

# JN Series Privilege Version Wind and Solar Hybrid Controller Product Manual



## Anhui JNGE Power Co.,Ltd

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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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## One Safe instructions

### 1.1 Safe signs

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

Safe symbol	Implication
 Danger	It means that if ignoring safety warning, it will lead to serious accident
 Warning	It means that if safety warnings are ignored, it will lead to serious accident , serious equipment damage or major business interruption.
 Notice	It means If ignoring safety warning, there is a risk of moderate equipment damage or partial business interruption.
 State	It means the content is additional information .

For electrical and electronic equipment, safety involves the whole process of installation, commissioning, operation and maintenance. So improper use or improper operation will endanger the life and personal safety of operators or third parties as well as the safety of equipment. In order to avoid casualties and damage to the equipment, the operation and maintenance should strictly follow all the following safety information tips, such as danger, warning and attention.

### 1.2 Safe notice



#### Warning !

All installation operations on the controller must be performed by a professional technician. Professional and technical personnel must undergo special training, complete the manual and master the safety related matters. .

The company shall not be liable for any injury caused by non-professional installation operation.

Failure to install and operate the controller according to the instructions in this manual will not be covered by our warranty.

#### ①Before Installation



#### Attention !

When getting product, check whether the controller is damaged during transportation . If you find any problem, please contact the company or the transportation company immediately.

#### ②During Installation

Before install the controller, Make sure the controller is not electrically connected and energized.



#### Warning !

The controller damage or other losses caused by the following circumstances will not be covered by our warranty.

When the photovoltaic array is configured, ensure that the maximum short-circuit current of the dc side is within the allowable range of the controller, otherwise it may cause irreparable damage.

When the photovoltaic array is configured, it is important to ensure that the open circuit voltage of each photovoltaic cluster string does not exceed the maximum input range of the controller, otherwise it will cause non-recoverable damage to the controller.

The charging current of the selected controller should not be greater than 0.3 times the battery capacity. If it is greater than 0.3 times the battery capacity, the battery will be damaged or the battery life

will be reduced.

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

Do not install the controller in flammable or explosive places or storage places for flammable or explosive materials.

Do not install the controller in an explosive location.

Do not install the controller where lightning strikes may occur.

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

The controller should be well ventilated when running.

The controller shall be installed in an upright position and shall ensure the air duct and other non-blocking conditions.



#### Warning!

Before all devices are not fully connected, Making sure to disconnect the photovoltaic array terminal, battery terminal, load terminal, etc. (circuit breaker) or fuse.

Prevented water from entering the inside of the JN Series controller.



#### Attention !

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

To ensure safe operation, proper grounding, proper conductor size and necessary short circuit protection are required.

The connection cable must choose the suitable specification, the connection is firm and the insulation is good.

After installation, check whether all wiring connections are tight to avoid the danger of heat accumulation caused by false connections.

### ③ Running



#### Danger!

Do not open the machine cover while the controller is powered!

### ④ Repair



#### Danger!

Maintenance work shall be carried out by professional maintenance technicians.

The machine needs to be cut off before maintenance. After the cut off, wait 5 minutes before dismantling the machine.

## Two Product Features

### 1、 Performance summary

Thank you for choosing the JN series Privilege Version Wind and Solar Hybrid solar charging controller. This series of products adopts advanced high-speed processor and MPPT control algorithm to ensure MPPT charging at low wind speed, featuring high response speed, high reliability and high industrial standard features.

The controller adopts color screen design, the display information is more comprehensive, the display interface is clearer, the controller supports WIFI module and GPRS module to expand and implement APP cloud monitoring. The controller is suitable for solar off-grid system, automatically controls charging and discharging, and can be applied in communication base stations, household systems, street lighting systems and field monitoring and other fields.

### 2、 Product features

- The display adopts color screen design, the display information is more comprehensive, the display interface is clearer, and the 4-key man-machine interface and operation setting are more convenient;
- The MPPT control algorithm used for fan charging ensures MPPT charging at low wind speed.
- Fan three-stage charging mode: MPPT charging-lifting charging-floating charging.
- Photovoltaic three-stage charging mode: CC constant current-lifting charging-floating charging.
- 12V/24V battery system automatically recognizes, or 12V/24V battery system automatically recognizes (Optional).
- RS485 communication can provide communication protocol to facilitate unified management and secondary development for customer.
- The controller operating parameters can be viewed and set through the mobile phone APP.( Optional )
- The controller has comprehensive protection functions such as overcharge, over discharge and overload;
- Lead-acid battery, ternary lithium battery, lithium iron phosphate, custom four battery types charging mode to choosing;
- The controller has various load control modes, the load has two outputs, and the output power and time can be set;
- The controller has wide adaptability, adaptive day and night;

