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Dear Customers,

Thanks for choosing the MPPT series solar charge controller.

Please take time to read this user manual, it will help you to make full use of many advantages the controller can provide your solar system.

This manual gives important recommendations for installing and using and so on. Read it carefully in your own interest and pay attention to the safety recommendations in it please.

## **1. Warranty**

Thank you very much for using our controller.

According to the prescription, Any damaged unit caused by the user's failure to install, disassemble or incorrect use of this product may provide maintenance.

1.1 Warranty regulations:

- 1) within 30 days from the date of purchased, the faulty controller will be free to be replaced the under normal using (with the authorized technical personnel authorized by the company).
- 2) within 2 years from the date of purchased, the faulty controller will be free to be repaired.

**Notes:** Disassembled privately, no warranty

## **2. Safety instructions and waiver liability**

### 2.1 safety instructions

Be aware that only qualified professionals could install these controllers. Please read all manuals before installing them.

- 1) Keep controller away from water. Don't use wet towel to wipe controller.
- 2) Keep controller in an environmental temperature from  $-22^{\circ}\text{C}$  ~  $+55^{\circ}\text{C}$ . Avoid direct sunlight.
- 3) Keep good heat dissipation.
- 4) Use the pure copper wires and connect all polarity correctly.
- 5) The load output is only for DC load less 5A current.
- 6) Please don't set any parameters if you are not professional since the controller can work fine in default condition except lithium battery.

### 2.2 Liability Disclaimer

The manufacture shall not be liable for damages, especially on the battery, caused by use other than as intended or as mentioned in this manual or if the recommendations of the battery manufacturer are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorized person, unusual use, wrong installation, or bad system design.

## **3. Overview**

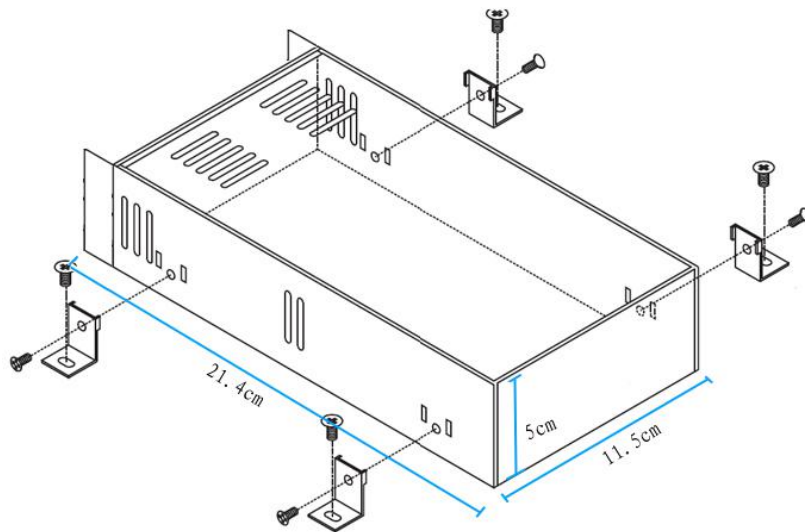
MPPT series solar charge controller is based on an advanced maximum power point tracking (MPPT) technology developed, dedicated to the solar system, the charge controller conversion efficiency up to 97%.

It comes with a number of outstanding features, such as:

- ❶ MPPT 30A/40A/50A/60A solar charge controller
- ❷ 100% MPPT technology
- ❸ Built-in DSP controller with high performance

- ④ Automatic switch for 12V/24V/36V/48V battery bank
- ⑤ 3-stage charging optimizes battery performance
- ⑥ Overcharge protection, Input PV polarity reverse protection, Output limited current protection, Over-temperature protection
- ⑦ Troubleshooting promotion function.
- ⑧ Suitable for battery types such as sealed lead acid, vented gel and lithium battery, etc
- ⑨ Easy to be mounted

#### 4. Dimensions



#### Notes:

Please use our screws only since it may damage the internal PCB if using other screws.

