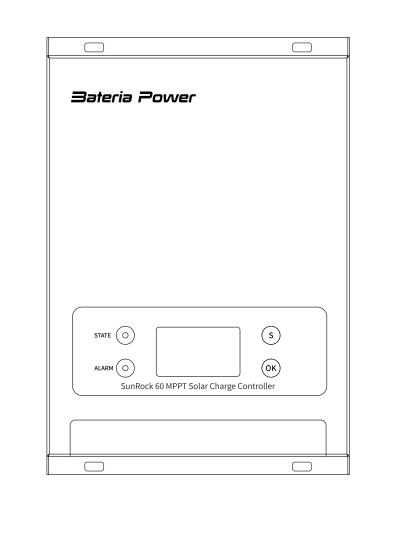
尺寸: 150*210mm

Bateria Powel

MPPT Solar Charge Controller SunRock 60

User Manual



About US

In 2017, Bateria Power was founded by a group of passionate engineers with extensive experience in the clean energy indus try. We are a leading independent clean energy provider. Dedicated to discovering user needs, product design, research and development, manufacturing, and sales. We advocate for a clean energy lifestyle and promote the convenience and access bility of clean energy for all.

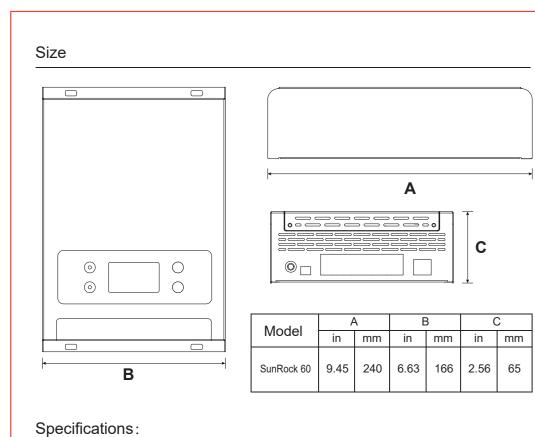
Bateria Power offers convenient and customized independent clean energy systems for various scenarios, ensuring uninterrupted and sustainable power supply. Our systems integrate neces sary hardware modules such as solar power generation, lithium battery storage, inverters, and charging controllers. They are equipped with advanced AloT Energy Internet technology, i enables remote device control, truly achieving the civilian use of industrial-grade products and accelerating the adoption of clean energy in a wider consumer market.

Whether it's powering homes, supporting outdoor travel, meet ing emergency power needs of daily life and work , or address ing electricity shortages in remote areas, our solutions fulfill people's demands for convenient and affordable clean energy

At Bateria Power, we take pride in providing efficient solutions for power generation, storage, and usage. Our products are designed with powerful interactivity and user-friendly features, enabling users to enjoy an immersive DIY experience. Our aim is to rapidly popularize clean energy applications in more households and among individuals.

Choose Bateria Power, Enjoy clean energy life.

The charging parameters of commonly used lithium-ion batteries.



1.0 Important s 2.0 Product int 2.1 Featur 2.2 Option 3.0 Installation 3.1 Installa 3.2 Installa 4.0 Working prin 4.1 The ma 4.2 Charge 4.3 Load c

SunRock 60 150V

Rated load current *The voltage of the PV array cannot exceed this limit.

*These power limits refer to the maximum power that the MPPT controller can handle High power arrays can be used without damaging the controller. But not suggested.

4.2 Charge status and parameters

The controller charges the lead-acid battery

The MPPT controller has a 4-stage battery charging algorithm to charge lead-acid batteries fast, efficiently and safe.

1 - CC State (Constant Current Charging): Fast Charging Phase - FAST

2 - CV state (constant voltage charging): regulated charging phase - KEEP

3 - CF Status (Float Charging): Prevents the battery from being overcharged for a long time. And make up for the loss of self-discharge. -FULL

4 - Boost charging: activate battery chemistry, desulphurization effect

The controller charges the lithium-ion battery

The MPPT controller will charge according to the specifications of the lithium-ion battery nainly in two stages. In the first stage, when the battery voltage is lower than the sa on voltage, it will rapidly charge according to the maximum power point that is track in the second stage, when the battery voltage is equal to the saturation voltage, it will charge at a constant voltage, and the charging current will gradually decrease to 0.

Charging parameter settings

The charging parameters of commonly used lead-acid battery. All voltage settings listed are for standard 12 volt batteries. Note: For a 24 volt battery, multiply the voltage setting by 2.