### 3、 Product appearance

#### 3.1 product appearance

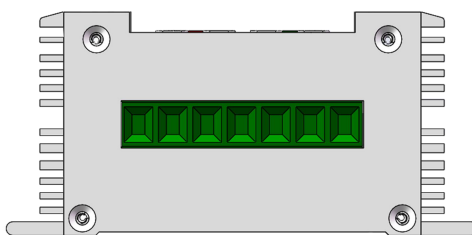


Picture 2-1 Product appearance size

Table2-1: Product quality size

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

#### 3.2 Interface Definition

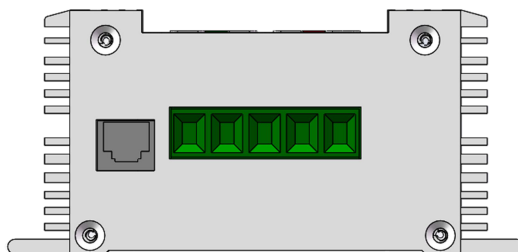


Picture 2-2 Product lower side connector

Table2-2 JN Series product lower side connection definition (From left to right)

No.	Name	Function	Explain
1	PV+	Photovoltaic array positive	Photovoltaic 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 (two-way load output common positive)
6	LOAD1-	DC load first negative	
7	LOAD2-	DC load second negative	

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



Picture 2-3 Product upper side connector

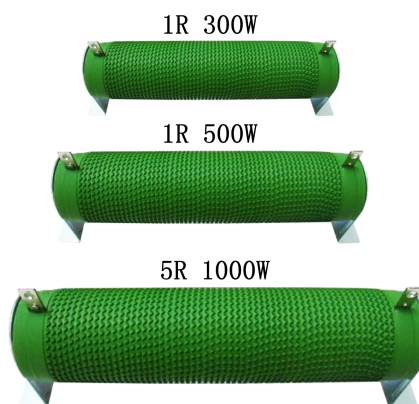
Table 2-3 JN Series product upper side interface definition (From left to right)

No.	Name	Function	Explain
1	RS485	Communication port	Realize the WIFI and GPRS communication monitoring
2	WP	Fan unloading positive	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	Fan unloading terminal

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

#### 4 Unloading resistance type

##### 4.1 Unloading resistance appearance



Picture 2-4 Unloading resistance

Table 2-4 Unloading resistance parameter table

Resistance type	Resistance parameter		Applicable fan type
	Resistance	Ppwer	
Porcelain tube ripple resistor	1R	300W	Fan power $\leq$ 300W
Porcelain tube ripple resistor	1R	500W	Fan power $\leq$ 500W
Porcelain tube ripple resistor	5R	1000W	Fan power $\leq$ 1500W

Remarks: Detailed installation size refer to item 8

##### 4.2 Unloading resistance working situation:



- 1, The charging current from the wind turbine is more than 1.2 times of the rated charging current.
- 2, The voltage from the battery is 0.1v higher than balance charge voltage.
- 3, The voltage from the battery is 0.1v higher than floating charge voltage.
- 4, The voltage from the wind turbine is higher than rated Unloading voltage.

## Three Installation Instruction

### 1、 Installation Notes

- (1) Read the entire installation section and familiarize yourself with the installation steps before installing.
- (2) Be very careful when installing the battery. For the installation of the open lead-acid battery, wear a protective mirror. When it comes into contact with the battery acid, please rinse it with clean water.
- (3) Avoid placing metal objects near the battery to prevent battery short circuit.
- (4) The battery may produce acidic gas when charging, ensuring good ventilation around the environment.
- (5) Please install indoors and outdoors to avoid direct sunlight and rain infiltration.
- (6) Phantom connections and corroded wires can cause excessive heat to melt the insulation layer, ignite surrounding materials, and even cause a fire. Therefore, it is important to ensure that the connectors are tightened and the wires are secured with a binding band to avoid loose connections caused by the shaking of the wires when moving applications.
- (7) The battery pack installed should match the charging voltage of the controller and the recommended range of charging current.



Danger! Explosion danger! Never install the controller and battery in the same confined space! Also do not install in a confined space where battery may collect.

### 2、 Installation instructions

Step 1: Choose the installation location

Avoid installing the controller in direct sunlight, high temperatures, and easy access to water, and ensure adequate ventilation around the controller.

