

# JW-MPPT High-end Type MPPT Wind Solar Hybrid Controller



Dear customers, thank you for choosing to use our products. Please read the following

instructions carefully before using this product:

Please keep this manual for future use

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## A safety description

### 1.1 Safety identification

The following safety symbols may appear in this manual, which represent the following meanings:

Security symbols	Significance
 Dangerous	A serious accident that may cause personal injury if safety warnings are ignored.
 Warning	Any neglect of safety warnings risk for serious injury accidents, serious equipment damage or major business disruption.
 Note	A risk of moderate injury accidents, moderate equipment damage or partial business disruption by ignoring safety warnings.
 Description	Indicates that the content is additional information to the text.

For electrical and electronic equipment, safety involves the whole process of its installation, trial operation, operation and maintenance. Therefore, incorrect use or misoperation will endanger the life and personal safety of the operator or a third party or the equipment. In order to avoid injuries and equipment damage, all the following hazards, warnings and attention shall be strictly observed during operation and maintenance.

### 1.2 Safety instructions



Warning!

All installation of the controller must be done by professional technicians. Professional and technical personnel must undergo special training, fully read this manual and master the safety matters related to the operation.

If the nonprofessional installation operation causes personnel injury, the Company will not assume the relevant responsibility.

Damage to the controller due to the installation and operation as described in the manual will not be within the warranty of the Company.

#### Before ① installation



Note!

When receiving the product, check whether the controller is damaged during transportation. If found, please contact our company or the transportation company immediately.

#### In the ② installation

Make sure the controller is not electrical connected and energized before installing the controller.



Warning!

Due to the controller or other damage will not be within the warranty of the Company.

When the photovoltaic array is configured, ensure that the maximum short-circuit current on the DC side is within the allowable range of the controller, otherwise irreversible damage may be caused.

During PV array configuration, be sure to ensure that the open circuit voltage of each PV cluster does not exceed the maximum input range of the controller, otherwise it will cause unrecoverable damage to the controller.

The selected controller charging current should not be greater than 0.3 times battery capacity, greater battery damage or lower battery life.

Improper selection of the controller installation environment will affect the machine performance and may cause machine damage.

Do not install the controller in the flammable, explosive place or flammable, explosive items storage

place.

- Do not install the controller in a place of an explosive hazard.
- Do not install the controller where you may suffer lightning strikes.
- Do not install the controller in places with more salt fog.
- Good ventilation shall be ensured during the controller operation.
- The controller shall be installed upright and ensure that the air duct is not blocked.



**Warning!**

Always disconnect the photovoltaic array end, battery end, load end, etc., with empty (circuit breaker) or fuse before all equipment are fully connected. Prevent water from entering inside the controller.



**Note!**

All electrical installations must comply with the local and national electrical installation standards. To ensure proper operation, require proper grounding, proper conductor size and necessary short circuit protection. The connection cables must be of suitable specifications, firmly connected and well insulated. After installation, check whether all line connections are tight to avoid the danger of heat aggregation due to virtual connection.

**In the ③ run**



**Dangerous!**

Do not open the machine cover plate when the controller is charged!

**④ Repair**



**Dangerous!**

Maintenance work shall be carried out by professional maintenance technicians. The machine should be cut off before maintenance, and wait for 5 minutes before dismantling the machine.

## Second, product characteristics

### 1、 Overview

Thank you for choosing the scenery complementary series of solar charging controller. The series adopts advanced high-speed processor and MPPT control algorithm, which can ensure MPPT charging at low wind speed, with high response speed, high reliability and high industrial standards;

The controller adopts LCD liquid crystal display design, more comprehensive display information and clearer display interface. The controller is suitable for solar off-grid system, automatically controls charging and discharge, and can be applied to many fields such as communication base station, household system, street lamp system and field monitoring.

### 2、 Product characteristics

- The display is LCD designed, more comprehensive display information, display interface is clearer, 4 button interface, operation setting is more convenient;
- The MPPT control algorithm used for fan charging can guarantee MPPT charging at low wind speed (PWM control algorithm is used for economical charging);
- Fan three-stage charging mode: MPPT charging-boost charging-floating charge;
- Photovoltaic three-stage charging mode: CC constant current-boost charging-floating charging;
- 12V /24V battery system automatic identification、 24V /48V battery system automatic identification、 12V /24V /48V battery system automatic identification (Optional);
- With overcharge, over discharge, overload and other comprehensive protection functions;

- Lead-acid battery, ternary lithium battery, lithium iron phosphate, custom four battery types of charging methods are optional;
- A variety of load control methods, the load has two outputs, the output power and time can be set;
- Extensive adaptable, adaptive day and night;
- Battery charging has battery activation function: lead acid colloidal battery loss seriously causes the power cut off, the fan can directly connect to the battery power supply and start the power supply; lithium iron phosphate or ternary lithium battery accidentally disconnected due to fault and other accidents, can be connected to the fan to open the lithium battery pack, normal charging.