Battery Type	Vollane		Equalization voltage	Equalization charging time	Undervolt- age protec- tion	Brown- out Recov- ery	
Gel (GEL)	14.2V	13.8V	14.2V	30 min self-defined	11.1V	12.6V	
Sealed (SEL)	L) 14.4V 1		14.6V	30 min self-defined	11.1V	12.6V	
Flooded (FLD)	146V	13.8V	14.8V	30 min self-defined	11.1V	12.6V	
Custom(CUS)	self-de- fined	self-de- fine	self-defined	30 min self-defined	self-defined	self-de- fined	
			10				

Battery Type	Standard Voltage	Saturation voltage	Discharge cut-off voltage	cut-off recovery voltage
LiFePO4 12V(4 strings of lithium iron phosphate)	12.8V	14.4V	10.8V	12.4V
LiFePO4 24V(8 strings of lithium iron phosphate)	25.6V	28.8V	21.6V	24.8V
LiFePO4 48V(15 strings of lithium iron phosphate)	48V	54V	40.5V	46.5V
Ternary- 12V(3 strings of ternary lithium)	11.1V	12.6V	9.6V	10.5V
Ternary- 24V(6 strings of ternary lithium)	22.2V	25.2V	19.2V	21.0V
Ternary-48V (13 strings of ternary lithium)	48.1V	54.6V	41.6V	45.5V

user- defined user- defined user- defined user- defined defined Note: These settings are general guidelines for user operation. MPPT can be set to meet various charging parameters. Check with the battery manufacturer for the best battery charging settings.

4.3 Load Control

The main purpose of the load control function is to disconnect the system load when ne battery is discharged to a low voltage state and reconnect the system load battery is charged back to a certain level. System loads can be lamps, appliances, or other electronic equipment. The total current of all loads must not exceed the MPPT maximum load rating.

Reminder: Risk of Equipment Damage

Do not connect any AC inverter to the load terminals of the MPPT. The load control circuit may be damaged. The inverter should be connected to the battery. If any other load may sometimes exceed the maximum voltage or current limit, the device should be connected directly to the battery or battery pack.

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Brief description of load control:

Model

Maximum PV open

Do not connect multiple MPPT load outputs in parallel to power supply dc loads that consume more than 30A current, depending on the MPPT model used. Be careful when connecting loads with specific polarities to controller load terminals. Reverse polarity connections may damage the load. Be sure to check the load

connection carefully before powering on. The load output voltage of the controller is the same as that of the battery string. F

example, when the battery voltage is 25.2V, the load output voltage is also 25.2V. When the load output current is lower than the rated load current, the system provides stable power to the load.

When the load output current exceeds the preset load current and lasts for minutes in the range of 100% to 120%, the load output is shut down and switches to the normal off mode.

When the load output current is detected to exceed 120% of the rated load current the load output will be shut down immediately and switch to the normal off mode.

Attention: When the Load switches to normal off mode, in order to restart the Load, the user needs to reset the Load to "ON" mode ON the controller or reset the Load mode through the mobile APP, upper computer, and meter header.

Load Control Mode:

1 - Normal on/Normal Off mode: The load output state is on or off. 2 - Optical control mode: The load output is turned on or off according to whether the

is light (input voltage limit). Refer to the following diagram for the working mechanism

3 - Dual-period timing control mode: The load switch of two different periods is controlled according to two timers. Refer to the following diagram for the working mechanism.

4 - Fixed time light control mode: according to whether there is light (input voltage limit), the load output is controlled to turn on or off in hourly units.

Light (PV) Co	ntrol Mode	Dual-timer Inte	rval Control Mode	Time & Ligl	nt (PV) Co	ntrol Mode
PV 30.0 V	PV 30.0 V	ON 18:30	ON 04:30	PV 30.0	V F	9V 30.0 V
Delay 10 min	Delay 10 min	OFF 22:30	OFF 06:30	ON 3	нс	DN 2 H
Load C	ИС	Load ON	Load ON	Load ON	Lo	oad ON
)))))	*)))))))*	*)))) *
Dusk Nigh	t Morning	Dusk	Night Morning	Dusk	Night	Morning

12

is running normally without faults.

4.5 Display wakeup

4.6 Key operation

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____ Attention: Only the normal ON/normal OFF mode can be set on the controller **T** panel. Other modes need to be set through other optional accessories.

Attention: Please refer to Section 4.5 for setting the normally on/OFF mode

Green: Indicates charging status. When flashing fast, it means it is in fast charging state (CC mode); when flashing slowly, it means it is in constant voltage charging state (constant voltage charging CV); when it is always on, it means it is in floating charging state (CF) or standby mode.

Red: If a fault occurs, the indicator is steady on. If it is off, it indicates that the device

The default screen backlight duration is 30 seconds (time can be set on Blue tooth, blue tooth is an extra device which is not included in the controller), and the backlight display can be awakened by operating buttons or touching the body

Press the " OK " and " S " keys at the same time for 6 seconds to restore the factory settings. The specific operation and display logic are shown in the following figure.

1.0 Important safety instructions

It is recommended to keep this manual.