Step 2: Unpacking and checking

- (1) Check the outer packaging for damage or deformation;
- (2) Unpacking inspection: one controller, one manual, one attachment, etc.;
- (3) Check appearance and accessories of the host are in good condition;

Step 3: fixed controller

Install the controller on the equipment platform or cabinet bracket through the mounting holes on both sides of the controller bottom casing, and reserve enough ventilation space around the installation.





Picture-1 Equipment installation space around

### 3、Wiring



Notes: For installation safety, we recommend a wiring sequence;



Warning: Do not connect the load terminal to electrical equipment that exceeds the surge power of the controller to prevent damage to the controller!



Warning: When it is necessary to move them around, make sure that all the wirings are fixed. Because the virtual connection points may cause heat to accumulate, it may cause fire in severe cases;

Step 1: Connect the battery, Fan, photovoltaic module, load, monitoring background;

Connect the battery, Fan, load, PV module, monitoring background (WIFI module / GPRS module) in turn, disconnect all switches during the wiring process, pay attention to distinguish between the positive and negative cable access, refer to the wiring diagram below;

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



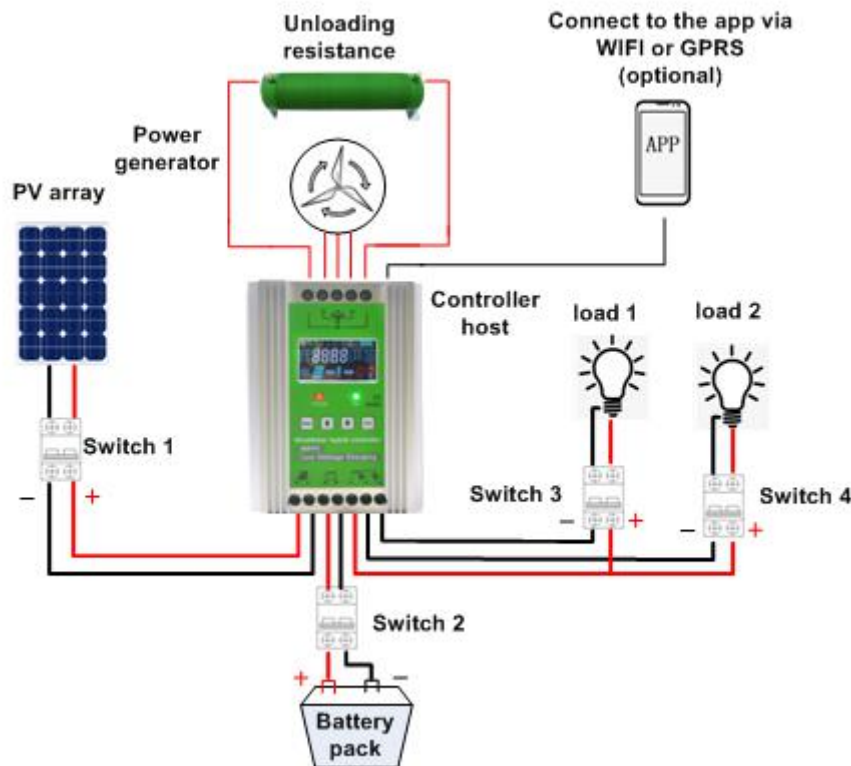
Warning: Do not connect the PV panel to the battery terminal of the controller, otherwise the controller will be burned out.

It is strictly forbidden to connect the positive and negative terminals of the battery. which will damage the controller. Please be careful.

It is Strictly to use ordinary network cable as communication cable, Which is produced by referring to the instruction manual of the specific communication method.

Step 2: Wiring Image

Connect the corresponding external device cable to the terminal through the upper and lower mounting holes of the chassis;



Picture 3-2 Controller wiring

Note: Monitoring background supports WIFI module and GPRS module expansion to achieve APP cloud monitoring (optional), see APP operation manual for details;  
The controller defaults to lead-acid batteries. If you need to connect the other types of batteries, you need to set the corresponding battery type and series number. For details, please refer to the relevant settings of the APP manual;

**Warning !**

1. Danger of electric shock! It is forbidden to touch the live parts of high voltage photovoltaic modules with bare hands;
2. Make sure that the solar array voltage in the system does not exceed the controller's maximum input voltage range;
3. The system needs to be connected to the inverter. Please connect the inverter directly to the battery, and do not connect to the load end of the controller.

