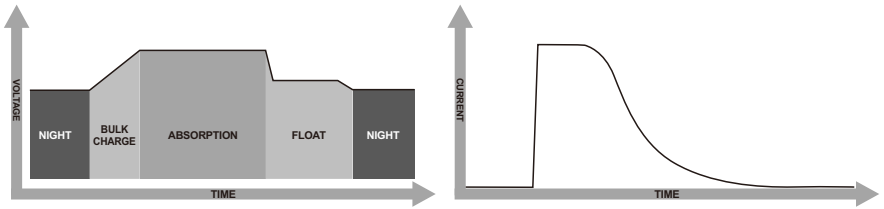
4.6 Introduction to load mode

Code	Pattern	Describe
01	Pure light control (light on at night, light off during the day)	When there is no sunlight, the panel voltage is lower than the light controlled on voltage, the controller turns on the load after a delay of a certain time, when there is sunlight, the panel voltage is higher than the light controlled off voltage, the controller turns off the load after a delay of a certain time.
02	Light time control for 1~14 hours.	When there is no sunlight, the panel voltage is lower than the light controlled opening voltage, the controller turns on the load after a delay of a certain time, and the load working time reaches the set value after turns off.
03	Manual mode	In this mode, the user can control the load on and off by pressing a button, regardless of whether it is day or night. This mode is used for special load situations or debugging.
04	Debug mode	It is used for system debugging. The load is off when there is an light signal, and the load is on when there is no light signal. It is convenient to check the correctness of system installation during installation and debugging.
05	Normally open mode	The power-on load is always in the output state. This mode is suitable for loads that require 24 hours of power supply.

5. CHARGING LOGIC

5.1 3-stage Charging

In general, this solar charge controller is designed with 3-stage battery charging algorithm for fast, efficient, and safe battery charging. The following picture shows the sequence of charging stages.

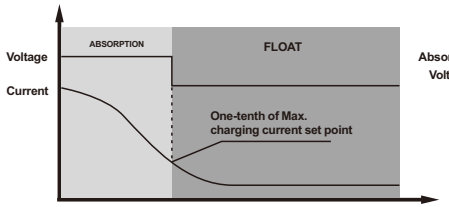


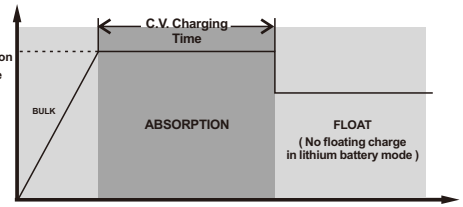
1) Bulk charge stage

In bulk charge stage, charge current begins to flow, typically at the maximum rate of the charge source. The controller will supply solar power to charge battery as much as possible.

2) Absorption stage

When battery charging voltage is reached to Absorption voltage point, the charging stage changes from bulk charge to Absorption. Constant-voltage regulation is used to maintain battery voltage at the Absorption stage. If the charging current drops to one-tenth of the maximum charging current setting point, the charging status will change to Float stage.





If the elapsed time of absorption stage is over setting value for C-V charging time, it will also transfer to Float stage.

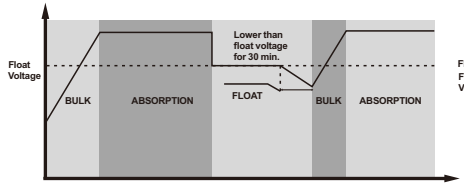
3) Float Stage

After the battery is fully charged in the Absorption stage, the controller will reduces the battery voltage to the setting point of Float voltage. Once in Float stage, constant-voltage regulation is used to maintain battery voltage at setting point of float voltage.

In lithium battery mode: the charging logic has no floating charge stage

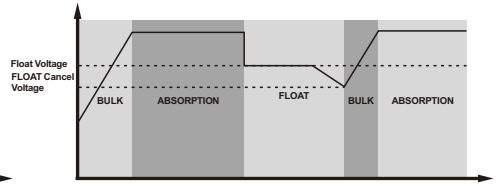
• *Float timeout*

If the battery voltage remains lower than the Float voltage for 30 minutes, the controller will return to Bulk charging stage.