This manual contains important safety, installation and operation instructions for the MPPT solar controller.

The following symbols are used in this manual to indicate potentially hazardous condi tions or to mark important safety instructions:

Warning: Indicates a potentially hazardous situation. Be careful when perform *ing related operations.*

Reminder: Indicates critical procedures for safe and correct operation of the *controller.*

NOTE: Indicates a program or function that is important to the safe and correct operation of the controller.

Security Information

•Before installation, read all the instructions and precautions in this manual.

•There are no user repairable parts in the MPPT. Do not disassemble or attempt to repair the controller.

↓ WARNING: Danger of electric shock. No power or other terminals are galvan cally isolated from the DC input and may be energized with dangerous solar voltages. Under certain fault conditions, the battery may overcharge. Before making contact, test the impedance between all terminals and ground

 λ WARNING: The communication port of the controller is not an isolated source and isolated signal, please be careful when connecting with other devices.

• Requires external solar and battery disconnect.

•Disconnect all power from the controller before installing or adjusting the MPPT.

Installation Safety Precautions

Warning: There is no GFDI (Ground Fault Detection Device) inside the control

 The MPPT controller must be installed indoors. Do not touch the components and no water allowed to enter the controller.

 The MPPT must be Installed in a location that is not easily accessible touched accident. MPPT heat sinks can get very hot during operation.

Please use insulated tools when working on batteries.

The battery pack must consist of the same type, brand and age batteries.

Do not smoke near the battery pack.

Avoid wearing jewelry during installation.

Power connections must be kept tight to avoid overheating due to loose connections

Use appropriately sized wires and circuit breakers.

• Grounding can be performed at the bottom fixing holes of the chassis.

• The MPPT controller must be installed by a qualified technician in accordance with the country's electrical codes.

• A overall device which can disconnect all power electrodes must be installed. The disconnect devices must be included in the fixed wiring.

 The MPPT positive power terminal is connected (common positive). If necessary grounding should be in accordance with instructions, local codes and regulations.

• The grounding position of the MPPT shell must be connected to a reliable ground

The grounding conductor must be fixed to prevent separation by accident

5.0 Common faults and handling

WARNING: Danger of electric shock.

Inputs and outputs are not electrically isolated and may be energized with dangerous solar voltages. Under certain fault conditions, the battery may overcharge. Before making contact, test the impedance between all terminals and ground.

Warning: Danger of electric shock

A device of disconnecting all power elect rodes must be provided. These disconnections must be included in the fixed wiring. Disconnect all power supplies

before removing the controller wiring cover or repairing the wiring.

The LCD screen doesn't light up, and the controller doesn't seem to be powered on.

Solution: Use a multimeter to check the voltage of the battery terminals on the MPPT. The battery voltage must be 10 VDC or higher. If the voltage on the controller battery terminal is between 10 and 60 VDC and no indicator light is on, contact the authorized distributor for repair. If the voltage is not measured, check the wiring, fuses, and circuit

The controller is not charging.

Solution

Check fuses, circuit breakers, and wiring connections in power wiring. Using a multimeter, check the array voltage directly on the MPPT solar input terminals. Before starting charging, the input voltage must be greater than the battery voltage. Check whether the battery voltage displayed on the LCD screen is within the recognition range of the controller system.

The battery has been in a low or dead state for a long time.

Solution:

Possible reasons: 1. There are not enough solar panels to generate enough energy to meet the system request, and the solar panel array can be increased appropri-

2. The battery capacity is too small to store enough energy for the system to use, and the capacity of the battery pack can be appropriately increased.

Battery safety

 WARNING: Batteries may present a risk of electric shock or burn due to hic short-circuit current, fire or explosion of exhaust gas. Follow proper precau-

▲ WARNING: Danger of explosion. Batteries need to be disposed of properly Do not dispose of batteries in a fire. Refer to local regulations or codes for requirements.

A Reminder: When replacing batteries, use the correctly specified quantity, type and rating based on the application and system design.

Reminder: Do not open or damage the battery. The electrolytes released are harmful to the skin and may be toxic.

• It should be performed or supervised by personnel who understand batteries and appropriate safety precautions when repair the batteries.

• Be very careful when using large lead-acid batteries. Wear safety goggles and have fresh water available to prevent contact with battery acid.

• Remove watches, rings, jewelry and other metal objects before using the battery. Wear rubber gloves and boots.

 Use tools with insulated handles and avoid placing tools or metal objects on top of the battery.

• Disconnect the solar panel or other charging power source before connecting or unnecting the battery terminals.

 Check if the battery is accidentally grounded. If so, remove the ground source. Conta with any part of a grounded battery may result in electric shock. The possibility of this type of shock is reduced if the battery ground is removed during installation and mainter nance (applies to equipment without a grounded power circuit and to remote battery

• Please read the battery manufacturer's instructions carefully before installing / connecting the MPPT or removing the battery from the MPPT.

