Wind and Solar Hybrid Series Solar Controller

Product Manual



Dear customer, thank you for choosing to use our company's products. Please read the following instructions carefully before using this product:

Please keep this manual for future reference

Contents

One Safety instructions..... - 2 -
1.1 safety signs..... - 2 -
1.2 safety notice..... - 2 -
Two Product Features..... - 4 -
1.overview..... - 4 -
2.features..... - 4 -
3.appearance..... - 4 -
4.unloading resistance type..... -6-
Three Installation Notes..... - 7 -
1.Installation Precautions..... - 4 -
2.Installation Notes..... - 4 -
3.wiring..... - 4 -
4.PV array requirements..... - 4 -
5.fan terminal voltage requirements..... - 4 -
6.cable selection requirements..... - 4 -
Four Operating Instructions..... - 11 -
4.1 indicator function..... - 11 -
4.2 button..... - 12 -
4.3 LCD display..... - 12 -
4.4 set operation..... - 15 -
Five Device parameters..... - 16 -
5.1 Protective function..... - 16 -
5.2 fault resolution..... - 17 -
5.3 system maintenance..... - 18 -
Six Warranty commitment..... - 19 -
Seven Device parameters..... - 20 -
1 model Description： ..... - 20 -
2 system parameter table..... - 20 -
3 battery parameter reference table..... - 20 -
Eight Installation size..... - 23 -
8.1 controller installation size..... - 23 -
8.2 unloading resistance installation size..... - 23 -
Nine Packing list and optional communication module accessories..... - 24 -

One Safety instructions

1.1 safety signs

The following safety symbols may appear in this manual, and their meanings are as follows：

Safety symbol	significance
Danger	Indicates that if safety warnings are ignored, serious accidents that may cause personal injury。
Warning	Indicates that if the safety warning is ignored, it may cause serious injury accidents, serious damage to equipment or major business interruption.
Note	It means that if the safety warning is ignored, it may cause the danger of moderate injury accident, moderate damage to the equipment or part of the business interruption.
Description	Indicates that the content is additional information of the body.

For electrical and electronic equipment, safety involves the entire process of 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 and the safety of the equipment. In order to avoid personal injury and death, as well as equipment damage, all the following safety information prompts such as dangers, warnings and cautions must be strictly observed during operation and maintenance.

1.2 Safety instructions

Warning！

All installation operations on the controller must be completed by professional and technical personnel. Professional and technical personnel must undergo special training, have read this manual completely, and have mastered operation-related safety matters.

If non-professionals perform the installation operation and cause personal injury, the company will not bear the relevant responsibility.

If the controller is damaged due to failure to install and operate according to the instructions in this manual, it will not be covered by our company's warranty.

① Before installation

Warning！

When you receive the product, you need to check whether the controller is damaged during transportation. If you find any problems, please contact our company or the transportation company immediately.

② Installing

Before installing the controller, make sure that the controller has not been electrically connected and powered on.

 Warning!

Damage to the controller or other losses caused by the following conditions will not be covered by the company's warranty.

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

When configuring the photovoltaic array, make sure that the open circuit voltage of each photovoltaic string does not exceed the maximum input range of the controller, otherwise it will cause irreversible damage to the controller.

The selected controller charging current cannot be greater than 0.3 times the battery capacity, if it is greater than it will cause damage to the battery or reduce the battery life.

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

Do not install the controller in a flammable or explosive place or a place where flammable or explosive materials are stored.

Do not install the controller in an explosive place.

Do not install the controller in a place where it may be struck by lightning.

Do not install the controller in a place with a lot of salt spray.

When the controller is running, ensure good ventilation.

The controller must be installed upright and ensure that the air duct is unobstructed.

 Warning!

Before all devices are fully connected, be sure to disconnect the circuit breakers (circuit breakers) or fuses at the photovoltaic array end, battery end, and load end. Prevent water from entering the inside of the controller.

 Warning!

All electrical installations must comply with local and national electrical installation standards.

In order to ensure safe operation, proper grounding, the use of appropriate conductor sizes, and the necessary short-circuit protection are required.

The connection cables must be of appropriate specifications, with firm connections and good insulation.

After installation, check whether all wiring connections are tight to avoid the danger of heat accumulation due to virtual connections.

③Running

 Warning!

When the controller is powered on, do not open the cover of the machine!

④Maintain

 Dangerous!

Maintenance work must be carried out by professional maintenance technicians. The machine needs to be powered off before maintenance. Wait 5 minutes after the power is off before disassembling the machine.

Two Product features

1、 Overview

Thank you for choosing the solar charge controller of wind and solar hybrid series. This series of products adopts advanced high-speed processor and MPPT control algorithm (high-end type and privilege type, economical type without), which can ensure the realization of MPPT charging under low wind speed, and has the characteristics of high response speed, high reliability and high industrial standards. ;

The controller adopts LCD liquid crystal display design, the display information is more comprehensive, and the display interface is clearer. The controller supports WIFI module and GPRS module expansion to realize APP cloud monitoring (optional). This controller is suitable for automatic control in solar off-grid systems Charging and discharging can be applied to communication base stations, household systems, street lighting systems and field monitoring and other fields.

2、 Product features

- The display adopts LCD design, displaying more comprehensive information, clearer display interface, 4-button interface, easier operation and setting;
- The MPPT control algorithm used for fan charging can ensure MPPT charging at low wind speeds (economical charging uses PWM control algorithm);
- Three-stage charging method of the fan: MPPT charging-boosting charging-floating charging (privilege, high-end);
- Photovoltaic three-stage charging method: CC constant current-boost charging-floating charge;
- 12V/24V battery system automatic identification, or 12V/24V/48V battery system automatic identification (optional);
- RS485 communication, can provide communication protocol to facilitate customers' unified integrated management and secondary development (optional);
- The operating parameters of the controller can be viewed and set through the mobile phone APP (optional);
- With comprehensive protection functions such as overcharge, overdischarge, and overload;
- Lead-acid battery, ternary lithium battery, liFePo4, and custom four battery types are available for charging;
- Various load control methods, the load has two outputs, output power and time can be set;
- Has a wide range of adaptability, adaptive to day and night;;

3、 Product appearance

3.1 appearance



Figure 2-1 Product appearance size

Table 2-1: Product quality dimensions

Parameter name	Weight and Size	
Weight(kg)	1.25	for reference
Product size L*D*H(mm)	165*140*66	Refer to item 8 for detailed installation dimensions