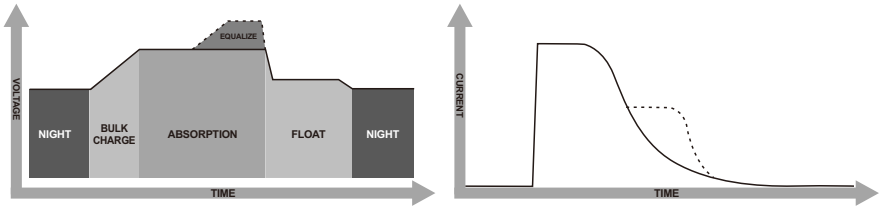
• *Float cancel voltage*

Once the battery voltage drops to setting point of Float cancel voltage, the controller also returns to Bulk charging stage. Float cancel voltage = Floating charging voltage – (1V x battery numbers in series)



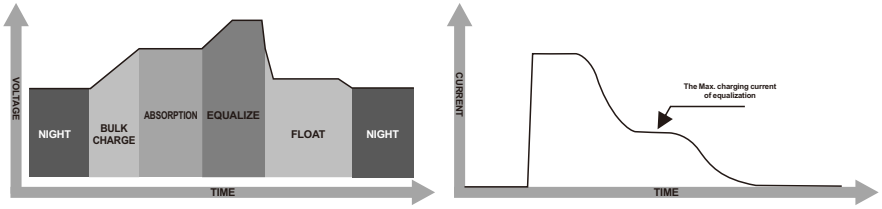
5.2 Equalize Stage

Equalization function is added into solar charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

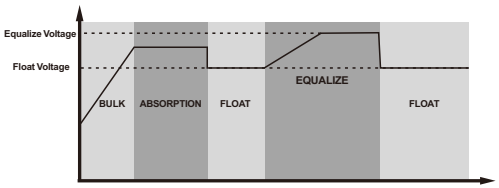


• When to Equalize

In Absorption stage, if the charging current drops lower than the maximum charging current of battery equalization, the controller will start to enter Equalize stage.

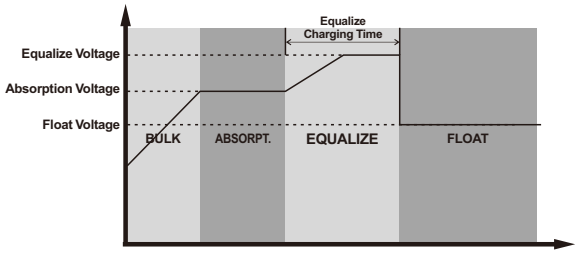


If solar charge controller is working in float stage, but at this time, the setting equalization interval (battery equalization cycle) is arrived, it will transfer to equalize stage.

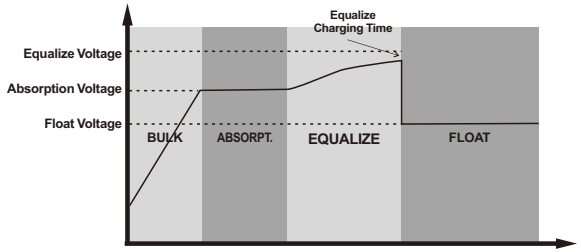


• Equalize charging time and timeout

In Equalize stage, based on maximum charging current of battery equalization, the controller will supply solar power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the solar charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the solar charge control will stop equalization and transfer to float stage.



5.3 Setting Parameter and Default Value

Recommended and default parameter settings are listed below.

Parameter	Battery type	Absorp. Stage	Float Stage	Equalize Stage	Equlize Activation	Absorp. Time	Equalize Time	Equalize Timeout	Equalize Interval
Unit	-	Volt	Volt	Volt	En/Disable	Minutes	Minutes	Minutes	Days
Option	AGM	14.4	13.6	14.6	Disable	150	60	120	30
Option	Flooded	14.6	13.8	14 .6	Disable	150	60	120	30
Default	Customized	-	-	-	Disable	150	60	120	30
Option	LIb	-	-	-	Disable	-	-	-	-

6. TROUBLE SHOOTING

Situation		Situation
Fault Code	Fault Event	
01	Over charge current	1. Restart the charger. 2. If the problem remains, please contact your installer.
02	Over temperature	1. Keep the charger in the cool environment. 2. If the problem remains, please contact your installer.
03	Battery voltage low	1. Check the battery wire connection. 2. If the wire connection is ok, please contact your installer.
04	Battery voltage high	1. Reconnect the battery to the charger. 2. If the problem remains, please contact your installer.
05	PV high loss	1. Please check the voltage of the solar panel, it should be less than 140V or 190V. 2. If the voltage is ok, please contact your installer.
06	Battery temperature too low	1. Check your remote temperature sensor and your battery ambient temperature. 2. If the problem remains, please contact your installer.
07	Battery temperature too high	1. Check your remote temperature sensor and your battery ambient temperature. 2. If the problem remains, please contact your installer.
06	Battery temperature too high	1. Check your remote temperature sensor and your battery ambient temperature. 2. If the problem remains, please contact your installer.
07	Battery temperature too high	1. Check your remote temperature sensor and your battery ambient temperature. 2. If the problem remains, please contact your installer.
No display in LCD screen.		1. Check battery wire connection. 2. Push the button, if the problem remains, please contact your installer.