### 3、 Product appearance

#### 3.1 Product appearance



Figure 2-1 Product exterior dimension diagram

Table 2-1: Product Quality Dimensions

Parameter name	Quality size	
Weight (kg)	1.25	For reference
Product Size L*D*H (mm)	165*140*66	For detailed installation dimensions, refer to item 8

#### 3.2 Interface definition

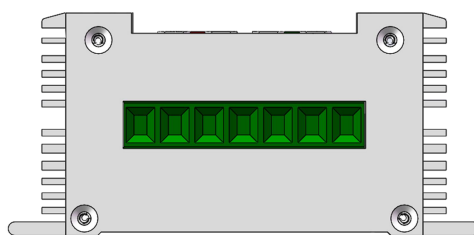


Fig. 2-2 Lower-side connection port diagram of the product

Table 2-2 Definition of lower side interface of landscape complementary series (from left to right order)

No	Name	Functions	Description
1	PV+	PV array positive pole	PV array input terminal
2	PV-	PV array negative pole	
3	BAT+	Battery positive pole	Connecting wire end of the battery pack
4	BAT-	Battery negative electrode	
5	LOAD+	DC load positive pole	DC load output terminal (two-way load output co-positive pole)
6	LOAD1-	DC load of the first path pole	
7	LOAD2-	The DC load is the second path pole	

Note: The lower side interface corresponds to the lower definition icon of the front display panel.

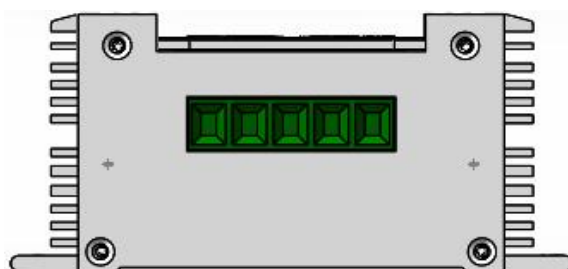


Fig. 2-3 Upper-side connection port diagram of high-end and economical products

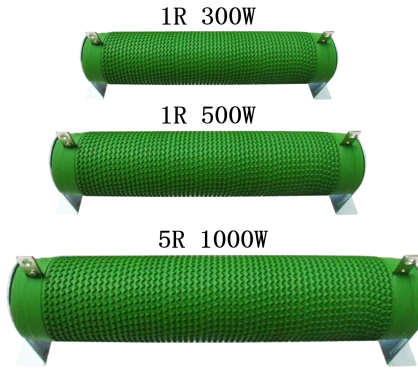
Table 2-3 Definition (from left to right)

No	Name	Functions	Description
1	WP	The fan charges the positive electrode	Fan unloading terminal
2	W1	Fan input 1	Input end of fan
3	W2	Fan input 2	
4	W3	Fan input 3	
5	WX	The fan charges the negative electrode	Fan unloading terminal

Note: The upper side interface corresponds to the upper side definition icon on the front display panel.

#### 4、 Unload resistance type

##### 4.1 Remove charge resistance appearance



**Figure 2-4 Discharge resistance**

Table 2-4 Discharge Resistance Parameters Table

Resistance type	Resistance parameters		The fan type is applicable
	Block value	Power	
Porcelain tube corrugated resistor	1R	300W	The fan power is $\cong$ 300W
Porcelain tube corrugated resistor	1R	500W	The fan power is $\cong$ 500W
Porcelain tube corrugated resistor	5R	1000W	The fan power is $\cong$ 1,500 W

Note: detailed installation dimensions;

#### 4.2 Fan unloading conditions

- 1、 Start unloading when the charge current of the fan is greater than 1.2 times the rated current;
- 2、 Start unloading when the battery voltage is greater than the current  $BCV+0.1V$ ;
- 3、 Start unloading when the battery voltage is greater than the current  $Float+0.1V$ ;
- 4、 Start to discharge when the fan voltage is greater than the fan discharge voltage;

### Three Installation instructions

#### 1、 Install precautions

- (1) You must read the entire installation section and be familiar with the installation steps before installation.
- (2) Take great care when installing the battery. Wear the protective lens of the open lead acid battery. Once you contact the battery acid liquid, please rinse with water in time.
- (3) Avoid placing metal objects near the battery to prevent a short circuit to the battery.
- (4) Battery charging produces acid gas to ensure good ventilation around the battery.
- (5) Please install in the indoor, when outdoor installation to avoid direct sunlight and rain infiltration.
- (6) The virtual connection point and corroded wires may cause great heat to melt the wire insulation, ignite the surrounding materials, and even cause fire, so to ensure that the connection head is tightened, the wire is best fixed with tie tape, to avoid moving the wire shaking and cause loose connection head.
- (7) The installed battery pack shall match the controller charging voltage and the recommended charging current range.



Dangerous!Explosion danger!Do not install the controller and the battery in the same closed space!Also do not be installed in a confined space where battery gas may gather.

## 2、 Installation instructions

Step 1: Select the installation location

Avoid installing the controller in direct sunlight, high temperature and easy water intake, and ensure good ventilation around the controller.

Step 2: Unboxing and inspection

- (1) Check whether the outer packaging is damaged or deformed;
- (2) Open box inspection: one controller, one instruction manual, one attachment, etc.;
- (3) Check whether the host appearance and accessories are in good condition;

Step 3: Fixed the controller

Install the controller to the equipment platform or cabinet bracket through the installation holes on both sides of the controller bottom shell, leaving sufficient ventilation space around the installation;



3-1 Reserve space diagram for four weeks around equipment installation

## 3、 Connection



Note: For installation safety, we recommend a wiring order;



Warning: prohibit the load terminal to connect the electrical equipment exceeding the surge power of the controller to prevent damage to the controller!



Warning: When it needs to be moved, determine that all wiring are fixed, because the virtual connection point may lead to heat aggregation, will cause fire when serious;

Connect the battery, load, fan and photovoltaic module in turn, interrupt all the wiring process, pay attention to the cable access that distinguish positive and negative poles, refer to the following wiring diagram;

Make sure the battery is in normal condition to connect the system.





