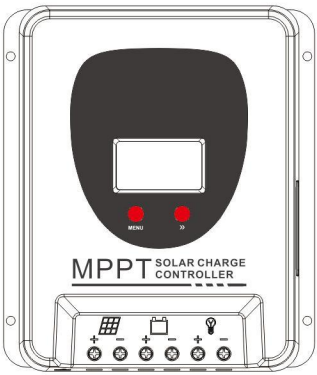
User's Manual



MPPT SOLAR CHARGE CONTROLLER

12V/24V 10A 20A 30A 40A 50A 60A

Your battery guard

Dear users,

Thank you for choosing our product !

Important Safety Instructions
Please keep this manual for future review.

This manual contains all instructions of safety, installation and operation for Maximum Power Point Tracking (MPPT) controller ("the controller" as referred to in this manual).

1. General Information

1.1 Overview

This controller is based on advanced MPPT control algorithm, with LCD displaying running status. The MPPT control algorithm can minimize the maximum power point loss rate and loss time, quickly track the maximum power point of the PV array and obtain the maximum energy from solar modules under any conditions; and can increase the ratio of energy utilization in the solar system by 20%-30% compared with a PWM charging method.

Limiting the charging power and reducing charging power functions ensure the system stable with over PV modules in high temperature environment.

With comprehensive electronic fault self-detecting functions and powerful electronic protection functions built inside the controller, component damage caused by installation errors or system failures can be avoided to the greatest extent possible.

Features:

- With the advanced dual-peak or multi-peak tracking technology, when the solar panel is shadowed or part of the panel fails resulting in multiple peaks on the I-V curve, the controller is still able to accurately track the maximum power point.
- Advanced MPPT technology, with efficiency no less than 99.5%
- Maximum DC/DC conversion efficiency of 98%
- Ultra-fast tracking speed and guaranteed tracking efficiency
- Advanced MPPT control algorithm to minimize the MPP loss rate and loss time

- Wide MPP operating voltage range
- Limit charging power & current over rated range.When the solar panel power exceeds a certain level and the charging current is larger than the rated current, the controller will automatically lower the charging power and bring the charging current to the rated level.
- Support the lead-acid,gel,flooded with the needed Temp. compensation and support lithium batteries start from solar panel
- Real-time working record function
- Power reduction automatically over temperature range
- Multiple load work modes
- TVS lighting protection.
- Monitor and set the parameters via App(optional)

1.2 Characteristics

❶ LCD
❷ Menu Button
❸ Operation Button
❹ PV Terminals
❺ Battery Terminals
❻ Load Terminals
❼ RJ45 Port
❽ Temperature Sensor
❾ USB Port



Figure 1-1 Product Characteristics

★If the temperature sensor is short-circuited or damaged, the controller will charge or discharge at the default temperature setting of 25℃.

1.3 Battery Charging Stage

The controller has a 3 stages battery charging algorithm (Bulk Charging, Boost Charging and Float Charging) for rapid, efficient, and safe battery charging.

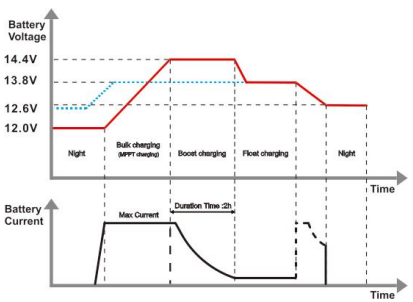


Figure 1-5 Lead acid Battery charging stage Curve

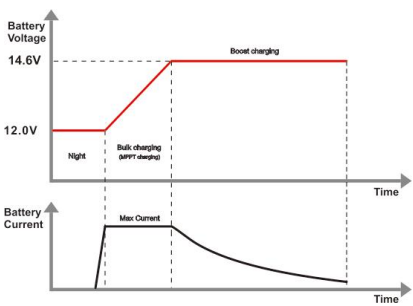


Figure 1-6 Li Battery charging stage curve

(1) Bulk Charging

In this stage, the battery voltage has not yet reached boost voltage, the controller operates in constant current mode, delivering its maximum current to the batteries (MPPT Charging).