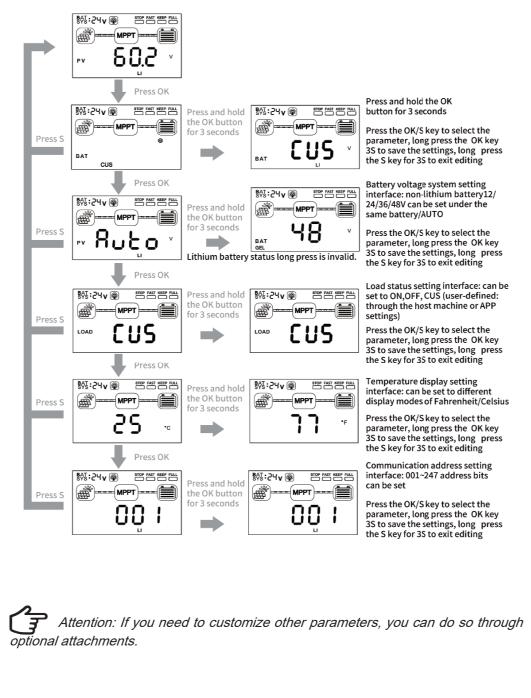
The cables which connected to the battery should not short circuit

• If in the event of an accident, ask someone nearby for assistance.

 Explosive battery gas may exist during charging. Make sure there is adequate ver tion to release the gas.

No smoking in the battery area.

	I		SunRock 60			
	MPPT effi	ciency	≥99.5%			
Product	No-load sta	iency $\geq 99.5\%$ ic loss $0.5W-1.2W$ Itage $12V/24V/36V/48$ AutoethodFan coolingsuit Voltage (VOC) $150Vdc$ g voltage point $3V$ higher than battery voltagerotection point $2V$ higher than the current battery voltagerotection point $150Vdc$ $12V$ System $780W$ $24V$ System $1360W$ $36V$ System $2340W$ $48V$ System $3120W$ tery typeLead-acid battery / Li-ion batteryration functionOptionalcurrent $60A$ ethodLead-acid battery: fast charge, equal chargeagesame battery voltagesurrent $30A$ methodNormally open and normally closed mode/dual period control mode/light control mode/light control-fixed time control modeathodHigh-definition LCD segment code backlight displayn method $e_{pin RJ45$ interface/R485/support host computer monitoring/suppor external Bluetoth, WiFl module expansion to realize app cloud monitoring/support external monitoring headerinctionInput and output wer-voltage protection, etc.perature $-20 C \rightarrow 450 C$ tertal $-40 C \sim +75 C$ in classIP21ire size $20mm^2$ tt(kg) $1962.7g$ ht(kg) $2.1kg$ e (mm) $240^$				
Category	system vo	oltage	12V/24V/36V/48 Auto			
	Cooling m	nethod	Fan cooling			
	PV Maximum Open Ci	rcuit Voltage (VOC)	150Vdc			
Input characteristics Input low voltage protection point 2V higher than the current battery voltage 2V higher than the current battery voltage 150Vdc Rated input power 12V System 780W 24V System 1560W 36V System 2340W 48V System 3120W Lithium battery activation function Optional Charging characteristics Charge rated current 60A Charging method Lead-acid battery: fast charge, equal charge, flo	Turn on the chargir	ng voltage point	3V higher than battery voltage			
	Input low voltage p	protection point	2V higher than the current battery voltage			
	150Vdc					
		12V System	780W			
	Rated input	24V System	1560W			
Rated input 24V System power 36V System 48V System 48V System Lithium battery activation function 24V System Charging Charge rated current Charging method Lea	2340W					
		48V System	3120W			
	Applicable ba	ittery type	Lead-acid battery / Li-ion battery			
	Lithium battery act	ivation function	Optional			
	Charge rate	d current	60A			
	charging n	nethod				
	load vol	tage	same battery voltage			
	Rated load	current	30A			
characteristics	Load contro	l method	12V/24V/36V/48 Auto 12V/24V/36V/48 Auto Fan cooling e(VOC) 150Vdc oint 3V higher than battery voltage oint 2V higher than the current battery voltage oint 2V higher than the current battery voltage oint 150Vdc oint 1500Vdc oint 1500Vdc oint 1500Vdc oint 1500Vdc oint 1500Vdc oint 1500Vdc oint 1200W oint 1000 Optional 60A Lead-acid battery: fast charge, equal charge, floating charge; floating charge; lithium battery: fast charge, equal charge same battery voltage 30A Nor			
	Display m	ethod	High-definition LCD segment code backlight display			
Display/Commu nication	communicatio	on method	external Bluetooth, WIFI module expansion to realize			
	Protective f	function				
	Working tem	perature				
	Storage tem	perature	-40 °C ~+75 °C			
Other	IP protection	on class	IP21			
properties	Maximum v	vire size	20mm ²			
	Net weigh	nt (kg)	1962.7g			
	Gross weig	ght (kg)	2.1kg			
	Product siz	e (mm)	240*166*65			
	Packaging s	ize (mm)	299*203*70			



• If battery acid comes into contact with skin, wash with soap and water. If acid contacts eyes, flush with fresh water and seek medical attention.