**Step 3: Check the connection**

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

**Step 4: Power On Sequence**

Recommended opening sequence: sequentially close the battery pack switch, photovoltaic switch, fan switch or load switch; Turn off :Turn off the PV, fan and load switch before turning off 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 shows the diameter of the copper wire according to the current level. The actual cable size should be greater than or equal to the data in the table.:

Table3-3 Cable size:

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

## Four Operating Instructions



Picture 4-1 Display panel

#### 4.1、Indicator function

The LED indicators on the display panel are the charging indicator (red) and the output indicator (green). The function definition is shown in the table below.

Table4-1 Indicator definition

No.	Indicator light	status	definition	Remarks
1	Charging indicator (red)	Extinguished	No charging	
2		Normally bright	Charging	
3	Output indicator (green)	Normally bright	Normal output	
4		Extinguished	Output off	

#### 4.2 Key

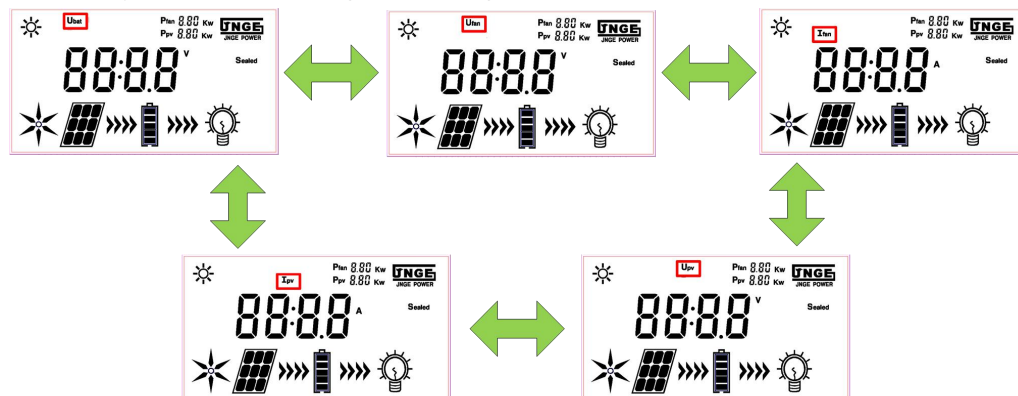
Table4-2 Key Function

Key	Key Function	Remarks
-----	--------------	---------

Address: No. 99, Yonghe Road, High-tech Zone, Hefei, Anhui, China Tel : 0551-65372576 <http://www.ahjnge.com>

Enter	Function 1: Main menu key, function 2: parameter setting save key;	
Esc	Exit the setup interface key;	
UP	Function one: Page up on display parameters; function two: parameter setting plus;	
DOWN	Function 1: Display page under parameter, function 2: parameter setting minus;	
Remark: Restore factory settings: In the main interface, press ESC first, then press DOWN, then release DOWN first and then release ESC;		

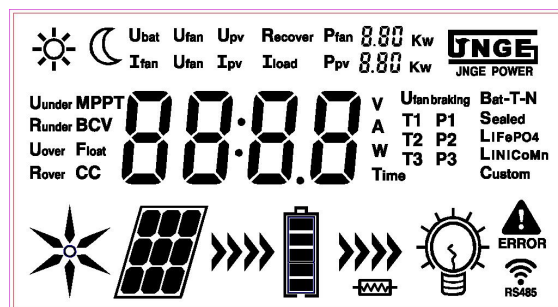
UP and DOWN key up and down page switching function:



Picture 4-2 UP and DOWN key display interface switching








### 4.3、LCD display

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



Picture 4-3 Display layout

Table4-3 Icon function introduction

Icon name	define	Function
	day	The icon lights up to indicate daylight
	night	The icon lights up to indicate the night
	Fan	The icon lights up to indicate that the fan is plugged in and turned
	Photovoltaic panel	The icon lights up to check the PV array access
	battery power	The icon lights up to indicate battery access and its internal scale indicates battery level
	load	The load is lit to indicate that the load has an output
	Status icon	The icon lights up and scrolls to indicate the charge status and discharge status, respectively.




	malfunction icon	The icon flashes to indicate that the system has a fault condition.
	Communication icon	The icon lights up to indicate that the communication is connected.
	Unloading icon	The icon lights up to indicate that the fan is unloading