Warning: Do not connect the photovoltaic panel to the battery terminal of the controller, otherwise the controller will be burned out.

No positive and negative battery terminal connection will damage the controller. Please operate carefully.

Strictly use the ordinary network cable as a communication cable, communication cable production with reference to the specific communication mode use instructions.

### Step 2: Wiring diagram

Connect the corresponding external equipment cable to the terminal through the upper and lower mounting holes of the casing;



Fig. 3-2 Controller wiring diagram

The controller defaults to the lead-acid battery. If other types of batteries, see the relevant settings of the APP instruction manual for details;



Warning!

1. The shock is dangerous! It is forbidden to contact the live components of high-voltage photovoltaic modules with their bare hands;
2. Please make sure that the solar array voltage in the system does not exceed the maximum input voltage range of the controller;

The 3. system needs to connect to the inverter, please connect the inverter directly to the battery, do not connect to the load end of the controller;

Step 3: Check the connections

Check that all the wiring polarity is correct and that the terminals are locked;

Step 4: Start sequence

Recommended sequence of opening and shutdown: close the battery pack switch, photovoltaic switch, fan switch and load switch successively;

Shut off the photovoltaic, fan and load switch before closing the battery switch.

#### 4、 PV array requirements

Table3-1 Photovoltaic electrical parameters:

Photovoltaic electrical parameters				
System rated voltage / V	12	24	48	--
PV array maximum open circuit voltage / V	27.6	55.2	105	--
Recovery Voltage after PV array maximum open circuit voltage/V	26.4	52.8	100	--
PV array minimum operating voltage / V	>Vbat+1V	>Vbat+1V	>Vbat+1V	--
PV module power / W	≅ 500	≅ 800	≅ 1000	--

#### 5、 Fan terminal voltage requirements

Table3-2 Fan electrical parameters:

Fan electrical parameters				Remarks
Battery system voltage level/ V	12	24	48	--
Fan rated voltage level / V	12	24	48	--
Maximum open circuit voltage wind turbine	25.6	51.2	102.4	--
Wind Turbine Power / W	≅ 500	≅ 800	≅ 1500	--

#### 6、 Cable selection requirements

The following table is converted to copper wire diameter size according to the current grade, and the actual use of cable size should be greater than or equal to the data in the table:

Table 3-3 Cable Dimensions:

Cable selection table					
Current grade / A	5	10	20	30	40
Line diameter / mm <sup>2</sup>	1	1.5	2.5	4	6
AWG	16	14	11	9	8

### Four operation instructions:

# LCD INDICATION AND SETTING

Large LCD screen / Humanized operation button / Various load control modes



Figures 4-1 shows the panel pictures

## 4.1. Indicator lamp function

The LED indicator on the display panel, charging indicator (red), output indicator (green), function defined in the following table.

Table 4-1 indicator lamp definition

No	Indicator lamp	state	Definition	Note
1	Charging indicator lamp (red)	Go out	No charging	
2		Chang Liang	Charging	
3	Output indicator lamp (green)	Chang Liang	The output is normal	
4		Go out	Output closed	

## 4.2. Keys

Table 4-2 Keypress function

Keys	Key button function	Note
Enter	Function 1: main single key, function 2: parameter setting save key;	
Esc	Exit the setting interface key;	
UP	Function 1: Turn the page on display parameters, function 2: parameter setting;	

DOWN	Function 1: display parameters down the page, function 2: parameter setting reduction;	
Note: Restore factory settings: under the main interface, press ESC then press DOWN, then release DOWN then release ESC;		

UP and DOWN keys up and down page switch function:

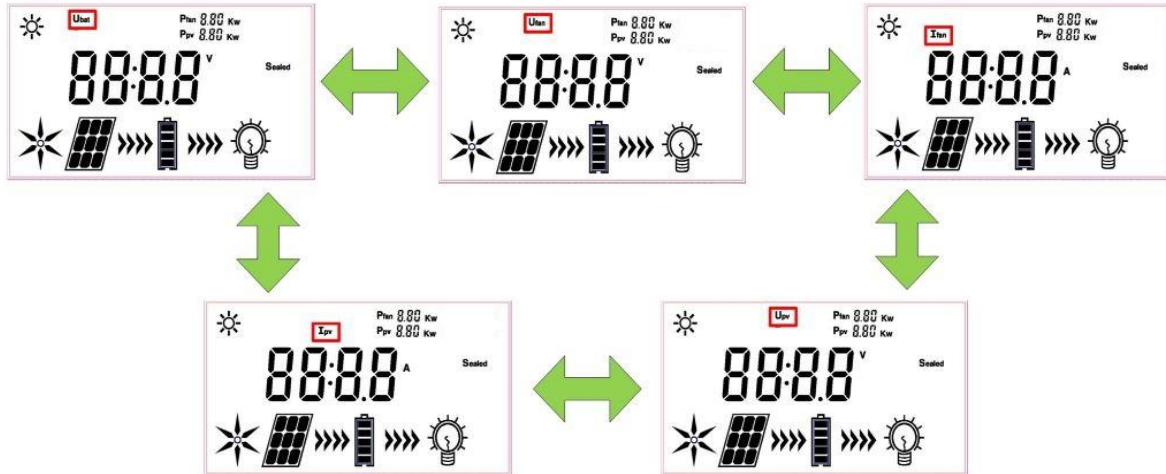


Figure 4-2 UP and DOWN buttons

### 4.3. LCD display screen

The controller display mode, the display layout diagram is as follows:

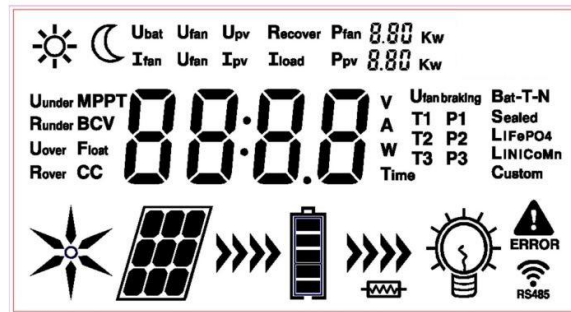


Figure 4-3 Display screen layout diagram

Table 4-3 Introduction of the icon function

icon name	Definition	Function description
	During the day	Icons illuminate for the day
	Night	Icons illuminate for the night
	Turbine	Icon indicates fan access and rotation
	PHOTOVOLTAIC panels	Icons highlight the inspection of photovoltaic array access
	Battery power	The icon illuminated indicates battery access, and its internal scale indicates battery power
	Load	The load lighting indicates that the load has an output
	Status icon	Icons illuminate and scroll for the charging and discharge states, respectively
	Fault icon	Icon flashing indicates a system failure, respectively


	Unload icon	Icon is up to indicate the fan discharge
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Table 4-4 field function description

The field name is called	Definition	Function description
U bat	Battery voltage	The field appears to display the current battery voltage value in the data display area
U fan	Turbine voltage	The field appears to display the current fan voltage value in the data display area
U pv	PHOTOVOLTAIC panel voltage	The field appears to display the current PV board voltage value in the data display area
I fan	Fan charging current	The field appears to display the current fan charging current value in the data display area
I pv	Photovoltaic charging current	The field appears to display the current PV charging current value in the data display area
P fan	Charging power of turbine	The field is lit up to show the maximum power value of the applicable fan charging
P pv	Photovoltaic charging power	The field is lit up to show the maximum power value of applicable photovoltaic charging
U under	Over discharge voltage	The field is up to set the battery under voltage, which flashes when the battery is under pressure
R under	Go back over	The field opens to set the battery under voltage return voltage
U over	Overcharge voltage	The field is up to set the battery over voltage protection value which flashes when the battery is overvoltage
R over	Overcharge returns	The field is up to set the battery over voltage return voltage
MPPT	Fast charging	Field flashes, indicating that the current fan is in the MPPT fast charging state
BCV	Improve charging	The field opens to set the battery boost charging voltage and flashes during the boost charging stage
Float	Floating charge voltage	The field opens, with the battery floating charge voltage set, and the field flashes during the floating charge stage
CC	Photovoltaic constant flow	The field flashes, indicating that the current photovoltaic is in the fast constant current charging state
U fan braking	Fender unloading	Field lit up, the fan discharge voltage value can be set;
Time	Household use and street lamp mode	The field is lit, the street lamp and household mode can be set, "24H" is the household mode, the load has always been output, when other numbers are set indicates the street lamp mode, its number has no specific meaning only indicates the street lamp mode. Its output is controlled by T1, T2, T3 and P1, P2, P3, with the default value of "15H".
T1	Time control period 1	The field opens, indicating that the first period of lighting time can be set in the street lamp mode, the default 15H;
P1	Time 1 brightness	The field is lit up, indicating that the first time control output power can be set in the street lamp mode, with the default 100;
T2	Time control period 2	The field appears, indicating that the second period can be set in the street lamp mode, with the default 00H;
P2	Time 2 brightness	The field is lit up, indicating that the second period of output power can be set in the street lamp mode, the default 000;
T3	Time control period 3	The field appears, indicating that the third period of lighting time can be set in the street lamp mode, with the default of 00H;

P3	Time 3 brightness	The field is lit up, indicating that the third period of output power can be set in the street lamp mode, the default 000;
Bat-T-N	Battery type	The field appears, and the battery type can be set: 1 indicates lead acid battery; 2 indicates lithium iron phosphate battery; 3 indicates ternary lithium battery; 4 indicates custom;
Sealed	Lead acid battery	Field lit, battery type is lead acid type;
L iFePO4	Lithium iron phosphate battery	The field is lit up, and the battery type is a lithium iron phosphate battery;
LiNiCoMn	ternary lithium battery	The field lit, the battery type is ternary lithium battery;
Custom	Custom Settings	The field is lit, the number of series battery packs can be set according to the actual number of battery packs, the default battery type is lead acid;

#### 4.4 Set up the operation

##### 4.4.1, General parameter settings:

In standby mode, press the setting (Enter) button and enter the undervoltage setting interface. The setting process refers to the figure below. Press (Esc) on any interface to exit the setting interface and return to the standby interface. Other general parameter setting items are the same as the undervoltage setting.