(2) Boost Charging

When the battery voltage reaches the boost voltage set point, the controller will start to

operate in constant charging mode, this process is no longer MPPT charging, and in the meantime the charging current will drop gradually, the process is not the MPPT charging. The Boost stage maintain 2 hours in default. When the accumulate time reach to 2hours, the charging mode will turn to Float charging.

(3) Float Charging

After the boost voltage stage, the controller will reduce charging current to Float Voltage set point. This stage will have no more chemical reactions and all the charge current transforms into heat and gas at this time. Then the controller reduces the voltage to the floating stage, charging with a smaller voltage and current. It will reduce the temperature of the battery and prevent the gassing and charging the battery slightly at the same time. The purpose of Float stage is to offset the power consumption caused by self consumption and small loads in the whole system, while maintaining full battery storage capacity.

In Float charging stage, loads are able to obtain almost all power from solar panel. If loads exceed the power, the controller will no longer be able to maintain battery voltage in Float charging stage. If the battery voltage remains below the Recharge Voltage, the system will leave Float charging stage and return to Bulk charging stage.

2 Installation Instructions

2.1 PV Array Requirements

(1) Serial connection (string) of PV modules

As the core component of PV system, controller could be suitable for various types of PV modules and maximize converting solar energy into electrical energy. According to the open circuit voltage (Voc) and the maximum power point voltage (VMpp) of the MPPT controller, the series number of different types PV modules can be calculated. The below table is for reference only.

Table 2-1-1 10A/20A(60V)

System voltage	36 cell Voc < 23V		60 cell Voc < 38V		72 cell Voc < 46V		96 cell Voc < 62V	
	Max.	Best	Max.	Best	Max.	Best	Max.	Best
12V	2	2	1	1	1	1	-	-
24V	2	2	1	1	1	1	-	-

Table 2-1-2 10A/20A/30A/40A/50A/60A(100V)

System voltage	36 cell Voc < 23V		48 cell Voc < 31V		54 cell Voc < 34V		60 cell Voc < 38V	
	Max.	Best	Max.	Best	Max.	Best	Max.	Best
12V	4	2	3	1	2	1	2	1
24V	4	2	3	2	2	2	2	2

System voltage	72 cell Voc < 46V		96 cell Voc < 62V		Thin-Film Module Voc > 80V
	Max.	Best	Max.	Best	
12V	2	1	1	1	1
24V	2	1	1	1	1

NOTE: The above parameter values are calculated under standard test conditions (STC (Standard Test Condition): Irradiance 1000W/m2, Module Temperature 25℃, Air Mass1.5.)

(2) Maximum PV array power

The MPPT controller has the function of current/power-limiting, that is, during the charging process, when the charging current or power exceeds the rated charging current or power, the controller will automatically limit the charging current or power to the rated charging current or power, which can effectively protect the charging parts of controller, and prevent damages to the controller due to the connection of some over-specification PV modules. The actual operation of PV array is as follows:

Condition 1:

Actual charging power of PV array ≤ Rated charging power of controller

Condition 2:

Actual charging current of PV array ≤ Rated charging current of controller

When the controller operates under "Condition 1" or "Condition 2" , it will carry out the charging as per the actual current or power; at this time, the controller can work at the maximum power point of PV array.

⚠ **WARNING:** When the power of PV is not greater than the rated charging power, but the maximum open-circuit voltage of PV array is more than 100V/10A-60A,60V/10A-20A(at the lowest environmental temperature), the controller may be damaged.

Condition 3:

Actual charging power of PV array > Rated charging power of controller

Condition 4:

Actual charging current of PV array > Rated charging current of controller

When the controller operates under "Condition 3" or "Condition 4", it will carry out the charging as per the rated current or power.

⚠ **WARNING:** When the power of PV module is greater than the rated charging power, and the maximum open-circuit voltage of PV array is more than 100V/10A-60A,60V/10A-20A(at the lowest environmental temperature), the controller may be damaged.