Table4-4 Field function introduction

Name	define	Function
Ubat	Battery voltage	The field lights up and the current battery voltage value is displayed in the data display area.
Ufan	Fan voltage	The field lights up and the current fan voltage value is displayed in the data display area.
Upv	Photovoltaic panel voltage	The field lights up and the current PV panel voltage value is displayed in the data display area.
Ifan	Fan charging current	The field lights up and the current fan charging current value is displayed in the data display area.
Ipv	Photovoltaic charging current	The field lights up and the current PV charging current value is displayed in the data display area.
Pfan	Fan charging power	The field is lit, corresponding to the maximum power value of the applicable fan charging.
Ppv	Photovoltaic charging power	The field is lit, corresponding to the maximum power value of the applicable PV charging.
Uunder	Over discharge voltage	The field lights up to set the battery undervoltage voltage. This field flashes when the battery is under voltage.
Runder	Over discharge return	The field lights up to set the battery undervoltage return voltage
Uover	Overcharge voltage	The field lights up to set the battery overvoltage protection value. This field flashes when the battery is overvoltage.
Rover	Overcharge return	The field is lit and the battery overvoltage return voltage can be set.
MPPT	Fast charging	The field flashes, indicating that the current fan is in the MPPT fast charging state.
BCV	Increase charging	The field lights up, the battery can be set to raise the charging voltage, and the field flashes during the boost charging phase.
Float	Floating charge	The field lights up to set the battery float voltage, and the field flashes during the float phase.
CC	Photovoltaic constant current	The field flashes, indicating that the current PV is in a fast constant current state of charge.
Ufanbraking	Fan unloading	The field lights up to set the fan unloading voltage value;
Time	Household and street light mode	The field lights up, and the street light and household mode can be set. "24H" is the household mode. The load always has output. When other numbers are set, the street light mode is indicated. The number has no specific meaning and only indicates the street light mode. Its output is controlled by T1, T2, T3 and P1, P2, P3. The default value is "15H".
T1	Time control period 1	The field is lit, indicating that the lighting time of the first time period can be set in the street light mode, the default is 15H;
P1	Time period 1 brightness	The field is lit, indicating that the output power of the first time period can be set in the street light mode, the default is 100;
T2	Time control period 2	The field is lit, indicating that the time of the second time period can be set in the street light mode, the default time is 00H;
P2	Time period 2 brightness	The field is lit, indicating that the output power of the second time period can be set in the street light mode, the default value is 000;
T3	Time control period 3	The field is lit, indicating that the time of the third time period can be set in the street light mode, the default time is 00H;

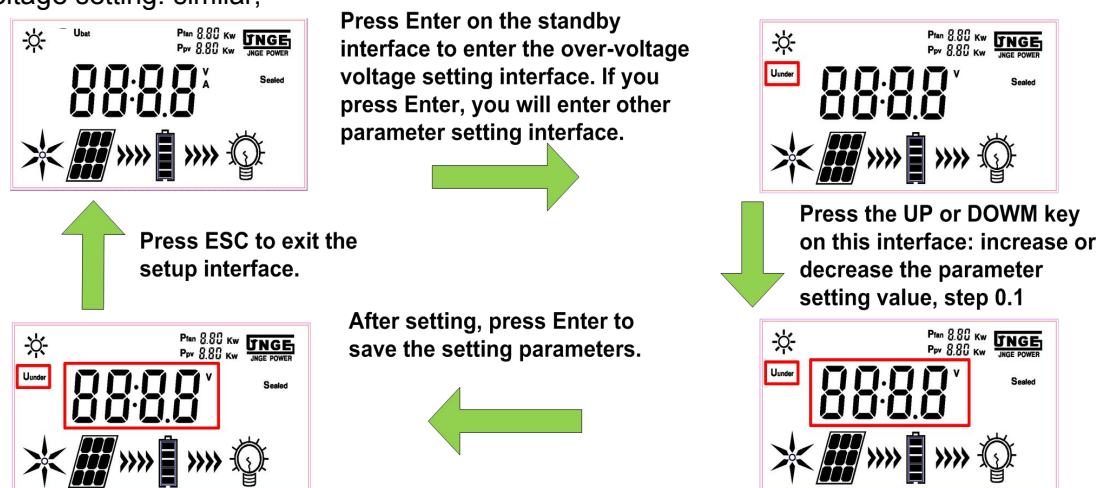


P3	Time period 3 brightness	The field is lit, indicating that the output power of the third time period can be set in the street light mode, the default value is 000;
Bat-T-N	Type of battery	The field is lit and the battery type can be set: 1 for lead-acid battery; 2 for lithium iron phosphate battery; 3 for ternary lithium battery; 4 for custom;
Sealed	Lead-acid batteries	The field is lit and the battery type is lead acid type;
LiFePO4	Lithium iron phosphate battery	The field lights up and the battery type is lithium iron phosphate battery;
LiNiCoMn	Ternary lithium battery	The field is lit and the battery type is a ternary lithium battery;
Custom	Custom settings	The field lights up, and the number of battery cells connected in series can be set according to the actual number of battery packs. The default battery type is lead acid;