Please use proper torque to push the screws into casing since it may damage the internal PCB by strong torque.

#### 5. Installation

##### 5.1 Installation Notes

##### 1st step: Connect the batteries

Connect the battery connection cable with the correct polarity to the middle pair of terminals on the solar charge controller (with the battery symbol). If the system is 12V, please make sure your battery voltage is more than 12V, then the controller can boot up.

##### 2nd step: Connect the solar panel

Ensure that the PV modules are protected from incident light. Ensure that the solar panel doesn't exceed the maximum permissible input current. Connect the PV modules connection cable to the correct polarity of the left pair of terminals on the solar charge controller (with the PV modules symbol).

##### 3rd step: connect loads

Connect the load cable to the correct polarity of the right pair of terminals on the solar charge controller(with the lamp symbol).To avoid any voltage on the wires,Please connect the wire to the load before connect to the controller.

**4th step:Final worked**

Tight all cables connected to the controller and remove all the debris around the controller(leaving a space of approx. 5.91in)

**Notes:**

when the reading data of PV or Battery is constantly changing,Don't worry about it.The controller is finding MPP point.it's caused by your PV input isn't enough.Please contact us soon.Our technological team will assist you.

**5.2 Air Circuit Breaker installation**

We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring.Solar PV modules create current whenever light strikes them.The current created varies with the light intensity,but even in the case of low levels of light,full voltage is given by the modules.So,protect the solar modules from incident light during installation.Never touch uninsulated cable ends,use only insulated tools,and make sure that the wire diameter is in accordance with the expected currents of solar charge controller.Connections must always be made in the sequence described below.

**Air Circuit Breaker and Wires Requirement**

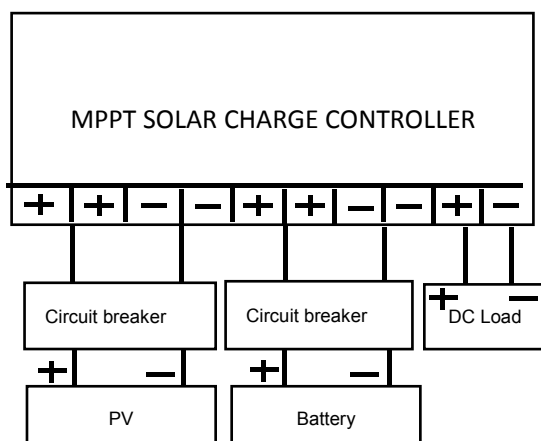
Models	MPPT-30A	MPPT-40A	MPPT-50A	MPPT-60A
Copper wires	6mm <sup>2</sup>	6mm <sup>2</sup>	6mm <sup>2</sup> x2PCS	6mm <sup>2</sup> x2PCS
Air circuit breakers	63A	63A	63A	100A

**Reminder**

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

For MPPT-50A and MPPT-60A, it's better to connect two wires to two PV+ and another two wires to two PV-.