3.2Interface definition

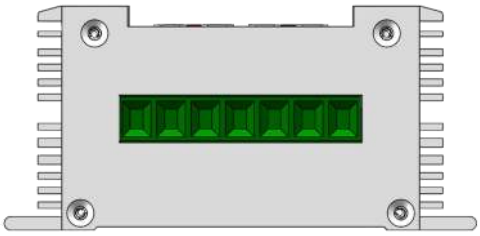


Figure 2-2 Connection port diagram on the lower side of the product

Table 2-2 Definition of the connection ports on the lower side of the wind and solar hybrid products (sequence from left to right)

No.	Name	Function	Description
1	PV+	Photovoltaic array positive	PV array input
2	PV-	Photovoltaic array negative	
3	BAT+	Battery positive	Battery pack terminal
4	BAT-	Battery negative	
5	LOAD+	DC load positive	DC load output terminal (two load outputs share a positive pole)
6	LOAD1-	The first negative pole of DC load	
7	LOAD2-	The second negative pole of DC load	

Remark：The lower side interface corresponds to the defined icon on the lower side of the front display panel

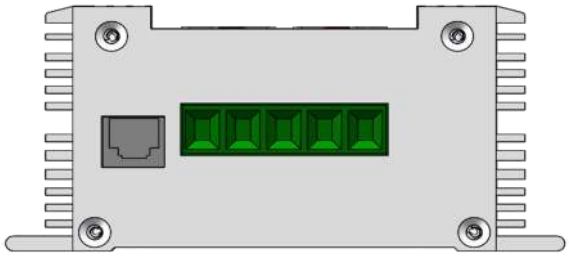


Figure 2-3 Connection port diagram on the upper side of the premium product

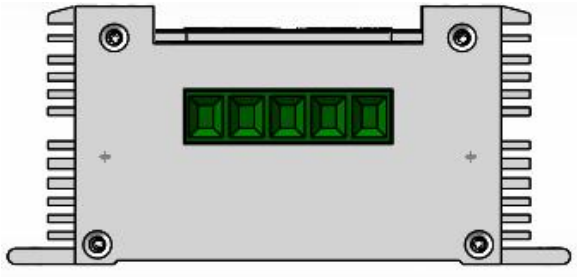


Figure 2-3 Connection port diagram on the upper side of high-end and economical products

Table 2-3 The definition of the interface on the side of the wind and solar hybrid series products (from left to right)

No.	Name	Function	Description
1	**RS485**	**Communication port**	Realize WIFI, GPRS communication monitoring (privilege version)
2	WP	Unloading positive pole of fan	Fan unloading terminal
3	W1	Fan input 1	Fan input
4	W2	Fan input 2	
5	W3	Fan input 3	
6	WX	Fan unloading negative pole	Fan unloading terminal
Remark：Upper side interface corresponds to the upper side definition icon on the front display panel.			

4、 Unloading resistance type (economic type selection)

4.1 Unloading Resistance Appearance



Figure 2-4 Unloading Resistance

Table 2-4 Unloading Resistance Parameter Table (Economic selection)

Resistance type	Resistance parameters		Type of fan applicable
	Resistance value	Power	
Porcelain tube corrugated resistor	1R	300W	Turbine power≦300W
Porcelain tube corrugated resistor	1R	500W	Turbine power≦500W
Porcelain tube corrugated resistor	5R	1000W	Turbine power≦1500W
Remarks: Detailed installation dimensions refer to item 8；			

4.2 Fan unloading condition (economic option)

1、Start unloading when the charging current of the turbine is greater than 1.2 times the rated current; ；

2、Battery voltage greater than current BCV 0.1V start unloading；

3、Battery voltage greater than current Float 0.1V start unloading；

4、Start unloading when the fan voltage is greater than the unloading voltage of the turbine；

Three installation instructions

1、 Attention to installation

(1) Before installation, you must read the entire installation section, familiar with the installation steps.

(2) When installing the battery, be very careful. For the installation of the open lead acid battery, wear a protective mirror. Once in contact with the battery acid, please rinse with clean water in time.

(3) Avoid placing metal objects near the battery to prevent short circuit of the battery.

(4) Battery charging can produce acid gas to ensure good ventilation around the battery.

(5) Please install in the indoor, outdoor installation to avoid direct sunlight and Rain Water infiltration.

(6) The virtual connection point and the corroded wire may cause great heat to melt the insulation layer of the wire, ignite the surrounding material, and even cause fire, so it is best to ensure that the connection head is tightened, and the wire is better fixed with the bandage. Avoid loose connection when moving.

(7) The installed battery should match the controller charging voltage and recommended charging current range.

⚠ Danger! Explosive hazard! Never install the controller and battery in the same closed space! Do not install in a closed 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, and ensure good ventilation around the controller.

Step 2: Open the box and check

(1)Check if the package is damaged or deformed；

(2)Open box inspection: one controller, one manual, one attachment, etc；

(3)Check mainframe appearance and accessories are in good condition；

Step 3: Controller fixation

Install the controller on the equipment platform or cabinet support through the installation hole on both sides of the bottom shell of the controller, and reserve enough ventilation and heat dissipation space around the installation；



3-1 Diagram of the reserved space around the equipment installation

3、 wiring

☞ Note: For installation safety, we recommend a wiring sequence;
⚠ Warning: prohibit the load end from connecting electrical equipment exceeding the

surge power of the controller to prevent damage to the controller!

Warning: when you need to move, make sure that all wiring is fixed, because the virtual connection point may lead to heat accumulation, serious fire;

Step 1: connect battery, photovoltaic module, fan, load, monitoring background (optional);

The battery, load, fan, photovoltaic module, monitoring background (WIFI module / GPRS module)(optional) in turn, the wiring process disconnected all switches, pay attention to distinguish between positive and negative cable access, refer to the following wiring diagram;

Before connecting the battery, make sure the battery is in normal condition to ensure the normal operation of the system.

Warning: do not connect the photovoltaic panel to the battery terminal of the controller, otherwise it will burn out the controller.

Battery positive and negative terminal connection is strictly prohibited, will damage the controller, please operate carefully.

Strict use of ordinary network cable as communication cable, communication cable production with reference to specific communication instructions.