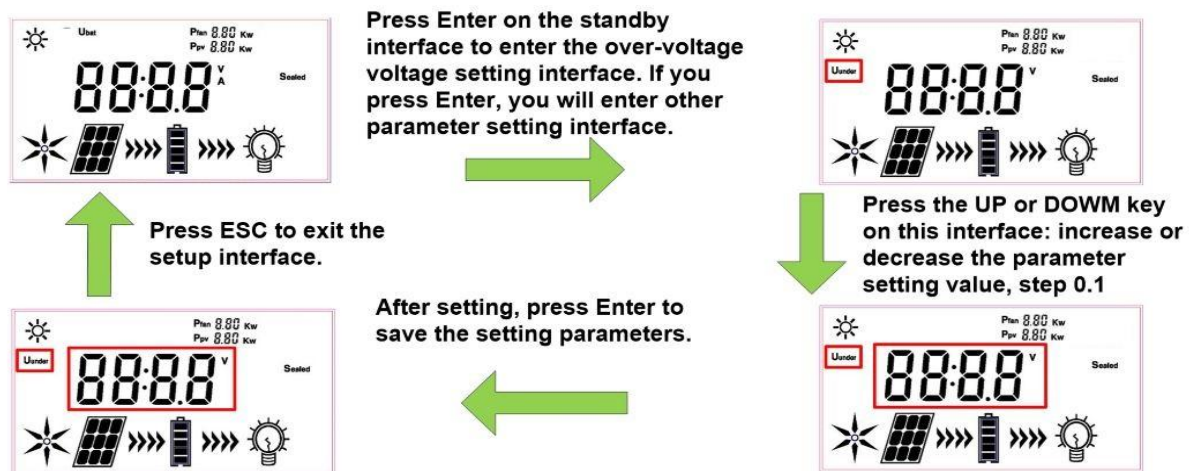


Fig. 4-4 General parameter setting- -Over discharge voltage point setting diagram

##### 4.4.2, Battery type settings



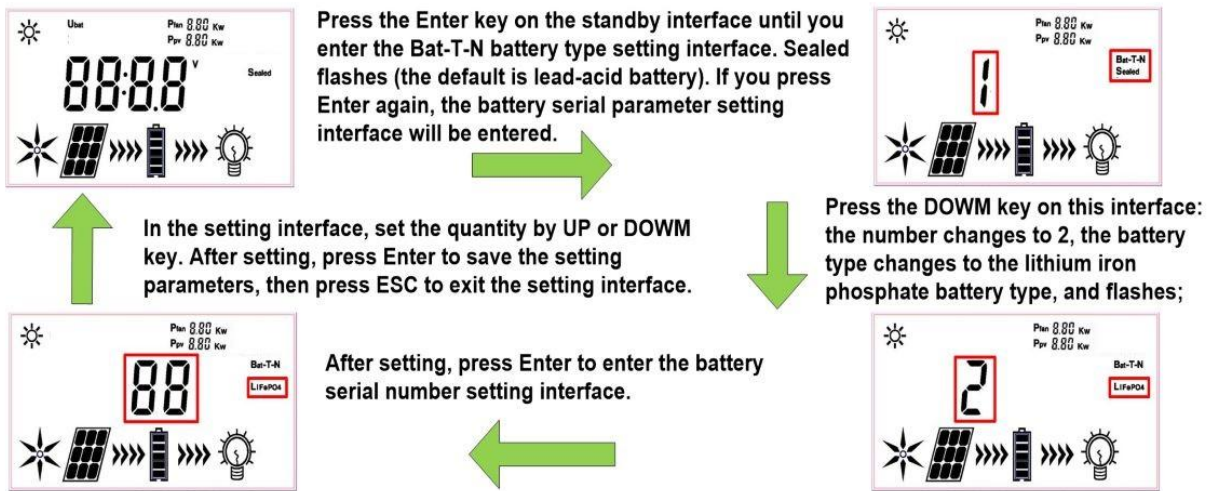


Figure 4-5 Battery type setting diagram

In the same way, other battery types and custom modes can be set in the above method, with the number number and battery type reference table as follows:

Table 4-5 Battery Settings Reference Table:

Digital type	Battery type	Definition
1	Sealed	Lead acid battery
2	L iFePO4	Lithium iron phosphate battery
3	L iNiCoMn	ternary lithium battery
4	Custom	Custom

#### 4.4.3, Time control parameter settings

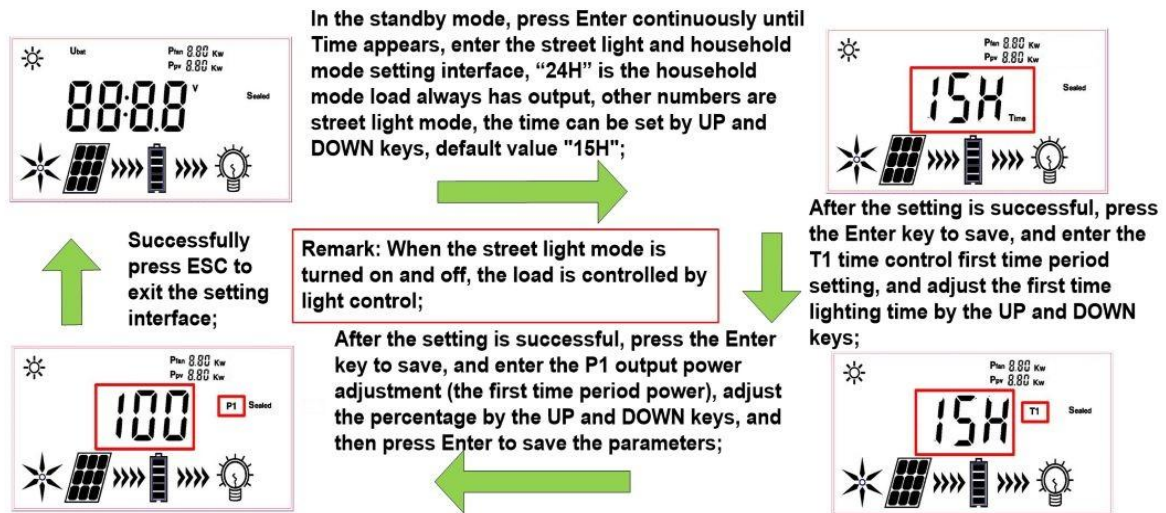


Figure 4-6 Control parameter setting diagram

Note: In the same method, you can set the percentage of the second period output power P2 and the third period T3, third period output power P3 in the same method;