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

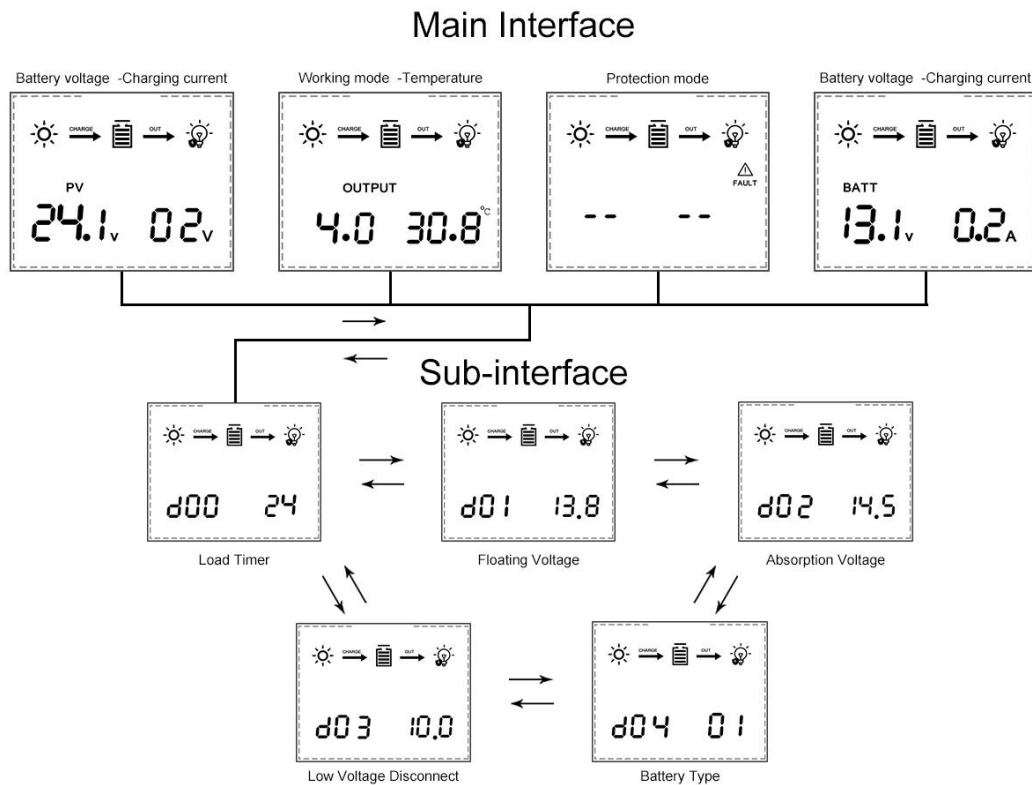


- 1.Install air circuit breaker between controller and batteries. Turn off the circuit breaker, then connect batteries to controller with correct polarity.
- 2.Install air circuit breaker between controller and PV modules. Turn off the circuit breaker, and ensure the PV polarity correct, then connect wires between PV modules and controller.
3. Turn on the air circuit breaker between controller and batteries.

4. Turn on the air circuit breaker between controller and PV modules.
5. The controller goes into the self-test mode. Its LCD displays the parameters if all is correct. And RUN lamp (under the fan inside of casing) will flash every one second. If the controller is no response, please read full manual again for reinstalling or contact us for help.

## 6. Operation

### 6.1 LCD display



Item	Description
1	PV voltage / Output power
2	Battery voltage / Charging current
3	Working mode / Temperature
4	Protection mode

### 5.2 Working mode

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

### 5.3 Batteries charge voltage reference

Battery Type	Absorption Voltage ( Constant voltage )			Floating Voltage		
	12V	24V	48V	12V	24V	48V
Vented	14.2V	28.6V	57.2V	13.2V	26.4V	52.80V
Sealed	14.4V	28.8V	57.6V	13.8V	27.6V	55.2V
Gel	14.4 V	28.8V	57.6V	13.8V	27.6V	55.2V
NiCd	14.2V	28.6V	57.2V	14.0V	28.0V	56.0V
Lithium or others	Defined by users					

### 5.4 Manual Setting

**Reminder: The controller will work fine under default setting except lithium battery.**



**Caution! All steps must be carried out when the PV modules are disconnected to controller.**

Step 1: D00

Press the button PRG, then LCD displays D00. This is setting for load working time (Default is 24-hour). Press ENT until numbers flash, then press UP/DOWN to set up time that you want, long-press ENT to confirm it. This output voltage is same as battery. The load is only for small DC loads less 5A current. If no load, just leave it.

Step 2: D01

Press the button UP, LCD shows 13.8. This is default value of floating charging. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT to confirm it.



**Caution!** This value is for one 12V battery. If there are many batteries in series, the controller will multiply them in proportion automatically and the LCD only displays the voltage of one battery (For example, if your battery is 4x12V, and if you set the voltage at 14.1, the charge voltage will be 4x14.1 automatically, but the LCD only displays 14.1).

Step 3: D02

Continue to press the button UP, LCD shows 14.5. This is highest absorption charging voltage for battery. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT to confirm it.