For the recommended maximum power of PV array for this controller, please refer to the table below:

Table 2-2 maximum power of PV array for this controller

Rated Charge Current	Rated Charge Power	Max. PV open circuit voltage
10A	130W/12V 260W/24V	55V① 60V② (PV 60V)
		95V① 100V② (PV 100V)
20A	260W/12V 520W/24V	55V① 60V② (PV 60V)
		95V① 100V② (PV 100V)
30A	390W/12V 780W/24V	95V① 100V②
40A	520W/12V 1040W/24V	
50A	650W/12V 1300W/24V	
60A	750W/12V 1500W/24V	

①At 25℃ environment temperature ②At minimum operating environment temperature

2.2 Wire Size

The wiring and installation methods must conform to all national and local electrical code requirements.

PV Wire Size

Since PV array output can vary due to the PV module size, connection method or sunlight angle, the minimum wire size can be calculated by the Isc * of PV array. Please refer to the value of Isc in the PV module specification. When PV modules connect in series, the Isc is equal to a PV modules Isc. When PV modules connect in parallel, the Isc is equal to the sum of the PV module's Isc. The Isc of the PV array must not exceed the controller's maximum PV input current. Please refer to the table as below:

NOTE: All PV modules in a given array are assumed to be identical.

* Isc=short circuit current(amps) Voc=open circuit voltage.

Table 2-3 PV array must not exceed the controller's maximum

Model	Max.battery wire size	Max. PV wire size *
10A	10mm2/8AWG	10mm2/8AWG
20A	10mm2/8AWG	10mm2/8AWG
30A	16mm2/6AWG	16mm2/6AWG
40A	16mm2/6AWG	16mm2/6AWG
50A	25mm2/4AWG	25mm2/4AWG
60A	25mm2/4AWG	25mm2/4AWG

* These are the maximum wire size compatible with the MC4 connector ports. The actual selection should be based on the current calculated from the PV terminals.

2.3 Mounting

⚠ **Warning**: risk of explosion! Never install the controller and an open battery in the same enclosed space! Nor shall the controller be installed in an enclosed space where battery gas may accumulate.

⚠ **Warning**: danger of high voltage! Photovoltaic arrays may produce a very high open-circuit voltage. Open the breaker or fuse before wiring, and be very careful during the wiring process.

Note: when installing the controller, make sure that enough air flows through the controller's radiator, and leave at least 100mm of space both above and below the controller so as to ensure natural convection for heat dissipation. If the controller is installed in an enclosed box, make sure the box delivers reliable heat dissipation effect.



2.4 Installation Procedure

Step 1: choose the installation site

Do not install the controller at a place that is subject to direct sunlight, high temperature or water intrusion, and make sure the ambient environment is well ventilated.

Step 2: Place the controller at a proper position, use a screw driver to fit screws in mounting hole.

⚠ **CAUTION:** If the controller is to be installed in an enclosed box, it is important to ensure reliable heat dissipation through the box.

Step 3: wire

Connect the system in the order of ❶battery ❷ PV array ❸load in accordance with Figure 2-2, “Schematic Wiring Diagram” and disconnect the system in the reverse order❸❷❶.

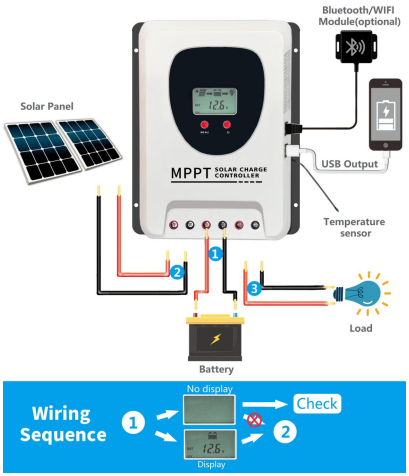


Figure 2-3 Schematic of wiring diagram

⚠**CAUTION:** While wiring the controller do not close the circuit breaker or fuse and make sure that the leads of "+" and "-" poles are connected correctly.

⚠**CAUTION:** A fuse which current is 1.25 to 2 times the rated current of the controller, must be installed on the battery side with a distance from the battery not greater than 150 mm.

⚠**CAUTION:** If an inverter is to be connected to the system, connect the inverter directly to the battery, not to the load side of the controller.