## Five equipment parameters

## 5.1 Protection function



Table 5-1 Reference to the following table:

Protection function	Explain
PV module polarity reverse connection	When the polarity of the PV module is reversed, the controller will not charge. The PV over and under voltage alarms can be viewed through APP. The controller will not be damaged. After re-wired correctly, the PV charging will resume normal operation.
PV under voltage protection	When the PV array charging voltage is below the controller input voltage range, the controller stops charging the battery pack.
PV over voltage protection	When the charging voltage of the PV array exceeds the input voltage range of the controller, the controller stops charging the battery pack, and the PV overvoltage alarm fault can be detected by the APP.
Photovoltaic charging over current protection	When the PV array charging current exceeds the internal set value, the display will report IPV and ERROR flashing and stop charging;
Fan under voltage protection	When the fan charging voltage is lower than the controller input voltage range, the controller stops charging the battery pack.
Turbine over voltage protection	When the fan charging voltage exceeds the unloading voltage value of the fan, the controller turns on the unloading function, and the display shows that the unloading resistance icon lights up.
Battery polarity reverse connection	When the polarity of the battery is reversed, the controller fuse or other device may be damaged. It is strictly forbidden to terminate the battery.
Battery undervoltage protection	When the battery voltage is lower than the set undervoltage value, the display shows U under and ERROR flashing alarms, and the load output is automatically stopped to prevent the battery from being over-discharged and damaged.
Battery overvoltage protection	When the battery voltage reaches the overvoltage protection setting value, the display shows U over and ERROR flashing alarms, and automatically stops charging the battery to prevent the battery from being overcharged and damaged.
Anti-reverse protection during night	At night, since the battery voltage is greater than the voltage of the photovoltaic module, the automatic protection prevents the battery voltage from being discharged through the photovoltaic module;



## 5.2 Troubleshooting

Check and troubleshoot the following methods if:

Table 5-2 Troubleshooting table

Malfunction	Indicator status and alarm icon	Possible Causes	Solution
Array over voltage	Upv and  flashing	1. The number of PV arrays in series is more than one; 2. The battery does not match the PV array;	Disconnect the PV array, reduce the number of PV arrays connected in series, and ensure that the PV array open circuit voltage does not exceed the set value in the "Table 3-1 PV Electrical Parameters" table;
Battery over voltage (Overcharge)	Uover and  flashing	1. The over voltage protection point of the controller is lower than the highest value of the charging range;	1. Reset the battery over voltage protection point through the device key or APP; 2. Battery aging requires replacement of the battery; 3. Reduce large dynamic changes in load;




		2.Battery aging or over discharge; 3.Large dynamic changes in load; 4.The number of battery series is set too small;	4.Reset the number of battery strings according to the actual battery serial number;
Battery under voltage (Over discharge)	 and Under icon flashing	The battery voltage value is lower than the under voltage protection setting value; The number of battery series is set too large;	1.Reduce or disconnect the load. If the alarm is released, the battery voltage returns to normal, indicating that the load power is too large or the battery voltage and capacity are low. Heavy load is likely to cause under voltage protection. 2.Disconnecting the load controller still alarms, the battery voltage is not restored to the over-discharge recovery setting value, and the battery pack needs to be charged by PV or other means, so that the fault can be released after the battery pack voltage reaches the recovery point set value; 3.Reset the number of battery strings according to the actual battery serial number;
	The indicator light is off and the display is not displayed.	Battery voltage is lower than device start up voltage	Use a multi meter to test whether the voltage across the battery is below 7V; The battery group needs to be charged by other means to make its battery voltage reach 8V or higher;
Charging over current	Ipv and  icons flash	PV charging over current protection check for abnormal current detection and malfunction	Restart several times if still can not be solved, need to return to the factory for maintenance
Note:In addition to the battery under voltage can not start, other faults can be referred to APP fault information;			

### 5.3 System maintenance

To maintain optimal long-term work performance, it is recommended to check below twice a year.

- (1) Verify that the controller is firmly mounted in a clean, dry environment.
- (2) Verify that the airflow around the controller will not be blocked and remove any dirt or debris from the radiator.
- (3) Check that all exposed wires have damaged insulation due to sun exposure, friction with other surrounding objects, decay, insect or rat damage, if necessary to repair or replace wires.
- (4) Tighten the screws for all electrical connection terminals as recommended.
- (5) Check the grounding of all components of the system and verify that all grounding wires are firmly and properly grounded.
- (6) Check all terminals for corrosion, insulation damage, high temperature or combustion, discoloration and tighten the terminal screws.
- (7) Check for dirt, nesting insects, and corrosion, and clean up as required.
- (8) If the arrester fails, replace the failed arrester timely to prevent lightning damage to the controller or even other user equipment.