**Caution!** This value is for one 12V battery. If there are many batteries in series, the controller will multiply them in proportion automatically and the LCD only displays the voltage of one battery.

Step 4: D03

Continue to press the button UP, LCD shows 10.0. This is protection value of battery discharge. Press ENT until numbers flash, then press UP/DOWN to set up voltage that you want, long-press ENT 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-.

Step 5: D04

Continue to press the button UP, LCD shows 00. 00 is default for acid batteries.

If it's for lithium battery, please press ENT until numbers flash, then press UP/DOWN to choose 01, long-press ENT to confirm it. Step 2 (D01) is no useful when you choose 01 for lithium battery. And the voltage set in step 3 (D02) will be highest charging voltage for lithium battery.

Press ESC to exit the setting menu.

Reminder: When you set up all steps, please disconnect battery. And reconnect controller to see if all setting is successful. When all setting is ok, then connect PV modules to controller.

## 6.Troubleshooting, Protections

### 6.1Troubleshooting

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
73	Over-charging current	Decrease the PV power

### 6.2 Protections

#### ①PV Over Current

The controller will limit charging power in rated charge power.An over-sized PV array will not operate at maximum power point.

#### ②PV Short Circuit

When PV short circuit occurs,the controller will stop charging.Remove it to start normal operation

#### ③PV Reverse Polarity

Fully protection against PV reverse polarity,no damage to the controller.Correct the connection to start normal operation.

#### ④Battery Over Voltage

If there are other energy sources to charge the battery,when the battery voltage exceeds 15.5/31.0/46.5/62.0V,The controller will stop charging to protect the battery from overcharging damage.(Pay attention to the stop charging means charging current is very low )

#### ⑤Battery Over Discharge

When battery voltage drops to the setting voltage point of low voltage disconnect,the controller will stop

discharging to protect the battery from over discharging damage.

⑥ Load Over Current protection

If the load current exceeds the maximum load current rating 1.25 times, the controller will disconnect the load.

⑦ Load Short Circuit Protection

Once the load short circuit happens, the Load Short circuit protection will start automatically.

⑧ Over Temperature Protection

**7. Technical Data**

Models		MPPT-30A	MPPT-40A	MPPT-50A	MPPT-60A
Charging mode		3-stage: constant current(MPPT), constant voltage, floating			
MAX PV Input Power	12V system	360W	480W	600W	720W
	24V system	720W	960W	1200W	1440W
	36V system	1080W	1400W	1800W	2100W
	48V system	1440W	1700W	2200W	2800W
Input specification DC	12V system DC	20V~80V	20V~80V	20V~80V	20V~80V
	24V system DC	37V~105V	37V~105V	37V~105V	37V~105V
	36V system DC	50V~160V	50V~160V	50V~160V	50V~160V
	48V system DC	72V~160V	72V~160V	72V~160V	72V~160V
Battery voltage automatic recognition: 12V Battery		DC9V~DC15V			
Battery voltage automatic recognition: 24V Battery		DC18V~DC29V			
Battery voltage automatic recognition: 36V Battery		DC30V~DC39V			
Battery voltage automatic recognition: 48V Battery		DC40V~DC60V			
Overcharging protection voltage		15V	30V	45V	60V
Limited current protection		31A	42A	51A	61A
Max efficiency		≥98.1%			
PV utilization		≥99%			
<b>Protection function</b>					
Temperature protection		75℃			
Fan-on temperature		>45℃			
Fan-off temperature		<40℃			
<b>Properties</b>					
Size (mm)		214x115x50			
Net weight(Kg)		1.1			
Gross weight(Kg)		1.2			
Electromagnetic compatibility		Accord to EN61000, EN55022, EN55024			
Enclosure		IP21			
Environmental temperature		-20℃ ~ +55℃			
Storage temperature		-40℃ ~ +75℃			



**9.Content Included**

1XMPPT Solar Charge Controller

1XEnglish manual

4XCorner connections

4XScrews for controller casing