Step 4：Power on the controller

After connecting all power wires solidly and reliably, check again whether wiring is correct and if the positive and negative poles are reversely connected. After confirming that no faults exist, first close the fuse or breaker of the battery, then see whether the LCD screen displays information. If the LCD screen fails to display information, open the fuse or breaker immediately and recheck if all connections are correctly done.

If the battery functions normally, connect the solar panel. If sunlight is intense enough, the controller begin to charge the battery.

After successfully connecting the battery and photovoltaic array, finally close the fuse or breaker of the load, and then you can manually test whether the load can be normally turned on and off. For details, refer to information about load working modes and operations.

Step 5：Choose the battery type

The controller supports various battery types, with lead-acid batteries set as the default. If you are using another type of battery, please follow the instructions in section 3.3.7 after installation and startup to select the appropriate battery type. Failure to choose the correct battery type may result in improper operation of the controller and, in severe cases, may damage to the battery.

⚠**Warning**: when the controller is in normal charging state, disconnecting the battery will have some negative effect on the DC loads, and in extreme cases, the loads may get damaged.

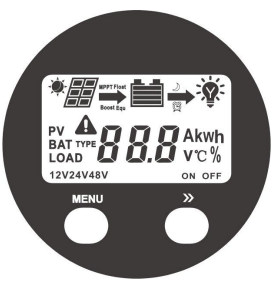
⚠**Warning**: within 10 minutes after the controllers stops charging, if the battery's poles are reversely connected, internal components of the controller may get damaged.

Note:

1) If no remote temperature sensor is connected to the controller, the battery temperature value will stay at 25 °C.

2) If an inverter needs to be connected in the system, directly connect the inverter to the battery, and do not connect it to the controller's load terminals.

3. Operation



3.1 Button

Mode	Note
Load ON/OFF	In load manual mode, it can turn the load On/Off via the "**>>**" button
Clear Fault	Press the "**>>**" button
Browsing Mode	Press the "**MENU**" button
Setting Mode	Press the "**MENU**" button. and hold on 5s to enter the setting mode Press the "**>>**" button. to set the parameters, Press the "**MENU**" button. to confirm the setting parameters or no operation for 10s, it will exit the setting interface automatically.

3.2 Interface

(1) Status Description

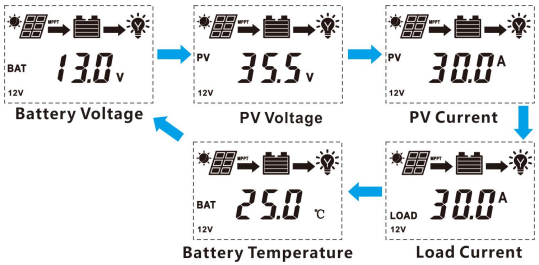
Item	Icon	Status
PV array		In daytime and PV connected correctly
		At night or no PV connect or reverse connect
		No Charging
		Charging In MPPT
		In Float Charging Mode
		In Boost Charging Mode
	PV	PV Voltage, Current and Power
Battery		Battery Capacity Indicating
	12V24V48V	Current System Voltage
	BAT	Battery Voltage and Current
	BAT TYPE	Battery Type
Load		Load ON
		Load OFF
		Light and Time Control Mode
		Light Control Mode
	LOAD TYPE	Load Working Mode
	LOAD	Discharging Current and Work Status

(2) Fault Indication

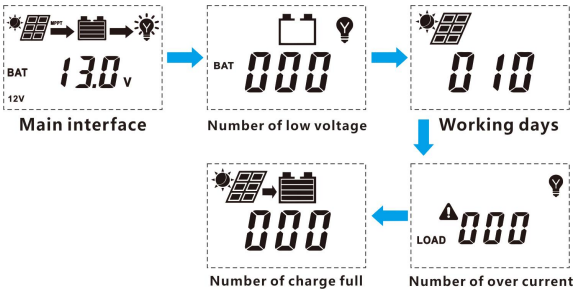
Status	Icon	Description
Battery over discharged		Battery level shows empty, battery frame blink, fault icon blink
Battery over voltage		Battery level shows full, battery frame blink, fault icon blink
Controller over temperature		Temp.icon shows Temp.inside controller is higher than 75℃, temperature icon blink, fault icon blink
Load failure		Load overload① ,Load short circuit
PV over voltage		It shows PV voltage is higher than rated PV open voltage.PV icon blink,fault icon blink