7. SPECIFICATIONS

Table 1 Electrical Specifications

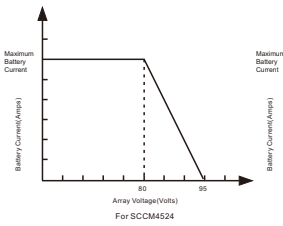
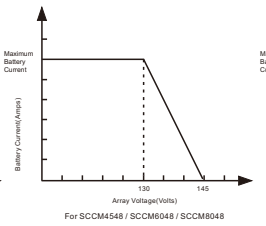
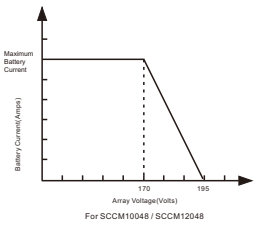
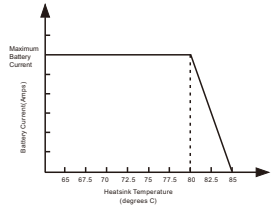
MODEL	SCCM2024-II	SCCM3024-II	SCCM4524-II	SCCM4548-II	SCCM6048-II	SCCM8048-II	SCCM10048-II	SCCM12048-II
Maximum Battery Current	20Amps	30Amps	45Amps	45Amps	60 Amps	80 Amps	100Amps	120 Amps
Nominal System Voltage	12,24VDC(Auto detection)			12V, 24V, 48V DC (Auto detection)				
Maximum Solar Input Voltage	95V			145V			195V	
PV Start-up Voltage	15V							
PV Array MPPT Voltage Range	12VDC/24VDC			12 VDC / 24 VDC / 48 VDC				
	15-80VDC/30-80VDC			15-130VDC / 30-130VDC 60-130VDC			15-170VDC / 30-170VDC 60-170VDC	
Maximum Input Power	12V - 280W	12V - 420W	12V - 625W	12V - 625W	12V - 825W	12V - 1100W	12V - 1375W	12V - 1650W
	24V - 550W	24V - 830W	24V - 1250W	24V - 1250W	24V - 1650W	24V - 2200W	24V - 2750W	24V - 3300W
	/	/	/	48V - 2500W	48V - 3300W	48V - 4400W	48V - 5500W	48V - 6600W
PV Array voltage & Battery current	 For SCCM4524			 For SCCM4548 / SCCM6048 / SCCM8048			 For SCCM10048 / SCCM12048	
Heatsink temperature & Battery current								
Transient Surge Protection	4500 Watts / port							
Protections	Solar high voltage disconnect Solar high voltage reconnect Battery high voltage disconnect Battery high voltage reconnect High temperature disconnect High temperature reconnect							

Table 2 Battery Charging

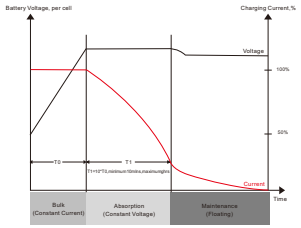
MODEL	SCCM2024-II	SCCM3024-II	SCCM4524-II	SCCM4548-II	SCCM6048-II	SCCM8048-II	SCCM10048-II	SCCM12048-II
Charging Algorithm	3-Step							
Charging stages	Bulk, Absorption, Float							
Temperature compensation coefficient	-5 mV / °C / cell (25 °C ref.)							
Temperature compensation range	0 °C to +50 °C							
Charging Curve								

Table 3 Mechanical and Environment

Model	SCCM2024-II	SCCM3024-II	SCCM4524-II	SCCM4548-II	SCCM6048-II	SCCM8048-II	SCCM10048-II	SCCM12048-II
Product Size (W x H x D,mm)	240x170x102	240x170x102	265x188x116	308x212x125	308x212x125	322x238x140	360x250x156	360x250x156
Product Weight (Kg)	0.9 Kg	1.06 Kg	3.36 Kg	2.99 Kg	3.2 Kg	3.5 Kg	5.1 Kg	5.1 Kg
Ambient Temperature Range	0°C to +55°C							
Storage Temperature	- 25°C to 75°C							
Humidity	0%-90%RH(No condensing)							
Enclosure	IP20(indoor&vented)							