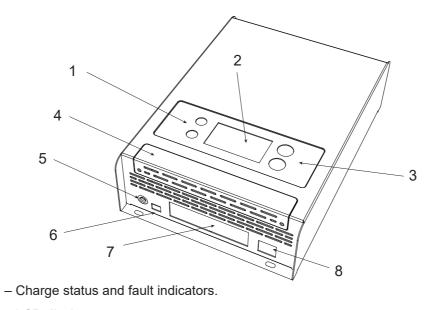
• Before starting to charge the lead-acid battery, make sure that the battery electrolyte level is correct. Do not attempt to charge a frozen battery.

When replacing the battery, pay attention to recycling the battery.

2.0 Product Introduction

2.1 Feature-Illustrationen

The features and illustration of the controller are as follows:



- LCD display.
- 3 Operation buttons.

Protective funct

Photovoltaic array short circuit

Load short circuit protection

Load overcurrent protection

Heat sink temperature limit

Battery disconnect protection

Cable Specification Table

Overvoltage and undervoltage protection

Internal overtemperature - Reduced power operation

- 4 Holes for wiring screws.
- 5 Input and output power line connectors. (PV+/PV-/BAT+/BAT-/LOAD+/LOAD

Anti-reverse connection protection - battery end and photovoltaic array en

- 6 Temperature sensing wire connector.
- 7 Mounting hole for grounding.
- 8 RJ45 serial communication interface

2.2 Optional accessories

The following accessories can be purchased separately from authorized dealers:

MH-M80(Meter)

Digital remote instruments display system working information. The information is displayed on the OLED display and the parameters of the controller can be easily set. can be mounted on the wall or close to the surface of ferrous material using the mounting bracket (accessory). The MH-M80 comes with a 3.3 ft (1.0 m) cable (extendable), mounting bracket and mounting screws. The MH-M80 connects to the RJ-45 communication port on the MPPT. The MH-M80 cannot be used with other communication equipment

MH-S80(Meter)

Digital remote instrument displays system working information and error indication. The formation is displayed on the OLED display and the parameters of the controller easily set. This meter can connect up to 4 controllers, and the controllers of the battery system can work in parallel. The head can be mounted on the wall or close to surface of ferrous material using the mounting bracket (accessory). The MH-S80 comes with a 3.3 ft (1.0 m) cable (extendable), mounting bracket and mounting screws. The MH-S80 connects to the RJ-45 communication port on the MPPT. The MH-S80 cannot be used with other communication equipment.

USB-RS485 communication line

The USB-RS485 communication line converts the R-l45 electrical interface into a st dard USB interface, thereby realizing the communication between the MPPT and personal computer (PC). This communication line can be used to modify the contr custom charging setpoint and record data in SolarMate. This communication cable cannot be used with other external devices.

A wireless communication box that can be used in connection with the controller. The communication box acts as a transceiver (near-field remote control), and the user can use the mobile phone software to monitor the MPPT controller via Bluetooth. The comm box cannot be used with other external devices.

Cloud-Box-M2

A wireless communication box that can be used in connection with the controller. The ommunication box acts as a transceiver (remote control), and the user can use th obile phone software to monitor the MPPT controller through the Internet cloud serv The comm box cannot be used with other external devices.

3.0 Installation Instructions

3.1 Installation Precautions

clean any contact with battery acid.

Please read through the entire installation section before beginning the installation

• Be very careful when using batteries. Wear goggles and use fresh water to wash and

• Use insulated tools and avoid placing metal objects near the battery.

Warning: Do not install the MPPT in an enclosure with an open/floode battery. Battery fumes are flammable and can corrode and destroy MP

Reminder: When installing the MPPT in the enclosure, ensure adequate vent / Iation. Installation in a sealed enclosure can result in overheating, reduced power operation, and shortened product life.

• Do not install in a location prone to water ingress and very humid.

• Loose power cord connections and corroded wires may cause contact points or line npedance to increase, melt wire insulation, burn surrounding materials, or even a fire. Ensure that the cables are securely connected and secured using cable clips to prevent the cables from shaking during mobile applications

• This MPPT controller can be connected to a battery or a battery pack.

• This MPPT controller prevents reverse current leakage at night, so diodes in series are not required in the system.