Step 2: Wiring Diagram

The corresponding external equipment cable is connected to the terminal through the upper and lower side mounting holes of the housing;

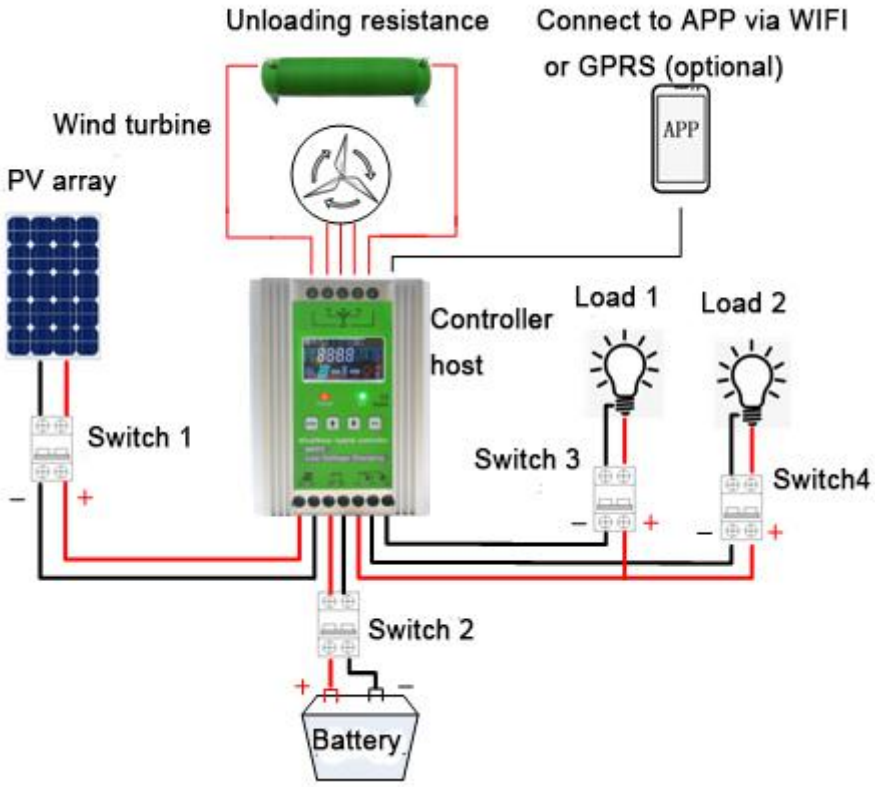


Figure 3-2 Controller wiring

Note: Support WIFI module and GPRS module expansion to achieve APP cloud monitoring (optional), see the APP instructions;
Controller default lead-acid battery, if connected to other types of batteries need to carry out the corresponding battery type and series set, see the APP instructions related to the settings;;

Warning!
1. Electric shock is dangerous! No bare-hand contact with live components of high voltage photovoltaic modules;
2. Make sure the solar array voltage does not exceed the maximum input voltage range of the controller;
3. The system needs to connect the inverter, please connect the inverter directly to the battery, do not connect with the load end of the controller;

Step 3: Check the connection
Check that all wiring polarity is correct and terminals are locked;
Step 4 : startup sequence
It is suggested that the order of switching on and off: closing battery switch, photovoltaic switch, fan switch and load switch in turn;

4、 PV array requirements

Table 3-1 PV electrical parameters:

PV electrical parameters				
System rated voltage/V	12	24	48	--
Maximum open circuit voltage for PV arrays/V	27.6	55.2	105	--
Maximum open circuit recovery voltage for PV arrays/V	26.4	52.8	100	--
Minimum operating voltage for photovoltaic arrays/V	>Vbat+1V	>Vbat+1V	>Vbat+1V	--
PV module power range/W	≦500	≦800	≦1000	--

5、 Fan terminal voltage requirements

Table 3-2 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 for fans/V	25.6	51.2	102.4	--
Wind turbine power range/W	≦500	≦800	≦1500	--

6、 Cable Selection Requirements

The following table shows the size of the copper wire diameter converted according to the current The actual cable size is greater than or equal to the data in the table:

Table 3-3 Cable Size：

Cable Selection Table					
Current level/A	5	10	20	30	40
Wire diameter/mm 2	1	1.5	2.5	4	6
AWG	16	14	11	9	8