	<p>Note: Electric shock hazard! We must ensure that all power from the controller is disconnected, and then perform the corresponding inspection or operation!</p>
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# Six warranty commitments

The controller has a free 1-year warranty starting from the date of sale.

The maintenance procedure is indeed correct according to the user use manual. If not solved, you can contact our technical customer service to help solve, if still not solve to deliver the problematic controller back to the company, freight advance, and provide date and place information related to the purchase. To enjoy the quick repair warranty service, the product returned products must indicate the model, serial number and detailed cause of the failure, the type and related parameters of components in the system, battery and system load; this information is important to quickly address your repair requirements.

The Company is not responsible for any controller damage due to improper use by the customer, or failure to follow this service manual! Maintenance procedures are conducted according to the above process with only maintenance costs.

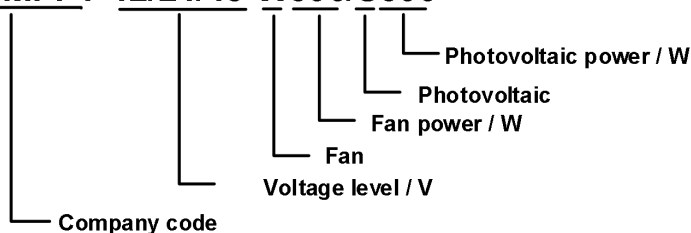
Statement: The Company reserves the right to make product changes, subject to product updates without notice!

Version number: V1.0

# Seven equipment parameters

## 1. Model description:

High-end-type: **JW-MPPT-12/24/48-W300/S300**



## 2. System parameter table

Parameter Name	Product model							
	JW-MPPT-12-W300/S500	JW-MPPT-12-W500/S500	JW-MPPT-24-W600/S800	JW-MPPT-24-W800/S1000	JW-MPPT-48-W800/S1000	JW-MPPT-48-W1000/S1000	JW-MPPT-48-W1200/S1000	JW-MPPT-48-W1500/S1200
Battery system voltage level (V)	12		24		48			

PV array maximum open circuit voltage (V)	27.6		55.2		105			
Recovery Voltage after PV array maximum open circuit voltage (V)	26.4		52.8		100			
PV array minimum operating voltage (V)	>Vbat+1V		>Vbat+1V		>Vbat+1V			
Photovoltaic rated current rating (A)	40	40	33	33	21	21	21	25
PV module power (W)	≅ 500	≅ 500	≅ 800	≅ 800	≅ 1000	≅ 1000	≅ 1000	≅ 1200
Fan rated voltage level (V)	12		24		48			
Fan array maximum open circuit voltage (V)	25.6		51.2		102.4			
Fan rated current(A)	25	40	25	33	17	21	25	31
Wind Turbine Power (W)	≅ 300	≅ 500	≅ 600	≅ 800	≅ 800	≅ 1000	≅ 1200	≅ 1500
Voltage of restriction charging (V)	Vbat>BCV+0.4V		Vbat>BCV+0.4V		Vbat>BCV+0.4V			
DC load output rated current(A) (LOAD1+LOAD2)	30A (Maximum one-way 15A)		30A (Maximum one-way 15A)		30A (Maximum one-way 15A)			
Remarks: 12V battery system: the max. power of the turbine is 500W, and the maximum power of the PV is 500W; 24V battery system: the max. power of the turbine is 800W, and the maximum power of the PV is 800W. 48V battery system: the max. power of the turbine is 1500W, and the maximum power of the PV is 1200W.								

### 3. Battery system and environment

Battery system identification voltage range (V)	12V system	DC9V-DC16V
	24V system	DC18V-DC32V
	48V system	DC42V-DC60V
Conversion efficiency	> 98%	
Operating mode	Default to streetlight mode	
Working environment parameters		
Working temperature	-20°C ~ 50°C	
Storage temperature	-30°C ~ 70°C	
Humidity (°C)	10% ~ 90% No condensation	
Protection level	IP30	

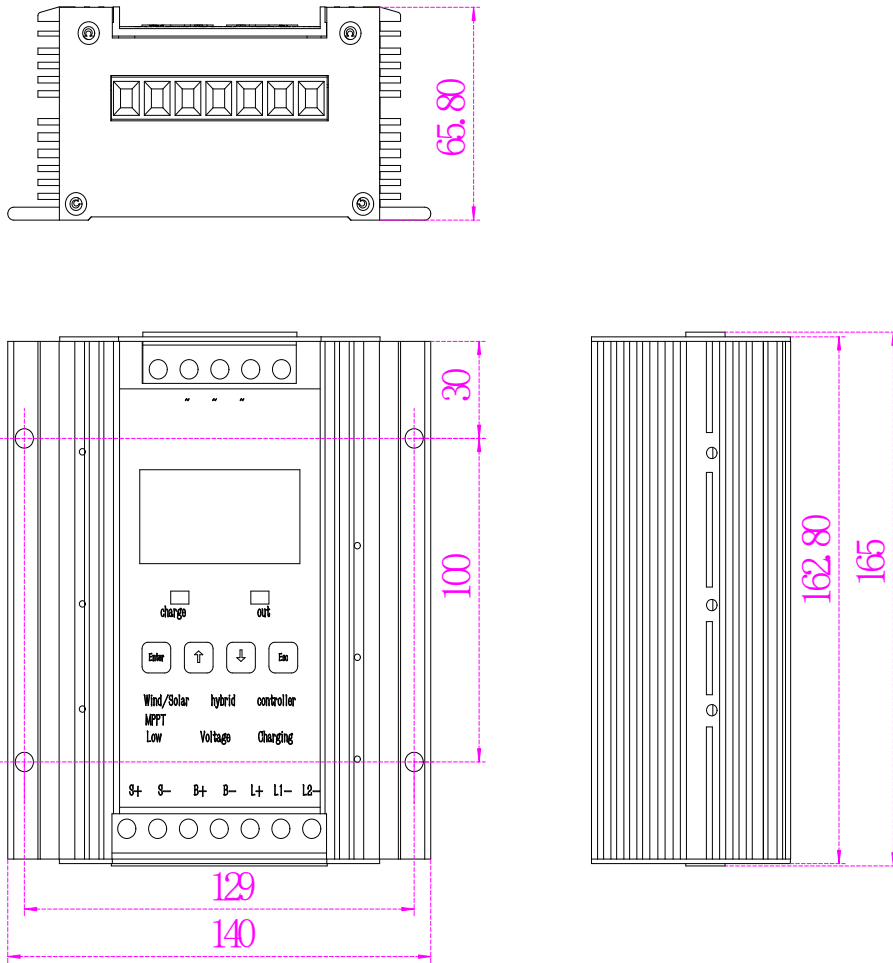
### 4. Battery parameters refer to the table