(3) Browse interface

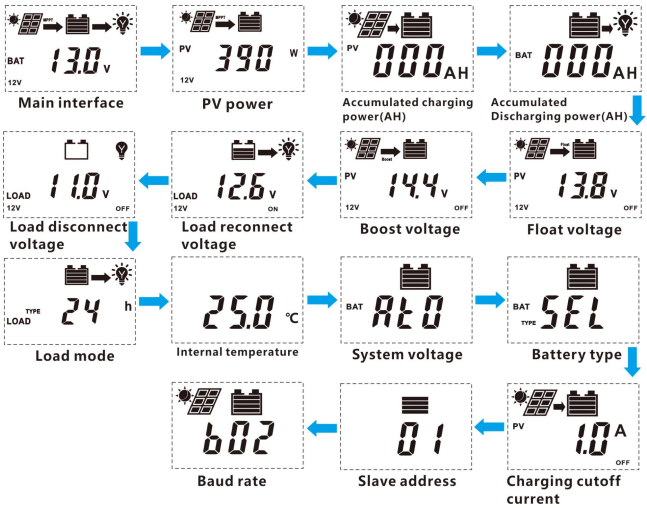
①If there is no operation within 20s in any interface or after powered on within 10s, The main interface will cycle to display the battery voltage,PV voltage,charging current,discharging current and battery temperature every 3s.Long press the **"››"** button can speed up the cycle display time.



②At main interface(cycle display),long press **menu** and "››" button at same time to enter working record status,it can show times of low voltage,working days,times of over current and times of full charging



③At main interface(cycle display),Press the **"MENU"** button and enter menu interface

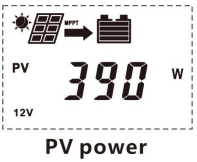


3.3 Setting

(1) Controller Restart

Controller Restart: On the PV power interface, press and hold the "››" key for 5 seconds, and the controller will automatically reset and restart once.

Note: This restart is a software reset. Before restarting, ensure that the controller is not charging and the PV is disconnected to prevent sudden reset from causing damage to the controller.



(2) Clear the charging power and discharging power(AH)

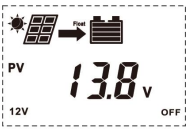
Operation:

Step 1: Press the "››" button and hold for 5s under the PV generated charging power interface and the value will be cleared.

Step 2: Press the "››" button and hold for 5s under the load discharging power interface and the value will be cleared

(3) Float Voltage Setting

Operation:



Float voltage

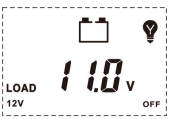
Step 1: At main interface(cycle display),Press the "**MENU**" button to enter float voltage interface

Step 2: Long press the "**MENU**" button(≥5S) until the value is flashing,then it enters the setting state.

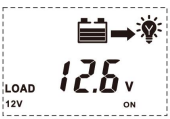
Step 3: Press the **"MENU"** and **"››"** button to change the value

Step 4: After setting,Long press the **"MENU"** button(≥5S) to save the new setting.If there is no operation within 20S,the controller will enter the main interface and cycle to display automatically.

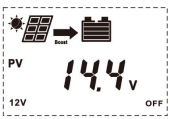
(4) Setting of boost voltage, low voltage reconnect voltage and low voltage disconnect voltage



Load disconnect voltage



Load reconnect voltage



Boost voltage

Operation:At main interface(cycle display),Press the **"MENU"** button to enter the relevant interface below:

The operation method of setting is the same as float voltage setting,Please refer to the above**"(3)".**

- **The following rules must be observed when modifying the parameter values in User**

Ⅰ.Charging Limit Voltage >Boost Charging Voltage >Float Charging Voltage > Boost Reconnect Charging Voltage.