Four. operation notice

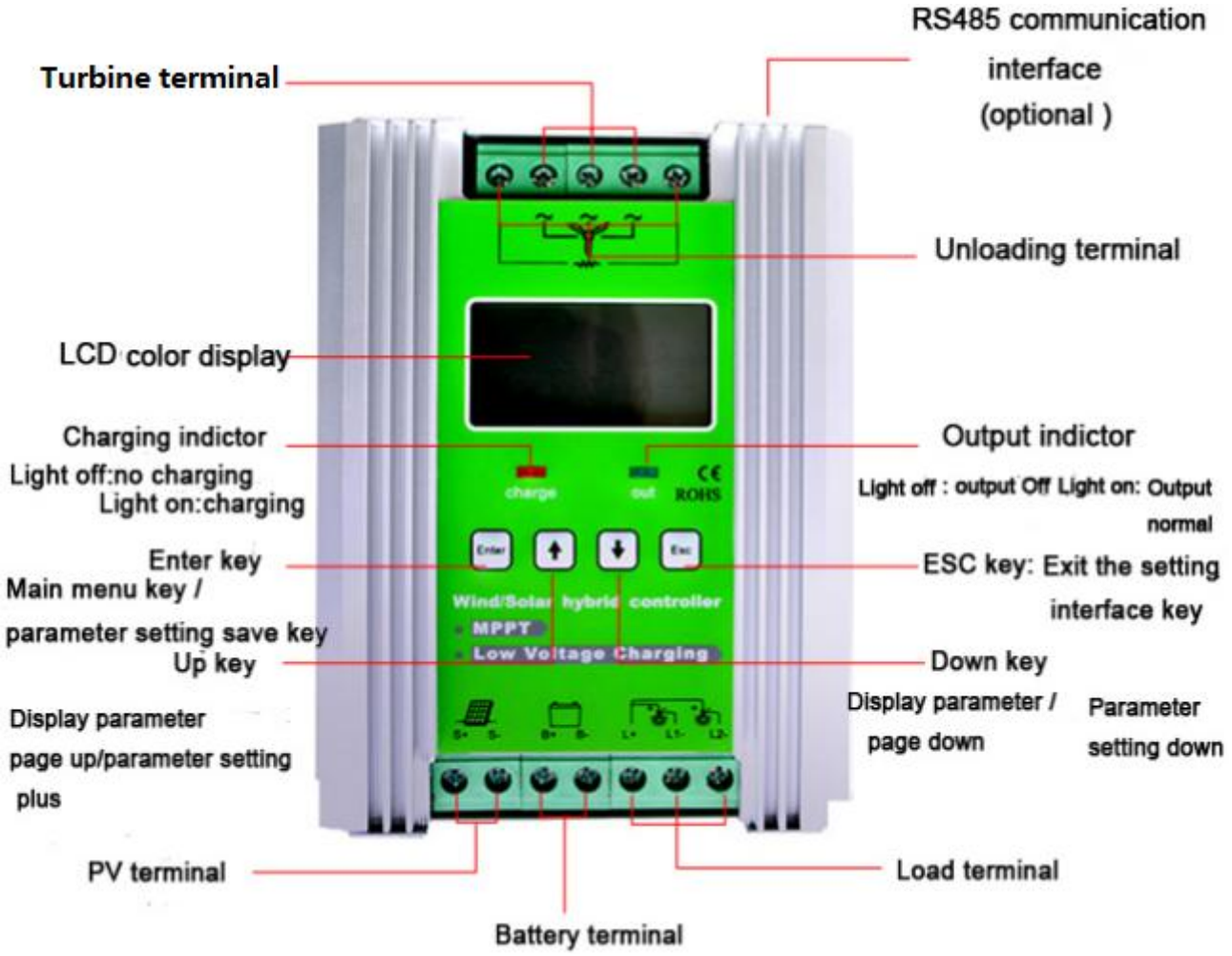


Figure 4-1 Display Panel Picture

4.1、Indicator function

LED indicator lights on the display panel are charge indicator lights (red), output indicator lights (green), function definitions are shown in the table below.

Table 4-1 Indicator Definition

No.	Indicator	Status	Definition	Remark
1	Charge indicator (red)	Light off	No charging	
2		Light on	Charging	
3	Output indicator （green）	Light on	Output normal	
4		Light off	Output closed	

4.2、Key

Table 4-2 key function

Key	Key function	remark
Enter	Function 1: main menu key, function 2: parameter setting save key	
Esc	Exit setting interface key;	
UP	Function 1: display parameters up page, function 2: parameter settings plus;	
DOWN	Function 1: display parameters down page, function 2: parameter setting minus;	
Note: restore factory settings: under the main interface, press the ESC first, then press the DOWN,, then release the DOWN and then release the ESC		

UP and DOWM button up and down page switching function：

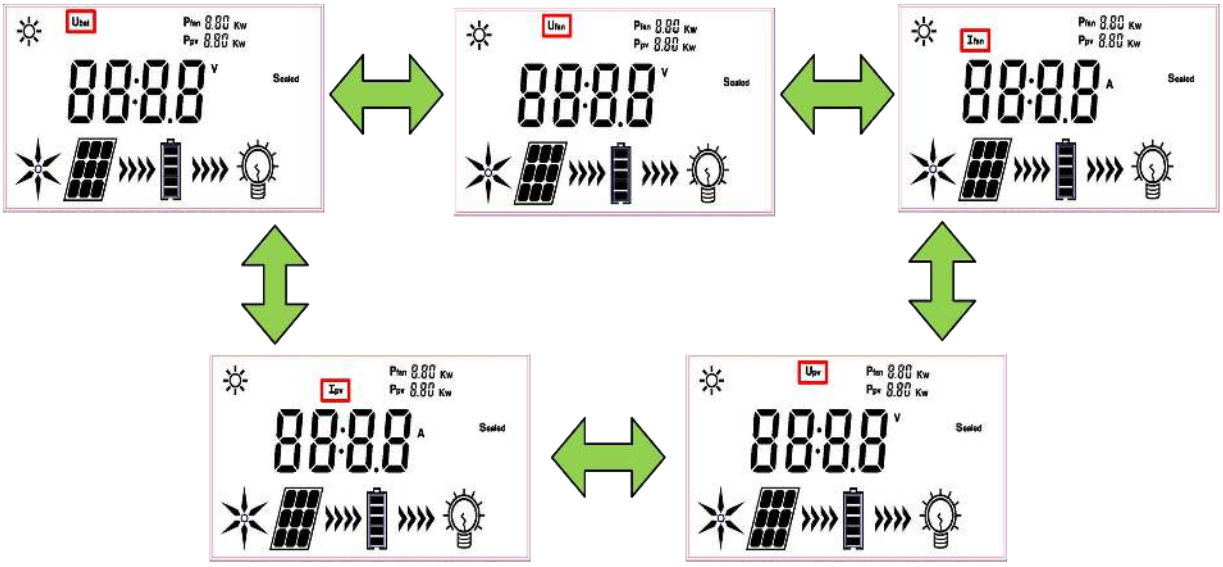


Figure 4-2 UP and DOWM key display interface switch diagram

4.3、LCD display

The display of the controller adopts the display mode of segment code screen, and the layout diagram of the display screen is as follows:

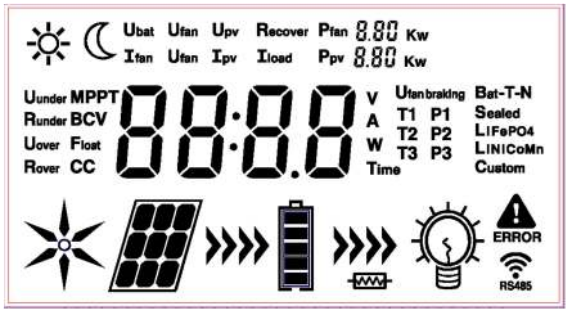


Figure 4-3 Display Layout

Table 4-3 Icon function introduction

Icon Name	Definition	Function declaration
	Day	The icon indicates daylight
	Night	The icon indicates night
	Fan	The icon lights up to indicate fan access and turns
	PV panel	Icon lit to indicate check for PV array access
	Battery V Capacity	The icon lights up to indicate battery access, and its internal scale indicates battery power
	Load	Load lights up to indicate load output
	Status icon	The icon lights up and scrolls to indicate charging and discharging states, respectively
ERROR	Fault icon	Icon flashing indicates system failure
RS485	Communicatio -n icon	Icon highlighted on a communication connection
	Unloading icon	The icon lights up to indicate fan unloading