8.MPPT charger controller match to the Inverter

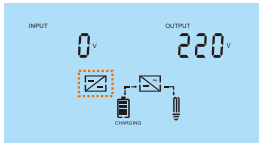
In actual application system, MPPT controller and inverter will charge the battery at the same time, the charging current will excessive to occur unsafe situation, so we add the function of matching the inverter to limit the charging current of the battery. However, since it needs to be matched with MPPT of different manufacturers , but the MPPT charging current cannot be limited. The current solution is to limit the charging current of the inverter.

The inverter match to the MPPT controller is mainly including two function:
1.Enabling or disable inverter to match the MPPT function. (Special attention: when upgrading the firmware of the inverter, it needs to disable the function matching MPPT first);

2.Limited the charging current of the inverter. The methods are as follows:
a) When the MPPT charging current ≥ inverter setting charging current, the maximum allowable charging current of the inverter equal to 0;
b) When the MPPT charging current ＜ inverter setting charging current, the maximum allowable charging current of the inverter equal to inverter setting charging current subtract MPPT charging current;

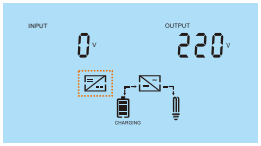
8.1 Match the inveter to the MPPT controller:

1.To enable the inverter to match the MPPT controller, the inverter and MPPT controller should be switched on first, and the communication lines between them have been connected;
2.Then press the “Down”button of the inverter for more than 2.5 seconds, until the MPPT charger icon flashes. At this time, you can release the button. The icon flashing indicates that the inverter is trying to communicate with the MPPT. The inverter is releasing. After pressing the button for 10 seconds, the icon stops flashing. When the communication is successful, it means that the function is successfully enabled.
3.After successfully enabling, the matching MPPT function flag will be saved in the EEPROM. Restarting the inverter does not need to be manually enabled again.
4.After successfully enabling, turning the page on the LCD screen will display MPPT PV voltage, power and other information.

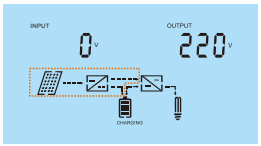
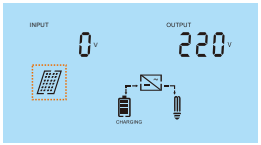
Action	Instruction	LCD display
Match the MPPT function enable	Long press “Down”button until the icon in the red box in the right picture flashes, indicating that the inverter is trying to communicate with MPPT. The icon stops flashing after the inverter loosens the button for 10 seconds.	

8.2 Matching MPPT function is prohibited:

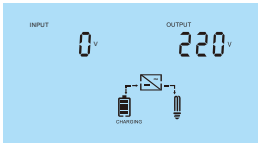
1.To prevent the inverter from matching the MPPT function, the MPPT should be turned off or the communication connection between the two should be disconnected.
2.Then long press the “Down”button of the inverter for more than 2.5 second, until the MPPT charger icon flashes. At this point, the button can be released. The flashing icon indicates that the inverter is trying to communicate with MPPT. The flashing icon will stop 10 seconds after the button is released. When communication fails, it means it is forbidden successfully.

Action	Instruction	LCD display
Matching MPPT function is prohibited	Long press“Down”button until the icon in the red box in the right picture flashes, indicating that the inverter is trying to communicate with MPPT. The icon disappears after the inverter loosens the button for 10 seconds.	

8.3 Matching MPPT function successfully enabled:

Action	Instruction	LCD display
Match MPPT function to enable successfully	If MPPT is in charging state：When the MPPT function is successfully enabled, the icon in the red box in the right picture will appear	
Match MPPT function to enable successfully	If MPPT is not in the charging state, but PV voltage is greater than 30V and is in the startup state：When the MPPT function is successfully enabled, the icon in the red box in the right picture will appear	

8.4 Matching MPPT function is prohibited successfully:

Action	Instruction	LCD display
Match MPPT function	When the matching MPPT function is prohibited successfully，MPPT icon information will no longer be displayed	
Whether matching MPPT function enables judgment	1. If the MPPT function is enabled, the LCD interface page turning will display PV voltage, power and other information； 2. If the matching MPPT function is prohibited, the LCD interface page turning will not display PV voltage, power and other information；	