• This MPPT controller is only used for solar power generation. Connection to any othe type of power source (such as a wind turbine or generator) may resulting in invalid

Warning: Serial solar and battery fuses or DC circuit breakers are required i *the system. These guards are located outside the MPPT controller.*

Warning: Installation must comply with electrical code requirements. Select suitable specifications for circuit breakers and fuses based on application reauirements.

2% Voltage Drop Charts for 75°C Solid Copper Wire

1-Way Wire Distance (feet), 12 Volt System

i way wire Distance (reet), 12 voit Cystem											
Wire Size (AWG)	60A	55A	50A	45A	40A	35A	30A	25A	20A		
2/0*	27.8	30.3	33.4	37.1	41.7	47.7	55.6	66.7	83.4		
1/0*	22.1	24.1	26.5	29.4	33.1	37.8	44.1	53.0	66.2		
2	13.9	15.1	16.6	18.5	20.8	23.8	27.7	33.3	41.6		
4	8.7	9.5	10.5	11.6	13.1	15.0	17.5	21.0	26.2		
6	5.5	6.0	6.6	7.3	8.2	9.4	10.9	13.1	16.4		
8	3.5	3.8	4.2	4.6	5.2	5.9	6.9	8.3	10.4		
10	2.2	2.4	2.6	2.9	3.3	3.8	4.4	5.3	6.6		
		1-Way W	/ire Dista	ance (m	eters), 1	2 Volt S	ystem				
Wire Size (mm ²)	60A	55A	50A	45A	40A	35A	30A	25A	20A		
70*	8.5	9.2	10.2	11.3	12.7	14.5	16.9	20.3	25.4		
50*	6.7	7.3	8.1	9.0	10.1	11.5	13.4	16.1	20.2		
35*	4.2	4.6	5.1	5.6	6.3	7.2	8.5	10.1	12.7		
25	2.7	2.9	3.2	3.5	4.0	4.6	5.3	6.4	8.0		
16	1.7	1.8	2.0	2.2	2.5	2.9	3.3	4.0	5.0		
10	1.1	1.1	1.3	1.4	1.6	1.8	2.1	2.5	3.2		
6	0.7	0.7	0.8	0.9	1.0	1.1	1.3	1.6	2.0		
avimum 1		ro distan	ce for 1	2 Volt s	etome (solid cor	ner 2%	voltade	dron		

Maximum 1-way wire distance for 12 Volt systems, solid copper, 2% voltage drop Attention: *Wires larger than 4 AWG (25 mm2) must be terminated at the junction box outside the MPPT. Use 4 AWG (25 mm2) or smaller wire to connect the MPPT to the junction box.

Attention: • The specified wire lengths are for a pair of wires (one-way distance) from the solar or battery power source to the controller. For a 24-volt system, multiply the length in the table by 2.

RJ45 Port definitions

Pin	Function	
1	RS485-A	
2	RS485-B	
3	-	
4	-	1 2 3 4 5 6 7
5	GND	
6	GND	
7	+5V	
8	+5V	

Number of PV modules in series reference table

Syst	Voc<	23V	Voc<	<31V	Voc<	Voc<34V		Voc<38V		Voc<46V		Voc<62V	
em Volt age	The maxi mum	The opti mum	The maxi mum	Th opt mu									
12V	6	2	4	1	4	1	3	1	3	1	2	1	
24V	6	3	4	2	4	2	3	2	3	2	2	1	
36V	6	4	4	3	4	3	3	3	3	2	2	1	
48V	6	5	4	4	4	3	3	3	3	2	2	2	
				Voc '	* N = P	V inpu	ıt < 20	0Vdc			-		
Syst	Voc<	23V	Voc<	<31V	Voc<	<34V	Voc<	<38V	Voc<	46V	0C<	oc<62V	
em Volt age	The maxi mum	The opti mum	The maxi mum	Th opi mu									
12V	8	2	6	1	5	1	5	1	4	1	3	1	
24V	8	3	6	2	5	2	5	2	4	2	3	1	
36V	8	4	6	3	5	3	5	3	4	2	3	1	
48V	8	5	6	4	5	3	5	3	4	2	3	2	
<i>Attention: N in the table represents the number of series, the data is for reference only.</i> 19													

2 Installation Steps

Check the controller if there is shipping damage install directly on flammable surfaces as the may become hot under certain operating condition

lake sure there is enough space for airflow, res least 30 cm (12 in) above and below the controll 50 mm (2 in) on two sides. Do not install in a contain where accumulator gas may accumulate.