Table 4-4 Field Function Description

Field Name	Definition	Function declaration
U bat	Battery voltage	Field lit up to display the current battery voltage value in the data display area
U fan	Fan voltage	The field lights up and displays the current fan voltage in the data display area
U pv	PV panel voltage	Field lit up to display the current PV panel voltage value in the data display area
I fan	Fan charging current	The field lights up and displays the current fan charging current value in the data display area
I pv	PV charging current	Field lit up to display the current PV charging current value in the data display area
P fan	Fan charging power	Field lights up, corresponding to display applicable fan charging maximum power value
P pv	PV charging power	The field lights up, corresponding to display the maximum power value of photovoltaic charging
Uunder	Over	The field lights up, and the battery undervoltage voltage can be

	discharge voltage	set. When the battery is undervoltage, the field flashes
R under	Over-discharge return	The field lights up battery undervoltage return voltage can be set
U over	Overcharge voltage	The field lights up and the battery overvoltage protection value can be set. When the battery overvoltage, the field flashes
R over	Overcharge Return	Field lights up, battery overvoltage return voltage can be set
MPPT	Quick charge	Field flashes indicating the current fan MPPT fast charging status
BCV	Boost charging	The field lights up, the battery can be set to increase the charging voltage, and the field flashes during the boost charging stage
Float	Floating charge voltage	The field is lit to set the battery float voltage and the field flashes
CC	Photovoltaic constant	Field flashing, indicating current PV in fast constant current charging state
U fan braking	Fan Unloading	Field light up, can set fan unloading voltage value；
Time	Household and street lamp models	Field lights up, can set street lamp and household mode ,"24 H" for household mode, load has been output, when setting other numbers to represent street lamp mode, its number has no specific meaning only means street lamp mode. The output is controlled by T1、T2、T3 and P1、P2、P3, default is "15 H"
T1	Time control period 1	Field lights up, indicating that in streetlight mode can be set to control the first time light time, default 15 H;
P1	Time 1 Brightness	The field lights up, indicating that the output power of the first time period can be set in street default 100；
T2	Time control period 2	Field lights up, indicating that in streetlight mode can be set to control the second period of light time, default H 00；
P2	Time 2 Brightness	The field lights up, indicating that the output power of the second time period can be set in streetlight mode, default 000；
T3	Time Control Period 3	The field opens that the third period lighting time can be set in street lamp mode, with default 00H；
P3	Time 3 Brightness	The field lights up, indicating that the output power of the third time period can be set in streetlight mode, default 000；
Bat-T-N	Battery Time 3 Brightness Type	The field lights up, you can set the battery type :1 for lead acid battery 2 for lithium iron phosphate battery 3 for ternary lithium battery 4 for custom；
Sealed	lead-acid cell	Field lit, battery type lead acid type；
LiFePO4	LiFePo4 battery	The field lights up and the battery type is LifePo4 battery；
LiNiCoMn	T0ernary lithium battery	The field lights up and the battery type is ternary lithium battery；
Custom	Custom	The field lights up and the number of series batteries can be

	settings	set according to the actual number of batteries in series. The default battery type is lead acid；

4.4 Settings

4.4.1、General parameter settings：

Press the set (Enter) button in standby mode, enter the undervoltage setting interface, the setting process refers to the following figure, press (Esc) button to exit the setting interface in any interface, return to the standby interface, Other conventional parameter settings are similar to undervoltage settings；