Ⅱ.Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage(BMS+0.2V)

Ⅲ. Boost Reconnect Charging voltage > Low Voltage Reconnect Voltage> Low Voltage Disconnect Voltage(BMS+0.2V)

- **Battery Voltage Control Parameters**

Below parameters are in 12V system at 25 ºC, please double the values in 24V system

Battery Type	SEL 24V*2	GEL 24V*2	FLD 24V*2	LF4(LiFePO44S/12V) LF8 (LiFePO4 8S/24V*2)	LI3 (Li(NiCoMn)O2 3S/12V) LI6 6S/24V	LI7 (Li(NiCoMn)O2 7S/24V)
Over Voltage Disconnect	16.0V	16.0 V	16.0 V	16.0V	17.0 V	32.0V
Charging Limited Voltage	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Over Voltage Reconnect	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Boost charge	14.4 V	14.2 V	14.6 V	14.4V	12.5V	29.2V
Float charge	13.8 V	13.8 V	13.8 V	14.0V	12.2V	27.6V
Boost Restart Voltage	13.2V	13.2V	13.2V	13.5V	12.1V	26.4V
Low voltage reconnect	12.6V	12.6V	12.6V	12.6V	10.5V	25.2V
Low voltage disconnect	11.0V	11.0V	11.0V	11.0V	9.3V	21.0V

(5) Load Working Mode

The default working mode of the controller is 24 hours,which means that as long as the battery has enough energy, the controller can supply power to the load continuously.

Operation:

Step 1: At main interface(cycle display),Press the **"MENU"** button to enter load mode interface.

Step 2: Long press the **"MENU"** button(≥5S) until the 24H is flashing,then it enters the setting state.

Step 3: Press the **"MENU"** and **"››"** button to change the value

Step 4: After setting,Long press the **"MENU"** button(≥5S) to save the new setting.If there is no operation within 20s,the controller will enter the main interface and cycle to display automatically.

Hours	Light and Timer Control
24H	Load will always be on
23H	The load remains on, and the load switch is not controlled by the key.
1H	Load will be on for 1 hour after sunset
2H	Load will be on for 2 hours after sunset
3H~14H	Load will be on for 3 ~ 14hours after sunset
14H~22H	Load will be on after sunset and be off before sunrise.

(6)System Voltage Setting

The system voltage is set to automatic recognition by default. The system voltage can only be set when a non-lithium battery type is selected. Users can lock the voltage level according to the actual battery voltage via this interface. The setting method is the same as "(5)"



System voltage

(7)Battery type

①support battery types

Lead-acid battery	Sealed(default)/Gel/Flooded/User
Lithium battery	LiFePO4 LF4/12V;LF8/24V;
	Li(NiCoMn)O2 LI3/12V;LI6/LI7/24V;

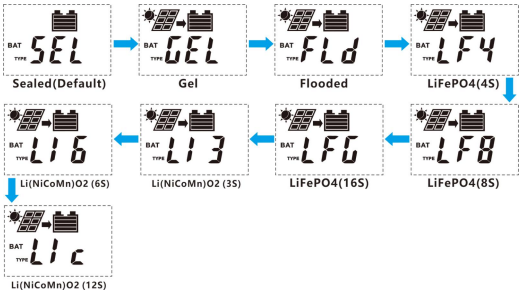
②Setting the battery type via LCD

Step 1: At main interface(cycle display),Press the **"MENU"** button to enter battery type mode interface.

Step 2: Long press the "**MENU**" button(≥5S) until the "SEL" is flashing,then it enters the setting state.

Step 3: Press the "**MENU**" and "**››**" button to confirm the battery type below:

Step 4: Long press the "**MENU**" button(≥5S) to save the new setting.If there is no operation within 20S,the controller will enter the main interface and cycle to display automatically.



(8) Stop Charging Cut-off Current Setting

When the battery type is set to lithium, the controller will stop charging once the battery reaches the boost charging voltage and the charging current drops below the stop charging cut-off current. Charging will resume when the battery voltage falls below the recharge recovery voltage or after the next nightfall. A higher current setting will result in an earlier charging stop. The default value is 1A, and the adjustable range is 0.2A to 10A.
The setting method is the same as in "(5)".