Lead acid battery (single 12V)
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System rated voltage (V)	12V system (1 string)	24V system (2 strings)	48V system (4 strings)	12V default value
Overvoltage (overcharge) (V)	13~17V	26~34V	52~68V	15.5V
Overvoltage return (V)	13~17V	26~34V	52~68V	15V
Increase charging voltage (V)	9~15V	18~30V	36~60V	14.4V
Floating charge voltage (V)	9~15V	18~30V	36~60V	13.8V
Under voltage(V)	7~13V	14~26V	28~52V	10.8V
Undervoltage return voltage(V)	9~15V	18~30V	36~60V	13.1V
<b>Ternary lithium battery (single section 3.7V)</b>				
System rated voltage	12V system (default 3 strings)	24V system (default 6 strings)	48V system (default 14 strings)	3 string defaults
Overvoltage (overcharge) (V)	10.5~15V	21~30V	49~70V	13.5V
Overvoltage return (V)	10.5~15V	21~30V	49~70V	12.6V
Increase charging voltage(V)	10.5~15V	21~30V	49~70V	12.4V
Floating charge voltage (V)	6~13.5V	12~27V	28~63V	12.0V
Undervoltage(V)	6~13.5V	12~27V	28~63V	9.3V
Undervoltage return voltage (V)	6~13.5V	12~27V	28~63V	10.5V
Number of strings	3~4	6~8	14~18	3
<b>Lithium iron phosphate (single section 3.2V)</b>				
System rated voltage	12V system (default 3 strings)	24V system (default 6 strings)	48V system (default 14 strings)	3 string defaults
Overvoltage (overcharge) (V)	9~12V	18~24V	42~56V	11.7V
Overvoltage return (V)	9~12V	18~24V	42~56V	11.1V
Increase charging voltage (V)	9~12V	18~24V	42~56V	10.8V
Floating charge voltage(V)	9~12V	18~24V	42~56V	10.2V
Undervoltage(V)	6~12V	12~24V	28~56V	8.4V
Undervoltage return voltage (V)	6~12V	12~24V	28~56V	9.6V
Number of strings	3~4	6~8	14~18	3

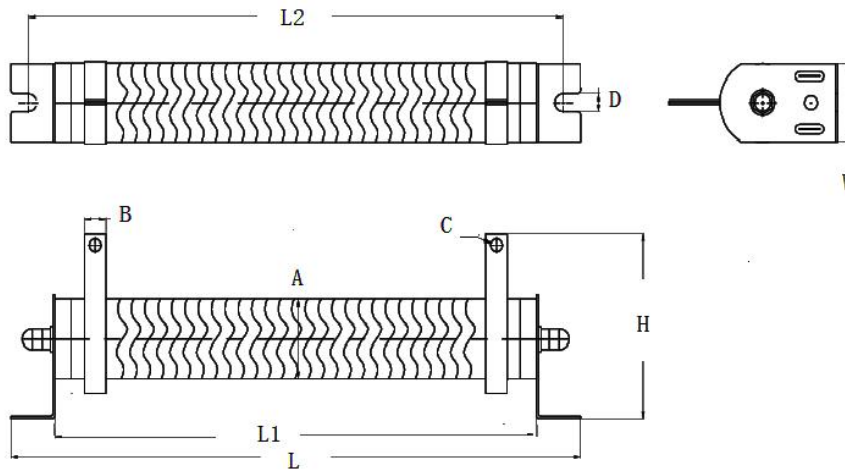
## Eight installation dimensions

### 8.1 Controller installation dimension:



**Figure 8-1 Installation Size Drawing Unit (mm)**

**8.2 Installation dimensions of unloading resistance**



**Fig. 8-3 Discharge resistance dimension diagram**

**Table 8-1 Discharge Resistance Dimensions Table**

Power	L±5	L1±5	L2±5	A±3	B±1	C±0.5	D±1	H±5	W±1
300W	216	180	198	50	14	6	8	100	50
500W	236	180	208	60	16	6	8	110	60
1000W	356	300	328	60	16	6	8	110	60

Unit: mm.

## **Nine packing list and communication mode module accessories optional**

No	Name	Number	Note
1	controller	One	
2	Product Use Manual	One	
3	Discharge resistance	One	