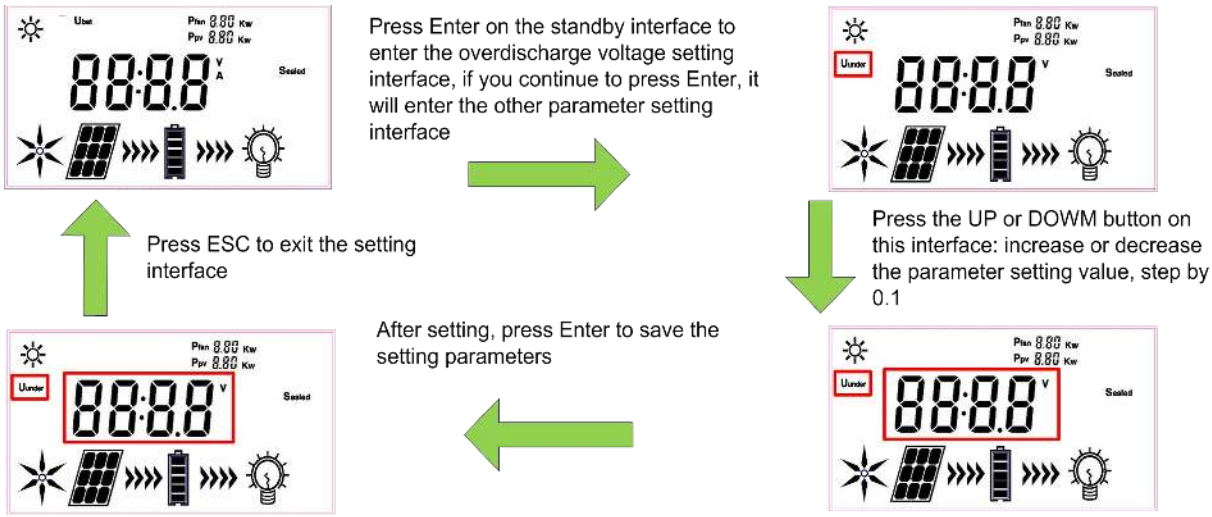


Figure .4-4 General parameter setting - Over discharge point setting

4.4.2、Battery type settings

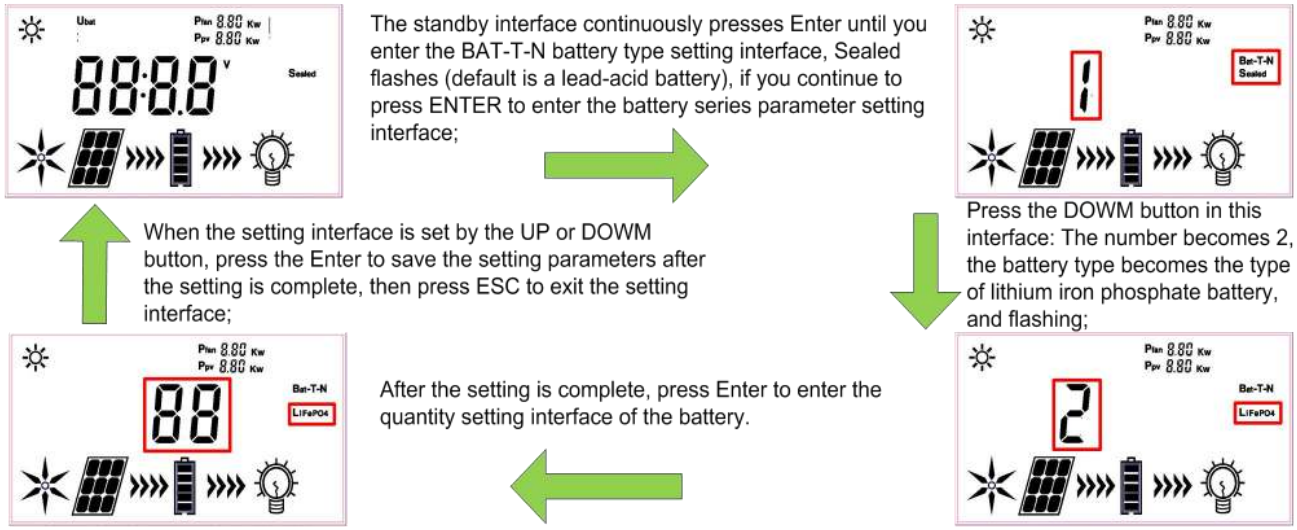


Figure 4-5 Battery type settings

Similarly, other battery types and custom modes can be set by the same method, and digital numbers, and battery type are shown as follows:

Table 4 - 5 Battery Setting Reference Table:

Number type	Battery type	definition
1	Sealed	lead-acid battery
2	LiFePO4	LiFePo4 battery
3	LiNiCoMn	Lithium ternary battery
4	Custom	Customize

4.4.3、 Time control parameter setting

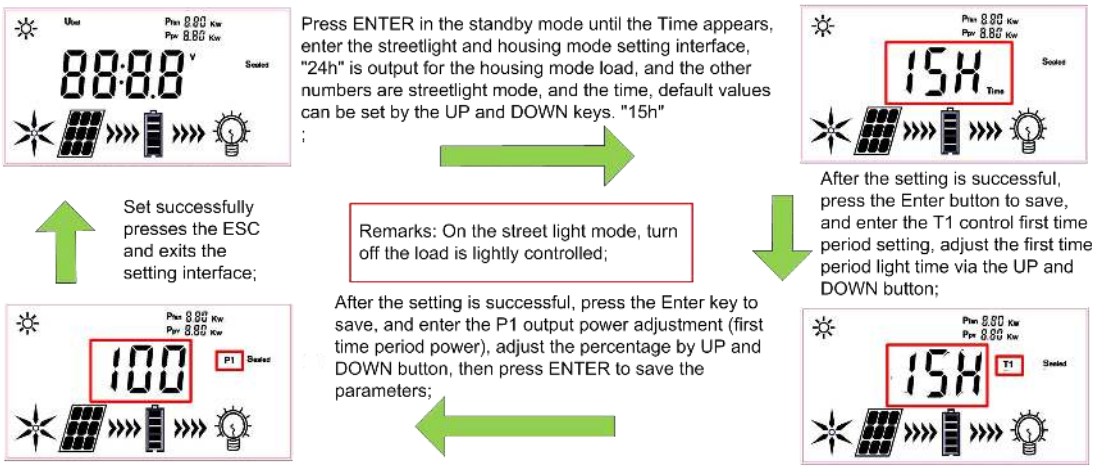


Figure 4-6 Time control parameter setting diagram

Note: the same method can be used to set the second time T2、 the second time output power P2 percentage and the third time T3、 the third time output power percentage;

4.4.4 、 APP (WiFi or GPRS mode) connection device settings, please refer to the corresponding APP manual；

Remarks	APP (WIFI or GPRS mode) is an option, and the device single communication can only take one way, not using two communication modes!

Five Device parameter

5.1 Protective function

Table 5-1 Refer to the table below for protection functions：

Protective function	**Explain**
Reverse polarity of photovoltaic modules	When the photovoltaic module is polar, the controller does not charge, can check the PV over and undervoltage alarm through APP, and the controller will not be damaged. After rewiring, the photovoltaic charging returns to normal operation。
PV under voltage protection	When the photovoltaic array charging voltage is lower than the controller input voltage range, the controller stops charging the battery pack。

PV over voltage protection	When the PV array charging voltage exceeds the controller input voltage range, the controller stops charging the battery pack；
Photovoltaic charging over current protection	When the photovoltaic array charging current exceeds the internal set value, the display screen reports IPV and ERROR flicker and stops charging;
Turbine under voltage protection	When the fan charging voltage is lower than the controller input voltage range, the controller stops charging the battery.
Turbine Over voltage Protection	When the fan charging voltage exceeds the fan unloading voltage, the controller opens the unloading function, and the display screen shows the unloading resistance icon on.
Battery polarity reverse	When battery polarity is reversed, the controller fuse or other devices will be damaged, battery terminal is not prohibited.
Battery undervoltage protection	When the battery voltage is lower than the set undervoltage value, the display screen displays the Uunder and ERROR flicker alarm, and automatically stops the load output to prevent the battery from being damaged by excessive discharge.
Battery overvoltage protection	When the battery voltage reaches the set value of overvoltage protection, the display screen displays Uover and ERROR flicker alarm, and automatically stops charging the battery to prevent the battery from overcharging and damaging.
Night-time protection	At night, because the battery voltage is larger than the photovoltaic module voltage, automatic protection prevents the battery voltage from discharging through the photovoltaic module;

5.2 Failure recovery

If the following faults occur, please follow the following methods to check and troubleshoot：

Table 5-2 Troubleshooting table

Fault	Indicator status and alarm icon	Possible causes	Resolvent
Array overvoltage	ERROR icon flicker	1. Large number of photovoltaic array series groups; ； 2.Battery and PV array mismatch；	Disconnect the photovoltaic array and reduce the number of photovoltaic array groups in series to ensure that the open circuit voltage of the photovoltaic array does not exceed the set values in Table 3-1 Photovoltaic Electrical parameters；
Battery overvoltag（over-charge）	UOVER ERROR and icon flicker	1.Controller over-voltage protection point below maximum charging range； 2.Battery ageing or over-discharge； 3.Large dynamic load changes； 4.Battery serial setting	1.Reset battery over voltage protection point via device key or APP； 2.Battery ageing needs to be replaced； 3.Reduce load dynamic changes； 4.Re-set the battery string number according to the actual number of battery series；

		is small	
Battery undervolt-age (over-discharge)	Uunder and ERROR icon flicker	Battery voltage value is below the under - voltage protection setting value； The number of batteries connected in series is 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, and heavy load can easily lead to under voltage protection phenomenon； 2.Disconnecting the load controller still alarm and the battery voltage is not restored to the over release recovery set value. Charge the battery pack through photovoltaic or other means until the battery pack voltage reaches the recovery point set point； 3.Re-set the battery string number according to the actual number of battery series；
	The indicator light is not fully on, and the display screen does not display	Battery voltage lower than equipment start-up voltage	A multimeter is used to test whether the voltage at both ends of the battery is below 7 V; Charge the battery pack by other means so that the battery pack voltage is more than 8 V .4；
Charging over current	IPV field and ERROR icon flicker	Over-current protection for photovoltaic charging to check abnormal current detection and mis-operation	If you can't solve the problem after restarting several times, you need to return to the factory for repair；
Remark ： Besides the battery under voltage can not be turned on, other faults can be viewed through the mobile phone（optional）；			

5.3 System maintenance

In order to maintain optimal long-term performance, it is recommended that the following checks be conducted twice a year.