(9)Slave Address Setting

When using RS485 communication and multiple controllers are present in the system for data monitoring, it is necessary to set the communication address of the current controller to ensure address uniqueness. The default slave address is 1, and the configurable range is 1–245

(10)Baud Rate Setting

When using RS485 communication, the default communication rate of the controller is 115200. The controller supports switching among three baud rates.

Setpoint	Baud Rate
B00	9600bps
B01	19200bps
B02	115200bps

4. Protections, Troubleshooting and Maintenance

4.1 Protection

PV Over Current/power	When the charging current or power of the PV array exceeds the controller's rated current or power, it will be charged at the rated current or power. **NOTE: When the PV modules are in series, ensure that the open-circuit voltage of the PV array does not exceed the "maximum PV open-circuit voltage" rating. Otherwise the controller may be damaged.**
PV Short Circuit	When not in PV charging state, the controller will not be damaged in case of a short-circuiting in the PV array.
PV Reverse Polarity	When the polarity of the PV array is reversed, the controller may not be damaged and can continue to operate normally after the polarity is corrected.
Night Reverse Charging	Prevents the battery from discharging through the PV module at night.
Battery Reverse Polarity	Fully protected against battery reverse polarity; no damage will occur for the battery. Correct the wrong wiring to resume normal operation. **NOTE: Limited to the characteristic of lithium battery, when the PV connection is correct and battery connection reversed, the controller will be damaged.**
Battery Over Voltage	When the battery voltage reaches the over voltage disconnect voltage, it will automatically stop battery charging to prevent battery damage caused by over-charging.
Battery Over Discharge	When the battery voltage reaches the low voltage disconnect voltage, it will automatically stop battery discharging to prevent battery damage caused by over-discharging. (Any controller connected loads will be disconnected. Loads directly connected to the battery will not be affected and may continue to discharge the battery.)
Load Short Circuit	When the load is short circuited (The short circuit current is ≥ 2 times the rated controller load current), the controller will automatically cut off the output. The controller will reconnect the output automatically every 30s to judge whether the short circuit is relieved , it needs to be cleared by pressing the operation button or restarting the controller.
Load Overload	When the load is overloading (The overload current is ≥ 1.1 times the rated load current), the controller will automatically cut off the output. If the load reconnects automatically every 30s, it needs to be cleared by pressing the Load button restarting the controller or restarting the controller.
Controller Overheating	The controller is able to detect the temperature inside the battery. The controller stops working when its temperature exceeds 85 °C and restart to work when its temperature is below 65 °C.
TVS High Voltage Transients	The internal circuitry of the controller is designed with Transient Voltage Suppressors (TVS) which can only protect against high-voltage surge pulses with less energy. If the controller is to be used in an area with frequent lightning strikes, it is recommended to install an external surge arrester.

★When the internal temperature is 75℃, the reducing power charging mode which reduce the charging power of 5% every increase 1℃ is turned on. If the internal temperature is greater than 85℃, the controller will stop charging. When the temperature declines to be below 65 ºC, the controller will resume.

4.2 Troubleshooting

Possible reasons	Faults	Troubleshooting
PV array disconnection	LCD display during daytime 	Confirm that PV wire connections are correct and tight.
Battery voltage is lower than 8V	Wire connection is correct, the controller is not working.	Please check the voltage of battery. At least 8V voltage to activate the controller.
Battery over voltage	 Battery level shows full, battery frame blink, fault icon blink	Check if battery voltage is higher than OVD(over voltage disconnect voltage), and disconnect the PV.
Battery over discharged	 Battery level shows empty ,battery frame n blink	When the battery voltage is restored to or above LVR(low voltage reconnect voltage), the load will recover
Load Overload	 1. The load is no output 2.Load and fault icon blink	①Please reduce the number of electric equipments. ②Restart the controller.
Load Short Circuit		①Check carefully loads connection, clear the fault. ②Restart the controller.

4.3 Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best performance.

- Make sure controller firmly installed in a clean and dry ambient.
- Make sure no block on air-flow around the controller. Clear up any dirt and fragments on radiator.
- Check all the naked wires to make sure insulation is not damaged for solarization, frictional wear, dryness, insects or rats etc. Repair or replace some wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LED is consistent with required. Pay attention to any troubleshooting or error indication .Take corrective action if necessary.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature or burnt/discolored sign, tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects and corrosion. If so, clear up in time.
- Check and confirm that lightning arrester is in good condition. Replace a new one in time to avoid damaging of the controller and even other equipments.