2 Note: There should be enough space between the top and bottom for the fan to dissipate

Step 1: Check Controller Parameter Limits

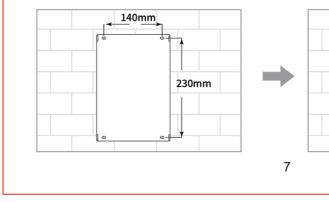
Check that the maximum temperature compensated solar array open circuit voltage /oc) and load current do not exceed the ratings of the MPPT controller. Multiple ontrollers can be installed in parallel on the same battery pack for higher total charg rrent. In this type of system, each MPPT must have its own solar panel. The terminals of multiple controllers can be connected together only if the total load does not exceed the rated current of a single controller.

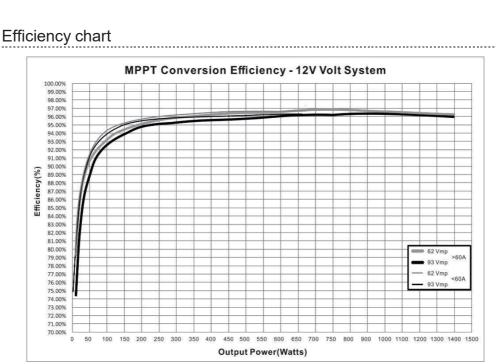
Step 2: Connect the input and output power cables

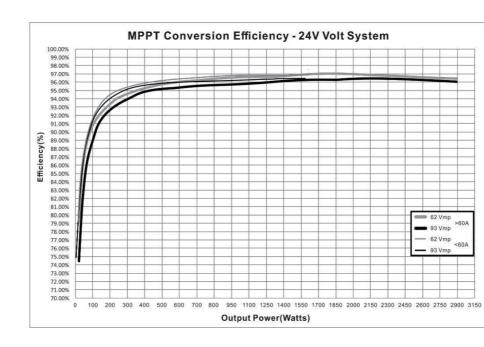
Follow the wiring sequence (1, 2), (3) to wire and tighten the screws.

Step 4: Make mounting holes in the mounting wall

easure and mark the distance on the wall, drill 4 holes of 6mm diameter and fill the 4 holes with plastic expansion pellets.









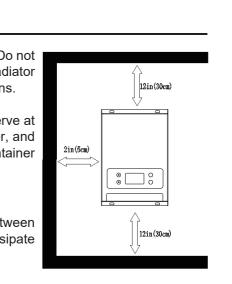
0 00 01 01 07 40 40 56 67

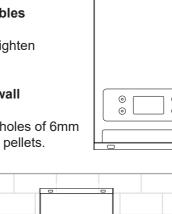
ð	2.8	3.1	3.4	3.7	4.2	4.8	5.6	6.7	8.4
10	1.7	1.9	2.1	2.3	2.6	3.0	3.5	4.2	5.2
		1-Way W	/ire Dista	ance (m	eters), 1	2 Volt S	ystem		
Wire Size (mm ²)	60A	55A	50A	45A	40A	35A	30A	25A	20A
70*	6.8	7.4	8.2	9.1	10.2	11.7	13.7	16.4	20.5
50*	5.4	5.9	6.5	7.2	8.1	9.3	10.8	13.0	16.2
35*	3.4	3.7	4.1	4.5	5.1	5.8	6.8	8.2	10.2
25	2.1	2.3	2.6	2.9	3.2	3.7	4.3	5.2	6.4
16	1.3	1.5	1.6	1.8	2.0	2.3	2.7	3.2	4.0
10	0.8	0.9	1.0	1.1	1.3	1.5	1.7	2.0	2.5
6	0.5	0.6	0.6	0.8	0.8	0.9	1.1	1.3	1.6
aximum 1-wa	ay wire dis	stance for	12 Volt sys	stems, stra	anded cop	per, 2% vo	oltage drop)	

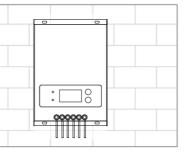
2% Voltage Drop Charts for 75°C Stranded Copper Wire

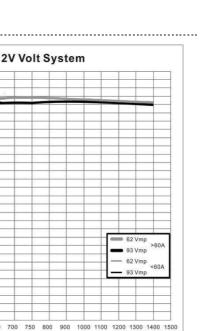
1-Way Wire Distance (feet), 12 Volt System

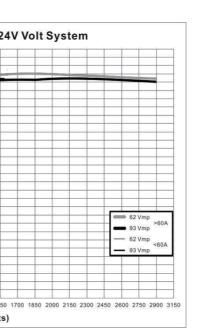
Wire Size 60A 55A 50A 45A 40A 35A 30A 25A 20A











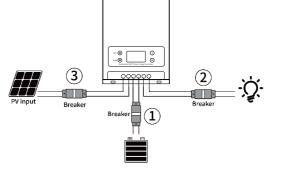
Step 5: Mount the Controller to the Wall

Alian the fixing holes of the controller with the mounting holes made in step 4, use M4 self-tapping screws to fix the controller on the installation wall and tighten the screws.