(1) Make sure the controller is securely installed in a clean, dry environment.
(2) Make sure that the airflow around the controller is not blocked, and remove any dirt or debris on 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 of all electrical connection terminals as recommended.

(5) Check the grounding of all parts of the system and verify that all grounding conductors are firmly and correctly grounded.
(6) Check all terminals for corrosion, insulation damage, heat 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 has failed, replace the failed arrester in time to prevent lightning damage to the controller and even other equipment.



Note：Risk of electric shock!
The above operation must be carried out to ensure that all the power supply of the controller has been disconnected and then checked or operated accordingly！

Six Warranty

Controller has a free 1 year warranty starting from the date of sale.

The maintenance procedure determines that the controller does have problems against the user's manual before requiring maintenance.If it can not be solved, we can contact our technical customer service to help solve the problem, such as still unable to solve the problem of the controller can be delivered back to our company, freight prepaid, and provide purchase related date and location information.In order to enjoy the fast repair guarantee service, the returned product must indicate the model, serial number and detailed cause of the failure, as well as the type of components in the system and related parameters, battery and system load； This information is very important to quickly solve your maintenance requirements.

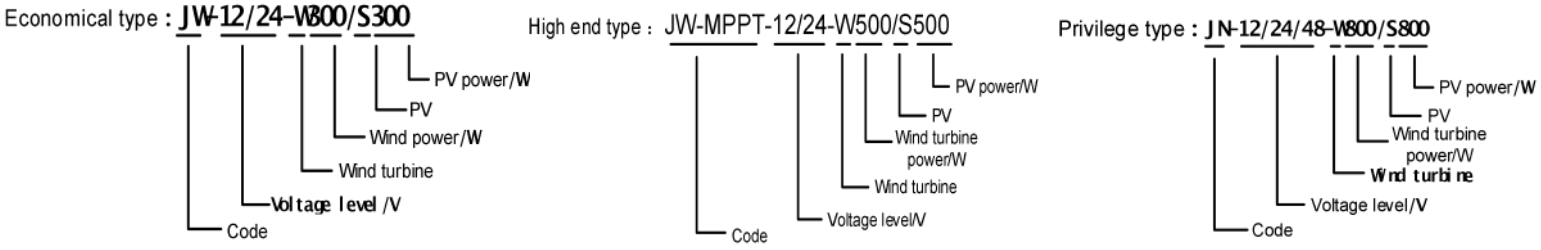
If due to customer reasons improper use or not in accordance with this manual to operate, resulting in controller damage, the company is not responsible! Maintenance procedures refer to the above procedures, only charged maintenance costs.

Statement: The Company reserves the right to product change subject to product updates without notice！

version number ：V1.0

Seven Device parameter

1. Model Description :



2. System parameter table

system parameter table									
Model	Econom-ical	JW-12-W300/S300	JW-12-W500/S500	JW-24-W600/S600	JW-24-W800/S800				
	High - end type	JW-MPPT-12-W300/S300	JW-MPPT-12-W500/S500	JW-MPPT-24-W600/S600	JW-MPPT-24-W800/S800				
	Privileg e type	JN-12-W300/S300	JN-12-W500/S500	JN-24-W600/S600	JN-24-W800/S800	JN-48-W800/S800	JN-48-W1000/S1000	JN-48-W1200/S1000	JN-48-W1500/S1000
Battery system voltage level(V)		12V		24V		48V			
Maximum open circuit voltage for PV arrays(V)		27.6		55.2		105			
Maximum open circuit recovery voltage for PV arrays(V)		26.4		52.8		100			
Minimum operating voltage for photovoltaic arrays (V)		>Vbat+1V		>Vbat+1V		>Vbat+1V			
PV rated current level (A)		25	40	25	33	17	21	21	21
PV module power(W)		≦300	≦500	≦600	≦800	≦800	≦1000	≦1000	≦1000
Fan rated voltage level(V)		12		24		48			

Maximum open circuit voltage for turbine (V)	25.6		51.2		102.4			
Wind turbine rated current(A)	25	40	25	33	17	21	25	31
Wind turbine power(W)	≦300	≦500	≦600	≦800	≦800	≦1000	≦1200	≦1500
Charge Limit Voltage(V)	Vbat>BCV+0.4V							
System identification voltage range(V)	DC9V~DC16V		DC18V~DC32V		DC42V~DC60V			
DC load output rated current(A)（LOAD1+LOAD 2）	≦30（Single maximum 15A)							
Transfer efficiency	＞98%							
Photovoltaic panel charging method	Three-stage：Constant current-boost charge-float charge							
Fan charging mode	Three-stage: MPPT charge (economical PWM charge)-lift charge-float charge							
Battery type	lead-acid cell 、Gel battery、LiFePo4、Ternary lithium、custom							
Working environment	-25℃ ～+55℃							
Storage temperature	-30℃ ～+70℃							
Protection level	IP21							
Humidity	10% ～ 90% No condensation							
Remarks：12V battery system: Wind turbine max. power is 500 W, solar max. power is 500 W; 24V battery system: Wind turbine max. power is 800 W, solar max. power is 800 W; 48V battery system: Wind turbine max. power is 1500 W, solar max. power is 1000 W;								