⚠WARNING：Risk of electric shock!

Make sure that all the power is turned off before above operations, and then follow the corresponding inspections and operations.

5. Technical Specifications

5.1 Electrical Parameters

Rated charge current	10A/20A	10A/20A	30A/40A/50A/60A
Rated discharge current	10A/20A	10A/20A	30A/40A/50A/60A
Max. PV open circuit voltage	② 60V ③ 55V	② 100V ③ 95V	② 100V ③ 95V
MPP voltage range	(Battery voltage +2V)～50V	(Battery voltage +2V)～75V	(Battery voltage +2V)～75V

Rated charge current	10A	20A	30A	40A	50A	60A
Rated discharge current	10A	20A	30A	30A	30A	30A
Battery voltage range	8～32V					
System nominal voltage	12/24VDC Auto ①					
Battery Type	Sealed(Default)/Gel/Flooded/LiFePO4/ Li(NiCoMn)O2/ User					
Rated charge power	130W/12V 260W/24V	260W/12V 520W/24V	390W/12V 780W/24V	520W/12V 1040W/24V	650W/12V 1300W/24V	750W/12V 1500W/24V
LVD	11.0V ADJ 9V....12V；×2/24V；					
LVR	12.6V ADJ 11V....13.5V；×2/24V；					
Float voltage	13.8V ADJ 13V....15V；×2/24V；					
Boost voltage	14.4V ；ADJ14V….15V；×2/24V；Battery Voltage less than Boost Restart Voltage Start Boost changing for 2hours					
Self-consumption	≤28mA(12V) ≤19mA(24V)					
Discharge circuit voltage drop	≤0.12V					
Temperature compensate Coefficient ④	-4mv/℃/2V					

①When a lithium battery is used, the system voltage can't be identified automatically.

②At minimum operating environment temperature

③At 25℃ environment temperature

④When a lithium battery is used, the temperature compensate coefficient will be 0

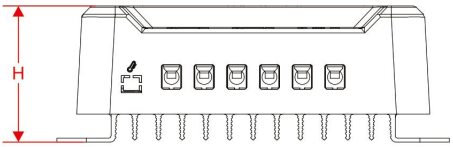
5.2 Environmental Parameters

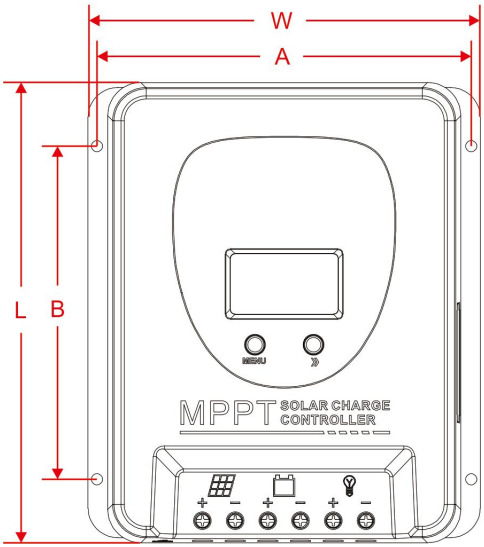
Working environment temperature◆	-20℃～+40℃(100% input and output)
Storage temperature range	-20℃～+70℃
Relative humidity	≤95%, N.C.
Enclosure	IP30

◆The controller can work under full load in the working environment temperature, When the internal temperature is more than 80℃, the reducing power charging mode is turned on.

5.3 Mechanical Parameters

Item	10A	20A	30A	40A	50A	60A
Dimension(L*W*H)	164.5×136×48.5 mm		204.5×174×60.5 mm		246×192×82.2 mm	
Mounting Dimension(A*B)	129×110mm		166×148mm		182×176mm	
Mounting hole size	Φ4mm		Φ5mm		Φ5mm	
Weight	0.50KG	0.60KG	1.4KG	1.5KG	2.1KG	2.2KG





Any changes without
prior notice
Version:V1.0