## 4.4 Setup operation

### 4.4.1、General parameter settings:

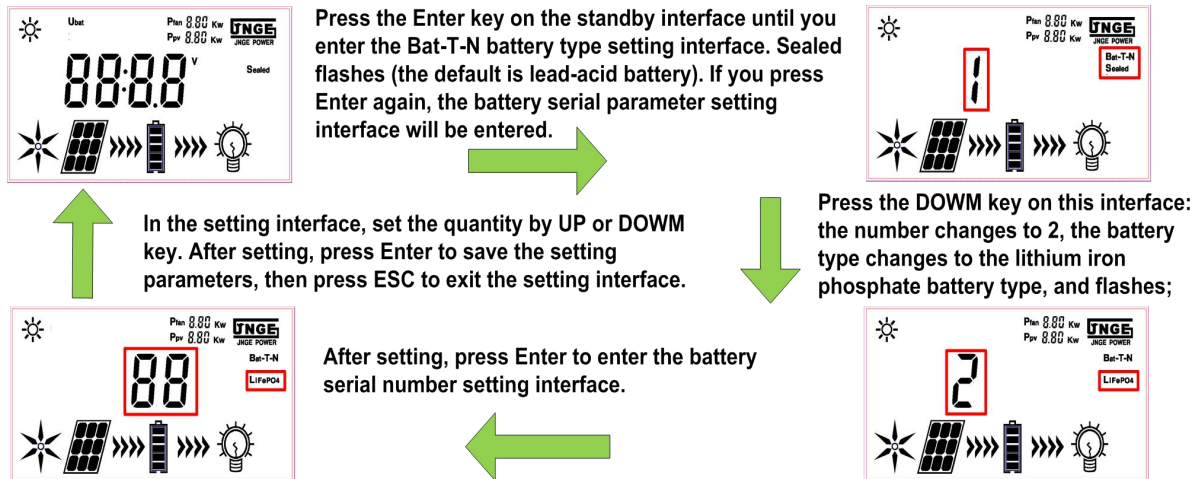
Press the Enter key in the standby mode to enter the undervoltage setting interface. Refer to the following figure for the setting process. Press the (Esc) button on any interface to exit the setting interface and return to the standby interface. Other general parameter setting items are the same as the undervoltage setting. similar;



Picture 4-4 General parameter setting--over-discharge voltage point setting

### 4.4.2、Battery type setting





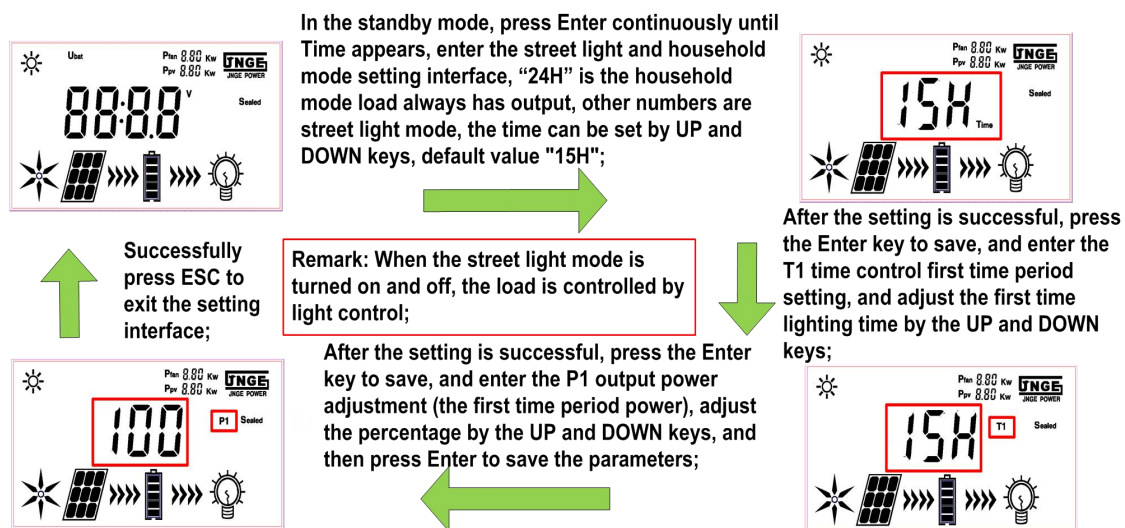
Picture 4-5 Battery type setting

Similarly, other battery types and custom modes can be set by the same method as above. The digital serial number and battery type reference table are as follows:

Table 4-5 Battery setting reference table:

Number type	type of battery	definition
1	Sealed	Lead-acid batteries
2	LiFePO4	Lithium iron phosphate battery
3	LiNiCoMn	Ternary lithium battery
4	Custom	customize

#### 4.4.3、 Time control parameter setting



4-6 Time control parameter setting

Picture

Remark: In the same way, the time and space second time period T2, the second time period output power P2 percentage and the space time third time period T3, and the third time period output power P3 percentage can be set;

4.4.4 、 APP (WIFI or GPRS mode) connection device setting method, please refer to the corresponding APP manual;



State

The APP (WIFI or GPRS mode) is an optional accessory. The equipment can only use one mode for single communication, and cannot use two communication modes at the same time!

## Five Equipment parameters

## 5.1 Protection function





Table 5-1 Protection function reference 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 undervoltage protection	When the PV array charging voltage is below the controller input voltage range, the controller stops charging the battery pack.
PV overvoltage 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 overcurrent protection	When the PV array charging current exceeds the internal set value, the display will report IPV and ERROR flashing and stop charging;
Fan undervoltage protection	When the fan charging voltage is lower than the controller input voltage range, the controller stops charging the battery pack.
Fan overvoltage 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.
Night anti-reverse protection	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 malfunction exclude

If the following symptoms occur, please check and troubleshoot as described below:

Table 5-2 Troubleshooting Table

Malfunction	Indicator status and alarm icon	Possible Causes	Solution
Array over voltage	 ERROR Icon 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)	 ERROR UOVE R and icon flashing	1. The over voltage protection point of the controller is lower than the highest value of the charging range; 2. Battery aging or over discharge; 3. Large dynamic changes in load; 4. The number of battery series is set too small;	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; 4. Reset the number of battery strings according to the actual battery serial number;
Battery under voltage (Over discharge)	 ERROR U Under and 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 multimeter 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	 ERROR IPV fields 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

In order to maintain the best long-term performance, it is recommended to conduct the following inspection twice a year.

- (1) Make sure controller is securely installed in a clean, dry environment.
- (2) Make sure airflow around the controller is not blocked and remove any dirt or debris from the radiator.
- (3) Make sure airflow around the controller is not blocked and remove any dirt or debris from the radiator.
- (4) Tighten screws to all electrical terminals as recommended.
- (5) Check grounding of all parts of the system and verify that all grounding wires are firmly grounded and properly grounded.
- (6) Check all terminals for signs of corrosion, insulation damage, high temperature or burning, discoloration, and tighten terminal screws to recommended torque.
- (7) Check for dirt, nesting insects and corrosion and clean as required.
- (8) If arrester has failed, replace the failed arrester in time to prevent the controller or even other users' equipment from being damaged by lightning.



Note: Electric shock risk! !

Make sure all the power supply of the controller is disconnected before checking or operating accordingly!

## Six Warranty

The controller has a one-year free warranty and the warranty period begins on the date of sale. Repair Procedures Before requesting repairs, check the user manual to determine if the controller does have a problem. If you can't solve it, you can contact our technical customer service to help solve the problem. If you still can't solve it, you can send the problem controller back to the company, prepaid the freight, and provide the date and place information related to the purchase. In order to enjoy the rapid repair guarantee service, the returned products must be marked with the model number, serial number and the detailed cause of failure, as well as the type of components in the system and related parameters, battery and system load; This information is important to quickly resolve your maintenance requirements.

If controller is damaged due to improper use or failure to follow this manual, the company shall not be responsible for it. The maintenance procedure is carried out according to the above procedure, and only the maintenance cost fee is charged.

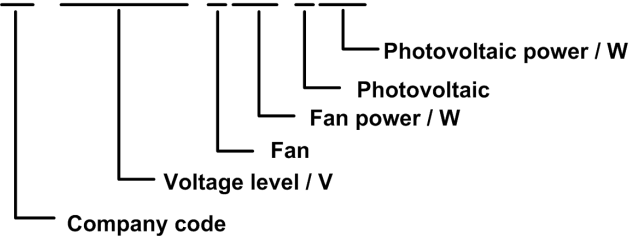
Disclaimer: The company reserves the right to change products, product updates without prior notice!

Version number: V1.0

## Seven Equipment parameters

### 1. Model instruction:

Controller naming method: **JN-12/24/48-W300/S300**



### 2. System parameter table

Parameter Name	Product model							
	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)	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)	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			
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 maximum power of the fan is 500W, and the maximum power of the PV is 500W; 24V battery system: the maximum power of the fan is 800W, and the maximum power of the PV is 800W. 48V battery system: the maximum power of the fan is 1500W, and the maximum power of the PV is 1000W.			