3. Reference table for battery parameters

Lead-acid cell (Single section 12V)				
System rated voltage(V)	12V system (1 string)	24V system (2 strings)	48V system (4 strings)	12V default values
Over voltage (Overcharge) (V)	13～17V	26～34V	52～68V	15.5V
Over voltage	13～17V	26～34V	52～68V	15V

return(V)				
Boost charging voltage(V)	9～15V	18～30V	36～60V	14.4V
Floating charging 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
Ternary lithium battery（Single section 3.7V）				
System rated voltage	12V system (default 3 string)	24V system (default 6 strings)	48V system (default 14 strings)	48V system (default 14 strings)
Over voltage (Overcharge) (V)	10.5～15V	21～30V	49～70V	13.5V
Over voltage return(V)	10.5～15V	21～30V	49～70V	12.6V
Boost charging voltage(V)	10.5～15V	21～30V	49～70V	12.4V
Floating charging voltage(V)	6～13.5V	12～27V	28～63V	12.0V
Under voltage(V)	6～13.5V	12～27V	28～63V	9.3V
Under voltage return voltage(V)	6～13.5V	12～27V	28～63V	10.5V
Range of strings	3～4	6～8	14～18	3
LiFePo4（single section 3.2V）				
System rated voltage	12V system (default 3 string)	24V system (default 6 strings)	48V system (default 14 strings)	3 strings default
Over voltage (Overcharge) (V)	9～12V	18～24V	42～56V	11.7V
Over voltage return(V)	9～12V	18～24V	42～56V	11.1V
Boost charging voltage(V)	9～12V	18～24V	42～56V	10.8V
Floating charging voltage(V)	9～12V	18～24V	42～56V	10.2V
Under voltage(V)	6～12V	12～24V	28～56V	8.4V
Under voltage return voltage(V)	6～12V	12～24V	28～56V	9.6V
Range of strings	3～4	6～8	14～18	3

Eight Installation size

8.1 Controller installation size :

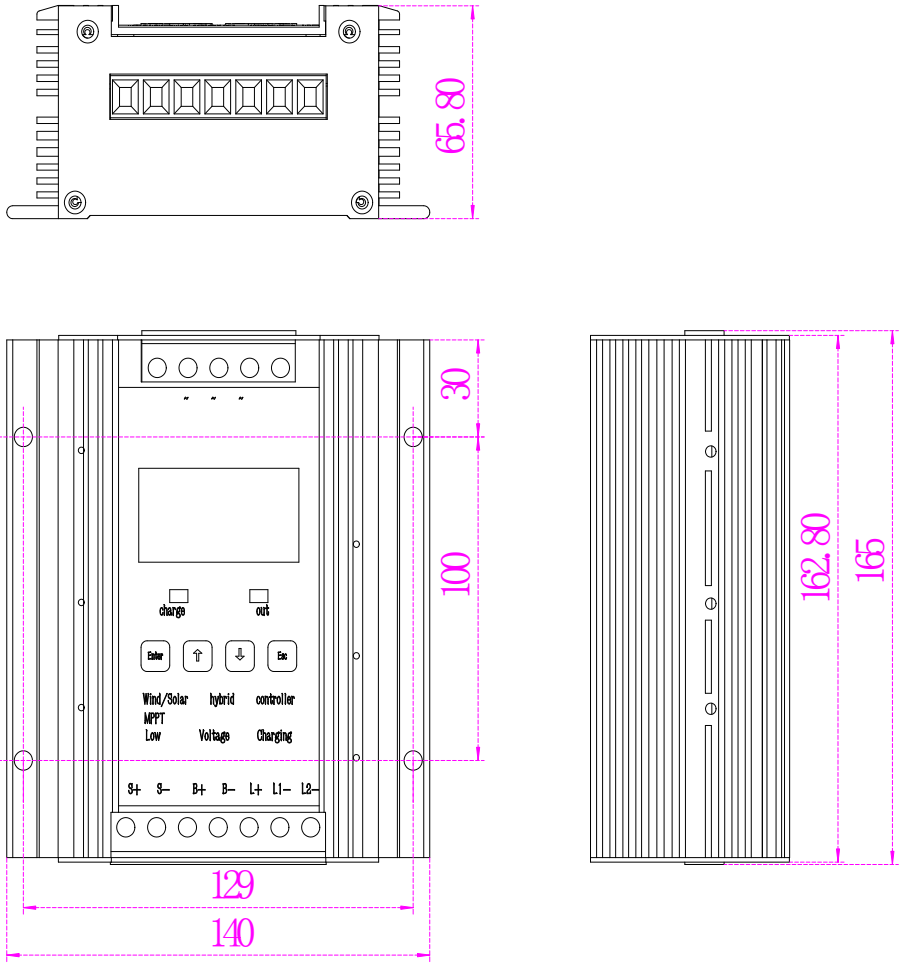


Figure 8-1 Installation size drawing unit (mm)

8.2 Unloading resistance installation size

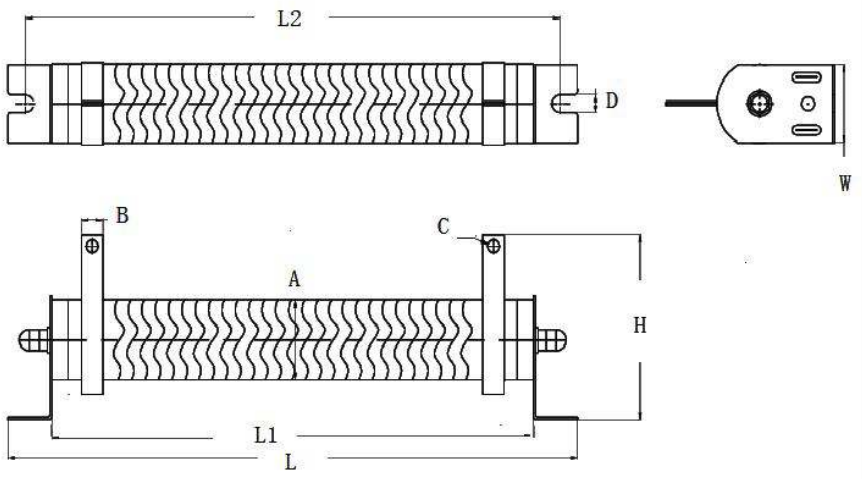


Figure 8-3 Dimensional drawing of unloading resistance

Table 8-1 Unloading resistor size 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 optional communication module accessories

No.	Name	Quantity	Remark
1	controller	1 set	
2	Product User Manual	1 piece	
3	Unloading resistance	1 piece	**(Economical type optional)**
4	RJ45 to WIFI module	1 piece	Communication optional
5	Special network	1 piece	
6	APP Operations Manual	1 piece	
7	RJ45 to GPRS module	1 piece	Communication optional
8	Special network	1 piece	
9	APP Operations Manual	1 piece	