Step 6: Power on and run

Check to make sure the solar panel and battery are in normal condition, double che that the input and output cables are connected correctly, then power up the battery first then the solar panel, the controller will run automatically.

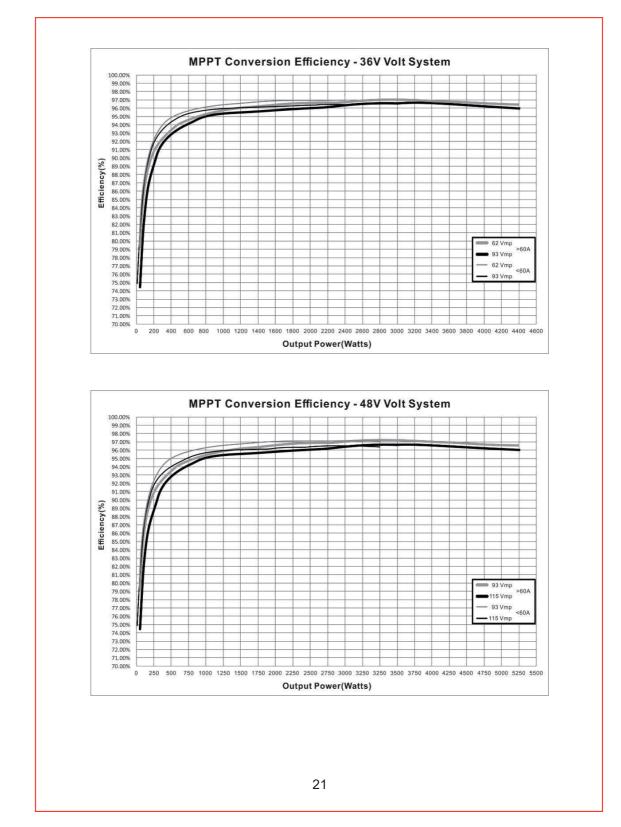
- Note: Before connecting the battery, the open circuit voltage of the batter system voltage is set to auto detect, battery voltages over 18V will be detected as a nominal 24V battery and the device will charge the 24V battery. 12/24/48V only auto-selected at power-up.
- Warning: Potential for damage
- Disconnect the battery from the MPPT as soon as possible after the solar input is disconnected. If the battery is removed during MPPT charging, there is a low chance of damage to the controller.
- Note: To prevent damage, power must be turned on in the following order power off must be reversed from power on



Start steps: step 1: Turn on the circuit breaker connected to the battery first, make sure that the controller is connected to the battery (the controller LCD will display the content and set the battery type;

step 2: If a DC output is required to control the load, Please set the output control mode first, Then open the DC output "breaker"; step 3: Connect a circuit breaker that turns on the PV input of the solar panel, If the

voltage of the PV input is within the charging operating range of the controller, the controller will enter the charging state; shutdown process : Turn off the "circuit breaker" in the turn of (3,2,1)



4.0 Working principle and operation guide

4.1 The maximum power point tracking technology

Power equals to voltage * current. The following equation holds *:

(1) Input power of MPPT = output power of MPPT

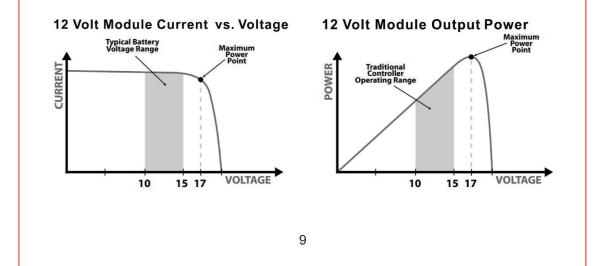
(2) Input voltage × input current = output voltage × output current

* Assumes 100% conversion efficiency, ignoring line losses and energy conversion

If the Vmp of the solar panel array is higher than the battery voltage, the battery curren must be proportionally higher than the solar input current to balance the input and output power. The larger the difference between the maximum photovoltaic input voltage and the battery voltage, the larger the difference between the input and output currents

For a given input power, a higher input voltage of a solar module array results in a low solar input current. An array of high voltage solar input modules allows to use small gauge solar wiring. This is very beneficial for the systems that require long wiring between the solar module array and the MPPT.

Compared to the traditional controller, the principle of it is to connect the solar module directly to the battery when charging. This requires the solar module to operate in a voltage range lower than the module Vmp. For example, in a 12V system, the batter oltage may be between 10-15VDC, but the Vmp of the module is usually around 17V The figure below shows a typical current vs. voltage output curve for a nominal 121 harging system.



Bateria Power

Mission:

Enable wider access to clean and affordable energy.

Vision: To be the global leading brand of independent clean energy

Values:

Customer first; Teamwork; Efficient execution; Honesty and integrity; Embrace change; Never give up

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