### 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℃ ~50℃	
Storage temperature	-30℃ ~70℃	
Humidity (℃)	10% ~ 90% No condensation	
Protection level	IP30	

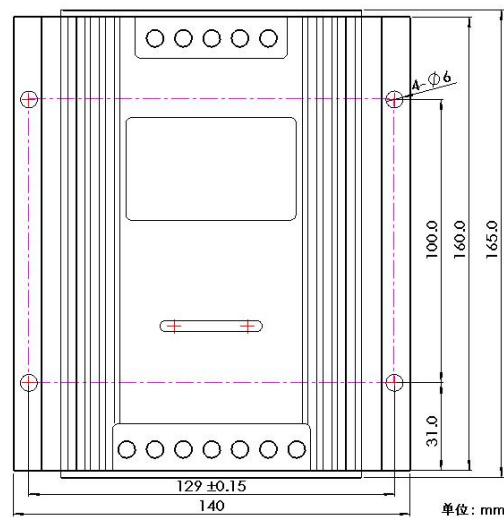
### 4. Battery parameter reference table:

Lead acid battery (single 12V)				
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
Undervoltage(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 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
Lithium iron phosphate (single section 3.2V)				
System rated voltage	12V system (default	24V system (default	48V system (default	3 string defaults

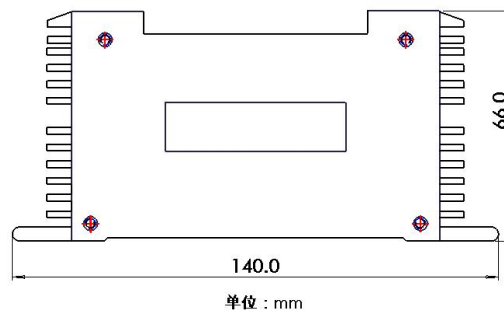
	3 strings)	6 strings)	14 strings)	
Overvoltage (overcharge) (V)	9~12V	18~24V	42~56V	11.7V
Overvoltage return (V)	9~12V	18~24V	42~56V	11.1V
Increase charging voltage (V)	9~12V	18~24V	42~56V	10.8V
Floating charge voltage(V)	9~12V	18~24V	42~56V	10.2V
Undervoltage(V)	6~12V	12~24V	28~56V	8.4V
Undervoltage return voltage (V)	6~12V	12~24V	28~56V	9.6V
Number of strings	3~4	6~8	14~18	3

## Eight Installation Size

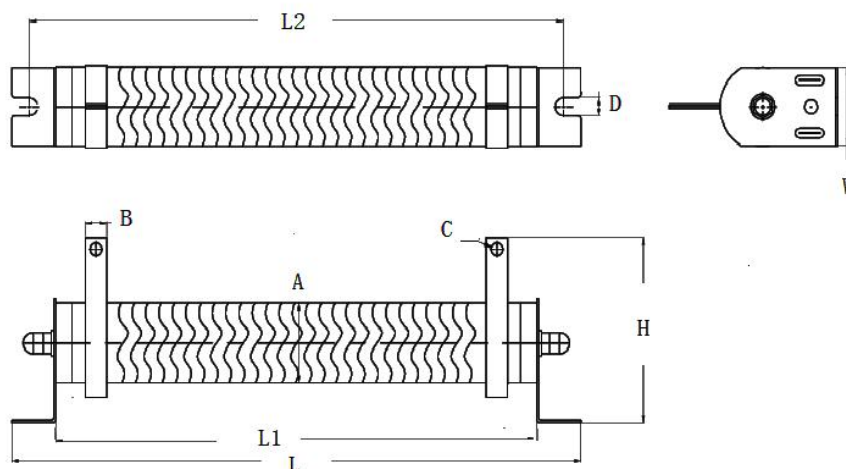
### 8.1 Installation Dimension of the whole machine



Picture 8-1 Controller installation size 1





**Picture 8-2 Controller installation size 2****8.2 Unloading resistance installation size****Picture 8-3 Unloading resistance size****Table 8-1 Unloading resistance dimension 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 method module attachment matching

No.	Name	Quantity	Remarks
1	controller	1 set	
2	Product manual	1 serving	
3	Unloading resistance	1 piece	According to the fan capacity
4	RJ45 to WIFI module	1 set	
5	Special network cable	1 piece	
6	APP Operation Manual	1 set	Optional
7	RJ45 to GPRS module	1 item	
8	Special network cable	1 piece	
9	APP Operation Manual	1 serving	